Staff Assessment

VALERO COGENERATION PROJECT

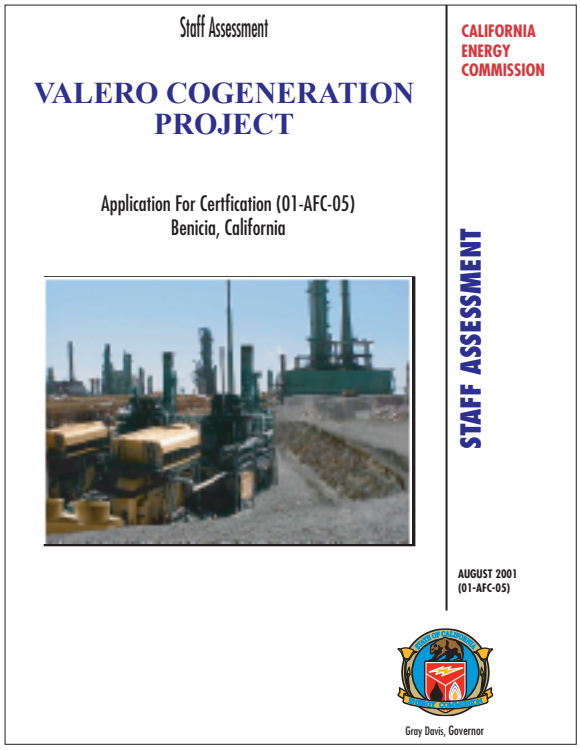
Application For Certfication (01-AFC-05)
Benicia, California

CALIFORNIA ENERGY COMMISSION

STAFF ASSESSMENT

AUGUST 2001
(01-AFC-05)

Gray Davis, Governor



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EXECUTIVE SUMMARY

Jack W. Caswell

INTRODUCTION

This Staff Assessment (SA) contains the California Energy Commission (Energy Commission) staff's evaluation of Valero Cogeneration Project (VCP) Project Application for Certification (AFC) (01-AFC-5). The proposed VCP electric generating plant is under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification.

Staff is an independent party in the proceedings. This SA is a staff document, presenting staff's independent analysis. It examines engineering and environmental aspects of the VCP, based on the information available at the time the SA is prepared. The SA contains analyses similar to those contained in Environmental Impact Reports required by the California Environmental Quality Act (CEQA). It is not a Committee document nor is the SA a final or proposed decision on the proposal. The SA presents staff's independent assessment, recommendations and proposed conditions of certification that would apply to the design, construction, operation, and closure of the proposed facility, if it is certified.

BACKGROUND

On May 7, 2001, the Valero Refining Company of Benicia, CA., filed an Application for Certification (AFC) for the Valero Cogeneration Project (VCP). The Energy Commission staff has reviewed the AFC for data adequacy. The AFC was determined to be data adequate by the Energy Commission at the June 6, 2001 Business Meeting, thus beginning the Energy Commission's review of this project.

In light of California's energy emergency, Senate Bill 28X and Public Resources Code, section 25552, requires the Energy Commission to expedite, to the extent feasible, a 120 day or less time frame for the processing of applications for certification for projects like VCP generating electricity in the simple cycle mode to be on line by December 31, 2002. The Energy Commission staff has proposed that this permitting process be completed in 95-120 days. The Committee adopted a schedule on the order of 95 days, as proposed by Staff.

The analyses contained in this SA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests, workshops and site visits; 4) supplementary information from federal, state and local agencies; and 5) existing documents and publications.

PROJECT DESCRIPTION

Valero Refining Company is proposing to construct and operate the Valero Cogeneration Project (VCP). The site is located at the existing refinery location at 3400 East Second Street, Benicia CA., Solano County, Assessor Lot Number 90-110-03,

VCP will be a nominally 102 megawatt (MW) cogeneration Power plant. The proposed facility will include two combustion turbine generators (CTGs) equipped with water injection to control oxides of nitrogen (NOx) emissions and associated support equipment. The project will be visually compatible with the existing refining equipment in the adjacent areas. The power plant area will be accessed via the existing roads and streets within the refinery. The power plant will consist of a two GE gas turbines (LM6000 - PC Sprint) with chillers, fuel gas compression facilities, power generators, heat recovery steam generators (HRSG), SCRs for emission control, and associated instrumentation, piping, and wiring. The produced power will be conveyed through underground cables to the new Valero switch house within the refinery. As a result of this project, the refinery will not require the current power consumed from the California electrical grid. A more complete description of the project is contained in the **PROJECT DESCRIPTION** section of this SA.

STAFF'S ASSESSMENT

Each technical area section of the SA contains a discussion of impacts, and where appropriate, mitigation measures and conditions of certification. The SA includes staff's assessments of:

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

In this SA, the staff has completed its analyses and has made recommendations in all of the technical areas contained in the SA. Listed in the table below is a summary of the technical sections showing the most significant potential impact level for that section. For details on the impacts you should refer to the technical section in this staff assessment. Staff believes that if the mitigation measures suggested in this document and conditions of certification are implemented, VCP will be in compliance with the applicable LORS, and no significant adverse direct, indirect, or cumulative impacts will occur.

Environmental and Engineering Check List	No Impact	Less Than Significant Impact	Less Than Significant Impact With Mitigation	Potentially Significant Impact
ENVIRONMENTAL				
Air Quality			X	
Biological Resources		X		
Cultural Resources		X		
Geology & Paleontology			X	
Hazardous Materials		X		
Land Use	X			
Noise			X	
Public Health		X		
Socioeconomic Resources		X		
Soil & Water Resources			X	
Traffic & Transportation	X		X	
Transmission Safety Nuisance		X		
Visual Resources			X	
Waste Management		X		
Worker Safety	X			
ENGINEERING , No Check List				
Efficiency	X			
Facility Design	X			
Reliability	X			
Transmission System Engineering		X		

Noteworthy issues remain with the following section. For a more detailed review of potential impacts for all sections see staffs technical section in this SA.

Waste Management

The Phase I Environmental Site Assessment (ESA- Application Appendix H) identified certain historical activities that could have resulted in contamination at the site. The Department of Toxic Substances Control submitted comments stating that the soil should be characterized prior to construction to determine if is has been impacted by a hazardous substance release (DTSC 2001a, p. 3). A work plan for the testing of soil and water has been provide by the applicant, If the test results show any significant contamination the applicant will be required to execute the clean up work plan prior to any ground disturbance. If clean up is required there will be a significant delay in the project.

ENVIRONMENT JUSTICE

Staff conducted an environmental justice analysis for the proposed Valero Cogeneration Project based on U.S. Environmental Protection Agency Guidance. Using Census 2000 data, staff determined that a minority population of greater than 50 percent exists within a six-mile radius of the proposed project. Staff uses a six-mile radius as the potential

affected area to be consistent with the area evaluated for cumulative air quality impacts. Several technical areas in this Staff Assessment include an environmental justice evaluation. Staff did not find a potential significant impact or disproportionate impact on the minority population, or any other population, and as a result there are no environmental justice issues associated with the Valero Cogeneration Project.

In addition to staff's regular notices or workshops and hearings, the Energy Commission's Public Advisor arranged to have 10,000 flyers discussing the Valero project inserted into the July 5th edition of the Benicia Herald.

SPECIAL FINDINGS REGARDING FOUR-MONTH REVIEW

Public Resources Code section 25552 establishes a four-month review process for qualifying power projects. That process was applied to the Valero Cogeneration Project. Section 25552 sets forth several requirements for approval of a Certification, which we address by proposing the following findings for adoption by the Energy Commission. Each proposed finding is followed by evidence or references to evidence supporting the finding.

Special Finding 1: The proposed powerplant, by itself, is not a major stationary source but is a modification to a major stationary source. It will be equipped with best available control technology for all pollutants except PM10 and SO_2. Public Resources Code Section 25552(d)(1) requires that, in order to qualify for approval under the Commission's 4-month review process, a powerplant be neither a major stationary source nor a modification to a major stationary source and that BACT be used for all pollutants. Although the proposed powerplant does not fully satisfy those requirements, the Energy Commission finds it necessary and appropriate to suspend the requirements of that subsection in order to allow the approval of this project. The project will benefit the residents of California by providing additional electrical power in a time of great need for additional generating capacity. Suspension of the subsection's restrictions is authorized by Governor's Executive Order D-26-01.
Required by: Section 25552(d)(1)
Supporting Evidence: The Air Quality section of this Staff Analysis indicates that the project is not a major stationary source in itself but is a minor modification of a major stationary source—the refinery as a whole. In addition, BACT is not being used for two pollutants—PM10 and SO2. Because neither pollutant is projected to be emitted at rates that exceed specified thresholds, the Air District's rules do not require BACT for them. The refinery gases that are proposed as fuel contain higher concentrations of sulfur than natural gas and therefore produce higher concentrations of PM10 and SO2 when combusted. BACT for PM10 and SO2 would require the exclusive use of natural gas to fuel the powerplant. BACT is used for all other pollutants, however. The refinery gases will be scrubbed to reduce sulfur levels to the lowest levels practicable. The exclusive use of gaseous fuels will limits the formation of PM10 emissions compared to liquid and solid fuels. The resulting emissions, including PM10 and SO2, are fully offset by emissions credits and other reductions in emissions at the refinery.

Under the Governor's Emergency Order D-26-01 the Energy Commission is authorized to suspend restrictions in Section 25552 "to the extent that they would prevent, hinder,

or delay the prompt mitigation of the effects of [California's energy] emergency." The additional electricity generating capacity provided by the proposed project will clearly help mitigate the emergency and it is appropriate to relax the requirements of Section 25552(d)(1).

Special Finding 2: The proposed powerplant and related facilities will not have a significant adverse effect on the environment or the electrical system as a result of construction or operation.
Required by: Section 25552(d)(2)
Supporting Evidence: The remaining sections of this Staff Analysis examine the potential environmental effects of the proposed project and find no significant adverse effects.

Special Finding 3: The applicant has contracted with a general contractor and has contracted for an adequate supply of skilled labor to construct, operate, and maintain the proposed powerplant.
Required by: Section 25552(d)(3)
Supporting Evidence: The applicant indicates that it has contracted with EDG Power Group of Tulsa, Oklahoma to engineer, design and construct the powerplant (AFC, p 2-4) and that it will be operated with existing refinery personnel who have experience with similar turbines and related equipment in the refinery (AFC, p 7-3).

Special Finding 4: The conditions of approval of the proposed project will:
(1) Assure that the proposed powerplant and related facilities will not have a significant adverse effect on the environment as a result of construction or operation;
(2) Assure protection of public health and safety; and
(3) Result in compliance with all applicable federal, state, and local laws, ordinances, and standards.
Required by: Section 25552(e)(1-3)
Supporting Evidence: The remaining sections of this Staff Analysis have not identified any unmitigated significant adverse environmental effects of the proposed project, any public health and safety impacts or any inconsistencies with the applicable federal, state or local laws, ordinances, regulations or standards.

Special Finding 5: The applicant has made a reasonable demonstration that the proposed powerplant and related facilities, if licensed on the expedited schedule provided by Section 25552, will be in service before December 31, 2002.
Required by: Section 25552(e)(4)
Supporting Evidence: The applicant plans to bring the first unit on line in June, 2002 and the second unit on line by August or September, 2002. Staff finds that schedule feasible and reasonable. Facility Design Condition GEN-10 requires that the project be fully operational by December 31, 2002.

Special Finding 6: The applicant will, as a condition of approval, enter into a binding and enforceable agreement with the commission, that demonstrates either that the powerplant will cease to operate and the permit will terminate within three years or that the proposed powerplant will be recertified, modified, replaced, or removed within a period of three years with a cogeneration or combined-cycle powerplant that uses best available control technology and obtains necessary offsets, as determined at the time

the combined-cycle powerplant is constructed, and that complies with all other applicable laws, ordinances, and standards.
Required by: Section 25552(e)(5)
Supporting Evidence: The applicant is proposing to convert the powerplant to a cogeneration powerplant at, or shortly after, it's commissioning. Facility Design Condition GEN-9, binding on the applicant along with the other conditions and enforceable by the Commission under its enforcement powers, requires that the conversion take place within three years of the approval of the AFC.

Special Finding 7: The proposed powerplant will obtain offsets or, where offsets are unavailable, pay an air emissions mitigation fee to the air pollution control district or air quality management district based upon the actual emissions from the powerplant, to the district for expenditure by the district pursuant to Chapter 9 (commencing with Section 44275) of Part 5 of Division 26 of the Health and Safety Code, to mitigate the emissions from the plant.
Required by: Section 25552(e)(6)
Supporting Evidence: The Air Quality section of this Staff Assessment indicates that the applicant is obtaining offsets to mitigate the emissions from the plant.

STAFF RECOMMENDATION

Staff has concluded that in light of California's energy emergency, and Public Resources Code, section 25552, requiring the Energy Commission to expedite to the extent feasible, a 120 day review for the processing of applications for certification of power plants, Staff recommends the Valero Cogeneration Project be granted a license to generate electricity provided the conditions and recommendations in this Staff Assessment are complied with.

VALERO COGENERATION PROJECT (01-AFC-5)
STAFF ASSESSMENT

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INTRODUCTION

PURPOSE OF THIS REPORT

The Staff Assessment (SA) is the California Energy Commission (Energy Commission) staff's independent analysis of the Valero Cogeneration Project's (VCP) Application for Certification (AFC). The SA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision. The SA describes the following:

- the existing environment;
- the proposed project;
- 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;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors which may lessen or eliminate potential impacts;
- the proposed conditions under which the project must be constructed, and operated, if it is certified ;
- project alternatives;
- project closure.

The analyses contained in this SA are based upon information from the: 1) AFC, 2) subsequent amendments, 3) responses to data requests, 4) supplementary information from local and state agencies and interested individuals, 5) existing documents, publications, 6) independent field studies and research 7) comments at workshops. The analyses for most technical areas include discussions of proposed 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 Compliance Unit's method of ensuring post-certification compliance with adopted requirements. The SA presents conclusions and proposed conditions that apply to the design, construction, operation and closure of the proposed facility.

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., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 15000 et seq.).

ORGANIZATION OF THE STAFF ASSESSMENT

This **INTRODUCTION** section explains the purpose of the SA and its relationship to the Energy Commission's siting process.

The **PROJECT DESCRIPTION** section provides a brief overview of the project including its purpose, location and major project components.

The environmental and engineering evaluations of the proposed project follow the "PROJECT DESCRIPTION". In the environmental analysis, the project's environmental setting is described, environmental impacts are identified and their significance assessed, and the project's compliance with applicable laws is reviewed. The mitigation measures proposed by the applicant are reviewed for adequacy and conformance with applicable laws; if any remaining unmitigated impacts are identified, staff proposes additional mitigation measures and project alternatives. Staff's conclusions and recommendations are discussed, and proposed conditions of certification are included, if applicable. In the engineering analyses, the project is evaluated in each technical area with respect to applicable laws and performance objectives. Staff proposed modifications to the facility, if applicable, are listed. Each technical section ends with a discussion of conclusions and recommendations. Proposed conditions of certification are included, if applicable.

ENERGY COMMISSION SITING 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, section 25500). The Energy Commission must review power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts, and compliance with applicable governmental laws or standards (Pub. Resources Code, section 25523 (d)), 25552.

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

In addition, staff must assess the completeness and adequacy of the measures proposed by the applicant in terms of applicable health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b)). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, section 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, section 21080.5 and Cal. Code Regs., tit. 14, section 15251 (k)).

The staff prepared a Staff Assessment (SA) that presents for the applicant, intervenors, agencies, other interested parties and members of the public, staff's analysis, conclusions, and recommendations. Where staff believes it is appropriate, the SA incorporates comments received from city, county, state, and federal agencies, the public and parties to the siting case, and comments made at the workshops. In this "four-month" process the SA serves, as staff's written testimony regarding the AFC..

There will be a comment and review period to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the review period, staff will conduct a workshop to discuss their findings, proposed mitigation, and proposed compliance-monitoring requirements. Based on the workshops and written comments, staff may amend their analysis, correct errors, and finalize conditions of certification to reflect areas where we have reached agreement with the parties.

The staff's assessment is only one piece of evidence that will be considered by the Committee (two commissioners who have been assigned to this project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public hearings, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. During the hearing proceedings the Committee allows 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.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD will be circulated for a comment period to be determined by the committee. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any intervenor may request that the Energy Commission reconsider its decision.

A <u>COMPLIANCE MONITORING PLAN AND GENERAL CONDITIONS</u> will be assembled from conditions contained in the SA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. The proposed Compliance Monitoring Plan and General Conditions are included at the end of the SA.

PROJECT DESCRIPTION

Jack W. Caswell

NATURE AND PURPOSE OF THE PROJECT

The Valero Cogeneration Project is wholly owned by Valero Refining Company, Benicia CA., (referred to as either “VCP,” or the “applicant”), filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) for a 4-month, expedited review to construct and operate a simple-cycle electrical generating facility providing steam for use in the Valero Refinery process.

The applicant’s objectives include removing the Valero Refinery facility from dependency on the California electrical grid system protecting refinery gas production and supply. VCP intends to provide increased electrical generation while taking advantage of the existing infrastructure at the existing Valero Refinery facility, including the gas supply, transmission facilities, water supply and discharge facilities; minimize the environmental and socioeconomic impacts of the project; and utilize proven technology while incorporating high-efficiency pollution control technology.

PROJECT LOCATION

The site for the proposed VCP is located at the existing refinery, located at: 3400 East Second Street, Benicia, CA., 94510, in Block 25, Township 3 North, Range 3 West of the Benicia Quadrangle, Solano County, Assessor Lot Number for the site is 90-110-03. **Project Description Figure 1,** shows the local setting for the refinery property, and location of the proposed plant. The project would disturb approximately 1.9-acres of the existing Valero Refinery facility site property. **Project Description Figure 2** shows a regional setting for the refinery property.

POWER PLANT

The proposed Valero Cogeneration Project facility will consist of: two GE gas turbines (LM6000 - PC Sprint), power generators providing electricity in the simple cycle process mode, chillers, fuel gas compression facilities, heat recovery steam generators (HRSG) providing steam for the refinery process, SCRs for emission control, and associated instrumentation, piping, and wiring, water injection to control oxides of nitrogen (NOx) emissions and associated support equipment. The produced power will be conveyed through underground cables approximately 1000 feet long to the new Valero switch house within the refinery at a voltage of 12 kV. As a result of this project, the refinery will no longer require approximately 50 MW of electrical power currently consumed from the California electrical grid system, while providing approximately 50 MW of additional electricity to the open market, a net gain of 100 MW. The project will be visually compatible with the existing refining equipment in the adjacent areas. The power plant area will be accessed via the existing roads and streets within the refinery. **Project Description Figure 3** shows the power plant layout configuration.

Project Description Figure 1
Local Plant Setting

Project Description Figure 2
Local Area Setting

Project Description Figure 3
Power Plant Layout Configuration

The project's installation of a selective catalytic reduction (SCR) emission control technology on both LM 6000 CTG units would use an Aqueous Ammonia system, using the existing refinery storage and distribution system currently in place for the refining process.

A new control room will be designed for the CTGs and associated equipment, while using existing buildings at the site and infrastructure for the refining process as support for the VCP to include the administration building, refinery control building, as well as a warehouse, storage and shop building.

TRANSMISSION LINE AND NATURAL GAS FACILITIES

About 1000 feet of underground 12 kV electrical conductors will be installed from the new generation equipment to a new 12 kV switch house at the northeast corner of the refinery-processing block. From this switch house the power will preferentially feed the refinery's demand with the surplus power being routed to the grid through Valero's existing 230 kV substation. If the refinery demand ever exceeds the amount generated, additional power will be imported from the grid. Currently, power being supplied to the refinery's processing facilities is imported from the grid through the 230 kV substation and 12 kV switch house.

WATER SUPPLY AND WASTE WATER TREATMENT

The minor amount of required cooling water would be supplied by a small packaged cooling water system. Makeup cooling water, estimated at about 70 gpm, (raw, untreated) will be obtained from the City of Benicia via existing facilities.

Water for each gas turbine injection is expected to total about 60 gpm and will also be obtained from the City of Benicia via existing facilities, but it will undergo treatment by the refinery's water treatment facilities. These treating facilities process approximately 1500 gpm and include cold lime softening and ion exchange demineralization. The small increase in treatment will not impact the treating operation, though a small RO (reverse osmosis) module may be installed as a polisher to ensure adequate quality. The additional water consumption, totaling about 200 gpm, or 0.28 MGD, is a small increase relative to the normal consumption rate of about 5-MGD for the refinery. The additional supply is covered by Valero's contract with the City and the City's agreement for North Bay Aqueduct water from the State Water Project.

Wastewater handling procedures for the new facilities will be integrated into the refinery's existing waste handling programs. Specifically, the SCR catalyst will require replacement on a 2 to 5 year cycle, just as is the case on three other SCR installations within the refinery. When the catalyst requires replacement the spent catalyst will be evaluated for regeneration by the supplier or else disposed of in accordance with regulatory requirements.

CONSTRUCTION AND OPERATION

The construction work will take place within the refinery and is expected to have a peak manning level of about 150 workers. Limited overtime and second shift work is

expected. Past project workloads at the refinery have been supported by field manning levels varying from as low as 50 workers to as high as 1200 workers for major maintenance and construction projects. At project completion, the applicant expects to operate the facility with on-site employees.

Construction is planned to begin in September 2001, if the Application for Certification is approved. The construction of the first CTG and HRSG is expected to be complete in early 2002, possibly in March, with plant testing in April and May. Full-scale operation is planned to commence no later than June 2002. A second 51 MW CTG is being planned for with an operational date in December 2002. Although the design and plan for this second CTG are complete, the economics of that second CTG are still being evaluated. The project capitol cost for both CTGs is estimated to be approximately $100 million.

FACILITY CLOSURE

The planned life of the VCP facility is 20 years or longer. Whenever the facility is closed, either temporally or permanently, the closure procedures will follow the described plan provided in the VCP AFC, LORS, and Staff Assessment, General Conditions, Facility Closure Plan, Conditions of Certification.

PROJECTS RELEVANT TO REVIEW OF CUMULATIVE IMPACTS

In addition to the VCP project, other projects are expected, though not certain, to take place in the vicinity. They are described and referred to in the following sections of this Staff Assessment where they are relevant to a determination of potential cumulative impacts of the VCP.

REFERENCES

VCP (Valero Cogeneration Project Application for Certification, 01- AFC-5, submitted May 2001)

VCP (Valero Cogeneration Project Supplement to Application for Certification, 01-AFC-5, submitted June 6, 2001)

CEC (Staff Assessment, General Conditions, Facilities Closure, Submitted July 31, 2001)

ENVIRONMENTAL ASSESSMENT

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AIR QUALITY

Testimony of Matt Layton

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed LM6000 combustion turbine units at the Valero Cogeneration Project (VCP). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), precusor organic compounds (POC) and particulate matter less than 10 microns in diameter (PM10).

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

- whether the combustion turbine generators (CTGs) at the VCP are likely to conform with applicable Federal, State and Bay Area Air Quality Management District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);
- whether the CTGs at the VCP are likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
- whether the mitigation proposed for the CTGs at the VCP are adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR and PSD analyses have been delegated by the United States Environmental Protection Agency (EPA) to the Bay Area Air Quality Management District (District). The PSD requirements do not apply to this project, as the project's net emissions increases are below the thresholds,[1] and the project is not a new major source, or a

[1] Major sources are those that exceed 100 tons per year for any pollutant. Major modifications of major sources are those that result in net increases 40 tons per year (tpy) of NOx, SO2 and POC, 100 tpy of CO, or 15 tpy of PM10.

major modification to an existing major source. Instead, it is a minor modification to an existing major source.

STATE

The California State Health and Safety Code, section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

The proposed project is subject to the Bay Area Air Quality Management District (District) rules and regulations. The rules and regulations are discussed in the Preliminary Determination of Compliance (PDOC) issued July 27, 2001 (District 2001). Rules that apply to the Project are summarized below. The rules and the project's compliance with them are described more fully in the PDOC.

Regulation 2

Rule 1 - General Requirements. This rule contains general requirements, definitions, and a requirement that an applicant submit an application for an authority to construct and permit to operate.

Rule 2 - New Source Review. This rule applies to all new and modified sources. The following sections of Rule 2 are the regulations that are applicable to this project.

- Section 2-2-301 - Best Available Control Technology (BACT) Requirement: This rule requires that BACT be applied for each pollutant which is emitted in excess of 10.0 pounds per day.
- Section 2-2-302 - Offset Requirement, Precursor Organic Compounds and Nitrogen Oxides. This section applies to projects with an emissions increase of 50 tons per year or more of organic compounds and/or NO_x. Offsets shall be provided at a ratio of 1.15 tons of emission reduction credits for each 1.0 ton of proposed project permitted emissions.
- Section 2-2-303 - Offset Requirements, Particulate Matter (TSP), PM10 and Sulfur Dioxide: If a Major Facility (a project that emits any pollutant greater than 100 tons per year) has a cumulative increase of 1.0 ton per year of PM10 or SO_2, emission offsets must be provided for the entire cumulative increase at a ratio of 1.0:1.0.

Emission reductions of nitrogen oxides and/or sulfur dioxide may be used to offset increased emissions of PM10 at offset ratios deemed appropriate by the Air Pollution Control Officer.

A facility that emits less than 100 tons of any pollutant may voluntarily provide emission offsets for all, or any portion, of their PM10 or sulfur dioxide emissions increase at the offset ratio required above (1.0:1.0).

- Section 2-2-606 - Emission Calculation Procedures, Offsets. This section requires that emission offsets must be provided from the District's Emissions Bank, and/or from contemporaneous actual emission reductions.

Rule 7-Acid Rain. This rule applies the requirements of Title IV of the federal Clean Air Act, which are spelled out in Title 40, Code of Federal Regulations, section 72. The provisions of Section 72 will apply when EPA approves the District's Title IV program, which has not been approved at this time. The Title IV requirements will include the installation of continuous emission monitors to monitor acid deposition precursor pollutants.

Regulation 6

Regulation 6 - Particulate Matter and Visible Emission. The purpose of this regulation is to limit the quantity of particulate matter in the atmosphere. The following two sections of Regulation 6 are directly applicable to this project:

- Section 301 - Ringelmann No. 1 Limitation: This rule limits visible emissions to no darker than Ringelmann No. 1 for periods greater than three minutes in any hour.
- Section 310 - Particulate Weight Limitation: This rule limits source particulate matter emissions to no greater than 0.15 grains per standard dry cubic foot.

Regulation 9

Rule 1 - Limitations

- Section 301: Limitations on Ground Level Sulfur Dioxide Concentration. This section requires that emissions of sulfur dioxide shall not impact at ground level in excess of 0.5 ppm for 3 consecutive minutes, or 0.25 ppm averaged over 60 minutes, or 0.05 ppm averaged over 24 hours.
- Section 302: General Emission Limitation. This rule limits the sulfur dioxide concentration from an exhaust stack to no greater than 300 ppm dry.

Rule 9 - Nitrogen Oxides from Stationary Gas Turbines. This rule limits gaseous fired, SCR equipped, combustion turbines rated greater than 10 MW to 9 ppm@15%O2.

Regulation 10

Rule 26 - Gas Turbines - Standards of Performance for New Stationary Sources. This rule adopts the national maximum emission limits (40 C.F.R. §60) which are 75 ppm NO_x and 150 ppm SO_2 at 15 percent O_2. Whenever any source is subject to more than one emission limitation rule, regulation, provision or requirement relating to the control of any air contaminant, the most stringent limitation applies.

SETTING

CLIMATOLOGY

The VCP, if approved, would be located at the Valero refinery near Benicia, California. The project area is characterized by prevailing strong winds from the west, particularly during the summer, fall and winter. Sometimes during spring, a weak westerly flow (flow from the east) develops causing elevated pollutant levels in the Bay Area. During these periods the Bay Area, in general, is affected by low wind speeds and shallow mixing depths, thereby allowing the build up of pollution levels.

Along with the winds, another climatic factor is atmospheric stability and mixing height. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually fewer direct[2] air quality impacts from a single air pollution source like the VCP. During the winter months between storms, very stable atmospheric conditions can occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts can result from stationary and mobile source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing

Pacific Gas and Electric (PG&E) collects meteorological data in Pittsburg, California. The data collected or subsequently estimated by PG&E includes wind direction, wind speed, temperature, and atmospheric stability class. The measured wind data are graphically represented as quarterly and annual wind roses in Appendix A. The data collection monitor is located approximately ten miles east (downwind) from the proposed project. The District has deemed the data collected by this monitor as representative of the area's meteorology, and that it is appropriate to use for air dispersion modeling analyses for this project.

AMBIENT AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the federal Environmental Protection Agency (USEPA). The state and federal air quality standards are listed in Air Quality Table 1. As indicated in Air Quality Table 1, the averaging times for the various air quality standards (the duration 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 and $\mu g/m^3$).

[2] Direct impacts refer to those impacts from air pollutants in the plume. Ozone is not directly emitted from a power plant.

In general, an area is designated as attainment for a specific pollutant if the measured concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

AIR QUALITY: Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	1 Hour	0.12 ppm (235 μg/m^3)	0.09 ppm (180 μg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 μg/m^3)	—
	1 Hour	—	0.25 ppm (470 μg/m^3)
Sulfur Dioxide (SO_2)	Annual Average	80 μg/m^3 (0.03 ppm)	—
	24 Hour	365 μg/m^3 (0.14 ppm)	0.04 ppm (105 μg/m^3)
	3 Hour	1300 μg/m^3 (0.5 ppm)	—
	1 Hour	—	0.25 ppm (655 g/m^3)
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	—	30 μg/m^3
	24 Hour	150 μg/m^3	50 μg/m^3
	Annual Arithmetic Mean	50 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	—	0.03 ppm (42 μg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.010 ppm (26 μg/m^3)
Visibility Reducing Particulates	1 Observation	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

The VCP is located near the Carquinez Strait, which is the link between the San Francisco Bay and the Sacramento Delta. The area is under the jurisdiction of the Bay Area Air Quality Management District. The District collects ambient air quality data at monitoring sites throughout the air basin. The data is used to determine attainment status and define air quality trends. The area designations are shown in Air Quality Table 2. The area is designated attainment for the state's CO, NO2, SO2, SO4 and lead standards, and attainment for the federal SO2 standard, and unclassified/attainment for the federal PM10 and CO standards. The area is non-

attainment of the state and federal 1-hour ozone standards and the state 24-hour PM10 standard (ARB 2001).

AIR QUALITY: Table 2
Federal and State Attainment Status for Bay Area Air District

Pollutant	Attainment Status*	
	Federal	State
Ozone	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Attainment	Nonattainment
Lead	Attainment	Unclassified

Source: BAAQMD Website (www.baaqmd.gov)

AIR QUALITY Figure 1 summarizes the historical air quality data for the project location for particulate matter less than 10 microns (PM10), CO, SO_2, O_3, and NO_2. In AIR QUALITY Figure 1, the normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most stringent ambient air quality standard. Because PM10 concentration data in the Antioch area are available for only 12 months, from August 1999 to September 2000, staff has used the PM10 concentrations collected at the nearest monitoring stations, which are located at Bethel Island and Vallejo.

Following is a more in-depth discussion of ambient air quality conditions in the Antioch area for O_3, CO, NO_2, and PM10.

Ozone

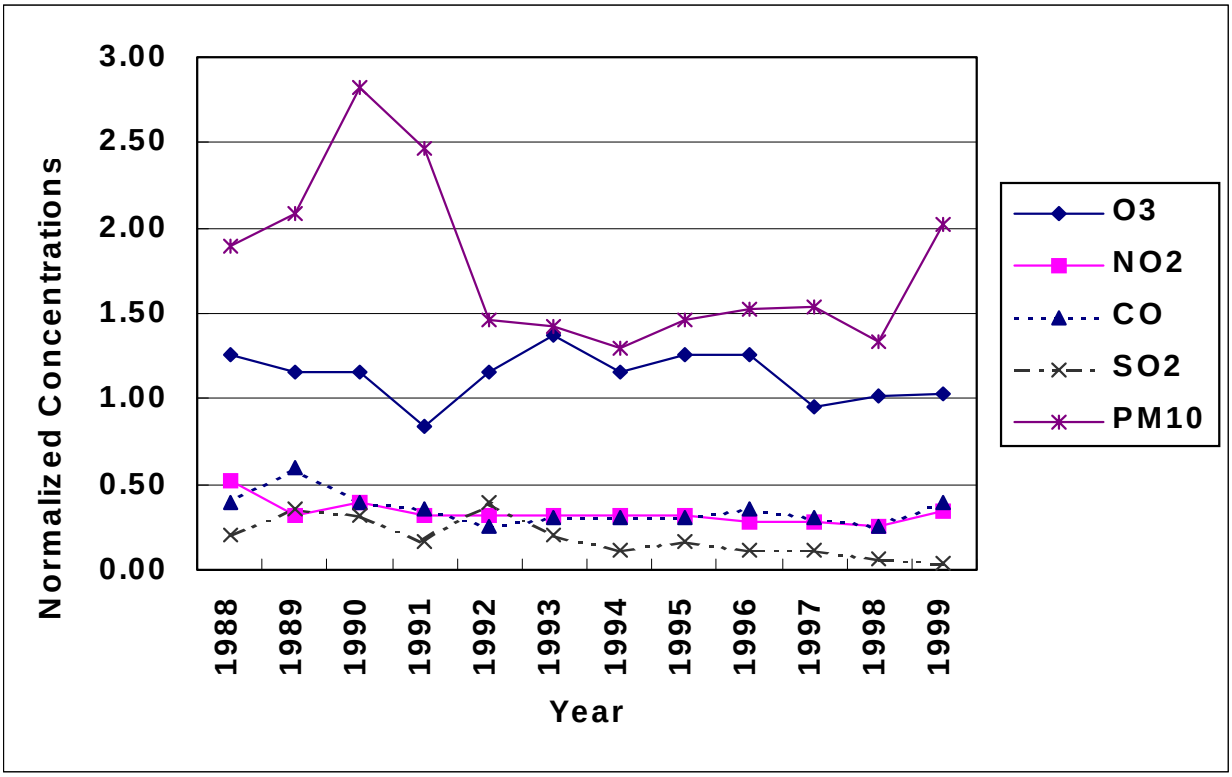
In the past 8 years, the area has experienced an average of four or five days per year with violations of the 1-hour state ambient air quality standard for ozone, and less frequent violations of the federal 1-hour ozone standard.

Ozone formation is influenced significantly by year-to-year changes in atmospheric conditions. For this reason, a long-term trend in ambient ozone levels is needed to understand if a region is experiencing reductions in its ambient ozone concentrations or not. As shown in AIR QUALITY Figure 2, the long-term statistics of ozone levels in the San Francisco Bay Area region shows that this region has made a steady stride toward attainment of the federal 1-hour ozone standard.

The exact reasons for the recent violations of the federal ozone standard shown in AIR QUALITY Figure 2 are not known. The District developed its 1997 State Implementation Plan (SIP) to identify a strategy to bring the air basin back to attainment of the federal 1-hour ozone standard (BAAQMD, 1997). The District will conduct additional studies in the future to better understand the ozone problem in the Bay Area air basin and surrounding air basins. The study results will be used to develop an

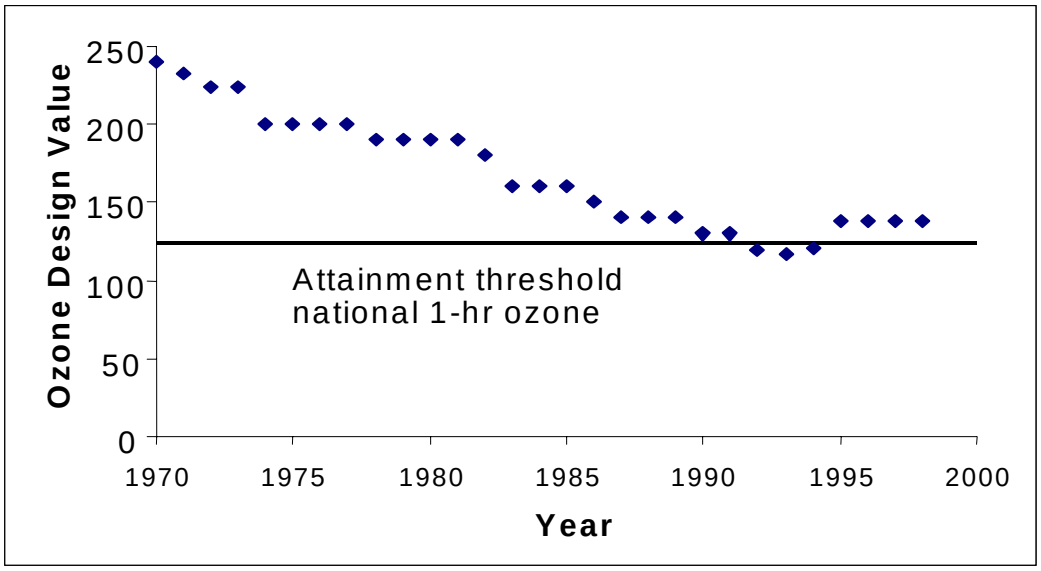
equitable and effective air quality management strategy to reach attainment of federal air quality standards.

AIR QUALITY Figure 1 Normalized Maximum Short-Term Historical Air Pollutant Concentrations: 1988-1999



A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1997 the highest 24-hour average PM10 concentration measured in Bethel Island was 77 µg/m^3. Since the most stringent ambient air quality standard is 50 µg/m^3, the 1997 normalized concentration is 77/50 = 1.54. Source: ARB.

AIR QUALITY Figure 2 - District Ozone Design Value 1970-1998

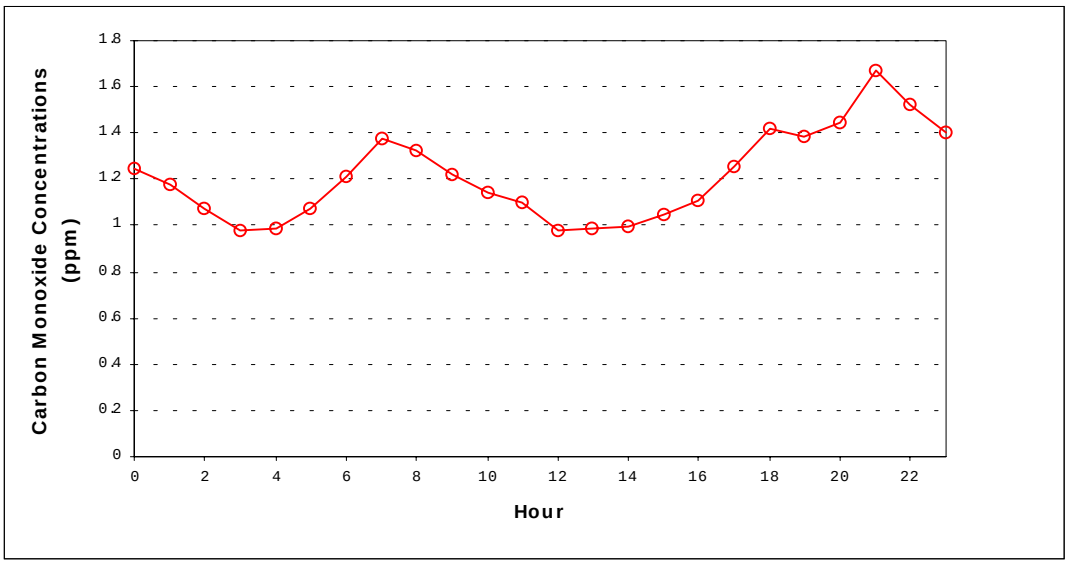


Each design value represents the fourth highest concentration recorded in the air basin during the previous three years. Design values are used to determine attainment status. Source: BAAQMD

Carbon Monoxide (CO)

The highest CO concentration levels measured in Vallejo, Pittsburg and Antioch are at least 50 percent lower than the most stringent California ambient air quality standards (see AIR QUALITY Figure 1). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since the mobile sector (cars, trucks, and buses) is the main source of CO, we expect ambient concentrations of CO to be highly dependent on emissions from the mobile sector. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. In Antioch, CO concentrations may also peak late in the evening, as shown in AIR QUALITY Figure 3. This is probably the result of CO emissions from wood burning in residential fireplaces in Antioch and/or adjacent areas.

AIR QUALITY Figure 3
Average Diurnal CO Profile
Antioch, January 1 - 15, 1996



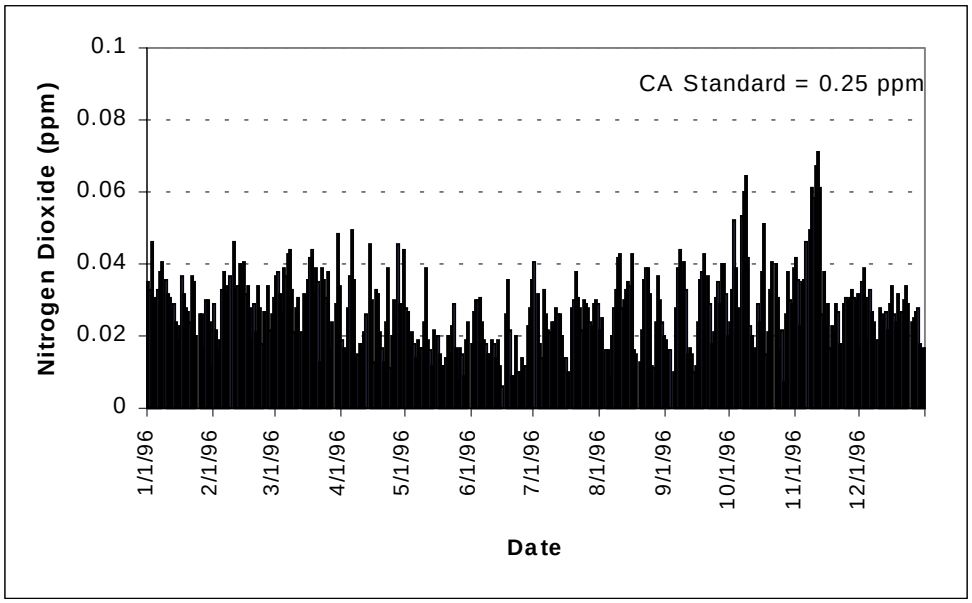
Source: ARB

Nitrogen Dioxide (NO_2)

NO_2 levels in Vallejo are no more than one-third of the most stringent NO_2 ambient air quality standards, as shown in AIR QUALITY Figure 1. Approximately 90 percent of the NO_x emitted from combustion sources is 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. This is why the highest concentrations of NO_2 occur during the fall (see AIR QUALITY Figure 4 for a typical annual average) and not in the winter when atmospheric conditions favor the trapping of ground level releases but lack significant

photochemical activity (less sun light). In the summer the conversion rates of NO to NO_2 are high but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard.

AIR QUALITY Figure 4
Maximum Daily 1-hour average NO_2 Concentrations measured in 1996: Typical of the Bay Area (Pittsburg Station)



Source: ARB,1998a

Particulate Matter (PM)

As shown in AIR QUALITY Figure 1, PM10 concentrations measured at the Vallejo and Bethel Island monitoring stations show a declining trend in the last ten years. The same trend has been observed at other sites at Contra Costa County. The highest PM10 concentrations are measured in the winter. During wintertime high PM10 episodes, the contribution of ground level releases to ambient PM10 concentrations is disproportionately high. For example, wood smoke contributes approximately 47 percent of the PM10 mass in San Jose, while the contribution at Pittsburg may be on the order of 30 percent (Chow et al. 1995). The contribution of wood smoke particles to the PM2.5 concentrations may be even higher, considering that most of the wood smoke particles are smaller than 2.5 microns.

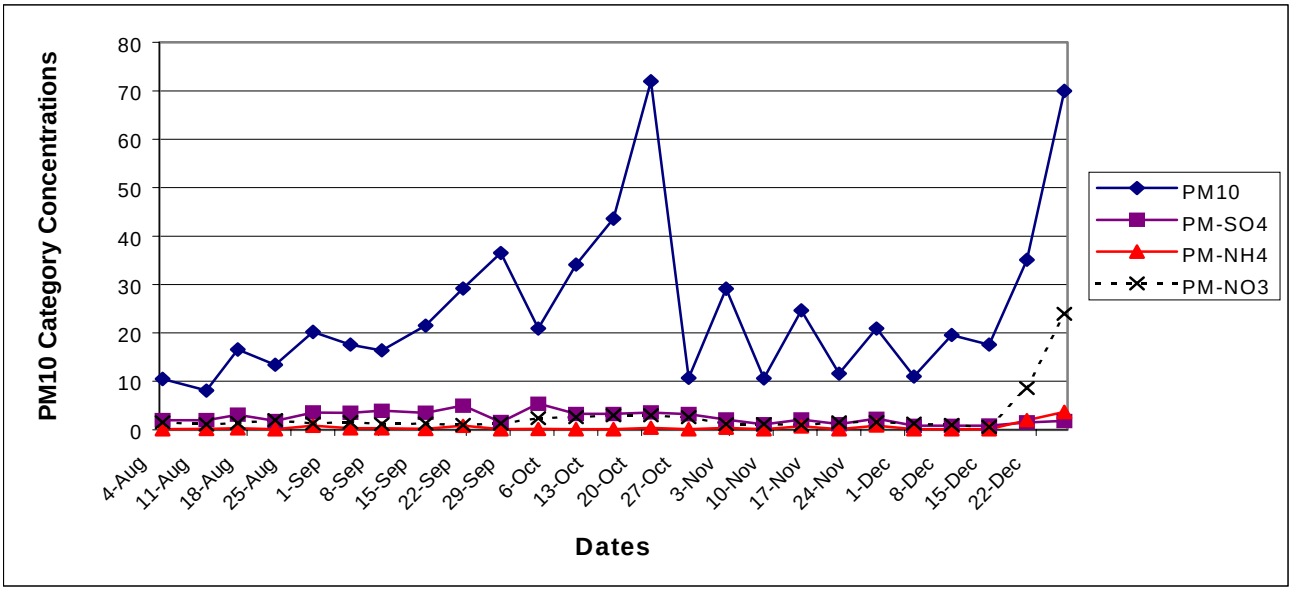
Nitrates and Sulfates

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NO_x emissions from combustion sources. AIR QUALITY Figure 5 shows that the nitrate ion concentrations during the winter time are a significant portion of the total PM10 and could be an even higher contributor to particulate matter of less than 2.5 microns (PM2.5).

PM sulfate (mainly ammonium sulfate) is formed in the atmosphere from the oxidation of SO_2 and subsequent neutralization by ammonia in the atmosphere. The oxidation of SO_2 depends on many factors, which includes: the availability of hydroxyl (OH), hydroperoxy (HO_2) and Methylperoxy (CH_3OH), and humidity. AIR QUALITY Figure 5 shows that the sulfate portion can range from 5 to 25 percent of the total PM10 measured.

AIR QUALITY Figure 5 also shows that one of the annual highest PM10 measurement happened on December 26, 1999, a Sunday after a major holiday. This limited data indicated that the highest PM10 concentration measured in the Antioch area might not be the result of industrial activities. Staff suspects that motor vehicles, domestic activities during the holiday, and perhaps limited air movement during this period might have caused such a spike of PM10.

AIR QUALITY Figure 5
PM10 Portions of Sulfates, Nitrates and Ammonium
Measured at Pittsburg Monitoring Station in 1999 (ARB)



Source: ARB

Ambient 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 air pollutants. Nitrogen oxides (NOx) and hydrocarbons (Precusor Organic Compounds [POCs]) interact in the presence of sunlight to form ozone. The reaction can take several hours to occur, so ozone generally forms downwind and/or lags the timing of the emissions peaks.

In 1997, the US EPA proposed a new 8-hour ozone standard of 0.08 ppm, in addition to the federal 1-hour standard of 0.12 ppm. Legal challenges have placed the new standard in the federal courts. Pending appeals, the current federal 1-hour ozone standard remains in place and 8-hour ozone data is being collected and reported. The

region is non-attainment of the 1-hour standard, and will probably be non-attainment of the proposed 8-hour standard.

The US EPA remains convinced that there is not a disconnect between controls for the 1-hour standard and the more stringent 8-hour standard. Whatever progress is made now toward attaining, or maintaining, the 1-hour federal standard will only speed attainment of the potentially more protective 8-hour standard since planning for the 8-hour standard does not have to be completed until 2003 and attainment not reached until 2005 at the earliest.

Air Emissions Implications of new Generation

Calpine and Florida Power and Light have built, or are planning the construction and operation of, new generation capacity the Bay Area and in the Delta region of the Bay Area. The new generation will be use clean-burning natural gas, and potential emission increases for most pollutants will be offset by emission reductions. Additionally, FPL will be implementing District Rule 9-11 by installing SCR at most of the existing boiler units at the Pittsburg, Potrero, and Contra Costa power plants, reducing permitted NOx emissions by up to 90 percent. Bay Area generation emissions for most air pollutants will be decreasing and/or are offset by emission reductions. It is expected that generation emission will become a smaller percent of overall pollutant inventories in the local region and the Bay Area.

PROJECT DESCRIPTION

PROPOSED EQUIPMENT

The proposed VCP consists of two phases. Phase 1 will install a General Electric LM 6000 combustion turbine with water injection for NOx control and a fired heat recovery steam generator (HRSG), which generates steam for the refinery. The Phase 1 CTG/HRSG use a wet cooling tower to reject heat from equipment and the process. VCP Phase 2 will install a General Electric LM 6000 combustion turbine with water injection for NOx control and a fired heat recovery steam generators (HRSG), which will also generate steam for the refinery. Both the CTGs and the fired-HRSGs will use refinery gas as the primary fuel, with natural gas as the backup or supplemental fuel.

CONSTRUCTION

The construction of the new combustion turbine power plant will include the following ancillary facilities and activities, either in series or parallel with the construction activities associated with the combustion turbines and HRSGs:

- Preparation of construction laydown and parking areas;
- Pipelines for refinery and natural gas; and
- Construction of underground transmission lines.

The combustion turbine power plant will take approximately 15 months to construct. The Phase 1 and Phase 2 power plant project construction itself consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection will occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves.

Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and are relatively small emissions generating activities in comparison to the early construction activities. Not surprisingly, the largest level of construction emissions for the project will occur from the project site activity, most of it due to earth moving and grading activities and large crane operations. The construction of facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions generated from the construction equipment and vehicles.

OPERATIONAL PHASE

EQUIPMENT OPERATION

The new CTGs will burn refinery gas, a by-product of the refined product processes at the Valero refinery. The refinery gas energy density is approximately 30 percent greater than natural gas, but it contains more sulfur than pipeline quality natural gas. Natural gas will be an alternative back-up fuel. Both CTG units are expected to operate continuously, or 8760 hours per year.

EMISSION CONTROLS

The exclusive use of a gaseous fuel will limit the formation PM10 emissions compared to liquid and solid fuels. The refinery gas will be scrubbed to remove sulfur, however, sulfur compounds in the fuel will be greater than natural gas. To minimize NOx emissions during the combustion process, the turbine is equipped with the low-NOx combustors. Additionally, water is injected into the combustor cans of the CTG to control NOx. After combustion in the CTG, the flue gases pass through the heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. Valero is proposing to use Selective Catalytic Reduction (SCR) to reduce NOx and a CO oxidation catalyst to reduce CO and VOC. A more complete discussion of these control technologies is included in the Mitigation section.

The cooling tower will be equipped with a high efficiency drift eliminator to control PM_{10} emissions. The drift eliminator will control the drift fraction to 0.005%.

ESTIMATED PROJECT EMISSIONS

A single CTG's representative criteria air pollutant 1-hour emissions are shown in Air Quality Table 2. Emissions rates can vary with ambient temperatures and fuel use. The higher emissions shown in Table 2 are from the combustion turbine during startup compared to emissions during steady state, full load operation. Most notably, emissions of NOx and CO are significantly higher during startup. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation, not start-up.

During startup and shutdown, combustion temperatures and pressures are rapidly changing, which results in less efficient combustion and higher emissions. Also, the flue gas controls, such as the catalyst discussed above, operate most efficiently when the turbine operates near or at full load, at which the catalysts are at or near design temperatures. Those flue gas controls are not as effective during the transitory temperature changes that occur during startup and shutdown.

The worst-case hourly and daily emissions from a turbine are shown in Air Quality Table 2. The table includes start-ups and different operating scenarios, and the resultant emissions. Annual emissions are also summarized in the Air Quality Table 2. Cooling tower PM10 emissions, shown in Table 2, occur as water is released from the tower as drift. The drift contains total dissolved solids (TDS), which become airborne as the water evaporates. Cooling tower PM10 emissions are minimized by limiting drift, and by limiting TDS in the cooling water.

Air Quality Table 2
Worst Case Project Emissions – one CTG (hourly, daily and annual)

Operational Profile	NOx	SO2	PM10	POC	CO
Hourly : 1 turbine start-up (lbs/hr)	38.12	10.96	3.14	0.68	60
CTG @ 100% load (lbs/hr)	7.95	10.8	1.55	1.26	11.0
CTG @ 100% w/duct firing (lbs/hr)	10.74	17.53	1.55	2.04	17.82
Cooling tower PM10 (lbs/hour)	---	---	0.084	---	---
Daily: 1 turbine start-up and 1 turbine steady state operation (lbs/day)	259.5	263.0	38.79	47.96 [a]	422.33
Cooling tower PM10 (lbs/day)	---	---	2.016	---	---
Annual: Start-up and steady state operation (tons per year)	42.12	21.91	6.79	8.59 [a]	69.85
Cooling tower PM10 (tons per year)	---	---	0.368	---	---

a. The POC numbers include fugitive emissions from the collection and distribution of the refinery gas. Note that the POC fugitive emissions for Phase 1 and Phase 2 are slightly different.

Source: District 2001a

Ammonia Emissions

Combustion turbines using SCR to control NOx emissions inject ammonia into the flue gas stream. Not all of this ammonia reacts in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted, un-reacted, out the stacks. These ammonia emissions are known as ammonia slip. The District has limited the VCP to an ammonia slip no greater than 10 ppm. This level is usually associated with the degradation of the SCR catalyst, generally in a time frame of five years or more after initial operation. At that point, the SCR catalysts are removed and replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of 1 to 2 ppm.

Initial Commissioning Phase Operation and Emissions

The combustion turbines will undergo an initial firing and commissioning. It should be noted that it is in the owner's best interest to minimize this initial commissioning phase in order for the project to be declared ready for commercial operation and thus able to generate revenues. Therefore, it is expected that this initial commissioning phase will, to the extent feasible, be as short as possible and thus minimize the higher than normal operations emissions that are inevitable during the necessary testing. The District's PDOC contains conditions of certification outlining emission limits for the project during the commissioning phase.

IMPACTS AND ANALYSIS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
AIR QUALITY – Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d. Expose sensitive receptors to substantial pollutant concentrations?		X		
e. Create objectionable odors affecting a substantial number of people?			X	

DISCUSSION OF IMPACTS AND ANALYSIS

a) Less than significant

The project emissions are fully mitigated and result in a net decrease in emissions from the Valero facility. The net emissions decreases are due to the RACT adjustments of the on-site contemporaneous reductions, which are part of the air quality plan. The project does not conflict with or obstruct the implementation of the applicable air quality plan. Therefore, the project's impacts are less than significant.

b) Less than significant with mitigation incorporated

The project emissions do not cause any new violations of ambient air quality standards. The project emissions will contribute to existing violations of the state and federal 1-hour ozone standards and the state 24-hour PM10 standard. However, the project's emissions will be fully offset, resulting in a net decrease in directly emitted PM10 and of PM10 and ozone precursor emissions. Therefore, the project's impacts are less than significant with mitigation incorporated.

c) Less than significant

The applicant performed a cumulative analysis of potential and/or permitted, but not yet operating, projects located up to six miles from the proposed facility site. None were identified, so additional analysis and cumulative modeling were not conducted. Therefore, the project's cumulative impacts are less than significant.

d) Less than significant with mitigation incorporated

The project emissions will contribute to existing violations of the state and federal 1-hour ozone standards and the state 24-hour PM10 standard, potentially exposing receptors to substantial pollutant concentrations. However, the project's emissions will be fully offset, resulting in a net decrease in directly emitted PM10 emissions and of PM10 and ozone precursor emissions. Therefore, the project's impacts are less than significant with mitigation incorporated.

e) Less than significant

No odor impacts are anticipated, since the facilities' gas turbine/HRSG SCR systems' ammonia slip will be limited to 10 ppmvd at the exhaust, which is below most published ammonia odor threshold values. The ambient ammonia concentrations, after dispersion, will be under the odor thresholds. No other significant emissions of odorous compounds will result from the gas turbine/HRSG, cooling tower, auxiliary boiler and emergency engine generator. Therefore, the project's odor impacts are less than significant.

ANALYSIS

MODELING APPROACH

The applicant performed an air dispersion modeling analysis to evaluate the project's potential impacts on the existing ambient air pollutant levels, both during construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually occur in the area. The

impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour-by-hour meteorological data collected in the vicinity of the project site is used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model was used for the screening and refined modeling.

CONSTRUCTION IMPACTS

Valero did not performed air dispersion modeling analyses of the potential construction impacts at the project site. However, both the applicant and the Energy Commission staff agreed that any construction impacts would be mitigated to the extent feasible by "boiler plate" construction conditions of certification. The boiler plate construction conditions of certification were derived for larger and longer construction projects and will be very conservative.

Although construction of the VCP and ancillary facilities will result in unavoidable short-term impacts, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because of the project's rather isolated location in the center of an industrial facility. Nevertheless, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the CO, PM10 and NO2 ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for combustion turbine steady-state operations, and the transitory conditions during turbine start-up and the special meteorological conditions associated with fumigation. The analysis assumes worst-case ambient temperatures during steady state operation to predict the highest impacts possible. The applicant analyzed the project with one turbine in start-up in a 24-hour period. Other operating configurations and ambient temperatures were analyzed to determine the maximum 3-hour, 8-hour, 24-hour and annual scenarios.

Valero provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during start-up conditions. The start-up emissions for NOx and CO are generally higher since the combustion turbine and downstream components, including the catalyst systems, are not at design (elevated) temperatures. This results in less complete combustion (i.e., increased CO emissions) and relatively uncontrolled NOx emissions. The modeling assumes these higher emission rates with stack parameters for turbine operation at 50 percent load. The low load conditions can cause higher impacts since the flue gas temperature and velocity are relatively low, resulting in less plume rise away from the facility.

The applicant did not perform modeling of the cooling tower and potential PM10 emissions. However, past experience and the relative size and emission rates of the cooling tower suggest that any impacts will be on the same order as the impacts from the CTG stacks plumes.

Fumigation Modeling

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes. Because of the short duration of fumigation events, only 1 to 8-hour impacts are calculated. The modeling results for are shown in Air Quality 3.

Air Quality Table 3
Fumigation Modeling Maximum Impacts

Pollutant	Averaging Time	Maximum Fumigation Modeled Concentrations (µg/m3)
NO2	1-hour	18.1
	Annual	---
CO	1-hour	28.5
	8-hour	6.0
SO2	1-hour	8.3
	3-hour	7.5

Project Impacts

Valero provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during normal steady state operation and during start-up conditions. The results of these modeling analyses are summarized in Air Quality Table 4. This modeling analysis reflected the use of the Ambient Ratio Method (ARM) to provide a more refined estimate of annual NO2 impacts.

The project does not cause any violations of ambient air quality standards. In most cases, the project's impacts plus background are considerably less than the standards. However, The project's PM10 impacts could contribute to existing violations of the state 24-hour and annual PM10 standards. These impacts, or contributions, from VCP directly emitted PM10 emissions could be significant if left unmitigated.

Secondary Pollutant Impacts

The project's emissions of gaseous emissions, primarily NOx, SO2 and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM10, particularly ammonium nitrate PM10 and sulfate. 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 VCP do have the potential (if left unmitigated) to contribute in some unquantified way to higher ozone levels in the region.

Air Quality Table 4
Combustion Turbine Refined Modeling Maximum Impacts

Pollutant	Averaging Time	Impact ($\mu g/m^3$) [a]	Back-Ground ($\mu g/m^3$) [c]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	1-hour	156.3	158.8	315.1	470	67
	Annual [b]	0.14	34.4	34.5	100	35
CO	1-hour	246.0	---	---	23,000	---
	8-hour	27.4	6,394	6,421	10,000	64
SO2	1-hour	61.6	---	---	655	---
	3-hour	38.1	---	---	1,300	---
	241-hour	6.49	31.9	38.4	105	37
	Annual [c]	0.13	5.3	5.4	80	7
PM10	24-hour	2.82	85	87.82	50	176
	Annual [c]	0.13	18	18.13	30	60

a. The worst-case emissions/impacts from Air Quality Tables 2 and 3.
b. Using the ARM default value of 0.75.
c. Background PM10, NO2, and CO data was collected between 1998 and 2000 at the Concord or Vallejo ambient air monitoring station.

Concerning secondary PM10 (primarily ammonium nitrate) formation, the process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there is not an agency (EPA or CARB) recommended model or procedure for estimating nitrate or sulfate formation. Staff believes that the emissions of NOx, SOx and VOC from VCP do have the potential (if left unmitigated) to contribute, to higher secondary PM10 (particularly of ammonium nitrate) levels in the region.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future impacts as part of the project impacts analysis, the applicant performed a cumulative modeling analysis. The cumulative analysis included potential and/or permitted, but not yet operating, projects located up to six miles from the proposed facility site. The applicant worked with the District to identify potential and/or permitted projects of size that might interact with the Valero project plumes and impacts. None were identified, so additional analysis and cumulative modeling were not conducted.

PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The PSD increment analysis is not required, per district rules.

VISIBILITY IMPACTS

A visibility analysis is not required, per district rules.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Construction Mitigation

Valero has agreed to staff proposed control measures to limit fugitive dust during the construction phase of a project. These include the use of chemical stabilizing agents and dust suppressants or gravel areas on site, and the wetting or covering of stored earth materials on site. These proposed measures also require that the transporting of borrow fill dirt material be wetted, covered, or that sufficient freeboard be allowed. They also require the use of paved access aprons, gravel strips, wheel washing or other means to limit mud or dirt carryout onto paved public roads.

To minimize combustion emissions such as NOx, CO and PM10, Valero has agreed to the staff proposed control measures that require that contractors properly maintain vehicle/equipment engines to control exhaust emissions. In order to address potential PM10 and NO2 emissions in equipment exhaust, staff is also proposing that the diesel fuel be limited to no greater than 15 ppm sulfur to achieve further reductions in PM10 and PM10 precursors from construction equipment exhaust. The current California standard for diesel fuel limits sulfur to 500 ppm. California on-road diesel averages 130 ppm sulfur, with some fuel distribution terminals selling 50 ppm or less (i.e., 15 ppm) sulfur diesel fuel.

The ARB predicted as much as a 25 percent reduction of directly emitted PM10 and an 80 percent reduction of SO2, a PM10 precursor, with the implementation of the 500 ppm sulfur diesel standard (ARB 1988). Staff believes that the use of 50 ppm sulfur diesel instead of 130 ppm diesel will reduce SO2 emissions by as much as 60 percent, and reduce PM10 between 5 percent (Clean 2000) and 10 percent. Reducing sulfur in diesel fuel helps extend engine life by reducing corrosive wear. Additionally, lower sulfur diesel ensures a greater compatibility with post-combustion catalysts and soot filters, where they are appropriate (ARB 1998). The use of 15 ppm S diesel will result in lower SO2 and PM10 compared to the use of on road diesel or 50 ppm S diesel fuel.

The oxidizing diesel particulate filter is a device that replaces the muffler of the construction equipment. It reduces CO and hydrocarbon (VOC) emissions by approximately 80-90% and PM10 emissions by approximately 90-99%. The Conditions of Certification will be written to give the on-site engineer the latitude to remove the oxidizing diesel particulate filters when it is determined that they are not appropriate for the specific construction activity or equipment application

Operations Mitigation

The VCP air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, Valero proposes to use low NOx combustors in the CTGs with water injection. In addition, each combustion turbine will use a SCR catalyst system to achieve a NOx concentration of 4.4 ppm, corrected to 15 percent oxygen averaged over a 3-hour period, subject to source testing. The District has concluded that this is BACT for a combustion turbine using refinery gas. However, if the unit is fired exclusively with natural gas, the units will be limited to 2.5 ppm NOx.

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NOx concentrations entering the HRSG are 42 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 10 ppm at 100 percent load.

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, a catalyst system will be installed in the HRSGs. Valero is proposing the SCR/oxidation catalyst systems to reduce NOx, VOC, and CO emissions. SCR systems are generally ineffective during turbine start-up or when catalyst temperatures are lower than 600°F.

The oxidation catalyst will control CO and VOC emissions to 10 ppm and 2 ppm, respectively. The District, subject to source testing considers these levels BACT. BACT is not triggered for PM10 or SO2. However, the PM10 emissions will be limited by the use of a clean burning gaseous fuel (refinery gas or natural gas) and the efficient combustion process of the CTGs. SO2 emissions will be limited by the removal of sulfur from the refinery gas to the lowest levels practicable. Currently, Valero uses an MEA scrubbing system.

Emission Offsets

District Regulation 2, Rule 2, Sections 302 requires that Valero provide emission offsets, in the form of emission reductions or banked Emission Reduction Credits (ERC), for the project's emissions increases of NOx, SOx, PM10 and POC. The offsets must be federally enforceable (i.e., meet federal requirements for offsets), provided on a tons per year basis. Additionally, if the offsets are provided as an interpollutant trade, the trade must be federally enforceable (i.e., meet federal requirements for offsets). The potential annual air emissions and offsets for the VCP Phase 1 are shown in Air Quality Table 5. The offsets are from contemporaneous emission reductions from the refinery (i.e., existing boiler shutdowns) and banked emission reduction credits. Additionally, Valero will curtail SO2 emissions throughout the refinery. The permitted SO2 emissions will not increase with the addition of the two combustion turbines and heat recovery steam generators.

Air Quality Table 5
VCP Phase 1 Emissions and Offsets (tons per year)

	Total Emissions	NOx	CO	POC	SO2	PM10
Phase I	CTG and HRSG	42.12	69.85	7.98	21.911	6.789
	Fugitives			0.597		
	Total Emissions	42.12	69.85	8.577	21.911	6.789
Offsets	S-38	-6.898	-144.206	-4.18	-1.35	-6.163
	S-39	-9.684	-102.722	-5.869	-0.962	-4.39
	Total Offsets	-16.574	-246.928	-10.049	-2.312	-10.553
Emissions Liability	CTG and HRSG	25.546	-177.078	-1.472	19.599	-3.764
	Offset Ratio [a]	1.15	N/A	1.15	1.0	1.0
	Total needed	29.378 [b c]	-177.078	credit [c]	curtailment [d]	credit [c]
ERCs		31.418				
Excess for Phase 2		2.04	177.078	1.472		3.764

a. Per District rules.
b. Valero will surrender ERC #703 having 31.418 tons per year NOx.
c. Valero will receive credits to be applied to Phase 2.
d. Valero will curtail SO2 emissions throughout the refinery facility to net out of SO2 increases.

Sources: District 2001a

VCP Phase 2 air emissions and offsets are shown in Table 6. Again, the emission reductions are from contemporaneous shutdowns and banked ERCs. For Phase 2, Valero will surrender POC ERCs to offset both NOx and POC. District rules allow the interpollutant trading of POC for NOx – both precursors to ozone and PM10. For SO2, Valero will curtail SO2 emissions throughout the refinery. The permitted SO2 emissions will not increase with the addition of the two combustion turbines and heat recovery steam generators.

Staff Mitigation

District rules do not require permits for most cooling towers. However, staff considers the air pollutant emissions from cooling towers in their analysis. PM10 emissions from the cooling tower are 0.368 tons per year, which could contribute to existing violations of the state-24hour standard and could be significant if not mitigated. Staff will require that 0.368 tons per year of PM10 ERCs be surrendered out of the 1.047 tpy PM10 credit available to Valero.

Air Quality Table 6
VCP Phase 2 Emissions and Offsets (tons per year)

	Total Emissions	NOx	CO	POC	SO2	PM10
Phase I	CTG and HRSG	42.12	69.85	7.98	21.911	6.789
	Fugitives			0.349		
	Total Emissions	42.12	69.85	8.329	21.911	6.789
Offsets	S-41	-11.197	N/A	-0.068	-1.561	-4.072
	From Phase 1		-177.078	-1.472	0.0	-3.764

	Total	-11.197	-177.078	-1.540	-1.561	-7.836
Emissions Liability	CTG and HRSG	30.923	-107.228	6.789	20.350	-1.047
	Offset Ratio [a]	1.15	N/A	1.15	1.0	1.0
	Total needed	35.561 [b]	N/A	7.807 [c e]	curtailment [d]	credit [e]
ERCs [b]		35.561		10.242		
Excess to be banked [e]		---	107.228	2.435	---	1.047

a. Per District rules.
b. Valero will surrender the excess NOx from Phase 1 (2.04 tpy), ERC #681 having 28.994 tons per year POC, and ERC #682 having 14.769 tpy POC (POC for NOx interpollutant trading).
c. Excess from ERC #681 and #682 will offset POC emissions.
d. Valero will curtail SO2 emissions throughout the refinery facility to net out of SO2 increases.
e. Valero will bank excess ERCs.

Sources: District 2001b

ADEQUACY OF PROPOSED MITIGATION

Construction Mitigation

Valero will be required to comply with the proposed control measures for limiting fugitive dust emissions during construction. Additionally, Valero will require contractors to maintain their vehicles and equipment and that they adopt the Energy Commission construction conditions of certification to limit exhaust emissions of PM10 and NOx. Staff and the applicant believe that these measures are necessary to mitigate, to the extent feasible, potential construction impacts.

Operations Mitigation

Emission Controls

Valero proposes to limit NOx emissions from the combustion turbines to 4.4 ppm at 15 percent O2 over a 3-hour rolling average, resulting from the use the use of a SCR and oxidation catalyst system. The NOx limit for the CTG/HRSG units, when fired on 100% natural gas, will be 2.5 ppm. Valero proposes VOC concentrations of less than 2.0 ppm at 15 percent O2 over a 1-hour rolling average, and CO concentrations of less than 10 ppm at 15 percent O2 over a 3-hour rolling average. Again, these emission rates result from the use of a SCR/ oxidation catalyst system. The NOx, CO and POC limits are considered BACT. BACT is not triggered for PM10 or SO2.

Offsets

Valero has identified a complete offset package that, on an annual basis, offsets the potential NOx, SO2, CO, PM10 and POC air emissions increases (District 2001a and 2001b) of the combustion turbines and heat recovery steam generators. Staff believes that these emission reductions mitigate any direct and indirect impacts of the project's combustion turbines and heat recovery steam generators emissions to a level of insignificance.

STAFF PROPOSED MITIGATION

Construction Mitigation

Staff proposes that prior to the commencement of construction, that Valero provide a fugitive dust maintenance plan that specifically spells out the mitigation measures that Valero will employ to limit fugitive dust during construction. It is anticipated that the fugitive dust measures be implemented for all construction activities at the project site and associated linear facilities such as transmission lines and gas pipelines.

Operation Mitigation

Staff proposes that Valero provide PM10 emission reductions to mitigate the potential impacts of the PM10 emissions from the cooling tower to a level of insignificance.

ENVIRONMENTAL JUSTICE

The applicant has performed air dispersion modeling and air quality analyses for the Valero Cogeneration Project. Screening modeling determined the worst case[3] emissions for the project. Using the worst case emissions, refined modeling calculated the maximum air quality impacts for project start-up, operation, and shutdown. Based on the modeling results and Bay Area ambient air quality data, the project does not cause any violations of the state or federal ambient air quality standards.

PM10 emissions from the project do contribute to existing violations of the state 24-hour PM10 ambient air quality standards. However, the project impacts, including PM10, do not expose a minority population community to a greater impact than a non-minority population, and are fully mitigated by offsets.

COMPLIANCE WITH LORS

FEDERAL

The District's NSR permit process, which generated the PDOCs (District 2001a and 2001b) does not require a Prevention of Significant Deterioration (PSD) permit process for this project. The District is not doing a separate PSD permit review. The District will also issue a Title V permit for the facility upon operation of the project.

STATE

The project, with the issuance of a complete Preliminary Determination of Compliance by the Bay Area Air Quality Management District, should comply with Section 41700 of the California State Health and Safety Code.

[3] "Worst case" considers equipment, load, fuel type, and ambient conditions.

LOCAL

The District issued a draft preliminary Determinations of Compliance (District 2001a and 2001b) July 27, 2001, with proposed conditions of certification, which are included below.

FACILITY CLOSURE

Eventually the VCP will close, either as a result of the end of its useful life (which is expected to be 30 years), or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur. If Valero were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how Valero plans to demonstrate compliance with District rules and fugitive dust and construction emissions control measures.

CONCLUSIONS AND RECOMMENDATIONS

The Valero Generating project is not a new major source or a major modification to an existing major source. The project uses BACT for NOx, CO, and POC. BACT was not triggered for SO2 and PM10. The project's air quality impacts from directly emitted PM10 and of the ozone precursor emissions of NOx and VOC and PM10 precursors of NOx, VOC and SO2 could be significant if left unmitigated. Valero will reduce operational emissions to the extent feasible, operate the facility under hourly, daily and annual emissions limits, and will provide NOx, SOx, PM10, and POC offsets well in excess of any potential air pollutant increases. Therefore, the project results in a net decrease of air pollutant emissions from the Valero refinery and any potential impacts are reduced to a level of insignificance.

Based on the District's draft Preliminary Determination of Compliance, staff believes that the project complies with the District's Rules and Regulations.

Therefore, staff recommends certification of the Valero Cogeneration project, contingent on completion and adoption of the District's DOC, and adoption of staff's proposed conditions of certification to reduce potential PM10 impacts from the cooling tower and potential impacts from on-site construction activities, to the extent feasible.

CONDITIONS OF CERTIFICATION

DETERMINATION OF COMPLIANCE CONDITIONS

Definitions:

1-hour period:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.

Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in Btu/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel, other than pilot gas, is flowing to a unit, measured in fifteen-minute increments.
MM Btu:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 256 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 20(b) and 20(d).
Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 20(b) through 20(d) until termination of fuel flow to the Gas Turbine.
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For emission point P-60 (combined exhaust of S-1030 Gas Turbine and S-1031 HRSG duct burners) and emission point P-62 (combined exhaust of S-1032 Gas Turbine and S-1033 HRSG duct burners) the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation.

Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager

Conditions for the Approval of the Authority to Construct- S-1030, S-1031:

AQ-1 Prior to the approval of the Authority to Construct S-1030 and S-1031, the owner will provide the following offsets: (Basis: NOx Offsets)

NOx 29.378 TPY from Cert # 703

Verification: The project owner shall provide copies of the ERC to the District and the CEC CPM 30 days prior to the combustion of fuel in the gas turbines.

AQ-2 For SO2 emissions offsets, a curtailment group is established as follows: (Basis: SO2 offsets)

	Source	Base Line	
SG703/2901	S-38, 39	2.312 tpy	
SG2302	S-41	1.561 tpy	
SG 1032	S-237	8.6 tpy	
F 4460	S-220	10.0 tpy	
MTBE Ships		9.5 tpy	
New Cogen	S-1030, 1031	N/A	App 2488
New Cogen	S-1032, 1033	N/A	App 2695
ERC's Deposited		0.0 tpy	Deposits applied as credits
Total		31.973 tpy	Not to be exceeded.

a. SO2 emissions from the Curtailment Group will not exceed 31.973 tpy for any consecutive four quarter period.

b. Emissions will be calculated using fuel flow meters and the TRS Gas Chromatograph CEM's data, or stack SO2 CEMS and flow data, or other District approved methods.

c. Owner can deposit any valid ERC certificate into the group as a credit, at any time.

d. A quarterly report of the group emissions will be submitted to the District, in a District approved format, to document compliance.

e. Sources may be added to or deleted from the group at Valero's request subject to District approval. This process will increase or decrease the total emission limit for the group by the source's base line amount, as calculated

per the District's ERC procedures found in Section 405 of Regulation 2, Rule 2.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. A quarterly report of the group emissions will be submitted to the District, in a District approved format, to document compliance. This report will be provided no later than 30 days after the end of the quarter

CONDITIONS FOR THE COMMISSIONING PERIOD - S-1030, S-1031:

AQ-3 The owner/operator of the S-1030 Gas Turbine and S-1031 HRSG shall minimize emissions of carbon monoxide and nitrogen oxides from these sources to the maximum extent possible during the commissioning period. Conditions AQ-3 through AQ-12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, the remaining conditions shall apply after the commissioning period has ended.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-4 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-1030 Gas Turbine combustors and S-1031 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-5 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-60 SCR System and A-61 CO Oxidation Catalyst System shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-1030 Gas Turbine and S-1031 Heat Recovery Steam Generator.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-6 Coincident with the as designed operation of A-60/61 SCR System, the Gas Turbine (S-1030) and the HRSG (S-1031) shall comply with the NO_x and CO emission limitations specified in conditions AQ-18(a) through AQ-18(b).

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-7 The owner/operator shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1030 Gas Turbine describing the procedures to be followed during the commissioning of the gas turbine and HRSG. 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 oxidation catalysts, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbine (S-1030) and HRSG (S-1031) without abatement by their respective SCR and CO Catalyst Systems.

Verification: The project owner shall submit a commissioning plan to the District and the CEC CPM at least four weeks prior to the first combustion of fuel in the CTG S-1030.

AQ-8 During the commissioning period, the owner/operator shall demonstrate compliance with conditions AQ-10 through AQ-12 through the use of properly operated, and maintained continuous emission monitors and data recorders for the following parameters:

- firing hours for the gas turbine and HRSG
- fuel flow rates through the train
- stack gas nitrogen oxide (and oxygen) emission concentrations at P-60
- stack gas carbon monoxide emission concentrations P-60
- stack gas SO2 emission concentrations at P-60 or fuel TRS/H2S concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbine (S-1030) and HRSG (S-1031). The owner/operator shall use District-approved methods to calculate heat input rates, NO_x mass emission rates, carbon monoxide mass emission rates, SOx mass emission rates, and emission concentrations of NO_x, SOx, and CO, summarized for each clock hour and each calendar day.

Verification: All records shall be retained on site for at least 5 years from the date of entry and made available to District, California Air Resources Board (CARB) and the Commission personnel upon request.

AQ-9 The District-approved continuous emission monitors specified in condition 8 shall be installed, calibrated, and operational prior to first firing of the Gas Turbine (S-1030) and Heat Recovery Steam Generator (S-1031). After first firing of the turbine, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO, SOx, and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: The design details providing the type, specifications, and location of these monitors shall be submitted to the District for review and approval at least 30 prior to installation of the monitors.

AQ-10 The total number of firing hours of S-1030 Gas Turbine and S-1031 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-60 SCR System and/or A-61 Oxidation Catalyst System shall not exceed 500 hours during the commissioning period. Such operation of S-1030 Gas Turbine and S-1031 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 500 firing hours without abatement shall expire.

Verification: The project owner shall provide written notice to the District Permit Services and Enforcement Divisions no more than 5 days after the completion of these activities.

AQ-11 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1030) and Heat Recovery Steam Generators (S-1031) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition AQ-22.

Verification: The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1030) and Heat Recovery Steam Generators (S-1031) during the commissioning period shall be included in the annual report specified in condition AQ-62.

AQ-12 Combined pollutant mass emissions from the Gas Turbine (S-1030) and Heat Recovery Steam Generators (S-1031) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1030 & S-1031).

NO_x (as NO_2)	2483 pounds per calendar day	107.4 pounds per hour
CO	832.2 pounds per calendar day	35.6 pounds per hour
POC (as CH_4)	94.8 pounds per calendar day	
PM10	37.2 pounds per calendar day	
SO_2	263 pounds per calendar day	

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Conditions for the Operation of Gas Turbine (S-1030) and the Heat Recovery Steam Generators (HRSG; S-1031)

AQ-13 The Gas Turbine (S-1030) and HRSG Duct Burners (S-1031) shall be fired on refinery fuel or natural gas. (Basis: BACT for SO_2 and PM_{10}).

Verification: Fuel use shall be included in the annual report required per AQ-22.

AQ14 The combined heat input rate to the power train consisting of a Gas Turbine and its associated HRSG (S-1030 and S-1031) shall not exceed 810 MM Btu per hour, averaged over any rolling 3-hour period. (Basis: PSD for NO_x).

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-15 The combined heat input rate to the power train consisting of a Gas Turbine and its associated HRSG (S-1030 and S-1031) shall not exceed 19,440 MM Btu per calendar day. (Basis: PSD for PM10)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-16 The combined cumulative heat input rate for the Gas Turbines (S-1030) and the HRSGs (S-1031) shall not exceed 6,351,000 MM Btu per year. (Basis: Offsets)

Verification: Annual heat input rates shall be included in the annual report required per AQ-22.

AQ-17 S-1030 Gas Turbine and S-1031 HRSG shall be abated by the properly operated and properly maintained A-60 Selective Catalytic Reduction (SCR) System and A-61 CO Oxidation Catalyst System whenever fuel is combusted at those sources and the catalyst bed has reached minimum operating temperature. (Basis: BACT for NO_x)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-18 The Gas Turbine (S-1030) and HRSG (S-1031) when firing natural gas shall comply with requirements (a) through (f) under all operating scenarios, including duct burner firing mode. Requirements (a) through (f) do not apply during a gas turbine start-up or shutdown. (Basis: BACT, PSD, and Toxic Risk Management Policy)

(a) The nitrogen oxide emission concentration at emission points P-60 shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any one hour period. (BACT for NO_x when firing natural gas)

(b) The carbon monoxide emission concentration at P-60 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-clock hour period. (BACT for CO when firing natural gas)

(c) Ammonia (NH_3) emission concentrations at P-60 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. Compliance with this ammonia emission concentration limit will be demonstrated by initial source test.

(d) Precursor organic compound (POC) mass emissions (as CH_4) at P-60 shall not exceed 2.0372 pounds per hour or 0.002515 Lb/MM Btu of natural gas fired. (BACT for POC when firing natural gas)

(e) Sulfur dioxide (SO_2) mass emissions at P-60 shall not exceed 1.134 pounds per hour (3-hour average) (BACT) or 0.0014 Lb/MM Btu of natural gas fired. (BACT for SO_2 when firing natural gas),

(f) Particulate matter (PM10) mass emissions at P-60 shall not exceed 4.795 pounds per hour or 0.00592 Lb/MM Btu of natural gas fired. (BACT for PM10 when firing natural gas)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-22

AQ-19 The Gas Turbine (S-1030) and HRSG (S-1031) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (Basis: BACT, PSD, and Toxic Risk Management Policy)

(a) Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO_2) at P-60 (the combined exhaust point for the S-1030 Gas Turbine and the S-1031 HRSG after abatement by A-60 SCR System) shall not exceed 10.74 pounds per clock hour

(b) The nitrogen oxide emission concentration at emission points P-60 shall not exceed 4.4 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 3-clock hour period. (BACT for NO_x)

(c) Carbon monoxide mass emissions at P-60 shall not exceed 17.82 pounds per clock hour, averaged over any rolling 3-hour period. This emission limitation shall be subject to adjustment based on the initial source test results. (PSD for CO)

(d) The carbon monoxide emission concentration at P-60 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-clock hour period. This emission limitation shall be subject to adjustment based on the initial source test results. (BACT for CO)

(e) Ammonia (NH_3) emission concentrations at P-60 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. Compliance with this ammonia emission concentration limit will be demonstrated by initial source test.

(f) Precursor organic compound (POC) mass emissions (as CH4) at P-60 shall not exceed 2.0372 pounds per hour. This limit is subject to adjustment based on the results of the initial source test. Demonstration of compliance will be based on source test results. (BACT)

(g) Sulfur dioxide (SO_2) mass emissions at P-60 shall not exceed 5.003 pounds per hour (rolling four quarter average) (BACT), nor 17.534 pounds per hour (3 hour average), nor 10.96 pounds per hour (24 hour average). (NSPS)

Either fuel sulfur (TRS) or stack SO2 must be monitored and meet the following limitation, as appropriate: Sulfur dioxide (SO_2) concentrations at P-60 shall not exceed 1.36 ppmv, on a dry basis, corrected to 15% O2 on a rolling four quarter average, nor 3.00 ppmv, on a dry basis, corrected to 15% O2 on a 24 hour average, nor 4.80 ppmv, on a dry basis, corrected to 15% O2 on a three hour average.

SO_2 concentrations in refinery fuel gas shall not exceed 51 ppm TRS on a rolling four quarter average, nor 100 ppm H_2S on a 24 hour average, nor 160 ppm H_2S on any three hour average.

(h) Particulate matter (PM10) mass emissions at P-60 shall not exceed 1.55 pounds per hour of refinery fuel gas fired **when the HRSG duct burners are not in operation.** This limit is subject to revision based on the results of the initial source test. Demonstration of compliance will be based on source test results. (Basis: BACT for PM10)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-22

AQ-20 A District approved initial source test will be commenced within 60 days of startup to demonstrate compliance with Conditions number 18 and 19. The test results will be forwarded to the District within 60 days of completion of the field test. The test should verify emission compliance near maximum firing on natural gas and refinery fuel gas. The results of the test on natural gas (Condition number AQ-18) will be the sole basis for determining BACT compliance for Phase I of Valero's Cogeneration project. The results of the test on refinery fuel gas (Condition number AQ-19) will be the basis for reviewing and potentially adjusting the limits in permit condition AQ-19 for purposes of defining BACT on refinery fuel gas. It is recognized that there is uncertainty as to the achievable reductions when firing on refinery fuel gas. (Basis: Compliance Verification with BACT)

Verification: A District approved initial source test shall be commenced within 60 days of startup to demonstrate compliance with Conditions number 18 and 19. The test results will be forwarded to the District within 60 days of completion of the field test.

AQ-21 The owner will conduct annual source tests and submit the results within 60 days of the test's completion. These tests will demonstrate compliance with POC and PM10 emission limits in conditions AQ-19 (f) and AQ-19 (h). (Basis: Compliance Monitoring)

Verification: Annual source test results shall be forwarded to the District within 60 days of completion of the test.

AQ-22 Total emissions from S-1030 & S-1031 shall not exceed the following annual limits: (Basis: Cumulative Increase, Offsets, PSD)

NOx - 42.12 TPY (based on CEM data)
POC - 8.577 TPY (based on source test results plus fugitive emissions of 0.597 tpy)
PM10 – 6.79 TPY (based on source test results)
SOx - 21.911 (based on quarterly curtailment group compliance under condition # 2)
CO - 69.9 TPY (based on CEM data)

Limits for POC, PM10, and CO are subject to revision based on initial source test results.

Verification: An annual report will be prepared by owner and submitted to the District and the CEC CPM documenting compliance with these annual limitations to mass emissions. An annual report will be prepared by owner and submitted to the District documenting compliance with these annual limitations to mass emissions.

AQ-23 To demonstrate compliance with conditions AQ-19(f), AQ-19(g) and AQ-19(h), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM_{10}) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO_2) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

(a) For each calendar day, POC, PM_{10}, and SO_2 emissions shall be summarized for: the combined power train [Gas Turbine (S-1030) and HRSG (S-1031)]

(b) On a daily basis, the 365 day rolling average cumulative total POC, PM_{10}, and SO_2 mass emissions, for both sources (S-1030 and S-1031) combined. (Basis: Offsets, PSD, Cumulative Increase)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-22.

AQ-24 The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District within 60 days of conducting the tests. (Basis: Source Test Compliance Verification

Verification: The owner/operator shall notify the District's Source Test Section in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s).

AQ-25 The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Basis: Regulation 2-6-502)

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

AQ-26 The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents.

Verification: These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-27 The owner/operator shall notify the District of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Basis: Regulation 2-1-403)

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

AQ-28 The stack height of emission points shall each be at least 80 feet above grade level at the stack base. (Basis: PSD, TRMP)

Verification: The design details providing the stack specifications shall be submitted to the District for review and approval at least 30 prior to the start of construction.

AQ-29 The Owner/Operator shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Basis: Regulation 1-501)

Verification: The design details providing the type, specifications, and location of these sampling ports shall be submitted to the District for review and approval at least 30 prior to installation of the sampling ports.

AQ-30 Within 180 days of the issuance of the Authority to Construct, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Basis: Regulation 1-501)

Verification: The design details providing the type and specifications of these sampling ports, monitors and source tests shall be submitted to the District for review and approval within 180 day from the decision.

AQ-31 The Cogeneration project shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Basis: Regulation 2, Rule 7)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Fugitive Equipment

AQ-32 All hydrocarbon control valves installed as part of the Cogeneration Project in Phase I shall be equipped with live loaded packing systems and polished stems, or equivalent.

Verification: The project owner shall provide copies of the design details of the ancillary equipment to the District at least 90 days prior to the delivery of the equipment to the project site.

AQ-33 All accessible hydrocarbon valves shall be inspected quarterly and inaccessible valves shall be inspected annually using a District approved leak detection device. Any valve found to be leaking in excess of 100 ppm shall be subject to the leak repair provisions of District Regulation 8, Rule 18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-34 All connectors installed in the piping systems as a result of Phase I of the Cogeneration project shall be equipped with graphitic-based gaskets. Any connector found to be leaking in excess of 100 ppm shall be subject to the leak repair provisions of Regulation 8, Rule 18

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-35 All new hydrocarbon centrifugal compressors installed as part of Phase I of the Cogeneration project shall be equipped with "wet" dual mechanical seals with a heavy liquid barrier fluid, or dual dry gas mechanical seals buffered with inert gas. All compressors shall be inspected and repaired in accordance with District Regulation 8, Rule 18. All compressors found to leaking in excess of 500 ppm shall be subject to the leak repair provisions of Regulation 8, Rule 18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-36 All new fugitive equipment in organic service will be integrated into the owner's fugitive equipment monitoring and repair program and will meet the requirements of District Regulation 8-18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-37 The Phase I project shall consist of no more than 400 valves, 1200 connectors and 2 compressors. The POC emissions from these fugitive components shall not

exceed 0.597 tons/year. The annual mass limit for POC may be adjusted based on final fugitive component count. Any additional POC offsets required due to a larger fugitive component count will need to be provided prior to permit issuance.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

CONDITIONS OF CERTIFICATION numbers AQ-38 through AQ-40 are reserved for future use.

Conditions for the Approval of the Authority to Construct – Phase II: S-1032, S-1033:

AQ-41 Prior to the approval of the Authority to Construct S-1032 and S-1033, the owner will provide the following offsets: (Basis: NOx and POC Offsets)

NOx 33.521 TPY from Cert # 703 and #681
POC 7.807 TPY from Cert # 681

Verification: The project owner shall provide copies of the ERC to the District and the CEC CPM 30 days prior to the combustion of fuel in the gas turbines.

AQ-42 For SO2 emissions offsets, a curtailment group is established as follows: (Basis: SO2 offsets)

	Source	Base Line	
SG703/2901	S-38, 39	2.312 tpy	
SG2302	S-41	1.561 tpy	
SG 1032	S-237	8.6 tpy	
F 4460	S-220	10.0 tpy	
MTBE Ships		9.5 tpy	
New Cogen	S-1030, 1031	N/A	App 2488
New Cogen	S-1032, 1033	N/A	App 2695
ERC's Deposited		0.0 tpy	Deposits applied as credits
Total		31.973 tpy	Not to be exceeded.

a. SO2 emissions from the Curtailment Group will not exceed 31.973 tpy for any consecutive four quarter period.

b. Emissions will be calculated using fuel flow meters and the TRS Gas Chromatograph CEM's data, or stack SO2 CEMS and flow data, or other District approved methods.

c. Owner can deposit any valid ERC certificate into the group as a credit, at any time.

d. A quarterly report of the group emissions will be submitted to the District, in a District approved format, to document compliance. This report will be provided no later than 30 days after the end of the quarter.

e. Sources may be added to or deleted from the group at Valero's request subject to District approval. This process will increase or decrease the total emission limit for the group by the source's base line amount, as calculated per the District's ERC procedures found in Section 405 of Regulation 2, Rule 2.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. A quarterly report of the group emissions will be submitted to the District, in a District approved format, to document compliance. This report will be provided no later than 30 days after the end of the quarter

Conditions for the Commissioning Period - S-1032, S-1033:

AQ-43 The owner/operator of the S-1032 Gas Turbine and S-1033 HRSG shall minimize emissions of carbon monoxide and nitrogen oxides from these sources to the maximum extent possible during the commissioning period. Conditions AQ-43 through AQ-52 shall only apply during the commissioning period as defined above. Unless otherwise indicated, the remaining conditions shall apply after the commissioning period has ended.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-44 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-1032 Gas Turbine combustors and S-1033 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-45 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-62 SCR System and A-63 CO Oxidation Catalyst System shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-1032 Gas Turbine and S-1033 Heat Recovery Steam Generator.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-46 Coincident with the as designed operation of A-61/62 SCR System, the Gas Turbine (S-1032) and the HRSG (S-1033) shall comply with the NO_x and CO emission limitations specified in conditions AQ-58(a) and AQ-58(b).

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-47 The owner/operator shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1032 Gas Turbine describing the procedures to be followed during the commissioning of the gas turbine and HRSG. 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 oxidation catalysts, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbine (S-1032) and HRSG (S-1033) without abatement by their respective SCR and CO Catalyst Systems.

Verification: The project owner shall submit a commissioning plan to the District and the CEC CPM at least four weeks prior to the first combustion of fuel in the CTG S-1030.

AQ-48 During the commissioning period, the owner/operator shall demonstrate compliance with conditions AQ-50 through AQ-52 through the use of properly operated, and maintained continuous emission monitors and data recorders for the following parameters:

- firing hours for the gas turbine and HRSG
- fuel flow rates through the train
- stack gas nitrogen oxide (and oxygen) emission concentrations at P-62
- stack gas carbon monoxide emission concentrations P-60
- stack gas SO2 emission concentrations at P-62 or fuel TRS/H2S concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbine (S-1032) and HRSG (S-1033). The owner/operator shall use District-approved methods to calculate heat input rates, NO_x mass emission rates, carbon monoxide mass emission rates, SOx mass emission rates, and emission concentrations of NO_x, SOx, and CO, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

Verification: All records shall be retained on site for at least 5 years from the date of entry and made available to District, California Air Resources Board (CARB) and the Commission personnel upon request.

AQ-49 The District-approved continuous emission monitors specified in Condition AQ-48 shall be installed, calibrated, and operational prior to first firing of the Gas Turbine (S-1032) and Heat Recovery Steam Generator (S-1033). After first firing of the turbine, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO, SOx, and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: The design details providing the type, specifications, and location of these monitors shall be submitted to the District for review and approval at least 30 prior to installation of the monitors.

AQ-50 The total number of firing hours of S-1032 Gas Turbine and S-1033Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-62 SCR System and/or A-63 Oxidation Catalyst System shall not exceed 500 hours during the commissioning period. Such operation of S-1032 Gas Turbine and S-1033 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 500 firing hours without abatement shall expire.

Verification: The project owner shall provide written notice to the District Permit Services and Enforcement Divisions no more than 5 days after the completion of these activities.

AQ-51 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1032) and Heat Recovery Steam Generators (S-1033) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition AQ-62.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-52 Combined pollutant mass emissions from the Gas Turbine (S-1032) and Heat Recovery Steam Generators (S-1033) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1032 & S-1033).

NO_x (as NO_2)	2483 pounds per calendar day	107.4 pounds per hour
CO	832.2 pounds per calendar day	35.6 pounds per hour
POC (as CH_4)	94.8 pounds per calendar day	
PM10	37.2 pounds per calendar day	
SO_2	263 pounds per calendar day	

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Conditions for the Operation of Gas Turbine (S-1032) and the Heat Recovery Steam Generators (HRSG; S-1033)

AQ-53 The Gas Turbine (S-1032) and HRSG Duct Burners (S-1033) shall be fired on refinery fuel or natural gas. (Basis: BACT for SO_2 and PM_{10})

Verification: Fuel use shall be included in the annual reports required by AQ-62

AQ-54 The combined heat input rate to the power train consisting of a Gas Turbine and its associated HRSG (S-1032 and S-1033) shall not exceed 810 MM Btu per hour, averaged over any rolling 3-hour period. (Basis: PSD for NOx)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-55 The combined heat input rate to the power train consisting of a Gas Turbine and its associated HRSG (S-1032 and S-1033) shall not exceed 19,440 MM Btu per calendar day. (Basis: PSD for PM10)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-56 The combined cumulative heat input rate for the Gas Turbines (S-1032) and the HRSGs (S-1033) shall not exceed 6,351,000 MM Btu per year. (Basis: Offsets)

Verification: The information shall be included in the annual reports required by AQ-62

AQ-57 S-1032 Gas Turbine and S-1033 HRSG shall be abated by the properly operated and properly maintained A-62 Selective Catalytic Reduction (SCR) System and A-63 CO Oxidation Catalyst System whenever fuel is combusted at those sources and the catalyst bed has reached minimum operating temperature. (Basis: BACT for NO_x)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-58 The Gas Turbine (S-1032) and HRSG (S-1033) when firing natural gas shall comply with requirements (a) through (f) under all operating scenarios, including duct burner firing mode. Requirements. The (a) through (f) do not apply during a gas turbine start-up or shutdown. (Basis: BACT, PSD, and Toxic Risk Management Policy)

(a) The nitrogen oxide emission concentration at emission points P-62 shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any one hour period. (BACT for NO_x when firing natural gas)

(b) The carbon monoxide emission concentration at P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-clock hour period. (BACT for CO when firing natural gas)

(c) Ammonia (NH_3) emission concentrations at P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. Compliance with this ammonia emission concentration limit will be demonstrated by initial source test.

(d) Precursor organic compound (POC) mass emissions (as CH_4) at P-62 shall not exceed 2.0372 pounds per hour or 0.002515 Lb/MM Btu of natural gas fired. (BACT for POC when firing natural gas)

(e) Sulfur dioxide (SO_2) mass emissions at P-62 shall not exceed 1.134 pounds per hour (3-hour average) (BACT) or 0.0014 Lb/MM Btu of natural gas fired. (BACT for SO_2 when firing natural gas),

(f) Particulate matter (PM10) mass emissions at P-62 shall not exceed 4.795 pounds per hour or 0.00592 Lb/MM Btu of natural gas fired. (BACT for PM10 when firing natural gas)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-62.

AQ-59 The Gas Turbine (S-1032) and HRSG (S-1033) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (Basis: BACT, PSD, and Toxic Risk Management Policy)

(a) Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO_2) at P-62 (the combined exhaust point for the S-1030 Gas Turbine and the S-1031 HRSG after abatement by A-60 SCR System) shall not exceed 10.74 pounds per clock hour

(b) The nitrogen oxide emission concentration at emission points P-62 shall not exceed 4.4 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 3-clock hour period. (BACT for NO_x)

(c) Carbon monoxide mass emissions at P-62 shall not exceed 17.82 pounds per clock hour, averaged over any rolling 3-hour period. This emission limitation shall be subject to adjustment based on the initial source test results. (PSD for CO)

(d) The carbon monoxide emission concentration at P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-clock hour period. This emission limitation shall be subject to adjustment based on the initial source test results. (BACT for CO)

(e) Ammonia (NH_3) emission concentrations at P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. Compliance with this ammonia emission concentration limit will be demonstrated by initial source test.

(f) Precursor organic compound (POC) mass emissions (as CH_4) at P-62 shall not exceed 2.0372 pounds per hour. This limit is subject to adjustment based on the results of the initial source test. Demonstration of compliance will be based on source test results. (BACT)

(g) Sulfur dioxide (SO_2) mass emissions at P-62 shall not exceed 5.003 pounds per hour (rolling four quarter average) (BACT), nor 17.534 pounds per hour (3 hour average), nor 10.96 pounds per hour (24 hour average). (NSPS)

Either fuel sulfur (TRS) or stack SO2 must be monitored and meet the following limitation, as appropriate: Sulfur dioxide (SO_2) concentrations at P-62 shall not exceed 1.36 ppmv, on a dry basis, corrected to 15% O2 on a rolling four quarter average, nor 3.00 ppmv, on a dry basis, corrected to 15% O2 on a 24 hour average, nor 4.80 ppmv, on a dry basis, corrected to 15% O2 on a three hour average.

SO_2 concentrations in refinery fuel gas shall not exceed 51 ppm TRS on a rolling four quarter average, nor 100 ppm H_2S on a 24 hour average, nor 160 ppm H_2S on any three hour average.

(h) Particulate matter (PM10) mass emissions at P-62 shall not exceed 1.55 pounds per hour of refinery fuel gas fired **when the HRSG duct burners are not in operation.** This limit is subject to revision based on the results of the initial source test. Demonstration of compliance will be based on source test results. (Basis: BACT for PM10)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-62.

AQ-60 A District approved initial source test will be commenced within 62 days of startup to demonstrate compliance with Conditions number 18 and 19. The test results will be forwarded to the District within 60 days of completion of the field test. The test should verify emission compliance near maximum firing on natural gas and refinery fuel gas. The results of the test on natural gas (Condition number AQ-58) will be the sole basis for determining BACT compliance for Phase I of Valero's Cogeneration project. The results of the test on refinery fuel gas (Condition number AQ-59) will be the basis for reviewing and potentially adjusting the limits in permit condition AQ-59 for purposes of defining BACT on refinery fuel gas. It is recognized that there is uncertainty as to the achievable reductions when firing on refinery fuel gas. (Basis: Compliance Verification with BACT)

Verification: A District approved initial source test shall be commenced within 60 days of startup to demonstrate compliance with Conditions number AQ-58 and AQ-59. The test results will be forwarded to the District within 60 days of completion of the field test.

AQ-61 The owner will conduct annual source tests and submit the results within 60 days of the test's completion. These tests will demonstrate compliance with POC and PM10 emission limits in conditions AQ-59 (f) and AQ-59 (h). (Basis: Compliance Monitoring)

Verification: Annual source test results shall be forwarded to the District within 60 days of completion of the test.

AQ-62 Total emissions from S-1032 & S-1033 shall not exceed the following annual limits: (Basis: Cumulative Increase, Offsets, PSD)

NOx - 42.12 TPY (based on CEM data)
POC - 8.329 TPY (based on source test results plus fugitive emissions of 0.349 tpy)
PM10 – 6.789 TPY (based on source test results)
SOx - 21.911 TPY (based on quarterly curtailment group compliance under condition AQ-42)
CO - 69.85 TPY (based on CEM data)

Limits for POC, PM10, and CO are subject to revision based on initial source test results.

An annual report will be prepared by owner and submitted to the District documenting compliance with these annual limitations to mass emissions.

Verification: An annual report will be prepared by owner and submitted to the District and the CEC CPM documenting compliance with these annual limitations to mass emissions. An annual report will be prepared by owner and submitted to the District documenting compliance with these annual limitations to mass emissions.

AQ-63 To demonstrate compliance with conditions AQ-59(f), AQ-59(g) and AQ-59(h), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM_{10}) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO_2) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

(a) For each calendar day, POC, PM_{10}, and SO_2 emissions shall be summarized for: the combined power train [Gas Turbine (S-1032) and HRSG (S-1033)]

(b) On a daily basis, the 365 day rolling average cumulative total POC, PM_{10}, and SO_2 mass emissions, for both sources (S-1032 and S-1033) combined.

(Basis: Offsets, PSD, Cumulative Increase)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-62.

AQ-64 The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds.

Verification: The owner/operator shall notify the District's Source Test Section in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s).

AQ-65 The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Basis: Regulation 2-6-502)

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

AQ-66 The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Basis: Regulation 2-6-501)

Verification: These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-67 The owner/operator shall notify the District of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition.–(Basis: Regulation 2-1-403)

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

AQ-68 The stack height of emission points shall be at least 80 feet above grade level at the stack base. (Basis: PSD, TRMP)

Verification: The design details providing the stack specifications shall be submitted to the District for review and approval at least 30 prior to installation of the start of construction.

AQ-69 The Owner/Operator shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Basis: Regulation 1-501)

Verification: The design details providing the location and specifications of the sampling ports shall be submitted to the District for review and approval at least 30 prior to installation of the monitors.

AQ-70 Within 180 days of the issuance of the Authority to Construct, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Basis: Regulation 1-501)

Verification: The design details providing the type and specifications of these sampling ports, monitors and source tests shall be submitted to the District for review and approval within 180 day from the decision.

AQ-71 The Cogeneration project shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Basis: Regulation 2, Rule 7)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Fugitive Equipment

AQ-72 All hydrocarbon control valves installed as part of the Cogeneration Project in Phase II shall be equipped with live loaded packing systems and polished stems, or equivalent.

Verification: The project owner shall provide copies of the design details of the ancillary equipment to the District at least 90 days prior to the delivery of the equipment to the project site.

AQ-73 All accessible hydrocarbon valves shall be inspected quarterly and inaccessible valves shall be inspected annually using a District approved leak detection device. Any valve found to be leaking in excess of 100 ppm shall be subject to the leak repair provisions of District Regulation 8, Rule 18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-74 All connectors installed in the piping systems as a result of Phase II of the Cogeneration project shall be equipped with graphitic-based gaskets. Any connector found to be leaking in excess of 100 ppm shall be subject to the leak repair provisions of Regulation 8, Rule 18

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-75 All new hydrocarbon centrifugal compressors installed as part of Phase II of the Cogeneration project shall be equipped with "wet" dual mechanical seals with a heavy liquid barrier fluid, or dual dry gas mechanical seals buffered with inert gas. All compressors shall be inspected and repaired in accordance with District Regulation 8, Rule 18. All compressors found to leaking in excess of 500 ppm shall be subject to the leak repair provisions of Regulation 8, Rule 18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-76 All new fugitive equipment in organic service will be integrated into the owner's fugitive equipment monitoring and repair program and will meet the requirements of District Regulation 8-18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-77 The Phase II project shall consist of no more than 200 valves, 600 connectors and 2 compressors. The POC emissions from these fugitive components shall not

exceed 0.349 tons/year. The annual mass limit for POC may be adjusted based on final fugitive component count. Any additional POC offsets required due to a larger fugitive component count will need to be provided prior to permit issuance.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

CONDITIONS OF CERTIFICATION numbers AQ-78 through AQ-80 are reserved for future use.

ENGERY COMMISSION STAFF CONDITIONS

These conditions are not included in the District's Determination of Compliance.

For the purposes of these conditions, the following definitions apply:

(1) ACTIVE OPERATIONS shall mean any activity capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, or heavy- and light-duty vehicular movement.

(2) CHEMICAL STABILIZERS mean any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation; and should meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(3) CONSTRUCTION/DEMOLITION ACTIVITIES are any on-site mechanical activities preparatory to or related to the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities; grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(4) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust.

(5) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(6) EARTH-MOVING ACTIVITIES shall include, but not be limited to, grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, or soil mulching.

(7) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man.

(8) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of ten consecutive days.

(9) STABILIZED SURFACE means:
(A) any disturbed surface area or open storage pile which is resistant to wind-driven fugitive dust;
(B) any unpaved road surface in which any fugitive dust plume emanating from vehicular traffic does not exceed 20 percent opacity.

(10) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

AQ-81 The project owner shall provide 0.368 tons per year of PM10 ERCs

Verification: The project owner shall surrender the PM10 ERCs to the District and provide copies of the surrendered ERCs to the CEC CPM 30 days after the start of project operation.

AQ-82 The project owner shall implement a CEC CPM approved fugitive Dust Control Plan.

Protocol: The plan shall include the following:

1. A description of each of the active operation(s) which may result in the generation of fugitive dust;
2. An identification of all sources of fugitive dust (e.g., earth-moving, storage piles, vehicular traffic, etc.
3. A description of the control measures to be applied to each of the sources of dust emissions identified above (including those required in AQ-71 and -72 below). The description must be sufficiently detailed to demonstrate that the applicable best available control measure(s) as specified in Table 1 (attached) will be utilized and/or installed during all periods of active operations;
4. In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the required control measures for any of the sources identified, a justification statement must be provided to explain the reason(s) why the required control measures cannot be implemented.

Verification: Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the CEC CPM for review and approval. The project owner shall maintain daily records to document the specific actions taken pursuant to the plan and Table 1. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

AQ-83 During the construction phase of the project, the project owner shall:

1. Prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations, or take at least one of the actions listed in Table 2 (attached) to prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations;
2. Install and use a track-out control device to prevent the track-out of bulk material from areas containing soils requiring corrective to other areas within the project construction site and laydown area;
3. Minimize fugitive particulate emissions from vehicular traffic on paved roads and paved parking lots on the construction site by vacuum mechanical sweeping or water flushing of the road surface to remove buildup of loose material. The project owner shall inspect on a daily basis the conditions of the paved roads and parking lots to determine the need for mechanical sweeping or water flushing.

Verification: The project owner shall maintain a daily log during the construction phase of the project indicating: 1) the manner in which compliance with this condition or Table 2 is achieved, and 2) the date and time when the inspection of paved roads and parking lots occurs and the date and time(s) when the cleaning operation occurs. The logs shall be made available to the California Energy Commission CPM upon request.

AQ-84 At any time when fugitive dust from OMGP project construction is visible in the atmosphere beyond the property line, the project owner will identify the source of the fugitive dust and implement one or more of the appropriate control measures specified in Table 3 (attached)

Verification: The project owner will maintain a daily log recording the dates and times that measures in Table 3 (attached) have been implemented and make them available to the CPM upon request.

AQ-85 The project owner shall mitigate, to the extent practical, construction related emission impacts from off-road, diesel fired construction equipment. Available measures which 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 10 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
<100 bhp	Yes or No	- ULSD
>100 bhp	Yes	- ULSD
>100 bhp	No	- ULSD and - CDPF, if suitable as determined by the CMM

- If compliance can not 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 for approval to the CPM. This report must contain at a minimum the cause of any deviation from the Construction Mitigation Plan, and verification to the CPM of the Construction Mitigation Plan measures as well as new measures that were implemented.

The following is acceptable proof of compliance, other methods of proof of compliance must be approved by the CPM.

1. EPA or CARB 1996 off-road equipment emission standards:
    a. A copy of the certificate from EPA or CARB.
2. Purchase and use of ultra-low sulfur fuel (15ppm or less).
    a. Receipt or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date; **and**
    b. 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.
3. Installation of CDPF:
    a. The suitability of the use of soot filters is to be determined by a qualified mechanic or engineer who must submit a report to the CPM for approval.
    b. Installation is to be verified by a qualified mechanic or engineer.
4. Construction equipment engine idle time:
    a. 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.

1. 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.
2. The measure is causing or is reasonably expected to cause significant engine damage.
3. The measure is causing or is reasonably expected to cause a significant risk to nearby workers or the public.
4. 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. 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.

TABLE 1
BEST AVAILABLE FUGITIVE DUST CONTROL MEASURES

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS
Earth-moving (except construction cutting and filling areas, and mining operations)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the CEC CPM, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.
Earth-moving: Construction cut areas and mining operations:	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	Apply chemical stabilizers within five working days of grading completion; OR
	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR
	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	Apply chemical stabilizers; OR
	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
	Install temporary coverings; OR
	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.
ALL CATEGORIES	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 1 may be used.

TABLE 2
TRACK-OUT CONTROL OPTIONS

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 2 may be used.

TABLE 3
CONTROL MEASURES FOR WIND CONDITIONS EXCEEDING 25 MPH

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	Cease all active operations; OR
	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
	Apply chemical stabilizers prior to wind event; OR
	Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
	Take the actions specified in Table 1, Item (3c); OR
	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	Apply chemical stabilizers prior to wind event; OR
	Apply water twice [once] per hour during active operation; OR
	Stop all vehicular traffic.
Open storage piles	Apply water twice [once] per hour; OR
	Install temporary coverings.
Paved road track-out	Cover all haul vehicles; OR
	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

REFERENCES

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ARB 1999. Air Resources Board. The 1999 California Almanac of Emissions and Air Quality.

ARB 2000a. California Air Quality Data, Annual and Quarterly Summaries, Aerometric Division, Sacramento.

ARB 2000b Air Resource Board. "Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards"

Clean 2000. Clean Diesel Technologies, Test Results Confirm that a Platinum/Cerium Diesel Fuel Combustion Catalyst Equals or Exceeds Low Sulfur Diesel Fuel in Reduction Particulate Emissions from a Heavy Duty Diesel Engine, News Bulletin, January 10, 2000.

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District 2001b. Preliminary Determination of Compliance, Application Number 2695, Bay Area Air Quality Management District, July 27, 2001.

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BIOLOGICAL RESOURCES

Testimony of Rick York and Julie Colyer

INTRODUCTION

This section provides the California Energy Commission (Energy Commission) staff's analysis of potential impacts to biological resources from the Valero Refining Company's (applicant's) proposal for the construction and operation of the Valero Cogeneration Project (VCP). This analysis is primarily directed toward impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This document presents information regarding the affected biotic community, the potential environmental impacts associated with the construction and operation of the proposed project, and where necessary, specifies mitigation planning and compensation measures to reduce potential impacts to non-significant levels. This document also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and specifies conditions of certification.

This analysis is based, in part, on information provided as of May 7, 2001 from Valero's Application For Certification (AFC), Valero's responses to Data Requests submitted June 25, 2001, staff's May 29, 2001 and July 12, 2001 site visits, and a discussion with California Department of Fish and Game on May 31, 2001.

LAWS, ORDINANCES, REGULATION AND STANDARDS

The applicant will need to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

FEDERAL

- **Clean Water Act of 1977**

  Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26), prohibits the discharge of dredged or fill material into the waters of the United States without a permit.

- **Endangered Species Act of 1973**

  Title 16, United States Code, section 1531 et seq., and Title 50, code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

- **Migratory Bird Treaty Act**

  Title 16, United States Code, sections 703-712, prohibits the take of migratory birds.

STATE

- **California Endangered Species Act of 1984**

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

- **Nest or Eggs-Take, Possess, or Destroy**

  Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

- **Birds of Prey or Eggs-Take, Possess, or Destroy**

  Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

- **Migratory Birds-Take or Possession**

  Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

- **Fully Protected Species**

  Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit take of animals that are classified as Fully Protected in California.

- **Significant Natural Areas**

  Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

- **Native Plant Protection Act of 1977**

  Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

- **California Code of Regulations**

  Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

SETTING

REGIONAL

The proposed VCP is located in the southwestern portion of Solano County, California, in the Bay-Delta region, approximately one half mile from the western edge of Suisun Bay. Wetlands in the Bay-Delta region support many amphibians, reptiles, songbirds,

birds of prey, shore birds, waterfowl, and small to medium sized mammals. The area is popular with waterfowl hunters, fishermen, as well as non-consumptive users.

Several plant and animal species listed under state and/or federal Endangered Species Acts are known to inhabit the project region. Sensitive species known to occur in the region include the California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostris*), salt marsh harvest mouse (*Reithrodontomys raviventris*), Sacramento splittail (*Pogonichthys macrolepidotus),* Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*), and Suisun marsh aster (*Aster lentus*).

Sensitive species known to inhabit the undeveloped upland areas of the project region include the Calippe silverspot butterfly (*Speyeria callippe callippe*) and the Diablo helianthella (*Helianthella castanea*), both of which utilize relatively undisturbed open grassland habitats.

Additionally, several other sensitive species have the potential to occur in the project region. These species include the California red-legged frog (*Rana anora draytonii*), which occurs in wetland habitat and the western burrowing owl (*Athene cunicularia*), which occurs in developed or undeveloped upland areas where existing burrows are available (AFC, page 6.12-1).

For a complete list of sensitive plant and animal species that were considered by staff for the proposed project, refer to Biological Resources Table 1, below.

BIOLOGICAL RESOURCES - Table 1
Sensitive Species Known to Occur in the Project Vicinity
(Valero Refining Company, May 2001)

Sensitive Plants	**Status***
Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*)	FPT/CNPS 1B
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	FPT/CNPS 1B
Diablo helianthella (*Helianthella castanea*)	FPT/CNPS 1B
Mason's lilaeopsis (*Lilaeopsis masonii*)	FPT/CNPS 1B
Soft bird's beak (*Cordylanthus mollis* ssp. *mollis*)	FE/CNPS 1B
Suisun marsh aster (*Aster lentus*)	FPT/CNPS 1B

Sensitive Wildlife	**Status***
California black rail (*Laterallus jamaicensis coturniculus*)	FPT/CT
California clapper rail (*Rallus longirostris*)	FE/CE
California red-legged frog (*Rana aurora draytonii*)	FT/CSC
Callippe silverspot butterfly (*Speyeria callippe callippe*)	FE
Salt marsh harvest mouse (*Reithrodontomys raviventris*)	FT/CT
Sacramento splittail *(Pogonichthys macrolepidotus*)	FT
Western burrowing owl (*Athene cunicularia*)	FPT/CSC

*STATUS LEGEND – FE = Federally listed Endangered; FT = Federally listed Threatened; FPT = Federal proposed Threatened; California Native Plant Society (CNPS) List 1B = Rare and endangered plants of California and elsewhere; CE = State listed Endangered, CT = State listed Threatened; and CSC = State Species of Special Concern.

LOCAL

The applicant proposes VCP to be located on approximately 2 acres of the existing Valero Refinery land. The existing Valero Refinery is adjacent to the Sulfur Springs Creek channel, which crosses the eastern boundary of the refinery, and a tributary of Sulfur Springs Creek that drains along the western boundary of the refinery.

Sulfur Springs Creek channel is an area vegetated with sedges (*Carex* spp.) and rush (*Juncus* spp.) which are common to slow-moving waterways. The tributary of Sulfur Springs Creek has been colonized by beavers and river otters in the past. Other drainage channels in the vicinity of the refinery support seasonal wetland vegetation and riparian vegetation. Typical upland vegetation is dominated by eucalyptus (*Eucalyptus* spp.), poison oak (*Toxicodendron diversiloba*), coyote brush (*Baccharis pilularis*) and willows (*Salix laevigata* and *S. lasiolepis*).

The Valero Refinery property consists of grasslands not currently used by the refinery and developed areas used by the refinery. These grasslands are dominated by non-native herbaceous species including wild oats (*Avena fatua*), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), Italian thistle (*Carduus pycnocephalus*), wild radish (*Raphanus sativus*), and yellow fennel (*Foeniculum vulgare*). Native plant species observed in the grasslands include bicolor lupine (*Lupinus bicolor*), blue dick (*Dichelostemma pulchellus*) and California poppy (*Eschscholzia californica*). Wildlife species include black-tailed jackrabbits (*Lepus californica*), ground squirrels (*Spermophila beechyii*), coyotes (*Canis latrans*), red-tailed hawks (*Buteo jamaicensis*), and American kestrels (*Falso sparvensis*).

The proposed VCP and ancillary facilities would be constructed within a developed portion of the existing Valero Refinery. This area consists of gravel roads, bare ground (with no vegetation), ornamental iceplant (*Carpobrotus* sp.), ornamental California lilac (*Ceanothus* sp.), and ruderal (weedy) plant species. There are no sensitive plant or animal species on the proposed site, nor are there burrows or other evidence of animal use (including burrowing owls).

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			X	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?			X	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?				X

ANALYSIS AND DISCUSSION OF IMPACTS

The environmental checklist items that address potential impacts to biological resources are discussed below.

a) Less Than Significant Impact

Power Plant, Laydown Areas and Substation

The proposed power plant site, laydown areas, and substation are proposed to be located on the existing Valero Refinery site. The proposed facilities will be located on currently gravel-covered areas containing some ornamental vegetation and ruderal plants species. The proposed power plant, laydown, and substation sites do not contain any native or sensitive plant species, and no sensitive animal species or their habitat occurs on site. Therefore, staff does not anticipate any temporary disturbance or permanent loss of sensitive plant or animal species at the proposed power plant site.

World War II-era igloo bunkers used to store toxic military materials were located in areas that are now part of the refinery. To address the concerns of potential soil and ground water contamination during construction of the proposed VCP, a de-watering testing plan is addressed in the **Soil and Water Resources** section (Condition of Certification **Soil & Water Resources-5**). If the site is contaminated, a Site Investigation Workplan provided by the applicant would identify 1) how soil and ground water will be tested for contaminants during construction, and 2) the disposal methods to be implemented for the contaminated soil and water. This plan will be provided to staff for review and approval prior to the start of project construction. Staff expects this plan, if necessary will minimize impacts to soil and water resources and to biological resources within and outside of the proposed VCP site.

Power Plant Exhaust Stacks

Tall structures such as radio and television antennas, power plant and refinery exhaust stacks, and even tall building can pose a threat to birds that might collide with them. There is no information to suggest that the current Valero Refinery tall structures pose a collision threat to local bird populations even though the refinery is located with the Pacific Flyway.

The proposed power plant project intends to construct two exhaust stacks that will be 80 feet tall. These stacks will be significantly shorter than several existing refinery facilities that are over 100 feet tall, and some that are more than 450 feet tall. When compared to the other existing stacks at the Valero Refinery, the two new 80-foot exhaust stacks are not expected to be prominent obstacles for bird species that might collide with them. Therefore, staff concludes that the proposed facilities will not pose a significant bird collision threat to local bird populations.

Linear Facilities

Valero Power Plant Access Road

The applicant has indicated that existing, paved or graveled, refinery roads will be used as access roads for construction and operation of the proposed VCP facility. No new access roads will need to be constructed, so staff concludes that there will be no new permanent loss or temporary disturbance to any sensitive species or their habitat.

Gas Supply Pipeline

Approximately 1,000 feet of new refinery fuel gas pipeline and 500 feet of new natural gas supply pipeline will be built within existing gravel roads, paved roads, and parking areas within the existing Valero Refinery site. These areas do not contain any vegetation or habitat for sensitive animal species, therefore, staff concludes that this work will not affect any sensitive species or their habitat.

Transmission Line

The proposed 2,000-foot, 12 kilovolt distribution line interconnection will be routed underground within the existing Valero Refinery paved or graveled roads. The proposed transmission line corridor does not contain any native plants or habitat for sensitive animal species; therefore staff does not anticipate any impacts to sensitive species or their habitat.

Water Supply Pipelines

Tie-ins to the existing refinery water distribution will require the construction of approximately 1,000 feet of water supply pipeline. There will be no additional area disturbed to bring these utilities to the proposed VCP site; therefore staff does not anticipate any new permanent loss or temporary disturbance to any sensitive species or their habitat.

b) Less Than Significant Impact

The proposed VCP will not be immediately adjacent to any riparian habitat or sensitive natural communities, such as Suisun Marsh, that exist in the region. A discussion of "less than significant" air quality and wastewater impacts to biological resources is presented below.

Air Quality Impacts to Biological Resources

Some terrestrial ecosystems that are nitrogen limited (e.g. serpentine grasslands) respond strongly to incremental additions of nitrogen, and exhibit changes in productivity, species composition, and nutrient retention (Weiss 1998). The applicant proposes to include nitrogen emission control devices for the proposed facility (AFC, page 2-2). The applicant proposes to equip the two combustion turbine generators with water injection and associated support equipment to control oxides of nitrogen (NO_x), carbon monoxide, and precursor organic compounds. Existing, refinery package boilers will be permanently shut down, and the emission credits from these boilers will be used to offset the nitrogen emissions from the new power plant. Staff understands that implementation of this strategy should result in a slight net *decrease* in NO_x emissions

from the combined Valero Refinery and proposed power plant once operation of the proposed VCP facility begins.

No sensitive habitats currently being impacted by high levels of nitrogen emissions occur in the project region. Therefore, staff concludes that the overall reduced refinery and power plant-related emissions should not result in any terrestrial ecosystems impacts to sensitive species and their habitat at or near the proposed VCP project site.

Wastewater Impacts to Biological Resources

Wastewater discharges from the refinery and the proposed power plant will ultimately drain into Suisun Bay and the Carquinez Strait, the channel between Suisun Bay and San Pablo Bay of the San Francisco Bay-Delta System. The applicant recognizes the need to protect a number of beneficial uses of the Suisun Bay and the Carquinez Strait including biological resources such as wildlife habitat, estuarine habitat, fish spawning and migration, and rare and endangered species (AFC, page 6.13-2). Aside from storm water, the water discharge to the Carquinez Strait from the proposed VCP will consist of power plant blowdown water (wastewater) and sanitary wastes that will have passed through the refinery's wastewater treatment facility. Once operation of the proposed VCP facility begins, the shutdown of at least three old package boilers at the refinery will result in a slight reduction in the total boiler blowdown water volume delivered to the sewer and the refinery's existing wastewater treatment facilities (AFC, page 2-2).

The proposed power plant facilities will include asphalt paving sloped to area drains that tie directly into the refinery's existing sewer system and wastewater treatment facilities. These drains will be sized to handle storm water from precipitation or firewater usage. Water quality is not expected to significantly change from current, baseline conditions. Because surface runoff for the project area will be totally contained and routed to the refinery's existing sewer system and waste water treatment facilities, there will be no impact to biological resources found in Sulfur Springs Creek or it's tributary, the Carquinez Strait, or Suisun Bay. For more information, see the **Soil and Water Resources** analysis.

c) No Impact

There are no federally protected wetlands, including vernal pools and/or marsh habitat, within or immediately adjacent to the proposed VCP area that may be affected by the project.

d) Less Than Significant Impact

Light

A slight increase in light and glare at the Valero Refinery site is expected to occur as a result of the construction and operation of the VCP facilities. This is expected since the facility will operate continuously and lighting is needed to address worker and public safety concerns. Under certain circumstances lights can disorient migratory birds flying at night, or attract wildlife such as insects and insect-eaters. Staff assumes that bats and birds forage in the area. However, surveys conducted by the applicant's biologists did not detect any sensitive wildlife species flying in the area that might be threatened

by an increase of lighting at the Valero Refinery for the construction and operation of the VCP facilities. Therefore, staff concludes that there will be no significant impacts to sensitive wildlife species from the additional lighting or glare associated with the proposed VCP facility.

Noise

The existing Valero Refinery currently generates noise within the area proposed for construction and operation of the VCP facilities. The proposed facility will generate additional noise, especially during construction. The potential impact from this additional noise is considered to be insignificant because the proposed project will be located within an existing refinery, and no sensitive species are known to occur in the immediate vicinity that staff expects would be impacted by any additional noise.

e) No Impact

Construction and operation of the proposed VCP facilities will not interfere with or conflict with any local policies or ordinances protecting biological resources since the project will be located on property within an industrial facility zoned for industrial uses. Addition of the proposed power plant and appurtenant facilities will be compatible with current zoning and will retain its industrial character.

f) No Impact

The proposed VCP will not conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan because there are no HCPs or NCCPs for this area.

CUMULATIVE IMPACTS

Cumulative impacts are those that result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future action, regardless of who is responsible for such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

As previously mentioned, the change in wastewater quality and quantity are less than significant and is not expected to cause a significant cumulative impact to biological resources found in Sulfur Springs Creek or it's tributary, Carquinez Strait, or Suisun Bay. Also, the proposed VCP power plant exhaust stacks will not be a prominent obstacle for bird species and therefore should not cause an increase in bird collisions or represent an impediment to bird movements, so the stacks do not contribute to any potential cumulative impact. The anticipated project noise increase, when considered with other current noise levels, should be insignificant and not contribute to any cumulative noise/wildlife noise concern.

The proposed VCP is consistent with the current patterns of development and land use within the Valero Refinery site since it will be located within an already heavily disturbed area by the existing refinery. There are no natural habitats remaining on the proposed facility site. The closest area of natural habitat is the Sulfur Springs Creek and tributary, which lie on the northern boundary of the Valero Refinery. All project-related

disturbances will be limited to already-disturbed areas, and those undisturbed areas directly adjacent to the proposed project are unlikely to be significantly affected. For these reasons, staff concludes that the proposed project is not expected to cause adverse habitat impacts, when considered in conjunction with other similar development projects in the region, and therefore should not have any cumulative biological resource impacts.

COMPLIANCE WITH LORS

Staff concludes that the project will be in compliance with all state, federal, and local laws, ordinances, regulations, and standards related to biological resources during construction and operation.

The project owner will need to comply with all terms and conditions in the National Pollutant Discharge Elimination System (NPDES) permit to be issued by the San Francisco Bay Region Water Quality Control Board.

FACILITY CLOSURE

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

Sometime in the future, the VCP will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an “on-site contingency plan” will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM).

Native vegetation has been cleared from the main refinery-processing site, including the area proposed for the project. Except for revegetation or alternative stabilization measures of any area where structures are removed so that surface soil erosion can be minimized, there is no anticipated need for other measures to address biological resources. If the power plant facilities are closed after an anticipated 30-year operational period, the surrounding areas may be more highly industrialized and densely populated. In this case, restoration to natural habitat (grassland) will probably not be practical.

UNEXPECTED TEMPORARY CLOSURE

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the VCP.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff discussed the proposed VCP with the California Department of Fish and Game (CDFG) May 31, 2001. Carl Wilcox (personal communication with Julie Colyer)

indicated that he did not have any concerns related to biological resources for the proposed VCP.

Multiple attempts were made to contact the U. S. Fish and Wildlife Service to see what, if any, concerns that agency may have about the project. Unfortunately, staff has not received any comments from this federal agency prior to submitting this staff analysis.

CONCLUSIONS AND RECOMMENDATIONS

In summary, there are no sensitive plant or animal species, or their habitat, known to occur on the proposed project site or in the immediate vicinity of the proposed VCP. Therefore, staff has concluded that it is unlikely that the proposed project will impact biological resources by anticipated wastewater discharges or incremental increases in noise, lighting or tall facilities. In addition, the management of hazardous and non-hazardous wastes generated during construction and operation of the VCP will not result in any significant adverse impacts if the applicant implements the waste management procedures described in the AFC (Valero 2001a) and **Hazardous Wastes** and **Soil and Water Resources** staff's proposed Conditions of Certification.

Staff prefers that native California plants be given careful consideration when planning and implementing a landscaping plan for the VCP facility.

PROPOSED CONDITIONS OF CERTIFICATION

As of this staff analysis, no biological resource Conditions of Certification are recommended at this time.

REFERENCES

California Native Plant Society (CNPS). 1994. Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1. 5th edition. 338 pp.

URS. 2001c. Data Responses for the Valero Cogeneration Project – 12 CD's containing SACTE Modeling and Transmission System Data Files. Submitted to the California Energy Commission on June 25, 2001.

VALERO (Valero Refining Company). 2001a. Application for Certification, submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission on May 7, 2001.

Weiss, S. 1999. Cars, cows and checkerspot butterflies: nitrogen deposition and management of nutrient-poor grasslands for a threatened species. *Conservation Biology* 13(6): 1476-1486.

Wilcox, C. 2001. California Department of Fish and Game, Yountville, CA. Personal communication with Julie Colyer on May 31, 2001.

CULTURAL RESOURCES

Testimony of Richard S. Shepard

INTRODUCTION

The cultural resources section discusses potential impacts of the proposed Valero Cogeneration Project (VCP) in Benicia regarding cultural resources, which are defined as the structural and cultural evidence of the history of human development and life on earth. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant cultural resources, including prehistoric archaeological resources, historic archaeological resources, and ethnographic resources, during project construction, operation and closure. Energy Commission staff designated all of the CEQA checklist items for cultural resources as "less than significant with mitigation incorporation". A brief cultural overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to cultural resources. The section concludes with the staff's proposed monitoring and mitigation measures with respect to cultural resources, with the inclusion of eight conditions of certification.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:

  (j) "Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

  (q) "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

- Public Resources Code, Section 5024.1 establishes a California Register of Historic Resources (CRHR). The implementing regulations are California Code of Regulations, Chapter 11.5, Section 4850 et seq.
- The California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; Title 14, California Code of Regulations, Section 15000 et seq.)

requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.

- Public Resources Code Section 21083.2 states that the lead agency determines whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the applicant’s cost of mitigation; sets time frames for excavation; defines “unique and non-unique archaeological resources”; and provides for mitigation of unexpected resources.
- Public Resources Code Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, Section 15126.4(b) prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Section 15064.5 defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.”
- Penal Code, Section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials. This section also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code Section 5097.99 provides restrictions on the possession of human remains or grave related artifacts. Part (b) specifies exceptions and states a person in violation of this section is guilty of a felony. Part (c) expands the section to say that any person, not under authority of law, who removes Native American artifacts or human remains with intent to sell or vandalize them is guilty of a felony.

LOCAL

Solano County and the City of Benicia have adopted general plans that promote preservation of significant cultural and historical resources. The Solano County General Plan calls for the preservation of significant cultural resources throughout the county. The City of Benicia General Plan requires that properties proposed for development be evaluated for their potential to contain significant historical or archaeological resources and encourages the preservation of those resources.

SETTING

The proposed power plant, transmission line, and construction staging areas will be located within the existing Valero Refinery in the City of Benicia in Solano County. Benicia is located on the northern bank of the Carquinez Straits, a narrow inlet between San Francisco Bay and smaller Suisan Bay. The straits mark the entry of the Sacramento and San Joaquin Rivers into the northern San Francisco Bay, providing a focal point for shipping and other industries both historically and in modern times. The cogenerator plant site is set in an urban industrial environment. Soil surfaces within the refinery have been extensively graded to accommodate the existing facility (and previous military storage yard). The associated transmission line will follow paved roads within the refinery. Two construction equipment staging areas are situated adjacent to the cogenerator site, both exhibiting graded surfaces.

The project area falls within the prehistoric cultural area designated as the Delta subregion of the Central Valley, characterized by marshes and sloughs radiating from the confluence of the Sacramento and San Joaquin Rivers (Moratto 1984). The earliest known sites in this region date to about 5,000 years ago. Sites from earlier periods are probably buried under alluvial deposition brought on by warmer Holocene conditions and rising sea and stream levels. Sites dating to 2,500 years ago signal the start of substantial population growth and movement in the region. The Augustine Pattern represents the archaeological signature of Late Period Wintuan peoples such as the Patwin of the Suisun Bay area. Augustine sites are marked by arrow points, harpoons, shell beads, and ceramic items (Moratto 1984).

The Patwin were organized into politically independent tribelets, each anchored by a permanent village and a number of smaller camps, most located along perennial streams. The Patwin were hunter-gatherer-fishers who depended on seasonably available plant foods (chiefly acorns) and a range of terrestrial and riverine animals. Salmon and sturgeon were caught with weirs; smaller fish were netted or speared. Hunters sought deer, elk, antelope, waterfowl, and turtles. Freshwater shellfish were collected along the edges of streams. Patwin material culture featured skillful basketry; tule balsa boats; flaked and ground stone tools; and items fashioned from shell, wood, and bone (Johnson 1978). Archaeologically, prehistoric habitation sites would most likely be found along rivers and streams, with short-term camps and activity locations possible in any areas not subject to inundation.

Founded in 1847, Benicia had become a successful Gold Rush port by the time Solano County was created in 1850 and briefly served as the state's third capitol during 1853-

54. A garrison established by the U.S. Army in 1849 was expanded as the Benicia Arsenal in 1851. Although the garrison closed in 1898, the Benicia Arsenal remained active for more than 100 years (Marschner 2000). Benicia's commercial industry was exemplified by the Turner/Robertson shipyard, which constructed 228 vessels between 1882 and 1918. The area around Benicia remains mostly industrial today. Archaeological sites from the historical period that could be significant would include subsurface physical remains associated with nineteenth century residences, military facilities, and commercial structures.

IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?			X	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?			X	
c) Disturb any human remains, including those interred outside of formal cemeteries?			X	

DISCUSSION OF IMPACTS

a. Less than significant impact

1. A cultural resources records search indicated that no properties with above-ground resources of historic age have been identified within one-half mile of the power plant site and transmission line (URS 2001). The historic Benicia Arsenal (California Historical Landmark No. 176) is located in the hills outside the Valero Refinery, just beyond the one-half mile radius. The Benicia Arsenal has been evaluated as eligible for the National Register of Historic Places, according to the Office of Historic Preservation's Historic Property Data File, but will not be affected by the project.

2. One potential historic resource was identified near the electrical transmission line route following the applicant's field survey. A military ammunition bunker that is more than 50 years old is located on the south side of Avenue F within the restricted access portion of the Valero Refinery property. The historic setting of the bunker was irrevocably altered when the Valero Refinery was constructed around it in 1969. The bunker has been evaluated as not eligible for the California Register of Historical Resources or National Register of Historic Places under Criterion C because it has no distinctive architectural

characteristics and is one of many such bunkers on military properties in the region (URS 2001c). The bunker has been evaluated as not eligible under any other criteria of the California Register or National Register.

3. There will be no impacts to any non-archaeological historical resources as a result of the proposed project. The bunker has been determined not significant as a historical resource; any impacts, therefore, would not be significant. The Commission concurs that the bunker does not meet the minimum qualifications for the California Register of Historical Resources. It should be noted that the linear transmission line will be installed below ground by trenching in street right-of-way, and the bunker will not be impacted by the construction activity. Construction of the new power plant within the existing refinery will not affect the setting of any nearby potential historical resource.

b. Less than significant

1. No below ground archaeological resources have been identified within one-half mile of the project area (URS 2001). One below ground archaeological resource of historic age, CA-SOL-265H, is located approximately 0.6 mile from the project area and just outside the southern boundary of the refinery property. It consists of the location of an historic house that was destroyed by fire in 1941. The site has not been evaluated for the California Register or National Register.

2. The consultant for the Applicant carried out a pedestrian survey of the proposed power plant site, two possible equipment staging areas, and linear transmission line route. Soil surfaces within the refinery property have been subjected to extensive grading and contouring. The proposed power plant site consists of two graded terraces. The staging areas have been graded and are either graveled or paved. The transmission line route is paved. No archaeological resources were identified as a result of the survey (URS 2001).

3. The proposed project will not impact any known archaeological resource. Due to extensive recontouring of the land within the refinery property, there is a very low potential for discovering previously unidentified archaeological resources during construction, and the consultant for the applicant did not recommend archaeological monitoring of subsurface construction activities. However, Commission staff recommends minimal monitoring to assure that any impact to cultural resources that might be discovered during construction would be reduced to less than significant.

4. In the event of an unanticipated discovery, the proposed Conditions of Certification CUL-1 through CUL-8 shall apply. Implementation of the proposed Conditions of Certification CUL-1 through CUL-8 will reduce impacts to any archaeological resource identified during construction to a level of insignificance. Development of a research design prior to the start of construction that could be applied to discoveries may reduce construction delays.

c. Less than significant

There is no record of interred human remains that would be disturbed by the proposed project. In the event that interred human remains are encountered during project construction; the proposed Conditions of Certification CUL-1 through CUL-8 and state law shall apply.

CUMULATIVE IMPACTS

Staff concludes that there are no known cumulative impacts because the project will not affect any known cultural or historical resources. Should any cultural resources be identified during construction, implementation of the proposed Conditions of Certification CUL-1 through CUL-8 will reduce cumulative impacts to a level of insignificance.

CONCLUSIONS

Based on the discussion above, the project will not cause any significant impacts to cultural resources provided the following conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance, the project owner shall provide the California Energy Commission (Commission) Compliance Project Manager (CPM) with the name and statement of qualifications for its Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, who will be responsible for implementation of all cultural resources Conditions of Certification.

Protocol: The statement of qualifications for the CRS and alternate shall include all information needed to demonstrate that the CRS meets the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the State Office of Historic Preservation (1983). The minimum qualifications include the following:

1) a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;

2) at least three years of archaeological resource mitigation and field experience in California; and

3) at least one year's experience in each of the following areas:

   a) leading archaeological resource field surveys;

   b) leading site and artifact mapping, recording, and recovery operations;

   c) marshalling and use of equipment necessary for cultural resource recovery and testing;

d) preparing recovered materials for analysis and identification;

e) determining the need for appropriate sampling and/or testing in the field and in the lab;

f) directing the analyses of mapped and recovered artifacts;

g) completing the identification and inventory of recovered cultural resource materials; and

h) preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Office, all appropriate regional archaeological information center(s).

The statement of qualifications for the CRS shall include:

1) a list of specific projects the CRS has previously worked on;

2) the role and responsibilities of the CRS for each project listed; and

3) the names and phone numbers of contacts familiar with the CRS's work on these referenced projects.

Verification: At least forty-five 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 days, prior to the start of construction, the project owner shall confirm in writing to the CPM that the approved CRS will be available at the start of construction and is prepared to implement the cultural resources Conditions of Certification.

At least ten days prior to the termination or release of the CRS, the project owner shall obtain CPM approval of the replacement CRS by submitting to the CPM the name and resume of the proposed new CRS.

CUL-2 Prior to the start of ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will 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 designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the cultural resources specialist and the CPM within five days. Maps shall show the

location of all areas where surface disturbance may be associated with project-related access roads, and any other project components.

Verification: At least forty days prior to the start of earth disturbing activities on the project, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings. Copies of maps or drawings reflecting changes to the footprint of the power plant and/or linear facilities shall be submitted to the cultural resources specialist and the CPM within five days of the changes.

CUL-3 Cultural Resource monitoring shall be conducted during the initial groundbreaking at the plant site and at the underground power lines. The potential for encountering undisturbed soils shall be assessed by the CRS based on the initial groundbreaking observations. If the initial assessment indicates that undisturbed soils exist within the plant site or in the area of the underground power lines, then periodic cultural resource monitoring shall continue until the CRS determines that no cultural resources will be impacted.

Verification: Within 2 days of initial groundbreaking, the CRS or alternate CRS will provide a letter (electronic or paper) to the CPM and the project owner of the assessment of the initial groundbreaking observations, including recommendations of any areas that shall require additional monitoring. If additional monitoring is required, resumes of individuals conducting the monitoring, if other than the CRS or alternate CRS, shall be provided to the CPM with the assessment letter. When all monitoring has been completed, the CRS shall provide a letter to the CPM and the project owner indicating that the CRS has determined that no cultural resources will be impacted.

CUL-4 The CRS, alternate CRS and the Cultural Resources Monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource 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 resource 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 days 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.

CUL-5 Prior to the start of ground disturbance, and each week throughout project ground disturbance, the project owner shall provide the CRS with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur until the CRS has determined that no cultural resources will be impacted. The CRS shall consult weekly with the project superintendent or construction field manager to confirm the area(s) to be worked during the next week, until the CRS has determined that no cultural resources will be impacted.

Verification: In each Monthly Compliance Report, until the CRS has determined that no cultural resources will be impacted, the project owner shall include a brief report by the CRS regarding construction activities.

CUL-6 If discoveries are made during project construction, the project owner shall ensure that the CRS performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during data recovery, mapping, and mitigation activities related to the project.

Verification: If discoveries are made during project construction, the project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university (ies), or other appropriate research specialists. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resources shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-7 After completion of the project, the project owner shall ensure that the CRS prepares a Cultural Resource Report (CRR) according to Archaeological Resource Management Reports (ARMR) Guidelines as recommended by the California Office of Historic Preservation. The project owner shall submit the

report to the CPM for review and approval. The report shall be considered final upon approval by the CPM.

Protocol: The CRR shall include (but not be limited to) the following:

a. For all projects:

1) description of pre-project literature search, surveys, and any testing activities;

2) maps showing areas surveyed or tested;

3) description of any monitoring activities;

4) maps of any areas monitored; and

5) conclusions and recommendations.

b. For projects in which cultural resources were encountered, include the items specified under "a" and also provide:

1) site and isolated artifact records and maps;

2) description of testing for, and determinations of, significance and potential eligibility; and

3) research questions answered or raised by the data from the project.

c. For projects regarding which cultural resources were recovered, include the items specified under "a" and "b" and also provide:

Protocol:

1) descriptions (including drawings and/or photos) of recovered cultural materials;

2) results and findings of any special analyses conducted on recovered cultural resource materials;

3) an inventory list of recovered cultural resource materials; and

4) the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: After completion of the project, the project owner shall ensure that the CRS completes the CRR within ninety days following completion of the analysis of the recovered cultural materials. Within seven days after completion of the report, the project owner shall submit the CRR to the CPM for review and approval. Within 30 days after receiving approval of the CRR, the project owner shall provide to the CPM documentation that the report has been sent to the public repository

receiving the recovered data and materials for curation, the SHPO and the appropriate archaeological information center(s).

CUL-8 Following the filing of the CPM-approved CRR with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty days after providing the CPM-approved CRR.

For the life of the project, the project owner shall maintain in its compliance files copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

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HAZARDOUS MATERIALS
AND
WORKER SAFETY/FIRE PROTECTION

Testimony of Rick Tyler and Alvin Greenberg

INTRODUCTION

The hazardous materials and worker safety sections of this Staff Assessment provide a discussion of staff's evaluation of the potential for impacts of the proposed Valero Cogeneration Generating Station Project (Valero 2001) associated with the handling of hazardous materials, worker safety, and fire protection issues. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts during project construction, operation and closure. Energy Commission staff has determined that all CEQA checklist items for hazardous materials, worker safety, and fire protection are either "less than significant impact" or "no impact". A brief overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to these subject items. The section concludes with the staff's proposed monitoring and mitigation measures, with the inclusion of two conditions of certification.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

A framework, based on environmental laws, ordinances, regulations and standards (LORS), exists to reduce risks of accidents and reduce routine hazards. The following federal, state, and local laws generally apply to the protection of public health and **Hazardous Materials Management** as well as **Worker Safety and Fire Protection**. Their provisions have established the basis for staff's determination regarding the significance and acceptability of the Valero Project.

FEDERAL

Hazardous Materials Management

The Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499, §301,100 Stat. 1614 [1986]), also known as SARA Title III, contains the Emergency Planning and Community Right To Know Act (EPCRA) as codified in 42 U.S.C. §11001 et seq. This Act requires that certain information about any release to the air, soil, or water of an extremely hazardous material must be reported to state and local agencies.

The Clean Air Act (CAA) of 1990 (42 U.S.C. §7401 et seq. as amended) established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The CAA section on Risk Management Plans - codified in 42 U.S.C. §112(r) - requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of the CAA are reflected in the California Health and Safety Code, section 25531 et seq.

Worker Safety and Fire Protection

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The congressional purpose of the Occupational Safety and Health Act is to "assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources," (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the OSH Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 CFR §1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 CFR §1952.170 – 1952.175 (Federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR §1910.1 – 1910.1500).

STATE

Hazardous Materials Management

The California Accidental Release Prevention Program (Cal-ARP) - Health and Safety Code, section 25531 - directs facility owners storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

Section 25503.5 of the California Health and Safety Code requires facilities which store or use hazardous materials to prepare and file a Business Plan with the local Certified Unified Program Authority (CUPA), in this case Solano County. This Business Plan is required to contain information on the business activity, the owner, a hazardous materials inventory, facility maps, an Emergency Response Contingency Plan, an Employee Training Plan, and other recordkeeping forms.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Title 8, California Code of Regulations, section 458 and sections 500 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

California Health and Safety Code, section 41700, requires that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes 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 persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

Worker Safety and Fire Protection

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as published in the California Labor Code § 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with §337-560 and continuing with §1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR §1910.1 - 1910.1500). The Federal Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (8 CCR §5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 CFR §1910.1200) which established on the federal level an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, 8 CCR §3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- 8 CCR §339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act;
- 8 CCR §337, et seq. Cal/OSHA regulations;
- 24 CCR § 3, et seq. - incorporates the current addition of the Uniform Building Code;
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code § 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

LOCAL AND REGIONAL

Hazardous Materials Management

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials in Articles 79 and 80. The latest revision to Article 80 was in 1997 (Uniform Fire Code, 1997) and includes minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design** portion of this document.

The City of Benicia Zoning Ordinance Section 17.70.260 requires compliance with this section's provisions as well as the California Code of Regulations invo9lving hazardous materials. The Benicia Fire Department administers this section of the

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for the outdoor storage of ammonia. The administering agency is the Benicia Fire Department.

Worker Safety and Fire Protection

The California Building Standards Code published at Title 24 of the California Code of Regulations § 3 et seq is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning/building & safety departments enforce the California Uniform Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code reflects the body of regulations published at Part 9 of Title 24 (H&S Code §18901 et seq.) pertaining to the California Fire Code.

Similarly, the Uniform Fire Code Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United State's premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition.

Applicable local (or locally enforced) requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9);
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.).
- Uniform Fire Code, 1997

The California Fire Code requires that industrial plants submit plans for review and approval by the City of Benicia Fire Department.

SETTING

The proposed Valero Project will be located on the property of Valero's existing Refinery in the City of Benicia in Solano County, California. The primary fuel source for the Valero Project is refinery fuel gas and/or natural gas. Selective Catalytic Reduction

(SCR) is to be used to reduce nitrogen oxide (NOx) emissions from the combustion of natural gas in the combustion turbine. Aqueous ammonia will be used in the SCR process to convert the NOx into nitrogen and water vapor. The existing aqueous ammonia storage system at the existing refinery will use by the new cogeneration plant. No hazardous materials are expected to be stored at the project site during operation. The hazardous materials which will be used at the cogeneration plant are already on site due to their use at the refinery.

Safeguards that are already in place at the existing refinery would be incorporated into the new Valero Cogeneration Project. Additional proposed safeguards and measures to greatly reduce the opportunity for, or the extent of, exposure to hazardous materials or other hazards would supplement the existing measures.

IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDOUS MATERIALS and WORKER SAFETY/FIRE PROTECTION – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport or use of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Exposes workers to inappropriate occupational safety and health risks and/or structural or chemical fires of undue duration?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDOUS MATERIALS and WORKER SAFETY/FIRE PROTECTION – Would the project:				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

DISCUSSION OF IMPACTS

The basis for designations provided in the checklist are discussed below.

a) Less Than Significant Impact

A variety of hazardous materials are proposed for storage and use during the construction of the project and for routine plant operation and maintenance. All hazardous materials to be used during operation of the facility are included in the AFC in Tables 6.9-1 and 6.9-2. However, these materials will be stored off-site at the refinery as they are already present and used for routine refinery operations.

The hazard characteristics of ammonia and refinery/natural gas and their proposed use during the operation of the plant pose the principle risk of off-site impacts. The potential threats from the other hazardous materials are not as significant as they are to be stored, handled or used for routine purposes in relatively smaller quantities at the facility and also have lower toxicity and/or environmental mobilities.

AQUEOUS AMMONIA

Selective Catalytic Reduction (SCR) is proposed to reduce nitrogen oxide (NOx) emissions to meet the plant's air quality permit requirements. Aqueous ammonia reacts with a catalyst to convert the NOx into inert water vapor and nitrogen in the SCR process. The aqueous ammonia proposed for use is a solution 29.5% ammonia and 70.5% water. Solutions containing more than 20% ammonia are considered regulated materials exceeding reportable quantities defined in the California Health & Safety Code section 25532(j). Use of aqueous ammonia significantly reduces the risks that would otherwise be associated with use of the more hazardous anhydrous form of ammonia. The aqueous form eliminates the high internal energy associated with the more lethal anhydrous form, which is stored as a liquefied gas at elevated pressure. The high

internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release that can rapidly introduce large quantities of the material to the ambient air where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are also much easier to contain than those associated with the anhydrous form. In addition, relatively slow mass transfer from the free surface of the spilled aqueous solution limits emissions from a spill of aqueous ammonia.

Aqueous ammonia is typically transported and handled safely and without incident. However mishandling can result in impacts on public health, particularly during transfer from a delivery vehicle to a storage tank. It is during this transfer operation that the greatest risk of an accidental spill and release could occur. An RMP has already been prepared and approved by the US EPA and Solano County for the existing aqueous ammonia storage tank. The results of the off-site consequence analysis showed no impacts off-site. The incremental increase in the amount of aqueous ammonia due to the cogeneration project will not affect these results.

A significant number of modern power plants routinely use aqueous ammonia and the California Energy Commission has licensed many such plants. Much of the risks associated with ammonia use are already reduced through Valero's proposed use of the aqueous form of ammonia. Project compliance with LORS and staff's proposed mitigation make it unlikely that the use aqueous ammonia will result in significant threat to public health and the environment.

The transportation of hazardous materials including aqueous ammonia particularly on California freeways, is routinely regulated and controlled by various federal and state laws, ordinances, regulations, and standards as discussed in the section titled Traffic and Transportation. There are a number of transportation accident studies that are support the fact that such incidents and corresponding chances are highly dependent on the type of roadway and surroundings. It has been reported that the truck accident frequency is highest for an undivided multilane road at 5.44 accidents per million miles compared to 0.93 accidents per million miles for a freeway in rural California (Davies et al. 1992). Similarly, the accident rate in urban California is highest for a multilane that is undivided at 13.02 accidents per million miles vis-a-vis 1.59 accidents per million miles on a freeway. A recent study went even further by concluding that releases of hazardous materials on freeways rarely play a role in deaths or injuries (FMCSA, 2000). It is therefore reasonable to say that the likelihood of an accident involving a release of ammonia is probably higher on the local roads than on the freeways. This is supported a report that observed that accident rates are typically much higher for two-lane rural roads compared to multi-lane highways (USDOT 1998).

Staff has evaluated the proposed route to be used for shipment of hazardous materials to the facility and concludes that the risk to the risk of public impact from transportation of aqueous ammonia is not significant. Most of the transportation route is on Interstate 680. Because the facility is located directly on this Interstate and the off-ramp and access road is short, it is very unlikely that a serious release would occur in the project area.

Staff therefore concludes that any potential adverse impacts from the transport of aqueous ammonia can be easily limited to a level of insignificance through the Applicant's conformance to applicable standards and laws, reinforced by staff's proposed mitigation.

REFINERY and NATURAL GAS

The primary fuel source proposed project is refinery gas and/or natural gas. Both pose a fire and/or explosion risk as a result of its flammability. Again, as with other hazardous materials, these gases are already present at the refinery and will not be stored on-site. The risk of a fire and/or explosion from these gases can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code 85A requires: 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems (NFPA 1987). These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture.

b) Less Than Significant Impact

Aqueous ammonia is being proposed for use in controlling NOx emissions created during the combustion of natural gas at the facility. The applicant is proposing to use existing ammonia storage system at the existing Valero Refinery. Staff does not believe that the additional piping for the new plant could result in a significant impact even in the event of a worst-case accidental release.

Compliance with applicable LORS, existing safeguards, and staff's Conditions of Exemption will greatly reduce the opportunity for, or extent of, exposure to ammonia vapors by the public.

c) No Impact

There are no known schools within a ¼ mile radius of proposed project.

d) Less Than Significant Impact

The Valero Cogeneration project has provided adequate information that all occupational safety and health LORS will be followed and that fire avoidance, detection and suppression systems will be installed as per all LORS.

e) No Impact

The Valero Cogeneration project is not located within an airport use plan.

f) No Impact

There are no private airstrips in the vicinity of the project. There are therefore no anticipated impacts from a private airstrip.

g) No Impact

It appears that the construction and operation of the project would improve upon the reliability of the local power system and therefore benefit the local emergency response

capabilities. No interference with emergency response plans or emergency evacuation plans is anticipated.

h) No Impact

The proposed site is paved and hence clear of substantial vegetation. The immediate area around the site is open space and brush. Fire hazard from vegetation is not a concern since those trees, brush, or grass in a buffer zone surrounding the site would be cleared or cut on a regular basis and fire suppression systems are adequate to combat a brush fire.

CONCLUSIONS

By incorporating the appropriate mitigation measures, the routine transport and use of hazardous materials at the project will not result in significant impacts to the public or the environment. By following all applicable LORS, worker safety programs and fire protection systems are adequate to maintain safety at the facility.

PROPOSED CONDITIONS OF EXEMPTION

HAZ-1 All aqueous ammonia deliveries to the facility shall be in tanker trucks that meet or exceed the US Department of Transportation requirements for hazardous materials as established in the Code of Federal Regulations No. 49 Parts 171-180.

Verification: The project owner shall include in its Monthly Compliance Reports, copies of all regulatory permits/licenses acquired by the project owner and/or subcontractors concerning the transport of aqueous ammonia and other hazardous materials.

HAZ-2 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, CFR part 355, Subpart J, section 355.50, not listed in appendix A, unless approved in advance by the CPM.

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.

WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Injury and Illness Prevention Program, containing the following:

- A Construction Safety Program;
- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;

- A Construction Emergency Action Plan; and
- A Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of Benicia Fire Department for review and comment prior to submittal to the CPM.

Verification: At least 7 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Injury and Illness Prevention Program. The project owner shall provide a letter from the City of Benicia Fire Department stating that they have reviewed and commented on the Construction Fire Protection and Prevention Plan Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of Benicia Fire Department for review and acceptance.

Verification: At least 7 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operations and Maintenance Safety & Health Program. It shall incorporate Cal/OSHA Consultation Service's comments, stating that they have reviewed and accepted the specified elements of the proposed Operations and Maintenance Safety and Health Plan.

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LAND USE

Testimony of Eileen Allen

INTRODUCTION

The land use analysis of the Valero Cogeneration Project (VCP) focuses on the project's compatibility with existing and planned land uses, and the project's consistency with applicable land use plans, ordinances and policies.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Land use LORS applicable to the proposed project are contained in the City of Benicia's General Plan, Zoning Ordinance, and Industrial Design Guidelines.

CITY OF BENICIA GENERAL PLAN

Land uses are controlled and regulated by a system of plans, policies, goals, and ordinances that are adopted by the various jurisdictions with land use authority over the area encompassed by the proposed project. The general plan is a broadly scoped planning document and defines large-scale planned development patterns over a relatively long timeframe.

The Benicia General Plan (BGP) includes specific policies to preserve and enhance existing development and to provide for orderly and appropriate new development of the City of Benicia (Benicia) until approximately the year 2020. Actions and approvals required by the City of Benicia Planning Department must be consistent with the BGP.

The BGP contains the Community Development and Sustainability chapter (Chapter 2), which includes a discussion of the various types of land uses in Benicia. It also has goals and policies addressing growth management, economic development, circulation (i.e., transportation and traffic), community/public services and public facilities. The General Plan's Community Identity chapter (Chapter 3) covers historic and cultural resources, visual character, and open space and conservation of resources. The Community Health and Safety chapter (Chapter 4) addresses options for developing a more healthy community, hazards to the community, emergency response plans and community safety measures, and community noise sources and related effects. Each General Plan chapter contains goals, policies, and implementation measures that may be pertinent to the proposed project.

The proposed project site exists within the geographic area named in the BGP as the Benicia Industrial Park, which is the major existing industrial area in the city. The proposed site is more specifically located in the Valero Refinery within the Industrial Park. Benicia's industrial land has been divided into three General Plan Land Use categories: 1) General Industrial; 2) Limited Industrial; and 3) Water-related Industrial. The land use designation for the project site is General Industrial, which is the least restrictive of the three categories, and is intended to allow flexibility for industrial development. Over half of the Benicia Industrial Park is designated General Industrial. This includes nearly all of the area north of I-780 and east of East Second Street. This

BGP category includes manufacturing, assembly, and packaging of goods and products from extracted, raw, and previously prepared materials and related industrial and commercial services. The Valero Refinery's operation involves manufacturing of petroleum products from raw materials. Electricity generation from the proposed cogeneration facility would be included in the sub-category of related industrial activities.

BGP goals and policies applicable to the proposed project from the land use perspective, include:

Economic Development

- Facilitate and encourage new uses and development which provide substantial and sustainable fiscal and economic benefits to the City and the community while maintaining health, safety, and quality of life (Goal 2.5)
- Continue to maintain and update an economic development strategy which focuses on both the acquisition of new businesses and retention of existing businesses. (Policy Program 2.5.F)
- Attract and retain a balance of different kinds of industrial uses to Benicia. (Goal 2.6)
- Preserve industrial land for industrial purposes and certain compatible "service commercial" and ancillary on-site retail uses. (Policy 2.6.1)
- Other land uses should not adversely affect existing industrial and commercial land uses. (Policy 2.6.2)
- Facilitate continued development of the Industrial Park; especially encourage general industrial uses to locate in the basin northeast of Downtown (around Industrial Way between East Second and the Freeway).(Policy 2.6.3)
- Link any expansion of industrial use to the provision of infrastructure and public services that are to be developed and in place prior to the expansion (Policy 2.6.4)
- Establish and maintain a land buffer between industrial/commercial uses and existing and future residential uses for reasons of health, safety, and quality of life. (Policy 2.6.5)
- Use topography, landscaping, and distance as a buffer between Industrial Park uses and residential uses. (Policy Program 2.6.F)

Circulation

- Continue to provide safe and direct access to the Industrial Park. (Goal 2.24)

Open space and Conservation of Resources

BGP Open Space and Conservation of Resources goals and policies include:

- Provide buffers throughout the community. (Goal 3.15)
- Use open space as a buffer against natural and man-made hazards. (Policy 3.15.4).

- Require open space buffers around known hazardous barriers such as the Valero Refinery and the Interpretive Trail site. (Policy Program 3.15.F).

In addition to the above policies, the BGP's Appendix B addresses two units of undeveloped, open space land owned by Valero which are : Unit 1) five parcels encompassing 272 acres, which are located west of East Second Street; and Unit 2) one parcel encompassing 152 acres, which is located east of East Second Street. Unit 1 has a BGP designation of Limited Industrial with a General Open Space buffer of at least 200 feet adjacent to residential uses.

Unit 2 has a BGP designation of General and Limited Industrial. The General Industrial Area begins at a point 700 feet from Valero's southern property line, adjacent to Low Density Residential, tapering to the open space buffer area adjacent to the City cemetery. The BGP states that a General Open Space buffer must be maintained along the south edge, with the buffer being at least 200 feet wide when adjacent to Low Density Residential.

Responses to Hazards

- Reduce health and safety hazards associated with hazardous materials users, hazardous waste generators, and hazardous waste disposal sites and toxic air contaminants. (Goal 4.20)
- Establish buffer zones between sensitive land uses and those land uses which involve the significant use, storage, or disposal of hazardous materials , hazardous waste, or toxic air contaminants. (Policy 4.20.1)
- Maintain and designate land along East Second Street for non-residential purposes. (Policy Program 4.20.A)
- Reduce significant hazards associated with pipelines, and high voltage transmission lines. (Goal 4.21).
- Continue to implement existing policies governing development near pipelines. (Program 4.21.A)
- Set back all residential uses, schools, and public buildings at least 150 feet from the edge of 230 kV electric transmission line easements. (Program 4.21.B)

CITY OF BENICIA ZONING ORDINANCE

The City of Benicia Zoning Ordinance (Benicia Zoning Ordinance) is the primary tool for achieving the objectives of the BGP. The Benicia Zoning Ordinance provides detailed specifications for allowable development within areas designated by the BGP. The project site is zoned General Industrial (IG), and exists within Benicia's principal "IG District". When "Major Utility" facilities, such as a cogeneration facility, are located within an IG district, they require a Conditional Use Permit (Hammer, 2001).

If the City of Benicia was the CEQA lead agency for this project, rather than the Energy Commission, the City's Planning Director or Planning Commission would review an application from Valero for a Conditional Use Permit. The Planning Director or Planning Commission would make certain findings required under the California Zoning Law and the Benicia Zoning Ordinance (Benicia Zoning Ordinance Title 17, Section 17.104.060).

Since the Energy Commission is the lead agency, the AFC functions as the application. The Planning Director or the Planning Commission will need to review the application, and forward their Use Permit Required Findings to the Energy Commission for incorporation into its Staff Analysis (SA), or a related Supplement. The Commission staff will work with the Benicia staff to incorporate Benicia's conditions into the SA.

The Use Permit Required Findings, are listed as Land Use Appendix at the back this document.

Valero's undeveloped land, which serves as a buffer between the refinery's industrial uses and other land uses, is zoned Limited Industrial (IL). The proposed project will not affect the IL zone.

CITY OF BENICIA INDUSTRIAL DESIGN GUIDELINES

The City of Benicia adopted Industrial Design Guidelines in March, 1989. The objectives of the Guidelines are to promote a functional and attractive environment; ensure a quality development image; protect and enhance private property values and investments; protect public investments; and to preserve the character of the historic Arsenal area. Given these objectives, the Guidelines focus on six concept areas:

- Site design
- Circulation, parking, and loading
- Landscape design
- Fencing and screening
- Exterior lighting
- Architectural design

SETTING

PROJECT LOCATION

Valero Cogeneration project Site

The approximately 1.9-acre proposed project site is entirely within the property of the existing Valero Refinery located at 3400 East Second Street in the City of Benicia. The site is located in an area currently occupied by two split-level gravel parking lots on a slope southeast of the refinery's administration building. The project's primary laydown area (Area A) is a large gravel lot located immediately east of the project site, and adjacent to an access road and existing refinery process facilities. It is currently used as a laydown area for miscellaneous refinery projects, and will continue in that use. The secondary laydown area (Area B) is located northwest of the project site on a currently sloping area with bare ground and scattered clumps of iceplant.

Linear Facilities

The proposed linear facilities for the project are an approximately 1,000-foot refinery gas pipeline; a 500-foot natural gas pipeline; and an underground 12 kV electric transmission outlet line of undetermined length which would connect the cogeneration project to a new 12 kV switch house at the northeast corner of the refinery processing block. All three linear facilities will be located entirely within the interior of the refinery.

SURROUNDING LAND USE

Land uses surrounding the project site include the following:

- The Valero Refinery's administration building is located on East Second Street, to the northwest of the project site. The refinery's process area is located immediately south and east of the project site.
- Crude oil storage tanks are located further south and east of the site and the refinery's process area.
- Abandoned bunkers to the northeast , which are associated with the historic Benicia Arsenal.
- Outside of the Valero Refinery property, other industrial uses located within the eastern section of the Benicia Industrial Park include refinery service businesses, warehousing, manufacturing, a self- storage unit operation, and CalTrans' Carquinez Bridge Maintenance Facility.
- Other uses to the east of the refinery property boundary include Interstate 680, the Southern Pacific Railroad, and the City of Benicia's waste water treatment plant.
- Valero's undeveloped buffer land areas are located to the west and south of the refinery.
- Residential uses are located west and south of the Valero buffer land boundaries, with the closest residence found approximately 3,000 feet away from the project site.

IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
LAND USE AND PLANNING -- Would the project:				
a) Physically divide an established community?				**X**
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				**X**

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
LAND USE AND PLANNING -- Would the project:				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				**X**

DISCUSSION OF IMPACTS

Land Use and Planning

A. No Impact

The proposed VCP would not physically divide an existing community, since it would be located entirely within the existing Valero Refinery, which was established in 1969. The site and its related linear facilities are located in an area within the City of Benicia designated for industrial development, and the proposed site is currently surrounded by industrial uses. Given its location within the refinery property, the project would not alter existing residential, recreational, commercial, institutional, and other industrial land use patterns. Therefore, there would be no impact.

B. No Impact

The proposed VCP would comply with the City of Benicia's LORS. Staff has concluded that the project is consistent with BGP goals and policies regarding economic development including industrial land uses, circulation, conservation and open space, and responses to hazards. Staff's consistency conclusion is derived from:

- the economic development features of the project;
- the compatibility of the project with the surrounding industrial land uses;
- the project's site within the interior of the existing refinery located in the Benicia Industrial Park; and
- the existence of the Valero open space buffer lands.

The project complies with the Benicia Zoning Ordinance provisions for General Industrial uses, and the Industrial Design Guidelines). Staff has concluded that the project would have no impact.

Staff has reviewed the Industrial Design Guidelines and discussed them with the City of Benicia staff. Given the nature of the project site's location in the refinery's interior, the refinery's extensive existing lighting, and the fact that nearly all of the project's structures will be visually screened from vantage points outside of the refinery, staff believes that the Guidelines are largely inapplicable. With respect to site design, Staff will be working with the applicant and the City of Benicia staff to ensure that erosion control measures will be used at the site, and to generally minimize the disruption of existing natural site features (see **WATER and SOILS** section). Circulation and parking items are addressed in the **TRAFFIC AND TRANSPORTATION** section. With respect

to preserving the historic Arsenal area, the proposed project will not affect the portions of the Arsenal that are found on the refinery property.

The project would be a complementary land use addition to the existing Valero Refinery operations. The objectives of the proposed project are to meet the electricity demand of the Valero Refinery, and to produce power for export into California's electricity grid. Given this objective, and the proposed project's consistency with the City of Benicia's applicable LORS, impacts would be less than significant.

C. No Impact

There are no habitat conservation plans or natural community conservation plans adopted by the City of Benicia that would be affected by the proposed project. Therefore, the proposed project would not conflict with existing plans and there would be no impact.

CUMULATIVE IMPACTS

Staff concludes that there are no cumulative land use impacts. Valero's MTBE phase-out is the only other project that staff is aware of in the area. From the land use perspective, staff believes that the proposed project and the MTBE phase-out project are complementary, and they will not result in cumulative land use impacts.

ENVIRONMENTAL JUSTICE

Staff has reviewed census tract information that shows there are significant minority populations within six miles of the VCP. One population is approximately two to six miles to the north and the other is about one to six miles to the west. There will be no significant direct or cumulative impacts, therefore, there are no environmental justice issues.

CONCLUSIONS

The project would not physically divide an established community, conflict with any applicable land use plan, policy, or regulation, and would not conflict with any applicable habitat conservation plan. The proposed use would be consistent with the provisions of the City of Benicia's General Plan, Zoning Ordinance, and Industrial Design Guidelines. The impacts for Land Use are, therefore, less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

None proposed by staff at this time. Staff may add conditions after review of the City of Benicia's conclusions, and conditions that the City may suggest after it completes its required findings in August 2001.

LAND USE APPENDIX

CITY OF BENICIA USE PERMIT REQUIRED FINDINGS

a. That the proposed location of the use is in accord with the objectives of this title (i.e. the Benicia Zoning Ordinance) and the purposes of the district in which the site is located; and

b. The proposed location of the conditional use and the proposed conditions under which it would be operated or maintained will be consistent with the general plan and will not be detrimental to the public health, safety, or welfare of persons residing or working in or adjacent to the neighborhood of such use, nor detrimental to properties or improvements in the vicinity or to the general welfare of the city; and

c. That the proposed conditional use will comply with the provisions of this title, including any specific condition required for the proposed conditional use in the district in which it would be located.

REFERENCES

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NOISE AND VIBRATION

Testimony of Jim Buntin

INTRODUCTION

This section evaluates the potential noise and vibration effects associated with the construction and operation of the Valero Cogeneration Project (VCP), which would be located in Benicia, California. As described in the AFC, the proposed project would be to construct a gas-fired simple cycle power plant at the Valero Refinery. The proposed project would connect to the existing transmission lines serving the refinery. The project would include approximately 1,000 feet of new refinery fuel gas line, and 500 feet of new natural gas supply line.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. Table 1 lists permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed; assuring that workers are made aware of overexposure to noise; and periodically testing the workers' hearing to detect any degradation. It should be noted that there are no federal laws governing offsite (community) noise.

NOISE: Table 1
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak

particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code Section 65302(f) encourages each local government entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. The Model also contains a definition of a “pure tone” which can be used to determine whether a noise source contains significant annoying tonal components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by 5 dBA.

Other State LORS include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

California Environmental Quality Act

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

a) exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

d) a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project….

The Energy Commission has interpreted the CEQA criteria such that noise produced by the permitted power-producing facility that causes an increase of more than 5 dBA in the background noise level (L_{90}) at a noise sensitive receiver during the quietest hours of the day is usually considered a significant effect.

For stationary noise sources, the City of Benicia General Plan considers an increase in ambient noise levels of 3 dB or more to constitute a significant environmental impact.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. The construction activity is temporary,
2. Use of heavy equipment and noisy activities is limited to daytime hours, and
3. All feasible noise abatement measures are implemented for noise-producing equipment.

CAL-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

LOCAL

The City of Benicia General Plan contains noise standards for stationary noise sources relative to noise sensitive developments. The standards are intended to prevent new industrial noise sources from encroaching upon existing noise-sensitive developments. Noise: Table 2 lists the noise performance standards which apply to the proposed project.

Noise: Table 2 - City of Benicia General Plan Noise Standards

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, dBA	55	50
Maximum Level, dBA	75	70

Since the proposed project would operate on a continuous basis over the 24-hour day, the nighttime standards of the General Plan would apply at the nearest residential properties.

The City of Benicia Municipal Code regulates noise from machinery. Section 12-206 of the Municipal Code states that it is “unlawful for any person to operate any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the ambient base noise level by more than five (5) decibels” (dBA). The ambient base noise level is defined as the average noise level over a 15-minute period without inclusion of noise from isolated identifiable sources, at the location and time of day near that at which a comparison is to be made. The minimum nighttime ambient base noise level for residentially-zoned land may range from 40 dBA to 50 dBA, depending upon the community environment.

Section 12-301 of the Benicia Municipal Code prohibits construction work within 500 feet of a residential zone between the hours of 10 p.m. and 7 a.m. which causes discomfort or annoyance to a reasonable person of normal sensitiveness. Since the

project site is located well beyond 500 feet from a residential area, there are no City restrictions on construction noise for this project.

SETTING

The VCP site would be located entirely within the Valero refinery property, near East Second Street. The nearest residential receivers are located north and west of the project site, and are removed from the project boundary by 3,000 to 4,000 feet.

Sensitive Receptors

The closest sensitive receptors are residences located approximately 3,000 feet to the north of the facility on Allen Way. Other residential receptors are located 4000 feet to the west of the facility on La Cruz Avenue.

Ambient Noise Levels

The applicant monitored ambient noise levels on May 21, 2001 to May 23, 2001, at two residences, on Allen Way and La Cruz Avenue. These data were provided to update noise level data collected in the project area in 1993. The current noise measurements were performed using acceptable sound measurement equipment, and weather was mild with a steady southwest wind. Noise levels recorded at these locations are listed in **Noise: Table 3**.

Noise: Table 3 - Long-Term Noise Measurement Summary

Monitoring Location	Nighttime Leq, dBA	Nighttime L90, dBA
388 Allen Way	43-50	42-44
37 La Cruz Avenue	52-54	49-53

Source: URS 2001b.

IMPACTS

Noise impacts associated with the project can be created by construction activities, and by normal long-term operation of the power plant. Following is the environmental checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
NOISE – Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b) Exposure of persons to or generation of excessive ground borne vibration noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the area to excessive noise levels?				X

DISCUSSION OF IMPACTS

A. Noise in Excess of Standards or Ordinances: Less Than Significant with Mitigation Incorporated

Construction Noise

Community Effects

Construction noise is a temporary phenomenon; the construction period for the VCP facility is scheduled to last 9 to 12 months (Valero 2001a, AFC Page 1-3). Construction of an industrial facility such as a power plant is typically and unavoidably noisier than what is usually permissible under noise ordinances. In order to allow the construction of

new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances. In this case, the City noise standard for construction applies only within 500 feet of a residentially-zoned area. As a result, construction noise would comply with the local standards. The applicant has recommended construction noise standards of 60 dBA Leq during daytime hours, and 55 dBA Leq during nighttime hours, as measured at a sensitive receptor. The predicted worst-case hourly construction noise level at the nearest sensitive receptor is 52 dBA. Staff recommends the measures described in the proposed Conditions of Certification **NOISE-1**, **NOISE-2** and **NOISE-8** to further reduce any potential noise impacts to the community.

Worker Effects

Normal construction-generated noise levels would range between 70 and 80 dBA at a distance of 100 feet from the construction activity. Therefore, construction workers will be subjected to occasional noise levels above 85 dBA. The State LORS require all noise levels to be limited to 85 dBA at three feet from equipment. If 85 dBA would be exceeded, then warning signs need to be posted and a Hearing Conservation Program implemented. With proper execution of the Hearing Conservation Program, as well as with the implementation of the measures described in proposed Condition of Certification **NOISE-3**, no occupational safety impacts are anticipated from construction noise.

Operational Noise

Community Effects

The applicant has prepared a detailed analysis of noise emissions expected from the proposed facility. Based upon that analysis, the projected noise levels from the VCP power plant at the closest residential receptors (on Allen Way and La Cruz Avenue) are 39 dBA and 34 dBA Leq, respectively (URS 2001b). Based on the results of the noise survey on May 21-23, 2001, these noise levels would be below the existing ambient noise level conditions, and would cause an increase in ambient noise levels of less than 3 dBA. The predicted noise levels are in compliance with the standards of the City of Benicia Noise Element and Municipal Code.

It should be noted that the noise level projections described above accounted only for distance and air absorption, but did not account for attenuation from barriers, wind, or temperature gradients. As a result, noise levels at the closest receptor would likely be lower than what is presented in the analysis because of the nearby industrial structures and topography that would partially shield power plant noise at many receivers. As a result, noise levels associated with power plant operations would be considered less than significant.

The noise analysis assumed the following noise controls:

1. CTG exhaust routed through an HRSG.
2. The water injection skid would include a manufacturer-supplied ”on-skid water injection skid enclosure.”
3. The auxiliary skid would include a “weather enclosure.”

4. The enhanced SPRINT skid would include a manufacturer-supplied “typical light gauge enclosure,” with acoustically absorptive lining.
5. The gas compressors would be enclosed in a manufacturer-supplied “acoustical enclosure.”

Staff recommends the implementation of the measures described in proposed Condition of Certification **NOISE-6** to further reduce any potential impacts to the local community associated with plant operations.

Worker Effects

The Applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and commits to comply with applicable LORS. A measure to be implemented for noise-related impacts includes a Hearing Conservation Program. With proper execution of the Hearing Conservation Program, as well as the implementation of the measure described in proposed Condition of Certification **NOISE-7**, no occupational safety impacts are anticipated from operational noise.

B. Excessive Vibration: No Impact

The primary source of vibration noise associated with a power plant is the operation of the turbines. It is anticipated that the plant’s turbines will be maintained in optimal balance to minimize excessive vibration that can cause damage or long term wear. Consequently, no excessive vibration would be experienced by adjacent land uses.

Another potential source of significant vibration is pile driving during construction. Given the relatively great distances to the nearest sensitive receptors, no vibration effects would be likely if pile driving were to be required.

C. Permanent Increase in Ambient Noise Level: Less Than Significant with Mitigation Incorporated

Construction Noise

As described above, construction of the power plant is a temporary phenomenon; the construction period for the VCP facility is scheduled to last 9 to 12 months.
As a result, noise generated from construction would not cause a substantial permanent increase in ambient noise levels.

Operational Noise

During the operating life, the VCP facility will represent essentially a steady, continuous noise source day and night. The primary noise sources anticipated from the proposed facility include the heat recovery steam generator, the combustion turbine generator package, the steam turbine generator, and the water injection, auxiliary and enhanced SPRINT skids. Secondary noise sources are anticipated to include auxiliary pumps, ventilation fans, motors, valves and gas compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The noise level from the proposed power plant was modeled to evaluate whether the new plant would contribute an incremental increase in noise levels at the nearest residential receptors. All major pieces of equipment were assumed to operate

continuously for the purpose of the modeling analysis. The projected VCP noise level at the closest residential receptor is 39 dBA Leq (URS 2001b). Based on the results of the noise survey on May 21-23, 2001, this noise level would be below the existing ambient noise level. The cumulative noise levels would increase by less than 2 dBA.

As a result, noise levels associated with power plant operations would be considered less than significant. Staff recommends the implementation of the measures described in Condition of Exemption **NOISE-6** to further reduce any potential noise impacts to the local community associated with operations.

Linear Facilities

The natural gas pipelines, and the new transmission line, would be buried below ground and would not produce any audible noise. No aboveground linear facilities (transmission lines) will be located near noise sensitive receptors. The 12 kV transmission line will not produce significant corona noise. Thus, there will be no noise impacts associated with linear facilities.

D. Substantial Temporary Increase in Noise Level: Less Than Significant with Mitigation Incorporated

Construction Noise

Community Effects

Construction impacts are generally short-term in nature and usually result from the operation of heavy-duty diesel- and gasoline-powered construction equipment (e.g., backhoes, boom trucks, delivery trucks, compressors). Noise levels were predicted for the construction of the VCP facility using information provided by Woodward-Clyde Consultants. The applicant has recommended construction noise standards of 60 dBA Leq during daytime hours, and 55 dBA Leq during nighttime hours, as measured at a sensitive receptor. The predicted worst-case hourly construction noise level at the nearest sensitive receptor is 52 dBA. These noise levels would be within the range of existing ambient noise levels at the receptors. As a result, construction noise would be considered less than significant. Staff recommends the implementation of the measures described in proposed Conditions of Certification **NOISE-1**, **NOISE-2,** and **NOISE-8** to further reduce any potential for noise impacts to the local community associated with construction activities.

Steam Blows

The highest noise levels that would be generated during the construction of the VCP facility would be associated with steam blows, if this technique is required. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has 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 path, and could adversely affect refinery equipment.

In order to prevent this, before the steam system is connected to the refinery, the steam line may have to be temporarily routed to the atmosphere. High-pressure steam would then be raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a 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 line is connected to the refinery steam turbine, which is then ready for operation.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to approximately 100 dBA, an exceedingly disturbing level, at the nearest residence, about 3,000 feet away. In order to minimize disturbance from steam blows, the steam blow piping can be equipped with exhaust silencers that will reduce noise levels by 20 dBA (or more), or to a level of 80 dBA at the nearest residence. This is still an annoying noise level; staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see measures described in proposed Conditions of Certification **NOISE-4** and **NOISE-5** below) to minimize annoyance to residents.

Alternatively, the Applicant may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at the nearest residence would thus be 50 dBA, within the range of daytime background noise levels.

Linear Facilities

Construction of the linear facilities (i.e., transmission line and natural gas line) will produce noise at locations near residential receptors. This noise will be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction area. This work, however, is only a temporary phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days. As a result, noise levels associated with construction of the linear facilities would be considered less than significant.

Operational Noise

As described above, the VCP facility will represent essentially a steady, continuous noise source day and night. However, occasional short-term increases in noise levels will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or from maintenance, noise levels will decrease. It is not anticipated that the short-term changes in noise levels would cause any significant impacts.

E. Airport Noise Impacts: No Impact No Impact

In general, the VCP area is not influenced by aircraft noise associated with local airports. Therefore, this criterion is not applicable to the proposed project.

F. Private Airstrip Impacts: No Impact

In general, the VCP area is not influenced by aircraft noise associated with local airports. Therefore, this criterion is not applicable to the proposed project.

CUMULATIVE IMPACTS

The applicant has stated that no other major new or proposed industrial sources of noise were identified that might cause cumulative effects which could exceed the noise standards or criteria for this project (Valero 2001a, AFC Page 6.3-7). Staff concludes there are no cumulative impacts.

ENVIRONMENTAL JUSTICE

Staff has reviewed census tract information that shows there is a minority population greater than 50 percent within six miles of the VCP (Please refer to Socioeconomics Figure 1 in this Staff Analysis). Because the project will not result in noise impacts, staff concludes that there will be no significant direct or cumulative impacts related to noise on the minority population. Therefore, there are no environmental justice issues.

CONCLUSION

Staff concludes the request for certification will not significantly impact the public or environment if the assumed mitigation measures and the proposed Conditions of Certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

The Applicant has developed an overall mitigation strategy to reduce noise impacts to less than significant levels. Mitigation for construction would include making sure that all equipment is fitted with original mufflers, silencers and enclosures, and that the equipment is maintained in proper operating conditions. Other measures include the adoption of noise control programs and the implementation of noise reducing facilities to cope with construction and operational noise. In addition to the Applicant's overall mitigation strategy, staff proposes the following Conditions of Certification.

NOISE-1 At least 15 days prior to the start of project-related ground disturbing activities, the project owner shall notify all residents and business owners within one-half mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of project-related ground disturbing activities, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints.

Protocol: The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (see Exhibit 1 for example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise related to the complaint;
- if the noise is project related, take all feasible measures to reduce the noise at its source; and
- submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument, with the CPM and the City of Benicia, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days, or a lesser period of time mutually agreed to by the Compliance Project Manager and the project owner, prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM the

above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 If a traditional, high-pressure steam blow process 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 110 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 8 a.m. to 5 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance. If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected period of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise levels do not exceed 55 dBA Leq at the most-affected residence. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

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.

NOISE-5 If high pressure steam blows are used, at least 15 days prior to the first steam blow(s), the project owner shall notify all residents or business owners within one-half mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM and the City of Benicia confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 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 3 dBA, and that the noise due to plant operations will comply with the noise standards of the City of Benicia Noise Element.

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. Steam relief valves shall be adequately treated or located to preclude noise that draws legitimate complaints.

Protocol: Within 30 days of the project first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same two monitoring sites used for the ambient noise survey. 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 either 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 30 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM and to the City of Benicia. Included in the report shall 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. If additional mitigation measures are necessary within 30 days of completion of installation of these 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-7 Within 30 days of the project first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Construction noise levels as measured at any affected residence shall be limited to 60 dBA Leq during daytime hours (7 a.m. to 10 p.m.) and 55 dBA Leq during nighttime hours (10 p.m. to 7 a.m.).

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Valero Cogeneration Project
(01-AFC-5)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____

Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: $ _____
Date installation completed: _____
Date first letter sent to complainant: _____ (copy attached)
Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

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PUBLIC HEALTH AND TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

The Valero Cogeneration Project (VCP) is proposed for the site of the Valero Refinery to produce energy for refinery operations as well as electricity for sale to customers in the Pacific Gas and Electric (PG&E) service area. Such direct energy to the refinery is intended to protect against any refinery shutdowns from rolling blackouts or other system energy curtailments. The proposed fuel is refinery gas with natural gas as the backup. According to information from the applicant, Valero Refining Company, or Valero, this refinery gas is produced from refinery operations and was chosen mostly for its ready availability (from the shut down of the older refinery boilers) and the need to prevent its flaring as a refinery by-product (Valero 2001a, page 5-2). Use of this refinery gas in the two proposed power generation units would create combustion products and possibly expose the general public and workers to these pollutants as well as toxic pollutants associated with the other aspects of routine facility operations. The potential for significant public health impacts is addressed in this section of staff's analysis in terms of cancer and non-cancer risks. The pollutants of concern in this regard are those for which no air quality standards have been established. These are known as non-criteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants and are assessed in the **Air Quality** section. Potential impacts on worker health are addressed in the **Worker Safety and Fire Protection** section.

As noted in the in the **Project Description Section**, the power from the proposed project will be delivered first to a new on-site Valero switch house to the northeast corner of the refinery processing block, and then to the refinery for its operations. A new underground 12 kV distribution line of approximately 2,000 feet will be used. It is from this switch house that some of the generated power will be delivered to the existing grid through the same 230 kV substation currently utilized for power delivery to the refinery. Since this proposed underground line is within the PG&E service area, it will be designed according to existing PG&E guidelines and construction practices reflecting compliance with applicable safety laws, ordinances, regulations and standards (LORS).

The perceivable impacts of usual concern with overhead lines will not be produced by the proposed line and underground lines in general because the electric fields that produce these effects are unable (unlike their companion magnetic fields), to penetrate the soil and most materials to produce such impacts in the area above the line. The only aboveground field would be the line's magnetic fields with such penetration ability. These electric field impacts manifest themselves as audible noise and interference with radio-frequency communication. Since they are located underground, such lines do not pose the obstruction hazard to area aviation also assessed for overhead lines. The only non-field impacts of potential significance are the hazardous shocks from direct or indirect contact with the buried line. For the proposed and similar lines in the PG&E service area, design and placement would be according to General Order 128 of the

California Public Utilities Commission intended for protection against such hazards. A specific condition of certification (**TLSN-1**) is recommended to ensure compliance.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Clean Air Act of 1970 section 112 (42 U.S C., section 7412)

This section requires new sources, which emit more than 10 tons per year of hazardous air pollutants (HAPs) or more than 25 tons per year of any combination of HAPs to apply the Maximum Achievable Control Technology (MACT).

STATE

CALIFORNIA HEALTH AND SAFETY CODE SECTION 41700

This section of the code states that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material 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 persons or the public, or which cause or have a natural tendency to cause injury or damage business or property."

THE CALIFORNIA HEALTH AND SAFETY CODE SECTION 39650 ET SEQ.

This section of the code mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in CARB's California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal-EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For non-cancer-causing toxic air pollutants, Cal-EPA established specific no-effects levels (known as reference exposure levels, or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk assessments.

CALIFORNIA HEALTH AND SAFETY CODE SECTION 44300 ET SEQ.

This section of the code requires facilities, which emit large quantities of criteria pollutants and any amount of non-criteria pollutants to provide the local Air District an inventory of toxic emissions. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The

CARB and the Air Quality Management District, which in this case is the Bay Area Air Quality Management District (BAAQMD), will ensure implementation of these requirements for the proposed project.

CALIFORNIA PUBLIC UTILITIES COMMISSION GENERAL ORDER 128 (G O 128)

This code specifies the requirements for the safe construction and operation of underground lines. The cancellation effects of fields from the closely spaced conductors of underground lines cause such lines to produce magnetic fields of the lowest intensities possible without impacting safety, efficiency, and reliability.

LOCAL

Bay Area Air Quality Management District Rule 2-1-316

To ensure compliance with California Health and Safety Code Section 44300 et seq., the Air District established this rule, which requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air pollutants in specified amounts. The applicant has complied with this requirement.

There are no local laws that are aimed at the physical dimensions of electric power lines for health or safety reasons.

SETTING

As detailed in the information from the applicant, (Valero 2001 pages 6.2-1, 6.2-2 6.5-1,and Appendix A), the refinery complex site of the proposed project is located in the northeast portion of the city of Benicia. The site is immediately bordered to the south and west by 470 acres of mostly undeveloped Valero property and areas of general industrial uses to the north and east. All the land for one mile to the south and west is zoned for general industrial development. Beyond these industrial zones is a band of open space that is followed by areas of residential developments. The nearest residences are approximately one-half mile southwest of the refinery's boundary lines. The project site was chosen because of its proximity to the refinery to be served. (Valero 2001 page 2-5).

ANALYSIS AND IMPACTS

ENVIRONMENTAL CHECKLIST

PUBLIC HEALTH -- Would the project's operation:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

PUBLIC HEALTH -- Would the project's operation:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause the surrounding population to be exposed to toxic pollutants at levels hazardous to health?			X	
b) Expose humans to electric or magnetic fields at levels higher than expected for lines with optimum field reducing designs?			X	

ANALYSIS AND DISCUSSION OF IMPACTS

a) Less Than Significant Impacts

A screening level health risk assessment was conducted to estimate the maximum cancer and non-cancer risks that could be associated with the toxic pollutants from project operations. This analysis was conducted using conservative assumptions intended to avoid underestimating the actual risks. The cancer risk estimates from such an analytical approach represent only the upper bound on this risk. The actual risk would likely much lower and could indeed be zero. It is from this screening-level estimates that staff establishes the need for the more refined analysis necessary to identify the necessity for additional mitigation (which is triggered by a risk of 10 in a million or more). When this screening-level estimate is less than 1 in a million, staff would consider the potential cancer risk as negligible and not warranting further analysis.

A risk estimate of 0.978 in a million was calculated for all the project's carcinogens from this screening level analysis. A more refined analysis would likely yield a lower estimate. This screening level estimates suggests that the project's cancer risk would be negligible and is significantly less than the 10 in a million which staff considers as a trigger for recommending mitigation above the applied toxic-best available control technology or T-BACT. This means that staff considers the proposed emission controls measures as adequate for the project's operations-related toxic emissions of primary concern in this analysis. This risk estimate is also below both the 1 in a million that BAAQMD considers significant for projects such as VCP and the 10 in a million requiring public notification.

A chronic hazard index of 0.0114 was calculated for the project's non-carcinogenic pollutants considered together. Their acute hazard index was calculated to be 0.085. Both values are significant below staff's 1.0 level of significance for the health effects involved. Specific mitigation requirements in the **Air Quality** section are considered adequate by staff to reduce the potential impacts of construction emissions (from dust generation or construction equipment exhaust) to insignificant levels.

b) Less than Significant Impacts

The project's shielded underground lines would produce the lowest magnetic fields possible for a line of this current-carrying capacity without impacts on safety, reliability, and efficiency. A specific condition of certification (**TLSN-1**) is proposed to ensure compliance with the CPUC requirements necessary. Such optimal field reduction constitutes the present CPUC requirement for maintaining power line electric or magnetic exposure within levels of insignificance.

CUMULATIVE IMPACTS

The magnetic fields from the closely spaced conductors of an underground line do not significantly extend beyond the line's location, meaning that the project's line fields would not interact with fields from lines from other area lines to produce exposures of a cumulative nature.

The information from the applicant (URS 2001b Appendix C) shows that no significant sources of the toxic pollutants of concern in this analysis are proposed within six miles of VCP. This means that the project's emissions and existing background concentrations would make up any exposures of a cumulative nature in the immediate project area.

Since the project is proposed within an operating refinery, staff considers it important to assess the contribution of on-going refinery emissions that constitute and important fraction of the existing background levels. The 1999 report for BAAQMD's Toxic Contaminant Control Program (BAAQMD 1999 page 15) shows these on-going refinery operations as not contributing these toxic pollutants at levels posing a significant health risk according to the Air District's significance criteria for such sources. The relatively low cancer and non-cancer risk estimates for the project suggest that the addition of its toxic emissions would be unlikely to increase any area cumulative exposures to significant levels.

These annual air contaminant reports are part of BAAQMD's program for reducing district-wide toxic emissions as required of all California Air District under California Assembly Bill 2588 (AB 2588) of 1987.

COMPLIANCE WITH LORS

Since (a) the effectiveness of the proposed pollution controls is reflected in the risk estimates for the VCP's toxic air pollutants of primary concern in this analysis, and (b) the project-related risk estimates are below the applicable levels of significance, staff considers the project as complying with the health LORS of concern in this analysis. The proposed undergrounding of the project-related line constitutes compliance with the LORS of concern with respect to health and safety.

ENVIRONMENTAL JUSTICE

The concern about environmental justice relates to the potential for disproportionate impacts on mostly minority populations either from a conscious effort to (a) cluster pollutant sources around minority areas or (b) employ less effective controls in nearby projects. As discussed above, any air toxics-related health impacts from operating the proposed project would be less than significant anywhere in the project area, suggesting that no effort was made to either site the project or control its emissions in ways that would significantly impact any discernible group of residents, whether minority or non-minority.

FACILITY CLOSURE

As noted in the introduction to this section, the toxic pollutants of primary in this analysis are those from routine operation of the proposed project. During temporary of permanent project closure, the major concern would be over non-routine releases of hazardous materials or wastes on site. Such releases are discussed respectively, in the **Hazardous Materials** and **Waste Management** sections. Since project operations would be stopped during forced, temporary closures, any hazardous material releases would unlikely be in insignificant amounts. During permanent closure, the only emissions of potential significance would derive from demolition or dismantling activities and the equipment used. Such emissions would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

In their July 13 2001 letter to the Valero Refining Company, the City of Benicia expressed specific concern about the reliability of both the emission factors and toxicity factors used in estimating the cancer and non-cancer risks from the project's toxic emissions. These issues have been addressed by the applicant to staff's satisfaction with related modifications reflected in the risk values presented in this analysis.

CONCLUSIONS AND RECOMMENDATIONS

While specific toxic pollutants would be associated with operation of the proposed project, staff's analysis shows that these pollutants will be unlikely to be emitted at levels posing any significant health risks to the surrounding population. Therefore, staff does not consider additional mitigation to be necessary with respect to these toxic pollutants. Use of an underground line would constitute the optimal magnetic field reduction the CPUC considers appropriate in light of the present health-based concern. Staff considers additional field mitigation measures as unnecessary. If the Commission certifies the proposed project, staff would recommend adoption of the condition of certification specified below.

PROPOSED CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct underground line of the proposed project according to the requirements of CPUC's GO-128 for underground lines.

Verification: Thirty days before starting line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming compliance with this requirement.

REFERENCES

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SOCIOECONOMICS

Testimony of Negar Vahidi

INTRODUCTION

The technical area of Socioeconomics includes several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of short-term and long-term project-induced population changes on housing, employment, and public services within the project area. For example, project impacts on housing stock, local schools, medical and protective services, as well as the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes are evaluated. The socioeconomic analysis also provides demographic data for use in various other technical area analyses to determine the potential for Environmental Justice impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

STATE

14 California Code of Regulations, Section 15131

- Economic or social effects of a project shall not be treated as significant effects on the environment.
- Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

DEMOGRAPHIC CHARACTERISTICS

The project site is located in the City of Benicia in the southernmost portion of Solano County. Located midway between San Francisco and Sacramento, Solano County is bounded by Sacramento County on the east, Napa County on the west, Yolo County on the north, and Contra Costa County on the south. Solano is described as one of the ten fastest growing counties in California, which is a trend anticipated to continue in the future (DOF, 2001). Among the nine San Francisco Bay Area counties, Solano is expected to account for 32 percent of all growth. Residents from the more densely populated areas of San Francisco and Alameda counties are migrating to Solano and Contra Costa Counties (ABAG, 2000).

Growth in Solano County may be attributed to the county's affordable land for housing, commercial/industrial development, and businesses serving the Bay Area, Sacramento, and global markets. Projections indicate that by 2010, the county's population will reach 481,700 and the number of jobs will be 171,960, which amount to an increase of about 80,000 and 30,000 from the year 2000, respectively (ABAG, 2000). This represents a projected population increase of approximately 17 percent, and a projected increase in employment of 20 percent over the next decade.

Socioeconomics Table 1 shows total 1990 population, minority population percentage (people of color as defined by the U.S. Census), and percent of the population below the poverty level for Solano County, Contra Costa County, City of Benicia, and census tracts within a 6-mile radius of the proposed project site. For purposes of comparison, **Socioeconomics Table 2** shows the same population characteristics as **Socioeconomics Table 1** by presenting data sets for 2000.

Socioeconomics Table 1
Demographic Profile Of Contra Costa County, Solano County, City of Benicia, and Project 6-Mile Radius: 1990

	Contra Costa County	Solano County	City of Benicia	6-Mile Radius
Total Population	803,732	340,421	24,453	140,304
Minority %	41%	29%	27%	43%
Poverty %	15%	14%	13%	8%
Total Housing	316,170 units	119,533 units	9,587 units	N/A
Vacancy Rate	5.0%	5.1%	3.9%	N/A
Total Employment (jobs within)	191,411	79,491	4,717	N/A
Total Labor Force (living within)*	406,507	151,310	12,974	N/A

* Indicates all residents of legal working age
N/A: Not Applicable
Source: US Census, 1990; Rose, 2001.

Socioeconomics Table 2
Demographic Profile Of Contra Costa County, Solano County, City of Benicia, and Project 6-Mile Radius: 2000

	Contra Costa County	Solano County	City of Benicia	6-Mile Radius
Total Population	948,816	394,542	27,500	157,767
Minority %	52%	43%	40%	54%
Poverty %	Unavailable	Unavailable	Unavailable	Unavailable
Total Housing	397,835 units	143,401 units	10,742 units	N/A
Vacancy Rate	5.1%	4.9%	4.1%	N/A
Total Employment (jobs within)[1]	499,700	195,400	Unavailable	N/A
Total Labor Force (living within)*	516,300	203,800	13,821	N/A

* Indicates all residents of legal working age
N/A: Not Applicable
Source: US Census, 2000; Claritas Corp., 2001; Rose, 2001.

[1] Monthly labor force data for counties provided by EDD, June 2001 (preliminary); 2000 benchmark, not seasonally adjusted.
Note: According to the U.S. Census Bureau, Census 2000 detailed (at the Census tract level) population and housing characteristics data, and detailed race characteristics are not available until the last quarter of 2001. In addition, demographic, social, economic, and housing characteristics at the Census tract level are not available until the 2nd quarter of 2002 (U.S. Census Bureau, 2001)

EMPLOYMENT AND ECONOMY

Socioeconomics Table 3 identifies labor force characteristics for Contra Costa and Solano Counties for the year 1999. 2000 statistics for Solano County indicate a civilian labor force of 195,400 with an unemployment rate of 4.3 percent, just below the state's unemployment rate of 5.1 percent (EDD, 2001). Adjacent Contra Costa County has a much larger civilian labor force, with approximately 3.3 percent unemployment rate. The civilian labor force represents all residents between 18-55 years of age and currently employed.

Services employ the highest proportion of any sector (14 percent), while trade accounts for another 2 percent of employment. Manufacturing accounts for 5 percent of jobs, government 12 percent, agriculture one percent, and construction approximately five percent. The construction sector employs about 9,000 workers in Solano County. Contra Costa County represents a much greater distribution by sector (with the exception of agriculture) including almost 24,700 workers in the construction trades.

Socioeconomics Table 3
Labor Force Characteristics in
Contra Costa and Solano Counties, 1999

Sector	Contra Costa County	Solano County
Civilian labor force	505,100	196,900
Unemployment	13,700	8,400
Agriculture	800	2,500
Construction	24,700	9,100
Manufacturing	23,900	10,200
Transportation/public utilities	20,100	4,300
Trade	72,200	4,200
Finance/insurance	28,900	2,500
Services	108,500	27,900
Government	47,100	24,400
Other	165,200	103,400
Source: California Employment Development Dept., March 1999 benchmark.		

It should be noted that for major construction projects, the construction labor pool comes from areas that are within a two-hour commute of a project site. Therefore, in the case of the proposed project, in addition to the local labor force in Solano County, the labor pool could commute into the project area from Contra Costa County or any of the other counties adjacent to Solano County such as Sacramento, Napa, and Yolo counties.

PUBLIC SERVICES

Fire Protection

The Benicia Fire Department provides fire protection services to the proposed project site. The City of Benicia maintains an "multi-hazard" Emergency Operations Plan (EOP) adopted by the City Council in 1989 that identifies procedures for various types of emergencies. The EOP is periodically updated and drills evaluating the effectiveness of the plan are conducted from time to time. **Socioeconomics Table 4** presents the existing capabilities of the Benicia Fire Department. The Benicia Fire Department has two stations, two fire engines and an ambulance staffed 24 hours a day.

Socioeconomics Table 4
City of Benicia Fire Protection

Station Location	No. of Personnel	Equipment (No. of vehicles, protective & preventative equipment, etc.)	Response Time (to Valero Power Plant)
150 Military West	6	7	4 to 5 Minutes
601 Hastings Drive	4	5	5 to 6 Minutes

Source: Tessier, 2001.

Police Protection

Police protection for the project areas is provided by the Benicia Police Department. The Benicia Police Department shares the responsibility for policing the Benicia Industrial Park, where the project site is located, with private guards employed by the individual industries in the park. The Benicia Police Department (located at 200 East L Street) has 36 sworn officers. According to Sergeant Dave Watson, the Police

Department projects a 1-minute response time to the Valero Power Plant (Watson, 2001).

Schools

The Benicia Unified School District (BUSD) serves the project area. According to the BUSD, the majority of schools serving the area are currently at capacity. **Socioeconomics Table 5** provides a listing of area schools and their current capacity status.

Socioeconomics Table 5
Project Area Schools

School	Capacity Status
Benecia High School	At Capacity
Liberty High School	At Capacity
Benecia Middle School	At Capacity
Mary Farmar Elementary School	At Capacity
Matthew Turner Elementary School	At Capacity
Mills Elementary School	At Capacity
Joe Henderson Elementary School	At Capacity

Source: Creighton, 2001.

Other Public Services

Other public services in a community include medical facilities, and libraries. There are no hospitals located in Benicia. However, there are two hospitals in nearby Vallejo, the Sutter Solano Medical Center and Kaiser Permanente. Other nearby hospitals in Contra Costa County include Kaiser-Martinez, Mt. Diablo Hospital, and Contra Costa County Regional Medical Center. The City of Benicia Public Library (located at 150 East L Street) serves the project area.

IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOCIOECONOMIC: POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
d) Have a significant minority or low-income population within a six-mile radius that may be subject to disproportionate adverse effects of the project?			X	
Result in substantial adverse physical impacts associated with the provision of new or physically altered facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for the following:				

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOCIOECONOMIC: POPULATION AND HOUSING -- Would the project:				
e) fire protection?				X
f) police protection?				X
g) schools?				X
h) other public services?				X

DISCUSSION OF IMPACTS

A. Induced Population Growth: No Impact

According to the Application for Certification (AFC) for the Valero Cogeneration Project, construction of the proposed project is expected to be completed in a 12- month period. Construction is anticipated to begin in the third quarter of 2001, as soon as the AFC is approved, and is expected to be completed in the summer of 2002. An average of 75 to 100 workers from varying trades common to the construction industry will be required during proposed project construction. Key trades involved would include carpenters and masons, pipefitters and boilermakers, electricians, steelworkers, equipment operators and other laborers. According to the AFC, there is sufficient labor force availability in Solano and the surrounding Bay area counties to find the required construction trades. **Socioeconomics Table 6** shows the distribution of workers by craft and month required for project construction activities.

SOCIOECONOMICS TABLE 6
PROJECTED MONTHLY CONSTRUCTION LABOR BY CRAFT

Month	Carpenters and Masons	Pipefitters and Boiler Makers	Electricians	Steel Workers	Equipment Operators	Laborers	Total
Sep-01	0	0	0	0	5	10	15
Oct-01	20	50	0	5	5	12	92
Nov-01	20	50	30	5	5	13	123
Dec-01	20	50	30	5	2	13	120
Jan-02	20	70	40	5	2	13	150
Feb-02	10	70	50	5	2	13	150
Mar-02	10	70	50	5	2	13	150
Apr-02	10	70	50	5	2	13	150
May-02	10	70	50	5	2	13	150
Jun-02	10	70	50	5	2	13	150
Jul-02	10	70	50	5	1	14	150
Aug-02	0	40	0	0	0	10	100
Total	140	680	450	50	30	150	1,500

For major construction projects, the labor pool within a two-hour commute is considered to be feasible for construction workers. The areas within a two-hour commute to the project site include counties adjacent to Solano County. These areas have large populations, including a labor force with adequate members of the trades required for construction of an energy facility.

The proposed project will require approximately 12 months for construction with a peak construction period during the 5th through 11th months. The peak construction labor force projected for the proposed project is 150 employees during this 6-month period. It is expected that most construction laborers would remain active during the entire construction phases, therefore resulting in a likely maximum of 150 total construction workers working on the project at any given time.

Socioeconomics Table 3 indicates that in 1999, within nearby Contra Costa and Solano Counties, a total of 33,800 residents were employed within the construction labor force. An assumed need of 300 construction workers (twice the expected peak labor for the project) for the construction of the proposed project represents less than one percent (0.8 percent) of the total construction workforce within Contra Costa and Solano Counties.

In addition, the Valero Cogeneration Plant is expected to share most operating and maintenance staff with the adjacent existing Valero Refinery. Consistent with other similar power generating facilities, it is assumed that only up to three to four additional full-time employees may be required to operate the plant.

Because the number of construction and operation workers required represents such a small portion of the local available labor force, it is assumed that no inmigration of residents would occur as a result of construction or operation activities. Therefore, the project will not directly or indirectly induce substantial population growth in the area.

B. Displacement of Housing: No Impact

The proposed project site is an industrial facility and contains no housing. As such, no housing will be displaced as a result of the project. Sufficient vacant housing exists if any construction workers seek temporary housing during the 12 months of construction. However, it is expected that most construction workers are within commuting distance from the project site and therefore would not need to move into the area for the duration of construction. As presented in **Socioeconomics Table 2**, there was a 5.1 percent housing vacancy rate in Contra Costa County in 2000, a 4.9 percent housing vacancy rate in Solano County, and a 4.1 percent housing vacancy rate in the City of Benicia. These vacancy rates indicate approximately 9,400 available housing units within a commuting distance of the project area. Even under a worst-case scenario of approximately 150 (peak labor) construction workers relocating to the area for a short period, this would comprise less than 0.002 percent of the estimated population base, and would therefore have no impact on the housing supply.

The proposed project is not likely to significantly alter the location, distribution, density, or growth rate of the population of any nearby County since construction impacts are of a short-term and temporary nature. According to the applicant, the cogeneration plant is expected to share most operating and maintenance staff with the adjacent existing plant. Only three to four additional full-time employees will be required to operate the plant. It is assumed these full-time employees would currently reside within the project area, resulting in a negligible impact to housing outside current demands. Therefore, the proposed project would not displace substantial numbers of any existing housing

and would not necessitate the construction of replacement housing elsewhere. No impacts to housing would occur.

C. Displacement of People: No Impact

As described in Item B (above), no housing or population will be displaced by the proposed project. Therefore, no impacts would occur.

D. Adversely Affect Minority or Low-Income Populations – Environmental Justice Screening Analysis: Less Than Significant Impact

For all siting cases, Energy Commission staff conducts the environmental justice screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in USEPA's National Environmental Policy Act (NEPA) Compliance Analysis" dated April 1998. The purpose of the screening analysis is to determine whether there exists a low-income and/or minority population, which may be exposed to disproportionately high and adverse human health or environmental effects as a result of the proposed project.

Minority populations, as defined by USEPA's guidance document, are identified where either:

- The minority population of the affected area is greater than fifty percent of the affected area's general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

The Guidance does not define the term "affected area", however it states that the analyst should interpret the term "as that area which the proposed project will or may have an effect on." Typically, Energy Commission staff has defined the affected area as the area potentially impacted by the proposed project in the areas of air quality, public health, noise, water, traffic, hazardous materials, transmission line safety and nuisance, waste management, and visual resources. This area has been determined by the Energy Commission as that area within a six-mile radius of the proposed site; this is consistent with the radius used for staff's cumulative air quality analysis.

As shown in **Socioeconomics Tables 1 and 2**, the minority populations for Contra Costa County, Solano County, City of Benicia, and 6-Mile radius of the project have increased between the years 1990 and 2000. Specifically, the minority population in the census tracts living within a six-mile radius of the proposed project location has increased from 43 percent to 54 percent. Please refer to **Socioeconomics Figure 1,** which shows the percentage of minority residents within the six-mile radius as based on 2000 census data.

It should be noted that the total population within a six-mile radius of the proposed project has increased 11.1 percent between the years of 1990 and 2000. The total minority population within a six-mile radius of the proposed project is greater than 50 percent, triggering a more detailed environmental justice analysis in appropriate

technical areas (air quality, public health, noise waste, visual, land use, traffic and transportation, hazardous materials, transmission line safety and nuisance, and water).

While poverty statistics are not currently available for the year 2000, the 1990 data shows only 8 percent of the population within a six-mile radius of the proposed project living in poverty. It is assumed that poverty levels have increased incrementally and proportionally with total population increases, likely resulting in more persons of poverty currently living within a six-mile radius of the proposed project. However, staff does not expect the presence of persons of poverty in year 2000 to exceed the 50 percent threshold for a more detailed environmental justice analysis. There are no potentially adverse impacts as a result of this project. Therefore, there are no environmental justice issues.

Socioeconomics Figure 1

E. Fire Protection: No Impact

Physical impacts to public services and facilities are usually associated with population inmigration and growth in an area, which increase the demand for a particular service leading to the need for expanded or new facilities. An increase in population in any given area may result in the need to develop new, or alter existing, government facilities in order to accommodate increased demand.

As an electric generation project seeking to meet the current demand of customers, the proposed project is not expected to result in an increase in the population of the area (as described in Items A through C, above). As described in the AFC, construction of the generation station would require an average of 75-100 workers, with a maximum peak labor force of 150. According to data obtained from the California Employment Development Department, the workforce in the project area would be adequate to fulfill project's need for its temporary construction workforce. In addition, the proposed project is expected to increase its current workforce by only three to four full-time employees to operate the Valero Cogeneration Facility. Given the availability of local workforce and the temporary nature of construction activities, proposed project construction is not expected to result in population growth. In addition, given the number of operational personnel needed (maximum four personnel), plant operation would only result in a negligible contribution to the area's population. Given adequate existing fire protection personnel, equipment and response times, the proposed project would not increase demand for fire protection services. Therefore, it is not expected that the proposed project would increase the use of existing fire protection facilities such that a substantial physical deterioration, alteration, or expansion of these facilities would occur. No significant impacts would occur.

E. Police Protection: No Impact

Refer to Item D (above). In addition, given that the proposed project would have security services, and the adequate existing police protection personnel, equipment and response times, the proposed project would not increase demand for police protection services. Therefore, it is not expected that the proposed project would increase the use of existing police facilities such that a substantial physical deterioration, alteration, or expansion of these facilities would occur. No significant impacts would occur.

F. Schools: No Impact

Refer to Item D (above). In addition, as shown in **Socioeconomics Table 5** (above), there is currently a shortage of schools in the BUSD. As evidenced by capacity conditions, the current demand for schools has not been met. Development of the proposed project would not induce more growth in the area, but is intended to meet the existing electric power demand of area's population through the construction of a new power generation facility. It should be noted that as part of project development, the applicant would contribute School Impact Fees that would total approximately $10,000 (or $0.33 per square foot of development). These fees are intended to help school districts address their capacity problems by requiring developments to provide a fair share of the cost to develop new school facilities. Given the proposed project's contribution of School Impact Fees and the

fact that there would be no population in-migration into the area, there would be no need for new school facilities resulting from the proposed project. No impacts to schools would occur.

F. Other Public Services: No Impact

Refer to Item D (above). In addition, the project will not directly or indirectly induce substantial population growth in the area. Any short-term increase in population due to construction activities is considered to be minimal, with adequate numbers of construction workers currently residing within the project area. Therefore, no further constraints would be placed on any current public services providers as a result of the proposed project. No adverse physical impacts associated with the provision of public facilities (new or altered) would occur.

CUMULATIVE IMPACTS

Given that the proposed project would not result in any significant socioeconomic impacts to population and housing, or public services, it is unlikely that it would contribute considerably to cumulative socioeconomic impacts. Staff concludes that there are no cumulative impacts.

CONCLUSIONS

The proposed project would not induce significant population growth in the area, nor would it involve the displacement of housing or people. In addition, the project will not significantly impact schools or public services. Therefore, the project will not result in any significant socioeconomic impacts to population and housing, or public services. As stated in the Application for Certification, the project will contribute about $1 million annually in property taxes to Solano County, and materials purchased locally will total about $5 million during construction.

Although there is a minority population greater than 50 percent within a six-mile radius of the project site, staff concludes that there are no significant adverse, direct, or cumulative socioeconomic impacts on the minority population. Therefore, there are no environmental justice issues.

PROPOSED CONDITIONS OF CERTIFICATION

None proposed.

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TRAFFIC & TRANSPORTATION

Testimony of James Fore

INTRODUCTION

The staff assessment of the traffic and transportation section provides an independent analysis of the Valero Cogeneration Project (VCP). Potential impacts related to traffic operations and safety hazards resulting from the construction and operation of the project are discussed.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Federal, state, and local regulations that are applicable to the area roadways and for the transportation of hazardous materials are listed below. These regulations are designed to control and mitigate for potential impacts resulting from the transportation of such materials. The applicant has indicated its intent to comply with all federal, state and local regulations.

FEDERAL

- Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, addresses safety considerations for the transport of goods, materials, and substances over public highways.

STATE

- Section 353 defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for a particular waste stream.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.

- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11 regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- Sections 25160 et seq. addresses the safe transport of hazardous materials.
- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, the possession of certificates permitting the operation of vehicles transporting hazardous materials is required.
- California Street and Highways Code, section 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, sections 660, 670, 1450, 1460, et seq., 1470, and 1480, regulate right-of-way encroachment and the granting of permits for the encroachment on state and county roads.
- California Health and Safety Code, sections 25160 et seq., addresses the safe transport of hazardous materials.

LOCAL

The City of Benicia has a policy to maintain intersection operation at a level of service (LOS) of D or better, except where improvements would be infeasible or undesirable due to consolidations of right-of-way, impacts of neighboring properties, aesthetics, or community character. The City of Benicia has established through truck routes within the city. There is a truck weight limit of seven tons for local roadways.

SETTING

The VCP will be located within the property bounty of the Valero Refinery in the City of Benicia. The proposed facility will include two combustion turbine generators of approximately 50 megawatts each. The project site is 1.5 miles north of the merge between Interstate 780 (I-780) and Interstate 680 (I-680) at the north end of the Benicia-Martinez Bridge. Direct construction access to the VCP will be via Valero Refinery Gates 4 or 9 located off of Park Road.

General access to the VCP site would be via the following roads and freeways:

Interstate 780 - A four lane, east-west freeway extending from the Benicia-Martinez Bridge to Interstate 80 (I-80) in Vallejo.

Interstate 680 - A four-lane, east-west freeway that extends from I-80 north of the plant site south to Interstate 550 in Dublin. I-680 merges with I-780 at the Benicia-Martinez

Bridge. After this merger I-680 becomes a six-lane freeway south of the Benicia-Martinez Bridge.

East Second Street - This is a north-south arterial roadway that provides access from I-780 to the refinery. The main entrance to the refinery is located on East Second Street. East Second Street is four-lanes south of Rose Street and two-lanes north of Rose Street.

Industrial Way - This is a two-lane north-south roadway that provides access from East Second Street and I-680 to the Benicia Industrial Park.

Bayshore Road - This road extends from H Street in Benicia northward to parallel I-680, connecting to I-680 just north of the I-780 interchange. Bayshore Road terminates at the Valero Refinery just past Park Road, except for a short discontinuous segment at Industrial Way.

Park Road - This is a two-lane roadway that crosses under and runs parallel to I-680 extending north into the Benicia Industrial Park area. Park Road provides access to the refinery by Gate 9 and Gate 4.

Access to the Valero Refinery is restricted and controlled through various gates located around the facility. Access for the construction traffic to the project site will be through refinery Gates 4 and 9 off of Park Road. Gate 9 will be used by the workforce while Gate 4 will be used for trucks delivering construction supplies and equipment.

ANALYSIS AND IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
TRANSPORTATION/TRAFFIC – Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			**X**	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?		**X**		
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				**X**
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				**X**
e) Result in inadequate emergency access?				**X**
f) Result in inadequate parking capacity?		**X**		
g) Create a significant hazard to the public or the environment through the routine transportation of hazardous material?				**X**

ANALYSIS AND DISCUSSION OF IMPACTS

A. Less than Significant Impact

The construction period for the project will be approximately 12 months with two construction phases associated with the construction of each of the combustion turbine generators. The maximum work force associated with each phase will be 150 workers. The peak associated with the first phase is scheduled to occur during the first three months of 2002. The second peak is scheduled to occur during June through August of 2002.

The average work force will be between 75 to 100 workers. Assuming a worst case of no construction worker ridesharing, the anticipated average work force is expected to generate between 150 to 200 daily trips (75 to 100 round trips). During the peak construction phases 300 daily trips are expected (150 round trips) based on a peak workforce of 150.

The addition of VCP project traffic will have little impact on the existing average LOS for the area freeways and roadways. Each of the freeways and roadways are expected to continue to operate at an acceptable level of service (i.e., LOS D or better according to the Circulation Element of the City of Benicia General Plan) with the addition of the VCP construction traffic.

During the construction phase the major impact is expected to be on the intersection of Park and Bayshore Roads. This intersection will experience a reduction in the LOS. The LOS for the intersection will change from a C to a D during the PM peak hour when construction is at its peak of 150 workers. This LOS is within the LOS established by the City of Benicia.

All other impacted roadways and intersections will experience no significant and/or adverse impacts from this project as all have sufficient capacity to absorb all project-generated traffic. Furthermore, the increases in traffic volumes on the affected highways, roadways and intersections would only occur on a temporary basis (i.e., during the construction phase of the project).

Caltrans may use East 2nd Street for a detour route during the early stages of construction on the Benicia-Martinez Bridge (Caltrans 2001). This would be between the hours of 12:00 AM and 4:00 AM. The VCP project is not scheduled to impact the use of this roadway during those hours.

Operation of the VCP will be run by personnel at the refinery, and therefore will not require additional personnel. Therefore, no traffic impacts would result from the operation of the VCP.

The project has a railroad spur available that is used by the refinery for the delivery of material and heavy equipment. The project owner plans to use this railroad spur to transport the heavy equipment required for the project. If the project is unable to use the railroad spur for the delivery of heavy equipment the project owner will need to obtain the necessary permits from Caltrans and local jurisdictions for the transportation of this equipment.

Although this project will not have a significant impact on the area roadways the project owner needs to meet with the City of Benicia prior to and during construction (City of Benicia 2001). The purpose of these meetings will be to review any traffic issues and implement measures on an as-needed basis to ensure that the construction traffic generated by the project does not have a significant impact on the City of Benicia roadways.

B. Less than Significant with Mitigation

The construction of the VCP project could result in a decrease in the LOS to unacceptable levels for some area intersections if it runs concurrently with other construction or maintenance projects. The refinery is planning a methyl tertiary butyl ether (MTBE) phase-out project. This project is scheduled to have a peak workforce of 700.

The traffic associated with the MTBE peak construction workforce could result in a reduction in the LOS for East 2nd Street during the PM peak traffic period. The LOS for the intersection of East 2nd Street and the traffic departing through Gate 8 on the City Corporate Yard Road goes from a B to F for traffic turning left on to East 2nd Street. At the East 2nd Street and I-780 westbound ramp the LOS goes from C to F during the PM peak period.

To mitigate PM peak traffic impacts at the intersection of East 2nd Street and the City Corporate Yard Road. The MTBE project proposes to have the workers exit the parking area on to Park Road through Gate 7. This would result in MTBE construction traffic impacting the intersection along Park Road at Bayshore Road and Industrial Way.

The MTBE traffic directed along Park Road would result in a reduction in the LOS for some intersection, but these intersections would be maintained at a LOS of D or better. This was not felt to be significant as the LOS were maintained at acceptable LOS and the decline in LOS would exist for only six months or less.

The VCP greatest traffic impact is on the intersection of Park and Bayshore Roads. The LOS for this intersection changes from a C to a D during the construction of the VCP. This is an acceptable LOS. If the MTBE project's proposed re-directing of PM traffic to Park Road occurs concurrently with the VCP project, this would result in intersections along Park Road being degraded to an unacceptable LOS.

The MTBE project also could result in a decrease in the LOS for northbound traffic turning left at the intersection of Park Road and West Industrial Way. It goes from a C to D in during the peak PM traffic period.

Therefore, the VCP project will need to coordinate its construction activity with the MTBE project and other construction or maintenance projects that may occur to minimize peak traffic volume and maintain acceptable LOS for the area roadways and intersections. This coordination could include the following mitigation measure:

- Providing someone to direct traffic at the impacted intersections during the peak period when construction traffic is leaving the site,

- Stagger the construction work hours for the different projects to reduce traffic impact at the PM peak hour,

- Investigate the possibility of changes in signal timing with the City of Benicia Public Works Department, and

- Provide weekly information to the Benicia Police Department on expected traffic volume and travel routes.

The applicant will need to work with the City of Benicia and Caltrans to develop a traffic control plan that will maintain the LOS for the area roadways at acceptable levels.

C. No Impact

The VCP has no major commercial aviation centers in the area. The major airports in the area are Oakland International Airport and Travis Air Force Base. Oakland International Airport is approximately 25 miles west-southwest of the site. Travis Air Force Base is located about 20 miles east of the facility.

The stacks associated with the combustion turbine generators are approximately 80 feet. This is considerably less than other stacks located in the refinery.
Since the VCP stack's height is less than surrounding stacks at the refinery the stacks associated with the VCP will not affect air traffic safety.

D. No Impact

Traffic resulting from the construction of the VCP will not affect public safety. All construction workers for the VCP project are to come and leave from the Valero parking lot located just inside of Gate 9. Gate 9 is located off of Park Road. It is anticipated that the construction workforce would be commuting from the following areas: 60 percent from the south across the Benicia-Martinez Bridge; 17 percent from the north on I-680; 20 percent from the west on I-780 and 3 percent from the City of Benicia. Although left-turn lanes are not provided to accommodate vehicles turning left into the site, excessive delays are not expected from this movement due to the low level of existing traffic on Park Road.

Truck traffic for the project is expected to reach 20 construction trucks per day during the peak construction period and 10 trucks per day for the remaining months of construction. Truck traffic is expected to follow routes very similar to the workforce. The only difference is that truck traffic will enter and leave the refinery through Gate 4. This gate is used for truck access to the refinery from Bayshore Road.

E. No Impact

If roadways impacted by construction are maintained at a LOS acceptable to Caltrans and the City of Benicia the project should have adequate emergency access.

F. Less Than Significant with Mitigation Incorporated Impact

The refinery has two parking areas used primarily for workers doing construction and maintenance projects, (URS Greiner Woodward Clyde). A 500 space parking lot is located inside Gate 8. This lot has 376 spaces available for contractor parking. The other parking lot is located inside of Gate 9 and has 350 spaces of which 260 would be available for contractor parking. This gives a total of 636 spaces available for contractor parking.

According to the AFC, the construction workers associated will the VCP will enter the refinery through Gate 9 and park in the lot located inside this entrance. The workers will then be bused to the VCP site in the refinery. The parking lot at Gate 9 will accommodate the VCP workforce.

While the VCP is under construction the refinery may have a MTBE phase-out project under construction. This project is expected to have a peak workforce of 700 workers. The MTBE project is expected to use the parking lot located inside of Gate 8 as its primary parking area with the overflow from this parking lot going to the parking area inside of Gate 9.

If both projects peak at the same time parking would be required for a maximum of 850 vehicles. This would result in a shortfall of 214-spaces. The refinery has additional parking lots as well as open space that could be used for parking.

During the construction of the power plant a policy should be in place for the refinery to make available onsite parking for all construction workers in designated parking areas. The refinery should enforce a policy the all workers will park in the designated areas to avoid parking on roadways adjacent to the refinery.

G. No Impact

The construction and operation of the plant will require the transportation of various hazardous materials as indicated in the Hazardous Material Section including aqueous ammonia. The refinery currently receives approximately 10 ammonia shipments via truck per month carrying 200 barrels each. The VCP will require the delivery of two truckloads of aqueous ammonia per month. If the applicant follows the LORS for handling and transportation of hazardous material then no significant impact is expected.

CUMULATIVE IMPACTS

The workforce associated with the VCP and the MTBE Phase-Out projects could result in insufficient parking being available on site. The traffic associated with these projects could result in an adverse impact for the LOS for the area roadways. To avoid these problems, the construction activity associated with these projects must be coordinated to avoid simultaneous or overlapping peak workforce intervals. This coordination should result in maintenance of acceptable LOS levels for intersections around the refinery during the PM peak period. Similarly, this coordination should result in sufficient on site parking during the VCP construction period.

ENVIRONMENTAL JUSTICE

Staff has reviewed census tract information that shows there are minority populations greater than 50 percent within six miles of the VCP (please refer to Socioeconomics Figure 1 in this Staff Analysis). One population is approximately two to six miles to the north and the other is about one to six miles to the west.

Traffic related to the construction of the facility will not impact these areas. Traffic associated with the VCP will be using I-680 coming from the north and south or I-780 form the west. This traffic is not expected to exit these freeways on to local roadways until they are near the Valero Refinery. Therefore, Bayshore Road, Park Road and Industrial Way will be the roadways impacted. These roadways serve a non-residential, commercial and industrial area northeast of the City of Benicia. There will be no significant direct or cumulative impacts caused by traffic on the minority population of the area; therefore, there are no environmental justice issues.

CONCLUSIONS AND RECOMMENDATIONS

The project by itself would have minimal impact on the area roadways and intersections. However, when the traffic associated with this project is combined with other projects being considered by the refinery it results in a reduction in the LOS for various intersections. The applicant will need to develop a traffic control plan to minimize the flow of traffic during the peak construction period. This plan will need to consider scheduling of construction so the workforce for various projects do not peak during the same time period, designate additional on site parking areas, and address ride sharing requirements.

Although there is a minority population greater than 50 percent within six miles radius of the project site, staff concludes that there are no significant direct or cumulative impacts on the minority population. Therefore, there are no environmental justice issues.

The project owner will need to establish a traffic and transportation system policy to avoid on-street parking, reduce the impact of construction traffic on East Second Street, and follows all LORS acceptable to Caltrans and the City of Benicia for the handling of hazardous materials. If this is done then the project will result in less than significant impacts.

PROPOSED CONDITIONS OF EXEMPTION

TRANS-1 During construction of the power plant and all related facilities, the project owner shall arrange for on-site construction-period parking. If this is not possible the project owner shall establish a parking area off-site and bus the workers to the project.

Verification: At least 60 days or a lesser period of time mutually agreed to by the Compliance Project Manager (CPM) and the project owner, prior to any earth moving or disturbance activity, the project owner shall submit a parking and staging plan for all phases of project construction to the City of Benicia for review and comment and to the CPM for review and approval.

TRANS-2 The project owner shall 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. .

Verification: The project owner shall include in its Monthly Compliance Reports copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transportation of hazardous substances.

TRANS-3 The project owner shall comply with Caltrans and City/County limitations on vehicle size and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: The project owner shall keep copies of any oversize and overweight transportation permits received at the project site.

TRANS-4 Following completion of construction of the power plant and all related facilities, the project owner shall return all roadways to original or as near original condition as possible.

Protocol: Prior to start of construction, the project owner shall photograph sections of public roadways that will be affected by project construction traffic. The project owner shall provide the CPM and the City of Benicia with copies of these photographs.

Verification: Within 30 days of the completion of project construction, the project owner will meet with the CPM and the City of Benicia to determine and receive approval for the action necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible.

TRANS-5 The project owner shall develop a traffic control plan and implementation program that will ensure that the LOS for the existing roadways and intersections continue to operate at a LOS acceptable to the City of Benicia. The project owner shall submit the traffic control plan to the City of Benicia and Caltrans for review and comments, and to the CPM for review and approval. The plan shall address but not be limited to the following issues:

- The timing of other construction project at the refinery and their traffic impact;
- Establishment of construction work hours outside of peak traffic periods;
- Provision of a person to direct traffic if necessary for workers leaving the site during the peak period of construction;
- Changes in signal timing to improve the flow of traffic;
- Maintain emergency access;

- On-site parking for construction workers;
- Requirements for construction worker ridesharing; and
- Timing of truck deliveries for heavy equipment and building materials.

Verification: At least 30 days prior to start of construction the project owner shall provide to the CPM for review and approval, a copy of its construction traffic control and implementation program.

TRANS-6 The owner shall schedule construction work hours that avoid the morning and evening peak hour traffic periods, including truck traffic.

Verification: The project owner shall maintain workers time cards or a log which specify arrival and departure times and a delivery log which specifies, in part, the time and date of each delivery in the on-site compliance file.

REFERENCES

Valero Refining Company – California. Valero Cogeneration Project. Application for Certification (01-AFC-5), Submitted to the California Energy Commission, May 4, 2001.

Caltrans 2001. Telephone conversation with Moshen Pazooki, Senior Transportation Engineer, Toll Bridge Program, District 4, California Department of Transportation, Oakland California, May 24, 2001.

City of Benicia. Correspondence with Dan Schiada, Traffic Engineer, Department of Public Works. May 31, 2001.

URS Greiner Woodward Clyde. Environmental Impact Report EXXON MTBE PHASE-OUT PROJECT Administrative Draft. November 23, 1999.

From 1847 Benicia General Plan Into the 21st Century, City of Benicia. Adopted: June 15, 1999

VISUAL RESOURCES

Testimony of James Adams

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the Valero Cogeneration Project (VCP) would cause visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards. The determination of the potential for visual impacts resulting from the proposed project is required by the California Environmental Quality Act (CEQA). Staff has proposed conditions of certification that will mitigate any potential impact to a level less than significant.

This analysis includes the following:

- Description of applicable laws, ordinances, regulations and standards;
- Assessment of the visual setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting and evaluation of feasible mitigation for potential significant impacts;
- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;
- Conclusions; and
- Proposed Conditions of Certification.

A summary of the visual resources analysis methodology is presented in Appendix 1.

LAWS, ORDINANCES, REGULATION AND STANDARDS

FEDERAL

The proposed project is located on private land. Therefore, the project is not subject to federal land management requirements.

STATE

The proposed project is not located near any state designated scenic highways and is not subject to any state management requirements.

LOCAL

Local goals and policies relevant to visual resources are contained in the Visual Character Section of the City of the Benicia General Plan. This section of the plan provides goals and policies that maintain and reinforce Benicia's small-town character. The focus is on preserving natural features and vistas, designating and maintaining

scenic roads and highways, identifying and enhancing the gateways to the city, and improving the streetscape.

In particular, the following goals and policies are applicable to the VCP:

Goal 3.12 Improve the appearance of the Industrial Park

- Encourage additional attractive, quality development in industrial areas

Goal 3.9 Protect and enhance scenic roads and highways

- Preserve vistas along I-780 and I-680

The Municipal Code of the City of Benicia has two main zoning ordinances related to use classifications for general industrial development related to visual impacts. Section 17.32.030 lists requirements for lot size and setback criteria and Section 17.108 concerns design review of structures to ensure visual harmony with the surrounding area.

A discussion of the proposed project's consistency with local plans and policies is provided in a later section of this analysis.

SETTING

EXISTING LANDSCAPE

The project region is situated on the north side of the Carquinez Straits, east of San Pablo Bay and west of Suisun Bay. The City of Benicia is located at the junction of State Route (SR)-780 and SR-680 and has scenic views of the waterfronts and Bays to the south as well as rolling hills to the northwest. The project would be built within the Valero refinery, which is within a small valley in the industrial park among the hills northeast of downtown Benicia. Parts of the refinery are visible from surrounding roads, highways, commercial and residential areas.

The site is industrial in appearance, exhibiting complex forms and lines and geometric shapes. The site is dominated by the existing oil refinery and is situated between SR 780 to the west, SR 680 to the east, Pine Lake to the south, and East 2nd Street to the west and north. Within the refinery, the tall structures are painted green while the shorter ones are painted yellow. These colors blend in with the color of the trees and hills during the dry season. The immediate project vicinity includes commercial facilities to the east, and open fields and residences west, south and north of the site. The visual quality of the proposed site and vicinity is low to moderate.

The major components of the project include two combustion turbine generators, two heat recovery steam generators (HRSG), a three cell cooling tower, fuel compression facilities, approximately 1,000 feet of new refinery fuel gas line and 500 feet of new natural gas supply line, and piping, instruments, pumps, and other equipment. In terms

of the most notable features of the project, the cooling tower (25 feet high), and the HRSG stack (80 feet high), would be the most visible. In addition, the cooling tower would generate plumes that could rise approximately 100 feet during certain times of the year.

VIEWER EXPOSURE

Most views of the power plant site are limited to adjacent roadways, commercial enterprises and residences near the refinery area. The refinery is particularly visible to motorists driving south on SR 680. The VCP would not be visible from either SR-780 or SR-680. With the exception of a few residences to the west, south, and north, the refinery and rolling hills will essentially block views of the VCP. Viewers would be occupants of residences and commercial buildings in the adjacent area. The refinery is a co-dominate feature in the landscape in conjunction with the rolling hills to the west, north and east. Residents to the west, south, and north of the project site have views of the refinery. Residences along Panorama Drive to the west, East Fifth Street to the south and Lake Herman Road to the northeast have the best visibility of the refinery.

A few residences to the north, west and south will be able to see a portion of the 80 foot tall heat HRSG stack and the rare plume it will create, as well as the plumes from the three-cell cooling tower. Most of the project structures will be hidden or obscured by the much larger and visually dominant refinery. Moreover, there are about a dozen stacks at the refinery that are significantly taller than the HRSG, including a 462 foot concrete stack.

Due to the long-term nature of visual exposure that would be experienced from residences, and the sensitivity with which people regard their places of residence, residential viewers are considered to have high viewer concern. Viewer concern is rated moderate for commuters. Workers and occupants of industrial, commercial, and office buildings are attributed low viewer concern since the focus of their attention is interior to their location.

The rare HRSG plume and more frequent cooling tower plumes will be visible to commuters driving south on SR 680. The viewshed of the plumes would encompass the immediate project vicinity and extend to the roadways and viewing areas within a couple of miles. However, as discussed below, the VCP plumes would be considerably smaller than the plumes generated by the refinery.

The underground gas and water supply pipeline and electric transmission cables will be located within the refinery and would not be visible during project operation. However, pipeline and transmission line construction activities, materials, and personnel may be visible to some workers in the adjacent commercial and industrial areas where the photograph from Key Observation Point (KOP)-3 was taken.

KEY OBSERVATION POINTS

The Applicant, with input from staff, selected three KOPs, whose locations are depicted in **VISUAL RESOURCES** Figure 1. The following paragraphs briefly summarize the

concluding assessments of overall visual sensitivity at each KOP. Overall visual sensitivity takes into account existing landscape visual quality, viewer concern, and overall viewer exposure.

KOP 1 represents the view looking north from East Fifth Street approximately one mile south of the proposed VCP. (**VISUAL RESOURCES Figure 2**). The viewpoint is located next to St. Dominic's Cemetery and Church where a high number of residential viewers are present and the duration of exposure is long. Residents in this location are exposed to several plumes generated periodically at the refinery. Overall visual sensitivity of the landscape is moderate to high. This conclusion is based on the low to moderate visual quality of the view looking north, given the refinery in the mid-ground, and the more scenic hillsides in the background, the long duration of view, and the high visual concern but moderate to high exposure of the residents in this area.

KOP 2 (**VISUAL RESOURCES Figure 3**) represents the view from about a mile west of the project site across the street from a residence at 127 Panorama Drive in an area where a moderate number of viewers reside and the duration of exposure is long. The VCP would be moderately visible in the mid-ground with scenic vistas of Suisun Bay in the background. Viewers see plumes generated by the refinery at various times of the year. The view looking east is of moderate quality and residents have a high level of concern. Thus, the overall sensitivity of the landscape is moderate to high.

KOP 3 is from 603 Indiana Street Warehouses, about .25 mile east of the refinery. (**VISUAL RESOURCES Figure 4**). Viewers from this location are in close proximity to the project area with the refinery in the foreground, and the visibility of the project would be moderate to high. There is moderate to high viewer exposure, low visual quality due to the industrial and commercial character of the area, and low to moderate viewer concern. Several plumes are visible at different times of the year. The duration of the view is low to moderate. Therefore, the overall visual sensitivity of the landscape is low to moderate.

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VISUAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?		X		
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?		X		

ANALYSIS AND IMPACTS

Appendix 1 provides a visual resources summary of analysis and a visual analysis methodology is discussed in Appendix 2. The following discussion explains the responses to the questions in the environmental checklist.

A. Scenic Vistas

Scenic vistas of high visual quality that were identified within the viewshed (area of potential visual effect) include the Suisun Bay, Carquinez Strait, and Mt. Diablo. The VCP will not significantly degrade the overall landscape or scenic vistas beyond the current impact of the refinery. As discussed in more detail below, the HRSG stack and cooling tower plumes will blend in with refinery structures and normal operations. KOP-2 is the only KOP with a good view of the scenic vistas. The addition of the VCP would cause low to moderate visual change. It would cause a low degree of contrast with existing structures, be subordinate to the refinery, and would not block views of the scenic vistas. With staff's proposed conditions of certification, and given the low to moderate overall visual change, the VCP would have a less than significant impact on the identified scenic vistas as viewed from KOP-2 ,as well as the viewshed at KOP 1 and 3.

B. Scenic Resources

There are no state designated scenic highways within the project viewshed. As indicated in the Visual Section of the AFC, there is a locally designated scenic vista on SR 680 between Morrow Lane and the Benicia-Martinez Bridge. The VCP will not be visible from this scenic vista or any portion of SR-680 or SR-780, however, the cooling tower plumes might be briefly visible to motorists for a short period of time depending on wind direction. On the other hand, according to the Benicia General Plan, the scenic vista is to the southeast toward Suisun Bay and away from the VCP. Therefore, the project would not have a substantial adverse effect on scenic resources.

C. Visual Character or Quality

Project aspects that were evaluated in the assessment of Item C included project construction; power plant structures; electric transmission line, water and gas supply pipelines; and cooling tower plumes.

PROJECT CONSTRUCTION

Construction of the proposed power plant would cause temporary visual impacts due to the presence of equipment, materials, and workforce. Viewers would primarily be workers at the commercial area just east of the refinery near KOP-3. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and a temporary laydown/staging area. The proposed project construction would occur over a 6-month period. Due to the short-term nature of project construction and the low overall visual sensitivity at KOP-3, no substantial visual degradation of the site or its surroundings would occur during construction.

Power Plant and Linear Facilities

The power plant and linear facilities would not cause significant long-term visual impacts. The linear facilities, gas and water pipelines, and transmission cables will be underground and within the refinery property boundaries. Some residents to the north, south and west of the VCP may notice the facility and associated plumes, and the inhabitants of the commercial buildings to the east will be able to see substantial parts of the project.

VISUAL RESOURCES Figure 5 presents a visual simulation of the proposed power plant viewed from KOP 1 (Looking north from East Fifth Street). As mentioned above, the overall visual sensitivity from this viewpoint is moderate to high. This is due to a high number of viewers, long duration of view, low to moderate visual quality, high visual concern, and moderate to high viewer exposure. The refinery is approximately one mile to the north and occupies the mid-ground of the viewshed. The VCP in the simulation is a dark gray color to help a reviewer see the exact location of the project. In addition, the rare HRSG plume and more frequent cooling tower plumes will be added to the viewshed.

The VCP would be subordinate to the more dominant refinery and cause a low degree of contrast with existing structures in regard to form, line and color. The project would cause a low amount of view blockage and a low to moderate overall visual change. Staff proposes condition of certification VIS-1 that will require the project owner to paint the VCP green and yellow in order for it to blend in with the refinery. Therefore, the VCP would cause a less than significant impact on the visual resources at KOP-1.

KOP-2 (Looking west near a residence on Panorama Drive) has moderate to high overall visual sensitivity. This occurs because of a high number of viewers, long duration of view, moderate visual quality, high visual concern, and moderate visual exposure. The refinery is approximately a quarter of a mile to the west. As noted earlier, significant scenic vistas are visible from KOP-2. The VCP would cause a low degree of visual change from this KOP. This is due to the project being subordinate to the more dominate refinery, low degree contrast with existing structures and minimum view blockage. Thus, the VCP would have a less than significant impact from this KOP.

KOP-3 (Looking northwest from 633 Indiana Street) a low to moderate overall visual sensitivity. This is due to a moderate to high visibility of the project, moderate to high viewer exposure, long duration of view, low visual quality due to the industrial and commercial character of the area, and low to moderate viewer concern. of the area.

The HRSG stack and cooling tower plumes would be evident, though as noted above, there are stacks and plumes in close proximity currently. The VCP will be subordinate to the refinery and the contrast with existing structures and view blockage would be low. The overall visual change will be low to moderate and the VCP would have a less than significant impact from this KOP.

HRSG and Cooling Tower Plumes

Staff analyzed the project site's existing plume conditions and the proposed VCP cooling tower and HRSG exhaust stack visible plumes.

The Applicant provided, in Data Request Response #27 (URS 2001c), a listing of existing visible plume sources at the refinery that can be seen from one or more of the KOPs. The list of visible plume sources identified by the Applicant were:

- 5-Cell Cooling Tower
- 2-Cell Cooling Tower
- Two "Catacarb" Regenerator Stacks
- Deaerator Stack
- "Big Hogger" Stack

The data provided by the Applicant identified the 5-cell and 2-cell cooling towers as the largest existing visible plume sources. To assess the potential visual impacts from the proposed project, staff modeled the existing cooling towers, the new cooling tower, and the new HRSG to determine reasonable worst-case visible plume frequencies and dimensions (CEC 2001x).

The Applicant provided, in Data Requests Responses 28 and 29 (URS 2001c), and information provided subsequently to supplement those data responses (McGuire 2001), a description of the existing cooling towers and new cooling tower exhaust conditions. The cooling tower exhausts were modeled and the predicted visible plume frequency results are presented in **Visual Resources Table 1**.

VISUAL RESOURCES: Table 1
Staff Predicted Hours for all Cooling Tower Visible Plumes
San Francisco Airport 1990 to 1995 Meteorological Data

	Valero Cooling Towers	
	Total	**Percent**
All Hours	38,698	73.60%
Daylight No Fog/Rain Hours	12,022	48.69%
Seasonal Daylight No Fog/Rain Hours	7,151	69.07%

The percentages shown in this table represent the percentage of the quantity listed (i.e. all hours = 52,582 hours, daylight no fog = 24,694, and seasonal November-April daylight hours = 10,354 hours).

The predicted plume frequency is the same for all of the modeled cooling towers (existing and proposed) due to the simplification of the operating exhaust condition assumptions.

The dimensions of plumes expected to occur 10 percent of the time from the existing cooling towers and the new cooling tower are presented in **Visual Resources Table 2**.

VISUAL RESOURCES: Table 2
10th Percentile Cooling Tower Visible Plume Dimensions

All Hours	**5-Cell Tower**	**2-Cell Tower**	**New Cooling Tower**
Length (ft)	2,693	1,555	364
Height (ft)	594	426	157
Width (ft)	180	112	30

Daylight No Fog/Rain Hours			
Length (ft)	892	538	141
Height (ft)	604	361	102
Width (ft)	131	82	23
Seasonal Daylight No Fog/Rain Hours			
Length (ft)	1,046	630	157
Height (ft)	784	466	118
Width (ft)	151	95	26

Seasonal = November through April

As Table 2 shows, the new cooling tower plumes are predicted to be significantly smaller than the existing cooling tower plumes. These results are consistent with the fact that the design-cooling load for the new cooling tower is significantly smaller than the cooling loads of the two existing cooling towers.

After a review of the Applicant's Data Request Responses #30 through #32, a psychrometric analysis and dispersion modeling analysis was performed to determine the potential for HRSG visible plumes. Staff's modeling analysis (CEC 2001x) indicated that no visible plumes would form for the given range of meteorological conditions in the six-year San Francisco Airport meteorological data set initially modeled. In addition, staff modeled the HRSG exhausts using 1990 to 1993 meteorological data from Sacramento Airport. Visible plumes were predicted to occur for a total of 52 hours for the range of conditions in the Sacramento meteorological file. Of the 52 hours with predicted visible plume formation, three daylight hours with no fog no rain conditions were predicted to have visible plume formation. The range of temperatures for these three hours was 20°F to 24°F, and the range of temperatures for visible plume formation under any condition occurred between 20°F and 31°F.

These modeling results indicate HRSG exhaust visible plume will not form under normal weather conditions at this site. However, there is the potential that HRSG exhaust visible plume may form infrequently during extreme cold weather conditions.

The VCP cooling tower plumes would be visible for more than 10 percent of the time, which exceeds staff's frequency criterion for a potential significant visual impact. However, considering the number and size of the existing visible plumes at the site, the large size of the refinery site, and the overall industrial character of the site; the cooling tower visible plumes from the VCP project are not expected to cause a noticeable change in the character or quality of the views surrounding the Valero refinery, and are therefore not considered to cause a significant visual impact.

The modeling analysis indicates that, under normal weather conditions that occur at the site, visible plumes are not expected to occur from the HRSG exhausts. Therefore, the HRSG plumes will not cause a significant visual impact.

D. Light or Glare

Based on a visit to the site at night, staff believes that the Valero Refinery is well lit without being excessive. It has two red warning lights on one of the tallest stacks. All other lighting is of the white and is directed down to minimize the illumination of adjacent areas. There is very little light projected out from the facility. The proposed project would require nighttime lighting for operational safety and security. The

additional project lighting would be consistent in appearance and intensity with that of existing refinery lighting and would not substantially increase the amount of lighting at the project site. The new plant lighting will cause a slight increase in light and glare but will not adversely affect the nighttime visual environment of the immediate project vicinity. Staff has proposed condition of certification VIS-2 to ensure the impact from project lighting and glare will be less than significant, and therefore not adversely affect nighttime views in the area.

CUMULATIVE IMPACTS

Cumulative impacts to visual resources could occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast at the VCP is increased.

In this case, the viewshed will be minimally altered by the VCP structures and plumes. The visual contrast and view blockage would be low, the project would be subordinate to the refinery, and the overall visual change would be low to moderate. In addition, there are no other projects planned in the VCP/refinery area. Therefore, staff believes that the cumulative visual effects of project structures on the viewshed would not be significant.

Considering the two fairly large existing visible plumes at the site, the size of the site, the overall industrial character of the refinery, the relatively small project cooling tower plumes, the VCP project is not expected to cause a noticeable change in the character or quality of the views surrounding the Valero refinery. The cumulative effect of additional plumes added to current operations would not be a significant change.

ENVIRONMENTAL JUSTICE

Staff has reviewed census tract information that shows there are significant minority populations within six miles of the VCP. One population is approximately two to six miles to the north and the other is about one to six miles to the west. Most of the people in this largely residential area can not see the refinery because of the hilly nature of the geography. Those residents who can see the refinery may be able to notice the HRSG stack and cooling tower plumes, but in general, the VCP will blend in with the refinery. There will be no significant direct or cumulative impacts on the visual character of the area, therefore, there are no environmental justice issues.

COMPLIANCE WITH LORS

As discussed earlier, there are no Federal or State LORS applicable to the VCP. Table 3 provides a listing of the applicable LORS from the Visual Character Section of the City of Benicia General Plan. Two goals pertain to the appearance and enhancement of

visual quality. The proposed project is consistent with both these goals referenced in Table 3.

In addition, the City of Benicia's Municipal Code has two applicable zoning ordinances related to general industrial development. Section 17.32 requires, among other things, that industrial developments are compatible with the character of the area in which they are located, and minimize the impact on adjacent residential districts. Section 17.108 relates to design review of industrial uses to ensure that structures are visually harmonious with their site, by using materials and colors that mimic adjacent development and natural landforms. Staff believes that the VCP, with the proposed conditions of certification outlined below, is consistent with these ordinances. The proposed project is therefore consistent with local LORS.

Table 3 - Proposed Project's Consistency with Local LORS Applicable to Visual Resources: City of Benicia General Plan and Municipal Code

LORS		Consistency Determination Before Mitigation	Basis for Consistency
General Plan/ MunicipalCode Section	**Goal Descriptions**		
Visual Character Section / General Plan	Goal 3.12. • : Improve the appearance of the Industrial Park. • Encourage additional attractive, quality development.	YES	While the proposed project would not specifically improve the appearance of the Industrial Park, it would generally appear consistent with other on-site and nearby industrial facilities. Not applicable
	Goal 3.9. • Protect and enhance scenic roads and highways Preserve vistas along SR-780 and SR-680.	Yes	The project would not be visible from either SR-708 or SR-680 and thus would not degrade the scenic nature of the vistas.
Section 17.32.030/ 17.108 Municipal Code	Property Development Regulations Structure Design Review	Yes	The VCP is consistent with the sections of the Municipal Code related to visual harmony for General Industrial Development and Design Criteria

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has reviewed the City of Benicia's Preliminary Determination of Compliance (PDOC) related to land-use for the VCP. The PDOC notes that the project is consistent with Goal 3.9 of the General Plan, mentioned above. It further notes that the VCP will be visually compatible with the existing refinery equipment.

CONCLUSIONS AND RECOMMENDATIONS

The proposed VCP power plant and appurtenant facilities, including new plant night lighting, are not expected to have significant adverse visual impacts with the recommended conditions of certification described below. Computer analyses of water vapor plumes from the cooling tower and HRSG exhaust stack indicate these would also represent less than significant visual impacts. With effective implementation of the proposed conditions of certification listed below, the VCP would cause less than significant visual impacts. There will be no significant direct or cumulative impacts on the visual character of the area, therefore, there are no environmental justice issues. If the Commission decides to approve the project, staff recommends that the Commission adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Painting of structures. Prior to the first turbine roll, the project owner shall paint low-lying or shorter structures such as piping and cooling towers yellow, while

taller structures such as the HRSG stack shall be painted green. The paint used should be non-reflective and match the existing colors used by the refinery.

Protocol: The project owner shall submit a painting plan to the Compliance Project Manager (CPM) for review and approval. The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: At least 60 days prior to the painting, the project owner shall submit the plan to the City of Benicia for review and comment and to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing the painting that the VCP is ready for inspection.

VIS-2 Night Lighting. Prior to first turbine roll, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized both during construction and operation.

Protocol: The project owner shall submit a lighting plan to the CPM for review and approval. The lighting plan shall require that:

- Lighting shall be designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance shall be provided with switches or motion detectors to light the area only when occupied.

- A lighting complaint resolution form (following the general format of that in Appendix 3) shall be used by plant operations, to record all lighting complaints received and to document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Lighting shall not be installed before the plan is approved.

Verification: At least 60 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the City of Benicia Planning Department for review, and the CPM for review and approval. If the CPM notifies the project owner that any revisions are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM

a revised plan. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection

REFERENCES

The City of Benicia, 1999. City of Benicia General Plan, Visual Character Section, Adopted June 15, 1999.

The City of Benicia, 2001a. Memorandum from Kitty Hammer regarding City of Benicia Municipal Code for General Industry Development to James Adams, California Energy Commission, dated July 18, 2001.

The City of Benicia, 2001b. Preliminary Determination of Compliance, Submitted to the California Energy Commission, dated July 19, 2001.

URS 2001a. Memorandum from Lynn Mcguire regarding Visual Data Adequacy to James Adams, dated May 31, 2001.

URS 2001b. Memorandum from Lynn Mcguirer regarding Plume Dimensions and Exhaust Temperatures to James Adams, dated June 11, 2001.

URS 2001c. Record of communication between Lynn McGuire, URS, and William Walters, Aspen Environmental Group, July 2001.

VALERO (Valero Refining Company) 2001a. Application for Certification, Submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission on May 7,2001.

VALERO (Valero Refining Company) 2001b. Supplement to the Application for Certification, Submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission in June 2001.

VALERO (Valero Refining Company) 2001c. Data Responses for Visual Resources, Submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission on June 22,2001.

VALERO (Valero Refining Company) 2001d. Proposed Conditions of Certification, Submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission on July 17, 2001.

Walters, W., 2001. Air Quality Engineer, Aspen Environmental Group, Memorandum Regarding Valero Plume Analysis to James Adams, dated July 19, 2001.

APPENDIX 2: ANALYSIS METHODOLOGY

Visual resources analysis has an inherent subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Significance Criteria

Commission staff considered the following criteria in determining whether a visual impact would be significant.

State

The CEQA Guidelines defines a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or visual significance (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Local

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?

- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?

- Will the project eliminate or block views of valuable visual resources?

- Will the project result in significant amounts of backscatter light into the nighttime sky?

- Will the project be in conflict with directly identified public preferences regarding visual resources?

- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

- Will the project result in a substantial and persistent visible exhaust plume?

View Areas and Key Observation Points

The proposed project is visible from a number of areas in the project region. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points[1], or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing conditions photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area.

Evaluation Process and Terminology

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Staff conducted a site visit and concluded that the three KOPs presented in the Application were appropriate for this analysis. Staff also took existing conditions photographs at each of the KOPs and had a photo simulation produced using the photograph from KOP-1. These are presented in the Visual Resource analysis.

Elements of the Visual Setting

To assess the existing visual setting, staff considered the following elements:

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as “picture postcard” landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

[1] The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

Viewer Concern

Viewer concern is a measurement of the level of viewer interest regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. Travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists, to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

Types of Visual Change

To assess the visual changes that the project would cause, staff considered the following factors:

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

View Blockage

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality features causes adverse visual impacts. The degree of view blockage can range from none to high.

APPENDIX 3
LIGHTING COMPLAINT RESOLUTION FORM

Valero Cogeneration Project Solano County, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
Description of corrective measures taken: Complainant's signature: _____ Date:
Approximate installed cost of corrective measures: $ Date installation completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct: Plant Manager's Signature:

(Attach additional pages and supporting documentation, as required.)

APPENDIX 1
VALERO COGENERATION PROJECT
VISUAL RESOURCES SUMMARY OF ANALYSIS
(DOES NOT INCLUDE PLUME ANALYSIS)

VIEWPOINT		EXISTING VISUAL SETTING								VISUAL CHANGE					IMPACT SIGNIFICANCE	
				Viewer Exposure												
Key Observation Point (KOP)	Description	Visual Quality	Viewer Concern	Visibility	Distance Zone	Number of Viewers	Duration of View	Overall Viewer Exposure	Overall Visual Sensitivity	Description of Visual Change	Visual Contrast	Project Dominance	View Blockage	Overall Visual Change	Mitigation / Conditions	Impact Significance with Mitigation
KOP 1 **East Fifth Street**	View to the north from East Fifth Street about one mile south of the proposed VCP.	**Low to Moderate** Mixed industrial and rural landscape with the co-dominant existing refinery in the midground and hillsides in the background.	**High** View is representative of residents in this area.	**Moderate**	**Mid-ground**	**High**	**Long**	**Moderate to High**	**Moderate to High**	Additional structures with industrial forms, lines and color. Industrial character of the proposed project would be similar to that already established in the landscape. Negligible increase in visible light at night.	**Low**	**Subordinate**	**Low**	**Low to Moderate**	**VIS-1 & 2**	**Less than Significant**
KOP 2 **127 Panorama Drive**	View to the east from across the street from residence at 127 Panorama Drive about one mile west of VCP.	**Moderate** Mixed industrial and scenic landscape with co-dominate existing refinery.	**High** View is representative of some residences in this area with hills in the foreground, refinery in mid-ground and scenic vistas in background.	**Moderate**	**Mid-ground**	**Moderate**	**Long**	**Moderate**	**Moderate to High**	Additional structures with industrial forms and lines. Industrial character of the proposed project would be similar to that already established in the landscape. Negligible increase in visible light at night.	**Low**	**Subordinate**	**Low**	**Low to Moderate**	**VIS-1 & 2**	**Less than Significant**
KOP 3 **603 Indiana Street**	View to the west from commercial and warehouse area at 603 Indiana Street Warehouses about .25 miles east.	**Low** View of an industrial landscape dominated by the existing refinery.	**Low to Moderate** Commercial workers.	**Moderate to High**	**Foreground**	**Moderate**	**Low to Moderate**	**Moderate to High**	**Low to Moderate**	Additional structures with complex forms and lines. Industrial character of the proposed project would be similar to that already established in the landscape. Noticeable increase in visible light at night.	**Low**	**Subordinate**	**Low**	**Low to Moderate**	**VIS-1 & 2**	**Less than Significant**

WASTE MANAGEMENT

Testimony of Michael Ringer

INTRODUCTION

This section discusses potential impacts of the proposed Valero Cogeneration Project (VCP) from the generation and management of hazardous and nonhazardous wastes. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts from wastes generated during project construction, operation and closure. A brief overview of the project is provided, as are discussions regarding selected CEQA checklist items with respect to hazardous and nonhazardous wastes. A discussion of additional items listed in the Hazards and Hazardous Materials portion of the checklist may be found in the **Hazardous Materials Management** section of this staff analysis. A discussion of additional items listed in the Utilities and Service Systems portion of the checklist may be found in the **Water and Soils** section of this staff analysis.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Superfund Amendments and Reauthorization Act of 1986

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program, and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C.F.R., § 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility through preparation of Risk Management Plans. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

Resource Conservation and Recovery Act, RCRA (42 U.S.C. § 6922)

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires the generators of hazardous wastes to comply with requirements regarding:

- Record keeping practices which identify the quantities and disposal of hazardous wastes generated,
- Labeling practices and use of appropriate containers,
- Use of a recording or manifest system for transportation, and
- Submission of periodic reports to the EPA or an authorized state agency.

Title 40, Code of Federal Regulations, Part 260

These sections specify the regulations promulgated by the EPA to implement the requirements of RCRA as described above. To facilitate such implementation, the defining characteristics of each hazardous waste are specified in terms of toxicity, ignitability, corrosivity, and reactivity.

STATE

California Health And Safety Code § 25100 et seq. (Hazardous Waste Control Act of 1972, as amended)

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control or DTSC, under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt specific criteria and guidelines for classifying such wastes. The act also requires all hazardous waste generators to file specific notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

California Health and Safety Code, Section 41700

California Health and Safety Code, section 41700, requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes 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 persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

Title 14, California Code Of Regulations, § 17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)

These regulations specify the minimum standards applicable to the handling and disposal of solid wastes. They also specify the guidelines necessary to ensure that all solid waste management facilities comply with the solid waste management plans of the administering county agency.

Title 22, California Code Of Regulations, § 66262.10 et seq. (Generator Standards)

These sections establish specific requirements for generators of hazardous wastes with respect to handling and disposal. Under these requirements, all waste generators are required to determine whether or not their wastes are hazardous according to state-specified criteria. As with the federal program, every hazardous waste generator is required to obtain an EPA identification number, prepare all relevant manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, all hazardous wastes are required to be handled only by registered hazardous waste transporters. Requirements for record keeping, reporting, packaging, and labeling are also established for each generator.

LOCAL

Benicia General Plan Policy 4.7.5

Requires that all sites known or suspected to have unexploded ordnance and/or a toxic history be tested and remediated before any development can occur.

Benicia General Plan Policy 4.16

Requires hazardous waste management handling and disposal procedures that are protective of human health and the environment.

SETTING

The proposed Valero Cogeneration Project is to be located on about two acres within the existing Valero refinery near 10th Street and Avenue G. Please refer to the **Project Description** section for more detail.

The site consists of two terraces separated by a steep artificial cut. The eastern portion is unpaved, flat, and covered with gravel, with some patches of pavement. It is currently occupied by two mobile trailers and a shipping container, all of which are used as offices. The western portion is located on a hill and is 19 feet higher than the eastern portion. The western portion has been paved, and is used for storage of compressed air cylinders, empty 55-gallon drums, and miscellaneous storage, including drums of spent catalyst containing heavy metals such as molybdenum, cobalt, vanadium, and nickel. The site has always been undeveloped. The site has been sprayed for weeds in the past.

The construction and operation of the proposed project will utilize and be integrated into the existing Valero refinery waste management processes and procedures. The refinery currently has a comprehensive program to manage wastes in accordance with federal and state regulations. No new waste management-related permits would be required for the project.

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport or use of hazardous materials?			X	
b) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
c) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	
UTILITIES AND SERVICE SYSTEMS – Would the project:				
d) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
e) Comply with federal, state, and local statutes and regulations related to solid waste?			X	

ANALYSIS AND DISCUSSION OF IMPACTS

a) Less Than Significant Impact

The Valero Cogeneration Project would generate minor quantities of hazardous wastes during project construction and operation. The project owner is currently classified as a generator of hazardous waste and falls under the jurisdiction of federal law (the Resource Conservation and Recovery Act – 42 U.S.C. 6901 et seq.) and state law (California Hazardous Waste Control Act – Health and safety Code Sections 25100 et seq.). These laws govern the storage, transport, and disposal of hazardous waste.

The types of hazardous wastes normally generated during construction include waste lubricating oil, cleaning solvents, paints, batteries, oily rags and absorbent, and welding materials. Table 6.11-2 of the Application lists the types and quantities

of wastes which may be generated during construction, as well as the proposed management method for each. All hazardous wastes generated during construction will be recycled or disposed of in a licensed hazardous waste treatment or disposal facility.

Hazardous waste generated during construction could also include contaminated soil from the site which may have to be removed or relocated. The Phase I Environmental Site Assessment (ESA- Application Appendix H) identified certain historical activities that could have resulted in contamination at the site, such as storage of catalyst and herbicide spraying for weed control. The ESA recommended soil sampling during construction and the Department of Toxic Substances Control submitted comments stating that the soil should be characterized prior to construction to determine if is has been impacted by a hazardous substance release (DTSC 2001a, p. 3). Staff has requested Valero to submit a sampling protocol so that the site can be adequately characterized regarding levels of persistent pesticides, heavy metals, and polycyclic aromatic hydrocarbons (PAHs, which may be present as a result of refinery activities) prior to any earthmoving activities. If levels are found which exceed regulatory standards for hazardous waste, soil will be required to be treated or disposed of in a properly permitted hazardous waste landfill. If found to be nonhazardous, it will be evaluated for use on-site or for conformance with landfill acceptance criteria.

Hazardous wastes generated during facility operation include spent air pollution control catalyst, used oil, paint and thinner waste, batteries, oil-water separator sludge, solvents, and compressor washwater. Table 6.11-3 of the Application lists the types and quantities of hazardous wastes generated during operation of the facility, as well as the proposed management method for each.

Some of the hazardous wastes can be recycled, such as used oil, solvents, and batteries. All hazardous wastes generated during construction and operation will be managed in accordance with federal and state laws and regulations. The wastes will be properly characterized, and transported offsite to approved treatment, storage, or disposal facilities by licensed hazardous waste haulers.

Hazardous wastes from construction and operation of the proposed project will be integrated into the existing Valero refinery waste management processes and procedures. Because the waste management and disposal measures proposed by the Applicant will comply with all applicable federal and state laws, ordinances, regulations, and standards, staff expects that there will be no significant impacts to the public or the environment from disposal of project-related hazardous wastes.

b) No Impact

There are no schools within one-quarter mile from the proposed project. The refinery complex is immediately bordered by 470 acres of mostly undeveloped Valero property to the south and west and general industrial uses to the north and east. From the project site, all land is zoned general industrial development for one mile to the south and east.

In all cases, licensed hazardous waste transporters using proper containers and transportation procedures conforming to applicable Caltrans requirements would be used. Staff therefore concludes that impacts from the transportation of project-related hazardous wastes would be less than significant.

c) Less Than Significant Impact

A Phase I Environmental Site Assessment (ESA) was conducted for the proposed site (Application, Appendix H). The ESA included a review of federal, state, and local regulatory agency databases of businesses and properties that handle hazardous materials or wastes, or are known locations of releases of hazardous substances. The Benicia Refinery was listed in the Cal-Sites database which contains known and potential hazardous substance sites. However, the proposed site in particular is not affected by hydrocarbon-contaminated groundwater. Two monitoring wells, located upgradient about 50 to 100 feet from the site, were installed between December 1991 and February 1992. These wells have been part of the quarterly groundwater monitoring program since monitoring began in 1992. In April 2000, quarterly sampling was performed as part of the program, and no groundwater contaminants were detected at the site.

d) Less Than Significant Impact

Nonhazardous waste disposal sites suitable for disposal of project-related construction and operation wastes are identified in Table 6.11-1 of the Application (Valero 2001a). The landfill closest to the site, the Keller Canyon landfill, has approximately 35 million cubic yards of remaining capacity and a remaining life of about 37 years. Other available landfills have almost 30 million cubic yards of capacity remaining. During construction of the proposed project, a total of less than 100 cubic yards of nonhazardous waste is anticipated to be generated. Recycling will reduce some of the wastes, including scrap metal, empty containers, and absorbent materials. Project operation will generate minimal amounts of nonhazardous waste, on the order of several cubic yards weekly. Thus, the total amount of nonhazardous waste generated from project construction and operation will contribute only a fraction of one percent of available landfill capacity. Staff concludes that this potential impact will be less than significant.

e) Less Than Significant Impact

Project-related wastes will be placed in covered dumpsters and transported by certified haulers to appropriately permitted facilities in accordance with applicable laws, ordinances, regulations, and standards. Staff concludes that the proposed project will comply with all applicable federal, state, and local statutes and ordinances regarding solid waste management.

CUMULATIVE IMPACTS

Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

ENVIRONMENTAL JUSTICE

In the **Socioeconomics** section of this staff analysis, staff presents census tract information that shows significant minority populations within six miles of VCP. One population is approximately two to six miles to the north and the other is about one to six miles to the west. Since staff has concluded that there will be no significant direct or cumulative waste management-related impacts, there will also be no significant impact to any minority populations that have been identified. Therefore, there are no environmental justice issues.

COMPLIANCE WITH LORS

As discussed under section (g) above, staff concludes that the project will comply with all applicable LORS pertaining to the management and disposal of nonhazardous wastes. Additionally, because Valero currently has a comprehensive program to manage hazardous wastes and has a hazardous waste generator identification number (required by law for any generator of hazardous wastes), staff also concludes that the project will comply with all applicable LORS pertaining to the management and disposal of hazardous wastes. All hazardous wastes will be properly managed on site, transported by permitted hazardous waste haulers, and treated or disposed at permitted facilities.

FACILITY CLOSURE

During any type of facility closure (see staff's **General Conditions and Compliance** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff has determined that conditions of certification in the **General Conditions and Compliance** section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments were received on waste management.

CONCLUSIONS

Management of hazardous and nonhazardous wastes generated during construction and operation of the VCP will not result in any significant adverse impacts if Valero implements the waste management procedures described in the Application (Valero 2001a) and staff's proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-2 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CEC CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 7 days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 7 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-3 The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies,

available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 7 days prior to the start of construction, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-4 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the San Francisco Regional Water Quality Control Board, the Solano County Department of Environmental Health, and the Berkeley Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within 5 days of their receipt.

WASTE-5 The project owner shall conduct soil sampling for metals, herbicides, and polycyclic aromatic hydrocarbons (surface sampling only for PAHs) at the proposed site and transmission line sufficient to adequately characterize the nature and extent of any contamination which may be present.

Verification: The project owner shall submit soil sampling results (including all appropriate documentation) for metals, herbicides, and polycyclic aromatic hydrocarbons (surface sampling only for PAHs) to the CPM for approval 7 days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification.

WASTE-6 The project owner shall provide a soil management workplan providing the methods which will be used to properly handle and/or dispose of soil which may be classified as hazardous or contain contaminants at levels of potential concern. The workplan will discuss, as necessary, the reuse of soil on site in accordance with applicable criteria to protect construction or future workers onsite, disposal of soil to a Class I (hazardous) landfill, and disposal to a Class II or III landfill.

Verification: The project owner shall submit the soil management workplan to the CPM for approval 7 days prior to any earth moving activities, including those associated

with site mobilization, ground disturbance, or grading as defined in the general conditions of certification.

REFERENCES

DTSC (Department of Toxic Substances Control) 2001a. Comments representing the separate evaluation of DTSC's two main programs, Hazardous Waste Management and Site Mitigation Program. Submitted to the California Energy Commission on July 2, 2001.

VALERO (Valero Refining Company) 2001a. Application for Certification, submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission on May 7, 2001.

SOIL AND WATER RESOURCES

Testimony of Mike Krolak and John Kessler

INTRODUCTION

This analysis examines the water and soil resource aspects of the Valero Cogeneration Project (VCP), proposed by Valero Refinery – Benicia ("Valero" or "Applicant") specifically focusing on the following areas of concern:

- whether the project's demand for water affects surface or groundwater supplies;
- whether construction or operation will lead to accelerated wind or water erosion and sedimentation;
- whether project construction or operation will lead to degradation of surface or groundwater quality; and
- whether the project will comply with all applicable laws, ordinances, regulations and standards.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Clean Water Act

The Clean Water Act (33 USC section 1257 et seq.) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in a National Pollutant Discharge Elimination System (NPDES) Permit. Stormwater discharges during construction and operation of a facility also fall under this act and must be addressed through either a project specific or general NPDES permit. In California, the nine Regional Water Quality Control Boards (RWQCB) administer the requirements of the Clean Water Act.

Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. The Army Corps of Engineers (ACOE) issues site-specific or general (nationwide) permits for such discharges.

Section 401 of the Clean Water Act provides for state certification of federal permits allowing discharge of dredged or fill material into waters of the United States. These certifications are issued by the RWQCBs. For this project, any 401 certification will be handled with the Waste Discharge Requirements (WDR) permit.

STATE

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the Central Valley Region Water Quality Control Plan. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes with elevated temperature to the state's waters. These standards are applied to the proposed project through the Waste Discharge Requirements (WDRs) permit.

California Water Code

Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable, the use is not detrimental to public health, will not impact downstream users or biological resources, and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary

State Water Resources Control Board Policies

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the SWRCB which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant 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 powerplant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should come from, in order of priority: wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. This policy also addresses cooling water discharge prohibitions.

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

The Safe Drinking Water and Toxic Enforcement Act of 1986, Health and Safety Code section 25249.5 et seq., prohibits the discharge or release of chemicals known to cause cancer or reproductive toxicity into drinking water sources.

LOCAL

Solano County

The Solano County General Plan sets forth policies that address the protection of soil and prime agricultural farmland. The NRCS defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. The General Plan policies recognize prime farmland as a valuable, finite resource and provide for its preservation and limit encroachment upon it by other land uses.

City of Benicia

The City of Benicia General Plan sets forth policies that address the protection of soil and prime agricultural farmland, as defined by the NRCS. In general, the City of Benicia's land use policies support the location of industrial enterprises in the areas already developed and designated for general industrial land uses.

SETTING

The land use in the vicinity of the VCP is primarily industrial, with a few businesses and residences in the vicinity. The VCP will be constructed within 800 acres owned by Valero that is currently being used for industrial uses associated with oil refining activities. The VCP project area is located approximately 1.5 miles northeast of downtown Benicia, California, in Solano County. The refinery site is located on rolling hill topography. The VCP footprint will occupy approximately two acres, utilizing an existing vacant area near the Process Block of the refinery.

SOILS

The VCP (including the Cogeneration Plant, 12 kV underground interconnection power line and associated utilities) are located within currently developed industrial land owned by Valero. Altamont clay covers the entire site, underlain by bedrock consisting of mudstone with interbedded sandstone. This soil type occurs on dissected terraces and is used regionally for dry-farmed grain and pasture, wildlife habitat and recreation. The VCP site and construction laydown areas are not currently used for agriculture, nor have they been since before the refinery was developed in 1969. The soil has moderate erosion potential, low permeability and moderate water runoff characteristics. The clay and mudstone is moderately expansive, shrinking and swelling according to moisture content.

The VCP site is currently graded at two levels, and will be re-graded into one level grade using cut and fill techniques, and construction of a retaining wall in the cut slope,

and possibly the fill slope. The maximum elevation difference along the cut slope is about 15 feet. The Altamont clay will be compacted as fill to support the generators and other structures.

Following construction, the site will be paved and stormwater will flow into the existing stormwater management system for treatment at the refinery's wastewater treatment plant before discharge into the Carquinez Strait. The project will make use of existing refinery laydown and staging areas, which are already graded and graveled or paved, and already have erosion control and storm management features in place.

The proposed transmission line will run underground for a distance of approximately 2,000 feet through the existing refinery development, and is estimated to disturb an area of about 0.2 acres. In addition, supply lines for gas and water will tie into existing pipelines within the developed refinery. These lines will include approximately 1,000 feet of refinery fuel gas line to supply the turbines, 500 feet of the natural gas line serving as backup fuel for the turbines, and 1,000 feet of water supply lines. There will be no new areas of disturbance as a result of bringing these utilities to the VCP site. After backfilling and compacting trenches for the proposed power and pipeline extensions, the soil surface will be protected with erosion control materials including gravel and paving.

SOIL AND WATER CONTAMINATION

A Phase I ESA prepared for the Valero Refinery site identifies site conditions of potential concern, including potential soil impacts from storage and handling of waste spent catalysts, which are classified as hazardous waste, and to groundwater petroleum hydrocarbon plumes in other areas of the Valero Refinery. Of the several groundwater hydrocarbon contaminant plumes on the refinery site, only one exists upgradient from the VCP site, near the Marketing Terminal. Based on available groundwater monitoring information for wells located upgradient of the VCP and downgradient of the Marketing Terminal, the groundwater plumes present at the refinery do not appear to extend to the VCP site. With respect to control of groundwater hydrocarbon plumes in the vicinity of the VCP, additional groundwater monitoring does not seem warranted at this time.

The potential for contamination to soil at the VCP site stems from the longstanding practice of transferring spent catalysts from drums to bins in this area. Though this area is paved, which minimizes the potential impact to soil and groundwater, there were no specific containment precautions applied during transfer practices.

Benicia Arsenal Bunker

One of 23 remaining World War II era igloo munitions bunkers is located adjacent to the proposed VCP site. The location of 55 other previously demolished bunkers is not known in relation to the VCP site. The bunkers were used to store munitions in the 1940's and some radioactive materials in the 1950's and 1960's. It may also be possible that the bunkers were used to store chemical warfare material. Because these materials were stored in the bunkers and the history of military transfer and storage operations is unknown, it is possible that these materials could have resulted in contamination in the area. Staff has developed a condition of certification that will allow

for the development of an approved testing scheme for soils and groundwater resources (**SOIL & WATER 5**).

VCP WATER SUPPLY

The VCP proposes to use fresh inland water for cooling through use of evaporative (wet) cooling. The North Bay Aqueduct conveys fresh water from the State Water Project to the City of Benicia, in addition to other customers, including the Cities of Fairfield and Vacaville. An existing raw water service from the City of Benicia to the Valero refinery is proposed to supply both the VCP and the existing refinery, as it has sufficient capacity for both operations. Potable and service water for the project will be provided by the City of Benicia's domestic water supply. Total annual water use for the VCP will average 314 acre-feet/year (102 million gallons), with 37 percent of this water being makeup water for the new VCP cooling tower. Existing annual water use for the refinery operations averages 5,490 acre-feet/year (1.8 billion gallons), with 47 percent of this water being makeup water for the refinery's cooling tower.

For supply of the existing refinery operations, Valero's water service contract with City of Benicia requires purchase at a combined fixed rate of $47,865/month and variable rate of $93.28/Million Gallons per Day (MGD). Assuming an average of 4.9 MGD for 365 days/year, the fixed rate for a year would be $574,380 ($47,865/month x 12 months), and the variable rate would be $166,831 ($93.28/MGD/Day x 4.9 MGD x 365 Days/Year), for a total combined rate of $741,211/year. This is equivalent to about $135/AF. The incremental increase in cost to supply the VCP would add $9,533/year, based on average daily use at a rate of 0.28 MGD.

Soils and Water Table 1 summarizes the use of water for VCP operations and construction, and the discharge of wastewater associated with the proposed VCP. The refinery has three existing boilers, which would be removed from service as a result of steam produced from the Heat Recovery Steam Generators associated with the VCP. After construction of the first phase, two of the boilers would be removed from service, and following construction of the second phase, the third boiler would be removed from service. The VCP would result in water use of approximately 60 gallons per minute (gpm) each (120 gpm total) for turbine injection, 70 gpm for cooling tower makeup, and no net change in boiler feedwater, for a total average annual demand of 190 gpm, and a peak daily demand of 230 gpm.

Soils and Water Table 1
VCP Facility Water Balance

Component Stream	Annual	Maximum
	Ann. Average (gpm)	Max Daily (gpm)
Turbine #1 Injection Water	60	65
Turbine #2 Injection Water	60	65
Cooling Tower Makeup	70	100
HRSG #1 Feed Water	250	700
HRSG #2 Feed Water	250	700
Other Refinery Boilers	(500)	(1400)
Total Water Consumption (Net)	**190**	**230**
Blowdown HRSG #1	5	10
Blowdown HRSG #2	5	10
Blowdown Cooling Tower	10	15
Blowdown SG-703	(5)	(10)
Blowdown SG 2901	(5)	(10)
Blowdown SG 2302	(10)	(15)
Total Wastewater (Net)	**0.0**	**0.0**
Construction Water	**1**	**100**

Notes:
1. HRSG #'s 1 and 2 will replace three existing refinery boilers SG-703, SG 2901 and SG 2302.
2. There will be no net increase in either boiler feedwater or blowdown within the refinery as a result of the VCP.
3. Blowdown from the cooling tower reflects 5 – 6 cycles of concentration.

Wastewater Discharge

Due to the removal of three existing refinery boilers and the proposed use of the existing SWP water supply, the proposed VCP is not anticipated to cause any net change in the quantity or quality of wastewater stream from the refinery into the Carquinez Strait. The applicant has consulted with the Regional Water Quality Control Board (RWQCB), and the RWQCB has concluded that no significant wastewater discharge impacts are expected (CRWQCB 2001a). Furthermore, the RWQCB has indicated that no change in the refinery's NPDES Permit is required.

ANALYSIS AND IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOIL AND WATER RESOURCES -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?			**X**	

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOIL AND WATER RESOURCES -- Would the project:				
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?		X		
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?		X		
f) Otherwise substantially degrade water quality?		X		
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

DISCUSSION OF IMPACTS

a) Less than Significant Impact

As proposed, the VCP is not expected to cause any net change in the quantity or quality of wastewater streams from the refinery into the Carquinez Strait. The waste streams created by the VCP are similar to existing refinery waste streams, which include boiler and cooling tower blowdown, that are currently being treated and discharged in compliance with water quality limits as specified under the existing NPDES Permit. The applicant has consulted with the Regional Water Quality Control Board (RWQCB), and the RWQCB has concluded that no significant wastewater discharge impacts are expected (CRWQCB 2001a). Furthermore, the RWQCB has indicated that no change in the refinery's NPDES Permit is required.

When the project starts utilizing recycled water, this new water supply may introduce new constituents to the waste streams associated with the VCP. The effects of using recycled water will have to be determined and compared to the project's wastewater and the discharge limits regarding any necessary modifications to the existing NPDES permit.

b) No Impact

The VCP proposes to use raw surface water as supplied from City of Benicia, and will not be using groundwater as a source of supply. The use of recycled water will have no effect on groundwater supply. Therefore, groundwater supplies will not be depleted.

c) Less Than Significant With Mitigation Incorporated

About two acres of land will be disturbed during construction of the facility. The approximately two acres of soil that will be excavated and graded during construction will be subject to erosion. Best Management Practices (BMPs) for erosion control are proposed to be implemented and will be described in the Sediment and Erosion Control Plan, which will include the following measures:

- BMPs to minimize erosion prior to construction and implement the BMPs during and after construction. The proposed BMPs include diverting stormwater around the site by construction of a swale around the uphill side of the project, soil compaction, and placement of silt fences and hay bales.
- In the construction area soil should be graded and compacted to ensure that soil is not left in irregular piles that are more susceptible to water and wind erosion. Seeding or vegetative planting will be performed in the areas where natural vegetation has been distressed or removed by construction activity.
- Following construction, the site will be paved and stormwater will flow into the existing stormwater management system for treatment at the refinery's wastewater treatment plant before discharge into the Carquinez Strait.

The project will make use of existing refinery laydown and staging areas, which are already graded and graveled or paved and have erosion control and storm management features in place. The other areas that will be disturbed for the construction of the linear facilities will have their drainage patterns reestablished after construction. Existing roadways will be used to the maximum extent possible. If additional roadways are necessary, they will be sited and graded to minimize potential disturbance to erosion and runoff patterns. Best engineering management practices and drainage control will be implemented to minimize impacts from construction activities.

The paving around equipment foundations will help to maintain consistent soil moisture content by preventing surface water infiltration, and the foundations will be prepared with non-expansive granular material to protect the concrete footings. Because large equipment foundation mats will extend from areas varying from bedrock to clay with dissimilar qualities, differential settlement will be minimized by deepening the excavation in areas of fill or colluvium, so that large equipment is bedded consistently in bedrock conditions. Cut slopes will achieve stability by maintaining an inclination of no greater than 1.5:1 within existing fill, and 2:1 for new fill.

Although construction will be regulated under a Sediment and Erosion Control Plan, because the site development is less than 5 acres, a construction-related Storm Water Pollution Prevention Plan (SWPPP) and General Storm Water Permit for Construction are not required from the applicant. However, for VCP operation, an existing SWPPP is being modified to account for site alterations and discharge as regulated under an existing NPDES Permit for the refinery, which will include the VCP operations.

The applicant has indicated that adequate sedimentation and erosion controls will be employed, and has provided a Draft Sediment and Erosion Control Plan. The applicant will be revising its existing SWPPP for the refinery operation to manage changes in stormwater runoff caused by operation of the VCP. The applicant will be required to provide a final Sediment and Erosion Control Plan prior to the start of construction.

d) Less Than Significant Impact With Mitigation Incorporated

Drainage at the VCP site has been designed to prevent flooding of permanent facilities and roads, and the system design will also follow best management practices. The stormwater runoff that is collected from outside bermed or graded storm water collection areas (uncontaminated runoff) will be allowed to follow natural drainage patterns. The Valero Refinery is currently permitted for stormwater treatment and discharge under an existing NPDES Permit, and the SWPPP will be revised and submitted for approval to the RWQCB to include the VCP.

e) Less Than Significant Impact With Mitigation Incorporated

The storm water flow associated with industrial activity at the existing Valero Refinery is controlled on-site. The developed areas are bermed and graded to direct stormwater runoff to a drainage system that conveys the runoff to the wastewater treatment plant before discharge to the Carquinez Strait. The proposed VCP site will also be bermed, graded and paved, and storm water runoff from the VCP site will also be directed to the existing on-site wastewater treatment plant. The drainage systems for the VCP site have been designed for the storm water flow resulting from a precipitation event of 1.25”/hour and 4”/day, consistent with the design for the existing refinery stormwater management system.

f) Less Than Significant With Mitigation Incorporated

The project’s waste will be discharged in accordance with applicable laws; no impacts to water quality are expected. In addition, no hazardous materials will be stored at the VCP site during operation, which greatly reduces the potential for hazardous materials to come into contact with storm water.

It is unknown at this time what effect the use of recycled water would have on the project’s wastewater, but it is expected to be minor.

If the groundwater generated from the dewatering activities is determined to have some level of contamination, mitigation will be required in order to satisfy the discharge limits of the refinery’s NPDES permit (see **Soil & Water 5**).

Any contaminated soils encountered during excavation will have to be disposed of in a manner consistent with LORS to mitigate any potential release of contaminants to water resources. In order to identify possible soil contamination during construction, the Phase I ESA recommends that the soil at the site of the VCP should be handled during construction by stockpiling one-foot lifts and characterizing the resulting soil stockpiles. The characterization would focus on heavy metals and leachability testing for both off-site and on-site disposal options. In addition, color and odor of soils excavated would be monitored, and if suspect soils were encountered, they would be stockpiled separately for characterization. The Phase I ESA recommends composite soil testing of potentially impacted soils at a rate of at least one four-point sample for every 1,000 cubic yards of soil removed. Staff observes that in order to achieve this rate of sampling, the four-point samples should be conducted for about every 6 inches of excavation. Please refer to the **Waste Management** section for more conditions of certification regarding contaminated soils.

The Phase I ESA did not address potential contamination from the munitions bunkers. Staff has requested that the applicant characterize the specific materials stored in the Benicia Arsenal Bunkers on the refinery property and provide any evidence of past remediation. Staff has developed a condition of certification that will require a testing procedure for soils and groundwater resources (**SOIL & WATER 5**).

g-j) No Impact

The cogeneration plant footprint is not located within a 100-year flood zone, as is the balance of the refinery. Minimum grade for the power plant area will be 1 percent and all drainage will be directed away from buildings and equipment within the footprint. Storm water is conveyed to the wastewater treatment plant. The drainage systems for the VCP site have been designed for the storm water flow resulting from a precipitation event of 1.25”/hour and 4”/day, consistent with the design for the existing refinery stormwater management system.

ADDITIONAL WATER SUPPLY ANALYSIS

City of Benicia Water Supply

The City of Benicia’s primary source of water is from the State Water Project (SWP) via the North Bay Aqueduct (NBA), consisting of a current normal allocation of 15,980 acre-feet/year. Like other SWP customers, City of Benicia’s SWP allocation is subject to curtailment in dry years, which in 2001, consisted of curtailment to 35% of normal, or 5,593 acre-feet/year. In order to makeup deficiencies in supply during dry years, the City of Benicia has contracted with City of Vallejo for additional amounts of 1,100 and 4,400 acre-feet/year through 1962 and 1992 Agreements respectively, which is available as current excess to Vallejo’s SWP allocation. As an example of cost of water supply applicable to the 1992 Agreement, in order to reserve the 4,400 acre-foot portion, the City of Benicia must pay a standby fee of $50/acre-foot whether it uses the water or not, which amounts to an annual fee of $220,000 in order to reserve all 4,400 acre-feet. In addition, City of Benicia pays $75/acre-foot for the water it uses, amounting to an additional annual fee of up to $330,000, and a total fee of $550,000 for all 4,400 acre-feet ($125/acre-foot).

City of Benicia has also developed a water banking agreement with the Mojave Water Agency (MWA), which serves to help buffer deficiencies in dry years for City of Benicia. During normal or wet years, Benicia may make available to MWA a portion of Benicia’s SWP allocation for groundwater recharge. During dry years, City of Benicia may draw 50% of the water it has banked, or up to 8,000 acre-feet/year from MWA’s SWP allocation after it has accumulated and banked 16,000 acre-feet in previous years. When Benicia chooses to draw on its banked water, MWA is capable of making-up the reduction in its SWP supply from groundwater withdrawal. As a recent indicator of cost of new water supply in the region, the Cities of Vacaville and Fairfield recently acquired rights to use a portion of Kern County Water District’s SWP allocation at a cost of $1,000/acre-foot.

In addition to supply curtailments by the SWP due to dry water conditions, conveyance of SWP water through the North Bay Aqueduct, which includes supply for the Cities of Benicia, Fairfield and Vacaville, is hydraulically limited to a maximum flow of 142 cubic-feet/second (cfs). Seasonal curtailments of SWP water supply limiting North Bay Aqueduct flows to 65 cfs can occur during late spring (i.e. during most of May and June in 2001) for purposes of protecting Delta Smelt. The duration of this curtailment appears to become more extensive with the severity of the dry year.

Although the City of Benicia can currently make up deficits by purchasing water from other sources that may have surplus (like City of Vallejo), Benicia is concerned with its ability in the future to meet demands under its own projections for growth and development compounded by less availability of surplus water for purchase from others whose surplus supplies are also diminished by growth (Mustain 2001). The City of Benicia, along with the Cities of Fairfield and Vacaville, are seeking other means to sustain use of their fresh water supplies to meet future demands. This includes seeking an Appropriative Water Right from the SWRCB to establish priority for their SWP allocation based on Area of Origin to the Sacramento River. If successful, the Water Right would reduce their vulnerability to curtailments.

Soil & Water Tables 2 and 3 are a summary of raw water deliveries and total allotment of raw water supplies to the City of Benicia over the past 10 years, from 1992 - 2001. Although 2001 includes some estimated data for the balance of the year, it was considered relevant because it is one of three years in which the City of Benicia's primary supply from the North Bay Aqueduct was curtailed due to drought conditions. **Soil & Water Table 4** demonstrates how City of Benicia has been able to bank excess water supply available from the SWP during normal and wet water years to maintain reserve for critically dry years. **Soil & Water Table 5** demonstrates the percent utilization of the City of Benicia's water supply, examining the Net Water Supplied to City of Benicia (after shipping surplus to MWA) compared to the Total Supply Allotment from all sources. The comparison considers the availability of banked water from MWA in a critically dry year, and also the possible lack of availability of MWA water should there be two consecutive critically dry years, such as the hydrologic conditions experienced during 1976 and 1977. Under this worst-case scenario, utilization of allotment increases from 68% to 96%, under current (2001) demands with and without the availability of water banked with MWA, respectively. Although the SWP provides ample supply during normal and wet hydrologic conditions, and the banked water supply from MWA provides a one-year buffer for critically dry years, the City of Benicia is vulnerable to a lack of supply during either consecutive critically dry years, or within a span of years before it has the opportunity to replenish its water bank with MWA.

In conjunction with seeking to appropriate water through the SWRCB, the Cities of Benicia, Fairfield and Vacaville retained CH2MHill (a consultant company) to prepare an EIR in compliance with CEQA. Included in the EIR is an analysis of the City of Benicia's projected water demands and supply based on the City of Benicia's General Plan. Projected water demands at build-out are 17,120 AF. Projected supplies, including the new water appropriation, are predicted to be sufficient 41% of the time, capable of meeting most of the demand about 70% of the time, and experiencing shortfalls as significant as 4,720 AF about 5% of the time during critically dry years (CH2MHill 2001). During periods of deficiency to City of Benicia's supply, Valero's fresh water supply would be curtailed proportionately.

Due to the City of Benicia's potential for future deficiencies in its fresh water supply, staff has analyzed water supply alternatives. The applicant has provided information pertaining to recycling of existing refinery wastewater for VCP use. Although it is technically feasible, the applicant at first suggested that it was not economically practical considering that treatment plant improvements would cost approximately $5-6Million (M), and treated water conveyance would cost an additional $1-2M, for a total

capital investment of $6-8M. In addition, the Applicant estimates increased O&M costs of at least $500,000 per year. More recently the applicant has been willing to consider refinery produced wastewater as an alternative to fresh water.

Soil and Water Table 2
CITY OF BENICIA - SUMMARY OF WATER DELIVERIES (Acre-Feet), 1991 – 2001

Year	Benicia NBA	Mojave Exch.	1962 Vallejo Agree.	1992 Vallejo Agree.	Benicia/ Vallejo Exchange	Solano Irrig.	Berryessa Pool/Exch. Water	Suisun NBA Water	Sched. 12D Water	NBA Interruptible/ Carryover	Water Conserv.	Total
1992	4,847		1,100	1,011	1,809		0		98	911		9,776
1993	9,658		26	0			0	0	0			9,684
1994	6,444		737	0			0	132	0	4,215		11,528
1995	9,064		0	0			2,087	0	0			11,151
1996	10,507		0	0			1,231			101		11,839
1997	11,721	2,000	0	0		727						14,448
1998	8,482	2,000	0	0						3,146		13,628
1999	11,018	3,000	548	0		977				0		15,543
2000	11,290	4,000	752	0		770				0		16,812
2001	5,593	0	1,252	3,744		0				1,784	395	12,766

Notes:

1. Actual water used by City of Benicia excludes water banked to Mojave Exchange during 1997 – 2000;
2. Because Schedule 12D Water is not considered a firm source of supply, it is not included in the total allotment of available supply.

Soil and Water Table 3
CITY OF BENICIA - SUMMARY OF WATER ALLOTMENT (Acre-Feet), 1991 – 2001

Year	Benicia NBA	Mojave Exch.	1962 Vallejo Agree.	1992 Vallejo Agree.	Benicia/ Vallejo Exchange	Solano Irrig.	Berryessa Pool/Exch. Water	Suisun NBA Water	Sched. 12D Water	NBA Interruptible/ Carryover	Water Conserv.	Total
1992	4,847		1,100	4,400	2,556		6,798		15,176			19,701
1993	12,730		1,100	4,400			6,798	0	15,176			25,028
1994	6,444		1,100	4,400			8,494	150	15,176	6,184		26,772
1995	13,540		1,100	4,400	0		8,494	150	10,961			27,684
1996	13,950		1,100	4,400			1,231			4,792		25,473
1997	14,350		1,100	4,400						4,691		24,541
1998	14,760	1,000	1,100	4,400						407		21,667
1999	15,170	2,000	1,100	4,400								22,670
2000	15,570	3,500	1,100	4,400								24,570
2001	5,593	5,500	1,100	4,400						1,784	395	18,772

Notes:

1. Benicia's North Bay Aqueduct (NBA) Allotment recognizes historical dry-year curtailments from the SWP limiting allotments in the following years: 1) 2001 @ 35% of the 15,980 AF normal; 2) 1994 @ 53% of the 13,105 AF normal; and 3) 1993 @ 45% of the 10,770 AF normal allocation.

2. Because Schedule 12D Water is not considered a firm source of supply, it is not included in the total allotment of available supply.

Soil and Water Table 4
CITY OF BENICIA
SUMMARY OF WATER BANKED TO MOJAVE EXCHANGE (Acre-Feet)
1997 – 2001

Year	Water Banked with Mojave Exchange	Cumulative Water Banked with Mojave Exchange at End of Year	Mojave Water Available in A Future Critical Year @ 50% of Banked Water
1997	2,000	2,000	1,000
1998	2,000	4,000	2,000
1999	3,000	7,000	3,500
2000	4,000	11,000	5,500
2001	0	11,000	5,500

Soil and Water Table 5
CITY OF BENICIA
SUMMARY OF UTILIZATION – ALLOTMENTS VS. DELIVERIES (Acre-Feet), 1992 – 2001

Year	Total Deliveries (1)	Deliveries to Mojave Exchange (2)	Net Deliveries to Benicia (3)		Total Supply Allotments (4)	Mojave Exchange Water Avail. (5)	Supply Allotments w/o Mojave Exch. (6)		% Utilization w/ Mojave Exchange (3)/(4)		% Utilization w/o Mojave Exchange (3)/(6)
1992	9,776		9,776		19,701		19,701		50%		50%
1993	9,684		9,684		25,028		25,028		39%		39%
1994	11,528		11,528		26,772		26,772		43%		43%
1995	11,151		11,151		27,684		27,684		40%		40%
1996	11,839		11,839		25,473		25,473		46%		46%
1997	14,448	2,000	12,448		24,541		24,541		51%		51%
1998	13,628	2,000	11,628		21,667	1,000	20,667		54%		56%
1999	15,543	3,000	12,543		22,670	2,000	20,670		55%		61%
2000	16,812	4,000	12,812		24,570	3,500	21,070		52%		61%
2001	12,766	0	12,766		18,772	5,500	13,272		68%		96%

CUMULATIVE IMPACTS

The project will not significantly change the volume or quality of wastewater discharge as proposed. The RWQCB has determined that no changes to the existing NPDES permit for the Valero refinery will be necessary. Staff concludes there are no significant cumulative impacts.

COMPLIANCE WITH LORS

The project as proposed, with the modification of using recycled water from the City of Benicia or the Valero refinery, will comply with LORS provided the recommended Conditions of Certification are adopted.

FACILITY CLOSURE

The VCP is expected to operate for a minimum of 20 years. Closure options range from "mothballing," with the intent of a restart at some time, to the removal of all equipment and facilities.

The decommissioning plan will be submitted to the Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans will be required. The plan will address all concerns in regard to potential erosion and impacts on water quality.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

During the July 12, 2001 VCP Informational Hearing in Benicia, two public comments were received addressing use of Water Resources as proposed by the applicant. These comments are paraphrased as follows:

1) What are alternatives to, or mitigation for, use of fresh water by the VCP?

2) Concern was expressed regarding the availability of fresh water and the potential for generation curtailments during drought conditions due to limitations in water supply.

Additionally, City of Benicia believes that the VCP would achieve a much higher degree of water supply reliability by utilizing recycled water to the extent possible, noting that any portion of Valero's industrial water demands capable of being supplied by recycled water would not be subject to drought-related curtailments in the future. In recognition of discussions that have occurred over the past 10 years between the City and the applicant regarding utilization of recycled water and a Good Neighbor Agreement between the City and applicant, whereby the applicant
has committed to study the feasibility of utilizing recycled water within its overall refinery operations, the City is most interested in using the VCP as the catalyst to initiate use of the City's treated wastewater by the applicant. (Mustain 2001).

In response to the public's and City of Benicia's comments, staff has already requested and received information from the Applicant on reuse of wastewater from the Valero Refinery for supply to the VCP. Although the applicant initially expressed that they were not interested in using that source of recycled water due to cost, the applicant has more recently expressed that it may reconsider use of refinery wastewater. Additionally, staff had requested the applicant to analyze use of recycled water from the City of Benicia's Wastewater Treatment Plant, which culminated in discussion with the applicant in which they expressed willingness to consider both the refinery's and City of Benicia's wastewater for reuse.

During a July 25, 2001 phone conference with the Applicant, staff emphasized that based on information already available, utilization of recycled water appeared to be a reasonable alternative to use of fresh water for the VCP. Staff's opinion is based on a number of factors including LORS, projected shortfalls to City of Benicia's fresh water supply that could negatively affect VCP reliability and City of Benicia's domestic customers, technical feasibility of using the refinery's and the City of Benicia's wastewater effluent, and that there are no expected impacts to the quality of wastewater discharged to the Carquinez Strait. The Applicant indicated that responding to Staff's latest data request regarding analysis of recycled water alternatives was problematic in terms of time and scope, and that such an analysis would be more meaningful if analysis for the VCP was included in an analysis for the refinery overall. The Applicant further stated that it had already committed to the City of Benicia to perform such a study consistent with the Good Neighbor Agreement between the parties. In response to the Applicant, Staff offered a performance goal concept in lieu of performing further analysis of recycled water supply specific to the VCP at this time, whereby a condition of certification for the VCP would require utilization of recycled water to reduce the use of fresh water in its integrated VCP and refinery operation in an amount equivalent to the water supply demands of the VCP (estimated at 0.28 MGD), within 2 years of VCP certification. The Applicant's initial response to this concept was favorable. A Condition of Certification requiring use of recycled water and reducing the use of fresh water in an amount equivalent to the demands of the VCP has been included as **Soil & Water 6**.

Recycled Water Recommendation

Staff believes that the use of recycled water is preferable and feasible, and also consistent with California Water Code section 13550 et seq., and SWRCB Resolution 75-58. These LORS identify the use of potable or fresh inland water for power plant cooling as unreasonable use and only to be used if other sources or other methods of cooling would be environmentally undesirable or economically unsound. In light of the projected deficits in fresh water supply, the City of Benicia believes that Valero would achieve a much higher degree of water supply reliability by utilizing recycled water to the extent possible (Mustain 2001). Any portion of Valero's industrial water demands capable of being supplied by recycled water would not be subject to drought-related curtailments in the future. In addition, the City of Benicia incurs costs for reserving supplementary freshwater supply from City of Vallejo, incurring a standby cost of about $220,000/year plus an additional cost for actual water purchased of up to $330,000/year, for a total of up to $550,000/year. If Valero reduces its freshwater use

through the utilization of recycled water, the City of Benicia would be willing to consider these types of avoided costs and savings in any negotiations with Valero, translating into potential cost-sharing in the development and supply of recycled water for use by Valero. Condition of Certification **Soil & Water 6** addresses this recycled water issue.

CONCLUSIONS

Staff has determined the proposed project will result in less than significant impacts to the public or the environment if the suggested mitigation measures and the following conditions of certification are implemented. Staff recommends the use of recycled water for the VCP based on reliability factors, State Water Code Section 13550 et seq., SWRCB Resolution 75-58, and the City of Benicia's concerns.

PROPOSED CONDITIONS OF CERTIFICATION

The following conditions have been developed for the project:

SOIL & WATER 1: Prior to beginning any site mobilization activities, the project owner shall obtain staff approval for a final Erosion Control Plan that addresses all project elements. The final plan to be submitted for staff's approval shall contain all the elements of the draft plan, including provisions for containing and treating any contaminated soil or groundwater, with changes made to address any staff comments and the final design of the project.

Verification: The Erosion Control Plan shall be submitted to the CPM at least thirty 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 2: The project owner shall comply with all provisions of the NPDES Permit. The project owner shall notify the Energy Commission CPM of any proposed changes made to this permit and provide copies of materials related to permit amendment, modification and renewal. The project will not operate without this permit in place.

Verification: Within thirty days following receipt of a new, amended, or modified NPDES Permit from the RWQCB, the project owner shall submit a copy of the permit to the Energy Commission CPM. The project owner shall submit to the Energy Commission CPM in the annual compliance report a copy of the annual monitoring report submitted to the RWQCB. The project owner shall notify the Energy Commission CPM in writing of any changes made to this permit.

SOIL & WATER 3: During project operation, the project owner will collect and convey stormwater into the refinery's existing wastewater treatment plant, prior to discharge into the Carquinez Strait. Any stormwater leaving the site will be discharged in compliance with the refinery's existing NPDES Permit and Storm Water Pollution Prevention Plan (SWPPP). The SWPPP for refinery operations must be revised to include the VCP operations, and

approved by the RWQCB and Energy Commission staff prior to commercial operation and/or offsite discharge of stormwater.

Verification: The project owner will submit to the CPM a copy of the revised Storm Water Pollution Prevention Plan (SWPPP) as submitted for approval to the RWQCB and prepared under the requirements of the existing refinery NPDES Permit, at least 30 days prior to the start of commercial operation and/or offsite stormwater discharge. The project owner shall provide verification of RWQCB approval of the revised SWPPP prior to commercial operation.

SOIL & WATER 4: The project owner will install metering devices and record on a monthly basis the amount of fresh and recycled water used by the project. The annual summary will include the monthly range and monthly average of daily usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet. For subsequent years the annual summary will also include the yearly range and yearly average water use by the project. This information will be supplied to the Energy Commission and the City of Benicia.

Verification: The project owner will submit a VCP water use summary to both the CPM and the City of Benicia on an annual basis for the life of the project. Any significant changes in the water supply for the project during construction or operation of the plant shall be in conformance to Condition **Soil and Water 6** and shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change

SOIL & WATER 5: Due to the potential for soil contamination at the site of the VCP, the soil shall be stockpiled and characterized at a rate of at least one four-point sample for every 6 inches of excavation. The characterization would focus on heavy metals and leachability testing for both off-site and on-site disposal options. In addition, color and odor of soils excavated are to be monitored, and if suspect soils are encountered, they are to be stockpiled separately for characterization. Any groundwater that may need dewatering during excavation shall be tested for contamination. A Site Investigation Workplan identifying how soil and groundwater will be tested for contaminants and the disposal methods will be provided to staff for review and approval.

Verification: Seven days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification, the project owner will provide a Site Investigation Workplan for approval. The plan must be approved prior to the commencement of site mobilization activities. The project owner will provide sampling results during excavation activities to the CPM on a weekly basis.

SOIL & WATER 6: Within two years of certification of the Valero Cogeneration Project, the project shall use recycled water. The source of recycled water may be either refinery wastewater or City of Benicia's wastewater treatment plant secondary effluent. The recycled water use is specified as a minimum of 314 acre-feet per year, based on an average daily use by the VCP of 280,000 gallons per day. The project owner's plans for implementing recycled water use shall be prepared in

consultation with the City of Benicia, consistent with the Good Neighbor Agreement between the parties, which encourages the project owner to achieve even broader reductions in its use of fresh water through use of recycled water. Recycled water use must comply with all Department of Health Services requirements as specified under Title 22 of the CCR.

Verification: On a quarterly basis, during the two years following VCP certification, the project owner shall provide the CPM and City of Benicia a status report of its recycled water study/plan including status of its consultation with City of Benicia. The applicant shall provide a draft plan for use of recycled water at the VCP (can be a part of a Valero refinery-wide plan) to the CPM for review and approval eighteen (18) months following the certification date of the VCP.The VCP shall start using recycled water no later than the two year anniversary of certification. The project owner shall install water supply metering devices, adequate to account for use of fresh vs. recycled water supply, and provide water use reports to the CPM in accordance with Soil and Water 4.

REFERENCES

CH2MHill 2001. Technical Memorandum to City of Benicia titled Future Water Availability for the City of Benicia. July 16, 2001.

CRWQCB (California Regional Water Quality Control Board) 2001a. Installation of Two Gas Turbine Generator and Their Impacts on Valero's Existing Wastewater Discharge. Submitted to the California Energy Commission on June 27, 2001.

Mustain, Virgil 2001. Public Works Director, City of Benicia. Personal communication with John Kessler, July 16, 2001.

URS 2001b. Supplemental Information prepared to support data adequacy - 100-bound copies - 12-CD's Air Quality and Public Health Modeling Files. Submitted to the California Energy Commission on June 11, 2001.

URS 2001c. Data Responses for the Valero Cogen Project – 77 bound copies and 12 CD's containing data responses, CD's contain SACTE Modeling and Transmission System Data Files – POS. Submitted to the California Energy Commission on June 25, 2001.

VALERO (Valero Refining Company) 2001a. Application for Certification, submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission on May 7, 2001.

ENGINEERING ASSESSMENT

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FACILITY DESIGN

Testimony of Brian Payne

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the engineering LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision ….which includes…(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state and federal standards, ordinances, or laws…" (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

The applicant, Valero Refining Company (Valero), proposes to construct and operate the new 102 megawatt (MW) Valero Cogeneration Plant. This plant is proposed for construction at the existing Valero Refinery, in Benicia, California. This facility is proposed to include two combustion turbine generators, equipped with water injection and emissions control equipment and two heat recovery stream generators. The first unit will produce electricity for use in the Valero Refinery. The second unit will produce electricity that can be exported into the power grid (Valero 2001a and URS 2001b). For more information on the site and related project description, please see **Project Description**.

The site lies in seismic zone 4, the zone of greatest seismic shaking in the United States. Additional engineering design details are contained in the Application for Certification (AFC), Section 7.0 and Appendix N (Valero 2001a and URS 2001b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS for each engineering discipline (civil, structural, mechanical, electrical, and controls) are described in the following AFC Appendices (Valero 2001a and URS 2001b).

- Foundations and Civil Engineering – Appendix N-1
- Mechanical Engineering – Appendix N-2
- Electrical Engineering – Appendix N-3
- Control Engineering – Appendix N-4
- Structural and Seismic Engineering – Appendix N-5

Some of these LORS include: California Building Code (CBC), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM), and the American Boiler Manufacturers Association (ABMA).

ANALYSIS

The basis of this analysis is the applicant's proposed analysis and construction methods and the list of engineering LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see Valero 2001a and URS 2001b, Appendices N-1 through N-5 for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities,

will likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC), and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** (below), which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

NATURAL GAS PIPELINE

Normally, refinery fuel gas will be used to fuel the combustion turbine generators. However, natural gas may be used an alternative fuel source. An existing Pacific Gas and Electric Company (PG&E) natural gas pipeline will be used to furnish gas to the site. This line is connected to existing refinery piping. The line is operated and maintained by PG&E in accordance with U.S. Department of Transportation (DOT), Title 49, Code of Federal Regulations (CFR) Chapter 1, Part 192 "Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards," and the California Public Utilities Commission, General Order 112-E (CPUC GO 112-E). Compliance with these requirements will help mitigate the impacts of pipeline rupture by ensuring proper operation and maintenance of the existing line. Therefore, no mitigation beyond a pipeline operated and maintained to applicable regulations is necessary.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, either the City of Benicia or Solano County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from “mothballing” to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans, and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.

3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the General Conditions portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;

2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 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 CBC is in effect, the 1998 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.

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 – Certificate of Occupancy].

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.

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 **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.

Table 1: Major Structures and Equipment List

Equipment/System	**Quantity (Plant)**
Combustion Turbine (CT) Foundation and Connections	2
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
15KV Transformer Foundation and Connections	1
5KV Transformer Foundation and Connections	1
480V Transformer Foundation and Connections	1
CT Building Structure Shell and Facade, Foundation and Connections	2
CT Inlet Air Plenum Structure, Foundation and Connections	2
HRSG Exhaust Stack, Foundation and Connections	2
Isolated Phase Bus Duct	2
HRSG Transition Duct Burner and Forced Draft Structure, Foundations and Connections	2
Selective Catalytic Reduction Unit Structure, Foundation and Connections	2
Pipe and Cable Way Structures, Foundations and Connections	1 Lot
Control Room Building Structure, Foundation and Connections	1
Electrical MCC Building Structure, Foundation and Connections	1
Utility Building Structure, Foundation and Connections	1
SPRINT Injection Skid Foundation and Connections	2
Water Injection Skid Foundation and Connections	1 Lot
CT Mechanical Accessory Compartment Foundation and Connections	2
Switchgear Equipment Foundation and Connections	1 Lot
Natural Gas Compressor Foundation and Connections	2
Fuel Gas Compressor Foundation and Connections	2
Fuel Gas Filter/Regulator Foundation and Connections	1 Lot
Knockout Drum Foundation and Connections	2

Equipment/System	Quantity (Plant)
All Building Structures, Foundations and Connections	1 Lot
Lube Oil Package Foundation and Connections	1 Lot
Drain Cooler Foundation and Connections	1
Air Receiver Foundation and Connections	1 Lot
Air Dryer Foundation and Connections	1 Lot
Cooling Water Tower Structure, Foundation and Connections	1 Lot
Demineralized Water Filter Foundation and Connections	1 Lot
Demineralized Water Storage Tank, Foundation, and Connections	1
Demolition Plan – Package Boilers	3
Potable Water Systems	1 Lot
Drainage Systems (including sanitary, storm drain, and waste)	1 Lot
Building Energy Conservation Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
High Pressure Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 1998 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated

responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;

3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;

4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are 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.

At least 30 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 for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are 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.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers 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; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

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 project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [1998 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and

2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;

2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;

4. Recommend field changes to the civil engineer and RE;

5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and

6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

   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 [1998 CBC, section 104.2.4, Stop orders].

C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with LORS;

4. Evaluate and recommend necessary changes in design; and

5. Prepare and sign all major building plans, specifications and calculations.

D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

   Verification: At least 30 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 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.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

   A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.
If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered in any work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [1998 CBC, Section 106.4.2, Retention of plans].

Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

GEN-9: The project owner shall convert the powerplant to a cogeneration powerplant within 3 years of the approval of the AFC. If the conversion does not take place

within 3 years, the permit to operate will terminate. Because the project owner has described its plans and equipment to convert to cogeneration as part of this AFC, no amendment or modifications to its permit will be necessary unless it changes the design or other parameters from those described in the AFC.

Verification: On or before the date 3 years after approval of the AFC, the project owner shall submit satisfactory evidence to the CPM that the powerplant is fully operational in cogeneration mode.

GEN-10: The Valero Project shall be on line by no later than December 31, 2002. If the project is not fully operational by December 31, 2002, the Energy Commission will conduct a hearing to determine the cause of the delay and consider what sanctions, if any, are appropriate. If the Energy Commission finds that the project owner failed to proceed with due diligence to have the project in operation by December 31, 2002, the project owner shall forfeit its certification as to the portions of the project not in operation by December 31, 2002.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;

2. An erosion and sedimentation control plan;

3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. Soils report as required by the 1998 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report].

At least 15 days prior to the start of site grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthworks and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [1998 CBC, Section 104.2.4, Stop orders].

The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions.

Within five days of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site grading operations for which a grading permit is required shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy].

Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 1**, above):

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and

5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;

2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures 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 on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents]; and

4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record].

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction of any structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification. The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of major piping or plumbing construction, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Table 1**, Condition of Certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal Documents, Section 108.3, Inspection Requests, Section 108.4, Approval Required; 1998 California Plumbing Code, Section 103.5.4, Inspection Request, Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);

- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Specific City/County code(s).

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [1998 CBC, Section 104.2.2, Deputies].

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of major piping or plumbing construction listed in **Table 1**, Condition of Certification **GEN-2** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests].

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 1998, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements; and
7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

- receipt or delay of major electrical equipment;
- testing or energization of major electrical equipment; and
- a signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

Valero (Valero Refining Company) 2001a. Application for Certification, Valero Cogeneration Project (01-AFC-5). Submitted to the California Energy Commission on May 7, 2001.

URS 2001b. Supplement to Application for Certification from the Valero Cogeneration Project. Submitted to the California Energy Commission on June 11, 2001.

GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY

Testimony of Dr. Patrick Pilling

INTRODUCTION

The geology and paleontology section discusses potential impacts of the proposed Valero Cogeneration Project (VCP) regarding geological hazards, geological (including mineralogical) and paleontological resources. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources during project construction, operation and closure. All of the California Environmental Quality Act (CEQA) checklist items for geology and paleontology were designated by Energy Commission staff as "no impact." A brief geological and paleontological overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to geological hazards and resources, and paleontological resources. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, and geological and paleontological resources, with the inclusion of 10 conditions of exemption.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS are listed in the Application For Certification (AFC), in Section 8.0 of the AFC (Valero Refining Company [VALERO], 2001a). A brief description of the LORS for geological hazards and resources, and paleontological resources, follows:

FEDERAL

There are no federal LORS for geological hazards and resources, grading or paleontological resources for the proposed project.

STATE AND LOCAL

The California Building Code (CBC), 1998 edition, is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33). The CBC supplements the UBC's grading and construction ordinances and regulations.

The CEQA Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The "Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources" (Society of Vertebrate Paleontologists [SVP], 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (SVP).

SETTING

SITE GEOLOGY

The proposed VCP is located within the California Coastal Range geomorphic province. This area is characterized by elevated topography with northwest-trending ridges, valleys, and faults. Two geologic units are generally present in the vicinity of the site and include the Franciscan Complex and the Great Valley Complex (California Division of Mines and Geology [CDMG], 1982). The Franciscan Complex consists of metamorphosed oceanic crustal rocks and marine sediments. The metamorphosed oceanic crustal rocks form the lower plate of a complex system of thrust faults known as the Coast Range Thrust. The Great Valley Complex consists of sedimentary rocks that were deposited in a continental slope marine environment, is located on the upper plate of the Coast Range Thrust, and forms much of the eastern flank of the Coast Range.

Exploration at the site generally encountered various depths of fill, colluvium, alluvial fan and fluvial deposits, and bedrock of the Great Valley Complex. The fill materials consist of stiff to very stiff sandy clay materials, which were generated by cutting into native bedrock. Where present, the thickness of the fill varies from 18 to 53 feet, and this material is considered moderately to highly expansive. The colluvium, which overlies site bedrock, is approximately 6-feet-thick and consists of a clay-rich unit (stiff to very stiff clay and sandy clay), which has developed as an in-place weathering product of the underlying bedrock, and has subsequently been subject to downslope movement by soil creep and slope movement. This material is considered moderately to highly expansive. The alluvial fan and fluvial deposits are of Pleistocene age and consist of dense clayey sand/sandy clay with varying amounts of gravel. The underlying bedrock is part of the Great Valley Complex and consists of sandstone and shale of Cretaceous age. This material is described as fractured, weathered, weak, and moderately consolidated interbedded sandstone and mudstone.

Grading at the site will involve cuts up to approximately 15 feet along the western site perimeter, which will remove a majority of the fill materials. Retaining walls will be constructed along western and northern perimeters to maximize plant pad size and provide a relatively level pad on which to construct the proposed facility. The materials expected to be exposed by such grading operations will exhibit moderate to high expansion potential such that mitigation of such materials will be necessary. A 2H:1V (Horizontal:Vertical) slope is planned along the southern perimeter. As the bedrock in this area is anticipated to dip to the southeast, such slopes will need to be inspected by

qualified geotechnical or engineering geology personnel to verify the exposed dipping planes do not affect the integrity of the cut slopes.

SITE SEISMICITY

Energy Commission staff reviewed the CDMG publication “Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions,” dated 1994 (CDMG, 1994), and maps of known active fault near-source zones in California and adjacent parts of Nevada (International Conference of Building Officials [ICBO], 1998). The project is located within Seismic Zone 4 as delineated on Figure 16-2 of the CBC. No known faults cross the proposed expansion site or proposed linear facility improvements. The closest known active fault is the Concord-Green Valley Fault, located approximately 2 miles east of the site. The estimated peak horizontal ground acceleration for the project is on the order of 0.6g. This estimate is based upon a moment magnitude 6.9 earthquake on the Concord-Green Valley Fault, approximately 2 miles east of the site.

LIQUEFACTION, DYNAMIC COMPACTION, HYDROCOMPACTION, SUBSIDENCE, EXPANSIVE SOILS, AND LANDSLIDES

Liquefaction is a nearly complete loss of soil shear strength that can occur during a seismic event. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, effectively reducing the internal strength of the soil. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) and very soft silts lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic settlements of overlying structural improvements and lateral spreading of the liquefied layer when confined vertically but not horizontally. Soil borings contained in the AFC indicate ground water is present at depths as shallow as 8 feet below existing grade based on measurements made in 1989 (VALERO, 2001a, Appendix K, Plates 2 through 8). The borings also indicate the site is underlain by surficial clay soils overlying native bedrock, which consists of mudstone and sandstone. As a result, the potential for liquefaction and associated lateral spreading of site soils is negligible.

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. Since the site is underlain by clay soils overlying native bedrock, the potential for dynamic compaction is negligible.

Partially saturated soils can possess bonds that are a result of chemical precipitates that accumulate under semi-arid conditions. Such soluble compound bonds provide the soils with cohesion and rigidity; however, these bonds can be destroyed upon prolonged submergence. When destroyed, a substantial decrease in the material’s void ratio is experienced even though the vertical pressure does not change. Materials that exhibit this decrease in void ratio and corresponding decrease in volume with the addition of water are defined as collapsible soils. Collapsible soils are typically limited to true

loess, clayey loose sands, loose sands cemented by soluble salts, and windblown silts. Based on the nature and density of the existing fill soils, native soils, and bedrock, hydrocompaction is not considered significant at the proposed cogeneration plant site.

Ground subsidence is typically caused when ground water is drawn down by irrigation activities such that the effective unit weight of the soil mass is increased, which in turn increases the effective stress on underlying soils, resulting in consolidation/settlement of the underlying soils. Since ground water is generally present at the clay soil/bedrock interface, since the bedrock can be considered relatively incompressible, and since the minor amount of water usage (0.28 million gallons per day) will be accommodated by the existing City of Benicia facilities, the potential for ground subsidence is considered low.

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure which, in turn, causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. The site soils and bedrock are known to exhibit a moderate to high potential to expand with an increase in moisture content. As a result, mitigation of clay soils will be necessary.

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that are usually implemented by an increase of the material's moisture content above a layer which exhibits a relatively low strength. Debris-flows are shallow landslides that travel downslope very rapidly as muddy slurry. Energy Commission staff have reviewed the relative landslide and debris-flow susceptibility maps (CDMG, 1987) for this area. Based on the information contained in this publication, the area is considered marginally susceptible to landslides and debris-flows; however, no landslides or debris-flows are shown as existing within the limits of the project. As a result and based on the site geology as presented in the AFC (VALERO, 2001a) and supplemental AFC (URS, 2001b and c), the potential for landslides and debris-flows at the site is considered low.

Tsunamis and Seiches are earthquake-induced waves which inundate low-lying areas adjacent to large bodies of water. The proposed site is situated approximately 110 feet above mean sea level and approximately 7,000 lineal feet northwest of the Carquinez Straight. As a result and based on the information contained in the AFC (URS, 2001c), the potential for tsunamis and Seiches to affect the site is considered negligible.

GEOLOGICAL, MINERALOGICAL, AND PALEONTOLOGICAL RESOURCES

Energy Commission staff have reviewed applicable maps of thermal springs and wells for this area (CDMG, 1982). Based on this information and the information contained in the AFC (VALERO, 2001a; and URS, 2001b and c), there are no known geological or mineralogical resources located at or immediately adjacent to the proposed expansion site. A paleontological resources field survey and sensitivity analysis were conducted by the applicant's consultant for the proposed power plant expansion and the proposed

linear facility improvements to support the expansion. No significant fossil fragments were identified. The proposed expansion site has been disturbed in the past and is not likely to contain significant paleontological resources in-situ.

IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
GEOLOGY – Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			X	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		
d) Be located on expansive soil, as defined in Table 18- 1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		
MINERAL RESOURCES – Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
PALEONTOLOGICAL RESOURCES -- Would the project:				
a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

DISCUSSION OF IMPACTS

Geology

A. I. Less Than Significant Impact

The proposed power plant expansion and related linear facilities are not located on a fault, as delineated by the ICBO (1998).

II. Less Than Significant Impact

The proposed project is located in CBC Seismic Zone 4. The estimated peak horizontal ground acceleration for the site is approximately 0.6g.

III. Less Than Significant Impact

Based on site geology, the potential for liquefaction is considered low.

IV. Less Than Significant Impact

Based on the site geology and configuration of the proposed improvements, the potential for landsliding at or adjacent to the site is considered to be low.

C. Less Than Significant Impact With Mitigation Incorporated

The cuts proposed for this site could expose adverse dipping planes in site bedrock. Examination of such cut slopes will be necessary (see **GEO–2**).

D. Less Than Significant Impact With Mitigation Incorporated

Expansive soils are present at this site. Mitigation of expansive soils will be necessary (see **GEO–3**).

Mineral Resources

A. No Impact

B. No Impact

Paleontological Resources

A. Less Than Significant Impact With Mitigation Incorporated

The soil at the proposed project has been disturbed by previous activities at the site. No fossils were encountered or are known to be located on site; however, a strict protocol will be required during construction (see **PAL-1**).

CUMULATIVE IMPACTS

Staff concludes that there are no cumulative impacts.

CONCLUSIONS

The project will result in no significant impacts to the public or the environment with respect to geological hazards, geological, mineralogical, paleontological resources or to soils provided that the proposed conditions of exemption are implemented.

PROPOSED CONDITIONS OF EXEMPTION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the CBC Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM. The functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license.

Verification: At least thirty (30) days (or a lesser number of days mutually agreed to by the project owner and the CPM) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction. In particular, examine cut slopes for adverse dipping of bedding planes.
3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318, Completion of Work, to the CBO, and to the CPM on request.

GEO-3 Chapter 18 of the CBC requires all structures to be designed to resist the effects of expansive soils. Since expansive soils are present at this site, mitigation of such soils will be necessary.

Verification: Prior to the start of construction, the project owner shall submit to the CPM an updated geotechnical report, which includes all laboratory test data and engineering calculations in support of recommended mitigation procedures for expansive soils at this site.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological

resource management and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least sixty (60) days prior to the start of construction (or a lesser number of days mutually agreed to by the project owner and the CPM), the project owner shall submit the name, statement of qualifications, and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall approve or disapprove of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

Protocol: The project owner shall develop a Paleontological Resources Monitoring and Mitigation Plan in accordance with the guidelines of the Society of Vertebrate Paleontologists (SVP, 1994) that shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.
- At least forty-five (45) days prior to the start of construction (or a lesser number of days mutually agreed to by the project owner and the CPM), the project owner shall provide the CPM with a copy of the Paleontological Resources Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction and throughout the project construction period as needed for all new employees, the project owner and the designated

paleontological resource specialist shall prepare, and the owner shall conduct, CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least thirty (30) days prior to the start of project construction (or a lesser number of days mutually agreed to by the project owner and the CPM), the project owner shall submit to the CPM for review and approval the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee-training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potential fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification

and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activities' potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

CBC (California Building Code). 1998

CDMG (California Division of Mines and Geology), 1982. *Geologic Map of The Santa Rosa Quadrangle*; Scale 1:250,000.

CDMG, 1994. *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*, Scale: 1:750,000.

CDMG, 1987. *Landslide Hazards in the Benicia-Vallejo Area, Solano County, California*, Landslide Hazard Identification Map No. 8.

ICBO (International Conference of Building Officials), 1998. *Map of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada.*

SVP (Society for Vertebrate Paleontology), 1994. *Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures.*

VALERO (Valero Refining Company), 2001a. *Application for Certification (AFC)*, submitted by Valero Refining Company, Benicia, CA. Submitted to the California Energy Commission May 7, 2001.

URS, 2001b. Supplemental Information prepared to support data adequacy – 100-bound copies – 12-CD;s Air Quality and Public Health Modeling Files. Submitted to the California Energy Commission on June 11, 2001.

URS, 2001c. Data Responses for the Valero Cogen Project – 12 CD's containing SACTE Modeling and Transmission System Data Files – POS. Submitted to the California Energy Commission on June 25, 2001.

POWER PLANT EFFICIENCY

Testimony of Richard Minetto P.E.

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Valero Cogeneration Project (VCP) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the VCP's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- Determine whether the facility will likely present any adverse impacts upon energy resources;
- Determine whether these adverse impacts are significant; and if so,
- Determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

The Valero Refining Company (Valero) proposes to construct a gas-fired cogeneration plant (VCP) at the Valero Refinery in the City of Benicia in Solano County, California.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

California Environmental Quality Act Guidelines

CEQA Guidelines state that the environmental analysis "…shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

Valero is proposing to construct and operate a fuel gas fired power plant within the Valero Refinery. The proposed facility is expected to produce approximately 100 MW of peak generation and 600-psig steam for refinery use. The design of the project includes two General Electric (GE) combustion gas turbines (CTGs – LM6000 PC SPRINT®) with chillers, and two heat recovery steam generators (HRSGs). Ancillary systems will provide for fuel gas compression, selective catalytic reduction (SCR) and associated instrumentation, piping, and wiring (Valero 2001a, AFC Section 2.0).

The project will provide the refinery with the following benefits:

- The HRSGs will allow the shutdown of at least three existing package boilers at the refinery. Also, the HRSGs will be equipped with duct burners for additional steam production only when other refinery boiler production is limited.
- The electrical output from the first unit will, in essence, allow the refinery to operate "off line." This will benefit both the refinery and the electrical grid through effective management of resources based on cost and system need. This also provides for increased reliability to the refinery by having on site generation, thus eliminating or reducing the number of outages caused by disruption in the current electrical supply.
- When the second CTG is installed, the refinery will have approximately 50 MW of excess power to deliver to the electrical grid.

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- Adverse effects on local and regional energy supplies and energy resources;
- A requirement for additional energy supply capacity;
- Noncompliance with existing energy standards; or
- The wasteful, inefficient and unnecessary consumption of fuel or energy.

Project Energy Requirements and Energy Use Efficiency

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. Under normal fuel conditions, Valero will burn residual fuel gas produced through the refinement process at a nominal rate of 410 MMBtu/hr LHV (LHV – lower heating value) for 8,760 hours per year (Valero 2001a, AFC Section 7.4, Figure 7.4-2). Back up fuel of natural gas will be used at a nominal rate of 418 MMBtu/hr LHV. This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

The applicant proposes to utilize two General Electric LM6000 SPRINT® turbines. From published data this machine typically provides efficiency values between 40-42 percent. The present mode of operation at the refinery is to flare excess byproducts from the refinement process. The proposed project increases overall efficiency by utilizing the fuel gas as a source for generation of electricity and steam.

Adverse Effects On Energy Supplies and Resources

The project equipment will be designed to operate with refinery fuel gas with alternate operation through the combustion of natural gas (Valero 2001a, AFC Section 2.0). The refinery fuel gas is produced by the refining process and will vary considerably in composition. The fuel gas includes hydrogen, methane, ethanes, propanes, butanes, and other organic and inert materials (Valero 2001a, AFC Section 2). Because the refining produces the primary fuel for the project process there is no adverse effect on energy supplies and resources.

The project does allow for combustion of natural gas as a backup fuel. The use of natural gas will not adversely affect energy supply as it in essence replaces the existing use of natural gas in other operations. Valero indicates that natural gas supply will be available for the life of the project (Valero 2001a, AFC Section 7.3).

Additional Energy Supply Requirements

As provided in the AFC, the applicant proposes natural gas as an alternate fuel with fuel gas as the primary source of fuel to the combustion turbine. The fuel gas is a byproduct of the refinement process and will be treated to minimize sulfur compounds and compressed from 70 psi to the required 675 psi for use in the combustion turbine. The fuel gas will be transported to the site through a pipeline. The natural gas will be interconnected to existing gas supplies within the refinery and transported when necessary through compressors to the combustion turbine.

Compliance With Energy Standards

No standards apply to the efficiency of the VCP, as the applicant has not proposed that the project be considered as a Qualifying Facility cogeneration project.

Alternatives To Reduce Wasteful, Inefficient and Unnecessary Energy Consumption

The VCP alternatives were limited due to the fact that the fuel gas is a byproduct of the existing refining process. Various design constraints were considered in the selection of the combustion turbine and location of the facility within the refinery.

Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

Project Configuration

The proposed configuration of the VCP provides for the eventual installation of two GE LM6000 SPRINT® Combustion turbines. These turbines would be provided with fuel compression. Two HRSGs would be provided for production of steam to be used in the refinery for processing (Valero 2001a, AFC Section 2.0). The HRSGs will be equipped with duct burners to be used only when additional steam is required due to other refinery boiler production being limited due to maintenance or refinery upset conditions (Valero 2001a, AFC Section 2.1).

Equipment Selection

The equipment selection for VCP was based on the refinery's need for steam and electrical output. The first unit will provide for the shut down of at least three (3) existing boilers (Valero 2001a, AFC Section 2.1). The first unit also provides for the electrical requirements of the refinery. Under varying conditions, there may be a nominal amount of electrical energy delivered to the grid or imported from the grid. The second unit provides for a nominal 50 MW of electrical capacity to be delivered to the grid. The LM6000 SPRINT® with the addition of the HRSG provides both the steam and electrical power needs and was therefore selected.

Alternative Generating Technologies

Alternatives considered were diesel generators, no project, and consideration of alternative locations outside the refinery. Also various alternatives were considered for emissions controls including SCONOX and SCR technologies. The range of alternatives was somewhat limited due to the nature of the project itself. Since the fuel gas is produced on the refinery site, other locations were not economically feasible. Further diesel generation was not viable from a cost standpoint. The selection of the CTS, the HRSGs and the SCR control systems were determined based on the refinery's need for electrical and thermal energy, the most proven technologies, and the size and location of the loads these facilities will serve (Valero 2001a, AFC Section 5.0).

CUMULATIVE IMPACTS

Staff knows of no other projects that could result in cumulative energy impacts. Because VCP proposes to utilize an existing byproduct of the refining process for fuel, there are no cumulative impacts on fuel supply. The project as proposed increases the overall efficiency of operation and provides added benefits to the refinery and consumers.

FACILITY CLOSURE

A planned or unplanned closure of the facility will not affect, nor will it be affected by, project efficiency. Any efficiency impacts due to closure of the project would be on the entire California electric system. The large size of the electric system serving California, the number of generating plants offering to sell power contracts to the State and competitively to the California Independent System Operator (CaISO) will ensure the efficient management of the system and lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS

The VCP, if constructed and operated as proposed, would generate a nominal 100 MW of electric power. Approximately one-half of the electrical output would be available to the grid. The VCP also produces steam for refinery use intended to offset the production of at least three existing boilers. The combustion turbine selected will produce at an overall efficiency of approximately 42 percent (LHV). No energy efficiency standards apply to the project. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. Staff concludes that the VCP would present no significant adverse impacts upon energy resources. No cumulative impacts on energy resources are likely. Facility closure would not likely present significant adverse impacts on electric system efficiency.

RECOMMENDATION

No Conditions of Certification are proposed.

REFERENCES

GE (General Electric) 2001a. Engine – LM6000 Specifications Published in html format at http://www.geae.com/marine/lm60_serv_engmodels.html July 15, 2001.

Valero (Valero Cogeneration Project). 2001a. Application for Certification, Valero Cogeneration Project (01-AFC-5). Submitted to the California Energy Commission on May 4, 2001.

WPOWER PLANT RELIABILITY

Testimony of Richard Minetto P.E.

INTRODUCTION

The Power Plant Reliability (PPR) analysis provides the basis for the findings in the Energy Commission's decision. This Staff Assessment (SA) indicates whether or not the proposed power plant project conforms to all applicable laws, ordinances, regulations and standards (LORS) required for reliability, and provides conditions of certification for compliance if required. This analysis by the Energy Commission staff examines reliability issues to determine if the proposed power plant is likely to be built in accordance with typical industry norms for reliability of power generation.

Valero Refining Company (Valero) proposes to utilize an existing byproduct of the refinement process as fuel to produce both electricity and steam for refinery use. The project is referred to as the Valero Cogeneration Project (VCP).The scope of this power plant reliability analysis covers:

- Equipment availability;
- Plant maintainability;
- Fuel and water availability; and
- Power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While VCP has predicted a better than 98 percent availability for the power plant (see below), staff uses the benchmark identified above, rather than VCP's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the Commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project's reliability is acceptable if it does not degrade the reliability of the utility transmission system to which it is connected. This is considered to be likely if the power plant's reliability is at least equal to that of other power plants on that transmission system (see **Setting** below).

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin". This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or

transmission facilities. The utilities generally maintained a seven to ten percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of the total system resources. This margin proved adequate because the reliability of the power plants that constituted the system were appropriate to meet the need should a contingency arise.

Now, in the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO). The Cal-ISO is responsible for dispatching electrical power throughout the state and contracting for ancillary services intended to ensure overall system reliability. Protocols are being employed that will allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements, "participating generator", and "load reduction" agreements are mechanisms being employed to ensure an adequate supply of reliable power (Mavis 1998, pers. Comm.) (Cal-ISO 2001 program filings).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- Filing periodic reports on plant reliability
- Reporting all outages and causes
- Scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. Comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. There has been cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures would act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It was seen as possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by the Cal-ISO to ensure system reliability would prove invalid. Recent energy shortages, exacerbated by an unexpectedly high level of power plant forced outages, have pointed to power plant reliability as a vital factor in system operation. Until the restructured competitive electric power system has undergone an adequate shakeout period, and all the effects of varying power plant reliability are understood and compensated for, Energy Commission staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

Valero is proposing to construct and operate a fuel gas fired power plant within the Valero Refinery. The proposed facility is expected to produce approximately 100 MW of peak generation and 600-psig steam for refinery use. The design of the project includes two General Electric (GE) combustion gas turbines (CTGs – LM6000 PC SPRINT®) with chillers, and two heat recovery steam generators (HRSGs). Ancillary systems will provide for fuel gas compression, selective catalytic reduction (SCR) and associated instrumentation, piping, and wiring (Valero 2001a, AFC Section 7.3).

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Throughout its intended life, the VCP is expected to perform reliably in base load duty. VCP is designed to operate full time with only an expected shutdown annually three times for two to five days each (Valero 2001a, AFC; Section 7.3). Additionally, one unexpected annual shutdown is anticipated for one day's duration. Based on the applicant's assessment, the VCP would have an availability factor greater than 98 percent. This is well above industry norms for typical power plant operations. Because the VCP offers many advantages to Valero, it is in the applicant's best interest to ensure the reliability of the project. In fact, the project provides benefits in terms of reliability to the refinery itself through reduced disruption from existing electrical supply.

Acceptable reliability can be accomplished by, in addition, providing adequate redundancy of critical components. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the VCP will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/ quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

Valero has provided an outline of the expectations for quality control from the design concept phase through project commissioning. Qualified engineers, licensed in California, will perform design. Equipment will be purchased from qualified suppliers that employ an approved QC program. Designs will be checked and equipment inspected upon receipt; installation will be inspected and systems tested. Included in the proposed program are:

- Conceptual Design
- Licensing and permitting
- Detailed design
- Procurement
- Construction and construction management
- Startup, testing and checkout
- Project completion

In the steps described above, the applicant has provided design criteria and appropriate testing procedures to ensure quality control through the project construction process (Valero 2001a, AFC Appendix N; Section 7). To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of the document entitled **Facility Design.**

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundancy for those pieces of equipment most likely to require service or repair.

Valero plans to provide appropriate redundancy for all critical pumps and fuel compressors. Specifically, failure of any of the fuel compressors can be accommodated by increased duty on other other compressors. The lube oil system will also have redundancy built into the project design (Valero 2001a, AFC Section 7.3).

Maintenance Program

Valero has provided information relevant to expected plant shutdowns for maintenance activity. Turbine borescope inspections and combustor inspections are provided for in the expected annual shutdowns. Valero indicates that the refinery's intent is to follow the turbine manufacturers recommended maintenance and inspection recommendations for the life of the machines (Valero 2001a, AFC Section 7.3). Valero also provides for a plant shakedown and debugging period for start-up and testing. The applicant has similar experience throughout the refinery and anticipates little problem with project start-up (Valero 2001a, AFC Section 7.3).

Fuel Availability

The VCP proposes to utilize as the primary fuel, fuel gas produced as a byproduct of the refining process. As a back up supply, VCP proposes to utilize natural gas. Valero indicates that natural gas supply will be available for the life of the project (Valero 2001a, AFC Section 7.3). Staff agrees with the applicant's prediction that there will be adequate fuel supply to meet the project's needs.

Water Supply Reliability

Valero requires some additional water resources for turbine injection and makeup. The total expected additional water consumption is about 200 gallons per minute or 0.28 MGD. Normal consumption at the refinery is approximately 5 MGD. The additional water requirements are a small percentage of the overall refinery usage.

The current water requirements for the refinery are provided by the refinery's contract with the City of Benicia and the City's agreement for North Bay Aqueduct water from the State Water Project. Valero projects no mitigation for the small additional water supply needed for the project. (Valero 2001a, AFC Section 2, Section 6.13).

Staff believes the VCP provides sufficient likelihood of a reliable supply of water resources for the project. (For further discussion of water supply, see that portion of this document entitled **Soil and Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. Local flooding, high winds, and seiches (waves in inland bodies of water), and tsunamis (tidal waves) will not likely represent a hazard for this project, but seismic shaking (earthquake) and landslides represent credible threats to reliable operation (Valero 2001a, AFC Section 6.16).

Seismic Shaking

The applicant completed a geologic hazards report and identified several faults near the project site with large magnitudes possible. The area where the project is proposed is characterized as being seismically active. It can be expected that the site will experience shaking due to periodic earthquakes, and it is possible that the site could experience a major earthquake (Richter magnitude seven to eight-plus) (Valero 2001a, AFC Section 6.16; Appendix K). (For further discussion, see that portion of this document entitled **Geology and Paleontology**).

The project will be designed and constructed to the latest appropriate LORS. Since LORS have been periodically and continually upgraded, the required compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities. This power plant will likely perform at least as well as, and perhaps better than, existing plants in the electric power system because it will be built to the latest seismic design LORS. In light of the acceptable historical performance of California power plants, gas transmission pipelines, and the electrical system during seismic events, staff believes there is no special concern with overall power plant reliability that would adversely affect the electric system's reliability due to seismic events.

Landslides

Valero indicates that the site is in a "Marginally Susceptible Area" for slope instability because it contains moderate slopes underlain by competent material. There are several "Most Susceptible Areas" within 2 miles from the site but are considered relatively small and have a low probability of affecting the project site (Valero 2001a, AFC). Staff believes that landslides do not pose a significant threat to the proposed VCP. (For further discussion, see that portion of this document entitled **Geology and Paleontology**).

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout North America on project reliability data though its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics in written form or on the internet. NERC reports the following summary generating unit statistics for the years 1995-1999.

Unit Fuel:	Gas
Unit Size:	1-99 mW
Availability Factor:	89.28%

Valero predicts an availability factor of over 98 percent (Valero 2001a, AFC Section 7.3). This is based on operating the maximum possible number of hours per year with three scheduled shutdowns and one unscheduled shutdown. VCP is being designed to provide many benefits to the refinery and as such will be a critical component to the efficient operation of the refinery. Because of its integral link to the production of the refinery it should be expected to meet or exceed the industry averages for availability.

The applicant's estimate of plant availability appears above the industry norm. Based on expectations from the project VCP will be available as often as possible with routine maintenance a high priority to ensure overall plant availability. The stated procedures for assuring design and procurement appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering.**

CONCLUSION

The applicant predicts an equivalent availability factor in the range of 98 to 99 percent which staff believes is achievable in light of the industry norm of 89 percent and given the inherent advantage to the applicant for plant availability. Staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation.

RECOMMENDATIONS

No Conditions for Certification are proposed.

REFERENCES

Cal-ISO (California Independent System Operator). 2001. 2001 Demand Relief Program Offering and 2001 Discretionary Load Curtailment Program Offering.

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission, January 23, 1998.

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. Operational Experience in Competitive Electric Generation, an Executive Report, 1994.

NERC (North American Reliability Council). 2001a. 1995-1999 Historical Availability Statistics, Reliability Assessment 2000-2009, 1995-19999 Generating Availability Report.

VCP (Valero Cogeneration Project). Application for Certification, Volume 1 (01-AFC-05). Submitted to the California Energy Commission on May 4, 2001.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's decision. This staff assessment indicates whether the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations, and standards (LORS) required for safe and reliable electric power transmission.

The Valero Refining Company (VRC) -California, the applicant, is at present a PG&E industrial customer in the city of Benicia in Solano County, California. The VRC proposes to construct their project, the Valero Cogeneration Project (VCP), within the Valero Refinery (VRC 2001a, AFC section 1.1, page 1.1) and to be connected through the VCP's 230 kV/12.5 kV existing substation facilities to the Pacific Gas and Electric Company (PG&E) Bahia 230 kV substation, which is part of the California Independent System Operator (Cal-ISO) controlled bulk power system grid. The Cal-ISO is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards. The Cal-ISO will provide testimony at the Energy Commission's hearings.

Staff's analysis also evaluates the power plant switchyard, outlet line and termination facilities identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.

- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability

Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance” which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

- North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the project. Also of major importance to projects which may sell power to the California deregulated wholesale market are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol requires that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and so that if congestion is anticipated, the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine the actual net power output required by the generating units to meet their scheduled obligations. (Cal-ISO 1998a, Cal-ISO 1998b).

- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

Existing Facilities

At present the VRC is a PG&E industrial customer in the city of Banecia in Solano County, California and is receiving power at the PG&E Bahia 230 kV substation through the VRC's three 56 MVA, 230 kV/12.5 kV transformers (VRC 2001a, AFC section 2.2, Appendix D). From Bahia substation the power is transmitted inside the refinery for distribution to loads to a 12.5 kV switch house through three 12.5 kV overhead lines. The PG&E Bahia 230 kV substation has a 3-section single bus construction (sections D, E & F) with 2000 ampere bus section breakers. Each section of the 230 kV bus is carrying a 56 MVA, 230 kV/12.5 kV transformer for the VRC through a 1200 ampere breaker, sections F and D are carrying 230 kV lines to Vaca Dixon and Moraga respectively through a 2000 ampere breaker, and each of the sections E and F is carrying a 56.6 MVA distribution transformer bank. Each 56 MVA transformer 12.5 kV terminals are connected to an overhead line initially through a 3000 ampere breaker and then through a 500 feet long 3000 kilo-circular mills (KCML) paper insulated lead covered (PILC) underground riser cable, 2 cables per phase, with a normal thermal rating of 65 MVA. The 12.5 kV switch house located within the fenced yard of the VRC has a 3-section 3000 ampere single bus configuration with two 3000 ampere normally open bus section breakers with automatic transfer scheme, each section is carrying one of the three 12.5 kV overhead lines through a 3000 ampere breaker. Each of the three 12.5 kV overhead lines, now existing between a 3000 ampere breaker at the 12.5 kV switch house and an underground riser cable connected to a 56 MVA transformer 12.5 kV side 3000 ampere breaker at Bahia substation, is about 3000 feet long and constructed with 1113 KCML, all aluminum conductors (AAC), named "Marigold", 3 conductors bundled per phase, with a normal thermal rating of 65 MVA.

Interconnection Facilities and Switchyard

The VCP site will be near the existing 12.5 kV switch house, about 1650 feet apart, within the fenced yard of the VRC. The VCP will consist of two combustion gas turbine generating units (units 1 & 2), 51 MW each, for a total nominal output of 102 MW (VRC 2001a, AFC section 1.1). Each of the new 12.5 kV generating units will terminate in its 3000 ampere 12.5 kV single bus through a 3000 ampere breaker (VRC 2001a, AFC section 2.2, Appendix D). At each of the two generator buses, the outlet, a 3000 KCML directly buried PILC underground cable, about 900 feet long and 2 cables per phase with a normal thermal rating of 65 MVA, will be connected through a 3000 ampere breaker. The underground cables from the power plant switchyards will terminate in a new 12.5 kV power house, adjacent to the existing 12.5 kV switch house. The new 12.5 kV power house will have a 3-section 3000 ampere single bus construction with two 3000 ampere normally open bus section breakers, section 1 will carry the new generating unit 1 underground cable outlet through a 3000 ampere breaker, section 3 will carry the new generating unit 2 underground cable outlet through a 3000 ampere breaker and each of the three bus sections will loop in and out of one of the three

existing 12.5 kV overhead lines (between the existing 12.5 kV switch house and the underground cable risers connected to 56 MVA transformer 12.5 kV side breakers at Bahia substation) through 3000 ampere breakers on each side of the bus. This configuration for the new cogen plant interconnection and switchyard will provide the following:

a) To consume directly the power generated by the new cogen units for the refinery load and to transmit the excess cogenerated power to the Cal-ISO 230 kV grid through the three 12.5 kV overhead lines inside the refinery and the three 56 MVA, 230 kV/12.5 kV transformers at PG&E Bahia substation. OR

b) To receive power, per present practice, from the Cal-ISO 230 kV grid through the VRC's three 56 MVA, 230 kV/12.5 kV transformers at PG&E Bahia substation and to transmit the power inside the refinery through the three 12.5 kV ovehead lines for consumption in the refinery load, when there will be no or less cogeneration by the new VCP generators.

c) This configuration for the cogeneration interconnection and switchyard is in accordance with good industrial and utility practices, and is considered acceptable. All work will be done within the fenced yard of the VRC and PG&E Bahia substation.

SYSTEM ANALYSIS AND IMPACTS

Transmission Lines

Besides the12.5 kV interconnection facilities and switchyards as proposed by the applicant (discussed above), accommodating the power output of the VCP will not require any new or modified 230 kV transmission line.

Downstream Impacts

The project impacts on the 230 kV transmission system downstream of the interconnection facilities are discussed in the System Reliability section. While an additional study report from PG&E is still awaited, the updated studies indicate no adverse impact on PG&E Bahia 230 kV substation and the surrounding 230 kV system. The staff anticipates no requirement for any new or modified 230 kV transmission line or mitigation measures.

The preliminary short circuit study performed by the VRC staff indicate that the maximum available fault current in the refinery 12.5 kV system is now 23 kilo-ampere (KA) i.e. 500 MVA and will increase significantly with the addition of the new generators. A final short circuit study will be performed during the detailed engineering for the project (VRC 2001c, AFC supplemental II). To limit the available fault current in the 12.5 kV system with the addition of the new generators to 32 kA (692 MVA), the VRC has proposed to install several current limiting reactors in the proposed 12.5 kV interconnection facilities for the new generators and to trigger sectionalizing schemes in the 12.5 kV system in the event of a fault. These mitigation measures will allow the 12.5 kV equipment to withstand the increased fault current due to the addition of the

new generators. All work will be done within the fenced lines of the VRC and would not cause any significant environmental impacts.

SYSTEM RELIABILITY

Introduction

A system reliability impact study for connecting a new power plant to the existing power system grid is performed to determine the interconnection facilities to the grid, downstream transmission system impacts and their mitigation measures in conformance with system performance levels as required in Utility reliability criteria, NERC planning standards and WSCC reliability criteria. The study identifies both positive and negative impacts, and also the reliability criteria violation cases i.e. the negative impacts determine the additional transmission facilities or other mitigation measures. The study is conducted without, and with the new generation project and its interconnection facilities with the computer model cases for the year the project will come on-line. The study in general includes Load Flow study, Transient Stability study and Short Circuit study focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages) and short circuit duties. The study must be conducted under normal condition (N-0) of the system with all system elements in service for the scenario and also for all appropriate contingency/emergency conditions, which include the loss of a single system element (N-1) such as a transmission line or a transformer or a generator, and also include the simultaneous loss of two system elements (N-2) such as two transmission lines or a transmission line and a generator. In addition to the above analysis special studies may be performed to measure system losses and to verify whether sufficient active or reactive powers are available in the area system or area sub-system to which the new generator project will be added.

Scope of Reliability Impact Studies

A Generator Transmission Interconnection study (GTIS), a 7 day study per Executive Order D-26-01, was initially performed by PG&E (VRC, 2001b) and additional GTIS was performed by PG&E (VRC, 2001c) to determine system impacts, and identify downstream facilities and mitigation measures in the PG&E 230 kV bulk power and 115 kV system due to the addition of two new 51 MW VCP units to 12.5 kV buses at Bahia 230 kV substation. The studies were performed with 2002 summer peak and off-peak computer model cases (VRC 2001b&c, AFC supplemental I&II).

System Reliability Impact Study Results

1. **Power Flow Study Results**

   The power flow study was conducted with 2002 summer peak and off-peak cases with and without the 2-51 MW VCP generators for normal conditions (N-0) of the network and under single (N-1) and double (N-2) contingencies at Bahia 230 kV substation and in the surrounding PG&E 230 kV bulk power system. In the study the VRC load was varied between 54 MW and 5 MW for peak and off-peak operational loads of the refinery respectively, so as to analyze the system impacts for minimum and maximum on-line new available generation from the VCP to the Cal-ISO grid

No overloading or voltage violations were found in the transmission system indicating no transmission congestion during normal conditions of the network.

For the single contingency cases performed, no criteria violations were observed in the study and therefore, no mitigation measure is called for.

For double contingency cases performed, one contingency case showed overload conditions. With the outage of Vaca Dixon 230 kV bus section 2E, the Vaca Dixon 230 kV/115 kV transformer nos. 2 and 2A are overloaded by 138% and 115% respectively in both cases with and without the addition of the new VCP units, and therefore, do not call for any mitigation measures due to the addition of the new generators.

More power flow contingency case study especially in 500 kV lines connected to Vaca Dixon 500 kV bus is expected to be performed in the Facility Cost Report (FCR) study which has not yet been provided by PG&E. At this stage, the staff anticipates no criteria violations which can not be mitigated.

2. Transient Stability Study Results

According to the Cal-ISO preliminary interconnection approval letter and the CEC Data Requests, transient stability study results with and without the VCP under critical N-1 and N-2 contingency conditions have not yet been provided by PG&E. On receipt of the study report and stability plots, the reliability impacts in respect of generator and system stability will be clear to the staff. At this stage, the staff anticipates no criteria violations which can not be mitigated.

3. Short Circuit Study Results

The short circuit study was performed by PG&E for a 3 phase fault and a single line to ground fault at Bahia 230 kV bus with and without the new VCP generators. The study results indicate that the breakers or other equipment at Bahia 230 kV substation are not overstressed due to less than 10% increase in fault current for the addition of the VCP and therefore, do not call for any mitigation measures for 230 kV equipment.

The preliminary short circuit study performed by the VRC staff indicate the maximum available fault current in the refinery 12.5 kV system is now 23 kilo-ampere (KA) i.e. 500 MVA and will increase significantly with the addition of the new generators. To limit the available fault current with the addition of the new generators to 32 kA (692 MVA), the VRC has proposed to install several current limiting reactors in the proposed 12.5 kV interconnection facilities for the new generators and to trigger sectionalizing schemes in the 12.5 kV system in the event of a fault. These mitigation measures will allow the 12.5 kV equipment to withstand the increased fault current due to the addition of the new generators.

4. Conclusions

The study report for transient stability analysis and for additional load flow analysis has not yet been provided by PG&E. However, no adverse reliability impact is anticipated on the PG&E bulk power system due to addition of the 102 MW of the

Valero Cogen plant. No major new downstream facilities are anticipated to be required for the interconnection to meet NERC, WSCC and Cal-ISO reliability criteria.

The cogen plant will not only meet their own 54 MW refinery load including about 12 MVAR reactive power demand, but also will meet the local load at the Bahia substation. Moreover, the cogen plant will relieve loading in some 230 kV lines especially in Bahia-Vaca Dixon 230 kV line and loading of the 500 kV/230 kV transformer at Vaca Dixon substation. The power supply to the refinery and Bahia substation will be more reliable during shortage of power supply in the Cal-ISO grid.

Cal-ISO Review

The Cal-ISO has reviewed the Generator Transmission Interconnection Study (GTIS), a 7day study per Executive Order D-26-01, submitted by the applicant in a supplemental filing dated May 15, 2001. PG&E performed the study at the request of the applicant to determine the transmission system impacts and to identify interconnection facilities and downstream transmission facilities due to the addition of 2-51 MW generators to the 12.5 kV bus at Bahia 230 kV/12.5 kV substation. The Cal-ISO has granted preliminary interconnection approval (Cal-ISO, 2001b) for the VCP and recommended development of a Facilities Cost Report (FCR) Study for the Valero Cogeneration Project. The FCR Study will: 1) determine the work scope and costs associated with direct assignment facilities associated with the interconnection the project to the transmission grid. 2) determine the work scope and costs of mitigating any system impacts caused by the addition of the project to the transmission grid. 3) provide transient stability analyses of the project as recommended by the Cal-ISO and the CEC staff data requests. 4) provide additional system analyses as recommended by the Cal-ISO and the CEC staff data requests. Final Interconnection approval will be granted by the Cal-ISO on satisfactory completion of the FCR study. The Cal-ISO will provide testimony as required on the FCR study, will discuss the conclusions and additional analysis requested in their preliminary approval letter, and will provide conclusions and findings in the Energy Commission's hearings. The Cal-ISO final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria.

Cumulative Impacts

Since the VCP will be located at the load center of the VRC and all the proposed facilities will be located within the proposed fence lines of the VRC, the project will not have any significant potential cumulative impacts.

Alternative Transmission Line Routes

No other alternative Interconnection Facilities or transmission lines have been proposed by the applicant. This is acceptable to staff because no significant environmental impacts have been identified for the outlet facilities.

COMPLIANCE WITH LORS

The proposed 12.5 kV switchyards, underground cable outlets and terminations at the new 12.5 kV power house will be located within the fenced yard of the VRC and are

acceptable. The facilities will comply with LORS assuming the recommended conditions of certifications are implemented.

FACILITY CLOSURE

All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). The Participating Generator Agreement includes procedures for planned, unexpected temporary closure and unexpected permanent closure that must be developed or verified to facilitate effective communication and coordination between the generating station owner, the PTO and the Cal-ISO to ensure safety and system reliability.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

There are no agency and public comments received so far. The staff, therefore, has no response.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. Staff's findings indicate that there is no significant unmitigated adverse reliability impacts on the PG&E bulk power system due to the addition of the VCP.
2. The addition of the VCP will increase reliability of power supply to the refinery and to the Bahia substation loads. The VCP will relieve loadings in the PG&E bulk power system to some extent.
3. No new significant downstream facilities are anticipated to be required for interconnection of the VCP to meet NERC, WSCC, and Cal-ISO reliability criteria.
4. The Cal-ISO has issued a preliminary interconnection approval for the VCP and will confirm staff's conclusion upon issuance of the final interconnection approval. The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria.
5. The Cal-ISO will provide testimony on the preliminary approval letter at the Commission's hearings
6. The proposed power plant switchyards, outlet lines, and terminations are located within the fenced yard of the VRC, are acceptable and will comply with LORS assuming the recommended conditions of certification are implemented.

RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of 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 (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for equipment (see a list of major equipment in **Table 1: Major Equipment** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment

DESCRIPTION
Breakers
Power House 12.5 kV
Switchyards 12.5 kV
Buses
Underground cables
Disconnects
Take off facilities
Overhead lines
Switchyard control building
Step-up transformer
Others

TSE-2 Prior to the start of construction 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. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires 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:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 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 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, the project owner shall document the discrepancy and recommend the corrective action required. 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. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have

been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

a) receipt or delay of major electrical equipment;
b) testing or energizing of major electrical equipment; and
c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The substitution of Compliance Project Manager (CPM) and CBO approved "equivalent" equipment and equivalent substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", National Electric Safety Code (NEC) and related industry standards.
b) Breakers and buses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
d) Termination facilities shall comply with CPUC Rule 21 and applicable interconnection standards (PG&E).
e) The project conductors shall be sized to accommodate the full output from the 102 MW plant.
f) The project owner shall provide:
   i) The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Remedial Action Scheme (RAS) sequencing and timing if applicable,
   ii) Executed Facility Interconnection Agreement.

Verification: At least 60 days prior to the start of construction of transmission facilities, the project owner shall submit to the CBO for approval:

a) Design drawings, specifications and calculations conforming with CPUC General Order (GO) 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, CPUC Rule 21, CPUC GO-128, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, underground cables, grounding systems and major switchyard equipment.
b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, CPUC Rule 21, CPUC GO-128 applicable interconnection standards, and related industry standards.
c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.
d) The Facilities Study and signed letter from the applicant stating that mitigation is acceptable 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 approval.

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.

Verification: At least 60 days prior to the construction of transmission facilities, 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.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, CPUC GO-128, NEC and related industry standards. In case of non-conformance, the project owner shall inform

[1] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", CPUC GO-128, CPUC Rule 21, and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in responsible charge.

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:

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

Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator) 2001. California ISO Preliminary Approval letter from Jeffrey Miller, Submitted to the California Energy Commision on May 18, 2001.

VRC (Valero Refining Company-California) 2001a – Application for Certification, Valero Cogeneration Project (01-AFC-5). Submitted to the California Energy Commission on May 4, 2001.

VRC (Valero Refining Company-California) 2001b– Application for Certification, Supplemental I, Valero Cogeneration Project (01-AFC-5). Submitted to the California Energy Commission on May 15, 2001.

VRC (Valero Refining Company-California) 2001c– Application for Certification, Supplemental II, Valero Cogeneration Project (01-AFC-5). Submitted to the California Energy Commission on July 9, 2001.

WSCC (Western Systems Coordinating Council) 1997. WSCC Reliability Criteria, August 1998.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September, 1997.

DEFINITION OF TERMS

AASS	Aluminum cable steel supported. A composite conductor made up of aluminum wire with a steel core, which supports the conductor.
ACSR	Aluminum cable steel reinforced. A composite conductor made up aluminum wire with a steel core, which reinforces the conductor.
AAC	All Aluminum Conductor
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.

Bundled	More than one conductor connected together.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation, and transmission loading (imports) will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcml	Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.
Kilovolt	kV. A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
Loop	An electrical cul de sac. A transmission configuration, which interrupts an existing circuit, diverts it to another connection and returns a different circuit forming a loop or cul de sac.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.
Megavolt ampere	MVA. A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.
Megawatt	MW. A unit of power equivalent to 1,341 horsepower.
Normal Operation/ Normal Overload	When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency.
Outlet	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis	A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.
PILC cable	Paper Insulated Lead Covered cable
Reactive Power	Reactive power is generally associated with the reactive nature such as motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.
Remedial Action Scheme (RAS)	A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.
SF6	Sulfur hexafluoride is an insulating medium.
Single Contingency	Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.
Solid dielectric cable	Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.
Thermal rating	See ampacity.
TSE	Transmission System Engineering.
TRV	Transient Recovery Vlotage
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line – generally at 90 degrees.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) principle transmission line

ALTERNATIVES

Testimony of Jack W. Caswell and Kevin Kennedy

PURPOSE OF THE ALTERNATIVES ANALYSIS

Staff is required to examine the "feasibility of available site and facility alternatives to the applicant's proposal that substantially lessen the significant adverse impacts of the proposal on the environment". The purpose of staff's alternatives analysis is to provide the Energy Commission with an analysis of a reasonable range of feasible alternative sites which could substantially reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, § 1765). This analysis reviews the potential significant impacts of the proposed project and evaluates the ability of technology alternatives and alternative sites to meet the project objectives and reduce or avoid significant impacts.

ALTERNATIVE ANALYSIS CRITERIA

The "Guidelines for Implementation of the California Environmental Quality Act" (CEQA), Title 14, California Code of Regulations Section 15126.6(a), provide direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must address the "no project" alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. CEQA states that an environmental document does not have to consider an alternative of which the effect cannot be reasonably ascertained and of which the implementation is remote and speculative (Cal. Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (*City of Santee v. County of San Diego* (4th Dist. 1989) 214 Cal. App. 3d 1438).

To prepare this alternatives analysis, staff used the following methodology:

- identify the basic objectives of the project;
- identify and evaluate alternatives to the project;
- identify and evaluate alternative locations or sites; and
- evaluate the impacts of not constructing the project (the "no project" alternative).

SCOPE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to provide the Energy Commission with a reasonable range of feasible alternatives which could substantially reduce or avoid any

potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potential significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding significant impacts. Consideration was also given to the ability of the alternatives to meet the underlying objectives of the proposed project.

BASIC OBJECTIVES OF THE PROJECT

After studying the Applicant's Application for Certification (AFC), Energy Commission staff has determined that the project has the following primary objectives:

1. To provide the Valero Refinery with a reliable source of electrical energy and steam;

2. To minimize environmental and other impacts from the project by locating on or near the existing Valero Refinery plant and making use of the existing infrastructure to the extent possible, including transmission line interconnections, supplies of process water and fuel supplies; and

3. To increase electrical generation capacity available to meet peak demand in California.

PROJECT DESCRIPTION AND SETTING

A more complete description of the project and its setting is in the **Project Description** section of this Staff Assessment (SA).

PROJECT SETTING

The VCP is proposed for a site within the Valero refinery located in the City of Benicia, Solano County. This oil refinery facility and provides gasoline supplies to the open market. Prior to establishment of the refinery, the property was part of the Benicia Arsenal, which was established in 1851. The arsenal property was closed in 1962, and included some of the hills surrounding the Benicia Refinery. The surrounding area is bordered by highways 680 and 780 to the west and is designated as a major industrial area with other refinery process plants and petroleum storage as typical land use. VCP's existing refinery plant characterizes much of the terrain. Scattered throughout the area are seaport facilities for oil distribution, access roads, power supply lines, and pipelines for assorted uses. **Alternative Figure 1** provides a view of the over-all refinery plant setting, **Alternative Figure 2** provides a view of the proposed transmission route within the refinery boundaries.

“ALTERNATIVES FIGURE 1”
Proposed Site and Related Facilities

“ALTERNATIVES FIGURE 2”
Transmission Line Route and Related Facilities

PROJECT DESCRIPTION

Power Plant

The proposed VCP is a nominal 102-megawatt, simple-cycle, refinery gas-fired power plant with two combustion turbine generators/heat recovery steam generator (HRSG) combinations. VCP will provide adequate power to run the refinery, replacing approximately 50 MW now taken from the grid, and export approximately 50 MW to the grid. Steam generated in the two HRSGs would be used to replace existing boilers that provide steam for the refining process. Overall air emissions from the refinery will be reduced when the VCP replaces the existing boilers. The power plant would be located on 1.9-acres within the refinery grounds. The facility operation will be accomplished with existing full time Valero Refinery employees.

Related Facilities

Transmission Line

Electricity generated by the Valero facility would be transmitted through underground cables approximately 1,000 feet in length to a new 12 kV switchyard within the Valero Refinery. No additional transmission lines are required for this project. The tie-in to the existing transmission system will be via the new 12 kV Switchyard.

Water Supply

The cooling water required for this project will be supplied by a small packaged cooling water system. All other water needs will be met by the City of Benicia via existing facilities. The additional supply of water is covered by a contract agreement with the City of Benicia and the City's agreement for North Bay Aqueduct water provided by the State Water Project.

Wastewater Disposal

Several on-site collection areas direct storm water, boiler blowdown, and cooling water blowdown to the refinery's wastewater treatment plant. The current refinery Waste Discharge permit for the Valero Refinery process will accommodate the proposed generating VCP facility.

Gas Supply

The Valero Refinery fuel production and pipelines located within the refinery boundaries will supply refinery fuel gas as a source for the generators. Natural Gas provided by an existing PG&E pipeline would serve as a backup fuel supply. This refinery pipeline would be mounted above ground on pipe supports and is consistent with all existing pipe routing in the refinery facility.

POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

At this time there are no technical areas that have been identified as having potentially significant environmental impacts that cannot be mitigated to less than significant levels.

Staff has determined that in the areas of air quality, geology, paleontological resources, noise, soil and water resources, traffic and transportation, and visual resources, some impacts require mitigation to ensure that they are less than significant. These impacts are described briefly below, and in more detail in the appropriate sections of this staff assessment.

AIR QUALITY

Staff has determined that mitigation measures are necessary to ensure that the impacts associated with, construction, operation, flue gas controls, and cooling towers will be required to insure that the impacts are reduced to less than significant levels. Specifically in the areas of, NOx, SOx, POC, VOC, CO, and PM10 staff has proposed Conditions of Certification (**AQ-1** through **AQ-85**) that mitigate these impact levels. The Bay Area Air Quality Management District has submitted a Preliminary Determination of Compliance to further insure that impacts are reduced to levels below significant.

GEOLOGY

Staff has determined that the cuts proposed for this project could expose adverse dipping planes in the site bedrock, and that expansive soils are present at the site. Both conditions result in the possibility of significant impacts if not appropriately mitigated. Staff has proposed Conditions of Certification (**GEO-2** and **GEO-3**) that mitigate these impacts to less than significant levels.

NOISE

The construction of this facility has the potential to create significant noise impacts unless appropriate mitigation measures are adopted. Staff has determined that, construction noise impacts to the surrounding community can be mitigated to meet local community standards. Operational noise levels in the surrounding community are also expected to comply with local standards. Noise levels from both construction and operation for workers require mitigation to comply with all applicable occupational safety standards. Staff has proposed a series of Conditions of Certification (**NOISE-1** through **NOISE-8**) that will ensure compliance with all local community and occupational noise standards and will reduce potential noise impacts from the construction and operation of the project to less than significant levels.

PALEONTOLOGICAL RESOURCES

No paleontological resources have been discovered during previous activities at the project site, but the discovery of unanticipated resources during the construction of the project could result in a significant impact if not appropriately mitigated. Staff has proposed a Condition of Certification (**PAL-1**) that mitigates any impact from such unanticipated discoveries to less than significant levels.

SOIL AND WATER RESOURCES

Staff has determined that mitigation measures are necessary to ensure that the impacts associated with water use, erosion, stormwater drainage and the removal of potentially contaminated soils will not result in potentially significant impacts. Staff has proposed a

series of Conditions of Certification (**SOIL&WATER-1** through **SOIL&WATER-6**) that will ensure that these impacts are mitigated to less than significant levels.

TRAFFIC AND TRANSPORTATION

Staff has determined that construction and operation of this project will not, on its own, result in any potentially significant traffic and transportation impacts. However, the Valero Refinery is also planning a second major construction project, the phase out of methyl tertiary butyl ether (MTBE), during the same general time frame as this project. The cumulative effect of the two projects could result in potentially significant impacts in terms of traffic on surrounding roads and in terms of parking if not properly mitigated. Staff has proposed two Conditions of Certification (**TRANS-5** and **TRANS-6**) that will ensure that the cumulative impact of these projects does not result in a significant impact on surrounding roads. Staff has also proposed Condition of Certification **TRANS-1** requiring that the applicant provide sufficient parking to ensure that no significant impacts result from the construction of the project.

VISUAL RESOURCES

Staff has determined that nighttime lighting at the VCP project requires mitigation to ensure that the visual will not result in potentially significant impacts. Staff has proposed a Condition of Certification (**VIS-2**) that will ensure that these impacts are mitigated to less than significant levels.

ALTERNATIVES TO THE PROJECT

GENERATION TECHNOLOGY ALTERNATIVES

Public Resources Code, section 25305(c) limits the scope of the alternative analyses during a siting case under specific conditions. These section states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's Electricity Report and shall not be considered as alternatives to a proposed facility during the siting process. Thus, such alternatives are not included in this SA.

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Because one of the key objectives of the VCP project is to provide process steam to the Valero Refinery, only technologies utilizing thermal generation processes were considered. The proposed VCP is designed to replace existing steam boilers, which will result in a net reduction in air emissions from the Valero Refinery. The technologies examined were those principal thermal electricity generation technologies that do not burn fossil fuels: solar thermal, geothermal and biomass.

Solar thermal generation technologies do not provide the continuous reliable power that is one of the key objectives for the VCP. Solar resources also require large land areas in order to generate electricity. Specifically, utility scale solar projects require between four and ten acres per megawatt depending on the type of system (parabolic trough,

parabolic dish, or central receiver systems) (CEC 1996, pp. B.14.1, B.15.1-2). A project comparable to the proposed 102 megawatt VCP would require a minimum of 400 acres, or more than 200 times the amount of space taken by the proposed project. Wind generation "farms" generally require about 17 acres per megawatt, with 102 megawatts requiring 1,734 acres, more than 850 times the amount of space taken by the proposed plant site and linear facilities (CEC 1996, pp. B.16.1). Because this technology cannot provide continuous reliable power and because of the large land area required, staff does not believe solar thermal technologies provide a feasible alternative to the proposed project.

Geothermal resources are available in limited areas of California, including the Geysers area north of Benicia (CEC 2000). While development of additional geothermal resources in California is possible, geothermal power resources are not available in close enough proximity to the Valero Refinery to allow such a project to provide process steam. Because the provision of process steam is one of the key objectives of the VCP project, staff does not believe geothermal power provides a feasible alternative to the project.

Biomass plants are typically under 10 MW, substantially smaller than the expected capacity of the proposed 102 MW VCP project. Emissions from biomass projects are also typically greater than from gas-fired projects. For these reasons, staff does not believe biomass power provides a feasible alternative to the proposed project.

SITING AND RELATED FACILITIES ALTERNATIVES

Power Plant Siting Alternatives

The objectives of this project include provision of reliable supplies of both electricity and steam to the Valero Refinery. Because steam cannot be transported for long distances, to meet this objective, the project must be located in close proximity to the refinery. As discussed above, the use of VCP to provide steam for the refinery is intended to allow the shut down of existing steam boilers, which will reduce net emissions from the refinery. Location of the project too far from the refinery for steam distribution would require that the steam boilers remain in operation, resulting in a net increase in emissions from the refinery. For this reason, only locations in close proximity to the Valero Refinery have been considered.

Without more detailed evaluation of a particular site, staff is uncertain whether impacts related to cultural resources, geology, paleontological resources, and traffic and transportation, would increase or decrease. However, staff has proposed mitigation measures for the proposed project that reduce the impacts in these areas to less than significant levels. The noise and visual resource impacts would be likely to increase by moving the project out from the middle of the refinery site and placing it in an area without refinery operations. Because a site in this area would reduce the ability of the project to meet its basic objectives and because impacts in some technical areas would be likely to increase, staff has not conducted a more detailed evaluation of potential sites in this industrial area.

Alternative sites within the main refinery complex have not been considered as part of this analysis, since the impacts associated with such sites are likely to be similar to those associated with the proposed site. Undeveloped Valero-owned land lies south and west of the refinery complex, but serves as a buffer zone between refinery operations and residential land uses in those directions. These areas would likely increase the impacts from the proposed project, and have also been eliminated from consideration.

Industrial land uses are present east of the refinery property. Locating the project in this area would increase the length of the fuel and steam pipelines and the transmission line needed for the project. The longer steam line would reduce the efficiency with which the VCP could provide steam to the refinery.

No other areas that are feasible for the proposed project are sufficiently close to the refinery site to meet the project's objectives.

Related Facilities Alternatives

The place of the proposed project in close proximity to existing refinery infrastructure reduces the need for substantial new pipelines, transmission lines, or other related facilities. For this reason, no alternatives to the proposed related facilities are considered in this analysis.

THE "NO PROJECT" ALTERNATIVE

CEQA Guidelines and Energy Commission regulations require consideration of the "No Project" alternative. This alternative assumes that the project is not constructed, and is compared to the proposed project. A determination is made whether the "no project" alternative is superior, equivalent, or inferior to the proposed project.

If the proposed project is not licensed, new air emissions from the project will be avoided but the existing steam boilers would remain in operation. This would result in a net increase in emissions from the Valero Refinery compared to allowing the proposed project to operate. The project will comply with all air quality requirements. Staff has not identified any impacts that cannot be mitigated to less than significant levels resulting from the proposed project. In addition, the reliability of electrical supply at the refinery would be lower, and the refinery would continue to draw approximately 50 MW from the grid that would otherwise be available to supply peak demand to other users in the state.

The project also offers economic benefits. The "No Project" alternative would also eliminate the expected economic benefits, which the proposed project would bring to Solano County. These include minimum property tax revenues of approximately $1 million annually. Local construction supply and materials purchases are estimated to be $5 million, with another $10,000 in direct school impact fees. Plant operations are not expected to create any additional permanent jobs at the Valero Refinery facility (01-AFC-5, pp. 6.6-1 and 6.7-2).

Staff has determined that the "No Project" alternative is not superior to the proposed project. The Valero Cogeneration project would not have any significant environmental

impacts. Staff believes measures proposed by staff and the applicant will reduce any impacts to less than significant levels. Alternative technologies are not able to meet the basic objectives of the project. Alternative sites would not serve to reduce significant environmental impacts without impeding the achievement of project objectives. In addition, staff recognizes potential economic benefits will be derived from the project. Therefore, staff believes that, overall, the “No Project” alternative is not superior to the proposed project.

CONCLUSIONS AND RECOMMENDATION

Staff has determined the proposed power plant as suggested in the AFC Project Description is the best option among those discussed. The proposed project does not result in any impacts that cannot be mitigated to less than significant levels. Alternatives have limited ability to meet the project objectives. Staff recommends that the Energy Commission find the proposed Valero Cogeneration Project to be the preferred option for this project.

REFERENCES

California Energy Commission (CEC). 1996. Energy Aware: Planning Guide for Energy Facilities. California Energy Commission, Sacramento, California. P700-96-006.

California Energy Commission (CEC). 2000. Map of Geothermal Resources in California, http://www.energy.ca.gov/maps/geothermal_map.html, accessed July 23, 2001.

VCP (Valero Cogeneration Project Application for Certification 01-AFC-5, May 7, 2001, sections 1.0, 2.0, 4.0, 5.0)

VCP (Valero Cogeneration Project Supplement to Application for Certification 01-AFC-5 June 6, 2001)

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Jeri Zene Scott

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:
   - set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
   - set forth the requirements for handling confidential records and maintaining the compliance record;
   - state procedures for settling disputes and making post-certification changes;
   - state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
   - establish requirements for facility closure plans.

2. Specific conditions of certification:
   - Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION:

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is therefore not considered construction.

GROUND DISTURBANCE:

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING:

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION:

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

a. The installation of environmental monitoring equipment.
b. A soil or geological investigation.
c. A topographical survey.
d. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility.
e. Any work to provide access to the site for any of the purposes specified in a., b., c., or d.

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and,
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and,
4. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. The post-certification changes do not include changes related to replacement of the simple-cycle power plant with a combined-cycle power plant pursuant to section 25552 of the Public Resources Code. All facility changes related to replacement of the power plant will be addressed through the review of an Application for Certification for the replacement combined-cycle power plant. Failure to comply with

any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

Access

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all "as-built" drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

Compliance Verifications

Each condition of certification is followed by a means of "verification". The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition**

number and include a brief description of the subject of the submittal. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
Valero Cogeneration Project (01-AFC-5)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area,
2. the condition number,
3. a brief description of the verification action or submittal required by the condition,
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
5. the expected or actual submittal date,
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable, and

7. the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

Pre-Construction Matrix

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner’s **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

Tasks Prior to Start of Construction

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner’s own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Monthly Compliance Report

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;

2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

Annual Compliance Report

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;

4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

Confidential Information

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

Department of Fish and Game Filing Fee

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars ($850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

Reporting of Complaints, Notices, and Citations

Prior to the start of construction, the project owner must send a letter to property owners living within 1,000 feet of the project site and 500 feet of the linear facilities notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be

recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on the following page.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

COMPLAINT LOG NUMBER _____
Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):
Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:
Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:
If not, explain:

Other relevant information:

If corrective action necessary, date completed:
Date first letter sent to complainant: _____(copy attached)
Date final letter sent to complainant: _____(copy attached)

This information is certified to be correct.
Plant Manager's Signature: _____ Date:

(Attach additional pages and supporting documentation, as required.

CONSTRUCTION MILESTONES

The following is the procedure for establishing and enforcing milestones, which include milestone dates for pre-construction and construction phases of the project as required by the Governor's Executive Order D-25-01.

Milestones, and method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after project approval, the date of docketing. If this deadline is not met, the CPM will establish the milestones.

I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION WITHIN ONE YEAR OF CERTIFICATION

1. Obtain site control.
2. Obtain financing.
3. Mobilize site.
4. Begin rough grading for permanent structures (start of construction).

II. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION

1. Begin pouring major foundation concrete.
2. Begin installation of major equipment.
3. Complete installation of major equipment.
4. Begin gas pipeline construction.
5. Complete gas pipeline interconnection.
6. Begin T-line construction.
7. Complete T-line interconnection.
8. Begin commercial operation.

The CPM will negotiate the above-cited pre-construction and construction milestones with the project owner based on an expected schedule of construction. The CPM may agree to modify the final milestones from those listed above at any time prior to or during construction if the project owner demonstrates good-cause for not meeting the originally-established milestones. Otherwise, failure to meet milestone dates without a finding of good cause is considered cause for possible forfeiture of certification or other penalties.

III. A finding that there is good cause for failure to meet milestones will be made if any of the following criteria are met:

1. The change in any milestone does not change the established commercial operation date milestone.
2. The milestone is changed due to circumstances beyond the project owner's control.
3. The milestone will be missed, but the project owner demonstrates a good-faith effort to meet the project milestone.
4. The milestone will be missed due to unforeseen natural disasters or acts of God which prevent timely completion of the milestones.

If a milestone date cannot be met, the CPM will make a determination whether the project owner has demonstrated good cause for failure to meet the milestone. If the determination is that good cause exists, the CPM will negotiate revised milestones.

If the project owner fails to meet one or more of the established milestones, and the CPM determines that good cause does not exist, the CPM will make a recommendation to the Executive Director. Upon receiving such recommendation, the Executive Director will take one of the following actions.

1. Conclude that good cause exists and direct that revised milestones be established; or
2. Issue a reprimand, impose a fine, or take other appropriate remedial action and direct that revised milestones be established; or
3. Recommend, after consulting with the Siting Committee, that the Commission issue a finding that the project owner has forfeited the project's certification.

The project owner has the right to appeal a finding of no good cause, or any recommended remedial action to the full Commission.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting that will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure shall be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

Unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or other emergency.

UNEXPECTED PERMANENT CLOSURE

Unplanned permanent closure occurs when the project owner closes the facility suddenly and/or unexpectedly on a permanent basis. This includes the scenario in which the owner remains accountable for implementing the on-site contingency plan as well as the scenario in which the project owner is unable to implement the contingency plan and the project is essentially abandoned.

PLANNED CLOSURE

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.

2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;

3. identify all facilities or equipment that will a) be immediately removed from the site after closure (e.g., hazardous materials); b) <u>temporarily</u> remain on the stie after closure (e.g., until the item is sold or scrapped): and c) <u>permanently</u> remain on site after closure. The plan must explain both why the item cannot be removed and why it does not present a risk of harm to the environment and the public health and safety to remain *insitus* for an indefinite period; and

4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion, as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforeseeable events, and other factors the Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the

complaint and investigation process. The procedure for informal dispute resolution is as follows:

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,

4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.
The criteria that determine which type of change process applies are explained below.

AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

INSIGNIFICANT PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does <u>not</u> require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

VERIFICATION CHANGE

Pursuant to Title 20, California Code of Regulations, section 1770 (d), the staff may modify the verification provisions as necessary to enforce the conditions of certification without requesting an amendment to the decision.

This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

KEY EVENT LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Rough Grading	
Start Construction	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Fuel Supply Line Construction	
COMPLETE FUEL SUPPLY LINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

PREPARATION TEAM

Project Manager ..... Jack Caswell
Staff Counsel ..... Paul Kramer
Project Assistant ..... Luz Manriquez
Air Quality ..... Matt Layton
Alternatives ..... Jack Caswell/Kevin Kennedy
Biological Resources ..... Rick York/Julie Colyer
Cultural Resources ..... Richard S.Shepard
Executive Summary ..... Jack Caswell
Facility Design ..... Brian Payne
General Conditions of Exemption ..... Jeri Scott
Geology, Paleontology, Soils, and Mineral Resources ..... Patrick Pilling
Hazardous Materials and Worker Safety ..... Alvin Greenberg/Rick Tyler
Introduction ..... Jack Caswell
Land Use ..... Eileen Allen
Noise ..... Jim Buntin
Power Plant Efficiency ..... Rich Minetto
Project Description ..... Jack Caswell
Public Health ..... Obed Odoemelam
Power Plant Reliability ..... Rich Minetto
Socioeconomics ..... Negar Vahidi
Soil and Water Resources ..... Mike Krolak/John Kessler
Traffic and Transportation ..... Jim Fore
Transmission Line Safety and Nuisance ..... Obed Odoemelam
Transmission System Engineering ..... Al McCuen and Ajoy Guha
Visual Resources ..... Jim Adams
Waste Management ..... Mike Ringer