

Staff Assessment

# MALBURG GENERATING STATION PROJECT

Application For Certification (01-AFC-25)  
Los Angeles County



**CALIFORNIA  
ENERGY  
COMMISSION**

**STAFF ASSESSMENT**

SEPTEMBER 2002  
(01-AFC-25)



Gray Davis, Governor

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**CALIFORNIA  
ENERGY  
COMMISSION**

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# EXECUTIVE SUMMARY

Testimony of William Pfanner

On December 18, 2001, the City of Vernon filed an Application for Certification (AFC) for the Malburg Generating Station (MGS or Project) seeking approval from the California Energy Commission to construct and operate a 134 megawatt (MW) natural gas-fired, combined cycle power generating facility.

On May 8, 2002, the Energy Commission found the AFC to be Data Adequate, thus initiating an expedited review process to consider the application for certification. The analyses contained in this initial Staff Assessment (SA) are based upon information from: 1) the AFC; 2) responses to initial data requests, workshops, and site visits; 3) supplementary information from federal, state, and local agencies; 4) existing documents and publications; and 5) staff research.

The AFC is being reviewed under an expedited six-month review process in accordance with the emergency siting regulations implementing Public Resources Code section 25550 (AB 970, Chapter 329, Statutes of 2000). These regulations require local, regional, and State agencies to provide their final comments, determinations and opinions within 100 days of the date an AFC is deemed Data Adequate.

This SA contains the California Energy Commission staff's independent analysis and recommendations on the MGS. The MGS and related facilities such as the project's associated natural gas line and water supply lines are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency (Pub. Resource Code § 25519(c)) under the California Environmental Quality Act (Pub. Resource Code §§ 21000 et seq.). Its process has been certified by the Secretary for Resources, allowing the Commission's siting plan documentation to be used in lieu of an environmental impact report (Cal. Code Regs., tit. 14 § 15251(k)).

It is the responsibility of the Energy Commission staff to complete an independent assessment of the project's potential effects on the environment, the effects on the public's health and safety, and determine whether the project conforms to all applicable laws, ordinances, regulations and standards (LORS). Staff also recommends measures to mitigate potential significant adverse environmental impacts associated with the construction, operation, and eventual closure of the project, if approved by the Energy Commission.

This SA is not the decision document for the Energy Commission. It is preliminary in nature and represents preliminary conclusions at the staff level only. The final decision on the proposed project will be made by the Commissioners of the California Energy Commission only after submission of a Final Addendum to this SA and testimony of the applicant and other parties, and evidentiary hearings. The Commissioners will consider the recommendations of all interested parties, including those of the Energy Commission staff; the applicant; intervenors; concerned citizens; and local, state, and federal agencies, before making a final decision on the application to construct and operate the MGS.

## PROJECT LOCATION AND DESCRIPTION

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The Project would be located on approximately 3.4 acres of the City of Vernon's existing Station A complex. The existing site includes 5.9 acres, located at 2715 East 50<sup>th</sup> Street, in Vernon, California. The City is located near the geographic center of metropolitan Los Angeles County. The City is bordered on the north and west by the city of Los Angeles, on the east by the cities of Commerce and Bell, and on the south by the cities of Huntington Park and Maywood.

The general location of the MGS is shown on Figure 1, See **Project Description Figure 1**. An aerial view of the plant layout **Project Description Figure 2** shows the existing power plant site and electrical substation. The project will interconnect with the existing substation so no new transmission lines are required. **Project Description Figure 3** provides a view of how the plant would look on the site. **Project Description Figure 4** shows elevations of the power plant facilities.

Linear facilities for the MGS would include new 1,300-foot long natural gas and sewer pipelines to the existing gas system and existing sewer system respectively, and a new 18-inch diameter, approximately 1.8-mile long reclaimed water pipeline to deliver reclaimed water to the MGS site from the existing Central Basin Municipal Water District (CBMWD) reclaimed water supply system. The Project is designed to use reclaimed water as the primary source of cooling tower, evaporation coolers, and steam cycle makeup water needed by MGS.

A 1,300-foot long 12-inch sewer line from the Project to Fruitland Avenue will be required for discharge to the local sewer. The existing sewer trunk is capable of handling all wastewater flows from the Project. The wastewater will flow to the County Sanitation District of Los Angeles County existing treatment facility. No improvements to the treatment facility are required. The treatment facility is capable of handling all wastewater flows from MGS.

## CONSTRUCTION AND OPERATIONS

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The total Project cost is estimated to be approximately \$100 million dollars. In concert with the six-month review program, the City expects to mobilize to begin construction of the MGS immediately upon certification. The Project construction, including the natural gas, sewer, and reclaimed water pipelines is expected to take about 12.5 months. The initial commissioning of the CTGs will take about 3 months. Thus, the MGS is planned to begin commercial operation by mid 2004 after about a 16-month construction and initial commissioning period.

The MGS is designed to serve the City's electric utility customers. The City expects that MGS, because it incorporates state-of-the-art pollution control and generation equipment, will be one of the most efficient generation facilities available (efficiency for a natural gas-fired combined cycle system is typically 50 to 58 percent). MGS will operate with a capacity factor between 60 and 85 percent, and have an availability factor of 90 to 98 percent. It is projected that the MGS will operate from 5 to 7 days per week and generally 24 hours per day depending upon customer load and weather

conditions. Other factors that can affect the operation of the Project are market and control area conditions for both energy and ancillary services requirements.

## **PUBLIC AND AGENCY COORDINATION**

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A publicly noticed workshop was held on the topics of air quality, cultural resources, soil and water resources, traffic and transportation, transmission system engineering, and visual resources. The workshop was held in the City of Vernon Council Chambers on July 1, 2002. In addition to this workshop, extensive coordination has occurred with the numerous local, state, and federal agencies that have an interest in the project.

Written comments on this initial SA are encouraged and will be considered in staff's Final Addendum. Comments are due by October 25, 2002.

## **INITIAL STAFF ASSESSMENT**

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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.

## **OVERVIEW OF STAFF'S CONCLUSIONS**

Staff believes that in general the project poses little potential for significant environmental impacts. Those potentially significant environmental impacts that have been identified can be mitigated to less than significant levels in all areas except Air Quality, which will require further mitigation. Staff's analysis also indicates that the project can comply with all LORS. Below is a summary of the potential environmental impacts and LORS compliance for each technical area.

<b>Technical Discipline</b>	<b>Environmental/ System Impact</b>	<b>Conforms with LORS</b>
Air Quality	Unresolved	Unresolved
Biological Resources	None	Yes
Cultural Resources	Impacts mitigated	Yes
Power Plant Efficiency	None	N/A
Power Plant Reliability	None	N/A
Facility Design	N/A	Yes
Geology, Mineral Resources, and Paleontology	Impacts mitigated	Yes
Hazardous Materials	Impacts mitigated	Yes
Land Use	N/A	Yes
Noise and Vibration	Impacts mitigated	Yes
Public Health	None	Yes
Socioeconomics	None	Yes
Traffic and Transportation	Impacts mitigated	Yes
Transmission Line Safety	None	Yes
Transmission System Engineering	Impacts mitigated	Yes
Visual Resources	Impacts mitigated	Yes
Waste Management	None	Yes
Water and Soil Resources	Impacts mitigated	Yes
Worker Safety	None	Yes

The following summarizes staff's position with respect to air quality, the only area of special concern during our analysis. For a more complete discussion of conclusions of all environmental impacts, see the respective technical sections of the SA.

### **Air Quality**

Staff identified two significant air quality issues: 1) construction impacts, and 2) cumulative impacts during operation.

Staff has concluded that the potential construction emissions exceed State and Federal standards in all categories except SO<sub>2</sub>. These impacts occur only in the immediate vicinity of the construction site and are attributed to fugitive dust, moving dirt and construction equipment emissions. This condition is likely to exist for only the first two months of the project construction schedule. Compared to other power plant cases, these results are unusually high and can be attributed to the close proximity of the construction site to the project's property lines.

Staff has identified these emissions as a significant impact during the first two month of construction, but has proposed mitigation measures to reduce this short term and localized impact to an acceptable level. Staff recommends monitoring air quality at the construction site during the first two months of construction to ensure that these impacts are reduced to a less than significant level.

The project's direct and secondary PM10 emission impacts (which include the precursor emissions of SOx and NOx), resulting from the operation of the facility, could be significant if left unmitigated. The City has not fully mitigated the SOx and PM10 emission impacts. Staff finds that the PM10 emissions have not been fully mitigated by the purchase of Priority Reserve Credits (PRCs) on both a daily and annual basis. Therefore, staff recommends that the City procure further mitigation beyond the mitigation provided in the amount of 6.8 lbs/day of PM10 and 6.8 lbs/day of SO2.

## **RECOMMENDATIONS AND SCHEDULE**

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The project is being reviewed under the six-month AFC process. Staff anticipates that the resolution of the air quality issues and receipt of a timely Final Determination of Compliance (FDOC) from the South Coast Air Quality Management District (SCAQMD) will be the only items preventing the completion of staff's assessment and the beginning of evidentiary hearings.

SCAQMD completed its Preliminary Determination of Compliance (PDOC) on August 27, 2002. The PDOC is currently under a 30-day (minimum) comment period required before a Final Determination of Compliance (FDOC) can be filed. Staff will conduct a workshop to resolve these outstanding issues.

**CITY OF VERNON - MALBURG GENERATING STATION  
(01-AFC-25)  
STAFF ASSESSMENT**

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# INTRODUCTION

Testimony of William Pfanner

## PURPOSE OF THIS REPORT

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On December 18, 2001, the City of Vernon filed an Application for Certification (AFC) for the Malburg Generating Station (MGS or Project) seeking approval from the California Energy Commission to construct and operate a 134 megawatt (MW) natural gas-fired, combined cycle power generating facility. On May 8, 2002, the Energy Commission found the AFC to be Data Adequate, thus initiating an expedited six-month review process to consider the application for certification.

The Staff Assessment (SA) is the Energy Commission staff's independent analysis of the Project's 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 proposed project;
- the existing environment;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
- the environmental consequences of the project including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors which may lessen or eliminate potential impacts;
- the proposed conditions under which the project should be constructed and operated, if it is certified;
- project alternatives.

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 and publications, 6) independent field studies and research, and 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 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 §25500 et seq. and Title 20, California Code of Regulation §1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, §15000 et seq.).

## ORGANIZATION OF THE STAFF ASSESSMENT

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The **INTRODUCTION** section of this SA 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** analyses, 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. Each technical section ends with a discussion of conclusions and recommendations. Proposed conditions of certification are included, if applicable.

## ENERGY COMMISSION SITING PROCESS

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The California Energy Commission has the exclusive authority to certify the construction, modification and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, §25523 (d)).

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, §§1742 and 1742.5(a)). Staff's independent review shall be presented in a report (Cal. Code Regs., tit. 20, §1742.5). This Staff Assessment is that report.

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

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act. No additional Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been

certified by the Resources Agency as meeting all requirements of a certified regulatory program (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)).

The staff prepares a SA and presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's analysis, conclusions, and recommendations. Where staff believes it is appropriate, the SA incorporates comments received from agencies, the public and parties to the siting case, and comments made at the workshops.

Staff will provide a comment period to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period after the publishing the SA, staff will conduct workshops to discuss its findings, proposed mitigation, and proposed compliance-monitoring requirements. Based on the workshops and written comments, staff may refine its analysis, correct errors, and finalize conditions of certification to reflect areas where agreements have been reached 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. The hearing before the Committee also 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. 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 party may appeal the decision to the Energy Commission.

## **PUBLIC AND AGENCY COORDINATION**

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The MGS is proposed on land currently zoned for a power plant. Publicly noticed workshops on air quality, cultural resources, geology, socioeconomics, traffic and transportation, transmission system engineering, visual resources, soil and water, and other issues have been held in the City of Vernon.

In addition to these workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with the City of Vernon, County of Los Angeles, California Independent System Operator (Cal-ISO), South Coast Air Quality Management District, California Air Resources Board, U.S. Environmental Protection

Agency and the Regional Water Quality Control Board to identify and resolve issues of concern. In addition, Commission staff has coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, California Departments of Fish and Game, and Parks and Recreation, U.S. Army Corp of Engineers, intervenors, and the interested residents of the community.

# PROJECT DESCRIPTION

Testimony of William Pfanner

On December 18, 2001, the City of Vernon filed an Application for Certification (AFC) for the Malburg Generating Station (MGS or Project) seeking approval from the California Energy Commission to construct and operate a 134 megawatt (MW) natural gas-fired, combined cycle power generating facility.

## PROJECT LOCATION

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The Project would be located on approximately 3.4 acres of the City of Vernon's existing Station A. The existing site includes 5.9 acres, located at 2715 East 50<sup>th</sup> Street, in Vernon, California, in Township 25, Range 13 West, San Antonio Spanish Land Grant, in Los Angeles County. The assessor's parcel number for the site is 6308-002-900. The site is owned by the City.

The Project would be located in an industrial land use area in Vernon. The City is located near the geographic center of metropolitan Los Angeles County. The City is bordered on the north and west by the city of Los Angeles, on the east by the cities of Commerce and Bell, and on the south by the cities of Huntington Park and Maywood. Vernon is three miles southeast of downtown Los Angeles and 15 miles north of the major harbor and port facilities in San Pedro and Long Beach. The City is located within two miles of four major freeways.

The general location of the MGS is shown on Figure 1, See **Project Description Figure 1**. An aerial view of the plant layout **Project Description Figure 2** shows the existing power plant site and electrical substation. **Project Description Figure 3** provides a view of how the plant would look on the site. **Project Description Figure 4** shows elevations of the power plant facilities.

## POWER PLANT

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The MGS is an electrical generating facility, which would be located on approximately 3.4 acres of Vernon's existing Station A. Station A began operation in 1933. It would consist of the Vernon Substation 69 kV switchyard, a building that contains the Johnson & Heinze Diesel Plant (five diesel-fueled reciprocating, internal combustion generators, Units 1 through 5, each rated at 3.5 MW gross output, the H. Gonzales Generating Station (two natural gas-fired combustion turbine-generator (CTG) units, Units 6 and 7, each rated at 5.5 MW gross output), and the Control Room. The diesel-fueled generators began operating in 1933, and the combustion turbine units began operating in 1988. These units are located indoors. Natural gas is brought to the site by pipeline, and diesel fuel is brought by tanker truck. The site also contains a cooling tower, heat exchangers, and transmission towers. All power from the site is distributed through the Vernon Substation 69 kV switchyard.

The new generating facility would be named the Malburg Generating Station, and the two new CTGs would be Malburg Units 1 and 2. The Steam Turbine Generator (STG) would be Malburg Unit 3.

The Project would consist of two ALSTOM GTX100 frame-type natural gas CTGs with dry low-NO<sub>x</sub> (DLN) combustors for oxides of nitrogen (NO<sub>x</sub>) control including nitrogen dioxide (NO<sub>2</sub>), which is a regulated criteria air pollutant. The CTGs will each be equipped with evaporative inlet air coolers/filters to enhance turbine performance in hot weather.

Hot exhaust gases from the CTGs will be directed to parallel Heat Recovery Steam Generators (HRSGs) where steam will be generated. The steam produced by the HRSGs will be combined to drive a single STG (ALSTOM MP24). The HRSGs will include duct burners to increase steam output and achieve higher levels of power output in selected modes of operation. The HRSGs will also include selective catalytic reduction (SCR) emissions control equipment for further reduction of NO<sub>x</sub> and an oxidation catalyst for reduction of carbon monoxide (CO) and volatile organic compound (VOC) emissions in the exhaust gas. The exhaust gases from each HRSG will be exhausted to the atmosphere through a stack that will be 110 feet in height.

The new generation will be connected to the existing 69 kV bus in the Vernon Substation on the MGS. The power from the MGS generators will be distributed through the existing Vernon Substation to Vernon customers.

## **LINEAR FACILITIES**

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There are no new transmission line facilities proposed with the MGS project.

Linear facilities for the MGS would include new 1,300-foot long natural gas and sewer pipelines to the existing gas system and existing sewer system respectively, and a new 18-inch diameter, approximately 1.8-mile long reclaimed water pipeline to deliver reclaimed water to the MGS site from the existing Central Basin Municipal Water District (CBMWD) reclaimed water supply system. The Project is designed to use reclaimed water as the primary source of cooling tower, evaporation coolers, and steam cycle makeup water needed by MGS.

## **WATER SUPPLY AND WASTE WATER TREATMENT**

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The MGS has been designed to operate with the minimum potable water requirements. The primary source of makeup water for the MGS will be reclaimed water supplied by the City and purchased from the CBMWD under a long-term contract. It will be delivered to the project site via an 18" reclaimed water pipeline connecting to the existing CBMWD reclaimed water distribution system located approximately 1.8 miles from the Project. Potable water needs will be served from the City's existing 6-inch water supply line presently on site. Additional potable water consumption for the Project is estimated at 17 gallons per minute (gpm).

The MGS will consume significant quantities of reclaimed water by evaporation in its cooling tower in order to reject heat from the steam turbine condensers. The MGS will utilize reclaimed water exclusively in the cooling tower arrays and will require a peak demand of approximately 1,000 gpm of reclaimed water. The use of available reclaimed water will ultimately allow the Project to limit its average additional potable

water consumption to approximately 10 gpm (17 gpm peak). CBMWD has approximately 250 gpm of reclaimed water available without modifications to its reclaimed water system. In order to meet the Project's peak demand of 1000 gpm, CBMWD has committed to supplying available reclaimed water to satisfy the needs for MGS in a Will-Serve letter issued to the City.

The final combined wastewater discharge from the Project will include the following streams: cooling tower blowdown, sanitary drains, turbine evaporative cooler blowdown, reverse osmosis (RO) system reject, HRSG blowdown, steam cycle drains, and oil/water separator discharge. The combined wastewater stream is estimated to average 230 gpm and will be directed to the local sewer for disposal.

A 1,300-foot long 12-inch sewer line from the Project to Fruitland Avenue will be required for discharge to the local sewer. From that point on the existing sewer trunk is capable of handling all wastewater flows from the Project. The wastewater will flow through the County Sanitation District of Los Angeles County (CSDLAC) existing treatment facility. No improvements to the treatment facility are required. The treatment facility is capable of handling all wastewater flows from MGS.

## **CONSTRUCTION AND OPERATIONS**

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The total Project cost is estimated to be approximately \$100 to \$110 million dollars. In concert with the six-month review program, the City expects to mobilize to begin construction of the MGS immediately upon certification. The Project construction, including the natural gas, sewer, and reclaimed water pipelines is expected to take about 12.5 months. The initial commissioning of the CTGs will take about 3 months. Thus, the MGS is planned to begin commercial operation by the spring of 2004 after about a 16-month construction and initial commissioning period.

The MGS is designed to serve the City's electric utility customers. The City expects that MGS, because it incorporates state-of-the-art pollution control and generation equipment and with its combined cycle configuration, will be one of the most efficient generation facilities available. MGS will operate with a capacity factor between 60 and 85 percent, and have an availability factor of 90 to 98 percent. It is projected that the MGS will operate from 5 to 7 days per week and generally 24 hours per day depending upon customer load and weather conditions. Other factors that can affect the operation of the Project are market and control area conditions for both energy and ancillary services requirements.

### **Project Objectives**

The objectives of the proposed project are as follows:

- Provide an efficient, cost effective, and reliable source of electric generation to the City's customers and to the Southern California area at the least practicable impact to the environment.
- To build upon the existing site and area infrastructure, including the existing Vernon Substation, the electrical interconnection capacity, the potable water supply, and the established wastewater discharge and treatment systems.

# AIR QUALITY

Testimony of Joseph M. Loyer

## INTRODUCTION

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This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the planned construction and operation of the Malburg Generation Station (MGS) as proposed by the City of Vernon (City). 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 (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM<sub>10</sub>).

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

- whether the MGS is likely to conform with applicable Federal, State and South Coast Air Quality Management District air quality laws, ordinances, regulations and standards, as required by (Title 20, California Code of Regulations, section 1744 (b));
- whether the MGS is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards(see Attachment A), as required by (Title 20, California Code of Regulations, section 1742 (b)); and
- whether the mitigation proposed for the MGS is adequate to lessen the potential impacts to a level of insignificance, as required by (Title 20, California Code of Regulations, section 1742 (b)).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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### 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 analysis has been delegated by the Environmental Protection Agency (EPA) to the South Coast Air Quality Management District (District). The District determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceeds 100 tons per year for any pollutant.

### 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 - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

The proposed project is subject to the following South Coast Air Quality Management District rules and regulations:

### **Regulation II – Permits**

This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment.

#### **Rule 202 – Temporary Permit to Operate**

This rule states that any new equipment that has been issued a Permit to Construct (PTC) shall be allowed to use that PTC as a temporary Permit to Operate (PTO) upon notification to the Air Pollution Control Officer (APCO).

#### **Rule 203 – Permit to Operate**

This rule prohibits the use of any equipment that may emit air contaminants or control the emission of air contaminants, without first obtaining a PTO except as provided in Rule 202.

#### **Rule 217 – Provisions for Sampling and Testing**

The Executive Officer (EO) may require the applicant to provide and maintain facilities necessary for sampling and testing. The EO will inform the applicant of the need for testing ports, platforms and utilities.

#### **Rule 218 – Continuous Emission Monitoring**

This rule describes the installation, QA/QC and reporting requirements for all sampling interfaces, analyzers and data acquisition systems used to continuously determine the concentration or mass emission of an emission source. However, this rule does not apply to the CEMS required for NO<sub>x</sub> monitoring under RECLAIM (Regulation XX).

### **Regulation IV – Prohibitions**

This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events. Please note that San Bernardino County Rule 53 and 53A have not been superseded by District rules and may apply to this project.

#### **Rule 401 – Visible Emissions**

Generally this rule restricts visible emissions from a single source for more than three minutes in any one hour from being as dark or darker than that designated on the No. 1 Ringelman Chart (US Bureau of Mines).

## **Rule 402 – Nuisance**

This rule restricts the discharge of any contaminant in quantities which cause or have a natural ability to cause injury, damage, nuisance or annoyance to businesses, property or the public.

## **Rule 403 – Fugitive Dust**

This rule requires that the applicant must prevent, reduce or mitigate fugitive dust emissions from the project site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM<sub>10</sub> emissions (between up and down wind measurements) to less than 50 ug/m<sup>3</sup> and restricts the tracking out of bulk materials onto public roads. Additionally, the applicant must utilize one or more of the best available control measures (identified in the tables within the rule). Mitigation measures may include, adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities. Finally, a contingency plan maybe required if so determined by the US EPA.

## **Rule 407 – Liquid and Gaseous Air Contaminants**

This rule limits CO emissions to 2,000 ppm and SO<sub>2</sub> emissions to 500 ppm, averaged over 15 minutes. However, internal combustion engines are exempt from the SO<sub>2</sub> limit, as are equipment that comply with rule 431.1. The applicant will comply with rule 431.1 and thus the sulfur limit of rule 407 will not apply.

## **Rule 408 – Circumvention**

This rule allows the concealment of emissions released to the atmosphere in cases where the only violation involved is of Section 48700 of the Health and Safety Code or District Rule 402.

## **Rule 409 – Combustion Contaminants**

This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter of gas, calculated to 12% CO<sub>2</sub>, averaged over 15 minutes. This rule does not apply to IC engines or jet engine test stands.

## **Rule 431.1 – Sulfur Content of Gaseous Fuels**

This rule restricts the sale or use of gaseous fuels that exceed a sulfur content limit. The sulfur content limit for natural gas is 16 ppmv calculated as H<sub>2</sub>S. This rule also establishes monitoring and reporting requirements, as well as test methods to be used.

## **Rule 431.2 – Sulfur Content of Liquid Fuels**

This rule establishes a sulfur content limit for diesel fuel of 0.05% by weight, as well as, record keeping requirements and test methods.

## **Rule 475 – Electric Power Generating Equipment**

This rule limits combustion contaminants (PM10) from electric power generating equipment to 11 pounds per hour and 23 milligrams per cubic meter @ 3% O<sub>2</sub> (averaging time subject to Executive Officer decision).

## **Regulation VII – Emergencies**

### **Rule 701 – Air Pollution Emergency Contingency Actions**

This rule requires that facilities employing 100 or more people or emitting 100 or more tons of pollutants (NO<sub>x</sub>, SO<sub>x</sub> or VOC) per year, upon declaration or prediction of a Stage 2 or 3 episode, reduce NO<sub>x</sub>, SO<sub>x</sub> and VOC emissions by at least 20% of normal workday operations. This rule also requires that upon declaration of a state of emergency by the Governor that the facility complies with the Governor's requirements. A power plant facility may be exempt from Rule 701 if they are determined to be an essential service responding to a public emergency or utility outage.

## **Regulation IX – Standards of Performance for New Stationary Sources**

Regulation IX incorporates provisions of Part 60, Chapter I, Title 40, of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO<sub>2</sub> and NO<sub>2</sub> emissions from the facility as well as monitoring and test method requirements.

## **Regulation XI – Source Specific Standards**

### **Rule 1110.1 – Emissions from Stationary Internal Combustion Engines**

This rule generally applies to engines larger than 50 brake horsepower (bhp) and places restriction on rich-burn or lean-burn engines. These restrictions are in the form of NO<sub>x</sub> and CO emission limits and the required submittal of a control plan to demonstrate compliance. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.1.

### **Rule 1110.2 – Emissions from Gas and Liquid Fueled Engines**

This rule establishes NO<sub>x</sub>, VOC and CO emission limits for stationary and portable engines over 50 bhp in rated capacity. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.2.

## **Regulation XIII – New Source Review**

This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of non-attainment contaminants and their precursors as well as ozone depleting compounds (ODC) and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NO<sub>x</sub> or SO<sub>x</sub>

emissions from certain sources, which are regulated by Regulation XX (RECLAIM). This regulation applies to SOx emissions from the MGS, but not to the NOx emissions from the project.

### **Regulation XVII – Prevention of Significant Deterioration**

This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. The MGS will trigger PSD review for NOx only.

### **Regulation XX – Regional Clean Air Incentives Market (RECLAIM)**

The Regional Clean Air Incentives Market (RECLAIM) is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces their allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other specified district rules, where there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is established in Rule 2007. The MGS is exempt from the SOx RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NOx RECLAIM project and therefore subject to the rules of RECLAIM for NOx emissions.

### **Regulation XXX – Title V Permits**

The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without the other.

### **Regulation XXXI – Acid Rain Permits**

Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SOx emissions as well as monitoring SOx, NOx and CO2 emissions from the facility.

## **ENVIRONMENTAL SETTING**

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### **METEOROLOGICAL CONDITIONS**

The general climate of California is typically dominated by the eastern Pacific high-pressure system centered off the coast of California. In the summer, this system results in low inversion layers with clear skies inland and typically early morning fog by the coast. In winter, this system promotes wind and rainstorms originating in the Gulf of Alaska and striking Northern California.

The large-scale wind flow patterns in the South Coast basin are a diurnal cycle driven by the differences in temperature between the land and the ocean as well as the mountainous terrain surrounding the basin. The Tehachapi and Temblor Mountains separate the South Coast and San Joaquin Valley air basins. The San Bernardino, San Gabriel and Santa Rosa Mountains generally make up the eastern mountain range of the South Coast air basin. The Santa Monica and Santa Ana Mountains make up the northern and southern (respectively) coastal mountain ranges of the South Coast air basin.

The project is located on approximately 3.4 acres of the City's existing Station A at 2715 East 50<sup>th</sup> Street, in Vernon, California, which is approximately 3 miles southeast of downtown Los Angeles and 4.5 miles north of the Watts Towers Historic Park. The City of Vernon is bordered on the north and west by the City of Los Angeles, on the east by the Cities of Commerce and Bell and on the south by the Cities of Huntington Park and Maywood.

The site elevation is approximately 190 feet above sea level and is approximately 15 miles north of the major harbors of San Pedro and Long Beach. Temperatures recorded at Los Angeles Civic Center (3 miles north of the City) range from approximately 58°F to above 90°F with an average humidity of 72%. The South Coast basin receives most of its rainfall between November and April, an annual average of 15 inches.

The wind patterns near the project site are predominately from the west. Calm conditions prevail from 10% to approximately 18% of the time. The mixing heights recorded at LAX in the morning range from 335 meters (1,100 feet) to greater than 1,000 meters (3,050 feet). The mixing heights recorded at LAX (11 miles southwest) in the afternoon range from 510 meters (1,670 feet) to 1,200 meters (3,940 feet).

### **EXISTING 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 EPA. 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<sup>1</sup> or micrograms<sup>2</sup> of pollutant in a cubic meter of air ( $\text{mg}/\text{m}^3$  and  $\mu\text{g}/\text{m}^3$ ).

In general, an area is designated as attainment for a specific pollutant if the 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.

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<sup>1</sup> A milligram is one 1,000<sup>th</sup> of a gram.

<sup>2</sup> A microgram is one 1,000,000<sup>th</sup> of a gram

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

<b>Pollutant</b>	<b>Averaging Time</b>	<b>Federal Standard</b>	<b>California Standard</b>
Ozone (O <sub>3</sub> )	1 Hour	0.12 ppm (235 µg/m <sup>3</sup> )	0.09 ppm (180 µg/m <sup>3</sup> )
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1 Hour	35 ppm (40 mg/m <sup>3</sup> )	20 ppm (23 mg/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	---
	1 Hour	---	0.25 ppm (470 µg/m <sup>3</sup> )
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	80 µg/m <sup>3</sup> (0.03 ppm)	---
	24 Hour	365 µg/m <sup>3</sup> (0.14 ppm)	0.04 ppm (105 µg/m <sup>3</sup> )
	3 Hour	1300 µg/m <sup>3</sup> (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 µg/m <sup>3</sup> )
Respirable Particulate Matter (PM <sub>10</sub> )	Annual Geometric Mean	---	30 µg/m <sup>3</sup>
	24 Hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	Annual Arithmetic Mean	50 µg/m <sup>3</sup>	---
Sulfates (SO <sub>4</sub> )	24 Hour	---	25 µg/m <sup>3</sup>
Lead	30 Day Average	---	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	---
Hydrogen Sulfide (H <sub>2</sub> S)	1 Hour	---	0.03 ppm (42 µg/m <sup>3</sup> )
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 µg/m <sup>3</sup> )
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 MGS is located in the City of Vernon and is under the jurisdiction of the South Coast Air Quality Management District (District). AIR QUALITY Table 2 shows the attainment or non-attainment status of the District for each criteria pollutant for both the federal and state ambient air quality standards. The federal classifications go from moderate to extreme.

**AIR QUALITY Table 2**  
**Attainment ~ Non-Attainment Classification**  
**South Coast Air Quality Management District**

<b>Pollutants</b>	<b>Federal Classification</b>	<b>State Classification</b>
Ozone	Extreme Non-Attainment	Extreme Non-Attainment
PM10	Non-Attainment	Non-Attainment
CO	Serious Non-Attainment	Non-Attainment
NO <sub>2</sub>	Attainment	Attainment
SO <sub>2</sub>	Attainment	Attainment

**Ozone**

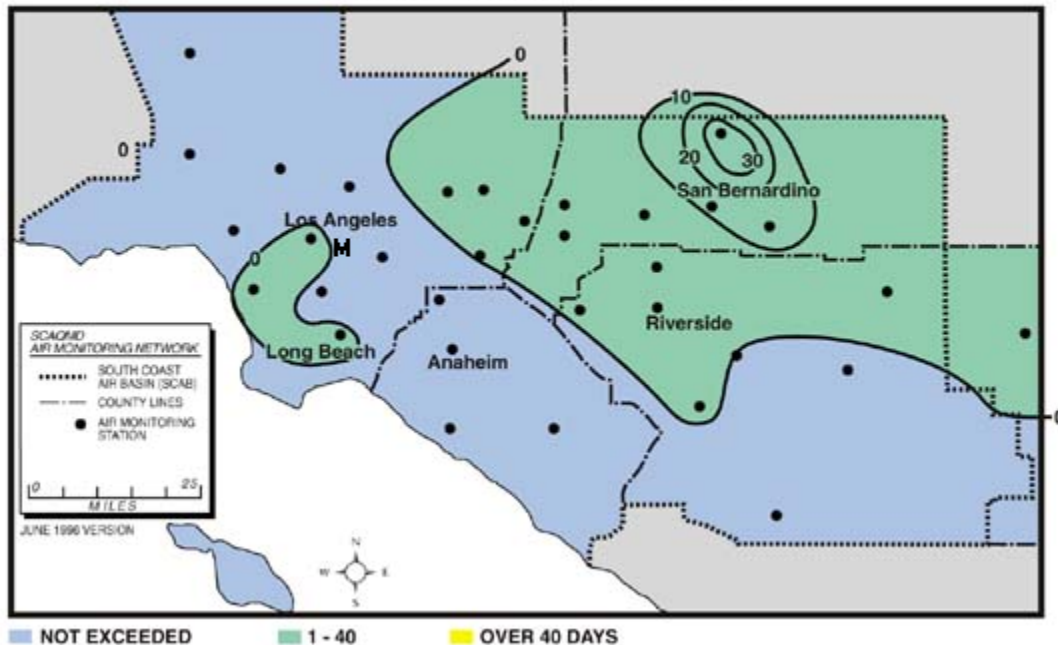
Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NO<sub>x</sub>) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The District is designated extreme non-attainment for ozone, meaning that the South Coast air basin ambient ozone design concentration is 0.280 ppm or above and it will take longer than 17 years (from 1990) to reach attainment. Attaining the federal ozone ambient air quality standard is typically planned for by controlling the ozone precursors NO<sub>x</sub> and VOC. The 1997 Ozone State Implementation Plan for the South Coast Air Basin (SCAQMD 1999) relies on the California Air Resource Board (CARB) to control mobile sources, the US Environmental Protection Agency (US EPA) to control emission sources under federal jurisdiction and SCAQMD to control local industrial sources. Through these control measures, California and SCAQMD are required to reach attainment of the federal ozone ambient air quality standard by 2010.

Exceedances of the national and state ozone ambient air quality standards occur in the Los Angeles area down wind of the project site (see AIR QUALITY Figure 1). In 1999, the South Coast air basin experienced more exceedances of the federal ozone standards than anywhere else in the United States. As AIR QUALITY Figure 1 shows, the highest number of exceedances of the federal ozone standards in 1999 occurred in the Central San Bernardino Mountains. This is also the location of the highest recorded measurement of ozone (0.17 ppm) of 1999. The approximate location of the project site is indicated in AIR QUALITY Figure 1 with an **M**.

The 2001 statistics show a very similar trend, the Central San Bernardino Mountains lead the South Coast air basin in number of violations and highest ozone measurements. In 2001, there were 36 violations of the national 1-hour ozone standard and 121 violations of the state 1-hour ozone standard with the highest 1-hour measurement of ozone being 0.19 ppm.



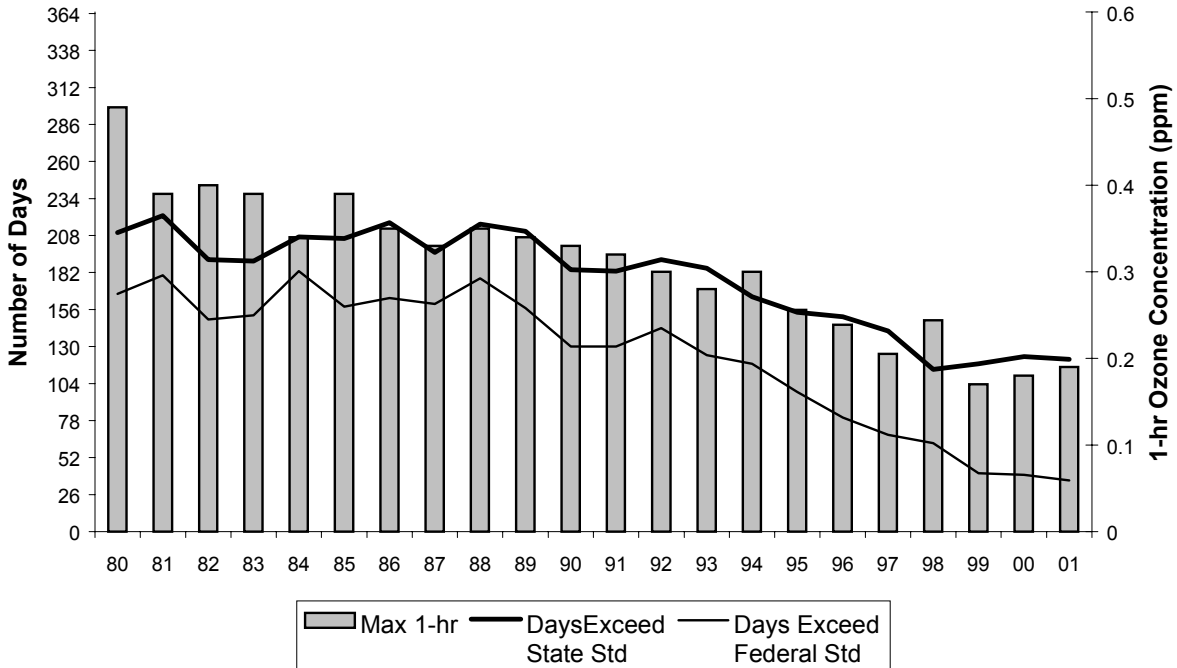
**AIR QUALITY Figure 1**  
**OZONE – 1999**  
**Number of Days Exceeding the Federal Standard**  
**(1-hour average > 0.12 ppm)**



Source: 1999 Air Quality Standards Compliance Report, South Coast Air Quality Management District

Though there are a significant number of exceedances of the ozone ambient air quality standards, it is important to consider the improvements that have occurred in recent years. The SCAQMD leads the nation in air quality management methods and regulatory programs. These programs have significantly improved the air quality in spite of the growing population and industrial and commercial enterprises. AIR QUALITY Figure 2 shows the improvements in exceedances of the federal and state 1-hour ozone standards and maximum annual ozone concentrations over the past 22 years in the South Coast air basin. Unfortunately, AIR QUALITY Figure 2 also shows a slow down in the improvement trend in the last 3-4 years. As can be seen, the maximum 1-hour ozone concentrations have actually increased and the number of exceedances of the national and state standards have become fairly stable or even increased. There can be many reasons for this trend, weather conditions are most likely the primary cause, however, increased population and industrialization might also cause them.

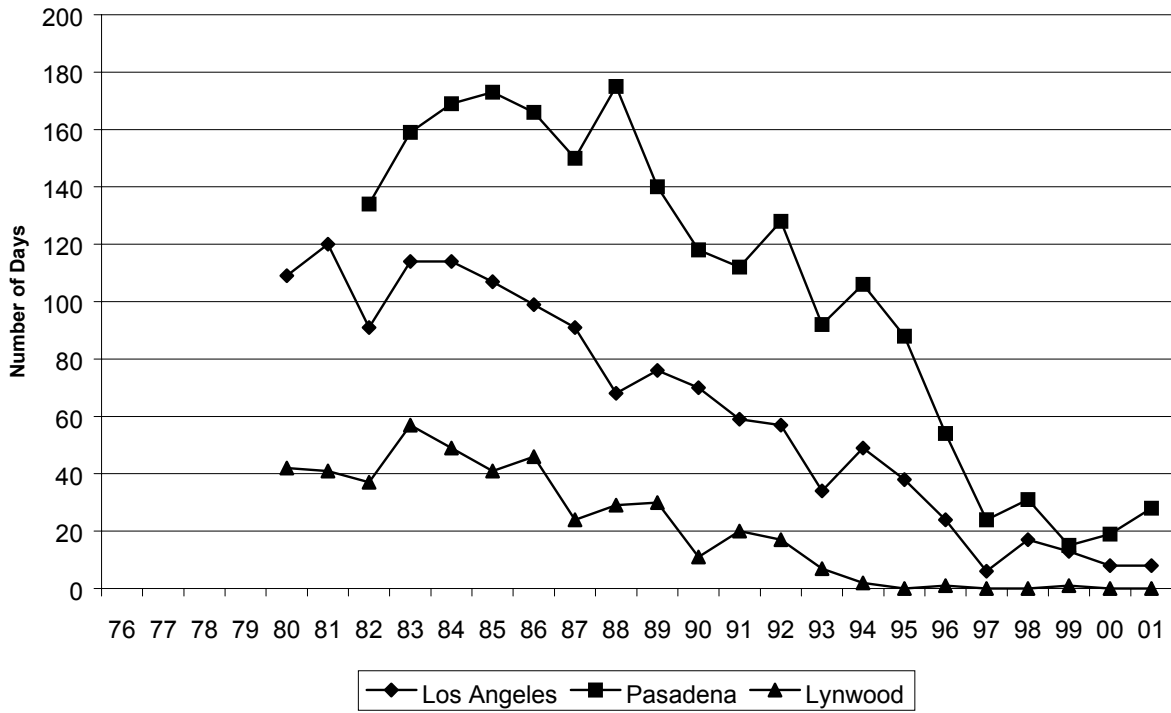
**AIR QUALITY Figure 2**  
**Historic Ozone Air Quality Trends of the South Coast Air Basin**  
**1980 to 2001**



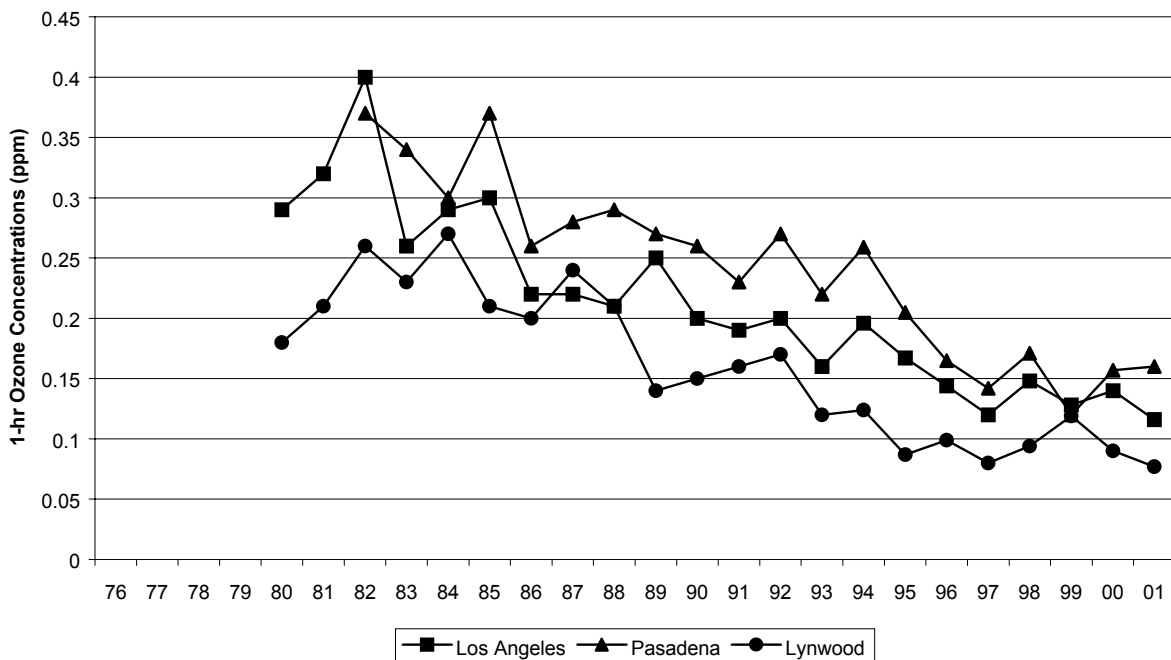
Source: South Coast Air Quality Management District

The project site has three air quality monitoring stations nearby, one in Los Angeles on Main Street (5 miles north of the project site), the second in Lynwood on Long Beach Blvd (5 miles south) and the third in Pasadena (9 miles north-east). AIR QUALITY Figure 3 shows the general trends of exceedances of the 1-hour ozone standards near the project site using the monitoring data from these three stations. As can be seen, there is a significant downward trend in the number of days exceeding the state 1-hour ozone standards from 1980 to 2001. AIR QUALITY Figure 4 shows the maximum annual 1-hour ozone concentrations measured at both monitoring stations from 1980 to 2001. AIR QUALITY Figure 4 demonstrates a downward trend in ozone formation near the project site. Given the overall trends in ozone formation in the South Coast air basin and near the power plant site, staff proposes to use the highest of the three 1-hour annual-maximum ozone measurements in 2001 to describe the background air quality conditions, 0.160 ppm.

**AIR QUALITY Figure 3**  
**Ozone Trend – Days Exceeding the State 1-hour Standard**  
**1980 to 2000**



**AIR QUALITY Figure 4**  
**Maximum Measured Annual 1-hour Ozone Concentrations**  
**1989 to 2000**



## Ozone Transport

The transportation of ozone and ozone precursors (NO<sub>x</sub> and VOC) outside of the air district or air basin of origin may cause or contribute to exceedances of the ozone air quality standards in down wind areas. In their most recent report on the contribution of upwind air basins to ozone violations in downwind air basins (CARB 1996), the California Air Resources Board identifies several transport couplings for the South Coast air basin (see AIR QUALITY Table 3). These couplings come in three qualitative varieties, Overwhelming, Significant and Inconsequential. Overwhelming couplings indicate that emissions from the upwind area caused a violation of the state 1-hour ozone standard (0.09 ppm) on at least one day independently of any emission sources within the downwind area. Significant couplings indicate that emissions from the upwind area contribute, but not overwhelmingly, to a violation of the state 1-hour ozone standard. Inconsequential couplings indicate that emissions from the upwind area were not transported or did not contribute significantly to a violation of the state 1-hour ozone standard.

**AIR QUALITY Table 3**  
**Transport Couples for the South Coast Air Basin**

<b>TRANSPORT COUPLE</b>	<b>Characterization</b>
South Coast to Mojave Desert	O, S
South Coast to San Diego	O,S, I
South Coast to Salton Sea	O, S
South Coast to South Central Coast	S, I
South Central Coast to South Coast	S, I
Southeast Desert (now Mojave and Salton Sea) to South Coast	I
O – Overwhelming S – Significant I – Inconsequential	

In the case of the South Coast air basin, there are several downwind areas. In May 1996, CARB split the Southeast Desert air basin into the Mojave Desert and Salton Sea air basins. CARB determined that the South Coast air basin contributions to violations of the state 1-hour ozone standard in the Mojave Desert air basin were overwhelming on some days and significant on others, with inconsequential contributions occurring less frequently than once per year. CARB also determined that the South Coast air basin contributions to violations of the state 1-hour ozone standard in the Salton Sea air basin were overwhelming on some days and significant on others.

In the November 1996 Triennial Review, CARB re-enforced the 1993 findings that the South Coast air basin contributed to violations of the 1-hour state ozone standard in the San Diego air basin overwhelmingly on some days, significantly on some other days and inconsequentially on other days. However, the number of days where contributions were classified as overwhelming dropped from 20 in 1993 to 5 in 1995. The number of days that were classified as significant increased from 31 to 48 and the number of days that were classified as inconsequential increased from 39 to 43. Since there were significant improvements in ozone measurements within the South Coast air basin

during this time frame (see AIR QUALITY Figure 2), it is reasonable to believe that the improvement in ozone violations within the South Coast air basin and the transport connections outside the basin are related.

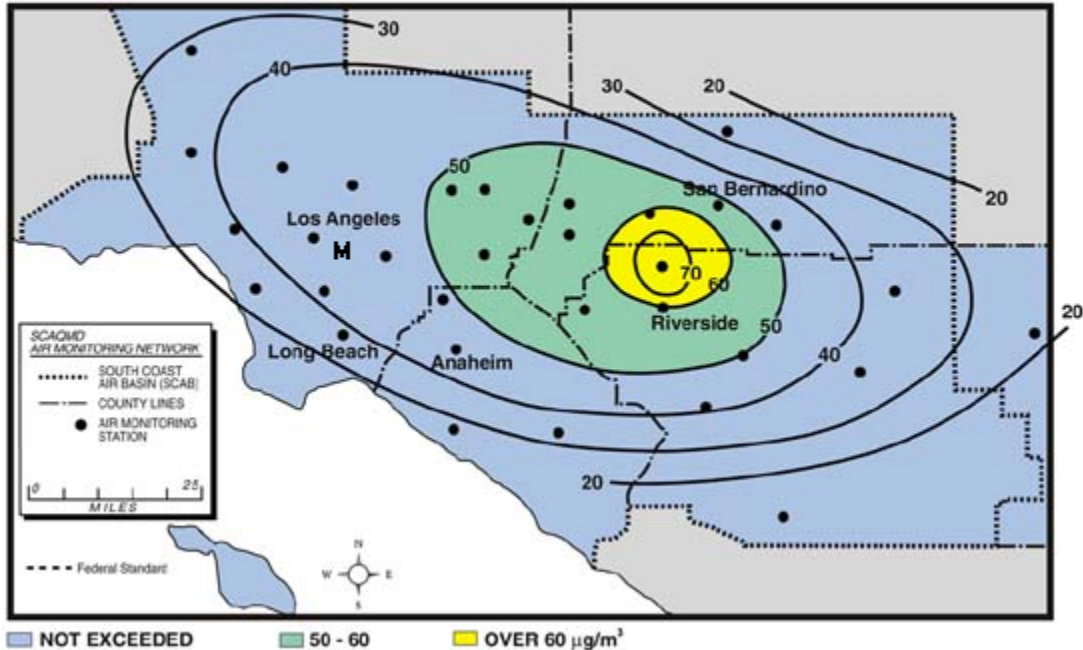
The transportation of ozone and ozone precursors from the South Coast air basin to the South Central Coast air basin is complicated by the existence of other transport couplings to the South Central Coast. The San Joaquin Valley air basin is classified as a significant contributor on some days and insignificant on others. The contributions from the California Coastal Waters (consisting of oil platforms and San Miguel, Santa Rosa and Santa Cruz Islands) are also considered significant on some days. Additionally there is a possibility that ozone transported within the inversion layer was tapped and may have been responsible for some of the ozone violations in the South Central Coast. In the November 1996, Second Triennial Review, CARB concludes that nine 1-hour ozone violations in Santa Barbara County (part of the South Central Coast) from 1994 to 1996 seemed to be related to transport from outside of the county. CARB classifies the South Coast contributions as significant on some days and inconsequential on others. However, CARB further classifies the nine violation days in Santa Barbara County as shared transport days.

For mitigation purposes, CARB requires two things of upwind air basins, a commitment to adopt best available retrofit control technologies for NO<sub>x</sub> and VOC emission sources and, for overwhelming transport, the inclusion of measures in the air quality plans to ensure expeditious attainment of the state 1-hour ozone standard in the downwind areas. SCAQMD Rule 1135 is a retrofit rule that applies to all electric power generating systems except those regulated by the RECLAIM program (Regulation XX). The RECLAIM program is considered a retrofit rule because it continually reduces the emission limits of NO<sub>x</sub> sources within the SCAQMD authority. The South Coast Air Quality Management Plan addresses attainment of the **federal** 1-hour ozone standard by the year 2010 for the SCAQMD only. However, the South Coast Air Quality Management Plan will have a positive and significant effect on the number and severity of violations of the 1-hour state ozone standard in downwind areas. Therefore, staff finds that the South Coast Air Quality Management Plan is well within the intent of the proposed CARB mitigation for upwind air basins.

### **Ambient PM10**

PM10 is a particulate that is 10 microns in diameter or smaller that is suspended in air. PM10 can be directly emitted from a combustion source (primary PM10 or PM2.5) or soil disturbance (fugitive dust) or it can form downwind (secondary PM10) from some of the constituents of combustion exhaust (NO<sub>x</sub>, SO<sub>x</sub> and ammonia). San Bernardino (not the entire South Coast air basin) has been designated a non-attainment zone for the **federal** 24-hour and annual PM10 ambient air quality standards. The South Coast air basin (including a portion of the San Bernardino County within the basin) has been designated as a non-attainment zone for the **state** 24-hour and annual PM10 ambient air quality standards (see AIR QUALITY Table 2). AIR QUALITY Figure 6 shows the violations of the federal annual PM10 standard for 1999 in the South Coast air basin. The highest PM10 concentrations are occurring in both San Bernardino and Riverside Counties, as is shown in AIR QUALITY Figure 6. The project location is indicated by an **M** on AIR QUALITY Figure 6.

**AIR QUALITY Figure 6**  
**PM10 – 1999**  
 Annual Arithmetic Mean,  $\mu\text{g}/\text{m}^3$   
 (Federal Standard =  $50 \mu\text{g}/\text{m}^3$ )



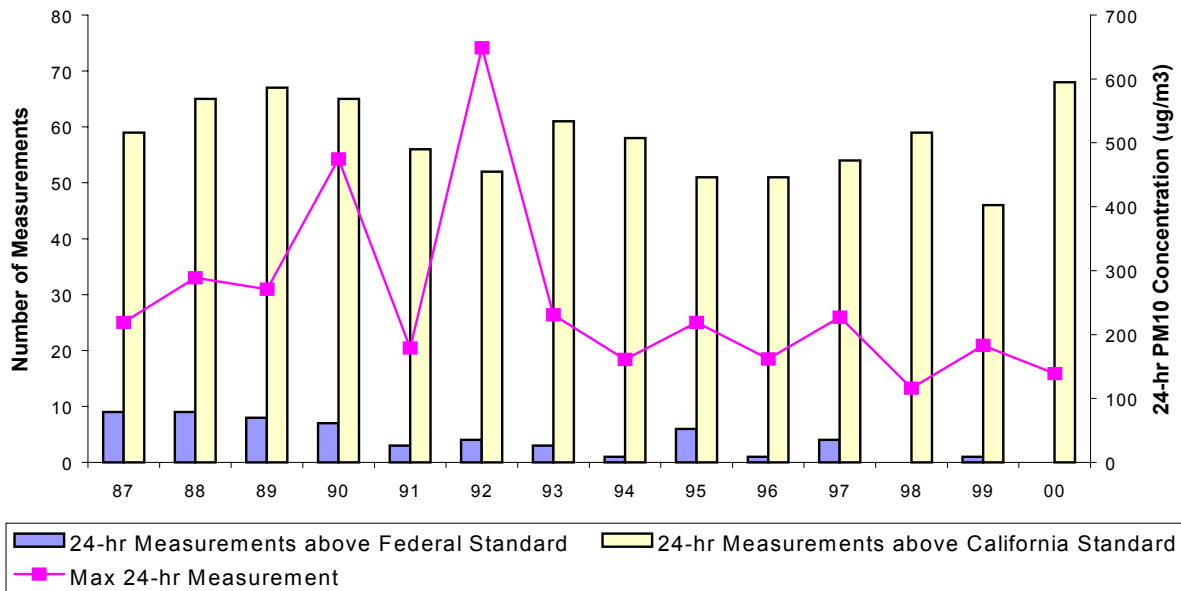
Source: 1999 Air Quality Standards Compliance Report, South Coast Air Quality Management District

AIR QUALITY Figure 7 shows the historic trend of 24-hour PM10 concentrations and the percent of samples (or measurements) that exceeded the state and federal ambient air quality standards. As the figure shows, the 24-hour annual maximum measured concentrations have been significantly reduced from 1987 to 2000. Although violations of the state standard are still numerous, violations of the federal standard is coming under control for the South Coast air basin. The annual geometric mean<sup>1</sup> (state annual PM10 standard,  $30 \mu\text{g}/\text{m}^3$ ) and the annual arithmetic mean<sup>2</sup> (federal annual PM10 standard,  $50 \mu\text{g}/\text{m}^3$ ) are still well over their respective ambient air quality standards, even though they show improvement from 1987 to 2000 (see AIR QUALITY Figure 8).

<sup>1</sup> A geometric mean is the  $n^{\text{th}}$  root of the product of  $n$  measurements.

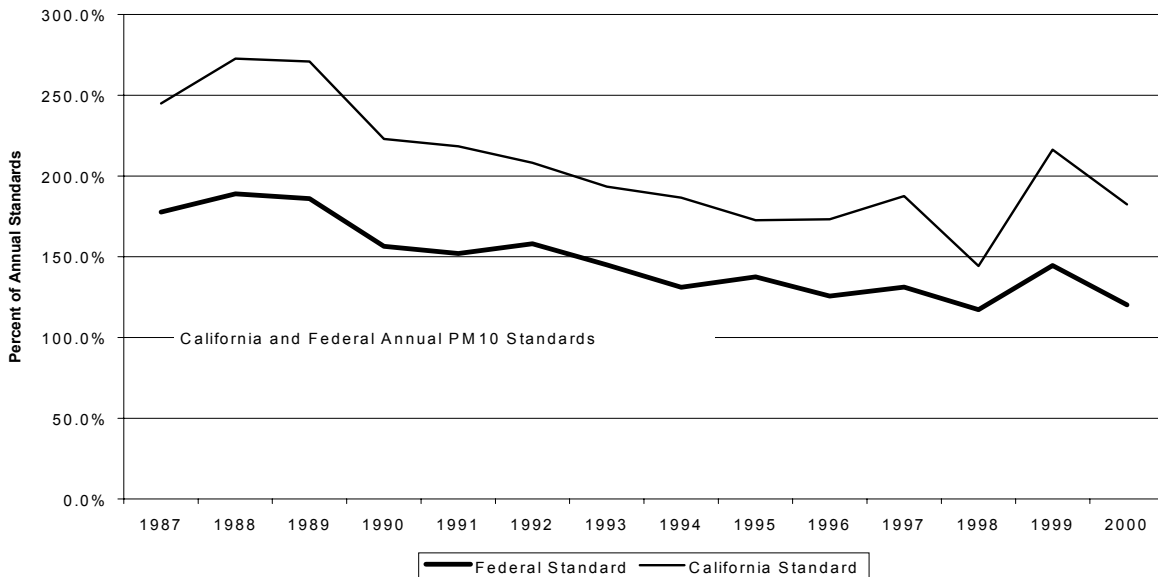
<sup>2</sup> An arithmetic mean is the sum of  $n$  measurements divided by  $n$ .

**AIR QUALITY Figure 7**  
**Historic 24-hour PM10 Concentrations within the South Coast Air District**  
**1987 to 2000**



Source: California Air Resources Board

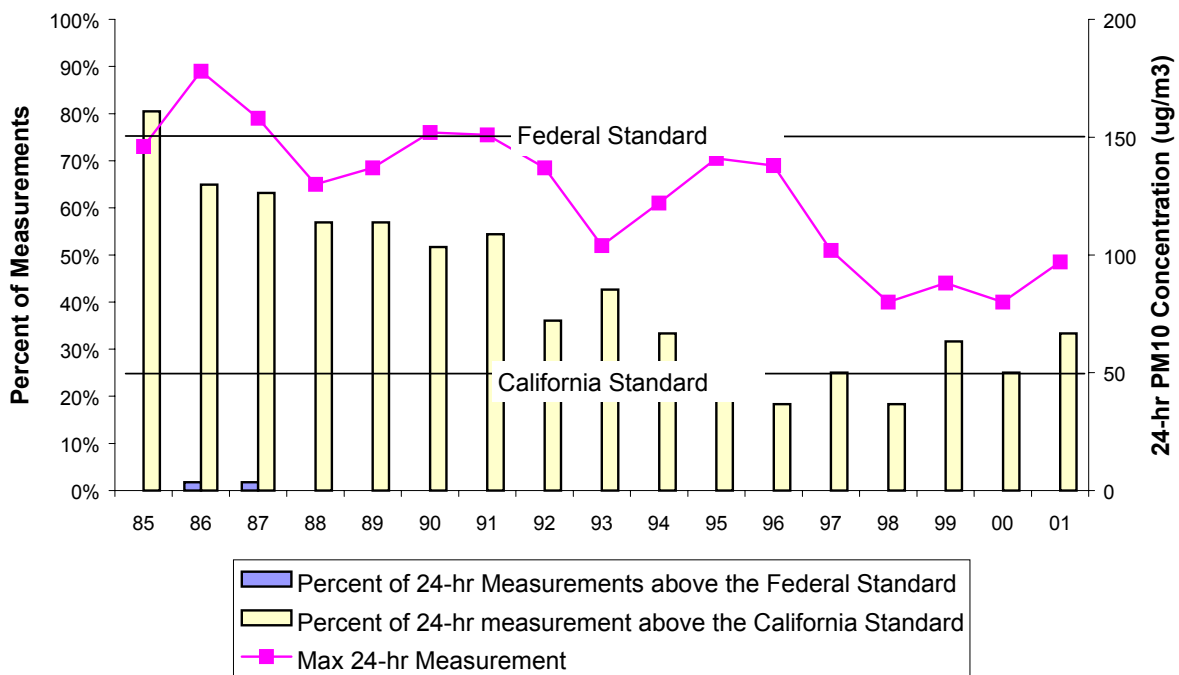
**AIR QUALITY Figure 8**  
**Historic Annual Average PM10 Concentrations in the South Coast Air Basin**  
**1987 to 1999**



Source: California Air Resources Board

AIR QUALITY Figure 9 shows the historic (1989 to 2000) 24-hour PM10 measurements made at the Los Angeles monitoring station. As can be seen, the federal 24-hour PM10 standard (150 ug/m<sup>3</sup>) has not been exceeded since 1989 at this station, however the California 24-hour PM10 standard continues to be exceeded. The annual maximum 24-hour PM10 measurements at the Los Angeles monitoring station seems to be improving from 1985 to 2001 although they are somewhat erratic. Between 1996 and 2001, the trend seems to be more controlled and improving reasonably steadily. Therefore, staff recommends the use of the 2001 annual maximum 24-hour PM10 measurement recorded at the Los Angeles monitoring station to represent the background 24-hour PM10 concentrations for modeling purposes. That measurement is 97 ug/m<sup>3</sup>.

**AIR QUALITY Figure 9**  
**Historic 24-hour PM10 Measurements**  
**Los Angeles Main Street Monitoring Station**  
**1985 to 2001**



Source: California Air Resources Board

AIR QUALITY Figure 10 shows the annual geometric and arithmetic means for the PM10 measurements at the Los Angeles monitoring station from 1985 to 2001 as a percent of the State and Federal annual PM10 ambient air quality standards. As can be seen, there is a notable improvement from 1985 to 1997, which stabilizes with a slight increase thereafter. Staff recommends the use of the highest recent measurements to represent the annual PM10 background for modeling purposes. In staff's opinion the highest recent measurement for the arithmetic mean (federal standard) at the Los Angeles monitoring station was 44.8 ug/m<sup>3</sup> in 1999 and the highest measurement for the geometric mean (state standard) was 42.1 ug/m<sup>3</sup>.



**AIR QUALITY Figure 10**  
**Historic Annual PM10 Measurements**  
**Los Angeles Main Street Monitoring Station**  
**1985 to 2001**



Source: California Air Resources Board

**Secondary PM10**

PM10 can be formed downwind from an emission source as a secondary emission (similar to ozone) from a reaction between ammonia and airborne acids. The most dominant reactions are between SOx emissions (as sulfuric acid, H<sub>2</sub>SO<sub>4</sub>) and NOx emissions (as nitric acid, HNO<sub>3</sub>). The complexity of these reactions arises from the formation of gaseous, liquid and solid forms of the products and reactants involved. The qualitative understanding of these reactions indicates that all the available ammonia will be reacted with all the available sulfuric acid prior to any ammonia being reacted with any available nitric acid (Seinfeld 1986). From this presumption, two cases of interest arise. One is the sulfate rich case, where the molar ratio of ammonia (NH<sub>3</sub>) to sulfate (SO<sub>4</sub>) is less than 2 so that there is insufficient ammonia to react with the sulfate. The other is the ammonia rich case, where the molar ratio of ammonia to sulfate is greater than 2, so that the sulfate is completely reacted and there is excess ammonia (Seinfeld 1986).

A 1995 study on the characterization of PM2.5 and PM10 in the South Coast Air Basin included a monitoring site in downtown Los Angeles (SCAQMD 2000a). As part of that study the ammonia ion NH<sub>4</sub><sup>+</sup> was measured along with sulfates, nitrates and other contributors to PM10 and PM2.5. The data recorded in the South Coast study seems to indicate that the downtown Los Angeles area is ammonia rich (i.e., the molar ratio of

ammonia to sulfate is greater than 2:1) from September through April and ammonia poor from May through August. This is generally the trend for the rest of the monitoring sites reported in the study with the exception of the San Bernardino area. The study also shows that PM10 and PM2.5 peaked in the October – December time frame at approximately 200 ug/m<sup>3</sup> for PM10. The rest of the year, PM10 was measured at approximately 50 ug/m<sup>3</sup> for the Los Angeles downtown area. The study indicates that during the summer months, the on-shore winds in the area tend to increase the dust component of the PM10 and reduce the secondary component to a low of 22% of the total PM10 concentration. During the winter months, a high-pressure system can form in the desert areas of San Bernardino, trapping air in the Los Angeles basin. This condition was identified as the cause of the formation of high concentrations of secondary PM2.5, as high as 82% of the total PM10 mass. The study concludes that concentrations of sulfate were highest in the summer and lowest in the winter, while concentrations of nitrates were highest in the fall. The study indicates that on an annual average basis, the downtown Los Angeles area is clearly ammonia rich.

### **Primary PM2.5**

PM2.5, a subset of PM10, are particles with an aerodynamic diameter less than or equal to 2.5 microns. PM2.5 is primarily a product of combustion and includes nitrates, sulfates, organic carbon (ultra fine dust) and elemental carbon (ultra fine soot). Particles within the PM2.5 fraction of PM10 penetrate more deeply into the lungs, and cause the majority of the visibility reduction attributable to PM.

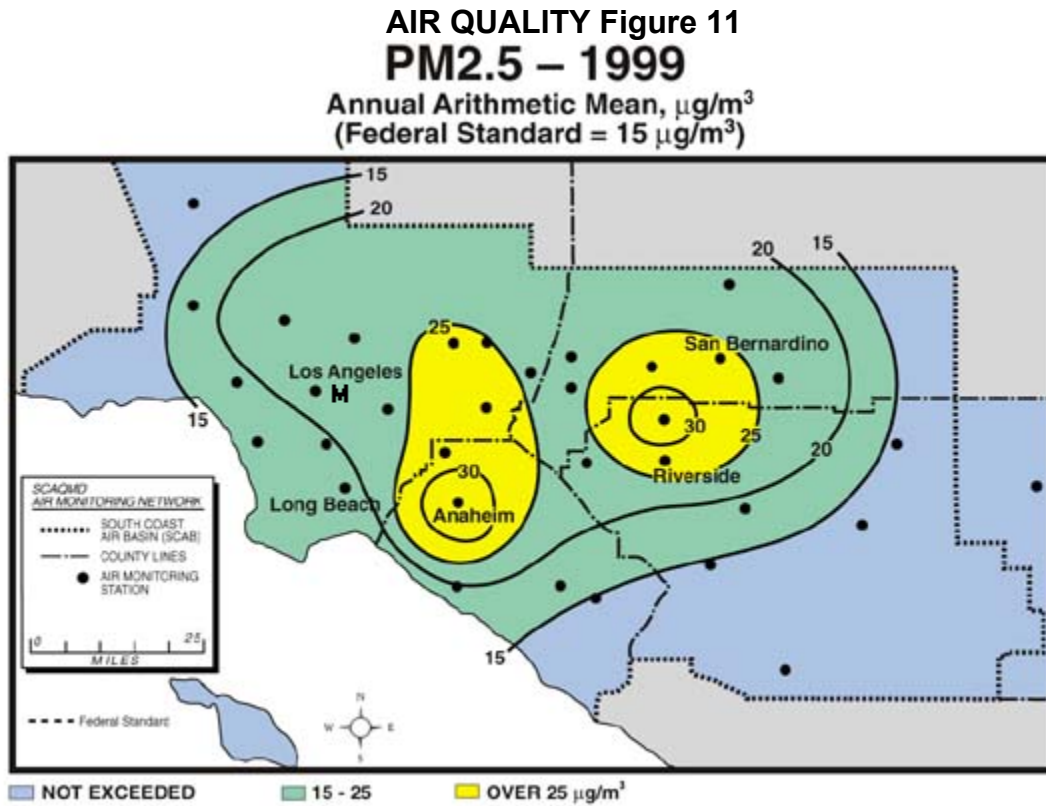
The new PM2.5 and ozone standards adopted by EPA in 1997 were upheld by the Supreme Court in 2001 over the challenge from the American Trucking Association (et al). EPA is expected to designate PM2.5 non-attainment areas by 2003 and require attainment plans by 2006 at the earliest. CARB also adopted new PM10 and PM2.5 standards for California which are expected to go into effect late this year or early next year. AIR QUALITY Table 4 shows both the new federal and California PM2.5 and PM10 standards that are currently adopted.

**AIR QUALITY Table 4**  
**Adopted PM2.5 and PM10 Federal and California Standards**  
**(ug/m<sup>3</sup>)**

		<b>Federal</b>	<b>California</b>
PM2.5	Annual	15	12 <sup>a</sup>
PM2.5	24-hour	65	No standard
PM10	Annual	No change	20 <sup>b</sup> (down from 30)
<sup>a</sup> Annual Arithmetic Mean. This standard is not currently in effect. <sup>b</sup> Averaging method is also changed from Annual Geometric Mean to Annual Arithmetic Mean. This standard is not currently in effect.			

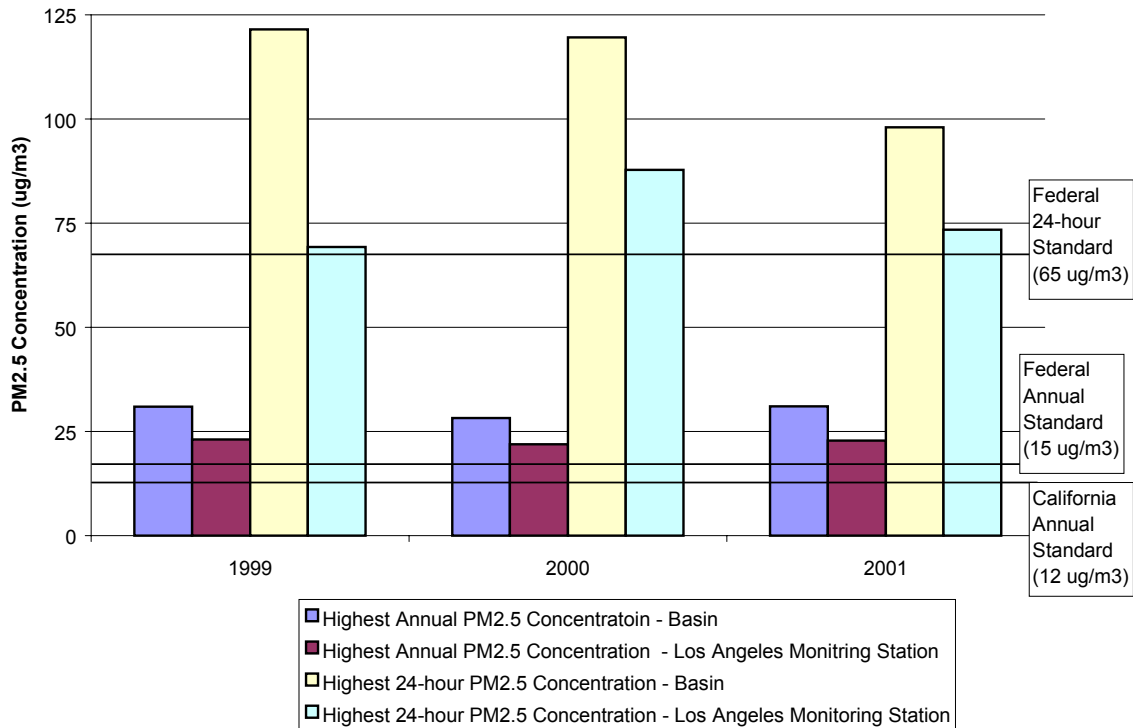
The highest concentrations of PM2.5 in 1999 occur within the counties of San Bernardino and Riverside (similarly to PM10), but also centering near Anaheim as shown in AIR QUALITY Figure 11. As shown in AIR QUALITY Figure 12, the maximum measured PM2.5 ambient air quality concentration in 1999 was 119.6 ug/m<sup>3</sup>, recorded at the Riverside County 1 monitoring station. Figure 12 also shows that the Los  
 September 2002 4.1-19 AIR QUALITY

Angeles monitoring station exceeding both the annual and 24-hour federal and California PM2.5 ambient air quality standards from 1999 through 2001. Staff suggests the highest of the three available measurements for PM2.5 be used as the background ambient air quality for modeling purposes. Staff suggests the measurements of 23.1  $\mu\text{g}/\text{m}^3$  in 1999 for the annual PM2.5 background and 87.8  $\mu\text{g}/\text{m}^3$  in 2000 for the 24-hour PM2.5 background as recorded at the Los Angeles monitoring station.



Source: 1999 Air Quality Standards Compliance Report, South Coast Air Quality Management District

**AIR QUALITY Figure 12**  
**PM2.5 Concentrations from 1999 to 2001**  
**The South Coast Air Basin and the Los Angeles Monitoring Station**

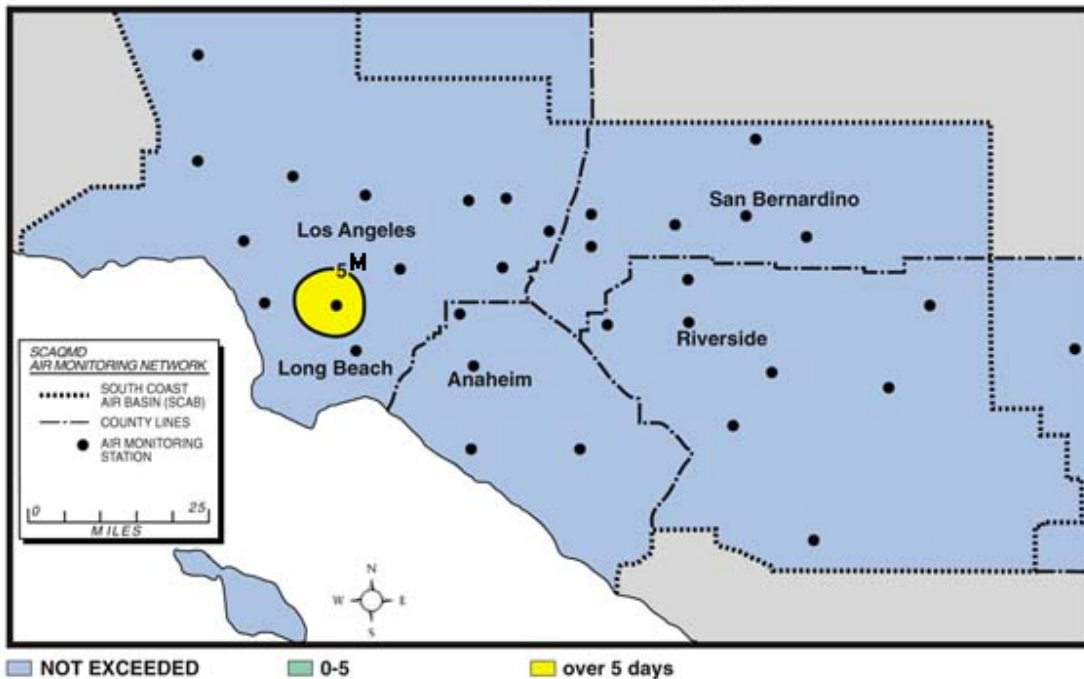


Source: California Air Resources Board

**Carbon Monoxide**

Carbon monoxide (CO) is a directly emitted air pollutant as a result of combustion. The South Coast Air Quality Management District is designated Serious Non-Attainment for the federal 1-hour and 8-hour CO ambient air quality standards. This means that the area has an average CO concentration value of 16.5 ppm or above. **AIR QUALITY Figure 13** shows the exceedances of the federal CO standard occur in downtown Los Angeles which is only a few miles from the project site.

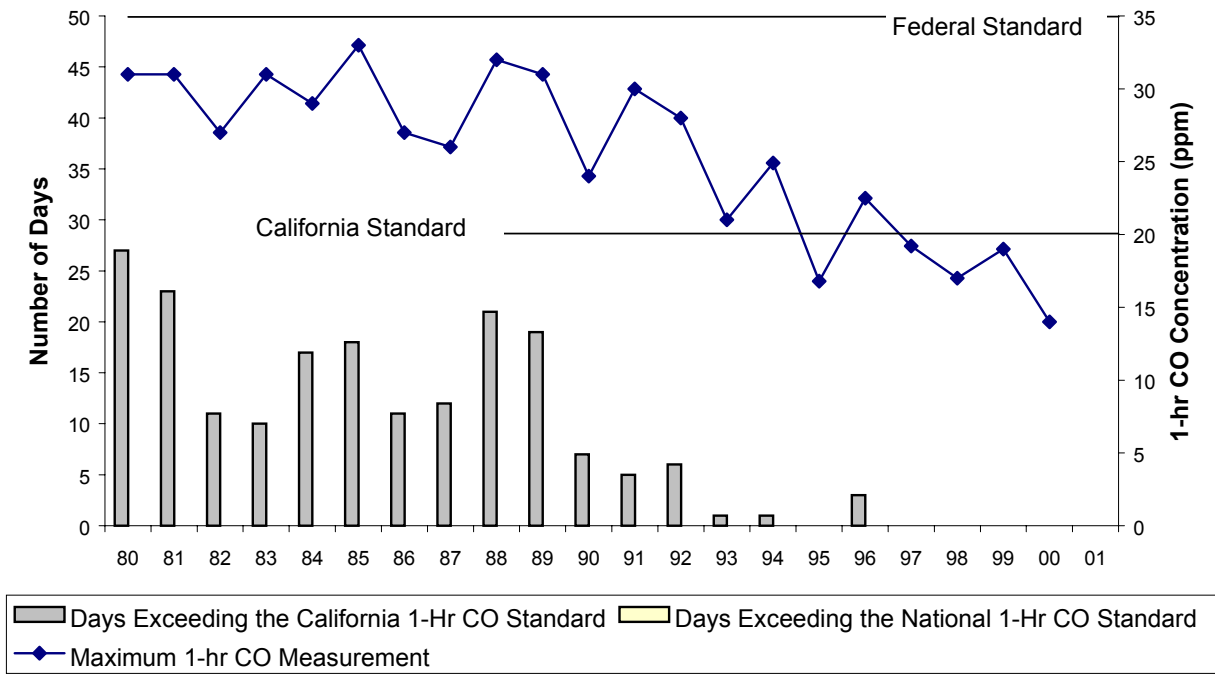
**AIR QUALITY Figure 13**  
**CARBON MONOXIDE - 1999**  
 Number of Days Exceeding Federal Standard  
 (8-Hour Average CO > 9.5 ppm)



Source: 1999 Air Quality Standards Compliance Report, South Coast Air Quality Management District

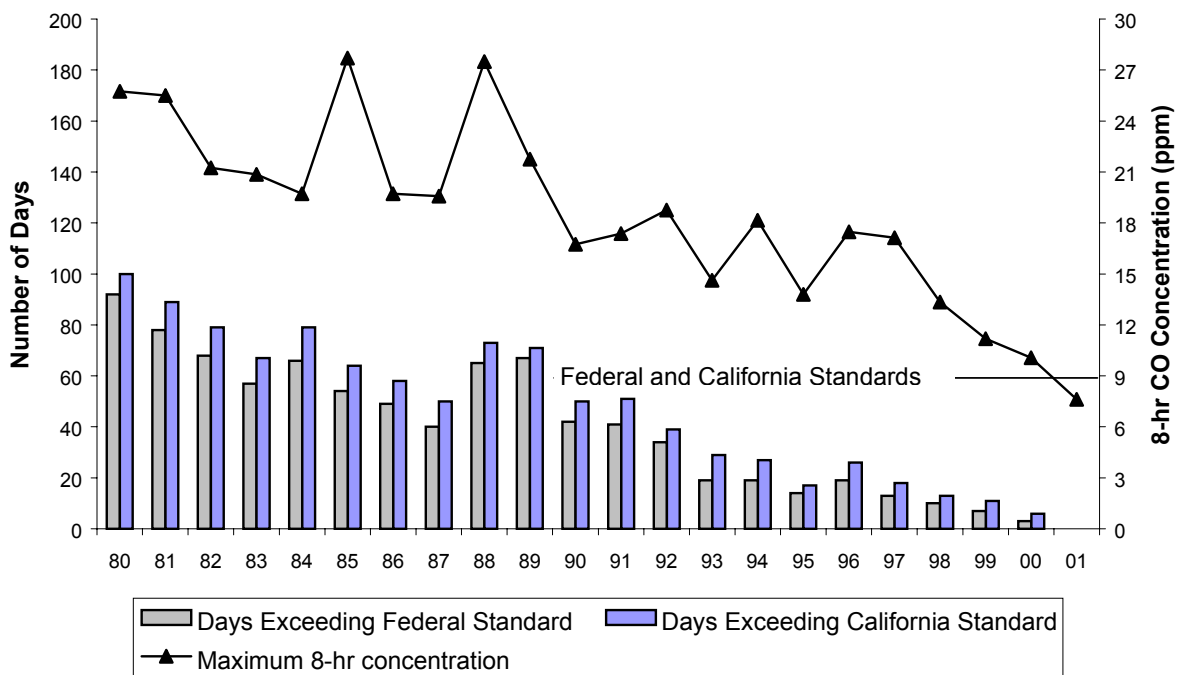
AIR QUALITY Figures 14 and 15 show the 1-hour and 8-hour CO trend for the South coast Air Basin from 1980 to 2001. As can be seen, the basin has been in compliance with the 1-hour CO federal and California ambient air quality standards since 1997 and has had an overall downward trend since 1988. However, 2001 is the first year that the basin has not experienced an exceedance of either the federal or California 8-hour CO ambient air quality standards, although a trend towards compliance is clearly demonstrated since 1992.

**AIR QUALITY Figure 14**  
**Historic 1-hour Maximum CO Concentrations in the South Coast Air Basin**  
**1980 to 2001**



Source: California Air Resources Board

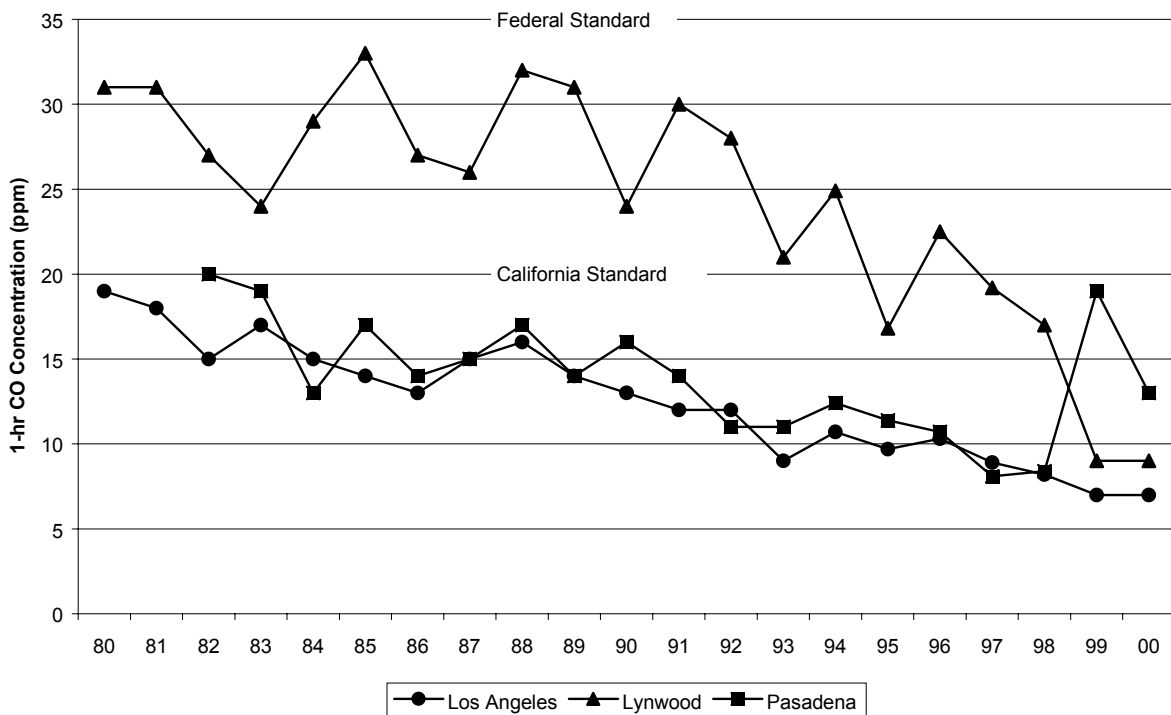
**AIR QUALITY Figure 15**  
**Historic 8-hour Maximum CO Concentrations in the South Coast Air Basin**  
**1980 to 2001**



Source: California Air Resources Board

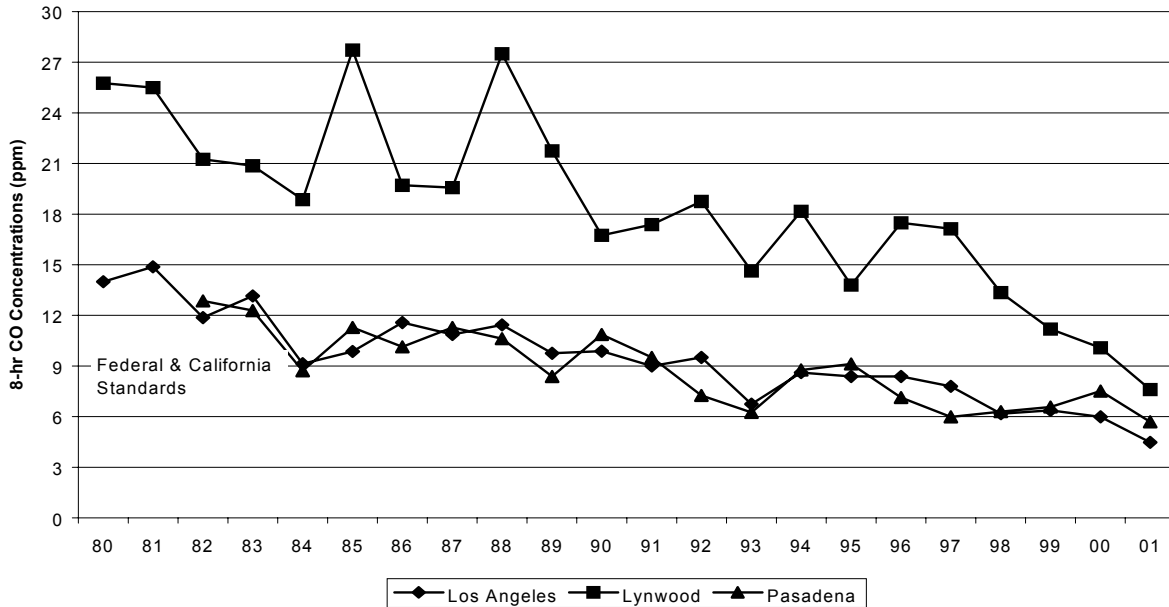
AIR QUALITY Figures 16 and 17 show the 1-hour and 8-hour CO concentration trends at the three near by monitoring stations, Los Angeles, Lynwood and Pasadena. These two figures clearly show the same trend as for the rest of the South Coast Basin, steady improvement since approximately 1991. Over most of this time, the highest measurements of CO concentrations have been made at the Lynwood monitoring station, with the exception of the 1-hour measurements made in 1999 and 2000 which were highest at the Pasadena monitoring station. For modeling purposes, staff recommends the use of the Pasadena 1999 1-hour CO ambient air quality concentration measurement of 19 ppm and the Lynwood 2001 8-hour CO ambient air quality concentration measurement of 7.61 ppm.

**AIR QUALITY Figure 16**  
**Historical 1-Hour CO Concentrations**  
**Los Angeles, Lynwood and Pasadena Monitoring Stations**  
**1980 to 2000**



Source: California Air Resources Board

**AIR QUALITY Figure 17**  
**Historical 8-Hour CO Concentrations**  
**Los Angeles, Lynwood and Pasadena Monitoring Stations**  
**1980 to 2001**



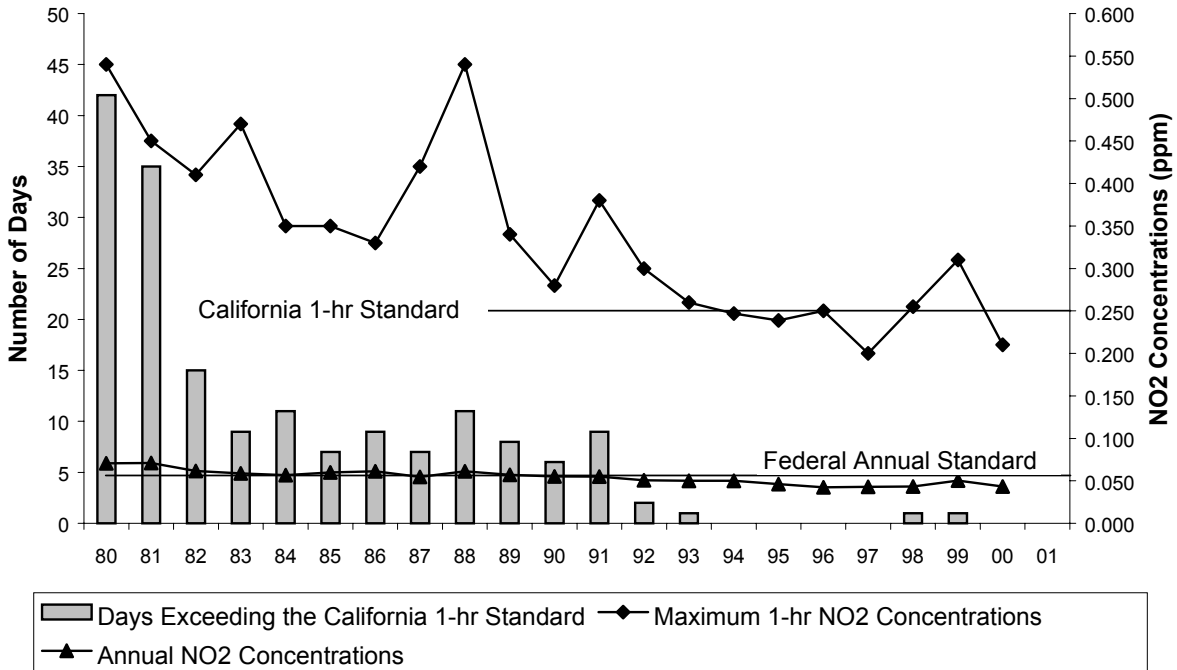
Source: California Air Resources Board

**Nitrogen Dioxide**

Nitrogen dioxide (NO<sub>2</sub>) can be emitted directly as a result of combustion or formed from nitric oxide (NO) and oxygen. NO is typically emitted from combustion sources and readily reacts with oxygen or ozone to form NO<sub>2</sub>. The NO reaction with ozone can occur within minutes and is typically referred to as ozone scavenging. By contrast, the NO reaction with oxygen is on the order of hours under the proper conditions. The South Coast Air Basin is designated attainment for both the state and federal NO<sub>2</sub> ambient air quality standards. AIR QUALITY Figures 18 shows both the 1-hour and annual NO<sub>2</sub> trends for the South Coast Basin. AIR QUALITY Figures 19 and 20 show the 1-hour and annual NO<sub>2</sub> concentrations measured at the Los Angeles, Lynwood and Pasadena monitoring stations. These figures show a slight, but erratic improvement in NO<sub>2</sub> concentrations from 1980 to 2001. Staff therefore recommends that the highest of the 2001 measurements be used. The highest 1-hour average NO<sub>2</sub> concentration in 2001 is 0.149 ppm, measured at the Pasadena monitoring station. The highest annual average NO<sub>2</sub> concentration in 2001 is 0.038 ppm, measured at the Los Angeles monitoring station.

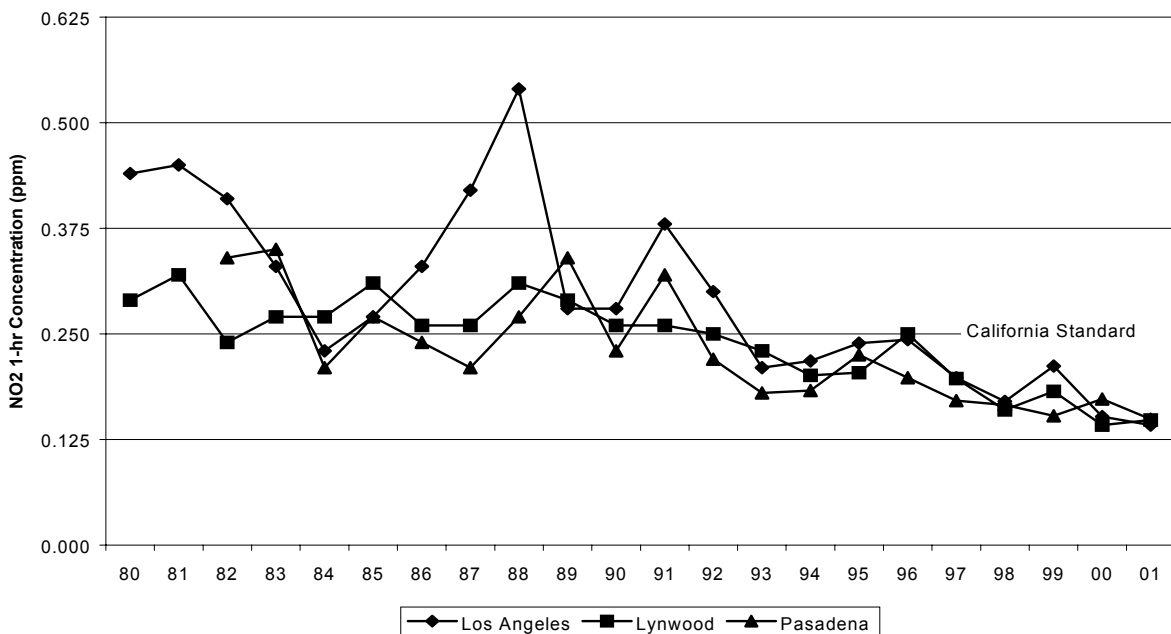


**AIR QUALITY Figure 18**  
**Historical 1-Hour NO<sub>2</sub> Concentrations**  
**South Coast Air Basin**  
**1980 to 2001**



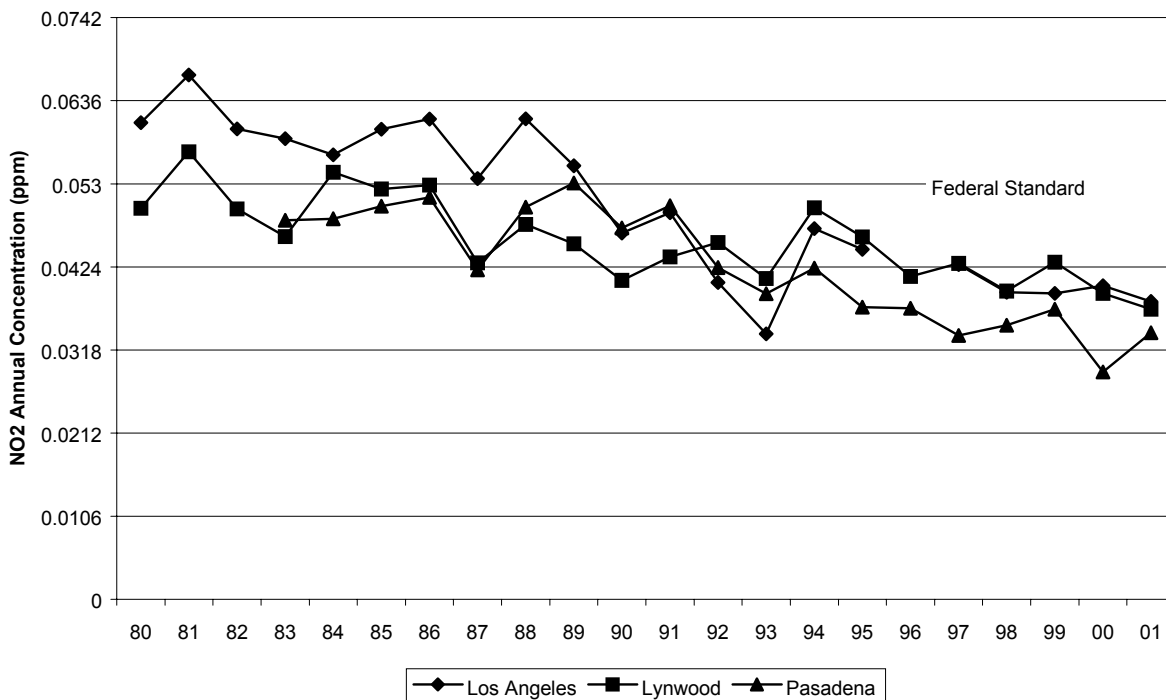
Source: California Air Resources Board

**AIR QUALITY Figure 19**  
**Historical Maximum 1-hour Average NO<sub>2</sub> Concentrations**  
**Los Angeles, Lynwood and Pasadena Monitoring Station**  
**1980 to 2001**



Source: California Air Resources Board

**AIR QUALITY Figure 20**  
**Historical Annual Average NO<sub>2</sub> Concentrations**  
**Los Angeles, Lynwood and Pasadena Monitoring Station**  
**1980 to 2001**

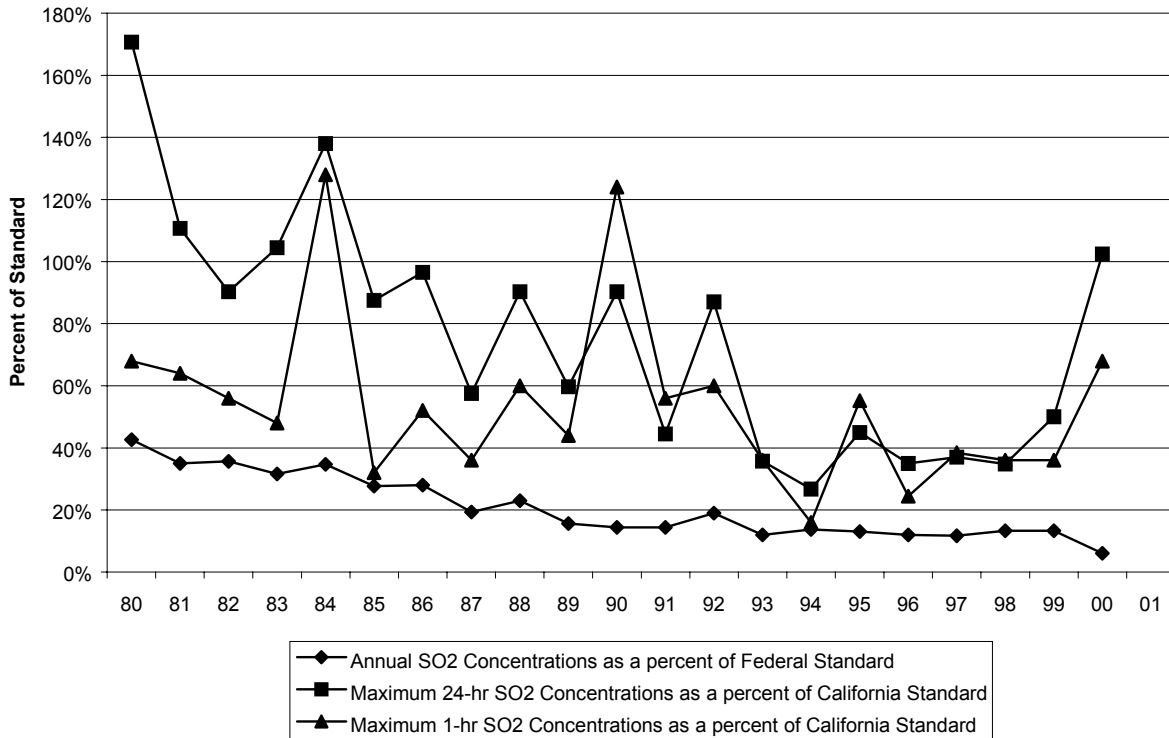


Source: California Air Resources Board

## **Sulfur Dioxide**

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO<sub>2</sub> emissions when combusted. By contrast, fuels high in sulfur content such as lignite (a type of coal) emit very large amounts of SO<sub>2</sub> when combusted. Sources of SO<sub>2</sub> emissions within the South Coast Air District come from every economic sector and include a wide variety of fuels, gaseous, liquid and solid. The South Coast air basin is designated attainment for all the SO<sub>2</sub> state and federal ambient air quality standards. AIR QUALITY Figures 21 shows the historic 1-hour, 24-hour and annual average SO<sub>2</sub> maximum concentrations for the South Coast Air Basin as a percent of the either the federal or California ambient air quality standards. Although AIR QUALITY Figure 21 shows an exceedance of the California 24-hour SO<sub>2</sub> ambient air quality standard, this does not in turn, designate them as a non-attainment area. This designation, in the case of California ambient air quality standards, is set by CARB through a regulatory process that is not being pursued at this time.

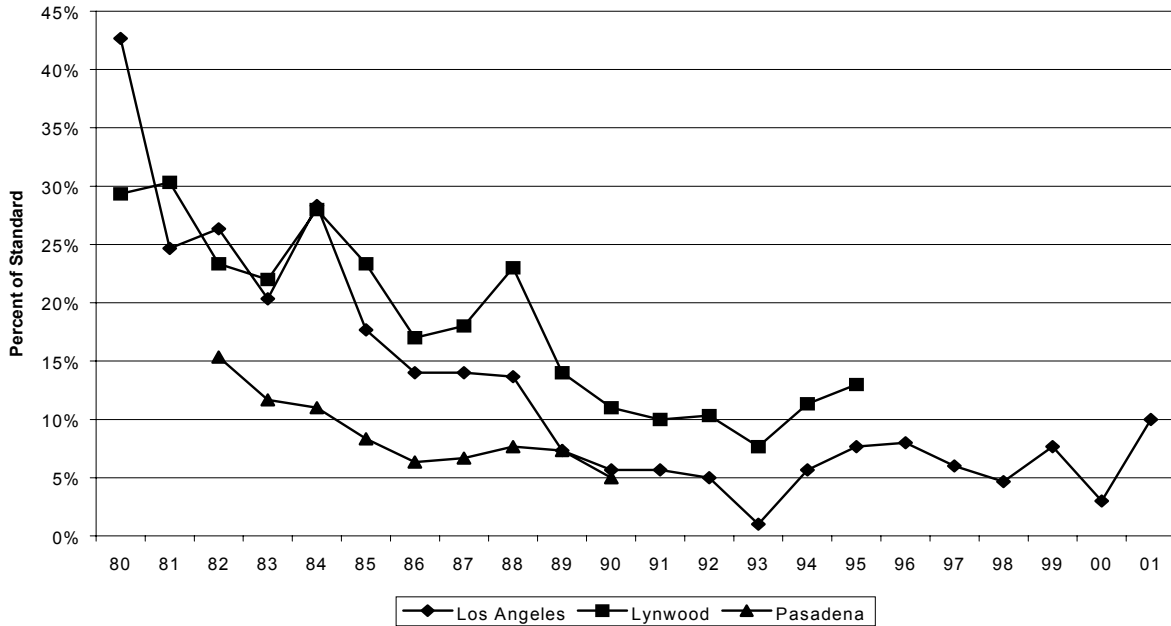
**AIR QUALITY Figure 21**  
**Historical Maximum Annual, 24-hour and 1-Hour SO<sub>2</sub> Concentrations**  
**As a percent of the Ambient Air Quality Standards**  
**South Coast Air Basin**  
**1980 to 2000**



Source: California Air Resources Board

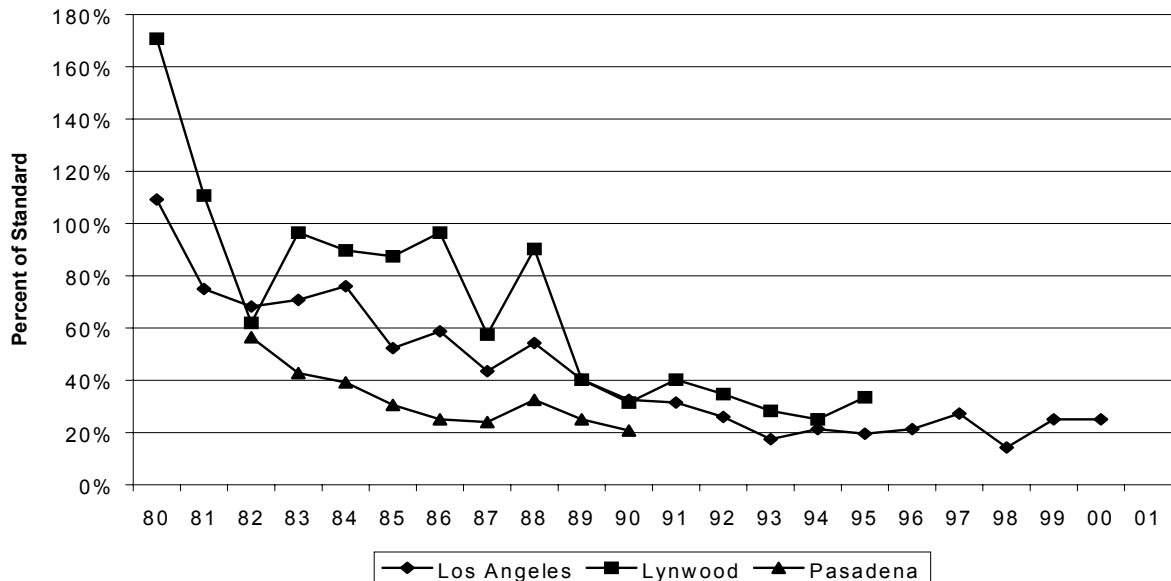
AIR QUALITY Figures 22, 23 and 24 show the annual, 24-hour and 1-hour SO<sub>2</sub> ambient air concentrations measured at the Los Angeles, Lynwood and Pasadena air quality monitoring stations. These figures show that the concentrations of SO<sub>2</sub> are far below the state and federal SO<sub>2</sub> ambient air quality standards. However, the trends are ambiguous and indicate neither an increase nor a decrease in SO<sub>2</sub> concentrations. Therefore, staff recommends the highest concentrations within the last 5 years be used to represent the background for SO<sub>2</sub> for modeling purposes. Since the Los Angeles monitoring station was the only one of the three that has continued operation for the last 5 years, all background measurements will be from that station. For the 1-hour standard, staff recommends 0.096 ppm, measured in 1997, for the 24-hour standard, staff recommends 0.0148 ppm, measured in 1997 and for the annual standard, staff recommends 0.003 ppm, measured in 2001.

**AIR QUALITY Figure 22**  
**Historical Annual SO<sub>2</sub> Concentrations**  
**as a Percentage of the Ambient Air Quality Standard**  
**Los Angeles, Lynwood, Pasadena Monitoring Stations**  
**1980 to 2000**



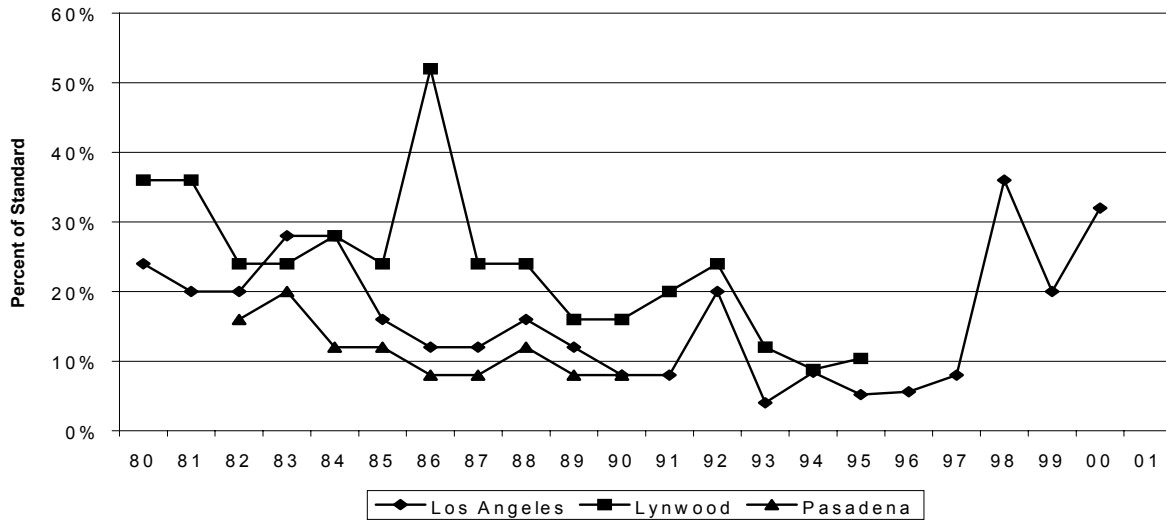
Source: California Air Resources Board

**AIR QUALITY Figure 23**  
**Historical 24-hour SO<sub>2</sub> Concentrations**  
**as a Percentage of the Ambient Air Quality Standard**  
**Los Angeles, Lynwood, Pasadena Monitoring Stations**  
**1980 to 2000**



Source: California Air Resources Board

**AIR QUALITY Figure 24**  
**Historical 1-hour SO<sub>2</sub> Concentrations**  
**as a Percentage of the Ambient Air Quality Standard**  
**Los Angeles, Lynwood, Pasadena Monitoring Stations**  
**1980 to 2000**



Source: California Air Resources Board

**Summary**

In summary, staff recommends the background ambient air concentrations in AIR Quality Table 5 for the purpose of modeling and evaluating potential ambient air quality impacts from the proposed project.

**AIR QUALITY Table 5**  
**Staff Recommended Background Concentrations**

Pollutant	Averaging Time	Concentration (ug/m <sup>3</sup> )	Concentration (ppm)
Ozone	1 Hour	320	0.160
Particulate Matter (PM10)	Annual Geometric Mean	42.1	--
	Annual Arithmetic Mean	44.8	--
	24 Hour	97	--
PM2.5	Annual Arithmetic Mean	23.1	--
	24 Hour	87.8	--
Carbon Monoxide	8 Hour	8,456	7.61
	1 Hour	21,850	19
Nitrogen Dioxide	Annual Average	71.7	0.038
	1 Hour	280	0.149
Sulfur Dioxide	Annual Average	8.0	0.003
	24 Hour	38.6	0.0148
	1 Hour	251.5	0.096

## PROJECT DESCRIPTION AND EMISSIONS

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### CONSTRUCTION

The ESPII will construct or modify the following major elements at the project site:

- 2 Alstrom GTX100 gas fired combustion turbines with gas fired heat recovery steam generators.
- An Alstrom MP24 steam generator.
- A 3-celled cooling tower.
- A diesel powered firewater pump.

The MGS will construct the following linear ancillary service projects off the project site:

- Natural gas pipeline; 1,300 feet long, 10-inch diameter (approximately 200 feet being constructed on-site) to be constructed in 300 foot sections.
- Sewer pipeline; 1,300 feet long, 12-inch diameter (approximately 200 feet being constructed on-site) to be constructed in 300 foot sections.
- Reclaimed water pipeline; 10,000 feet long, 12-inch diameter and expanding to 18-inches in some places (approximately 400 feet being constructed on-site) to be constructed in 300 foot sections.
- The lay down areas will be on adjacent properties and will not require any pre-construction activities.

Construction is expected to last 12.5 months and will be followed by 3 months of initial commissioning. The highest PM10 emissions (including fugitive dust) are expected to occur in the first two months, being substantially lower there after. The highest NOx emissions are also expected to occur in the first two months and reduce to substantially lower levels there after.

The City proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from MGS that follow this section take these control measures into consideration.

To control exhaust emissions from heavy diesel construction equipment:

- Limit engine idle time and shutdown equipment when not in use (although a specific time limit was not indicated).
- Perform regular preventative maintenance to reduce engine problems.
- Use CARB Low-Sulfur fuel for all heavy construction equipment.
- Ensure that all heavy construction equipment complies with EPA 1996 Diesel standards if available.

To control fugitive dust emissions:

- Use water to remove the build up of loose material on paved roads.
- Require all trucks hauling loose material to apply an appropriate cover.
- Limit traffic speed on unpaved surfaces to 25 mph.
- Use water application to control wind erosion from disturbed areas.

## **Project Site**

The power plant itself will take approximately 12.5 months to construct. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest fugitive dust emissions are generated during the civil/structural activity, where work such as demolition, grading, site preparation, foundations, underground utility installation and building erection 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. This is a relatively small emissions generating activity in comparison to the early construction activities. From estimates made by the City, the highest emissions occur during the first two months of construction. The highest daily emissions, based on the 12.5 months of construction emissions, are shown in AIR QUALITY Table 6. AIR QUALITY Table 7 shows the expected annual emissions from construction activities at the project site.

**AIR QUALITY Table 6  
Maximum Daily On-site Construction Emissions (lbs/day)**

	<b>NOx</b>	<b>VOC</b>	<b>CO</b>	<b>SOx</b>	<b>PM10</b>	<b>Fugitive PM10</b>
Construction Equipment	104.29	15.11	128.47	2.42	6.05	--
Worker Travel, Truck and Rail Deliveries <sup>1</sup>	2.13	1.61	4.56	0	0.11	--
Windblown Dust	--	--	--	--	--	26.09
Total <sup>3</sup>	106.42	16.72	133.03	2.42	6.16	26.09
1 Includes both paved and unpaved road travel						

Source: (CEC 2001a)

**AIR QUALITY Table 7  
Annual On-site Construction Emissions (tons/year)**

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	6.61	0.96	8.14	0.15	0.38	--
Worker Travel, Truck and Rail Deliveries <sup>1</sup>	0.07	0.18	0.45	0.00	0.00	--
Windblown Dust	--	--	--	--	--	0.55
<b>Total</b>	<b>6.68</b>	<b>1.14</b>	<b>8.59</b>	<b>0.15</b>	<b>0.93</b>	<b>--</b>
1 Includes construction, truck deliveries, train deliveries and worker travel.						

Source: (CEC 2001a)

### **Linear Facilities**

The linear facilities include the reclaimed water pipeline (10,000 feet long), the sewer pipeline (1,300 feet long) and the natural gas pipeline (1,300 feet long). The construction of the sewer and the natural gas pipelines are not expected to last longer than 2 months. The construction of the reclaimed water pipeline is expected to last approximately 7½ months, due to its length. AIR QUALITY Table 8 shows both the expected peak hourly emissions and the total emissions from the construction of the linear facilities.

**AIR QUALITY Table 8  
Linear Construction Emissions**

<b>PEAK HOURLY (LBS/HR)</b>	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Natural Gas Pipeline	3.59	0.52	3.09	0.08	0.24	0.64
Sewer pipeline	2.44	1.25	2.64	0.06	0.16	0.64
Reclaim Water Pipeline	4.24	1.52	4.44	0.10	0.28	0.64
<b>Total Linear Construction (Lbs)</b>						
Natural Gas Pipeline	369.59	56.34	298.01	8.57	26.26	123 <sup>a</sup>
Sewer pipeline	59.06	15.87	56.48	1.37	4.02	51 <sup>b</sup>
Reclaim Water Pipeline	980.91	187.81	957.29	22.75	65.56	976 <sup>c</sup>
<sup>a</sup> Assuming 2 backhoes operating 12 8-hour days at 0.642 lbs/hr average. <sup>b</sup> Assuming 1 backhoe and 1 dump truck operating for 5 8-hour days at 0.642 lbs/hr average. <sup>c</sup> Assuming 3 backhoes and 2 dump trucks operation for 38 8-hour days at 0.642 lbs/hr average.						

Source: (CEC 2001a)



## **OPERATIONAL PHASE**

### **Equipment Description**

The equipment at the MGS will consist of the following components:

- 2 Alstrom GTX100 gas fired combustion turbines (input heat rate 520.62 mmbtu/hr, nominal output of 42.5 MW), with gas fired heat recovery steam generators (73.4 mmbtu/hr), DLN combustors, oxidizing catalyst and ammonia injected selective catalytic reduction (SCR).
- An Alstrom MP24 steam turbine generator with a nominal output of 55MW.
- A 3-celled cooling tower, with 25,000gpm throughput and 0.0005% drift rate.
- A 266 Bhp diesel powered firewater pump.
- 5-7,000 Bhp diesel powered emergency power generators (these were modified with ultra low sulfur diesel fuel and are not considered part of the project but are the source of SO<sub>2</sub> mitigation for the project).

### **Equipment Operation**

The City is assuming that the MGS will startup and shutdown approximately once a week (56 times a year). Additionally, the City is assuming the MGS will have 4 cold startups a year, typically following a planned maintenance operation for the facility. Other than startup, shutdown or down time, the City assumes that the MGS will be at full load, including the heat recovery steam generators (HRSG). The City intends to service their local load with this generation and on rare occasions sell power to the market. The firewater pump is assumed to be tested once a week for ½ hour and not to exceed 199.9 hours of operation in a year.

### **Emission Controls**

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO<sub>2</sub> and PM<sub>10</sub> emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur compound emissions in the flue gas which are generally counted as SO<sub>2</sub>. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur emissions from the combustion of natural gas are very low.

Like SO<sub>2</sub>, the emissions of PM<sub>10</sub> from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue; therefore it is a relatively clean-burning fuel.

A sulfur content of 0.50 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO<sub>2</sub> emission calculations.

To minimize NO<sub>x</sub>, CO and VOC emissions during the combustion process, the CTGs are equipped with the latest dry low-NO<sub>x</sub> (DLN) combustor design. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis.

After combustion, the flue gases pass through the natural gas fired heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. MGS is proposing to use ammonia injected Selective Catalytic Reduction (SCR) system to reduce NOx emissions. An oxidizing catalyst will also be installed in the HRSG to reduce CO and VOC emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

The cooling tower will be designed to a drift rate of 0.0005% to maintain a low PM10 emission.

### **Project Operating Emissions**

The MGS project emissions are shown in AIR QUALITY Tables 9 through 12. AIR QUALITY Table 9 shows the maximum expected hourly emissions, Table 10 shows the maximum expected daily emissions and Table 11 shows the maximum expected annual emissions. AIR QUALITY Table 12 shows the maximum expected emissions for the first year of operation, which include the emissions from initial commissioning.

**AIR QUALITY Table 9**  
**Maximum Expected Hourly Emissions**  
**(lbs/hr)**

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total	Assumptions
CO	48.6	0	1.20	49.80	a,c,d
NOx	26.2	0	3.46	29.66	a,c,d
PM10	7.78	0.25	0.15	8.18	b,c,d
VOC	3.3	0	0.09	3.39	a,c,d
SOx	0.3	0	0.004	0.304	b,c,d
Ammonia	7.6	0	0.00	7.60	b,c,d
<b>Assumptions</b>					
a The gas turbines are undergoing a cold startup @ 38 deg F.					
b The gas turbines are at full load @ 38 deg F with the duct burners on.					
c The cooling tower is at full load.					
d The Firewater pump is being tested for ½ hour.					

Source: (CEC 2001a)

**AIR QUALITY Table 10**  
**Maximum Expected Daily Emissions**  
**(lbs/day)**

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total	Assumptions
CO	165.14	0	1.20	166.34	a,d,e,
NOx	217.96	0	3.46	221.42	a,d,e,
PM10	186.72	6.00	0.15	192.87	b,d,e
VOC	40.9	0	0.09	40.99	c,d,e
SOx	7.2	0	0.004	7.20	b,d,e
Ammonia	182.4	0	0.00	182.40	b,d,e
<b>Assumptions</b>					
a The gas turbines are undergoing cold startup (2 hours), 21.5 hours of baseload operation and 0.5 hours shutdown @ 38 deg F.					
b The gas turbines are at full load for 24 hours @ 38 deg F with the duct burners on					
c The gas turbines are undergoing cold startup (2 hours) and baseload operation for 22 hours @ 38 deg F.					
d The cooling tower is at full load for 24 hours					
e The Firewater pump is being tested 0.5 hours					

Source: (CEC 2001a)

**AIR QUALITY Table 11**  
**Maximum Expected Annual Emissions**  
**(lbs/year)**

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total		Assumptions
				Lbs/yr	Tons/yr	
CO	44,647	0	478	45,125	22.56	a,c,d
NOx	70,558	0	1,377	71,935	35.97	a,c,d
PM10	68,153	2,190	58	70,401	35.20	b,c,d
VOC	14,892	0	35	14,927	7.46	a,c,d
SOx	2,628	0	2	2,630	1.31	b,c,d
Ammonia	66,576	0	0	66,576	3.29	b,c,d
<b>Assumptions</b>						
a The gas turbines are undergoing initial commissioning for three months then 3 cold startups, 39 warm startups, 42 shutdowns and 6486 hours at full load with the duct burners on @ 65 deg F.						
b The cooling tower at full load for 8760 hours.						
c The Firewater pump is being tested 199 hours.						

Source: (CEC 2001a)

**AIR QUALITY Table 12**  
**Maximum Expected First Year Emissions**  
**(lbs/year)**

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total		Assumptions
				Lbs/yr	Tons/yr	
CO	112,311	0	478	112,789	56.39	a,b,c
NOx	565,695	0	1,377	567,072	283.54	a,b,c
PM10	48,668	2,190	58	50,917	25.46	a,b,c
VOC	40,370	0	35	40,405	20.20	a,b,c
SOx	4,276	0	2	4,277	2.14	a,b,c
Ammonia	49,294	0	0	49,294	24.65	a,b,c
<b>Assumptions</b>						
a The gas turbines are undergoing initial commissioning for three months then 3 cold startups, 39 warm startups, 42 shutdowns and 6486 hours at full load with the duct burners on @ 65 deg F.						
b The cooling tower at full load for 8760 hours.						
c The Firewater pump is being tested 199 hours.						

Source: (CEC 2001a)

### **Ammonia Emissions**

Due to the combustion turbines used in this project and the need to control NOx emissions, ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. The City has committed to an ammonia slip no greater than 5 ppm, which is the current lowest ammonia slip level being permitted throughout California. On a daily basis, the ammonia slip of 5 ppm is equivalent to approximately 182 lbs/day of ammonia emitted into the atmosphere per turbine.

It should be noted that the ammonia slip of 5 ppm is usually associated with the degradation of the SCR catalyst, usually in a time frame of two 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, corresponding to a mass emissions of approximately 36 to 72 pounds per day per turbine.

### **INITIAL COMMISSIONING**

The initial commissioning of a power plant refers to the time frame between completion of construction and the consistent production of electricity for sale on the market. Normal operating emission limits usually do not apply during initial commissioning procedures. The turbines used at the MGS will go through several layers of testing during initial commissioning. During the first set of tests, post-combustion controls will not be operational (i.e., the SCR and oxidation catalyst).

These tests start with a Full Speed-No Load test. This test runs the turbine at approximately 20% of its maximum heat input rate. Components tested include the ignition system, synchronization with the electric generator and the turbine overspeed safety system. Part Load testing runs the turbines to approximately 60% of the

maximum heat input rating. During this test the turbine and HRSG will be tuned to minimize emissions and the HRSG steam lines will be checked. Full Load testing runs the turbines to approximately 100% of their maximum heat input rate. This testing entails further tuning of the turbine and HRSG as well as the steam lines. Full Load – Partial SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia injection grid for the first time. Finally, Full Load – Full SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia inject grid at its full capacity. It is during this test that the SCR system will be completely tuned and operating at design levels (i.e., NOx control at 2.5 ppm).

AIR QUALITY Table 13 shows the expected emissions from the initial commissioning for both MGS combustion turbines. It is typical, based on previous licensing cases, that initial commissioning for a combined cycle system of this size would last approximately 30 days. Additionally, daily operation of the turbines is typically limited to several hours a day. Staff assumes that the turbines would be operated, on average, not more than 4 hours in a single day during the initial commissioning period. Staff also assumes that the SCR and oxidation catalyst will be installed approximately 15 days into the initial commissioning period. Based on these assumptions, staff makes the following estimates of emissions due to initial commissioning procedures.

**AIR QUALITY Table 13**  
**Initial Commissioning Emissions Estimate**

	<b>NOx</b>	<b>CO</b>	<b>VOC</b>	<b>SOx</b>	<b>PM10</b>
Maximum Hourly Emissions (lbs/hr)	68.35	33	63	0.90	3.81
Maximum Daily Emissions (lbs/day)	269	340	631	3.6	102
Total Initial Commissioning Emissions (lbs) <sup>1</sup>	7,398	14,364	6,972	122	2,804
<sup>1</sup> Total emissions include controlled and uncontrolled emissions for both turbines.					

Sources: (CEC 2001a), (SCAQMD 2002b)

## **FACILITY CLOSURE**

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Eventually the MGS will close, either as a result of the end of its useful life, 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.

The Permit to Operate, issued by the District, is required for operation of the facility and is usually renewed on an annual schedule. However, during those five years, the City must still pay permit fees annually. If the City chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the City pays the fees to renew the Permit to Operate.

If the City were to decide to dismantle the project, there would likely be fugitive dust and equipment 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 MGS plans to demonstrate compliance with the District Rules regarding fugitive dust emission limitations.

## **PROJECT IMPACTS**

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### **MODELING APPROACH**

The MGS 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 refined modeling. The refined complex terrain model, CTSCREEN, was used to evaluate some impacts in more detail.

### **CONSTRUCTION IMPACTS**

The City performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the construction activity and combustion emissions from the equipment. The emissions used in the analysis were the highest emissions of a particular pollutant during a single month, converted to a gram per second emission rate for the model. Most of the highest emissions occurred during the first and second month of the 12.5-month construction period.

The results of this modeling effort are shown in AIR QUALITY Table 14. They show that the construction activities would cause violations of the state 1-hour average NO<sub>2</sub> and PM<sub>10</sub> standards (direct impact) and further exacerbate existing violations of the CO and annual PM<sub>10</sub> standards (cumulative impacts).

**AIR QUALITY Table 14  
Maximum Construction Impacts**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>Direct Impact (µg/m<sup>3</sup>)<sup>2</sup></b>	<b>Background (µg/m<sup>3</sup>)<sup>1</sup></b>	<b>Cumulative Impact (µg/m<sup>3</sup>)</b>	<b>Limiting Standard (µg/m<sup>3</sup>)</b>	<b>Cumulative as a Percent of Standard</b>
NO <sub>2</sub> <sup>2</sup>	<b>1-hour<sup>3</sup></b>	<b>4,616.7</b>	280	<b>4,896.7</b>	470	<b>1,042%</b>
	<b>Annual<sup>4</sup></b>	41.1	71.7	<b>112.2</b>	100	<b>112%</b>
CO <sup>2</sup>	<b>1-hour</b>	5,236.5	21,850	<b>27,087</b>	23,000	<b>118%</b>
	<b>8-hour</b>	1,629.4	8,456	<b>10,085</b>	10,000	<b>101%</b>
SO <sub>2</sub> <sup>2</sup>	1-hour	104.1	251.5	355.6	655	54%
	24-hour	10.8	38.6	49.4	130	38%
	Annual	1.0	8.0	9.0	80	11%
PM <sub>10</sub>	<b>24-hour</b>	<b>141.4</b>	97	<b>238.4</b>	50	<b>477%</b>
	<b>Annual<sup>5</sup></b>	5.0	43.1	<b>48.1</b>	30	<b>160%</b>
	<b>Annual<sup>6</sup></b>	5.0	44.8	<b>49.8</b>	50	<b>99%</b>
1 See AIR QUALITY Table 4. 2 Based on daily emission during month 1 and 2. 3 Employs ozone-limiting method, factor of 0.58 used. 4 Employs ARM method, default district ratio of 0.71. 5 Annual Geometric Mean, State Standard 6 Annual Arithmetic Mean, Federal Standard						

Source: (CEC 2001a)

Since the general public work in the vicinity of the project site, the construction of the MGS may expose the general public to adverse air quality conditions, resulting in significant short-term impacts. Thus, staff believes that the impact from the construction of the project could have a significant impact on the NO<sub>2</sub>, CO and PM<sub>10</sub> ambient air quality standards if left unmitigated.

## **PROJECT OPERATION INCREMENTAL IMPACTS**

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during the facility start-up and steady-state operations.

### **Fumigation Impacts**

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.

The SCREEN3 model, which is an EPA approved model, is what is typically used for the calculation of fumigation impacts. However, this model is applied to rural areas, not urban areas such as the project site. Therefore, the City did not perform any fumigation modeling. Impacts from fumigation are typically significantly lower than the impacts of a power plant's normal operation (approximately 1/10<sup>th</sup> the size). Using this as a rough estimate, staff developed AIR QUALITY Table 15 to show the potential fumigation impacts on the 1-hour NO<sub>2</sub>, CO and SO<sub>2</sub> standards. Since fumigation impacts will not typically occur much beyond a 1-hour period, only impacts on these 1-hour standards were addressed. The results of the modeling analysis show that fumigation impacts will not violate directly or contribute to a violation of the NO<sub>2</sub>, CO or SO<sub>2</sub> 1-hour standards.

**AIR QUALITY Table 15**  
**Estimated Facility Fumigation Maximum 1-Hour Impacts**

<b>Pollutant</b>	<b>Direct Impact<sup>1</sup> (µg/m<sup>3</sup>)</b>	<b>Background<sup>2</sup> (µg/m<sup>3</sup>)</b>	<b>Cumulative Impact (µg/m<sup>3</sup>)</b>	<b>Limiting Standard (µg/m<sup>3</sup>)</b>	<b>Cumulative Impact as a Percent of Standard</b>
NO <sub>2</sub>	2.2	280	282	470	60
CO	4.0	21,850	21,854	23,000	95
SO <sub>2</sub>	0.03	251.5	251.5	655	38
1 Impacts include emissions from both turbines with duct burners, and are 1/10 <sup>th</sup> the impacts as reported for the project normal operation (see AIR QUALITY Table 16). 2 See AIR QUALITY Table 4					

### **Operational Modeling Analysis**

The City provided staff with a modeling analysis, using the ISCST3 model to quantify the potential impacts of the project for both turbines, during normal steady state, start-up and shutdown operations. This modeling analysis consisted of a refined level modeling effort that assumed the most logical worst case conditions as opposed to developing a series of pre-screening modeling analyses. That is, assuming that the worst case NO<sub>x</sub>, VOC and CO emissions would occur during startup and shutdown, while the worst case PM<sub>10</sub> and SO<sub>2</sub> emissions occur during full load operations. Further presumptions are made to make the estimate of impacts (i.e., modeling results) more conservative. For example, assuming on an annual basis that the facility will be either in startup, shutdown or under full load operations and that there will be zero downtime. The refined modeling impacts with the appropriate assumptions for only the combustion turbines are shown in AIR QUALITY Table 16.



**AIR QUALITY Table 16  
Combustion Turbines and Cooling Tower  
Modeling Maximum Impacts**

	<b>Averaging Time</b>	<b>Direct Impact (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Limiting Standard (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Direct Impact as a Percent of Standard</b>
NO <sub>2</sub>	1-hour, Startup	21.82	470	5
	Annual <sup>b</sup>	0.39	100	1
CO	1-hour, Startup	40.46	23,000	0
	8-hour, Full Load	1.205	10,000	0
SO <sub>2</sub>	1-hour, Shutdown	0.332	655	0
	24-hour, Full Load	0.062	105	0
	Annual, Full Load	0.0189	80	0
PM <sub>10</sub>	24-hour, Full Load	1.94	50	4
	Annual <sup>c</sup> , Full Load	0.474	30	2
	Annual <sup>d</sup> , Full Load	0.474	50	1
<sup>a</sup> See AIR QUALITY Table 4 <sup>b</sup> Assumes 4 cold startups, 52 warm startups, 56 shutdowns and 8646 hours of full load operation with the duct burners on. <sup>c</sup> Annual Geometric Mean, State Standard, includes both the combustion turbines and the cooling towers. <sup>d</sup> Annual Arithmetic Mean, Federal Standard, includes both the combustion turbines and the cooling towers.				

Source (CEC 2001a)

Startup, shutdown and full load operations were modeled separately for each of the major pollutants shown in AIR QUALITY Table 16 (NO<sub>x</sub>, SO<sub>x</sub>, CO and PM<sub>10</sub>), which shows the maximum impact for each pollutant and averaging time. In general, the maximum 1-hour based emission impacts (NO<sub>x</sub>, SO<sub>x</sub> and CO) occurred approximately 1¾ miles to the north of the project site, while the maximum 8-hour, 24-hour and annual emission impacts were approximately ¼ to ½ mile to the east. The maximum 24-hour and annual PM<sub>10</sub> emission impacts are expected to be ¼ and ½ miles to the east of the project site respectively. Since these emissions do not cause a direct violation of the ambient air quality standards, staff considers them to be insignificant.

The project emissions impacts that are shown in AIR QUALITY Table 16 do not include those from the diesel powered firewater pump. The reason being is that the necessary information was not available to the applicant in a timely manner to be included in the modeling. As a consequence, staff recommends that certain restrictions be placed on the testing (not emergency operation) of the firewater pump as reflected in the modeling provided. Staff recommends that the testing of the firewater pump not occur during the startup of either turbine, on a day when any startup or shutdown of either turbine has occurred or during a planned shutdown of either turbine. This is due to the fact that the City modeled the MGS firewater pump emission impacts with the turbines and cooling

tower at full load operation and not startup or shutdown. It is unlikely that any power plant would test their firewater pump during a startup or planned shutdown or, in most case, on a day when a startup or planned shutdown has occurred. It is therefore staff's opinion that these restrictions on the testing of the firewater pump do not represent an undue burden to the City.

AIR QUALITY Table 17 shows the maximum expected impacts from the testing of the diesel firewater pump. This testing is expected to require ½ an hour to complete and is required once a week. The City originally modeled the firewater pump testing as 52 times a year (for a total of 26 hours per year) for the annual emission impacts. However, the District regulations allow the firewater pump to operate up to 199.9 hours per year for testing. Therefore, staff has modified the diesel firewater pump annual emission impacts (NOx, SOx and PM10) provided by the City to reflect the annual limit placed upon it by the District. As is shown in AIR QUALITY Table 17, there are no direct violations of the ambient air quality standards from the MGS project emission impacts. Therefore, staff finds that there no significant direct impacts from the MGS project emissions.

**AIR QUALITY Table 17**  
**Diesel Powered Firewater Pump, Combustion Turbines and Cooling Towers**  
**Modeled Maximum Impacts**

	<b>Averaging Time</b>	<b>Direct Impact (µg/m<sup>3</sup>)</b>	<b>Limiting Standard (µg/m<sup>3</sup>)</b>	<b>Direct Impact as a Percent of Standard</b>
NO2	1-hour <sup>e</sup>	124.6	470	26.5
	Annual <sup>b</sup>	0.91	100	1
CO	1-hour <sup>e</sup>	42.3	23,000	0
	8-hour <sup>e</sup>	2.59	10,000	0
SO2	1-hour <sup>e</sup>	0.372	655	0
	24-hour <sup>e</sup>	0.062	105	0
	Annual <sup>b</sup>	0.015	80	0
PM10	24-hour <sup>e</sup>	1.28	50	3
	Annual <sup>c</sup>	0.388	30	1
	Annual <sup>d</sup>	0.388	50	1
<p><sup>a</sup> See AIR QUALITY Table 4</p> <p><sup>b</sup> Assumes 8760 hours of full load operation with the duct burners on and 199.9 hours of testing for the emergency diesel powered firewater pump.</p> <p><sup>c</sup> Annual Geometric Mean, State Standard, includes both the combustion turbines and the cooling towers and 199 hours testing of the emergency diesel powered firewater pump.</p> <p><sup>d</sup> Annual Arithmetic Mean, Federal Standard, includes both the combustion turbines and the cooling towers and 199.9 hours testing of the emergency diesel powered firewater pump.</p> <p><sup>e</sup> Assumes bot turbines and the cooling tower at full load operation with ½ hour testing of the emergency diesel powered firewater pump.</p>				

Source (CEC 2001a)

## **Secondary Pollutant Impacts**

The project's gaseous emissions of NO<sub>x</sub>, SO<sub>2</sub>, VOC and ammonia can contribute to the formation of secondary pollutants, ozone and PM<sub>10</sub>. There are air photochemical 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 NO<sub>x</sub> and VOC emissions to ozone formation, it can be said that the emissions of NO<sub>x</sub> and VOC from the MGS do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

Secondary PM<sub>10</sub> formation, as discussed earlier, is the process of conversion from gaseous reactants to particulate products. 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 are no agency (EPA or CARB) recommended models or procedures for estimating secondary PM<sub>10</sub> formation.

Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO<sub>2</sub> and NO<sub>x</sub>. The data from these studies can be used to approximate the conversion of SO<sub>2</sub> and NO<sub>x</sub> to particulate. This can be done by using an aggregate conversion factor (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model is run with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO<sub>2</sub> and NO<sub>2</sub> that is converted to particulate. This approach is an over simplification of a complex process; nevertheless, given the stringency of the PM<sub>10</sub> standards, and the need to address interpollutant conversion rates in setting offset ratios for interpollutant trading, staff believes this issue needs to be addressed. NO<sub>x</sub> and SO<sub>2</sub> emissions if left unmitigated, do have the potential to contribute to secondary PM<sub>10</sub> formation and thus higher PM<sub>10</sub> levels in the area.

As discussed in the setting section, ammonia emissions during the ammonia poor times of the year (from May to August) have the potential to contribute to secondary PM<sub>10</sub> formation. However, during this time frame inorganic dusts dominate the secondary PM<sub>10</sub> ambient air concentrations the Nitrate/Sulfate compounds are about 22% of the total PM<sub>10</sub>. It is staff's opinion that any air quality impacts from the ammonia emissions of the MGS alone are too speculative to estimate and may not have the potential to cause or contribute to an exceedance of the short-term or long-term, state or federal ambient air quality standards. Therefore staff concludes that the ammonia emissions from the MGS to not have a reasonable expectation of causing or contributing to an exceedance of the ambient air quality standards.

## **VISIBILITY IMPACTS**

The City did not perform a visibility analysis for the MGS proposed project because they have shown that the MGS project does not trigger the requirements for performing one under the District rules. By District rule 1303, the City must produce a visibility analysis if the MGS facility emits more than 15 tons/yr of PM<sub>10</sub> or 40 tons/yr of NO<sub>x</sub> and it is closer than the triggering distances as reproduced in AIR QUALITY Table 18. The

MGS does emit more than the trigger amount of PM10 and NOx, however, does not trigger the distance for the closest Federal Class 1 area, the San Gabriel Wilderness Area as is shown in AIR QUALITY Table 18. Therefore, it is staff's opinion that the City is not required by District Rule 1303 to produce a visibility impacts assessment due to their distances from class 1 areas.

**AIR QUALITY Table 18**  
**Primary Screening Level for Visibility Impacts**  
**South Coast Air Quality Management District**

Federal Class I Areas	Triggering Distance (km)	Distance to MGS Project Site (km)
Agua Tibia	28	128
Cucamonga	28	41
Joshua Tree	29	161
San Gabriel	29	34
San Gorgonio	32	100
San Jacinto	28	127

## CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impact analysis, staff needs specific and timely information. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when the applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that the applicant develops the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those probable future projects in our cumulative impact analysis that are currently under construction, or are currently under District review. Projects located up to six miles from the proposed facility site usually need to be included in the analysis. Historic and current emissions sources are represented by adding the modeled expected future project emission impacts to the measured background ambient air quality conditions. It is staff's opinion that this method satisfies the cumulative impacts requirement of CEQA.

The City requested assistance from the California Energy Commission in developing a list of projects in the vicinity of the MGS site to investigate as potential sources for the cumulative impact analysis. On the City's behalf, staff contacted the District and reviewed more than 800 potential sources within 6 miles of the MGS project site vicinity that received or requested, new or modifications to, their Permit to Construct or Permit to Operate no earlier than 1999. This many sources would be difficult if not impossible to represent using the ISCST3 model. Additionally, if this many sources could be modeled, it is likely that the large number of smaller emission sources would skew the results. Therefore, staff refined this list to include 78 sources located within 20 different facilities. Staff did this by first eliminating sources that, while going through permit changes, were not changing their emissions (typically a name or ownership change). Secondly, staff eliminated sources that were replacing existing sources where the emissions were either staying the same or decreasing (typically replacing an older boiler with a newer boiler). This left only emission sources that had new and increasing emissions. Staff then eliminated any source that was less than 5 lbs/day (of any pollutant) and more than 4 miles from the facility site and was not located in the vicinity of the main wind corridors as centered on the facility site. The wind corridor is primarily a west-east direction for the MGS, ranging on the eastern side from northeast to east-southeast and primarily west on the western side. AIR QUALITY Table 19 lists the 20 facilities that staff directed the City to investigate for reasonable model input parameters and model. Staff also reviewed recent Environmental Impact Reports (Draft and Finals)

that included the Vernon City area to ensure that no other sources were expected in the vicinity of the MGS. Staff concluded that several EIRs were recently completed which included the Vernon City area, but did not result in any emission increases other than VOC, which is not modeled. These EIRs were for the Chevron and ARCO/BP refineries' switch from MTBE to ethanol as an emissions control additive to gasoline. The VOC emission occurred as a result of modifications done for the refuel stations in or near Vernon City.

**AIR QUALITY Table 19**  
**List of Facilities**  
**Recommended by Staff for inclusion in the**  
**Cumulative Modeling Analysis**

Airsep System Inc.
A's Match Dyeing & Finishing
Baker Commodities Inc.
Chevron Products Company
Color Master Printex
Color America Textile Processing
Filia Fab's
JDS Finishing
LA MTA #2
LA Corona USA
Life-Like Products
Match Master Dyeing & Finishing
Paramount Petro Corp.
Poly Pak America
Popular Textile Corp.
Techni-Cast Corp.
Trillium USA
USC Health Science
US Namsung Textile
Valley Plating Works Inc.

Source (COV 2002b)

The City investigated and developed emission rates and stack parameters for each of the 78 sources identified by staff. Staff approved these source characteristics prior to the City completing the cumulative modeling. AIR QUALITY Table 20 shows the maximum expected cumulative impacts considering the 20 facilities identified in AIR QUALITY Table 19 plus the MGS. As AIR QUALITY Table 20 shows, only PM10 is expected to contribute to an exceedance of the ambient air quality standards (both annual and 24-hour). MGS PM10 emissions represent 64% of the 24-hour impacts and 50% of the annual cumulative PM10 impacts shown in AIR QUALITY Table 20. Therefore, staff considers the contribution of the MGS PM10 emissions to the cumulative impact to be significant if left unmitigated.

**AIR QUALITY Table 20  
Maximum Cumulative Impacts**

	Averaging Time	Future Direct Impact ( $\mu\text{g}/\text{m}^3$ )	Back-Ground <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ )	Cumulative Impact ( $\mu\text{g}/\text{m}^3$ )	Limiting Standard ( $\mu\text{g}/\text{m}^3$ )	Cumulative Impact as a Percent of Standard
NO <sub>2</sub>	1-hour	92.0	280	372	470	79
	Annual	5.9	71.7	77.6	100	78
CO	1-hour	259.2	21,850	22,109	23,000	96
	8-hour	65.0	8,456	8,521	10,000	85
SO <sub>2</sub>	1-hour	5.9	251.5	257.4	655	39
	24-hour	1.2	38.6	39.8	105	38
	Annual	0.4	8.0	8.4	80	11
PM <sub>10</sub>	<b>24-hour</b>	2.4	97	99.4	50	<b>199</b>
	<b>Annual</b>	0.9	43.1	44.0	30	<b>147</b>
	Annual	0.9	44.8	45.7	50	91

<sup>a</sup> See AIR QUALITY Table 4

Source (CEC 2002a)

## MITIGATION

### APPLICANT'S PROPOSED MITIGATION

#### Construction Mitigation

The City proposes to implement the following measures to reduce emissions during construction activities.

To control exhaust emissions from heavy diesel construction equipment:

- Limit engine idle time and shutdown equipment when not in use (although a specific time limit was not indicated).
- Perform regular preventative maintenance to reduce engine problems.
- Use CARB Low-Sulfur fuel for all heavy construction equipment.
- Ensure that all heavy construction equipment complies with EPA 1996 Diesel standards if available.

To control fugitive dust emissions:

- Use water to remove the build up of loose material on paved roads.
- Require all trucks hauling loose material to apply an appropriate cover.

- Limit traffic speed on unpaved surfaces to 25 mph.
- Use water application to control wind erosion from disturbed areas.

## **Operations Mitigation**

The City's air pollution emissions impacts will be reduced by using emission control equipment on the MGS project and by providing emission offsets. To reduce NO<sub>x</sub> emissions, the City proposes to use dry-low NO<sub>x</sub> combustors in the CTGs, an oxidizing catalyst and a Selective Catalytic Reduction system with an ammonia injection grid.

To reduce CO and VOC emissions, the City proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. SO<sub>2</sub> and PM<sub>10</sub> emissions will be limited by the use of a clean-burning fuel (natural gas) and the efficient combustion process of the CTGs.

## **Combustion Turbine**

### **Dry Low-NO<sub>x</sub> Combustors**

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NO<sub>x</sub> formed during combustion. Because of the expense and efficiency losses due to steam or water injection in the combustor cans to reduce combustion temperatures and the formation of NO<sub>x</sub>, CTG manufacturers are presently choosing to limit NO<sub>x</sub> formation through the use of dry low-NO<sub>x</sub> technologies. In this process, firing temperatures remain somewhat low, thus minimizing NO<sub>x</sub> formation, while thermal efficiencies remain high. At steady state CTG loads greater than 60 percent, NO<sub>x</sub> concentrations entering the HRSG are 9 ppm corrected to 15 percent O<sub>2</sub>. CO concentrations are more variable, with concentrations greater than 100 ppm up to approximately 60 percent load, then dropping to 9 ppm from there up to full load.

### **Flue Gas Controls**

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. The City is proposing two catalyst systems, an ammonia injected selective catalytic reduction system to reduce NO<sub>x</sub>, and an oxidizing system to reduce CO and VOC.

### **Selective Catalytic Reduction (SCR)**

Selective catalytic reduction refers to a process that chemically reduces NO<sub>x</sub> by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NO<sub>x</sub> rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100°F.

Catalysts generally operate between 600 to 750°F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600°F, the ammonia reaction rate may start to decline, resulting in increasing



ammonia emissions, called ammonia slip. At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770°F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO<sub>x</sub> to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

The City proposes to use a combination of the dry low-NO<sub>x</sub> combustors and SCR system to produce a NO<sub>x</sub> concentration exiting the HRSG stack of 2.0 ppm, corrected to 15 percent excess oxygen averaged over a 1-hour period.

### **Oxidizing Catalyst**

To reduce the turbine carbon monoxide (CO) emissions, the ESPII proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO<sub>2</sub>). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to 2 ppm, corrected to 15 percent excess oxygen and averaged over 1-hour.

### **Emission Offsets**

The City will provide emission reduction credits (ERCs) from the District ERC bank and potentially the Priority Reserve (CO and PM<sub>10</sub> only). The City has sufficient RECLAIM trading credits (RTCs) to mitigate the facilities NO<sub>x</sub> emissions for the first year and on an annual basis thereafter. The ERCs purchased are shown in AIR QUALITY Table 22 through 24, which show the ERC certificate number, ownership and the quantity of pollutant purchased. The quantity purchased is in terms of pounds per day per District banking rules.

**AIR QUALITY Table 22**  
**Carbon Monoxide Emission Reduction Credits Procured**  
**for the**  
**Malburg Generation Station Project Emission Offsets**

Certificate Number	Company	Amount (lbs/day)
AQ004457	City of Vernon	8
AQ004458	City of Vernon	13
AQ004466	City of Vernon	13
AQ004474	City of Vernon	2
AQ004475	City of Vernon	2
In Process	--	65
Priority Reserve	District	166.5
<b>Total Emission Reduction Credits</b>		<b>271.5</b>

**AIR QUALITY Table 23**  
**PM10 Emission Reduction Credits Procured**  
**for the**  
**Malburg Generation Station Project Emission Offsets**

Certificate Number	Company	Amount (lbs/day)
Priority Reserve	District	186
<b>Total Emission Reduction Credits</b>		<b>186</b>

**AIR QUALITY Table 24**  
**Volatile Organic Compounds Emission Reduction Credits Procured**  
**for the**  
**Malburg Generation Station Project Emission Offsets**

Certificate Number	Company	Amount (lbs/day)
AQ004367	City of Vernon	108
AQ004493	City of Vernon	22
<b>Total Emission Reduction Credits</b>		<b>130</b>

The District has determined that the City must hold at least 279,624 lbs of NOx RTCs for the first year of operation. The first year of operation includes emissions from initial commissioning as well as normal startups and expected operations. For each year of operation the District will re-evaluate the necessary amount of RTCs for the MGS facility as a whole. The District has estimated that the annual RTC holding will need to be 34,238 lbs/yr. The City has available to it NOx RTC allocations sufficient to comply with the District requirements.

The City has 5 existing 7,000 bhp diesel powered internal combustion engines at the MGS project site. The applicant has changed the fuel from 500 ppm sulfur content diesel to the CARB certified ultra-low sulfur (15 ppm) diesel fuel. Staff estimates that

this change in fuel will result in a SO<sub>2</sub> emission reduction of 0.46 lbs/day and 2,731 lbs/yr from the MGS facility. Staff proposes to use these emission reductions to partially mitigate the project SO<sub>2</sub> emission impacts.

## **ADEQUACY OF PROPOSED MITIGATION**

### **Construction Mitigation**

Staff finds that the mitigation proposed for fugitive dust control is reasonable and will mitigate the impacts from fugitive dust to the extent feasible. However, staff finds that there are further mitigation measures possible for the control of combustion emissions from construction equipment. These additional mitigation measures are discussed in the Staff Proposed Mitigation section below.

### **Operations Mitigation**

#### **Emission Controls**

The City has proposed all practical and technically feasible mitigation measures to limit NO<sub>x</sub> emissions from the combustion turbines to 2.0 ppm over a 1-hour average. In addition, the City proposes to use an oxidizing catalyst to limit CO emissions to 2 ppm over a 1-hour period, which will also limit VOC emissions to 1.4 ppm over a 1-hour period. This is consistent with recent BACT findings from both the CARB and EPA.

#### **Offsets**

The emission reduction credits (ERCs) and RECLAIM trading credits (RTCs) identified in section above are intended to mitigate the MGS air quality impacts. The amount of ERCs determined necessary for mitigating the emission impacts of the MGS (the ERC liability) is based on the daily average of the worst case month. In the case of MGS this is the month of August. The District calculates the total expected monthly emissions from the MGS for August and divides that total by 30 (days per month) to determine the daily average. These calculations will be shown in more detail in the District Determination of Compliance (SCAQMD 2002b).

For the purposes of a CEQA analysis, staff considers all emissions and mitigation measures. Thus, staff will assume a reasonable worst case operating scenario for the hourly, daily and annual emissions from the MGS. On a daily basis this may result in a slight difference when comparing to the District methodologies.

Staff traditionally recommends the use of federally enforceable emission reduction credits to mitigate the MGS project emissions. The District RECLAIM program (NO<sub>x</sub> RTCs) is a valid and established federal new source review (NSR) program that will be used to mitigate the MGS NO<sub>x</sub> emission impacts. The District NSR program for non-RECLAIM pollutants is also a valid and established federal program to mitigate the MGS project VOC and part of the CO emission impacts. The Priority Reserve Credits (PRCs) are a relatively new source of emission reductions available to power projects, however, they have been established in the District Air Quality Attainment Plan (and the California State Implementation Plan) since 1995 and are considered a valid federally enforceable emission reduction program. Therefore, staff recommends the use of PRCs as mitigation for the MGS PM<sub>10</sub> and CO emission impacts.

Staff recommends the contemporaneous SO<sub>2</sub> emission reductions at the project site as provided by the applicant for mitigating the MGS long-term SO<sub>2</sub> emission impacts.

In AIR QUALITY Table 25 and 26, staff presents the balance of emissions and mitigation on an annual and daily basis, respectively. AIR QUALITY Tables 25 and 26 both show a final liability of PM<sub>10</sub> and NO<sub>x</sub> emission impacts. This indicates that from a CEQA point of view the project has unmitigated emissions and thus may have unmitigated impacts.

**AIR QUALITY Table 25**  
**Comparison of Expected Annual Emissions to Offsets Provided**  
**(lbs/year)**

	Liability <sup>1</sup>	RTC Or ERC Procured <sup>2</sup>	Offsets/Mitigation	
			Excess	Shortfall
CO	45,125	99,098	53,972	
<b>NO<sub>x</sub></b>	71,935	71,215		<b>720</b>
<b>PM<sub>10</sub></b>	70,401	67,890		<b>2,511</b>
VOC	14,927	47,450	32,523	
SO <sub>x</sub>	2,630	2,731	102	
<sup>1</sup> These emissions include startup, shutdown and normal operations of the CTGs, testing of the firewater pump and full load operation of the cooling tower. <sup>2</sup> (SCAQMD 2002b)				

The MGS project NO<sub>x</sub> emissions are not causing a direct impact, but may contribute to the down wind formation of ozone (i.e., NO<sub>x</sub> emissions are a precursor to ozone formation). However, the VOC emissions (also a precursor to ozone formation) are mitigated to such an excess on an annual basis, that they more than offset the excess NO<sub>x</sub> emissions (by a ratio of more than 45:1). Therefore, it is staff's opinion that the excess NO<sub>x</sub> emissions are mitigated to a level of insignificance by the excess VOC offsets.

AIR QUALITY Table 26 (the daily balance of emissions and mitigation) shows an excess amount of SO<sub>x</sub>, PM<sub>10</sub> and NO<sub>x</sub> emissions from the MGS project. This amount of excess SO<sub>x</sub> emissions may contribute to secondary PM<sub>10</sub> impacts, but is not expected to cause or contribute to a direct impact on the SO<sub>x</sub> ambient air quality standards. It is staff's opinion that the excess SO<sub>x</sub> emissions can be mitigated with the same source of mitigation eventually used for the staff proposed PM<sub>10</sub> mitigation. Staff will outline the recommendations for PM<sub>10</sub> and SO<sub>x</sub> mitigation that in the Staff Proposed Mitigation Section. As is the case for the annual balance of the MGS project emissions and mitigation, AIR QUALITY Table 26 shows an excess of VOC offsets that mitigate the slight excess of NO<sub>x</sub> emissions by a ratio greater than 3:1 (typical trading ratios of VOC for NO<sub>x</sub> are 2:1).

**AIR QUALITY Table 26**  
**Comparison of Expected Daily Emissions to Offsets Provided**  
**(pounds/day)**

	Daily Liability <sup>1</sup>	RTC Or ERC Procured <sup>2</sup>	Offsets/Mitigation	
			Excess	Shortfall
CO	166.3	271.5	105.2	
<b>NOx</b>	221.4	195.1		<b>26.3</b>
<b>PM10</b>	192.8	186.0		<b>6.8</b>
VOC	41.0	130.0	89.0	
<b>SOx</b>	7.2	0.46		<b>6.8</b>
1 See AIR QUALITY Table 10				
2 (SCAQMD 2002b)				

As AIR QUALITY Tables 25 and 26 show there remains unmitigated PM10 and SOx emissions, which have the potential to contribute to a cumulative impact on the ambient air quality. Based on the ISCST3 modeling provided, staff estimates the direct PM10 impacts from the unmitigated PM10 emissions at the point of maximum impact to be approximately 0.017 ug/m<sup>3</sup> on an annual basis and 0.067 ug/m<sup>3</sup> on a daily basis. The secondary PM10 impacts from the unmitigated SOx emissions are estimated by the City's assumption that all of the SOx emissions would be converted into secondary PM10. Staff concurs with the City's approach as a reasonably conservative approach that will likely over-estimate the MGS secondary PM10 impacts from the SOx emissions. The City concluded that the unmitigated SOx emissions would contribute 0.13 ug/m<sup>3</sup> of PM10 to the ambient air on a daily basis at the point of maximum impact.

The unmitigated MGS PM10 and SOx emissions will add a total of 0.20 ug/m<sup>3</sup> of PM10 on a daily basis and 0.017 ug/m<sup>3</sup> of PM10 on an annual basis to the ambient air at the point of maximum impact. As a direct impact, this does not cause an exceedance of the ambient air quality standards. However, the cumulative assessment adds these impacts to the measured background concentrations (97 ug/m<sup>3</sup> for 24-hour and 43.1 ug/m<sup>3</sup> for annual state mean) and reasonably foreseeable future projects (0.698 ug/m<sup>3</sup> for 24-hour, 0.237 ug/m<sup>3</sup> for annual state mean). Thus, these unmitigated emission impacts contribute to a cumulative impact of 98 ug/m<sup>3</sup> on a daily basis and 43.3 ug/m<sup>3</sup> on an annual basis, exceeding the both the state PM10 24-hour and annual ambient air quality standards (50 ug/m<sup>3</sup> and 30 ug/m<sup>3</sup> respectively). If left unmitigated, staff would consider these cumulative impacts to be significant even though the direct impacts are relatively small.

## **STAFF PROPOSED MITIGATION**

### **Construction Mitigation**

The modeling assessment discussed earlier shows that the internal combustion sources used for heavy construction have the potential for causing significant air quality impacts. Staff has determined that a viable alternative to the use of 1996 CARB certified low

emission diesel engines and ultra-low sulfur content diesel fuel (<15 ppm) is the use of oxidizing soot filters on all heavy diesel powered construction equipment. Since the construction emission impacts are so severe (see AIR QUALITY Table 14), staff recommends the following measures be considered for mitigation during the first two months of construction.

- Isolate and redirect pedestrian traffic from the square block area described by the intersections of Leonis, 50<sup>th</sup>, Seveille and Soto avenues.
- Place NOx, CO and PM10 monitoring devices at the outskirts of this square block.
- Restrict the use of multiple heavy construction equipment at the MGS project site.
- Perform construction activities during non-business hours only.
- Use a water emulsion diesel fuel in all diesel powered construction equipment to reduce both PM10 and NOx emissions.

### **Operational Mitigation**

Staff has identified the need for additional mitigation for the MGS PM10 and SOx emissions. In staff's opinion the recommended mitigation of 6.8 lbs/day of PM10 and 6.8 lbs/day of SOx are necessary to address the cumulative and possible secondary emission impacts from the MGS emissions. Staff cannot make specific recommendations at this time; however, staff does offer these few guidelines.

- Purchase emission reduction credits (ERCs) originating near the City of Vernon as opposed to purchasing Priority Reserve Credits (PRCs).
- Electrify local boilers, diesel pumps or other such stationary equipment.
- Replace a sufficient number of diesel powered, local delivery trucks, garbage trucks, school buses, stationary sources, etc to fully mitigate the project. Note that the District will not be able to give PM10 ERCs for mobile emission reductions (only NOx ERCs are allowed under current District rules to be generated from mobile sources).

### **ENVIRONMENTAL JUSTICE IMPACTS**

In this section staff discuss the potential impacts regarding air quality related environmental justice issues. This section is not intended to provide a definitive analysis on environmental justice impacts in general, but only addresses those concerns related to air quality. Conclusions reached here are limited in scope to air quality impacts only.

Environmental Justice impacts are determined based in principle on the idea that low income and minority populations may incur a higher portion of pollution due to their proximity to light or heavy industry as compared to affluent or non-minority populations. In determining if there is such an impact, it is the Commission staff approach to first determine if there is a potential for residual, significant and adverse emission impacts. If a potential for an impact exists, then Commission staff determines if a low income or minority population exists and at what demographic concentrations. Concentrations of low income or minority populations greater than 50% within a census tract would designate that tract as an Environmental Justice Population (EJP). Once an EJP has been identified within six miles of the proposed site, then Commission staff determines

the impacts of the residual air emissions (excluding ozone and secondary PM10 impacts which are regional in nature) on that EJP and compares them with the impacts on non-EJPs (within six miles). If staff determines that the impact on the EJP is significant and adverse, then staff conducts an analysis of the potential for those impacts to be disproportionately higher on the EJP as compared to the non-EJP. For further information on the staff approach to environmental justice, please see the Socioeconomics section of this report.

Staff has demonstrated that there is a potential for significant cumulative impacts from the unmitigated residual MGS PM10 and SOx emissions (see Cumulative Assessment Section). Staff has also recommended that the City procure further emission reductions in order to mitigate these impacts (see Staff Recommended Mitigation Section). Staff can not complete the environmental justice assessment until further information regarding the potential emission reductions the City may perform is better understood. Following the publication of the staff Initial Report, if mitigation of the potentially significant impacts is found to be acceptable (see Staff Proposed Mitigation), then no further environmental justice analysis will be necessary (as there will be no residual emission impacts). However, if a significant impact still exists after the planned air quality workshop, then staff will complete the analysis of the potential for the MGS residual emission impacts to determine if they will cause a disproportionate impact on the nearby EJP.

## **COMPLIANCE WITH LORS**

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### **FEDERAL**

The District has not yet issued a Final Prevention of Significant Deterioration (PSD) permit as part of their Determination of Compliance for the MGS. The Final Determination of Compliance is expected to serve as the basis for the PSD permit for this project. The Permit to Construct will be issue after the Commission Decision is finalized.

### **STATE**

The City will demonstrate that the MGS will comply with Section 41700 of the California State Health and Safety Code with the District Final Determination of Compliance and the CEC staff's affirmative finding for the project.

### **LOCAL**

Compliance with specific SCAQMD rules and regulations are discussed below. For a more detailed discussion of the compliance of the MGS project, please refer to the Determination of Compliance (SCAQMD 2002b).

### **Regulation II**

#### **Rule 212:**

Installation of two new turbines at City of Vernon facility is considered a significant project under this rule as the turbines' emissions [CO, NOx, PM<sub>10</sub> and VOC] exceed the daily maximum specified in subdivision (g). The AQMD will

prepare the 30-day public notice and it will contain sufficient information to fully describe the project. After the public notice is published, there will be a 30-day public comment period.

**Rule 218:**

Continuous Emission Monitoring:- The City of Vernon project will require installation of CO CEMS to verify CO emissions meet the hourly concentration limits for BACT and monthly mass limits for Rule 1303 offsets. The facility will need to submit a CEMS application for AQMD review and approval prior to its installation on each combustion turbine. The applicant is required to retain the records and comply with the reporting requirements.

**Rule 401:**

Visible Emissions:- Under normal operating conditions of the turbines and the emergency operation of the diesel fueled firewater pump engine, visible emissions are not expected.

**Rule 402:**

Nuisance:- Nuisance problems are not expected under normal operation of the turbines and the emergency engine.

**Rule 403:**

Fugitive Dust:- This rule requires the use of best available control measures to minimize fugitive dust formation from "active operations" including but not limited to, earth moving, construction, and vehicular movements. The rule prohibits active operations from causing visible emissions that extend beyond the facility's fence line. The City of Vernon has stated in their EIR document (filed with CEC) that they plan to use best available control measures during construction of the MGS facility. Compliance is expected.

**Rule 407:**

Liquid and Gaseous Air Contaminants: This rule limits CO emissions to 2000 ppm and SO<sub>2</sub> emissions to 500 ppm for equipment not subject to the requirements of Rule 431.1. Both MGS combustion turbines and HRSGs will be required to comply with Rule 431.1, therefore, only CO limit of 2000 ppm is applicable. The CO emissions from the CTs/HRSGs will be controlled by an oxidation catalyst to 2 ppmvd @ 15% O<sub>2</sub> (3-hr average). Thus, the turbines will be in compliance with the rule, which will be verified with CO CEMS data. Emergency I. C. engine is exempt from this rule requirement as per rule subsection (b)(1).

**Rule 409:**

Combustion Contaminants: This rule limits the PM emissions from combustion contaminants to be at 0.1 gr/scf. These turbines are expected to meet this limit at the maximum firing load @ 38°F.

**Rule 431.1:**

Sulfur Content of Natural Gas:- MGS turbines/HRSGs will use commercial grade natural gas, which has an average sulfur content of 4 ppm and will thus meet the rule requirements.

**Rule 431.2:**



Sulfur Content of Liquid Fuels:- The rule requires that the any stationary sources in the District shall not burn or purchase any liquid fuel with sulfur content of more than 500 ppm by weight. The proposed diesel fuel for the emergency engine will have sulfur content of less than 15 ppm by weight, which complies with the rule requirements.

**Rule 474:**

Fuel Burning Equipment NOx Requirements:- Since this facility will be in NOx RECLAIM, it is exempt from this Rule limit as per Rule 2001, Table 1.

**Rule 475:**

Electric Power Generating Equipment:- This rule applies to electric power generating equipment greater than 10MW installed after May 7, 1976. The rule requires that the combustion contaminants (combustion contaminants are defined as particulate matter in AQMD Regulation 1) shall not exceed 11 lb/hr or 0.01 gr/scf. Compliance is demonstrated if either the mass limit or the concentration limit is met. Mass PM<sub>10</sub> emissions from the Malburg Generating Station (MGS) is estimated to be 4 lb/hr and as per calculation shown under R-409 evaluation, the estimated grain loading will be 0.00560 gr/scf. Thus, the rule requirements of 0.01 gr/scf will be complied with. Actual compliance will be verified during initial performance **test**.

**Regulation IX**

Standards of Performance for New Stationary Sources:-Regulation IX incorporates provisions of Part 60, Chapter I, Title 40, of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO<sub>2</sub> and NO<sub>2</sub> emissions from the facility as well as monitoring and test method requirements. The MGS is expected to surpass these emission limits with the controls proposed.

**Regulation XIII**

New Source Review:- This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of non-attainment contaminants and their precursors as well as ozone depleting compounds (ODC) and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NOx emissions from the MGS project, which are regulated by Regulation XX (RECLAIM). MGS has complied with all requirements of the Regulation.

**Regulation XVII**

Prevention of Significant Deterioration:- This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. MGS will not trigger PSD for any pollutant.

## **Regulation XX**

Regional Clean Air Incentives Market (RECLAIM):- The Regional Clean Air Incentives Market (RECLAIM) program is designed to allow facilities flexibility in achieving emission reduction requirements for NO<sub>x</sub> and SO<sub>x</sub> through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces its allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other district rules, where there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is established in Rule 2007. MGS is exempt from the SO<sub>x</sub> RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NO<sub>x</sub> RECLAIM project and therefore subject to the rules of RECLAIM for NO<sub>x</sub> emissions. MGS has complied with all aspects of the RECLAIM Regulation.

## **Regulation XXX**

Title V Permits:- The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without compliance of both regulations. The District will issue the Title V permit as part of the Permit to Construct.

## **Regulation XXXI**

Acid Rain Permits:- Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SO<sub>x</sub> emissions as well as monitoring SO<sub>x</sub>, NO<sub>x</sub> and CO<sub>2</sub> emissions from the facility. MGS will comply with the monitoring requirements of the acid rain provisions with the use of gas meters in conjunction with gas analysis.

## **CONCLUSIONS AND RECOMMENDATIONS**

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The MGS operational emission impacts of NO<sub>x</sub>, SO<sub>x</sub> and CO will not cause or contribute to a violation of any NO<sub>x</sub>, SO<sub>x</sub> or CO ambient air quality standards, and therefore, staff considers these impacts to be not significant. However, the project's **air** quality impacts from the ozone precursor emissions of NO<sub>x</sub> and VOC could be significant if left unmitigated. The City will reduce emissions by providing emission offsets for NO<sub>x</sub> and VOC emissions, and thus reduce the potential for ozone formation

to a level of insignificance. The project's direct and secondary PM10 emission impacts (which include the precursor emissions of SOx and NOx) could be significant if left unmitigated.

The City has not fully mitigated the SOx and PM10 emission impacts. At this time, staff finds that while on an annual basis the City has mitigated the MGS SOx emission impacts with a contemporaneous fuel switching for the existing IC engines at the MGS facility site, they fall short on a daily basis (as the engines are only tested once a month) in the amount of 6.8 lbs/day. Staff finds that the PM10 emissions have not been fully mitigated by the purchase of PRCs on both a daily and annual **basis (6.8 lbs/day and 2,511 lbs/year)** primarily due to the emissions from the cooling tower.

Staff has identified potentially significant and adverse impacts for the project PM10 and SOx emissions (contribution to direct and secondary PM10 formation) in the amount of 0.20 ug/m<sup>3</sup> on a daily basis and 0.017 ug/m<sup>3</sup> on an annual basis. Staff has concluded that while these impacts do not represent a significant direct impact they do represent a significant cumulative impact in the amount of 98 ug/m<sup>3</sup> on a daily basis and 43.3 ug/m<sup>3</sup> on an annual basis. Therefore, staff recommends that the City procure further mitigation beyond that mitigation all ready provided in the amount of 6.8 lbs/day of PM10 and 6.8 lbs/day of SO2.

In the Final Report, staff will address the potential of the additional mitigation provided by the City to offset the MGS PM10 and SOx emission impacts and complete the assessment on the contribution of the MGS air quality impacts on any potential environmental justice impacts.

## CONDITIONS OF CERTIFICATION

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### STAFF RECOMMENDED CONDITIONS OF CERTIFICATION

**AQ-C1** The City of Vernon shall develop and submit to the CPM for approval an Air Quality Construction Mitigation Plan (AQCMP) using any or all of the elements listed below to maintain construction related NO<sub>x</sub>, PM<sub>10</sub> and CO emissions below the short-term ambient air quality standards and no more than 10 ug/m<sup>3</sup> difference between upwind and downwind monitoring for any of the three pollutants identified. The City shall identify the placement of upwind and downwind monitoring for NO<sub>x</sub>, PM<sub>10</sub> and CO in the AQCMP. In addition to or in place of the measures identified below, the City may develop alternative measures to be approved by the CPM in order to achieve the identified goals.

- 1) Redirect pedestrian traffic from the square block area described by the intersections of Leonis, 50<sup>th</sup>, Seveille and Soto Avenues.
- 2) Restrict the use of multiple heavy construction equipment at the MGS project site.
- 3) Perform construction activities during non-business hours only.
- 4) Unless shown to be impractical, use a water emulsion diesel fuel in all diesel powered construction equipment to reduce both PM<sub>10</sub> and NO<sub>x</sub> emissions (equipment tanks must be emptied and refilled with this fuel prior to operation on-site). Otherwise, use ultra low sulfur diesel fuel (equipment tanks must be emptied and refilled with this fuel prior to operation on-site).
- 5) Use only 1996 CARB or EPA Certified or better diesel engines.
- 6) In the event that a 1996 CARB or EPA certified engine is not available, use in conjunction with ultra low sulfur diesel fuel, a catalyzed diesel particulate filters (CDPF) on all diesel engines over 100 bhp with the exemptions listed. All exempted equipment must use water emulsion diesel fuel if available on-site. If water emulsion diesel fuel is not available on-site, then all exempted equipment must use CARB certified ultra low sulfur diesel fuel. Exempted equipment are:
  - 1) Cranes,
  - 2) On-road licensed vehicles,
  - 3) and loaders, skiffs or backhoes that operate less than 2 hours at a time.
- 7) Identify the employee parking area(s) and surface composition of those parking area(s)
- 8) Watering of all disturbed areas to maintain a soil moisture content of 12%.
- 9) Evaluate the application of chemical dust suppressants.
- 10) Use sandbags to prevent run off.
- 11) Use wheel-washing areas prior to large trucks leaving the project site.

- 12) Describe methods that will be used to clean mud and dirt that has been tracked-out from the project site onto public roads.
- 13) For any transportation of solid bulk material
  - 1) Use vehicle covers
  - 2) Wet the transported material
  - 3) Use appropriate amount of freeboard
- 14) Identify methods for the stabilization of storage piles and disturbed areas.
- 15) Employ windbreaks at appropriate locations.

**Verification:** The City of Vernon shall submit the AQCMP for approval to the CPM no later than 45 days prior to site mobilization.

**AQ-C2** The City of Vernon shall identify the individual(s), for approval by the CPM, that will be on-site during all construction activities to ensure that all measures called for in the AQCMP are carried out.

**Verification:** The City of Vernon shall submit the name and contact information along with a resume of the individual(s) for approval to the CPM 10 days prior to site mobilization.

**AQ-C3** The City of Vernon shall submit to the CPM for approval a monthly compliance report signed by the individual(s) identified in **Condition of Certification AQ-C2**, that identifies all upwind-downwind monitoring results and mitigation measures implemented per the AQCMP. The City of Vernon shall submit for approval the format of this monthly report to the CPM.

**Verification:** The City of Vernon shall submit the format for the Monthly Compliance Report to the CPM no later than 10 days prior to site mobilization. The City of Vernon shall submit the Monthly Compliance Report for each month that construction activities occur for approval by the CPM no later than the 15<sup>th</sup> of the following month.

**AQ-C4** The City of Vernon shall submit to the CPM for approval prior to construction of the cooling tower, the cooling tower design details including following elements:

- 1) The cooling tower type,
- 2) materials of construction,
- 3) drift eliminator design and details (to be designed to a drift rate of 0.0005%),
- 4) vendor specific justification for the correction factor to be used to correlate blowdown total dissolved solid (TDS) to drift TDS in **Condition of Certification AQ-C7**, and
- 5) the circulating water recirculation rate.

**Verification:** The City of Vernon shall submit the information required above for approval to the CPM, no later than 45 days prior to commencement of construction of the cooling towers.

**AQ-C5** No chromium containing compounds shall be added to cooling tower circulating water.

**Verification:** The City of Vernon shall make the site available for inspection by representatives of the District, CARB and the Commission.

**AQ-C6** The City of Vernon shall determine the TDS levels in the blowdown water by independent laboratory testing prior to initial operation and periodically thereafter.

**Verification:** The City of Vernon shall submit for approval to the CPM, a protocol for initial and weekly testing and the identification of the independent laboratory to be used 90 days prior to cooling tower operation. The City of Vernon shall submit weekly TDS reports for the blowdown water as part of the quarterly emission report to the CPM for approval.

**AQ-C7** PM10 emissions from the cooling tower (in total) shall not exceed 6.0 lb/day.

**Protocol:** Compliance with the PM10 daily emission limit shall be demonstrated as follows:

$$\text{PM10 lb/day} = A * B * C * D$$

where:

A = circulating water recirculation rate (**Condition of Certification AQ-C4**)

B = total dissolved solids concentration in the blowdown water to be updated on a weekly basis (**Condition of Certification AQ-C6**)

C = design drift rate (**Condition of Certification AQ-C4**)

D = correction factor (**Condition of Certification AQ-C4**)

**Verification:** The City of Vernon shall calculate the daily PM10 emissions from the cooling tower and submit all calculations and results on a quarterly basis in the quarterly emission reports to the CPM for approval.

**AQ-C8** The City of Vernon shall refrain from testing the firewater pump on the same day as either gas fire combustion turbines have been started up or shutdown as defined by **Condition of Certification AQ-C9**.

**Verification:** The City of Vernon shall submit for approval all testing times and results of the diesel fired emergency firewater pump in the quarterly emissions report.

**AQ-C9** The City of Vernon shall use the following definitions to determine compliance with startup, shutdown and any related emission or operational limitations.

Startup is defined as beginning when fuel is first delivered to the combustors of the combustion turbine and ending when the combustion turbine reaches all NOx and CO emission limits for normal operation.

Shutdown is defined as beginning during normal operation with the intent to shutdown and ends with the secession of fuel being delivered to the combustors of the combustion turbine.

**Verification:** See Verification for **Condition of Certification AQ-6**.

**AQ-C10** The City of Vernon shall commission and operate the Malburg Generation Station within the following emission limits.

### **Commissioning**

During the first year of commissioning and operation, the following emission limits shall apply.

**Annual Commissioning Emission Limits**  
Units are in Pounds per year

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total	Assumptions
CO	112,311	0	478	112,789	a,b,c
NOx	565,695	0	1,377	567,072	a,b,c
PM10	48,668	2,190	58	50,917	a,b,c
ROG	40,370	0	35	40,405	a,b,c
SOx	4,276	0	2	4,277	a,b,c
Ammoni a	49,294	0	0	49,294	a,b,c
<b>Assumptions</b>					
a The gas turbines are undergoing initial commissioning for three months then 3 cold startups, 39 warm startups, 42 shutdowns and 6486 hours at full load with the duct burners on @ 65 deg F.					
b The cooling tower at full load for 8760 hours.					
c The Firewater pump is being tested 199 hours.					

**Post Commissioning**

After the end of the commissioning period, the following hourly and daily emission limits shall apply. The following annual emission limits shall only apply until after the first calendar year of operation is complete.

**Hourly Emission Limits**  
Units are in pounds per hour

	Gas Turbines (2)	Firewater Pump	Facility Total	Assumptions
CO	48.6	1.20	49.80	a,c,d
NOx	26.2	3.46	29.66	a,c,d
PM10	7.78	0.15	8.18	b,c,d
ROG	3.3	0.09	3.39	a,c,d
SOx	0.3	0.004	0.304	b,c,d
Ammonia	7.6	0.00	7.60	b,c,d
<b>Assumptions</b>				
a The gas turbines are undergoing a cold startup @ 38 deg F.				
b The gas turbines are at full load @ 38 deg F with the duct burners on.				
c The cooling tower is at full load.				
d The Firewater pump is being tested for ½ hour.				

**Daily Emission Limits**  
Units are in pounds per day

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total	Assumptions
CO	165.14	0	1.20	166.34	a,d,e,
NOx	217.96	0	3.46	221.42	a,d,e,
PM10	186.72	6.00	0.15	192.87	b,d,e
ROG	40.9	0	0.09	40.99	c,d,e
SOx	7.2	0	0.004	7.20	b,d,e
Ammonia	182.4	0	0.00	182.40	b,d,e

<b>Assumptions</b>
a The gas turbines are undergoing cold startup (2 hours), 21.5 hours of baseload operation and 0.5 hours shutdown @ 38 deg F.
b The gas turbines are at full load for 24 hours @ 38 deg F with the duct burners on
c The gas turbines are undergoing cold startup (2 hours) and baseload operation for 22 hours @ 38 deg F.
d The cooling tower is at full load for 24 hours
e The Firewater pump is being tested 0.5 hours

**Annual Emission Limits**  
Units are in pounds per year

	Gas Turbines (2)	Cooling Tower	Firewater Pump	Facility Total	Assumptions
CO	44,647	0	478	45,125	a,c,d
NOx	70,558	0	1,377	71,935	a,c,d
PM10	68,153	2,190	58	70,401	b,c,d
ROG	14,892	0	35	14,927	a,c,d
SOx	2,628	0	2	2,630	b,c,d
Ammonia	66,576	0	0	66,576	b,c,d
<b>Assumptions</b>					
a The gas turbines are undergoing initial commissioning for three months then 3 cold startups, 39 warm startups, 42 shutdowns and 6486 hours at full load with the duct burners on @ 65 deg F.					
b The cooling tower at full load for 8760 hours.					
c The Firewater pump is being tested 199 hours.					

**Verification:** The City of Vernon shall submit to the CPM for approval on a quarterly basis all emission records and calculations to demonstrate compliance with the emission limits stated herein as part of the quarterly emissions report.

**AQ-C11** The City of Vernon shall submit a quarterly emissions report on a quarterly basis to the CPM for approval. The quarterly emissions report shall generally report all ammonia, NOx, SOx, CO, PM10 and VOC emissions from the Malburg Generation Station as necessary to demonstrate compliance with all emission limits. The fourth quarter emission report shall include an annual summary of all emissions of ammonia, NOx, SOx, CO, PM10 and VOC as necessary to demonstrate compliance with all annual emission limits.

**Verification:** The City of Vernon shall submit the quarterly emissions report no less than 30 days after the end of each calendar quarter.

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT  
RECOMMENDED CONDITIONS OF CERTIFICATION**

**AQ-1** Except for open abrasive blasting operations, the City of Vernon shall not discharge into the atmosphere from any single source of emissions whatsoever any contaminant for a period or periods aggregating more than three minutes in any one hour which is:

- (a) As dark or darker in shade as that designated No. 1 on the Ringlemann Chart, as published by the United States Bureau of Mines; or
- (b) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subparagraph (a) of this condition.

**Verification:** The City of Vernon shall make the Malburg Generating Facility site accessible for inspection to the District, CARB and Commission.



**AQ-2** The City of Vernon shall not use diesel oil containing sulfur compounds in excess of 15 ppm by weight as supplied by the supplier.

**Verification:** The City of Vernon shall submit fuel purchase records for approval to the CPM on a quarterly basis in the quarterly emissions report.

**AQ-3** The city of Vernon shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

Purchase records of fuel oil and sulfur content of the fuel

**Verification:** The City of Vernon shall submit fuel purchase records for approval to the CPM on a quarterly basis in the quarterly emissions report.

**AQ-4** Accident release prevention requirements of Section 112 (r)(7):

a). The City of Vernon shall comply with the accidental release prevention requirements pursuant to 40CFR Part 68 and shall submit to the Executive Officer and the CPM, as a part of an annual compliance certification, a statement that certifies compliance with all of the requirements of 40 CFR Part 68, including the registration and admission of a risk management plan (RMP).

b). The City of Vernon shall submit any additional relevant information requested by the Executive Officer, designated agency or CPM.

**Verification:** The City of Vernon shall submit for approval to the CPM the above required statement of compliance and any further information requested on an annual basis as part of the annual compliance report.

**AQ-5** The City of Vernon shall limit the emissions from both gas fired combustion turbine-heat recovery steam generator train exhaust stacks as follows:

Contaminant	Emissions Limit
CO	7,633 lbs in any one month
PM <sub>10</sub>	5,568 lbs in any one month
VOC	3,236 lbs in any one month
SO <sub>x</sub>	214 lbs in any one month

For the purpose of this condition, the limit(s) shall be based on the total combined emissions from the exhaust stacks.

The City of Vernon shall calculate the emission limit(s) for CO during commissioning period, using fuel consumption data and the following emission factors: 37.56 lb/mmscf

The City of Vernon shall calculate the emission limit(s) for CO after commissioning period and prior to the CO CEMS certification, using fuel consumption data and the following emission factors: 4.65 lb/mmscf

The City of Vernon shall calculate the emission limit(s) for CO after the CO CEMS certification, based on readings from the certified CEMS. In the event the CO CEMS is not operating or the emissions exceed the valid upper range of the analyzer, the emissions shall be calculated in accordance with the approved CEMS plan.

The City of Vernon shall calculate the emission limit(s) by using the monthly fuel use data and the following emission factors:- PM10: 7.61 lb/mmscf, VOC: 1.63 lb/mmscf & SOx: 0.39 lb/mmscf.

**Verification:** The City of Vernon shall submit all emission calculations, fuel use, CEM records and a summary demonstrating compliance of all emission limits stated in this Condition for approval to the CPM on a quarterly basis in the quarterly emissions report.

**AQ-6** The 2 ppm NOx emission limit shall not apply during turbine commissioning, start-up and shutdown. The commissioning period shall not exceed 573 hours per turbine from the initial start-up. Start-ups shall not exceed 2 hours and the number of start-ups shall not exceed one per day per turbine. Shutdowns shall not exceed 30 minutes and the number of shutdowns shall not exceed one per day per turbine. The City of Vernon shall provide the District and the CPM with the written notification of the initial start-up date. Written records of commissioning, start-ups and shutdowns shall be kept and made available to District and submitted to the CPM for approval.

**Verification:** The City of Vernon shall provide the District and the CPM with the written notification of the initial start-up date no later than 60 days prior to the startup date. The City of Vernon shall report to the CPM for approval all emissions, fuel use and emission calculations during the commissioning period on a monthly basis as part of the monthly compliance report. The City of Vernon shall submit to the CPM for approval, a record of all startups and shutdowns including duration and date of occurrence on a quarterly basis as part of the quarterly emission report.

**AQ-7** The 2 ppm CO emission limit shall not apply during turbine commissioning, start-up and shutdown. The commissioning period shall not exceed 573 hours per turbine from the initial start-up. Start-ups shall not exceed 2 hours and the number of start-ups shall not exceed one per day per turbine. Shutdowns shall not exceed 30 minutes and the number of shutdowns shall not exceed one per day per turbine. The City of Vernon shall provide the District and CPM with the written notification of the initial start-up date. Written records of commissioning, start-ups and shutdowns shall be kept and made available to District and reported for approval to the CPM.

**Verification:** See Verification for **Condition of Certification AQ-6**.

**AQ-8** The 80.13 lb/mmscf NOx emission limit(s) shall only apply during interim period to report RECLAIM emissions. The interim period shall not exceed 12 months from the initial start-up date.

**Verification:** The City of Vernon shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report.

**AQ-9** The 2 PPM NO<sub>x</sub> emissions limit(s) are averaged over 1 hour at 15 percent oxygen, dry basis.

**Verification:** The City of Vernon shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report.

**AQ-10** The 2 ppm CO emission limit(s) are averaged over 3 hours at 15 percent oxygen, dry basis.

**Verification:** The City of Vernon shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report.

**AQ-11** The 2 ppm ROG emission limit(s) are averaged over 1 hour at 15 percent oxygen, dry basis.

**Verification:** The City of Vernon shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report.

**AQ-12** The 5 ppm NH<sub>3</sub> emission limit(s) are averaged over 1 hour at 15 percent oxygen, dry basis.

**Verification:** The City of Vernon shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report.

**AQ-13** For the purpose of determining compliance with District Rule 475, combustion contaminant emissions may exceed the concentration limit or the mass emission limit listed, but not both emission limits at the same time.

**Verification:** The City of Vernon shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report.

**AQ-14** The City of Vernon shall not use engine cylinder lubricating oil containing the following specified compounds:

Compound		Weight percent
Ash Content	Greater than	0.038

**Verification:** The City of Vernon shall submit fuel purchase records for approval to the CPM on a quarterly basis in the quarterly emissions report.

**AQ-15** The City of Vernon shall limit the operating time of the diesel fueled emergency backup generators and the firewater pump to no more than 199 hours each in any one year.

**Verification:** See Verification for **Condition of Certification AQ-C8**.

**AQ-16** The City of Vernon shall install and maintain a pressure relief valve set at 25 psig in the firewater pump.

**Verification:** The City of Vernon shall make the firewater pump available for inspection by the District, Commission or CARB.

**AQ-17** The City of Vernon shall install and maintain a(n) non-resettable elapsed time meter into the firewater pump to accurately indicate the elapsed operating time of the engine.

**Verification:** The City of Vernon shall make the firewater pump available for inspection by the District, Commission or CARB.

**AQ-18** The City of Vernon shall install and maintain a(n) non-resettable totalizing fuel meter to accurately indicate the fuel usage of the turbines.

**Verification:** The City of Vernon shall make the firewater pump available for inspection by the District, Commission or CARB.

**AQ-19** The City of Vernon shall install and maintain a(n) flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH<sub>3</sub>).

The City of Vernon shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

**Verification:** The City of Vernon shall submit to CPM for approval the design drawing that clearly show the flow meter and recording device for the ammonia injection grid no less than 90 days prior to installation of the ammonia injection grid. The City of Vernon shall submit to the CPM for approval the annual calibration report for the flow meter and recording device as part of the annual compliance report.

**AQ-20** The City of Vernon shall install and maintain a(n) temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor.

The City of Vernon shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

**Verification:** The City of Vernon shall submit to CPM for approval the design drawing that clearly show the temperature gauge and recording device for the inlet to the SCR reactor no less than 90 days prior to installation of the SCR. The City of Vernon shall submit to the CPM for approval the annual calibration report for the temperature gauge and recording device as part of the annual compliance report.

**AQ-21** The City of Vernon shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches of water column.

The City of Vernon shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

**Verification:** The City of Vernon shall submit to CPM for approval the design drawing that clearly show the pressure gauge and recording device across the SCR reactor no less than 90 days prior to installation of the SCR. The City of Vernon shall submit to the CPM for approval the annual calibration report for the pressure gauge and recording device as part of the annual compliance report.

**AQ-22** The City of Vernon shall conduct source test (s) for the pollutant(s) identified below:

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
CO Emissions	District Method 100.1	1 hour	Outlet of SCR
NOx Emissions	District Method 100.1	1 hour	Outlet of SCR
PM Emissions	Approved District Method	District approved averaging time	Outlet of SCR
VOC Emissions	Approved District Method	1 hour	Outlet of SCR
SOx Emissions	Approved District Method	District approved averaging time	Fuel Sample
NH <sub>3</sub> Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR

The test (s) shall be conducted after approval of the source test protocol, but no later than 180 days after initial start up.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the test shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine and steam turbine generating output (MW).

The test shall be conducted in accordance with a District approved source test protocol. The protocol shall be submitted to the District engineer and the CPM no later than 45 days before the proposed test date and shall be approved by the District and the CPM before the test commences. The test protocol shall include the proposed operating conditions of the turbines during the test the

identity of the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted with and without duct burner firing when this equipment is operating at loads of 100, 75, and 50 percent of maximum load for the NO<sub>x</sub>, CO, VOC and ammonia tests. For all other pollutants, the test shall be conducted with and without the duct burner firing at 100% load only.

The District and the CPM shall be notified of the date and time of the test at least 10 days prior to the test.

**Verification:** The City of Vernon shall submit for approval to the District and the CPM the required initial source testing protocol no less than 45 days prior to the date of the source test. The City of Vernon shall notify the District and CPM of the date and time of the source test no less than 10 days prior to the test. The City of Vernon shall submit to the District and CPM for approval the results of the initial source test no later than 60 days following the date of the source test.

**AQ-23** The City of Vernon shall conduct source test(s) for the pollutant(s) identified below:

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
VOC Emissions	Approved District Method	1 hour	Outlet of SCR
SO <sub>x</sub> Emissions	Approved District Method	District approved averaging time	Fuel Sample
PM Emissions	Approved District Method	District approved averaging time	Outlet of SCR

The test shall be conducted at least once every three years.

The test shall be conducted and the results submitted to the District and the CPM within 60 days after the test date. The District and the CPM shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration and/or monthly emissions limits.

The test shall be conducted 1) when the gas turbine and the duct burners are operating simultaneously at 100 percent of maximum heat input and 2) when the gas turbine is operating alone at 100 percent of maximum heat input.

**Verification:** The City of Vernon shall submit for approval to the District and the CPM the required source testing protocol no less than 45 days prior to the date of the source test. The City of Vernon shall notify the District and CPM of the date and time of the source test no less than 10 days prior to the test. The City of Vernon shall submit to the District and CPM for approval the results of the source test no later than 60 days following the date of the source test.

**AQ-24** The City of Vernon shall conduct source test(s) for the pollutant(s) identified below:

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NH <sub>3</sub> Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR

The test shall be conducted and the results submitted to the District and the CPM within 60 days after the test date. The District and the CPM shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NO<sub>x</sub> concentration, as determined by the certified CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable or not yet certified, a test shall be conducted to determine the NO<sub>x</sub> emissions using District Method 100.1 measured over a 60-minute averaging period.

**Verification:** The City of Vernon shall submit for approval to the District and the CPM the required source testing protocol no less than 45 days prior to the date of the source test. The City of Vernon shall notify the District and CPM of the date and time of the source test no less than 10 days prior to the test. The City of Vernon shall submit to the District and CPM for approval the results of the source test no later than 60 days following the date of the source test.

**AQ-25** The City of Vernon shall install and maintain a CEMS in each exhaust stack of the combustion turbine-HRSG trains to measure the following parameters:

CO concentration in ppmv

Concentrations shall be corrected to 15 percent oxygen on a dry basis

The CEMS will convert the actual CO concentrations to mass emission rates (lb/hr) and record the hourly emission rates on a continuous basis.

The CEMS shall be installed and operated in accordance with an approved District Rule 218 CEMS plan application. The City of Vernon shall not install the CEMS prior to receiving initial approval from District.

The CEMS shall be installed and operated to measure CO concentration over a 15minute averaging time period.

The CEMS shall be installed and operating no later than 90 days after initial start-up of the turbine.

**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-26** The City of Vernon shall install and maintain a CEMS to measure the following parameters:

NOx concentration in ppmv

Concentration shall be corrected to 15 percent oxygen on a dry basis.

The CEMS shall be installed and operating no later than 12 months after the initial start-up of the turbine and shall comply with the requirements of Rule 2012. During the interim period between the initial start-up and the provisional certification date of the CEMS, the City of Vernon shall comply with the monitoring requirements of Rule 2012 (h)(2) and Rule 2012 (h)(3). Within two weeks of the turbine start-up date, the City of Vernon shall provide written notification to the District of the exact date of start-up.

**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-27** The City of Vernon shall install and maintain a Continuous Emission Monitoring Device to accurately indicate the ammonia concentration at the SCR outlet, and alert the City of Vernon (via audible or visible signal alarm) whenever ammonia concentrations are near, or at, or in excess of the permitted ammonia limit of 5 ppmv, corrected to 15 percent oxygen. It shall continuously monitor, compute, and record the following parameters:

Ammonia concentration, uncorrected in ppmv

Oxygen concentration in percent

Ammonia concentration in ppmv, corrected to 15 percent oxygen

Date, time, extent (in time) of all excursion above 5 ppmv, corrected to 15% oxygen

The Continuous Emission Monitoring Device described above shall be operated and maintained according to a Quality Assurance Plan (QAP) approved by the Executive Officer and the CPM. The QAP must address contingencies for monitored ammonia concentrations near at, or above the permitted compliance limit, and remedial actions to reduce ammonia levels once an exceedance has occurred.

The Continuous Emission Monitoring Device may not be used for compliance determination or emission information determination without corroborative data using an approved reference method for the determination of ammonia.

The Continuous Emission Monitoring Device shall be installed and operating no later than 90 days after initial start-up of the turbine



**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-28** The City of Vernon shall vent combustion turbines and HRSGs to the CO oxidation/SCR control system whenever the turbines are in operation.

**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-29** The City of Vernon shall vent diesel fuel storage tank, during filling, only to the vessel from which it is being filled.

**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-30** For the purpose of the following condition number(s), “continuously record” shall be defined as recording at least once every hour and shall be calculated upon the average of the continuous monitoring for that hour.

Condition of Certification AQ-17

Condition of Certification AQ-18

**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-31** For the purpose of the following condition number(s), “continuously record” shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that month.

Condition of Certification AQ-19

**Verification:** The City of Vernon shall make the Malburg Generation Station available for inspection by the District, Commission or CARB.

**AQ-32** The MGS electric generating equipment shall not be operated unless the City of Vernon demonstrates to the Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the City of Vernon demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility hold sufficient RTCs in an amount equal to the annual emission increase. The City of Vernon shall submit all such information to the CPM for approval.

**Verification:** The City of Vernon shall submit all identified evidence demonstrating compliance to the CPM on an annual basis as part of the annual compliance report.

**AQ-33** The City of Vernon shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Emissions data shall be expressed in terms of concentration (ppmv), corrected to 15 percent oxygen, dry basis.

All exhaust flow rates shall be expressed in terms of dry standard cubic feet per minute (DCFM) and dry actual cubic feet per minute (DACFM).

All moisture concentration shall be expressed in terms of % corrected to 15% oxygen.

Emissions data shall be expressed in terms of mass rate (lb/hr), and lbs/mm cubic feet. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

Source test results shall also include turbine fuel flow rate under which the test was conducted.

Source test report shall also include the oxygen level in the exhaust, fuel flow rate (CFH), the flue gas temperature, and the turbine and generator output (MW) under which the test was conducted.

**Verification:** The City of Vernon shall submit the required source test of Conditions of Certification AQ-21, -22 and -23 in compliance with this condition.

**AQ-34** The City of Vernon shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

For architectural applications where no thinners, reducers, or other VOC containing materials are added, maintain semi-annual records for all coatings consisting of (a) coating type, (b) VOC content as supplied in grams per liter (g/l) of materials for low-solids coatings, (c) VOC content as supplied in g/l of coating, less, water and exempt solvent, for other coatings.

For architectural applications where thinners, reducers, or other VOC containing materials are added, maintain daily records for each coating consisting of (a) coating type, (b) VOC content as applied in grams per liter (g/l) of materials for low-solids coatings, (c) VOC content as applied in g/l of coating, less, water and exempt solvent, for other coatings.

**Verification:** The City of Vernon shall make these records available to the CPM upon request.

**AQ-35** The City of Vernon shall keep records, in a manner approved by the District, for the following parameters or items:

Date of operation, the elapsed time, in hour and the reason for operation of the emergency diesel powered generators and/or the firewater pump.

**Verification:** The City of Vernon shall submit these records to the CPM on an annual basis in the annual compliance report.

**AQ-36** The City of Vernon shall keep records, in a manner approved by the District, for the following parameters or items:

Natural gas fuel use during the commissioning period in the combustion turbines and HRSGs.

**Verification:** see verification of Condition of Certification AQ-6.

## REFERENCES

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- ARB (California Air Resources Board ) 1992., "Sources and Control of Nitrogen Emissions." Sacramento, August. p. 38
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# **ATTACHMENT A**

## **PARTICULATE MATTER SIGNIFICANCE CRITERIA**

### **THRESHOLD OF SIGNIFICANCE**

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Staff recommends measures to mitigate any particulate matter<sup>3</sup> (PM10) impacts to air quality that it finds to be significant under the California Environmental Quality Act (CEQA). Determining the significance of such impacts requires staff to examine the extent of the impact and compare it to a threshold of significance. Such a threshold is an identifiable quantitative, qualitative, or performance level, noncompliance with which means the effect would be regarded as significant and compliance with which means the effect is at a level below which staff would regard as less than significant.

Staff relies on the more stringent of either federal or state ambient PM10 air quality standards to determine significance. Specifically, if PM10 air emissions from a project would either cause or contribute to a violation of a standard, then staff considers the impacts caused by the emissions to be significant and would recommend mitigation measures to reduce the impacts to less than significant.

The following section explains the objective of ambient air quality standards, the basis upon which they are established, and implications of the health studies used to set PM10 standards. The final section explains staff's reasoning in relying upon the standards to establish a threshold of significance.

### **DERIVATION OF AMBIENT AIR QUALITY STANDARDS**

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The California Air Resources Board (CARB) is required to adopt ambient air quality standards based, in part, on public health considerations (Health & Safety Code §39606(a)(2)). The objective of an ambient air quality standard is to provide a basis for preventing or abating the effects of air pollution, including health effects (Title 17, §70101). Pollution levels below the standards should not ordinarily produce associated health effects (Id.).

CARB is periodically required to revise any of the standards it finds to be inadequate, with the revised standards to be established at levels that adequately protect the health of the public, including infants and children, with an adequate margin of safety (Health & Safety Code § 39606(d)(2)).

An adequate margin of safety in standard-setting is generally understood to account and compensate for scientific uncertainty, as well as the lack of precision regarding the health impacts of air pollutants on a multiplicity of potentially susceptible subpopulations (CARB and OEHHA 2002, p. 7-75). Some of the uncertainties identified by CARB and OEHHA in their recommendations for PM10 standards include potential health hazards that have not been identified, factors determining variability in response to PM among

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<sup>3</sup> Particulate matter includes both PM10 and the smaller PM2.5

susceptible subpopulations, micro-environmental variability in PM exposure related to indoor penetration of PM, activity patterns, and geographic proximity to point and area sources (CARB and OEHHA 2002, p. 7-76).

In December, 2000, based on data from numerous recently published epidemiological studies, CARB determined that the existing state PM<sub>10</sub> standards (established in 1982) may not adequately protect public health. CARB found that health effects may occur in infants, children, and other groups of the population exposed to PM<sub>10</sub> at or near levels corresponding to the current standards (CARB and OEHHA, 2000).

On June 20, 2002 CARB proposed to revise the PM standards. It proposed to retain the 24-hour PM<sub>10</sub> standard, lower the annual PM<sub>10</sub> standard from 30 to 20  $\mu\text{g}/\text{m}^3$ , and create a new annual PM<sub>2.5</sub> standard of 12  $\mu\text{g}/\text{m}^3$ .

The revised PM<sub>10</sub> standards are intended to prevent excess mortality, illness (including respiratory symptoms, bronchitis, exacerbation of asthma, emergency room visits and hospital admissions for cardiac and respiratory diseases), and restrictions in activity from both short- and long-term exposures (proposed amendments to Cal. Code Regs., tit. 17, sec. 70200). The new PM<sub>2.5</sub> standard is intended to prevent excess mortality and illness (including respiratory symptoms, asthma exacerbation, and hospital admissions for cardiac and respiratory diseases) from long-term exposures (Id.).

Many of the epidemiologic studies demonstrate associations between PM<sub>10</sub> and the risk of premature mortality. Such studies figure prominently in the levels of the new standards and the health outcomes the standards are designed to prevent.

An important observation from the epidemiologic studies is that both mortality and morbidity effects can occur at similar ambient PM<sub>10</sub> concentrations. Normally, one would expect a gradient whereby morbidity effects would occur at relatively lower ambient concentrations than mortality effects, which would begin to occur as concentrations increase. However, there is no evidence that morbidity effects occur at lower PM<sub>10</sub> concentrations than those associated with increased risks of mortality, probably due to the different populations at risk. For example, mortality in elderly adults has been observed at long-term average ambient concentrations comparable to concentrations at which morbidity outcomes in children (who are not at a high risk for mortality) have been detected. Therefore, there does not appear to be a gradient of exposure concentrations related to increasing health outcome severity. Thus, the proposed standards, primarily designed to protect against premature mortality, should also protect against the occurrence of morbidity outcomes.

Within the PM<sub>10</sub> concentration ranges in the studies examined by CARB and OEHHA, the exposure-response relationship appears to be linear with no identifiable threshold at which either short- or long-term exposure to PM<sub>10</sub> begins to create health effects. Thus, there has not been a level or concentration identified below which there would be no expected adverse health effects, so that the PM exposure concentration at which health impacts start to be seen cannot be determined. Although there may be uncertainty associated with the strength of the correlation between health impacts and

exposure at different ambient PM10 levels, the correlation is intuitively more likely when particle levels are elevated.

Most of the time-series (daily) studies demonstrate a 0.5 to one percent increase in total mortality per 10  $\mu\text{g}/\text{m}^3$  increase in PM10, while the estimated mortality effect of chronic PM10 exposure is in the range of four to seven percent per 10  $\mu\text{g}/\text{m}^3$  increase in the long-term PM10 average (CARB and OEHHA 2002, p. 7-77). Thus, incremental changes in PM10 levels, even on a daily basis, have been found to affect mortality rates.

## **AMBIENT AIR QUALITY STANDARD AS A THRESHOLD OF SIGNIFICANCE**

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As noted above, staff would consider PM10 emissions from a project to cause a significant impact if they have the potential to either cause or contribute to a violation of a PM10 ambient air quality standard.

The PM standards are set at levels to protect against both mortality and morbidity outcomes and to provide an adequate margin of safety to sensitive subpopulations. Since no exposure threshold has been identified below which there is an absence of health effects, the standards do not provide absolute protection for everyone in the population. Rather, they are meant to provide adequate protection to nearly all the population.

Pollution levels below the standards should not ordinarily produce associated health effects. At the level of a standard, the margin of safety is not compromised and should provide protection to most people in sensitive groups. As pollution levels begin to increase above the standard, the margin of safety is eroded so that less health protection is afforded to sensitive populations, and an increasingly higher number of sensitive people may begin to experience adverse health effects. Finally, at some level above the standard, the margin of safety disappears. But, since the exposure-response relationship appears to be linear and no exposure threshold has been identified, the exact level at which the margin of safety disappears is uncertain. At levels significantly above the standard, there is no remaining margin of safety. Thus, not only sensitive groups may experience adverse health effects from exposure to ambient air, but normal (non-sensitive) members of the population may also be at risk.

As described earlier, recent epidemiological studies have demonstrated that increases in both short- and long-term mortality rates are correlated with increases in PM10 levels. Staff does not believe that a particular level of increase in PM10 concentrations in an area that already experiences violations of the standard is necessary to support a conclusion of significance. The ambient standard itself provides a level below which nearly everyone is afforded health protection. At ambient levels even marginally above the standard, sensitive members of the population could experience health effects, including mortality.

Thus, the severity of the health effect (mortality) engendered by such PM10 increases, coupled with the recognition that such mortalities can result from even incremental

increases in particulate levels, persuade Energy Commission staff that any addition to PM10 levels in excess of the standard is potentially significant. Similarly, staff would regard any creation of a new violation of a standard (ambient levels which, after the project's operation, could exceed the standard) as significant, thus requiring mitigation.

## **REFERENCES**

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# BIOLOGICAL RESOURCES

Testimony of Stuart Itoga

## INTRODUCTION

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This section provides the California Energy Commission staff's analysis of potential impacts to biological resources from construction and operation of the Malburg Generating Station (MGS). 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 and potential environmental impacts associated with construction and operation of the proposed project. This document also determines compliance with applicable laws, ordinances, regulations and standards (LORS).

This analysis is based, in part, on information provided on December 21, 2001, from the City of Vernon's Application for Certification (COV 2001a AFC 2001a), and a staff site visit on May 5, 2002.

## LAWS, ORDINANCES, REGULATION AND STANDARDS

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### 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), which 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 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, prohibit 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.
- **Streambed Alteration Agreement**  
Fish and Game Code section 1600 et seq. requires CDFG to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.
- **California Code of Regulations**  
Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.
- **Clean Water Act**  
To verify that the federal Clean Water Act permitted actions comply with state regulations, the Regional Water Quality Control Board provides its certification after reviewing the federal permit(s) provided, if necessary, by the U.S. Army Corp of Engineers.

## LOCAL

- **City of Vernon General Plan**  
Section 3.0, Goals 1 and 2 provide for the preservation of open space land and the conservation and protection of regional natural resources.
- **Los Angeles County Significant Ecological Areas**  
Los Angeles County designated 61 Significant Ecological Areas (SEAs) with the intent of preserving biotic diversity. Proposed development within an SEA with potential for environmental degradation requires a conditional use permit.
- **Southern California Association of Governments (SCAG)**  
SCAG reviews Environmental Impact Reports of regional significance for consistency with regional plans.

## SETTING

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### REGIONAL

The proposed project site is located within the Los Angeles Basin. The Los Angeles Basin includes Los Angeles and, Orange Counties and portions of San Bernardino County. The Santa Monica Mountains bound this area to the north, the Whittier Fault to the east, the San Joaquin Hills to the south, and the Pacific Ocean to the west.

Historically, scrub, chaparral and annual grassland habitats were plentiful in the Los Angeles Basin. The Los Angeles River, which traverses the proposed project region, consisted of riparian and freshwater habitats. However, commercial, industrial and residential development altered the historic landscape and many of the natural communities in the project region. Consequently, wildlife populations, if not extirpated, have been greatly diminished. Plant and/or animal species listed under state and/or federal Endangered Species Acts are not known to inhabit the project region.

### LOCAL

The proposed project site is located in an area zoned General Industrial within the city limits of Vernon, Los Angeles County, California. Vernon is bordered on the north and west by the city of Los Angeles, on the east by the cities of Commerce and Bell, and on the south by the cities of Huntington Park and Maywood. Vernon is three miles southeast of downtown Los Angeles and fifteen miles north of the major harbor and port facilities in San Pedro and Long Beach. The city is located within two miles of four major freeways.

The proposed MGS site would be located on 3.4 acres of the existing 5.9-acre power plant site (Station A), owned and operated by the City of Vernon. The proposed site previously contained distillate fuel tanks and berms. The tanks have been removed and the site has been backfilled and leveled. Station A is bordered by train tracks and industrial warehouses to the north, Soto Street and industrial facilities and warehouses to the east, industrial facilities and warehouses to the south, and Seville Avenue, a railyard, and a storage facility to the west.

Applicant conducted sensitive species surveys on June 14, 2001. Results of sensitive species surveys submitted by Applicant indicated no sensitive species, sensitive habitats or natural communities were observed on the project site or within a one-mile radius of the Station A site (COV 2001a). Wildlife at the proposed site and along the proposed linear routes is limited to common bird species including the American crow and rock dove. Plant species are limited to horticultural and ruderal species including carrotwood tree, crepe myrtle, gardenia, and silver dollar eucalyptus. For a list of observed species, refer to **Table 1**(City of Vernon 2001) below.

**Table 1.**  
**Species Observed On the Site by City of Vernon**

**Wildlife**

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Rock dove (pigeon)	<i>Columba livia</i>
American crow	<i>Corvus brachyrhynchos</i>

**Plants**

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Carrotwood tree	<i>Cupaniopsis anacardioides</i>
Crepe myrtle	<i>Lagerstroemia indica</i>
Gardenia	<i>Gardenia sp.</i>
Gazania	<i>Gazania linearis</i>
Liquidambar	<i>Liquidambar styraciflua</i>
Loquat	<i>Eriobotrya japonica</i>
Navel orange	<i>Citrus sinensis</i>
Olive	<i>Olea sp.</i>
Pink lady	<i>Raphiolepis indica</i>
Schefflera	<i>Tupidanthus calyptratus</i>
Silver dollar eucalyptus	<i>Eucalyptus polyanthemus</i>

**ANALYSIS AND IMPACTS**

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The Environmental Checklist (see below) is presented in the California Environmental Quality Act (CEQA) guidelines to assist lead agencies in their analysis of project impacts. The checklist is a summary of staff's conclusions regarding the potential for adverse project impacts. Following the checklist is a discussion of staff's analysis and rationale for these conclusions.

## ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>BIOLOGICAL RESOURCES – Would the project or related facilities:</b>				
a) Have an adverse effect, either directly, indirectly, or cumulatively, on any species identified as a candidate, sensitive, or special status species in federal, state, local or regional plans, policies, or regulations (including those by the California Department of Fish and Game, National Marine Fisheries Service, U.S. Bureau of Land Management, U.S. Forest Service, or U.S. Fish and Wildlife Service) or habitat used by the above?				X
b) Have an indirect or direct adverse effect on any riparian habitat or other sensitive natural community identified in federal, state, local or regional plans, policies, and regulations (including those by the California Department of Fish and Game or U. S. Fish and Wildlife Service)?				X
c) Have an adverse effect on surface or ocean waters (including those considered by National Marine Fisheries Service as essential fish habitat), or on local aquatic resources, or on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, tidal and freshwater marshes, vernal pools, etc.) either through direct removal, filling, hydrological interruption, pollution (thermal, particulate, or chemical) or other means?				X
d) Interfere with the movement of any native fish or wildlife species (resident or migratory) or with established native (resident or migratory) wildlife corridors, or limit or impede the use of native wildlife nursery sites?				X
e) Conflict with any local policies or ordinances protecting biological resources, such as 1) a tree preservation policy or ordinance, or 2) a native landscape requirement?				X

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>BIOLOGICAL RESOURCES – Would the project or related facilities:</b>				
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
g) Create an adverse change in commercial or recreational species' distribution or population size, or harvesting opportunities for these species?				X
h) Facilitate the introduction, population growth, or spread of weedy plant species that are difficult to control (such as those classified by the California Department of Agriculture as List A, List B, or Red Alert species) or other invasive or non-native aquatic or terrestrial wildlife species (such as nest parasites)?				X

## **A) SENSITIVE SPECIES**

### **Power Plant**

The proposed project would occupy approximately 3.4 acres of the existing 5.9-acre Station A power plant. Station A, located at 2715 East 50<sup>th</sup> Street, consists of five diesel fuel powered generators, the Vernon Substation 69 kV switchyard, a cooling tower, heat exchangers and transmission towers. Station A has been operating since 1933.

Existing vegetation at Station A consists only of horticultural species. Staff visited the site on May 5, 2002 and noted the proposed MGS footprint was devoid of vegetation. Although staff observed no wildlife during the May 5, 2002 visit (Itoga personal observation), Applicant indicated American crows and rock doves (not considered sensitive species) have been observed on/near the proposed site (City of Vernon 2001). It is staff's opinion that crows and rock doves observed in the area are probably acclimated to industrial activities in the area and would not be affected by activities associated with construction and operation of the proposed MGS.

Because of the existing levels of activity and disturbance, and the lack of sensitive species and sensitive species habitat on or near the proposed project site, staff concludes that construction and operation of the proposed MGS would not adversely impact sensitive species.

### **Worker Parking and Staging Areas**

The proposed worker parking and construction laydown areas would be located on a paved lot at the southeast corner of Soto Avenue and East 50<sup>th</sup> Street. Pipe laydown

areas during construction of the natural gas, reclaimed water and sewer pipelines are proposed for paved areas to the west of Seville Avenue. Because of the lack of sensitive species in the proposed project area, staff concludes there would be no adverse impacts to sensitive species caused by use of the aforementioned areas for worker parking and laydown areas.

## **Linear Facilities**

### **Transmission Line**

Applicant indicated that construction of new transmission lines would not be needed for the proposed MGS, but interconnection of the proposed MGS to the Vernon Substation would require three underground 69 kV connections within the existing Station A fence line. Each of the proposed interconnections would be approximately 300 feet in length. The proposed interconnections would connect the two Combustion Turbine Generators and the single Steam Turbine Generator to the Vernon Substation. Because construction of the proposed interconnections would occur in a disturbed area that does not support sensitive species, staff concludes that construction of the underground interconnections would not adversely impact sensitive species.

### **Natural Gas Pipeline**

To supply the proposed MGS with natural gas, a new gas pipeline would be constructed. Applicant has proposed a preferred and an alternative natural gas pipeline route. The interconnection point for the preferred route would be an existing gas transmission pipeline beneath East Fruitland Avenue. A new, ten-inch diameter gas pipeline would be constructed along Seville and Fruitland Avenues. The preferred gas pipeline route (1,100 feet long) would make use of the existing rights-of-way of Seville and Fruitland Avenues.

The alternative gas pipeline route would begin at an existing gas transmission line at the intersection of Fruitland Avenue and Soto Street. This proposed route would be routed along the existing rights-of-way of Soto and 50<sup>th</sup> Streets. Applicant has indicated that this route is not preferred because it would be longer in length than the route designated as preferred (City of Vernon 2002).

Both proposed gas pipeline routes would utilize underground construction methods routing the gas pipelines within existing city street right-of-ways. An additional 200 feet of underground gas pipeline would be constructed within the existing Station A site. This single 200-foot section of pipeline is proposed for use with either the preferred or alternative pipeline route. Because of the lack of sensitive species, and existing levels of disturbance, in the proposed project area staff concludes there would be no adverse impacts to sensitive species associated with construction of either the preferred or alternative natural gas pipeline.

## **Water Pipelines**

### ***Reclaimed***

Applicant has proposed use of reclaimed water as the primary source of water for the cooling tower and Heat Recovery Steam Generators. Reclaimed water would be conveyed to the proposed MGS through a 1.8-mile long pipeline. The proposed pipeline would consist of approximately 6,500 feet of 18-inch pipe and an additional 2,800 feet of 12-inch pipe. The proposed pipeline would be installed underground beginning at an existing reclaimed water pipeline at the intersection of Randolph and Newell Streets. The proposed reclaimed water pipeline would then be routed along Randolph Street, Boyle Avenue, and East 50<sup>th</sup> Street before terminating at the Station A site. The proposed reclaimed water pipeline route would traverse areas zoned General Industrial, and no sensitive species exist along the proposed pipeline route or in the proposed project area. Because of the existing levels of disturbance and activity in and around the areas proposed for construction of the reclaimed water pipeline route, and the lack of sensitive species in the area, staff concludes that no sensitive species would be adversely impacted by its construction.

### ***Sewer***

As with the proposed preferred natural gas pipeline, the proposed sewer pipeline would be 1,100 feet in length and would be buried underground starting at the intersection of Fruitland and Seville Avenues. The proposed sewer pipeline would then parallel Seville Avenue before entering the west side of the proposed MGS. The proposed pipeline would be routed within city street rights-of-way traversing areas zoned and developed for general industry. Because of the existing levels of disturbance and activity along the proposed sewer pipeline route, and the lack of sensitive species in and around the proposed sewer pipeline route, staff concludes that construction of the proposed sewer pipeline would not adversely impact sensitive species.

## **B) RIPARIAN AND SENSITIVE COMMUNITIES**

Construction and operation of the proposed project would occur in a developed area zoned General Industrial. The Los Angeles River, where it traverses the proposed project area, was once riparian habitat but is now a concrete-lined channel. Staff concludes that the Los Angeles River, where it traverses the proposed project area, is not a riparian community. No sensitive communities are known to exist in the proposed project area. Staff concludes that construction and operation of the proposed project would not adversely impact any riparian areas or sensitive communities.

## **C) SURFACE WATERS**

The proposed project area is zoned General Industrial and is highly developed and disturbed. The Los Angeles River traverses the proposed project area approximately  $\frac{3}{4}$  miles north of the Station A site. However, water in the Los Angeles River (where it traverses the proposed project area) is comprised mostly of treated wastewater discharged from various waste water treatment facilities. The proposed MGS would not adversely impact the quality of Los Angeles River waters (see Soil and Water Resources section of this document). No jurisdictional wetlands exist on or near the



proposed MGS site. Proposed project cooling and wastewater would be discharged to the County Sanitation District of Los Angeles County (CSDLA) sewer system.

Because wastewater would be used for cooling and process water, and this water would then be discharged to an existing sewer system, staff concludes that the proposed project would not adversely impact surface waters in the proposed project area.

#### **D) MIGRATION CORRIDORS: NO IMPACT**

Wildlife observations on the proposed MGS site and the proposed project area were limited to species likely to be tolerant of disturbed and/or developed areas ( e.g. crows, rock doves). Although the proposed project area is located on the Pacific Flyway, lack of wildlife habitat in the area largely precludes use of the area by migratory birds. It is staff's opinion that bird collisions with proposed power plant stacks would be extremely random events. Terrestrial wildlife migration corridors do not exist in the proposed project area.

It is staff's opinion that there are no wildlife corridors in the proposed project area, and staff concludes that construction and operation of the proposed MGS would not pose a significant collision hazard to migratory birds or adversely impact any wildlife migration corridors.

#### **E) LOCAL POLICIES OR ORDINANCES**

The proposed project area is zoned General Industrial, and is not in a Los Angeles County SEA. It is staff's opinion that the proposed project would constitute an industrial land use. Furthermore, the proposed project would also be consistent with current land use practices in the proposed project area. Staff concludes that the proposed project would not conflict with any applicable local policies or ordinances.

#### **F) ADOPTED HCP**

The proposed project area is industrialized and disturbed, and there are no species in the proposed project area protected by the Endangered Species Act. Because the likelihood of take of endangered species in the project area is low, there are no approved Habitat Conservation Plans. Therefore, staff concludes that the proposed project would not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state Habitat Conservation Plan.

#### **G) COMMERCIAL AND RECREATIONAL SPECIES**

Habitat suitable for supporting significant numbers of commercially and/or recreationally important species does not exist in the proposed project area. The Los Angeles River, where it traverses the proposed project area, is probably occasionally used by some species of waterfowl and wading birds. However, this section of the river channel is concrete lined, and water in the channel consists mostly of wastewater effluent discharged from various water treatment facilities. Because of the lack of wildlife

habitat, and the marginal quality of water in the Los Angeles River, it is staff's opinion that the river, where it traverses the proposed project area, is not capable of supporting any significant populations of commercially or recreationally important species. Staff concludes that the proposed project would not adversely impact species of commercial or recreational significance.

## **CUMULATIVE IMPACTS**

The City of Vernon is mostly developed industrial land, and the proposed MGS would be constructed on an existing power plant site. Sensitive biological resources do not exist on the proposed site or in the proposed project area. For these reasons and because of existing levels of development and disturbance on the proposed site and in the proposed project area, staff does not anticipate any adverse incremental impacts to biological resources associated with the proposed MGS.

## **MITIGATION**

Applicant conducted sensitive species surveys on the proposed project site and for a distance of one-mile around it. Survey results submitted by Applicant indicated that there are no species or habitats afforded protection under federal, state or local laws, ordinances, standards or regulations. Applicant concluded that construction and operation of the proposed project would not adversely impact biological resources in the proposed project area, and did not propose mitigation measures.

Staff agrees with Applicant's assessment and concludes that because the project would not adversely impact biological resources in the proposed project area, no mitigation measures are necessary.

## **COMPLIANCE WITH LORS**

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Staff analyzed the proposed project's potential impacts to biological resources and concluded that construction and operation of the project would not adversely impact biological resources in the proposed project area. Because the proposed project would not adversely impact biological resources in the proposed project area, staff concludes that the project would be constructed and operated in compliance with LORS as applicable to biological resources.

## **FACILITY CLOSURE**

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Sometime in the future, the MGS could 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, public health and safety. To address facility closure, an "on-site contingency plan" will need to be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM).

## **CONCLUSIONS AND RECOMMENDATIONS**

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Because construction and operation of the proposed project would occur on a disturbed site, in an area of industrial development, with no sensitive biological resources in the proposed project area, staff concludes that the proposed project would not adversely impact biological resources in the proposed project area.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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Because there are no potential significant impacts to biological resources associated with the proposed project, no Conditions of Certification are proposed by staff.

## **REFERENCES**

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City of Vernon. (COV) 2001a, Application for Certification submitted to the California Energy Commission December 18, 2001.

# CULTURAL RESOURCES

Testimony of Mary Maniery, John Dougherty and Dorothy Torres

## INTRODUCTION

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The cultural resources section discusses potential impacts on cultural resources of the proposed changes at City of Vernon Malburg Generating Station (MGS) located in the City of Vernon, Los Angeles County. The term cultural resources as defined in law, includes buildings, sites, structures, objects, and historic districts. The primary purpose of the cultural resources analysis is to ensure that all potential impacts are identified, and that conditions of certification are set forth that ensure impacts are mitigated below a level of significance under the California Environmental Quality Act (CEQA).

Staff provides a cultural resources overview of the project, as well as an analysis based on CEQA criteria that assesses potential project related impacts. If cultural resources are identified, staff determines whether the project may affect any identified resources and if the resources are eligible for the California Register of Historic Resources (CRHR) or the National Register of Historic Places (NRHP). If eligible, staff recommends mitigation that ensures no significant impacts will occur and that will reduce impacts to the cultural resource to a less than significant level. In addition, a project may impact a previously unidentified resource or impact an identified historical resource in an unanticipated manner. Staff therefore recommends procedures in the conditions of certification that mitigate these potential impacts.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

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### STATE

- California Code of Regulations, Title 14, section 4852 defines the term "cultural resource" to include buildings, sites, structures, objects, and historic districts.
- Public Resources Code, section 5000 establishes a California Register of Historic Places (CRHR), criteria for eligibility to the CRHR and defines eligible resources. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- The California Environmental Quality Act (CEQA) (Pub. Resources Code, 21000 et seq.; Code of Reg., Title 14, 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. The California Energy Commission process is a CEQA equivalent process and Staff Assessments replace the CEQA environmental documents.
- 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.
- The CEQA Guidelines, Cal. Code Reg, Tit.14, section 15126.4(b) prescribe the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource. The Guidelines also discuss 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.
- Section 15064.5 of the CEQA Guidelines 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 ½ states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- 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.

## **LOCAL**

The General Plan adopted by the City of Vernon contains no provisions for cultural resources (COV 2001a:8.3-17, Table 8.3.2).

## **SETTING**

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The COV Project is located within the Los Angeles Basin. The physiography of the area is distinguished by the broad, cismontane, alluvial coastal plain of southern California. To the north and east the Transverse and Peninsular ranges rise, while to the west the Pacific Ocean bounds the western margin of the alluvial plains (COV 2001a, AFC p. 8.3-1).

Regional prehistoric cultural occupation in California appears to begin during the late Pleistocene when users of Clovis-like fluted points left scant traces of their presence in many areas of California including the desert regions of Southern California, east of the Peninsular Range. Throughout the prehistoric period the region seems to have witnessed gradually increasing local cultural differentiation (COV:2001a, AFC p. 8.3-1).

The ethnographic occupants of the region are presently known as the “Gabrielinos” because of the historic association between the group and the San Gabriel mission. The Gabrielinos were speakers of a Tacic language related to the broader family of Uto-Aztecan languages. Very little reliable ethnographic information is available for the Gabrielinos and present knowledge is largely dependent upon historic accounts and Spanish colonial and mission records. Some accounts reflect a complex society with strong class differentiation while other sources appear to be reflecting a comparatively simple, hunter-gatherer society (COV 2001a, AFC pp. 8.3-4 – 8.3-6).

Historic contact of Europeans within the region was initiated in the late 16<sup>th</sup> century with the exploration of Juan Cabrillo. Spanish presence in the region increased throughout the 17<sup>th</sup> and 18<sup>th</sup> centuries until the Mexican Revolution ended the connection with Spain. The project area lies within the territory of Rancho San Antonio, a Spanish Land Grant, granted in 1810 to Don Antonio Maria Lugo by the Spanish Crown and confirmed by the U. S. government in 1866. The grant was gradually divided into smaller parcels and agricultural emphasis shifted from cattle to crop production during the 19<sup>th</sup> century (COV 2001a, AFC p. 8.3-6). The vicinity figured during the Mexican-American War when the battle of La Mesa was fought nearby (COV 2001a, AFC pp. 8.3-7 – 8.3-8).

The City of Vernon was known as Vernondale until the city’s incorporation in 1905. The place was named for a Civil War veteran, George R. Vernon who moved to the area in 1871. Vernon itself has a curious and unique history. Founded by John B. Leonis, the city was conceived of as an exclusively industrial city. One of the early industries to settle in Vernon was meat packing which at one time was represented by more than twenty plants. Highly connected through a number of railroads, the city provided inexpensive transfer between the various major railroads.

The Station A Power Plant was the result of conflict between J. B. Leonis and the Edison Company, which was the principal power provider in the region. Unable to secure special rates for manufacturing concerns relocating to Vernon, Leonis encouraged the City to build its own plant. The result was the second largest, diesel-powered generating plant in the world at the time. By 1937 the City had leased the plant to the Edison Company (COV 2002f). The existing switchyard was constructed to replace the original equipment of the 1930’s facility in 1947.

## **ANALYSIS AND IMPACTS**

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### **PROJECT SPECIFIC IMPACTS**

The Environmental Checklist (see below) is presented in the California Environmental Quality Act (CEQA) guidelines to assist lead agencies in their analysis of project impacts. Staff provides this checklist as a summary of conclusions regarding the

potential for adverse significant project impacts. Following the checklist is a discussion of staff's analysis and rationale for these conclusions.

### Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>CULTURAL RESOURCES – Would the project:</b>				
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	

#### **a) Impacts to Historical Resources**

Known historical resources within the project area consist of the Station A Power Plant and structures located at various places along the linear routes for water and natural gas that follow Seville Avenue, East 50<sup>th</sup> Street, Boyle Avenue and Randolph Avenue. The applicant has also identified a core Vernon Historical District of industrial development which reflects the industrial heritage of the city. A record search conducted by the applicant through the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS) revealed a State Historical Landmark (SHL 167), located at 1490 Exchange Avenue, and a structure at 2947 Clarendon Avenue.

Station A consists of a historic structure containing the Johnson and Heinze Diesel Plant, the H. Gonzales Generating Station, and the Control Room. The Applicant proposes to turn the care, preservation and upkeep of the building over to a non-profit corporation. Station A has been found to be a potentially eligible historic resource under California Register of Historic Resources (CRHR) criteria 1 and 3 (COV 2002f: 2-15 to 2-16). The switchyard, because its construction post dates the period of significance for Station A, is not considered a contributing element of the significance of Station A. Staff agrees with this assessment.

The Applicant indicates that proposed project does not include alteration of the existing building in any fashion. The construction of the proposed project will alter Station A's setting. However, the proposed new building, which is a smaller structure, will not overpower Station A visually. While the new building will add new stacks to the view, these are comparatively slender. At present tall portions of other industrial facilities extend above rooftops on nearby property. The proposed project is industrial and would add a new power plant of lesser size than the original structure to the area adjacent to Station A, but whose function will not alter the industrial and power-generating purpose of the plant site. Alterations in setting, therefore, do not appear to be significant. The

applicant will maintain ownership of Station A and has proposed to manage Station A as an historical resource through a non-profit corporation, which should mitigate any other project-related effects to less than significant levels.

Since agreements for management of Station A have not been developed, there is no guarantee that the Station A will be maintained in its current condition. Deterioration, removal of original equipment, or alterations of the building would be impacts to Station A. As long as the applicant maintains Station A in accordance with the Secretary of Interior's Standards, staff agrees that the project impacts to Station A would be less than significant.

Figure 2-2, supplied by the applicant in response to Cultural Resources Data Request 2, indicates that as many as 46 potentially historical structures, including Station A, are located within or near the project site or one of its proposed linear facilities (COV 2002f). The present project design calls for placing linear facilities along the center lines of E. 50<sup>th</sup> Street, Boyle and Randolph Avenues. At present, historical structures along linear facility alignments have not been recorded or evaluated for significance. Present plans indicate that there should be no significant impact to these structures. Primary records have been prepared for all potentially historic structures along the project linears.

The industrial area surrounding Station A may be eligible to the CRHR as an historical district. The applicant has identified a core area including Station A as the Vernon Historical District. The proposed district is roughly bounded by Leonis Boulevard on the north, Pacific Avenue on the west, 54<sup>th</sup> Street on the south, and South Boyle on the east. The applicant has provided graphics that depict the historical district boundaries and the numbered structures mentioned in the delimitation of the district boundary (COV 2002f1, Figures).

The proposed district consists of the historic, pre-World War II, industrial core of the City of Vernon. The architecture of the district includes a range of historic American architectural styles including American (Commercial, Bungalow/Craftsman), Modern (Art Deco, Art Moderne, and International), and California Mission/Spanish Colonial. Forty-two structures have been identified as contributing structures, including Station A and contributing linear features (i.e. the railroads and spurs). The applicant considers the proposed Vernon Historical District eligible under criteria A (historic events) and C (design and construction) of the National Register of Historic Places. These correspond to criteria 1 and 3 of the California Register of Historical Resources.

The applicant argues that the proposed project will have no significant effect upon the integrity of the proposed district. The points made are that the project is "...appropriate to the historic setting of the District as ' . . . exclusively industrial . . .'" and that there will be no visual aesthetic alterations because the stacks of the proposed plant are of similar height to existing structures within the proposed historic district.

Building a new power facility within a historical district adds another non-contributing element to the district. This addition is an impact to the district. This would not materially impair the district and does not represent a significant impact.



State Historic Landmark 167 marks the La Mesa Battlefield of the war with Mexico. It is located northeast of the project area. The project will not affect this resource.

The previously recorded structure at the Clarendon Avenue location is in Huntington Park. The project will not affect the resource.

### **b) Impacts to Archaeological Resources**

Structures may have been removed to build the original Station A plant. There is no unequivocal information available at the time of writing in regard to this issue. Minor indications of potential historic material in the project area were identified during MGS project therefore appears to have the potential to adversely affect unidentified, buried historic archaeological resources. Staff recommends that the project be monitored by qualified archaeologists during ground disturbance pursuant to staff's proposed condition of certification **CUL-6**.

The Gabrielino/Tongva Tribal Council of the Gabrielino Tongva Nation provided a letter expressing concern that the project may have a significant environmental impact to the cultural resources of their tribal group. They recommended archaeological and Native American monitoring of subsurface construction activity. The letter also asserts cultural affiliation to the project area and offers assistance with cultural resources monitoring activities. The letter is signed by Samuel H. Dunlap, Tribal Secretary (Dunlap 2002).

### **Potential for Disturbance of Human Remains**

There are no known prehistoric or ethnographic archaeological sites within or near the project area. No affects to buried human remains are anticipated.

## **CUMULATIVE IMPACTS**

The applicant has indicated that further industrial development is planned in the City of Vernon, an industrial area. Mitigation measures such as recordation of potential historic resources and avoidance or excavation and data recovery of archaeological resources appears feasible. If these mitigation measures are conducted by all of the development projects, the potential cumulative impacts will be mitigated below a level of significance.

## **CONCLUSIONS AND RECOMMENDATIONS**

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Staff recommends implementation of the following conditions of certification to ensure that all impacts are mitigated below a level of significance.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**CUL-1** Prior to the start of ground disturbance, the project owner shall submit the resume of the proposed Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, to the CPM for review and approval. The CRS shall be responsible for implementation of all cultural resources conditions of certification and may obtain qualified cultural resource monitors (CRMs) to monitor as necessary on the project.

The resume for the CRS and alternate, shall include information that demonstrates that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the CFR 36, CFR Part 61 are met. In addition, the CRS shall have the following qualifications:

- a. The technical specialty of the CRS shall be appropriate to the needs of the project and shall include, a background in anthropology, archaeology, history, architectural history or a related field; and
- b. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California.

The resume shall include the names and phone numbers of contacts familiar with the work of the CRS on referenced projects and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction and operation. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed CRS or alternate has the appropriate training and background to effectively implement the conditions of certification.

CRMs shall meet the following qualifications:

- a. A BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or
- b. An AS or AA in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or
- c. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary; fulfills all the requirements of these conditions of certification; ensures that the CRS obtains technical specialists, and CRMs, if needed; and that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

**Verification:** The project owner shall submit the resume for the CRS at least 45 days prior to the start of ground disturbance. If an alternate is proposed, the resume of the alternate shall be submitted for review and approval, at least 10 days prior to the alternate beginning duties.

- At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS.
- At least 20 days prior to ground disturbance, the CRS shall submit written notification identifying any anticipated CRMs for the project stating they meet the minimum qualifications required by this condition. If additional CRMs are needed later, the CRS shall submit written notice one week prior to any new CRMs beginning work.

- At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions of certification.

**CUL-2** Prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps 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 CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM.

1. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM for approval. Maps shall identify all areas of the project where ground disturbance is anticipated.
2. If construction of the project will proceed in phases, maps and drawings, not previously submitted, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.
3. At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.
4. The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

**Verification:** The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance.

- If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.
- If project construction is phased, the project owner shall submit the subject maps and drawings 15 days prior to each phase.
- A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and also provided in each Monthly Compliance Report (MCR).
- The project owner shall provide written notice of any changes to scheduling of construction phases within 5 days of identifying the changes.

**CUL-3** Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by the CRS, to the CPM for approval. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures.

1. A proposed general research design that includes a discussion of research questions and testable hypotheses applicable to the project area. A refined research design will be prepared for any resource where data recovery is required.
2. The following statement shall be added to the Introduction: Any discussion, summary, or paraphrasing of the conditions in the CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. If there appears to be a discrepancy between the conditions and the way in which they have been summarized described, or interpreted in the CRMMP, the conditions, as written in the Final Decision, supercede any interpretation of the Conditions in the CRMMP. (The Cultural Resources conditions of Certification are attached as an appendix to this CRMP).
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
6. A discussion of all avoidance measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.
7. A discussion of the requirement that all cultural resources encountered will be recorded on a DPR form 523 and mapped (may include photos). In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
8. A discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how requirements, specifications and funding will be met. The name and phone number of the contact person at the institution. Indication the project owner pays all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.

9. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
10. A discussion of the proposed Cultural Resource Report (CRR) which shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines.

**Verification:** The project owner shall submit the subject CRMMP at least 30 days prior to the start of ground disturbance. Per ARMR Guidelines the author's name shall appear on the title page of the CRMMP. Ground disturbance activities may not commence until the CRMMP is approved. A letter shall be provided to the CPM indicating that the project owner will pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

**CUL-4** The project owner shall submit the Cultural Resources Report (CRR) to the CPM for review and approval. The CRR shall be written by the CRS and provided in ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, DPR 523 forms and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) shall be included as an appendix to the CRR.

**Verification:** The project owner shall submit the subject CRR within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the State Historic Preservation Office (SHPO), the CHRIS and to the curating institution (if archaeological materials were collected).

**CUL-5** Worker Environmental Awareness Program (WEAP) shall be provided, on a weekly basis, to all new employees starting prior to the beginning and for the duration of ground disturbance. The training may be presented in the form of a video. The training shall include:

1. a discussion of applicable laws and penalties under the law;
2. samples or visuals of artifacts that might be found in the project vicinity;
3. information that the CRS, alternate CRS or CRM has the authority to halt construction in the event of a discovery or unanticipated impact to a cultural resource;
4. instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the CRS or CRM;
5. an informational brochure that identifies reporting procedures in the event of a discovery;
6. an acknowledgement form signed by each worker indicating that they have received the training;
7. and a sticker that shall be placed on hard hats indicating that environmental training has been completed.

**Verification:** The project owner shall provide the WEAP Certification of Compliance Report form in the Monthly Compliance Report identifying persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

**CUL-6** The CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linears and ground disturbance at laydown areas or other ancillary areas to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or email providing a detailed justification for the decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

CRMs shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24hrs. of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

A Native American monitor shall be obtained, to monitor ground disturbance in areas where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored.

**Verification:** During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.

During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM.

Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The

telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

One week prior to ground disturbance in areas where there is a potential to discover Native American artifacts, the project owner shall send notification to the CPM identifying the person(s) retained to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who shall initiate a resolution process.

**CUL-7** The CRS, alternate CRS and the CRMs shall have the authority to halt construction if previously unknown cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor.

In the event resources are found or impacts can be anticipated, the halting or redirection of construction shall remain in effect until all of the following have occurred:

1. the CRS has notified the project owner, and the CPM has been notified within 24 hours of the find description and the work stoppage.;
2. The CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
3. Any necessary data recovery and mitigation has been completed.

**Verification:** At least 30 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 CRMs have the authority to halt construction activities in the vicinity of a cultural resource find, and that the CRS or project owner shall notify the CPM immediately (no later than the following morning of the incident or Monday morning in the case of a weekend) of any halt of construction activities, including the circumstance and proposed mitigation measures. The project owner shall provide the CRS with a copy of the letter granting the authority to halt construction.

**CUL-8** The project owner shall ensure that Station A is maintained in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (1995). The project owner shall provide a summary of maintenance activities completed within each calendar year.

**Verification:** In each annual compliance report, the project owner shall include the summary of Station A maintenance activities completed within the last calendar year.

## REFERENCES

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- COV (City of Vernon) 2001a. Application for Certification, No. 01-AFC-25. Submitted to the California Energy Commission, December 18, 2001.
- COV (City of Vernon) 2001b. Cultural Resources Technical Report (Appendix I). Submitted to the California Energy Commission, December 18, 2001.
- COV (City of Vernon) 2002f. Informational Hearing and Workshop, Data Requests. Submitted to the California Energy Commission, July 10, 2002.
- COV (City of Vernon) 2002f1. Cultural Resources Technical Report. Submitted to the California Energy Commission, August 16, 2002.
- Dunlap, Samuel H. 2002a. Letter from Gabrielino Tongva Nation. Submitted to California Energy Commission August 12, 2002.
- VGP (Vernon General Plan) 1992. Veron General Plan, adopted April 18, 1989, revised June 16, 1992.



# HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin J. Greenberg, Ph.D. and Rick Tyler

## INTRODUCTION

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The purpose of this Preliminary Staff Assessment is to determine if the proposed Malburg Generating Station (MGS) has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. Staff's **Worker Safety and Fire Protection** analysis describes the requirements applicable to the protection of workers from such risks.

The only acutely hazardous material proposed to be stored at the MGS in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j) is aqueous ammonia (19 percent ammonia in aqueous solution). (See Table 8.12-2 of the Application for Certification, COV 2001a). The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more hazardous anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous 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, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain than those associated with anhydrous ammonia with emissions from such spills being limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. Hazardous materials used during the construction phase include gasoline, diesel fuel, oil, welding gases, lubricants, solvents, antifreeze, pesticides and paint. No acutely toxic hazardous materials will be used onsite during construction. None of these materials pose significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. The City of Vernon owns an existing pipeline located approximately 1,100 feet from the proposed project site and runs under East Fruitland Avenue. A new 1,300-foot pipeline would be constructed connecting to the existing one, including 200 feet within the project boundaries (COV 2001a Section 6.1). The MGS will also require the transportation of aqueous ammonia

to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

### **FEDERAL**

The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.), contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III). The Clean Air Act (CAA) of 1990 (42 USC 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 CCA section on Risk Management Plans - codified in 42 USC §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 both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531 et seq

### **STATE**

The California Health and Safety Code, section 25534, 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).

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 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. These codes apply to anhydrous ammonia but are also 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.”

## **Gas Pipeline**

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192, Section 192.5):

- Class 1: Pipelines in locations within 220 yards of ten or fewer buildings intended for human occupancy in any 1-mile segment.
- Class 2: Pipelines in locations within 220 yards of more than ten but fewer than 46 buildings intended for human occupancy in any 1-mile segment. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in locations within 220 yards of more than 46 buildings intended for human occupancy in any 1-mile segment, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period (the days and weeks need not be consecutive).
- Class 4: Pipelines in locations within 220 yards of buildings with 4 or more stories above ground in any 1-mile segment.

The natural gas pipeline must be designed for Class 4 service and must meet California Public Utilities Commission General Order 112-E and 58-A. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days;
- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. This part contains regulations governing pipeline construction which must be followed for Class 2, 3, and 4 pipelines.

## **LOCAL AND REGIONAL**

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 issued in 1997 (Uniform Fire Code, 1997) and includes minimum setback requirements for outdoor storage of ammonia. The administering agency for this authority is the City of Vernon Department of Community Services & Water.

The Certified Unified Program Authority (CUPA) with responsibility to review RMPs and Hazardous Materials Business Plans is the City of Vernon Environmental Health Department.

## **SETTING**

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The proposed MGS project would be located in the City of Vernon in Los Angeles County, California, at the site of the existing "Station A" electrical generating plant. The site is located west of Interstate 15 and south of Highway 78. The site for the proposed MGS is located within an industrial area at 2715 East 50<sup>th</sup> Street in the City of Vernon. The City is bordered to the north and west by the City of Los Angeles, by the cities of Commerce and Bell to the east, and by the cities of Huntington Park and Maywood to the south. It is approximately three miles from downtown Los Angeles and within two miles of four major freeways. The site topography is flat, with an elevation of approximately 183 feet above mean sea level. The nearest residence is located approximately 0.25 miles southwest of the site. There are eleven sensitive receptors located within a one-mile radius.

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

## **METEOROLOGICAL CONDITIONS**

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the potential magnitude and extent of public exposure to such materials as well as the associated health risks. When wind speeds are low and the atmosphere is stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the Air Quality section (8.1) of the AFC. Staff agrees with the applicant that use of F stability (stagnated air, very little mixing) and 1.5 meter per second wind speed is appropriate for conducting the Offsite Consequence Analysis. Staff believes these represent a reasonably conservative scenario and thus reflects worst-case atmospheric conditions.

## **TERRAIN CHARACTERISTICS**

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. Terrain above stack height exists north of the project site and includes much of the City of Los Angeles (COV 2001a Figure 8.6-2).

## **LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS**

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses such as respiratory diseases. Sensitive receptor locations are facilities where significant numbers of sensitive receptors are routinely present. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 8.12-1 (AFC) shows the location of sensitive receptors in the project vicinity. The nearest sensitive receptors are two schools located approximately 3000 feet southeast and northeast of the proposed site. The nearest residence to the MGS site is located approximately 0.25 miles southwest of the site.

## **IMPACTS AND ANALYSIS**

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Staff thoroughly reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated.

## **METHODOLOGY**

In order to assess the potential for released hazardous materials to travel off-site, and impact on the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice of chemical to be used and the amount, the manner in which the applicant will use the chemical, the manner it will be transported to the facility and transferred to facility storage tanks, and the way the applicant chooses to store the material on-site.

Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to the public.

Staff conducted a thorough review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant in the AFC (Section 8.12). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Tables 8.12-2 of the AFC and determined the need and appropriateness of their use.
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the theoretical impacts on the public worst-case spill of hazardous materials even with the mitigation measures proposed by the Applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls until the potential for causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

## **PROJECT IMPACTS**

### **Small Quantity Hazardous Materials**

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form or in smaller quantities have low mobility or have low levels of toxicity. These hazardous materials include biocides, scale inhibitors, corrosion inhibitors, and small quantities of compressed gases used for maintenance and were eliminated from further consideration.

During the construction phase of the project, the only hazardous materials proposed for use include gasoline, diesel fuel, oil, welding gases, lubricants, solvents, antifreeze, pesticides and paint. Any impact of spills or other releases of these materials will be limited to the site due to the small quantities involved. Fuels such as mineral oil, lube oil, and diesel fuel are all of very low volatility and represent an insignificant hazard on- and off-site even in larger quantities.

Sulfuric acid, sodium hydroxide and sodium hypochlorite – all in aqueous (water) solution - will be stored on site in small quantities (350-700 gallons) and do not pose a risk of off-site impacts because in aqueous solution they have relatively low vapor

pressures and thus spills would be confined to the site. Because of concern at another proposed energy facility in 1995, staff conducted a quantitative assessment of the potential for impact associated with sulfuric acid (93% aqueous solution) use, storage, and transportation. Staff found no hazard would be posed to the public due to the extremely low volatility of this aqueous solution of sulfuric acid. Staff notes that the proposed MGS, only 29.5% sulfuric acid would be used. However, in order to protect against risk of vaporization of sulfuric acid fumes during a fire, an additional Condition of Certification (**HAZ-5**) will require that the project owner shall ensure that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: natural gas and aqueous ammonia.

## **Large Quantity Hazardous Materials**

### **Natural Gas**

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosion if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1983), natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas.

While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices. In particular, gas explosions can occur in the Heat Recovery Steam Generator (HRSG) and during start-up. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures are also required by local building and fire codes and will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error. Mandatory automatic fire detection and suppression systems will keep any fire at the turbines to a minimum (see **Worker Safety and Fire Protection** section).

Since the proposed facility would require the installation of a new 1100-foot gas pipeline off-site, impacts from this pipeline need to be evaluated. The design of the natural gas pipeline is governed by laws and regulations discussed here. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds. Many failures of older natural gas lines have been associated with poor quality welds or

corrosion. Current codes address corrosion failures by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure particularly relevant to the project area is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes. Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, and the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines that failed were older and not manufactured nor installed to modern code requirements. The February 2001 Nisqually Earthquake near Olympia Washington caused no damage to natural gas mains and there was only one reported gas line leak due to a separation of a service line going into a mobile home park.

The applicant will construct a 1,300 feet (1100 feet off-site and 200 feet on-site) 10-inch diameter pipeline connecting to the existing pipeline owned by the City of Vernon. If release of gas occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release can result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route. However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or  $2.5 \times 10^{-4}$  incidents per mile per Year. DOT has also evaluated and categorized the major causes of pipeline failure. The four major causes of accidental releases from natural gas pipelines are: Outside Forces-43 percent, Corrosion-18 percent, Construction/Material Defects-13 percent, and Other-26 percent.

Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture as seen in the Marina District of San Francisco during the 1989 Loma Prieta Quake and in Kobe, Japan in January 1995. The fourth category, "Other" includes equipment component failure, compressor station failures, operator errors and sabotage. The average annual service incident frequency for natural gas



transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged and the uncertainty regarding the locations of older pipelines.

In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. In November 2000, the DOT Office of Pipeline Safety proposed a program requiring the preparation of risk management plans for gas pipelines throughout the United States. These risk management plans will include the use of diagnostic techniques to detect internal and external corrosion or cracks in pipelines and to perform preventive maintenance. The project owner will be required to develop and implement these plans if the proposal is promulgated as a regulation.

The following safety features will be incorporated into the design and operation of the natural gas pipeline (as required by current federal and state codes): (1) while the pipeline will be designed, constructed, and tested to carry natural gas at a certain pressure, the working pressure will be less than the design pressure; (2) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves at the meter will be installed to isolate the line if a leak occurs.

### **Aqueous Ammonia**

Aqueous ammonia and natural gas are the only hazardous materials that may pose a risk of off-site impacts. Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NO<sub>x</sub>) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in very high down-wind concentrations of ammonia gas. One storage tank will be used to store the 19% aqueous ammonia with a maximum capacity of 8,400 gallons.

The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia, which will be used and stored on-site. However, as with aqueous hypochlorite, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e. ammonia that is not diluted with water) poses far less risk.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four "bench mark" exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm (recently changed

from the 200 ppm value), which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff will also assess the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact.

Section 8.12.2.2.2 of the AFC (COV 2001a) describe the modeling parameters used for the worst-case accidental releases of aqueous ammonia. The worst-case release is associated with a failure of the storage tank releasing 8,000 gallons into the 450-square foot secondary containment area and the alternative scenario is a failure of the tanker truck releasing 6,100 gallons into a bermed unloading area draining into a catch basin (COV 2001a, Page 8.12-8).

Winds of 1.5 meter per second and category F stability are assumed at the time of the accidental release. The EPA RMP\*comp (version 1.06) and SCREEN3 air dispersion models were used to estimate airborne concentrations of ammonia. The RMP\*comp only estimates the distance at which the concentration of the spilled material falls below the Emergency Response Planning Guidelines Level 2 (ERPG-2), and the SCREEN3 allows estimates of ammonia concentrations as a function of downwind distance.

The results of the applicant's accidental release modeling showed that off-site airborne concentrations of ammonia would not exceed the level the CEC uses for to establish insignificance (75 ppm) at any off-site location. Airborne concentrations of 75 ppm were predicted to extend to 25 meters, well within the facility fence line. The maximum airborne concentration predicted to occur at the site boundary (40 meters) is approximately 30 ppm (COV 2001a, page 8.12-10). This modeling also estimated the airborne concentration at 223 feet to be 11 ppm. Thus, based upon this modeling, it is doubtful that the nearest resident at ¼ mile (1320 feet) would even notice an odor should a release occur. The same holds true for all sensitive receptors described above.

Staff reviewed the applicant's modeling calculations, and conducted independent SCREEN 3 modeling. The worst-case scenario that staff calculated was the accidental release of 8,000 gallons of 19.5% aqueous ammonia from the proposed storage tank. Staff used wind speed of 1.0 m/s, stability class F, and temperature of 120°F, which staff believes is appropriate. Staff's modeling results found that the distance to the CEC Level of Concern (75 ppm) would be at 34 meters (110 feet), which is within the site boundary. The airborne concentration at the fence-line (40 meters or 131 feet) was found to be 53 ppm, which is higher than the 30 ppm calculated by the applicant. Staff's calculations also found that the concentration at the nearest residence would be 0.69 ppm (1,320 feet away) and 0.18 ppm at the nearest sensitive receptor (3,000 feet away). This modeling shows that all off-site airborne concentrations during a

catastrophic release of aqueous ammonia would be far below the CEC level of concern (75 ppm) and thus no adverse effects on the public – including sensitive individuals such as children with asthma – would be impacted. It is doubtful that an odor would be noticed at the schools or at the nearest home because the concentration would be expected to be below the odor threshold.

Staff therefore finds that due to the engineering controls proposed to be implemented by the applicant for the storage and transfer of aqueous ammonia, any accidental release of aqueous ammonia used for the project will not cause a significant impact.

### **Transportation of Hazardous Materials**

Hazardous materials, including aqueous ammonia, sodium hypochlorite, and others will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site, it is staff's belief that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport.

The transportation route for hazardous materials deliveries was not specified in the AFC, however it was stated in a data adequacy response that all deliveries of hazardous materials would follow Slauson Avenue (COV 2002). It is possible that ammonia can be released during a transportation accident but the extent of impact in the event of such a release would depend on the location of the accident and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

- the skill of the tanker truck driver,
- the type of vehicle used for transport, and on
- accident rates.

Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California Highways to ensure safe handling in general transportation (see The Federal Hazardous Materials Transportation Law 49 USC §5101 et seq., The US Department of Transportation Regulations 49 CFR Subpart H, §172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence.

To address the issue of tank truck safety, aqueous ammonia will be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 6,100 gallons. These vehicles will be designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. Staff has therefore proposed a Condition of Certification (**HAZ-8**) to ensure that regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker, which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on six references and three federal

government databases to assess the risks of a hazardous materials transportation accident.

Staff used the data from the Davies and Lee (1992) article which references the 1990 Harwood study to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The maximum usage of aqueous ammonia each year of operation of the proposed MGS will require about 4 - 5 tanker truck deliveries of aqueous ammonia per month (approximately 60 per year) traveling 5 miles each time from I-5 to the facility for a total of approximately 300 miles per year. Staff has found that this level of travel presents an insignificant risk of upset. Data from the U.S. DOT show that the actual risk of a fatality over a five year period from all modes of hazardous material transportation (rail, air, boat, and truck) was approximately 0.1 in one million.

Staff therefore believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

Staff is concerned about the use of Slauson Avenue as a hazardous materials transportation route. Staff traveled that route and found it to be a heavily traveled commercial route with at least one unguarded rail-line crossing. Staff feels that a more appropriate route would be from I-5 to I-710 and exit at Atlantic to District Blvd./Leonis St. (both are double-lane with a surface median most of the distance to Soto Road) and then Soto Road to the site. The land use along this route is all industrial and there are no unmarked rail crossings (which appear to be little-used spurs). This route and a proposed Condition of Certification are discussed more fully in the **Traffic and Transportation** section.

## **Seismic Issues**

The possibility exists that an earthquake would cause the failure of a hazardous materials storage tank and rupture of the natural gas pipeline. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, neutralization systems and the foam vapor suppression system. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. The effects of the Loma Prieta

earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995 heighten the concern regarding earthquake safety.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be followed in adequately designing and building storage tanks and containment areas as well as the natural gas pipeline to withstand a large earthquake. Staff notes that the proposed facility will be designed and constructed to the applicable standards of the Uniform Building Code for Seismic Zone 4 (COV 2001a Section 8.15.5), CPUC General Order 112E, and the CFR Regulation 49 Part 192. Staff concludes that the likelihood of accidental releases of hazardous materials during seismic events would be insignificant. Although the seismic safety record for modern natural gas transmission pipelines is very good, there is limited experience in this regard. Staff believes that this uncertainty poses some increased risk of pipeline damage and subsequent accidental release of natural gas in the event of a significant earthquake. In order to ensure the integrity of the gas pipeline the event of an earthquake in the immediate vicinity of the site, staff is proposing **HAZ-6, & 7** address the safety of the pipeline over time.

## **CUMULATIVE IMPACTS**

Staff reviewed the potential for the operation of the MGS combined with existing facilities to result in cumulative impacts on the population within the area. Staff finds that the facility, as proposed by the Applicant and with the additional mitigation measures proposed by the Staff, poses a minimal risk of accidental release that could result in off-site impacts. It is further extremely unlikely that an accidental release that has very low probability of occurrence (about one in a million per year) would independently occur at the MGS site and another facility at the same time. Therefore, staff concludes that the facility would not contribute to a significant cumulative impact.

## **APPLICANT'S PROPOSED MITIGATION**

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The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Administrative controls include the development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

## **ENGINEERING CONTROLS**

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- Construction of concrete berms or dikes surrounding the aqueous ammonia storage tank and truck unloading area to contain accidental releases that might

happen during storage or delivery; designed to contain the tank volume plus ten percent excess capacity to allow for 1 hour rain fall.

- Construction of a catch basin below the secondary containment area surrounding the aqueous ammonia storage tank with sufficient capacity to contain the entire contents of the tank with freeboard for precipitation. The opening of the catch basin would be nine square feet.

## **ADMINISTRATIVE CONTROLS**

Administrative controls also help to prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs, process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program required to be prepared by the Applicant must include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner will be required to designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

## **ON-SITE SPILL RESPONSE**

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In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation; spill cleanup, hazard prevention, and emergency response.

Fire support services to the site will be under the jurisdiction of the City of Vernon Fire Department. Station 2 is the closest station to the site and is located at 4305 Santa Fe Avenue, approximately one mile from the project location. The response time to the project site is estimated to be 5 minutes or less (Martinez 2002). Station 2 is also assigned as the off-site hazardous materials (hazmat) responder for the MGS. This station is equipped to respond to hazardous materials incidents and all personnel are hazmat trained.

## STAFF'S PROPOSED MITIGATION

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Staff proposes nine Conditions of Certification mentioned throughout the text (above) and listed below. **HAZ-1** ensures that no hazardous material would be used at the facility except those listed in the AFC unless there is prior approval by the County and the CPM. **HAZ-2** requires that a RMP be prepared and submitted prior to the delivery of aqueous ammonia.

The worst-case accidental release scenario evaluated in the AFC assumed that accidental spills of aqueous ammonia would occur from the storage tank into the catchment system. Staff believes that the most likely event resulting in a spill would be during transfer from the delivery tanker to the storage tank. Staff therefore proposes a condition (**HAZ-3**) requiring development of a safety management plan for the delivery of aqueous ammonia. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required Risk Management Plan (RMP). **HAZ-4** requires that the aqueous ammonia storage tank be designed to certain rigid specifications, **HAZ-5** addresses the storage of sulfuric acid, and **HAZ-6, & 7** address the safety of the gas pipeline over time and in the event of a nearby earthquake. The transportation of hazardous materials is addressed in **HAZ-8**.

## ENVIRONMENTAL JUSTICE

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Staff has reviewed Census 2000 information that shows the minority population is greater than 50 percent within a six-mile radius of the proposed MGS (please refer to **Socioeconomics Figure 1** in this Staff Assessment). Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Based on the **Hazardous Materials Management** analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no significant impacts from use of hazardous materials that could disproportionately impact the minority population.

## FACILITY CLOSURE

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The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner that poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, City of Vernon Environmental Health Department, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties.

## RESPONSE TO PUBLIC AND AGENCY COMMENTS

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No comments were received.

## CONCLUSIONS AND RECOMMENDATIONS

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Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose little potential for significant impacts on the public. With adoption of the proposed Conditions of Certification, the proposed project will comply with all applicable Laws, Ordinances, Regulations and Standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by US EPA, City of Vernon Environmental Health Department, and approval by the CEC staff. In addition, staff's proposed conditions of certification require The City of Vernon's review, and staff review and approval of the RMP prior to delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia.

Staff recommends the Energy Commission impose the proposed Conditions of Certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release.

## PROPOSED CONDITIONS OF CERTIFICATION

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**HAZ-1** The project owner shall not use any hazardous materials not listed in Appendix C, below, or in greater quantities than those identified by chemical name in Appendix C, below, unless approved in advance by City of Vernon and the CPM.

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

**HAZ-2** The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) to the Certified Unified Program Authority (CUPA) (City of Vernon Environmental Health Department) and the CPM for review at the time the RMP is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall reflect all recommendations of the CUPA and the CPM in the final documents. Copies of the final Business Plan and RMP, reflecting all comments, shall be provided to the CPM.

**Verification:** At least sixty (60) days prior to receiving any hazardous material on the site, the project owner shall provide a copy of a final Business Plan to the CPM. At least 60 days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final EPA-approved RMP, to the CUPA and the CPM.

**HAZ-3** The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.



**Verification:** At least sixty (60) days prior to the delivery of aqueous ammonia to the facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

**HAZ-4** The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6, or to API 620. In either case, a secondary containment basin capable of holding 125% of the storage volume shall protect the storage tank plus the volume associated with 24 hours of rain assuming the 25-year storm. The final design drawings and specifications for the ammonia storage tank and secondary containment basins shall be submitted to the CPM.

**Verification:** At least sixty (60) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

**HAZ-5** The project owner shall ensure that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

**Verification:** At least sixty (60) days prior to receipt of sulfuric acid on-site, the Project Owner shall provide copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any combustible or flammable materials within 100 feet of the sulfuric acid storage facility to the CPM for review and approval.

**HAZ-6** The project owner shall require that the gas pipeline undergo a complete design review and detailed inspection 30 years after initial startup and every 5 years thereafter.

**Verification:** At least thirty (30) days prior to the initial flow of gas in the pipeline, the project owner shall provide outline of the plan to accomplish a full and comprehensive pipeline design review to the CMP for review and approval. The full and complete plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented by the project owner.

**HAZ-7** After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline shall be inspected by the project owner.

**Verification:** At least thirty (30) days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline inspection in the event of an earthquake to the CPM for review and approval. This plan shall be reviewed and amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

**HAZ-8** The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles that meet or exceed the specifications of DOT Code MC-307.

**Verification:** At least sixty (60) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating these transport vehicle specifications to the CPM for review and approval.

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## APPENDIX A

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### HAZARDOUS MATERIAL MANAGEMENT

#### BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

Staff uses a health-based airborne concentration of 75 PPM to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this level is not consistent with the 200-ppm level used by EPA and Cal/EPA in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures for the entire population. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75-ppm STPEL. Appendix B provides a summary of adverse effects, which might be expected to occur at various airborne concentrations of ammonia.

## HAZARDOUS MATERIAL MANAGEMENT APPENDIX A TABLE 1

### Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH <sup>2</sup>	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10 <sup>1</sup>	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL <sup>2</sup>	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL <sup>3</sup>	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL <sup>4</sup>	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protects nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA <sup>2</sup>	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. Work shifts
ERPG-2 <sup>5</sup>	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

\* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

\*\* The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.



References for Appendix A, Table 1

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Abbreviations for Appendix A, Table 1

ACGIH, American Conference of Governmental and Industrial Hygienists

AIHA, American Industrial Hygienists Association

EEGL, Emergency Exposure Guidance Level

EPA, Environmental Protection Agency

ERPG, Emergency Response Planning Guidelines

IDLH, Immediately Dangerous to Life and Health Level

NIOSH, National Institute of Occupational Safety and Health

NRC, National Research Council

STEL, Short Term Exposure Limit

STPEL, Short Term Public Emergency Limit

TLV, Threshold Limit Value

WHO, World Health Organization

## Appendix B

### **SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA**

#### **638 PPM**

##### **WITHIN SECONDS:**

- Significant adverse health effects;
- Might interfere with capability to self rescue;
- Reversible effects such as severe eye, nose and throat irritation.

##### **AFTER 30 MINUTES:**

- Persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- Sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- asthmatics will experience a worsening of their condition and a decrease in breathing ability, which might impair their ability to move out of area.

#### **266 PPM**

##### **WITHIN SECONDS:**

- Adverse health effects;
- Very strong odor of ammonia;
- Reversible moderate eye, nose and throat irritation.

##### **AFTER 30 MINUTES:**

- Some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- Sensitive persons: experience difficulty in breathing;
- asthmatics: may have a worsening condition and decreased breathing ability, which might impair their ability to move out of the area.

#### **64 PPM**

##### **WITHIN SECONDS:**

- Most people would notice a strong odor;
- Tearing of the eyes would occur;
- Odor would be very noticeable and uncomfortable.
- Sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue
- Mild eye, nose, or throat irritation
- Eye, ear, & throat irritation in sensitive people



- asthmatics might have breathing difficulties but would not impair capability of self rescue

### ***22 or 27 PPM***

#### **WITHIN SECONDS:**

- Most people would notice an odor;
- No tearing of the eyes would occur;
- Odor might be uncomfortable for some;
- sensitive people may experience some irritation but ability to leave area would not be impaired;
- Slight irritation after 10 minutes in some people.

### ***4.0, 2.2, or 1.6 PPM***

- No adverse effects would be expected to occur;
- doubtful that anyone would notice any ammonia (odor threshold 5 - 20 PPM);
- Some people might experience irritation after 1 hr.

## **APPENDIX C**

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[Attach AFC Table 8.12-2 here.]

# LAND USE

Testimony of David Flores

## INTRODUCTION

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This land use analysis of the Malburg Generating Station (MGS) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses. These individual resource topics are discussed in separate sections of this Staff Assessment (SA).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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The project site is located within the western portion of the City of Vernon in central Los Angeles County. Land use LORS applicable to the proposed project are contained in the City of Vernon's General Plan and Zoning Ordinance.

### CITY OF VERNON GENERAL PLAN

Land uses are controlled and regulated through a series of goals and policies contained in plans adopted by the local jurisdiction that has land use authority over the area (in this case, the City of Vernon). Local agencies with land use authority (i.e., cities and counties) are required to adopt a General Plan for the area within their jurisdiction that sets forth policies regarding land use and other planning topics. The General Plan is the broadest planning document applicable to the site, expressing broad goals and policies to guide local decisions on future growth, development, and conservation. Other local plans, as well as the zoning ordinance that regulates land use, must be consistent with the goals and policies expressed in the General Plan.

The City of Vernon General Plan was adopted in 1989 and was most recently revised on June 16, 1992. In its preface, the Vernon General Plan is described as an official policy document adopted as a guide for making decisions concerning the development of the community according to desired goals. When adopted in 1989, it was intended to shape the future physical development of the city for the next 20 years. The City of Vernon's General Plan Land Use Element designates the project site as General Industrial. In addition, the existing power plant is designated Public Facility in the Land Use Element. The project's industrial land use designation promotes the City of Vernon's role as a regional industrial area and as a significant employment center within the Los Angeles region.

The City of Vernon was planned as an industrial city when it was incorporated in 1905. The reasons for incorporation outlined in Resolution No.4, which was adopted in 1905, established the City's land use policy as the promotion and advancement of manufacturing industries.

The Land Use Element of the General Plan has two major components that address the description of land uses and land use policies. First, the goals and policies state that the City will promote and maintain the industrial character of the City, and second, the City will encourage the modernization, replacement, or reuse of the older industrial facilities.

The Public Facilities land use designation indicates and provides land for a variety of public and quasi-public facilities. The objective of the Land Use Element in designating public facilities sites is to preserve public amenities and necessary public facilities for which alternative sites would be difficult to procure. Permitted public facilities include educational facilities, utilities, and other government buildings or open space areas.

The City of Vernon is developed to the point where acquisition of additional land for public facilities is not practical. As a result, existing public facility sites will not be relinquished unless it can be demonstrated that they will no longer be necessary to the public. The General Plan contains the following key goals, objectives and policies applicable to the proposed project:

#### Infrastructure Element

- Policy 6.1: Operate and maintain an electrical utility system, which provides an adequate level of service to businesses and other uses in the City.
- Policy 6.2: Periodically evaluate the electrical utility system to ensure its adequacy to meet any changes in demand over time.

## **CITY OF VERNON ZONING ORDINANCE**

Zoning is the specific administrative tool used by a jurisdiction to regulate land use and development, and is one of the primary tools for implementing the goals and policies of the General Plan. Zoning is typically more specific than the General Plan and includes detailed land use regulations and development standards. The City's Zoning Ordinance divides the land in the city into zones that permit different types of uses and imposes development standards appropriate to the uses permitted in each zoning district. **LAND USE Figure 1** shows the zoning districts in the area of the proposed project site. The MGS project site is located in the General Industrial (M) zoning district.

The purpose of the "M" District (Section 26.3.5 of the Vernon Zoning Ordinance) is "intended for the orderly development and operation of most types of industrial plants and to promote the concentration of such uses in a manner which will foster mutually beneficial relationships with each other." The "M" District permits a broad array of industrial uses, administrative and professional offices/services, automobile-related uses, trade schools, retail commercial uses, and service commercial uses. As indicated earlier in this analysis, the site is designated "Public Facility" which is an allowed use in the M Zoning District.

The Zoning Ordinance (Section 26.3.5-4) also includes minimum design and performance standards applicable to the construction of industrial and commercial buildings in the "M" District. These include standards for building intensities, outdoor activities and storage requirements and other design features.

## **SETTING**

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### **PROJECT LOCATION**

The project site is located in the City of Vernon in Los Angeles County, and is bordered on the north and west by the City of Los Angeles, on the east by the cities of Commerce and Bell, and on the south by the cities of Huntington Park and Maywood. Vernon has a population of 95 (California Department of Finance, January 2002) and employs approximately 50,000 people within its land area of 5.25 square miles.

The proposed MGS project site is located in an industrial corridor of the city. This area contains a diverse mix of both small and large light industrial, heavy industrial, and office uses. Although some retail commercial uses and a few residences are interspersed through the area, the vicinity of the project site is predominantly industrial in nature, characterized by manufacturing, processing, and fabricating facilities; slaughter facilities, distribution and warehouse facilities; contractor yards and meat packing plants; and miscellaneous industrial and business park developments.

### **SITE AND VICINITY DESCRIPTION**

#### **Proposed Project Site**

The proposed MGS site is approximately 5.9 acres in size and the project will require approximately 3.4 acres. The project will be constructed adjacent to the existing City of Vernon Station A generating facility. Perimeter chain-link fences enclose the 5.9-acre parcel.

Contractor office areas, construction staging, laydown areas, and parking areas will be located outside the property boundaries. The area directly west of the facility, across Seville Avenue, is one of the sites construction contractors will use to place office facilities and laydown/fabrication areas for the project facility and pipeline construction. This site is currently a railroad and storage yard.

A parking lot at the southeast corner of the intersection of Soto Street and East 50<sup>th</sup> Street, diagonally across from the project site, will be used for construction worker and visitor parking and as an additional laydown area for power generating facility construction. These staging, laydown, and parking areas are zoned General Industrial (M) and are an allowed use.

### **NATURAL GAS AND SEWER PIPELINES**

Natural gas and sewer lines will be delivered to the MGS site via a new 1,300-foot long 12-inch sewer and 10-inch gas pipeline beneath Seville and Fruitland Avenues, adjacent to and west of the project site. With the pipelines being constructed within existing roadways, no zoning issues or impacts to land use are expected to occur from the location of these pipelines.

**LAND USE Figure 1**  
**City of Vernon Zoning Map**

**LAND USE Figure 2  
General Plan Land Use Map**

## **RECLAIMED WATER PIPELINES**

A new 10,000 foot, 18-inch reclaimed water pipeline will be constructed to carry reclaimed water to the project site. The pipeline will originate from Randolph and Newell Avenues in Huntington Park just south of the Vernon border. The project site will also contain a 50-foot diameter, 480,000-gallon raw water tank, which will provide eight hours of make-up water. With the water pipeline being constructed within existing roadways, no zoning issues or impacts to land use are expected to occur from the location of the reclaimed water pipeline.

## **Existing Adjacent Uses**

**LAND USE Figure 2** shows the existing general plan land uses in the project vicinity. As indicated above, the proposed MGS site is located in a predominantly industrial area. Land uses in the vicinity of the project site include:

- North: Immediately north of the site is a Southern Pacific railroad right-of-way beyond which are several light industrial buildings;
- East: Soto Street borders the project site to the east. Beyond Soto Street are several industrial businesses;
- South: The power generation site (both existing and proposed power plant) is bordered by 50<sup>th</sup> Street to the south, beyond are several industrial businesses. The natural gas and sewer lines are bordered by 50<sup>th</sup> Street to the south, which has several industrial businesses. The reclaimed water pipeline right-of-way is surrounded by industrial businesses; and
- West: Seville Avenue borders the subject property to the west, with railroad and storage facilities and several warehouse structures.



## ENVIRONMENTAL IMPACTS

### ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>LAND USE AND PLANNING -- Would the project:</b>				
a) Physically divide an established community?				<b>X</b>
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?		<b>X</b>		
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				<b>X</b>
<b>RECREATION</b>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				<b>X</b>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				<b>X</b>

## DISCUSSION OF IMPACTS

### Land Use and Planning

#### A. Physical Division of an Existing Community

The proposed MGS project has no potential to physically divide an existing community. The site is located in an established industrial and mixed commercial area in the City of Vernon. The power plant would be located entirely on public property and neither the size nor nature of the project would result in a physical division of an established community. No new physical barriers would be created by the project (public access across the site is not currently allowed) and no existing roadways or pathways would be blocked. No new transmission lines, or transmission towers associated with the project would be constructed, therefore no such new physical barriers would be created. Given its location, the project would

not alter existing residential, recreational, commercial, institutional, or other industrial land use patterns in the area. Therefore, the project would not cause an impact on land use patterns.

## **B. Conflict with any Applicable Land Use Plan, Policy, or Regulation**

The proposed MGS project would comply with the City of Vernon's LORS. The proposed project is appropriately sited in an area designated for industrial development in the General Plan. The City's General Plan policies concerning the Industrial designated areas are generally supportive of new industrial projects for economic development reasons, rather than restrictive or prohibitive. Staff has concluded that the proposed project does not conflict with any of the relevant land use policies contained in the Vernon General Plan.

Of the various zoning districts in the City's Zoning Ordinance, the "M" District in which the project site is located, is the most appropriate zoning district for a power plant. Power plants are specifically listed as permitted in the "M" District, and this zoning district is the City's most intensive industrial zoning category, permitting a range of light and heavy industrial uses, including public utility facilities. The project complies with all of the applicable development standards (lot, and yard requirements) set forth in the Zoning Ordinance for the "M" District.

The City of Vernon has determined that the proposed MGS project would be consistent with the City's General Plan and Zoning Ordinance (Vernon City Planning Staff, 2002). This confirms staff's conclusion that the proposed project would comply with the City's LORS.

The proposed project also appears to comply with the parking standards and minimum design and performance standards applicable to the construction of industrial buildings in the "M" District. Some standards are subject to interpretation in the M Zone (e.g., "design elements that are harmonious and in proportion to one another") and others involve details not specifically presented in the AFC (e.g., container size of trees used in landscaping). The project presumably conforms to the architectural design principles included in the "M" District's design and performance standards. A condition of certification (**LAND-1**) has been proposed to ensure the project's compliance with the City's industrial design and performance standards for those standards subject to interpretation. Also, a condition of certification (**LAND-2**) has been proposed requiring that the applicant comply with the City of Vernon's parking standards. For a discussion of the project's effects on views and aesthetic resources, please see the **VISUAL RESOURCES** section of this SA.

Given the proposed project's consistency with the City of Vernon's applicable land use LORS, impacts will be less than significant if proposed **LAND-1** is implemented.

### **C. HABITAT /NATURAL COMMUNITY CONSERVATION PLANS**

There are no sensitive natural resource areas in the general vicinity of the project site (see the **BIOLOGICAL RESOURCES** section for more information). In addition, there are no adopted habitat conservation plans or natural community conservation plans in the vicinity of the proposed project site. Therefore, the proposed project would not conflict with any such plans.

### **Recreation**

#### **A. Increased Use of Recreational Facilities**

Physical impacts to public services and facilities such as recreational facilities are usually associated with population migration and growth in an area which increase the demand for a particular service. An increase in population in any given area may result in the need to develop new, or alter existing government facilities to accommodate increased demand.

As an electric generation project seeking to meet the current demand of MGS customers, the proposed project is not expected to result in an increase in the population of the area. As described in the MGS application, construction of the generation station would require an average of 100 workers, and 179 workers during peak construction (COV 2001a, p.8.10-20). 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 thirty-two personnel), plant operation would only result in a negligible contribution to the area's population. Therefore, it is not expected that the proposed project would increase the use of existing recreational facilities such that a substantial physical deterioration of these facilities would occur.

Furthermore, given that the make-up of the City of Vernon is industrial and commercial in nature, there are no recreation facilities within one mile of the MGS site, therefore no impacts would occur.

#### **B. Construction of Recreational Facilities**

As a power generation project, the proposed project does not include recreational facilities or require the construction or expansion of existing recreational facilities. As described above, the proposed project would not result in an increase in the area's population that would require new or expanded recreational facilities whose construction would in turn lead to an adverse physical effect on the environment. Therefore, no environmental impacts would occur.

## **CUMULATIVE IMPACTS**

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The proposed project is consistent with the City of Vernon's long-range land use policies for this Industrial designated area as expressed in the General Plan. Conformance with the General Plan is the primary consideration in determining a project's potential to contribute to adverse cumulative land use impacts. The General Plan sets forth the City's long-range vision for the physical development of the city and

other plans for infrastructure and public services are based on this long-range vision. Therefore, projects that are consistent with the City's long-range land use policies are not viewed as adverse from a cumulative impact perspective. Because the project is consistent with the City's long-range planning policies for industrial development in this area, cumulative land use impacts are not considered significant.

## **ENVIRONMENTAL JUSTICE**

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Staff has reviewed Census 2000 information that indicates the minority population is greater than 50 percent within a six-mile radius of the proposed MGS (please refer to **Socioeconomics Figure 1** in this Staff Analysis). The data for the population income levels within six miles of the MGS indicates that the low-income population is less than 50 percent. Staff's Land Use analysis did not result in any identified unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no land use environmental justice issues related to this project.

## **FACILITY CLOSURE**

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At some point in the future, the proposed facility would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned lifetime of the MGS is estimated at 30 years. At least twelve months prior to the initiation of decommissioning, the Applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the Applicant would have to comply with in the event of unexpected temporary closure or unexpected permanent closure of MGS.

## **CONCLUSIONS**

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The project would not physically divide an established community, would not conflict with any applicable land use plan, policy, or regulation, and would not conflict with any applicable habitat conservation plan. Staff has concluded that the MGS will be a compatible land use within the City of Vernon. The proposed use would be consistent with the policies of the City of Vernon's General Plan, and is considered a primary use permitted in the "M" District of the Zoning Ordinance. The project appears to conform to the development standards for the "M" District and such conformance can be assured

with the implementation of proposed condition of certification **LAND-1**. Therefore, the project's land use impacts are either less than significant or can be readily mitigated to a less-than-significant level.

Proposed Condition of Certification **LAND-2** would require that MGS comply with the City of Vernon's parking standards to ensure compliance with the Zoning Ordinance.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**LAND-1** The project owner shall comply with the minimum design and performance standards for the Industrial (M) District set forth in the City of Vernon Zoning Ordinance (Division 2, Sec.31-808).

**Verification** At least 30 days prior to site mobilization of the MGS project, the project owner shall submit written evidence to the Energy Commission Compliance Project Manager (CPM) that the project conforms to all applicable design and performance standards for the Industrial (M) District set forth in the City of Vernon Zoning Ordinance (Section 31-808). The submittal to the CPM shall include evidence of review by the City.

**LAND-2** The project owner shall comply with the parking standards established by the City of Vernon Zoning Ordinance (Division 2, Sec. 21-808).

**Verification**: At least 30 days prior to site mobilization, the project owner shall submit written evidence to the Energy Commission Compliance Project Manager (CPM) that the project conforms to all applicable parking standards as established by the City of Vernon zoning ordinance (Title 8, Chapter 82-16). The submittal to the CPM shall include evidence of review by the City.

## **REFERENCES**

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COV (City of Vernon) 2001a.. Application for Certification, Volume 1 & Appendices, Malburg Generating Station (01-AFC-25).

City of Vernon. 1992. City of Vernon General Plan, Volume 1.

City of Vernon 1995. City of Vernon Comprehensive Zoning Ordinance.

# NOISE AND VIBRATION

Testimony of Ron Brown

## INTRODUCTION

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The construction and operation of any power plant creates noise or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether a facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction, such as pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The Malburg Generating Station Project, (MGS), would be located in Los Angeles County, in the City of Vernon south of the City of Los Angeles. It is to be constructed on the property of Vernon's existing Station A. The proposed project would be to construct a 134-megawatt natural gas-fired combined cycle power plant. Linear facilities for the project would include connection to an existing substation at Station A, a new 1,300 foot natural gas pipeline, and a 10,000 foot reclaimed water pipeline.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of this project, and to recommend procedures to ensure that these impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### 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. These regulations list permissible noise exposure levels as a function of the amount of time to which the worker is exposed (see **Noise: Appendix A, Table A4** immediately following this section). 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.

There are no federal laws governing off-site (community) noise.

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 governmental 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 land use compatibility guidelines are listed in **NOISE: Table 1**.

**NOISE: Table 1 - Land Use Compatibility for Community Noise Environment**

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE – Ldn or CNEL (dBA)							
	50	55	60	65	70	75	80	
Residential - Low Density Single Family, Duplex, Mobile Home	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Residential - Multi-Family	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Transient Lodging – Motel, Hotel	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Auditorium, Concert Hall, Amphitheaters	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Sports Arena, Outdoor Spectator Sports	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Playgrounds, Neighborhood Parks	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Office Buildings, Business Commercial and Professional	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Industrial, Manufacturing, Utilities, Agriculture	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable
	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable	Normally Unacceptable
Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.



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 simple tone, or “pure tone,” in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. This Model 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**

The 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 adverse impact 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 staff, in applying Item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact may exist where the noise of the project plus the background exceeds the background  $L_{90}$  by 5 dBA  $L_{90}$  or more at the nearest location where the sound is likely to be perceived.

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 (see **NOISE: Appendix A, Table A4**).

## **LOCAL**

The project is located on a 5.9-acre parcel of land in the City of Vernon at the City's existing Station A power plant. Although the project is located in the City of Vernon, most of the affected residential areas are in the adjacent City of Huntington Park. The cities of Vernon and Huntington Park are identified as the involved agencies (COV, 2001a, AFC § 8.5.6 and Table 8.5-10).

### **City of Vernon**

City of Vernon – Noise Element – April, 1989. Exterior noise level standards, of the Noise Element for the City of Vernon defines exterior noise limits for single-occupancy dwellings in high-density population areas in terms of noise levels that are not to be exceeded. The level that is not to be considered abusive during the day is 70 dBA, for evening periods is 65 dBA, and for night periods is 62 dBA. The day period is defined as those hours from 7 a.m. to 7 p.m., the evening is defined as 7 p.m. to 10 p.m., and the night period is defined as the hours from 10 p.m. to 7 a.m.

The City does not restrict the hours of construction.

### **City of Huntington Park**

The City of Huntington Park Municipal Code, Section 5-11 limits noise that creates a "Nuisance." There are no specific noise levels stated. In this case it is reasonable to impose the condition that the average nighttime  $L_{90}$  cannot be increased by more than 5 dBA to avoid a nuisance. An increase in the ambient of more than 5 dBA will be noticeable by the public and thus could be considered a nuisance.

## **SETTING**

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### **PROJECT BACKGROUND**

The MGS involves the construction of a 134-megawatt (MW) natural gas fired combined-cycle power plant in the City of Vernon, CA.

The project will be built on a 3.4-acre portion of a 5.9-acre parcel currently occupied by the Cities Station A power plant located between Seville Ave. and Soto St. north of E. 50<sup>th</sup> St.

### **Power Plant Site**

This site is located in a predominately industrial area that is zoned for industrial land use. There is a population of 8,871 within a one-mile radius of the project site and the nearest residence is approximately 750 feet from the site.

## **Linear Facilities**

Additional linear facilities will consist of a new 1,300 foot natural gas pipeline, and a new 10,000-foot reclaimed water line, both of which would be buried below ground. The reclaimed water line will connect to the Central Basin Municipal Water District (CBMWD) reclaimed water supply system. Power interconnection will be made at the existing on-site substation. The gas pipeline and power lines are not near any noise sensitive receptors. The reclaimed water pipeline traverses mostly industrial areas, though some residential areas will be affected by construction.

## **EXISTING NOISE LEVELS**

The applicant monitored ambient noise levels on May 21 and 22, 2001 for a 25 hour period at the closest noise sensitive receptor. This location, Site R3, is located in the City of Huntington Park, approximately 1,600 feet southwest of the project. Additional samples were taken at two other sites. Site R1 is located about 3,500 feet northwest and Site R2 is located about 750 feet southwest of the project; both of these locations are in the City of Vernon. This data was collected to provide estimates of the long-term noise environment in the vicinity of the project. The noise measurements were conducted using Larson-Davis Model LD824 sound level meters meeting the requirements of the American National Standards Institute (ANSI S-1.4, 1983) for Type 1 Sound Level Meters. The microphones were placed about 5 feet off the ground and were protected with windscreens. The dominant noise sources at these locations were primarily local vehicular traffic. Noise levels recorded at these locations are listed in **Noise: Table 3**.

**Noise: Table 3 - Long-Term Noise Measurement Summary—AFC**

Monitoring Location	CNEL	Average L <sub>90</sub> in dBA	
		Day	Night
R1 – Furlong Place	(64)	(55)	(49)
R2 – La Villa Basque (Apt.)	(63)	(54)	(48)
R3 – 53 <sup>rd</sup> St. Residences	60	53	47

Source: City of Vernon 2001, AFC, Table 8.5-1. ( ) = Estimated from samples.

## **IMPACTS**

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Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

### **PROJECT SPECIFIC IMPACTS — CONSTRUCTION**

#### **Community Effects**

##### **General Construction Noise**

Construction noise is a temporary phenomenon; the construction period for the MGS facility is scheduled to last approximately 16 months (COV 2001a, AFC, Page 1-2). 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. The City noise standard does not specifically address construction noise; the limits are based on levels of all noise sources at a receptor location.

The applicant has predicted the sound levels that could be expected at the nearest residence during construction. During pipeline construction, predicted sound levels for this activity at the nearest residence would be between 43 and 80 dBA. The highest levels will be produced during construction of the reclaimed water pipeline construction along Boyle Ave. and Randolph St. The activity at any one location will be short in duration and the applicant has agreed to provide adequate notice to affected residents and to be readily available to alleviate problems during this construction. Also the applicant has stated that this construction will be limited to the hours of 7 a.m. to 4 p.m. except for the intersections identified below. Most of the remaining pipeline construction will produce noise levels below the average hourly daytime ambient  $L_{eq}$  levels at the receptors (Vernon 2001, AFC Table 8.5-3) and therefore should result in a less than significant noise impact. Note that construction noise is intermittent in nature; for this reason, the hourly  $L_{eq}$  is an appropriate metric. (For an explanation of these and other noise terms, please see **NOISE: Appendix A.**)

Noise levels produced by construction of the power plant will increase the average hourly  $L_{eq}$  values by less than 5 dBA. Because construction activity and related traffic are regulated by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the MGS project area are considered to be less than significant. Furthermore, most of the power plant construction, and all but a small amount of pipeline construction, will be limited to daytime hours as required in Condition of Certification **NOISE-8**. For the power plant construction, the low pressure steam-blow process will last for about 72 hours. The pipeline construction at the intersection of Fruitland and Seville Avenues must be performed at night; this will entail about 3 nights of activity.

### **Pile Driving Vibration**

Conventional pile driving could produce potentially significant ground-borne vibration at nearby receivers. However, there are no pile driving operations planned for this project.

### **Steam Blows**

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the 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 turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam was then 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, was quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, was performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line was connected to the steam turbine, which was then ready for operation.

These high-pressure steam blows could produce noise as loud as 130 dBA at a distance of 100 feet. In order to reduce disturbance from steam blows, the steam blow piping could be equipped with a silencer that would reduce noise levels by 20 to 40 dBA, still resulting in an annoying noise level.

In recent years, a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam over a continuous period of 36 hours or so. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at nearby receptors are typically similar to the ambient background noise level, and thus barely noticeable. Even more recently, compressed air has been substituted for steam in the continuous blow process; resulting noise levels are similar.

The applicant did not address the steam blow process in the AFC (COV 2001a, AFC). If the high pressure steam blow process is used without a silencer, creating a level of 130 dBA at 100 feet, the level at the nearest sensitive receptor, at a distance of 750 feet would be 114 dBA. This is clearly unacceptable. If a silencer with an attenuation of 30 dBA is used, the level at this same location would be 84 dBA, still quite loud. The noise level at the project property line using this procedure with a silencer would be approximately 100 dBA.

The project is located in an industrial area and there are businesses directly adjacent to the site. These businesses have offices occupied by workers that could be disturbed by these noise levels. Energy Commission staff believes that a low-pressure steam blow process must be utilized for this project to minimize the possible disruption of public activity (see proposed Condition of Certification **NOISE-4** below). The low-pressure steam blow process will result in a noise level of 64 dBA at the nearest receptor. This level is 17 dBA above the average nighttime L<sub>90</sub>, which is 47 dBA (see **NOISE-Table 3**). Staff is recommending the addition of a silencer to reduce the noise to a level that is less than 5 dBA above this ambient; see proposed Condition of Certification **NOISE-4**. Energy Commission staff further proposes a notification process to make neighbors aware of the steam blow schedule (see proposed Condition of Certification **NOISE-5** below). Adoption of these proposed conditions should render the steam blow process tolerable to the project's neighbors.

### **Linear Facilities**

New off-site linear facilities will include gas and water lines. Noise from these construction activities will be limited by adhering to the allowable hours of construction as cited in proposed Condition of Certification **NOISE-8**.

### **Worker Effects**

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction

workers (COV, 2001a, AFC § 1.10.5 and 8.5.5). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

## **PROJECT SPECIFIC IMPACTS — OPERATION**

### **Community Effects**

The applicant intends to achieve compliance with the noise performance requirements of all applicable LORS (Vernon, 2001, AFC § 1.10.5 and 8.5.5).

### **Power Plant Operation**

During its operating life, the MGS represents essentially a steady, continuous noise source day and night. Occasional brief increases in noise levels would 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 for maintenance, noise levels would decrease.

The primary noise sources anticipated from the proposed facility include the cooling towers, the heat recovery steam generator (HRSG), and the evaporator pump. 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.

Data from the noise survey were analyzed to determine an appropriate background ambient sound level; see **Noise: Table 3**. The hourly  $L_{90}$  has been selected as a meaningful parameter to use for this purpose. Furthermore, staff believes that an average value for several consecutive hours, more than four hours, is more reasonable than utilizing the lowest hourly level. In the area of the MGS, it was found that daytime levels are sometimes lower than those measured at night, due most likely to truck traffic on the Interstate. Since nighttime noise levels impact people when they are most sensitive to noise, that is, when sleeping, the nighttime average  $L_{90}$  has been selected as the background ambient. Based on the results of the noise survey, ambient  $L_{90}$  values have been assumed as follows:

**Noise: Table 5 — Assumed Average Ambient Background Levels**

Monitoring Site	Average Nighttime $L_{90}$ (dBA)
R1 — Furlong Place	(49)
R2 — La Villa Basque (Apt.)	(48)
R3 — 53 <sup>rd</sup> St. Residences	47

( ) = Estimated from samples

The noise level from the proposed power plant was modeled to evaluate whether the new plant would contribute to 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 MGS noise level at the closest residential receptors is a constant hourly  $L_{eq}$  of 35 to 48 dBA. Based on the results of the noise survey, the project constant noise level is less than the assumed

average ambient  $L_{90}$  of 47 to 49 dBA (**Noise: Table 5**), and would result in composite noise levels at the three receptors as shown in **Noise: Table 6**:

**Noise: Table 6 — Resultant Noise Levels Due to Project Operation**

Monitoring Site	Resultant Level $L_{eq}$ (dBA)	Increase at Receptor $L_{eq}$ (dBA)
R1 — Furlong Place	49	0
R2 — La Villa Basque (Apt.)	51	3
R3 — 53 <sup>rd</sup> St. Residences	49	2

With these increases, the project noise should only be barely noticeable during the quietest periods of the night, and would thus represent an insignificant impact.

### **Tonal and Intermittent Noises**

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. It is not expected that tonal noises will be generated during the operation of the project.

To ensure that no strong tonal noises are present and that intermittent noises are mitigated, Energy Commission staff has proposed a Condition of Certification (**NOISE-6**) which requires the applicant to mitigate pure tones and the noise from steam relief valves.

### **Linear Facilities**

The electrical output of the plant will be connected to the existing substation at the project site (COV 2001a, AFC § 1.2 and 8.5.2.2). Noise from the substation is expected to decrease by at least 12 dBA. The nearest residences are located as noted above and far out of range of any noise emissions from the substation. The project pipelines are underground and thus will not generate any noise.

To ensure that these noise levels do not impact residences in this area, Energy Commission staff has proposed a Condition of Certification (**NOISE-6**).

### **Worker Effects**

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (COV, 2001a, AFC § 8.5.4). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. The applicant would implement a comprehensive hearing conservation program. To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7**, below.

### **CUMULATIVE IMPACTS**

Section 15130 of the *CEQA Guidelines* (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual

impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The *CEQA Guidelines* require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

The AFC identified only one planned project that is about 0.6 miles from the project. Although possibly near enough to contribute to cumulative noise impacts in the project study area (COV 2001a, AFC § 8.5.3), this project will be completed before MGS construction begins, so there would be no cumulative construction noise impacts. The area around the MGS project is industrial and existing truck traffic impacts the nearby residential areas. This activity will continue to control the background ambient in most of the residential areas.

It has been noted that an additional project is planned in the vicinity of the MGS. An elementary school is to be built between 57<sup>th</sup> and 58<sup>th</sup> Streets, about 3,000 feet south of the MGS. The resultant noise level at this location is predicted to be less than 35 dBA (COV 2001a, AFC Table 8.5-8) and thus would result in an insignificant impact.

## **ENVIRONMENTAL JUSTICE**

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Staff has reviewed Census 2000 information that shows the population within a one-mile radius of the proposed MGS is approximately 8,871 with about 97.6 percent minority. Within 2 miles, the population is 141,936 with a minority population of 97.9 percent. The area within about ½ mile of the MGS is mostly industrial and commercial. These buildings will provide some shielding for most residences beyond this distance. The existing background ambient is also relatively high (47 to 49 dBA) and the composite noise level will increase by less than 5 dBA. Based on the noise analysis, staff does not believe the noise impact will reach beyond the ½ -mile project radius. With the mitigation proposed in the Conditions of Certification, it is certain that any potential impact will be reduced to less than significant out to this distance. Therefore, there is no potential disparate impact on the minority population, and there are no noise environmental justice issues related to this project.

## **FACILITY CLOSURE**

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In the future, upon closure of the MGS, all operational noise from the site would revert to the levels produced by Station A, and no further adverse noise impacts from operation of the MGS would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the MGS, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with



mufflers. Any noise LORS that are in existence at that time would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

## **RESPONSE TO PUBLIC AND AGENCY COMMENTS**

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There have been no adverse comments received from the public or other agencies regarding the proposed MGS.

## **CONCLUSIONS AND RECOMMENDATION**

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Energy Commission staff concludes that the MGS, with the recommended mitigation, will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the MGS facility were designed as described above, and further mitigated as described below in the proposed Conditions of Certification, it is not expected to produce significant adverse noise impacts.

To ensure compliance with all applicable noise LORS, Energy Commission staff recommends adoption of the following Conditions of Certification.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**NOISE-1** At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the site, by mail or other effective means, of the commencement of project construction. This notification must include residents of Vernon and Huntington Park. 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 Energy Commission Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of ground disturbance, 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.

The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (see Exhibit 1), 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 approved by the CPM, with the City of Vernon Director of Community Services & Water and the City of Huntington Park Senior Planner. and with the CPM, 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 ground disturbance, the project owner shall submit a noise control program to the CPM for review. 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 prior to the start of ground disturbance, 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** The project owner shall employ a low-pressure continuous steam blow process. 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 steam blow noise does not produce a noise level greater than 46 dBA at Site R3 where the average nighttime ambient  $L_{90}$  value is 47 dBA. 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 any steam blow activity, 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** At least 15 days prior to the first steam blow, the project owner shall notify all residents within one mile of the site, of the planned 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 or air 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 5 days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam or air 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 the noise level produced by operation of the power plant will not exceed an hourly  $L_{eq}$  of 48 dBA measured at any residence. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

- A. Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at Locations R1, R2, and R3 as a minimum. The noise survey shall also include short-term measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.
- B. If the results from the noise surveys (pre-construction vs. operations) indicate that the noise level due to the plant operations exceeds 48 dBA at any residence for any given hour during the 25-hour period, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.
- C. If the results from the noise surveys (pre-construction vs. operations) indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

**Verification:** Within 15 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the City of Vernon Director of Community Services and Water, and to the CPM. Included in the post-construction survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 15 days of 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 a sustained 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** Noisy construction or demolition work shall be restricted to the times of day delineated below:

Weekdays	7 a.m. to 7 p.m.
Weekends and Holidays	8 a.m. to 5 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Horizontal drill rigs may be operated on a continuous basis, provided that the rigs are fitted with adequate mufflers and engine enclosures, and that the rigs are shielded from view of residences by berms, canal banks or other suitable barriers.

**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

Malburg Generating Station (01-AFC-25)		
<b>NOISE COMPLAINT LOG NUMBER</b> _____		
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).

## REFERENCES

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City of Vernon, 1989. City of Vernon General Plan Revised 1992, Noise Element, April 19, 1989.

City of Huntington Park Municipal Code, September 30, 1989. Chapter 11 NUISANCES, Section 5-11 Noise.

Bolt Beranek and Newman, Inc. (BBN), 1977. Power Plant Construction Noise Guide, Empire State Electric Energy Research Corporation, 1977.

ALSTOM GTX100 Technical Information, May 21, 2001, Edition 1.

City of Vernon, 2001. Application for Certification for the Malburg Generating Station Project (01-AFC-25). Submitted to the California Energy Commission, December 21, 2001.

Edison Electric Institute, NY (Edison), 1978. Electric Power Plant Environmental Noise Guide, Edison Electric Institute, NY, NY. 1978.

Hoover & Keith, 1981. Noise Control for Buildings, Manufacturing Plants, Equipment, and Products. Seventh Printing – 1994, Hoover & Keith, Inc. 1981.

ENSR, 2001, Noise measurement conducted on July 13, 2001.

ENSR, 2001, Noise measurement from the Vernon Substation Switchyard, conducted on August 17, 2001.

U.S. EPA (U.S. Environmental Protection Agency). 1974. Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. 550/9-74-004, Office of Noise Abatement and Control, Washington, DC.

State of California General Plan Guidelines, Office of Planning and Research, June 1990.

## **NOISE: APPENDIX A FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE**

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE: Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (Leq), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (Ldn). Noise levels are generally considered low, when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical Ldn values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects (USEPA 1971). At 70 dBA, sleep interference effects become considerable.

In order to help the reader understand the concept of noise in decibels (dBA), **NOISE: Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

**NOISE: Table A1  
Definition of Some Technical Terms Related to Noise**

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L <sub>10</sub> , L <sub>50</sub> , & L <sub>90</sub>	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L <sub>90</sub> is generally taken as the background noise level.
Equivalent Noise Level, L <sub>eq</sub>	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L <sub>dn</sub> or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: California Department of Health Services 1976, 1977.



<b>NOISE: Table A2</b>			
<b>Typical Environmental and Industry Sound Levels</b>			
Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Peterson and Gross 1974

## **SUBJECTIVE RESPONSE TO NOISE**

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

### **COMBINATION OF SOUND LEVELS**

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

<b>NOISE: Table A3 Addition of Decibel Values</b>	
When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to $\pm 1$ dB.	

Source: Thumann, Table 2.3

### **SOUND AND DISTANCE**

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

### **WORKER PROTECTION**

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

**NOISE: Table A4**  
**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

# PUBLIC HEALTH

Testimony of Alvin J. Greenberg, Ph.D.

## INTRODUCTION

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The purpose of staff's public health analysis is to determine if toxic emissions from the proposed Malburg Generating Station (MGS) project will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section of this Preliminary Staff Assessment (PSA). Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** and **Worker Safety/Fire Protection** sections. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams to the public sewer system are discussed in the **Soils and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

The following sections describe staff's method of analyzing potential health impacts and the criteria used to determine their significance.

## METHOD OF ANALYSIS

Public health staff is concerned about toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people may come into contact with them through inhalation, dermal (skin) contact, or ingestion via contaminated food or water.

Air pollutants for which no air quality standards have been set are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since noncriteria pollutants do not have such standards, a process known as health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment procedure consists of the following steps:

1. Identify the types and amounts of hazardous substances that the MGS project could emit to the environment;
2. Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;
3. Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and

4. Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the power plant will be much lower than the risks that are estimated by the screening level assessment. This is accomplished by examining conditions that would lead to the highest, or worst-case risks, and then using those in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the plant;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- Assuming that an individual's exposure to cancer-causing agents occurs for 70 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances that could present a health hazard from noninhalation pathways of exposure (see CAPCOA 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term). Acute health effects result from short-term (1-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those that arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called "reference exposure levels" or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36). These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic

substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with CAPCOA guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions. In reality, the risk may generally be too small to actually be measured. For example, a one in one million risk level represents a one in one million increase in the normal risk of developing cancer over a lifetime, at whatever location is estimated to have the worst-case risk.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called "potency factors", and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower or even considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate assessment of potential public health risks.

## **SIGNIFICANCE CRITERIA**

Commission staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to

project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. Significance of project health impacts is determined separately for each of the three categories.

### **Acute and Chronic Noncancer Health Effects**

Staff assesses the significance of non-cancer health effects by calculating a “hazard index.” A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance, which has the same type of health effect, is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels (safe levels). Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

### **Cancer Risk**

Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a cancer risk significance level. Title 22, California Code of Regulations, § 12703(b) states that “the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure.” This level of risk is equivalent to a cancer risk of ten in one million, or  $10 \times 10^{-6}$ . An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65. The significant risk level of ten in one million is consistent with the level of significance adopted by the various Air Boards in California pursuant to Health and Safety Code § 44362(b), which requires notification of nearby residents when an air district determines that there is a significant health risk from a facility.

The South Coast Air Quality Management District (SCAQMD) Risk Management Policy states that a project with an incremental cancer risk of one in one million or less is acceptable without further risk management consideration, and without further toxics reduction measures. In addition, the SCAQMD Risk Management Policy states that a project with an incremental cancer risk of between one and ten in a million is acceptable if best available control technology has been applied to reduce risk. In general, SCAQMD would not approve a project with a cancer risk exceeding ten in one million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks to be above the

significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

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### **FEDERAL**

#### **Clean Air Act section 112 (42 U.S. Code section 7412)**

Section 112 requires new sources which emit more than ten tons per year of any specified hazardous air pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).

### **STATE**

#### **California Health and Safety Code sections 39650 et seq.**

These sections mandate the California Air Resources Board (CARB) and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

#### **California Health and Safety Code section 41700**

This section 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 to business or property.”

### **LOCAL**

#### **South Coast Air Quality Management District (SCAQMD) Rule 1401**

This rule requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air contaminants that exceed specified amounts.

### **SETTING**

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This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project’s potential for causing impacts on public



health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density, which, in turn, affects public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

## **SITE AND VICINITY DESCRIPTION**

The proposed project is located on an existing power generation site ("Station A"), within a 5.9-acre parcel owned by the City of Vernon in Los Angeles County. The proposed new electrical generating facility would occupy approximately 3.4 acres of this existing site, and is located at 2715 East 50<sup>th</sup> Street in the City of Vernon. The site is located between Seville Avenue to the west and Soto Street to the east. East 50<sup>th</sup> Street lies to the south and a Union Pacific rail-line lies to the north. The site topography is flat with an elevation of 183 feet above mean sea level.

The City of Vernon lies near the geographic center of Los Angeles County. To the north and west of the City of Vernon is the City of Los Angeles, to the east are the cities of Commerce and Bell and to the south are the cities of Huntington Park and Maywood. The area surrounding the proposed MGS site is urban, with mainly industrial and commercial land uses and limited residential areas nearby.

The nearest residence to the MGS site is located approximately 0.25 miles southwest of the site. Four schools and a hospital are located within a one-mile radius of the MGS site.

## **METEOROLOGY**

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The climate at the project site is dominated by the influence of the Pacific Ocean and the Pacific high-pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific high is at a maximum during the summer, when it is at its northernmost position, and results in strong northwesterly airflow and negligible precipitation. During this period, inversions become strong, winds are light, and the pollution potential is high. The Pacific high's influence weakens during the fall and winter when it moves southwestward, which allows storms from the Gulf of Alaska to reach northern California. The annual rainfall is approximately 12 inches. About 85 percent of the region's annual rainfall occurs between November and March. During the winter, inversions are weak, winds often moderate, and the potential for air pollution is low.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents more detailed meteorological data.

## **EXISTING AIR QUALITY**

The proposed site is within the jurisdiction SCAQMD, which includes all or portions of Los Angeles, Orange, Riverside and San Bernardino counties.

By examining average toxic concentration levels from representative air monitoring sites in California with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. For comparison purposes, it should be noted that the overall lifetime cancer risk for the average individual is about 1 in 4, or 250,000 in one million.

The toxic air monitoring station closest to the MGS project is in Los Angeles at 1630 North Main Street, approximately 5 miles north of the MGS site. Based on levels of toxic air contaminants measured at this monitoring station in 2001, the background cancer risk calculated for this location is 300 in one million (CARB 2002). The pollutants 1,3-butadiene and benzene, emitted primarily from mobile sources, were the two highest contributors to risk and together accounted for over half of the total. The risk from 1,3-butadiene was about 118 in one million, while the risk from benzene was about 95 in one million. Formaldehyde accounts for about 11 percent of the ambient cancer risk determined for Los Angeles, with a risk of about 32 in one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the proposed MGS project.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease of ambient levels of toxics and associated cancer risk during the past few years. For example, at the Los Angeles monitoring station, cancer risk was 653 in one million based on 1990 data and 512 in one million based on 1996 data.

## **SITE CONTAMINATION**

Site disturbances would occur during facility construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off-site through soil erosion, and uncovering buried hazardous substances.

Kleinfelder performed geotechnical and Phase II Environmental Site Assessments (ESA) of the Station A site during the year 2001 (COV 2001a, Appendix C). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. The results of the ESA are summarized in staff's **Waste Management** section. In addition, a records search and site inspection was performed by the City of Vernon Environmental Health department

for potentially contaminated sites, which may be encountered during construction of the MGS (COV 2001a, Appendix O). These results are also summarized in the **Waste Management** section.

## IMPACTS

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### CONSTRUCTION

Potential risks to public health during construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

As described in the **Waste Management** section, a Phase II Environmental Site Assessment (ESA) has been performed, including seven soil borings, four of which were within the proposed MGS location. None of the seven borings showed any detectable concentrations of volatile organic compounds (VOCs), and six of the seven borings revealed no detectable concentrations of total petroleum hydrocarbons (TPH). One boring, located on the proposed MGS site, revealed a detectable concentration of TPH of 67 mg/Kg (in the carbon range C<sub>22</sub> to C<sub>32</sub>), at a depth of six feet below the soil surface. In addition, Kleinfelder performed remediation services for the City of Vernon in July of 2001 following a sub-surface diesel fuel release on the Station A site. Consequently, a potential exists for encountering diesel-fuel contaminated soil during construction excavation and grading activities. The MGS Application for Certification (AFC) proposes mitigation measures to be employed in the event that contaminated soil is encountered during these activities. These mitigation measures are consistent with staff's proposed conditions of certification found in the **Waste Management** section. If required and implemented, these conditions would reduce the risk to both on-site workers and the off-site public to an insignificant level.

The **Waste Management** section also discusses potentially contaminated sites that may be encountered during construction of the linear facilities. As noted in the **Waste Management** section, MGS has proposed procedures to assure proper management of soil that might be contaminated when construction occurs in areas near suspected contamination.

The operation of construction equipment would result in air emissions from diesel-fueled engines. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the Air Resources Board (ARB) as toxic air contaminants.

Exposure to diesel exhaust causes both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased

coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants (SRP) recommended a chronic REL (see REL discussion in Method of Analysis section above) for diesel exhaust particulate matter of  $5 \mu\text{g}/\text{m}^3$  and a cancer unit risk factor of  $3 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$  (SRP 1998, p. 6). The SRP did not recommend a value for an acute REL, since available data in support of a value was deemed insufficient. On August 27, 1998, the ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved SRP's recommendations regarding health effect levels.

Construction of MGS is anticipated to take place over a period of 15 and 1/2 months, including commissioning. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from seven to seventy years.

AFC Section 8.1 presents diesel exhaust emissions from engines and fugitive dust from construction activities. Worst-case daily dust emissions of 32.25 lb/day  $\text{PM}_{10}$  are expected. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Modeling construction activities, which are assumed to occur for eight hours per day, gives a 24-hour maximum predicted concentration of  $141.4 \mu\text{g}/\text{m}^3 \text{PM}_{10}$  (COV 2001a, Table 8.1-24). Mitigation measures are proposed to reduce the maximum calculated  $\text{PM}_{10}$  concentrations (refer to the **Air Quality** section of the PSA). These include the use of extensive fugitive dust control measures (stipulated by SCAQMD rule 403). The fugitive dust control measures are assumed to result in 90% reductions of emissions.

In order to mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, staff proposes to require the use of ultra low sulfur diesel fuel and the installation of soot filters on suitable diesel equipment (see the **Air Quality** section). The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both mitigation measures in the range of approximately 85-92 percent. Such filters will reduce diesel emissions during construction and reduce any potential for significant health impacts.

## **OPERATION**

### **Emissions Sources**

The emissions sources at the proposed MGS project include two combustion turbine generators; two heat recovery steam generators, one condensing steam turbine generator, a diesel fire pump and cooling tower. The existing emergency generator would also be used for the proposed MGS project. During operation, potential public health risks are related to diesel exhaust emissions and from natural gas combustion emissions.

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

Diesel exhaust emissions contain a number of toxic compounds. However, a chronic REL and cancer risk factor have been established for diesel particulate matter that may be used to characterize emissions from diesel engines (please see the above discussion under **Construction Impacts**). The diesel engine used for the fire pump must be tested on a weekly basis in accordance with safety requirements, resulting in diesel particulate emissions that must be analyzed for health effects. The SCAQMD Risk Management Policy for Diesel Engines lists criteria for permitting stationary diesel engines, and states that if the annual emissions would result in an incremental cancer risk equal to or less than one in one million (measured at the point of maximum residential or off-site worker exposure) over an exposure period of 70 years, the project is acceptable without further risk management considerations.

Table 8.6-1 of the AFC lists non-criteria pollutants that may be emitted from MGS project turbines, cooling tower and Selective Catalytic Reduction (SCR) system as combustion byproducts. Emission factors for the toxic air contaminants emitted are listed in Table 8.6-2. Table 8.6-1 of the AFC lists toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include reference exposure levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the CAPCOA Guidelines (CAPCOA 1993). **Public Health** Table 1 lists toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern, but if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

**Public Health Table 1  
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions**

<b>Substance</b>	<b>Oral Cancer</b>	<b>Oral Noncancer</b>	<b>Inhalation Cancer</b>	<b>Noncancer (Chronic)</b>	<b>Noncancer (Acute)</b>
Acetaldehyde			✓	✓	
Acrolein				✓	✓
Ammonia				✓	✓
Arsenic	✓	✓	✓	✓	✓
Benzene			✓	✓	✓
Beryllium			✓	✓	
1,3-Butadiene			✓	✓	
Cadmium			✓	✓	
Chromium			✓	✓	
Copper				✓	✓
Ethylbenzene				✓	
Formaldehyde			✓	✓	✓
Hexane				✓	
Lead			✓	✓	
Manganese				✓	
Mercury				✓	✓
Napthalene		✓		✓	
Nickel			✓	✓	✓
Polynuclear Aromatic Hydrocarbons (PAHs)	✓		✓		
Propylene				✓	
Propylene oxide			✓	✓	✓
Silver				✓	
Toluene				✓	✓
Xylene				✓	✓

Source: AFC Table 8.6-1 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993 and SRP 1998.

### **Emissions Levels**

Once potential emissions are identified, the next step is to quantify them by conducting a "worst case" analysis. Maximum hourly emissions are required to calculate acute (one hour) noncancer health effects, while estimates of maximum emissions on an annual basis are required to calculate cancer and chronic (long-term) noncancer health effects.

AFC Table 8.6-2 shows maximum hourly and annual emissions for the gas turbines and auxiliary boiler. The maximum fuel use is combined with the emission factor for each toxic air contaminant to estimate hourly and maximum annual emissions. Emission factors are estimates of the amounts of toxic substances released per unit of fuel burned. The potential toxic air contaminants emitted from MGS were identified from the California Air Toxics Emission Factor (CATEF) Version 1.2 database maintained by the California Air Resources Board.

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The screening analysis was performed using the U.S. EPA approved ISCST3 dispersion modeling program (please see staff's Air Quality section for a detailed discussion of the modeling methodology). Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects which might occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Revised 1992 Risk Assessment Guidelines (October 1993) referred to earlier, and results in the following health risk estimates.

### **Impacts**

The screening health risk assessment for the project, including combustion and non-combustion emissions, resulted in a maximum acute hazard index of 0.062 at the site of the maximally exposed individual resident (MEIR) and 0.090 at the site of the maximally exposed individual worker (MEIW). The chronic hazard index at the point of maximum impact is 0.032 for the MEIR and the MEIW. The locations of the MEIR and MEIW are not indicated in the revised Public Health Section. As **Public Health Table 2** shows, both acute and chronic hazard indices are under the REL of 1.0, indicating that no short- or long-term adverse health effects are expected.

**Public Health Table 2  
Operation Hazard/Risk**

<b>Type of Hazard/Risk</b>	<b>Hazard Index/Risk</b>	<b>Significance Level</b>	<b>Significant?</b>
<b>RESIDENTIAL ACUTE NONCANCER</b>	0.062	1.0	No
<b>RESIDENTIAL CHRONIC NONCANCER</b>	0.032	1.0	No
<b>RESIDENTIAL INDIVIDUAL CANCER</b>	$0.57 \times 10^{-6}$	$10.0 \times 10^{-6}$	No
<b>OCCUPATIONAL ACUTE NONCANCER</b>	0.090	1.0	No
<b>OCCUPATIONAL CHRONIC NONCANCER</b>	0.032	1.0	No
<b>OCCUPATIONAL INDIVIDUAL CANCER</b>	$0.96 \times 10^{-6}$	$10.0 \times 10^{-6}$	No

Source: COV 2002, Revised Public Health Section, Table 2.

### **Cancer Risk**

As shown in **Public Health Table 2**, total worst-case individual cancer risk is calculated to be 0.57 in one million at the site of the MEIR and 0.96 in one million at the site of the MEIW.

The health risk assessment performed by the applicant has been reviewed by staff and was found to be in accordance with guidelines adopted by Office of Environmental Health Hazard Assessment (OEHHA), CARB, and CAPCOA. Staff performed an independent analysis of risks posed by operations of this proposed facility using standard Cal-EPA exposure assumptions. The maximum theoretical cancer risk was determined by staff to be 0.69 in a million for the MEIR, a value slightly higher than the 0.57 in a million value obtained by the applicant but still significantly lower than the significance level of 10 in a million. For the MEIW, staff determined cancer risk to be 0.97 in a million, a value equivalent to the 0.96 in a million value obtained by the applicant. Therefore, staff finds that the health risk assessment prepared by the applicant in the Revised Public Health Section of the AFC (COV 2002) accurately concludes that the maximum theoretical risks and hazards posed by the toxic air contaminants emitted by the three sources described above are less than the significance level of 10 in one million.



## ENVIRONMENTAL JUSTICE

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Staff has reviewed Census 2000 information that shows the minority population is greater than 50 percent within a six-mile radius of the proposed MGS (please refer to **Socioeconomics Figure 1** in this Staff Assessment). Staff also reviewed Census 1990 information that shows the low-income population is greater than fifty percent within the same radius.

Based on the this analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no environmental justice issues from the use or transport of hazardous materials related to this project.

## COMPLIANCE WITH LORS

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Staff concludes that construction and operation of the MGS project will be in compliance with all applicable LORS regarding long-term and short-term project impacts.

## FACILITY CLOSURE

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The scope of staff's public health analysis is the routine release of harmful substances (non-criteria pollutants) to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or non-routine releases from either hazardous materials or wastes that may be onsite. These are discussed in the sections **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

## RESPONSE TO PUBLIC AND AGENCY COMMENTS

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None received.

## CONCLUSIONS

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Staff has analyzed potential public health risks associated with construction of the MGS project, and does not expect any significant adverse cancer, or short- or long-term noncancer health effects from construction emissions.

The health risk assessment performed by the applicant as part of the Revised Public Health Section of the AFC (COV 2002) has been reviewed by CEC staff and was found

to be in accordance with guidelines adopted by OEHHA (Office of Environmental Health Hazard Assessment), CARB and CAPCOA.

## **PROPOSED CONDITIONS OF CERTIFICATION**

No conditions are proposed.

## REFERENCES

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California Air Resource Board (CARB) 2002. California Air Quality Data, <http://www.arb.ca.gov/aqd/aqd.htm>

CAPCOA. 1993. California Air Pollution Control Officers Association. CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee. October.

City of Vernon (COV) 2001a. Application for Certification. Dated 12/18/01 and docketed 12/21/01.

BAAQMD. 1993. Bay Area Air Quality Management District. Cumulative Air Toxics Modeling Study. Staff Report. July.

SRP. 1998. Scientific Review Panel on Toxic Air Contaminants. Findings of the Scientific Review Panel on The Report On Diesel Exhaust as adopted at the Panel's April 22, 1998 Meeting.

City of Vernon (COV) 2002. Revised Public Health Section of the AFC, July 2002.

# SOCIOECONOMICS

Testimony of Joseph Diamond, Ph.D.

## INTRODUCTION

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California Energy Commission (Energy Commission) staff socioeconomic impact analysis evaluates the project induced changes on community services and/or infrastructure and related community issues such as Environmental Justice (EJ) and facility closure. Direct, indirect, induced, and cumulative impacts are also included. Staff discusses the estimated impacts of the construction and operation of the Marlburg Generating Station (MGS) on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131. The MGS Project will be constructed, owned, and operated by the City of Vernon. It will be part of the City of Vernon's Utilities Department.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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The following LORS are applicable to the MGS:

*California Government Code, section 65996-65997*

As amended by SB 50 (Stats. 1998, ch. 407, Sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

## SETTING

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The MGS is located in the City of Vernon near the geographic center of metropolitan Los Angeles County. For a full description of the socioeconomic setting, please refer to 8.8.1 Affected Environment of the City of Vernon AFC. The study area (affected area), defined by the City of Vernon in the socioeconomics section of the AFC and by staff, includes: the regional area is Los Angeles County and the local area cities of Bell, Huntington Park, Los Angeles, Maywood, and Vernon. These communities are within a commute distance of the power plant site where construction and operations workers may live. The Applicant and staff utilized the Los Angeles Basin labor market area for its evaluation of construction and operation worker availability and community services and infrastructure impacts from MGS construction and operation.

Los Angeles County was used as the study area in identifying non-fiscal (private sector) benefits from the MGS. **Socioeconomics Table 1-Available Labor by Skill For Construction**, that follows, shows that the Los Angeles/Long Beach MSA has more than adequate labor supply for the MGS.

**SOCIOECONOMICS Table 1  
Available Labor By Skill For Construction**

<b>Trade</b>	<b>Los Angeles/Long Beach MSA</b>	<b>Total Workers Needed*</b>
Boilermaker	720	60
Carpenter	19,210	5
Electrician	12,260	3
Laborer	11,680	30
Pipefitter	7,690	35
Painter/Insulator	9,200	6
Bricklayer/Cement Finisher	1,660	35
Operating Engineers	3,040	3
Sheetmetal Workers	4,960	3
Welders	7,740	NA
Industrial Truck Equipment/Operators	17,980	3
Surveyors	520	1
Plant Operators	7,220	0
Administrative/Clerical	102,410	2
Mechanical Technicians	4,000	6
Electrical Technicians	11,690	11
<b>Source: California Employment Department, 2001</b>		
<b>* Workers not necessarily on-site at the same time.</b>		

Staffs discussion of setting for housing, fiscal, schools, police and medical services has been incorporated in the Discussion of Impact section that follows.

**ENVIRONMENTAL CHECKLIST**

	Potentially Significant Impact	Less than Significant With Mitigation Incorporate	Less Than Significant Impact	No Impact
Socioeconomics: Population, Housing, and Economic (Fiscal and Non-Fiscal)-Would the Project:				x
a) Have substantial effects on local employment and economy?				x
b) 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 infrastructures)?				x
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				x
d) Displace substantial numbers				

	Potentially Significant Impact	Less than Significant With Mitigation Incorporate	Less Than Significant Impact	No Impact
of people, necessitating the construction of replacement housing elsewhere?				x
e) Have substantial (negative) fiscal effects on local government expenditures, property and sales taxes?				x
f) Have a significant people of color or low-income population within a six-mile radius that may be subject to disproportionate adverse effects of the project?				x
Public Services-Would the project 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, or result in an inability to maintain acceptable service ratios, response times, or other performance objectives for the following:				
g) Schools				x
h) Police protection?				x
i) Medical and other public services				x

## DISCUSSION OF IMPACTS

Staff reviewed the City of Vernon AFC, Vol. I, December 15, 2001 socioeconomic section and socioeconomic data responses (February 2002) and socioeconomic data requests (June 2002). Based on staff's use of the socioeconomic data provided and referenced from governmental agencies, trade associations and staff's analysis, staff agrees with the AFC's socioeconomic analysis and conclusions.

California statute, section 65040.12 (c) of the Government Code, defines "environmental justice" to mean "fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." In light of the progress made by federal environmental agencies on environmental justice (EJ), the Energy Commission has examined federal guidelines pursuant to its desire to follow EJ principles for the environmental review of this project.

The U. S. Environmental Protection Agency (EPA) issued draft guidance for implementing Executive Order 12898, which was signed by President Clinton in 1998 and relates to considering EJ, in the context of the National Environmental Policy Act (NEPA), 42 U.S.C. section 4321 et seq. This guidance is entitled "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" (dated April 1998). In addition, the Council on Environmental Quality has developed additional guidance entitled "Environmental Justice Guidance Under the National Environmental Policy Act" (dated December 1997).

The steps recommended by these guidance documents to assure compliance with the Executive Order are: (1) outreach and involvement; (2) a screening-level analysis to determine the existence of a minority or low-income population; and (3) if warranted, a detailed examination of the distribution of impacts on segments of the population. Though the Federal Executive Order and guidance are not binding on the Energy Commission, staff finds these recommendations helpful for implementing this EJ analysis. For this project, staff has followed each of the above steps. The discussion of staff's review of EJ for this project is located in section F below.

## **A. Employment and Economy**

According to the Scott Company (industrial contractors) the specific geographic boundaries for all pertinent crafts will come from the Los Angeles basin. This area includes Los Angeles, Long Beach, San Fernando Valley, Pomona, and also Orange County. The average commute time for crafts, during the peak traffic hours will range from 30 minutes to one and a half-hours. This is considered local and is not out of the ordinary for local work. The "non-local" workers will be few if any for this project. The Los Angeles Basin has no trouble supplying labor for this project. The Scott Company does not consider this project to require non-local craft labor (CEC 2002a).

Staff has confirmed with the City of Vernon that they have contracted with The Scott Company to provide the skilled labor necessary to construct the proposed power plant (a copy of the contract will be filed with the Energy Commission) (Diamond 2002), and they are working on establishing contracts for operation and maintenance of the facility (Edwards 2002).

The Impact Analysis For Planning (IMPLAN) model (an input-output model), used in the AFC by the Applicant to estimate employment impacts from the MGS Project on the affected area, is widely used and therefore acceptable to staff. The University of California at Berkeley uses the IMPLAN model for regional economic assessment, and it has been used to assess other generating projects in California and the U.S. It is a common regional economic tool. In general, most multipliers are estimated by showing the total change divided by the initial change. Employment multipliers refer to the total additional employment stimulated by the new economic activity. IMPLAN is a disaggregated type of model that divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). An IMPLAN Type III SAM variety multiplier of 3.630 was used for construction (e.g., each new construction job's income supports approximately 284 indirect and induced jobs in the regional economy) and an IMPLAN Type III SAM variety multiplier of 5.5 was used for operations (approximately 144 indirect and induced jobs in the regional economy) (COV 2002w). These multipliers are within an acceptable range of two to three, often cited by many economists though the operations multiplier is on the high side (Moss et al. 1994).

Project construction (power generation, electric power transmission, and pipelines for fuel gas, water supply, wastewater, and completion of an access road) is expected to occur over a 16-month period. The greatest number of peak construction workers, estimated to be 179 workers, will be needed in the 2<sup>nd</sup> and 8<sup>th</sup> months of construction.

The number of construction workers will range from 35 in the last three months of construction to approximately 179 workers in the 2<sup>nd</sup> and 8th months of construction. The number of non-local workers needed for power plant construction is estimated to be minimal to none.

During operation of the project, about 32 workers will be needed to maintain and operate the project. These are expected to be contract workers and come from the local area.

The total employment, estimated by the MGS, using an IMPLAN Type III SAM variety multiplier of 3.630 for construction, is the equivalent of 392 jobs (which includes 284 secondary jobs), based on an average of 108 project-related construction jobs. For project operations, an average of 32 jobs with an IMPLAN Type III SAM variety multiplier of 5.5 for operations results in an equivalent of 176 total jobs (which includes 144 secondary jobs).

## **B. INDUCED POPULATION GROWTH**

As mentioned in Item A, the vast majority of construction and operation labor will be local.

## **C. Displacement Of Housing**

According to federal standards, permanent housing is considered to be in short supply if the vacancy rate is less than five percent (URS 2000). As of 2000 (see Table 8.8-5 of the City of Vernon AFC), there were approximately 31,277 housing units in Bell, Huntington Park, Maywood, and Vernon and 1,337,706 in Los Angeles. There are approximately 1.4 million total housing units in these communities. The vacancy rate for this housing averages approximately 1.7 to 2.3 percent. In addition, there are at least 100,137 total motel/hotel rooms in Los Angeles County with the availability being about 26 percent on average or 26,036 rooms (CEC 2001a). The combination of housing and motel/hotel rooms probably available to non-local construction workers for this project, which will be small, is more than sufficient for worker needs. The operations work force is expected to be drawn from the local labor force. The MGS will be built in an industrial area and not alter the residential and commercial community.

## **D. Displacement Of People**

As described in Item A (above), no people will be displaced by the MGS. Therefore, no impacts to displaced population would occur.

## **E. Fiscal**

The MGS Project is 134 MWs with total project costs of \$130 million (2001 dollars which is the case for all economic estimates except the economic impact analysis that used 2003 dollars). The cost of constructing the project is estimated to \$43 million. Of this amount, approximately \$13 million will be expended on construction related payroll. The total project cost for the operation phase is estimated to be \$4 million annually. This sum includes labor and materials for the operation and maintenance of the project. The project will generate \$4.6 million in taxes (from sales on materials) for Los Angeles County from the acquisition of \$58 million in equipment. The local sales tax rate for Los Angeles County is 8 percent hence \$4.6 million in sales tax receipts. There are no



other expected impacts on tax revenues resulting from the construction and operation of the project. The project's capital cost is estimated to exceed \$95 million, including equipment cost of \$58 million. The City of Vernon is a municipal utility, therefore, there is no direct source of tax revenue to the MGS Project.

## **F. People of Color And Low-Income Populations (Environmental Justice Outreach and Screening Analysis)**

The purpose of the EJ screening analysis is to determine whether a low-income and/or people of color population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" (Guidance Document) dated April 1998. People of color populations, as defined by this Guidance Document, are identified where either:

- the people of color population of the affected area is greater than fifty percent of the affected area's general population; or
- the people of color population percentage of the area is meaningfully greater than the people of color population percentage in the general population or other appropriate unit of geographic analysis.

The EPA requires local air districts to perform an EJ analysis for Prevention of Significant Deterioration permits. As the lead agency for reviewing applications to build new thermal electric generation facilities greater than 50 megawatts, the Energy Commission performs an EJ analysis in part to assist the local air districts.

The Energy Commission's EJ outreach consisted of:

- On May 2, 2002 a project description for MGS containing facts on MGS was sent to Mr. Abueg MGS Project Manager who put it in the Vernon Journal and it also went to the Vernon Chamber of Commerce, the local schools, and the Huntington Park Library.
- Applications For Certification were sent to seven libraries, including the Huntington Park Library.
- Information on a July 1, 2002 site visit and workshop at the City of Vernon City Council Chambers, which included an EJ component, was in the WAVE newspaper that has a circulation including Huntington Park, Maywood, Commerce, and Bell; the Vernon Chamber of Commerce, Vernon City Schools and the City of Vernon Utilities Department.
- On July 1, 2002, staff sponsored a public workshop in the City of Vernon, which included a discussion of EJ.

Staff has reviewed Census 2000 information that shows the people of color population is greater than fifty percent within a six-mile radius of the proposed City of Vernon power plant (See **Socioeconomics Figure 1**), and Census 1990 information that shows the low-income population is less than fifty percent (28.6 percent) within the same radius. Based on this socioeconomic analysis, staff has not identified significant direct or cumulative socioeconomic impacts resulting from the construction or operation of the project. This conclusion is supported by the fact that the MGS would be built in an industrial area, would not physically alter the residential

and commercial community, and would largely utilize a local labor force that would not create new demands on community infrastructure and services. Therefore, there are no socioeconomic EJ issues related to this project.

However, the **Air Quality** section of this initial staff assessment, one of the nine technical areas that consider EJ in the analysis, does show that there may be a potentially significant adverse cumulative environmental impact from PM10 emissions. (See the **Air Quality** analysis of this staff assessment for further information.) This is a preliminary finding of potential significant impact that may yet be mitigated prior to the Final Staff Assessment. If mitigation is found to be acceptable, no further analysis is warranted under the three-step approach. However, if this potential impact still exists after the planned staff air quality workshop, then Air Quality staff will prepare an analysis of the potential for disproportionate impacts on nearby EJ populations.

## **G. Schools**

Local schools include those in the City of Vernon and Huntington Park (nearest to the MGS), which are in the Los Angeles United School District (LAUSD). The total enrollment for the LAUSD is 673,176 (October 2000) with 761 schools (July 2000). Three schools out of the nine in the Cities of Vernon and Huntington Park are over capacity (Gage Middle School, Nimitz Middle School, and San Antonio High School), but overall capacity is 19,386 versus 18,845 in enrollment. Most of the close-by schools are below capacity (CEC 2001e). More importantly, little or no non-local labor and their families are expected to move into the area, so any impacts to the school system would be insignificant.

The Applicant is a municipality that is exempt from paying a school impact fee. Education Code section 17620 states that public agencies may not impose fees, charges or other financial requirements to offset the cost for "school facilities." School facilities are defined as "any school-related consideration relating to a school district's ability to accommodate enrollment." Local and state agencies are precluded from imposing (additional) fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools.

## **H. Police Protection**

Police protection for the MGS will be provided by the Vernon Police Department (VPD), which has 69 employees. The estimated emergency response time is 5 to 10 minutes. The MGS would not significantly increase the existing demand for police service or adversely affect police protection in and around the MGS area.

## **I. Medical Services**

Emergency services will be provided by the VPD and Vernon Fire Department (VFD). Paramedic support is contracted out to American Medical Responder (AMR) who is located at Station 2 and would provide ambulance service in a medical emergency at the project site.

Six hospitals are within 2.5 miles of the project site though one was at capacity as of July 2001 (See the AFC, Vol., I, 8.8.1.6). Overall, there appears to be adequate infrastructure to handle medical emergencies associated with the construction and operation of the proposed MGS.

The City of Vernon will provide natural gas fuel, electrical supply, and potable water during construction. The Los Angeles County Sanitation District will provide sanitary sewer service.

The City of Vernon via contractors provides solid waste disposal which is sent to Los Angeles County landfills though mainly to Puente Hills landfill in Whittier. Hazardous materials/wastes will be disposed at the nearest state and county recognized site. Please see the **Hazardous Materials Handling** and **Waste Management** sections of this Staff Assessments for more information.

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 zero to minimal, with adequate numbers of construction workers currently residing within the Los Angeles Basin. The number of operations workers for the project would be small and come from the local area. Therefore, no additional constraints would be placed on any current public service providers, including utilities, medical services and libraries, as a result of the MGS. No adverse physical impacts with the provision of public facilities would occur.

## **CUMULATIVE IMPACTS**

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that can not be met by local labor, resulting in an influx of non-local workers and their dependents.

There are eleven projects in discussion, five in the planning stage, twenty-five under construction (as of May 2002) and three demolition projects near the power plant site or associated pipelines (water, natural gas, and sewer). These projects will not require the development of new infrastructure facilities (CEC 2002e). As stated earlier, no labor shortages are expected for the MGS since it can draw on an ample supply of labor from the Los Angeles Basin.

Because the MGS would not result in any significant socioeconomic impacts to population or housing, or public services, it is unlikely that it would contribute considerably to cumulative socioeconomic impacts. Staff concludes that there are no adverse cumulative socioeconomic impacts.

## **FACILITY CLOSURE**

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### **PLANNED CLOSURE**

The MGS AFC did not provide for the inclusion of socioeconomic LORS that will be incorporated into the facility closure plan when it becomes necessary at the end of the project's economic life. The socioeconomic impacts of facility closure will be evaluated at that time.

## **UNEXPECTED TEMPORARY CLOSURE**

Any unexpected, temporary closure would not likely cause any significant environmental impacts on the affected area, because the likely result of a temporary closure would be reactivation of the power plant by the same or a new owner within a relative short period of time. Personnel changes may occur if there is an ownership change, but socioeconomic impacts would not change significantly because the number of operating personnel would remain relatively the same.

## **UNEXPECTED PERMANENT CLOSURE**

Any unexpected, permanent closure of the MGS would not likely cause any significant socioeconomic impacts on the affected area, because facility closure impacts (i.e., dismantling) would be similar to construction impacts, and staff has found no significant socioeconomic impacts due to the construction of the project.

## **MITIGATION**

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No significant impacts on socioeconomics were identified, therefore, no mitigation measures are proposed.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

There are estimated gross benefits from the MGS, which include increases in sales taxes, employment, and income for the Cities of Los Angeles, Bell, Huntington Park, and Vernon (the local area). For example, during average construction, there are estimated to be 108 direct project-related construction jobs for 16 months of construction 392 total jobs (108 average construction jobs x 3.630 (IMPLAN Type III SAM variety construction multiplier) that will be created, of which 284 are secondary (indirect and induced) jobs. For average operations, 32 direct jobs will be created with 144 secondary (indirect and induced) jobs for a total of 176 jobs. Also, the Los Angeles County sales tax on materials (purchase of equipment) is estimated to be \$4.6 million.

Staff finds that the MGS will not cause a significant adverse socioeconomic impact on the affected area's (i.e., the labor supply area) housing, schools, police, emergency services, hospitals, and utilities. Based on staff's demographic screening analysis, the population of people of color within six miles of the proposed power plant site met the threshold of greater than 50 percent though this was not true for low-income people. There were no significant socioeconomic impacts since most of the construction and operation workforce is within the regional or local labor market area. The MGS will be built in an industrial area and will not physically alter the residential or commercial community. EJ outreach efforts were undertaken and since there would be no significant adverse direct or cumulative socioeconomic impacts, staff has determined that there are no socioeconomic environmental justice issues.

The MGS, as proposed, is consistent with all applicable socioeconomic LORS.

## **RECOMMENDATIONS**

Staff recommends approval of the MGS with no proposed Socioeconomic conditions of certification.

## REFERENCES

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# SOIL AND WATER RESOURCES

Testimony of Antonio Mediati

## INTRODUCTION

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This section analyzes potential impacts to soil and water resources by the Malburg Generating Station (MGS) proposed by the City of Vernon (Applicant). This analysis incorporates information available to staff as of July 9, 2002. Specifically, this report focuses on the following areas of concern:

whether the project's demand for water could affect surface or groundwater supplies; whether construction or operation could lead to accelerated wind or water erosion and sedimentation; whether the project's wastewater management practices will lead to degradation of surface or ground water quality; whether project construction or operation could lead to degradation of surface water quality or drainage; and whether the project will comply with all applicable laws, ordinances, regulations and standards.

Where the potential for impacts is identified, mitigation and conditions of certification have been proposed.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

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### FEDERAL

#### Clean Water Act

The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. Storm water discharges during construction and operation of a facility, and incidental non-storm water discharges associated with pipeline construction also fall under this act, and are addressed through a general NPDES permit. In California, requirements of the Clean Water Act regarding regulation of point source discharges and storm water discharges are delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCB). In the case of the MGS, water quality is administered by Region 4, the Los Angeles RWQCB.

### STATE

#### California Constitution, Article X, Section 2

This section requires that the water resources of the State be put to beneficial use to the fullest extent possible. The waste, unreasonable use, or unreasonable method of use of water is prohibited. The conservation of such waters is to be exercised with a view to the reasonable and beneficial use in the interest of the people and for the public

welfare. The right to water or to the use or flow of water in or from any natural stream or water course in the State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use, or unreasonable method of use, or unreasonable method of diversion of water.

### **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. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDRs) permit. The Porter-Cologne Water Quality Control Act also requires the SWRCB and nine RWQCBs to ensure the protection of water quality through the regulation of waste discharges to land. Such discharges are regulated under Title 23, California Code of Regulations, Chapter 15, Division 3. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions regarding the construction, operation, monitoring and closure of the waste disposal site, including injection wells and evaporation ponds for waste disposal.

### **California Water Code**

California Water Code 13550 requires the use of reclaimed water, where available. The use of potable domestic water for nonpotable uses, including, industrial uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available.

California Water Code Section 13260 requires that, as part of the NPDES permit, any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system must submit a report of waste discharge to the RWQCB.

### **The California Safe Drinking Water and Toxic Enforcement Act (California Health & Safety Code Section 25249.5 et seq.)**

This Act prohibits actions contaminating drinking water with chemical known to cause cancer or possessing reproductive toxicity. The requirements of the Act are administered by the RWCQB.

## **STATE POLICIES**

### **State Water Resources Control Board**

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 Power plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. 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.

## **LOCAL**

### **County Sanitation Districts of Los Angeles County Wastewater Ordinance – April 1, 1972 (As Amended July1, 1998)**

In 1972, the Districts' Boards of Directors first adopted the Wastewater Ordinance. The purpose of the Ordinance is to establish controls on users of the Districts' sewerage system in order to protect the environment and public health, and to provide for the maximum beneficial use of the Districts' facilities.

### **Los Angeles County Ordinances**

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. While the project does not fall into the category of a private sector development, the applicant will comply with the requirements of the SUSMP by developing BMPs to meet the program objectives on the site.

## **ENVIRONMENTAL SETTING**

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### **REGIONAL AND SITE VICINITY DESCRIPTION**

The MGS site is located within an industrial land use area in the City of Vernon. The City of Vernon is located near the geographic center of metropolitan Los Angeles County. The City of Vernon is bordered on the north and west by the City of Los Angeles, on the east by the Cities of Commerce and Bell and on the south by the Cities of Huntington Park and Maywood.

The MGS will produce a nominal 134 megawatts of electricity. The proposed MGS site is a previously disturbed industrial property. The area immediately surrounding the site is predominantly industrial. An existing power generating facility is located on the property. The MGS will be constructed adjacent to the existing facility. The primary source of cooling and process water for the MGS will be reclaimed water from the Central Basin Municipal Water District (CBMWD). Potable water will be supplied by the City of Vernon through an existing water supply line. Potable water will also be used as emergency back-up water for the plant when reclaimed water is temporarily unavailable. Wastewater will be discharged to the County Sanitation District of Los Angeles County (CSDLAC).

The MGS site is relatively flat with a slope of one- percent draining from the center to the east and west. The elevation of the site is approximately 182 feet above mean sea level. The site will be graded such that ground surfaces will slope away from structures and roads into swales and catch basins. The average annual rainfall measured in the MGS area is 14.77 inches. The first 0.75 inches of storm water runoff will be retained

within storm water sedimentation/detention basins, with ultimate discharge to the existing storm conveyance system.

The proposed project would be constructed on a 5.9-acre parcel. Approximately 3.4 of those 5.9 acres will be permanently disturbed. The remaining 2.5 acres is occupied by the existing power facility. Approximately 70 percent of the proposed MGS (3.4 acre) site will be impervious surfaces, the remainder will be covered with gravel. Approximately 1.75 additional acres off-site will be used during construction. This additional acreage will be used for construction/laydown and parking. The construction/laydown and parking areas are mostly asphalt with a small portion graveled. Linear facilities for the MGS will include a 10-inch diameter 1,300-foot long natural gas pipeline, a 12-inch diameter 1,300-foot long sewer pipeline and an 18-inch diameter 10,000-foot long reclaimed water pipeline.

The preferred routes for the new linear facilities and the location of the parking and laydown areas are shown on AFC, Figure 3.6-1 (COV 2001a).

## **GROUNDWATER**

The MGS site is located within the Central Basin of the Los Angeles-San Gabriel Hydrologic Unit, which underlies most of Los Angeles County and part of Ventura County. The Los Angeles-San Gabriel Hydrologic Unit has a surface area of approximately 1608 square miles. Groundwater occurs within alluvium, Lake Formation and San Pedro Formation sediments. These sediments contain several very permeable layers of aquifers. Groundwater at the site was encountered at 40 to 45 feet below ground surface (bgs) (Appendix C of the AFC (COV 2001a)). Historical high groundwater level for the area is approximately 35 feet bgs.

## **SURFACE WATER HYDROLOGY**

The MGS site is located within the Los Angeles River Watershed. The Los Angeles River is located approximately  $\frac{3}{4}$ -mile northeast of the project site. The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers from the 1930s to the 1960s. The upper reaches of the river carry urban runoff and flood flows from the San Fernando Valley. In the lower reaches the flows are dominated by tertiary-treated effluent. Up to 75 million gallons of treated effluent are released daily from the Tillman Water Reclamation Plant in the Sepulveda Basin. Runoff and illegal dumping are major contributors to the impaired water quality of the river in this highly urbanized watershed.

There are not any natural surface water drainage features on the MGS site. The surface water feature closest to the MGS site is the concrete lined Los Angeles River.

The MGS site is not in any flood zone according to the City of Vernon Department of Community Services & Water and the Federal Emergency Management Agency (COV 2001a).

## **SOILS**

The MGS site and linear facilities will be located in areas underlain by two native soil types. The native soils for the area are the Hanford and the Tujunga-Soboba soil series.

The project site is underlain by approximately 20 feet of non-native fill material. Areas along the linear facilities may also contain fill material.

Hanford soil series generally consist of deep, well-drained soils that formed in moderately coarse textured alluvium from granitic parent material. This soil series is highly permeable, moderately drained with a low erosion hazard rating. Tujunga-Soboba soil series generally consist of very deep, excessively drained soils that formed in moderately coarse textured alluvium from granitic parent material. This soil series is highly permeable, rapidly drained with a low to moderate erosion hazard rating. The fill material is primarily composed of coarse brown silty sand and gravel with pieces of asphaltic concrete and pottery. These soils have limited agricultural potential. They are located in a highly industrial area and there are no agricultural resources in the area.

The surface material at the site has been recently disturbed by the removal of above ground fuel storage tanks and clean-up activities of a recent diesel fuel oil spill.

## **PROJECT WATER SUPPLY**

The MGS will use approximately 1400 acre-feet of water per year assuming an operating schedule of 8500 hours per year. The sources of water for the project are reclaimed water from the CBMWD and potable water from the City of Vernon. Staff has received a copy of a Will-Serve letter from the City of Vernon Department of Community Services & Water (COV 2001a, Figure 11-7) stating they will be able to supply the project with the 17 gallons per minute (gpm) of potable water demand and a maximum nine-day per year emergency back-up supply at 1000 gpm. Staff has also received a copy of a Will-Serve letter from the CBMWD (COV 2001a, Figure 11-8) stating they expect to be able to serve the projects request for 1000 gpm by the projects projected start date of the spring 2004. Three improvements to the reclaimed water distribution system will need to be made to supply the project. The improvements are installation of a booster pump, installation of a pressure-reducing station, and installation of 10,000 feet of pipeline. The reclaimed water pipeline is included in the MGS proposal as a linear facility. The other two installations are discussed in the AFC, however specifics are not available at this time. Design and construction must be coordinated with CBMWD.

Approximately 200,386 acre-feet of water was extracted from the Central Basin between July 1, 1999 and June 30, 2000 for use as a municipal potable supply. The Water Replenishment District of Southern California manages groundwater resources. The State Department of Water Resources acts as the court-appointed Watermaster in connection with water rights adjudication. The maximum allowable withdrawal from the Central Basin is 217,000 acre-feet per year. There is ample water available as back up to the reclaimed water should there be a temporary interruption of the reclaimed water supply.

The MGS facility water requirements are shown in **Soil and Water Table 1**. The table shows the average and maximum amount of water required for equipment in the plant and the total required for the plant in gallons per minute.

**Soil and Water Table 1**  
**Estimated Normal and Maximum Water Requirements**

Equipment	Normal (gpm)	Maximum (gpm)
Cooling Tower Make-up less evaporative Cooler Blowdown	812	879
Evaporative Cooler Make-up	20	45
Evaporative Cooler Blowdown to Cooling Tower	16	30
HRSG Make-up Water	8.5	10
Water Treatment Losses	1	2
Other Losses	1.8	2.5
Miscellaneous uses, total	25	37
<b>Total Make-up water rate plant</b>	<b>894</b>	<b>1,001</b>

Source: Table 3.4-9, (COV 2001a)

### **Water Quality**

The quality of the reclaimed water supply from the CBMWD is characterized in **Soil and Water Table 2**.

**Soil and Water Table 2**  
**Quality of the Reclaimed Raw Water Supply**

<b>Component</b>	<b>Units</b>	<b>Design Case</b>	<b>Average Case</b>
Total Alkalinity	mg/L	267	211
Hardness	mg/L	285	224
Chlorides	mg/L	256	160
Silicon	mg/L	23.3	8
Iron	mg/L	0.39	0.14
Oil & Grease	mg/L	5	4
Total BOD	mg/L	14	5
Total COD	mg/L	57	31
Total Dissolved Solids	mg/L	1021	669
Suspended Solids	mg/L	4	1
Chlorine*	mg/L	1	1
Calcium	mg/L	73.3	59
Magnesium	mg/L	21.8	17
Sodium (Na)	mg/L	219	143
Phosphate (PO4)	mg/L	5.1	2
Sulphate (SO4)	mg/L	180	114
Manganese (Mn)	mg/L	0.07	0.03
Cyanide (total)	mg/L	0.01	<0.01
Arsenic	mg/L	0.0022	0.0013
Cadmium	mg/L	0.039	0.002
Chromium (total)	mg/L	0.04	0.01
Copper	mg/L	0.04	0.01
Lead	mg/L	0.02	0.01
Nickel	mg/L	0.14	0.02
Mercury	mg/L	0.0001	0.0001
Silver	mg/L	0.01	0.01
Zinc	mg/L	0.11	0.053480
Total Organic Carbon	mg/L	11.5	6
Barium	mg/L	0.04	0.0333
Selenium	mg/L	0.03	0.001
Antimony	mg/L	0.0018	0.0008
Beryllium	mg/L	0.0025	0.0025
Thallium	mg/L	0.001	0.001
Potassium	mg/L	15	8.7
Ammonia Nitrogen	mg/L	33.9	10.3
Organic Nitrogen	mg/L	5.4	1.9
Nitrate Nitrogen	mg/L	6.5	3.5
Nitrite Nitrogen	mg/L	3.9	0.8
Conductivity	umho	1725	855
pH		6.8 to 7.3	6.8 to 7.3

Source: Table 3.4-10, (COV 2001a)

**Soil and Water Table 3  
Quality of the Potable Water Supply**

Analyte	Range of Data	Average
Total Hardness (mg/L)	170-233	207
Total Alkalinity, (CaCO <sub>3</sub> ) (mg/L)	150-200	180
Chlorides, (as Cl) (mg/L)	60-81	69
Calcium (mg/L)	40-57	44
Magnesium (mg/L)	17-22	21
Sodium (mg/L)	56-72	66
Sulfate (mg/L)	89-130	86
Manganese	Nd-120	60
Silica, (SiO <sub>2</sub> ) (mg/L)	20-25	22
Iron (mg/L)	nd-0.52	nd
TDS (mg/l)	373-491	404
TSS (as turbidity, ntu)	0.15-0.18	<0.5nu
pH	6.8 to 7.3	6.8 to 7.3
Conductivity	1725	855

Source: Table 3.4-11, (COV 2001a)

nd – not detected at the reporting limit

ntu – nephelometric turbidity units

TDS – Total Dissolved Solids

TSS – Total suspended Solids

## **WASTEWATER DISCHARGE**

Non-contact stormwater (stormwater that does not have a significant potential to come in contact with pollutants from project operations) from the project site will be sent to two stormwater retention structures with a combined capacity of 31,000 gallons. These retention structures will retain the first 0.75 inches of stormwater runoff prior to release to the existing stormwater conveyance system as per the Standard Urban Storm Water Mitigation (SUSMP) requirements called for under Los Angeles County Municipal NPDES Permit. These retention structures will hold a volume of water greater than the increase in peak flow as compared to the existing condition. Therefore, off-site facilities will not experience any increase in peak flow as a result of the project.

Contact stormwater (stormwater that does have a significant potential to come in contact with pollutants from project operations) will be impounded, tested and pumped to the appropriate discharge facilities.

The process wastewater system will collect wastewater produced from the project equipment, including the water treatment system. The drainage from equipment drains will be collected in a sump and passed through an oil/water separator prior to being combined with the cooling tower blowdown for discharge. The combined wastewater will be processed through a three inch Parshall Flume to monitor flow and then discharged to the Sanitation District sewer system. The estimates of wastewater quality are shown in **Soil and Water Table 5** and indicate the wastewater will meet the NPDES permit requirements of CSDLAC.

The wastewater volumes expected from the MGS based on average conditions are shown in **Soil and Water Table 4** below.

**Soil and water Table 4  
Wastewater Volumes**

<b>Wastewater Type</b>	<b>Estimated Quantity (Gallons per day)</b>	<b>Operational Process</b>
Cooling Tower Blowdown	304,000	Blowdown from cooling tower
Electrodialysis–Cell Condensate	2,000	Demineralized Water Treatment
Boiler Blowdown	10,000	Heat Recovery Steam Generator
Equipment Drains	7,000	Maintenance
<b>TOTAL</b>	<b>323,000</b>	<b>Overall</b>

Source: Table 8.14-4, (COV 2001a)

The estimated discharge concentrations from the MGS and the discharge requirements of the CSDLAC are shown in **Soil and Water Table 5** below. Staff has received a copy of a will-serve letter from the CSDLAC indicating they are willing to accept the wastewater from MGS and that the trunk sewer and treatment facility have adequate capacity to handle the discharge.

**Soil and water Table 5  
Estimated process Wastewater Quality and CSDLAC Requirements**

<b>Constituent</b>	<b>Estimated Discharge Concentration (mg/L)</b>	<b>CSDLAC Discharge limits (mg/L)</b>
Chemical Oxygen Demand	150	No limit
Total Suspended Solids	60	No limit
Arsenic	0.008	3
Cadmium	0.14	15
Chromium	0.14	10
Copper	0.14	15
Cyanide (total)	0.04	10
Lead	0.07	40
Mercury	0.0004	2
Nickel	0.5	12
PH	6.5 to 9 (pH units)	>6.0 (pH units)
Silver	0.04	5
Sulfide, dissolved	Not Detectable (<0.01)	0.1
Temperature	95°F	<140°F
Total Identifiable Chlorinated Hydrocarbons	None – Not Detectable	None
Zinc	0.4	25

Source: Table 8.14-5, (COV 2001a)

# ANALYSIS AND IMPACTS

## ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>SOIL AND WATER RESOURCES -- Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?			<b>X</b>	
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)?			<b>X</b>	
c) Substantially deplete or degrade local or regional surface water supplies, particularly fresh water, or fail to implement reasonable alternatives for water conservation?			<b>X</b>	
d) 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?		<b>X</b>		
e) 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?				<b>X</b>
f) 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?				<b>X</b>
g) Otherwise substantially degrade water quality?		<b>X</b>		
h) 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?				<b>X</b>
i) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				<b>X</b>
j) 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?				<b>X</b>
k) Inundation by seiche, tsunami, or mudflow?				<b>X</b>



## DISCUSSION OF IMPACTS

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### Would the project:

#### **a) Violate any Water Quality or Wastewater Standards**

As proposed, the MGS will dispose of process wastewater by discharging wastewater to the CSDLAC. The applicant has provided a copy of the draft Industrial Wastewater Discharge Permit Application (COV 2001a, Appendix P) to the CEC. An approved Industrial Wastewater Discharge Permit will be required as **Condition of Certification Soil & Water 6**.

The applicant has proposed discharge of all non-contact storm water to the existing stormwater conveyance system. This design will require the project owner to develop and abide by a Storm Water Pollution Prevention Plan (SWPPP) for construction and Industrial Activities under the National Pollution Discharge Elimination System (NPDES).

The MGS will be required to comply with the general NPDES storm water permit requirements that regulate storm water effluent limitations and monitoring and reporting requirements for both construction activities, and industrial (operational) activities. MGS has supplied a Notice of Intent (NOI) to the SWRCB to operate under both General NPDES Storm Water Permits for Construction and Industrial Activities. **Conditions of Certification SOIL & WATER 2 and 3** require the applicant to gain coverage under both General NPDES Permits prior to site mobilization and prior to operation, respectively.

Less than significant impacts are expected to water quality from the MGS as a result of Compliance with LORS.

#### **b) Deplete Groundwater Supplies**

The MGS does not propose to pump groundwater as a water source. However, the potable water supplied by the city of Vernon is partially made up from groundwater. Staff has received a copy of a Will-Serve letter from the City of Vernon Department of Community Services & Water which states they have adequate volume to supply the potable water needs including a maximum nine-day per year emergency back-up for process water needs. The potable water requirements of the MGS are small and a less than significant fraction of the City of Vernon potable water supply. **Conditions of Certification SOIL & WATER 5** will restrict the amount of potable water used for process water in the MGS. Therefore, less than significant impacts are expected to groundwater supply from the MGS.

#### **c) Deplete or Degrade Surface Supplies or Fail to Implement Reasonable Alternatives For Water Conservation**

The MGS will use reclaimed water as its primary source of process water. Therefore, less than significant impacts are expected to surface water supplies.

#### **d) Alter the Existing Drainage or Cause Erosion**

During construction of the facility, 3.4 acres (of a 5.9 acre parcel used for electrical generation) of land will be disturbed. The disturbed area will be subject to wind and water erosion until surface cover comprised of pavement or gravel is in place. The applicant has provided a Draft SWPPP for Construction Activity as required in a NPDES permit for construction activity.

The MGS development will alter drainage patterns on-site through creation of swales and stormwater retention structures. Existing roadways and utility right-of-ways will be used in the installation of linear facilities to the maximum extent possible.

Best Management Practices (BMPs) will be employed to minimize erosion during and after construction.

The project owner must obtain a General NPDES Storm Water Permit for Construction Activity.

The implementation of a SWPPP, BMPs and LORS compliance as required in **Conditions of Certification Soil & Water 2 and 3** will mitigate potential impacts to less than significant.

#### **e) Alter a Watercourse or Increase Surface Water Runoff**

Drainage of the MGS site has been designed to meet the requirements of the SUSMP of Los Angeles County. As designed, the stormwater retention structures have adequate storage capacity to prevent any increase in surface run-off or peak flow from the site from a 50-year storm event.

There are no on-site surface water features that will be affected through surface drainage or run-off from the MGS site, and therefore, no significant impacts are expected.

#### **f) Create Runoff that Exceeds Storm Water Drainage Capacity**

Preventive measures to avoid pollution of stormwater include separation of stormwater into two classes. Stormwater from facility contact areas will be collected and routed for treatment using an oil-water separator before being discharged to the sewer system or stored for off-site disposal. Stormwater from other non-contact areas will be discharged directly to the stormwater retention structures prior to release to the existing stormwater conveyance system. The implementation of the SUSMP measures will prevent an increase in the runoff from that of the existing condition.

No significant impacts are expected.

#### **g) Degrade Water Quality**

The project's wastewater will be disposed of in accordance with applicable laws (see sections a) and d) above). In addition, hazardous materials stored at the MGS site will be contained within storage sheds and isolated using secondary containment structures as spill protection. During construction stormwater will be managed consistent with

requirements of the General NPDES Permit for Discharge of Storm Water Associated with Construction Activity. Best Management Practices will be employed to mitigate any potentially significant adverse impacts to a level of insignificance. During operations the precautions outlined in a) through d) above will be employed.

Please refer to the **Waste Management** and **Hazardous Materials Management** sections for more detail about storage, handling, use and spill prevention practices which will be employed at the MGS.

**Conditions of Certification Soil & Water 2 and 3** have been included to ensure compliance with LORS. The implementation of LORS and BMPs will reduce the potential for adverse impacts to water quality to less than significant.

#### **h) Place Housing Within a 100-Year Flood Hazard Area**

The MGS development will not increase the risk to housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map. The MGS is not within any FEMA flood hazard area (COV, 2001a). No significant impacts are expected.

#### **I) PLACE STRUCTURES THAT WOULD IMPEDE OR REDIRECT FLOOD FLOWS WITHIN A 100-YEAR FLOOD HAZARD AREA**

See h) above. No significant impacts are expected.

#### **j) Expose Persons or Property to Flood Hazards**

The MGS will not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of failure of a levee or dam. All storage facilities included in the project development are of minimal size, and will be designed according to applicable building codes. No significant impacts are expected.

#### **k) Expose Persons or Property to Inundation by Seiche, Tsunami, or Mudflow**

The flat terrain in the area precludes landslides. Due to the elevated inland location and proximity of the site from any large bodies of impounded water, tsunamis and seiches do not appear to pose a potential hazard to the project (COV 2001a, Appendix C). No significant impacts are expected.

## **CUMULATIVE IMPACTS**

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The area surrounding the MGS site is primarily industrial.

Construction and operational activities related to the MGS project may cause a short-term increase in cumulative wind and water erosion. However, implementation of the conditions of certification will ensure that MGS will not contribute significantly to cumulative erosion and sedimentation impacts during construction and operation. The project will use reclaimed water for cooling and will not affect potable or fresh water supply. Staff concludes there will be no significant cumulative impacts to soil and water resources.

## COMPLIANCE WITH LORS

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During construction of the facility, 3.4 acres (of a 5.9 acre parcel used for electrical generation) of land will be disturbed. The disturbed area will be subject to wind and water erosion until surface cover comprised of pavement or gravel is in place.

The MGS development will alter drainage patterns on-site through creation of swales and stormwater retention structures. Existing roadways and utility right-of-ways will be used in the installation of linear facilities to the maximum extent possible.

The applicant has proposed discharge of all non-contact storm water to the existing stormwater conveyance system. This design will require the project owner to develop and abide by a Storm Water Pollution Prevention Plan (SWPPP) for construction and Industrial Activities under the National Pollution Discharge Elimination System (NPDES).

The MGS will be required to comply with the general NPDES storm water permit requirements that regulate storm water effluent limitations and monitoring and reporting requirements for both construction activities, and industrial (operational) activities. MGS has supplied a Notice of Intent (NOI) to the SWRCB to operate under both General NPDES Storm Water Permits for Construction and Industrial Activities. **Conditions of Certification SOIL & WATER 2 and 3** require the applicant to gain coverage under both General NPDES Permits prior to site mobilization and prior to operation, respectively.

Preventive measures to avoid pollution of stormwater include separation of stormwater into two classes. Stormwater from facility contact areas will be collected and routed for treatment using an oil-water separator before being discharged to the sewer system or stored for off-site disposal. Stormwater from other non-contact areas will be discharged directly to the stormwater retention structures prior to release to the existing stormwater conveyance system. The implementation of the SUSMP measures will prevent an increase in the runoff from that of the existing condition.

The project's wastewater will be disposed of in accordance with applicable laws. In addition, hazardous materials stored at the MGS site will be contained within storage sheds and isolated using secondary containment structures as spill protection. During construction stormwater will be managed consistent with requirements of the General NPDES Permit for Discharge of Storm Water Associated with Construction Activity.

As proposed, the MGS will dispose of process wastewater by discharging wastewater to the CSDLAC. The applicant has provided a copy of the draft Industrial Wastewater Discharge Permit Application (COV 2001a, Appendix P) to the CEC. An approved Industrial Wastewater Discharge Permit will be required as **Condition of Certification Soil & Water 6**.

Please refer to the **Waste Management** and **Hazardous Materials Management** sections for more detail about storage, handling, use and spill prevention practices which will be employed at the MGS.

The project as proposed, will comply with LORS provided the applicant's proposed mitigation and staff's recommended Conditions of Certification are implemented.

## **FACILITY CLOSURE**

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The MGS has an expected life of 30 years. Closure options range from "mothballing," with the intent of a restart at some time, to the removal of all equipment and facilities.

A decommissioning plan is required to be submitted to the Energy commission for approval prior to decommissioning. Compliance with all applicable LORS will be required.

## **RESPONSE TO AGENCY AND PUBLIC COMMENTS**

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No agency or public comments were received in the area of soil and water resources.

## **MITIGATION**

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### **APPLICANT PROPOSED MITIGATION**

Best management practices will be followed throughout the Project to minimize wind or water erosion. Temporary erosion control measures will be installed prior to construction and will be removed from the site after the completion of construction. Erosion and sedimentation control measures may include but are not limited to use of sand bags, mulches, protective coverings like jute or rip-rap, installation of culverts, installation of sedimentation basins, and construction of water diversions or water bars. Active construction areas will be wetted with water or by applying commercial dust palliative (soil binders) as necessary to prevent significant erosion. Construction activities will be monitored for dust emissions and for soil runoff. Monitoring will be visual and use instrumentation such as dust monitors, as appropriate. Following construction, the site will be surfaced to prevent soil erosion. During power plant operation, monitoring of storm water runoff will be conducted. Following closure, the site will be graded to drain and periodic monitoring will be done.

Proper implementation of Best Management Practices (BMPs) during construction and throughout Project operation (e.g., spill prevention and control, preventative maintenance, hazardous materials management), as well as adherence to all applicable codes and permits, will help minimize the potential for contamination of groundwater. No significant impacts to groundwater are anticipated.

As discussed in Section 8.9 (of the AFC), Agriculture and Soils, impacts to surface water from erosion are expected to be minimal during construction. Erosion will be controlled in accordance with a SWPPP as presented in Section 8.14.2.2 and an Erosion Control Plan as discussed in Section 8.9.2.2 (Agriculture and Soils; Construction) and a SWPPP. In addition, all operational activities will comply with SUSMP requirements called for under Los Angeles County Municipal NPDES Permit.

Permanent erosion control measures are discussed in Section 8.9.3.4 (of the AFC) (Agriculture and Soils; Permanent Erosion Control Measures) and include drainage systems. Operation of the facility will be in conformance with the California NPDES General Permit for Storm Water Discharge Associated with Industrial Activities (SWRCB, 1997). In accordance with this permit, an industrial SWPPP will be developed, and BMPs will be implemented to control pollutants in storm water discharges. BMPs will include refueling and maintenance of equipment only in designated lined and/or bermed areas, isolating hazardous materials from storm water exposure, and preparing and implementing spill contingency plans in specified areas. With proper implementation of these and other BMPs in the SWPPP, no significant impacts to surface water quality are anticipated during the long-term operation of the facility (COV 2001a).

## **CEC STAFF PROPOSED MITIGATION**

Project design and construction practices will minimize soil erosion during construction and operation of all MGS facilities. Soil erosion will be minimized by implementing recommendations of the Caltrans Storm Water Quality Handbook, Construction Site Best Management Practices. Best Management Practices will be implemented during construction according to specifications contained in a SWPPP prepared for the project prior to the start of construction.

## **CONCLUSIONS**

Staff has determined the proposed project will result in less than significant impacts to soil and water resources. Staff recommends approval of the MGS, provided the proposed Conditions of Certification are required. Staff does not recommend the adoption of this project without the following conditions.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**SOILS & WATER 1:** Prior to beginning any site mobilization activities associated with construction of any project element, the project owner shall obtain Energy Commission Compliance Project Manager (CPM) approval for a site specific Erosion Control and Sedimentation Plan that addresses all project elements.

**Verification:** No later than sixty days prior to the start of any site mobilization activities associated with any project element, the Erosion Control and Sedimentation Plan shall be submitted to the CPM for approval. The plan shall be provided to the City of Vernon for approval comments, and shall conform to all applicable city and county requirements. Approval of the final plan by the CPM must be received prior to the initiation of any site mobilization activities associated with construction of any project element.

**SOILS & WATER 2:** The project owner shall comply with all of the requirements of the NPDES general permit for storm water discharges associated with construction activities for MGS. The project owner, as required under the General Construction Activity Storm Water Permit, will develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the entire project. Prior to beginning any site mobilization activities associated with construction of any

project element, the project owner shall obtain Energy Commission CPM approval of the project-specific construction activity SWPPP.

**Verification:** Sixty days prior to the start of any site mobilization activities associated with the construction of any project element, the project owner shall submit a copy of the SWPPP that address final design, to the CPM for review and approval. Approval of the plan by the CPM must be received prior to the initiation of any site mobilization activities associated with construction of any project element.

**SOIL & WATER 3:** The project owner shall comply with all of the requirements of the NPDES general permit for storm water discharges associated with industrial activities of MGS. The project owner, as required under the General Industrial Permit, will develop and implement a Storm Water Pollution Prevention Plan for the operation of the power plant. The project owner must obtain approval of the General Industrial Activities SWPPP from the Energy Commission CPM prior to commercial operation of the MGS.

**Verification:** No later than sixty days prior to the start of power plant operation, the project owner will submit a copy of the SWPPP, that addresses final project design, prepared under requirements of the General Industrial Activity Storm Water Permit to the CPM for approval. Power plant operations will not start until the industrial SWPPP has been approved by the CPM.

**SOIL & WATER 4:** The project owner shall install metering devices and record on a monthly basis the amount of water, listed by source (potable and reclaimed), used by the project. The annual summary shall 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. The annual summary shall also include the yearly range and yearly average water use by the project. This information shall be supplied to the CPM.

**Verification:** The project owner shall submit, as part of its annual compliance report, a water use summary to the CPM on an annual basis for the life of the project.

**SOIL & WATER 5:** The project owner shall not use potable water for process cooling water for more than nine days (216 hours) annually.

**Verification:** The project owner shall include a detailed summary of all potable water and reclaimed water used for process water in the Annual Compliance Report.

**SOIL & WATER 6:** Prior to the start of operation the project owner shall submit a copy of an approved Industrial Wastewater Discharge Permit for the process wastewater produced at the MGS.

**Verification:** The project owner shall submit a copy of the approved Industrial Wastewater Discharge Permit to the CPM 60 days prior to the start of operations.

## REFERENCES

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California Energy Commission (CEC)/Bill Pfanner 2001a. Library Letter. Dated 12/21/01 and docketed 12/21/01.

California Energy Commission (CEC)/Paul Richins 2001b. Notice of Receipt. Dated 12/21/01 and docketed 12/21/01.

California Energy Commission (CEC)/Bill Pfanner 2001c. Request for Agency Participation in the Review of the City of Vernon project. Dated 12/21/01 and docketed 12/21/01.

California Energy Commission (CEC)/Bill Pfanner 2001d. Public Participation in the Review of the City of Vernon project. Dated 12/21/01 and docketed 12/21/01.

California Energy Commission (CEC)/Bill Pfanner 2002e. Power plant proposal site in the area. Dated 1/10/02 and docketed 1/10/02.

California Energy Commission (CEC)/Bill Pfanner 2002f. Power plant site proposal in area. Dated 1/10/02 and docketed 1/10/02.

California Energy Commission (CEC)/Bill Pfanner 2002g. Power plant site in your area. Dated 1/11/02 and docketed 1/10/02.

California Energy Commission (CEC)/Bill Pfanner 2002h. Data Adequacy Recommendation for Vernon. Dated 1/16/02 and docketed 1/16/02.

California Energy Commission (CEC)/Bill Pfanner 2002i. Library Letter for AFC Supplement. Dated 5/8/02 and docketed 5/8/02.

California Energy Commission (CEC)/Bill Pfanner 2002j. City of Vernon-Data Requests. Dated 5/23/02 and docketed 5/23/02.

California Energy Commission (CEC)/James D. Boyd/Robert Pernell/Bill Pfanner 2002k. Notice of Public Informational Hearing & Site Visit. Dated 5/8/02 and docketed 6/3/02.

California Energy Commission (CEC)/Bill Pfanner 2002l. Data Response/Issue Resolution Workshop. Dated 7/1/02 and docketed 6/20/02.

California Energy Commission (CEC)/Bill Pfanner 2002m. Vernon Issues Identification Report. Dated 6/21/02 and docketed 6/21/02.

City of Vernon (COV) 2001a. Application for Certification. Dated 12/18/01 and docketed 12/21/01.

City of Vernon (COV) 2002a. Zip Code listing. Dated 2/8/02 and docketed 2/8/02.

City of Vernon (COV) 2002b. Cumulative Assessment Foreseeable Local Sources. Dated 4/2002 and docketed 4/17/02.



City of Vernon (COV)/Bruce Malkenhorst 2002c. Waiver of 45-day Time Period for Information Hearing. Dated 5/21/02 and docketed 5/22/02.

City of Vernon (COV)/Kenneth J. DeDario 2002d. Request for Additional Time to provide information requested by CEC. Dated 5/30/02 and docketed 5/31/02.

City of Vernon (CEC) 2002e. Information Requested in the CEC's Data Requests.. Dated 6/18/02 and docketed 6/19/02.

City of Vernon (CEC) Bruce Malkenhorst 2002f. Informational Hearing for Data Requests. Dated 7/10/02 and docketed 7/11/02.

City of Vernon/Malkenhorst (CEC) 2002a. Supplemental Proof of Service for Applicant's Submission of Data in Resoponse to Requests for CEC pursuant to Title 20, Calif Code of Regulations, Sec. 1719 and 2025 POS. Dated 6/24/02 and docketed 6/20/02.

County of Los Angeles Fire Department (LAFD) 2002a. Environmental Impact Report. Dated 2/8/02 and docketed 2/13/02.

James D. Boyd/Robert Pernel (CEC)/Bill Pfanner 2002a. Committee Scheduling Order. Dated 7/8/02 and docketed 7/9/02.

South Coast Air Quality Management District (SCAQMD) 2002a. Permit Applications for Proposed Malburg Generating Station. Dated 1/3/02 and docketed 1/8/02.

U.S. Fish and Wildlife Service (USFWS) 2002a. Informal Section 7 Consultation for the Malburg Generating Station. Dated 2/4/02 and docketed 2/13/02.

# TRAFFIC AND TRANSPORTATION

Testimony of James Fore

## INTRODUCTION

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The Traffic and Transportation Section of this staff assessment provides an independent analysis of the transportation systems in the vicinity of the Malburg Generating Station (MGS). It addresses the City of Vernon Application for Certification (AFC) for the construction and operation of the MGS.

Staff has analyzed the information provided by the AFC and other sources to determine the potential for the MGS to have significant traffic and transportation impacts, and has assessed the availability of mitigation measures that could reduce or eliminate the significance of those impacts. Potential impacts related to traffic operation and safety hazards resulting from the construction and operation of the project are discussed.

Proposed conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations and Standards (LORS).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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Federal, state, and local regulations applicable to the area roadways and for the transportation of hazardous materials are listed below. These regulations ensure public safety and are implemented to control and mitigate potential impacts arising from the construction, operation and transportation of hazardous materials related to the MGS. The applicant has indicated its intent to comply with all federal, state, and local regulations.

### FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- 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

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and rights-of-way. In addition, the California Health and Safety Code address the transportation of hazardous materials. Provisions within the California Vehicle Code are:

- Section 353 defines hazardous materials. Sections 31303-31309 regulate the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- 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 Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.

California Street and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulate right-of-way encroachment and the granting of permits for encroachments on state and county roads.

All construction within the public right-of-way will need to comply with the “Manual of Traffic Controls for Construction and Maintenance of Work Zones” (Caltrans, 1996).

## **LOCAL**

The City of Vernon General Plan (VGP) Infrastructure Element contains goals for long term maintenance and improvement of streets that would be required to support the development envisioned by the Land Use Policy Map of the General Plan. Although no applicable traffic and transportation policies are identified in the Infrastructure Element it does contain a Circulation Element. The Circulation Element indicate the general location and extend of existing and proposed major thoroughfares, transportation routes, terminals and other utilities and facilities that are correlated to the Land Use Element of the General Plan.

The City of Vernon General Plan requires projects to comply with the goals and policies of the Infrastructure Element. The city's transportation goals are to:

- Provide a balanced transportation system for the safe and efficient movement of people, goods, and emergency services throughout the city.
- Ensure the provision of adequate off-street parking and loading facilities for each business.

The City of Vernon Department of Community Services and Water requires an Encroachment Permit and a Traffic Control Plan (TCP) for any project that requires excavation in the city streets. The City of Vernon Police Department requires temporary hauling permits for oversized or overweight vehicles.

## SETTING

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### REGIONAL DESCRIPTION

The City of Vernon is located approximately three miles southeast of downtown Los Angeles in central Los Angeles County. Since the City of Vernon is located in the greater Los Angeles metropolitan area there are a number of communities within one mile of the project. These communities include the City of Los Angeles to the north and west, Huntington Park on the south, and Maywood to the east.

#### ***Regional Freeways***

There are several transportation corridors that serve the City of Vernon. The major freeways in the area that provide regional access to the site are the Santa Monica/San Bernardino Freeway (I-10), the Golden State Freeway (I-5), Harbor Freeway (I-110), and the Long Beach Freeway (I-710).

**U.S. Interstate 10 (I-10)** - I-10 is known as the Santa Monica/San Bernardino Freeway. This freeway is an east-west freeway located north of the City of Vernon. This freeway provides access to Santa Monica on the West Side of Los Angeles and east to East Los Angeles, San Bernardino, and beyond.

**U.S. Interstate 5 (I-5)** - I-5 is known as the Golden State Freeway. This freeway is a north-south freeway providing access to northern California, the coastal communities located on the West Side of Los Angeles and south to San Diego.

**U.S. Interstate 110 (I-110)** - I-110 is known as the Harbor Freeway. This freeway is a north-south freeway providing access to the center of Los Angeles and south to the community of San Pedro and to the Los Angeles port facilities.

**U.S. Interstate 710 (I-710)** - I-710 is known as the Long Beach Freeway. This is a north-south freeway providing access north to East Los Angeles and south to the community of Long Beach.

## **LOCAL SETTING**

The City of Vernon was incorporated in 1905 as an industrial city. The city has over 1,200 businesses that would be classified primarily as industrial within its 5.2 square miles. These businesses provide employment for more than 50,000 individuals (COVWS).

California's Department of Finance estimates that the City of Vernon has a resident population of 93 with 26 housing units as of January 1, 2002. The City has proposed the MGS project, which will be located at the City's existing Station A generating facility. Station A is located in an industrial area at 2715 East 50<sup>th</sup> Street. The MGS facility will require approximately 3.4 acres of Station A's 5.9 acres site.

Construction activity for the MGS and its associated linears will take approximately 16 months. The construction workforce for the MGS will average 108 workers with a peak workforce of 179 in the eighth month after the start of construction. The linears (natural gas, sewer, and reclaimed water pipelines) will require approximately two months for construction and a workforce of 70.

### **Local roadways**

Access to the site from the north or south can be obtained via Alameda Street, Santa Fe Avenue, Soto Street, Downey Road, and Atlanta Street. From the east or west access to the site can be obtained via Bandini Boulevard, Slauson Avenue, and District Boulevard. These roadways are classified as arterial streets within the City of Vernon. Other roadways in the vicinity of the project that could be affected by construction traffic or activity are Fruitland Avenue, Alcoa Avenue, Seville Avenue, 50<sup>th</sup> Street, Boyle Avenue, State Street, Randolph Street and Newell Street.

### **Bicycle Facilities**

There are no bicycle lanes or paths in the vicinity of the MGS.

## **PUBLIC TRANSPORTATION**

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Public transportation via bus and rail is available in the vicinity of the MGS. The construction of the MGS will not significantly affect the area's public transportation. The construction of linears will have traffic implications for some of the area bus routes.

### **Bus Routes**

The Southern California Rapid Transit District (SCRTD) provides bus service for the city of Vernon. The following Bus Routes serve the area around the MGS:

- Bus Route 60 on Pacific Avenue,
- Bus Route 105 on Leonis Avenue,
- Bus Route 251 and 252 on Soto Street,
- Bus route 254 Boyle Avenue/State Street, and
- Bus Route 108 Slauson Avenue.

The construction of the reclaimed water pipeline will affect Routes 251 and 252 when construction occurs at the intersection of 50<sup>th</sup> and Soto Avenue. Bus Route 254 that runs along Boyle Avenue/State Street will be affected when construction activity for the reclaimed water pipeline occurs on Boyle Avenue/State Street. There are no bus stops in the area of construction activity.

### **Passenger Rail**

The nearest Metro Rail Service is located west of the site along Long Beach Avenue. This line is approximately two miles from the facility and will not be affected by activity at the MGS during construction or operation.

### **Railroads**

Union Pacific, Southern Pacific, and Santa Fe Railroads provide area rail service. The Southern Pacific line follows Alameda Street and the Union Pacific line follows Downey Road. Although the MGS does not have direct access to a railroad line there are several rail spurs and a branch line in the vicinity of the MGS that serve the area's industrial and commercial activities.

### **Airports**

There are regional airports in the area of the proposed MGS (i.e., Los Angeles International Airport, Long Beach Municipal Airport Compton Airport, and the Burbank-Glendale-Pasadena Airport). These airports are located 7 to 20 miles from the proposed MGS. Therefore, these airports are not located close enough to the MGS to be affected by construction activity or its operation.

## **PLANNED ROADWAY AND TRANSIT IMPROVEMENTS**

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The Cities of Vernon, Maywood and Huntington Park have indicated that no new or planned transportation/construction activity is planned in the area that would impact construction traffic for the MGS.

## **PROJECT DESCRIPTION**

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### **PROJECT SITE**

The City of Vernon has submitted an AFC for the construction of a new electrical generating facility. This facility will be a 134 megawatt combined cycle power plant. It will consist of two gas turbine generators and a steam turbine generator.

### **PROJECT LINEAR FACILITIES**

The project will require the construction of three underground linear facilities to support the generating facility. The linears will include a 1,100 feet of a natural gas fuel pipeline, a reclaimed water pipeline of approximately 9,650 feet, and a 1,100 feet of sewer pipeline. All construction activity for the facility and its associated linears will occur within Vernon's city limits except for the reclaimed water pipeline. This pipeline will originate along Vernon's southern border with the City of Huntington Park.

The construction activity associated with the pipeline linears will be in the City of Vernon and the Vernon/Huntington Park roadways. The underground pipeline installations will require temporary roadway lane closures. The natural gas and sewer pipelines will be placed in Seville Avenue running from the MGS to the intersection of Seville and Fruitland Avenues a distance of approximately 1,100 feet. Construction of the natural gas and sewer pipelines along Seville Avenue will require the closure of one lane. The construction activity will not result in a significant affect on traffic because of:

- The low traffic volume on Seville Avenue,
- Construction activity along Seville Avenue will be limited to 500 feet at a time, and
- Construction activity at the intersection of Fruitland and Seville Avenues will be undertaken at night to minimize traffic effects.

Construction activity for the reclaimed water pipeline in the City of Vernon will directly affect Seville Avenue, 50<sup>th</sup> Street, and Boyle Avenue. In the City of Huntington Park, State Street, and Randolph Avenue will have construction activity occurring in the roadway. The reclaimed water pipeline route will run through industrial/commercial areas, with a residential area located south of Randolph Street in the City of Huntington Park.

The reclaimed water line will originate in the City of Huntington Park running west from Newell Street along Randolph Street for approximately 1,300 feet to State Street. Randolph Street is located along the northern edge of Huntington Park. At the intersection of Randolph Street and State Street the line will turn north for approximately one mile. State Street becomes Boyle Avenue when it crossed Slauson Avenue. The eastern portion of State Street is in the City of Vernon while the western portion is in the City of Huntington Park. The pipeline will continue on Boyle Avenue to 50<sup>th</sup> Street. At the intersection of 50<sup>th</sup> Street and Boyle Avenue the line will turn west on 50<sup>th</sup> Street to Seville Avenue, approximately 2,800 feet. At the intersection of Seville Avenue and 50<sup>th</sup> Street the reclaimed water line will turn north on Seville Avenue for approximately 350 feet to the MGS. The construction of the reclaimed water pipeline will affect not only the roadways referred to above but also 13 intersections and two at grade single-track railroad crossings.

The construction of the pipeline will result in lane closures. The construction activity will require the use of 10 to 16 feet of the roadway width. The applicant has indicated in the AFC that construction activity would normally affect no more than 500 feet of roadway length at a time.

## **CURRENT INTERSECTION AND ROADWAY OPERATING CONDITIONS**

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Level of service (LOS) is used in the evaluation of operational conditions for roadways and intersection. LOS "A" represents the best operating conditions with free flowing traffic, while a LOS "F" represents the worst, with heavy congestion and the potential for substantial delays. A LOS of C or D are usually considered acceptable because this level of service ensures an acceptable quality of service to the users.

The current roadway characteristics are shown in **Traffic and Transportation Tables 1 and 2, Existing Roadway Characteristics and Existing Intersection Capacity Utilization.**

**TRAFFIC AND TRANSPORTATION TABLE 1  
Existing Roadway Characteristics**

<b>Roadway Segment (Between Intersections)</b>	<b>Road Class</b>	<b>Number of Lanes</b>	<b>Design Capacity (C)</b>	<b>Current Volume (V)</b>	<b>V/C (1)</b>	<b>Current LOS (2)</b>	<b>Percent Trucks</b>
Bandini (Soto and Downey)	Major	6	48,000	17,100	0.36	A	24
Bandini (Downey and I-710)	Major	6	48,000	21,900	0.46	A	29
Leonis (Soto and Boyle)	Collector	4	24,000	12,700	0.53	A	11
Leonis (Boyle and Alcoa)	Collector	4	24,000	13,500	0.56	A	14
Leonis (Alcoa and Downey)	Collector	4	24,000	16,800	0.70	B	13
Fruitland (Soto and Boyle)	Collector	4	24,000	4,200	0.18	A	10
50 <sup>th</sup> Street (Soto and Boyle)	Local	2	12,000	3,700	0.31	A	11
Soto (Fruitland and Leonis)	Primary	6	48,000	26,000	0.54	A	10
Soto (Leonis and Vernon)	Primary	6	48,000	27,400	0.57	A	8
Soto (Vernon and Bandini)	Primary	6	48,000	34,000	0.71	C	10
Boyle (Fruitland and Leonis)	Secondary	4	24,000	12,500	0.52	A	6
Boyle (Leonis and Vernon)	Collector	4	32,000	3,300	0.10	A	8
Alco (Fruitland and Leonis)	Collector	4	32,000	2,700	0.08	A	13
Alco (Leonis and Vernon)	Collector	4	32,000	900	0.03	A	39
Downey (Fruitland and Leonis)	Primary	4	32,000	13,400	0.51	A	8
Downey (Leonis and Vernon)	Primary	4	32,000	18,800	0.59	A	11
Downey (Vernon and Bandini)	Primary	4	32,000	19,600	0.61	B	12

Source: AFC Table 8.10- Page 8.10-19.

(1) V/C = Volume (V)/Capacity(C) Ratio.

(2) Level of Service (LOS), determined on basis of V/C Ratio, describes operating conditions on the roadways. LOS "A" is generally free-flowing. LOS "E" represents capacity. LOS "C" and "D" are typical in urban conditions. LOS "F" represents severe congestion.

Table 1 indicates that the roadways are operating at acceptable levels in the City of Vernon. Table 2 indicates that the off ramp from I-710 at Bandini Avenue has a LOS of E. It is operating at a level near capacity during the morning ambient peak traffic hour between 7:00 a.m. and 9:00 a.m. The Atlantic and Bandini intersection is operating at a level greater than its capacity as indicated by the LOS of F during the afternoon ambient peak hour between 4:00 p.m. and 6 p.m. This intersection is located off of the I-710 Freeway.



**TRAFFIC AND TRANSPORTATION TABLE 2  
Existing Intersection Capacity Utilization (1)**

Intersection	Existing Typical Street Peak Hour (LOS) (2)	
	AM (LOS)	PM (LOS)
Soto and 37 <sup>th</sup> /Bandini Blvd.	0.79 (C)	0.96 (E)
Soto and Vernon	0.84 (D)	0.70 (B)
Soto and Leonis Blvd.	0.76 (C)	0.77 (C)
Soto and Fruitland	0.83 (D)	0.77 (C)
Boyle and Leonis	0.54 (A)	0.78 (C)
Boyle and Fruitland	0.68 (B)	0.65 (B)
Alcoa Avenue and Leonis Blvd.	0.56 (A)	0.53 (A)
Alcoa Ave. and Fruitland	0.43 (A)	0.44 (A)
Downey and Bandini	0.80 (C)	0.88 (D)
Downey and Vernon	0.65 (B)	0.73 (C)
Downey and District-Leonis	0.79 (C)	0.78 (C)
Downey and Fruitland	0.83 (D)	0.66 (B)
Atlantic and District Blvd.	0.60 (A)	0.86 (D)
I-710 SB off ramp and Bandini Blvd.	0.91 (E)	0.64 (B)
Atlantic and Bandini	0.71 (C)	1.015 (F)

Source: AFC Table 8.10-4 Page 8.10-21.

- (1) Intersection Capacity Utilization evaluates the existing volume to capacity ratio for each traffic lane group that is then used to determine a critical volume to capacity ratio for the overall intersection. LOS "A" indicates under capacity while a LOS "E" indicates the intersection is at capacity. A volume to capacity ratio greater than one, LOS "F", indicates over capacity.
- (2) The ambient peak hour traffic for the area occurs between 7:00 a.m. to 9:00 a.m. in the morning and in the afternoon between 4:00 p.m. and 6:00 p.m.

**Existing Truck Traffic**

The truck routes in the City of Vernon pass through a mixture of industrial and commercial areas. The major intersections along the routes are controlled by automatic traffic stoplights. The industrial activity in Vernon results in the area having a high level of truck traffic. Truck traffic on the local roadways reaches a high of 39 percent along a portion of Alcoa Boulevard with a low of 6 percent on Boyle Road, (see **TRAFFIC AND TRANSPORTATION Table 1 Existing Roadway Characteristics**). Since Vernon is an industrial city with no major residential or retail areas the truck traffic effects on local traffic do not present a significant concern. The fact that most of the local roadways and intersections have a low traffic volume to capacity ratio also helps diminish the impact associated with heavy truck traffic on the local roadways.

The City of Vernon uses the vehicle height, width, length, size, and load limitations that are set forth in Division 15 of the State Vehicle Code. Therefore, California Vehicle Code limits apply to all study roadways (including state routes). These limits are 20,000 pounds per axle and 10,500 pounds per wheel or wheels, on one end of the axle. The front steering axle load is limited to 12,500 pounds.

## **SIGNIFICANCE THRESHOLDS**

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In order to determine whether there is a potentially significant impact staff reviews the project in light of the following criteria found in the Appendix G of the California Environmental Quality Act (CEQA):

- Traffic levels, particularly any increase which is substantial in relation to the existing traffic load and capacity of the street system (i.e., results in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).
- Level of service standard established for roads or highways.
- Hazards due to a design feature (e.g., sharp curves or dangerous intersections).
- Emergency access.
- Parking capacity.

In the Construction Impacts section of this analysis, staff discusses the above items found in the traffic section of Appendix G. Although not an Appendix G item, staff also discusses the potential traffic and transportation impacts of oversize and overweight loads in the Construction Impacts section. Emergency access and parking capacity are discussed primarily in the Construction Impacts section, since potential impacts in those areas are most applicable to the Construction phases. Hazards to the public or the environment through the routine transportation of hazardous material, and changes to air traffic patterns are discussed in the Operations section since potential impacts in those areas more commonly occur when the generating facility is operating.

## **ANALYSIS AND IMPACTS**

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### **CONSTRUCTION PHASE**

In assessing the MGS's potential impact on the local transportation system, LOS measurements are used as the foundation for analytic evaluation. The LOS measurements represent the flow of traffic and range from A, free flowing traffic, to F, which is heavily congested and can result in substantial delays.

#### **Commute Traffic**

Construction of the MGS will take approximately 16 months. The construction workforce for the generating plant and its associated linears will average 108 workers over this period. The workforce for the plant will peak in the eighth month at 179 workers. The construction schedule calls for the workforce to work a five-day, eight-hours/day workweek. The work hours are expected to be from 7:00 a.m. to 3:30 p.m. This will allow for the workforce to travel to and from the site at off peak traffic hours for the community.

For the traffic analysis a worst-cast assumption has been made that the workers will drive (i.e., with a vehicle occupancy rate of 1.15 persons per vehicles) to and from the site during peak hours. The occupancy rate of 1.15 persons per vehicle is based on regional vehicle occupancy counts conducted by the consulting firm of Austin-Foust Associates, Inc. (AFC page 8.10-5). To determine the effect of construction traffic volume on the local roadways and intersections the peak work month of 179 workers was used. Based on the expected car pooling, single shift peak traffic volume of 156 vehicles arriving and departing from the site was estimated. This results in 312 employee daily commute trips.

The Los Angeles area population is substantial and the available labor pool is diverse. The workforce for construction is expected to come from communities around the MGS. The preferred commuting route will depend on the location of the construction workers' residences. The distribution of construction traffic on the area roadways was based upon observation of traffic patterns in the vicinity of the project site. Fifty percent of the traffic flow was assumed to come from the north on the I-710 Freeway and an additional 25 percent was expected to come from the south along the I-710 Freeway. This traffic would exit from the I-710 at the Atlantic/Bandini interchange. It was assumed that the remaining 25 percent of the construction traffic flow would originate from the area southwest of the site.

Traffic exiting from the I-710 Freeway can take either Bandini Boulevard to Downey Road or Soto Street or Atlantic Street to Fruitland Avenue in traveling to the plant site. The MGS construction workforce on average would add approximately 81 morning and afternoon vehicle trips and during the peak construction month 120 morning and afternoon vehicle trips to this intersection. Given the 7:00 a.m. to 3:30 p.m. construction shift time, these trips would occur outside of the ambient morning and evening peak traffic hours and would not result in a significant increase in volume. If overtime work is required during construction, the worker's overtime schedule should be set to avoid workers traveling to and from the vicinity of the plant site during ambient peak traffic hours.

### **Level of service (LOS)**

The I-710 south bound off ramp and Bandini Boulevard operates at a LOS E during the morning peak hour. During construction of the MGS it is estimated that this intersection would experience, an average of 61 additional vehicle trips while the plant is under construction. The peak construction month would generate 100 additional trips. The proposed construction work schedule results in these trips occurring before the intersection experiences its peak traffic. Therefore, the impact should not be significant.

The distribution for traffic associated with the construction of the MGS does not result in a decrease in the level of service for the area roadways. The LOS for area roadways that could be affected by the MGS is represented in **TRAFFIC AND TRANSPORTATION Table 1, Existing Roadway Characteristics**. As shown in **Table 1** many of the roadways in the vicinity of the MGS are operating at a LOS that indicates free flowing traffic. In an urban area with heavy traffic flow the LOS associated with the intersections is also a critical element of the roadway system to assure adequate travel capacity, maximizing safety and minimizing environmental impacts.

## **Truck Traffic**

Trucks will be used to deliver some of the heavy equipment, construction materials (e.g. concrete, wire, pipe, cable, and fuels), and hazardous materials. The major portion of trucks delivering materials to the construction site would be using either the I-5 or I-710 Freeways. Truck deliveries will be spread through out the day and are expected to occur between 7:00 a.m. and 3:30 p.m.

The applicant estimates that 250 major truck deliveries will be made to the project site, with a maximum of 38 truck deliveries per day during the peak month of construction. During the other months of construction truck traffic is estimated at six trucks per day. This increase is less than one percent for the area roadways. Therefore, the increase in construction truck traffic will not be significant.

To keep truck traffic to a minimum during construction the applicant plans to use rail service for the delivery of heavy equipment. The applicant will arrange for this equipment to be shipped to the nearest common shipping depot, where it will be off-loaded. The equipment will then be transported to the site or to one of the proposed laydown areas by trucks or heavy equipment haulers. The applicant estimates that approximately 174 pieces of equipment will be delivered by rail. Proposed condition of certification **TRANS-6** requires the applicant to make the necessary arrangement with the rail carrier for the delivery of the heavy equipment.

If the applicant must move oversize or weightloads on the roadway, the California Energy Commission, will require the applicant to comply with Caltrans and other relevant jurisdictions limitations, (see proposed condition of certification **TRANS-1**).

## **Offsite Laydown and Workers' Parking Areas**

The applicant plans to have two off-site laydown areas. One site is located west of the MGS site across Seville Avenue. This area is to be used for a construction office and a laydown area for both plant and pipeline construction material and equipment. The other proposed laydown/parking area is located southeast of the construction site across Soto Street. These sites are within a block of the project therefore the moving of material and equipment from the laydown sites to the project will have an insignificant impact on traffic.

The laydown/parking site off of Soto Street will not accommodate all of the construction workers during the busiest construction period. The applicant will require the construction contractor to locate additional off street parking facilities for the construction workers and bus them to the site, (see proposed condition of certification **TRANS-4**). This will not result in significant effects for traffic.

## **Roadway Conditions**

Construction activities associated with the MGS have the potential to damage the surface of local roadways affected by traffic flow and construction activity in the roadway. The applicant needs to establish the condition of the local roadways prior to the start of construction, as required in the proposed condition of certification **TRANS-7**. This road condition inventory should include the potential truck routes for the delivery of

equipment, supplies and material and those roadways where the laying of natural gas, reclaimed water and sewer pipelines will occur.

### Site Construction - Overall Traffic Impacts

Construction traffic traveling through the area intersections would not result in degraded levels of service, see Traffic and Transportation Table 3. The intersection of Atlantic and Bandini has a LOS E and would be operating at capacity during the afternoon project peak hour.

**TRAFFIC AND TRANSPORTATION TABLE 3  
Intersection Capacity Utilization With Project Traffic Added**

Intersection	Existing Project Peak Hour (LOS)	
	AM (LOS)	PM (LOS)
Soto and 37 <sup>th</sup> /Bandini	0.75 (B)	0.89 (D)
Soto and Vernon	0.80 (C)	0.65 (B)
Soto and Leonis Blvd.	0.73 (C)	0.72 (C)
Soto and Fruitland	0.78 (C)	0.71 (C)
Boyle and Leonis	0.52 (A)	0.72 (C)
Boyle and Fruitland	0.65 (B)	0.60 (A)
Alcoa Avenue and Leonis Blvd.	0.54 (A)	0.49 (A)
Alcoa Ave. and Fruitland	0.41 (A)	0.41 (A)
Downey and Bandini	0.76 (A)	0.81 (B)
Downey and Vernon	0.62 (B)	0.68 (B)
Downey and District-Leonis	0.75 (C)	0.72 (C)
Downey and Fruitland	0.79 (C)	0.61 (B)
Atlantic and District Blvd.	0.58 (A)	0.80 (C)
I-710 SB off ramp and Bandini Blvd.	0.87 (D)	0.60 (A)
Atlantic and Bandini	0.67 (B)	0.94 (E)

Source: AFC Table 8.10-4 Page 8.10-21.

To ensure that the MGS construction does not worsen the LOS of the area roadways and intersections, the proposed Condition of Certification **TRANS-5** requires a traffic control plan (TCP) that is not limited to, but addresses the following site construction issues:

- Establishment of construction work hours outside of peak traffic periods,
- Maintaining access to adjacent residential and commercial property,
- Off street employee parking in designated parking lots,
- Timing of the delivery for heavy equipment and building materials outside of the ambient peak hours,
- Signing, lighting and traffic control device placement (if required), and
- Maintenance of emergency access

### Linear Construction

The construction activity associated with the natural gas, sewer and reclaimed water pipelines will be in roadways and could result in decreasing the LOS. The roadway construction activity will also require encroachment permits from the Cities of Vernon and Huntington Park. The natural gas fuel and sewer pipelines will result in construction activity occurring on Seville Avenue. The reclaimed water pipeline will

result in construction activity in the following streets, Seville Avenue, 50<sup>th</sup> Street, Boyle Road, State Street, and Randolph Street. The applicant will be responsible for obtaining the necessary encroachment permits for construction activity taking place in the roadway, (see proposed condition of certification **TRANS-2**).

The construction activity in public streets will not result in significant effects for traffic if the applicant provides an effective TCP before construction starts, (see proposed condition of certification **TRANS-5**). The limited amount of roadway (500 feet) that will be under construction at any one time and the fact that construction activity on any portion of the roadways will be of very short duration, will result in a limited effect on traffic.

To ensure that the effects of linear construction activity are not significant staff has proposed mitigation measures and condition of certification **TRANS-5**. It requires the applicant to develop a traffic control plan to be followed prior to the start of construction. Linear construction related mitigation measures should include but not be limited to:

- Proper advanced notification should be provided to property owners likely to be affected.
- The notification should be followed by periodic updates on construction activity that would include the date when driveway obstruction would occur.
- For those business with heavy daily truck traffic the applicant should coordinate with the owners/representatives to develop temporary access schemes for various stages of the construction activity to allow the facilities to continue to operate with minimal disruption.
- For two-lane roadways at least one lane will remain open. In those roadways greater than two lanes at least two lanes will be open for traffic to travel in both direction.
- Implementing lower speed limits through the construction/work zones and utilizing the presents of law enforcement or flagman if necessary to ensure that motorists obey the reduced speed limit signs.
- Ensuring that adequate signing and appropriate traffic control devices are installed in the proper location to warn motorists of impending construction activity.
- For crossing intersections, advance notification in the form of roadside signs should be provided to the driving public that the particular intersection will be closed to traffic with information such as the anticipated time frame and duration of construction activity. Detour signs should be provided where appropriate to reroute traffic.
- Provide adequate illumination on the work zone under conditions of limited visibility such as night construction or inclement weather.
- Restricting linears construction work if necessary to off-peak or evening hours to avoid conflict with heavy traffic volume.

- Require construction personnel to wear reflectorized clothing or vests to ensure visibility by motorists.
- If sidewalk become occupied by the work area, a temporary pedestrian walkway should be constructed to maintain accessibility to the area.
- For those street with parking, signs should be posted well in advance to warn motorists that the parking lane will be closed between certain dates.

Staff also wants to ensure that the local roadways are returned to as near as original conditions as possible after construction activity and has proposed condition of certification **TRANS-7**.

### **Increase In Road Hazards**

There are no traffic hazards such as sharp turns or dangerous intersections in the area of the MGS. The only potential safety hazards for the project construction traffic is the number of railroad crossings in the vicinity of the project. The City of Vernon is an industrial city that has a number of rail lines. The rail tracks associated with main line traffic are equipped with railroad crossing gate arms and hazard lights. The other rail lines are spur lines serving the industrial activity in the City of Vernon. Most of these crossings have hazard lights only.

There are a few rail crossings that do not have crossing gate arms or hazard lights. These are spur lines serving specific industrial location in which traffic may be less than once per day. Staff's does not feel that this presents a significant hazard to the MGS traffic.

### **Emergency Access**

If roadways affected by construction are maintained at acceptable LOS the project should have adequate emergency access. The Vernon Fire Department provides fire protection and the city contracts with American Medical Responder (AMR) for paramedic support. Vernon has four fire stations with Station 2 being the closest to the project site. AMR also operates out of Station 2. Station 2 is located approximately one mile northwest of the site at 4305 Santa Fe Avenue. All linear construction activity that will occur in the roadways will be south of the project. Therefore, emergency access to the facility will not be impaired by linear construction activity.

To ensure that emergency access is not impaired the proposed condition of certification **TRANS-5** addresses the applicant need for a TCP that requires access for emergency vehicles be maintained.

### **Construction Phase Summary**

Traffic control mitigation measures such as requiring workforce arrival/departure at off-peak times and the corresponding proposed conditions of certification are found above under Site Construction - Overall Traffic Impacts and Linear Construction and in the Proposed Conditions of Certification. These conditions will ensure that the traffic counts, LOS and physical condition of the area roadways and intersections will not become worse as a result of the MGS. Implementation of an effective TCP as proposed

under condition of certification **TRANS-5** will guarantee that any increase in traffic related to MGS construction activity will result in a less than significant impact.

## **OPERATIONAL PHASE**

### **Commute Traffic**

The proposed project will require approximately 32 full time employees. There will be 24 employees during the day shift and four each for the two night shifts. The peak for the day shift when employees are coming and leaving the site. There would be a total of 28 vehicles in the morning (24 coming to the plant and four leaving). In the evening there would be four coming to the facility and 24 leaving the facility. This level of vehicle activity will have insignificant traffic effects.

### **Employee Parking**

Plant operation will require the addition of 32 full time employees. These workers will be spread over three shifts, which will necessitate no more than 24 new parking spaces. The existing Station A has ample parking spaces to accommodate on-site parking during operation.

### **Vapor Plumes**

Staff analysis indicates that the potential exists for vapor plumes to form during operation of the MGS. Visible plumes would occur during periods of cold weather or cool wet weather. Although the plume formation can occur during daytime or nighttime the conditions for the formation of visible plume formation will be most prevalent during the nighttime and early morning hours.

The concern for local traffic is the formation of ground fog associated with the plume. The plume analysis indicates that there would be no plume fogging at 100 meters or more from the cooling towers. Therefore, the local roadways that would be most affected by plume fogging would be on 50<sup>th</sup> Street, Seville Avenue and Leonis Avenue. Seville Avenue is located approximately 26 meters west of the cooling towers, 50<sup>th</sup> Street some 80 meters south of the cooling towers, and Leonis Avenue approximately 95 meters north of the cooling towers, (City of Vernon MGS Plume Analysis).

Any ground level fogging should not result in a significant impact on traffic because traffic activity around the MGS is mainly serving local industrial activity around the site. The amount of roadway to be affected by possible fogging is also very limited. To ensure that the affect of the vapor plume is insignificant, the applicant should consult with the City of Vernon traffic engineer to determine if signs would be required to warn motorist about the potential of fog.

### **Plume Implications for Air Traffic**

The MGS cooling tower can create a visible vapor plume. The maximum height of the cooling tower plume is approximately 235 feet (COV 2002e). Staff's plume fogging and shadowing analysis concluded that the plume would not result in any significant hazard to air traffic (CEC 2002).



## **Air Traffic Patterns**

The Federal Aviation Administration (FAA) in Title 14, Code of Federal regulations, Sections 77.21, 77.23, and 77.25 established standards for determining obstructions in navigable airspace. The MGS stack height of approximately 110 feet will not affect navigable air space. The nearest airport is the Compton Airport that is approximately 7.6 miles from the MGS site. Therefore, the stacks will not have a significant impact on air traffic patterns.

## **Transportation Of Hazardous Material**

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 handling and disposal of hazardous substances are addressed in Waste Management, Workers Safety and Fire Protection, and Hazardous Material sections of this report.

The transportation and handling of hazardous substances particularly associated with the operation can increase the potential for roadway hazard. During operations there will be truck deliveries of aqueous ammonia once a week. Based on the location of the potential supplier for the aqueous ammonia the delivery drivers are expected to use I-5 in traveling to the facility. The applicant has proposed the following travel route for the aqueous ammonia trucks. From I-5 the trucks would exit at the Garfield Exit traveling west on Telegraph Road, south on Garfield, west along Slauson Avenue, north on Soto Street and west on 50<sup>th</sup> Street to the MGS. This route is a designated truck route for the areas. During the Commission staff site visit it was noted in driving the proposed route, that trucks were actively using Slauson Avenue. However, there is some a concern about the use of this route, with respect to hazardous material transport.

- The applicant had identified 17 sensitive receptors within one-half mile of Slauson Avenue.
- This route passes through the community of Maywood where several retail strips are located along Slauson Avenue.
- Steve Steinbercher, Contract City Engineer for the City of Maywood, indicates that the LOS for Slauson Avenue within the City of Maywood is F.

In evaluating the roadways in the area during the site visit, it was felt that the applicant needed to look at alternate routes to ensure that the safest truck route for transporting hazardous materials is selected. In looking for alternative routes staff felt that either Bandini Boulevard or District Boulevard might be acceptable alternative route for the transporting of hazardous materials (Note: The Section on Hazardous Materials Management recommends the use of District Boulevard as the safest alternative). These roadways had less retail and commercial businesses located along the routes and few sensitive receptors were observed. The Applicant has agreed to review the aqueous ammonia truck delivery route (COV 2002e).

The potential impact of delivery of hazardous material to the plant can be mitigated to insignificance by the selection of an appropriate route and compliance with Federal and State standards established to regulate the transportation of Hazardous Substances.

The proposed condition of certification **TRANS-3** ensures that the applicant must be in compliance with the LORS for hauling of hazardous materials.

## **CUMULATIVE IMPACTS**

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Based on the current LOS for the area roadways, there will be adequate capacity to accommodate project construction traffic.

Section 8.10.4 of the AFC indicates that there are no other construction projects planned in the vicinity of the MGS project site.

## **ENVIRONMENTAL JUSTICE**

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Staff has reviewed Census 2000 information that shows the minority population is greater than fifty percent within a six-mile radius of the proposed MGS power plant (please refer to **Socioeconomics Figure 1** in this Staff Assessment), and Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Based on the Traffic and Transportation analysis, staff has not identified unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no traffic and transportation environmental justice issues related to this project.

The major traffic impact on the area will occur during the construction period. This impact is expected to be greatest for approximately three months out of the 16 months construction schedule when the workforce is at its maximum. The travel and transportation routes that are expected to be used will avoid direct movement through much of the area included within the six-mile radius of the project. The majority of traffic is expected to use I-5 or I-710 thereby minimizing travel on surface streets in the communities around the City of Vernon. The major travel on surface streets will be within the industrial areas in the City of Vernon.

## **FACILITY CLOSURE**

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The minimum design life of the power plant is expected to be 30 years. To ensure that the planned closure will be completed in a manner that complies with all LORS at least twelve months prior to the proposed decommissioning, the applicant shall prepare a Decommissioning Plan for the Energy Commission's review and approval. At the time of closure all then applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of closure for the MGS on traffic and transportation will be similar to those discussed for the construction of the project. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce some truck traffic impacts. At this time, no specific conclusions can be drawn about the effects of project closure on traffic and transportation.

## **COMPLIANCE WITH LORS**

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The applicant has stated their intentions to comply will all federal, state and local LORS. Several proposed conditions of certification have been made to ensure compliance with the LORS. Therefore, the project is considered consistent with identified LORS.

## **MITIGATION**

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The applicant needs to comply with all LORS relating:

- To the transport of hazardous materials,
- The transport of oversized loads,
- To ensure that the necessary encroachment and transportation permits are obtained and complied with for any construction activity within public right-of-way,

The applicant should also implement the following traffic and transportation mitigation measures:

- Use proper signs and traffic control measures in accordance with Caltrans, City of Vernon, and the City of Huntington Park requirements for linear construction projects and projects occurring during peak traffic hours;
- Coordinate construction activities with appropriate state, city and county departments in order to maintain traffic flow and safety;
- Enforce a policy that all project-related parking for plant construction or linears occurs in designated parking areas;
- Repair any roadway damage associated with the linears and the plant construction traffic. Any repair work required shall be coordinated with the appropriate city public works or planning departments; and
- Prepare a Traffic Control Plan subject to review by the Cities of Vernon, Maywood, and Huntington Park. The Traffic Control Plan (TCP) will need to cover traffic associated with both plant construction and the associated linears.

## **CONCLUSIONS AND RECOMMENDATIONS**

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Staff has concluded that the intersections and roadways that are operating at acceptable LOS will not see a decline in their LOS to unacceptable levels.

If the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur. Further, if staff's proposed conditions of certification are observed and properly implemented, the MGS will be in compliance with applicable laws, ordinances, regulations, and standards.

If the Energy Commission certifies the MGS, staff recommends that the Commission adopt its proposed conditions of certification.

## PROPOSED CONDITIONS OF CERTIFICATION

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**TRANS-1** The project owner shall comply with Caltrans and other relevant jurisdictions' limitations on vehicle sizes 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:** In the Monthly Compliance Reports, the project owner shall submit copies of any permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

**TRANS-2** The project owner or its contractor shall comply with Caltrans and other relevant jurisdictions' limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

**Verification:** In Monthly Compliance Reports, the project owner shall submit copies of permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

**TRANS-3** The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

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

**TRANS-4** During construction of the power plant and all related facilities, the project shall develop a parking and staging plan for all phases of project construction to enforce a policy that all project-related parking occurs on-site or in designated off-site parking areas.

**Verification:** At least 60 days prior to start of site mobilization, the project owner shall submit the plan to the (City and/or County) for review and comment, and to the CPM for review and approval.

**TRANS-5** The project owner shall consult with the City of Vernon and the City of Huntington Park, and prepare and submit to the CPM for approval of a construction traffic control plan and implementation program which addresses the following issues:

- Timing of heavy equipment and building materials deliveries;
- Redirecting construction traffic with a flagperson;
- Signing, lighting, and traffic control device placement if required;
- Need for construction work hours and arrival/departure times outside of peak traffic periods;
- Insure access for emergency vehicles to the project site;

- Temporary travel lane closure; and
- Access to adjacent residential and commercial property during the construction of all linears.

**Verification:** At least 30 days prior to site mobilization, the project owner shall provide to the CPM a copy of the referenced documents.

**TRANS-6** Prior to the start of site mobilization the project owner shall make all necessary arrangements to allow the use of the existing rail line for delivery of construction material and heavy equipment.

Protocol: The project owner shall reach an agreement with the owner of the rail line to permit the use of the line for the purpose described above.

**Verification:** At least 30 days prior to the start of site mobilization the project owner shall reach an agreement with the owner of the rail line for use of the line for the purpose described above.

**TRANS-7** Following construction of the MGS project, the applicant shall meet with the CPM and the Cities of Vernon and Huntington Park to determine if any action is necessary and develop a schedule to complete the repair of any roadways damaged due to project construction.

Prior to start of construction, the project owner shall photograph, videotape or digitally record images of the roadways directly adjacent to the project site and between the laydown area and project site. This would include the following roadway segments: Seville Avenue between the plant site and Fruitland Avenue, 50<sup>th</sup> Street between Seville Avenue and Boyle Road, Boyle Road between 50<sup>th</sup> Street and Slauson Avenue, State Street between Slauson Avenue and Randolph Street, and Randolph Street between State Street and Newell Street.

Protocol: The project owner shall provide the Compliance Project Manager (CPM), the Cities of Vernon and Huntington Park with a copy of these images. Prior to start of construction, the project owner shall also notify the Cities of Vernon and Huntington Park about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction related activities associated with other projects.

**Verification:** Within 30 days after completion of the project, the project owner shall meet with the CPM and the Cities of Vernon and Huntington Park to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from the Cities of Vernon and Huntington Park stating their satisfaction with the road improvements.

## REFERENCES

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City of Vernon (COV). 2001a. Application for Certification, Dated 12/18/01 and docketed 12/21/01.

City of Vernon (COV) 2002e. Information requested in the CEC's Data Request. Dated 6/18/02 and docketed 6/19/02.

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# TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

## INTRODUCTION

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The City of Vernon would deliver the electrical energy from the proposed Malburg Generating Station (MGS) to its utility customers through the City's existing 69 kilovolt (kV) transmission lines. No new transmission lines would be needed. As specified in the information from the applicant, the City of Vernon (COV), this city-owned municipal transmission system interconnects to the Southern California Edison (SCE) 69 kV transmission system at specific points outside the city limits (COV 2001a, page 5-1).

The purpose of this analysis is to assess the proposed transmission system for potential compliance with requirements concerning the field and non-field impacts of potential significance to human health and safety. If such compliance were established, staff would recommend approval with respect to the issues of concern in this analysis; if not, staff would recommend revisions as appropriate. Since (a) line electric fields depend directly on applied voltage and (b) the generated power will continue to be transmitted at the existing 69 kV, all voltage-related impacts would remain the same during MGS operations. Such voltage-related impacts are mostly generated by the electric field component of the line fields. The only line fields that would be changed by project operations are the magnetic fields whose magnitude directly varies with the current in the line. This staff analysis will focus on the following issues as related primarily to the physical presence of the transmission system to be used, or secondarily to the physical interactions of its electric and magnetic fields:

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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The design-related laws, ordinances, regulations and standards (LORS) that are discussed below by subject area are those that govern the physical impacts of the overhead transmission lines in general and the proposed project lines in particular. Staff assesses the potential for significance in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local jurisdictions require such lines to be located underground because of the potential for visual impacts on the landscape.

## **AVIATION SAFETY**

Any potential hazard to area aircraft would relate to the potential for collision in the navigable air space. The applicable federal LORS discussed below are intended to ensure the distance and visibility necessary to prevent such collisions.

### **Federal**

- Title 14, Part 77 of the Code of Federal Regulations (CFR), "Objects Affecting the Navigation Space." Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a "Notice of Proposed Construction or Alteration" is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the proposed structure is located to avoid the aviation hazards of concern.
- FAA Advisory Circular (AC) No. 70/460-2H, "Proposed Construction and or Alteration of Objects that May Affect the Navigation Space." This circular informs each proponent of a project that could pose an aviation hazard of the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, "Obstruction Marking and Lighting." This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

These discussed LORS were applied to the design and construction of the City's 69 kV transmission lines to be used, as is standard for all high-voltage lines in the SCE System to which these lines are connected.

## **INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION**

Transmission line-related radio-frequency interference is one of the indirect effects of line operation produced by the physical interactions of line electric fields. Since electric fields are unable to penetrate most materials, including the soil, such interference and other electric field effects are not associated with underground lines. The level of any such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for perception of radio interference could be assessed from field strength estimates obtained for each proposed line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs. These regulations were also applied (as is standard industry practice) to the existing Vernon City grid lines at the time of construction.

### **Federal**

- Federal Communications Commission (FCC) regulations in Title 47 CFR, section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the



action of the electric fields on the surface of the energized overhead conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. The City of Vernon and the other state municipal and non-municipal utilities include specific complaint resolution measures in their line management programs to ensure compliance with this FCC requirement.

## **State**

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available as industry standards for minimizing these electric field-related impacts. When incorporated into the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

## **AUDIBLE NOISE**

### **Industry Standards**

As with radio-frequency noise, audible power line noise usually results from the action of the electric field at the surface of the overhead line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum, especially in wet weather. There are no design-specific federal regulations to limit the audible noise from transmission lines. As happens with radio noise, such noise is limited through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability and reliability. All modern overhead high-voltage lines (such as the existing Vernon City lines and the interconnected SCE lines) are designed to assure compliance. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed for each new line from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected from the 69 kV lines to be used for this project. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

## **NUISANCE SHOCKS**

### **Industry Standards**

Nuisance shocks are electric shocks associated with current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields and are mitigated to reflect the differences in patterns of generation. There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For the proposed project and all modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Line owners, such as SCE and the City of Vernon, are usually responsible for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made along the route of each new line.

## **FIRE HAZARDS**

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between the line and nearby trees and other combustible objects.

### **State**

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction” specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14, section 1250 of the California Code of Regulations: “Fire Prevention Standards for Electric Utilities” specifies utility-related measures for fire prevention.

The requirements of these regulations are incorporated into the design of all modern municipal and non-municipal high-voltage lines.

## **HAZARDOUS SHOCKS**

The hazardous shocks addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force within the City of Vernon and other utility service areas in the design and operation of transmission and other high-voltage lines.

### **State**

- GO-95, CPUC. “Rules for Overhead Line Construction” These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.

- Title 8, California Code of Regulations, sections 2700 through 2974. “High Voltage Electric Safety Orders” These safety orders establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

The requirements of these rules and orders were incorporated into the design of the proposed project line, as is standard for municipal and non-municipal utilities.

### **Local**

There are no shock hazard-related requirements on the physical dimensions of power lines at the local level.

### **Industrial Standards**

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the state’s municipal and non-municipal utility service areas from compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

## **ELECTRIC AND MAGNETIC FIELD EXPOSURE**

The possibility of deleterious health effects from electric and magnetic field (EMF) exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

### **State**

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the

present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. The available evidence has not identified any potential health risk as justifying the retrofit of existing lines. The CPUC further required SCE (the project area's major service utility) and other electric utilities within its jurisdiction to prepare a specific guideline document listing the specific EMF-reducing measures that would be incorporated into the standard safety designs for all new or upgraded power lines and related facilities within their respective service areas. These reduction measures were derived from the same general approaches employed over the years within the industry to minimize the fields from all energized lines. They therefore are essentially the same for all utilities, whether municipal or non-municipal. The CPUC further established specific limits on the resources to be used in each case to reduce the intensity of the line fields in question. Such limiting requirements were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Electrical utilities such as those of the City of Vernon that are not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements, thereby ensuring similarity in intensity for fields of lines of the same voltage and current-carrying capacity. This operational CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013.

In keeping with this CPUC policy, staff requires a showing by each applicant that each new or modified line would be designed to incorporate the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied in ways that prevent significant impacts on line operation and safety. The extent of such applications would be reflected by the ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since all new lines in California are currently required under current CPUC policy to be designed to directly incorporate or reflect incorporation of the EMF-reducing guidelines of the state's major electric utilities that are interconnected, the fields from each given line are expected under this policy to be similar in magnitude to the fields from similar lines in the service area in question. This requirement was established to reflect the fact that such fields have not been established as posing a health hazard to humans. If a new transmission line had been proposed for MGS, the applicable field-reducing guidelines would have reflected the requirements in the SCE guideline document, given that the same general reduction approaches are employed by all utilities. Incorporating such measures into the existing (standard) non field-related SCE or City of Vernon's safety designs would have constituted compliance with present CPUC requirements on field strength management.

## **Industrial Standards**

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF health issue.

In the face of the present uncertainty, several states have opted for design-driven regulations, which, as with California's, are intended to ensure that fields from new lines are generally similar in intensity to those from existing lines of similar voltage and current-carrying capacity. It is for this reason that staff considers it appropriate for the existing 69 kV City of Vernon utility lines to be used without retrofit in connection with the proposed MGS. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe, as do the CPUC and staff, that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component whose effects can manifest themselves as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate soil, building and other materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

## **SETTING**

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According to information from the applicant (COV 2001a, pages 3-1, 3-2, 5-1 through 5-4, and 8.4-2), the proposed MGS would be located on approximately 3.4 acres within the City's existing power generating station occupying approximately 5.9 fenced acres at 2715 East 50<sup>th</sup> Street in the City of Vernon, California. The existing 69 kV transmission system to be used consists of the five lines that connect the existing City power facility to SCE's 69 kV power grid. The magnetic field increases from transmitting the MGS-generated power would occur within these existing City lines as the power flows to the customers.

The land use around the proposed project site and the route of the existing 69 kV lines is mostly industrial with no nearby residences, meaning that the residential magnetic field exposure at the root of the present health concern would be insignificant for the areas of maximum magnetic field increases. The only project-related EMF exposures of

potential significance are the short-term switchyard- and tie-in-related exposures to plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in transit across the lines. These types of exposures are short-term, and well understood as not significantly related to the present health concern.

## **PROJECT DESCRIPTION**

The project's proposed interconnection to the City of Vernon's municipal power system would be made through the 69 kV switchyard for the existing power facility, thereby eliminating the need for new project transmission lines (COV 2001a, pages 2-23, 2-51, 3-8, and 3-9). Since the lines to be utilized are existing municipal utility lines that interconnect connect to the SCE transmission system, they were designed and built according to standard industry safety and field management guidelines reflected in the SCE requirements and will continue to be owned, operated and maintained by the City according to normal municipal utility practices that reflect compliance with existing health and safety LORS.

The power from each of the project's generators would be produced at the relatively low voltage of 13.8 kV before being transmitted via 15 kV underground cable for step-up to 69 kV (at pad-mounted step-up transformer). This stepped up power would then be transmitted to the 69 kV connection point at the existing Vernon Substation using 300 feet of underground cables (COV 2001a, page 5-1). Relatively minor modifications would be necessary at the connection points within this Vernon Substation to accommodate the connection to MGS's generators (COV 2001a, pages 3-8 through 3-10).

## **IMPACTS**

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### **PROJECT SPECIFIC IMPACTS**

Since the existing 69 kV lines to be used were designed and are currently operated and maintained by the City of Vernon according to standard municipal utility practices, their design-dependent field strength increases (and therefore, potential contribution to existing area field levels) should be at the same level as from area municipal or non-municipal utility lines of the same voltage and current-carrying capacity. As previously noted, the CPUC has not established the fields from such line designs as posing a significant hazard to human health. Staff recommends a specific condition of certification (**TLSN-1**) to provide the data necessary to compare the resulting fields with fields from area 69 kV of the same voltage and current-carrying capacity. As previously noted, it is the similarity in magnitude between the operational-phase fields within the corridor of the existing lines to be used and area lines of the same voltage and current-carrying capacity that would constitute compliance with existing CPUC policy on line field management.

Given that the existing municipal utility line design is in compliance with standard industry practices relative to aviation safety, nuisance shocks, hazardous shocks, fire hazards and interference with radio-frequency communication, staff considers the proposed use of the lines involved (without modification) as reflecting compliance with related CPUC requirements.

The field reduction measures that were utilized for this line design include the following general measures:

- Increasing the distance between the conductors and the ground;
- Reducing the spacing between the conductors;
- Minimizing the current in the line; and
- Arranging current flow to maximize the cancellation effects from interacting fields from nearby conductors.

Since these field-reducing measures were implemented to the extent that the City of Vernon established to be without impacts on line safety, efficiency, reliability and maintainability in its service area, staff considers any modification to be unnecessary at this point, but would assess compliance with field strength requirements using the data from the field intensity measurements required in **TLSN-1**.

## **CUMULATIVE IMPACTS**

Given that the municipal utility line to be utilized was designed according to standard field-reducing utility guidelines (currently considered adequate by the CPUC without line retrofit), staff expects any contribution to cumulative area exposures to reflect compliance with current CPUC requirements on field contributions from new sources. The actual contribution from the proposed line design would be assessed from results of the field strength measurements specified in **TLSN-1**. Such an assessment would help ensure that total exposures would remain within levels not established as hazardous to health.

## **ENVIRONMENTAL JUSTICE**

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The applicant (COV 2001a, pages 8.8-5 and 8.8-6) has provided population data showing the non-minority population to exceed 50 percent in specific areas within a six-mile radius of the proposed project and related facilities. The data also shows the low-income population to be less than 50 percent (28.6 percent) within the same impact zone. (Please refer to **Socioeconomics Figure 1** in this staff assessment). Since staff has found that the MGS project poses no significant environmental impacts from use of existing transmission lines, staff considers the proposed use of the lines involved (in this area of existing power production and transmission facilities) as not raising any issues of environmental justice.

## **COMPLIANCE WITH LORS**

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Current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility, which for the proposed MGS is SCE. Since the existing 69 kV municipal lines were designed, and are operated and maintained according to standard municipal utility guidelines on field-and non field-related impacts, staff considers their use for MGS as constituting compliance with the health-and safety-related LORS of concern in this analysis.

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

Since electric or magnetic field health effects have not been established for electric and magnetic fields from existing lines, staff considers using the existing 69 kV municipal utility lines for the proposed MGS as not posing a significant health hazard to humans. The long-term, mostly residential magnetic exposure at the root of the present health concern would be insignificant for the proposed transmission scheme in light of the general absence of residences along the route involved. On-site worker or public exposures would be short-term and at levels expected for the City of Vernon's and other area utility and non-utility lines of similar designs and current-carrying capacity. Such exposures are well understood and have not been established as posing a significant health hazard to humans.

The potential for hazardous shocks, nuisance shocks an aviation hazard, audible noise and interference with radio-frequency communication is insignificant and will remain insignificant as with typical for 69 kV California municipal utility lines.

### RECOMMENDATIONS

Since the transmission lines to be utilized are existing California municipal utility lines, designed to minimize the safety and nuisance impacts of specific concern to staff, and located along a route with few nearby residences, staff does not recommend further mitigation and recommends approval of their proposed use. If such approval is granted, staff would recommend that the Energy Commission adopt the condition of certification specified below to allow assessment of compliance with present CPUC requirements on line field intensities. The need for specific mitigation would be established from the results of the field measurements involved.

### CONDITIONS OF CERTIFICATION

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**TLSN-1** The applicant shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields as currently encountered within the corridor of the 69 kV lines to be used to transmit the power from the proposed project. The fields shall also be measured during the proposed project operation to allow for assessment of the contributions from the project-related current flow. These field strength measurements shall be made according to IEEE measurement protocols at representative points (on-site and along the line route) as necessary to identify the maximum area field exposures possible during project operations.

**Verification:** The applicant shall file copies of the pre- and post-energization measurements with the California Energy Commission Compliance Manager no later than 60 days after the post-energization measurements are completed. The post-energization measurements shall be initiated no later than 60 days from the start of commercial operations.



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# **VISUAL RESOURCES**

Testimony of Eric Knight

## **INTRODUCTION**

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Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether construction and operation of the Malburg Generating Station (MGS) Project 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)

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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### **FEDERAL**

The proposed project, including the linear facilities, is not located on federally administered public lands and is not subject to federal regulations pertaining to visual resources.

### **STATE**

None of the roadways in the project vicinity are eligible or designated State Scenic Highways (State Scenic Highway System Web Site: <http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm>). Therefore, no state regulations pertaining to scenic resources are applicable to the project.

### **LOCAL**

The proposed project site is located within the City of Vernon. Therefore, the project would be subject to local laws, ordinances, regulations, and standards (LORS) pertaining to the protection and maintenance of visual resources. Staff identified one visual resources-related policy in the Natural Resources Element of the Vernon General Plan. Policy 1.3 states that the City shall "encourage private property owners and industries to establish and maintain landscaped areas." In addition, one visual resources-related requirement in the City's Zoning Ordinance is applicable to the proposed project. Zoning Ordinance, Article III, Section 26.3.5-4(c) [General Industry Zone development standards] states: "Outdoor activities and storage may be permitted provided such activities and storage are not visible from the public right-of-way." An assessment of the project's consistency with this policy and zoning requirement is presented in the Compliance with LORS subsection of this analysis.

## **PROJECT DESCRIPTION**

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The following section describes the aspects of the proposed project that may have the potential to cause adverse impacts to visual resources.

## POWER PLANT

**Visual Resources Table 1** presents the dimensions and materials of a number of the key components of the power plant that would be visible offsite. The major visible components of the power plant include the two heat recovery steam generator (HRSG) units and the two HRSG exhaust stacks. The HRSG units and exhaust stacks would be 72 feet and 110 feet tall, respectively. The project also would include a 45-foot tall and 114-foot long wet cooling tower.

**Visual Resources Table 1  
Power Plant Dimensions and Materials**

<b>Structures</b>	<b>Height (Ft.)</b>	<b>Length (Ft.)</b>	<b>Width (Ft.)</b>	<b>Diameter (Ft.)</b>	<b>Materials</b>
HRSG Stacks (2)	110	N/A	N/A	11	Steel
HRSG Units (2)	72	118	30	N/A	Steel
Cooling Tower	45	114	39	N/A	Wood & Fiberglass
Pipe Rack	40	225	10	N/A	Steel
Steam Turbine Generator Building	36	50	30	N/A	Pre-finished metal siding, Prefabricated building
Gas Turbine Enclosures (2)	35	85	25	N/A	Pre-finished metal siding, Prefabricated building
Raw Water Tank	35	N/A	N/A	50	Steel
Fuel Gas Compressor Building	30	50	25	N/A	Pre-finished metal siding, Prefabricated building
Gas Turbine Control Module (2)	24	45	15	N/A	Pre-finished metal siding, Prefabricated building
Main MCC Room	24	120	30	N/A	Pre-finished metal siding, Pre-engineered Building
Instrument/Service Air Skid Enclosure	24	40	25	N/A	Pre-finished metal siding, Prefabricated building

## LINEAR FACILITIES

No new offsite electrical transmission lines would be needed because the MGS would interconnect with the existing substation on the site. The project would require new 1,300 foot-long natural gas supply and sewer pipelines, and a new 1.8-mile long reclaimed water pipeline to deliver reclaimed water to the MGS site for cooling purposes. These pipelines would be installed underground within existing road rights-of-way.

## SETTING

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### REGIONAL SETTING

The MGS site is located in Vernon, California. The City of Vernon, which is located three miles southeast of downtown Los Angeles, is bounded on the north and west by the City of Los Angeles, on the east by the City of Commerce and on the south by the cities of Maywood and Huntington Park. The City was developed early in the last century as an industrial city. According to the City's General Plan, manufacturing, warehousing, and trucking operations occupy approximately 65 percent of the land area

within Vernon. Another 30 percent of the City's land area is occupied by streets, railroad rights-of-way and spur lines, utility rights-of-way, and the Los Angeles River. Very little of the City remains undeveloped or has been set aside as open space. The Los Angeles River runs through the northeasterly part of Vernon within a concrete channel. Street trees have been planted along many streets within Vernon, including Soto Street and Leonis Boulevard in the immediate project vicinity. A Los Angeles Department of Water and Power right-of-way located between Alcoa Avenue and Downey Road has been partially landscaped, including areas that are cultivated, such as north of Fruitland Avenue, east of the MGS site.

## **PROJECT AREA SETTING**

The proposed MGS would be located on approximately 3.4 acres of vacant land at the City of Vernon's existing Station A power plant. Station A, which has been in operation since 1933, is located at 2715 East 50<sup>th</sup> Street. The existing generating units are located within a 56-foot tall, concrete building. Ten, approximately 90-foot tall exhaust stacks protrude from the top of the building. A four-cell cooling tower and an electrical substation also occupy the Station A site. Vernon is a primarily industrial city, with a few remaining pockets of residential uses, including five residences east of the MGS site on Fruitland Avenue east of Alcoa Avenue and an apartment complex on 50<sup>th</sup> Street and Downey Road. To the north of the project site are railroad tracks and industrial warehouses. Seville Avenue is to the west of the site, beyond which lie more railroad tracks and industrial warehouses and facilities. The Orval Kent Food Processing facility is located immediately south of the site across East 50<sup>th</sup> Street. On two visits to the project area in May and July, staff observed a very small water vapor plume emanating from a vent at the top of the Orval Kent facility. A plume approximately 50 feet above ground level was observed originating from Orval Kent during a winter site visit (Walters 2002). During these visits no plumes were observed emanating from the Station A facility. Many of the existing plume sources in the project area are located up near the Los Angeles River (such as the animal product rendering facilities on Bandini Boulevard), farther from the residential populations of Huntington Park and Maywood than the MGS project. To the east of the MGS site, across Soto Street are industrial uses. **Visual Resources Figure 1** presents several visual character photographs of the project area. **Visual Resources Figure 2** shows the locations and view directions of the character photographs.

### **View Areas, Key Observation Points, and Evaluation of Existing Setting**

Due to intervening structures and distance, the MGS project structures would not be visible from sensitive viewing locations, including the few residences in Vernon and the residential areas of Huntington Park and Maywood to the south and east. Project structures would be visible to travelers along nearby roadways, including East 50<sup>th</sup> Street, Seville Avenue, Leonis Avenue, and Soto Street. These roadways in the vicinity of the MGS site are all industrial in character.

In preparation of the AFC, Energy Commission staff visited the project area with the applicant for the purpose of identifying key observation points (KOPs) from which photographs would be taken to document existing conditions and serve as a basis for

evaluating project-related visual impacts<sup>1</sup>. KOPs are selected to be representative of the most critical locations from which a project would be seen. Staff and the applicant were able to identify only one sensitive viewing location that would have views of the proposed project structures. This KOP was selected to represent views of the project from the seven residences located at the terminus of East 53<sup>rd</sup> Street in Huntington Park, about 1,250 feet southwest of the MGS site. **Visual Resources Figure 2** shows the location and view direction of the East 53<sup>rd</sup> Street KOP. However, subsequent to the filing of the AFC, a warehouse was constructed between the KOP area and the project site, and views of the project would not be possible from this KOP. AFC Figure 8.11-5 shows the view from this KOP toward the MGS site as it existed at the time the AFC was prepared. AFC Figure 8.11-6 shows a simulation of the MGS project as it would have appeared from this KOP had the Gavina Gourmet Coffee warehouse not been built. **Visual Resources Figure 3** shows the current view from this location toward the MGS site. As the figures demonstrate, the project structures would not be visible from this location.

Because water vapor plumes emanating from a power plant's exhaust stacks and cooling tower can increase the visibility of a project, staff discussed with the applicant the possibility of establishing a new KOP if the plumes would be large enough to be visible from sensitive viewing locations. Based on staff's computer modeling, the reasonable worst case cooling tower plumes are predicted to be approximately 220 feet long and 233 feet tall. For comparison, the project's tallest structural elements would be 110 feet tall. Plumes of this size would be visible from residences in the vicinity. In response to staff's data request, the applicant established a new KOP to represent residential viewers' exposure to the project's visible plumes. The KOP is located about 3,000 feet south of the project site in Huntington Park along East 58<sup>th</sup> Street (between Seville Avenue and Soto Street). **Visual Resources Figure 4** shows the location and view direction of the East 58<sup>th</sup> Street KOP.

To assess the existing visual setting of the East 58<sup>th</sup> Street KOP, staff considered the following elements: visual quality, viewer concern, and viewer exposure. These elements combine into a rating of **overall visual sensitivity** or the susceptibility of a view area to impacts due to visual change.

**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.

**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,

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<sup>1</sup> 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.

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 an increased level of 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.

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.

The following discussion provides an assessment of the overall visual sensitivity at the KOP on East 58<sup>th</sup> Street.

### **East 58<sup>th</sup> Street (between Seville Avenue and Soto Street) KOP**

**Visual Resources** Figure 5 presents character photographs showing views looking west and east along East 58<sup>th</sup> Street. **Visual Resources Figure 6** shows the view in the direction of the MGS site (which is not visible due to intervening structures) from a viewpoint on East 58<sup>th</sup> Street between Seville Avenue and Soto Street. There are approximately 30 residential dwellings along East 58<sup>th</sup> Street; however, many of these would not have as direct, or unobstructed of a view as that shown in Figure 6. There are approximately 100 residences along East 57<sup>th</sup> Street and another approximately 11 residences along East 56<sup>th</sup> Street. However, for the majority of these residences, either the primary view direction is to the south, or existing structures or vegetation would block views in the direction of the site.

**Visual Quality:** A litter-strewn street and weed filled vacant lot surrounded by a chain link fence occupy the foreground and middleground of the view. Also visible in the view across the vacant lot are residences and trees along East 57<sup>th</sup> Street. Behind the residences on East 57<sup>th</sup> Street is the truck loading area of a large warehouse. In Figure 6, the warehouse appears as the washed out area above the houses on the left side of photograph. Power poles and lines and a large water tower also detract from the quality of the view. Visual quality in the direction of the site is rated low.

**Viewer Concern:** Residential viewers are generally considered to be highly sensitive to landscape changes, so viewer concern is rated high.



**Viewer Exposure:** The MGS site is located about 3,000 feet to the north of the KOP. The warehouse north of East 57th Street would obscure the lower portion of the plume from view, so visibility of the plume on clear to partly cloudy days is considered moderate. The plume would be visible to a varying amount to a moderate number of residential viewers in the KOP area. Duration of view is considered high because the KOP is in a residential area and plumes would typically be present during the early morning and evening hours when residents would be expected to be home. Considering these factors, overall viewer exposure would be moderate to high.

**Overall Visual Sensitivity:** Considering the low visual quality, high viewer concern, and moderate to high viewer exposure, overall visual sensitivity at the KOP is moderate.

## IMPACTS ANALYSIS

### ENVIRONMENTAL CHECKLIST

VISUAL RESOURCES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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, which would adversely affect day or nighttime views in the area?			X	

### DISCUSSION OF DIRECT IMPACTS

The following discussion explains the responses to the questions in the environmental checklist.

#### **A. Scenic Vistas**

Staff did not identify any scenic vistas in the vicinity of the MGS project site, nor are any described in the Vernon General Plan. The project would have no impact under this criterion.

#### **B. Scenic Resources**

As indicated in the previous discussion of LORS, there are no state-designated scenic highways within the proposed project area. Furthermore, the project would not damage

scenic resources such as trees, rock outcroppings, and historic buildings. Thus, the MGS project would have no impact under this criterion.

### **C. Visual Character or Quality**

#### **Project Construction**

Project construction would occur over a 14-month period. Construction of the proposed power plant and linear facilities would cause temporary visual impacts due to the presence of equipment, materials, excavated piles of dirt, and workforce. Construction activities would include site clearing and grading, trenching, construction of actual facilities, and cleanup and restoration of the site and rights-of-way.

The AFC identifies two locations that would be used as construction staging, laydown, fabrication, and parking areas. A rail and storage yard located directly west of the MGS site across Seville Avenue would be used as a contractor office area and a laydown/fabrication area for construction of the power plant and pipelines. A parking lot located diagonally across from the MGS site at the southeast corner of the intersection of Soto Street and East 50<sup>th</sup> Street would be used for construction worker and visitor parking and as an additional laydown area for the power plant construction. Both sites are industrial in character and have low visual quality.

The proposed 1,100-foot long natural gas supply pipeline would be installed underneath the existing rights-of-way of Seville and Fruitland Avenues. The gas pipeline route is industrial in character and has low visual quality. The 1,300-foot long wastewater discharge pipeline would follow the same route as the gas pipeline. Construction of these pipelines is expected to last about one month. The 1.8-mile long reclaimed water supply pipeline would interconnect with an existing reclaimed water pipeline at Randolph and Newell Streets. The new line would travel west underneath Randolph Street, head north underneath Boyle Avenue, and then head west underneath East 50<sup>th</sup> Street to the MGS site. The route would traverse industrial, commercial, and residential areas.

The visual impacts of project construction would not be significant because construction activities would be temporary and would primarily occur within industrial areas with low visual quality and no sensitive viewers. To reduce the visibility of construction equipment and materials from adjacent roadways, the applicant proposes to install a fence covered with polyethylene screening strips around the MGS site and construction laydown areas (COV 2002c).

#### **Project Operation**

##### **Cooling Tower and HRSG Visible Plume Computer Modeling Analysis**

Staff modeled the cooling tower plumes using the Combustion Stack Visible Plume (CSVP) model (Walters and Blewitt 2002). **Visual Resources Table 2** provides the CSVP model visible plume frequency results using a six-year (1990-1995) meteorological data set from Long Beach.

**Visual Resources Table 2  
Staff Predicted Hours with Cooling Tower Steam Plumes  
Long Beach 1990-1995 Meteorological Data**

	Available (hr)	Plume (hr)	Percent
<b>Full load with Duct Firing</b>			
All Hours	41,617	25,375	61.0%
Daylight Hours	26,631	11,905	44.7%
Daylight No Rain/Fog Hours	23,369	9,125	39.0%
Seasonal Daylight No Rain/ No Fog Hours*	10,339	5,129	49.6%
<b>Full load no Duct Firing</b>			
All Hours	41,617	17,345	41.7%
Daylight Hours	26,631	6,161	23.1%
Daylight No Rain/Fog Hours	23,369	3,800	16.3%
Seasonal Daylight No Rain/ No Fog Hours*	10,339	2,362	22.8%

\*Seasonal conditions occur anytime from November through April and represent the period of the year with the greatest potential for plume formation.

These results confirm that visible plumes would mainly occur during the cold weather or cool wet weather months. Additionally, visible plumes can occur during the daytime or nighttime; however, the meteorological data reviewed indicates that conditions for visible plume formation are more prevalent during nighttime and early morning hours. The actual frequency of occurrence is weather dependent and would vary from year to year. For the proposed cooling tower, the maximum temperature where a visible plume is predicted for both duct firing and no duct firing is 69° Fahrenheit (F) when the relative humidity is 100 percent.

Staff's CSVP modeling analysis visible cooling tower plume dimension results, using a six-year (1990-1995) meteorological data set from Long Beach are provided in **Visual Resources Table 3**.

**Visual Resources Table 3  
Staff CSVP Results of Cooling Tower Visible Plume Dimensions  
Long Beach 1990-1995 Meteorological Data**

All Hours	Percentile	Duct Firing	No Duct Firing
Length (ft)	50%	180	No Plume
	10%	528	446
	Maximum	1122	984
Height (ft)	50%	135	No Plume
	10%	341	308
	Maximum	853	738
Width (ft)	50%	52	No Plume
	10%	105	89
	Maximum	194	170
<b>Daytime No Rain/ No Fog Hours</b>			
Length (ft)	50%	No Plume	No Plume
	10%	233	184
	Maximum	554	466
Height (ft)	50%	No Plume	No Plume
	10%	210	148
	Maximum	807	666
Width (ft)	50%	No Plume	No Plume
	10%	72	52
	Maximum	164	141

<b>Seasonal Daytime No Rain/ No Fog Hours*</b>			
Length (ft)	50%	No Plume	No Plume
	10%	249	203
	Maximum	554	466
Height (ft)	50%	No Plume	No Plume
	10%	236	177
	Maximum	807	666
Width (ft)	50%	No Plume	No Plume
	10%	79	62
	Maximum	164	141

\*Seasonal = November through April (day 120-304).

Staff modeled the HRSG plumes using the CSVP model with a six-year meteorological data set from Long Beach. **Visual Resources Table 4** provides the CSVP model visible plume frequency results.

**Visual Resources Table 4  
Staff Predicted Hours with HRSG Steam Plumes  
Long Beach 1990-1995 Meteorological Data**

	<b>Available (hr)</b>	<b>Plume (hr)</b>	<b>Percent</b>
<b>Full load with Duct Firing</b>			
All Hours	41,617	20	0.05%
Seasonal Daylight No Rain/ No Fog Hours*	10,339	0	0.00%
<b>Full load no Duct Firing</b>			
All Hours	41,617	0	0.00%

\*Seasonal conditions occur anytime from November through April.

The low frequency of steam plumes from the HRSGs is due to the high exhaust temperatures anticipated by the applicant. These exhaust temperatures are as much as 60°F or more higher than other combined cycle projects currently before the Energy Commission. For the proposed HRSGs, the maximum temperature where a visible plume is predicted is 45°F when the relative humidity is 100 percent.

A plume frequency of 10 percent of seasonal (November through April) daylight no rain/no fog (SDNRNF) hours is used as an initial plume impact threshold trigger, where if exceeded, the analysis is further refined by performing a high visual contrast hours analysis of the SDNRNF plume hours. The high visual contrast hours analysis methodology is discussed below. Visible plumes from the proposed MGS wet cooling tower exhaust would occur frequently and occur greater than 10 percent of SDNRNF hours for both duct firing (49.6 percent) and no duct firing (22.8 percent) cases. It is reasonable to assume that the actual plume frequency would be somewhere between 22.8 percent and 49.6 percent because duct firing is typically used to increase generating capacity during periods of high electrical demand, which normally do not occur during the cold weather periods most favorable to plume formation. Because the cooling tower plume frequency exceeds 10 percent of SDNRNF hours, the analysis was further refined by performing a high visual contrast hours analysis of the SDNRNF plume hours. Visible plumes from the HRSGs would rarely occur and are well below 10 percent frequency for SDNRNF hours. Therefore, unabated HRSG plumes would not be expected to cause significant visual impacts under the anticipated operating conditions and no further impact analysis has been performed for the HRSG plumes.

During clear meteorological conditions plumes have the greatest potential to cause adverse visual impacts. For projects such as this one for which the available meteorological data set categorizes sky cover in 10 percent increments<sup>2</sup>, staff includes in the “Clear” category a) all hours with total sky cover equal to or less than 10 percent plus b) half of the hours with total sky cover 20-100 percent that have an unlimited ceiling height<sup>3</sup>. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with the sky under clear conditions, and when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100 percent and there is an unlimited ceiling height, clouds do not substantially reduce the plumes’ contrast with the sky; staff estimates this time as approximately half of these hours.

The results of the high visual contrast hours analysis is provided in **Visual Resources Table 5**.

**Visual Resources Table 5  
Cooling Tower High Visual Contrast SDNRNF Plumes**

	Amount of Total Sky Cover							
	All		Clear		Broken		Overcast	
	Hrs	%	Hrs	%	Hrs	%	Hrs	%
<b>Duct Firing</b>	5,129	49.6	1,913	18.5	1,471	14.2	1,745	16.9
<b>No Duct Firing</b>	2,362	22.8	768	7.4	597	5.8	997	9.6

For the Duct Firing case, the meteorological data indicates that 1,913 plume hours, or 18.5 percent of all SDNRNF hours, are expected to occur during clear conditions. For the No Duct Firing case, 768 plume hours, or 7.4 percent of SDNRNF hours would occur during clear conditions. After consideration of sky cover data, a visual impact analysis of the cooling tower plumes is still warranted because the plume frequency for the Duct Firing case would exceed staff’s threshold of 10 percent of SDRNF high visual contrast hours.

**East 58<sup>th</sup> Street (between Seville Avenue and Soto Street) KOP**

The following discussion assesses the amount of the visual change that would be caused by the project's cooling tower plumes. Factors considered in this assessment are visual contrast, dominance, and view blockage.

**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.

<sup>2</sup> These are Hourly US Weather Observations (HUSWO) data sets.

<sup>3</sup> The sky opacity during an hour with an unlimited ceiling height is almost always 50 percent or less.

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 (scale dominance). A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature (spatial dominance). The level of dominance can range from low (subordinate) to high (dominant).

**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.

**Visual Resources Figure 7** presents a simulation of a reasonable worst case (10<sup>th</sup> percentile SDNRNF duct firing plume) cooling tower plume as it would be seen from residences on East 58<sup>th</sup> Street. In conducting this visual analysis, staff determined that the plume depicted in the simulation prepared by the applicant in response to staff's data request (COV 2002e) is substantially oversized. The applicant's plume simulation appears to be assuming a considerably shorter distance from the cooling tower to the camera than in reality. Staff believes that Figure 7 accurately shows the appearance of the reasonable worst case plume, as an observer would see it on East 58<sup>th</sup> Street located about 3,000 feet away. The plume appearance was simulated by the creation of an accurately scaled 3D computer model, representing the starting and end points of the 10<sup>th</sup> percentile plume, and a 'virtual camera' duplicating the known location and lens setting of the KOP photograph used as the base image of the simulation<sup>4</sup>. The analysis was conducted with a 3D modeling and visualization program, Autodesk 3D VIZ. When the image of the virtual scenario is rendered by the program, if the relationships within the computer model accurately reproduce the actual physical relationships of the project to the camera, as well as the camera lens setting, angle, etc., used in producing the base photography, then the rendered image of the plume accurately represents the scale, size, and location of the actual plume as it would appear in the photograph. In this exercise, the model was validated with information (e.g., distance from the KOP to cooling tower) obtained from City of Vernon staff and verified by Energy Commission staff. The endpoint of the plume was simulated as an object with the diameter and location predicted by the CSVP model; the resulting image then served as a basis for painting the plume onto the photographic image. The predicted plume used in this representation has a length of 220 feet, a height of 233 feet, and a diameter at its endpoint of 78 feet<sup>5</sup>. The proposed cooling tower has three cells and would thus produce three such plumes side-by-side, which merge into a single plume with an assumed width of roughly 234 feet. It should be noted that the reasonable worst case plume predicted to occur during clear conditions for the No Duct Firing case would be smaller (165 feet tall and 171 feet long) and therefore less visible from the KOP area than the plume simulated in Figure 7.

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<sup>4</sup> According to the Applicant's consultant who took the photograph, a 35 mm camera with a 50 mm lens setting was used (Merriam 2002).

<sup>5</sup> These dimensions differ slightly from the dimensions provided to the Applicant for their simulation and those reported in Table 3. These are the 10<sup>th</sup> percentile plume dimensions (Duct Firing case) for plumes occurring during clear conditions only, as opposed to the 10<sup>th</sup> percentile dimensions of plumes that would occur during all SDNRNF hours.

**Visual Contrast:** During field visits staff did not observe any existing plumes from this KOP area. The MGS cooling tower plumes would appear as billowing linear to irregular forms with irregular and changing outlines, unlike the forms and lines established in the existing setting. The plumes would be unique moving forms, originating from behind the warehouse and rising vertically to diagonally. Given the small size and middleground distance of the plumes, form and line contrast is considered to be moderate. At this distance, the white color of the plumes would contrast moderately with the clear (blue) to partly cloudy sky. The plumes would appear small in size compared to the structures, power poles, and trees in the setting, so scale contrast would be low. Visual contrast would be moderate overall.

**Dominance:** The plume would occupy a very small part of the total field of view. The plumes would be somewhat conspicuous because of their movement and because they would be partly backdropped by the sky. The plume's overall dominance rating is low to moderate.

**View Blockage:** The plume would block from view a very small part of the sky. Due to the level terrain in the area, no other landscape features of higher visual quality would be blocked. Given the low overall visual quality of the view, view blockage is considered low.

**Overall Visual Change:** The overall visual change that would be experienced at the KOP would be low to moderate due to the plumes' moderate contrast, low to moderate dominance and low view blockage.

**Visual Impact Significance:** When considered within the context of moderate overall visual sensitivity, the low to moderate visual change that would be perceived at this KOP would cause an adverse but less than significant impact. Therefore, unabated cooling tower plumes would not cause significant adverse visual impacts.

## **D. Light or Glare**

The site and vicinity are industrial in character. There are existing lights at Station A and the substation, and streetlights surround the site (COV 2001a). The MGS project would require lighting to meet security, operation, maintenance, and safety requirements. The applicant proposes to equip the project's lights with shields or hoods to direct lighting downward and inward toward the areas to be illuminated to minimize nighttime light and glare impacts (COV 2001c).

The applicant proposes to paint the project structures in a gray color to blend with the existing Station A building. The MGS structures would be given a flat finish to reduce the reflectivity (daytime glare) of structural surfaces (COV 2001a).

Given the industrial and highly urbanized nature of the site and immediate project area, and because project structures and lighting would either not be visible or not substantially visible from sensitive viewing locations due to intervening structures and distance, light and glare impacts would not be significant. Furthermore, the applicant has proposed measures to reduce the impacts of light and glare. Staff generally agrees with the applicant's proposed mitigation measures and has incorporated (and expanded

upon) these measures in proposed conditions of certification **VIS-1** (lighting controls) and **VIS-2** (structure painting).

## **CUMULATIVE IMPACTS**

Cumulative impacts to visual resources could occur where project plumes occupy the same field of view as other existing plumes. The significance of a 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 proposed project's visual contrast is increased.

The nearest existing plume to the KOP area that staff identified emanates from the Orval Kent food processing facility located at East 50<sup>th</sup> Street and Soto Street. A 50-foot tall (above ground level) plume was observed originating from this facility during a visit in January. Staff estimates that this plume could be up to 100 feet tall or higher during a very cold winter day (Walters 2002). A plume 100 feet tall would be barely visible from the KOP area due to intervening structures and distance (over ½ mile). In addition, the Orval Kent plume and the MGS cooling tower plume would most likely merge together and appear as one plume because of their close proximity to each other. Thus, the MGS cooling tower plume would not cause cumulative visual impacts.

## **ENVIRONMENTAL JUSTICE**

Census 2000 information shows that the minority population is greater than fifty percent within a six-mile radius of the proposed MGS power plant (please refer to **Socioeconomics Figure 1** in this SA). In addition, Census 1990 information shows that the low-income population is less than fifty percent within the same radius. Because the MGS project would not cause significant direct or cumulative visual impacts, there are no visual resources environmental justice issues for this project.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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### **LOCAL**

**Visual Resources Table 6** provides a listing of the applicable City of Vernon LORS. One General Plan policy and one zoning standard were found to pertain to the enhancement and/or maintenance of visual quality. Table 6 includes a determination of the project's consistency with this policy and standard.



**Visual Resources Table 6  
Proposed Project's Consistency with  
Local LORS Applicable to Visual Resources**

LORS		Consistency Determination Before Conditions of Certification	Basis for Consistency
Source	Policy and Standard Descriptions		
City of Vernon General Plan • Natural Resources Element	<p>Policy 1.3: "Encourage private property owners and industries to establish and maintain landscaped areas."</p> <p>The Natural Resources Element makes the following statements about landscaping:</p> <ul style="list-style-type: none"> <li>◆ "...landscaping can benefit the limited number of City residents as well as the thousands of people who come to Vernon each day to work."</li> <li>◆ Landscape areas on building sites "may create a sense of visual space within intensely urbanized areas."</li> <li>◆ The City's efforts to plant and maintain street trees will enhance boulevards..."</li> </ul>	PARTIALLY	There are existing trees on the Seville Avenue and East 50 <sup>th</sup> Street boundaries of the Station A property. There are also some existing street trees along Soto Street adjacent to the property. Although Policy 1.3 is a City directive to <i>private</i> property owners and industries, it would appear that, at least in the case of the Station A property, the City has applied this policy to themselves. It appears feasible that the City could plant trees along the east side of the MGS site to enhance views of the new power plant from Soto Street, which is a heavily traveled thoroughfare. Staff recommends condition of certification <b>VIS-3</b> to ensure that the MGS project is fully compliant with Policy 1.3.
City of Vernon Zoning Ordinance • Article III, Section 26.3.5-4(C)	"Outdoor activities and storage may be permitted provided such activities and storage are not visible from the public right-of-way."	YES	The MGS would be behind a fenced area. All activities during the operation of the project would be behind the fenced area and inside the control buildings. The City intends on complying with this ordinance by installing a fence covered with polyethylene screening strips so that materials and outdoor activities would not be visible from public rights-of-way (COV 2002c). Staff recommends <b>VIS-4</b> to ensure compliance with this ordinance.

## RESPONSES TO AGENCY AND PUBLIC COMMENTS

Staff has not received any agency or public comments regarding project-related visual resources issues.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

Proper implementation of the applicant's mitigation measures and staff's proposed conditions of certification would ensure that the project would not cause significant adverse direct or cumulative visual impacts, and would be consistent with applicable LORS.

## RECOMMENDATION

If the Energy Commission approves the project, staff recommends that the Commission adopt staff's proposed conditions of certification.

## PROPOSED CONDITIONS OF CERTIFICATION

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**VIS-1** The project owner shall design and install all permanent lighting such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

- a) Lighting shall be designed so 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 the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- b) All lighting shall be of minimum necessary brightness consistent with worker safety;
- c) High illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have switches or motion detectors to light the area only when occupied;
- d) A lighting complaint resolution form (following the general format of that in Appendix VR-1) shall be used by plant operations to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

**Verification:** At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to first turbine roll, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 30 (thirty) days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

**VIS-2** Prior to the first turbine roll, the project owner shall paint or treat the surfaces of all project structures and buildings visible to the public in a gray color to blend with the existing Station A building. Surfaces shall be treated with finishes that minimize glare. The project owner shall ensure proper treatment maintenance for the life of the project.

**Verification:** Prior to first turbine roll, the project owner shall notify the CPM that all buildings and structures are ready for inspection. The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

**VIS-3** The project owner shall plant trees along the east side of the MGS site to enhance views of the new power plant from Soto Street, consistent with the City of Vernon General Plan policy 1.3. The project owner shall ensure proper maintenance of the trees for the life of the project.

**Verification:** Prior to first turbine roll, the project owner shall notify the CPM that the trees are ready for inspection. The project owner shall provide a status report regarding tree maintenance in the Annual Compliance Report.

**VIS-4** The project owner shall ensure that any outdoor activities and storage at the MGS site are not visible from public rights-of-way, consistent with the City of Vernon Zoning Ordinance, Article III, Section 26.3.5-4(C). Screening materials may consist of fences covered with polyethylene screening strips, industrial fabric, or other opaque (or appears essentially opaque when viewed from public rights-of-way) material. The color of the screening material shall minimize visual intrusion and contrast by blending with the landscape.

**Verification:** At least 60 days prior to ordering any screening materials, the project owner shall submit to the CPM for review and comment written documentation describing the type and color of screening material proposed for use, and incorporate the CPM's comments in screening material orders.

Prior to start of commercial operation, the project owner shall notify the CPM that outdoor activities and storage have been screened and are ready for inspection. If the CPM notifies the project owner that modifications to the screening are needed to ensure compliance with the ordinance, within 30 (thirty) days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

## REFERENCES

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- California Energy Commission (CEC)/Bill Pfanner. 2002j. City of Vernon-Data Requests. Dated 5/23/02 and docketed 5/23/02.
- City of Vernon (COV). 2001a. Application for Certification. Dated 12/18/01 and docketed 12/21/01.
- City of Vernon (COV)/Malckenhorst. 2002c. Supplemental Information to City of Vernon Application for Certification. Dated 4/24/02 and docketed 4/24/02.
- City of Vernon (COV). 2002e. Information Requested in the CEC's Data Requests. Dated 6/18/02 and docketed 6/19/02.
- City of Vernon General Plan. Adopted April 18, 1989. Revised June 16, 1992.
- City of Vernon Zoning Ordinance. Section 26.3.5.
- Merriam, Andrew. 2002. Principal, Director of Planning, Cannon Associates. Personal communication with Eric Knight on July 24, 2002.
- Walters, William. 2002. Air Quality Engineer, Aspen Environmental Group. Electronic mail communications with Eric Knight on January 23 and July 22, 2002.
- Walters, William, and Lisa Blewitt. 2002. Aspen Environmental Group. City of Vernon Malburg Generating Station Cooling Tower and HRSG Exhaust Visible Plume Analysis. August 2002.

## APPENDIX VR – 1: LIGHTING COMPLAINT RESOLUTION FORM

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### LIGHTING COMPLAINT RESOLUTION FORM

Malburg Generating Station City of Vernon, Los Angeles 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 VR – 2: VISUAL RESOURCES FIGURES**

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### **VISUAL RESOURCES FIGURES 1 THROUGH 7**

# WASTE MANAGEMENT

Testimony of Alvin Greenberg, Ph.D.

## INTRODUCTION

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This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the proposed Malburg Generating Station (MGS). Staff evaluated the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation except wastewater discharged pursuant to National Pollutant Discharge Elimination System (NPDES) permits. Wastewater is discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

- The management of the wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project will be managed in an environmentally safe manner; and
- The disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

#### **Resource Conservation and Recovery Act (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 generators of hazardous waste to comply with requirements regarding:

- Record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- Labeling practices and use of appropriate containers,
- Use of a manifest system for transportation, and
- Submission of periodic reports to the EPA or authorized state.

#### **Title 40, Code of Federal Regulations, part 260**

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

## 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 (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 criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

### **Title 14, California Code of Regulations, §17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)**

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

### **Title 22, California Code of Regulations, §66262.10 et seq. (Generator Standards)**

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

### **Title 22, California Code of Regulations, §67100.1 et seq. (Hazardous Waste Source Reduction and Management Review)**

These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.

### **California Health and Safety Code, § 41700 (Emission Limitations)**

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."

## LOCAL

The City of Vernon Environmental Health Department locally administers the California Laws and Regulations for both non-hazardous and hazardous wastes. The City's Fire Department and the Sheriff's Department have additional regulatory responsibilities with



respect to hazardous wastes. MGS will be required to obtain a Hazardous Materials Business Plan from the City of Vernon Environmental Health Department before storing hazardous materials and wastes on site.

## SETTING

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### PROJECT AND SITE DESCRIPTION

The proposed project is located in the City of Vernon in Los Angeles County, California, at the site of the existing "Station A" electrical generating plant. The City of Vernon, exclusively developed for industrial and commercial business, has operated electrical switching and generating facilities at this site since 1933, which is comprised of a switchyard, five diesel-fueled generating units, and, more recently, (since 1988) two natural gas-fired combustion turbine generators, along with related heat exchanging and electrical equipment.

The site for the proposed MGS is located within an industrial area at 2715 East 50<sup>th</sup> Street in the City of Vernon. The City is bordered to the north and west by the City of Los Angeles, by the cities of Commerce and Bell to the east, and by the cities of Huntington Park and Maywood to the south. It is approximately three miles from downtown Los Angeles and within two miles of four major freeways. The Los Angeles River, in a concrete channel, is located approximately three-fourths of a mile to the northeast of the proposed project site. The topography of the area is flat, and the projected finish grade of the facility should remain at 183 feet above mean sea level.

The proposed MGS will occupy approximately 3.4 acres of the 5.9-acre site owned by the city of Vernon. It will be comprised of two new combustion turbine generators (CTG), two heat recovery steam generators (HRSG), and one steam turbine generator (STG), along with accompanying evaporative coolers, condenser, cooling tower, control facilities, natural gas pipeline, water supply pipelines and storage tanks, electrical transformers and switchgear, and other related equipment. As proposed, the combined cycle system will have a nominal generating capacity of approximately 134 megawatts (MW) at 75 °F ambient temperature, and can function in a variety of operational modes at a projected 90 to 98 percent annual average availability. Reclaimed water will be used in the plant's cooling system.

The City of Vernon Environmental Health department completed a records search and site inspection of the entire Station A site, resulting in the identification of four potential waste management issues (see AFC Appendix O). Three of the issues are associated exclusively with Station A operations. Only one matter, the potential for diesel-fuel contaminated soil, is associated with the proposed location of the MGS, as the site was formerly occupied by above ground fuel storage tanks.

Kleinfelder performed geotechnical and Phase II environmental assessments of the Station A site during the year 2001 (COV 2001a, Appendix C), including seven soil borings, four of which were within the proposed MGS location. None of the seven borings showed any detectable concentrations of volatile organic compounds (VOCs), and six of the seven borings revealed no detectable concentrations of total petroleum hydrocarbons (TPH). One boring, located on the proposed MGS site, revealed a

detectable concentration of TPH of 67 mg/Kg (in the carbon range C<sub>22</sub> to C<sub>32</sub>), at a depth of six feet below the soil surface. This concentration is below any risk-based cleanup level. In addition, Kleinfelder performed remediation services for the City of Vernon in July of 2001 following a sub-surface diesel fuel release on the Station A site. Consequently, some potential exists for encountering diesel-fuel contaminated soil during construction excavation and grading activities. The MGS Application for Certification (AFC) proposes mitigation measures to be employed in the event that contaminated soil is encountered during these activities.

## **IMPACTS**

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### **PROJECT SPECIFIC IMPACTS**

#### **Construction**

Site preparation and construction of the proposed generating plant and associated facilities would generate both nonhazardous and hazardous wastes in solid and liquid forms.

#### **Nonhazardous Solid Wastes**

Solid wastes anticipated to be generated during construction are detailed in Section 8.13.2.1.1 of the AFC (COV 2001a) and summarized in Table 8.13-1. Approximately 2,400 pounds per month of wood, paper, cardboard, glass, plastics, silicate and mineral wool insulating materials, concrete, and nonhazardous chemical containers are anticipated during construction activities. In addition, approximately 1,000 pounds per month (eight total tons over 16 months) of scrap metals are anticipated, as are an estimated 100 pounds per month of waste oil filters (drained of free flowing oil). Wherever possible and practical, these wastes would be recycled, particularly the metals and used oil filters. The solid waste hauler for the City of Vernon would provide recycling bins for some materials. Non-recyclable materials would be properly disposed of in the Puente Hills Landfill in Whittier, California. This facility is one of eight area Class III landfills listed in AFC Table 8.13-2. The small volumes of waste requiring disposal would result in an anticipated insignificant (less than 0.01 percent increase to current disposal volumes) impact to this landfill.

#### **Hazardous Wastes**

Hazardous wastes anticipated to be generated during construction are discussed on pages 8.13-5 through 7 of the AFC (COV 2001a) and are also summarized in Table 8.13-1. Solid hazardous wastes may include spent welding materials (approximately 20 pounds per month), oily rags and absorbent, spent batteries, and empty hazardous materials containers. Liquid hazardous wastes would include waste oil (estimated 50 gallons per month); flushing, cleaning and passivating fluids (estimated 15,000 total gallons); and waste solvents, paints and other material coatings (estimated 25 gallons per month). Wherever possible, the treatment method of choice for these wastes would be recycling at a permitted facility. The cleaning, flushing and passivating liquids would be sampled and characterized to determine whether or not they possess any hazardous characteristics, and disposed of accordingly. Any non-recyclable hazardous wastes would be properly disposed of in one of five permitted Class I landfills discussed in the

noted AFC pages. The three of those five facilities that are located in California are listed in table 8.13-3.

The City of Vernon would be considered the generator of hazardous wastes at the MGS, and therefore responsible for compliance with all applicable LORS regarding these wastes. Construction contractors would be contractually bound by the City to comply with requirements for employee training, accumulation limits, record keeping, and reporting.

As noted above, diesel fuel contaminated soils could be encountered during soil excavation activities for the Malburg Generating Station. In that event, the suspected soil would be segregated, sampled, and tested in order to determine the appropriate notification, reporting, storage, treatment and/or disposal actions. Soils thus segregated would be monitored to estimate any VOC emissions and determine compliance with Air Quality Management rules. Soils determined to be hazardous or containing levels of contamination exceeding regulatory action levels would be stored, transported, treated and/or disposed of according to all applicable LORS and the specific guidance of the City's Environmental Health Department. Conditions of Certification **WASTE-4** and **WASTE-5** are proposed to address this matter.

## **Operation**

The proposed MGS facility will generate both nonhazardous and hazardous wastes, in solid and liquid forms, under normal operating conditions as described in Section 8.13.2.1.2 of the AFC. Table 8.13-4 in the AFC lists these wastes along with their respective amount, frequency of generation, and management method.

### **Nonhazardous Solid Wastes**

Nonhazardous solid wastes generated during plant operation are expected to be similar to those generated by the existing facility and include scrap metal, plastic, insulation material, paper, glass, empty containers, used equipment parts and gaskets, office wastes, spent air filters, and spent turbine parts. AFC Table 8.13-4 presents the expected waste streams, estimated amounts, and management methods. These wastes would be recycled when practical, with the remainder disposed of in a Class III landfill. The low volumes of these wastes would result in a less than significant impact to available landfills.

### **Nonhazardous Liquid Wastes**

These wastes would be generated during facility operation, and are discussed in the **Water Resources** section of this document. However, it must also be noted here that the MGS would require a Conditional Exemption Limited (CEL) permit from the DTSC in order to remove non-RCRA hazardous waste oil from process wastewater in the on-site oil-water separator. A draft copy of the permit application is included in the AFC as Appendix P.

### **Hazardous Wastes**

Hazardous wastes anticipated to be generated during routine project operation include waste oil, spent hydraulic fluid, oily rags and absorbents, spent cleaning solvents, Selective Catalytic Reduction (SCR) and oxidation catalysts, and acidic and alkaline chemical cleaning wastes. AFC Table 8.13-4 presents the expected waste streams,

estimated amounts, and management methods. Approximately 1,500 gallons of waste oil would be generated each year, along with up 120 gallons of wash water every six months. The emission control catalysts would require regeneration every three to five years, resulting in 43,000 pounds of SCR material and 3,000 pounds of CO catalyst material, which should be regenerated and recycled. However, it is possible that the spent catalysts could require off-site disposal in a TSD if regeneration and/or recycling is not feasible. In total, then, it is estimated that approximately 36,000 pounds of solid hazardous wastes would be generated each year, of which 50 to 75 percent would normally be recycled. The amount of hazardous wastes requiring off-site disposal should be minimal, and result in a less than significant impact to permitted TSD facilities.

## **IMPACT ON EXISTING WASTE DISPOSAL FACILITIES**

Section 3.6.5 of the AFC indicates that unrecyclable nonhazardous solid wastes generated during construction would be disposed of in the Puente Hills Landfill in Whittier, California; a facility operated by the Los Angeles County Sanitation District. While no similar statement is made regarding this type of waste generated during facility operation, staff assumes that Puente Hills would initially receive these wastes as well. Table 8.13-2 in the AFC indicates that Puente Hills has a permitted capacity of 106 million cubic yards, and is currently operating at a daily capacity of 13,200 cubic yards, leaving a remaining capacity of about 20 million cubic yards and an estimated closure date of 2003 to 2004. Table 8.13-2 subsequently lists seven additional Class III landfills in the general area of the MGS that accept nonhazardous wastes. The eight listed facilities possess an aggregate of 123 million cubic yards of remaining capacity with closure dates as late as 2053. It is estimated that the MGS would account for a less than significant increase in disposal volume to these facilities of under 0.01 percent.

Table 8.13-3 in the AFC lists three Class I landfills in California that are permitted to accept hazardous waste: at Kettleman Hills in King's County, Buttonwillow in Kern County, and Laidlaw in Imperial County. In total, there is an excess of 21.9 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with remaining operating lifetimes up to the year 2078. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

Much of the hazardous waste generated during facility construction and operation would be recycled, such as used oil and spent catalysts. The volume of hazardous waste from MGS requiring off-site disposal would be a very small fraction (less than 0.01 percent) of the existing combined capacity of the three Class I landfills, and would not significantly impact the capacity or remaining life of any of these facilities.

## **CUMULATIVE IMPACTS**

As proposed, the quantities of nonhazardous and hazardous wastes generated during construction and operation of the MGS project would add to the total quantities of waste generated in the City of Vernon and the State of California. However, because (a) the wastes would be generated in small quantities, (b) recycling efforts would be prioritized wherever practical, and (c) capacity is available in a variety of disposal facilities, these

added quantities would not result in significant waste management impacts to any hazardous or nonhazardous landfill.

## **ENVIRONMENTAL JUSTICE**

Staff has reviewed Census 2000 information that shows the minority population is greater than 50 percent within a six-mile radius of the proposed MGS (please refer to Socioeconomics Figure 1 in this Staff Assessment). Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Based on the Waste Management analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project. Therefore, there are no Waste Management environmental justice issues related to this project.

## **FACILITY CLOSURE**

During any type of facility closure (see staff's General Conditions 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 believes that conditions of certification in the General Conditions 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 be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure requires 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.

For planned permanent closure, MGS will develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS, which are applicable at the time of closure.

## **COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

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Energy Commission staff concludes that the Malburg Generating Station would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during MGS construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the various departments within the California Environmental Protection Agency (Cal EPA). Because hazardous wastes would be produced during project construction and operation, MGS should utilize its existing California Department of Toxic Substances Control (DTSC) facility

identification number (CAL 000031305) as a hazardous waste generator. Accordingly, MGS will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, Title 22, section 67100.1 et seq., a hazardous waste Source Reduction and Evaluation Review and Plan must be prepared by MGS.

## MITIGATION

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In section 8.13.5 of the AFC, the City of Vernon states that several best management practices will be put in place at the MGS in order to manage and minimize wastes during both construction and operation of the facility. These business practices would be employed to facilitate the following hierarchical approach to waste management, listed in order of preference from greatest to least:

- Source reduction
- Recycling
- Treatment
- Disposal

Accordingly, the City proposes four mitigation measures to follow this waste management hierarchy and to assure compliance with applicable LORS. These measures may be summarized as follows:

- **WM-1** Hazardous Waste Management Plan and Procedures to minimize hazardous waste generation, while should include the hierarchy noted above.
- **WM-2** Appropriate hazardous waste storage
- **WM-3** Hazardous waste training for MGS employees.
- **WM-4** Management of subsurface soil discovered to contain petroleum hydrocarbons or other potentially hazardous substances.

AFC sections 8.13.5.1 and 8.13.5.2 further discuss the City's general waste LORS compliance procedures for the construction and operation phases respectively.

Staff has examined the waste management related measures proposed by the Applicant and concluded that, together with applicable LORS and the Conditions of Certification proposed by staff, they will adequately assure that no significant adverse environmental impacts will result from the management and disposal of project-related waste.

## CONCLUSIONS AND RECOMMENDATIONS

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Management of the wastes generated during construction and operation of the MGS would not result in any significant adverse impacts if the City of Vernon implements the waste management measures proposed in the Application for Certification and the proposed conditions of certification.

## CONDITIONS OF CERTIFICATION

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**WASTE-1** The project owner shall provide the resume of a Registered Professional Engineer or Geologist, who shall be available for consultation during soil excavation and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

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 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM.

**WASTE-2** 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 Los Angeles Regional Water Quality Control Board, the City of Vernon Environmental Health Department, the City of Vernon Fire Department, and the Glendale 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. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

**WASTE-3** 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-4** The project owner shall prepare a Construction Waste Management Plan and an Operation Waste Management Plan for all wastes generated during construction and operation of the facility, respectively, and shall submit both plans to the City of Vernon Environmental Health Department and the City of

Vernon Fire Department for comment and to the CPM for review and approval. 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 30 days prior to the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the City of Vernon Environmental Health Department, City of Vernon Fire Department, and CPM.

The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to the planned management methods.



## REFERENCES

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City of Vernon (COV) 2001a. Application for Certification for the Malburg Generating Station. Dated 12/18/01 and docketed 12/21/01.

# **WORKER SAFETY AND FIRE PROTECTION**

Testimony of Alvin J. Greenberg, Ph.D. and Rick Tyler

## **INTRODUCTION**

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Worker safety and fire protection is legislated by laws, ordinances, regulations, and standards (LORS), and enforced through regulations codified at the Federal, State, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Industrial workers at the facility operate process equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment or procedural controls.

The purpose of this Staff Assessment is to assess the worker safety and fire protection measures proposed by the Malburg Generating Station (MGS) project and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

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### **FEDERAL**

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 the 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 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**

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 edition 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**

The California Building Standards Code published at Title 24 of the California Code of Regulations § 3 et seq. consists 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 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 of the California Code of Regulations.

Similarly, the Uniform Fire Code (UFC) 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. The City of Vernon adopted the 1997 Uniform Fire Code in 1998. The City of Vernon Fire Department administers the UFC (Martinez 2002).

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.); and
- Uniform Fire Code, 1997.

## **SETTING**

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The proposed project is located on an existing power generation site, within a 5.9-acre parcel owned by the City of Vernon in Los Angeles County.

The Malburg Generating Station (MGS) project involves construction and operation of a combined cycle natural gas fired cogeneration facility with ancillary facilities including pipelines.

Fire support services to the site will be under the jurisdiction of the City of Vernon Fire Department. Station 2 is the closest station to the site and is located at 4305 Santa Fe Avenue, approximately one mile from the project location. The response time to the project site is estimated to be 3 minutes or less (Martinez 2002, Parker 2002). This station would also provide first EMS response, and is able to provide adequate response in the event of a major accident involving multiple injuries. Station 1, located at 3375 Fruitland Avenue, 1.25 miles from the MGS site, would be the second responder with response time of approximately 3 minutes.

Station 2 is also assigned as the off-site hazardous materials (hazmat) responder for the MGS. There are 6 personnel assigned to the HazMat team, and they are all certified hazardous materials specialist. This station is adequately equipped to respond to hazardous materials incidents. Backup HazMat support would be provided by the Santa Fe Springs Fire Department (Parker 2002).

## **IMPACTS**

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### **WORKER SAFETY**

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the Malburg Generating Station project to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

### **FIRE HAZARDS**

During construction and operation of the proposed Malburg Generating Station project there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards. The City of Vernon Fire Department has stated that it is adequately equipped

and staffed to respond to an on-site fire within 3 minutes or less (Martinez 2002, Parker 2002) and that it can also respond adequately to a hazardous materials spill.

## **APPLICANT'S PROPOSED MITIGATION**

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### **WORKER SAFETY**

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

#### **Construction Safety and Health Program**

The Malburg Generating Station project encompasses construction and operation of a natural gas fired facility with ancillary facilities such as transmission lines and pipelines. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at 8 CCR § 1502, et seq. These requirements are promulgated by Cal/OSHA and are applicable to the construction phases of the project. The Construction Safety and Health Program will include the following:

- Construction Injury and Illness Prevention Program (8 CCR § 1509);
- Construction Fire Protection and Prevention Plan (8 CCR § 1920); and
- Personal Protective Equipment Program (8 CCR §§ 1514 - 1522).

Additional programs under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will include:

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;
- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Prevention Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;
- Hot Work Safety Program;
- Respiratory Protection Program;

- Employee Exposure Monitoring Program;
- Confined Space Entry Program;
- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Air Monitoring Program;
- Heat and Cold Stress Monitoring and Control Program; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to the start of construction of the Malburg Generating Station project, detailed programs and plans will be provided pursuant to condition of certification **WORKER SAFETY-1**.

### **Operations and Maintenance Safety and Health Program**

Upon completion of construction and prior to operations at the Malburg Generating Station project, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203);
- Emergency Action Plan (8 CCR § 3220);
- 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).

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will be applicable to the project. Written safety programs, which the applicant will develop, for the Malburg Generating Station project will ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (COV 2001a, page 8.7-4). Prior to operation of the Malburg Generating Station project, all detailed programs and plans will be provided pursuant to condition of certification **WORKER SAFETY-2**.

### **Safety and Health Program Elements**

The Applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

## **Injury and Illness Prevention Program (IIPP)**

The Applicant will submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction and operation of the project.

The IIPP will include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and
- A training program for:
  - introducing the IIPP;
  - new, transferred, or promoted employees;
  - new processes and equipment;
  - supervisors; and
  - contractors.

## **Emergency Action Plan**

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (Table 8.7-3).

The outline lists the following features:

- Purpose and Scope of Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;
- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;
- Hazard Communication;
- Spill Containment and Reporting;



- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

### **Fire Prevention Plan**

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

- Responsibilities;
- Procedures for fire control;
- Fixed and portable fire-fighting equipment;
- Housekeeping;
- Employee alarm/communication practices;
- Servicing and refueling areas;
- Training; and
- Flammable and combustible liquid storage.

Staff proposes that the Applicant submit a final Fire Protection and Prevention Plan to the Vernon Fire Department for review and comment prior to submission to the California Energy Commission Compliance Project Manager (CPM) for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1 and 2**.

### **Personal Protective Equipment Program**

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are encountered that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). The Malburg Generating Station project operational environment will likely require PPE.

All safety equipment must meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and Cal-OSHA standards. Each employee will be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When the protective clothing and equipment are to be used;
- Benefits and limitations; and
- When and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program.

### **Operations and Maintenance Written Safety Program**

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include the following:

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

### **Operations and Maintenance Safety Training Programs**

Employees will be trained in the safe work practices described in the above-reference safety programs.

## **FIRE PROTECTION**

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (COV 2001a, Section 8.7) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required by the City of Vernon Fire Department.

During construction an interim fire protection system will be in place. The permanent facility fire protection system will be placed in service as early as possible during the construction phase.

Staff finds that if the applicant follows the fire prevention plan as indicated in the AFC, it will meet the minimum fire protection and suppression requirements of the UFC, CFC, and the NFPA. Elements include both fixed and portable fire extinguishing systems. The fire water supply consists of 150,000 gallons of firewater which will be supplied from an existing 275,000-gallon underground cooling water tank. A fire main for the proposed facility will be connected to this existing tank. The firewater system will include a primary electric-driven pump, a "jockey" pressure maintenance electric-driven pump, and an emergency diesel-driven pump (COV 2002e). This system will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations,

and water spray and sprinkler systems. The fire pumps have a capacity of 1,500 gallons/minute to deliver water to the fire protection water piping network.

A carbon dioxide fire protection system will be provided for the combustion turbine generator (CTG) and accessory equipment. Fire detection sensors will also be installed.

Fire hydrants and hose stations will supplement the plant fire protection system using water from the plant firewater system. Fire hydrants with hose stations must be placed at approximately 300-foot intervals around the perimeter of the plant in accordance with NFPA 24 and local fire codes.

In addition to the fixed fire protection system, smoke detectors, combustible gas detectors, and appropriate class of service portable extinguishers will be located throughout the facility at code-approved intervals.

The applicant will be required to provide the final Fire Protection and Prevention Program to staff and to the City of Vernon Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

Because the proposed facility is located within an area that is currently served by the local fire department, staff reviewed the ability of the local fire department to respond in a timely and adequate manner to a fire at the power plant and interviewed the City of Vernon Fire Chief. Staff concluded that the fire risks of the proposed facility are similar to those of existing facilities in the immediate vicinity and thus pose no significant added demands on local fire protection services. In fact, there has not been a significant fire in recent history at a natural gas power plant certified by the Energy Commission. The City of Vernon Fire Department stated that their stations are equipped and staffed adequately to respond to any incident at the proposed MGS or along the transportation route when in their jurisdiction (Martinez 2002, Parker 2002).

## **FACILITY CLOSURE**

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The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed prior to closure to incorporate these requirements.

## **CUMULATIVE IMPACTS**

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Staff reviewed the potential for the construction and operation of Malburg Generating Station (MGS) project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City of Vernon Fire Department and found that cumulative impacts were insignificant. The City of Vernon Fire Department Chief was confident that the response time, equipment and personnel at stations 1 and 2 were adequate for the fire department to respond to whatever fire occurred at an industrial facility of this type (Martinez 2002, Parker 2002). The Fire Chief stated that

this facility would not have any impact on their ability to respond to emergencies in their jurisdiction.

## **CONCLUSION AND RECOMMENDATIONS**

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If the Applicant for the proposed Malburg Generating Station (MGS) provides a Project Construction Safety and Health Program and a Project Operations Safety and Health Program as required by Conditions of Certification **WORKER SAFETY 1** and **2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. Staff also concludes that the proposed project will not have significant impacts on local fire protection services.

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Construction Safety and Health Program and the Operations Safety and Health Program proposed by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**WORKER SAFETY-1** The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Injury and Illness Prevention 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, Injury and Illness Prevention Program, Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, if appropriate, for review and comment concerning compliance of the program with all applicable Safety Orders, and then to the CPM for review and approval. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of Vernon Fire Department for review and comment prior to submittal to the CPM for review and approval.

**Verification** At least 30 days prior to the start of construction, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, including a copy of the cover letter transmitting the Programs to Cal/OSHA's Consultation Service, if appropriate.

**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;
- 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 prior to submittal to the CPM for review and approval. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of Vernon Fire Department for review and comment prior to submittal to the CPM for review and approval.

**Verification** At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

## REFERENCES

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1998 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

City of Vernon (COV) 2001a. Application for Certification. Dated 12/18/01 and docketed 12/21/01.

City of Vernon (COV) 2002e. Information Requested in the CEC's Data Requests. Dated 6/18/02 and docketed 6/19/02.

Martinez, Luz. Secretary to the Fire Chief, City of Vernon Fire Department. Personal communication July 9, 2002.

Parker, N. Steven. Fire Chief, City of Vernon Fire Department. Letter to Alvin Greenberg dated September 3, 2002.

# FACILITY DESIGN

Testimony of Shahab Khoshmashrab, Al McCuen and Steve Baker

## INTRODUCTION

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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.
- Compliance with CEQA.

## 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

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The City of Vernon proposes to construct and operate a nominally rated 134 megawatt combined cycle power plant known as Malburg Generating Station (MGS). The project will be located in Vernon, Los Angeles County. The site will occupy approximately 3.4 acres of the City of Vernon's existing Station A. The existing site includes 5.9 acres, located on East 50<sup>th</sup> Street and will lie in seismic zone 4. For more information on the site and related project description, please see the **Project Description** section of this document. References to “the City” and “the County” designate the City of Vernon and Los Angeles County, respectively. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices B2 through B6 (COV 2001a).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (COV 2001a, Appendices B2 through B6). 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 American Welding Society (AWS).

## ANALYSIS

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The basis of this analysis is the applicant's proposed analysis and construction methods and 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 AFC Appendices B2 through B6 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.

## **PROJECT QUALITY PROCEDURES**

The AFC (COV 2001a, § 3.8.3.8) describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

## **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 or the 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**

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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

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### 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

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**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.

**Verification:** Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the 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.

**Verification:** At least 60 days (or project owner and CBO approved alternative timeframe) 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**

<b>Equipment/System</b>	<b>Quantity (Plant)</b>
Combustion Turbine (CT) Foundation and Connections	2
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator Foundation and Connections	1
Steam Condenser and Auxiliaries Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
High Pressure HRSG Feed Pumps Foundation and Connections	4
Low Pressure HRSG Feed Pumps Foundation and Connections	4
HRSG Stack Structure, Foundation and Connections	2
CT Main Transformer Foundation and Connections	2
ST Main Transformer Foundation and Connections	1
Condensate Pumps Foundation and Connections	2
Circulating Water Pumps Foundation and Connections	2
Water Treatment Makeup Pumps Foundation and Connections	2
Cooling Tower Makeup Pumps Foundation and Connections	2
Raw Water Storage Tank and Pump Foundations and Connections	1
Water Treatment System Structure, Foundation and Connections	1
Condensate Storage and Transfer System Foundation and Connections	1
Condensate Water Tank Foundation and Connections	1
Closed Cooling Water Heat Exchanger Foundation and Connections	1
Auxiliary Cooling Water Pumps Foundation and Connections	2
Waste Water Collection System Foundation and Connections	1
Fuel gas Heater Foundation and Connections	1
Fire Protection System	1
Cooling Tower Structure, Foundation and Connections	1
Generator Breakers Foundation and Connections	3
Transformer Breakers Foundation and Connections	3
Natural Gas Metering Station Structure, Foundation and Connections	1
Natural Gas Compressor Foundation and Connections	3
Natural Gas Compressor Enclosure Structure, Foundation and Connections	1
Ammonia Storage Facility Foundation and Connections	1
Boiler Chemical Feed Skids Foundation and Connections	2
Vacuum Pump Skid Foundation and Connections	2
Auxiliary Space Cooling Water Skid Foundation and Connections	1
Ammonia Vaporizer System Foundation and Connections	2
Continuous Emissions Monitoring Systems Structure, Foundation and Connections	1
Instrument/Service Air System Foundation and Connections	2

Equipment/System	Quantity (Plant)
MCC/Relaying/Metering Building Structure, Foundation and Connections	1
Control Room Structure, Foundation and Connections	1
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Substation/Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	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.

**Verification:** 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.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume 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 resume 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 soils engineer, or a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; and C) an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the

project: D) 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; E) a mechanical engineer; and F) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730, 6731 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 soils engineer or geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. 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;
2. 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; (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both);
3. Recommend field changes to the civil engineer and RE;
4. 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
5. 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 engineering geologist shall:

1. Review all the engineering geology reports and prepare final soils grading report;

D: 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 engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

E: 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.

F: 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 project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible 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 resume 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 [1998 CBC,

Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; 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).

**Verification:** At least 15 days (or project owner and CBO approved alternative timeframe) 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** If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required [1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall 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.

**Verification:** 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].

**Verification:** 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.

**CIVIL-1** 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].

**Verification:** At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of site grading 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 earthwork and construction in the affected areas when the responsible soils engineer or 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].

**Verification:** The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours 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 [1998 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. 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.

**Verification:** 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].

**Verification:** 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; and
4. Turbine/generator pedestal.

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].

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) 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 non-conforming 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 engineering 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.

**Verification:** 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 [1998 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. 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.

**Verification:** 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 the requirements of this Chapter.

**Verification:** At least 30 days (or project owner and CBO approved alternate timeframe) 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** 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.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [1998 CBC, Section 104.2.2, Deputies].

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) 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.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) 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** The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration 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].

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) 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:
8. Receipt or delay of major electrical equipment;
  9. Testing or energization of major electrical equipment; and
  10. 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.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) 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

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MGS (Malburg Generating Station). 2001a. Application for Certification, Malburg Generating Station (01-AFC-25). Submitted to the California Energy Commission, December 21, 2001.

# **GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY**

Testimony of Dal Hunter, Ph.D., C.E.G.

## **INTRODUCTION**

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The geology and paleontology section discusses potential impacts of the proposed Malburg Generating Station (MGS) 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 important 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" or "less than significant with mitigation incorporated." 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 Conditions of Certification.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

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The applicable LORS are listed in the Application for Certification (AFC), in Section 8.15.6 of the AFC (City of Vernon, 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 or grading for the proposed project. The Federal Antiquities Act of 1906 (PL 59-209; 16 United States code 431 *et seq.*; 34 Stat. 25), in part, protects paleontological resources from vandalism and unauthorized collection on federal land. The National Environmental Policy Act of 1968 (United States Code, Section 4321 4327; 40 Code of Federal Regulations, Section 1502.25), as amended, requires analysis of potential environmental impacts to important historic, cultural and natural aspects of our national heritage.

### **STATE AND LOCAL**

The California Building Code (CBC) 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 project 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 (California Building Standards Commission [CBSC]), 1998.

The California Environmental Quality Act 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 "Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures" (SVP, 1995) is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1995 by the Society of Vertebrate Paleontologists (SVP), a national organization.

## **SETTING**

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### **REGIONAL AND SITE GEOLOGY**

The proposed MGS is located within the northeast corner of the Peninsular Ranges geomorphic province. This area within the Peninsular Ranges is characterized by the Los Angeles Basin, an active structural basin. Major geologic units present in the area include older Quaternary alluvium and Quaternary alluvium (Dibblee, 1989). The older Quaternary alluvium consists of weakly consolidated alluvial deposits of gravel, sand, and silt. The Quaternary alluvium consists of unconsolidated and flood plain deposits of silt, sand, and gravel.

Geotechnical exploration at the plant site generally encountered a surficial brown, silty sand fill overlying variable yellow brown, silty sand to poorly graded sand. Clayey sand to sandy clay was also encountered underlying the variable silty sand and poorly graded sand at depths below approximately 38 feet. The surficial silty sand fill was encountered from the ground surface to depths of 5 feet. The variable silty sand and poorly graded sand was encountered to depths of approximately 44 feet below the overlying surficial silty sand fill. Ground water was encountered at depths ranging from 38 feet to 44-1/2 feet below the ground surface (Kleinfelder, 2001).

The proposed gas, sewer, and reclaimed water pipeline alignments have been mapped as passing through Quaternary alluvium (Dibblee, 1989).

### **SITE SEISMICITY**

Energy Commission staff reviewed the California Geological Survey (CGS) publication Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, dated 1994 (CGS, 1994), Maps of Known Active Fault Near-source Zones in California and Adjacent Parts of Nevada (International Conference of Building Officials [ICBO], 1998), the Geologic Map of California – Los Angeles Sheet (Jennings and Strand, 1969), the Geologic Map of the San Bernardino Quadrangle (Bortugno and Spittler, 1986); the Seismic Hazard Evaluation of the South Gate 7.5-Minute Quadrangle, Los Angeles County, California (CGS, 1998), the Seismic Hazard Evaluation of the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California,

the Earthquake Hazards Associated with Faults in the Greater Los Angeles Metropolitan Area, Los Angeles County, California, including faults in the Santa Monica – Raymond, Verdugo – Eagle Rock, and Benedict Canyon Fault Zones (Hill et al., 1979); and the Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones – Southern Region (CGS, 2000). The project is located within Seismic Zone 4 as delineated on Figure 16-2 of the CBC, but not within an Alquist-Priolo Special Studies Zone.

The Los Angeles area contains numerous mapped Holocene (active) faults and poorly understood blind thrust faults. These blind thrust faults have been responsible for the 1987 magnitude (M) 6.0 Whittier Narrows and 1994 M6.7 Northridge earthquakes (Oskin, et. al, 2000). Active blind thrust faults in the vicinity of the MGS are not mapped by ICBO (1997); however, based upon new research, these faults should be included as active faults that may impact the MGS. By definition, blind thrust faults do not intersect the ground surface so that they cannot be directly observed. As a consequence, their very presence, including their location, orientation, and the number of segments each fault has must be interpreted from subsurface and surface data. This data is primarily drawn from studies of past earthquakes and micro-seismicity, deep geophysical studies oil well logs, and anticlinal folding mapped by geologists. Because of the complexity of the process, interpretation is in a relatively young stage and still evolving. Several different interpretations are postulated that may or may not end up being in conflict (Shaw and Shearer, 1989; Oskin, et. al., 2000).

The applicant has reviewed the available information in considerable detail and has concluded that three blind thrust faults have the most potential to affect the MGS. Staff concurs with their analysis. The closest is the Los Angeles segment of the Puente Hills blind thrust fault, which underlies the site. This fault dips to the north at 27 degrees and projects to the ground surface just southwest of the MGS. The Los Angeles segment of the fault is thought to have the potential to generate a magnitude (M) 6.6 earthquake. The Elysian Park (M 6.7) and the Compton (M 6.8) blind thrust faults have less effect on the site at distances of 3.1 miles and 3.7 miles, respectively. Using the average of a variety of attenuation relationships, the applicant has calculated peak horizontal ground acceleration at the site of 0.779 of the acceleration of gravity (g), based on rupture of the Los Angeles segment of the Puente Hills fault. This includes a 50 percent increase for blind thrust faults, as suggested by K.W. Campbell (Blake, 1989-2000). Without the 50 percent increase, the average value is 0.526 g.

### **Liquefaction, Dynamic Compaction, Hydrocompaction, Subsidence, Expansive Soils, and Landslides**

Liquefaction is a nearly complete loss of soil shear strength that can occur during an earthquake. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, greatly reducing the internal strength of the soil. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non- to slightly-plastic fines) and very soft silts, all lying below the ground water table. The higher the ground acceleration caused by the earthquake, 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. Geotechnical exploration at the plant site encountered medium dense to dense silty sand and poorly

graded sand along with ground water at depths ranging from 38 feet to 44-1/2 feet below the ground surface (Kleinfelder, 2001). Due to the low ground water and medium dense to dense sandy soils present at the plant site, the potential for liquefaction is low. There are no LORS that require linear facilities to be protected from liquefaction or earthquake damage, even when they cross an active fault (Anderson, 2001).

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 fine flash flood deposits, true loess, clayey loose sands, loose sands cemented by soluble salts, and windblown silts. Based on the nature and of the existing native soils, hydrocompaction potential is not considered significant at the proposed MGS site; however, no subsurface information along the proposed linear alignments was provided in the AFC (City of Vernon, 2001a).

Ground subsidence is typically caused by oil or gas withdrawal when ground water is drawn down by municipal or irrigation wells 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. As the MGS will obtain reclaimed water from the Central Basin Municipal Water District (CBMWD) via a new water pipeline to the site, significant draw down of the water table due to MGS operations is not anticipated. The closest oil field, the Inglewood Oil Field, lies approximately 1-1/2 miles to the west. Oil bearing strata related to the Inglewood Oil Field has not been mapped beneath the MGS site (DOGGR, 1992). As a result, the potential for ground subsidence is 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 precipitation, landscape irrigation, capillary tension, water line breaks, etc. allows the clay soils to draw water molecules in their structure, which, in turn, causes an increase in the volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. Geotechnical exploration at the plant site encountered silty sands and poorly graded sands to depths ranging from 31-1/2 feet to 45 feet below the ground surface overlying clayey sands to sandy clays. Due to the depth of clay soils, the potential for soil expansion is low; however, no subsurface information along the proposed linear alignments was provided in the AFC (City of Vernon, 2001a).

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that is 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. Based on the staff's review of the site topography (flat) and geology as presented in the AFC (City of Vernon, 2001a), the potential for landslides and debris-flows at the site is considered low.



## **GEOLOGICAL, MINERALOGICAL, AND PALEONTOLOGICAL RESOURCES**

Energy Commission staff have reviewed applicable geologic mapping for this area (CDMG, 2001; Larose et al., 1999; Tooker and Beeby, 1958; Evans et al., 1979; DOGGR, 1982; and Miller, 1994). Based on this information and the information contained in the AFC (City of Vernon, 2001a), there are no known geological or mineralogical resources located on or immediately adjacent to the proposed MGS site. The applicant's consultant conducted a paleontological resources field survey and a sensitivity analysis for the proposed MGS and the proposed linear facility improvements to support the MGS. No fossil fragments were observed at the MGS site or along associated linear facilities. However, several paleontological localities are present near the MGS site in the same geologic formation as present beneath the sites disturbed surface soils. The MGS plant site contains both fill material and Quaternary alluvium. As a result, the proposed MGS site has been assigned a no potential sensitivity rating for the fill material and an undetermined sensitivity rating for the Quaternary alluvium (Lander, 2001) for paleontological resources such that standard mitigation procedures will be necessary (see **PAL-1** through **PAL-7**).

# IMPACTS

## ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>GEOLOGY – Would the project:</b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
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
<b>MINERAL RESOURCES – Would the project:</b>				
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
<b>PALEONTOLOGICAL RESOURCES – Would the project:</b>				
a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

## **DISCUSSION OF IMPACTS**

### **Geology**

#### **A. Expose People or Structures to Potential Substantial Adverse Effects:**

##### **I. Rupture of Known Earthquake Faults:**

###### **No Impact**

The proposed MGS and related linear facilities are not located on a fault, as delineated by the ICBO (1998).

##### **II. Strong Seismic Ground Shaking**

###### **Less Than Significant Impact with Mitigation Incorporated**

The proposed project is located in CBC Seismic Zone 4. The estimated peak horizontal ground acceleration for the site is approximately 0.58g. All structures should be designed accordingly (See **GEN-1**, **GEN-5**, **CIVIL-1**, and **CIVIL-3** under **FACILITY DESIGN**).

##### **III. Seismic Related Ground Failure, Including Liquefaction:**

###### **Less Than Significant Impact**

Based on site geology, the potential for liquefaction is considered low.

##### **IV. Landslides**

###### **No Impact**

Based on the site topography and configuration of the proposed improvements, the potential for landsliding at or adjacent to the site is considered to be negligible.

#### **C. BE LOCATED ON A GEOLOGIC UNIT OR SOIL THAT IS UNSTABLE:**

###### **Less Than Significant Impact**

Based on site geology, the potential for lateral spreading, subsidence, or collapse is considered low.

#### **D. BE LOCATED ON AN EXPANSIVE SOIL:**

###### **No Impact**

Expansive soils are not present at this site.

### **Mineral Resources**

#### **A. RESULT IN THE LOSS OF AVAILABILITY OF A KNOWN MINERAL RESOURCE:**

###### **No Impact**

#### **B. RESULT IN THE LOSS OF AVAILABILITY OF A LOCALLY IMPORTANT MINERAL RESOURCE:**

###### **No Impact**

### **Paleontological Resources**

#### **A. DIRECTLY OR INDIRECTLY DESTROY A UNIQUE PALEONTOLOGICAL RESOURCE:**

###### **Less Than Significant Impact With Mitigation Incorporated**

No fossils were encountered or are known to be located on site; however, known paleontological sites have been documented near the site. As a result, a strict protocol will be required during construction (see **PAL-1 through PAL-7**).

## **CUMULATIVE IMPACTS**

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The MGS lies in an area that exhibits moderate geologic hazards, common to Southern California, and no known or likely geologic resources such as minerals, aggregates, oil, or natural gas. Paleontologic resources have not been identified at the plant site or along associated linear facilities; however, paleontologic sites exist nearby. Based on this information and the proposed Conditions of Certification to mitigate potential project specific impacts, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project is low.

## **CONCLUSIONS**

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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 Certification are implemented. Although improvements to other, relatively nearby, power plants have been proposed by other applicants (Magnolia Power Generation Station, Burbank, California, El Segundo Generating Station, El Segundo, California), there would be no cumulative effects on geological hazards, or geological/paleontological resources.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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General Conditions of Certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **FACILITY DESIGN** section. Conditions of Certification for Paleontology are as follows:

**PAL-1** The project owner shall provide the CPM with the resume and qualifications of its Paleontological Resource Specialist (PRS) and Paleontological Resource Monitors (PRMs) for review and approval. If the approved PRS or one of the PRMs is replaced prior to completion of project mitigation and report, the project owner shall obtain CPM approval of the replacement.

The resume shall include the names and phone numbers of contacts. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontologists (SVP) guidelines of 1995. The experience of the PRS shall include the following:

- 1) institutional affiliations or appropriate credentials and college degree;
- 2) ability to recognize and recover fossils in the field;
- 3) local geological and biostratigraphic expertise;

- 4) proficiency in identifying vertebrate and invertebrate fossils;
- 5) publications in scientific journals; and
- 6) the PRS shall have at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The PRS shall obtain qualified paleontological resource monitors to monitor as necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- 1) BS or BA degree in geology or paleontology and one year experience monitoring in California; or
- 2) AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
- 3) Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

**Verification:** At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

**PAL-2** The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the PRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

**Verification:** At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings.

If there are changes to the footprint of the project, revised maps and drawings shall be provided at least 15 days prior to the start of ground disturbance.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

**PAL-3** The PRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontologists (SVP, 1995) and shall include, but not be limited to, the following:

- 1) Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, 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 will be performed according to the PRMMP procedures;
- 2) Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and all conditions for certification;
- 3) A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
- 4) An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained beds;
- 5) A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring;
- 6) A discussion of the procedures to be followed in the event of a significant fossil discovery, including notifications;

- 7) 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;
  - 8) Procedures for 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
  - 9) Identification of the institution that has agreed to receive any data and fossil materials recovered, 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; and,
- 10) A copy of the paleontological conditions of certification.

**Verification:** At least thirty (30) days prior to ground disturbance, the project owner shall provide a copy of the PRMMP. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the project owner evidenced by a signature.

**PAL-4** Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all project managers, construction supervisors and workers who operate ground disturbing equipment or tools. Workers to be involved in ground disturbing activities in sensitive units shall not operate equipment prior to receiving worker training. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address 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. In-person training shall be provided for each new employee involved with ground disturbing activities, while these activities are occurring in highly sensitive geologic units, as detailed in the PRMMP. The in-person training shall occur within four days following a new hire for highly sensitive sites and as established by the PRMMP for sites of moderate, low, and zero sensitivity. Provisions will be made to provide the WEAP training to workers not fluent in English.

The training shall include:

- 1) A discussion of applicable laws and penalties under the law;
- 2) For training in locations of high sensitivity, the PRS shall provide good quality photographs or physical examples of vertebrate fossils that may be expected in the area;

- 3) Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
- 4) Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
- 5) An informational brochure that identifies reporting procedures in the event of a discovery;
- 6) A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
- 7) A sticker that shall be placed on hard hats indicating that environmental training has been completed.

**Verification:** At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

If an alternate paleontological trainer is requested by the owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval. Alternate trainers shall not conduct training prior to CPM authorization.

The project owner shall provide in the Monthly Compliance Report the WEAP copies of the Certification of Completion forms with the names of those trained and the trainer for each training offered that month. The Monthly Compliance Report shall also include a running total of all persons who have completed the training to date.

**PAL-5** The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

- 1) Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.



- 2) PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
- 3) The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
- 4) For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

**Verification:** The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the project shall include a justification in summary as to why monitoring was not conducted.

**PAL-6** The project owner, through the designated PRS, shall ensure the 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 their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved PRR. The project owner shall be responsible to pay curation fees for fossils collected and curated as a result of paleontological monitoring and mitigation.

**PAL-7** The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the recovered fossil materials and related information and submitted to the CPM for review and approval.

**Verification:** The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

Within ninety (90) days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover.

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# POWER PLANT EFFICIENCY

Testimony of Kevin Robinson and Steve Baker

## INTRODUCTION

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The Energy Commission makes findings as to whether energy use by the Malburg Generating Station (MGS) 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 MGS'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:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

No federal LORS apply to the efficiency of this project.

### STATE

No State LORS apply to the efficiency of this project.

### LOCAL

No local or county ordinances apply to power plant efficiency.

## SETTING

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The applicant proposes to construct and operate the 134 MW (nominal gross output) combined cycle, merchant MGS power plant to generate baseload and load following power, selling energy to the power market (MGS 2001a, AFC §§ 1.4, 3.4.3, 3.7). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.) The MGS will consist of two Alstom GTX100 frame-type combustion gas turbines with evaporative inlet air coolers/filters, two multi-pressure heat recovery steam generators (HRSGs) with duct burners, and a single 2-pressure, reheat, condensing steam turbine (ST) generator producing approximately 30-50 percent of the total 134 MW output (MGS 2001a, AFC § 3.8.3.1). The gas turbines and HRSGs will be equipped with dry low-NOx combustors and selective catalytic

reduction to control air emissions (MGS 2001a, AFC §§ 1.2, 3.4.4.1, 3.4.4.2, Appendix B). Natural gas will be delivered by the existing City of Vernon gas distribution system through a new 1,300-foot section of 10-inch pipeline (MGS 2001a, AFC §§ 1.2, 1.8, 3.1, 3.4.6, 3.8.3.6).

## **ANALYSIS**

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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).

### **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 conditions, the MGS will burn natural gas at a nominal rate of 810 million Btu per day, lower heating value (LHV) without duct firing. With duct firing, the expected fuel consumption is estimated at 951 million Btu per day, LHV (MGS 2001a, AFC § 3.4.6). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, electricity will be generated at a full load efficiency of approximately 51.58 percent LHV without duct burning and 49.33 percent LHV with duct burning (MGS 2001a, AFC Tables 3.4-4, 3.4-5); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

### **Adverse Effects On Energy Supplies And Resources**

The Applicant has described its sources of supply of natural gas for the project (MGS 2001a, AFC §§ 1.2, 1.8, 3.1, 3.4.6, 3.8.3.6, 6.0). Natural gas for the MGS will be supplied from the existing City of Vernon system via a new 1,300-foot section of 10-inch pipeline. The City of Vernon system is capable of delivering the required quantity of gas to the MGS. Furthermore, the City of Vernon gas supply represents an adequate source for a project of this size. It is therefore highly unlikely that the project could pose a substantial increase in demand for natural gas in California.

## **Additional Energy Supply Requirements**

Natural gas fuel will be supplied to the project by the City of Vernon via a new 1,300-foot section of 10-inch pipeline (MGS 2001a, AFC §§ 1.2, 1.8, 3.1, 3.4.6, 3.8.3.6). There is no real likelihood that the MGS will require the development of additional energy supply capacity.

## **Compliance With Energy Standards**

No standards apply to the efficiency of the MGS or other non-cogeneration projects.

## **Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption**

The MGS could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. 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 MGS will be configured as a combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust (MGS 2001a, AFC §§ 1.1, 1.2, 3.1, 3.4.3, 3.4.4, 3.8.3.1). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The Applicant proposes to use inlet air coolers, HRSG duct burners (re-heaters), two-pressure HRSG and steam turbine units and circulating water system (MGS 2001a, AFC §§ 1.1, 1.2, 3.1, 3.4.3, 3.4.4, 3.8.3.1). Staff believes these features contribute to meaningful efficiency enhancement to the MGS. The two-train CT/HRSG configuration also allows for high efficiency during unit turndown because one CT can be shut down, leaving one fully loaded, efficiently operating CT instead of having two CTs operating at an inefficient 50 percent load.

The MGS includes HRSG duct burners, partially to replace heat to the ST cycle during high ambient temperatures when CT capacity drops, and partially as added power. Duct firing also provides a number of operational benefits, such as load following and balancing and optimizing the operation of the ST cycle.

## **Equipment Selection**

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The Alstom GTX100 turbine to be employed in the MGS represents one of the most modern and efficient such machines now available. The applicant will employ 2 Alstom GTX100 gas turbine generators in a two-on-one combined cycle

power train (MGS 2001, AFC §§ 1.1, 1.2, 3.1, 3.4.3, 3.4.4.1). The Alstom GTX100 configuration is nominally rated at 124.5 MW and 54 percent efficiency LHV at ISO conditions (GTW 2001).

## **Efficiency Of Alternatives To The Project**

The project objectives include generation of baseload electricity and ancillary services, as market conditions dictate (MGS 2001a, AFC §§ 1.4, 3.4.3, 3.7).

## **Alternative Generating Technologies**

Alternative generating technologies for the MGS are considered in the AFC (MGS 2001a, AFC § 1.11). Fossil fuels, biomass, waste, nuclear, solar, hydroelectric, and wind technologies are all considered. Given the project objectives, location, and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

## **Natural Gas-Burning Technologies**

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel-efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of gas turbines, incorporating technological advances made in the development of aircraft (jet) engines, combined with the cost advantages of assembly-line manufacturing, has made available machines that not only offer the lowest available fuel costs, but at the same time sell for the lowest per-kilowatt capital cost.

MGS has selected the Alstom GTX100, one of the most modern simple cycle gas turbine generators available. The Alstom GTX100 gas turbine generator in a two-on-one combined cycle power train is nominally rated at 124.5 MW and 54 percent LHV at ISO conditions (GTW 2001). Alternative machines that can meet the project's objectives are the LM6000 Sprint and FT8 which are aeroderivative machines, adapted from General Electric and Pratt & Whitney aircraft engines, respectively.

The LM6000 Sprint gas turbine generator in a one-on-one combined cycle power train is nominally rated at 56 MW and 53 percent LHV at ISO conditions (GTW 2001). The LM6000 Sprint is further enhanced by the incorporation of spray intercooling (thus the name, SPRay INTercooling). This takes advantage of the aeroderivative machine's two-stage compressor.<sup>1</sup> By spraying water into the airstream between the two compressor stages, the partially compressed air is cooled, reducing the amount of work that must be performed by the second stage compressor. This reduces the power consumed by the compressor, yielding greater net power output and higher fuel

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<sup>1</sup> The larger industrial type gas turbines typically are single-shaft machines, with single-stage compressor and turbine. Aeroderivatives are two-shaft (or, in some cases, three-shaft) machines, with two-stage (or three-stage) compressors and turbines.



efficiency. The benefits in generating capacity and fuel efficiency increase with rising ambient air temperatures. At temperatures above 90°F, the Sprint machine enjoys a four- percent increase in both power output and efficiency (GTW 2000).

Another alternative is the Pratt & Whitney Twin FT8 Plus gas turbine generator in a two-on-one combined cycle power train that is nominally rated at 74 MW and 51 percent LHV at ISO conditions (GTW 2001).

Machine	Generating Capacity (MW)	ISO Efficiency (LHV)
<b>ALSTOM GTX100</b>	<b>124.5</b>	<b>54 %</b>
GE LM6000 Sprint	56	53 %
P & W Twin FT8 Plus	74	51 %

Source: GTW 2001

The Alstom GTX100 is only slightly more efficient than the alternatives. Selecting among these machines is based chiefly on factors such as generating capacity, cost, and commercial terms.

### **Inlet Air Cooling**

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ evaporative inlet air-cooling (MGS 2001a, AFC §§ 1.2, 3.4.3, 3.4.4.1, 3.8.3.1). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

### **CUMULATIVE IMPACTS**

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for

the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the MGS. Since natural gas will be burned by the power plants that are most competitive on the spot market, the most efficient plants will run the most. The high efficiency of the proposed MGS should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants in the market, and therefore not impacting or even reducing the cumulative amount of natural gas consumed for power generation.

## **FACILITY CLOSURE**

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Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

The project, if constructed and operated as proposed, would generate a nominal 134 MW of electric power at an overall project fuel efficiency between 49 and 51 percent LHV. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. 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. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

### **RECOMMENDATION**

No Conditions of Certification are proposed.

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# POWER PLANT RELIABILITY

Testimony of Kevin Robinson and Steve Baker

## INTRODUCTION

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In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

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 the City of Vernon has predicted a 90 to 98 percent availability for the Malburg Generating Station (see below), staff uses the benchmark identified above, rather than the applicants projection, to evaluate the project's reliability.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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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 is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

## SETTING

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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 total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the recently restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), an entity that purchases, dispatches, and sells electric power throughout the state. How Cal-ISO will ensure system reliability is still being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. “Must-run” power purchase agreements and “participating generator” agreements are two mechanisms being employed to ensure an adequate supply of reliable power.

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 their causes; and
- scheduling all planned maintenance outages with the Cal-ISO.

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. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, 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.

The applicant proposes to operate the 134 MW (nominal output) Malburg Generating Station (MGS), selling energy and capacity to the power market (COV 2001a, §§ 1.4, 3.4.3, 3.7). The project is expected to operate at an overall availability in the range of 90 to 98 percent (COV 2001a, §§ 1.4, 3.4.3, 3.7, 3.8.3.1, 3.8.3.4), and at a capacity factor, over the life of the plant, of 60 to 85 percent of base load (COV 2001a, §§ 1.4, 3.7).

## **ANALYSIS**

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The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (COV 2001a, § 3.8.3.1), the MGS will be expected to perform reliably. Power plant systems must be able to

operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the MGS 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**

The MGS describes a QA/QC program (COV 2001a, § 3.8.3.8) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this 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 redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide appropriate redundancy of function for the combined cycle portion of the project (COV 2001a, § 3.8.3.3, Table 3.8-1, Appendix 5). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers, and inverters. Other balance of plant equipment will be provided with redundant examples, thus:

- two 100 percent raw water pumps;;
- two 100 percent condensate pumps;
- three 100 percent lube oil pumps; and
- two 100 percent air compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

### **Maintenance Program**

The applicant proposes to establish a preventive plant maintenance program typical of the industry (COV 2001a, §§ 3.8.3.1, 3.8.4.2). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

### **FUEL AND WATER AVAILABILITY**

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

#### **Fuel Availability**

The MGS will burn natural gas from the City of Vernon distribution system. Gas will be transmitted to the plant via a new 1,300-foot section of 10-inch diameter pipeline connected to the existing gas transmission system (COV 2001a, §§ 1.2, 1.8, 3.1, 3.4.6, 3.8.3.6). This City's natural gas system represents a resource of considerable capacity. This system offers access to adequate supplies of gas (COV 2001a, §§ 3.4.6, 3.8.3.6, 6.0). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

#### **Water Supply Reliability**

The MGS will obtain reclaimed water from the Central Basin Municipal Water District (CBMWD) for cooling tower makeup, CTG evaporative coolers, and the HRSGs to meet the water requirements for the project (COV 2001a, § 3.4.7.2). The applicant predicts a peak demand of 1,000 gallons per minute of reclaimed water for the project (COV 2001a, § 3.4.7.2). Potable water will be provided by the City's existing pipeline and a backup connection will be used for plant makeup in the event that reclaimed water is not available (COV 2001a, § 3.4.7). Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

### **POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS**

Natural forces can threaten the reliable operation of a power plant. High winds, flooding, tsunamis (tidal waves), and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) presents a credible threat to reliable operation.

## **Seismic Shaking**

The site lies within Seismic Zone 4 (MGS 2001a, AFC §§ 3.8.1.1, 3.9.5); see that portion of this document entitled **Geology, Mineral Resources, and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (MGS 2001a, AFC §§ 3.8.1.1, 3.9.5, 8.15.2.3). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

## **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 the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (<http://www.nerc.com>). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

### **For Combined Cycle units (All MW sizes)**

Availability Factor = 91.49 percent

The gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor in the 90 to 98 percent range (COV 2001a, §§ 1.4, 3.4.3, 3.7, 3.8.3.1, 3.8.3.4) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

## **FACILITY CLOSURE**

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Closure of the facility, whether planned or unplanned, cannot impact power plant reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in the **Transmission System Engineering** section of this document.



## **CONCLUSION**

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The applicant predicts an equivalent availability factor in the 90 to 98 percent range, which staff believes is achievable in light of the industry norm of 91.5 percent for this type of plant. 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. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

## REFERENCES

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McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation, an Executive Report*, 1994.

COV (City of Vernon). 2001a. Application for Certification, Malburg Generating Station (01-AFC-25). Submitted to the California Energy Commission, December 21, 2001.

NERC (North American Electric Reliability Council). 1999. 1994-1998 Generating Availability Report.

# TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha, P.E. and Sudath Arachchige

## SUMMARY OF CONCLUSIONS

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Staff concludes that the proposed power plant switchyard and interconnection facilities to the City of Vernon electric system are acceptable and would comply with Laws, Ordinances, Regulations and Standards (LORS) assuming implementation of the recommended Conditions of Certification.

The System Impact Studies reveal that interconnection of the power plant would have some adverse impacts in the City of Vernon system and a very minimal impact in the SCE system. The mitigation measures selected will be effective in eliminating the adverse impacts of the project.

## INTRODUCTION

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The Transmission System Engineering (TSE) analysis identifies whether or not 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, and assesses whether or not the applicant has accurately identified all interconnection and downstream facilities required for the addition of the project to the electric grid.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant. Staff's analysis provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (California Code of Regulations, title 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid and also for any construction or operation of transmission facilities that are required as a result of the power plant's addition to the California transmission system but are beyond the project's interconnection with the existing transmission system.

The City of Vernon (applicant) filed an Application for Certification (AFC) with the California Energy Commission to construct a nominal 134 megawatt (MW) (see Definition of terms) natural gas-fired combined cycle generating facility to be located in the City of Vernon. The applicant proposes to connect their project, Malburg Generating Station (MGS), to the existing Vernon 66 kV substation of the City of Vernon system, which tie into the Southern California Edison (SCE) system at the Laguna Bell 230/66 kV substation. The project is expected to be on line in the spring of 2004 (COV 2001a, AFC Section 3.0).

Unlike other applications for certifications, since the City of Vernon system is not a part of the California Independent System Operator (Cal-ISO) grid, the Cal-ISO is not directly responsible for ensuring electric system reliability for the generator interconnection and will not provide interconnection approval to the project and testimony in the Commission's process. The staff, therefore, has increased responsibility to evaluate the system reliability impacts of the project and provide conclusions and recommendations to the Commission.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

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- 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 and operation or use of overhead electric lines and to the public in general.
- California Public Utilities Commission (CPUC) General Order 128(GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- The North American Electric Reliability Council (NERC) and Western Systems Coordinating Council (WSCC) Planning Standards were merged. The combined Planning Standards are now referred to as the NERC/WSCC Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. Certain aspects of the NERC/WSCC standards are either more stringent or more specific than the NERC standards. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WSCC system is based to a large degree on Section I.A of the standards, "NERC and WSCC Planning Standards with Table I and WSCC Disturbance-Performance Table" and on Section I.D, "NERC and WSCC Standards for Voltage support and Reactive Power". These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) and to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major

disturbance (such as loss of multiple 500 kV lines in a right of way and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WSCC 2001).

- NERC Planning Standards provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC planning standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Planning Standards are similar to WSCC Standards, certain aspects of the WSCC standards are either more stringent or more specific than the NERC standards for Transmission System Contingency Performance. The NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Grid Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the Cal-ISO transmission grid facilities. The Cal-ISO Grid Planning Standards incorporate the WSCC and NERC Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC and the NERC Planning Standards for Transmission System Contingency Performance. However, the Cal-ISO Standards also provide some additional requirements that are not found in the WSCC or NERC Planning Standards. The Cal-ISO Standards apply to all participating transmission owners interconnecting to the Cal-ISO controlled grid. They also apply when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO (Cal-ISO 2002a).

## **EXISTING FACILITIES AND RELATED SYSTEMS**

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The 66 kV municipal electric system of the City of Vernon is a part of the Cal-ISO control area and is tied to the SCE bulk power system and the Cal-ISO grid at Laguna Bell 230/66 kV Substation. The system has a summer load demand of about 190 MW (mostly industrial), and has existing diesel and gas-fired generating plants for a total capacity of about 26.5 MW located at the existing Vernon 66 kV Substation. Additional generating capacity of about 96 MW is available from the qualifying and merchant facilities within the system. The city serves its electric customers with a combination of its own generation and long-term wholesale power supply contracts. As such, the City currently depends on third party suppliers over the Cal-ISO grid for over 90 percent of its ancillary services and energy needs, and this creates uncertainty about providing reliable energy supply to the City's electric customers. The new plant will substantially reduce the need to purchase power from the wholesale power market, and will provide more efficient and reliable local power to the City customers. The City has proposed interconnection of the new MGS plant at the same generating plant site of the Vernon Substation (COV 2001a, AFC Sections 1.1.1 & 1.6.1).

## **PROJECT DESCRIPTION**

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### **SWITCHYARD AND INTERCONNECTION FACILITIES**

The MGS site would be located inside the compound of the existing generating plant site of the City of Vernon, at the existing Vernon Substation. The MGS would consist of two combustion turbine generators (CTG), each with an output of approximately 50 MVA and one steam turbine generator (STG), with a maximum nominal output of 58.8 MVA, for a total maximum plant net output of 134 MW. Each of the generating units would be connected to a dedicated 13.2/69 kV step-up transformer through a 13.2kV 3000-ampere breaker and 13.2 kV underground cables, and the high voltage terminals of each transformer would be connected to the existing Vernon 66kV Substation switchyard by 69 kV underground cables. In order to accommodate the New MGS, the Vernon Substation switchyard, which has an existing configuration of a double bus and double breaker arrangement, would be extended to three new switching bays, each bay with a double breaker arrangement. The new STG unit would be connected to a new bay and two of the existing 66 kV underground transmission lines would be shifted to the new switching bays to make room for connection of the two new CTG units.

This configuration of the switchyard and interconnection is in accordance with good utility practices and is acceptable to staff. The Vernon Substation is connected with Laguna Bell 230/66kV substation through three 66kV transmission lines. The interconnection point to the Cal-ISO grid will be at the existing Laguna Bell Substation. (COV 2001a, AFC Sections 3.0 & 5.0).

## **ANALYSIS AND IMPACTS**

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### **SYSTEM RELIABILITY**

#### **Introduction**

A System Impact Study (SIS) for connecting a new power plant to the existing power system grid is performed to determine the alternate and preferred 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, WSCC reliability criteria and Cal-ISO reliability criteria. The study determines both positive and negative impacts, and for the reliability criteria violation cases (for the negative impacts) determines the alternate and preferred additional transmission facilities or other mitigation measures. The study is conducted with and without the new generation project and its interconnection facilities by using the computer model base case for the year the generator project would come on-line. The study normally includes a Load Flow study, Transient Stability study, Post-transient Load Flow study and Short Circuit study. The study is focused on thermal overloads, voltage deviations, system stability (excessive oscillations in the generators and transmission system, voltage collapse, loss of loads or cascading outages) and short circuit duties. The study must be conducted under the normal condition (N-0) of the system and also for all credible contingency/emergency conditions, which includes the loss of a single system element (N-1) such as a transmission line, transformer or a generator and the simultaneous loss of two system elements (N-2), such as two transmission lines or a transmission line and a generator. The study may also be conducted for credible simultaneous loss of multiple (more than two) system elements.

In addition to the above analysis, the studies may be performed to verify whether sufficient active or reactive power margins are available in the area system or area sub-system to which the new generator project would be interconnected. The SIS is followed by supplemental studies conducted by the participating transmission owner with details provided in a Detailed Interconnection Facility Study (DIFS) or a Facility Cost Report (FCR).

Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities required for connecting a project to the grid are considered part of the project and are subject to the Application for Certification review process.

### **Scope of System Impact Study (SIS)**

The SIS was initially performed by Navigant consulting (Navigant) on behalf of the City of Vernon to identify the transmission system impacts caused by the MGS project on the systems of the City of Vernon, SCE and the Los Angeles Department of Water and Power (LADWP). The Power Flow Study was conducted with and without the MGS with a 2003 summer peak base case and a 2003 spring off-peak base case. The Transient Stability Study was conducted with the MGS using a 2003 summer peak base case and a 2003 Light spring base case to determine whether the MGS would create instability in the system following certain selected outages. The short circuit studies were conducted with and without the MGS to determine if the MGS would result in overstressing existing Substation facilities (COV 2002c, SIS by Navigant).

After removing a significant amount of the queue generation from the SCE system, an additional Power Flow Study for the SCE system was performed by SCE with a 2004 summer peak base case and a 2004 light spring base case, which included very high internal Los Angeles Basin area generation. The short circuit study was also performed by SCE with or without MGS for the SCE system (COV 2002g, SIS by SCE). In addition a short circuit study was performed by Los Angeles Department of Water and Power (LADWP) with and without MGS for the LADWP system.

### **Power Flow Study Results**

No adverse impact is observed in the SIS performed by Navigant. However, the results of the SIS performed by SCE show some marginal adverse impacts in the SCE system under emergency contingency conditions of the network due to the interconnection of the MGS. The SIS has provided a summary of the overload violations under the required criteria (COV 2002g, SIS by SCE, Pages 1-2, Tables 2-1 & 2-2).

### **normal (n-0) conditions**

- There are no overload violations identified during normal conditions due to the addition of the MGS project under 2003 and 2004 summer peak and light spring conditions.

### **contingency (n-1/cal-iso category b) conditions and mitigation**

- The Navigant study identified no overload violations on the transmission facilities under single contingency conditions. However, the SCE study identified the following two pre-project emergency overload violations under 2004 light spring conditions:

1. The Lighthipe-Hinson 230kV line violated overload planning criteria for an outage of the Hinson-Del Amo 230kV line. The line loading increased from 122 percent to 123 percent of the emergency rating of the line. This violation marginally increases the existing pre-project emergency overload.
  - MITIGATION: The Mitigation measures considered in the SIS report are to reconductor the line with 2x1033 Kcmil ACSR conductors or implement a Remedial Action Scheme (RAS) and curtail 654 MW of generation which would include 134 MW from the MGS. The mitigation measures recommended by SCE are a RAS and curtailment of generation. The applicant has selected the measures and staff considers them effective (COV 2002k, Data response).
  
2. The Lighthipe-Mesa cal 230 kV line violated overload planning criteria for an outage of the Alamitos-Barre No. 2 230 kV line. The line loading increased from 113 percent to 114 percent of the emergency rating of the line. This violation marginally increases the existing pre-project emergency overload.
  - MITIGATION: The mitigation measures considered are to replace wave traps at both ends of the Lighthipe-Mesa Cal 230 kV line to 4000-ampere rating or implement a RAS and curtail 374 MW of generation which would include 134 MW from the MGS. The mitigation measure recommended by SCE is to replace wave traps at both ends of the Lighthipe-Mesa Cal 230 kV line to 4000-ampere rating. The applicant has selected the measure and staff considers it effective (COV 2002k, Data response).

### **contingency (n-2/cal-iso category c) conditions and mitigation**

- The Navigant study identified no overload violations of transmission facilities under double contingency conditions. However, the SCE study identified the following three pre-project emergency overload violations under 2004 summer peak and light spring conditions:
1. The Lighthipe-Hinson 230 kV line violated overload planning criteria for a double line contingency under 2004 summer peak conditions and for three double line contingencies under 2004 light spring conditions. The most severe overload was found for outage of the Hinson-Del Amo and Lighthipe-Long Beach 230 kV lines. The line loading increased from 175 percent to 177 percent of the emergency rating of the line. This violation marginally increases the existing pre-project emergency overload.
    - MITIGATION: The mitigation measures considered in the SIS report are to re-conductor the line with 2x1033 Kcmil ACSR conductors or implement a RAS and curtail 654 MW of generation which would include 134 MW of the MGS. The mitigation measures recommended by SCE are a RAS and curtailment of generation. The applicant has selected the measures and staff considers them effective (COV 2002k, Data response).
  
  2. The Longbeach-Lighthipe 230 kV line violated overload planning criteria under 2004 light spring conditions due to outage of the Lighthipe-Hinson and Hinson-Del Amo 230 kV lines. The line loading increased from 140 percent to 142 percent of the



emergency rating of the line. This violation marginally increases the existing pre-project emergency overload.

- MITIGATION: The mitigation measures considered in the SIS report are to re-conductor the line with 2x1033 Kcmil ACSR conductors or implement a RAS and curtail 264 MW of generation which would include 134 MW from the MGS. The mitigation measures recommended by SCE are a RAS and curtailment of generation. The applicant has selected the measures and staff considers them effective (COV 2002k, Data response).
3. The Lighthipe-Mesa cal 230 kV line violated overload planning criteria for four double line contingencies under 2004 light spring conditions. The most severe overload was found for outage of the Hinson-Del Amo and Redondo-Mesa Cal 230 kV lines. The line loading increased from 136 percent to 138 percent of the emergency rating of the line. This violation marginally increases the existing pre-project emergency overload.
- MITIGATION: The mitigation measures considered are to replace wave traps at both ends of the Lighthipe-Mesa Cal 230 kV line to 4000-ampere rating or implement a RAS and curtail 654 MW of generation which would include 134 MW from the MGS. The mitigation measure recommended by SCE is to replace wave traps at both ends of the Lighthipe-Mesa Cal 230 kV line to 4000-ampere rating. The applicant has selected the measure and staff considers it effective (COV 2002k, Data response).

### **Transient Stability Study Results**

The Transient Stability Study was conducted by Navigant using 2003 summer peak and spring off peak base cases to determine if the MGS would cause any adverse impact on the stable operation of the transmission grid following the selected Cal-ISO category B (N-1) & C (N-2) outages (COV 2002c, SIS by Navigant, Section 5, Pages 5-1 to 5-2). The results indicate there are no identified transient stability concerns on the transmission system following the selected disturbances for integration of the MGS.

### **Short Circuit Study Results and Mitigation**

The Short Circuit Study performed by SCE identified a marginal increase in fault currents at six 230 kV substations in the SCE system due to the addition of the MGS, but the breaker duties were within 60 percent of their ratings and as such complied with the SCE reliability criteria (COV 2002g, SIS by SCE, Page 8). SCE has, therefore, concluded that the interconnection of Malburg GS would not require any replacement or upgrade of circuit breakers on the SCE distribution and transmission systems (COV 2002m, Letter from SCE). Staff considers this acceptable.

The SIS performed by Navigant (COV 2002c, SIS by Navigant, Section 6, Pages 6-1 & 6-2) identified considerable increase in fault currents, which would overstress breakers at five 66 kV substations in the City of Vernon 66kV system due to the addition of the MGS. As a mitigation measure, the applicant has decided to replace a total of forty 66 kV breakers in the City of Vernon system, which include twenty breakers at Leonis Substation, fourteen breakers at Vernon Substation, four breakers at Owill Substation, and one breaker each at Coldgen Tap and Growgen Tap Substations. The new breakers will have 1200-ampere continuous rating and 40-kiloampere (kA) interrupting

rating (COV 2002m, Letter from the City of Vernon). These breaker changes would occur within the substation's fence line and would not cause any significant environmental impacts. Staff considers the mitigation effective.

While the LADWP study also detected a minimal increase in fault currents due to the addition of the MGS at four substations in the LADWP 230 kV transmission system, breakers at these substations were already overstressed before the addition of the MGS for pending generation and transmission projects, and LADWP has a plan to replace and upgrade fifty-six 230 kV breakers in these substations in a near future before the on-line date of the MGS (COV 2002m, Letter from LADWP and City of Vernon). While it is uncertain at this stage whether or not Malburg will participate in the replacement plan for breakers in the LADWP system, staff finds that in any case the MGS will have no impact on the LADWP system when it will come on-line in 2004

### **NEW TRANSMISSION LINE AND SYSTEM MODIFICATIONS**

Besides the interconnection facilities at the Vernon Substation as proposed by the applicant, accommodating the power output of the MGS would not require any new transmission facilities.

System modification requirements would include shifting of two of the existing 66 kV underground transmission lines to the new switching bays at the Vernon Substation and replacing forty 66 kV breakers with higher capacity in the City of Vernon system.

### **CUMULATIVE IMPACTS**

Depending on the amounts of generation and loads in the City of Vernon system, Staff believes that the project should have minimal or no cumulative impacts on the interconnected transmission system. The cumulative impacts due to the MGS, as identified in the SIS, will be mitigated.

### **ALTERNATIVE TRANSMISSION ROUTES**

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The applicant did not consider any interconnection alternative other than the proposed interconnection at the Vernon 66 kV Substation, since the site already has the existing generating plants and an existing 66 kV transmission system for interconnection and no new transmission line will be necessary (COV 2001a, AFC Section 9.3.3).

### **COMPLIANCE WITH LORS**

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The new interconnection facilities and system modifications would be done within the fenced yards of the existing substations of the City of Vernon system. The facilities are in accordance with good utility practices, acceptable to staff and would comply with LORS assuming the Conditions of Certification are met,

## **FACILITY CLOSURE**

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### **PLANNED CLOSURE**

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which in conjunction with applicable LORS, is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the Transmission Owner (TO), in this case the City of Vernon<sup>1</sup>, to assure (as one example) that the TO's system would not be closed into the outlet thus energizing the project Substation. Alternatively, the owner may coordinate with the TO to maintain some power service via the outlet line to supply critical station service equipment or other loads.<sup>2</sup>

### **UNEXPECTED TEMPORARY CLOSURE**

An unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

### **UNEXPECTED PERMANENT CLOSURE**

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. 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. An on-site contingency plan, that is in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities, would be developed to assure safety and reliability (see **General Conditions Including Compliance Monitoring and Closure Plan**).

## **RESPONSE TO AGENCY AND PUBLIC COMMENTS**

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No agency or public comments related to the TSE discipline have been referred to TSE staff for this case.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

Staff concludes as follows:

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<sup>1</sup> Should a Participating Generator Agreement or Meter Substation System Agreement be made with the Cal-ISO, then the owner must coordinate with the Cal-ISO.

<sup>2</sup> These are mere examples, many more exist.

1. The System Impact Studies comply with the NERC/WSCC, NERC and Cal-ISO planning standards and reliability criteria. After reviewing the System Impact Studies, staff finds that interconnection of the MGS would not cause any overload criteria violation under normal conditions of the system. No overload criteria violations were found within the City of Vernon system under emergency conditions. However, the SIS identified considerable fault current increases due to the addition of Malburg, which would overstress breakers at five 66 kV substations within the City of Vernon system. As a mitigation measure the applicant has decided to replace and upgrade forty 66 kV breakers of the affected substations. The mitigation measures are considered effective and acceptable to staff.
2. However, under highly stressed condition used in the SIS, the MGS would have very marginal overload criteria violations in the SCE transmission system under emergency conditions of the electrical grid and mitigation options have been discussed. The mitigation measure selected by the applicant for each criteria violation as recommended by SCE, the transmission owner, is considered effective and acceptable to staff.
3. The MGS will substantially reduce the need and uncertainty for the City of Vernon to purchase power from the wholesale power market and will essentially provide more efficient and reliable local power to the City customers.
4. The proposed MGS interconnection facilities to the City of Vernon electric system are in accordance with good utility practices and are acceptable to staff. The interconnection facilities will comply with LORS assuming the Conditions of Certification are met.

## RECOMMENDATIONS

If the Commission approves the project, staff recommends the following Conditions of Certification to ensure system reliability and conformance with LORS.

## CONDITIONS OF CERTIFICATION FOR TSE

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**TSE-1** The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

**Verification:** 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 major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below).

Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

<b>Table 1: Major Equipment List</b>
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

**TSE-2** Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq., require 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 which include the documentation of any discrepancies in design and/or construction identified by the project owner. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the 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 energization 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 to 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 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 (GO 95) or 128 (GO 128) 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 Code (NEC) and related industry standards.
- b.) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c.) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner’s standards.
- d.) The project conductors shall be sized to accommodate the full output from the project.
- e.) Termination facilities shall comply with applicable SCE interconnection standards.
- 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) and/or Special Protection System (SPS) sequencing and timing if applicable.
  - ii) Executed Facility Interconnection Agreement.
  - iii) Verification of Cal-ISO Notice of Synchronization.
  - iv) A letter stating that the mitigation measures or projects selected by the transmission owners for each criteria violation are acceptable.

**Verification:** At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agree to by the project owner and CBO, the project owner shall submit to the CBO for approval:

- a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or GO 128 or NESC, Title 8, Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.
- b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on “worst case conditions”<sup>3</sup> 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 GO 128 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, NEC, applicable interconnection standards, and related industry standards.
- c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5 a)** through f) above.
- d) The DFS operational mitigation measures, RAS, SPS, executed Facility Interconnection Agreement and Verification of Cal-ISO Notice of Synchronization 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 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 week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and

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<sup>3</sup> Worst case conditions for the foundations would include for instance, a dead-end or angle pole.



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

**Verification:** The project owner shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one week prior to initial synchronization with the grid. The project owner shall contact the Cal-ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

**TSE-8** The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

**Verification:** Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

- a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, 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 charge.

## REFERENCES

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- 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) 2002a. Cal-ISO Grid Planning Standards, February 7, 2002.
- Cal-ISO (California Independent System Operator) 2002b. Cal-ISO Review of the System Impact by Navigant Consulting, Cal-ISO letter of March 14, 2002 to the City of Vernon.
- City of Vernon (COV) 2002c. Attachment 1, the System Impact Study by Navigant Consulting. Docketed on 4-24-02.
- City of Vernon (COV) 2002g. The System Impact Study by SCE. Docketed on 7-11-02.
- City of Vernon (COV) 2002k. Data response from the City of Vernon dated July 31, 2002. Docketed on 8-01-02.
- City of Vernon (COV) 2002n. Letters and emails from City of Vernon, SCE .and LADWP. Docketed on 8-19-02.
- NERC (North American Electric Reliability Council) 1998. NERC Planning Standards, September 1997.
- WSCC (Western Systems Coordinating Council) 2001. NERC/WSCC Planning Standards, June 2001.

## DEFINITION OF TERMS

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ACSR	Aluminum cable steel reinforced.
SSAC	Steel Supported Aluminum 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.

Kiloampere (kA) 1,000 Amperes

Bundled Two wires, 18 inches apart.

Bus Conductors that serve as a common connection for two or more circuits.

Conductor The part of the transmission line (the wire) that carries the current.

Congestion Management  
Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) would not violate criteria.

Emergency Overload  
See Single Contingency. This is also called an L-1.

Kcmil or KCM  
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. 1,000 Volts.

Loop An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar One megavolt ampere reactive.

Megavars Megavolt 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.

#### Reactive Power

Reactive power is generally associated with the reactive nature of inductive loads like 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, would 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.

**Switchyard** A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

#### Thermal rating

See ampacity.

**TSE** Transmission System Engineering.

**TRV** Transient Recovery Voltage

#### Tap

A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at

existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

**Undercrossing**

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

**Underbuild**

A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

# ALTERNATIVES

Testimony of William Pfanner

## INTRODUCTION

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The CEQA Guidelines provide direction regarding the proper scope of an “alternatives” analysis by requiring 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 project objectives but would avoid or substantially lessen any of the significant effects of the project,” (Cal. Code Regs., tit. 14, §15126.6(a)). 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. The CEQA Guidelines specifically state that “Alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the [review] need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project.” (Cal. Code Regs., tit. 14., Section 15126.6(f))

To prepare the alternatives analysis, staff used the methodology summarized below:

- Identify the basic objectives of the proposed project.
- Determine whether there are any feasible *site alternatives* for analysis by evaluating the extent to which most of the project objectives can be achieved and the degree to which any significant impacts of the project would be substantially lessened at such alternative sites.
- Evaluate whether the alternative sites would create any impact of its own.
- Identify and evaluate *technical alternatives* to the project such as increased energy efficiency (or demand side management) and the construction of alternative technologies (e.g. wind, solar, or geothermal).
- Evaluate the feasibility and impacts of not constructing the project (the “*no project*” alternative).

## ANALYSIS

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Staff’s alternatives analysis begins by identifying the basic objectives of the project, describing the project and project setting, and listing potential significant impacts from the project as currently proposed. The analysis then turns to a consideration of various alternatives to the proposed MGS project. These alternatives were developed in response to information received from the project applicant (City of Vernon), Energy Commission’s staff and from other agencies.

## **BASIC OBJECTIVES OF THE PROJECT**

After studying the applicant's Application for Certification (AFC), staff has determined that the project's major objectives are to :

- Provide an efficient, cost effective, and reliable source of electric generation to the City's customers and to the Southern California area at the least practicable impact to the environment.
- Select a generating unit that is highly efficient to maintain reasonable cost of generation;
- Select equipment that utilizes tested and reliable technology to assure reliable generation;
- Utilize Best Available Control Technology (BACT) to minimize air pollution emissions
- Locate the project at a site currently used for generation to minimize the need for new infrastructure improvements such as water, fuel supply and transmission facilities.

## **POTENTIAL PROJECT IMPACTS**

Staff's assessment of the expected environmental consequences of the proposed project is summarized below for one technical area where a significant unmitigated issue has been identified. Staff's complete assessment of all potential impacts is presented in more detail in the individual sections of this document.

Staff's review of the proposed project has identified that the MGS PM10 and SOx emissions will contribute to a potentially significant and adverse cumulative air quality impact on the State Ambient Air Quality 24-hour and Annual PM10 Standards if left unmitigated. Staff's analysis of this impact is summarized below. Staff's assessment has identified that this impact would not be eliminated or substantially reduced by redesigning the project or locating it at an alternative site.

Staff has identified potentially significant and adverse impacts for the project PM10 and SOx emissions (contribution to direct and secondary PM10 formation) in the amount of 0.20 ug/m<sup>3</sup> on a daily basis and 0.017 ug/m<sup>3</sup> on an annual basis. Staff has concluded that while these impacts do not represent a significant direct impact they contribute to significant cumulative impacts in the aggregate, amounting to 98.0 ug/m<sup>3</sup> on a daily basis and 43.3 ug/m<sup>3</sup> on an annual basis. Therefore, staff recommends that the City procure further mitigation beyond the mitigation provided in the amount of 6.8 lbs/day of PM10 and 6.8 lbs/day of SO2. If this mitigation is secured, these impacts would be reduced to less than significant.

## **ALTERNATIVES**

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The range of alternatives considered were those that would reasonably accomplish the basic project objectives, while avoiding or lessening any potentially significant negative impacts of the proposed project. Project alternatives, and specifically, evaluation of the No Project Alternative, are required by the CEC's regulations, so that it can comply with the requirements of the California Environmental Quality Act (CEQA). Alternatives considered and evaluated included alternate plant sites, different project sizes, different

electrical generating technologies, alternative water sources, alternative natural gas supply pipeline routes, and the No Project Alternative.

As part of the evaluation, we considered a broad range of alternatives, including:

- Project site alternative.
- Project size alternative.
- Generation technology and configuration alternative.
- No Project Alternative.

The purpose of MGS is to meet the project objectives described above. These objectives include providing reliable electrical power to the City of Vernon customers and the Southern California area. In order to meet these objectives, the following criteria was used to evaluate the sites:

- **Proximity to infrastructure** – The site must be located in close proximity to high voltage transmission lines, a high-pressure major gas transmission system, and potential water source(s).
- **Environmental viability** – The site should have few or no environmentally sensitive areas and should allow development with minimal environmental impacts.
- **Minimal impact on surrounding community** – The site should enable the development of a power plant with minimal negative impact on the surrounding community.
- **Economically feasible** – The site should be located on property currently owned by the City with sufficient right-of-ways should offsite construction be needed.
- **Compliance with LORS** – The site should provide opportunity for compliance with all LORS.

Three sites that satisfy these criteria were identified:

1. A solid waste transfer site, located at 2221 East 55<sup>th</sup> Street (Alternative Site 1).
2. A City storage yard, located at 2800 South Soto Street (Alternative Site 2).
3. The existing City of Vernon Station A electrical generating facility, located at 2715 East 50<sup>th</sup> Street (Alternative Site 3).

The locations of these three sites are shown in **Figure 1**.

### **Solid Waste Transfer Site**

Use of the solid waste transfer site would require construction of a new switchyard and transmission lines approximately one-half mile long each, a natural gas pipeline approximately 2,500 feet long, and a reclaimed water pipeline approximately 22,000 feet long. Additionally, this site does not currently have water or sewer service, which would also have to be added to the site. Construction of a power facility at this site would not eliminate the cumulative air quality impact identified with the proposed MGS project. Further, there could be additional environmental impacts not identified with the MGS project.



## **City of Vernon Storage Yard**

Use of the City storage yard would also require construction of a new switchyard and one-half mile long transmission line. This site currently has water and sewer service, but a natural gas pipeline approximately 1,000 feet long and a reclaimed water pipeline approximately 28,000 feet long would still need to be constructed. This storage yard would have to be cleared and its contents moved to another location. Construction of a power facility at this site would not eliminate the cumulative air quality impact identified with the proposed MGS project. Further, there could be additional environmental impacts not identified with the MGS project.

## **City of Vernon Station A**

This site is already an electrical generating facility, therefore the new generating units can connect to the 69 kV transmission system through the Vernon Substation, eliminating the need to construct new transmission lines. Additionally, the site already has a potable water source and sewer service and is zoned for industrial use. A natural gas pipeline and a new sewer line, each approximately 1,300 feet long and a new reclaimed water pipeline approximately 10,000 feet long will still need to be constructed to serve the Project. Thus, based on the above mentioned criteria, the existing City of Vernon Station A was selected for the Project.

As part of the selection of the existing Station A site, geotechnical investigations were conducted to confirm the geological and civil suitability of the site. Since the site has been used as a power generating facility for nearly 70 years, no significant cultural, biological, visual, land use, or other site-specific impacts are anticipated.

## **GENERATION TECHNOLOGY**

The MGS will supply electrical power to the City's electric customers by early 2004. The natural gas-fired combined-cycle combustion turbine technology intended for this purpose was selected after considering alternative generating technologies and fuels, because this technology is the cleanest and most fuel-efficient technology that can be constructed by early 2004 to provide reliable electrical power to the City's electric customers.

The purpose of considering alternative generating technologies is to determine if any of the technologies could potentially avoid or substantially reduce potentially significant environmental impacts from the proposed technology while providing similar efficiency and reliability.

### **Alternate Generating Technology Evaluation Criteria**

The following criteria were used to evaluate alternative generative technologies:

- Commercial availability - The technology has to be proven commercially at an acceptable cost.
- Feasibility - The technology has to be capable of implementation within the City.
- Environmental, health and safety impacts - The technology cannot have significant adverse impacts on the environment, public health, or public or worker safety.

- Relative costs - Technologies that were not rejected based on the first three criteria were evaluated with respect to their relative costs.

### **Technologies Rejected as Not Commercially Available at an Acceptable Cost**

The following generating technologies are currently under development and/or testing, but they were not considered, because they are not currently commercially available at a reasonable cost:

- Kalina Combined Cycle, which uses a mixture of water and ammonia in the heat recovery boiler.
- Advanced gas turbine technologies, including humid air turbines, chemically recuperated gas turbines, and intercooled steam recuperated gas turbines.
- Magnetohydrodynamics.
- Fuel cells.
- Integrated gasification combined-cycle.

### **Technologies Rejected as Not Capable of Implementation within the City**

The following generating technologies were not considered, because they cannot be reliably implemented within the City:

- Hydroelectric - The resources required for hydroelectric generation do not exist within the City.
- Geothermal - There are no geothermal resources within the City.
- Wind generation - Wind generation was eliminated from consideration due to the large land area required, the poor wind resource in the City, and the lack of energy generation during peak demand periods.
- Solar/Photovoltaics - These technologies would require large land areas, which are not available within the City, in order to provide the proposed generating capacity.

### **Technologies Rejected Because of Potential Adverse Impacts**

Technologies relying on oil, coal, or other solid fuels for fuel were rejected because of the higher air pollutant emission rates that tend to be associated with these fuels.

These technologies include:

- Coal or other solid fuel-fired conventional furnace/boiler steam turbine generators.
- Atmospheric and pressurized fluidized bed combustion boilers.
- Direct and indirect coal-fired combustion turbines.  
These higher emission rates have the potential for causing significant adverse impacts on air quality and/or public health.

### **Evaluation of Remaining Generating Technologies**

The following technologies were evaluated further:

- Natural gas-fired simple-cycle.

- Natural gas-fired conventional combined-cycle.
- Natural gas-fired conventional furnace/boiler steam turbine-generator.
- Natural gas-fired supercritical boiler steam turbine-generator.

Efficiency for a natural gas-fired combined cycle system is typically 50 to 58 percent, resulting in lower air emissions per kilowatt hour (kWh) than simple-cycle gas turbine systems or conventional boiler-steam systems. In addition, natural gas combustion in a state-of-the-art combined-cycle unit emits less NO<sub>x</sub>, CO, VOC, SO<sub>x</sub>, and PM<sub>10</sub>. Because of its high efficiency, low air pollutant emissions, and low generation costs, this technology was selected for the Project.

Simple-cycle gas turbines have a low capital cost, have efficiency approaching 35 percent, and are fast-starting. Air quality impacts are higher with this technology than with combined-cycle technology because the high exhaust gas temperatures make it more difficult to control NO<sub>x</sub> and because more fuel must be burned to produce the equivalent amount of power as compared to a natural gas-fired conventional combined-cycle facility. Because of the relatively low efficiency and high emissions rate, this technology was eliminated from consideration.

Natural gas-fired conventional furnace/boiler steam turbine generators are less efficient (35 to 40 percent) than combined-cycle technology and emit more air pollutants per kWh generated. Due to the large size and complex nature of the equipment required, the capital costs and time to construct are greater. In addition, the cost of generation is comparatively high. Based on lower plant efficiency, higher emissions per kWh generated, higher capital costs, and increased labor costs to operate and maintain the facility, this technology was eliminated from consideration.

The efficiency of natural gas-fired supercritical boiler steam turbine-generators are higher than conventional boiler steam turbine-generator systems (generally 38 to 45 percent), but additional capital costs are incurred to construct the generating units. As a result, the costs to produce power using supercritical technology are somewhat lower than conventional technology, but higher than natural gas-fired combined-cycle technology. Based on lower plant efficiency, higher emissions per kWh generated, and higher capital and operating costs, this technology was eliminated from consideration.

## **PROJECT SIZE ALTERNATIVE**

The generating capacity of MGS (134 MW for combined-cycle operation) was chosen to initially supply approximately 70 percent of the City's electric utility customer's projected 2003 peak load demand of 190 MW. A smaller plant may or may not reduce cumulative PM10 impacts (depending on the turbines selected), would be of less assistance to Vernon and the state, and it may operate at a lower efficiency. A larger plant would exceed the power needs of the City and impose substantial infrastructure burdens, including transmission facilities, and would increase air emissions impacts.

## **NO PROJECT ALTERNATIVE**

The No Project Alternative assumes that the MGS will not be built. Should this occur, the primary result would be the loss of 134 MW of generating capacity to provide energy

to the City of Vernon and State of California. Were the No Project Alternative to result, the following environmental changes would not occur:

- Approximately 1,500 acre-feet of reclaimed water would remain allocated to CBMWD. The water line extension will not occur, thus denying availability of reclaimed water to other businesses at this time.
- Ambient noise of the area would remain unchanged.
- Ambient air quality of the area would remain unchanged (exceeds both State and Federal air standards).
- Increase in energy conversion efficiency would not occur. The proposed gas turbine combined cycle generating facility, will be one of the most efficient generating facilities in the state. The MGS will incrementally increase the state's average energy conversion efficiency. Under the No Project Alternative, the increase in efficiency will not be realized because less efficient older and peaking plants, including the City's existing 1933 diesel units, will run more hours of the year, further degrading air quality.

Additional consequences of the No Project Alternative include:

- Loss of generating capacity to serve California load. - If the no project alternative were selected, the state may need to encourage existing power generators to utilize maximum generation capacity even if it were to exceed the emission permits of such power generators. The absence of this project would further increase energy dependence from aging power plants that would have higher air emission rates of NO<sub>x</sub>, CO, PM10 and SO<sub>2</sub>. Continuing to depend on high wholesale electricity prices from third-party suppliers could adversely impact the economic climate in the City of Vernon. Further, the reductions in transmission line losses that would be achieved by siting new generating plant within the City would not be realized.
- No improvement to air quality. Regardless of whether the MGS is built, the region will remain in non compliance for Federal and State air standards for Ozone, PM10 and CO.

## **CONCLUSIONS**

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Staff has analyzed in detail alternatives to the project design and related facilities, alternative technologies, alternative sites for the project and the "no project" alternative. Staff determined that developing the project at an alternative site would not allow MGS to make use of infrastructure at the existing site, one of the objectives of the project, and would not lessen the impacts of the project identified in the staff's assessment. Further, reducing the size of the facility may or may not reduce cumulative PM10 impacts (depending on the turbines selected), and would not meet the project's objectives of providing energy for the City of Vernon. Further, regardless of whether the MGS is built (no project alternative), the region will remain in non compliance for Federal and State air standards for ozone, PM10 and CO.

Staff has determined that the preferable alternative is the proposed project. Staff does not believe that energy efficiency measures and alternative technologies present any feasible alternatives to the proposed project.

## **REFERENCES**

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City of Vernon (CEC) 2001a, Application for Certification. Dated 12/18/01 and docketed 12/21/01

# **GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN**

Testimony of Christopher Meyer

## **INTRODUCTION**

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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 compliance 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 elements 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;
- establish requirements for facility closure plans.
- Identify specific conditions of certification that follow each technical area and 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 assuring that the condition has been satisfied.

## **GENERAL CONDITIONS OF CERTIFICATION**

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### **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 construction 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:

- the installation of environmental monitoring equipment;
- a soil or geological investigation;
- a topographical survey;
- any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or
- any work to provide access to the site for any of the purposes specified above

## **START OF COMMERCIAL OPERATION**

For compliance monitoring purposes, “commercial operation” is that phase of project development which begins after the completion of start-up and commissioning, where the power plant has reached steady-state production of electricity with reliability at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

## **COMPLIANCE PROJECT MANAGER RESPONSIBILITIES**

A Compliance Project Manager (CPM) will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy 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 the approval will involve all appropriate staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy 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 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):

- all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- all monthly and annual compliance reports filed by the project owner;
- all complaints of noncompliance filed with the Energy Commission; and
- all petitions for project or condition changes and the resulting staff or Energy Commission action.

### **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. 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. A summary of the General Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section. The designation after each of the following summaries



of the General Compliance Conditions (**Com-1, Com-2, etc.**) refers to the specific General Compliance Condition contained in **Compliance Table 1**.

### **Construction Milestones, Compliance Condition of Certification-1 (COM-1)**

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 in the 6-month AFC process, start of substantial construction must occur within 1-year of the Commission Decision. Therefore, construction milestones have been included as noted below. Milestones and method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after docketing of the Commission's final decision. If this deadline is not met, the CPM will establish the milestones.

- I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF SUBSTANTIAL 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 within three years of the Commission's final decision.

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 will be missed due to circumstances beyond the project owner's control.
3. The milestone will be missed, but the project owner demonstrates a good-faith
4. The milestone will be missed due to unforeseen natural disasters or acts of God which prevent timely completion of the milestones.
5. The milestone will be missed due to requirements of the California ISO to maintain existing generation output.

### **Access, COM-2**

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, COM-3**

The project owner shall maintain project files onsite or at an alternative site approved by the CPM, for the life of the project unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, all documents submitted as verification for conditions, and all other project-related documents.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

### **Reporting of Unplanned Outages, COM-4**

Throughout the life of the project, the project owner shall immediately report all unplanned outages, via e-mail to the Compliance Program Manager and to the CPM. The expected duration and reason for the outage shall be included in the report. Telephone communication is also encouraged. Contact shall be made as follows:

- Compliance Program Manager  
*E-mail: [cnajaria@energy.state.ca.us](mailto:cnajaria@energy.state.ca.us) telephone: (916) 654-4079*
- Compliance Project Manager  
*E-mail: [cmeyer@energy.state.ca.us](mailto:cmeyer@energy.state.ca.us) , telephone: (818) 292-2320*

### **Compliance Verification Submittals, COM-5**

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. providing appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation 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  
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.

### **Pre-Construction Matrix and Tasks Prior to Start of Construction** **COM-6**

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 or prior to the first pre-construction meeting, whichever comes first. It will be in the same format as the compliance matrix referenced above.

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. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents 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.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

Project owners frequently anticipate starting project construction as soon as the project is certified. In those cases, it may be necessary for the project owner to file compliance submittals prior to project 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 the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the Final Decision

## **COMPLIANCE REPORTING**

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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, COM-7**

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;
7. the compliance status of each condition (e.g., "not started," "in progress" or "completed" (include the date); and
8. the project's pre-construction and construction milestones, including dates and status.

Satisfied conditions do not need to be included in the compliance matrix after they have been identified as satisfied in at least one monthly or annual compliance report.

## **MONTHLY COMPLIANCE REPORT, COM-8**

The first Monthly Compliance Report is due one 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 Form 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 and pre-construction and construction milestones (fully satisfied conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions and milestones that 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 or milestones;
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.

## **ANNUAL COMPLIANCE REPORT, COM-9**

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;
9. an evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section]; and
10. a listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved complaints, and the status of any unresolved complaints.
11. a listing of all outages planned for the coming year and a listing of all outages that occurred during the previous year, including the anticipated duration and the reason for each outage occurrence.

## **CONSTRUCTION AND OPERATION SECURITY PLAN, COM-10**

Prior to commencing construction, a site-specific Security Plan for the construction phase shall be developed and maintained at the project site. Prior to commercial operation, a site-specific Security Plan for the operational phase shall be developed and maintained at the project site. The plans may be reviewed at the site by the CPM during compliance inspections.

### **Construction Security Plan**

The Construction Security Plan must address:

1. site fencing enclosing the construction area;
2. use of security guards;

3. check-in procedure or tag system for construction personnel and visitors;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. evacuation procedures.

### **Operation Security Plan**

The Operations Security Plan must address:

1. permanent site fencing and security gate;
2. use of security guards;
3. security alarm for critical structures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. evacuation procedures;
6. perimeter breach detectors and on-site motion detectors;
7. video or still camera monitoring system; and
8. fire alarm monitoring system.
9. site personnel background checks.
10. site access for vendors and requirements for Hazardous Materials vendors to conduct personnel background security checks.
11. In addition, the project owner shall prepare a Vulnerability Assessment and implement site security measures addressing hazardous materials storage and transportation consistent with US EPA and US Department of Justice guidelines.

The CPM may authorize modifications to these measures, or may require additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

### **CONFIDENTIAL INFORMATION, COM-11**

Any information that 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, that 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, COM-12**

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of \$850. The payment instrument shall be provided to the Energy Commission's Project Manager (PM), not the CPM, at the time of project certification and shall be made payable to the California Department of Fish and Game. The PM 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, COM-13**

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project 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. All recorded inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

[http://www.energy.ca.gov/sitingcases/power\\_plants\\_contacts.html](http://www.energy.ca.gov/sitingcases/power_plants_contacts.html)

Any changes to the telephone number shall be submitted immediately to the CPM who will update the web page.

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 (Attachment A).

## **FACILITY CLOSURE**

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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 that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will 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, unplanned temporary closure and unplanned permanent closure.

## **CLOSURE DEFINITIONS**

### **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.



## **Unplanned Temporary Closure**

An 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 an emergency.

## **Unplanned Permanent Closure**

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unplanned closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

## **GENERAL CONDITIONS FOR FACILITY CLOSURE**

### **Planned Closure, COM-14**

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 any facilities or equipment intended to remain on site after closure, the reason, and any future use; 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.

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 Energy 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 Energy 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 Energy Commission approval of the facility closure plan is obtained.

### **Unplanned Temporary Closure/On-Site Contingency Plan, COM-15**

In order to ensure that public health and safety and the environment are protected in the event of an unplanned 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 impacts 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 than 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 unplanned 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 unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, 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 an unplanned temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with the requirements 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).

## **Unplanned Permanent Closure/On-Site Contingency Plan, COM-16**

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned 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 unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, 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 the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

## **CBO DELEGATION AND AGENCY COOPERATION**

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In performing construction and operation monitoring of the project, Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Commission staff retains CBO authority when selecting a delegate CBO including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental control when conducting project monitoring.

## **ENFORCEMENT**

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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 Energy Commission Decision. The specific action and amount of any fines the Energy 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, oversight, unforeseeable events, and other factors the Energy Commission may consider. Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, 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 the 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 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 48 hours, followed by a written report filed within seven 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 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 agencies 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 Energy Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Cal. Code Regs., tit. 20, §§ 1232-1236).

### **POST CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES, COM-17**

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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 Energy 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, or 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 not 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**

As provided in Title 20, Section 1770 (d), California Code of Regulations, a verification may be modified by staff without requesting an amendment to the decision if the change does not conflict with the conditions of certification.

## KEY EVENTS LIST, COM-8

**PROJECT: Malburg Generating Station Combined Cycle Project**

**DOCKET #: 01-AFC-25**

**COMPLIANCE PROJECT MANAGER: Christopher Meyer**

**EVENT DESCRIPTION**

**DATE**

Certification Date/Obtain Site Control	
Online Date	
<b>POWER PLANT SITE ACTIVITIES</b>	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
<b>TRANSMISSION LINE ACTIVITIES</b>	
Start T/L Construction	
SYNCHRONIZATION WITH GRID AND INTERCONNECTION	
COMPLETE T/L CONSTRUCTION	
<b>FUEL SUPPLY LINE ACTIVITIES</b>	
Start Gas Pipeline Construction and Interconnection	
COMPLETE GAS PIPELINE CONSTRUCTION	
<b>WATER SUPPLY LINE ACTIVITIES</b>	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

**TABLE 1**  
**COMPLIANCE SECTION**  
**SUMMARY of GENERAL CONDITIONS OF CERTIFICATION**

<b>CONDITION NUMBER</b>	<b>PAGE #</b>	<b>SUBJECT</b>	<b>DESCRIPTION</b>
COM-1	4	Start of Construction	The project owner shall commence substantial construction within one year of the Commission decision.
COM-2	5	Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COM-3	5	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COM-4	6	Reporting of Unplanned Outages	Throughout the life of the project, the project owner shall immediately report all unplanned outages.
COM-5	6	Compliance Verification Submittals	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 or the project owner or his agent.
COM-6	7	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: <ul style="list-style-type: none"> <li>▪ property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns,</li> <li>▪ a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction,</li> <li>▪ all pre-construction conditions have been complied with,</li> <li>▪ the CPM has issued a letter to the project owner authorizing construction.</li> </ul>
COM-7	8	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COM-8	8	Monthly Compliance Report including a Key Events	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Commission business meeting date on which the project was



<b>CONDITION NUMBER</b>	<b>PAGE #</b>	<b>SUBJECT</b>	<b>DESCRIPTION</b>
		List	approved and shall include an initial list of dates for each of the events identified on the Key Events List.
COM-9	9	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports (ACRs) which include specific information. The first ACR is due after the air district has issued a Permit to Operate.
COM-10	10	Security Plans	Prior to commencing construction, the project owner shall submit a Construction Security Plan. Prior to commencing operation, the project owner shall submit an Operation Security Plan.
COM-11	11	Confidential Information	Any information the project owner deems confidential shall be submitted to the Commission's Dockets Unit.
COM-12	11	Dept of Fish and Game Filing Fee	The project owner shall pay a filing fee of \$850 at the time of project certification.
COM-13	11	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COM-14	12	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least twelve months prior to commencement of a planned closure.
COM-15	13	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COM-16	14	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COM-17	17	Post-certification changes to the Decision	The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: <b>Malburg Generating Station Combined Cycle</b> AFC Number: <b>01-AFC-25</b>
<b>COMPLAINT LOG NUMBER</b> _____ 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.)

**CITY OF VERNON—MALBURG GENERATING PLANT  
STAFF ASSESSMENT PREPARATION TEAM**

Executive Summary ..... William Pfanner  
Introduction ..... William Pfanner  
Project Description ..... William Pfanner

***Environmental Assessment***

Air Quality ..... Joseph M. Loyer  
Biological Resources ..... Stuart Itoga  
Cultural Resources ..... Mary Maniery, John Dougherty, and Dorothy Torres  
Hazardous Materials ..... Alvin Greenberg, Ph.D. and Rick Tyler  
Land Use ..... David Flores  
Noise and Vibration ..... Ron Brown  
Public Health ..... Alvin Greenberg, Ph.D.  
Socioeconomics ..... Joseph Diamond, Ph.D.  
Soil and Water ..... Antonio Mediati  
Traffic and Transportation ..... James Fore and Eileen Allen  
Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.  
Visual Resources ..... Eric Knight  
Waste Management ..... Alvin J. Greenberg, Ph.D.  
Worker Safety and Fire Protection ..... Alvin J. Greenberg, Ph.D. and Rick Tyler

**Engineering Assessment**

Facility Design ..... Shahab Khoshmashrab, Al McCuen, and Steve Baker  
Geology, Mineral Resources, and Paleontology ..... **Dal Hunter, Ph.D., CEG**  
Power Plant Efficiency ..... Kevin Robinson and Steve Baker  
Power Plant Reliability ..... Kevin Robinson and Steve Baker  
Transmission System Engineering ..... Ajoy Guha, P.E. and Sudath Arachchige  
Alternatives ..... William Pfanner  
General Conditions ..... Christopher Meyer  
Project Assistant ..... Evelyn Johnson  
Support Staff ..... Angela Hockaday, Luz Manriquez