# EXECUTIVE SUMMARY

On December 21, 2000, EL Segundo Power II LLC (ESP II) filed an Application for Certification (AFC) seeking approval from the California Energy Commission to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 in the City of El Segundo with a 630 megawatt (MW) natural gas-fired, combined cycle electric generation facility. On February 7, 2001, the California Energy Commission found the AFC to be data adequate.

The applicant proposes to modify an existing power plant in El Segundo, California, an incorporated city in Los Angeles County. This facility consists of 3 contiguous parcels approximately 34 acres in size. The site is bordered by Vista Del Mar Boulevard and the Chevron Refinery on the east, Santa Monica Bay on the west, 45th Street of the City of Manhattan Beach on the south and the Chevron Marine terminal on the north. The facility is located at Township 3 South, Range 15 West, of the Venice USGS Quadrangle Map. See **Project Description Figure 1.**

The El Segundo Power Redevelopment Project (ESPR) and related facilities such as the electric transmission lines, natural gas line, water supply lines and wastewater lines are under the Energy Commission jurisdiction (Public Resources Code (PRC) §§ 25500 et seq.). When issuing a license, the Energy Commission acts as lead state agency (PRC § 25519(c)) under the California Environmental Quality Act (PRC §§ 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (PRC § 21080.5).

The primary responsibility of the Energy Commission staff is to provide an independent assessment of the project's potentially significant effects on the environment, the public's health and safety, conformance with all applicable laws, ordinances, regulations and standards (LORS), and measures to mitigate any identified significant effects. The South Coast Air Quality Management District provided its preliminary Determination of Compliance with District rules and regulations, and staff has incorporated it into the Air Quality section. Energy Commission staff has completed this Staff Assessment (SA) and, after workshops and hearings on this document, a Presiding Member's Proposed Decision (PMPD) will be completed. The SA is staff's independent assessment and recommendation to the Commissioners of the California Energy Commission, the decision-makers in this proceeding.

During evidentiary hearings, the Energy Commission Committee assigned to the ESPR proceedings will consider and weigh the testimony and recommendations of all interested parties, including Energy Commission staff, the applicant, intervenors, public, City of El Segundo, and other local, state and federal agencies, before making the final decision. The analyses contained in this document were prepared in accordance with PRC §§ 25500 et seq.; the California Code of Regulations (CCR) Title 20, §§ 12001 et seq.; and the California Environmental Quality Act (PRC §§ 21000 et seq.) and its guidelines (CCR title 14 §§ 15000 et seq.).

## PROJECT DESCRIPTION

The El Segundo Power Redevelopment Project is proposed on land currently zoned for a power plant. The new combined cycle facility is expected to generate 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and their replacement with Units 5, 6, and 7 in the footprint of Units 1 and 2. The steam cycle heat rejection system, which utilizes cooling water from Santa Monica Bay, will remain and be used for the new equipment. The existing ESGS Units 3 and 4 located adjacent to Units 1 and 2 will not be modified by this project.

New connections to the existing adjacent SCE-owned 230 kilovolt (kV) switchyard will be added as part of the proposed project. No new transmission lines will be built.

Natural gas will be supplied to the project via an existing pipeline.

The project will use Selective Catalytic Reduction (SCR), a dry, low NOx combustor and an oxidation catalyst system to reduce air emissions. An ammonia pipeline will be installed into the directly adjacent Chevron marine terminal property to deliver aqueous ammonia to the site for SCR.

Water requirements for the project are estimated at 207 million gallons per day at full operation and will be supplied from a combination of sources. The new units will use the existing seawater cooling system without modifying the intake or outfall structures and lines, and without modifying the flow rates and capacity. The applicant has proposed use of a pilot project to ascertain the viability of reducing fish kill.

The City of El Segundo, through purchases from the Metropolitan Water District, will supply potable water. The plant will be using approximately 180,000 gallons per day. A new 1.55-mile pipeline will be installed in El Segundo city streets to supply this water.

The West Basin Municipal Water District will supply approximately 86,000 gallons of reclaimed water per day for both irrigation and for pumps and bearings seal water augmentation. A new 1.75-mile pipeline will be installed in El Segundo city streets to supply this water.

Wastewater discharge will be into the City of Manhattan Beach Sanitary Sewer System via a new 3-inch water pipeline hookup on the 45$^{th}$ Street side of the plant

The project is estimated to have a capital cost of approximately $400 million. If approved, construction of the ESPR, from site preparation to commercial operation is expected to take approximately 20 to 26 months. The applicant plans to complete construction and start operation of the combined-cycle unit in 2003.

The project will require a construction workforce of approximately 422 craftspersons over the proposed demolition and construction period. The construction period will begin immediately after a four to six month site preparation phase that will include demolition of units 1 and 2 and the modification of the fuel storage tanks for use as a domed laydown area. Operation of the completed project will require a minimum of 50 skilled workers.

## PUBLIC AND AGENCY COORDINATION

Publicly noticed workshops on air quality, water resources, biological resources, cultural resources, noise, visual resources, traffic and transportation and other issues have been held in El Segundo. These workshops have been highly productive.

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 Cities of El Segundo and Manhattan Beach, County of Los Angeles, California Independent System Operator (Cal-ISO), South Coast Air Quality Management District, California Air Resources Board, FAA, U.S. Environmental Protection Agency, California Coastal Commission 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, National Marine Fisheries, California Departments of Fish and Game, and Parks and Recreation, U.S. Army Corp of Engineers, intervenors, and the interested residents of the community.

The California Coastal Commission, in a letter dated June 8, 2001, concurred with the conclusions of the staff regarding the need for additional studies related to aquatic biology. However, the Coastal Commission disagreed with the timing of the studies being conducted post-certification as recommended by staff. Energy Commission staff is confident that because the studies are required as Conditions of Certification with Energy and Coastal Commission oversight, any mitigation that would be required, will begin prior to the operation of the plant. The specific provisions necessary to meet the objectives of the Coastal Act were identified early in the analysis process and incorporated into the SA. Coastal Commission staff were participants, when available, in all proceedings of this AFC. The issues now raised by the Coastal Commission will need to be addressed by the Energy Commission during subsequent hearings.

A series of publicly noticed workshops and hearings will be conducted on this document during July. Information gathered during these workshops and hearings will be used to prepare the Presiding Member's Proposed Decision (PMPD). Additionally, written comments on the SA will be included in the PMPD.

## CONCLUSIONS AND RECOMMENDATIONS

The SA is a document of the Energy Commission staff so, by its very nature, the conclusions and recommendations presented are considered staff's testimony. The final decision of the Energy Commissioners will be based on the evidence presented at upcoming hearing in July.

Each technical area assessment in the SA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS); whether the facility can be constructed and operated safely and reliably; project specific and cumulative impacts; the environmental consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated, should it be approved.

In summary this SA finds that:

- The project is in conformance with all Laws, Ordinances, Regulations and Standards (LORS), with the exception of Air Quality.
- With the proposed conditions of certification included in the various technical areas, the project's demolition, construction and operation impacts can be mitigated to a level less than significant. However, the applicant has yet to identify all required emissions reduction credits to fully offset project emissions.
- The South Coast Air Quality Management District believes that the project currently complies with the appropriate rules and requirements of the District and will not contribute to the degradation of the air quality in the South Coast Air Quality Management District.
- Staff has concluded that the existing aquatic biological studies may be inadequate because of their age. The applicant is currently performing a study of a nearby aquatic environment to estimate potential environmental impacts of the project. Staff recommends that this study from King's Harbor be provided prior to the Commission's decision to allow staff and the Committee to determine the validity of the data. If the King's Harbor data is not acceptable to the Committee, staff has recommended Conditions of Certification that will require the applicant to begin both 316(a) and 316(b) studies after certification. These studies will take approximately one year to complete.
- The California Coastal Commission disagrees with staff's timing of required aquatic biological studies as contained the SA Biological Resources Conditions of Certification.
- Staff has not received the final Tank Farm Plan, Storm Water Pollution Prevention Plan or the Alternative Water Supply Study. To ensure compliance with all LORS, the applicant shall provide these documents no less than 10 days prior to the start of Evidentiary Hearings.

**EL SEGUNDO POWER II LLC (00 AFC 14)**
**FINAL STAFF ASSESSMENT**


EXECUTIVE SUMMARY ..... 1

INTRODUCTION ..... 2

PROJECT DESCRIPTION ..... 3

ENVIRONMENTAL ASSESSMENT ..... 4

- AIR QUALITY ..... 4.1
- BIOLOGY RESOURCES ..... 4.2
- CULTURAL RESOURCES ..... 4.3
- HAZARDOUS MATERIALS MANAGEMENT ..... 4.4
- LAND USE ..... 4.5
- NOISE ..... 4.6
- PUBLIC HEALTH ..... 4.7
- SOCIOECONOMIC RESOURCES ..... 4.8
- TRAFFIC AND TRANSPORTATION ..... 4.9
- TRANSMISSION LINE SAFETY AND NUISANCE ..... 4.10
- VISUAL RESOURCES ..... 4.11
- VISUAL RESOURCES APPENDIX B ..... 4.11B
- WASTE MANAGEMENT ..... 4.12
- SOIL AND WATER RESOURCES ..... 4.13
- WORKER SAFETY AND FIRE PROTECTION ..... 4.14

ENGINEERING ASSESSMENT ..... 5

- FACILITY DESIGN ..... 5.1
- GEOLOGY AND PALEONTOLOGY ..... 5.2
- POWER PLANT EFFICIENCY ..... 5.3
- POWER PLANT RELIABILITY ..... 5.4
- TRANSMISSION SYSTEM ENGINEERING ..... 5.5

ALTERNATIVES ..... 6

GENERAL CONDITIONS ..... 7

PREPARATION TEAM ..... 8

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# INTRODUCTION

James W. Reede, Jr.

## PURPOSE OF THIS REPORT

On December 21, 2000, EL Segundo Power II LLC (ESP II) filed an Application for Certification (AFC) seeking approval from the California Energy Commission to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 in the City of El Segundo with a 630 megawatt (MW) natural gas-fired, combined cycle electric generation facility. On February 7, 2001, the California Energy Commission found the AFC to be Data Adequate. The finding of data adequacy by the Commission began staff's analysis of the project.

The Staff Assessment (SA) is the Energy Commission staff's independent analysis of the El Segundo Power Redevelopment Project (ESPR) 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 verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements. The SA presents conclusions and proposed conditions that apply to the design, construction, operation and closure of the proposed facility.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq. and Title 20, California Code of Regulation

section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 15000 et seq.).

## ORGANIZATION OF THE STAFF ASSESSMENT

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

## ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction, 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, section 25500). The Energy Commission must review power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, section 25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, section 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, sections 1742 and 1742.5(a)). Staff's independent review shall be presented in a report (Cal. Code Regs., tit. 20 , section 1742.5).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b)). Staff is required to develop a compliance plan (coordinated

with other agencies) to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, section 1744(b)).

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

The staff prepares a Staff Assessment (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. The SA serves as staff's only written testimony proposal.

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 we 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. A revised PMPD shall be circulated for a 15-day comment period. 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.

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

with the conditions adopted by the Energy Commission. The proposed **COMPLIANCE MONITORING PLAN AND GENERAL CONDITIONS** are included at the end of the SA.

## PUBLIC AND AGENCY COORDINATION

The El Segundo Power Redevelopment Project is proposed on land currently zoned for a power plant. Publicly noticed workshops on air quality, water resources, biological resources, cultural resources, noise, visual resources, traffic and transportation and other issues have been held in El Segundo. These workshops have been highly productive.

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 Cities of El Segundo and Manhattan Beach, County of Los Angeles, California Independent System Operator (Cal-ISO), South Coast Air Quality Management District, California Air Resources Board, FAA, U.S. Environmental Protection Agency, California Coastal Commission 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, National Marine Fisheries, 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

James W. Reede, Jr.

## NATURE AND PURPOSE OF THE PROJECT

On December 21, 2000, EL Segundo Power II LLC (ESP II) filed an Application for Certification (AFC) seeking approval from the California Energy Commission to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 with a 630 megawatt (MW) natural gas-fired, combined cycle electric generation facility.

## PROJECT LOCATION

The applicant proposes to modify an existing power plant in El Segundo, California, an incorporated city in Los Angeles County. This facility consists of 3 contiguous parcels approximately 34 acres in size. The site is bordered by Vista Del Mar Boulevard and the Chevron Refinery on the east, Santa Monica Bay on the west, 45$^{th}$ Street of the City of Manhattan Beach on the south and the Chevron Marine terminal on the north. The facility is located at Township 3 South, Range 15 West, of the Venice USGS Quadrangle Map. See **Project Description Figure 1.**

## POWER PLANT

The new combined cycle facility is expected to generate 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and their replacement with Units 5, 6, and 7 in the footprint of Units 1 and 2. The steam cycle heat rejection system, which utilizes cooling water from Santa Monica Bay, will remain and be used for the new equipment. The existing ESGS Units 3 and 4 located adjacent to Units 1 and 2 will not be modified by this project.

Units 5 and 7 will be General Electric PG7241FA combustion turbine generators. These natural gas fired generators will each have a base load gross output of 171.7MW. The gross output will be increased to 183.4 MW for peak loads by using steam injection. The combined cycle configuration will be accomplished with the addition a Heat Recovery Steam Generator (HRSG) to the exhaust outlets of both Units 5 and 7. The addition of a General Electric Steam Turbine Generator (STG) will complete the combined cycle configuration. The STG will have a peak generating output of 280MW.

The project will use Selective Catalytic Reduction (SCR); a dry, low NOx combustor and an oxidation catalyst system to reduce air emissions. An ammonia pipeline will be installed into the directly adjacent Chevron marine terminal property to deliver aqueous ammonia to the site for SCR.

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 will look on the site. **Project Description Figure 4** shows elevations of the power plant facilities.

## TRANSMISSION LINE FACILITIES

No new transmission lines are required for the project. Three new generator step-up transformers will be installed and connected to the existing 230 kV switchyard. The connections to the switchyards will be made via aboveground lead lines and new steel support poles.

## WATER SUPPLY AND WASTE WATER TREATMENT

Water requirements for the project are estimated at 206 million gallons per day at full operation and will be supplied from a combination of sources. The new units will use the existing seawater cooling system without modifying the intake or outfall structures and lines, and without modifying the flow rates and capacity. The applicant has proposed use of a pilot project to ascertain the viability of reducing fish kill.

The City of El Segundo, through purchases from the Metropolitan Water District, will supply potable water. The plant will be using approximately 180,000 gallons per day.

The West Basin Municipal Water District will supply approximately 86,000 gallons of reclaimed water per day for both irrigation and for pumps and bearings seal water augmentation.

Wastewater discharge will be into the City of Manhattan Beach Sanitary Sewer System via a new 3-inch water pipeline hookup on the 45$^{th}$ Street side of the plant

## CONSTRUCTION AND OPERATION

Two existing fuel storage tanks, previously used by Southern California Edison, are proposed for demolition as part of the project. The area presently occupied by the tanks is proposed for construction laydown. The applicant has proposed using the tanks as domed storage facilities during construction to reduce dust and to mitigate noise due to construction activities. The storage tank area will require soil contaminant remediation prior to use.

The project will require a construction workforce of approximately 422 craftspersons over the proposed 20-month construction period. The construction period will begin immediately after a four to six month site preparation phase that will include demolition of units 1 and 2 and the removal of the fuel storage tanks. Operation of the completed project will require a minimum of 50 skilled workers.

# ENVIRONMENTAL ASSESSMENT

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# AIR QUALITY

Testimony of Joseph M. Loyer

## INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the planned construction and operation of the El Segundo Power Redevelopment Project (ESPR) as proposed by the El Segundo Power II LLC (ESPII). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM10).

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

- whether the ESPR 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 1742.5 (b);

- whether the ESPR is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and

- whether the mitigation proposed for the ESPR is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

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

## FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the Environmental Protection Agency (EPA) to the South Coast Air Quality Management District (District). The EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 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 – CONTINUOS 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 NOx 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 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 PM10 emissions (between up and down wind measurements) to less than 50 $ug/m^3$ 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 SO2 emissions to 500 ppm, averaged over 15 minutes. However, internal combustion engines are exempt from the SO2 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% $CO_2$, 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 $H_2S$. 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% $O_2$ (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 (NOx, SOx or VOC) per year, upon declaration or prediction of a Stage 2 or 3 episode, reduce NOx, SOx 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 comply 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, SO2 and NO2 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 that 50 brake horsepower (bhp) and places restriction on rich-burn or lean-burn engines. These restrictions are in the form of NOx 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 NOx, VOC and CO emissions 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 NOx or SOx emissions from certain sources, which are regulated by Regulation XX (RECLAIM). This regulation applies to SOx emissions from the ESPR, 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 ESPR 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 ESPR 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 require 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

## 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 rain storms 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 in the coastal region of the South Coast basin, in the City of El Segundo of Los Angeles County, approximately 2.5 miles from southwest of the Los Angeles Airport (LAX). The site elevation is approximately 15 feet above sea level and is located directly on the coast, bordered by the Pacific Ocean, the coastline and a portion of urban Los Angeles. The coastline runs north-northwest to south-southeast along the project boundary. Small bluffs (approximately 100 feet high) run north to south just east of the project boundary, with elevated terrain a significant distance from the project site (approximately 6 miles). Temperatures recorded at LAX range from 27 $^{o}$F to 110 $^{o}$F with an average humidity of 72%. The South Coast basin receives most of its rainfall between November and April, LAX recorded an annual average of 12 inches.

The wind patterns near the project site are predominately from the west or northwest (approximately 30%). Calm conditions prevail from 10% to approximately 16% 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 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 or micrograms of pollutant in a cubic meter of air ($mg/m^3$ and $\mu g/m^3$).

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.

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

| Pollutant | Averaging Time | Federal Standard | California Standard |
|---|---|---|---|
| Ozone (O3) | 1 Hour | 0.12 ppm (235 $\mu g/m^3$) | 0.09 ppm (180 $\mu g/m^3$) |
| Carbon Monoxide (CO) | 8 Hour | 9 ppm (10 $mg/m^3$) | 9 ppm (10 $mg/m^3$) |
| | 1 Hour | 35 ppm (40 $mg/m^3$) | 20 ppm (23 $mg/m^3$) |
| Nitrogen Dioxide (NO2) | Annual Average | 0.053 ppm (100 $\mu g/m^3$) | --- |
| | 1 Hour | --- | 0.25 ppm (470 $\mu g/m^3$) |
| Sulfur Dioxide (SO2) | Annual Average | 80 $\mu g/m^3$ (0.03 ppm) | --- |
| | 24 Hour | 365 $\mu g/m^3$ (0.14 ppm) | 0.04 ppm (105 $\mu g/m^3$) |
| | 3 Hour | 1300 $\mu g/m^3$ (0.5 ppm) | --- |
| | 1 Hour | --- | 0.25 ppm (655 $\mu g/m^3$) |
| Respirable Particulate Matter (PM10) | Annual Geometric Mean | --- | 30 $\mu g/m^3$ |
| | 24 Hour | 150 $\mu g/m^3$ | 50 $\mu g/m^3$ |
| | Annual Arithmetic Mean | 50 $\mu g/m^3$ | --- |
| Sulfates ($SO_4$) | 24 Hour | --- | 25 $\mu g/m^3$ |
| Lead | 30 Day Average | --- | 1.5 $\mu g/m^3$ |
| | Calendar Quarter | 1.5 $\mu g/m^3$ | --- |
| Hydrogen Sulfide ($H_2S$) | 1 Hour | --- | 0.03 ppm (42$\mu g/m^3$) |
| Vinyl Chloride (chloroethene) | 24 Hour | --- | 0.010 ppm (26 $\mu g/m^3$) |
| Visibility Reducing Particulates | 1 Observation | --- | In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. |

The ESPR is located in the City of El Segundo 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**

| Pollutants | Federal Classification | State Classification |
|---|---|---|
| Ozone | Extreme Non-Attainment | Non-Attainment |
| PM10 | Non-Attainment | Non-Attainment |
| CO | Serious Non-Attainment | Non-Attainment |
| $NO_2$ | Attainment | Attainment |
| $SO_2$ | 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 (NOx) 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 $NO_x$ 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.

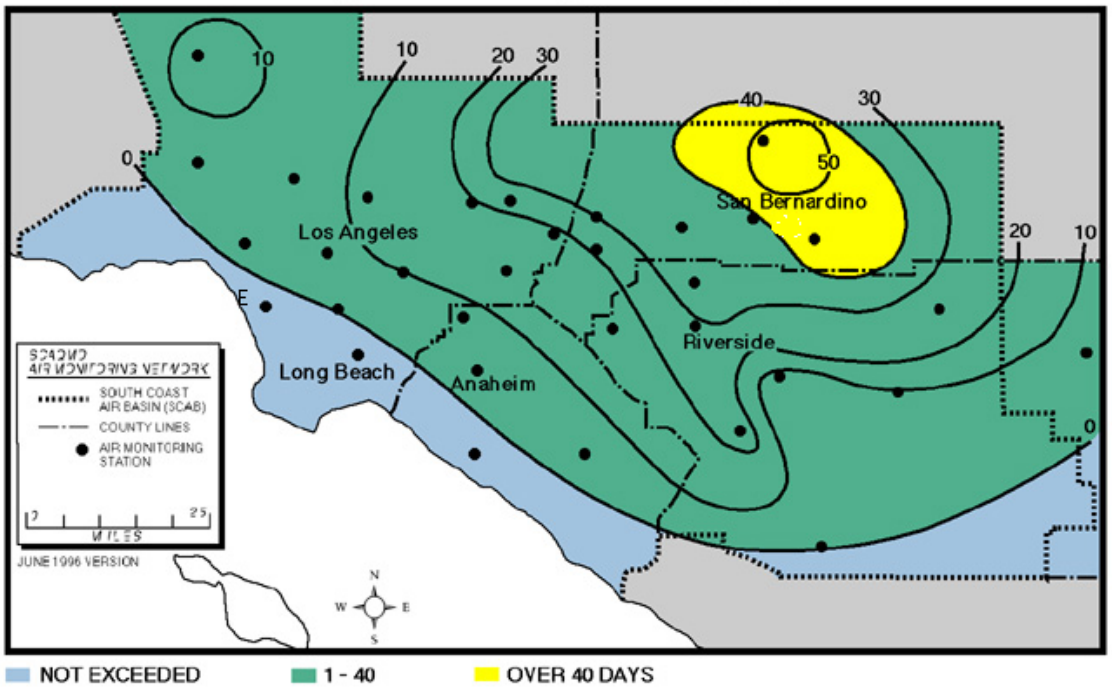
Exceedances of the national (and state) ozone ambient air quality standards occur in the Los Angeles area down wind of the project site (see AIR QUALITY Figure 1). In 1998, the South Coast air basin experienced more exceedances of the federal ozone standards than anywhere else in the United States. As AIR QUALITY Figure 1 shows, the highest number of exceedances of the federal ozone standards in 1998 occurred in the Central San Bernardino Mountains. This is also the location of the highest recorded measurement of ozone (0.24 ppm). The approximate location of the project site is indicated in AIR QUALITY Figure 1 with an **E**.

The 1999 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 1999, there were 30 violations of the national 1-hour ozone standard and 93 violations of the state 1-hour ozone standard with the highest 1-hour measurement of ozone being 0.17 ppm.

**AIR QUALITY Figure 1**

# OZONE – 1998

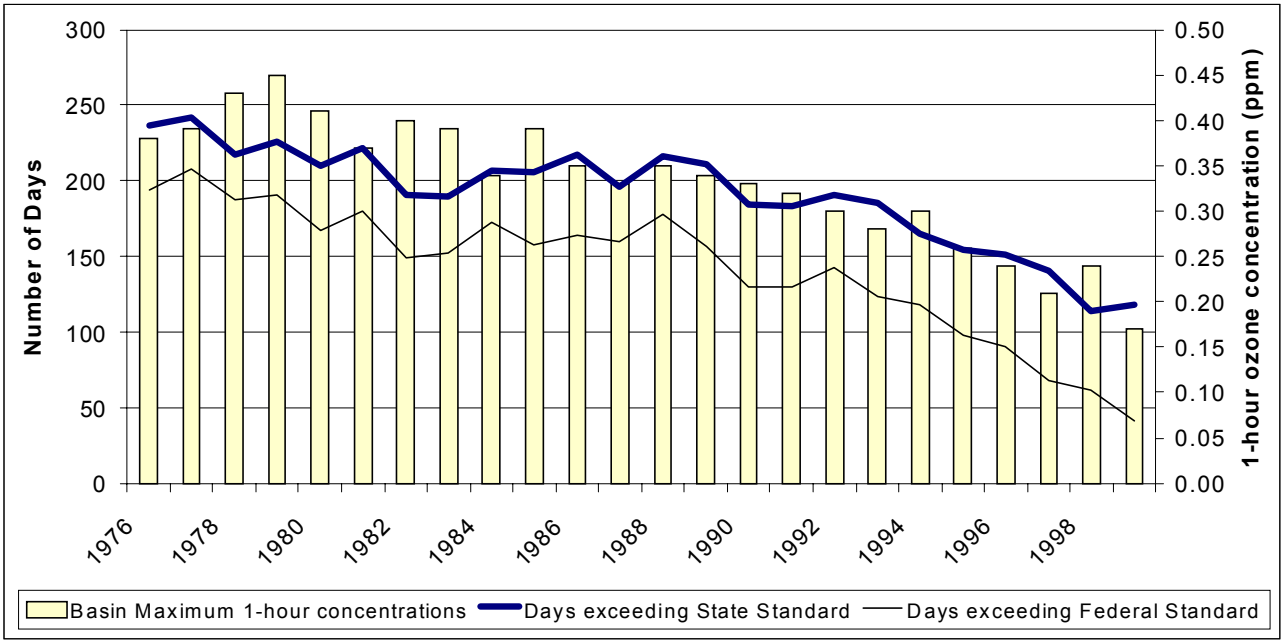
**Number of Days Exceeding the Federal Standard**
**(1-hour average > 0.12 ppm)**




Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

Though there are a significant number of exceedences of the ambient air ozone 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 exceedences of the federal and state 1-hour ozone standards and maximum annual ozone concentrations over the past 20 years in the South Coast air basin.

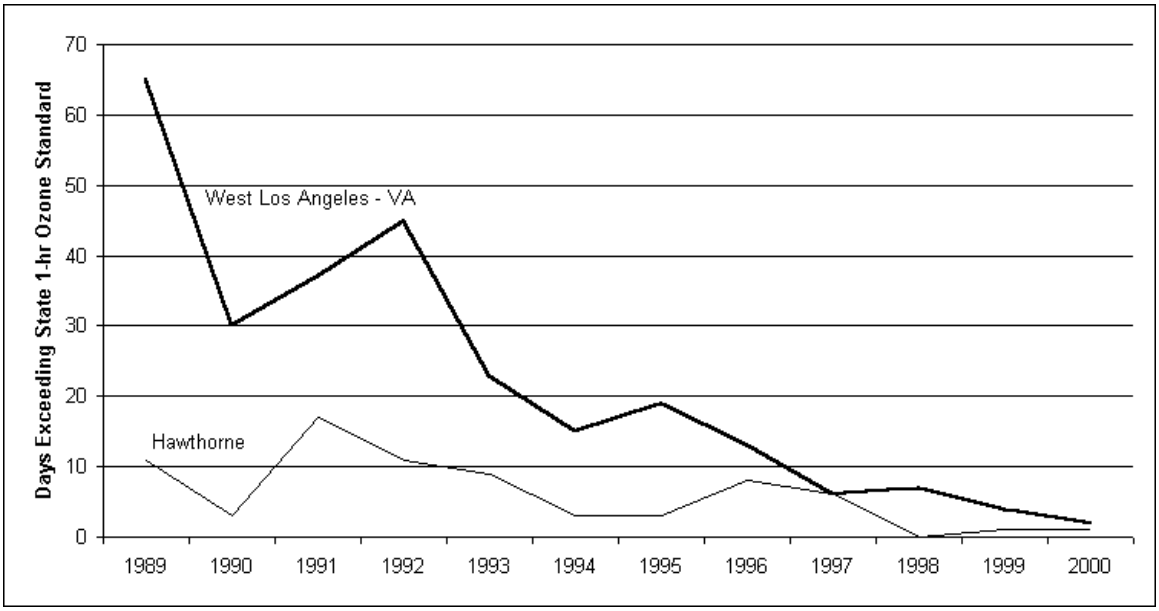
**AIR QUALITY Figure 2**
**Historic Ozone Air Quality Trends of the South Coast Air Basin**
**1976 to 1999**



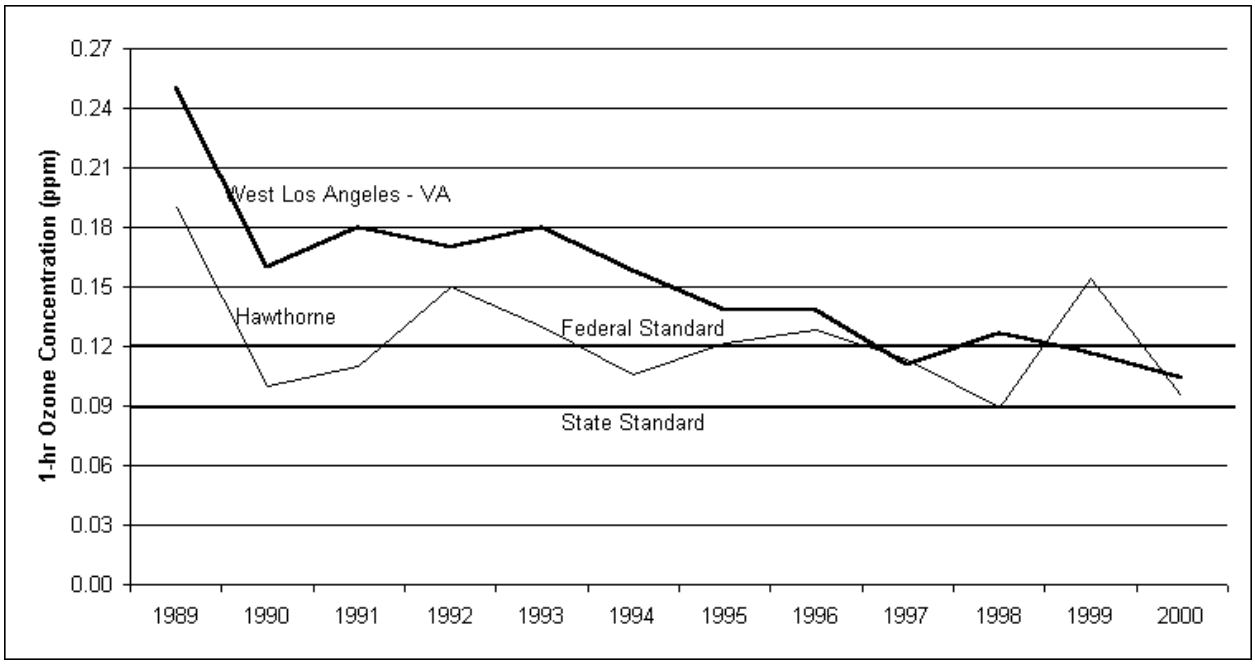

Source: South Coast Air Quality Management District

The project site has two air quality monitoring stations nearby, one in West Los Angeles near the Veterans Hospital (7 miles north-northeast of the project site) and the other in the City of Hawthorne (3.5 miles east-southeast of the project site). AIR QUALITY Figure 3 shows the general trends of exceedences of the 1-hour ozone standards near the project site using the monitoring data from these two stations. As can be seen, there is a significant downward trend in the number of days exceeding the state 1-hour ozone standards from 1989 to 2000. AIR QUALITY Figure 4 shows the maximum annual 1-hour ozone concentrations measured at both monitoring stations from 1989 to 2000. 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 lowest 1- hour annual-maximum ozone measurements to describe the background air quality conditions. The lowest annual maximum 1-hour ozone concentration was measured at the Hawthorne monitoring station in 1998 at 0.089 ppm.

**AIR QUALITY Figure 3**
**Ozone Trend – Days Exceeding the State 1-hour Standard**
**1989 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 (NOx and VOC) outside of their air district or air basin of origin may cause or contribute to exceedances of the ozone air quality standards in a 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**

| Transport Couple | Characterization |
|---|---|
| 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<br>S – Significant<br>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 where 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 NOx 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 NOx 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*

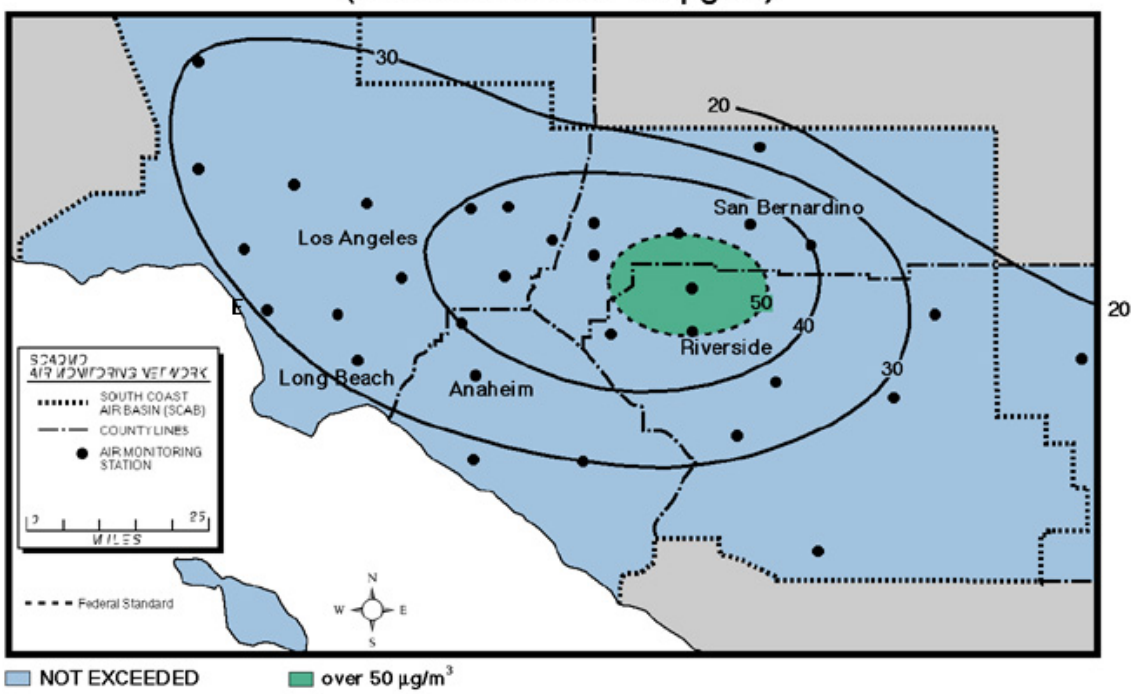
PM10 is a particulate that is 10 microns in diameter or smaller that is suspended in air. PM10 can be directly emitted from a combustion source (primary PM10 or PM2.5) or soil disturbance (fugitive dust) or it can form downwind (secondary PM10) from some of the constituents of combustion exhaust (NOx, SOx 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 1998 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 **E** on AIR QUALITY Figure 6.

**AIR QUALITY Figure 6**

**PM10 – 1998**

**Annual Arithmetic Mean, μg/m³**
**(Federal Standard = 50 μg/m³)**




Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

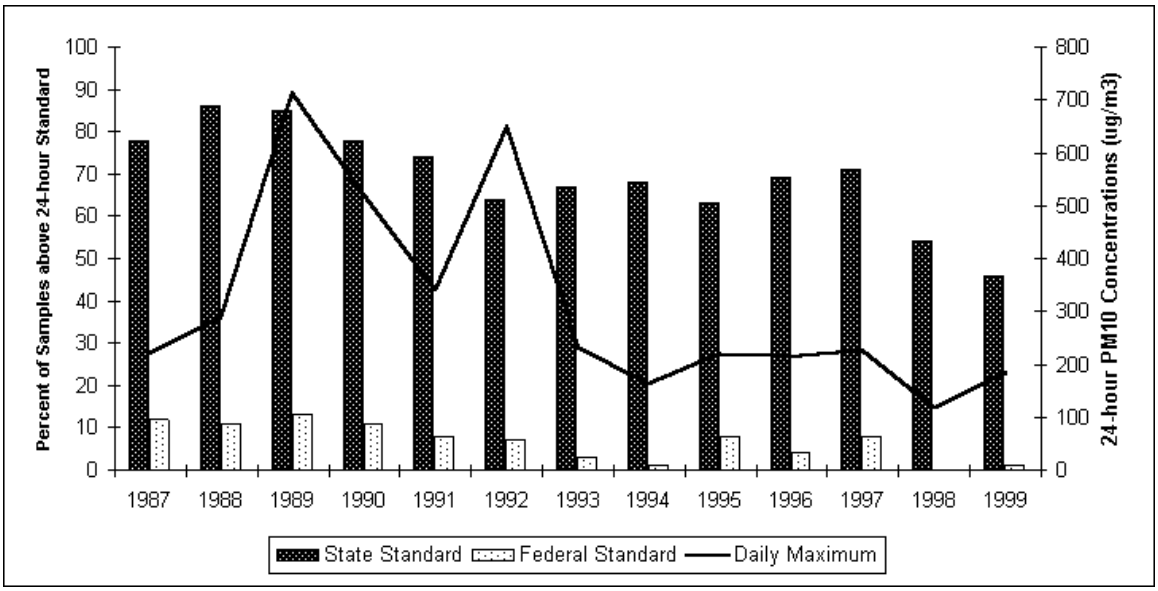
AIR QUALITY Figure 7 shows the historic trend of 24-hour PM10 concentrations and the percent of samples (or measurements) that exceed the state and federal ambient air quality standards. As the figure shows, the 24-hour annual maximum measured concentrations have been significantly reduced from 1987 to 1999. 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[1] (state annual PM10 standard, 30 ug/m$^3$) and the annual arithmetic mean[2] (federal annual PM10 standard, 50 ug/m$^3$) are still well over their respective ambient air quality standards, even though they show improvement from 1987 to 1999 (see AIR QUALITY Figure 8).

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

[1] A geometric mean is the n$^{th}$ root of the product of n measurements.

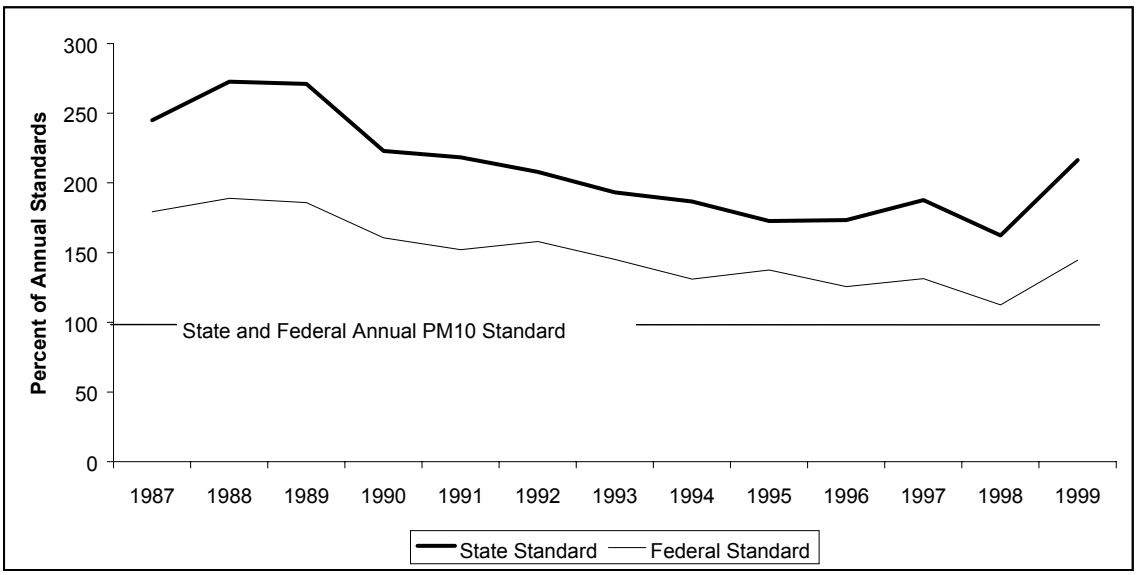
[2] An arithmetic mean is the sum of n measurements divided by n.

**1987 to 1999**




Source: California Air Resources Board

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

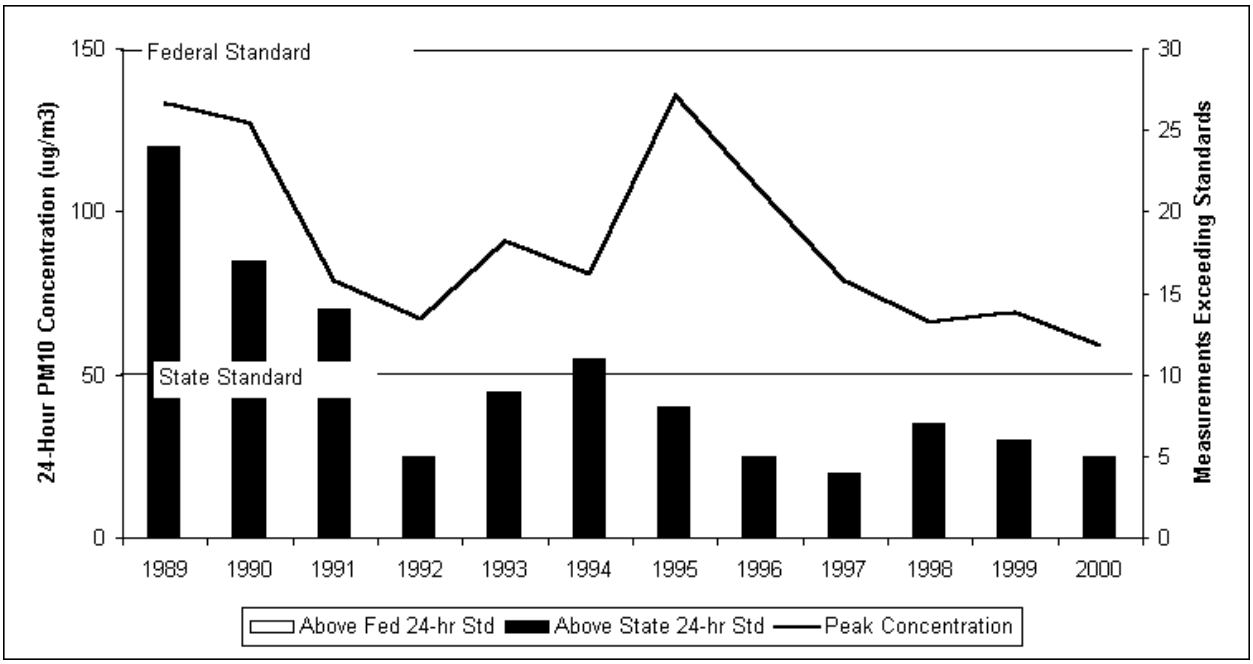



Source: California Air Resources Board

AIR QUALITY Figure 9 shows the historic (1989 to 2000) 24-hour PM10 measurements made at the Hawthorne monitoring station. As can be seen, the federal 24-hour PM10 standard (150 ug/m$^3$) has not been exceeded since 1989 at this station, however the state 24-hour PM10 standard continues to be exceeded. The annual maximum 24-hour PM10 measurements at the Hawthorne monitoring station improved from 1989 to 1992, but appears to degrade from 1992 to 1996.

Between 1997 and 2000, the trend seems to be controlled and improving. Therefore, staff recommends the use of the 1999 annual maximum 24-hour PM10 measurement recorded at the Hawthorne monitoring station to represent the background 24-hour PM10 concentrations for modeling purposes. That measurement is 69 ug/m$^3$.

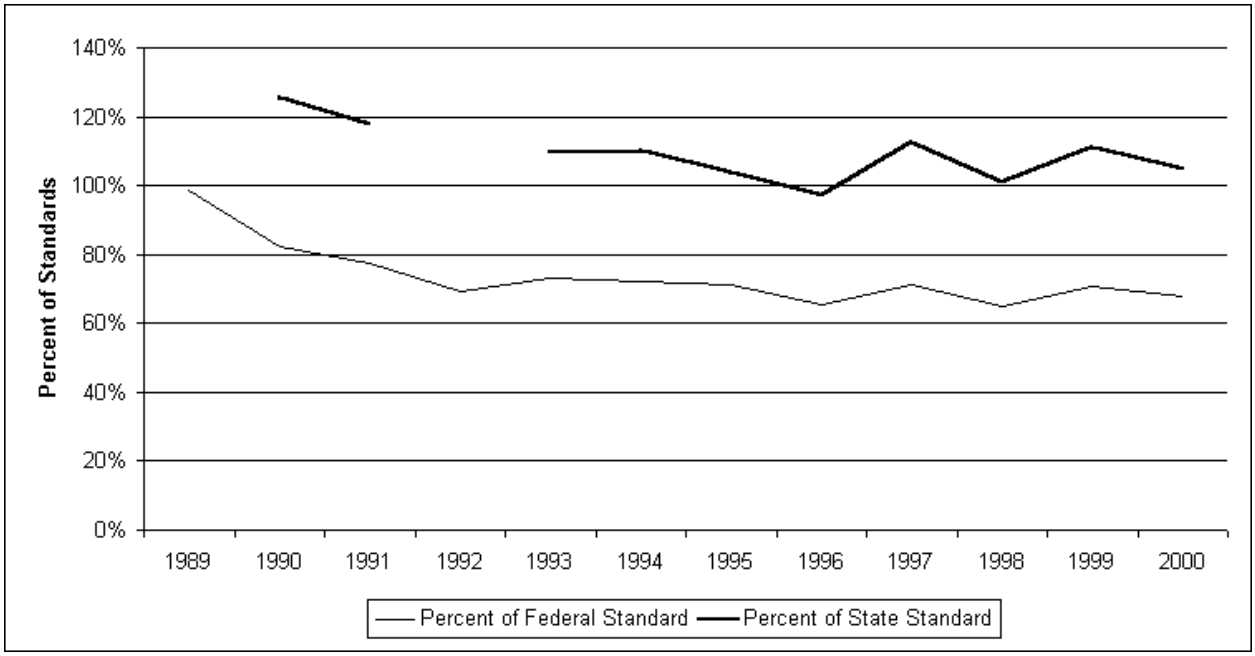
**AIR QUALITY Figure 9**
**Historic 24-hour PM10 Measurements**
**Hawthorne Monitoring Station**
**1989 to 2000**




Source: California Air Resources Board

AIR QUALITY Figure 10 shows the annual geometric and arithmetic means for the PM10 measurements at the Hawthorne monitoring station from 1989 to 2000 as a percent of the State and Federal annual PM10 ambient air quality standards. As can be seen, there is a notable improvement from 1989 to 1992, which stabilizes between 32 and 36 ug/m$^3$ there after for the federal standard. For the state standard, there is also an improvement from 1989 to 1992, but stabilizes between 29 and 34 ug/m$^3$. 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 Hawthorne monitoring station was in 35.4 ug/m$^3$ in 1999. The highest recent measurement for the geometric mean (state standard) at the same monitoring station was 33.8 ug/m$^3$ in 1998.

**AIR QUALITY Figure 10**
**Historic Annual PM10 Measurements**
**Hawthorne Monitoring Station**
**1989 to 2000**




Source: California Air Resources Board

### SECONDARY PM10

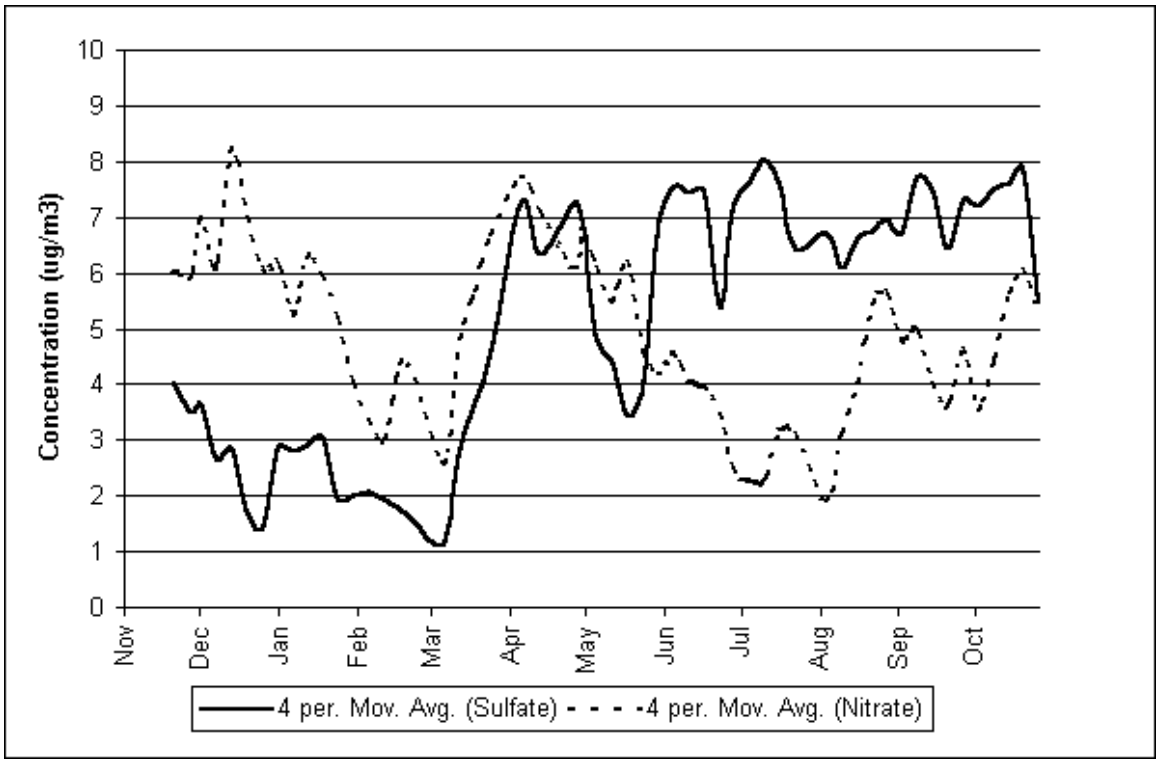
PM10 can be formed downwind from an emission source as a secondary emission (similar to ozone) from a reaction between ammonia and airborne acids. The most dominant reactions are between SOx emissions (as sulfuric acid, $H_2SO_4$) and NOx emissions (as nitric acid, $HNO_3$). The complexity of these reactions 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. The sulfate rich case, where the molar ratio of ammonia ($NH_3$) to sulfate ($SO_4$) is less than 2, so that there is insufficient ammonia to react with the sulfate. 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).

There has been no direct measure of ambient concentrations of ammonia in the general vicinity of the El Segundo project site. The closest measurement taken was in a 1995 study on the characterization of PM2.5 and PM10 in the South Coast Air Basin that included a monitoring site in downtown Los Angeles (SCAQMD 2000a). As part of that study the ammonia ion $NH_4^+$ 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$^3$, the rest of the year PM10 was measured at approximately 50 ug/m$^3$ for the Los Angeles downtown area. The study indicates that during the summer months, the on shore winds in

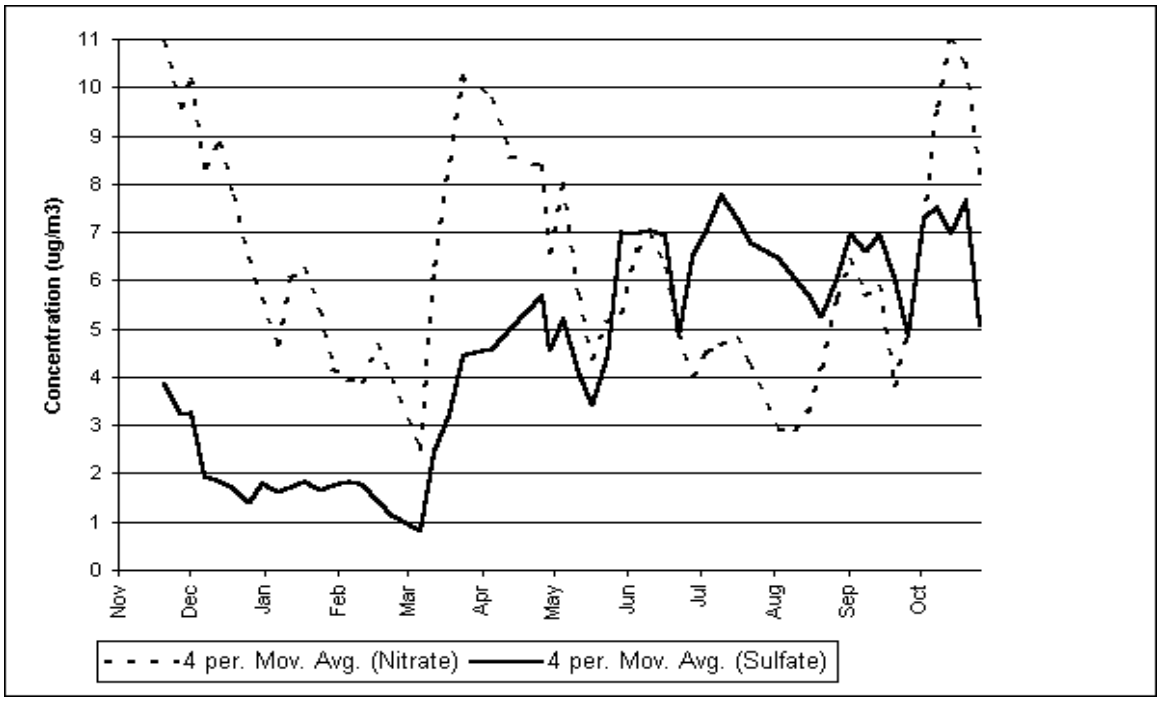
the area tend to increase the dust component of the PM10 and reduce the secondary component to a low of 22% of the total PM10 concentration. During the winter months, a high pressure system can form in the desert areas of San Bernardino trapping air in the Los Angeles basin. This conditions it what is 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.

**AIR QUALITY Figure 11**, shows a four point moving average of the measured nitrate and sulfate concentrations at the Hawthorne monitoring station. As can be seen, the sulfate concentration peaks in the summer months while nitrate peaks in the fall. Comparatively, the sulfate and nitrate components in downtown Los Angeles are similar although higher than those at the Hawthorne station (see **AIR QUALITY Figure 12**). It is staff's opinion that this tends to indicate that the two areas are very similar in ambient chemical composition. It is therefore staff's opinion that the ambient ammonia conditions in the downtown Los Angeles can be substituted for the ambient conditions in the El Segundo area.

**AIR QUALITY Figure 11**
**Hawthorne Monitoring Station**
**November 1999 to October 2000**

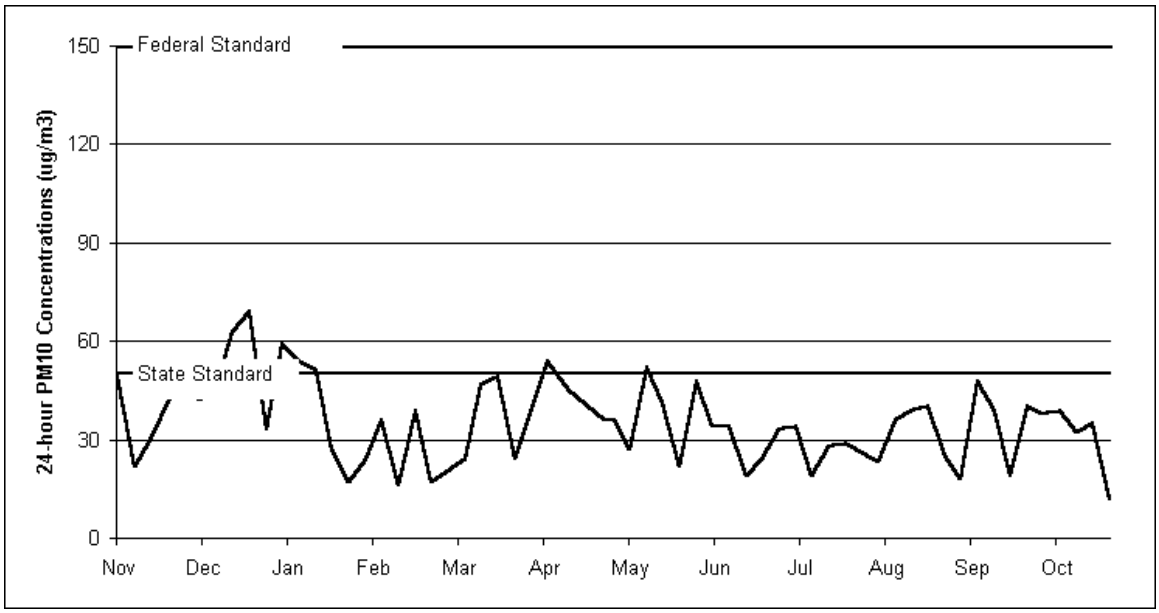



**AIR QUALITY Figure 12**
**Los Angeles Main Street Monitoring Station**
**November 1999 to October 2000**



Based on the presumption that the area down wind of the project is ammonia rich from September through April, it is staff's opinion that the ammonia emissions from the project do not have the potential to cause or contribute to an exceedance of the PM10 ambient air quality standard during this time frame. From April through September, the background concentrations of PM10 at the Hawthorne monitoring station have been below the state ambient air quality 24-hour standard with the exception of two excursions, one in April and one in May (see **AIR QUALITY Figure 13**). It has been determined in other power plant licensing cases that the potential impact of power plant ammonia emissions, with a 10 ppm limit, is approximately 1 ug/m$^3$ of secondary PM10 formation. This project will be limited to 5 ppm ammonia slip. It is therefore staff's opinion that this level of impact does not have the potential to cause or contribute to an exceedance of the state or federal 24-hour PM10 ambient air quality standards.

**AIR QUALITY Figure 13**
**24-Hour PM10 Measurements**
**Hawthorne Monitoring Station**
**November 1999 to October 2000**



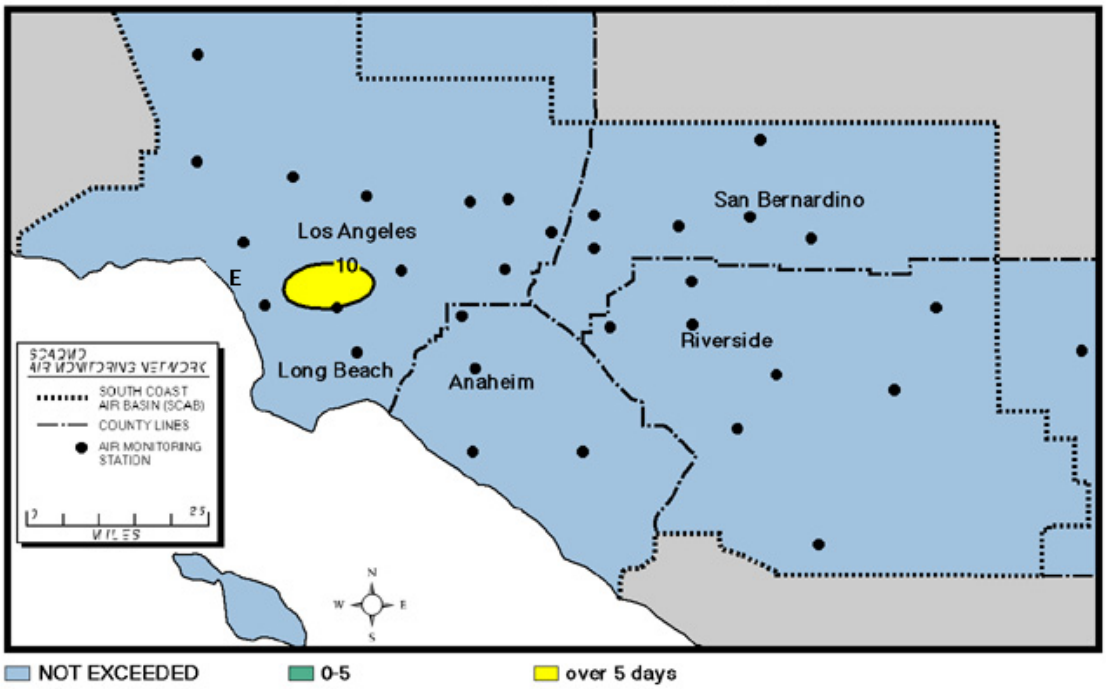

## *CARBON MONOXIDE*

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. However, as **AIR QUALITY Figure 14** shows, the exceedances of the federal CO standard occur in downtown Los Angles which is more than 10 miles from the project site.

**AIR QUALITY Figure 14**

# CARBON MONOXIDE - 1998

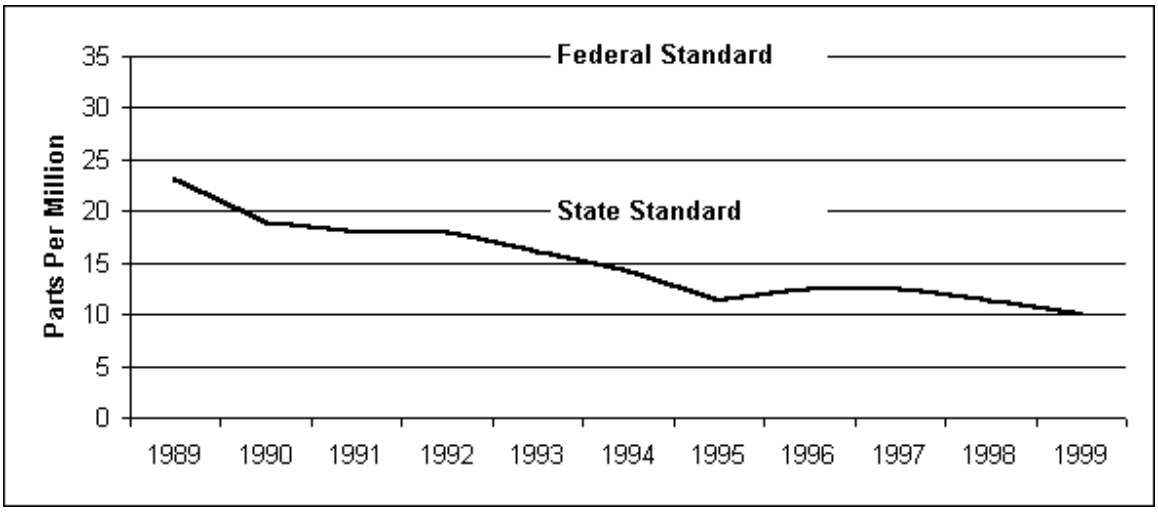
**Number of Days Exceeding Federal Standard**
**(8-Hour Average CO > 9.5 ppm)**




Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

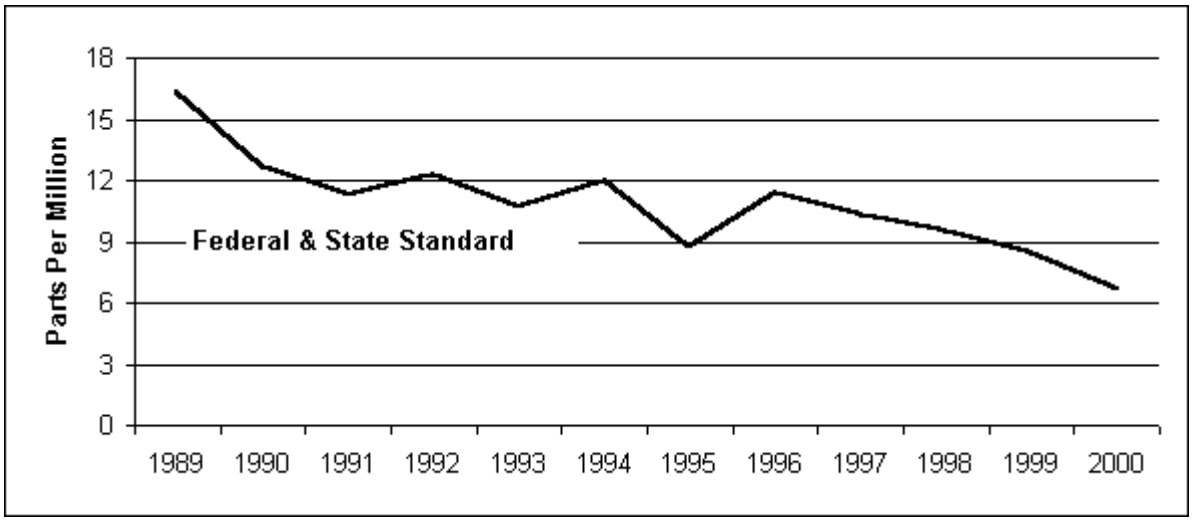
The closest CO monitoring station to the project site is the Hawthorne monitoring station. AIR QUALITY Figures 15 and 16 show the historical CO concentrations at the Hawthorne monitoring station. These figures demonstrate a slight downward trend from 1989 to 2000. Therefore staff recommends the lowest value be used for the background CO concentrations for air quality impact modeling purposes. For both the 1-hour and 8-hour standards, this is the 1999 measurement of 10 ppm and 6.64 ppm respectively.

**AIR QUALITY Figure 15**
**Historical 1-Hour CO Concentrations**
**Hawthorne Monitoring Station**
**1989 to 1999**




Source: California Air Resources Board

**AIR QUALITY Figure 16**
**Historical 8-Hour CO Concentrations**
**Hawthorne Monitoring Station**
**1989 to 2000**

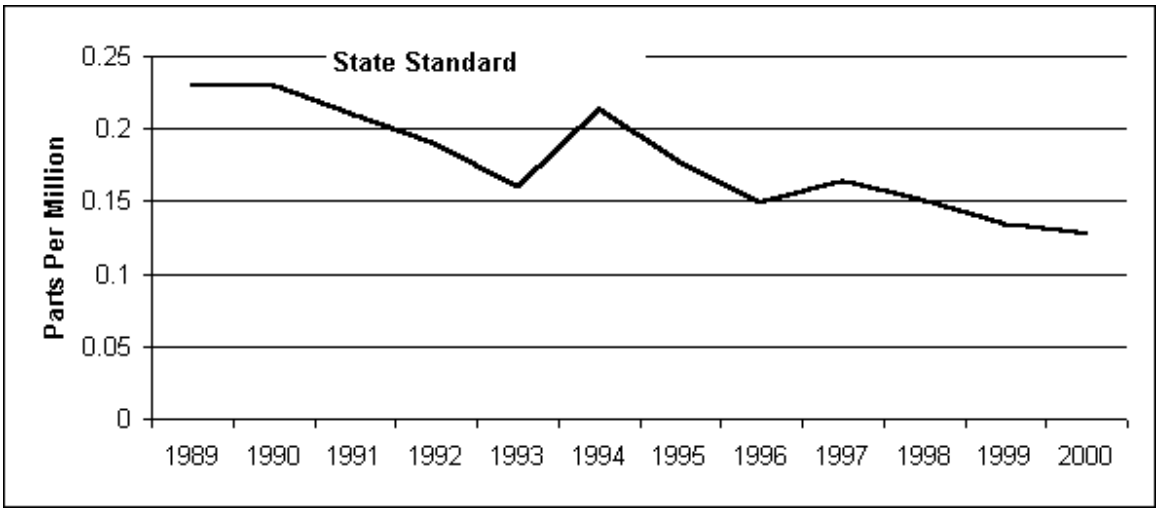



Source: California Air Resources Board

### *NITROGEN DIOXIDE*

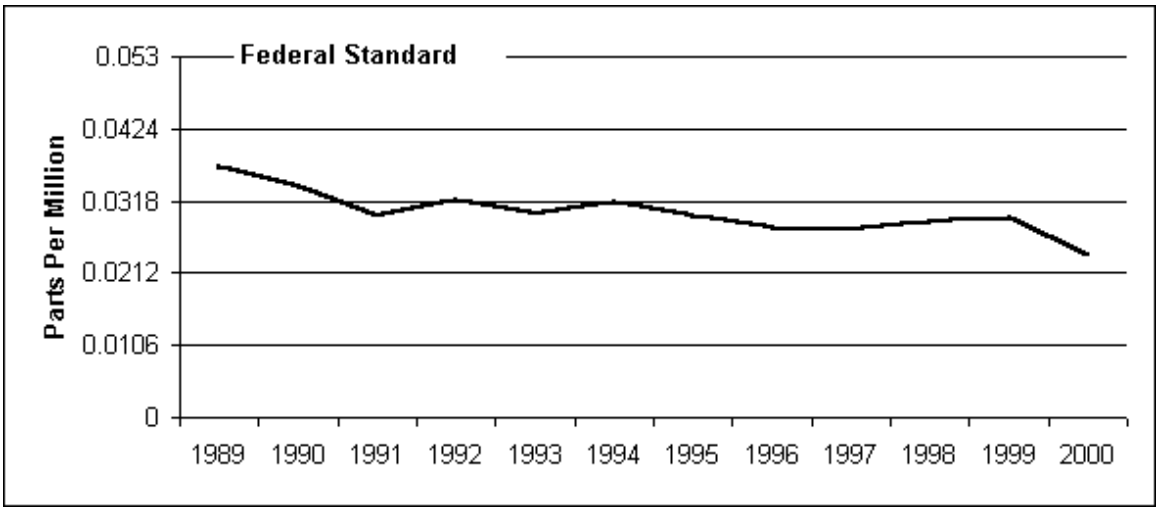
Nitrogen dioxide (NO2) can be emitted directly as a result of combustion or formed from nitric oxide (NO) and oxygen. NO is typically emitted from combustion sources and readily reacts with oxygen or ozone to form NO2. The NO reaction with ozone can occur within minutes and is typically referred to as 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 NO2 ambient air quality standards. AIR QUALITY Figures 17 and 18 show the 1-hour and annual NO2 concentrations measured at the Hawthorne monitoring station, the closest NO2 monitoring station to the project site. These figures show a slight, but erratic improvement in NO2 concentrations from 1989 to 2000. Staff therefore recommends that the 2000 measurements be used as they represent reasonably higher values and are the most recent. The 1-hour and annual average NO2 concentrations measured at the Hawthorne monitoring station in 2000 are 0.128 ppm and 0.024 ppm respectively.

**AIR QUALITY Figure 17**
**Historical 1-Hour $NO_2$ Concentrations**
**Hawthorne Monitoring Station**
**1989 to 2000**




Source: California Air Resources Board

**AIR QUALITY Figure 18**
**Historical Annual Average $NO_2$ Concentrations**
**Hawthrone Monitoring Station**
**1989 to 2000**

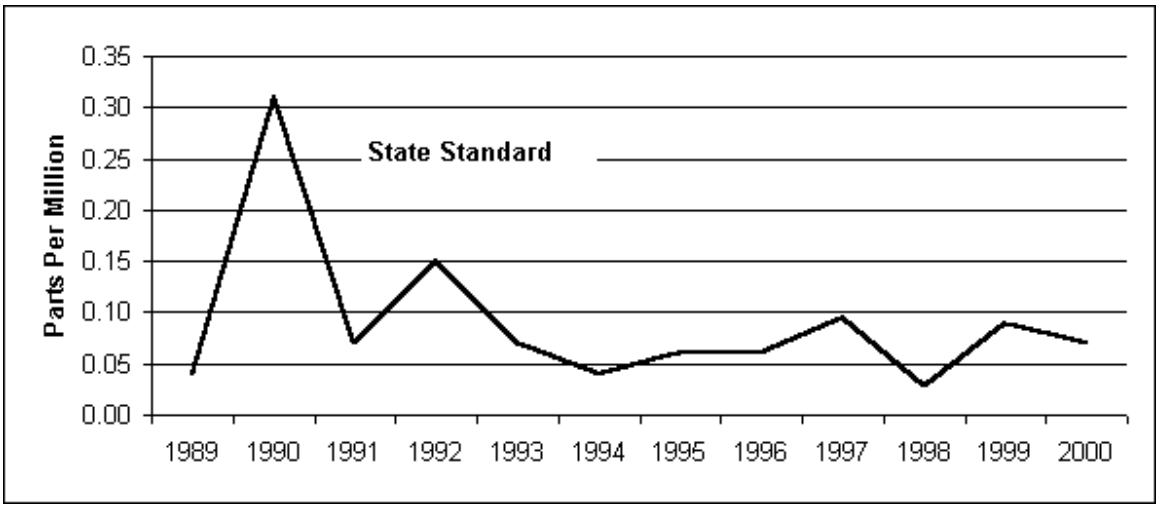



Source: California Air Resources Board

## *SULFUR DIOXIDE*

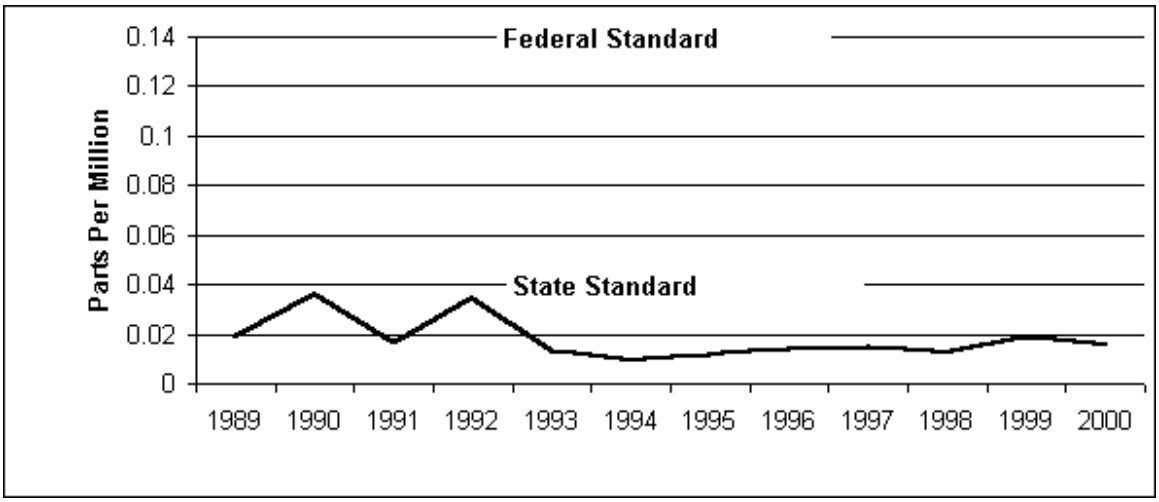
Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO2 emissions when combusted. By contrast fuels high in sulfur content such as lignite (a type coal) emit very large amounts of SO2 when combusted. Sources of SO2 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 SO2 state and federal ambient air quality standards. The closest SO2 monitoring station to the project site is the Hawthorne monitoring station. AIR QUALITY Figures 19, 20 and 21 show the historic 1-hour, 24-hour and annual average SO2 concentrations measured at the Fontana monitoring station. These figures show that the concentrations of SO2 are far below the state and federal SO2 ambient air quality standards. However, the trends are ambiguous and indicate neither an increase nor a decrease in SO2 concentrations. Therefore staff recommends the highest concentrations within the last 5 years be used to represent the background for SO2 for modeling purposes. For the 1-hour standard, this is 0.096 ppm (measured in 1997). For the 24-hour standard, 0.014 ppm (1999). For the annual standard, 0.004 (1999).

**AIR QUALITY Figure 19**
**Historical 1-Hour $SO_2$ Concentrations**
**Hawthorne Monitoring Station**
**1989 to 2000**



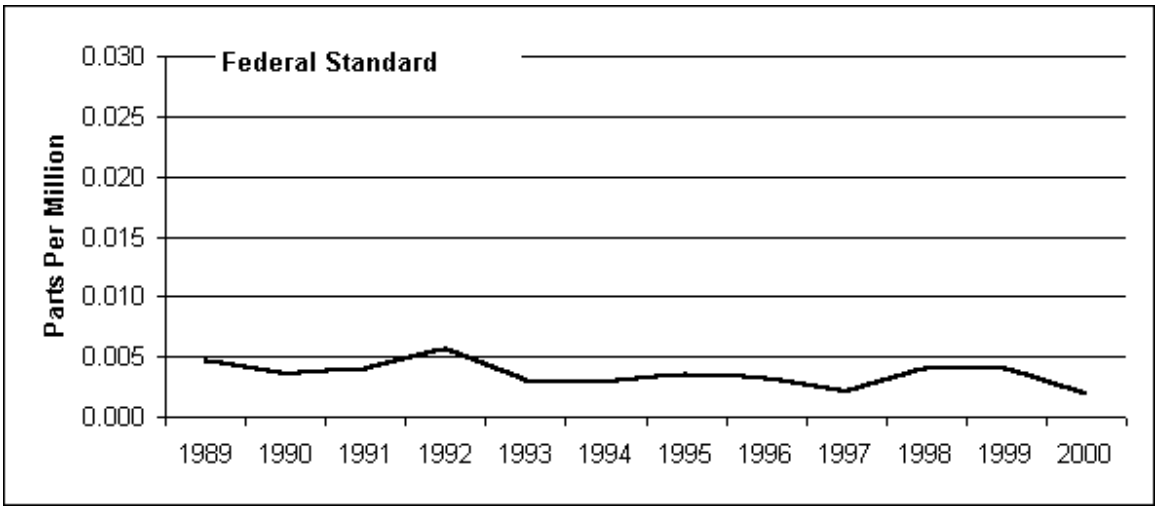

Source: California Air Resources Board

**AIR QUALITY Figure 20**
**Historical 24-Hour $SO_2$ Concentrations**
**Hawthorne Monitoring Station**
**1989 to 2000**




Source: California Air Resources Board

**AIR QUALITY Figure 21**
**Historical Annual Average $SO_2$ Concentrations**
**Hawthorne Monitoring Station**
**1989 to 2000**




Source: California Air Resources Board

## *SUMMARY*

In summary, staff recommends using the background ambient air concentrations in AIR QUALITY Table 4 for modeling and evaluating potential ambient air quality impacts from the proposed project.

**AIR QUALITY Table 4**
**Staff Recommended Background Concentrations**

| Pollutant | Averaging Time | Concentration ($ug/m^3$) | Concentration (ppm) |
|---|---|---|---|
| Ozone | 1 Hour | 178 | .089 |
| Particulate Matter | Annual Geometric Mean | 33.8 | -- |
| | Annual Arithmetic Mean | 35.4 | -- |
| | 24 Hour | 69 | -- |
| Carbon Monoxide | 8 Hour | 7378 | 6.64 |
| | 1 Hour | 11428 | 10 |
| Nitrogen Dioxide | Annual Average | 45.3 | 0.024 |
| | 1 Hour | 240 | 0.128 |
| Sulfur Dioxide | Annual Average | 10.7 | 0.004 |
| | 24 Hour | 36.5 | 0.014 |
| | 1 Hour | 251.5 | 0.096 |

## PROJECT DESCRIPTION AND EMISSIONS

## CONSTRUCTION

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

- The demolition of Boiler Units 1 and 2.
- The addition of two General Electric Frame 7FA gas fired combustion turbines with duct fired heat recovery steam generators (HRSG) driving one steam turbine, arranged as a 2-on-1 system.
- The addition of a new 265 Bhp diesel fired backup firewater pump.
- Minor modification of the existing power transmission and distribution system.

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

- A potable and reclaimed water pipeline in parallel, 1.9 miles long.
- A sanitary discharge pipeline, 200 feet long.
- An aqueous ammonia supply pipeline, 0.5 miles long.

On-site demolition of existing boiler units is expected to take approximately 6 months. Following demolition, on-site construction is expected to last 20 months with the highest fugitive emissions occurring in the fourth month and the highest overall emissions occurring in the sixth month. Offsite construction is expected to be completed much faster than on-site construction, on the order of four months.

ESPII proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from ESPR 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 application or chemical dust suppressant on unpaved travel surfaces and parking areas.
- Use vacuum or water flushing on paved travel surfaces and parking areas.
- Require all trucks hauling loose material to either cover or maintain a minimum of two feet of freeboard.
- Limit traffic speed on unpaved roads to 25 mph.
- Install erosion control measures.

- Re-plant disturbed areas as soon as possible.
- Use gravel pads and wheel washers as needed.
- Use wind breaks and chemical dust suppressant or water application to control wind erosion from disturbed areas.

### *PROJECT SITE*

The power plant itself will take approximately 20 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 ESPII, the highest emissions occur during the sixth month of construction. The highest daily emissions, based on the sixth month emissions, are shown in AIR QUALITY Table 5. AIR QUALITY Table 6 shows the expected annual emissions from construction activities at the project site.

**AIR QUALITY Table 5**
**Maximum Daily On-site Construction Emissions (lbs/day)**

| | NOx | VOC | CO | SOx | PM10 | Fugitive PM10 |
|---|---|---|---|---|---|---|
| Construction Equipment | 182.5 | 21.3 | 192.8 | 5.4 | 12.2 | 15.36 |
| Truck Deliveries [1] | 103.62 | 10.69 | 75.90 | 5.45 | 6.24 | 0.43 |
| Rail Deliveries | 83.93 | 3.11 | 8.27 | 5.36 | 2.08 | 2.60 |
| Worker Travel [1] | 73.51 | 81.95 | 752.02 | 0.10 | 2.47 | 0.45 |
| Windblown Dust [2] | -- | -- | -- | -- | -- | 10.32 |
| Total [3] | 443.56 | 117.05 | 1029.00 | 16.31 | 23.00 | 29.14 |

1 Includes both paved and unpaved road travel

2 Includes emissions from the active construction area, laydown area and contractor parking.

3 Emission totals for the sixth month of construction.

Source: (ESPR 2000a)

**AIR QUALITY Table 6**
**Annual On-site Construction Emissions (tons/year)**

| | NOx | VOC | CO | SOx | PM10 | Fugitive PM10 |
|---|---|---|---|---|---|---|
| Construction Equipment | 14.64 | 2.33 | 25.48 | .41 | 1.05 | 2.09[1] |
| Truck Deliveries [1] | 4.67 | 0.48 | 3.42 | 0.25 | 0.27 | -- |
| Rail Deliveries | 1.54 | 0.06 | 0.15 | 0.10 | 0.04 | -- |
| Worker Travel [1] | 7.65 | 8.53 | 78.26 | 0.01 | 0.26 | -- |
| Windblown Dust [2] | -- | -- | -- | -- | -- | 1.88 |
| Total | 28.50 | 11.40 | 107.31 | 0.77 | 1.62 | 3.97 |

1 Includes construction, truck deliveries, train deliveries and worker travel.

2 Includes emissions from the active construction area, laydown area and contractor parking.

Source: (ESPR 2000a)

## *LINEAR FACILITIES*

The linear facilities include the potable water pipelines, the wastewater pipeline and the aqueous ammonia pipeline. The construction of all linear facilities is not expected to last longer than six months. AIR QUALITY Table 7 shows the maximum daily emissions expected from the construction of all the linear facilities.

**AIR QUALITY Table 7**
**Maximum Daily Natural Gas Pipeline Construction Emissions (lbs/day)**

| | NOx | VOC | CO | SOx | PM10 | Fugitive PM10 |
|---|---|---|---|---|---|---|
| Construction Equipment | 107.1 | 7.8 | 33.6 | 3.5 | 6.4 | 5.51 |
| Truck Deliveries | 10.72 | 1.11 | 7.85 | 0.56 | 0.63 | 0.04 |
| Excavation | -- | -- | -- | -- | -- | 2.61 |
| Back Filling | -- | -- | -- | -- | -- | 0.13 |
| Windblown Dust | -- | -- | -- | -- | -- | 0.24 |
| Total | 117.82 | 8.91 | 41.45 | 4.06 | 7.03 | 8.53 |

Source: (ESPR 2000a)

## OPERATIONAL PHASE

### *EQUIPMENT DESCRIPTION*

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

- Two natural gas fired General Electric Frame 7FA combustion turbine generators (CTG), nominally rated at approximately 175 MW (increased to 183 MW with steam injection). Each of the CTGs will be equipped with evaporative inlet air coolers;
- Each CTG would be equipped with gas fired heat recovery steam generators (HRSG) and ancillary equipment;
- One steam turbine, rated at approximately 288 MW;
- One 265 Bhp diesel fired backup firewater pump;
- Two existing gas fired utility boilers (units 3 and 4), rated at 302 MW each.

### *EQUIPMENT OPERATION*

The El Segundo facility is intended to be a base loaded power plant with the capability to respond to market demands. The two remaining boilers (units 3 & 4) and the two CTGs (units 5 & 7) will operate exclusively on natural gas. The 265 Bhp backup firewater pump IC engine will operate exclusively on diesel fuel. Operation of the existing boilers (Units 3 and 4) are not considered a part of the project; however, they are reviewed in the context of potential cumulative impacts.

### *EMISSION CONTROLS*

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO2 and PM10 emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur dioxide emissions in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low.

Like SO2, the emissions of PM10 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 0.25 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO2 emission calculations.

To minimize NOx, CO and VOC emissions during the combustion process, the CTGs are equipped with the latest dry low-NOx (DLN) combustor design developed by GE. 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. ESPR is proposing to use a Selective Catalytic Reduction

(SCR) system to reduce NOx emissions. An oxidizing catalyst, will also be installed in the HRSG to reduce CO emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

The existing boilers (units 3 and 4) have been retrofitted with SCR technology for additional NOx control, however this is part of activities on the facility site that are unrelated to the new units.

### *PROJECT OPERATING EMISSIONS*

The air emissions associated with the ESPR are shown in AIR QUALITY Tables 8 and 9. Table 8 shows the emission rates for the GE Frame 7FA turbines equipped with DLN combustors, SCRs and oxidation catalysts. Table 8 also shows the estimated emission rates for the existing boilers (from recent source testing) and the firewater pump. AIR QUALITY Table 9 shows the emission rates for the turbines at various ambient temperatures and with or without the HRSG duct firing natural gas. The emission rates in AIR QUALITY Table 9 are used to calculate the long-term annual average emissions for the ESPR. The short-term (hourly through daily) emissions are calculated using the emission rates in AIR QUALITY Table 8. The NOx and CO emission rates shown in AIR QUALITY Table 9 assume that the ESPR will average (on an annual basis) a lower concentration than that used for the short-term emission rates. For NOx, the short-term emission rates are based on a 2.5 ppm concentration limit, the long-term emission rates are based on a 2.0 ppm concentration. For CO, the short-term emission rates are based on a 6.0 ppm concentration limit and the long-term emission rates are based on a 2.0 ppm concentration. Since both NOx and CO emissions will be continuously monitored in the stack (see compliance with LORS section), making this assumption is reasonable and enforceable.

**AIR QUALITY Table 8**
**Short-Term Estimated Emission Rates**
**(lbs/hour)**

| Equipment | Operation | NOx | SOx | CO | VOC | PM10 |
|---|---|---|---|---|---|---|
| Turbine | Full Load[1] | 22.71 | 1.75 | 33.18 | 6.41 | 15 |
| | Full Load[2] | 15.68 | 1.21 | 22.91 | 2.55 | 11 |
| | Cold Startup | 35.7 | 1.35 | 50 | 2.56 | 11 |
| | Warm Startup | 35.7 | 1.35 | 62.5 | 2.56 | 11 |
| | Hot Startup | 35.7 | 1.35 | 100 | 2.56 | 11 |
| Existing Boiler | Full Load | 33.90 | 2.01 | 281.4 | 18.43 | 25.46 |
| Firewater Pump | Full Load | 1.96 | 0.05 | 0.08 | 0.07 | 0.02 |

1 The turbine is at full load in 83 $^{o}$F ambient air temperature with duct firing and power augmentation.
2 The turbine is at full load in 83 $^{o}$F ambient air temperature without duct firing or power augmentation.

Source: (SCAQMD 2001c)

**AIR QUALITY Table 9**
**Estimated Turbine Annual Average Hourly Emission Rates**
**(lbs/hour)**

| Temp. ($^{o}$F) | Power Aug. | Duct Firing | NOx[1] | SOx | CO[2] | VOC | PM10 |
|---|---|---|---|---|---|---|---|
| 83 | On | On | 18.17 | 1.75 | 11.06 | 6.37 | 15.00 |
| 83 | Off | Off | 12.54 | 1.21 | 7.64 | 2.56 | 11.00 |
| 41 | Off | Off | 13.96 | 1.35 | 8.5 | 2.85 | 11.00 |

1 The NOx emission rates assume that the ESPR can achieve 2.0 ppm averaged over the entire year, excluding startups and shutdowns.
2 The CO emission rates assume that the ESPR can achieve 2.0 ppm averaged over the entire year, excluding startups and shutdowns.

Source: (SCAQMD 2001c)

## STARTUP

The ESPR has three general startup scenarios: cold start, warm start and hot start. Cold startups usually occur after extended periods of shutdown, typically 3 days or more. Warm startups occur generally after a shorter shutdown duration than those for cold startups, from 24 to 72 hours. Hot startups generally occur following a trip off line or non-critical emergency shutdown, usually lasting only a few hours. Except for CO emissions, the ESPII has chosen to assume that hot and warm startups emissions are the same as cold startup emissions (see AIR QUALITY Table 8). The ESPII has requested that they assume 365 hours of startups per year per turbine.

### OPERATING EMISSIONS

Operating emissions for the ESPR include emission from the combustion turbines, the gas-fired HRSGs (duct firing) and, for purposes of evaluating cumulative impacts, the existing boilers. Emissions from the combustion turbines vary with the ambient temperature. Generally speaking, the colder the ambient temperature is,

the denser is the inlet air. Denser air results in a slightly higher power output and a higher volume throughput, which tends to result in higher mass emission rates. ESPII investigated emission rates at several different ambient temperatures, with and without duct firing and power augmentation. They found that the highest mass emission rates occur while the combustion turbine is at full load, the ambient temperature is 83 $^{o}$F and the duct firing and power augmentation are both on. For normal operations, the boilers are assumed to be at full load.

### MAXIMUM EXPECTED EMISSIONS

The maximum expected emissions for the ESPR are calculated on a hourly, daily and annual basis. AIR QUALITY Table 10 shows the hourly emissions and assumes that the boilers and one combustion turbine are at full load while the other combustion turbine is either in startup or full load. Since both NOx and CO (and to an extent VOC) emissions are controlled through post combustion techniques, these pollutants are highest when those controls are not in operation. The only time these controls are not in operation is when the combustion turbine is undergoing a startup. Therefore, for the one-hour worst case NOx and CO emissions, the ESPII has assumed that the second combustion turbine is undergoing a hot startup. SOx, VOC and PM10 emissions are controlled mainly through good combustion practices and therefore are highest when the most fuel is being burned in the combustion turbine (i.e., full load with the duct burner and power augmentation on).

**AIR QUALITY Table 10**
**Project Maximum Hourly Emissions**
**(lbs/hr)**

| Equipment : Operation | NOx | SOx | CO | VOC | PM10 |
|---|---|---|---|---|---|
| Boiler Unit 3: Full Load | 33.90 | 2.01 | 281.40 | 18.43 | 25.46 |
| Boiler Unit 4: Full Load | 33.90 | 2.01 | 281.40 | 18.43 | 25.46 |
| CTG Unit 5: Turbine 1 Full Load w/DB+PA | 22.71 | 1.75 | 33.18 | 6.41 | 15.00 |
| CTG Unit 7: Turbine 2 (see notation) | 35.70[1] | 1.75[2] | 100.0[1] | 6.37[2] | 15.0[2] |
| **TOTAL** | **126.21** | **7.52** | **695.98** | **49.64** | **80.92** |

Notation: operational assumptions for the worst case hourly emissions change based on the pollutant being emitted.
1 This emission value represents the CTG undergoing a hot startup.
2 This emission value represents the CTG operating under full load with the duct burner and power augmentation on.

AIR QUALITY: Table 11 shows the maximum daily emissions and assumes the existing boilers are operating at full load with the new turbines starting up and then operating at full load for the balance of the day. The ESPII has assumed that the combustion turbines will not operate with the duct burners and power augmentation on for more than 15 hours in any one day. The ESPII further assumes that cold startup will last for three hours and that the combustion turbines will be operated at full loaf without the duct burners or power augmentation on. The ESPII will stagger the startups of the combustion turbines, however to be conservative, the ESPII assumes that the worst day will include an extra hour of operation for the second turbine to startup.

**AIR QUALITY Table 11**
**Project Daily Emissions**
**(lbs/day)**

| Equipment: Operation | Duration | NOx | SO2 | CO | VOC | PM10 |
|---|---|---|---|---|---|---|
| Boiler Unit 3: Full Load | 24 | 813.7 | 48.24 | 6753.6 | 442.22 | 611.04 |
| Boiler Unit 4: Full Load | 24 | 813.7 | 48.24 | 6753.6 | 442.22 | 611.04 |
| CTG Unit 5 Cold Startup | 3 | 107.1 | 4.05 | 150 | 7.68 | 33 |
| CTG Unit 5 Full Load w/ DB+PA | 15 | 340.65 | 26.25 | 497.70 | 96.15 | 225 |
| CTG Unit 5 Full Load w/o DB + PA | 6 | 94.08 | 7.26 | 137.46 | 15.30 | 66 |
| CTG Unit 7 Cold Startup | 3 | 107.1 | 4.05 | 150 | 7.68 | 33 |
| CTG Unit 7 Full Load w/ DB+PA | 15 | 340.65 | 26.25 | 497.70 | 96.15 | 225 |
| CTG Unit 7 Full Load w/o DB + PA | 6 | 94.08 | 7.26 | 137.46 | 15.30 | 66 |
| Backup Firewater Pump | 30 minutes | 0.98 | 0.025 | 0.04 | 0.03 | 0.01 |
| **Total** | **24** | **2,712.0** | **171.6** | **15,077.6** | **1,122.7** | **1,870.1** |
| | | | | | | |

The annual emissions for the ESPR are summarized in the AIR QUALITY Table12. The annual emissions include 200 hours of operation from the firewater pump. The CTG Units are assumed to operate 365 hours in startup mode per turbine and 2099 hours of duct burn and power augmentation while at full load. The CTGs are assumed to operate half the year at 41$^{o}$F and half at 83$^{o}$F, for a total of 8,395 hour per year. The boiler units are assumed to operation 8760 hours per year.

**AIR QUALITY Table 12**
**Project Annual Emissions (including existing boilers)**
**(tons per year [ton/yr])**

| Equipment: Operation | Hours | NOx | SO2 | CO | VOC | PM10 |
|---|---|---|---|---|---|---|
| **Boiler Units 3 and 4:FullLoad** | 8760 | 296.96 | 17.61 | 2,465.06 | 161.45 | 223.03 |
| **CTG Units 5 and 7** | | | | | | |
| Cold Startup | 365 | 13.03 | 0.49 | 18.25 | 0.93 | 4.02 |
| Warm Startup | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hot Start | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Full Load, 83°F w/DB + PA | 2099 | 38.14 | 3.67 | 23.21 | 13.37 | 31.49 |
| Full Load, 83°F w/o DB + PA | 2099 | 26.32 | 2.54 | 16.04 | 5.37 | 23.09 |
| Full Load, 41°F w/o DB + PA | 4197 | 58.59 | 5.67 | 35.67 | 11.96 | 46.17 |
| CTG Units 5 and 7 Total | 8761 | 136.08 | 12.37 | 93.18 | 31.64 | 104.76 |
| **Backup Firewater Pump** | 200 | 0.20 | 0.01 | 0.01 | 0.01 | 0.00 |
| **Total** | | 433.24 | 29.98 | 2,558.25 | 193.09 | 327.79 |
| | | | | | | |

### *AMMONIA EMISSIONS*

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of 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 ESPII 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 356 lb./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 60 to 125 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 ESPR will go through several layers of test during initial commissioning. During the first set of tests, post-combustion control 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 ESPR 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 hour 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**

| | NOx | CO | VOC | SOx | PM10 |
|---|---|---|---|---|---|
| Maximum Hourly Emissions (lbs/hr)[1] | 448 | 902 | 2.6 | 1.8 | 11.0 |
| Maximum Daily Emissions (lbs/day)[2] | 1,792 | 3,608 | 10.4 | 7.2 | 44.0 |
| Total Initial Commissioning Emissions (lbs)[3] | 34,535 | 111,463 | 1,803 | 664 | 7,128 |

1 (ESPR 2000a)
2 Maximum daily emissions are four times maximum hourly emissions.
3 Total emissions include controlled and uncontrolled emissions for both turbines (SCAQMD 2000c).

## FACILITY CLOSURE

Eventually the ESPR 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 a five year schedule. However, during those five years, the ESPII must still pay permit fees annually. If the ESPII 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 ESPII pays the fees to renew the Permit to Operate.

If the ESPII were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how ESPR plans to demonstrate compliance with the District Rules regarding fugitive dust emission limitations.

## PROJECT INCREMENTAL IMPACTS

## MODELING APPROACH

The ESPII 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 ESPII 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 one month period, converted to a gram per second emission rate for the model. Most of the highest emissions occurred during the 6$^{th}$ month of the 20-month construction period.

The results of this modeling effort are shown in AIR QUALITY Table 14. They show that the construction activities would come close to causing a violation of the state 1-hour average NO2 standard and further exacerbate existing violations of the state 24-hour and annual average PM10 standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site.

**AIR QUALITY Table 14**
**Maximum Construction Impacts**

| Pollutant | Averaging Time | Impact ($\mu g/m^3$) [2] | Background ($\mu g/m^3$)[1] | Total Impact ($\mu g/m^3$) | Limiting Standard ($\mu g/m^3$) | Percent of Standard |
|---|---|---|---|---|---|---|
| NO2[2] | **1-hour[3]** | 225 | 240 | 465 | 470 | **99** |
| | Annual[4] | 19 | 45.3 | 64.3 | 100 | 64 |
| CO[2] | 1-hour | 4129 | 11,428 | 15,557 | 23,000 | 68 |
| | 8-hour | 1403 | 7,378 | 8,781 | 10,000 | 88 |
| SO2[2] | 1-hour | 115 | 251.5 | 366.5 | 655 | 56 |
| | 24-hour | 13 | 36.5 | 49.5 | 130 | 38 |
| | Annual | 1 | 10.7 | 11.7 | 80 | 15 |
| PM10 | **24-hour** | 178 | 69 | 247 | 50 | **494** |
| | **Annual[5]** | 37 | 33.8 | 70.8 | 30 | **236** |
| | **Annual[6]** | 37 | 35.4 | 72.4 | 50 | **145** |

1 See AIR QUALITY Table 4.
2 Based on daily emission during month 6.
3 Employs ozone limiting method.
4 Employs ARM method, default district ratio of 0.71.
5 Annual Geometric Mean, State Standard
6 Annual Arithmetic Mean, Federal Standard

Source: (ESPR 2000a)

Since the general public live and work in the vicinity of the project site, the construction of the ESPR may result in unavoidable short-term impacts that may expose the general public to adverse air quality conditions. Thus, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the PM10 ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

## PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for 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 ESPII used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts. AIR QUALITY Table 15 shows the modeled fumigation results and impacts on the 1-hour NO2, CO and SO2 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 at either partial load (50 percent) or full load will not violate the NO2, CO or SO2 1-hour standards.

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

| Pollutant | Impact[1] ($\mu g/m^3$) | Background[2] ($\mu g/m^3$) | Total Impact ($\mu g/m^3$) | Limiting Standard ($\mu g/m^3$) | Percent of Standard |
|---|---|---|---|---|---|
| NO2 | 4.26 | 240 | 244.26 | 470 | 52 |
| CO | 6.23 | 11,428 | 11,434 | 23,000 | 50 |
| SO2 | 0.33 | 251.5 | 251.83 | 655 | 39 |

1 Impacts include emissions from both turbines with duct burners
2 See AIR QUALITY Table 4

Source (ESPR 2000a)

## *OPERATIONAL MODELING ANALYSIS*

The ESPII provided staff with a modeling analysis, using the ISCST3 and CTSCREEN models to quantify the potential impacts of the project for both turbines, during normal steady state operation and during start-up conditions. This modeling analysis consisted of a screening level and a refined level analysis. The screening level analysis tested basic operating conditions, which combined various load levels and duct burner operations with several ambient air temperatures. The refined modeling was developed from these screening level runs. The refined modeling impacts are shown in AIR QUALITY Table 16.

In modeling the project operational emission impacts, the ESPII has chosen to include emissions from the base load operation of the existing boiler units 3 and 4, even though these emissions would normally be considered part of the background concentrations. This conservative approach over estimates the project's potential ambient air quality impacts. The ESPII has modeled the startup emissions and steady state operational emissions of the CTG systems alone as well. These emission impacts are compared in the El Segundo AFC in Table 5.2-36 (ESPR 2000a) and clearly demonstrate the conservative nature of the ESPII's assumptions. The project's PM10 impacts could contribute to existing violations of the state 24-hour and annual average PM10 standards. Because of the conservatism of the air dispersion model itself, staff believes that the actual impacts

from the project would be somewhat less than the projected modeled impacts shown in AIR QUALITY Table 16.

**AIR QUALITY Table 16**
**Facility Modeling Maximum Impacts**

| Pollutant | Averaging Time | Impact ($\mu g/m^3$)[2] | Back-Ground[1] ($\mu g/m^3$) | Total Impact ($\mu g/m^3$) | Limiting Standard ($\mu g/m^3$) | Percent of Standard |
|---|---|---|---|---|---|---|
| NO2 | 1-hour | 93.24 | 240 | 333.24 | 470 | 71 |
| | Annual | 1.77 | 45.3 | 47.07 | 100 | 47 |
| CO | 1-hour | 278.5 | 11,428 | 11,706.5 | 23,000 | 51 |
| | 8-hour | 173.3 | 7,378 | 7,551.3 | 10,000 | 76 |
| SO2 | 1-hour | 4.75 | 251.5 | 256.25 | 655 | 39 |
| | 24-hour | 1.85 | 36.5 | 38.35 | 130 | 30 |
| | Annual | 0.64 | 10.7 | 11.34 | 80 | 14 |
| PM10 | **24-hour** | 8.64 | 69 | 77.64 | 50 | **155** |
| | **Annual[3]** | 1.36 | 33.8 | 35.16 | 30 | **117** |
| | **Annual[4]** | 1.36 | 35.4 | 36.76 | 50 | 73 |

1 See AIR QUALITY Table 4

2 Emissions include CTG, duct burners, boiler units 3 and 4 and the fire water pump

3 Annual Geometric Mean, State Standard

4 Annual Arithmetic Mean, Federal Standard

Source (ESPR 2000a)

## *SECONDARY POLLUTANT IMPACTS*

The project's gaseous emissions of NOx, SO2, VOC and ammonia can contribute to the formation of secondary pollutants, ozone and PM10. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the ESPR do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

Secondary PM10 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 nitrate or sulfate formation.

Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO2 and NOx. The data from these studies can be used to approximate the conversion of SO2 and NOx 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 SO2 and NO2 that is converted to particulate. This approach is an over simplification of a complex process; nevertheless, given the stringency of the PM10 standards, and the need to address interpollutant conversion rates in setting offset ratios, for interpollutant trading, staff believes this issue needs to be addressed. However, as discussed in the setting section, it is staff's opinion that the ammonia emissions from the ESPR do not, alone, have the potential to cause or contribute to an exceedance of the short-term or long-term, state or federal ambient air quality standards. NOx and SO2 emissions if left unmitigated, do have the potential to contribute to secondary PM10 formation and thus higher PM10 levels in the area.

## VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NOx) and particulate (PM10) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 areas to the ESPR site are the Cucamonga and San Gabriel Wilderness area. ESPR used the EPA approved model ISCST3 to assess the project's visibility impacts. The results from the modeling analysis indicated that the project's visibility impacts would be below the significance criteria for contrast and perception. Therefore the project's visibility impacts on these Class 1 areas are considered insignificant.

## CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impacts 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 ESPII develop the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those probable future projects in our cumulative impacts 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 ESPII requested, and received from the District a list of projects in the vicinity of the ESPR site to investigate as potential sources for the cumulative impact analysis. The final list included the Redondo Beach Power Plant, the Scattergood Power Plant, the nearby Chevron refinery and the Los Angeles International Airport. Upon

further investigation by both the ESPII and Energy Commission staff, it was revealed that these potential sources did not represent actual emission increases. In fact the Redondo Beach, Scattergood and LAX sources are reducing emissions through added control technologies and the Chevron refinery is reducing emissions from a cracking unit. Thus, it is staff's opinion that there are no new foreseeable emissions sources within six miles of the ESPR site. Therefore the maximum project impacts as presented in ARI QUALITY Table 16 also represent the cumulative impacts for the ESPR project.

## ENVIRONMENTAL JUSTICE IMPACTS

In this section staff will 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, staff must first determine where, if anywhere, low income or minority population exist and at what demographic concentrations. Concentrations of low income or minority populations at 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 the direct air quality impact (excluding ozone and secondary PM10 impacts) on that EJP must be compared with the impacts on non-EJPs (within six miles). If the impact on the EJP is significantly higher than that on the non-EJP, then staff must conclude that there is a potential for an Environmental Justice Impact if the emissions are left unmitigated.

Based on the demographics information provided in the **Staff Assessment Socioeconomic Section**, staff concludes that the nearest population that would qualify as a EJP is approximately 2.3 miles east of the project site, on the opposite side of the Chevron Refinery. As shown in AIR QUALITY Table 16, the ESPR has the potential to cause an exceedance of the 24-hour and annual PM10 standards (if left unmitigated). Staff considers only directly emitted PM10 emissions from the ESPR for the purpose of an Environmental Justice evaluation. According to the modeling provided by the ESPII, the maximum potential PM10 impacts on the EJP is approximately 0.0319 ug/m$^3$. Comparatively, the maximum potential PM10 impacts on the Manhattan Beach area (non-EJP) is 1.36 ug/m$^3$, or 42 times that of the identified EJP. Staff concludes that there is no potential for an air quality based significant environmental justice impact from the criteria air pollutant emissions of the ESPR project on the identified EJP.

# MITIGATION

## APPLICANT'S PROPOSED MITIGATION

### *CONSTRUCTION MITIGATION*

ESPII proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from ESPR 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.
- 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, to the extent feasible

To control fugitive dust emissions

- Use water application or chemical dust suppressant on unpaved travel surfaces and parking areas.
- Use vacuum or water flushing on paved travel surfaces and parking areas.
- Require all trucks hauling loose material to either cover or maintain a minimum of two feet of freeboard.
- Limit traffic speed on unpaved roads to 25 mph.
- Install erosion control measures.
- Re-plant disturbed areas as soon as possible.
- Use gravel pads and wheel washers as needed.
- Use wind breaks and chemical dust suppressant or water application to control wind erosion from disturbed areas.

### *OPERATIONS MITIGATION*

The ESPR's air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, the ESPII proposes to use dry-low NOx combustors in the CTGs and a Selective Catalytic Reduction system with an ammonia injection grid.

To reduce CO emissions, the ESPII proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. VOC and PM10 emissions will be limited by the use of a clean burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO2 emissions.

## COMBUSTION TURBINE

### *Dry Low-NOx Combustors*

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx 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 NOx, CTG manufacturers are presently choosing to limit NOx formation through the use of dry low-NOx technologies. The GE version of the dry low-NOx combustor is a two-stage ignition system. Initially the fuel/air mixture is ignited in two independent combustors and the combustor enters a premix stage (0% to 60% load). The low emissions are achieved from approximately 60% load on with the ignition of the center burner.

In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 60 percent load, NOx concentrations entering the HRSG are 9 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm up to approximately 60 percent load, dropping to 9 ppm from there on.

## 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 ESPII is proposing two catalyst systems, a selective catalytic reduction system to reduce NOx, and an oxidizing system to reduce CO.

### *Selective Catalytic Reduction (SCR)*

Selective catalytic reduction refers to a process that chemically reduces NOx 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 NOx 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$^{o}$F.

Catalysts generally operate between 600 to 750$^{o}$F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600$^{o}$F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800$^{o}$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$^{o}$F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of $NO_x$ 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 ESPII proposes to use a combination of the dry low-$NO_x$ combustors and SCR system to produce a $NO_x$ concentration exiting the HRSG stack of 2.5 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 (CO2). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to 6 ppm, corrected to 15 percent excess oxygen and averaged over 1-hour.

## *EMISSION OFFSETS*

The ESPII will be replacing the existing boiler systems (units 1 and 2) with a 2 on 1 combustion turbine package (units 5, 6 and 7). This will result in a reduction of NOx and CO emissions, but an increase in VOC, SOx and PM10 emissions. To mitigate these increased emission impacts, the ESPII has provided emission reduction credits (ERCs) from the District ERC bank and the Priority Reserve (PM10 only). The ESPR has sufficient RECLAIM trading credits (RTCs) to mitigate the facilities NOx emissions. The ERCs purchased are shown in AIR QUALITY Table 17 through 19 shows the ERC certificate number, company, city of origin and the quantity of pollutant purchased for SOx, VOC and PM10. The quantity purchased is in terms of pounds per day via District banking rules. AIR QUALITY Table 20 shows a summary of both the emission reductions from the shutdown of boiler units 1 and 2 as well as the purchased ERCs. Furthermore, AIR QUALITY Table 20 compares these emission reductions to the offset liability as identified by the District in its Preliminary Determination of Compliance (SCAQMD 2000c). It is the ESPII's intention to purchase at least a portion of the remaining PM10 credits they need from the South Coast Priority Reserve.

**AIR QUALITY Table 17**
**Sulfur Dioxide Emission Reduction Credits Procured**
**for the**
**El Segundo Power Redevelopment Project Emission Offsets**

| Certificate Number | Company | City | Amount (lbs/day) |
|---|---|---|---|
| | ARCO | | 245 |
| AQ000951<br>AQ003264 | Multi Fuels Marketing Cc. | Newhall,<br>Long Beach | 2 |
| **Total Emission Reduction Credits** | | | **247** |

**AIR QUALITY Table 18**
**Volatile Organic Compounds Emission Reduction Credits Procured**
**for the**
**El Segundo Power Redevelopment Project Emission Offsets**

| Certificate Number | Company | City | Amount (lbs/day) |
|---|---|---|---|
| | Honeywell | | 33 |
| | National Offsets | | 47 |
| Zone 2 | National Offsets | | 50 |
| | National Offsets | | 70 |
| | Honeywell | | 114 |
| **Total Emission Reduction Credits** | | | **314** |

**AIR QUALITY Table 19**
**PM10 Emission Reduction Credits Procured**
**for the**
**El Segundo Power Redevelopment Project Emission Offsets**

| Certificate Number | Company | City | Amount (lbs/day) |
|---|---|---|---|
| | Aerochem | | 6 |
| AQ000210 | Kenny Snadblasting | South El Monte | 7 |
| AQ002660 | Multi Fuels Marketing Cc | Newhall | 2 |
| AQ000742 | US Tile Zone 2 | Corona | 3 |
| AQ001022<br>AQ000013 | Multi Fuels Marketing Cc | Santa Anna<br>Paramount | 5 |
| **Total Emission Reduction Credits** | | | **23** |

**AIR QUALITY Table 20**
**Summary of Emission Reduction Credits Procured**
**for the**
**El Segundo Power Redevelopment Project Emission Offsets**

| | CO | SOx | VOC | PM10 |
|---|---|---|---|---|
| | lbs/day | lbs/day | lbs/day | lbs/day |
| Shutdown of Units 1&2 | 1600 | 0 | 105 | 0 |
| ERCs Purchased | | 247 | 264 | 20 |
| **Total** | **1600** | **247** | **369** | **20** |
| Offsets Required | 0 | 43 | 112 | 373 |
| Remaining excess or liability | 0 | 204 | 257 | **-353** |

The District has determined that the ESPII must hold at least 297,651 lbs of NOx RTCs for the first year of operation. Each year of operation the District will re-evaluate the necessary amount of RTCs for the El Segundo facility as a whole. The first year of operation includes emissions from initial commissioning as well as normal startups and expected operations. The ESPII has available to it NOx RTC allocations from the El Segundo Facility in the amount of 268,693 lbs and will be required to transfer an additional 28,958 lbs of NOx RTCs from the Long Beach Generation Stations, for a total of 297,651 lbs.

## 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 ESPII has proposed, in its opinion, all practical and technically feasible mitigation measures to limit NOx emissions from the combustion turbines to 2.5 ppm over a 1-hour average. In addition, ESPII proposes to use an oxidizing catalyst to limit CO emissions to 6 ppm over a 1-hour period, which will also limit VOC emissions to 1.4 ppm over a 1-hour period.

#### OFFSETS

The emission reduction credits (ERCs) and RECLAIM trading credits (RTCs) identified in AIR QUALITY Tables 17 through 20 are intended to mitigate the ESPR air quality impacts. The amount of ERCs determined necessary for the ESPR (the ERC liability) is based on the daily average of the worst case month. In the case of ESPR this is most likely to be in the August time frame. The directive from the District is to calculate the total expected monthly emissions from the ESPR for

August and divide that total by 30 (days per month) to determine the daily average. These calculations will be shown in more detail in the "Compliance with LORS" section of this analysis. For purposes of a CEQA analysis, staff considers all emissions and mitigation measures. In AIR QUALITY Table 21 and 22 staff presents the balance of emissions and mitigation on a annual and daily basis, respectively. At this point in time, however, it is still unclear as to the final mitigation package that will be used for the ESPR. Therefore, the following two tables must be considered incomplete.

**AIR QUALITY Table 21**
**Comparison of Expected Annual Emissions to Offsets Provided**
**(tons/year)**

| | Liability[1] | Historic Boiler Emissions[2] | RTC Or ERC Procured[3] | Remaining Liability | Convert SOx to PM10[4] | Final Liability |
|---|---|---|---|---|---|---|
| NOx | 136.08 | -- | 149 | -13 | -- | 0 |
| CO | 93.18 | 181 | 0 | -88 | -- | 0 |
| VOC | 31.65 | 13 | 68 | -50 | -- | 0 |
| SOx | 12.38 | 1 | 45 | -34 | -- | 0 |
| PM10 | 104.73 | 18 | 4 | 83 | 0 | 83 |

1 These emissions include only the CTGs and the fire water pump.
2 Based on emission reductions as reported by the District (SCAQMD 2000c).
3 Based on summary of current status of RTCs and ERCs (SCAQMD 2000c).
4 The interpollutant trading ratio has not been determined at this time.

AIR QUALITY Tables 21 and 22 both show a final liability of PM10. This indicates that from a CEQA point of view the project has unmitigated emissions and thus unmitigated impacts. However, there are available emission reduction credits from the Priority Reserve managed by the District at a cost of $25,000 per lbs/day as well as the possibility of other mitigation methods for the PM10 emissions. The District has instructed the ESPII that it will need to provide an additional 350 lbs/day of PM10 ERCs for mitigation purposes (SCAQMD 2000c). However the District is basing this assessment on District Rule 1304 which allows for only the mitigation of that portion of emissions that would represent the proportional increase in capacity at the facility. In this case that portion of ESPR PM10 emissions that will be mitigated is approximately 45%. Staff's analysis is intended to evaluated the project emissions as compared to the proposed mitigation and as such can not excuse any emission increase that may have the potential to cause a significant impact.

AIR QUALITY Tables 21 and 22 show that the ESPR will emit 82 tons/year and 402 lbs/day of unmitigated PM10 emissions. These tables also show that the ESPR will have a excess of SOx ERCs, 34 tons/year and 189 lbs/day respectively. The District has determined a range of possible interpollutant trading ratios for the ESPR to use, from 4.5:1 to 8.8:1 (SCAQMD 2000c). Based on this range and the requirement by the District for the ESPII to submit 350 lbs/day of PM10 ERCs, staff estimates that the ESPR will emit between 11 to 14 tons/year and 10 to 31 lbs/day

of unmitigated PM10 emissions. Assuming the highest emissions, staff estimated, based on the modeling provided, that this emission represents an impact of 0.18 ug/m$^3$ on an annual basis and 0.41 ug/m$^3$ on a 24-hour basis. However, it should be noted that this impact is expected to occur within the Chevron Refinery located near the ESPR property. On the closest community, this emission represents an impact of 0.065 ug/m$^3$ on a 24-hour basis. It is staff's opinion, that this unmitigated PM10 emission may represent a significant impact on the local community. However, at this point in time ESPII has not finalized their PM10 mitigation plan. Therefore staff will reserve judgement on the proposed mitigation and project PM10 emission impacts until the PM10 mitigation plan is finalized.

**AIR QUALITY Table 22**
**Comparison of Expected Daily Emissions to Offsets Provided**
**(pounds/day)**

| | Daily Liability[1] | Historic Boiler Daily Emissions[2] | RTC Or ERC Procured[3] | Remaining Liability | Convert SOx to PM10[4] | Final Liability |
|---|---|---|---|---|---|---|
| NOx | 1085 | -- | 815 | 269 | -- | 269 |
| CO | 1570 | 2206 | -- | -636 | -- | 0 |
| VOC | 238 | 161 | 373 | -296 | -- | 0 |
| SOx | 75 | 18 | 247 | -189 | -- | 0 |
| PM10 | 648 | 223 | 20 | 405 | 0 | 405 |

1 See AIR QUALITY Table 11
2 Based on emission factors consistent with emissions reported in RECLAIM from April 1999 to March 2001 (SCAQMD 2000c).
3 Based on summary of current status of RTCs and ERCs (SCAQMD 2000c).
4 The interpollutant trading ratio has not been determined at this time.

Air Quality Table 22 shows a final liability of 269 lbs/day of NOx. However, the operating scenario under which this daily excess may occur is restricted to a short-term duration in which the turbines employ the power augmentation and duct burners. That is expected to be no more than 2099 hours per year (less than a quarter of the year) and no more than 15 hours in a single day. The RECLAIM program essentially allows an emission source to operate as they see fit during the year so long as they have sufficient RTCs (and that they do not use all their RTCs in one quarter). Since the ESPR will be monitoring NOx emissions in stack, it is unlikely, in staff's opinion, that the ESPII will exceed their RTC allocation and therefore unlikely that the ESPR will emit unmitigated NOx emissions.

## STAFF PROPOSED MITIGATION

### *CONSTRUCTION MITIGATION*

The modeling assessment discussed earlier shows that the 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. Staff proposes Conditions of Certification AQ-C1 through AQ-C3 to be considered with these mitigation measures.

### *OPERATIONS MITIGATION*

Currently, the CARB and EPA have not had the opportunity to comment on the validity of the ERCs or RTCs provided for the ESPR. Additionally there is still some questions as to the remaining PM10 mitigation that will need to be provided. Therefore, staff will reserve final judgement of the mitigation to be provided for the ESPR.

## COMPLIANCE WITH LORS

## FEDERAL

The District has not yet issued a Final Prevention of Significant Deterioration (PSD) permit as part of their Determination of Compliance for the ESPR. The Final Determination of Compliance is expected to serve as the PSD permit for this project.

## STATE

ESPR will demonstrate that the ESPR will comply with Section 41700 of the California State Health and Safety Code when the District issues the 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 Mountainview project, please refer to the Determination of Compliance (SCAQMD 2000c).

### *REGULATION II – PERMITS*

#### RULE 218 – CONTINUOS EMISSION MONITORING

The ESPR will be required to install a CO CEMS to verify emissions of CO meet the hourly and daily emission limits. The CO CEMS will need to comply with the requirements of Rule 218, and the facility will need to submit a CEMS application for District review and approval prior to installing the CEMS. (Continuous monitoring for NOx emissions is required under the RECLAIM and acid rain regulations, discussed further below.)

### *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.

### RULE 401 – VISIBLE EMISSIONS

Visible emissions are not expected under normal operating conditions of the turbines.

### RULE 402 – NUISANCE

Nuisance problems are not expected under normal operating conditions of the turbines.

### RULE 403 – FUGITIVE DUST

The ESPII will submit a fugitive dust plan to both the District and the Commission.

### RULE 407 – LIQUID AND GASEOUS AIR CONTAMINANTS

This rule limits the CO emissions to 2000 ppm max, and the sulfur content of the exhaust to 500 ppm for equipment not subject to the emission concentration limits of 431.1. Since the turbines are subject to the limits of Rule 431.1, only the 2000 ppm limit of this rule applies. It is expected that the equipment will be able to meet the CO limit with the use of an oxidation catalyst. Compliance will be verified through CEMS data.

### RULE 409 – COMBUSTION CONTAMINANTS

Limits PM emissions to 0.1 gr/scf. The equipment is expected to meet this limit based on the calculations shown below:

Estimated exhaust gas 60 mmscf/hr

$$\text{Grain loading} = \frac{11 \text{ lbs/hr } (7000 \text{ gr/lb})}{60 \text{ E+06 scf/hr}}$$

$$= 0.00128 \text{ gr/scf}$$

Compliance will be verified through the initial performance test as well as periodic testing as required by Title V.

### RULE 431.1 – SULFUR CONTENT OF GASEOUS FUELS

The rule requires that gas fired equipment meet a sulfur content limit of 40 ppm on a 4 hour averaging time. Commercial grade natural gas to be burned in the turbines is expected to meet this limit.

### 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. The project owner shall not use fuel oil containing sulfur compounds in excess of 0.05 percent by weight.

### RULE 475 – ELECTRIC POWER GENERATING EQUIPMENT

This rule applies to power generating equipment greater than 10 MW installed after May 7, 1976. Requirements are that the equipment meet a limit for combustion contaminants (combustion contaminants are defined as particulate matter in AQMD Regulation I) of 11 lbs/hr or 0.01 gr/scf. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM10 emissions from the project turbines are estimated at 11 lbs/hr. However, on a concentration basis estimated grain loading is 0.00128 gr/scf (see calculations under Rule 409 discussion). Therefore, compliance is expected. Compliance will be verified through the initial performance test as well as periodic testing required by Title V.

## *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, SO2 and NO2 emissions from the facility as well as monitoring and test method requirements. The ESPR 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 ESPR project, which are regulated by Regulation XX (RECLAIM). The ESPII 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. It is likely that the ESPR will trigger PSD for NOx only. The PSD permit will be issued by the District as part of the Final Determination of Compliance.

## *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 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. The ESPR 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. The ESPII 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 require 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. 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 SOx emissions as well as monitoring SOX, NOx and CO2 emissions from the facility. It is expected that ESPR 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

The ESPR's emissions of NOx, SO2 and CO will not cause a violation of any NO2, SO2 or CO ambient air quality standards, and therefore, its impacts are not significant. The project's air quality impacts from directly emitted PM10 and of the ozone precursor emissions of NOx and VOC and PM10 precursors of NOx and SO2 could be significant if left unmitigated. ESPII will reduce emissions to the extent feasible by providing emission offsets for their NOx, VOC and SO2 emissions, and thus reduce the potential for directly emitted pollutants, as well as ozone and secondary PM10 formation to a level of insignificance. However, ESPII is currently discussing other possible mitigation options with the District for the ESPR PM10 emission impacts. The District has recommended in its PDOC that ESPII purchase PM10 ERCs from the District's Priority Reserve (at a cost of $25,000 per lbs/day). At this point in time ESPII has not committed to either purchasing these ERCs or alternative mitigation measures.

The District has submitted a Preliminary Determination of Compliance (SCAQMD 2000c) that concludes that the ESPR will comply with all applicable District rules and regulations and therefore has proposed a set of conditions presented here as Conditions of Certification AQ-1 through AQ-30.

CEC staff recommends the inclusion of three additional Conditions of Certification (AQ-C1, AQ-C2 and AQ-C3) that address the construction related impacts

Staff can not recommend the certification of the ESPR without the final determination of the mitigation package for the ESPR PM10 emission impacts and the Final Determination of Compliance from the District. However, staff recommends the following proposed Conditions of Certification for consideration for the ESPR.

## CONDITIONS OF CERTIFICATION

**AQ-C1** The project owner shall require as a condition of its construction contracts that all contractors/subcontractors ensure that all heavy earthmoving equipment, that includes, but is not limited to bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. The project owner shall further require as a condition of its construction contracts that this equipment shall either (1) employ high pressure fuel injection; (2) employ injection timing retardation to control the emissions of oxides of nitrogen; or (3) be certified to EPA off-road equipment emission standards. The project owner shall further require as a condition of its construction contracts that all diesel fired construction equipment use CARB Low-Sulfur fuel (<15ppm sulfur by weight). The project owner shall further require as a condition of its construction contracts that all heavy construction equipment, to the extent practical, shall remain running at idle for no more than 5 minutes.

**Verification:** The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation which demonstrates that the contractor's/subcontractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain construction contracts on the site for six months following the start of commercial operation.

**AQ-C2** The project owner shall employ the following measures to mitigate, to the extent practical, construction related emission impacts from off-road, diesel fired construction equipment. These measures include the use of oxidizing soot filters, oxidizing catalysts, diesel fuel certified to CARB low sulfur fuel standards (sulfur content less than 15 ppm) and diesel engines that are either equipped with high pressure fuel injection, employ fuel injection timing

retardation or are certified to EPA and CARB 1996 or better off-road equipment emission standards. Additionally, the project owner shall restrict idle time, to the extent practical, to no more than 5 minutes.

The use of each mitigation measure is to be determined by a Qualified Environmental Professional (QEP) or a qualified independent California Licensed Mechanical Engineer (ME). The QEP or ME is to be approved by the CPM prior to the submission of any reports. The QEP or ME will determine the mitigation measures to be used within the following framework.

**Construction Mitigation Framework**

1. No measure or combination of measures shall be allowed to significantly delay the project construction or construction of related linear facilities nor shall they be allowed to cause significant damage to the construction equipment or cause a significant risk to on site workers or the public.
2. Engines certified to EPA and CARB 1996 or better off-road equipment emission standards **and** CARB certified low sulfur diesel fuel maybe used in lieu of oxidizing soot filters and oxidizing catalysts.

The QEP or ME, in consultation with the California Air Resources Board (CARB), will submit the following reports to the CPM for approval:

- Construction Mitigation Plan
- Reports of Change and Mitigation Implementation
- Emergency Termination of Mitigation Reports, as necessary

**Construction Mitigation Plan:**

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

1. A list of all diesel fuel burning, off-road, stationary or portable construction-related equipment to be used either on the project construction site or the construction sites of the related linear facilities.
2. All equipment listed under (1), shall be identified as either using engines certified to EPA and CARB 1996 or better off-road equipment emission standards, using diesel engines that are equipped with high pressure fuel injection, or using diesel engines that employ fuel injection timing retardation.
3. The determination of the suitability of all equipment listed under (1) to work appropriately with an oxidizing catalyst shall be identified except as provided for in item 3 of the **Construction Mitigation Framework** above. If a piece of equipment is determined to be unsuitable for an oxidizing catalyst, the QEP or ME will provide an explanation as to the cause of this determination.

4. The determination of the suitability of all equipment listed under (1) to work appropriately with an oxidizing soot filter shall be identified except as provided for in item 3 of the **Construction Mitigation Framework** above. If a piece of equipment is determined to be unsuitable for an oxidizing-soot filter, the QEP or ME will provide an explanation as to the cause of this determination.

5. Maximum idle times shall be identified for all equipment listed under (1).

6. The sulfur content of all diesel fuel to be burned in any equipment listed under (1) shall be identified.

**Report of Change and Mitigation Implementation**

The QEP or ME shall submit a Report of Change and Mitigation Implementation for approval to the CPM following the initiation of construction activities which contains at a minimum the cause of any deviation from the Construction Mitigation Plan, and verification of the Construction Mitigation Plan measures that were implemented. Verification includes, but is not limited to, the following:

1 EPA or CARB engine certifications for item 2 of the **Construction Mitigation Plan**.

2 A copy of the contract agreement requiring subcontractors to comply with the elements under item 2 of the **Construction Mitigation Plan**.

3 Confirmation of the installation of either oxidizing catalysts or oxidizing soot filters as identified in items 3 and 4 of the **Construction Mitigation Plan** or the cause preventing the identified installations.

4 A copy of the contract agreement requiring subcontractors to comply with the elements under item 5 of the **Construction Mitigation Plan**.

5 A copy of receipts of purchase of diesel fuel indicating the sulfur content as identified in item 6 of the **Construction Mitigation Plan**.

**Emergency Termination of Mitigation Report**

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

1. The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.
2. The measure is causing or reasonably expected to cause significant damage to the construction equipment engine.
3. The measure is causing or reasonably expected to cause a significant risk to nearby workers or the public.
4. Any other seriously detrimental cause which has approval by the CPM prior to the change being implemented.

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

**AQ-C3** Prior to breaking ground at the project site, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the El Segundo Power Redevelopment Project and related facilities.

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

- the identification of the employee parking area(s) and surface of the parking area(s);
- the frequency of watering of unpaved roads and disturbed areas;
- the application of chemical dust suppressants;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site;

- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads; and,
- the use of on-site monitoring devices.

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

Conditions of Certification AQ-1 through AQ-27, below, pertain to the following equipment:

1,896 MMBTU/HR Gas Turbine (ID No. D46) (A/N 378766) No. 5 GE Model 7241FA with Dry Low NOx combustors and steam injection for power augmentation connected directly to a 179 MW (nominal) Electric Generator (ID No. B47) and a Heat Recovery Steam Generator (ID No. B49) with 600 MMBTU/HR Duct Burners (ID No. D48) connected in common with Gas Turbine No. 7 to a 288 MW (nominal) steam turbine (ID No. B50). Selective Catalytic Reduction (ID No. C52) (A/N 378771) with 4379 cubic feet of total volume 3 feet height, 44 feet long, 41 feet wide with an ammonia injection grid (ID No. B53) and a CO oxidation catalyst (ID No. C51) with 1000 cubic feet of total volume connected to an exhaust stack (ID No. S54) (A/N 378771) No 5.

1,896 MMBTU/HR Gas Turbine (ID No. D55) (A/N 378767) No. 7 GE Model 7241FA with Dry Low NOx combustors and steam injection for power augmentation connected directly to a 179 MW (nominal) Electric Generator (ID No. B56) and a Heat Recovery Steam Generator (ID No. B58) with 600 MMBTU/HR Duct Burners (ID No. D57) connected in common with Gas Turbine No. 5 to a 288 MW (nominal) steam turbine (ID No. B59). Selective Catalytic Reduction (ID No. C61) (A/N 378773) with 4379 cubic feet of total volume 3 feet height, 44 feet long, 41 feet wide with an ammonia injection grid (ID No. B62) and a CO oxidation catalyst (ID No. C60) with 1000 cubic feet of total volume connected to an exhaust stack (ID No. S63) (A/N 378773) No 7.

**AQ-1** The operator shall not operate at the El Segundo Power Generation facility combined cycle turbines No. 5 and No. 7 unless prior to the initial operation, the operator demonstrates to the Executive Officer that the facility holds RTCs in the amount of 297,651 lbs for the initial compliance year.

**Verification:** The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District in each Quarterly Operational Report (see **AQ-9**).

**AQ-2** The operator shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH3) to the SCR in combined cycle turbines 5 and 7. The operator 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 twelve months.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-3** The operator shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor in combined cycle turbines 5 and 7. The operator 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 twelve months.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-4** The operator shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column in combine cycle turbines 5 and 7. The operator 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 twelve months.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-5** The operator shall conduct source test(s) for the pollutant(s) identified below.

| Pollutants to be Tested | Test Method | Averaging Time | Test Location |
|---|---|---|---|
| NH3 Emissions | District Method 207.1 and 5.3 or EPA Method 17 | 1 hour | Outlet of SCR serving this equipment |

The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NOx concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60 minute averaging time period.

**Verification:** The project owner shall submit the proposed protocol for the source tests 60 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 7 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 45 days following the source test date to both the District and CPM.

**AQ-6** The operator shall conduct source test(s) for the pollutant(s) identified below on combine cycle turbine units 5 and 7.

| Pollutants To be Tested | Required Test Method | Averaging Time | Test Location |
|---|---|---|---|
| NOx Emissions | District Method 100.1 | 1 hour | Outlet of SCR serving this equipment |
| CO Emissions | District Method 100.1 | 1 hour | Outlet of SCR serving this equipment |
| SOx Emissions | District Method 6.1 | 1 hour | Outlet of SCR serving this equipment |
| ROG Emissions | Approved District Method | 1 hour | Outlet of SCR serving this equipment |
| PM Emissions | District Method 5.2 | 1 hour | Outlet of SCR serving this equipment |
| NH3 Emissions | District Method 207.1 and 5.3 or EPA Method 17 | 1 hour | Outlet of SCR serving this equipment |

The test shall be conducted after District and CPM 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 tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine and steam turbine generating output in MW.

The test shall be conducted in accordance with a District and CPM approved source test protocol. The protocol shall be approved by the District and CEC before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of District Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at loads of 100, 75, and 50 percent of maximum load.

**Verification:** The project owner shall submit the proposed protocol for the initial source tests 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall submit source test results no later than

60 days following the source test date to both the District and CPM. The project owner shall notify the District and CPM no later than 10 days prior to the proposed initial source test date and time.

**AQ-7** The operator shall conduct source test(s) for the pollutant(s) identified below on combine cycle turbine units 5 and 7.

| Pollutants to be Tested | Required Test Method | Averaging Time | Test Location |
|---|---|---|---|
| SOx Emissions | District Method 6.1 | 1 hour | Outlet of SCR serving this equipment |
| ROG Emissions | Approved District Method | 1 hour | Outlet of SCR serving this equipment |
| PM Emissions | District Method 5.2 | 1 hour | Outlet of SCR serving this equipment |

**Verification:** The project owner shall submit the proposed protocol for the source tests 60 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 7 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 45 days following the source test date to both the District and CPM.

**AQ-8** The operator shall provide to the District and CPM any source test report in accordance with the following specifications:

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

Emission data shall be expressed in terms of concentration (ppmv), corrected to 15 percent oxygen (dry basis), mass rate (lbs/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.

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

All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen, dry basis.

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

**Verification:** See verifications for **AQ-5, -6,** and **–7.**

**AQ-9** The project owner shall submit to the Commission, Quarterly Operational Reports that include the fuel use associated with each gas turbine train (both gas turbine and duct burner), in addition to the CO and NOx CEMS recorded data for each gas turbine exhaust stack on an hourly basis in order to verify the following emissions limits.

Except during startup, shutdown and initial commissioning, emissions from each gas turbine exhaust stack shall not exceed the following limits:

| | |
|---|---|
| NOx (measured as NO2): | 2.5 ppm at 15% oxygen on a dry basis averaged over one hour and 22.71 lbs/hour. |
| CO: | 6 ppm at 15% oxygen on a dry basis averaged over 1 hour and 33.18 lbs/hr. |
| SOx (measured as SO2): | 1.75 lbs/hr |
| VOC: | 6.41 lbs/hr |
| PM10: | 11.0 lbs/hr |
| Ammonia: | 5 ppm at 15% oxygen on a dry basis. |

**Verification:** The project owner shall submit the Quarterly Operational Reports as specified herein to the CPM no later than 30 days following the end of each calendar quarter.

**AQ-10** The operator shall vent the combined cycle turbine units 5 and 7, as well as their associated duct burners to the CO oxidation and SCR control whenever this equipment is in operation.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-11** The operator shall limit emissions from this equipment as follows:

| Contaminant | Emissions Limit |
|---|---|
| CO | 20,488 LBS IN ANY 1 MONTH |
| PM10 | 20,336 LBS IN ANY 1 MONTH |
| VOC | 7,624 LBS IN ANY 1 MONTH |
| SOx | 2,336 LBS IN ANY 1 MONTH |

The operator shall calculate the emission limit(s) by using monthly fuel use data and the following emission factors: PM10 6.37 lbs/MMscf , VOC 2.39 lbs/MMscf, and SOx 0.73 lbs/mmscf.

The operator shall calculate the emission limit(s) for compliance with the monthly CO limit through valid CEMS data. In the absence of valid CEMS data, the operator

shall calculate the monthly CO emissions using monthly fuel use data and the following emission factor: CO 501 lbs/MMscf during the turbine commissioning period during the full speed no load tests and the part load tests when the turbine is operating at or below 60% load, CO 14 lbs/MMscf during the turbine commissioning period during the full load tests when the turbine is operating above 60% load, and CO 6.42 lbs/MMscf after the unit is commissioned.

For the purposes of this condition, the limit(s) shall be based on the total combined emissions from combined cycle gas turbine No. 5 and No. 7.

**Verification:** The project owner shall submit the monthly fuel use data and emission calculations to the CPM in the Quarterly Operation Reports (**AQ-9**).

**AQ-12** The operator shall keep records, in a manner approved by the District, for natural gas fuel use during the commissioning period.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-13**. The operator may, at his discretion, chose not to use ammonia injection if the following requirement is met:

The inlet exhaust temperature to the SCR is 450 degrees F or less, not to exceed 3 hours during a cold startup, 2 hours during a warm startup, and 1 hour during a hot startup.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-14** The operator shall install and maintain a CEMS to measure 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 (lbs/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 operator 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 15 minute averaging time period.

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

States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-15** The operator shall install and maintain a CEMS to measure NOx concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 12 months after 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 operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the turbine startup date, the operator shall provide written notification to the District of the exact date of start-up.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-16** The 2.5 PPM NOx emission limit(s) shall not apply during turbine commissioning and startup periods. Startup time shall not exceed 3 hours per day. The commissioning period shall not exceed 33 operating days from the date of initial start-up. The operator shall provide the AQMD with written notification of the start-up date. No more than one turbine shall be in start-up mode at any one time. Written records of commissioning and start-ups shall be maintained and made available upon request from AQMD.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-17** The 6 PPM CO emission limit(s) shall not apply during turbine commissioning and startup periods. Startup time shall not exceed 3 hours per day. The commissioning period shall not exceed 33 operating days from the date of initial start-up. The operator shall provide the AQMD with written notification of the initial start-up date. No more than one turbine shall be in start-up mode at any one time. Written records of commissioning and start-ups shall be maintained and made available upon request from AQMD.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-18** The 109 LBS/MMCF NOx emission limit(s) shall only apply during the turbine commissioning period during the full speed no load tests and the part load

tests when the turbine is operating at or below 60% load to report RECLAIM emissions.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-19** The 33.9 LBS/MMCF NOx emission limit(s) shall only apply during the turbine commissioning period during the full load tests when the turbine is operating above 60% load to report RECLAIM emissions. This emission limit shall also apply during the interim reporting period to report RECLAIM emissions. The interim reporting period shall not exceed 12 months from the initial startup date.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-20** The 35.7 lbs/hour NOx emission limit(s) shall only apply during turbine startups. Only one turbine shall be in startup mode at any one time. Startups shall not exceed 3 hours per day.

**Verification:** The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9.**

**AQ-21** The 102 LBS/MMCF NOx emission limit(s) shall only apply to report RECLAIM emissions during the interim period for the duct burner. The interim reporting period shall not exceed 12 months from the initial start-up date.

**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

**AQ-22** For the purpose of the following condition numbers, the phrase “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 hour.

Condition no. **AQ-2**
Condition no. **AQ-3**
Condition no. **AQ-24**

**Verification:** See verifications for **AQ-2, -3,** and **–24.**

**AQ-23** For the purpose of the following condition number, the phrase "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 no. **AQ-4**

**Verification:** See verifications for **AQ-4.**

**AQ-24** The 2.5 PPMV NOx emission limit(s) are averaged over 60 minutes at 15 percent oxygen, dry.

**Verification:** The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9.**

**AQ-25** The 6 PPMV CO emission limit(s) are averaged over 60 minutes at 15 percent oxygen, dry.

**Verification:** The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9.**

**AQ-26** The 5 PPMV NH3 emissions limit(s) are averaged over 60 minutes at 3 percent O2, dry. The operator shall calculate and continuously record the NH3 slip concentration using the following:

NH3 (ppmv) = [a-(b*c/1000000)]*1000000/b, where
a = ammonia injection rate (lb/hr)/17 (lbs/lb-mole)
b = dry exhaust gas flow rate (lb/hr)/29 (lbs/lb-mole)
c = change in measured NOx across the SCR (ppmv, dry basis)

The operator shall install and maintain a NOx analyzer, or other method as approved by the District, to measure the SCR inlet NOx ppm accurate to within +/- 5 percent calibrated at least every 12 months.

**Verification:** The project owner shall submit CEMS records and all calculations demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9.**

**AQ-27** This equipment shall not be operated unless the operator 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 operator demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase.

**Verification:** The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District in each Quarterly Operational Report (see **AQ-9**).

Condition of Certification AQ-28, below, pertain to the following equipment:

Internal combustion engine, emergency fire pump, diesel Clarke, Model JDFP 06WA, turbocharged, aftercooled, 265 BHP A/N 378769 (ID. No. D45).

**AQ-28** The operator shall limit the operating time to no more than 199 hours in any one year.

To comply with this condition, the operator shall install and maintain a non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.:

The records shall include, date of operation, the elapsed time in hours, and the reason for operation. Records shall be kept and maintained on file for a minimum of 5 years and made available to AQMD upon request.

**Verification:** The project owner shall submit the recorded data specified in this condition on an annual basis as part of the fourth Quarter Operational Report (see **AQ-8**).

Conditions of Certification AQ-29 and AQ-30, below, pertain to the following equipment:

Underground Aqueous Ammonia Storage Tank, TK-001, carbon steel, double walled with three transfer pumps and a PVR set at 50 PSIG, 20000 gallons capacity. A/N 379904 (ID. No. D30)

**AQ-29** The operator shall install and maintain a pressure relief valve set at 50 psig.

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

**AQ-30** The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In compliance with all mitigation measures as stipulated by the “Statement of Findings, Statement of Overriding Considerations, and Mitigation Monitoring Plan” and final subsequent Environmental Impact Report dated January, 1994 (SCH No. 88032315) for the El Segundo Generating Station ammonia storage and selective catalytic reduction project.

**Verification:** The project owner shall submit the “Statement of Findings, Statement of Overriding Considerations and Mitigation Monitoring Plan” and the final subsequent Environmental Impact Report dated, 1994 (SCH No. 88032315) to the CPM in a timely manner.

## REFERENCES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# BIOLOGICAL RESOURCES

Testimony of Dr. Noel Davis, Dr. Mike Foster, Shari Koslowsky and Rick York

## INTRODUCTION

This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the El Segundo Generating Station (ESGS) Power Redevelopment Project, 00-AFC-14 (ESPR 2000a). 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 the potential environmental impacts associated with the construction and operation of the proposed project. Impacts to biological resources may be directly associated with structures or actions undertaken as part of the retooling effort or indirectly as they may affect the physical environment, which in turn, negatively affects habitat conditions for sensitive species. Impacts to biological resources that are similar in nature to existing or foreseeable future projects in the area are addressed in the Cumulative Impacts Section.

Where necessary, the document specifies mitigation planning and compensation measures to reduce potential impacts to non-significant levels. This document also determines compliance with applicable laws, ordinances, regulations and standards (LORS) and specifies conditions of certification.

This information is based, in part, on information provided in the Application for Certification (AFC) (ESPR 2000a), El Segundo Power LLC's supplemental AFC material submitted during January 2001 (ESPR 2000h), various data request responses and staff's site visit completed on March 14, 2001.

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

## FEDERAL

### *ENDANGERED SPECIES ACT OF 1973*

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is the U. S. Fish and Wildlife Service (USFWS).

### *MIGRATORY BIRD TREATY ACT*

Title 16, United States Code, sections 703 through 711, prohibits the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.

### *CLEAN WATER ACT*

Title 33 United States Code, section 404 et seq., prohibits the discharge of dredged or fill material into the waters of the United States without a permit. Nationwide permit (NWP) 7 is required to construct an outfall structure and the effluent is authorized under the National Pollution Discharge Elimination System (NPDES) program (Section 402). The administering agencies are the U. S. Army Corps of Engineers and the Regional Water Quality Control Board.

### *FISH AND WILDLIFE COORDINATION ACT*

Title 16 United States Code, section 661 et seq., requires federal agencies such as the U. S. Army Corps of Engineers to coordinate federal actions with the USFWS to conserve fish and wildlife resources. The administering agency is the USFWS.

### *MARINE MAMMAL PROTECTION ACT*

Title 16 United States Code, Chapter 31 1361-1375 provides protection for marine mammals.

## 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*

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

### *BIRDS OF PREY OR EGGS*

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*

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, and 5515 prohibits take of animals that are classified as Fully Protected in California.

### *SIGNIFICANT NATURAL AREAS*

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

### *NATIVE PLANT PROTECTION ACT OF 1977*

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

### *CALIFORNIA CODE OF REGULATIONS*

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

### *GOVERNOR EXECUTIVE ORDER D-22-01*

Governor Gray Davis' Executive Order proclaiming a State of Emergency regarding energy shortages in California. Dated: January 17, 2001.

### *CALIFORNIA COASTAL ACT OF 1976*

#### POLICY 30230

This policy states that marine resources shall be maintained, enhanced, and where feasible, restored and that special protection shall be given to areas and species of special biological or economic significance. This policy specifies also that uses of the marine environment be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms.

#### POLICY 30231

This policy states that biological productivity and the quality of coastal waters, streams, wetlands, estuaries and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater supplies and substantial interference with surface water flow, encouraging wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

## LOCAL

The El Segundo General Plan includes the following issues in the Conservation Element: beach preservation, maintenance of a safe water supply, protection of groundwater from contamination, improvement of the urban landscape, and protection of the El Segundo blue butterfly, a federally-listed Endangered species. The City's policy on the El Segundo blue butterfly is to "develop and encourage environmental protection policies that protect sensitive habitat areas, including coordination with city, county, state and federal agencies having jurisdiction over such areas." The administering agency is the City of El Segundo Planning and Development Department.

## SETTING

The proposed El Segundo Power Redevelopment (ESPR) Project would be located on the property of the existing El Segundo Generating Station at 301 Vista Del Mar. This site is approximately 2.5 miles southwest of the Los Angeles International Airport (LAX) and west of the San Diego Freeway (I-405), on the eastern shore of Santa Monica Bay. The site is bordered by Vista Del Mar and the Chevron refinery to the east, 45th Street in the City of Manhattan Beach on the south, Santa Monica Bay on the west and the Chevron Marine Terminal on the north. The 33-acre site is currently comprised of three parcels.

- Existing ESP II generating units are located on APN 4138-029-002, an approximately 24.7 acre parcel.
- Existing Southern California Edison (SCE) substation is located on APN 4138-029-800, an approximately 2.25 acre parcel.
- Existing SCE tank farm is located on APN 4138-029-801, an approximately 9.0 acre parcel. This site will be used for laydown, staging and parking during construction.

The existing topography at the south end of the site slopes downward, at a 1-1.5 gradient, from 90 feet above mean sea level (amsl) at the gatehouse to 39 feet amsl at the fuel tank area to 25 feet amsl at the retention basin. The proposed power block complex will be at 20 feet amsl, with drop inlet locations at 18 feet amsl.

## TERRESTRIAL BIOLOGICAL RESOURCES

The proposed project site and ancillary facilities are located in a highly industrialized area, with the exception of the adjacent marine environment of Santa Monica Bay. Historically, terrestrial habitat at and adjacent to the site may have included sand beach, southern dune scrub, coastal salt marsh and coastal sand dune habitat adjacent to the Bay. Today, only small, isolated patches of natural vegetation and associated wildlife remain as a result of heavy industrial development of the area, including a few small areas of ornamental plantings (i.e. palm trees) immediately to the east of the existing ESGS boundary and isolated patches of ruderal vegetation such as grasses, thistles and other weedy species. Consequently, few wildlife species are supported on the site or adjacent, vegetated habitats. Common urban birds are most common and include pigeons, mourning doves, starlings and house sparrows.

### *SENSITIVE TERRESTRIAL SPECIES*

Table 1 below provides a list of sensitive species that may be found in the terrestrial environment of the Project area (ESPR, 2000a, AFC, Table 5.6-1) ; however it is unlikely that any of these species would persist within the project site or adjacent areas given the highly disturbed and fragmented nature of the habitat. Exception to this are two sensitive habitat areas located at the Chevron Preserve approximately 0.3 miles NE of the Power Plant site, and the El Segundo Dunes Preserve located approximately 1.5 miles NNW of the site that provide habitat to the El Segundo blue butterfly (*Euphilotes battoides allyni*) a federally-listed endangered species. More distant from the plant are the Ballona Wetlands located approximately 4.5 miles

NNW and Malaga Cove, the latter of which is also occupied habitat for the El Segundo blue butterfly, located approximately 7 miles S of ESGS. These two sites are not affected by the potential impacts to terrestrial biological resources that are discussed in the following sections.

**Biological Resources Table 1: Sensitive Terrestrial Species Potentially Occurring in the Project Vicinity (ESPR 2000a)**

| Scientific Name | Common Name | Status* |
|---|---|---|
| **CLASS DICOTYLEDONAE** | **PLANTS** | |
| *Potentilla multijuga* | Ballona cinquefoil | FSC |
| *Dithyrea maritima* | beach spectaclepod | FSC/ST |
| *Lasthenia glabrata* ssp. *Coulteri* | Coulter's goldfields | FSC |
| *Hemizonia parryi* ssp. *australis* | southern tarplant | FSC |
| *Astragalus pycnostachyus* var. *lanosissimus* | Ventura marsh milk vetch | SE |
| | | |
| **CLASS AVES** | **BIRDS** | |
| *Passerculus sandwichensis beldingi* | Belding's savannah sparrow | SE |
| *Athene cunicularia* | burrowing owl | SSC |
| *Polioptila californica* | California coastal gnatcatcher | FE/SSC |
| | | |
| **CLASS INSECTA** | **INSECTS** | |
| *Euphiloites battoides allyni* | El Segundo blue butterfly | FE |

*** Status Legend**: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **ST** = State Threatened, **FSC** = Federal Species of Concern, **SSC** = State Species of Special Concern

The El Segundo blue butterfly is unique to a few locations in Los Angeles County. It occurs only in relatively undisturbed coastal sand dunes, including, historically, the El Segundo sand dunes. These dunes were undisturbed until the 1880s, when development of the City of Redondo Beach separated the main dunes from their southern extension. The growth of Venice eliminated the dunes north of the mouth of Ballona Creek and conversion of the central dunes began in 1911, when Chevron constructed their refinery. This separated the remaining dunes into two fragments. Both fragments were progressively damaged as a result of housing development and, by 1960, only 80 acres of dune habitat remained. In 1992, the City of Los Angeles created the 200-acre El Segundo Dunes Preserve at the western end of Los Angeles International Airport (Mattoni 1998, USFWS 1976).

Today, the El Segundo blue butterfly occurs only in dune habitat at the El Segundo Dunes Preserve (LAX site), the Chevron Refinery (Chevron Preserve or CHEV site) and Malaga Cove (MC site). In 1991, the El Segundo Dunes Preserve supported

the largest population of the El Segundo blue butterfly both in terms of area and density, with approximately 5000 butterflies on 3,358 plants on 24 acres. In 1986, the Chevron Preserve supported about 400 butterflies on 1,240 plants on 1.6 acres. And in 1990, the Malaga Cove dunes supported a population of approximately 60 butterflies on 50 plants (Mattoni 1998).

## MARINE BIOLOGICAL RESOURCES

### *MARINE COMMUNITIES*

The ESGS is located adjacent to Santa Monica Bay, an open embayment on the central part of the southern California coast. Santa Monica Bay is bordered offshore by Santa Monica Basin and on each end by rocky headlands (Point Dume at the northwest end and Palos Verdes Point at the southeast end).

The natural marine habitats in the vicinity of ESGS consist primarily of sand substrate. However, the sandy beach and nearshore sand bottom are broken by various manmade structures that provide some hard bottom habitat. These structures include the intake and discharge facilities of Units 1 and 2 and Units 3 and 4 of the ESGS, the Chevron Refinery outfall, the Scattergood Generating Station intake and outfall, and the Hyperion Sewage Treatment Plant outfalls. A rock groin to retard beach erosion has been constructed by Chevron on the beach in front of ESGS. In 2000, an artificial surfing reef (Pratte's Reef) was built in 15 feet of water about 1500 yards north of ESGS.

Characteristic sandy beach organisms at the southern end of Santa Monica Bay include bean clams (*Donax gouldii*), isopods (*Excirolana chiltoni*), sand crabs (*Emerita analoga*), beach hoppers (*Orchestoidea* spp.), and a number of species of polychaete worms (Straughan 1980). Intertidal surveys at ESGS in the early 1970's showed that *E. analoga* and *E. chiltoni* were by far the most abundant species on the beach near the power plant (Benson et al 1973). The worm *Nephthys californiensis* was third in abundance.

The intake and discharge for Units 1 and 2 are located approximately 2,590 and 1,989 feet respectively offshore at a depth of 32 feet Mean Lower Low Water (MLLW). The intake and discharge structures for Units 1 and 2 are located about 240 feet north of the intake and discharge facilities for Units 3 and 4.

MBC Applied Environmental Sciences has monitored the marine environment in the vicinity of ESGS for over 20 years (MBC 1999). Annelid worms, crustaceans and mollusks dominate the invertebrate community living in the sand (infauna). The community is diverse and species composition is somewhat variable from year to year, with no particular species dominant in all years. In the last three years the polychaete worm, *Apoprionospio pygmaea*, was the most abundant species collected (MBC 1997, 1998, 1999).

Common epifaunal (living on top of the sand) invertebrates in the vicinity of ESGS include sand dollars (*Dendraster excentricus*), tube worms (*Diopatra* spp. and

*Owenia* spp.) and a variety of crabs (*Portunus xantusii, Pyromaia tuberculata, Cancer antennarius, C. anthonyi,* and *C. gracilis*) (MBC 1997, 1998, 1999).

Fish populations in the vicinity of ESGS are typical of southern California nearshore soft bottom habitats. The most abundant fishes caught in trawls in the vicinity of ESGS include white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), northern anchovy (*Engraulis mordax*) and Pacific sanddab (*Citharichthys stigmaeus*) (Love et al 1986).

Fish impingement sampling is conducted at the ESGS intakes during representative periods of normal operation and during all heat treatment procedures to obtain an estimate of total impingement for the year. Table 2 shows the ten most abundant fish species impinged at ESGS and nearby Scattergood Generating Station between 1990 and 1999. In 1997 and 1998, the three most abundant fish species impinged at ESGS were jacksmelt (*Atherinopsis californiensis*), queenfish, and salema (*Xenistius californiensis*) (MBC 1997, 1998). In 1999 the three most abundant fish species impinged at ESGS were sargo (*Anisotremus davidsoni*), Pacific sardine (*Sardinops sagax),* and salema.

**Biological Resources Table 2: Ten Most Abundant Fish Species Impinged at the ESGS and Scattergood Generating Station Intakes between 1990 and 1999 (MBC 1999)**

| Common Name | Scientific Name |
|---|---|
| Queenfish | *Seriphus politus* |
| Topsmelt | *Atherinops affinis* |
| Salema | *Xenistius californiensis* |
| Jacksmelt | *Atherinopsis californiensis* |
| White Croaker | *Genyonemus lineatus* |
| Kelp Bass | *Paralabrax clathratus* |
| Barred Sand Bass | *Paralabrax nebulifer* |
| Sargo | *Anisotremus davidsonii* |
| Blacksmith | *Chromis punctipinnis* |
| Yellowfin Croaker | *Umbrina roncador* |

Limited data are available on the ichthyoplankton (fish eggs and larvae) in the vicinity of ESGS. Zooplankton were collected in the vicinity of the ESGS intake in September, October, and November of 2000 (Pondella 2001). The most abundant fish larvae collected were unidentified gobies, white croaker, and northern anchovy. Other fish larvae collected in the vicinity of ESGS included queenfish, spotted kelpfish (*Gibbonsia elegans*), black croaker (*Cheilotrema saturnum),* California clingfish (*Gobiesox rhessodon),* giant kelpfish (*Heterostichus rostratus*), and slender sole (*Lyopsetta exilis*).

Bird species observed during recent surveys in the ocean waters offshore ESGS include the California brown pelican (*Pelecanus occidentalis californicus*), surf scoter (*Melinita perspicillata*), western gull (*Larus occidentalis*), Heermann's gull (*L. heermanni*), western grebe (*Aecmophorus occidentalis*), Brandt's cormorant

(*Phalacrocorax pencillatus*), Caspian tern (*Sterna caspia*), and royal tern (*S. maxima*) (MBC 1997, 1998, 1999). The sandy beach in the vicinity of ESGS is used for foraging by a variety of shorebirds including sanderling (*Calidrus alba*), willet (*Catrophorus semipalmatus*), whimbrel (*Numenius phaeopus),* marbled godwit (*Limosa fedoa*), and black-bellied plover (*Pluvialis dominica*).

Four species of baleen whales and eight species of toothed whales have been recorded in Santa Monica Bay waters (MBC 1988). The species most frequently sighted in recent marine mammal surveys in Santa Monica Bay were bottlenose dolphin (*Tursiops truncatus*), short-beak common dolphin (*Delphinus delphis*), and long-beak common dolphin (*D. bairdii)* (Bearzi 1999). Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) and Risso's dolphins (*Grampus griseus*) were observed in Santa Monica Bay less frequently. Minke whales (*Balaenoptera acutorostrata*) and gray whales (*Eschrichtius robustus)* were recorded during their winter and spring migrations. The California sea lion (*Zalophus californianus*) is the most abundant pinniped species in Santa Monica Bay followed by the Pacific harbor seal (*Phoca vitulina*) (Bearzi 1999). California sea lions and bottlenose dolphins have been observed in the vicinity of ESGS during recent monitoring surveys (MBC 1997, 1998, 1999).

### *SENSITIVE MARINE SPECIES*

Table 3 lists sensitive marine species that have the potential to occur in the vicinity of ESGS.

**Biological Resources Table 3: Sensitive Marine Species Potentially Occurring in the Project Vicinity**

| Scientific Name | Common Name | Status* |
|---|---|---|
| **CLASS OSTEICHTHYES** | **BONY FISHES** | |
| *Oncorhynchus mykiss* | southern steelhead | FE, SSC |
| | | |
| **CLASS REPTILIA** | **REPTILES** | |
| *Caretta caretta* | loggerhead sea turtle | FT |
| *Dermochelys coriacea* | leatherback sea turtle | FT |
| *Chelonia midas* | green sea turtle | FE |
| | | |
| **CLASS AVES** | **BIRDS** | |
| *Gavia immer* | common loon | SSC |
| *Pelecanus occidentalis californicus* | California brown pelican | FE, SE |
| *Phalacrocorax auritus* | double-crested cormorant | SSC |
| *Charadrius alexandrinus nivosus* | western snowy plover | FT, SSC |
| *Numenius americanus* | long-billed curlew | SSC |
| *Larus californicus* | California gull | SSC |
| *Sterna elegans* | elegant tern | FSC, SSC |
| *Sterna antillarum browni* | California least tern | SE, FE |
| *Rynchops niger* | black skimmer | SSC |
| | | |
| **CLASS MAMMALIA** | **MAMMALS** | |
| *Enhydra lutris nereis* | southern sea otter | FT |
| *Arctocephalus townsendii* | Guadalupe fur seal | FT, ST |
| *Balaenoptera musculus* | blue whale | FE |
| *Balaenoptera physalus* | fin whale | FE |
| *Balaenoptera borealis* | Sei whale | FE |
| *Megaptera novaenglinae* | humpback whale | FE |
| *Eubalaena glacialis japonica* | Pacific right whale | FE |
| *Physeter catondon* | sperm whale | FE |
| | | |

*** Status Legend**: **FE** = Federal Endangered; **FT** = Federal Threatened; **SE** = State Endangered; **ST** = State Threatened; **FSC** = Federal Species of Concern; **SSC** = State Species of Special Concern

The state and federally listed Endangered California least tern (*Sterna antillarum browni*) nests on the sandy beach at Venice Beach approximately 4 miles north of ESGS. In 1997 and 1998, 375 pairs of terns bred at this colony (Fancher 1997, Keane, personal communication, 2000). In 1999, the number of least tern pairs at Venice Beach declined to 43 but increased to 200 in 2000 (Keane 2001). Least terns nest between April and August, and winter in Central or South America. The

preferred prey of California least terns is northern anchovy and topsmelt (*Atherinops affinis*). Least terns from the Venice Beach colony use all the waters in the vicinity of the colony for foraging, but feed most frequently in shallow nearshore waters within 2 miles of the colony (Atwood and Minsky 1983).

The western snowy plover (*Charadrius alexandrinus nivosus*) is a federally listed Threatened species and a California Species of Special Concern. This small shorebird nests on coastal sandy beaches and the shores of salt ponds and alkaline lakes. They forage for insects and marine invertebrates in wet sand along the edge of the water. Snowy plovers do not nest in the vicinity of ESGS, but wintering snowy plovers would be expected to forage occasionally on the sandy beach near ESGS. Surveys of wintering snowy plovers between 1979 and 1985 recorded a yearly median of 13 birds in the El Segundo/Hermosa Beach area (Page et al 1986).

The federally and state listed Endangered California brown pelican nests on Anacapa and Santa Barbara Islands, off the Pacific coast of Baja California, Mexico and in the Gulf of California, Mexico. California brown pelicans are common in the waters offshore ESGS especially during the non-breeding season of July through December. They feed primarily on northern anchovy.

Several marine bird species that are California Species of Special Concern would be expected to occur in the nearshore waters offshore ESGS. These species include the common loon (*Gavia immer*), double-crested cormorant (*Phalacrocorax auritus*), and elegant tern (*Sterna elegans*). Of these species only elegant terns breed locally. Elegant terns nest in the Port of Los Angeles, about 14 miles southeast of ESGS. Black skimmers (*Rynchops niger*) also nest in the Port of Los Angeles and forage occasionally in ocean waters.

California gulls (*Larus californicus*), a California Species of Special Concern, nest inland primarily at Mono Lake but are common on the beaches and nearshore ocean waters in the vicinity of ESGS during the non-breeding season. The long-billed curlew, a California Species of Special Concern, is a shorebird that winters in southern California and is most common in wetlands. They might occasionally forage on the sandy beach near ESGS.

The other sensitive species listed in Biological Resources Table 3 (above) would be expected to occur only very rarely in the nearshore waters in the vicinity of ESGS.

## DIRECT AND INDIRECT IMPACTS

## SITE PREPARATION AND CONSTRUCTION IMPACTS

The proposed project includes construction of a 630 MW, combined cycle power plant within the footprint of two existing units that will be demolished. The new combined cycle unit will consist of two combustion turbine generators (CTGs), two heat recovery steam generators (HRSGs) and one steam turbine generator (STG). Heat rejection for the STG will utilize the de-aerating, steam surface condenser

connected to an existing ocean-circulating water system that was used by the two existing conventional steam power plants to be demolished.

Since all ESPR construction activities will take place on land, no construction-related impacts to marine resources are anticipated. Existing ESGS power generators will be replaced with improved equipment. To do so, a landscaped embankment between the east side of the ESGS facility and Vista Del Mar Boulevard may be graded, but will be restored with similar ornamental vegetation following construction. Because the plant site is void of native biological resources, construction activities would not result in significant impacts to such resources.

Any noise generated during power plant construction will cause little impact to wildlife, as those animals that occur in the area have become adapted to current noise levels. Also, no state or federally listed species are known to occur adjacent to the current power plant that would be affected by current and anticipated power plant noise levels.

Two 250-foot high stacks will replace the two existing 210-foot high exhaust stacks on site. These structures may present a collision hazard to birds, especially migrating waterfowl or other insectivorous species that migrate at night. The Federal Aviation Administration has issued a "Determination of No Hazard to Air Navigation" for the ESPR Project and as a condition of the Determination, the exhaust stack structures must be marked and/or lighted in accordance with FAA requirements (ESPR, data response 157). Birds may confuse constant or intermittent red or white lights with constellations that may guide their flight. Fog or low clouds can further add to the potential for bird collisions. The number of bird collisions in the area is presumed to be high given the surrounding industrial facilities. Although records of bird collisions are not maintained by plant operators, anecdotal information indicates that collisions are not a problem at ESGS (ESPR, 2000a, AFC, page 5.6-31). The contribution of the two replacement stacks to bird mortalities from collisions is not expected to be significantly greater from existing impacts, given the small, 40 foot difference in height between the existing and replacement stacks. The Applicant will select lighting fixtures and arrangements with consideration for minimizing potential collision hazards while maintaining Federal Aviation Administration safety standards (ESPR, data response 157). In considering the likelihood that the ESPR Project will not increase the bird collision hazard, along with the need for safety considerations staff believes that this impact will not be significant.

### *AIR EMISSIONS AND THE EL SEGUNDO BLUE BUTTERFLY*

Populations of the federally protected El Segundo blue butterfly and its habitat could be indirectly affected by air emissions from the upgraded power plant. In a recent study for the San Francisco Peninsula, Weiss (1999) found that increased nitrogen levels in the air, as a result of automobile emissions and other sources, could raise nitrogen deposition levels in nearby nitrogen-poor serpentine grasslands, encouraging the growth of introduced, annual grasses (*Lolium* sp., *Bromus* sp. and *Avena* sp.) at the expense of native plants (*Plantago erecta* and *Castilleja*

*densiflora*). These native plants are essential to the Bay checkerspot butterfly, another federally listed Threatened butterfly.

The habitat and essential host plant for the El Segundo blue butterfly are quite different than the San Francisco Peninsula and the Bay checkerspot butterfly. There are no nitrogen poor serpentine soils or serpentine grasslands in the vicinity of the ESPR Project, and coastal buckwheat (*Eriogonum latifolium*), a coastal sandy dune species, is the essential food plant for the El Segundo blue butterfly. However, there is research, albeit limited, to support the idea that changes in other nutrient poor soils that support vegetation types like coastal sage scrub may alter plant species composition (Allen 1998) and therefore, this impact might also be applicable to dune and other coastal soil types that are low in nutrients.

Air modeling results for all nitrogen emission sources located on the proposed ESPR Project site, indicate that maximum nitrogen deposition levels (in kilograms of nitrogen per hectare per year, kg N/ha-yr) adjacent to the ESGS facility could be 4.47 kg N/ha-yr., though deposition rates are reduced to approximately 0.2 kg N/ha-y at the perimeter of the detectable range (ESPR 2000a, AFC, Figure 5.6-10, ESPR, data response 161) that overlaps with the Chevron Preserve and the El Segundo Dunes Preserve. The modeled scenario presumed worse operating conditions at full load for Units 3, 4, 5 and 7. This represents 1.5 percent of the 1994 levels of nitrogen deposition reported for Long Beach (13.46 kg N/ha-yr.; Blanchard et al., 1996) that were considered as a reasonable background estimate for the El Segundo area (ESPR 2000a, AFC, 5.6-30). The dunes at Malaga Cove (7 miles to the south) will not be affected by air emissions from the ESGS because at this distance the contribution of the plant to nitrogen deposition is negligible. Weiss (1999) estimated impacts to the serpentine habitats considered in his study at 10-15 kg N/ha-y. The United States Forest Service has developed a generic significance level of 3 kg N/ha-y for shrub and herbaceous vegetation in Class I wilderness areas[1]. Above this level it is projected that vegetation will be injured (Peterson et al 1992).

It is important to consider that total $NO_x$ emissions from ESGS will be reduced by 99 tons per year with the new turbines (ESPR 2000a, AFC, Table 5.2-4) and therefore, the power plant's contribution to N deposition in the Chevron Preserve and El Segundo Dunes Preserve (LAX site) will be less under the future operating scenario. In addition, the spatial loss of the El Segundo sand dunes habitat to urbanization reached its maximum in the 1970's. The other dune habitats, including restorable sites, cannot be further developed at this time because of legal constraints, safety, or geological hazard. Together these sites are sufficient to maintain El Segundo Blue populations indefinitely, given habitat quality. This

[1] These USFS values are applied to Class I wilderness areas defined as those with more than 5,000 acres that were in existence as of August 7, 1977, or any later expansions made to these wildernesses. They were derived in order to comply with provisions of the Clean Air Act of 1977. However, the values themselves are generic condition classes set for ecosystem impacts to different vegetation types in California and can ostensibly be used for other areas. At levels less than those defined above, no injury is expected. Injury in this case is defined broadly at the ecosystem level to collectively include processes such as plant metabolism and deposition effects on vegetation structure and diversity.

viability analysis is based on potential habitat area and topography that could support annual adult populations in the order of 100,000 individuals. Habitat management is critical to maintaining the quality of remaining habitat. Control of exotics to promote the success of coastal buckwheat, the El Segundo blue butterfly's essential host plant, is a part of management efforts at the El Segundo Dunes Preserve (Mattoni, 1998).

Populations of the El Segundo blue butterfly under the present environmental conditions in the preserves therefore, appear to be stable with management efforts directed at maintaining habitat quality. Although there is no site-specific information available to link soil quality and the availability of host plants for the El Segundo blue butterfly with air quality, under future conditions it is likely that $NO_x$ emissions from ESGS would not contribute to negative significant effects on the butterfly's habitat.

## COOLING WATER INTAKE SYSTEM

The applicant proposes to use the existing cooling water intake system. The new Units 5, 6 and 7 will use the intake and discharge structures of Units 1 and 2, which the new units will replace. No modification of the existing intake or outfall is proposed. Therefore, construction impacts to marine resources will not occur.

Potential impacts of the ESGS Power Redevelopment Project to marine resources are related to entrainment and impingement by the intake and the temperature effects of the thermal discharge. Impingement refers to the trapping of organisms on the screens of the intake. Entrainment refers to the process by which organisms are drawn into and through the cooling water system.

The maximum discharge volume of the new units will not exceed the maximum discharge for Units 1 and 2 of 207 million gallons per day (mgd). However, Units 1 and 2 have not been operating at their maximum rate in recent years. The new units will essentially become baseload units for the ESGS, and Units 3 and 4 will be used when power demand dictates. The baseload units are projected to increase in operational days per year compared to the existing operational days for Units 1 and 2. The increase in volume of the new units will result in an overall increase in volume for the ESGS cooling water system even though daily volumes of the new units will not exceed the existing maximum volume of 207 mgd. This increase will probably be offset somewhat by a decrease in operational days per year for Units 3 and 4. The AFC projects that the total mean daily flow after implementation of the Redevelopment Project will be 421 mgd (ESPR 2000a). However, the potential exists for ESGS to operate at its maximum permitted volume of 607 mgd.

Ocean water surface temperatures in Santa Monica Bay range from approximately 52 to 63 degrees Fahrenheit (F) in the winter and 61 to 73 degrees F in the summer (MBC 1994). The permitted discharge temperatures for Units 1 and 2 and Units 3 and 4 are not to exceed 105 degrees F (ESPR 2000a). The AFC states that the maximum thermal loading from the El Segundo Power Redevelopment Project will be less than the maximal thermal loading from Units 1 and 2 (ESPR 2000a). According to the AFC, during peak power generation and worst-case ocean

temperatures, the maximum discharge temperature of Units 1 and 2 will be 93 degrees F. Table 4 shows intake and discharge temperatures measured at ESGS during recent monitoring when Units 1 and 2 were operating at less than maximum capacity. These data suggest that when units are operating at close to maximum capacity, as Units 3 and 4 did during the summers of 1997, 1998, and 1999, the temperature difference between the intake and the discharge is between 15 and 20 degrees F.

**Biological Resources Table 4: Intake and Discharge Temperatures at the Existing ESGS Outfalls (1997-1999) (ESPR 2000a)**

| Season & Date | Outfall | Intake Temp. (°F) | Discharge Temp. (°F) | Average Flow Rate (mgd) |
|---|---|---|---|---|
| Winter 1999 - February 24 | Units 1 & 2 | 60.08 | 60.98 | 0.07 |
| | Units 3 & 4 | 62.06 | 71.06 | 162.5 |
| Summer 1999 - August 13 | Units 1 & 2 | 66.92 | 86 | 103.7 |
| | Units 3 & 4 | 68 | 82.94 | 398.6 |
| Winter 1998 - April 10 | Units 1 & 2 | 63.32 | N/A | 0 |
| | Units 3 & 4 | 63.32 | 67.46 | 168.4 |
| Summer 1998 - August 11 | Units 1 & 2 | 69.98 | 84.02 | 103.7 |
| | Units 3 & 4 | 68.72 | 87.26 | 389.3 |
| Winter 1997 - April 28 | Units 1 & 2 | 57.02 | 62.06 | 51.8 |
| | Units 3 & 4 | 57.02 | 74.48 | 194.8 |
| Summer 1997 - July 29 | Units 1 & 2 | 60.08 | 63.14 | 194.8 |
| | Units 3 & 4 | 59.9 | 79.52 | 398.6 |

To provide estimates of the thermal plume characteristics after construction of the ESGS Power Redevelopment project, a two-dimensional modeling analysis was conducted. The details of that analysis are discussed in the Soil and Water Resources Staff Assessment. Under the conditions used in the model simulation, an area of about 800 acres was elevated by 4 degrees F from the combined thermal discharges of Units 3 and 4 and Units 5, 6 and 7. The 4 degrees F temperature rise isotherm was predicted to intersect the beach over a length of 2,000 to 3,000 feet. The modeling results indicate that the thermal plume would violate the California Thermal Plan requirements for a new discharge. These requirements specify that the discharge of elevated temperature wastes shall not result in increases in water temperature exceeding 4 degrees at the shoreline or the ocean surface beyond 1000 feet from the discharge. A much smaller area (less than 40 acres) was elevated 10 degrees F above the ambient ocean temperature, and this area of larger temperature rise did not reach the beach (CEC 2001).

In addition to the discharge of heated water as a result of unit operation, the applicant proposes to conduct heat treatments to eliminate fouling organisms that grow within the cooling water system. During the treatment, the flow of the cooling water is temporarily recirculated (thus increasing the temperature) and reversed alternately so that the discharge point becomes the intake and the intake point the discharge point. Heat treatment typically is conducted every six weeks and lasts for about six hours per conduit. During heat treatment the highest permitted discharge

temperature is 125 degrees F (except during gate adjustment) for two hours. During gate adjustments, which control the temperature of the water recirculated in the intake and discharge points during the heat treatment, the discharge temperature can be increased up to 135 degrees F for no more than 30 minutes. During heat treatments, fishes and invertebrates living in the intake unit and forebay are killed, impinged on the screens and then removed from the forebay.

Except for individuals trapped by currents within the forebay of the intake during heat treatments, fishes and mobile invertebrates will avoid water temperatures that are above their thermal tolerance. An elevation in ocean water temperature of 4 degrees F or less generally is within the natural range of ocean water temperatures in Santa Monica Bay and would be expected to be within the tolerance level of most marine organisms. The 1973 ESGS Thermal Effects study noted only minor differences between the biological communities near the ESGS outfalls and the control (Benson et al 1973). Fewer species of fish were found near the outfalls compared to the controls, although the total number of individual fish was actually greater near the outfalls. Two species, the white seaperch (*Phanerodon furcatus*) and the walleye surfperch (*Hyperprosopon argenteum*), were significantly more abundant at the control than the outfalls. These data suggest that some species of fish may avoid the area around the outfalls. The 1973 study as well as annual monitoring of invertebrates in the vicinity of ESGS has noted few differences between the benthic community around the intake and discharge structures and control areas (Benson et al 1973, MBC 1997, 1998, 1999). The thermal effects of normal operations of the ESGS on marine life are expected to be insignificant.

The Venice Beach colony of the State and Federal Threatened California least tern is dependent on an adequate prey base of small fishes in the vicinity of the colony. Although least terns from the Venice Beach colony probably forage occasionally in ocean waters near the ESGS, the ESGS outfall is sufficiently distant (4 miles) from this colony, that the thermal discharge would not be expected to have a significant effect on least tern foraging.

Other sensitive seabird species, such as the endangered California brown pelican, that forage in nearshore waters near ESGS also would not be expected to suffer a significant impact from the increased discharge. Any thermal effects on fish populations would be limited to a relatively small area in the immediate vicinity of the discharge plume.

Federally Threatened western snowy plovers forage on the beach near ESGS. The thermal discharge plume from ESGS would not be expected to elevate temperatures in the intertidal zone to the extent that there would be any effects on the invertebrate prey of snowy plovers. The Thermal Effect Study for the ESGS (Benson et al 1973) did not find that there was a reduction in sandy beach organisms near the power plant compared to transects further away. Therefore, the discharge would not be expected to affect the prey base of the western snowy plover.

Some plankton organisms, which have limited mobility, might be carried into the area of high temperatures surrounding the outfall and would not be able to avoid

water temperatures above their tolerance limits. The impacts to plankton of exposure to extreme temperatures would add to the impacts of entrainment by the intake.

To predict the effects of entrainment and impingement by the intake on marine resources, the applicant has presented the results of a 1982 study done by Southern California Edison (SCE) to comply with Section 316(b) of the Clean Water Act (SCE 1982). The ESGS 316(b) study was part of a demonstration for all SCE's power plants with intakes in offshore southern California marine waters and protected harbor waters including ESGS, then owned and operated by SCE. Instead of measuring entrainment impacts for each individual facility, the study estimated entrainment for each facility by studying representative sites and applying those results to facilities with similar intake structures. The Ormond Beach Generating Station was the representative site for entrainment sampling for the group of physically similar intakes into which ESGS was classified. Both power plant intakes are located in the shallow nearshore zone of the Southern California Bight, and both have a similar intake structure including a velocity cap to reduce fish impingement. However, the study did not demonstrate that ESGS and Ormond Beach were biologically similar. The Ormond Beach Generating Station is in the City of Oxnard in Ventura County, approximately 55 miles north of ESGS. Mean daily entrainment at the Ormond Beach Generating Station was determined from monthly samples collected from August 1979 through July 1980. Mortality of entrained larvae was assumed to be 100%. Estimates of entrainment at the ESGS intakes were developed by applying a flow rate adjustment to daily entrainment observed at the Ormond Beach Generating Station intake system.

The most abundant fish larvae collected at the Ormond Beach Generating Station intake were those of northern anchovy, white croaker and queenfish. These three species comprised 83.8% of the entrained individuals.

Adult fish losses at ESGS result from impingement in the station cooling water system. Normal operation impingement data were collected regularly from October 1978 to September 1980. Impingement data were also collected during heat treatments. Normal operation fish losses were estimated by multiplying the mean daily impingement loss times the number of days that circulating water pumps were in operation during the period. Heat treatment fish loss, representing the actual count and weight, was added to the estimated normal operation fish loss to determine total fish loss on an annual basis. Individual fish impingement losses during the 1978 to 1980 study period were dominated by queenfish comprising 50 percent of the impingement losses at Units 1 and 2 and 67.6 percent of the impingement losses at Units 3 and 4. Walleye surfperch and white seaperch were also impinged in substantial numbers at Units 1 and 2, while white croaker and shiner surfperch (*Cymatogaster aggregata)* were the second and third most abundant species impinged at Units 3 and 4. Queenfish remain among the species impinged in greatest numbers at ESGS in recent years, but in the last three years jacksmelt and salema also have been among the species impinged in greatest numbers (MBC 1999, 1998, 1997). The number of surfperch impinged at ESGS apparently has decreased in recent years.

To estimate the total impact to fish populations of entrainment and impingement at ESGS, Southern California Edison adapted a fish population model developed by MacCall et al. (1983). The model calculates the magnitude of the probability ($R_c$) of a fish surviving entrainment and impingement mortality through five years of age. The statistic ($1-R_c$) indicates the percent probability of mortality due to station operation. The effect of losses in each size class is summed and passed on to later stages to derive a cumulative $R_c$ value. The probability of survival is estimated as a ratio of the loss of each size class of each species at the generating station intake to the estimated size of the population of that age class for that species in the Southern California Bight.

To evaluate the impact of ESGS on fish populations, the study calculated $R_c$ for 15 target species. These target species were northern anchovy, white croaker, queenfish, Pacific butterfish, white seaperch, shiner surfperch, walleye surfperch, black surfperch (*Embiotica jacksoni*), kelp bass (*Paralabrax clathratus*), barred sandbass (*P. nebulifer*), sargo, spotfin croaker (*Roncador stearnsi*), bocaccio (*Sebastes paucispinus*), black croaker and yellowfin croaker (*Umbrina roncador*). All of the target species either had a probability of mortality ($1-R_c$) due to the intake of less than 1% or were entrained or impinged in numbers too low to calculate an $R_c$ value. Queenfish was the species calculated to have the greatest probability of mortality at the Units 1 and 2 intake (0.3546%). The probability of mortality of queenfish at the Units 3 and 4 intake was calculated to be 0.6372%. Shiner surfperch was the species with the highest probability of mortality at the Units 3 and 4 intake (0.7624%). The 316(b) study considered the impacts of each intake separately and did not add the cumulative impacts to fishes of both of the ESGS intakes. Even if the probability of mortality at both ESGS intakes was added, the total for all species was still under 1%.

CEC staff is concerned that the determination of the effects of the ESGS intake is based on studies done 20 years ago for a generating station located approximately 55 miles north of ESGS. Populations of target fish species in the Southern California Bight may have changed in the last two decades. For example, a recent analysis indicates that populations of queenfish and white croaker within the Southern California Bight may have experienced a long-term decline (Herbinson et al 2000 cited in AES 2001). Furthermore, plankton populations near Ormond Beach may not be representative of populations vulnerable to entrainment by the ESGS in southeastern Santa Monica Bay. In response to this concern, the Applicant has proposed to use recent ichthyoplankton data from the entrance to King Harbor, and a recent appraisal of the standing crop of fish stocks in Santa Monica Bay to update the 316(b) resource assessment for ESGS. The appropriateness of this methodology has not yet been determined. Therefore, as a Condition of Certification, staff recommends that this analysis be completed, and based on the evaluation of the field study results, mitigation for impacts, or additional studies to determine impacts, may be required. See Biological Resources Conditions of Certification **BIO-1**, **BIO-2**, **BIO-3**, and **BIO-4**.

Fish impingement is related to flow rate, although other factors also may be important. The ESGS Power Redevelopment Project would be expected to increase flow rates over the existing condition. The annual volume for Units 1 and 2

and Units 3 and 4 in 1999 was 104,430 million gallons, which equals a mean daily flow of 385 million gallons per day, and the combined fish impingement for all units was 0.38 tons comprised of 1,330 individual fishes (ESPR 2000a). Invertebrate impingement was 36,113 animals with a total biomass of about 3 tons. Fish and invertebrate impingement would be expected to increase after construction of the ESGS Power Redevelopment Project.

The maximum biomass of fish impinged at all ESGS units between 1979 and 1999 was 3.88 tons and the mean for these 20 years was 1.33 tons (MBC 1999). Between 1979 and 1983 when Units 1 and 2 and Units 3 and 4 were operating at close to maximum capacity the mean fish biomass impinged per year was about 3.33 tons (MBC 1999). Power demand from ESGS decreased after 1984 when new units from the San Onofre Nuclear Generating Station began operating. It is likely that with implementation of the ESGS Power Redevelopment Project, power generation at ESGS would be similar to the levels in the early 1980's and that annual fish impingement would increase to those levels.

Units 1 and 2 have a vertical intake riser with an inside diameter of 11 feet 4 inches x 14 feet covered by a velocity cap 3 feet above the riser. Ocean water is conveyed to the cooling water system through a 10-foot diameter pipe that leads into a large forebay. Fishes swim through the large intake structure into the forebay and, because of the strong currents generated by the intake, cannot escape. All of the fishes trapped in the intake structure are killed during heat treatments although, because they apparently cannot escape, they essentially are lost to the ocean anyway.

CEC staff is concerned that the design of the ESGS intake does not represent the Best Available Technology for the protection of marine life. Methods, such as a fish return system, may be available to significantly reduce the number of fishes trapped within the forebay.

## CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines requires a discussion of cumulative environmental impacts when they are determined to be potentially significant. Cumulative impacts are defined as those impacts that are created because of the combination of the project evaluated in conjunction with other projects causing similar 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 proposed project alone.

The CEQA Guidelines also mandate two different ways in which cumulative impacts are to be evaluated. One of these mandated approaches is to summarize growth projections in an adopted General Plan or in a prior certified environmental document. The second method involves compilation of 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 impacts of impingement and entrainment by the ESGS cooling water intake on nearshore fish populations in Santa Monica Bay will act cumulatively with the impacts of impingement and entrainment at the other Santa Monica Bay power plants that draw water from the ocean for their cooling water systems. In addition to ESGS, two other power plants that draw cooling water from the ocean are located in southeast Santa Monica Bay. These are Scattergood Generating Station, located approximately 3,500 feet to the north of ESGS, and the Redondo Generating Station, located approximately 5 miles to the south. CEC staff is concerned that the cumulative impacts of these three cooling water intake systems on marine resources may be significant. The applicant has not yet provided an adequate analysis of the cumulative impacts of the three intake systems. The applicant has proposed to include a cumulative impact analysis in the proposed update of the 316 (b) resource assessment using recent ichthyoplankton data from King Harbor. As a Condition of Certification, staff recommends that this analysis should be completed, and, based on the evaluation of its results, mitigation for impacts or additional studies to determine impacts may be required. For more information, see Biological Resources Conditions of Certification **BIO-1**, **BIO-2**, **BIO-3**, and **BIO-4**.

## MITIGATION

## APPLICANT'S PROPOSED MITIGATION MEASURES

Staff notes that with the exception of the three bulleted items below, many of the applicant's proposed mitigation measures are <u>not</u> applicable to the ESGS, and appear to have been copied from another project (La Paloma Generating Project 99-AFC-2C, Kern County). The applicant has proposed in Section 5.6.3 of the Application for Certification to stipulate to and accept several standard CEC conditions that apply to protection of sensitive biological resources. Some of the measures are not applicable to the site because the activities or facilities referenced in them will not be undertaken for this project (e.g. employing a Designate Biologist). Others reference standard industry practices and are relatively inconsequential (e.g., avoiding sensitive species, site hygiene and prohibition of hunting).

In addition to the measures summarized above, the applicant proposes the following three mitigation measures that are relevant to biological resources at the site. These include:

- Impacts to ornamental vegetation on the cut-slope on the north side of the existing ESGS facility will be mitigated by landscaping this area following disturbance.

- The applicant proposes to maintain the existing cooling water intake structure with its velocity cap and to continue to monitor and report fish impingement and the presence/absence of the federally listed Endangered green sea turtle in the vicinity of the intake structure, as required under the current program.

- The applicant proposes to initiate a pilot project to investigate the feasibility of a fish removal method prior to heat treatment. The applicant proposes to evaluate the deployment of a modified beach seine to scoop fish out of the forebay of the cooling water system, prior to heat treatment, and return the fish to the ocean.

## STAFF'S PROPOSED MITIGATION MEASURES

### *IMPINGEMENT AND ENTRAINMENT*

The applicant's proposed measure to continue to monitor and report fish impingement is a requirement of its NPDES permit and is not considered mitigation. Staff is concerned that project-specific and cumulative impacts from impingement and entrainment may be significant. Studies done 20 years ago at a power plant 50 miles from ESGS are not considered adequate to determine the current impacts of the ESGS intake. An updated analysis of impingement and entrainment effects of the cooling water system intake needs to be done to determine whether impingement and entrainment are having a significant effect on the marine resources of Santa Monica Bay. This analysis should consider the cumulative impacts of other Santa Monica Bay power plants that withdraw cooling water from the Pacific Ocean.[2]

If the updated analysis determines that the proposed ESGS will have a significant adverse impact on any of the marine species in Santa Monica Bay (i.e. that the populations of any affected marine specie could be reduced by five percent (5%) or more per year), either directly or cumulatively, the applicant shall be required to mitigate those impacts to insignificance. Mitigation may consist of one or more measures to reduce fish losses caused by the cooling water intake and/or may include habitat enhancement/compensation. The final determination of mitigation will be made by the Energy Commission in consultation with state, federal, and local agencies. For more information, see Biological Resources Conditions of Certification **BIO-1, BIO-2, BIO-3** and **BIO-4**.

### *COOLING WATER INTAKE STRUCTURE*

Staff is concerned that a large number of fish are currently trapped in the forebay portion of the cooling water intake system. These fish do not escape and ultimately are killed during heat treatment and during normal operation. The project's existing intake design may not be the best technology currently available for reducing impacts and protecting marine life. More recently constructed facilities (such as the San Onofre Nuclear Generating Station) often utilize fish return structures as part of

[2] Staff's requirement that current field data be provided by the applicant so staff can complete its impacts analysis is consistent with other coastal power plant projects (Moss Landing, Morro Bay, Huntington Beach Retool, and Potrero Unit 7) that have recently been certified or are currently before the Commission for certification. Staff believes that an updated analysis using current data from ESGS to determine the actual impingement and entrainment losses of the ESGS Power Redevelopment Project and the cumulative effect of the three Santa Monica Bay power plants needs to be undertaken soon. The California Department of Fish and Game (Paznokas, personal communication, 2001), the California Coastal Commission (CCC 2000a), and the National Marine Fisheries Service (Hoffman, personal communication, 2001) support staff's recommendation that updated entrainment surveys are needed to assess the project's current impacts.

the cooling water system. The applicant's proposed measure to scoop fish out of the forebay prior to heat treatments might not be feasible or, if feasible, might not reduce significantly fish mortality. Furthermore, the Environmental Protection Agency is expected to propose new rules for existing intakes in 2002. These rules may require that the intake be redesigned to include technologies to reduce fish impingement. If the updated study of impingement and entrainment impacts determines that impingement losses are a significant impact to one or more species of fish (i.e. that the populations of any affected fish could be reduced by five percent (5%) or more per year), possible mitigation measures to eliminate these significant impacts shall include improvements to the intake structure and/or its operation. For more information see Biological Resources Condition of Certification **BIO-4**.

## CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

Staff concludes that there will be no significant impacts to terrestrial biological resources, including federal or state endangered or threatened species.

Regarding marine biological resources, staff concludes that impingement and entrainment impacts from the cooling water intake system are considered to be potentially significant at both the project-specific and the cumulative impact levels. It is anticipated that with (a) completion of the updated aquatic studies, and (2) implementation of mitigation/compensation, if necessary, as required in the Conditions of Certification below, any marine biological impacts from this project will be reduced to a level of insignificance.

## RECOMMENDATIONS

Staff has concluded that the existing aquatic biological studies may be inadequate because of their age. The applicant is currently performing a study of a nearby aquatic environment to estimate potential environmental impacts of the project. Staff recommends that this study from King's Harbor be provided prior to the Commission's decision to allow staff and the Committee time to determine the validity of the data and whether it is appropriate for determining potential biological impacts of the project. If the King's Harbor data is not acceptable to the Committee, staff has recommended Conditions of Certification that will require the applicant to begin both 316(a) and 316(b) studies after certification. These studies will take approximately one year to complete.

Staff recommends that the following Conditions of Certification be adopted and implemented to ensure compliance with all federal, state, and local laws, ordinances, regulations and standards.

## CONDITIONS OF CERTIFICATIONS

## IMPINGEMENT AND ENTRAINMENT

**BIO-1** The project owner will submit to the Commission the results of its updated analysis of entrainment and impingement impacts at ESGS. This analysis will use recent data from the mouth of King Harbor to determine the impacts of entrainment. The analysis will provide strong scientific justification that those data are appropriate to determine the entrainment impacts of ESGS. The analysis also will address the cumulative impacts of ESGS, Scattergood Generating Station, and Redondo Generating Station on the marine resources of Santa Monica Bay.

Protocol: Analysis protocols should use the Adult Equivalent Loss model or other accepted methodologies developed from the 316(a) and 316(b) studies at Diablo Canyon, Moss Landing and Morro Bay and recent data to determine the significance of impingement and entrainment losses on fish populations. This analysis shall consider the cumulative effect of all Santa Monica Bay power plants on the marine resources of Santa Monica Bay. The methods, analysis, results, and conclusions of the study will be documented in a scientific style report and submitted to the CEC Compliance Project Manager (CPM) for review and approval. The report must provide strong scientific justification for the data and methods used in the analysis. Other agencies, including the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the California Department of Fish and Game, the California Coastal Commission, and the Regional Water Quality Control Board, shall be included in the review of the draft report. The study results will be utilized during the NPDES permit renewal evaluation to be completed by the Santa Ana Regional Water Control Board in 2005.

**Verification:** The project owner will submit to the CEC CPM, for review and approval, a draft report that discusses the results of the impingement and entrainment analysis within 30 days of project certification. If the data and methodology in the draft report are determined by the CEC and other reviewing agencies to be appropriate for the determination of impingement and entrainment impacts, the project owner will submit the final report to CEC within 60 days of project certification.

**BIO-2** If upon review of the draft analysis of entrainment and impingement impacts using plankton data from the mouth of King Harbor, the CEC determines that the data are not appropriate for the impact analysis, the project owner shall prepare a monitoring/study plan and conduct one year of monitoring to determine the actual impingement and entrainment losses resulting from the operation of the cooling water system of the new ESGS Power Redevelopment Project units and the existing Units 3 and 4. The project owner will sample the intake and source water to determine fractional losses relative to their abundance in the source water.

Protocol: Sampling design and data analysis protocols shall follow those developed from the most recent 316(a) and 316(b) studies at Diablo Canyon, Moss Landing and Morro Bay power plants and/or MacCall (1983), and the results used to determine the significance of impingement and entrainment losses on fish populations. This analysis shall consider the cumulative effect of all Santa Monica Bay coastal power plants on nearshore fish populations. The study objectives, sample design, metrics, methods (protocols), and consultant to perform the studies, shall be submitted to CEC CPM for review and approval. The study protocols will be developed and put into a study plan within 90 days of project certification. The project owner will commence the monitoring within 30 days of the start of commercial operation of the new units. The methods, analysis, results, and conclusions of the monitoring study shall be documented in a scientific style report and submitted to the CPM for review and approval. Other agencies, including the National Marine Fisheries Service, the California Department of Fish and Game, the California Coastal Commission, and the Regional Water Quality Control Board, shall be included in the review of the draft report. A final report shall be prepared upon completion of the field sampling. The study results will be utilized during the NPDES permit renewal evaluation to be completed by the Santa Ana Regional Water Control Board in 2005.

**Verification:** If the CEC determines that a one-year field study is necessary, the project owner will submit a draft study plan to the CEC CPM for review and approval within 90 days of project certification. Within 120 days of certification, an agency and CEC-approved final study plan will be provided to the CEC CPM. The project owner will submit quarterly reports to the CPM during the study sampling period within 60 days following the completion date of that quarter of field sampling.

The project owner will submit to the CEC CPM a draft report that discusses the results of the impingement, entrainment and source water sampling studies within six months of the end of field sampling, and a final report to the CEC CPM within nine months from the end of field sampling.

**BIO-3** If a complete impingement, entrainment , and source water sampling study and analysis is determined to be needed, and to cover all anticipated costs associated the project owner's impingement, entrainment, and source water sampling and analysis, the project owner will provide a check for $1,500,000 (One million and five hundred thousand) to the Center for Natural Lands Management (CNLM). In the event study costs exceed those placed in trust, the project owner shall cover those necessary costs to complete the studies.

Protocol: The project owner will contact CNLM Executive Director Ms. Sherry Teresa (address: 425 E. Alvarado Street, Suite H, Fallbrook, CA 92028-2960, phone number: (760) 731-7790) to establish the El Segundo Generating Station Trust Account to be used to fund the project's impingement, entrainment, and source water sampling studies, if such studies are determined to be necessary. The CEC CPM will authorize the project owner's expenditures from the fund for the field study protocol development and implementation (impingement, entrainment and source

water sampling), data analysis, draft and final report preparation, and implementation of mitigation measures.

**Verification:** No later than 30 days prior to the start of commercial operation, the project owner will provide written verification to the CEC CPM that 1) a check for $1,500,000 has been provided to the Center for Natural Lands Management and 2) that the El Segundo Generating Station Trust Account has been established.

**BIO-4** If the entrainment and impingement study (either the analysis using King Harbor data identified in **BIO-1** or, if necessary, the one-year field sampling and analysis identified in **BIO-2**) determines that significant marine impacts from this project could occur, the project owner will take those steps the Energy Commission requires to mitigate the impact to insignificance (as described further in the Protocol to this Condition). The impacts of impingement and/or entrainment will be considered significant if the study determines that the project intake will reduce the population of any target fish or invertebrate species by 5 percent or more, either directly or cumulatively.

Protocol: The project owner, in consultation with the CEC CPM and state, federal and local resource agencies, will evaluate one or more feasible mitigation measures to reduce any impacts caused by the cooling water intake on marine resources to insignificance. At a minimum, the following potential mitigation measures will be considered for feasibility and effectiveness:

- Rescue of fish trapped in the intake forebay to reduce impingement losses
- Modification of the intake structure to reduce loss of fish by impingement
- Reduction in the volume of cooling water withdrawn from the ocean to reduce entrainment and impingement
- Habitat enhancement by the creation of an artificial reef.
- Habitat enhancement by the restoration of tidal wetlands
- Habitat enhancement by the implementation of measures to improve water quality in Santa Monica Bay by reducing pollutant loads.

Final approval of the mitigation package will be made by the Energy Commission. After appropriate mitigation, if any, has been established by the Commission, a mitigation plan will be prepared by the project owner and submitted to the CPM for approval. The mitigation plan will include a schedule for implementation of the mitigation measures and, if appropriate, a monitoring plan to insure adherence to the approved mitigation.

**Verification:** The CPM will review the draft mitigation plan to ensure the wording is clear, meets the terms of the mitigation package approved by the Energy Commission, and is enforceable. The CPM will ensure the mitigation plan is completed within 120 days of determination of the need for mitigation/compensation. The project owner will provide written verification to the CPM that each mitigation measure has been implemented according to the

schedule in the approved mitigation plan. The project owner will provide any required mitigation monitoring reports to the CPM according to the schedule in the approved monitoring plan.

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# CULTURAL RESOURCES

Testimony of Jeanette A. McKenna and Dorothy Torres

## INTRODUCTION

The purpose of this analysis is twofold. Staff evaluates potential impacts caused by the proposed project on previously identified cultural resources. Secondly, staff evaluates potential impacts to cultural resources that might be discovered as a result of activities during the over all construction and demolition process.

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

## FEDERAL

- Code of Federal Regulations, 36 CFR Part 61. Federal Guidelines for Historic Preservation Projects: The U.S. Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for mitigation of impacts to cultural resources on public lands in California.

- National Historic Preservation Act, 16 U.S.C. § 470, commonly referred to as Section 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulation revised in 1997 (36 CFR Part 800 et. Seq.) set forth procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria and the process are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

## STATE

The term "cultural resource" is used broadly to include the following categories of resources that are identified pursuant to California Code of Regulations, Title 14, Chapter 11.5, Section 4852. A list of categories of potential resources appears below.

### *TYPES OF RESOURCES ELIGIBLE FOR NOMINATION:*

1. Building. A resource, such as a house, barn, church, factory, hotel, or similar structure created principally to shelter or assist in carrying out any form of human activity. 'Building' may also be used to refer to an historically and functionally related unit, such as a courthouse and jail or a house and barn;

2. Site. A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished where the location itself possesses historical, cultural, or archeological value regardless of the values of any existing building, structure, or object. A site need not be marked by physical remains if it is the location of a prehistoric or historic event, and if no buildings, structures, or objects marked it at that time. Examples of such sites are trails, designed landscapes, battlefields, habitation sites, Native American ceremonial areas, petroglyphs, and pictographs;
3. Structure. The term 'structure' is used to describe a construction made for a functional purpose rather than creating human shelter. Examples of structures included mines, bridges and tunnels;
4. Object. The term 'object' is used to describe those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed, as opposed to a building or a structure. Although it may be movable by nature or design, an object is associated with a specific setting or environment. Objects should be in a setting appropriate to their significant historic use, role, or character. Objects that are relocated to a museum are not eligible for listing in the California Register. Examples of objects include fountains, monuments, maritime resources , sculptures, and boundary markers; and
5. Historic district. Historic districts are unified geographic entities which contain a concentration of historic buildings, structures, objects, or sites united historical, culturally, or architecturally. Historic districts are defined by precise geographic boundaries. Therefore, districts with unusual boundaries require a description of what lies immediately outside the area in order to define the edge of the district and to explain the exclusion of adjoining areas. The district must meet at least one of the criteria for significance discussed in Section 4852 (b)(1)-(4) of this chapter.

When a cultural resource is determined to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, it may be considered to be an "historical resource" and eligible for inclusion in the California Register of Historic Resources (CRHR).

If the archaeological resource does not meet the criteria for an historical resource, it may be assessed to determine whether it meets the criteria of a unique resource as defined in the Public Resources Code.

This Staff Assessment will provide an overview of procedures used to identify cultural resources in the project vicinity. If cultural resources are identified, staff determines whether there may be a project related impact to identified resources and if the resource is eligible for the CRHR, staff then recommends mitigation that will reduce the impact to the historical resource to a less than significant level.

There is also a potential that a project may impact a resource that has not been previously discovered or impact an historical resource in an unanticipated manner. Staff also recommends procedures that mitigate these potential impacts.

Four prehistoric sites are located in the vicinity of the El Segundo Power Redevelopment Project (ESPR). These sites have been previously recorded, but not evaluated for eligibility to the CRHR. Moreover, there are two historic properties and one historic district also in the project vicinity. The historic sites and historic district appear eligible for listing on the CRHR and the applicant plans to avoid them. Cultural Resources monitoring, often including a Native American monitor in areas where ground disturbance might unearth previously undiscovered cultural resources, would mitigate potential impacts.

- Public Resources Code, Section 5020.1 defines several terms, including the following:
  - (j) "Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
  - (q) "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.
- Public Resources Code, Section 5024.1 establishes a California Register of Historic Resources (CRHR). The implementing regulations are California Code of Regulations, Chapter 11.5, Section 4850 et seq.
- The California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; Title 14, California Code of Regulations, Section 15000 et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code Section 21083.2 states that the lead agency determines whether a project may have a significant effect on "unique" archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the applicant's cost of mitigation; sets time frames for excavation; defines "unique and non-unique archaeological resources"; and provides for mitigation of unexpected resources.
- Public Resources Code Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a "historic resource" and describes what constitutes a "significant" historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, Section 15126.4(b)
- prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project's impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

- CEQA Guidelines, Section 15064.5 defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.”
- Penal Code, Section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials. This section also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code Section 5097.99 provides restrictions on the possession of human remains or grave related artifacts. Part (b) specifies exceptions and states a person in violation of this section is guilty of a felony. Part (c) expands the section to say that any person, not under authority of law, who removes Native American artifacts or human remains with an intent to sell or vandalize them is guilty of a felony.

## LOCAL

### *CITY OF EL SEGUNDO*

The City of El Segundo does not have a specific ordinance pertaining to cultural resources, but follows all the provisions of CEQA. In the event resources are discovered, the City requires notification of the appropriate administering entity (ESPR 2000a p. 5.7-71).

### *CITY OF MANHATTAN BEACH*

The City of Manhattan Beach does not have a specific ordinance pertaining to cultural resources, but defers to CEQA and insists that notification of the appropriate entities occurs (ESPR 2000a, p. 5.7-71).

### *CITY OF LOS ANGELES*

The City of Los Angeles does not have any specific City LORS that pertain to cultural resources. The city follows the provisions of CEQA and requires that the appropriate entities are notified regarding any discoveries of cultural resources (ESPR 2000a, p.5.7-71).

# ENVIRONMENTAL SETTING

## REGIONAL DESCRIPTION

Surficial sedimentary units of predominantly Pleistocene and Holocene age underlie the entire project area. These sediments include depositions that range from continental, alluvial fan-derived sediments to sub-aerial floodplain to marine terrace and near shore deposits. Lithologies include sand, gravel, silt and clay. The successive series of Pleistocene marine terraces that have undergone geomorphic development have been subsequently dissected by the major west flowing river drainages of the Los Angeles Basin.

The Cenozoic rock formations range in facies type from conglomerates to sandstone to unconsolidated siltstone and clays, all of which are either fossiliferous or potentially fossiliferous. Gradual, long-term erosion has removed parts of the Tertiary and Quaternary rock throughout most of the project area. These formations or parts of formations now exist at or near the surface as rock outcrops with varying width across the project area terrain, but are obscured in most areas by industrial development and surficial sediments. The majority of the plant site area is overlain by imported fill or is comprised of unconsolidated sediments of Holocene age.

Many of the temporary staging and parking components lie within the ancient Los Angeles River floodplain and river basin. The Ballona Creek serves as a secondary drainage flowing to the southwest along the base of the Del Rey bluffs. Rainfall averages about twelve inches per annum in the Los Angeles Basin. The bluffs probably supported grasslands in prehistoric times, and in the 1900s, the area around Ballona Lagoon was essentially swamp, thickets, and a rather rich riparian environment (CSPR 2000g p.J-6).

## PROJECT VICINITY DESCRIPTION

The El Segundo Power Redevelopment (ESPR) project area involves acreage within the City of El Segundo, Los Angeles County, California. “The project area is localized along the Pacific Ocean shoreline of the Los Angeles Basin. Specifically, the proposed ESPR project components are limited to the geomorphologic transition zone extending from the sandy beaches up to the Late Pleistocene and Holocene stabilized sand dunes immediately east, on the adjacent bluffs above the shoreline” (ESPR 2000g, p. J-7).

The proposed primary ESPR project components are located in El Segundo, and would extend westward from the sandy beaches into stabilized sand dunes locates on the adjacent shoreline bluffs.

Refer to the **PROJECT DESCRIPTION** section of this document for additional information and maps of the project development region and the project area.

## PREHISTORIC SETTING

The majority of Southern California was inhabited, at one time or another over the past 10,000+ years, by prehistoric Native Americans. The prehistoric occupation of

this area is well within the boundaries of the much discussed and cited chronologies for Southern California, specifically those of Warren (1968), Wallace (1955), and more recently, Mason and Peterson (1994). This particular area of Southern California is associated with the ancestors of the Gabrieleno/Tongva and Chumash.

The Los Angeles plain and fringing coastline has supported a continuous cultural occupation for at least the last 8000 years. An archaic occupation has been identified in the archaeological record that reflects the early emergence of non-agricultural village-based groups in the Los Angeles Basin. Current archaeological evidence suggests that a relatively small population existed in the basin until approximately 2000 years before present (B.P.). After that temporal marker, populations appear to have expanded considerably into resource-rich coastal and near-shore estuarine environments. Report from early European contacts to the area such as Juan Rodriquez Cabrillo and Sebastian Vizcaino indicated that some of the larger coastal villages had hundreds of occupants. These observations appear to be supported by the archaeological evidence, although by the late 18$^{th}$ Century, reports indicate that the Los Angeles City environs supported only a small but established hunter/gatherer culture. Mason and Peterson (1994) suggest that the coastal populations migrated away from the coast and back to the coast in response to environmental factors – suggesting a break in the archaeological records in certain areas of Southern California (ESPR 2000g, p.14).

## ETHNOGRAPHIC BACKGROUND

Seasonal migrations of these various populations make delineation of their respective traditional territories difficult to define. The location of the project area, however, suggests a strong association with the Gabrielenos (ESPR 2000g, p.14).

The earliest evidence of human occupation in the immediate area of the Del Rey bluffs comes from the Lambert study of 1983, where the southern fringes of the Ballona Lagoon and creek have been identified within a few miles of the current study area. The evidence is based on the presence of non-fluted projectile points and crescents. Such remains have been compared to artifacts identified further east, in the Mojave Desert regions, suggesting a correlating date of occupation in the ca. 9,000 B.P. range. (ESPR 2000g, p. 19).

In Southern California, the Millingstone period has been identified as at least 6,000 years of age and likely dates in some areas to 8,500 years B.P. This particular period is characterized by the presence of artifacts indicative of seed processing (e.g., metates, manos, other hand stones, flaked tools, etc. Overall, the populations were dependent on a hunter/gatherer economic base supplemented by exploitation of the ocean resources (e.g., fishing and collecting of shell fish) (ESPR 2000g, p. J-10).

On the Del Rey bluffs, the presence of desert culture-related artifacts and cremations, a noticeable lack of shell ornamentation, and the apparent lack of marine resources suggest a change in the population. This is generally attributed to the presence of Shoshone speakers from the Desert regions (also referred to as the Shoshonean Intrusion; see McCawley 1996) (ESPR 2000g, p. J-10).

For approximately 500 years prior to Spanish contact, the western Los Angeles Basin was occupied during the Late Prehistoric by the "Canalino" culture known for their ability to exploit the ocean resources. The coastal site typically exhibited an abundance of shellfish and other marine resources. In the specific area of the current project, CA-LAN-47, a Late Prehistoric Gabrielino village site, has yielded inhumations, stone bowl, projectile points, pestles, and scrapers all indicative of a Gabrielino presence. The site is described as a seasonal village for the procurement of resources along Ballona Lagoon (ESPR 2000g, p.13).

## HISTORIC SETTING

The first recorded contact with Southern California Native Americans (including the Gabrielino) involved the Spanish exploration led by Juan Rodriquez Cabrillo in 1542. Many years later, in ca. 1769, the Portola Expedition traversed present-day Los Angeles County and made direct contact with the Native population. Shortly thereafter, the Spanish Missionaries led by Father Junipero Serra began establishing the missions throughout California. The references to the Gabrielino are directly related to the founding of the Mission San Gabriel in the San Gabriel Valley of Los Angeles County (ESPR, 2000g, p. J-13).

The City of Los Angeles was officially founded in 1786 and by 1800 there were as many as 30 small adobe structures in the area. The current project area (El Segundo) is well outside this early settlement. The Spanish government lost its claim to California ca. 1824 and California became part of the Mexican government holdings. Mexico's control was short-lived, yielding to the American government in 1848 – following the Mexican-American War (ESPR 2000g, J-13).

The City of El Segundo began as a "melon patch" and in 1911 was surveyed by representatives of the Standard Oil Company. The community was called "El Segundo" because it was the second Standard Oil Refinery location in Southern California. The City of El Segundo was incorporated in 1917 and developed into an industrial center when the farming activities gave way to commercial development, eventually including an airfield and other commercial ventures (ESPR 2000q, p. 4).

El Segundo is located within the lands of the historic Rancho El Sausal Redondo, a 25,000 acre Mexican Period land grant originally granted to Ygnacia Abila in 1837 (ESPR 2000q p. 4). The rancho remained in Abila's family for ten years following his death (d. 1868) and, in 1868, the property was sold to Robert Burnett. Daniel Freeman, who leased the rancho from Burnett, eventually purchased the property in 1882. Freeman was successful in raising grains, citrus, and other "truck" crops – including melons. Freeman sold the majority of the rancho by 1886, including the lands currently occupied by the City of El Segundo.

The arrival of the Standard Oil refinery in 1911 had a profound effect on the development of early El Segundo. The company almost immediately became the primary employer of the community, resulting in a reference to the "Standard Oil Payroll Town" (ESPR 2000q, p. 5). Residential housing was constructed shortly

after the founding of the refinery and privately owned businesses were established throughout the area. Services were established along Richmond Street, El Segundo's first business district. At the time of incorporation, El Segundo had a population of 1,000.

The El Segundo Land and Improvement Company began surveying, grading, and development in 1911, installing curbs, sidewalks, and subdividing 1,470 acres. By 1912, many of the lots had sold, but only nine had been developed. The residential housing boom in El Segundo began with incorporation in 1917. C.D. Goldthwaite, a Los Angeles Contractor, proposed to build "… whole blocks of stock houses from shelf-worn plans …" without proliferating a "cookie cutter" design (ESPR 2000q, p. 6).

From the onset, the commercial enterprises of El Segundo concentrated on Richmond Street, rather than the adjacent Main Street. Numerous small, wood framed commercial buildings on Richmond on two blocks between Ballona (later El Segundo Boulevard) and the Pacific Electric tracks (Grand). Most of these structures were destroyed in a fire (ca. 1917), resulting in a redevelopment using bricks rather than wood. City Hall was constructed at Richmond and Franklin (1918) with an annex in 1926. This building was destroyed in the 1933 Long Beach Earthquake. By 1921, eleven buildings were reconstructed on Richmond Street. Other streets were developed in the 1920s and early 1930s, resulting on a commercial core for the City. The three major streets within this core were Richmond Street, Main Street, and Grand (ESPR 2000q, p. 7-8).

The 1930s brought the beginnings of the Los Angeles Airport (originally Mines Field) and the aerospace industry to El Segundo – including Douglas Aircraft (1928), Northrup (1932) and North American Aviation (1935). Hughes Aircraft arrived in the 1950s, supplementing the post-World War II military presence in the area (ESPR 2000q, p. 10).

## RESOURCES INVENTORY

### *LITERATURE AND RECORDS SEARCH*

An archaeological literature and records search was completed through the California State University, Fullerton, South Central Coastal Archaeological Information Center, the local repository for all reports, site records, and maps maintained under the California Historical Resources Information System (CHRIS). An arbitrary APE of one half mile surrounding the plant site and various alignments was assigned by the cultural resources consultants. Supplemental research was completed as needed. Records searches were conducted on October 9, 2000, November 1, 2000 and November 8, 2000 (ESPR 2000g, p.18).

Results of the literature and records search showed that a minimum of 20 cultural resource studies have been completed within one mile of the project area. No previously recorded archaeological sites were identified within the project area, but four have been recorded within project vicinity. These include CA-LAB-47, a village

site; CA-LAN-1698, a midden deposit; CA-LAN-2345, another prehistoric village site; and CA-LAN-2386/H, and a World War II era bunker site (ESPR 2000g, p. J-9).

## *FIELD SURVEYS*

Field investigations involved four separate activities that required differing approaches:

1. confirmation of areas under pavement;
2. a pedestrian survey of the proposed alternative pipeline alignments;
3. a pedestrian survey of the proposed construction areas, and
4. a survey of historic buildings along the proposed water pipeline routes (ESPR 2000g, p. J-21).

On November 3, 2000, Byron Bass of URS Corporation conducted the field inventory for archaeological resources. The existing El Segundo plant site, including the tank farm area, and proposed linear project areas were surveyed via a pedestrian survey. Systematic, regularly spaced transects were not employed, as the environment is nearly all built and precluded such an approach. All accessible areas were covered, including those with limited access – the Chevron Marine Terminal and Refinery, the Kramer Staging area, and the Fed-Ex staging/parking area. A second survey on November 28, 2000, provided additional access to those areas sampled earlier (ESPR 2000g, p. J-21).

### ARCHITECTURAL RECONNAISSANCE

During the cultural resources surveys, the project team observed several potentially significant historic buildings or structures. Although two of the units at the project site began operation on 1955 and 1956 with the two additional units coming on line in 1964 and 1965, none of these units meet the criteria that would make them eligible for listing on the NRHP or CRHR (ESPR 2000a, Appendix K, p.9-17). Units 1 and 2 which would be demolished were completed in 1956 and the tank farm area that would be used first as an additional construction laydown area and then demolished was also completed in the mid-fifties. The tank area was also assessed by the consultant to the applicant as not significant.

However, there are properties in the vicinity of the project that may have had historic importance. These structures were identified along the proposed potable and reclaimed water pipeline alignments. Due to the proximity of the structures to the alignments and the fact that the alignments involved historic roadways, they were identified and researched, resulting in the identification of potentially significant buildings. Two of the forty-two properties investigated were determined to be potentially significant: the 1911 hotel/boarding house located at 221 Concord Street; the residence at 224 Concord Street; including the rental units at 226 A & B Concord Street. In addition, the Richmond Street Historic District, comprising two blocks between El Segundo Boulevard and Grand Avenue, has been identified and recognized by the City (ESPR 2000q p.16).

An additional potentially historic site is the laydown area The Kramer site. It is an area that includes foundations from the early 1950's and will be used as a parking/laydown storage area for the project.

### *NATIVE AMERICAN CONTACTS*

The Native American Heritage Commission was contacted in October of 2000, and requested to provide any and all data pertaining to Native American sacred or religious sites within or near the project area. A subsequent request was made in November of 2000, when changes in the project description necessitated additional research. A response from the Native American Heritage Commission was received on November 17, 2000, stating that no known resources were identified in their Sacred Lands File.

Subsequently, local Native American representatives were contacted via certified mail. These individuals, identified through the Native American Heritage Commission's referral listings, were provided with a brief description of the project, maps identifying areas of impact, and were requested to provide any pertinent information regarding the project area. Three responses were received, one person indicated that a letter would be forthcoming. However, no letter has been received. There were two additional responses, one from a Gabrielino representative and one from a Chumash representative; both people expressed concern about ground disturbance in the area. The Chumash representative said that it was a good idea to include Native Americans during initial surveys because they often aided in identifying sites. He suggested that areas be resurveyed in the company of a Native American monitor. The Gabrielino representative expressed particular concern regarding two areas. No additional specific site data was provided (ESPR 2000g, p. J-5 to J-6 and Attachment C).

## IMPACTS

Impacts to cultural resources may result either directly or indirectly during the ground preparation, construction, and operation phases of a project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, excavation or other earth-moving activities. Direct impacts may include alteration of the surrounding built environment such that the significance of an historical resource would be materially impaired. Indirect impacts may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility. Since El Segundo is an area where many archaeological sites have previously been identified, cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the vicinity of the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are encountered during project development and construction activities. Although the existence of known cultural resources indicates further potential for unknown resources to be

encountered, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur. In addition, the potential for discovery does not measure the significance of individual artifacts or other cultural resources present, since it is impossible to accurately predict what specific materials could be encountered. Furthermore, sometimes the full significance of discovered cultural resources can only be determined after they have been collected, prepared, and studied by professional archaeologists and/or historians.

Project elements described in the **PROJECT DESCRIPTION** section of this Staff Assessment may have the potential to cause significant impacts to cultural resources.

## POTENTIAL FOR PROJECT IMPACTS

Because project-related site development and construction would entail ground disturbance, the proposed project has the potential to adversely affect previously unknown cultural resources. Four archaeological sites are known to be located within one-quarter mile of the project area (ESPR 2000g, pp. J-19 to J-20). Moreover, there are three historic properties and one historic district, all but one, identified as potentially significant within the vicinity of the project (ESPR 2000g p. J-24, ESPR 2000q, p.16). These sites include prehistoric and historic resources and represent a variety of resource types. The presence of previously identified sites, structures and features within the project vicinity indicates a potential for discovering previously unidentified resources.

### *POWER PLANT SITE*

The proposed power plant location yielded no physical evidence of cultural resources. Nonetheless, the location is associated with the Ballona Lagoon and Los Angeles River floodplain and, therefore, associated with the alluvial deposits from the eroding San Gabriel Mountains. There is a potential for buried deposits within this property. Units 1 and 2 and the existing tank farm will all be demolished. Removal of Units 1 and 2 may require excavation to a depth of 20 feet. The Units and the tank farm have been determined not to be eligible for recommendation to the CRHR by the consultant to the applicant (ESPR 2000a, Appendix K, p. 19) and staff concurs with that assessment. However, cultural resource monitoring during ground disturbance will be necessary to mitigate any potential impacts to previously undiscovered resources.

### *SANITARY DISCHARGE LINE*

There was no native soil visible along this pipeline. Ground disturbance in this area has the potential to unearth previously undiscovered cultural resources. Staff recommends cultural resources monitoring during ground disturbance on this pipeline (ESPR 2000g, p. J-23).

### *AQUEOUS AMMONIA PIPELINE*

No native soil was observed by the consultant to the applicant during surveys along this pipeline route. It does not appear that this short pipeline, extending primarily

through paved areas, will impact any cultural resources. However, there is a potential to encounter buried resources along this route (ESPR 2000g p. J-2). To mitigate for impacts to buried resources, staff recommends cultural resource monitoring during ground disturbance on this pipeline.

### *POTABLE WATER AND RECLAIMED WATER PIPELINES*

The various pipeline alternatives are located along existing road alignments. No new roads will be constructed and each alignment involves areas previously disturbed by urban developments. The proposed potable and reclaimed water pipelines will share a route. There are two historic properties and one historic district identified by the consultant to the applicant as potentially eligible for listing on the CRHR within the potential routes for these waterlines. The applicant is requesting approval of a route that will avoid these resources. This route extends along Grand Avenue to Eucalyptus to El Segundo Blvd (ESPR 2000v, p. soil 39). This route will avoid impacts to any of the significant cultural resources. However, given the presence of archaeological sites in the region and the size of the trench that will be needed to accommodate two separate lines, staff recommends monitoring ground disturbance along this pipeline.

### *STAGING AREAS/PARKING AREAS*

There are eight proposed staging and/or parking areas. Most of these areas are paved. One area, the Kramer Staging Area is the location of previous industrial activity and existing foundations attest to its previous use. It does not appear that the Kramer Staging Area would meet the requirements for listing on the CRHR. It also does not appear that project activity will damage the foundations. However, the AFC states that grading will occur at the Kramer and Federal Express Staging areas (ESPR 2000a, p. 5.4.3). It is possible that ground disturbance to these areas may yield buried cultural resources. To avoid potential impacts to undiscovered resources, staff recommends cultural resource monitoring during ground disturbance in these areas.

Moreover, since several of the identified sites within one quarter mile of the project are located in the vicinity of staging areas, ground disturbance or activity that requires use of an area that is not already paved should be monitored. Although no adverse impacts have been identified and none are expected due to the presence of sites in the vicinity of some of the staging areas, monitoring is warranted during ground disturbance.

### *NATURAL GAS LINE*

Natural gas will be delivered to the new units via existing pipelines. There will be no ground disturbance associated with the natural gas pipeline (ESPR 2000a, p. 1-3).

### *TRANSMISSION LINES*

Existing lines within the boundaries of the existing plant will be used for this project (ESPR 2000a, p. 1-6).

## CHARACTERIZATION OF IDENTIFIED RESOURCES

Laws identified in the LORS section of this document apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of impacts to the resources and the activities that may be required to mitigate any such impacts.

Under federal law, only historic or prehistoric sites, objects or features, or architectural resources that are evaluated by a qualified researcher as “important” or “significant’ in accordance with federal guidelines typically need to be considered during the planning process. The significance of historic and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4 or to the California Register of Historic Resources. If such resources are determined to be significant, and therefore eligible for listing in either of these registers, they are afforded certain considerations under the National Historic Preservation Act.

The National Register criteria state that “eligible historic properties” are: districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that

a. are associated with events that have made a significant contribution to the broad patterns of our history;
b. that are associated with the lives of persons significant in our past;
c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values;
d. that represent a significant distinguishable entity whose components may lack individual distinction; or
e. that have yielded or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria.

Isolated finds by definition do not meet these criteria.

Resources determined not to be significant under the NHPA, that is not eligible for Nation Register listing, are subject to recording and documentation only, and are afforded no further consideration. However, occasionally certain resources, although they may not be eligible for inclusion in the NRHP may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed NRHP significance. Staff evaluates any known resources located within or adjacent to the project APE to determine whether they meet these eligibility criteria.

A resource is considered to be “historically significant” and eligible for listing in the California Register of Historical Resources if it meets one of the following criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;

2. It is associated with the lives of persons important in our past;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;
4. It has yielded, or may be likely to yield, information important in prehistory or history [California Code of Regulations, Title 14, Section 15064.5(a)(3)].

The CEQA guidelines require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect "historical resources" and sets forth a listing of criteria for making this determination. As used in CEQA, the term "historical resources" includes any resource, regardless of age, as long as it meets these any of these criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a substantial adverse change in the significance of that historical resource, which the regulations define as a significant effect on the environment. California Code RegulationsTitle 14, Section 15064.5 offers the following guidance:

- A resource listed in, or determined to be eligible by, the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code Section 5024.1, Title 14 CCR, Section 4850 et seq.);
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant; or
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, science, economic, agricultural, educational, social, political, military or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If the criteria are met, the Energy Commission must evaluate whether the project will cause a substantial adverse change in the significance of that historical resource, which the regulations define as a significant effect on the environment.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC meet one or more of the criteria for being an historical resource.

CEQA establishes limitations on applicants' costs of mitigation for, and does not require discussion of, archeological resources that are not unique (Public Resources Code, section 21083.2). The statute also provides a definition of unique archeological resources. However, the CEQA Guidelines state that this prohibition does not apply when an archeological resource also meets the definition of an

historical resource (California Code of Regulations, Title 14, Section 15064.5). Because staff has determined that the impacts for which it is recommending mitigation do meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this Preliminary Staff Assessment.

## CUMULATIVE IMPACTS

The potential for cumulative impacts may be associated with the degree of prehistoric and historic sensitivity. The ESPR site would be located in an area where both historic properties and archaeological sites have previously been identified. Most of the area proposed for use by ESPR has already been disturbed by development. Therefore, cumulative impacts are not an issue at this time.

Proposed developments such as the ESPR power plant and its associated linear facilities in conjunction with other development projects would not alter the amount of land currently exposed to public access and/or the potential removal or damage to cultural resources. The combined effects of development may accelerate the potential for impacts to cultural resources, but not in this case.

## IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the El Segundo Power Redevelopment project is expected to be thirty years. If the plant is economically viable at the end of thirty years, it may continue to operate. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned, orderly closure that will occur when the plant becomes economically non-competitive (ESPR 2000a, p. 3.11-1).

## PLANNED CLOSURE

The anticipated lifetime of the project is expected to be thirty years. If economically feasible, that time might be extended (ESPR 2000a, p. 3.11-1). At the time of closure, all then-applicable LORS and local/regional plans will be identified and the closure plan will address compliance with those LORS and plans. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are more likely to depend upon the final location of project structures in relation to existing resources, upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no final conclusion can be drawn with respect to the impact of permanent facility closure on cultural resources. However, if closure plans are submitted and approved through the Energy Commission process, and there is compliance with all conditions of certification and LORS, there will be no impacts to cultural resources.

## TEMPORARY CLOSURE

According to the AFC, a temporary closure where there is no release of hazardous materials would necessitate the implementation of 24-hour security. A contingency

plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

## UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

## COMPLIANCE WITH APPLICABLE LORS

Staff's proposed conditions of certification would ensure compliance with applicable LORS.

## MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

## APPLICANT'S PROPOSED MITIGATION

As indicated in the AFC, the best mitigation measure is to avoid impacts. At this time, there are no identified adverse impacts to cultural resources. In general, and given the relative sensitivity for this area to yield buried deposits, archaeological monitoring will be required. Basically, this can be accomplished through coordination between the Project Archaeologist and the Project Engineer. Together they can identify the specific areas of concern and schedule adequate coverage by the archaeological monitor.

Prior to initiation of construction, the CRS and the Project Engineer will familiarize themselves with both historic and prehistoric cultural resources within the general area. To protect cultural resources and to minimize potential impacts, the Project Archaeologist and the Project Engineer must conduct a worker education meeting with Crew Supervisors and inform them of the locations of cultural resources, the nature of their marking on the ground, and their importance. This time can also be used to explain the reasons to protect resources, including both the importance of their information and their legal protections. Various instructions can be given to the Crew Supervisors addressing parking and driving in marked areas, collecting of artifacts, and reporting of materials when artifacts are encountered. A one or two page summery of monitoring actions, contacts, and personnel also could be distributed.

The following program is recommended:

- Avoidance

- Physical demarcation and Protection
- Crew Education
- Archaeological Monitoring
- Native American Monitoring
- Formal Compliance with CEQA Sections 15064.5 and 15126.4 (ESPR 2000g, p. 33 & 34).

## STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the associated filings. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the U.S. Secretary of the Interior's guidelines and incorporate the policies and guidelines of the cities of El Segundo, Manhattan Beach, and Los Angeles. The mitigation measures set forth in the conditions have been applied to previous projects before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts while allowing the timely completion of many projects throughout California.

Monitoring should occur within the proposed plant site and along the various linear alignments associated with all pipelines. No human remains have been identified within the project area. However, should such resources be identified, all requirements of Health and Safety Code, Section 7050.5 and Public Resources Code Sections 5097.98 and 5097.99 will be fulfilled.

In addition, staff recommends that cultural resource monitoring occur at all the staging and parking areas during any ground disturbance. A Native American monitor shall be retained as a member of the cultural resources team to be present during cultural resources monitoring in the vicinity of any previously identified sites or where there is a potential for encountering Native American artifacts.

## CONCLUSIONS AND RECOMMENDATION

## CONCLUSIONS

There are four previously identified prehistoric sites within one-quarter mile of the project area. The water pipeline route chosen by the applicant will avoid two historic properties and one historic district. These historic properties appear eligible for listing on the CRHR. The presence of these properties and of prehistoric sites in the vicinity of the project warrants caution during ground disturbance.

The presence of these previously identified cultural resources within one-quarter mile indicates that project construction could encounter potentially significant buried cultural resources. Cultural resources monitoring is recommended as a mitigation to protect undiscovered resources from impacts. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards, and no significant adverse impacts will occur.

## RECOMMENDATION

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

## PROPOSED CONDITIONS OF CERTIFICATION

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

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

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

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

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

   a) leading archaeological resource field surveys;

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

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

   d) preparing recovered materials for analysis and identification;

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

f) directing the analyses of mapped and recovered artifacts;

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

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

The statement of qualifications for the CRS shall include:

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

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

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

**Verification:** At least ninety days prior to the start of ground disturbance, the project owner shall submit the name and statement of qualifications of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

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

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

**CUl-2** Prior to the start of ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the cultural resources specialist and the CPM within five days. Maps shall show the location of all areas where surface disturbance may be associated with project-related access roads, and any other project components.

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

shall be submitted to the cultural resources specialist and the CPM within five days of the changes.

**CUL- 3** Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to sensitive cultural resources. Approval of the CRMMP, by the CPM, shall occur prior to any construction-related vegetation clearance or earth disturbing activities or project site preparation.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures.

a. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials.
b. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.
c. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
d. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
e. A discussion of any 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.
f. A discussion of the location(s) where monitoring of project construction activities is deemed necessary by the designated cultural resource specialist. Monitoring shall be conducted full time, during ground disturbance on the project site, linear alignments, and staging areas.
g. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all significant or diagnostic resources will be collected for analysis and eventual curation 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.

h. 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.
i. Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how they will be met. Also the name and phone number of the contact person at the institution shall be included.

**Verification:** At least sixty (60) days prior to the start of project construction related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

**CUL-4** Prior to the start of ground disturbance, the CRS shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and approval.

The training plan and all program components will be submitted to the CPM. The drafts of the training plan and the program components will be reviewed and approved. The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall include a lecture and a video, if a video is desired that will address the following topics: (1) applicable state and federal laws pertaining to cultural resources; (2) cultural materials that, upon discovery, will require notification of the construction supervisor, cultural resources monitor, and./or CRS; and (3) authority of the CRS, alternate CRS, or Cultural Resources Monitor(s) to halt or redirect construction activities that have the potential to affect cultural resources. The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall include the statement that the CRS, alternate CRS or cultural resources monitor has the authority to halt construction in the event of an unanticipated discovery. The employees shall be given a small durable Environmental Awareness Training Manual that includes all of the legal and procedural information necessary to fulfil the Conditions of Certification and contact names of the CRS and alternate CRS.

A form shall be developed as part of the cultural resources awareness program for the workers to sign that certifies (1) their completion of the environmental awareness training program, (2) their understanding of their responsibilities under the program, and (3) their comprehension of potential legal penalties that could be sought against them individually should they violate applicable laws.

The training program may be combined with other training programs prepared for biological resources, paleontological resources, hazardous materials, or any other areas of interest or concern.

**Verification:** At least sixty (60) days prior to the start of project related vegetation clearance, earth disturbing activities, or project site preparation, the project owner shall submit to the CPM for review and approval, the proposed employee training plan and its components (e.g. the script of the proposed video if one is proposed) and the name and resume of the individual(s) performing the training.

**CUL-5** Prior to the start of ground disturbance and throughout the project construction period for all new employees, the project owner shall ensure that the CRS or qualified individual(s) approved by the CPM provide the CPM-approved cultural resources training in-person to all project managers, construction supervisors, and workers. If a video or general environmental training is provided, then in-person training provided by the CRS or CPM approved trainer shall be provided for new employees at least every two weeks. If there is no video or general environmental training, then the in-person training shall be provided for new employees at least once a week. Tailgate sessions are acceptable. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Training at the project site may be discontinued after all ground disturbance at the site has concluded and the CRS has inspected the site and determined that no cultural resources will be impacted. Training shall continue for project personnel working in the vicinity of other project components including linears and landscaping until ground disturbance is concluded at these locations.

**Verification:** In each Monthly Compliance Report (MCR) after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided the CPM-approved cultural resources training and the set of reporting and work curtailment procedures to all workers.

After completion of all ground disturbance at the project site, if the project owner wishes to discontinue training at the project site, the project owner shall provide a letter to the CPM indicating that the CRS has inspected the project site and has determined that no cultural resources will be impacted by completion of the project.

**CUL-6** The CRS, alternate CRS and the Cultural Resources Monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered or if known resources may be impacted in a previously unanticipated manner.

If such resources are found, the halting or redirection of construction shall remain in effect until all of the following have occurred:

a. the CRS has notified the CPM and the project owner of the find and the work stoppage;

b. the CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and

c. any necessary data recovery and mitigation has been completed.

If data recovery or other mitigation measures are required, the CRS and/or the alternate CRS and cultural resource monitor(s), including Native American monitor(s), shall monitor these data recovery and mitigation measures, as needed.

For any cultural resource encountered, the project owner shall notify the CPM within 24 hours after the find.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

**Verification:** At least thirty days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS and Cultural Resources Monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find and stating that the CRS will notify the CPM and project owner within 24 hours after a find.

**CUL-7** Throughout the project site preparation and construction period, the project owner shall provide the CRS and the CPM with a current schedule of anticipated monthly project activity (presented on a week-by-week basis) The CRS shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

**Verification:** The project owner shall provide the CRS and the CPM with a week-by-week schedule of the upcoming construction activities, one month in advance. These advance schedules are to be provided to the CPM with the MCR.

**CUL-8** The CRS shall monitor ground disturbance during construction and demolition in the vicinity of the project site, pipelines and staging/parking areas to ensure there are no impacts to the undiscovered resources. In addition to the areas where cultural resource monitoring is required, the CRS, alternate CRS or CRS monitor(s) shall be present at times the CRS deems appropriate, during the construction and demolition phases of the project to monitor ground disturbance, during project construction, and at any other locations specified in the approved monitoring and mitigation plan.

**Verification:** During the construction and demolition phases of the project, and throughout the periods of ground disturbance, 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.

**CUL-9** Throughout the ground disturbance phase of the project, the CRS shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities.

The CRS may informally discuss the cultural resources monitoring and mitigation activities with Commission technical staff.

**Verification:** Throughout the project pre-construction and construction period, the project owner shall ensure that the daily log is available for periodic audit by the CPM. The weekly summary reports shall be included in the MCR.

**CUL-10** The project owner shall ensure that the CRS performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project. If artifacts are discovered, concerned Native Americans shall be included as consultants/monitors in all phases of data recovery, lab work, and plans for curation.

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

**CUL-11** After completion of the project, the project owner shall ensure that the CRS prepares a Cultural Resource Report (CRR) according to Archaeological Resource Management Reports (ARMR) Guidelines as recommended by the California Office of Historic Preservation. The project owner shall submit the report to the CPM for review and approval. The report shall be considered final upon approval by the CPM.

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

a. For all projects:

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

2. maps showing areas surveyed or tested;

3. description of any monitoring activities;

4. maps of any areas monitored; and

5. conclusions and recommendations.

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

1. site and isolated artifact records and maps;

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

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

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

Protocol:

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

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

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

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

**Verification:** After completion of the project, project owner shall ensure that the CRS completes the CRR within ninety days following completion of the analysis of the recovered cultural materials. Within seven days after completion of the report, the project owner shall submit the CRR to the CPM for review and approval.

**CUL-12** The project owner shall submit an original, an original-quality copy, and a computer disc copy (or other format to meet the repository's requirements), of the CPM-approved CRR to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO), the appropriate regional archaeological information center(s), If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the CRR to be sent to the curating repository, the SHPO, and the regional CHRIS shall include the following (based on the applicable scenario (a, b, or c) set forth in the previous condition:

a. originals or original-quality copies of all text;
b. originals of any topographic maps showing site and resource locations;
c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.
d. photographs of any cultural resource site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curation repository with a set of negatives for all of the photographs.

**Verification:** Within thirty days after receiving approval of the Cultural Resources Report, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO and the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation.

**CUL-13** Following the filing of the CPM-approved CRR with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

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

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

**CUL-14** Prior to the start of any ground disturbance, the project owner and the designated cultural resources specialist shall consult with Native American tribal representatives and retain a Native American monitor to be present during ground disturbance in areas where Native American artifacts may be discovered. The monitor(s) shall have traditional ties to the area that will be monitored. The monitor(s) shall be considered a member(s) of the cultural resource team and shall be present during the ground disturbing phases of the project whenever there is a possibility that Native American artifacts may be discovered.

**Verification:** At least fifteen days prior to the start of ground disturbance, the project owner shall provide the CPM with a notification, signed by the Native American retained as a monitor. The notification shall confirm that he/she has been retained for the purpose of cultural resource monitoring on the ESPR project. If efforts to obtain the services of qualified Native American monitor(s) prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

**CUL-15** If the water lines and associated pipelines are to be located anywhere but in an area originally defined as part of the proposed project, a cultural resource assessment shall be conducted prior to any ground disturbance. The cultural resource assessment shall consist of a records search and a pedestrian survey which gives equal emphasis to prehistoric and historic resources and an evaluation of significance. A Native American monitor from a group with historic ties to the affected area shall be retained as part of the cultural resources team during any surveys or subsurface investigation.

**Verification:** Ninety days prior to the start of any ground disturbance or project site preparation at the newly identified location of the waterlines and associated pipelines, the project owner shall submit the following for approval by the CPM: (1) The results of the records search and the results of the survey. (2) An evaluation, including site records, of all cultural resources within or adjacent to the project Area of Potential Effects. (3) The information shall also include the name and tribal affiliation of the Native American monitor.

## REFERENCES


ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000g – Cultural Resources – Section 5.7 and Appendix J Submitted to California Energy Commission on January 9, 2001.

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# HAZARDOUS MATERIALS MANAGEMENT

Testimony of Ramesh Sundareswaran

## INTRODUCTION

The purpose of this analysis is to determine if the proposed El Segundo Power Redevelopment Project (ESPR) will result in the potential for a significant impact on the public resulting from 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 thus employees, in exchange for compensation, accept a higher level of risk than would be acceptable for general public exposure. Workers are therefore not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials (see staff's **WORKER SAFETY AND FIRE PROTECTION** section).

According to available information furnished by the Applicant, a variety of hazardous materials are proposed for storage and use during the construction phase of the project and for routine plant operation and maintenance (O & M) following construction (ESPR 2000a). Gasoline, diesel, fuel oil, lubricants, solvents, adhesives, paint materials and welding gases are listed for use during construction. The O&M materials include but are not limited to aqueous ammonia, lubricating oils, sodium hypochlorite, hydrazine, hydrochloric acid, various gases and piped-in natural gas. The transportation and delivery of hazardous materials is routinely regulated and controlled by various federal and state laws, ordinances, regulations and standards. Analysis for the potential for impact associated with hazardous materials deliveries is addressed in staff's **TRAFFIC AND TRANSPORTATION** section.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

A framework, based on environmental laws, ordinances, regulations and standards (LORS), exists to reduce risks of accidents and routine hazards due to hazardous materials. The following generally 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 (SARA) Title III, section 301 and Clean Air Act, section 112 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 requirements of the Federal law are reflected in the California Health and Safety Code, section 25531 et seq. The rules include requirements for businesses to develop and implement risk management programs that incorporate three elements: a hazard assessment, a prevention program and an emergency response program and are commonly referred to as the US Environmental Protection Agency Risk Management Program (USEPA RMP).

## STATE

Title 19, Chapter 4.5 of the California Code of Regulations, as codified in California Health and Safety Code, commencing with section 25500 directs facility owners, storing or handling acutely hazardous materials in threshold quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the US 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) and is called the California Accidental Release Prevention Program (CalARP). The City of El Segundo Fire Department is designated as the local implementing agency under this program.

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. The program is called the California Occupational Safety & Health (Cal/OSHA) Process Safety Management (PSM).

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 AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC 1997).

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A

further discussion of these requirements is provided in the **FACILITY DESIGN** section of this document.

Various ordinances of the City of El Segundo contain provisions for the designation and disclosure of hazardous materials. These include and are not limited to ordinances 1088, 1264, 1280 and 1285.

## SETTING

## SITE AND VICINITY DESCRIPTION

The ESPR will be located at the existing El Segundo Generating Station (ESGS) situated at 301 Vista Del Mar in the City of El Segundo. The ESPR includes the demolition of existing power blocks of Units 1 and 2 and construction operation of a combined cycle power plant at the former locations of Units 1 and 2. The ESGS was built in 1955 and is located in a heavy industrial zone. Land use in the surrounding areas is predominantly industrial to the north, residential and commercial to the south, recreational to the west and industrial and public thoroughfare to the east. The nearest sensitive receptor is a school located more than 0.5 miles northeast of the ESGS. The closest residence is located approximately 1500 feet to the south of the ESGS.

## IMPACTS

Staff has identified three major types of hazards associated with the ESPR. These include the accidental release of ammonia, hydrazine vapor mishandling and fire and explosion from natural gas.

## AQUEOUS AMMONIA

The ESPR will utilize Selective Catalytic Reduction (SCR) to reduce combustion generated nitrogen oxide (NOx) emissions to comply with air permit requirements. Aqueous ammonia (29% ammonia and 71% water) will be used as a reactant within a catalyst to knock down the NOx to water vapor and nitrogen. The ammonia will be stored in a 20,000 gallon capacity double walled underground storage tank which is equipped with leak detectors, pressure relief valves and gauges for temperature and pressure. Deliveries of aqueous ammonia will be facilitated through a proposed pipeline from the neighboring Chevron facility. The pipeline will be designed and built in accordance with current engineering standards and requirements. Bulk of the pipeline will be aboveground with about 15% being located underground. The underground sections of the pipeline will be engineered to minimize corrosion effects. Valves and other measures will be utilized on the entire pipeline to prevent releases of ammonia. The ammonia will be trucked in should the pipeline be down for any reason.

Large accidental and continuos releases of ammonia culminating in potentially catastrophic outcomes to the public are possible through three main potential accident initiators for the ESPR. One of the initiating events is the failure of the

underground storage tank. The other two are the failures of the operating pipeline and that of the tanker truck during delivery respectively. 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 in parts per million (PPM). These include: 1) the lowest concentration posing a risk of lethality, 2,000 PPM; 2) the Immediately Dangerous to Life and Health level (IDLH) of 300 PPM; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 200 PPM, 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. If the exposure associated with a potential release would exceed 75 PPM at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

The ammonia underground storage tank is double walled with pressure relief valves and overlain by soil overburden. High operating pressures would not be used to store the aqueous ammonia in the tank. Consequently, any rupture or puncture of the tank would not be capable of blowing away the soil overburden resulting in large releases of ammonia. Instead, in the event of a release, the ammonia would enter the surrounding atmosphere with very little momentum and velocity. Risks to the public from such an accident would therefore be minimally low.

The other two ammonia accident scenarios were modeled and evaluated by the Applicant. The modeling was done in accordance with USEPA RMP and CalARP requirements. The modeling reflects a unique combination of wind direction speed, and atmospheric stability conditions. A 75-ppm impact area with a radius of approximately 1060 feet (0.2 miles) was determined for the pipeline release scenario and an impact area with a radius of approximately 2450 feet (0.5 miles) was forecast for the tanker truck scenario. Sections of Vista Del Mar Blvd and the public beach to the northeast fall within the 1060 feet impact area. The tanker truck scenario’s impact area extends to some of the residences to the south and portions of the Vista Del Mar and the public beach. The Applicant through a risk analysis has estimated the potentials for both scenarios. The analysis suggests that there is a chance of 0.0000063 of an accident involving an ammonia release due to a major release from the ammonia pipeline in any particular year. Similarly, the probability of a major ammonia release due to a tanker truck unloading accident is 0.000038 on an annual basis. It is assumed that the ammonia release stems from the failure of a hose due to operator error during the unloading/delivery.

Both scenarios appear rather remote for the following reasons. A worst case approach has been used for both scenarios. In a worst case environment, the greatest possible amount of the chemical is assumed to be released from a storage vessel or piping in a fast, rapid motion at the ground level. Active mitigation devices that need mechanical, human or other energy to manage releases must be assumed to have failed. Further, the weather conditions are assumed to be unique

and mild. The ammonia modeling for the ESPR is therefore not only conservative but also pessimistic thereby culminating in outcomes that are overstated.

The USEPA RMP, CalARP and Cal/OSHA PSM programs each individually list threshold-planning quantities for specific hazardous materials. Only materials that met certain toxicological, physical and accident criteria were identified and listed. If the quantity of a material on-site exceeds the threshold amount, the facility needs to implement chemical accident prevention and preparedness measures that may include a Risk Management Plan (RMP), pursuant to each regulation. The RMP is a detailed engineering analysis of the potential accident factors at a business and the mitigation measures that can be implemented to reduce accident potentials. Of the listed materials for the ESPR, aqueous ammonia will need to be managed in accordance with the requirements of the CalARP and USEPA RMP Programs, as the maximum amount of that chemical will be above each respective program's threshold. The ESGS site currently has chemical accident prevention and preparedness safeguards as required by CalARP and USEPA RMP programs, in place based on its consumption of aqueous ammonia, hydrogen, hydrochloric acid, cyclohexylamine and sulfuric acid. The ESPR however necessitates an increase in the consumption of aqueous ammonia, thereby prompting a revision of the existing safeguards and procedures to reflect that change pursuant to each applicable program. In addition, the ESGS 's current RMP will need to be revised and upgraded to reflect the increased ammonia usage

Those safety and hazard prevention practices that are already in place at the ESGS would further be incorporated into the ESPR. The Applicant has indicated that they have safety systems that add several layers of protection and defense between hazardous materials and the public as part of accident prevention. These include but are not limited to use of written plans and procedures for hazardous materials management, fire extinguishing and spill response equipment for emergencies and training programs for plant personnel in hazardous materials handling.

The slight chance or very low probability of occurrence of each individual scenario, as estimated, suggests that it is unlikely that such accidents would occur.

Additional safeguards and measures, as discussed in the Conditions of Certification, should supplement existing ones to greatly reduce the opportunity for, or extent of, public exposure to ammonia.

## HYDRAZINE

Hydrazine will be stored and used onsite for the ESPR as an oxygen scavenger in boiler water treatment. Its formulation will consist of 35% hydrazine and 65% water culminating in an approximate 4:1 solution of hydrazine in water. Unlike ammonia, which is only toxic, hydrazine is also corrosive and flammable in addition to being toxic. Though it will be stored and used in amounts less than the CalARP thresholds, hydrazine requires special storage and handling in order to avoid or minimize impacts from it's accidental release, given hydrazine's unique characteristics. The Applicant has indicated that passive mitigation in the form of secondary containment will be available to control any hydrazine release in the

storage area. This is important as the containment would reduce the size of the pooled hydrazine thereby resulting in a smaller vapor cloud. However, additional precautions for hydrazine storage and handling, as outlined in the Conditions of Certification, need to be considered in addition to those proposed by the Applicant in order to prudently reduce or eliminate any potential risks posed by hydrazine.

Alternatively, less hazardous and benign substitutes to hydrazine are available commercially. Use of these substitutes will virtually eliminate all potential risks associated with hydrazine. The Applicant has indicated that a feasibility study will be undertaken, during the project's detailed design phase, to evaluate substitution of hydrazine with a less hazardous alternative.

## NATURAL GAS

Natural gas, which will be used as a fuel by the ESPRP, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. No changes are expected to be needed to the existing piping network for the ESPRP. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices.

## CUMULATIVE IMPACTS

The facility as conditioned will not lead to any cumulative unmitigable impacts resulting in any significant risk of off-site impacts.

## FACILITY CLOSURE

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 which poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, City of El Segundo Fire 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 (O.E.S. 1990).

## MITIGATION

Staff, is of the opinion, that the conditions proposed by the Applicant, though prudent, need to be supplemented by additional precautions so as to preclude the potential for significant risk of public health impacts associated with accidental releases of hazardous materials.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSION

It is staff's determination that compliance with applicable LORS, proposed and existing safeguards, and additional conditions outlined below should greatly reduce the opportunity for, or extent of, exposure to hazardous materials for the public.

### RECOMMENDATION

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 any accidental hazardous material releases.

## PROPOSED CONDITIONS OF CERTIFICATION

**HAZ-1** The project owner shall not use any hazardous material not listed in Table 5.15-2( revised as of June 7, 2001) in the AFC or in greater quantities than those identified by chemical name in the revised Table 5.15-2, unless approved in advance by the CPM.

**Verification:** The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility in quantities that require disclosure under applicable City of El Segundo Fire Department ordinances.

**HAZ-2** The project owner shall provide an updated Business Plan.

**Verification:** At least 45 days prior to the startup of the ESPR Units 5, 6 and 7, the owner shall undertake a hazardous materials floor plan exercise with the City of El Segundo Fire Department and provide a copy of the revised Business Plan approved by the City of El Segundo Fire Department to the CPM.

**HAZ-3** The project owner shall revise the existing CalARP Program Risk Management Plan (RMP) and provide a copy to the CPM and City of El Segundo Fire Department for review. A final RMP shall then be prepared and furnished incorporating the comments of the CPM and the City of El Segundo Fire Department, if needed. Similarly, the project owner shall also revise its existing RMP pursuant to the USEPA RMP Program and submit it to USEPA for review. A copy of the same RMP shall also be furnished to the CPM and the City of El Segundo Fire Department at the time it is submitted to USEPA. The final copy of the RMP shall reflect recommendations of the CPM and the City of El Segundo Fire Department and be provided to both entities once accepted by USEPA.

**Verification:** At least 45 days prior to startup of Units 5,6 and 7, the project owner shall furnish an updated copy each of the appropriate RMP to the CPM for approval.

**HAZ-4** The project owner shall develop and implement an ammonia pipeline safety management and monitoring plan. The goal of the plan will be to prevent and control the accidental release of ammonia from the pipeline. As a minimum, the plan shall include discussions on the various safety devices selected for the pipeline, provisions for backup safety devices, protective shut-in actions, emergency support systems, monitoring programs and personnel training. The shut-in actions shall include responses to pipeline overpressures and also leaks, as a minimum.

**Verification:** At least 45 days prior to startup of Units 5,6 and 7, the project owner shall furnish a copy of the plan to the CPM for approval. A copy of the plan shall also be furnished to the City of El Segundo Fire Department for comments.

**HAZ-5** The project owner shall undertake a feasibility study for the substitution of the 35% hydrazine with a less hazardous chemical. Should the study conclude that substitution is infeasible, the project owner shall develop and prepare a safety management plan focussing on the storage and handling of the hydrazine and the associated protective equipment requirements, handling techniques, personnel training, spill response procedures, detectors and alarms, as a minimum.

**Verification:** At least 45 days prior to startup of Units 5,6 and 7, the project owner shall furnish a copy of either the feasibility study or the hydrazine storage and handling management plan, as appropriate, to the CPM for review and approval. A copy of the study or plan shall also be furnished to the City of El Segundo Fire Department for review.

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# LAND USE

Testimony of Michael Berman and Mark Hamblin

## INTRODUCTION

The El Segundo Power Redevelopment Project ("ESPR" or "project") involves the replacement or modernization of the existing 400 megawatt (MW) Units 1 and 2 at the existing El Segundo Generating Station with a 630 MW combined cycle power generating facility. El Segundo Power II LLC (herein referenced as "Applicant") proposes the project located within the City of El Segundo (City), County of Los Angeles, California.

Refer to **PROJECT DESCRIPTION** of the Staff Assessment (SA) for a more detailed discussion of the modernization activities.

The land use analysis for the ESPR focuses on two main issues: the project's consistency with 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 would be incompatible with existing and planned uses when it creates unmitigated noise, dust, public health hazard, nuisance, traffic, visual impacts. These areas are discussed in detail in their section of this SA.

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

## FEDERAL

### *FEDERAL AVIATION REGULATIONS (TITLE 14 CODE OF FEDERAL REGULATIONS, PART 77)*

The Federal Aviation Regulations (FAR) provide regulations and requirements for insuring the safe, efficient, and secure use of the Nation's airspace, by military as well as civil aviation, for promoting safety in air commerce, for encouraging and developing civil aeronautics, including new aviation technology, and for supporting the requirements of national defense.

FAR Section 77:"(a) Establishes standards for determining obstructions in navigable airspace; (b) Sets forth the requirements for notice to the Administrator of certain proposed construction or alteration; (c) Provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace; (d) Provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation; and (e) Provides for establishing antenna farm areas."

The proposed project is approximately 2.5 miles south of Los Angeles International Airport (LAX). Karen Mc Donald, Specialist, Airspace Branch of the FAA completed an aeronautical study of the project as required under FAR Part 77. The study revealed that the structure does not exceed obstruction standards and would not be

a hazard to air navigation provided the exhaust stacks are marked and/or lighted in accordance with FAA Advisory Circular 70/7460-1K, Obstruction Marking and Lighting. These regulations are designed to promote the safety of airport operations in the LAX airport area by defining a clear zone above which structures are seldom permitted to penetrate.

## STATE

### *CALIFORNIA COASTAL ACT OF 1976 (PUB. RESOURCES CODE §30000 ET SEQ.)*

The California Coastal Act establishes a comprehensive scheme to govern land use planning along the entire California coast. The Coastal Act sets forth general policies that govern the California Coastal Commission's review of permit applications and local plans (§30200 et seq.). Specific to energy facilities, the Coastal Act requires that the Coastal Commission designate specific locations within the coastal zone where the establishment of a thermal power plant subject to the Warren-Alquist Act could "prevent the achievement of the objectives" of the Coastal Act (§30413(b)). According to section 30500, each local government lying within the coastal zone is required to prepare a Local Coastal Program (LCP) for management of that portion of the coastal zone within its jurisdiction. Once the Coastal Commission certifies a LCP, the authority to issue coastal development permits for development within the coastal zone is delegated to the local jurisdiction (§30519(a)). Notwithstanding section 30519(a), section 30600(a) of the Coastal Act specifies that a proponent must obtain a coastal development permit for any development "other than a facility subject to the provisions of Section 25500" (such as a thermal power plant or related facility subject to the Warren-Alquist Act).

The City of El Segundo has an LCP certified by the Coastal Commission that includes the City of El Segundo Coastal Zone Specific Plan, Zoning Ordinance and Land Use Map.

The Coastal Act also requires the Coastal Commission to designate specific locations within the coastal zone where the establishment of a thermal power plant subject to the Warren-Alquist Act could prevent the achievement of the objectives of the Coastal Act (Section 30413 (b)). Under Section 30413 (b) it states

> "(b) The commission shall, prior to January 1, 1978, and after one or more public hearings, designate those specific locations within the coastal zone where the location of a facility as defined in Section 25110 would prevent the achievement of the objectives of this division; provided, however, that specific locations that are presently used for such facilities and reasonable expansion thereof shall not be so designated . . . The commission shall transmit a copy of its report prepared pursuant to this subdivision to the State Energy Resources Conservation and Development Commission".

Staff has reviewed the Coastal Commission's most recent designation (Re-adopted December 1985) of areas unsuitable for thermal power plants. Areas adjacent to the power plant site have been designated as suitable for future expansion of the El Segundo Power Plant project. The ESPR would be located entirely within the

existing 33 acre El Segundo Power Plant project site. Furthermore, the project is consistent with Coastal Commission policy that prefers onsite expansion of existing power plants to development of new power plants in currently undeveloped areas of the coastal zone.

### *WARREN-ALQUIST ACT (PUB. RESOURCES CODE § 25500 ET SEQ.)*

Pursuant to § 25120 of the Warren-Alquist Act, thermal power plants are defined as "any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of 50 MW or more, and any appurtenant facilities thereto." Per the Warren-Alquist Act, the California Energy Commission (Energy Commission) is the sole State permitting agency for the siting, development, alteration, or expansion of thermal power plants exceeding 50 MW, and the Energy Commission may pre-empt local land use requirements.

Per § 25500, the Energy Commission's authority is stated as "in accordance with the provisions of this division, the commission shall have the exclusive power to certify all sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. The issuance of a certificate by the [Energy] commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supercede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law."

The Warren-Alquist Act provides under "definitions" (Chapter 5.9, Article 1), the phrase "modification of an existing facility." This is defined as "any alteration, replacement, or improvement of equipment that results in a 50-megawatt or more increase in the electric generating capacity of an existing thermal power plant or an increase of 25 percent in the peak operating voltage or peak kilowatt capacity of an existing transmission line" (§ 25123).

Since the Applicant is altering, replacing and improving equipment that will result in the facility having an increased generating capability of greater than 50MW, the Applicant was required to file for a license from the California Energy Commission. The total increase in the generating capacity of the new facility over the old facility is 280 MW.

### *SUBDIVISION MAP ACT (PUB. RESOURCES CODE § 66410-66499.58)*

The goals of the Subdivision Map Act (Map Act) are to: (1) encourage orderly development at a local level by providing for the regulation and control of the design and improvement of a subdivision; (2) ensure that areas within a subdivision that are dedicated for public purposes are properly improved by the subdivider so that they do not become a burden to the community; and, (3) protect the public and individual transferees from fraud and exploitation. Subdivision is defined by statute as "the division, by any subdivider, of any unit or units of land of improved or unimproved land, or any portion thereof, shown on the latest equalized county [or city] assessment roll as a unit or as contiguous units, for the purpose of sale, lease, or financing, whether immediate or future" (Public Resource Code § 66424). The

Map Act provides for land divisions by the local jurisdictional authority, and requires each jurisdiction to adopt an ordinance regulating such divisions for which the Map Act requires a tentative and final parcel map.

The original ESPR property involved a number of underlying parcels compromising approximately 33 acres. The property was later lot line adjusted to create three parcels (Parcel 1 – 2.25 ac., Parcel 2 – 9.0 ac., Parcel 3 – 24.7) by then applicant Southern California Edison Company (SCE). The Certificate of Compliance was signed by the Director of the City of El Segundo Planning and Building Safety on December 23, 1997 and recorded at the Los Angeles County Recorder's Office on December 23, 1997, identified as Document No. 97-2012822.

The Applicant purchased Parcel 3 from SCE in 1998. SCE will continue to maintain ownership of Parcel 1, which contains the switching yard. Parcel 2 is currently owned by SCE and contains 2 oil storage tanks. Parcel 2 is under negotiation for purchase by the Applicant.

## LOCAL

Staff reviewed various local land-use planning documents relevant to the ESPR. A discussion of the project's conformity with applicable goals, policies, standards and regulations from each of these planning documents can be found in the subsection entitled **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS** (LORS).

### *EL SEGUNDO GENERAL PLAN*

The City of El Segundo General Plan was updated in 1992. It contains an evaluation of existing conditions and provides long-term goals and policies necessary to guide development in the direction of fulfilling the city's vision for the future.

### *EL SEGUNDO LOCAL COASTAL PROGRAM*

The City of El Segundo Local Coastal Program (LCP) was certified in July 1980. The LCP is El Segundo's land use plan, zoning ordinance, and zoning district map for the coastal zone where the project is proposed. The coastal zone within the City's jurisdiction is defined as a narrow strip of land approximately 200 yards wide and 0.8 miles long and includes the existing power plant site. In this area, the City of El Segundo certified LCP supercedes the City's General Plan Land Use Element land use designations and policies.

### *EL SEGUNDO ZONING ORDINANCE*

The City of El Segundo Zoning Ordinance provides detailed standards that regulate land uses. These regulations were adopted in 1993 and were last amended in March 1998.

### *MANHATTAN BEACH GENERAL PLAN*

The City of Manhattan Beach General Plan was adopted in February 1988. The Land Use Element describes the City's policies for the project area that are

designed to permit and protect the multi-family uses that exist in the area, as well as commercial uses to the south.

### *MANHATTAN BEACH LOCAL COASTAL PROGRAM*

The City of Manhattan Beach has an LCP Phase III Implementation Program that was certified by the Coastal Commission on May 24, 1994, and was last amended on October 7, 1997. The LCP describes allowed land use and regulations for the coastal land within the City of Manhattan Beach's jurisdiction.

### *MANHATTAN BEACH MUNICIPAL CODE*

The City of Manhattan Beach Municipal Code Zoning Regulations provides detailed regulations that are applicable to land uses proposed in the City. The Zoning Ordinance was adopted in June 1941 and last amended on June 6, 2000.

### *CITY OF LOS ANGELES GENERAL PLAN*

The Westchester/Playa Del Rey Community Plan provides the Land Use Element for the Playa Del Rey area of the City of Los Angeles. This document was adopted in 1974 and was last amended in 2001. However, the document does not provide policies applicable for the Applicant's proposed installation of water pipelines in the City of Los Angeles's public right-of-way.

### *CITY OF LOS ANGELES MUNICIPAL CODE*

The City of Los Angeles zone regulations (City of Los Angeles Municipal Code Section 12.20.) applies to the area where the water pipeline is proposed in the City of Los Angeles. However, the document does not provide regulations related to construction and operation of a water pipeline within the public right-of-way.

## SETTING

The ESPR site is located in the City of El Segundo within the Los Angeles urban area at 301 Vista Del Mar. El Segundo is approximately 20 miles from Los Angeles downtown area, and the project site is approximately 2.5 miles south of Los Angeles International Airport. The power plant is located on the approximately 0.8 miles of coastline within the City of El Segundo. The site is bounded by Vista Del Mar in the east (and the Chevron refinery east of Vista Del Mar); Santa Monica Bay beaches to the west, 45th Street in the City of Manhattan Beach in the south, and the Chevron Marine Terminal to the north.

North of the project site is a portion of the City of Los Angeles that contains industrial development (the Hyperion Sewage Treatment Plant), beyond that is the Los Angeles International Airport, which is also within the City of Los Angeles. Northeast, east and southeast of the project site is the City of El Segundo. Residential uses, open space, and commercial uses are located to the northeast along the proposed water supply line route. East of the project site are various heavy industrial uses. The Chevron Refinery lies to the east and southeast of the project site. South of the project site are residential uses located within the City of Manhattan Beach.

The site is on the edge of Santa Monica Bay. Bicycle path and beaches used for recreational purposes are located immediately west of the site. Several parking lots to the north and south of the project area are used for coastal access.

## SITE AND VICINITY DESCRIPTION

The existing El Segundo Generating Station (constructed by Southern California Edison and in operation since 1955) contains four power block gas-fired conventional generating units. Two storage tanks are located on the south portion of the site. A Southern California Edison substation is located adjacent to the project site and is connected to the regional electrical transmission grid. The site is located west of Vista Del Mar, which is located at a higher elevation than the power plant which is located in a minor depression.

Residential uses are located to the south of the project site. **LAND USE Figure 1** depicts the existing residential uses within one mile of the project site. A retail gas station is located on a one-acre site to the southeast of the project site. **LAND USE Figure 1** depicts the existing commercial uses within one mile of the project site.

Industrial uses are located north of the project site within the City of Los Angeles and east of the project site within the City of El Segundo. **LAND USE Figure 1** depicts the existing industrial uses within one mile of the project site.

Parks and open space are located along the coast west of the project site. **LAND USE Figure 1** depicts the existing open space and park uses within one mile of the project site. No agricultural uses are located within a mile of the project site.

The proposed project does not interfere with the public's right of access to the coast. Currently, there exists public access from the nearest public roadway to the beach/shoreline and along the coast. 45$^{th}$ Street, which borders the power plant property, provides direct beach access. Also, there is existing coastal access available by means of a bicycle path that runs along the beachfront (westerly) side of the power plant property. The path links access areas to the north and to the south of the project site into Manhattan Beach.

The Applicant in their "Proposed New Conditions of Certification" presented in the Response To Data Requests dated May 4, 2001 has proposed a donation of 1.2 acres of land for increased public access in the form of a public access easement **LAND-2**. The City of El Segundo has requested dedication of approximately 7 acres for public access to beach areas, which coincides with Parcel 2 of the 33-acre power plant property.

The applicant has proposed using parking lots that provide beach access for lay down during construction. The project construction lay down or construction crew use of parking would temporarily reduce beach access during construction in those areas where lots are used for coastal access. The proposed parking would be at Dockweiler State Beach, Hyperion, and Grand Avenue parking lots (see Figure 3.2-1 of the Application for Certification (AFC)). The Los Angeles Department of Beaches and Harbors operates the parking lots subject to Coastal Commission

oversight. The Los Angeles Department of Beaches and Harbors would review any application by the El Segundo Power Plant operators to use the parking lots for construction parking and would not allow that use to interfere with public access to the beach (Personal communication Mr. Joe Chesler, Los Angeles Department of Beaches and Harbors). No significant reduction in beach access associated with project construction parking is anticipated because adequate parking is available for public use at the parking lots. Also, the Los Angeles Department of Beaches and Harbors would not allow an agreement for use of the parking lot if it would jeopardize public beach access.

Construction of the sewer line from the intersection of 45th Street and The Strand to the project site has the potential to limit beach access at the Strand parking lot in Manhattan Beach, because the parking lot entrance is narrow and trenching/ excavations would be in an area that could block access. Reduction in access would be temporary and would be reduced if construction of this sewer facility connection occurred in the off-peak recreational season, specifically on a weekday. However, there would be sufficient room in the parking lot driveway for a single lane to be kept open at all times during construction, ensuring that this impact would be less than significant. Condition of Certification **LAND-1** is recommended to ensure that the proposed project does not result in a significant reduction in coastal access. See the **TRAFFIC AND TRANSPORTATION** section for additional discussion of this parking access issue.

## WASTEWATER AND SEWER PIPELINE ROUTE DESCRIPTION

Residential uses are located in the City of El Segundo in the vicinity of the proposed water lines along Grand Avenue north of the project site. Residential uses are also located south of the project site in the City of Manhattan Beach in the area of a proposed sewer line connection. Commercial uses are located northeast of the project site along El Segundo Boulevard, Main Street, and Grand Avenue where the proposed water supply line route is proposed. Industrial uses are located north of the project site within the City of Los Angeles along Grand Avenue and north and east of the project site within the City of El Segundo. Parks and open space are located to the northeast of the water pipeline area in El Segundo, and southeast of the site in Manhattan Beach.

# INSERT FIGURE 1

## IMPACTS

According to Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), a project may have a significant effect on land use if a proposed project would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- Disrupt or divide the physical arrangement of an established community.
- Convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use.

A project may also have a significant impact on land use if it would create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it precludes or unduly restricts existing or planned future uses.

## COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the Commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience or necessity."

When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (Public Resources Code, Section 25523(d)(1)). The laws, ordinances, regulations, and standards (LORS) and policies applicable to the project have been analyzed below.

## CITY OF EL SEGUNDO

### *GENERAL PLAN*

The El Segundo General Plan Land Use Element identifies the land use designation for portions of the City outside of the coastal zone. **LAND USE Figure 2** depicts the location of General Plan land use designations for the area. The project site is designated "Heavy Industrial" by the General Plan's Land Use Element. This land use designation would allow construction of a power plant. However, the Local Coastal Program designation supercedes the General Plan land use designation and is discussed below.

The El Segundo General Plan restricts the floor area ratio (FAR) for “Heavy Industrial” areas to 0.6. The project would result in a FAR of less than 0.2 (5.5 acres within 32.8 fenced acres), and is therefore consistent with this requirement.

# INSERT FIGURE 2

### *LOCAL COASTAL PROGRAM*

The Local Coastal Program land use designation for the project site is "Power Plant". The proposed power plant is an allowed use in this designation and this use is therefore consistent with the Local Coastal Program.

The Local Coastal program specifies that modifications to existing facilities shall be subject to the requirements of the M2 Zoning District. Permitted uses in the M2 Zone "shall not be objectionable by reason of noise, odor, dust, smoke, mud, vibration, refuse, or other similar causes." (Section 20.42.030 (3) El Segundo Zoning Ordinance). See the **NOISE**, **AIR QUALITY**, and **PUBLIC HEALTH** sections of the SA for further discussion on these issues. Project impacts in these areas would be less-than-significant after mitigation measures have been implemented.

### *ZONING*

The "M2" Zoning District identifies steam electric generating stations as a permitted use. The proposed project is therefore consistent with the use requirements of the El Segundo Zoning Ordinance. Front and side yard setbacks are required only when a precise plan, variance, or conditional use permit is required. The proposed project is not required by a precise plan, variance or conditional use permit to have a front or side yard setback.

Title 20-Zoning Chapter 20.41 Heavy Industrial (M2) Zoning District Section 20.41.060(c) Height states that buildings and structures shall not exceed a height of 200 feet. Exhaust stacks are subject to Title 20-Zoning Chapter 20.12 Chapter 20.12 General Provisions Section 20.12.030 Exceptions to Building Height, which states chimneys and smokestacks may be erected above the 200 feet height limit. Therefore, the 250-foot high exhaust stacks and the buildings proposed by the applicant would be consistent with the zoning district height requirements.

An encroachment permit from the City Public Works Department is required for construction of the water and reclaimed water lines within the public-right-of-way. Liability insurance and a fee may also be required. The construction of a potable water line and a reclaimed water line would be required to comply with health regulations that stipulate physical separation between these pipelines. A utility search to identify the location of existing utilities in the right-of-way is necessary to ensure that these facilities are not disrupted by the construction of the new facilities.

## CITY OF LOS ANGELES

### *GENERAL PLAN*

The City of Los Angeles General Plan designates the area around Grand Avenue as "Heavy Industrial". The Westchester-Playa Del Rey Community Plans (a portion of the Los Angeles General Plan) do not provide any policies, regulations or standards related to construction of water lines within the public right-of-way.

### *ZONING*

The City of Los Angeles Zoning Code does not contain any regulations related to construction of water lines. The West Los Angeles Bureau of Engineering requires an Excavation Permit and may require a bond, insurance, and fees. The Bureau may also require their inspectors to review the work performed. The construction of a potable water line and a reclaimed water line is required to comply with health regulations requiring physical separation between these pipelines. A utility search to identify the location of existing utilities in the right-of-way would be necessary to ensure that these facilities are not disrupted by the construction of the new facilities.

## CITY OF MANHATTAN BEACH

### *GENERAL PLAN*

The City of Manhattan Beach General Plan does not provide any policies relevant to construction of a sewer line within the public right-of-way.

### *ZONING*

The City of Manhattan Beach Zoning Ordinance does not provide any regulations relevant to construction of a sewer line within the public right-of-way. The City expressed concern that construction of the sewer line would reduce access to the parking lot on the beach. As a result the applicant has agreed to plate the trenching/excavation to keep the access open or to bore the line to the manhole.

## COMPATIBILITY WITH EXISTING AND PLANNED LAND USE

The proposed power plant improvements would be constructed on the site of an existing power plant facility. **LAND USE Figure 3** depicts the location of existing land uses for the area. The proposed power plant facility is compatible with the existing power plant use and with recreational uses along the trail and cycle path to the west. The proposed project is also consistent with existing heavy industrial and energy uses to the north and east of the project site. The project development is sufficiently distant from residential uses to the south and is separated from these residential uses by the power plant. The project is therefore consistent with those residential uses. Potential noise issues are discussed in the section on **NOISE**.

Linear facilities including the water, reclaimed water, ammonia, and sewage lines are all compatible with uses in close proximity to those lines. The water and wastewater supply lines would be constructed in existing roadway right-of-way located in commercial, residential, and heavy industrial areas. The ammonia pipeline would be constructed on private property within heavy industrial areas. These pipelines would be constructed according to local engineering requirements and would be buried under the pavement after construction. During construction, there may be some temporary reduction in access where pipelines are to be constructed in the public-right-of-way. See the **TRAFFIC AND TRANSPORTATION** section of this report for additional discussion of this issue. After construction, the land use impacts of the project's linear features would be less than significant because the pipelines would be buried and would not interfere with normal use of adjacent uses.

# INSERT FIGURE 3

## CUMULATIVE IMPACTS

Cumulative land use impacts may occur when a project would have effects that are individually limited but cumulatively considerable when viewed together with effects of related projects.

The proposed project does not require a general plan amendment. The proposed project would therefore not contribute to cumulative impacts from past land uses, land uses currently being proposed, and those that are anticipated to be proposed in the future.

## DISPROPORTIONATE IMPACT

Staff follows the U.S. Environmental Protection Agency's guidance in conducting a two-step analysis to determine whether the proposed project would have a disproportionately high and adverse effect on the health or environment of minority and low-income populations. The analysis assesses whether the potentially affected community has a population that is more than 50 percent minority and/or low income, or has a minority or low-income population percentage that is meaningfully greater than the percent of minority or low-income persons in the general population, or other appropriate unit of geographic analysis. The analysis also assesses whether the environmental impacts are likely to fall disproportionately on the minority and/or low income population.

With regard to Land Use, the staff analysis has concluded that the project would not disrupt an existing community, and would not conflict with existing or planned land uses. The affected area for this analysis included land areas within a one-mile radius of the project, and within one-quarter mile of any electrical or gas transmission route.

The project impacts for Land Use, discussed in this portion of the staff assessment, would tend to decrease as the area under review is further removed from the actual project site. The General Plan and Zoning Ordinances of the respective cities apply only within their jurisdictional boundaries. The six-mile radius study area for disproportionate impact is further removed from the municipalities in which the project site or linear facilities are located. Staff has identified no evidence that locating the project at the proposed location would have an impact on the land use of areas within one mile of the site. Additionally, staff concluded that no land use impacts would occur within the six-mile radius area. No impacts for Land Use have been identified that would fall disproportionately on a minority and/or low income population.

## FACILITY CLOSURE

At some point in the future, the project will cease operation and will close down. At that time it will 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 information provided in the AFC did not specifically address the effects of project closure on land use issues and concerns. The proposed ESPR is expected to be in operation for 30 years (AFC Page 3.11-1). The project owner will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval at least 12 months prior to the proposed closure. At the time of closure, all applicable LORS would be identified and the closure plan would address how these LORS would be complied with.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure, and unexpected permanent closure. In the event of temporary facility closure, staff has not identified any LORS from a land use perspective with which the project owner would have to comply. In the event of unexpected permanent closure and dismantling of the facility, staff has not identified any LORS from a land use perspective with which the project owner would have to comply.

## MITIGATION

Staff's proposed conditions of certification would ensure that the ESPR would comply with the Warren-Alquist Act, City of El Segundo General Plan, Local Coastal Plan and Zoning regulations, City of Los Angeles General Plan, and the City of Manhattan Beach General Plan and zoning provisions.

## COMPLIANCE AND RECOMMENDATIONS

## CONCLUSIONS

The ESPR maintains the character of the City and its land use resources because:

- the project is compatible with the heavy industrial character of the site;
- the project would not disrupt or divide the physical arrangement of an established community;
- the project would not preclude or unduly restrict existing or planned land uses; and
- with mitigation, operation of the project would not cause any significant noise, dust, public health, traffic, or visual impacts to nearby land uses, nor would the operation of the ESPR contribute substantially to any cumulative land use impacts.

### *CITY OF EL SEGUNDO*

The proposed project is consistent with the applicable LORS in the City of El Segundo.

### *CITY OF LOS ANGELES*

The proposed project is consistent with the applicable LORS in the City of Los Angeles.

### *CITY OF MANHATTAN BEACH*

The proposed project is consistent with the applicable LORS in the City of Manhattan Beach. The proposed project could result in a temporary construction related reduction in coastal access at the beach parking lot on 45th Avenue. This impact can be reduced to a less-than-significant level by ensuring that any disruptions to traffic entering the parking lot would not reduce access to the beach. Use of steel plates to cover trenches or use of boring under the roadway would achieve this.

## RECOMMENDATIONS

If the Energy Commission certifies the ESPR project, staff recommends that the Commission adopt the following conditions of certification.

## PROPOSED CONDITIONS OF CERTIFICATION

**LAND-1** The project owner shall either bore the proposed sewer line under 45th Avenue in the City of Manhattan Beach or use conventional excavation techniques using steel cover plates to allow traffic to have access to the Grand Avenue parking lot at all times. The time period necessary to complete the 45th Avenue sewer excavation/trenching and connection shall be kept to a minimum.

**Verification:** The project owner shall submit written notification to the City of Manhattan Beach Public Works Department for review and the California Energy Commission's Compliance Project Manager (CPM) for review and approval, at least 15 days prior to any ground disturbance within the 45th Avenue right-of-way, providing a plan describing the method that would be used to complete any excavations in 45th Avenue. The plan shall indicate the proposed time to begin and complete the sewer line connection. The plan shall illustrate how the construction crew and traffic control will ensure that access to the parking lot is not disrupted. The project owner shall monitor the construction of the sewer line in the 45th Avenue right-of-way at all times and promptly notify the City of Manhattan Beach Public Works Department and CPM of any difficulties experienced. The CPM or City of Manhattan Beach designated representative may conduct random site visits to verify compliance and may temporarily stop construction to ensure access is maintained.

**LAND-2** The project owner shall provide not less than 1.2 acres of land to be established for public use subject to the approval of the California Energy Commission. Said land shall be covered under an easement designating it for public use. Said land shall be maintained by the project owner and shall be available for public access and use, subject to restrictions required for security and public safety. The project owner may dedicate such public use land to any local agency agreeing to operate or maintain it for the benefit of the public. If no local agency agrees to operate or maintain said land for the benefit of the public, the project owner may dedicate the land to the State.

**Verification:** The project owner shall provide to the CPM a copy of the recorded grant deed and public use easement on the land approved by the Energy Commission prior to the start of power generation by the new facility.

**LAND-3** Prior to the issuance of building or grading permits, the project owner shall submit a detailed site development plan for the project to the Director of the City of El Segundo Community Economic and Development Service Department for review and comment and to the CPM for review and approval. The project owner shall provide a letter from the City of El Segundo Community Economic and Development Service Department stating that the detailed site development plan is consistent with the City of El Segundo General Plan, Local Coastal Plan, and Zoning Ordinance.

Protocol: The project owner shall submit to the CPM for review and approval a detailed site development plan, including support facilities and a landscaping plan. The project owner shall submit a letter from the Director of the City of El Segundo Community Economic and Development Service Department stating that the site development plan conforms to the City of El Segundo Zoning Code. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan. Landscaping shall not be planted before the plan is approved. The project owner shall notify the CPM when the landscaping has been planted and is ready for inspection.

**Verification:** At least 60 days prior to the start of any ground disturbance related to construction, the project owner shall submit a detailed site development plan including support facilities, a landscape plan and a copy of the signed letter of comment from the Director of the City of El Segundo Community Economic and Development Service Department to the CPM for approval. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall notify the CPM within seven days after landscaping is planted that the landscaping is ready for inspection.

**LAND-4** The project owner shall provide the Director of the City of El Segundo Community Economic and Development Service Department for review and comment and the CPM for review and approval: (1) descriptions of the final lay down/staging areas identified for construction of the project, including (a) Assessor's Parcel numbers; (b) addresses; (c) land use designations; (d) zoning; (e) site plan showing dimensions; (f) owner's name and address (if leased); and, (g) duration of lease (if leased); and, if a discretionary permit was required; (2) copies of all discretionary and/or administrative permits necessary for site use as lay down/staging areas.

**Verification:** At least 30 days prior to the start of any ground disturbance related to construction, the project owner shall provide to the Director of the City of El

Segundo Community Economic and Development Service Department for review and comment and the CPM for review and approval all project-related documentation, as specified above, for the project's construction lay down and staging areas.

**LAND-5** The project owner shall mark and/or light the project's new exhaust stacks in accordance with FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting, Chapters 3, 5, and 12.

Protocol: The project owner shall complete FAA Form 7640-2, Notice of Actual Construction or Alteration. Said Form shall be completed and returned to the FAA Western/Pacific Region office at least 10 days prior to the construction and also within 5 days after construction reaches its greatest height. This requirement shall also be applied if at any time the project is abandon.

**Verification:** At least 30 days prior to start of commercial operation, the project owner shall submit proof that the project's stacks have been marked and/or lighted in accordance with FAA regulations and requirements.

**LAND-6** Any future land-use proposed on Parcel 2 (the current oil tank storage property) shall be submitted to the Director of the City of El Segundo Community Economic and Development Service Department for a consistency review with the City of El Segundo General Plan, Local Coastal Plan and Zoning Ordinance, and for the approval of the specific project and issuance of a local government development permit (e.g. grading permit, building permit, etc.), except activities subject to the provisions of the Warren-Alquist Act (e.g. expansion or modification of 50 megawatts and greater to the existing power plant, etc.). The project owner shall inform the City of Manhattan Beach Planning Department of any future land-use proposed on Parcel 2 prior to the City of El Segundo's issuance of a development permit.

**Verification:** A project owner proposing a land use on Parcel 2 shall submit a detailed site development plan/information as required to the Director of the City of El Segundo Community Economic and Development Service Department for review and approval. A copy of the issued City of El Segundo's development permit shall be provided to the CPM prior to construction of the City approved project.

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# NOISE AND VIBRATION

Testimony of Jim Buntin

## INTRODUCTION

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 the 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 operation or of construction practices, such as pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the El Segundo Power Redevelopment Project (00-AFC-14), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

### FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. 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.

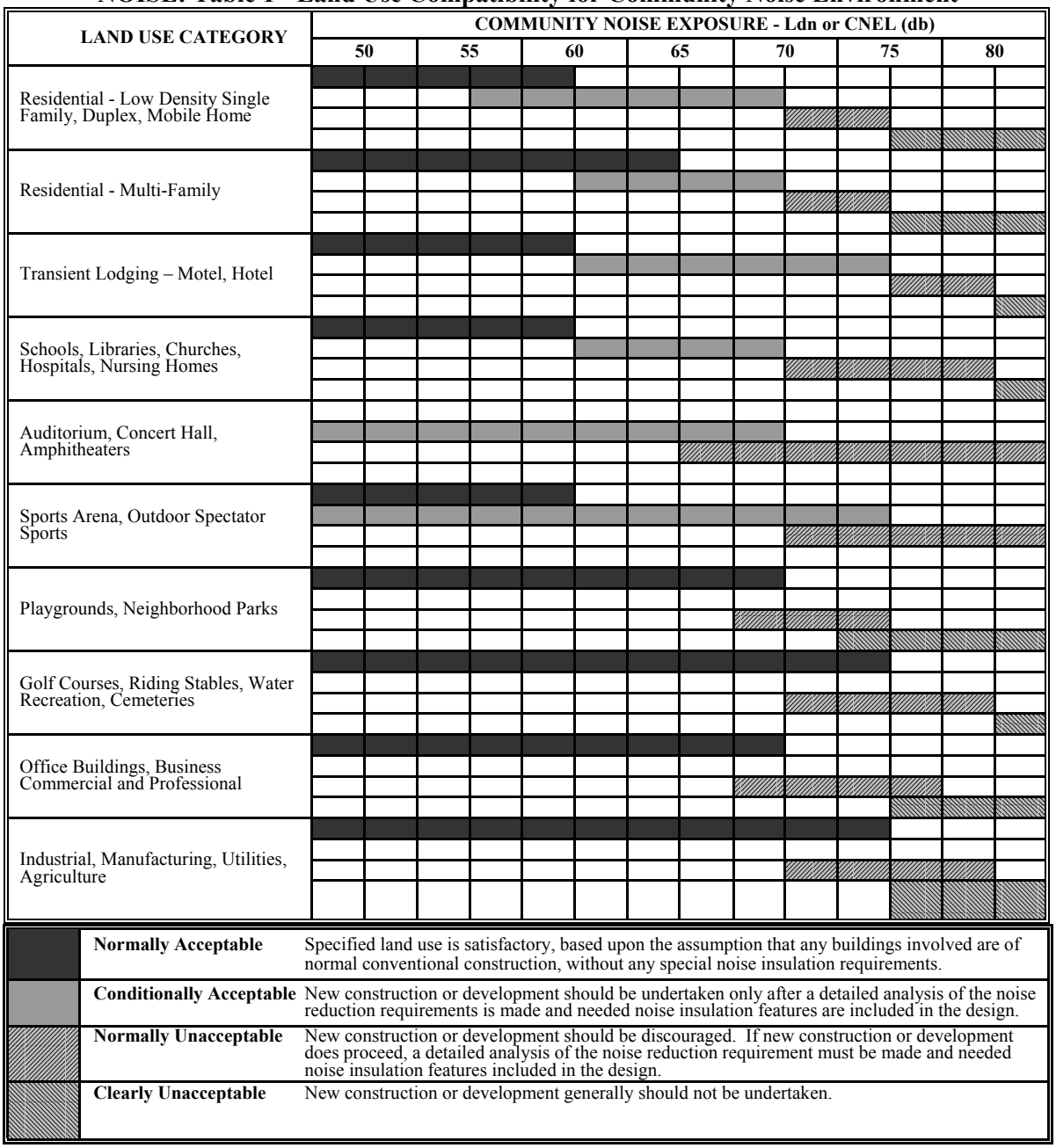
There are no federal laws governing off-site (community) noise.

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 government entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in **NOISE: Table 1**.

**NOISE: Table 1 - Land Use Compatibility for Community Noise Environment**




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 "pure tone" which can be used to determine whether a noise source contains significant pure tone components. The Model Community Noise Control Ordinance states that a pure tone exists 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. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by 5 dBA.

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

### *CALIFORNIA ENVIRONMENTAL QUALITY ACT*

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

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

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

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

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

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

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

### *EL SEGUNDO MUNICIPAL CODE*

The City of El Segundo has adopted a noise control ordinance as part of the City Municipal Code, Chapter 9.06. The noise ordinance prohibits the creation of noise within the City which causes the noise level when measured at the receptor to exceed 5 dBA above the ambient noise level (for residential property) or 8 dBA above the ambient noise level (for industrial property). If the receptor property is located on a boundary between two different noise zones, the lower noise level standard applicable to the quieter zone shall apply.

Increases to the noise standards may be permitted as shown by **NOISE: Table 1**.

**Noise: Table 1 – El Segundo Municipal Code Noise Level Adjustments**

| Permitted Increase, dBA | Duration of Increase (minutes)* |
|---|---|
| 0 | 30 |
| 5 | 15 |
| 10 | 5 |
| 15 | 1 |
| 20 | Less than 1 |
| * Cumulative minutes during any one hour | |

The City noise standard is therefore based upon the ambient $L_{50}$, or median, noise level. The above noise standards are applied at any point on the receptor property.

Noise due to construction is exempted from the noise standards during the hours of 7:00 a.m. and 6:00 p.m., Monday through Saturday, provided that the noise level does not exceed 65 dBA plus the limits shown by **NOISE: Table 1** as measured on the receptor residential property line, and provided that any vibration created does not endanger the public health, welfare and safety.

The El Segundo Municipal Code prohibits creation of vibration which is perceptible without use of instruments to any reasonable person of normal sensitivity at any point on any affected property.

Since these El Segundo Municipal Code sections regulate noise produced in the City limits, these standards are the primary local noise regulations affecting this project.

### *MANHATTAN BEACH MUNICIPAL CODE*

The City of Manhattan Beach has adopted a noise control ordinance as part of the City Municipal Code, Chapter 5.48. The noise ordinance prohibits the creation of noise within the City which causes the noise level when measured at any residential property to exceed the noise standards shown by **NOISE: Table 2**.

**Noise: Table 2 – Manhattan Beach Municipal Code Residential Noise Standards**

| Descriptor | Allowable Noise Level, dBA | |
|---|---|---|
| | 7:00 a.m. to 10:00 p.m. | 10:00 p.m. to 7 :00 a.m. |
| $L_{50}$ (30 minutes/hour) | 50 | 45 |
| $L_{25}$ (15 minutes/hour) | 55 | 50 |
| $L_8$ (5 minutes/hour) | 60 | 55 |
| $L_2$ (1 minute/hour) | 65 | 60 |
| $L_0$ (maximum) | 70 | 65 |
| $L_{eq}$ (equivalent) | 55 | 50 |

If the measurement location is on a boundary between two different land uses, the noise level limit for the more restrictive land use classification, plus 5 dBA, applies. For any source of noise that emits a pure tone or contains impulsive noise, the noise standards are reduced by 5 dBA. If the ambient noise level exceeds any of the levels stated above, the ambient noise level becomes the noise standard.

Section 5.48.060 of the Manhattan Beach Municipal Code states that: "All construction activity shall be prohibited, except between the hours:

7:30 a.m. and 6:00 p.m. Mondays through Friday
9:00 a.m. and 6:00 p.m. Saturdays"

Since the noise associated with the project is produced in the City of El Segundo, the Manhattan Beach Municipal Code noise standards do not apply to the project, but, as a practical matter, they are relevant to the determination of whether project-related noise will have a significant effect on noise sensitive land uses.

The major differences between the noise standards of the cities of El Segundo and Manhattan Beach are:

- The El Segundo Municipal Code allows operational noise to exceed the ambient noise level by up to 5 dBA. The Manhattan Beach Municipal Code does not allow operational noise to exceed the ambient noise level at all (when it is higher than the stated noise standard).
- The El Segundo Municipal Code exempts construction noise between the hours of 7:00 a.m. to 6:00 p.m. The Manhattan Beach Municipal Code exempts construction noise between the hours of 7:30 a.m. to 6:00 p.m.
- Outside of the hours stated above, the El Segundo Municipal Code allows construction, so long as the resulting noise level does not exceed the noise

standard. The Manhattan Beach Municipal Code prohibits construction outside of the hours stated above.

- The El Segundo Municipal Code establishes a limit for construction noise of 65 dBA $L_{50}$ at the nearest residential property.

Section 10.60.120 of the Manhattan Beach Municipal Code applies to all use classifications in all zoning districts. It states that "No use activity, or process shall produce vibrations that are perceptible without instruments by a reasonable person at the property lines of a site."

## SETTING

## PROJECT BACKGROUND

The El Segundo Power Redevelopment (ESPR) Project involves the construction and operation of a 630-megawatt (MW) power plant, which is proposed to be located at the existing El Segundo Generating Station site.

The new units will replace currently operating generation Units 1 and 2 with two state-of-the-art combined cycle units. Station net power will increase by approximately 280 MW with the addition of the new units. The new unit will consist of two gas-fired turbines and one steam turbine driven by the heat produced by the other two turbines.

The ESPR will continue to interconnect with the electrical grid at the existing Southern California Edison substation located adjacent to the plant site.

The Project will include demolition of the on site fuel oil tank farm, and of the existing Unit 1 and 2 equipment (boiler – steam turbine complex). Demolition of the tank farm is expected to take place over a period of six to nine weeks. The tank farm will be used as a staging area for power plant demolition for about one year, and as a staging area for construction of the new units for about eighteen months.

The equipment that has the greatest potential to generate significant noise levels during plant operation includes the gas and steam turbines, steam generators, pumps, motors, main transformers, and an instrument air compressor. During construction of the project, demolition of the tanks has the potential to produce significant noise levels at the nearest residences. In addition, removal of the tanks is expected to result in an increase in ambient noise levels from the existing Units 3 and 4, as the removal will eliminate a significant barrier to sound propagation in that direction.

## EXISTING LAND USE

### *POWER PLANT SITE*

This site is located within the City of El Segundo, Los Angeles County, bordered on the west by the Pacific Ocean and on the east by Vista Del Mar Boulevard. The

beachfront is property of the State of California, administered by the City of Manhattan Beach. The beachfront includes a bike path which is regularly used by pedestrians, joggers, skaters and bicyclists. The south property boundary is 45th Street, and residences are located on the south side of that street. These residences are in the City of Manhattan Beach. The Project would be located within the existing El Segundo Generating Station property, where the current Units 1 and 2 are located. Land uses in the project vicinity include recreational, residential, commercial, school and business uses.

Noise from the existing plant has little effect on the background acoustical environment at residences in the near vicinity. The closest noise sensitive receptors are homes located at the north end of The Strand, which is immediately south of the plant boundary. These houses are shielded from plant noise by the existing tank farm, so that the dominant background noise source there is the ocean surf. On the west side of the plant, the plant noise is dominant immediately adjacent to the property boundary, decreasing in effect as the observer moves toward the ocean surf. Traffic on Vista Del Mar Boulevard contributes to the daytime noise environment east of the plant site. North of the project site, and on the hillside east of the plant, the plant noise is audible and dominant.

The noise levels produced by the existing plant vary depending upon the level of power production. In general, plant noise is higher during daytime hours, when electrical demand is highest. The dominant plant noise sources appear to be the fans, generators and transformers.

The operation of the power plant includes notification of outside workers using a loudspeaker system. Residents south of the power plant have expressed concern about the level of sound produced by the loudspeakers, and the plant operator has pledged to resolve this issue outside of the Energy Commission permit process.

The project will involve replacing the electrical generation equipment which is most distant from the residential receptors. This is not expected to have a significant noise effect, as the existing Units 3 and 4 provide some shielding of the new units from the residences. However, the removal of the tank farm is likely to increase the ambient noise levels at the nearest residential receptors due to the removal of the effective noise barriers provided by the tanks.

### *LINEAR FACILITIES*

The ESPR will continue to interconnect with the electrical grid at the existing Southern California Edison substation located on the plant site. Therefore, no off-site linear facility construction is required for this project. (ESPR 2000a, AFC § 3.6)

The ESPR will require new potable and fire water supply pipelines, as well as a new sanitary sewer, to be placed in city streets in El Segundo.

## EXISTING NOISE LEVELS

In order to predict the likely noise effects of the project on adjacent sensitive receptors, the applicant commissioned ambient noise surveys of the area. The

surveys were conducted at various hourly time intervals in July, August, and November 2000, and were supplemented in April 2001. The noise surveys were conducted using Bruel & Kjaer and Metrosonics sound level meters meeting the requirements of the American National Standards Institute (ANSI) for Type 1 and Type 2 sound level measurement systems. The measurements were performed at heights of approximately five feet above ground level to simulate the average height of the human ear (ESPR 2000a, AFC § 5.12.1.2).

The applicant's noise survey monitored existing noise levels at the following sixteen short-term monitoring locations, which are shown by **NOISE: Figure 1** and **NOISE: Figure 2**:

1 NW Corner of plant by PL
2 SW Corner of plant by PL
3 Midpoint along south PL
4 Near 120 45th Street
5 Near lifeguard station 61
6 Boardwalk by 4220 43rd Street
7 Sand Dune Park
8 Grand View Elementary School
9 Beach Babies Children's Center
10 Dockweiler State Beach
11 119 Loma Vista Street
12 Opposite Unit 1 in plant recreation area
13 South end of recreation area
14 120 feet from NW corner of Units 3 & 4
15 Near 318 45th Street
16 304 Loma Vista Street

**NOISE: Table 3** summarizes the ambient noise measurement results (ESPR 2000a, AFC § 5.12).

**Noise: Table 3 - Summary of Short-Term Measured Noise Levels**

| Measurement Sites | Measured Noise Levels, dBA | | |
|---|---|---|---|
| | Daytime | | CNEL* |
| | $L_{50}$ | $L_{90}$ | |
| ST-1 | 60/58 | 59/56 | 65 |
| ST-2 | 60 | 58 | 66 |
| ST-3 | 56/54 | 54/52 | 61 |
| ST-4 | 61 | 59 | 67 |
| ST-5 | 62/59 | 61/57 | 66 |
| ST-6 | 57/59 | 55/57 | 64 |
| ST-7 | 56 | 53 | 62 |
| ST-8 | 46 | 45 | 52 |
| ST-9 | 59 | 54 | 65 |
| ST-10 | 59 | 57 | 65 |
| ST-11 | 51 | 50 | 57 |
| ST-12 | 66 | 65 | 71 |
| ST-13 | 59/60 | 58/59 | 65 |
| ST-14 | 71/72 | 71/71 | 77 |
| ST-15 | 60 | 55 | 66 |
| ST-16 | 60 | 51 | 66 |
| * - Energy Commission staff estimate | | | |

Insert **NOISE: Figure** 1 here…….

Insert **NOISE: Figure 2** here…….

Long-term noise measurements were conducted at three locations, as shown by **NOISE: Figure 1**. The noise measurement results are summarized by **NOISE: Table 4**.

**NOISE: Table 4 – Summary of Long Term Noise Measurements**

| Site ID | Date | Location | Sound Level, dBA | | | |
|---|---|---|---|---|---|---|
| | | | $L_{dn}$ | CNEL | Average Nighttime $L_{50}$ | Average Nighttime $L_{90}$ |
| LT-1 | 7/20-7/21/2000 | NW Corner at PL | 68.5 | 68.9 | 61* | 60* |
| LT-1a | 8/31-9/1/2000 | Same as LT-1 | 65.6 | 65.9 | 58* | 56* |
| LT-2 | 7/20-7/21/2000 | South PL | 62.0 | 62.4 | 54 | 52 |
| LT-2a | 8/31-9/1/2000 | Same as LT-2 | 64.3 | 64.6 | 57 | 56 |
| LT-3 | 8/31-9/1/2000 | West PL at Break Area | 66.4 | 66.8 | 58 | 58 |
| LT-3a | 11/13-11/14/2000 | Same as LT-3 | N/A | N/A | 60 | 59 |
| * - Estimated by Energy Commission staff after exclusion of construction noise | | | | | | |

Based upon the noise level measurements at Site LT-2, ambient noise levels are lowest between the hours of 10:00 p.m. and 2:00 a.m. In this time period, the median noise level (L50) at Site LT-2 on July 20-21, 2001, ranged from 52 dBA to 54 dBA.

Because of the importance of defining the ambient noise level in implementing the LORS, Energy Commission Staff has requested supplemental continuous noise monitoring at a residence adjacent to the south project boundary, over a one-month period. These data will be used to characterize the ambient noise level for the purposes of local noise ordinance enforcement.

In response to a data request from the Energy Commission, additional short-term noise measurements were performed on the plant site, and at one of the nearest residences (4420 The Strand, Manhattan Beach), during nighttime hours on April 1-2, 2001. The purpose of these noise measurements was to assess the potential contribution of noise from the existing power plant to ambient noise levels in the absence of the storage tanks. **NOISE: Table 5** summarizes the noise measurement results.

**NOISE: Table 5 – Summary of Nighttime Noise Measurements**

| Location | Sound Level, dBA | | |
|---|---|---|---|
| | $L_{eq}$ | $L_{50}$ | $L_{90}$ |
| Ambient Noise – with storage tanks | | | |
| Outside on deck | 62 | 62 | 61 |
| Inside house | 50 | 50 | 48 |
| Estimated Plant Noise – without storage tanks | | | |
| Outside on deck | 52 | 52 | 51 |
| Inside house | 52 | 52 | 51 |
| Estimated Cumulative Noise – without storage tanks | | | |
| Outside on deck | 62 | 62 | 61 |
| Inside house | 55 | 54 | 54 |

The applicant also conducted frequency analyses of the noise measured at three locations, with one generating unit in operation. These data will provide the basis for a comparison of the frequency content of the existing units and the new plant, primarily to determine the presence of pure tones and potentially significant low frequency noise at the bike path. The operating unit did not produce any pure tones, nor did it produce excessive low frequency noise (ESPR 2000a, AFC Figure 5.12-4).

## IMPACTS

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 usually considered a temporary phenomenon. In this case, the construction period for the ESPR includes four phases: preparation of the storage tank farm area (about 30 days), demolition of the existing Units 1 and 2 (about 11 months), and construction of the new power plant generation units (18 months), and creation of a public access area as part of the tank farm area (14 months). There is likely to be some overlap in these activities, so the total construction time is expected to be 24 to 30 months. Construction and demolition of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances, as discussed above.

The applicant has prepared analyses of construction noise impacts, listing the equipment to be used, schedules of use, and the predicted worst-case noise levels

at the nearest noise sensitive receptors due to the construction activities in each phase.

At the nearest noise sensitive receptors, the predicted cumulative worst-case average hourly noise level during the first phase of tank farm area preparation is 67 dBA. This level is 2 dBA higher than the construction noise standard of the El Segundo Municipal Code. The purpose of this phase is to create work and storage areas at the tank farm, which will include opening access doors into the two tanks.

During the second phase, which involves demolition of Units 1 and 2 and use of the tank farm site for materials storage, the use of heavy equipment would generate cumulative worst-case average hourly noise levels in the range of 67-69 dBA. This level is 2-4 dBA higher than the construction noise standard of the El Segundo Municipal Code. This phase will include crushing of the cement from Units 1 and 2, to take place in the vicinity of Units 1 and 2.

During construction of Units 5, 6 and 7 (Phase III), the soil, sand and crushed concrete that was stored in the tanks will be returned to the main construction site for fill. The northern tank will be removed, and that area used for storage. Welding and fabrication will take place inside the south tank, and loaders and trucks will move materials. These activities are expected to produce cumulative worst-case average hourly noise levels in the range of 69-70 dBA. These levels are 4-5 dBA higher than the construction noise standard of the El Segundo Municipal Code.

In the fourth phase, the south tank will be removed, and the tank farm area will be repaved. The public access area will also be graded and landscaped. These activities are expected to produce cumulative worst-case average hourly noise levels in the range of 69-70 dBA. These levels are 4-5 dBA higher than the construction noise standard of the El Segundo Municipal Code.

Based upon the potential noise impacts of construction and demolition noise, the Energy Commission staff has recommended the inclusion of three Conditions of Certification (**NOISE-1**, **NOISE-2**, and **NOISE-8**) to monitor and mitigate potential construction and demolition noise impacts.

Because construction activities are limited to daytime hours and certain noise levels by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the ESPR project area are considered to be less than significant.

### PILE DRIVING VIBRATION

Conventional pile driving produces potentially significant ground-borne vibration. Although the applicant has not provided a specific analysis of potential pile driving vibration effects, it is the opinion of Energy Commission staff that pile driving in the vicinity of Units 1 and 2 will not have any significant effects on the nearest residential receptors, which are approximately 2,000 feet distant.

### STEAM BLOWS

Typically, the steam blows during construction and start-up create the loudest noise encountered during the construction phase. Steam blows are necessary after erection and assembly of the feedwater and steam systems because the piping and tubing that comprises the steam path accumulate dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were to start up without thoroughly cleaning out the piping and tubing, 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. High-pressure steam is 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, is effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

According to the applicant, un-silenced steam blow noise levels could be as high as 130 dBA at a distance of 100 feet, which would produce about 103 dBA at the nearest residence, over 2,000 feet away. The applicant has proposed to provide a temporary silencer to limit the steam blow noise level to 110 dBA at a distance of 100 feet, which would reduce the maximum noise level to about 83 dBA. The applicant has further proposed to conduct steam blows only during the hours of 7:00 a.m. to 7:00 p.m. weekdays, and from 8:00 a.m. to 6:00 p.m. weekends and holidays.

The applicant has proposed to mitigate the noise generated from construction steam blows by use of noise control steam system vents. Energy Commission staff proposes that any high-pressure steam blows be muffled with an appropriate silencer and be performed only during daytime hours to minimize annoyance to residents (see proposed Condition of Certification **NOISE-4** below).

Energy Commission staff further proposes a notification process to make neighbors aware of scheduled steam blows (see proposed Condition of Certification **NOISE-5** below).

### LINEAR FACILITIES

This project includes no new linear facilities. Therefore, no significant noise effects are expected.

### OFFSITE FACILITIES

This project includes new offsite facilities in the form of water, aqueous ammonia, and sewer lines, some of which will be installed under the streets of El Segundo and Manhattan Beach. The potable and reclaimed water lines will be buried in the same trench starting at about El Segundo Boulevard and Main Street, north to Grand Avenue, west on Grand, then south of Vista Del Mar Boulevard to the project site.

The sewer line will be connected to an existing line about 200 feet south of the southern plant boundary. The aqueous ammonia line will be routed from the Chevron refinery under Vista Del Mar Boulevard into the plant at the northern fence line.

Potential noise effects would be primarily the result of heavy equipment use when excavating and filling the trenches. The work is expected to proceed in a linear fashion, moving from one section of pipe to another at a rate of up to several hundred feet per day. The duration of noise-producing activity in a given area would be about one week. Total construction time is expected to be about four months.

The applicant has estimated that typical heavy construction equipment used for the pipeline construction will produce noise levels of about 87-88 dBA at a distance of 50 feet.

A portion of the pipeline route is adjacent to about 1,100 linear feet of residences in El Segundo. Another portion (the sewer line) is within about 150 feet of residences in Manhattan Beach. Construction noise levels would be within the range of ambient (traffic) noise levels at the residences in El Segundo, though the exposure would be continuous during the periods of the day when the equipment is in use. In Manhattan Beach, construction noise would also be within the range of ambient (traffic) noise levels at the residences, although most residences would be shielded by intervening buildings.

Cumulative noise levels could increase by significant amounts during this phase of construction. These increases would be perceptible, but would be insignificant if noise-generating activities are limited to daytime hours.

Based upon the potential noise impacts of construction noise, the Energy Commission staff has recommended the inclusion of three Conditions of Certification (**NOISE-1**, **NOISE-2**, and **NOISE-8**) to monitor and mitigate potential construction noise impacts.

Because construction activities are limited to daytime hours and certain noise levels by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the ESPR project area are considered to be less than significant.

### *WORKER EFFECTS*

The applicant acknowledges the need to protect construction workers from noise hazards. The applicant recognizes those applicable LORS that would protect construction workers, and commits to complying with them (ESPR2000a, AFC § 5.12.2.1). 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 has incorporated noise reduction measures into the design of the project to ensure that there will not be a substantial increase in noise levels due to operation of the new units at the nearest residences, which are at the south project boundary in Manhattan Beach. However, removing the storage tank farm is expected to have the incidental effect of increasing ambient noise levels, even without operation of the new units. This is the result of removing the tanks, which currently serve as barriers to sound propagation between the existing Units 3 and 4, and the nearest residences.

Attaining compliance with the LORS (the El Segundo Municipal Code) would be consistent with the established Energy Commission policy of limiting increases in noise exposure to no more than 5 dBA, to prevent a significant increase in background noise levels. However, in this case, such an increase would exceed the noise standards of the adjacent community (Manhattan Beach), where the noise sensitive receptors live, and therefore could be considered significant.

#### POWER PLANT OPERATION

During its operating life, the ESPR represents essentially a steady, continuous noise source day and night. Occasional short-term 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 facility include the steam turbine generator, gas turbine generators, heat recovery steam generators, transformers, boiler feed pumps, circulating water pumps, fin fan coolers and gas compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The applicant performed acoustical calculations to predict the facility noise emissions, and to develop noise mitigation measures. The calculations were based on generalized manufacturer noise data for the major equipment planned for the facility (ESPR 2000a, AFC § 5.12.1.4). The modeling was performed as an iterative process to refine noise mitigation measures and requirements for equipment noise emission factors. Specific noise mitigation measures evaluated included:

- Enclosure around the gas turbine compartments
- Noise barriers around the gas turbine generators
- Acoustic shroud around the gas turbine exhaust ducts
- Acoustic shroud around transition ductwork
- Noise barriers around boilers
- Silencers at the boiler exit stack
- Enclosures around the steam turbine package and the generator package

- Noise barriers around transformers
- Enclosures for major pumps
- Noise barriers for fin fan coolers

The mitigated operational noise level at the bike path is predicted to be 61.4 dBA. When added to the assumed ambient noise level of 59 dBA $L_{50}$, the cumulative noise level will be 63.4 dBA. This level is less than 5 dBA above the ambient noise level, and would be in compliance with the LORS.

The mitigated operational noise level at the southern plant boundary is predicted to be 42.2 dBA. Assuming the ambient noise level is about 52 dBA $L_{50}$, the cumulative noise level would remain at about 52 dBA.

Therefore, the noise due to the new generating units is not expected to have a significant noise effect.

As noted above, the removal of the storage tank farm will eliminate the noise barrier effects (shielding) currently enjoyed by the nearest residents, and the predicted noise level of 52 dBA due to operation of the existing power generation Units 3 and 4 will be approximately equal to the ambient noise level, currently assumed to be an $L_{50}$ value of 52 dBA. The resulting cumulative noise level will be 55 dBA, which is 3 dBA higher than the assumed ambient noise level. Energy Commission staff, in proposed Condition of Certification **NOISE-6**, has requested supplemental noise level measurements at one of the nearest residences to define the ambient noise level.

Although the cumulative noise level will comply with the noise standard of the El Segundo Municipal Code, which clearly applies to the project, it will exceed the Manhattan Beach noise standard (which is the ambient noise level) by 3 dB. This is potentially a significant effect, as this change in sound level would be perceptible, and the character (frequency content) of the power plant noise would be different from that of the ambient noise source, which is the ocean surf.

Again assuming an ambient nighttime $L_{50}$ value of 52 dBA, to ensure satisfaction of the Manhattan Beach noise standard, the noise level produced by the existing Units 3 and 4 would have to be reduced by 10 dB, to about 42 dBA. Any higher noise level would result in some incremental change in the ambient noise level, in accordance with **NOISE: Table 6**.

**NOISE: Table 6 – Cumulative Noise Levels Resulting from Noise From Units 3 & 4 Plus Ambient Noise**

| Sound Level, dBA | | |
|---|---|---|
| Assumed Ambient | Units 3 and 4 | Cumulative |
| 52 | 42 | 52.4 |
| 52 | 43 | 52.5 |
| 52 | 44 | 52.6 |
| 52 | 45 | 52.8 |
| 52 | 46 | 53.0 |
| 52 | 47 | 53.2 |
| 52 | 48 | 53.5 |
| 52 | 49 | 53.8 |
| 52 | 50 | 54.1 |
| 52 | 51 | 54.5 |
| 52 | 52 | 55.0 |

The applicant has proposed to reduce the noise level produced by Unit 4 by 2 dBA. This would result in a noise level of about 50 dBA due to Unit 4 at the nearest residence, which would produce a cumulative noise level of 54.1 dBA, as shown by **NOISE-Table 6**. The cumulative noise level would therefore be about 2 dBA higher than the ambient noise level as currently defined.

It is common in the acoustical literature to state that a change of one decibel is imperceptible, except in the laboratory. A change of 3 dBA is usually considered to be the threshold of perception for environmental noise. Therefore a change of 3 dBA could be considered the threshold of potential significance.

Other jurisdictions have adopted noise standards of significance based upon the change in ambient noise levels. As noted before, an increase of more than 5 dBA is usually considered significant by the Energy Commission, and is significant in the context of the El Segundo Municipal Code.

The State of California Department of Transportation (Caltrans) has adopted a screening procedure for highway noise analyses which states that, if a project causes an increase in traffic noise levels of 3 dBA or more as compared to existing levels, a detailed noise analysis is required. This indicates that the threshold of potential significance is an increase in traffic noise of 3 dBA.

The Federal Interagency Committee on Noise (FICON), when considering aircraft noise, indicated that the criterion for requiring further review of potential noise impacts is an increase in noise exposure of 1.5 dB $L_{dn}$ or CNEL, when the existing aircraft noise level exceeds the federal noise compatibility guideline (and the State of California airport noise standard) of 65 dB $L_{dn}$ or CNEL. An increase of 3 dB $L_{dn}$ or CNEL is considered by FICON to be the criterion for requiring further review of potential noise impacts when the existing aircraft noise level is between 60 and 65 dB $L_{dn}$ or CNEL. These criteria are based upon the observed relationship of

changes in annoyance to changes in cumulative noise exposure as described by $L_{dn}$ and CNEL.

Finally, it is important to observe that the accuracy of ambient noise measurements is defined in part by the natural variability in ambient noise conditions, and further, by the assumed precision of sound level measurement equipment. In most cases, the required end-to-end accuracy of sound level measurement systems for environmental noise assessments is +/-1.5 dBA.

Based upon the above information, it is the opinion of the Energy Commission staff that the project will comply with the LORS, and will ensure that there will be no significant change in noise levels, if the project is regulated so that the cumulative noise exposure does not result in an increase in the ambient $L_{50}$ noise level.

As a result of these analyses, Energy Commission staff believes that no significant noise impacts are likely to occur due to the operation of the project, as mitigated. The proposed Condition of Certification **NOISE-6** would ensure that the project operation would not cause an increase in the ambient noise level ($L_{50}$) at the most-affected residence, and that noise due to the plant operations would not exceed the standards of the El Segundo Municipal Code.

If additional noise mitigation is required to achieve compliance with the noise standards, suitable methods may include noise-attenuating blankets or “skins” at Units 3 or 4, noise barriers at the property line, or similar measures in the proximity of the most significant noise sources.

### 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. The applicant has stated that no strong tonal noises will be generated during the operation of the project.

Pressure relief valves will likely be installed on the HRSG. The applicant has not provided an estimate of the noise levels associated with the steam system vents at the nearest receptors. Emergency pressure safety valve (PSV) discharges are typically not silenced, and produce noise only under emergency conditions. Given the distance from the pressure relief valves to the nearest residential areas, their noise effects are expected to be insignificant.

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**, below), which requires the applicant to mitigate pure tones and the noise from steam relief valves.

### LINEAR FACILITIES

No new off-site linear facilities are proposed as part of this project. Given the relatively small increase in power generation due to the project, the operation of the power plant is not expected to create any incremental increase in noise levels from

Southern California Edison's high voltage transmission system. Noise from the transmission lines will include a corona discharge hum, which is expected to be less than 40 dBA at a distance of 40 feet of the power lines (ESPR 2000a, AFC § 5.12.2.2). However, there are no noise sensitive lad uses near the switchyard or the transmission lines. As a result, no noise impacts are assumed to occur from linear facilities.

### *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 (ESPR 2000a, AFC § 5.12.2.1). 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 a 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.

There are no planned projects that could contribute to cumulative noise impacts in the project study area identified in the AFC. There are industrial noise sources north of the project site which could contribute to the cumulative noise levels at receptors in that direction. In addition, traffic noise levels are significant in the Vista Del Mar Boulevard corridor. The effects of noise produced by those sources have been accounted for by the ambient noise level measurements, and the resulting noise levels are described in the noise level predictions listed above.

## FACILITY CLOSURE

In the future, upon closure of the ESPR, all operational noise from the entire ESPR site would cease, and no further adverse noise impacts from operation of the ESPR 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 ESPR, 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 would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

## CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that the ESPR will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the ESPR 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 proposed Conditions of Certification.

## PROPOSED CONDITIONS OF CERTIFICATION

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

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

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

Protocol: The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (see Exhibit 1), 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 Cities of El Segundo and Manhattan Beach, 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 project-related ground disturbing activities, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

**Verification:** At least 30 days prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

**NOISE-4** If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 110 dBA, measured at a distance of 100 feet. The project owner shall limit conducting steam blows to Monday through Friday during the hours of 7:30 a.m. to 6:00 p.m., and Saturday during the hours of 9:00 a.m. to 6:00 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that off-site noise impacts will not cause annoyance. If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM, who shall review the proposal with the objective of ensuring that the

resulting noise level does not exceed 65 dBA $L_{50}$ at the nearest residential property line. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

**Verification:** At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM and the Cities of El Segundo and Manhattan Beach drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

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

**Verification:** Within 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 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 project will not cause resultant noise levels to exceed the ambient median noise level ($L_{50}$) at residential receivers, and that the noise due to plant operations will otherwise comply with the noise standards of the El Segundo Municipal Code. If a pure tone is present, the applicable noise standards shall be reduced by 5 dBA.

No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

During the period of June 1, 2001 to August 31, 2001, the project owner will conduct a 30-day continuous community noise survey at one of the closest residential receptors (in Manhattan Beach), while the existing power plant is operating normally. The survey must include hourly calculation and reporting of the measured $L_{eq}$, $L_{50}$ and $L_{90}$ values, and daily summaries of power plant operational levels. Energy Commission staff, in cooperation with the Cities of El Segundo and Manhattan Beach, will apply the survey results to describe

the ambient noise level ($L_{50}$) for the purposes of enforcing this Condition of Certification.

Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct short-term survey noise measurements at monitoring sites ST-1, ST-2, ST-3 and ST-12. In addition, the applicant shall conduct a 25-hour community noise survey at the same receptor location used for the 30-day noise measurement cited above. The survey shall also include 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.

If the results from the 25-hour noise survey at the residential receptor indicate that the average median noise level ($L_{50}$) for the quietest four-hour period has increased as compared to the ambient $L_{50}$ value defined above, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

If a pure tone is found to be present at any of the above monitoring sites, mitigation measures shall be implemented to eliminate the pure tone.

If the results from the noise survey measurements at monitoring sites ST-1, ST-2, ST-3 or ST-12 indicate that the noise standards of the El Segundo Municipal Code have been exceeded at any of those locations, mitigation measures shall be implemented to reduce noise to a level of compliance with the appropriate standard.

**Verification:** Within 15 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the Planning Departments of the Cities of El Segundo and Manhattan Beach, and to the CPM. Included in the 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 after the facility is in full operation, 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** Heavy equipment operation and noisy construction or demolition work shall be restricted to the times of day delineated below:

| | |
|---|---|
| Monday-Friday | 7:30 a.m. to 6:00 p.m. |
| Saturday | 9:00 a.m. to 6:00 p.m. |

Noise levels due to construction shall be limited to the average daytime ambient L50 value plus 5 dBA, or 65 dBA $L_{50}$, whichever is higher, at the nearest residential property line.

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.

**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.

**NOISE-9** The project design and implementation shall ensure that demolition or construction of the power plant will not cause vibration to exceed a peak particle velocity of 0.2 in/sec at any residential receptor. Power plant operation shall not cause vibration which is perceptible without use of instruments to any reasonable person of normal sensitivity at any residential receptor.

Protocol: 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 vibration complaint;
- Attempt to contact the person(s) making the vibration complaint within 24 hours;
- Conduct an investigation to determine the source and magnitude of vibration related to the complaint;
- If the noise is project related, take all feasible measures to reduce the vibration 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 vibration reduction efforts; and, if obtainable, a signed statement by the

complainant stating that the vibration problem is resolved to the complainant's satisfaction.

**Verification:** Within 30 days of receiving a vibration complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the Cities of El Segundo and Manhattan Beach, 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.

## EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

El Segundo Power Redevelopment Project
(00-AFC-14)

**NOISE COMPLAINT LOG NUMBER** _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

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

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

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

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

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

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

This information is certified to be correct:

Plant Manager's Signature: _____

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

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## 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<br>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. |
| $L_{10}$, $L_{50}$, & $L_{90}$ | The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. $L_{90}$ is generally taken as the background noise level. |
| Equivalent Noise Level, $L_{eq}$ | 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, $L_{dn}$ 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. |

Source: California Department of Health Services 1976.

| NOISE: Table A2<br>Typical Environmental and Industry Sound Levels | | | |
|---|---|---|---|
| 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<br>Kitchen with Garbage Disposal Running | Loud |
| Freeway (100') | 70 | | Moderately Loud |
| Vacuum Cleaner (100') | 60 | Data Processing Center<br>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:

**NOISE: Table A3**
**Addition of Decibel Values**

| 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 ± 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 Obed Odoemelam, Ph.D.

## INTRODUCTION

Operating the El Segundo Power Redevelopment project (or ESPR) would expose the general public and workers to combustion byproducts as well as the toxic chemicals associated with other aspects of facility operations. As detailed by the applicant (ESPR, pages 5.2-6 through 5.2-9 and page 5.2-44), and noted in the **Project Description** section, the proposed is a modification project in which two 1950s-vintage generating units (1 and 2) of the existing El Segundo Generating Station (ESGS) are replaced with three more efficient units (5, 6, and 7) for increased power generation. The existing Units 3 and 4 would continue to be operated, meaning that the project emissions of concern in this analysis would originate mainly from Units 3 and 4 together with the new Units 5, 6, and 7 and related diesel-fired fire pump engine.

The purpose of this public health analysis is to assess the project's operations to establish whether or not such increase in power generation would produce air pollutant at levels posing a significant health risk to area residents. If such a risk were to be established, staff would recommend mitigation as appropriate. The issue of possible worker impacts is addressed in the **Worker Safety and Fire Protection** section of this Staff Assessment (SA) while the health significance of exposure to the project-related electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

Since this modification is proposed for a site with past and on-going industrial activities, the applicant, El Segundo Power II, LLC has assessed the possibility of on-site chemical contamination at levels that could pose a human health or ecological hazard in the post-modification period. This assessment was intended to determine whether specific remediation would be necessary before construction or project-related demolitions. Related findings are presented in the **Waste Management** section together with recommended waste management requirements.

The air pollutants of primary concern in this analysis are those for which no air quality standards have been established. These are known as non-criteria pollutants, which are further classified as toxic air pollutants, or air toxics when emitted into the air, or as toxic soil contaminants when encountered in the soil. These pollutants exist as volatile or semi-volatile organic compounds (VOCs), or as toxic metals. Those pollutants for which ambient air quality standards have been established are known as criteria pollutants and are emitted in much larger amounts from common sources. A project's ability to comply with these air quality standards is assessed in the **Air Quality** section by comparing operational-phase ambient concentrations with the applicable air quality standards. When any project is proposed for an area in violation of any of these standards, mitigation might be necessary to prevent significant additions to the existing levels. Since this project is proposed for an area with existing violations of specific air quality standards as

noted by the applicant (ESPR 2000a, page 5.2-3) and discussed in the **Air Quality** section, such mitigation is recommended in that section.

The criteria pollutants are identified in this analysis (along with regulations for their control) because they usually contribute significantly to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies is discussed in the **Air Quality** section for this project.

## LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

### FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major criteria pollutants: nitrogen oxides (NOx), ozone, sulfur dioxide, carbon monoxide, sulfates, lead, and particulate matter with a diameter of 10 micron or less (PM10).

### STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions influencing its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

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

The California Health and Safety Code section 39650 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants and identify the best available methods for controlling their emission. These laws also require that the new source review rules for each air quality management district (AQMD or Air District) include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB's April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines to allow for uniform assessment as emitted from all combustion sources in the state. Cal-EPA has developed specific cancer potency estimates for assessing

any cancer risk they may pose at specific exposure levels. For toxic air pollutants that do not cause cancer, Cal-EPA established specific no-effects levels (known as reference exposure levels or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk analyses.

California Health and Safety Code section 44300 et seq. requires facilities, which emit large quantities of criteria pollutants and any amount of non-criteria pollutants to provide the local air district an inventory of toxic emissions. Operators of such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB ensures statewide implementation of these requirements through the state's Air Districts.

The California Public Resources Code Section 2550 (a); 20 California Code of Regulations Sections 1752, 2300-2309 and Division 2, Chapter 5, Article 1, Appendix B, Part (1) California Energy Commission, whose requirements include a quantitative health risk assessment for any pollution sources for which a permit is sought from the Commission.

## LOCAL

Local implementation of provisions of the Health and Safety Code section 44300 in the project area is ensured by the area's Air District, the South Coast Air Quality Management District (SCAQMD) which established Rule 1401 in this regard. The applicant has complied with the related Air District requirements by submitting a Health Risk Assessment as part of their permit application.

## SETTING

As detailed in the information from the applicant, (ESPR 2000a pages 3.2-1, 3.4-2 5.9-2 through 5.9-4, 5.13-1 and 5.18-1) the proposed project will be located on a 5.5-acre portion of the ESGS, which occupies a site of approximately 33 acres in the City of El Segundo. The site is bordered on the east by a road, Vista Del Mar, by 45$^{th}$ Street in the City of Manhattan Beach to the south, by Santa Monica Bay on the west and the Chevron Marine Terminal to the north. The immediate surroundings are zoned for industry, commercial establishment, residential housing and open spaces.

The applicant (ESPR 2000a, pages 6.16-1 and 6.16-26) has identified specific locations with sensitive receptors within a two-mile radius from the project site. Sensitive receptors are individuals who may be more susceptible than the general population to the impacts of environmental pollutants. These individuals include children, pregnant women, the elderly, and the chronically ill. They may be found in relatively small numbers in individual residences, or in relatively large numbers in specific establishments or institutions such as schools, daycare centers, retirement homes, hospitals, or recreation centers. Exposure limits against the non-cancer impacts of all environmental pollutants are established to include safety margins

considered adequate to protect against health symptoms among both the general public and sensitive individuals. These margins of safety are established from health effects information as available during the standard setting period. As more becomes known through further studies, each standard could be revised to ensure the health protection at issue. Such sensitivity to non-cancer impacts does not necessarily apply to cancer-causing effects whose underlying biological mechanisms are different. Staff requires identification of such sensitive receptor locations for further insight into the nature of the population potentially exposed to the toxic pollutants at issue. Such information is not necessarily intended for specific mitigation. The health significance of above-limit exposures is assessed through established methods, which differ for the criteria and non-criteria pollutants.

## METHOD OF ASSESSING THE POTENTIAL IMPACTS OF TOXIC AIR POLLUTANTS

Any toxic air pollution-related health risks from operating the proposed ESGS modification would mainly be associated with emissions from its previously noted natural gas-fired turbines, boilers and supporting diesel-fueled fire pump. For the surrounding population, the potential for the cancer and non-cancer effects of such emissions is assessed from exposure estimates obtained for the identified project sources from both air dispersion and exposure modeling. For the pollutants at issue, the potential for cancer is considered particularly important because of the present assumption by most scientists that there is no “safe” exposure to a carcinogen, meaning that every carcinogenic exposure is capable of a theoretical cancer risk. This non-threshold concept (as applied to carcinogenic effects) differs from present assumptions about non-cancer effects, which are assumed to result only after exposure above levels that overwhelm the body’s ability to protect against such impacts. The procedure for such impact assessment is known as a health risk assessment, which consists of the steps listed below:

- A hazard identification step in which each pollutant of concern is identified along with possible health effects;
- A dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- An exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling; and
- A risk characterization step in which the nature and the magnitude of the possible human health risk is assessed.

### *HEALTH EFFECTS ASSESSED*

The types of air toxics-related health impacts of concern in this analysis are those that can result shortly after exposure or following long-term (or chronic) exposure. Those from short-term exposure are known as acute effects and generally result from exposure at relatively high levels. Some examples of pollution-induced non-cancer health effects from acute or chronic exposure include headaches, dizziness, coughing, nausea, asthma, skin rash, and irritation of any part of the body such as the eyes, throat and skin. According to present understanding, only those effects

from chronic exposure are capable of causing cancer whose risk of manifestation increases with the level and duration of such exposure.

For the proposed or similar gas-fired facilities, high-level toxic exposures (at levels capable of acute effects) could occur only during major accidents, not during routine operations when emissions are much lower. Compliance with Air District-mandated emission control technologies is reflected by the incremental cancer and non-cancer risk estimates calculated for toxic pollutants. These risk estimates are calculated the same way for the proposed and other gas-fired power plant projects. Therefore, they can be used, despite underlying scientific uncertainties, to compare similar projects for compliance with the requirements for use of the best emission control technologies as currently identified by the ARB.

### ESTIMATING THE RISK OF NON-CANCER EFFECTS

The method used by regulatory agencies to numerically assess the likelihood of acute or chronic impacts of air toxics or soil contaminants is the hazard index method. In this approach, a hazard index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source being considered. This index is calculated by dividing the exposure estimate by the applicable reference exposure level. After calculating the hazard indices for the individual pollutants, these indices are added together for all those that affect the same part of the body or target organ, to obtain a total hazard index for the source. Total hazard indices of 1.0 or less are regarded as indicating a potential lack of significant health impacts while an index of more than 1.0 may indicate a significant potential for the non-cancer acute or chronic effects being considered.

### ESTIMATING THE RISK OF CANCER

Since cancer is currently considered possible from every exposure to a carcinogen, staff considers the risk of cancer manifestation as more sensitive than the risk of non-cancer effects for assessing the environmental acceptability of a source of both carcinogens and non-carcinogens. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the risk of operations-related cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens to be emitted. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together to obtain the total incremental cancer risk from operations. Given the previously noted conservatism in the this risk calculation process, these numerical estimates are best regarded as only representing the upper bounds on the cancer risk at issue. They should not be presented as the real risk, which will likely be lower and could indeed be zero. Since the same calculation process is used in all cases, these risk numbers are best used in practice for (a) setting mitigation priorities, (b) choosing between competing control technologies, and (c) assessing the effectiveness of control measures. The significance of any specific estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

## STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is mostly considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. The South Coast Air Quality Management District (SCAQMD) considers a risk of 25 in a million as the significance criterion in this regard. For new or modified sources with best available toxics control technology (TBACT), the District's significance criterion is 10 in a million. For those without such controls the criterion is 1 in a million.

For the proposed and similar projects, the Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is considered negligible (meaning that project operation is not expected to result in any increase in cancer). For estimates that reflect a risk above this level, any recommended action would depend on the magnitude of the estimate in question. However, specific mitigation would be recommended only when the possible risk is specified as more than 10 in a million. This regulatory approach is intended in light of current knowledge to limit the rate of addition to the already high (1 in 4, 25 %, or 250,000 in a million) background cancer risk of the average individual.

While the carcinogenic property of several environmental pollutants is well established, the causes of most of human cancers remain largely unknown. What has become clearer to scientists is that environmental pollution is responsible for only a small fraction of human cancers in general. This fraction, according to the South Coast Air Quality Management district (2000, page 2), represents only about two percent of cancer cases. The present risk-based regulatory approach is, in practice, intended to avoid all avoidable human carcinogenic exposure, especially when such exposures are not within the individual's control, as would be true of the emissions from ESPR and other sources.

For non-carcinogenic pollutants, staff considers significant health impacts to be unlikely when the total hazard index is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective. It would not automatically call for specific mitigation whose recommendation would depend on magnitude of the index value involved.

## IMPACTS

## PROJECT SPECIFIC IMPACTS

The health impacts of the toxic air contaminants of primary concern in this analysis can be assessed separately as construction-phase impacts and operational-phase impacts.

### *CONSTRUCTION PHASE IMPACTS*

The results of the applicant's site contamination assessments (ESPR 2000a, Appendix T) established that there are specific pockets of soil contamination from past industrial activities within and outside the ESGS site. It also established the site's underground water to be contaminated with contaminants from off site sources the most important of which is the nearby Chevron refinery. Past site investigations were listed in the Site Assessment report as related to past assessments for specific mitigation. Related ground water monitoring and mitigation are continuing in compliance with specific requirements of the Los Angeles Regional Water Quality Control Board. The procedure for the safe clean up and removal of any discovered contamination is discussed in the **Waste Management** section with respect to the demolition and construction phases of the proposed project. Implementing conditions for certification are also recommended in that section. Staff expects compliance to protect against significant health impacts on construction workers or the general public.

The other possibility of impacts on construction workers would derive from exposure to the toxic emissions from the vehicles and equipment to be used. The applicant has identified the construction-phase vehicles and equipment to be used along with expected emission rates for the relatively short (21-month) construction period of specific concern (ESPR 2000a, Appendix I.2-1, pages 1-16 through 1-28). The applicant also modeled and presented the concentrations of the criteria pollutants and diesel emissions of potential health significance in this regard (ESPR 200a, Appendix 1.2, pages 1-7 through 1-14). Staff is in agreement with the applicant's impact assessment approach as more fully discussed in the **Air Quality** section along with the applicant's mitigation plan and staff's recommended mitigation.

One of these staff-recommended mitigation measures (specified in the **Air Quality** section as **AQ-C2** ), is considered adequate by staff for minimizing the impacts of both criteria and non-criteria pollutants whose maximum levels were estimated by the applicant to occur at locations around the ESGS property boundaries. All construction- and operations-related wastes will be managed to prevent significant health or environmental impacts as detailed by the applicant (ESPR 2000a, page 5.14 –26 through 5.14-28). Implementing conditions of certification are recommended in the **Waste Management** section.

### *DIRECT OPERATIONAL IMPACTS*

As noted in a report by the South Coast AQMD (2000, page 6), one characteristic that distinguishes the air toxics of primary concern in this analysis from the criteria pollutants (some of which are subject to further reactions in the course of dispersion), is that their impacts tend to be highest in close proximity to their sources and quickly drop off with distance from such sources. This means that the proposed project's air toxics levels would be highest immediately around it and decrease rapidly as one moves into the surrounding area, away from the points of maximum impacts.

The applicant's estimates of ESPR's contributions to the area's risk of cancer and non-cancer effects were obtained from a health risk assessment conducted

according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines (ESPR 2000a, pages 5.16-1). The results from this assessment were provided to staff along with documentation of the assumptions used (ESPR 2000a, pages 5.2-51 through 5.2-64, 5.16-3 through 5.16-11, and Appendix 1.4). Such documentation was provided with respect to the following:

- Pollutants considered;
- Emission levels assumed for the pollutants involved;
- Dispersion modeling used to estimate potential exposure levels;
- Exposure pathways considered;
- The cancer risk estimation process;
- Hazard index calculation; and
- Characterization of project-related risk estimates.

Staff has found these assumptions to be acceptable and concur with the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non-carcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the maximum potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

The following toxic air pollutants were considered with respect to non-cancer effects: acetaldehyde, acrolein, ammonia, benzene, 1,3 butadiene, ethylbenzene, formaldehyde, naphthalene, polycyclic aromatic hydrocarbons (PAHs), propylene oxide, toluene, and xylenes. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, chrysene, formaldehyde, PAHs and propylene oxide.

A maximum incremental cancer risk of 0.94 was calculated for the maximally exposed individual for a location approximately 2.1 kilometers east-southeast of the project site. This number is below staff's significance criterion of 1.0, suggesting a lack of a material cancer risk to any individual within the project area. The maximum chronic hazard index of 0.02 was calculated for the individual at the location identified with respect to the maximum cancer risk. This is significantly below staff's significance criterion of 1.0, meaning that the project's emissions would be unlikely to significantly add to area's health status related to chronic non-cancer effects. A maximum acute hazard index of 0.01 was calculated for the same location, suggesting a potential lack of significant modification-related impacts of an acute nature. The values for all sensitive receptor locations are much lower.

## CUMULATIVE IMPACTS

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic

pollutants are normally localized within relatively short distances from the source. Toxic pollutant levels beyond the point of maximum impact quickly fall within ambient background levels. This modification project is proposed for a site already committed to power generation and related industrial and commercial activities. Given the low cancer and non-cancer risks to be associated with the proposed modification project, staff does not expect its operations to contribute significantly to any area toxic exposure of a cumulative nature.

## CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the construction and operation of the proposed ESPR project would be unlikely to significantly affect the health of area residents. The cancer and non-cancer risks from the project's electricity generation would be at levels reflecting controls using the technology established by the ARB as most effective for this and similar facilities.

Since the operation of the ESPR project would allow for more efficient power generation without significant health impacts, staff recommends approval with respect to the toxic pollutants considered in this analysis. The conditions for ensuring compliance with all applicable air quality standards are specified in the **Air Quality** section for the area's problem criteria pollutants. No Public Health Conditions of Certification are recommended.

## REFERENCES

California Air Resources Board (ARB) 1996. California Toxic Emissions Factors (CATEF) Database for Natural Gas-Fired Combustion Turbine Cogeneration.

California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.

ESPR (El Segundo Power Redevelopment Project) 2000a. Application for Certification, Volumes 1 through IV, El Segundo Redevelopment Power Redevelopment Project. Submitted to the California Energy Commission on December 20, 2000.

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# SOCIOECONOMIC RESOURCES

Testimony of Michael Fajans and Amanda Stennick

## INTRODUCTION

The technical area of Socioeconomics includes several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of potential short-term and long-term project-related population changes on local schools, medical and protective services, as well as the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population. The socio-economic analysis also includes consideration of Environmental Justice, a determination of whether any project impacts fall disproportionately on a low-income or minority population. This analysis discusses the potential direct and cumulative impacts of the proposed El Segundo Power Redevelopment Project (ESPR) on local communities, community resources, and public services.

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

## FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

Civil Rights Act of 1964, Public Law 88-352, 78 Stat.241 (Codified as amended in scattered sections of 42 U.S.C.) Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national programs in all programs or activities receiving federal financial assistance.

## STATE

### *CALIFORNIA GOVERNMENT CODE, SECTIONS 65996-65997*

As amended by SB 50 (Stats. 1998, ch. 407, sec.23), these sections state that public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

### *14 CALIFORNIA CODE OF REGULATIONS, SECTION 15131*

- Economic or social effects of a project shall not be treated as significant effects on the environment.

- Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

## SETTING

## PROJECT LOCATION

The proposed project is at the site of the existing El Segundo Generating Station (ESGS) Power Plant in the City of El Segundo, California. The project site is in the western edge of town, between Vista Del Mar and the shore of Santa Monica Bay. For a more complete description of the location, please refer to the **Project Description** section of this document and the facility location section of the Application for Certification (El Segundo Power Redevelopment Project AFC, Section 3.2). The study area for socioeconomics as defined in the AFC includes all of Los Angeles County in terms of labor issues and a considerably smaller area within a six-mile radius of the project in terms of environmental justice and potential community impacts.

## DEMOGRAPHIC CHARACTERISTICS

**Socioeconomics Table 1** shows population growth patterns for Los Angeles County and the cities of El Segundo and Manhattan Beach, which contain and are adjacent to the proposed project, respectively. Los Angeles County has a very large population and has grown for many years. According to census data, population grew by 1.4 million between 1980 and 1990, and at a slower rate, 600,000 from 1990 to 2000. According to the Southern California Association of Governments forecasts (SCAG), the County population will grow by more than a million residents in each of the next two decades. As relatively central communities that were effectively built out by 1980, population growth rates in El Segundo and Manhattan Beach have been more gradual than that of the county.

**Socioeconomics Table 1**
**Population Trends**

| | 1980 | 1990 | 2000 | 2010 | 2020 |
|---|---|---|---|---|---|
| Los Angeles County | 7,477,421 | 8,901,987 | 9,519,338 | 10,868,900[1] | 12,249,100[1] |
| City of El Segundo | 13,750 | 15,223 | 16,033 | 18,610[2] | N.A. |
| City of Manhattan Beach | 31,350 | 32,063 | 33,852 | N.A. | N.A. |
| Source: U.S. Census 1980-2000, except (1) SCAG Forecasts and (2) El Segundo General Plan | | | | | |

## EMPLOYMENT AND ECONOMIC CHARACTERISTICS

Leading industrial categories in Los Angeles County are services, with 33 percent of all jobs, trade with 22 percent of all jobs, manufacturing with 15 percent, and government with 14.5 percent. While construction, at 3.2 percent, does not

represent a major proportion, 133,000 workers, including approximately 10,000 workers in heavy construction, and 90,000 in special trades, represents a large substantial labor force for project construction. **Socioeconomics Table 2** shows the distribution of employment by industrial sector for Los Angeles County. According to SCAG estimates, Los Angeles County employment grew by 7.5 percent from 1994 to 2000.

**Socioeconomics Table 2.**
**Employment By Industry: January 2001**

| Sector | Los Angeles County |
|---|---|
| Agriculture/mining | 11,100 |
| Construction | 132,800 |
| Manufacturing | 626,000 |
| Transportation/Public Utilities | 246,100 |
| Trade | 909,000 |
| Finance/Insurance Real Estate | 232,900 |
| Services | 1,370,000 |
| Government | 594,500 |
| Total | 4,629,500 |

Sources: California EDD, February 2001
Note: employment by place of work, excludes self-employed

While El Segundo only has about 10,000 employed residents, there are approximately 100,000 persons employed in the City, with the manufacturing sector responsible for about 70 percent of the jobs. Aerospace and technology firms predominate, but the large Chevron refinery is the most land expansive land use in the City. Airport related offices, hotels, and services are also a significant economic factor in El Segundo.

The existing ESPR employs 51 people (AFC, page 5.10-20). Businesses and industrial uses near the project site include the Chevron refinery, Los Angeles Department of Water and Power's Scattergood plant, the Hyperion Sewage Treatment facility, and a service station at Vista Del Mar and 45$^{th}$.

## *HOUSING*

As of January 2000, Los Angeles County had 3,272,000 housing units, including 180,000 vacant units, a 5.5 percent vacancy factor (DOF). El Segundo had a housing stock of 7,362 units, and a 5.8 percent vacancy rate. Of the El Segundo housing stock, 47 percent were single-family units, 12 percent were in buildings with two-four units, and 41 percent were in buildings with five or more units. Manhattan Beach had 15,293 units in January 2000, including 74 percent single-family units. Vacancy rate was 4.8 percent. Neither El Segundo nor Manhattan Beach has a significant supply of mobile homes. According to 1990 estimates, El Segundo had an inventory of 1,400 hotel and motel rooms (El Segundo General Plan, page 2-10).

### *SCHOOLS*

The El Segundo Unified School District provides K-12 education for the community. The closest school is El Segundo High School, at 640 Main Street, approximately one mile northeast of the project site. Elementary and middle schools are about 1.5 miles from the site. Manhattan Beach has a separate school district, as do many of the surrounding communities.

### *UTILITIES, EMERGENCY, AND OTHER SERVICES*

Southern California Gas provides natural gas to the project site and the new plant will replace an existing one. Southern California Edison provides electricity to the site and community. The primary local telephone provider is Pacific Bell.

The City of El Segundo provides water and sewer service within the city limits, and will provide potable water to the project. Sanitary sewer discharge from the existing plant is to the sewer system operated by the City of Manhattan Beach. Reclaimed water will be acquired from the West Basin Municipal Water District, and cooling water from Santa Monica Bay will continue to use the existing intake structure servicing the site.

Fire protection is provided by the El Segundo Fire Department, which has 54 firefighters and paramedics operating from two fire stations. The closest station, # 1, normally has 10 staff on duty per shift. Response time to the site is approximately three to five minutes (AFC, page 5.10-6). With a major refinery in town, the El Segundo Fire Department has an environmental safety division that coordinates with local industries to develop emergency response plans (El Segundo Fire Department). Manhattan Beach Fire Department is also available via mutual assistance.

Police protection is provided by the El Segundo Police Department, with 69 authorized sworn officers plus a support staff. On-duty patrol staff ranges from three to eight officers. Response time to the project site is under four minutes (Evanski). The Manhattan Beach Police Department is of comparable size and will provide mutual aid if required.

The closest hospital with full emergency services is the Robert F. Kennedy Medical Center in Hawthorne, approximately four miles northeast of the site. There are industrial medical clinics in El Segundo and several other medical centers five to 10 miles from the project site.

### *FISCAL AND FINANCIAL*

The existing El Segundo Generating Station is a significant fiscal factor for the City of El Segundo, paying both property taxes and natural gas franchise fees that are substantial revenue sources for the City. According to estimated value, the current plant pays approximately $1 million annually in property taxes, of which the largest amount (48 percent) goes to schools and colleges, 12 percent goes to the County general fund and approximately nine percent, or $90,000 would go to the City of El Segundo. Annual natural gas franchise or usage fees are also paid to the City.

# IMPACTS

## PROJECT-SPECIFIC IMPACTS

Staff reviewed the El Segundo Power Redevelopment Project Application (00-AFC-14) for Certification, dated January 2001 and the responses to data adequacy requests dated March 7 and April 9, 2001. Additionally, staff requested and reviewed a demographic research analysis from the marketing firm Claritas, Inc. The analysis was specific to the projected year 2000 demographic profile of the area within a six-mile radius of the ESPR site. The applicant used appropriate public databases in the analysis contained in the AFC. Staff's analysis is based on verification of the information in the AFC and independent research.

### *EMPLOYMENT*

Construction will occur over a 20-month period. The peak construction labor requirement for the power plant and associated pipeline is estimated at 422 workers, and is expected to occur during the 11$^{th}$ and 12$^{th}$ months of construction. The number of workers is expected to exceed 300 workers for eight months and exceed 200 workers for a 13-month period, months four through 16 of the process (AFC, page 5.10-18 and -19. **Socioeconomics Table 3** shows the distribution of workers by craft over the construction effort. The primary task for the first 4 to 6 months would be demolition of elements of the existing plant that will be replaced. This is programmed to occur on a 2-shift seven-day a week basis (AFC, page 5.10-16).

Los Angeles County has a large construction labor force with an ongoing demand for their services, including major public works and private projects. As a result, there is a supply of workers in the trades required to construct the plant. Employment of up to 422 construction workers at the site would not result in any problems with labor availability for other construction projects.

The permanent employment associated with the proposed project (53 workers) would include two additional employees. This will not have a significant impact on the Los Angeles County labor force.

### *HOUSING*

As stated previously, construction of the proposed project is not expected to result in workers moving to the area for construction or permanent jobs. However, if for some reason a few workers did temporarily relocate, there was a housing vacancy rate of 4 to 6 percent in El Segundo, Hawthorne, and other nearby cities in 2000 (DOF). Los Angeles County is also a dynamic community with constant movement and relocation

## Socioeconomics Table 3
## ESPR Construction Staffing Schedule

| | Month of construction | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | |
| Craft | Number of workers | | | | | | | | | | | | | | | | | | | |
| Boilermakers | | | | | | | | | | | | | | | | | | | | |
| Bricklayers & masons | | | | | | | | | | | | | | | | | | | | |
| Carpenters | | | | | | | | | | | | | | | | | | | | |
| Electricians | | | | | | | | | | | | | | | | | | | | |
| Insulation workers | | | | | | | | | | | | | | | | | | | | |
| Ironworkers | | | | | | | | | | | | | | | | | | | | |
| Laborers | | | | | | | | | | | | | | | | | | | | |
| Millwrights | | | | | | | | | | | | | | | | | | | | |
| Operating Engineers | | | | | | | | | | | | | | | | | | | | |
| Plasterers | | | | | | | | | | | | | | | | | | | | |
| Painters | | | | | | | | | | | | | | | | | | | | |
| Pipefitters | | | | | | | | | | | | | | | | | | | | |
| Sheetmetal Workers | | | | | | | | | | | | | | | | | | | | |
| Sprinkler-fitters | | | | | | | | | | | | | | | | | | | | |
| Surveyors | | | | | | | | | | | | | | | | | | | | |
| Teamsters | | | | | | | | | | | | | | | | | | | | |
| Manual staff subtotal | | | | | | | | | | | | | | | | | | | | |
| Contractor staff | | | | | | | | | | | | | | | | | | | | |
| Total On-site | | | | | | | | | | | | | | | | | | | | |

Source: AFC, pages 5.10-18,19.

of population, so there is a turnover of housing supply on a constant basis. Staff does not expect any significant impact on housing from the construction of the ESPR.

### *SCHOOLS*

Temporary workers are not expected to move to and/or bring families to El Segundo or nearby communities during the construction period. Thus, there is not expected to be any impact on the need for school facilities. One-time school impact fees may be assessed once plans are submitted to the El Segundo Unified School District (AFC, page 5.10-27).

### *PUBLIC FINANCE AND FISCAL*

Construction of the proposed project will generate one-time sales tax receipts. Because the majority of supplies and equipment will be purchased outside of the City of El Segundo and Los Angeles and Orange Counties, limited local sales tax will be generated by the project. According to applicant estimates, about $2-3 million worth of material and equipment would be purchased locally. Construction payroll is estimated to be about $60-65 million. On-going operational payroll is projected at approximately $1.6 million (AFC, page 5.10-21). Thus, the project will result in both one-time and ongoing economic benefits to local businesses.

The existing ESGS yielded approximately $90,000 in annual property tax to the City of El Segundo and a total of $1 million to all agencies in 1999, based on an assessed value of approximately $100 million. The assessed value of the redeveloped El Segundo Generating Station is estimated to be $350-400 million (AFC, page 5.10-21). Based on the expectation that approximately $250 million of improvements will represent net gain in assessable value (subtracting old elements that will be removed), the City of El Segundo will receive $227,000 annually in additional property tax revenue, the County General Fund $300,000, and the Schools will receive $1.2 million additional annually (**Socioeconomics Table 4**). Franchise fees to El Segundo for natural gas would increase by some unknown amount, depending on the rate and the proportion of time the new units are on-line, expected to be higher than the current units.

**Socioeconomics Table 4:**
**Estimated Incremental Property Tax for El Segundo Generating Station Project**

| TAXING JURISDICTION | Approximate share of tax increment | Approximate incremental revenue |
|---|---|---|
| City of El Segundo | 9.1% | $227,500 |
| County General Fund | 11.9% | $297,500 |
| Schools | 47.7% | $1,192,500 |
| Special Districts | 12.4% | $310,000 |
| Redevelopment Agencies | 18.1% | $452,500 |
| Others | .8% | $20,000 |
| Total | 100.0% | $2,500,000 |

Source: Estimates based on applicants projections of property value and Los Angeles County allocation factors.

## ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

The purpose of the screening analysis is to determine whether there exists a low-income and/or minority population, which may be exposed to disproportionately high and adverse human health or environmental effects as a result of the proposed project. For all siting cases, Energy Commission staff conducts the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" dated April 1998.

### *MINORITY POPULATION ANALYSIS*

Minority populations, as defined by EPA's guidance document, are identified where either:

- The minority population of the affected area is greater than fifty percent of the affected area's general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

The Guidance does not define the term "affected area", however it states that the analyst should interpret the term "as that area which the proposed project will or may have an effect on." Typically, Energy Commission staff has defined the affected area as that area potentially impacted by the proposed project in the areas of air quality, public health, noise, water, traffic, and visual resources. This area has been determined by Energy Commission staff as that area within a six-mile radius of the proposed site.

**Socioeconomics Tables 5** and **6** contain 1990 census data and 2000 population estimates for minority populations within a 6-mile radius of the project, and the Cities of El Segundo, Inglewood, Gardena, Hawthorne, Torrance, Manhattan Beach, Santa Monica, Culver City, Hermosa Beach, Redondo Beach, Los Angeles County, and the

State of California, respectively. **Socioeconomics Figure 1** shows the geographic distribution of race and ethnicity within the six-mile radius. Based on the screening process for environmental justice, the data in **Socioeconomics Tables 5** and **6** indicate that the minority population within six miles of the project is between 44.9 percent and 57.6 percent. With the exception of the coastal cities, both tables indicate a high percentage of minorities within the six-mile radius, the other cities, the county, and the state.

**Socioeconomics Table 5: Minority Populations 1990**

| | Total Population[1] | Minority Population[2] | Percent Minority |
|---|---|---|---|
| 6-mile radius | 683,654 | 307,072 | 44.9% |
| El Segundo | 15,223 | 2,315 | 15.2% |
| Inglewood | 109,602 | 100,217 | 91.4% |
| Gardena | 49,847 | 39,275 | 78.8% |
| Hawthorne | 71,349 | 49,318 | 69.1% |
| Torrance | 133,107 | 44,289 | 33.2% |
| Manhattan Beach | 32,063 | 3,318 | 10.3% |
| Santa Monica | 86,905 | 21,568 | 24.8% |
| Culver City | 38,793 | 16,316 | 42.1% |
| Hermosa Beach | 18,219 | 2,302 | 12.6% |
| Redondo Beach | 60,167 | 12,036 | 21.0% |
| Los Angeles County | 8,863,164 | 5,228,442 | 58.9% |
| State of California | 29,760,021 | 12,730,895 | 42.8% |

1. 1990 US Census Data
2. Minority includes non-white and white-Hispanic populations.

**Socioeconomics Table 6: Minority Populations 2000**

| | Total Population[1] | Minority Population[2] | Percent Minority |
|---|---|---|---|
| 6-mile radius | 607,426 | 350,061 | 57.6% |
| El Segundo | 16,033 | 3,677 | 23% |
| Inglewood | 112,580 | 107,952 | 95.9% |
| Gardena | 57,746 | 50,682 | 87.7% |
| Hawthorne | 84,112 | 73,175 | 87% |
| Torrance | 137,946 | 65,712 | 47.6% |

| | | | |
|---|---|---|---|
| Manhattan Beach | 33,852 | 4,939 | 14.6% |
| Santa Monica | 84,084 | 23,602 | 28.1% |
| Culver City | 38,816 | 20,141 | 51.9% |
| Hermosa Beach | 18,566 | 2,744 | 14.8% |
| Redondo Beach | 63,261 | 18,442 | 29.2% |
| Los Angeles County | 9,529,721 | 6,444,315 | 67% |
| State of California | 33,560,448 | 17,100,904 | 51% |

1. Source: Dept. of Finance Demographic Research Center. 2000US Census Data
2. Minority includes non-white and white-Hispanic populations.

Socioeconomics Figure 1

## *LOW-INCOME POPULATION ANALYSIS*

**SOCIOECONOMICS TABLE 7** contains data for low-income populations within a 6-mile radius of the project.

**Socioeconomics Table 7: Low-Income Populations**

| | Population Below Poverty Level[1] | Percent Below Poverty Level |
|---|---|---|
| 6-Mile Radius | 72,980 | 10.67% |
| Source: 1990 US Census | | |

The poverty threshold for a family of four persons was $12,674 per year (1990 US Census Data). 2000 Census data on poverty is not yet available. To determine the number of persons below the poverty level, Energy Commission staff reviewed data from the 1990 US Census: Poverty Status By Age; Universe: Persons for whom poverty status is determined. Because the guidelines do not give a threshold to determine the existence of a low-income population, Energy Commission staff uses the fifty-percent threshold used for minority populations. The data in **Socioeconomics Table 7** indicates that there is not a greater than 50 percent population of low-income people within the project area.

## *STAFF FINDINGS*

As stated above, the data in **Socioeconomics Tables 5** and **6** show that the minority population within the six-mile radius is between 44.9 percent and 57.6 percent, and this population is predominantly located about three miles inland in the cities of Inglewood, Gardena, Hawthorne, Culver City, and Torrance.

The guidelines also state that a minority population may be identified when the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Therefore, a demographic comparison to the next larger geographic area or political jurisdiction should also be presented when determining whether impacts fall disproportionately on minority and low-income populations. For this comparison, staff looked at the 2000 data on minority populations for Los Angeles County. Comparing the six-mile radius which has a total minority population of 57.6 percent to Los Angeles County which has a total minority population of 67 percent indicates that the minority population in the six-mile radius is, although lower by 10 percent, similar to that of the county as a whole.

Air Quality staff analyzed the six-mile radius with respect to potential air quality impacts on minority and low-income populations. An analysis of air quality impacts shows that with implementation of air offsets, the project will not cause significant impacts to individuals in the affected area, including any member of any minority or low-income population. Please refer to the **Air Quality** section for a full discussion of direct and cumulative impacts. In addition, analysis of public health impacts shows that the project will cause no significant impacts upon any individual in the affected area, including any

member of any minority or low-income population. Please refer to **Public Health, Traffic and Transportation, Noise, Water, and Visual** sections for a full discussion of potential impacts and mitigation in these areas.

### *PROPERTY VALUES*

Neighbors of projects similar to the proposed project have expressed property value concerns. To address such concerns on previous projects, staff has reviewed the literature on the potential property value impacts associated with linear facilities, toxic sites, and other locally unwanted land uses. In general, staff has determined that there is no information or study that demonstrates an adverse or negative impact on surrounding property values directly attributable to a natural gas-fired power plant. In this particular case, the neighboring homes in the El Porto neighborhood of Manhattan Beach have both the advantages of proximity to the adjacent beach (and views in some cases), and the disadvantage of proximity to the power plants (El Segundo and Scattergood), the Chevron refinery, and a transmission corridor. These uses have been neighbors for many years, and housing values in the area, although presumably lower than would be the case if none of the less desirable land uses were present, are primarily reflective of proximity to the beach, coastal influenced air quality, and relatively good access to employment opportunities.

Negative impacts, however, can be generated if there are significant adverse impacts such as visual, noise, traffic, or air quality. Based upon this finding and the fact that the proposed project is a replacement of an existing power plant and not a change in land use, staff has concluded that the proposed project is unlikely to adversely impact property values in the vicinity.

In this case, neighbors have voiced specific concern that the demolition of the oil storage tanks that visually buffer the neighborhood from the power plant could result in a “more industrial view” and/or exposure to temporary construction noise. If appropriate visual screening is provided during the construction period as well as permanently, the view will be enhanced compared to the present and there should not be an adverse impact on property values. Likewise, mitigation measures to reduce construction noise impacts should reduce temporary impacts of that activity. Please refer to the **Noise** and **Visual** sections for a complete analysis of potential impacts and associated mitigation.

## CUMULATIVE IMPACT

Los Angeles County is an area that has a relatively high level of development of public and private projects, including highway projects, new commercial development, and new residential development. There are on-going projects that would occur concurrently with the El Segundo Power Redevelopment Project should it be approved. The only potential impact from a cumulative socioeconomic point of view could be a possible shortage of workers in some trades, creating an influx of new population, having impacts on housing and schools. However, because of the size of the County and the construction labor force, no cumulative impacts are anticipated.

## FACILITY CLOSURE

Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur. The planned lifetime of the proposed power plant is 25 to 40 years; however, given unforeseen circumstances the plant may be retired prematurely for a variety of reasons.

Should the plant be temporarily shutdown or closed, there would not be any significant socioeconomic impacts. The applicant would conduct a review to determine if there had been any environmental damage or release of hazardous materials. If not, the plant could be mothballed. Before the plant begins commercial operation, the applicant will develop a contingency plan to deal with premature or unexpected closures. This would include communication with the Energy Commission, the City of El Segundo, and local agencies regarding schedule of facility closure and compliance with LORS.

In the event that the decision is made to permanently close the facility, the applicant will develop a plan for decommissioning that will be submitted to the Energy Commission and other appropriate agencies. The plan will include compliance with all applicable LORS. Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, and property and other tax revenues would no longer occur. This would have a small adverse impact on the tax revenues of the City of El Segundo.

## MITIGATION

Energy Commission staff has identified economic and fiscal benefits to the project area such as employment, project expenditures, sales, and property tax revenues. Staff proposes no socioeconomic mitigation for this project.

## CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

Staff believes that the El Segundo Generating Station Project would not cause a significant adverse direct or cumulative impact on housing, employment, schools, public services or utilities. The project would have a temporary benefit to the City of El Segundo and adjacent areas in terms of an increase in local jobs and commercial activity during the construction of the facility. The construction payroll and project expenditures would also have a positive effect on the local and county economies. The estimated benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods, and equipment. Overall, staff believes that the project will have a positive socioeconomic impact on the El Segundo area. The project, as proposed, would be consistent with all applicable socioeconomic LORS.

## *RECOMMENDATIONS*

If the Energy Commission certifies the proposed project, staff does not propose any socioeconomic conditions of certification.

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# TRAFFIC AND TRANSPORTATION

Testimony of Steven J. Brown

## INTRODUCTION

The Traffic and Transportation Section of the Staff Assessment addresses the extent to which the project may impact the transportation system within the vicinity of the proposed El Segundo Power Redevelopment (ESPR) project location. The influx of large numbers of construction workers can, over the course of the construction phase, increase roadway congestion and also affect traffic flow. In addition, the transportation of large pieces of equipment can impact roadway congestion and safety. The construction of linear facilities (such as pipelines for water service) can temporarily disrupt traffic flows when trenching across roadways.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

### 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. The California Health and Safety Code addresses the transportation of hazardous materials. Specific provisions include:

- California Vehicle Code, section 353 defines hazardous materials. California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon;
- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials;
- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements;
- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases;

- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways;
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-.7, 34506, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials;
- California Health and Safety Code, sections 25160 et seq., addresses the safe transport of hazardous materials;
- California Vehicle Code, sections 2500-2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives;
- California Vehicle Code, 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, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials;
- 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, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

## LOCAL

### *CITY OF EL SEGUNDO MUNICIPAL CODE*

#### HEAVY VEHICLES AND EQUIPMENT

Section 10.20.010 addresses requirements for the movement of heavy vehicles on local roadways including necessary permits and maximum truck load weights.

#### TRUCK ROUTES

Section 10.40.010 establishes method of designating a truck route and the requirements imposed upon such routes.

#### OBSTRUCTIONS

Sections 12.04.050 ,12.04.060, and 12.04.070 establish requirements for construction activity within the public street right-of-way including necessary permits, approval, and notification.

## *CITY OF EL SEGUNDO GENERAL PLAN CIRCULATION ELEMENT (1992)*

### LEVEL OF SERVICE STANDARDS

Policies C1-1.5 and C1-1.9 establish a LOS standard of LOS D or better for the circulation system in El Segundo. These policies require that existing roadways are upgraded to full Circulation Element standards as warranted by roadway operating conditions of Level of Service "E" or "F."

### PROJECT MITIGATION

Policy C3-1.1 requires all new development to mitigate project-related impacts on the existing and future circulation system and further states that the mitigation measures shall be provided for and paid by the project developer.

## *CITY OF MANHATTAN BEACH MUNICIPAL CODE*

### CONSTRUCTION ACTIVITY WITHIN PUBLIC RIGHT-OF-WAY

Chapters 7.08.010, 7.16.030, 7.36.010, and 7.40.020 identify requirements pertinent to construction activity within the public right-of-way including necessary permits and processes.

### HEAVY VEHICLE TRANSPORT/TRUCK ROUTES

Chapters 14.48.010 and 14.64.010 address requirements for the movement of heavy vehicles on designated local truck routes including necessary permits and maximum truck load weights.

## *CITY OF LOS ANGELES (COMMUNITY OF PLAYA DEL REY) GENERAL PLAN CIRCULATION ELEMENT*

### PROVISION OF ADEQUATE ACCESSIBILITY

Chapter IV Goal A requires provision of adequate accessibility to work opportunities and essential services, and acceptable levels of mobility for all those who live, work, travel, or move goods in Los Angeles. Object 5 of this goal provides for efficient movement of goods and for adequate access to intermodal facilities partly through Policy 5.8, which encourages the development, and siting of pipelines only within suitable utility corridors or public rights-of-way. This policy further states that such siting will be carried out in such a manner as to least disrupt sensitive environments, to protect public health, ground water quality, and to improve the safety and reliability of the system.

## *LOS ANGELES COUNTY REGIONAL TRANSPORTATION PLAN AND CONGESTION MANAGEMENT PLAN*

The project is located in Los Angeles County. Los Angeles County is part of the Southern California Association of Governments (SCAG). SCAG is required by federal and state mandates and requirements to develop the Regional Transportation Plan (RTP), which outlines transportation goals, objectives, and policies for the SCAG region. Los Angeles County also has the Congestion

Management Plan (CMP), which provides goals and policies in regards to traffic operation on the transportation system in Los Angeles County. The SCAG RTP (SCAG, 1998) and Los Angeles County CMP (amended 1990) contain the guiding policies used in the operational analysis for this project.

## SETTING

## REGIONAL DESCRIPTION

The El Segundo Generating Station (ESGS) site is located within the City of El Segundo in Los Angeles County, California along the shore of the Pacific Ocean. The Manhattan Beach city limits form the southern boundary of the ESGS site. Vista Del Mar is the roadway adjacent to the project site on the east and serves as the primary project access.

Descriptions of some the critical roads and highways in the study area are provided below. The roads and highways in the project vicinity are shown in **TRAFFIC AND TRANSPORTATION Figure 1, Project Study Area**.

### *FREEWAYS AND LOCAL ROADWAYS*

U.S Interstate 405 (San Diego Freeway), located about 4 miles east of the project site, is a north-south freeway providing regional access to the coastal communities on the west side of Los Angeles. I-405 has four lanes in each direction and auxiliary lanes. A High Occupancy Vehicle (HOV) lane is currently provided between Century Boulevard and Vermont Avenue.

U.S Interstate 105 (Glenn M. Anderson Freeway), located about 2 miles north of the project site, is an east-west freeway extending from Sepulveda Boulevard on the west to the San Gabriel Freeway (I-605) on the east. I-105 consists of three mixed-flow lanes and one HOV lane in each direction.

Aviation Boulevard is a major arterial, four-lane divided roadway, providing north-south access through the cities of El Segundo and Manhattan Beach.

El Segundo Boulevard is an east-west secondary arterial from Vista Del Mar on the west to Sepulveda Boulevard on the east. It is considered a major arterial east of Sepulveda Boulevard. El Segundo Boulevard is approximately 1 mile from the project site, and connects traffic from collector streets on the west side of El Segundo to I-405 and the regional freeway system.

Grand Avenue is a four-lane undivided east-west, secondary arterial roadway from Vista Del Mar on the west to Center Street.

**TRAFFIC AND TRANSPORTATION Figure 1**
**Project Study Area**

Source: Adapted from Fehr and Peers Associates, Inc. ESPR Traffic and Transportation Site Assessment.

Imperial Highway is a four-lane divided, east-west secondary arterial from Main Street on the west to Sepulveda Boulevard. East of Sepulveda Boulevard, Imperial Highway is a six-lane divided roadway.

Imperial Avenue is a two-lane undivided, east-west collector street, from Main Street on the west to California Street on the east.

Rosecrans Avenue is a five-lane divided, east-west major arterial roadway from the westerly boundary of Manhattan Beach to Sepulveda Boulevard. East of Sepulveda Boulevard, Rosecrans Avenue is a six-lane divided roadway.

Sepulveda Boulevard is an eight-lane divided, north-south major arterial roadway providing connections to I-405 north of LAX and to I-105 south of LAX. Sepulveda Boulevard provides access to northern and southern points of the Los Angeles area. Sepulveda Boulevard is designated State Route 1 (SR-1) from Lincoln Boulevard on the north to Pacific Coast Highway on the south.

Vista Del Mar is a four-lane undivided, north-south secondary arterial roadway that bounds the easterly perimeter of the project site.

## PUBLIC TRANSPORTATION

Public transportation via bus, rail, or airline is available within or near the project study area. Bus routes, bicycle facilities, and pedestrian facilities provide access directly to the project site.

## BICYCLE FACILITES

A Class I bicycle facility exists along the western boundary of the project site. This bicycle path extends along the beach adjacent to Vista Del Mar. On-street bicycle facilities are provided to the southern project boundary via the streets of Manhattan Beach.

## PLANNED ROADWAY AND TRANSIT IMPROVEMENTS

No planned roadway improvements are expected to affect project development. Roadway extensions are proposed on Grand Avenue and Mariposa Avenue on the eastern side of El Segundo. No relevant transit improvement projects are proposed for the study area.

## LINEAR FACILITIES

No additional transmission lines or natural gas lines will be needed as a result of the project. The existing transmission lines and adjacent switchyard will be used. Existing gas lines have sufficient capacity for total plan operation. Connections to the existing natural gas lines already exist for Units 1 and 2 and no upgrades external to the site are needed.

## NATURAL GAS PIPELINE

No changes to the natural gas pipeline or onsite connection to the pipeline is being proposed for the redevelopment project.

## WATER SUPPLY PIPELINES

Construction of new potable and reclaimed water supply lines are proposed for the project. These supply lines will begin at the intersection of Eucalyptus Drive and El Segundo Boulevard. The pipeline will be installed in a common trench that will extend approximately 1.5 miles, routed west along El Segundo Boulevard, north on Richmond Street, west on Grand Avenue, and south on Vista Del Mar. Immediately north of the project site, the new water supply pipelines will be routed under Vista Del Mar at an overpass currently used by the adjacent Chevron Refinery for routing pipe. Construction of the pipeline will take place within the street right-of way and therefore temporarily impact traffic flow.

## EFFLUENT WATER DISCHARGE LINE

A proposed sanitary waste pipeline will begin on the project property, be routed to the southern project boundary, and then extend for approximately 200 feet to an existing manhole at the intersection of The Strand and 45$^{th}$ Street in the City of Manhattan Beach. Construction of the pipeline will take place within the street right-of way and therefore temporarily impact traffic flow.

## AQUEOUS AMMONIA PIPELINE

A proposed pipeline carrying aqueous ammonia will begin at a junction on the Chevron Refinery and be routed for approximately 0.5 miles to the north boundary under Vista Del Mar via the overpass currently used by the Chevron Refinery to route pipelines. Construction of the pipeline will take place within the street right-of way and therefore temporarily impact traffic flow.

## TRUCK TRAFFIC

Traffic volumes on roadways adjacent to the site consist of approximately 5% heavy vehicles (i.e. - trucks). Many of these trucks are serving existing industrial land uses adjacent to the site. The designated truck routes within the City of El Segundo primarily follow the arterial street system. The City of El Segundo does not have truck load limits for local roadways. Therefore, California Vehicle Code limits apply to all study roadways (including state routes). These limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle. The front steering axle load is limited to 12,500 pounds.

## CURRENT INTERSECTION AND ROADWAY OPERATING CONDITONS

Intersections are usually the critical elements of the roadway system in assuring adequate travel capacity, maximizing safety, and minimizing environmental impacts. The operating conditions of a roadway system, including intersections, are

described using the term “level of service”. Level of service (LOS) is a description of a driver’s experience at an intersection or roadway based on the level of congestion (delay). However, it is not a measure of safety or accident potential. LOS can range from “A”, representing free-flow conditions with little or no delay, to “F”, representing saturated conditions with substantial delay.

LOS standards and thresholds differ for each jurisdiction. Any study roadway or intersection operating below these thresholds is considered unacceptable for purposes of this report. The ten study intersections, the cities in which they are located and their corresponding standards, and the current service levels (AM/PM) are listed below in **TRAFFIC AND TRANSPORTATION Table 1, Intersection Level of Service – Existing Conditions**. Those listed in bold do not meet the current service level standards.

**TRAFFIC AND TRANSPORTATION Table 1**
**Intersection Level of Service - Existing Conditions**

| North/South Street | East/West Street | Jurisdiction | LOS Standard[1] | AM Peak Hour (7:00-8:00) LOS | PM Peak Hour (4:00-5:00) LOS |
|---|---|---|---|---|---|
| Vista Del Mar | Grand Ave. | Los Angeles | LOS E or better | C | B |
| **Sepulveda Blvd.** | El Segundo Blvd. | El Segundo | LOS D or better | **E** | **F** |
| Vista Del Mar | Imperial Hwy. | Los Angeles | LOS E or better | A | B |
| Pershing Dr. | Imperial Hwy. | Los Angeles | LOS E or better | B | B |
| Vista Del Mar | 45th St. | El Segundo / Manhattan Bch. | LOS D or better | C | B |
| **Vista Del Mar** | Rosecrans Ave. | Manhattan Bch. | No Standard | **F** | **E** |
| **Sepulveda Blvd.** | Rosecrans Ave. | El Segundo / Manhattan Bch. | LOS D or better | **F** | **F** |
| Aviation Blvd. | El Segundo Blvd. | El Segundo | LOS D or better | D | C |
| **Aviation Blvd.** | Rosecrans Ave. | El Segundo / Manhattan Bch. /Hawthorne[2] | LOS D or better | **F** | **F** |
| **Sepulveda Blvd.** | Imperial Hwy. | El Segundo | LOS D or better | D | **F** |

Notes:
[1] – Most restrictive standard used when multiple jurisdictions are involved.
[2] – Information from the City of Hawthorne is yet to be received. The City of El Segundo LOS standard is used.
**Bold – denotes unacceptable conditions**

**Table 1** shows that five of the intersections are operating below acceptable standards for LOS. The unacceptable LOS occurs at one or both of the peak hours. The intersection at Vista Del Mar and Rosecrans in Manhattan Beach does not have an established LOS standard but the LOS is F in the AM Peak Hour and E in the PM Peak Hour, which is normally unacceptable in most communities.

LOS was measured on eight study roadway segments using methodologies contained in the *Highway Capacity Manual,* Transportation Research Board, National Research Council U.S., 1997. The roadway segments analyzed are identified in the Regional Setting section of this report under the Freeway and Local Roadways subsection. **TRAFFIC AND TRANSPORTATION Table 2, Roadway Level of Service – Existing Conditions** summarizes operations on the study area roadway segments. Those listed in bold do not meet the current service level standards.

Similar to the LOS associated with the intersections in the project area there are sections of Imperial Avenue, Rosecrans Avenue, and Sepulveda Boulevard operating below the acceptable LOS.

**TRAFFIC AND TRANSPORTATION Table 2**
**Roadway Level of Service - Existing Conditions**

| Roadway | From | To | Jurisdiction | LOS Standard[1] | LOS |
|---|---|---|---|---|---|
| Vista Del Mar | Hawaii | Rosecrans | El Segundo | LOS D or better | B |
| El Segundo Blvd. | Nash | Douglas | El Segundo | LOS D or better | C |
| Grand Ave. | Vista Del Mar | Main | El Segundo / Los Angeles | LOS D or better | A |
| **Imperial Hwy.** | Center | Sepulveda | El Segundo / Los Angeles | LOS D or better | **F** |
| Imperial Ave. | Main | Center | El Segundo / Los Angeles | LOS D or better | A |
| **Rosecrans Ave.** | Douglas | Aviation | El Segundo / Manhattan Bch. | LOS D or better | **F** |
| **Sepulveda Blvd.** | El Segundo | Rosecrans | El Segundo | LOS D or better | **F** |
| Vista Del Mar | Grand | City Limit | El Segundo / Los Angeles | LOS D or better | A |

Notes:
[1] - Most restrictive standard used when multiple jurisdictions are involved.
**Bold – denotes unacceptable conditions**

## IMPACTS

The California Environmental Quality Act (CEQA) indicates that a project could have a significant effect on traffic and transportation if the project will:

- Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the highway and road system (i.e. result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate parking capacity.

## CONSTRUCTION PHASE

### *COMMUTE TRAFFIC*

The construction phase of the project will require a peak workforce of approximately 422 workers per day. An estimate of the number of daily trips by construction workers is based upon a worst-case assumption that all workers will drive alone (i.e., no carpooling assumed, no public transit use) to/from the site during peak hours, which would result in 844 employee commute trips.

The preferred commuting route will depend on the residence location of construction workers. Based upon the overall population distribution in the greater Los Angeles area, an assumption of 50% of the project construction workforce will be commuting from the east, 20% from north of LAX airport, 25% from areas to the south, and 5% from local areas (i.e., El Segundo).

The size of the construction workforce will require the workers to park in designated areas. The majority of construction employee parking will be provided at remote locations with shuttle service provided to and from the site. Final determination of which parking area will be used has not been made.

The applicant is working with the County of Los Angeles to determine if some of the beach parking lots located north of the project site can be used to accommodate construction parking. The County of Los Angeles has an obligation to give priority for public beach access, but does have a procedure for processing parking requests. The county will review ESPR request for use of the beach parking lots and may grant access to one or more lots if the project parking does not compromise access to the beach. The applicant is also pursuing other off-site parking options in addition to the beach parking lots. No matter which parking lots are selected the applicant will provide shuttle service between the remote parking lots and the project site.

The Traffic impact evaluation assumes that construction employee parking will be at one or more of the following locations:

- Fed Ex site (northeast El Segundo);
- LAX Pershing site (west portion of the LAX property); and
- County/State Beach area (Hyperion, Grand Avenue, Dockweiler, and /or Marina del Rey located along the coast north of the project).

To determine the potential for impact, staff assessed whether levels of congestion could increase as a result of construction employee commute trips being added to existing traffic volumes on study area roadways and intersections. This assessment included scenarios for use of each potential parking site. **TRAFFIC AND TRANSPORTATION Table 3, Intersection Level of Service – Existing Plus Project Conditions** summarizes intersection operations without and with the project assuming employee parking at the locations identified above.

According to the analysis, LOS at the intersection of El Segundo Boulevard at Sepulveda Boulevard located in El Segundo is expected to deteriorate from LOS E to F with the addition of project-related trips during the AM peak hour in the peak month of construction activity. The intersection of Rosecrans Boulevard and Vista Del Mar located in Manhattan Beach is expected to deteriorate from LOS E to F under both the LAX/Pershing and County/State Beach parking location scenarios with the addition of project-related trips during the PM peak hour. LOS at all other study intersections would insignificantly change (i.e., LOS D or better to LOS D or better) with the addition of project-related traffic.

**TRAFFIC AND TRANSPORTATION Table 3**
**Intersection Level of Service - Existing Plus Project Conditions**

| | | | | AM Peak Hour (7:00-8:00) | | | | PM Peak Hour (4:00-5:00) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Plus Project | | | | Plus Project | | |
| N/S Street | E/W Street | Jurisdiction | LOS Standard[1] | Exist. | Fed Ex | LAX | Beach | Exist. | Fed Ex | LAX | Beach |
| Vista Del Mar | Grand Ave. | Los Angeles | LOS E or better | C | C | C | C | B | B | B | B |
| **Sepulveda Blv**d. | El Segundo Blvd. | El Segundo | LOS D or better | E | **F** | **F** | **F** | F | F | F | F |
| Vista Del Mar | Imperial Hwy. | Los Angeles | LOS E or better | A | A | B | B | B | B | B | B |
| Pershing Dr. | Imperial Hwy. | Los Angeles | LOS E or better | B | C | B | B | B | B | B | B |
| Vista Del Mar | 45th St. | El Segundo/ Manhattan Beach | LOS D or better | C | C | C | C | B | B | B | B |
| **Vista Del Mar** | Rosecrans Ave. | Manhattan Beach | No Standard | F | F | F | F | E | E | **F** | **F** |
| Sepulveda Blvd. | Rosecrans Ave. | El Segundo/ Manhattan Beach | LOS D or better | F | F | F | F | F | F | F | F |
| Aviation Blvd. | El Segundo Blvd. | El Segundo | LOS D or better | D | D | D | D | C | C | C | C |
| Aviation Blvd. | Rosecrans Ave. | El Segundo/ Manhattan Beach/ Hawthorne[2] | LOS D or better | F | F | F | F | F | F | F | F |
| Sepulveda Blvd. | Imperial Hwy. | El Segundo | LOS D or better | D | D | D | D | F | F | F | F |

Notes:
[1] – Most restrictive standard used when multiple jurisdictions are involved.
[2] – Information from the City of Hawthorne is yet to be received. The City of El Segundo LOS standard is used.
**Bold – denotes significant impact due to change in LOS with the project.**

The City of Manhattan Beach does not have an adopted LOS standard for intersections. However, we have assumed that the project-related deterioration from LOS E to F at the intersection of Rosecrans Boulevard and Vista Del Mar is a significant impact. The City of El Segundo ordinances include a service level standard of LOS D or better and that project mitigation is required when a project causes deterioration of operations to an unacceptable level. The intersection of El Segundo Boulevard at Sepulveda Boulevard currently operates unacceptably at

LOS E without the project and falls to LOS F with the project. Therefore, the project-related deterioration of LOS to unacceptable levels (i.e., LOS F) at this location is a significant impact. No other study intersections or roadway segments are significantly impacted (i.e.- cause a location to be worse than relevant standard) by the project under existing plus project conditions with each parking site scenario. Measures and Conditions of Certification that ensure mitigation of impacts are discussed later in this analysis.

### *TRUCK TRAFFIC*

Truck deliveries are expected to occur between 6:00 AM and 6:00 PM. At the peak month of construction (month 6), 29 delivery trucks per day are expected to access the project site. This averages approximately 3 trips per hour. The addition of 3 trucks will represent a negligible increase in traffic volumes along proposed routes of travel. The proposed designated truck routes for the project include Interstates 405 and 105 to west to Imperial Highway and north via Vista Del Mar to the project entrance.

In addition to deliveries of heavy equipment, construction materials (such as concrete, wire, pipe, cable, fuels), and consumables, other deliveries will include hazardous materials to be used during project construction. The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the Waste Management Section, and the Hazardous Materials Section of this report. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of Hazardous Substances. Conditions of Certification that ensure this compliance are discussed under their respective subsection later in this analysis.

The California Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to carry a manifest, available for inspection by the California Highway Patrol at inspection stations along major highways and interstates. Drivers are also required to check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous waste spills.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important to ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol.

Transportation of equipment that will exceed the load size and limits of certain roadways will require special permits from the City of El Segundo, City of Los Angeles, City of Manhattan Beach, and/or Caltrans. Mitigation measures and Conditions of Certification that ensure this compliance are discussed later in this analysis.

## OPERATIONAL PHASE

### *COMMUTE TRAFFIC*

The proposed project is expected to add 2 new full-time employees above the current operations employee levels. This increase in staff represents an insignificant increase in traffic levels as a result of the on-going operation the power plant.

### *TRUCK TRAFFIC*

Deliveries to the project site are expected for on-going maintenance of the plant. The incremental change in the number of delivery trips to the plant site is expected to be nominal and will generally occur during non-commute periods. Therefore, the resulting LOS on local roadways would remain unchanged from the existing LOS.

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. During operation this would be the delivery of aqueous ammonia. To minimize this risk, ESPR Project plans to purchase it ammonia requires from the nearby Chevron Refinery. It will take delivery of the ammonia via a pipeline to be constructed between the refinery and plant site. If hazardous material is delivered to the plant the potential impacts of its transportation can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of Hazardous Substances. Mitigation measures and Conditions of Certification that ensure this compliance are discussed under their respective subsection later in this analysis.

The handling and disposal of hazardous substances are also addressed in the Waste Management, Workers Safety and Fire Protection, and Hazardous Materials sections of this report.

## CUMULATIVE IMPACTS

Based on the current and future traffic characteristics of the area, congestion associated with the operation of the project is nominal, and regional and local roadways will have adequate capacity to accommodate project construction traffic.

Section 5.20 of the AFC identifies projects that could potentially create a cumulative impact on the area if combined with project traffic. The list of projects included in Table 5.20-1 of the AFC represents projects located within a five-mile radius of the project site, a one-mile radius of proposed linear facilities, and projects of potential regional significance. The traffic volume from all cumulative projects, plus the power plant project will likely increase the congestion levels on area roadways and intersection. However, the impacts associated with the construction phase of the project are short-term and the operational phase impacts will be insignificant due to the slight increase in employees (i.e., 2 new full-time employees) above current conditions, thus significant impacts are not expected under cumulative conditions.

## FACILITY CLOSURE

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 will all LORS at least twelve months prior to the proposed decommissioning, the applicant shall prepare a Decommissioning Plan for submission to the Energy Commission for review and action. 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 El Segundo Generation Station 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 impacts from truck traffic. At this time, no specific conclusions can be drawn about the effects of project closure on traffic and transportation.

## MITIGATION

The applicant has indicated their intention to comply with all LORS relating to:

- The transport of hazardous materials;
- The transport of oversized loads; and
- The receipt and compliance with all necessary encroachment and transportation permits for any construction activity within the public right-of-way.

The applicant should also implement the following traffic and transportation mitigation measures:

- Enforce a policy that all project-related parking occurs in designated parking areas;
- Repair any damage to adjacent roadway sections incurred during construction to the road's pre-project construction condition. Any repair work needed shall occur outside of the ambient street traffic peak periods;
- Prepare a Transportation Management Plan subject to review by the City of El Segundo, the City of Manhattan Beach, and the City of Los Angeles. The Transportation Management Plan should include measures to ensure that at least 40 percent of project-related traffic previously assumed to occur during the AM peak hour occurs outside of the AM peak hour, and at least 80 percent of project-related traffic previously assumed to occur during the PM peak hour occurs outside of the PM peak hour. This will mitigate the project impacts at the intersection of El Segundo Boulevard and Sepulveda Boulevard during the AM peak hour and Rosecrans Boulevard at Vista Del Mar during the PM peak hour to a level of insignificance. The Transportation Management Plan should also include a Traffic Control Plan with measures to mitigate impacts associated with construction activities occurring within any public street right-of-way in accordance with local jurisdictional requirements.

## CONCLUSIONS

Staff has concluded that the intersections and roadways that are operating at acceptable LOS (LOS of D or better) will not see a decline in their LOS to an unacceptable LOS. Because, some of the area intersections and roadways are operating at a LOS below an acceptable standard the potential exists for the project to cause an impact in the traffic and transportation area. Any identified impacts can be mitigated to a level of insignificance by implementing the mitigation measures identified below.

## CONDITIONS OF CERTIFICATION

**TRANS-1** The applicant shall comply with California Department of Transportation (Caltrans) and affected local jurisdictions on limitations on vehicle sizes and weights. In addition, the project owner or their 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 oversize and overweight transportation 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 applicant shall comply with the California Department of Transportation (Caltrans) and local jurisdictional limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

**Verification:** In the Monthly Compliance Reports, the project owner shall submit copies of any encroachment 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-3** The applicant shall ensure that all federal and state regulations for the transport of hazardous materials are observed.

**Verification:** The project owner shall include in its Monthly Compliance Reports during construction and Annual Compliance Reports during operations copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous materials.

**TRANS-4** Following completion of ESPR project construction, the applicant shall repair any damage to the segment of Vista Del Mar directly adjacent to the project site incurred during construction to the road's pre-project construction condition.

Protocol: Prior to start of construction, the project owner shall photograph, videotape or digitally record images of Vista Del Mar directly adjacent to the project site. The project owner shall provide the Compliance Project

Manager (CPM), and the City of El Segundo with a copy of these images. Prior to start of construction, the project owner shall also notify the City of El Segundo 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 redevelopment project, the project owner shall meet with the CPM and the City of El Segundo 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 City of El Segundo if work occurred within their jurisdictional public right of way stating their satisfaction with the road improvements.

**TRANS-5** The applicant shall develop a Transportation Management Plan. The Transportation Management Plan shall include measures to ensure that at least 40 percent of project-related traffic previously assumed to occur during the AM peak hour occurs outside of the AM peak hour, and at least 80 percent of project-related traffic previously assumed to occur during the PM peak hour occurs outside of the PM peak hour. The Transportation Management Plan shall include a Traffic Control Plan that ensures mitigation of impacts associated with construction activities occurring within any public street right-of-way to a level of insignificance in coordination with the City of El Segundo, the City of Manhattan Beach, and the City of Los Angeles subject to the satisfaction of the CPM.

**Verification:** Prior to start of site preparation or earth moving activities, the project owner shall provide a Traffic Control Plan to the City of El Segundo, the City of Manhattan Beach, and the City of Los Angeles for review and comment. After receipt of their comments, the CPM shall review and approve the Traffic Control Plan.

**TRANS-6** During construction and operation of the ESPR project, the applicant shall enforce a policy that all project related parking occurs in designated parking areas.

**Verification:** Prior to start of construction, the project owner shall submit a parking and staging plan for all phases of project construction to the CPM for review and approval.

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*Highway Capacity Manual*, Special Report 209, Transportation Research Board, Washington D.C., 1997.

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# TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

## INTRODUCTION

As presented in the **Project Description** section, the proposed El Segundo Power Redevelopment project (ESPR) is a modification of the existing El Segundo Generating Station (ESGS) owned by the applicant, El Segundo Power II LLC. This proposed modification is intended to increase the amount of electric power presently generated at the facility per unit of natural gas fuel utilized. The generated power will be transmitted off site to the Southern California Edison (SCE) power grid by way of the presently utilized SCE 230 kV El Segundo Switchyard located adjacent to ESGS. This transmission will be made using existing SCE transmission lines, meaning that no new off-site transmission lines will be built in connection with the proposed project modification. The only new lines would be the two on-site 230 kV overhead connections between the new replacement generating units 5, 6, and 7 and the SCE Switchyard. As replacement lines, these new lines will be located within the same route as the connecting lines for the existing 1950s-vintage units 1 and 2, which are the units to be replaced. Since the post-modification power will still be transmitted at the existing 230 kV, the system's electric fields will remain the same, meaning that all electric field-field-related impacts will remain the same along the line routes. The only fields that would change are the companion magnetic fields, which alone depend on the current flow and will therefore, increase with the increased power generation.

The purpose of this analysis is to (a) assess the construction and operation of the on-site replacement lines for appropriate incorporation of the design measures necessary for compliance with existing LORS, and (b) determine whether or not the magnetic field increases in the off-site lines would allow for compliance with these LORS as related to magnetic field intensity. If compliance is established for both lines, the Commission staff (staff) would recommend approval of the applicant's operational plans; if not, revisions would be recommended as appropriate. Staff's analysis will focus on the issues noted below which relate primarily to the physical presence of the line or secondarily to the physical interactions of line 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 (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of the lines to be associated with the ESPR project. The impacts of concern are addressed through specific federal or state regulations or through established industry standards and practices. There presently are no local laws or regulations specifically focused on limiting the physical structure, dimensions, or operation of these lines.

## AVIATION SAFETY

Any hazard to aircraft in the project area relates to the potential for collision with the electric power line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collisions.

### *FEDERAL*

- Title 14, Part 77 of the Federal Code of 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 structure is located to avoid any significant hazards to area aviation.
- 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.

## 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. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts can be assessed from field strength estimates obtained for the 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.

### *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 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 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. Staff usually recommends specific conditions of certification as necessary 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 for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

## AUDIBLE NOISE

### *INDUSTRY STANDARDS*

There are no design-specific federal regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience. These standards have proven effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance with these standards. Any noise will usually result from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, hissing sound, or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV such as the on-site or off-site lines associated with the proposed 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*

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of 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.
The applicant is usually responsible for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification as necessary to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

## FIRE HAZARDS

The following regulations address fire hazards 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.

## HAZARDOUS SHOCKS

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force 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, CCR, Section 2700 et seq., “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

### *INDUSTRIAL STANDARDS*

There are no design-specific federal regulations to prevent hazardous shocks from power lines. Safety is assured through 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 (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field 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 considering exposure as EMF exposure. As noted by the applicant (ESPR 2000a, pages 5.16-14 and 5.16, and 5.18-30 through 5.18-33), the available evidence as continually evaluated by CPUC and other regulatory agencies, 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 the present uncertainty, to reduce such fields to the extent feasible.

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 relate to 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. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This PUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed line (whether new or modified) will be designed to incorporate the EMF-reducing design guidelines applicable to the utility service area involved. The service area in this case is that of SCE. 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. It is, therefore, up to each applicant to ensure that such measures are applied in ways that have no significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Because of this, staff requires their measurements for each new or modified line.

The field strengths (or intensities) of any given line can be estimated 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 structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new or modified line in California is currently required to be designed according to the safety and EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to verify implementation of the reduction measures necessary. The applicable condition for this project is TLSN-1.

### *INDUSTRIAL STANDARDS*

No federal regulations have been established 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 issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new or modified lines are generally similar to those from existing lines. Some states (Florida, Minnesota, Montana, New Jersey, and New York) 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 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 as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because

only it can penetrate building 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 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 the power line environment.

## SETTING

The proposed ESPR project is located on a 5.5-acre portion of the existing ESGS facility, which occupies a site of approximately 33 acres in the City of El Segundo (ESPR 2000a pages 3.2-1, 3.4-2 and 5.18-1). Since the project-specific, on-line connection to the SCE El Segundo Switchyard will remain within the same corridor as the lines for the existing Units (1 and 2) to be replaced, this corridor will remain the only source of line-related fields between the SCE Switchyard and the replacement units. Since this on-site interconnection will lie entirely within the ESGS property boundaries, the residential exposures at the root of the present health concern would be insignificant with respect to these new lines. With no public access to the ESGS site, the only exposure of potential significance would be the relatively short-term exposure to line, or other facility workers, or any individuals who may enter the project site. These types of exposures are well understood as not significantly responsible for the present health-based concern. The only sources of residential exposure will continue to be the existing off-site SCE grid lines that will still be used after the proposed modification. The regulatory significance of their project-related increases is one of the main points at issue in this analysis.

As discussed by the by the applicant (ESPR 2000a, pages 3.6-3 and 3.6-4), the two beginning sections of these SCE system kV lines in question presently exit the El Segundo Switchyard from where one interconnects with the El Nido Substation while the other first interconnects with the Chevmain Substation (at the Chevron El Segundo refinery) before proceeding to the same El Nido Substation. Both lines are about the same length and essentially share the same right-of-way and tower structures on their route between El Nido and El Segundo. The interactive effects of their individual fields would be reflected in the field strength values estimated for this right-of-way. Since these lines were designed and continue to be owned and operated by SCE, staff assumes that they were designed according to SCE design and operational guidelines reflecting compliance with existing LORS. Compliance with such guidelines is the main requirement of the previously noted CPUC policy on power lines and their field impacts.

## PROJECT DESCRIPTION

According to information from the applicant (ESPR 2000a, pages 3.6-1 through 3.6-5), the power delivery lines to be used for the proposed will consist of the specific components listed below:

- The two overhead on-site lines connecting the new Units 5, 6, and 7 and the on-site SCE Switchyard;
- The existing SCE transmission lines extending from the on-site SCE Switchyard to area substations.

The new on-site lines will be supported on single-shaft tubular steel poles allowing for conductor-to-ground clearance of at least 30 feet. The applicant provided the structural details of these line supports together with the points of line connection to the SCE Switchyard (ESPR 2000a, pages 3.6-2 through 3.6-8, and page 5.18-1).

## IMPACTS

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## GENERAL IMPACTS

GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to avoid the direct or indirect line contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts considered in terms of the also noted nuisance shocks, radio noise, communications interference and field exposure. The relative magnitude of such impacts would depend on the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation together with related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will therefore, vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to apply such measures to the extent appropriate for the geographic area involved. The potential for these impacts is assessed separately for each proposed project

## PROJECT SPECIFIC IMPACTS

### *IMPACTS FROM PHYSICAL PRESENCE*

The on-site lines that presently connect Units 1 and 2 to the SCE Switchyard were designed according to SCE's guidelines bearing on aviation safety, fire hazards, field strength reduction and hazardous shocks. These lines have been safely used from the start of ESGS operations in 1995 without such impacts. Since the replacement lines will be designed according to these same guidelines (as currently required by CPUC), and located within the same route within ESG's property lines, staff considers it appropriate to assume that such satisfactory use will continue in the post-modification era. Therefore, no specific conditions for certification are recommended.

### *ELECTRIC FIELD EFFECTS*

The potential for electric field-related audible noise, nuisance shocks, and interference with radio-frequency communication depends on the field strength levels, which in turn, depend on line voltage. Since (a) there will be no change in the voltage in the utilized lines and (b) the proposed and existing lines reflect compliance with SCE guidelines bearing on these electric field effects, staff considers their proposed use as appropriate with respect to these electric field effects.

### *ELECTRIC AND MAGNETIC FIELD EXPOSURE*

The applicant (ESPR 2000a, pages 5.18-4 and page 5.18-14) measured the electric field strengths at the perimeter of the existing SCE Switchyard to assess existing electric field exposures near it. Measured fields were reported to range from 0.1 kV/m to 4.4 kV/m. For the existing on-site lines, related exposures in the nearest public impact areas were measured as between 0.006 kV/m and 0.027 kV/m. Current exposures at the nearest points of public access to the existing SCE lines were measured as between 0.02 kV/m and 0.14 kV/m. The Estimates for the post-modification period (of increased current flow) were reported as 1.1 kV within and at the edge of the right-of-way. These relatively low field strength values are as expected for similar SCE lines and related facilities.

Since residences are not intended to be built within transmission line rights-of-way, this edge of each right-of-way would mark the starting point of any residential exposures as well as the electric field impacts of concern in this analysis. Staff does not expect such impacts to be significant at the measured and estimated field levels as (a) borne out by the applicant's calculations (ESPR 2000a, pages 5.18-37 through 5.18-47), and (b) typical of SCE lines of the same voltage.

According to the applicant (ESPR 2000a, pages 5.18-19 through 5.18-27), existing magnetic field exposures at the nearest point of public access to the existing SCE Switchyard were measured to range from 10 mG to 37 mG. The nearest public access point in this regard is a spot 50 feet away. Exposures at these access points were measured to vary from 6.2 mG to 3.9 mG with respect to the on-site connecting lines. For the off-site SCE lines, maximum magnetic field exposures at these public access points (beginning about 25 feet away) were measured to range from about 4.8 mG to 11 mG. Existing field strengths were calculated to vary between from 10.3 mG to 32.8 mG at the edge of the right-of-way and between 18.9 mG to 60.0 within the right of way.

A maximum post-modification field strength of 41.5 mG was calculated for the edge of the right-of-way while a maximum value of 76.0 mG was calculated for the area within it. Since the right-of-way is intended as the beginning of the areas of human habitation around transmission line, measurements at this point would reflect the maximum residential exposures possible in the post-modification period at issue.

As with their companion electric fields, these magnetic fields values are as expected for SCE lines of similar voltage and current carrying capacity and significantly lower than 150 mG to 250 mG established for transmission lines and related facilities by

states with specific regulatory limits. The applicant has pointed to this fact (ESPR 2000a, page 5.18-34). Maintaining these project-related fields within existing limits would reflect compliance with the noted CPUC policy on EMF and health.

Staff has recommended condition of certification **TLSN-2** to (a) verify the field strength reduction assumed by the applicant for the on-site replacement lines and (b) ensure compliance with the field strength limitations assumed for the existing SCE lines in the post-modification era of current flow increases.

## CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from the proposed and similar lines are usually calculated to factor the interactive effects of fields from nearby lines. Therefore, the values calculated or measured for the proposed on-site replacement lines reflect the levels of any cumulative exposures that could occur at any point along its route entirely within the ESGS property. For the off-site SCE lines to be used, the calculated values reflect the interactive effects of fields in their impact areas. As reflected in these values, any exposure of a cumulative nature would be at levels associated with similar 230 kV lines within the SCE transmission system.

# CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

Since the proposed replacement lines would (a) be designed according to SCE's health and safety guidelines and (b) be located entirely with the fenced of ESGS site, staff does not expect their operation to pose a significant risk of the field- and non field-related impacts of concern in this analysis. The off-site SCE lines were also designed and are currently operated by SCE according to the same health and safety guidelines. Therefore, staff does not expect their post-modification use to pose a significant risk of the health and safety impacts at issue.

## RECOMMENDATIONS

The CPUC requires that power line fields be maintained within existing levels in light of the present health concern, and has caused the utilities to more clearly specify the design and operational guidelines for achieving this goal. Therefore, staff considers it necessary to measure the post-modification field strengths to verify the guideline implementation necessary with respect to on-site replacement lines. Since the SCE lines are proposed for use without modification, such measurements would verify that post-modification fields levels would remain the same as expected for SCE lines of the same voltage and current-carrying capacity.

Given the noted compliance with existing safety and the field-related impacts of concern in this analysis, staff recommends that these project-related lines be approved by the Commission as proposed. If such approval is granted, staff would recommend adoption of the following conditions of certification to verify compliance with the applicable mitigation measures.

## CONDITIONS OF CERTIFICATION

**TLSN-1** The project owner shall ensure that the proposed on-site replacement lines (associated with Units, 5, 6, and 7) are designed and constructed in compliance with CPUC's GO-95, GO-52, Title 8, Section 2700 Sections 2700 through 2974 of the California Code of Regulations and SCE's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

**Verification:** Thirty days before the start of line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) evidence of their intention to comply with the above requirements.

**TLSN-2** The project owner shall ensure that a qualified individual is engaged to measure the strengths of the project-related electric and magnetic in the post-modification period. Measurements should be made at the same points along the perimeter of the SCE Switchyard, within the route of the on-site replacement lines, and the route of the existing off-site SCE lines, for which field strength values were presented by the applicant.

**Verification:** The project owner shall ensure that the post-modification measurements are tabulated together with the pre-modification measurements presented by the applicant. A copy of these measurement results shall be filed with the CPM within 60 days after completion of the measurements.

## REFERENCES

ESPR (El Segundo Redevelopment Project) 2000a. Application for Certification, Vols. 1-4. Submitted to the California Energy Commission, December 21 2000.

Electric Power Research Institute (EPRI) 1982. Transmission Line Reference Book: 345 kV and Above

Energy Commission Staff 1992. High Voltage Transmission Lines: Summary of Health Effects Studies. California Energy Commission Publication, P700-92-002

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August, 1998.

# VISUAL RESOURCES

Testimony of William Kanemoto

## INTRODUCTION

The following analysis evaluates potential visual impacts of the El Segundo Power Redevelopment Project (ESPR), its consistency with applicable LORS, and conformance with applicable guidelines of the California Energy Commission and the California Environmental Quality Act. Potential project impacts of the (ESPR), Units 5, 6, and 7, have been evaluated against the baseline of strong existing visual impacts of the existing El Segundo Generating Station (ESGS), Units 1 through 4. As a result, few project-related significant impacts were identified. With implementation of the proposed Perimeter Landscape Plan and staff-recommended Certifications, no significant impacts would be anticipated as a result of the project.

However, staff does not regard either the existing ESGS or unmitigated ESPR projects as visually compatible with their coastal setting as viewed from sensitive foreground viewpoints. Therefore staff recommends adoption of Conditions of Certification VIS-1, 2, 3 and VIS-4 as feasible measures to restore and enhance this visually degraded area of the coastal zone pursuant to Section 30251 of the California Coastal Act.

With implementation of the proposed Landscape Plan and recommended Conditions of Certification VIS-1 through VIS-5, project impacts from sensitive foreground viewpoints would be beneficial and the project would then conform with all applicable Laws, ordinances, regulations, and standards related to visual quality.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

### FEDERAL

The project is not located on federal lands and thus would not be subject to federal land management regulations. Consequently, no federal LORS pertaining to visual resources would apply to the project.

### STATE

#### *CALIFORNIA COASTAL ACT*

Provisions of the California Coastal Act would apply to the proposed project, which is located within the coastal zone (Public Resources Code, Division 20). Authority for implementation of the Coastal Act is delegated to the local jurisdiction under a Local Coastal Program (LCP) approved and certified by the State Coastal Commission. The City of El Segundo's Coastal Zone Specific Plan has been certified by the Coastal Commission as its LCP. Section 30251 of the Coastal Act states that "(T)he scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be

sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas."

## LOCAL

### *CITY OF EL SEGUNDO*

#### LOCAL COASTAL PROGRAM

The City of El Segundo has adopted a Coastal Zone Specific which was certified by the California Coastal Commission as its Local Coastal Program in 1982 (City of El Segundo, 1980). Section VI.L., Visual Resources and Special Communities states that the City General Plan land use element contains policies which apply to industrial areas and which address scenic and visual qualities. The discussion further states that "existing City plans are fully adequate to protect scenic and visual resources in the coastal zone (ibid, p.11)." Applicable policies of the General Plan include:

#### GENERAL PLAN – LAND USE ELEMENT

***Policy LU5-2.1.*** New industrial developments shall provide landscaping in parking areas and around the buildings. This landscaping is to be permanently maintained.

***Policy LU5-2.2.*** All outdoor storage shall be properly screened by masonry walls and landscaping.

***Objective LU5-3.*** Encourage the rehabilitation of existing substandard blighted industrial areas through the combined efforts of private and public sectors.

***Policy LU5-3.1.*** Revitalize and upgrade industrial areas which contain aesthetic or functional deficiencies in such areas as landscaping, off-street parking, or loading areas.

***Policy LU7-2.2.*** Continue long-term programs in conjunction with Southern California Edison and the Los Angeles Department of Water and Power for eventually placing all utilities, that they are responsible for, underground.

### *CITY OF MANHATTAN BEACH*

The proposed ESPR would be constructed entirely within the City of El Segundo, thus policies of the City of Manhattan Beach would not apply. However, the following policy indicates the City's intent with regard to the potentially affected residential area south of the ESGS.

***Land Use Policy 5.2.***

Require the separation or buffering of low density residential areas from businesses that produce noise, odors, high traffic volumes, light or glare, and parking through the use of landscaping, setbacks, and other techniques.

***LU Goal 7.*** Protect existing residential neighborhoods from the intrusion of inappropriate and incompatible uses.

## VISUAL ANALYSIS METHODOLOGY

The following discussion describes the evaluation methodology employed in the visual resource analysis of the proposed ESPR. This methodology was developed by Energy commission staff and applied on numerous previous power plant siting cases, and is fundamentally consistent with similar professionally accepted visual assessment techniques employed by various government agencies.

In the following analysis the project's visual setting is described in terms of existing visual character and quality. Visual character refers to formal attributes of the visual setting and is descriptive. Visual quality is an evaluative measure that reflects a judgment of a landscape's attractiveness as determined by characteristics broadly recognized as valued and preferred by most viewers. These include the presence of natural features, particularly vegetation and water, and visual attributes typically identified as preferred or valued in various professionally accepted assessment methodologies, such as distinctiveness, coherence, intactness, variety and interest. The project setting was delineated into areas or landscape units of contiguous, broadly consistent visual character and quality. Generally, these correspond broadly with land uses as well as typical physiographic characteristics and are also referred to as image types.

Within each landscape type, Key Observation Points (KOPs) were then identified to represent the most critical locations from which the project would be seen and reflect, in particular, those key sensitive viewer groups most likely to be affected. Assessments of project impact are determined from these KOPs.

The visual characteristics of the project are then described. Typically, accurate visual simulations of the project as seen from KOPs, accurately representing the perceived scale of the project from these locations, are required, as described further below.

The Energy Commission staff's visual assessment methodology evaluates impact to a particular KOP in terms of two primary factors: Susceptibility to Impact and Impact Severity.

*Visual Susceptibility* captures those aspects of viewers and their setting that determine the likelihood of adverse impact. The fundamental elements of susceptibility include:

- ***viewer exposure -*** Visibility of a landscape feature, the number of viewers, and the duration of the view are primary factors affecting viewer susceptibility to impacts.
- ***viewer sensitivity –*** Viewer sensitivity to visual change (viewer attitudes and expectations) reflects the level of concern of viewers with the visual environment. It is often correlated with viewer activity type (e.g., certain activities, such as recreation, are considered to be of high sensitivity, while others, such as work-related activities, are generally considered to be of lower sensitivity). Residences are generally considered to be of high sensitivity. Expressions of public policy with regard to visual resources are given great weight in determining viewer sensitivity.
- ***visual quality -*** The evaluation of the existing visual quality of the setting.

Visual susceptibility is rated on a scale of low to high. Thus, high visual quality, high viewer sensitivity to change, and high viewer exposure to the project, combine to create high susceptibility to impact.

*Impact Severity* captures the degree of *visual change* expected as a result of the project. The fundamental elements of visual change include:
- ***visual contrast –*** The conspicuousness or prominence of a project, and its compatibility with its setting, is primarily a function of its contrast with that setting. Contrast is described in terms of formal attributes of form, line, color, and texture of the project in comparison to those of the setting.
- ***visual dominance –*** in the context of this methodology, dominance refers to the project's apparent size and scale within the field of view and in comparison to other objects in the field of view.
- ***view blockage/intrusion*** – blockage of existing scenic views is a criterion for determining significant visual impacts under the CEQA Guidelines. View blockage is assigned greater weight according to the quality of the blocked view.

Impact severity is rated on a scale of Negligible to Very Strong.

Impact severity and susceptibility ratings are then combined in a matrix to arrive at preliminary findings of potential project impact significance, as depicted in Visual Resources Appendix A.

In addition, the project is evaluated for conformance with applicable LORS. Adopted expressions of local public policy pertaining to visual resources are also given great weight in determining both visual quality and viewer sensitivity.

As needed, conditions of certification are proposed to reduce potentially significant impacts to less than significant levels.

## SIGNIFICANCE CRITERIA

The following regulatory criteria were considered in determining whether a visual impact would be significant. Technical criteria for determining impacts under the

study's methodology are depicted in Visual Resources Appendix A, and for vapor plume impacts, below.

### *STATE*

The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance." (Cal. Code Regs., tit.14, § 15382.)

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant.

1. Would the project have a substantial adverse effect on a scenic vista?

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

4. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

### *LOCAL*

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

### *PROFESSIONAL STANDARDS*

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see, e.g., Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

Will the project substantially alter the existing viewshed, including any changes in natural terrain?
Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
Will the project eliminate or block views of valuable visual resources?
Will the project result in significant amounts of backscatter light into the nighttime sky?
Will the project be in conflict with directly-identified public preferences regarding visual resources?
Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

Will the project result in a substantial visible exhaust plume?

### *VAPOR PLUME IMPACT CRITERIA*

Visual impacts of vapor plumes are more difficult to evaluate than structures because they vary in both size and duration depending upon operating and meteorological conditions. Vapor plumes are generally associated with heavy industrial land uses and thus tend to be regarded negatively by visually sensitive observers.

Plumes were considered to represent a potentially significant impact if they were anticipated to represent a significant impact (as determined by the visual impact and susceptibility of a KOP under Appendix A) with strong or lower levels of impact for 50 percent or more of critical viewing periods, as defined below; or to have very strong impact severity in conditions of high or moderate-to-high visual impact susceptibility for 10 percent or more of critical periods. The 10% criterion is intended to limit plumes of very large magnitude under conditions of high-to moderate viewer impact susceptibility. These 'critical viewing periods' were defined as daylight hours without fog per season, or nighttime hours without fog per season (where those are relevant due to potential night illumination or direct impacts from ground level plumes). The seasonal criterion reflects the tendency of visible plumes to be concentrated in certain seasonal periods and not in others. The 'without fog' criterion simply reflects the fact that plumes may often form in conditions that are also conducive to fog formation, but they are not likely to be highly visible or perceived as substantially adverse under such conditions. Nighttime plumes would generally only have the potential to cause impacts if they were to be illuminated by bright night lighting, or were to directly engulf sensitive activities at the ground level.

Due to the recreational land uses adjacent to the ESGS and the very high scenic quality and sensitivity of affected foreground portions of the coastal zone, acceptable levels of visual impact and frequency for industrial plumes under today's typical standards of both professional visual assessment and general popular sentiment, would be relatively low. These contemporary standards are reflected in the criteria for determining plume impact that have been described above. The criteria applied here for evaluating plume impacts are comparable to those that would be typically applied in other visually sensitive, high quality urban landscapes in the state.

## SETTING

## REGIONAL SETTING

The existing ESGS project is located on the coast of Santa Monica Bay in the City of El Segundo, Los Angeles County, approximately 1-1/2 miles south of the Los Angeles International Airport. The project site is situated at the foot of a coastal bluff west of Vista del Mar (Coast Highway), directly overlooking Dockweiler and Manhattan Beach State Parks, which are parts of a system of public beaches along Santa Monica Bay extending for miles to the north and south. From the vicinity of

the project site to the northern boundary of LAX approximately 3 miles to the north, Vista del Mar follows the western edge of the elevated coastal bluff, affording outstanding, panoramic, largely unimpeded views of the entire Santa Monica Bay to the northwest, west, and south. By contrast, views from Vista del Mar to the east are generally blocked near the road edge by terrain or structures. From the project site southward, views to the Bay from Vista del Mar are blocked by developed portions of the existing ESGS site and fencing surrounding the adjacent tank farm site to its south, and then by continuous residential and commercial development in the City of Manhattan Beach. Bay views are available however, from publicly accessible local streets and parking lots to the west in and adjacent to Manhattan Beach State Park.

## PROJECT SITE

The ESPR is located within the existing ESGS in the approximate location of the existing Units 1 and 2 power block, which would be demolished and replaced by the proposed Units 5, 6 and 7. The proposed Units 5, 6, and 7 location occupies the northernmost portion of the ESGS facility. In addition, the adjacent Southern California Edison tank farm located directly south of the ESGS would be acquired by ESGS and serve as the laydown and staging location for construction of the project. The site occupies a portion of the coast of Santa Monica Bay, at the foot of a tall coastal bluff (approximately 90 feet tall in the project vicinity) that extends for much of the Bay coastline.

The site is visually characterized by two large power blocks, Units 1 and 2, and Units 3 and 4, whose tall exhaust stacks and frequent vapor plumes are visible to background distances of 3 miles in unimpeded views within the viewshed. The existing Units 3 and 4 occupy the southern portion of the ESGS site, with a top-of-power block elevation of 156 feet, and a top-of-exhaust stack height of 215 feet. The existing Units 1 and 2, to be replaced, occupy the northern portion of the ESGS site with a top-of-power block height of 157 feet and a top of stack height of 224 feet. Thus, both existing power blocks extend far above the top of the bluff, and Vista del Mar which occupies the bluff's edge. Both existing structures present visually chaotic views of fully exposed industrial machinery, piping, ductwork and scaffolding. They contrast strongly with their highly scenic coastal setting and with the general visual character of other industrial and residential land uses in the surrounding viewshed. The ESGS currently has landscape screening of 8 feet – 10 feet height on most of its eastern (Vista del Mar) perimeter, which helps screen and soften the presence of the power plants from the immediate foreground but does little to screen views of the taller power blocks and stacks. A number of taller fan palms are located near the ESGS entrance near the southern boundary of the site but are too few in number and extent to provide significant screening of the tall power plant features. A 450-foot-long landscaped area also borders the site to the west of existing Units 1 and 2. Further visual detail of the site is provided in the discussion of particular foreground KOPs, below.

## PROJECT AREA SETTING

### *KEY OBSERVATION POINTS (KOPS): VISUAL CHARACTER AND QUALITY, VIEWER SENSITIVITY, AND VIEWING CONDITIONS*

The *viewshed* or area of potential visual effect (the area within which the project could potentially be seen) is delineated in **VISUAL RESOURCES FIGURE 1**, Project Viewshed: Landscape Units and KOPs. As depicted in that figure, the viewshed is restricted to a narrow strip of the coastal zone, enclosed immediately to the east of Vista del Mar by terrain and existing development, but extending to background distances to the north, west and south.

ESGS power plant stacks (and vapor plumes) are visible to background distances (roughly 3 miles) from Vista del Mar to the north, though such views tend to be dominated by the larger, nearer Scattergood Power Plant. They are also visible to background distances from beaches to the north and south.

The following discussion subdivides the viewshed into landscape types, or areas of broadly uniform visual character and quality, to provide an overview of the existing setting. Visual character and quality as they affect specific KOPs are discussed in detail under each KOP.

All figures referred to in the text may be found at the end of this section.

As delineated in **VISUAL RESOURCES FIGURE 1**, the viewshed is divided into coastal open space, encompassing the areas with unimpeded views to Santa Monica Bay; LAX; coastal residential-commercial development of Manhattan Beach; and the coastal industrial zone within which the ESGS itself is located.

KOP numbers from the AFC and subsequent Data Responses have been retained, but the order of discussion has been changed to correspond to the organization of this analysis.

#### UNIT 1 - COASTAL INDUSTRIAL LANDSCAPE

As depicted in **VISUAL RESOURCES FIGURE 1**, the project setting, although broadly set within the scenic coastal zone, occupies a portion of an extensive coastal heavy industrial area extending to the east and west of Vista del Mar from 45th Street in Manhattan Beach to Grand Street in El Segundo, and to the east of Vista del Mar from Grand Street north to Imperial Highway, approximately 1-1/2 miles to the north of the ESGS site. Industrial uses within this area include the adjacent Chevron marine loading facility immediately to the north of the ESGS, the Chevron Refinery to the east, and the LADWP Scattergood Power Plant and Hyperion regional waste treatment facility to the north. The entire designated coastal zone within the City of El Segundo, bounded to the east by Vista del Mar, consists of the aforementioned industrial uses. Public coastal access to the beach west of the ESGS is provided via a County-managed bike path immediately west of the power plant and loading facility. Beach access within the City of El Segundo is available only at Grand Street and Vista del Mar, north of the Chevron marine

terminal. Other access in the vicinity includes 45th Street and other local streets within the City of Manhattan Beach south of the ESGS.

Despite these industrial uses, existing visual quality of the area is mixed and often good as seen from key viewpoints, notably from Vista del Mar. Between Grand Street and 45th Street, the entire Chevron site to the east is substantially screened by a very tall, wide, heavily landscaped berm. Industrial facilities of the refinery are reasonably well-screened from Vista del Mar and the vicinity, and the landscaped berm and setback contribute to an attractive roadway corridor character (**VISUAL RESOURCES FIGURE 2**, Industrial Facilities in the Project Viewshed). From Imperial Highway to the Chevron marine terminal, views westward to Santa Monica Bay from Vista del Mar are generally unimpeded. East of Vista del Mar between Imperial Highway and ESGS, the Hyperion waste treatment facility, though obviously industrial and very extensive, has been treated with architectural and landscape screening measures at the western boundary that conceal much of the plant's functional apparatus and create a degree of visual unity. Similarly, the Scattergood power plant, though obviously industrial and highly exposed to view, is housed within a building-style enclosure, albeit characterized by extremely prominent, red and white striped exhaust stacks. North of this industrial zone, facilities of LAX are almost entirely concealed by tall vegetated sand dunes.

In the immediate vicinity of the ESGS, views from Vista del Mar to the Bay are largely blocked by a combination of the power plant facilities and perimeter landscape screening. The latter contribute to blocking of Bay views, but also reduce the industrial character of the power plants as seen from these foreground viewpoints, though they do not screen upper portions of the facilities. The effects of the screening are therefore mixed. The ESGS power blocks and stacks are the only features within the wider viewshed which sky-line views from Vista del Mar to Santa Monica Bay.

***KOPs:*** No KOPs were identified within this landscape type, because potential viewers in these locations were presumed to have low visual sensitivity or concern with project impacts due to the industrial, work-related nature of their activities.

### UNIT 2 - COASTAL OPEN SPACE

As described previously, this portion of the viewshed consists primarily of public beaches and adjacent Vista del Mar. Visual quality is very high, characterized by highly intact, panoramic views of Santa Monica Bay, which extend to the horizon to the north, west, and south and include views of beaches and surrounding mountains. From the public beaches, which occupy the entire coastline within the viewshed, views tend to be partially enclosed to the east by the coastal bluff face, further emphasizing seaward views. Views from Vista del Mar (Coastal Highway 1) which follows the bluff edge throughout the entire viewshed from the boundary of the City of Manhattan Beach to background distances to the north, are enhanced by its elevated position.

***KOP 1 - Dockweiler Beach*. VISUAL RESOURCES FIGURE 3A** depicts the view toward the site from Dockweiler Beach State Park from a distance of approximately 1/2 mile looking south. Dockweiler Beach State Park receives very heavy use

throughout much of the year. Views of the ESGS are unimpeded and the facility can appear co-dominant with the LADWP Scattergood Plant in this general area of use.

Visual Quality - Despite the prominence of the existing ESGS facility, the visual quality at this KOP is high due to the open panoramic views of the Bay. Slopes east of the beach in the foreground of the Chevron marine loading facility are heavily landscaped.

Viewer Sensitivity - Viewer sensitivity is considered high due to the recreational activities of visitors and their expectations of high scenic quality.

Visibility and Visual Exposure - Visibility and exposure to the project site are high. Views to the plant are unimpeded, duration of views extended, and number of viewers very high.

Overall visual susceptibility of this KOP is therefore High.

***KOP 7* - Bike Path West of ESGS. VISUAL RESOURCES FIGURE 4A** depicts the view toward the project site from Dockweiler Beach State Park from near foreground distance (approximately 500 feet) looking east. This viewpoint is representative of beach visitors in the immediate foreground distances of the ESGS, and particularly, of thousands of walkers, bicyclists, and joggers who use this portion of Dockweiler Beach in transit from the north and south each year. The photograph is taken from the nearby rock groin extending into the Bay, and while it provides a good overview of the location, most viewers in the area actually experience the power plant from the bike path directly adjoining the western plant boundary, along the fence-line seen in this photograph (see **VISUAL RESOURCES FIGURE 5.**

Views within this foreground zone surrounding the ESGS are obviously strongly dominated by the existing power plants. Various other features in the visual foreground include the narrow strip of beach; extensive rock revetment at the SCE tank farm site immediately north of Manhattan Beach State Park; a portion of the ESGS site perimeter enclosed by cyclone fence, affording open views into the site; a 10 foot tall, 350 foot long concrete wall abutting the bike path; and a sizable lawn and landscaped area (approximately 450 feet long) adjoining the bike path west of existing Units 1 and 2. A rock groin extends approximately 500 feet into the Bay at the northern boundary of the ESGS property. The beach in this area was substantially eroded during large storms in 1977 and remains very narrow. The coastal strip thus serves primarily as lateral access between Manhattan and Dockweiler Beaches.

The contrasting viewing conditions of users of the bike path have been broken down for convenience into three distinct image types relevant to determination of potential impacts: the industrial image type of the ESGS site itself; the area of coastal open space and Bay views; and the landscaped area west of existing Units 1 and 2 adjacent to the bike path. Each of these image types has different corresponding susceptibility to impact.

Existing ESGS as Viewed from Bike Path

Visual Quality – Views toward the plant are completely dominated by the existing power plants, whose visually chaotic, highly industrial character is of low visual quality.
Viewer Sensitivity – The relevant viewers in this area are users of the path and beach. Their sensitivity is high as is true elsewhere along the State beaches.
Visibility and Visual Exposure – Visibility and visual exposure to the plant are unimpeded and high. View duration at this distance is normally transitory – few visitors remain in this portion of the beach but experience it in transit from one part of the beach to another. Typical duration of exposure within this foreground viewing zone can therefore range from 5 to 20 minutes at a time. Nevertheless the numbers of visitors is very high, and viewing distance very low. Visual exposure is thus high overall.

Overall, impact susceptibility of views to the existing ESGS is thus Low to Moderate.

Beach

Visual Quality – Visual quality of the beach and Bay views is high.
Viewer Sensitivity – Viewer sensitivity is high.
Visibility and Visual Exposure – Visibility and visual exposure are unimpeded and high.

Overall impact susceptibility in this portion of the view is thus High.

ESGS Units 1 and 2 Landscaped Area Viewed from Bike Path

Visual Quality – Despite the backdrop of Units 1 and 2, the landscaped area is seen in the immediate foreground of path users, lowering incompatible contrast of the power plant and representing a substantial (450 feet) area of moderate, rather than low, visual quality.
Viewer Sensitivity – High
Visibility and Visual Exposure - High

Overall impact susceptibility is thus Moderate to High.

***KOP 2 - Manhattan Beach State Park.*** **VISUAL RESOURCES FIGURE 6A** depicts the view toward the project site from Manhattan Beach State Park at approximately 1/2 mile distance. This view is representative of the thousands of annual visitors to Manhattan Beach, at a point nearest the project site.

Visual Quality – Visual quality from the area of this KOP is high due to panoramic Bay views of in three directions. The ESGS Units 1 and 2 power block is hidden behind Units 3 and 4, revealing only the visually subordinate exhaust stacks. The ESGS facilities as a whole are sufficiently distant to appear visually subordinate to the tank farm located in the foreground. These industrial features, though tending to lower visual quality, occupy a relatively small sector of the view, and draw less

attention than views of the Bay and distant mountains, which exert strong visual attraction westward.
Viewer Sensitivity – Viewer sensitivity is high due to recreational viewer activity.
Visibility and Visual Exposure – Visibility of the proposed ESPR site from this KOP is low due to the intervening Units 1 and 2, which largely screen it. Overall exposure is thus moderate, despite the very high numbers of viewers.

Overall Susceptibility is thus Moderate to High.

***KOP 4 - Manhattan Beach Pier.*** **VISUAL RESOURCES FIGURE 7A** depicts the view from Manhattan Beach Pier at far middleground (approximately 2-1/2 miles) distance to the south.

Visual Quality – Visual quality is high as at other beach locations due to scenic Bay views.
Viewer Sensitivity – High, as elsewhere at beaches.
Visibility and Visual Exposure – Visibility and exposure were considered low due to distance. Visual dominance of the ESGS is very subordinate at this distance.

Overall Susceptibility is thus Low to Moderate.

***KOP 8*** - ***Vista del Mar.*** **VISUAL RESOURCES FIGURE 8A** depicts the view toward the project from Vista del Mar at foreground distance (1/2 mile or less), southbound. For motorists on Vista del Mar, views of the existing ESGS Units 3 and 4 become highly dominant from a distance of roughly ¼ mile, although when viewers are at their nearest proximity to the plant (approximately 500 feet or less), it tends to fall outside of the motorist's normal cone of vision (power block is visible only at nearly perpendicular viewing angles), due to a left turning curve in the roadway in this segment.

Visual Quality – Within the foreground radius represented by this KOP, quality of views for southbound motorists is moderate. On one hand, intermittent views to the Bay may still be seen, and extensive landscaping of the Chevron site contribute to a moderately high scenic quality. On the other, the existing views of the plant itself, including power blocks, stacks, and appurtenant lattice transmission towers and lines at the roadside, as well as visible portions of the Chevron marine terminal to the west, are of low quality. Thus, overall quality was considered to be moderate.
Viewer Sensitivity – Viewer sensitivity was considered moderate to high. Very high numbers of viewers consist of a combination of tourists and recreationists with high scenic expectations, and commuters, workers and others who would be expected to have lower levels of scenic expectation and concern.
Visibility and Visual Exposure – Overall visual exposure was considered moderate to high. Visibility of the existing ESGS is high, due to the great height and prominence of the existing power blocks and stacks above the roadway. The ESGS power plants are the only structures within the 6-mile-long viewshed to skyline (intrude into the horizon of) views of the Bay from Vista del Mar. Existing landscape screening in this portion of roadway reduces exposure to the plant, but at 8 feet to 10 feet in height, has little effect in screening the tall plant features. Very high numbers of viewers, almost exclusively motorists, see the plant at very close

distances, but the duration of exposure within the ¼- to ½-mile foreground radius (from vicinity of Grand Street in El Segundo, and 43th Street in Manhattan Beach) within which strong impacts could be expected is relatively transitory and brief, usually between 20 and 40 seconds at 45 mph.

Overall Susceptibility is thus Moderate to High

***KOP 10 - Vista del Mar***. From middle-ground distances (approximately ½-mile to 3 miles), a combination of moderate viewer sensitivity and low exposure due to distance contributes to an overall low level of impact susceptibility, despite high visual quality of the area.

### UNIT 3 - EL PORTO - COASTAL RESIDENTIAL

***KOP 9* - VISUAL RESOURCES FIGURE 9** depicts the view from residences on 45th Street, Manhattan Beach (El Porto) toward the tank farm. Potential sensitive receptors within this portion of the viewshed include residents of approximately 166 homes in the City of Manhattan Beach along 45th Street (views from homes further south are largely blocked by intervening structures (ESPR 2000p). While views of the ESGS from the vicinity of 45th Street are largely screened by the existing storage tanks, and proposed Units 5, 6 and 7 would be screened to a large extent by the nearer existing Units 1 and 2, residents of 45th Street would have very prominent views of laydown and construction activities at the existing tank farm site.

Visual Quality – Moderate to High. Bay views are generally present but limited and narrow, and views tend to be dominated by existing residential development, perimeter landscaping, berm, and tank farm.
Viewer Sensitivity – Viewer sensitivity of residences is generally considered high.
Visibility and Exposure – Visibility and exposure to the ESPR project site would be low, but to the tank farm laydown site, very high.

Overall Susceptibility is thus considered High.

***KOP 3 - Vista del Mar*. VISUAL RESOURCES FIGURE 10a** depicts the view toward the project site from Vista del Mar from Manhattan Beach looking north at foreground distance (approximately ½ mile). This KOP is representative of views of the ESGS by northbound motorists on Vista del Mar at distances of about 1/2–mile or less. It is also representative of views from some residences lining Vista del Mar. Within the City of Manhattan Beach, views of the power plant are visually subordinate to co-dominant, framed by low-rise residential development on each side. Entering the City of El Segundo at 45th Street at a distance of approximately 1/3-mile, views of the plant become dominant against the backdrop of the Bay horizon.

Visual Quality – Visual quality from this viewing area is generally moderate, typified by medium density residential structures with little or no landscaping and limited scenic views, but also including some views of the Bay and Santa Monica Mountains in the vicinity of 45th Street.

Viewer Sensitivity – Viewer sensitivity is considered moderate to high, due to the combination of recreationists, tourists, and residents with higher viewer concern, and commuters and others with lower levels of viewer concern.
Visibility and Visual Exposure – Visibility and exposure to the plant is moderate to high. Near-distance views to the existing plant, strongly sky-lined against a background of Bay and mountains at the horizon, are generally unimpeded.

Overall Susceptibility is thus considered Moderate to High.

## IMPACTS

As described previously under Visual Analysis Methodology, visual impacts are assessed as a function of Impact Susceptibility (viewing attributes) and Impact Severity (anticipated degree of visual change).

In this particular case, visual impact severity - the anticipated change in visual character and quality as a result of the proposed project - was assessed in relation to the existing, developed site, currently occupied by Units 1 and 2, which represent the assessment baseline. Thus, the increment of change in overall impact (contrast, dominance and view intrusion) between the existing ESGS and the proposed ESPR project is the basis for determining the level of project impact severity and resulting impact significance.

Ratings of existing and proposed project contrast, dominance, and impact severity were made on the basis of field observation, photo documentation, and study of applicant-prepared visual simulations and other project information. It is important to note that, particularly due to the panoramic format used in the visual simulations, evaluation of simulations should utilize full-sized (11” image height) prints viewed at a normal reading distance of roughly 1 foot in order to approximate the field of view and level of contrast and dominance seen in the actual location.

KOP numbers from the AFC have been retained. However, the order in which they are discussed has been changed to accord with the structure of this analysis.

## VISUAL PROJECT DESCRIPTION

### *POWER PLANT*

**VISUAL RESOURCES FIGURES 11 AND 12** depict architectural elevation and isometric views of the proposed power plant. The existing ESGS Units 3 and 4 have a top-of-power block elevation of 156 feet and a top-of-exhaust stack height of 215 feet. The existing Units 1 and 2 to be replaced have a top-of-power block height of 157 feet, and a top of stack height of 224 feet. The proposed units would have a top-of-HRSG elevation of 125 feet, slightly shorter than the existing power blocks, and a top-of-stack elevation of 250 feet, slightly taller than the existing stacks. The proposed stacks would also be slightly broader than existing stacks. The taller HRSG and exhaust stack structures of Units 5 and 7 would be spatially separated by about 160 feet. Individually, they would be smaller than the existing Units 1 and 2

power block; taken together, they would be of roughly similar scale to the existing plant.

Unit 6 and related structures (Steam Turbine Generator and related components) located between the taller, more dominant Units 5 and 7, would be approximately 40 feet in height.

A 10 foot tall, approximately 450 foot long seawall is proposed west of the proposed Units 5, 6 and 7 immediately on the eastern side of the existing bike path. An additional wall west of the existing retention pond south of Units 3 and 4 has also been proposed.

### *CONSTRUCTION STAGING AREA*

The abandoned SCE tank farm site adjoining the ESGS to the south would be modified and used as the construction staging and laydown area as described in the applicant's proposed Tank Farm Plan. During project construction, or a period of up to 3-1/2 years, the existing abandoned tanks would be converted into enclosed domes, which would contain and conceal most material equipment and storage. Toward the end of the construction period, these tank/domes would be removed, existing rock revetment east of the existing bike path would be removed, and perimeter landscaping installed.

### *LINEAR FACILITIES*

No new off-site transmission lines are proposed in connection with the ESPR project. New single-pole generator lead towers would be constructed on-site east of proposed Unit 6.

Water Pipeline – A new 8-inch diameter underground pipeline would be constructed to carry reclaim water from a tie-in point near the intersection of Richmond Street and El Segundo Boulevard, north on Richmond Street, west on Grand Avenue, then south on Vista del Mar, a total length of approximately 1.75 miles.

## VISUAL IMPACT ASSESSMENT

### *OPERATION IMPACTS*

In discussions of simulations or respective KOPs, readers should note that representations are of the unmitigated project, except where identified otherwise.

The following discussions apply to potential impacts of the project structures, lighting and visible vapor plumes.

#### MIDDLEGROUND KOPS (KOPS 4 AND 10)

Impact severity or anticipated degree of visual change due to introduction of proposed project structures from middle-ground viewpoints (over ½ mile distance) were considered to be weak to negligible due to low levels of contrast with existing conditions, low levels of visual dominance, and negligible view blockage effects. Combined with low to moderate levels of impact susceptibility due mainly to

distance, and in particular, because significant impacts in this distance zone are not anticipated as a result of project vapor plumes, as discussed above, significant impacts are not anticipated to KOPs in this category. Thus, further discussion of impacts to these middle-ground KOPs is not considered necessary and the following analysis focuses upon potential impacts within the foreground distance zone.

### NIGHT LIGHTING IMPACTS

The CEQA Guidelines identify "new sources of substantial light or glare which would adversely affect day or nighttime views" as a potentially significant adverse impact.

Due to the prominence of the proposed Units 5 and 7 HRSG structures above the level of Vista del Mar, unmitigated night lighting has the potential to have a significant adverse impact on motorists from KOPs 3 (foreground views from Vista del Mar in Manhattan Beach) and 8 (foreground views from Vista del Mar in El Segundo). Unmitigated night lighting would also potentially adversely impact visitors at Dockweiler Beach at night.

In addition, the removal of existing storage tanks after completion of construction would expose views of night lighting of Units 3 and 4 and related ESGS ground-level lighting to the view of residents on 45th Street. Without mitigation this could also represent a significant adverse impact. Impacts to residents in this area due to lighting at the proposed units is not anticipated because of its obscuration by the intervening existing Units 3 and 4.

With recommended Condition of Certification VIS-5, these impacts would be reduced to less than significant levels.

### VISIBLE VAPOR PLUMES

Staff conducted computer modeling of predicted visible vapor plumes using the CSVP model. The results are depicted in VISUAL RESOURCES Table 1 and 2, below (Walters, 2001).

Table 1 - Staff Predicted Worst-Case HRSG Steam Plume Seasonal Frequency
Full Load w/o Duct Burner, w/Power Augmentation
1990-1995 LAX Meteorological Data[1]

| Year | | Spring | Summer | Fall | Winter | Annual |
|---|---|---|---|---|---|---|
| 1990 | Hours | 15 | 0 | 5 | 72 | 92 |
| | Frequency | 1.28% | 0.00% | 0.55% | 8.14% | 2.21% |
| 1991 | Hours | 34 | 0 | 2 | 41 | 77 |
| | Frequency | 2.88% | 0.00% | 0.24% | 4.81% | 1.94% |
| 1992 | Hours | 2 | 0 | 4 | 38 | 44 |
| | Frequency | 0.17% | 0.00% | 0.45% | 4.45% | 1.09% |
| 1993 | Hours | 11 | 1 | 9 | 43 | 64 |
| | Frequency | 0.94% | 0.09% | 1.00% | 5.24% | 1.58% |
| 1994 | Hours | 22 | 0 | 14 | 24 | 60 |
| | Frequency | 1.99% | 0.00% | 1.52% | 2.66% | 1.46% |
| 1995 | Hours | 37 | 2 | 5 | 37 | 81 |
| | Frequency | 3.36% | 0.18% | 0.64% | 4.93% | 2.18% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Average | Hours | 20 | 1 | 7 | 43 | 70 |
| | Frequency | 1.75% | 0.04% | 0.74% | 5.04% | 1.74% |

[1] – Frequencies based on the seasonal daylight no fog no rain hours.

These results show that even when modeling the most conservative operating condition the plume occurrence frequency for daylight no fog no rain hours is predicted to be less than 10% seasonally.

Plume magnitudes were predicted to be as follows:

Table 2 - Staff Predicted HRSG Steam Plume Dimensions (meters)
Daylight No Fog No Rain Hours

| **Full Load w/Duct Burner and Power Augmentation** | **Length** | **Height** | **Width** |
|---|---|---|---|
| Maximum | 240 | 172 | 31 |
| Average | 223 | 153 | 29 |
| **Full Load w/o Duct Burner and Power Augmentation** | | | |
| Maximum | * | * | * |
| Average | * | * | * |
| **50% Load w/o Duct Burner and Power Augmentation** | | | |
| Maximum | 131 | 111 | 18 |
| Average | 121 | 103 | 16 |
| **Full Load w/o Duct Burner, w/Power Augmentation** | | | |
| Maximum | 465 | 659 | 57 |
| Average | 166 | 150 | 25 |

* - model results do not show plumes forming during daylight no fog no rain hours for this exhaust condition.

The Unit 1 and 2 Stack Exhaust Parameters can be considered to be similar to those for Unit 3 and 4. Using the LAX 1990 to 1995 met data the following plume frequencies were determined for Units 3 and 4:

Table 3 - Staff Predicted Unit 3 and 4 Steam Plume Frequency Summary
1990-1995 LAX Meteorological Data[1]

| | **Full Load w/Duct Burner and Power Augmentation** | |
|---|---|---|
| | **Hours** | **Frequency** |
| Day | 786 | 2.95% |
| Day nf/nr | 194 | 0.81% |
| Night | 4107 | 15.84% |
| Total | 4893 | 9.31% |

[1] - Summary of all six years plume frequencies (52,577 total hours).
nf/nr – no fog no rain hours

The CSVP predicted plume size characteristics for daylight no fog no rain hours are as follows:

Table 4 - Staff Predicted Unit 1 and 2 Stack Steam Plume Dimensions (meters)
Daylight No Fog No Rain Hours

| | Length | Height | Width |
|---|---|---|---|
| Maximum | 433 | 609 | 57 |
| Average | 169 | 156 | 25 |

The modeling results show that the plumes from the existing Unit 1 and 2 stacks are significantly more frequent and somewhat larger than the predicted plumes from the ESPR project Unit 5 and 7 HRSG stacks. Therefore, the replacement of Units 1 and 2 with new Units 5 and 7 will serve to reduce the existing visible plume impacts from the plant. Overall, the staff modeling indicates that frequencies of plumes with significant magnitude would not approach the 10% seasonal daytime no-fog criterion used for establishing potentially significant visual plume impacts. In terms of both the existing baseline condition, and absolute criteria established by staff for plume impact evaluation, the ESPR project would thus have less than significant plume impacts.

### LANDSCAPE UNIT 1 – COASTAL INDUSTRIAL

No KOPs were identified within this landscape type, because viewers in these locations were presumed to have low visual sensitivity or concern due to the industrial, work-related nature of their activities.

### LANDSCAPE UNIT 2 – COASTAL OPEN SPACE

***KOP 1*** – ***Dockweiler Beach.*** **VISUAL RESOURCES FIGURES 3a** and **3b** represent views from Dockweiler Beach State Park from approximately ½-mile, looking south.

Existing ESGS

*Visual Contrast* - From this viewpoint, representing the farther limit of the foreground distance zone at Dockweiler Beach, form, line and texture contrast of the existing ESGS against the horizontal lines of the bluffs, beach, Bay, and background mountain ridges is high, due to its unique blocky, vertical forms and visually chaotic industrial character. Color contrast against the sky and beach are moderate to high, and overall, contrast is high.

*Visual Dominance* – The existing ESGS is visually dominant from this KOP, strongly drawing attention by prominent sky-lining against the visual setting of level beach and open sky.

*View Blockage* – The existing ESGS intrudes conspicuously into the otherwise relatively intact view of sky and horizon. At the far limit of the foreground distance

zone (about ½ mile), the portion of the overall field of view occupied by the ESGS is relatively small, resulting in a moderate level of change.

*Overall Impact* – Overall, the existing impact is strong.

Proposed ESPR

*Visual Contrast* - As depicted in **VISUAL RESOURCES FIGURE 3b,** the high degree of existing contrast would continue under the proposed project and increase somewhat due to a perceptible increase in exhaust stack height and diameter and resulting increased vertical line and form contrast against the strong horizontal lines and open sky of the existing setting. The resulting change in levels of contrast between the existing and proposed conditions would, however, be weak.

*Visual Dominance* - The high degree of existing dominance of the ESGS would continue under the proposed project, increasing somewhat due to more prominent sky-lining against the horizon and open sky. The resulting change in levels of dominance would nevertheless be negligible to weak.

*View Blockage* – The degree of view blockage of horizon and sky would increase somewhat from the existing condition under the proposed project due to the increased height and prominence of the new structures. However, the change in levels of view blockage would be negligible.

*Overall Impact* - The level of impact severity under the proposed ESPR project would be strong. The level of overall visual *change* from this KOP would be weak.

*Impact Significance* – The susceptibility to impact of this KOP is high. However, since the level of overall visual change between the existing and proposed conditions would be weak, anticipated impacts would be less than significant.

***KOP 7* – Bike Path West of ESGS. VISUAL RESOURCES FIGURES 4A and 4B** represent views in the immediate vicinity of the ESGS, as seen from the bike path and beach directly adjacent to the power plant, but seen in this photograph from the existing rock groin facing east. This viewpoint is representative of beach visitors in the immediate foreground of the ESGS, and particularly, of the thousands of pedestrians, bicyclists, and joggers who use this portion of beach in transit from Dockweiler Beach to the north and Manhattan Beach to the south. Although the photograph, taken from the end of the nearby rock groin extending into the Bay, provides a good overview of this use area, nearly all viewers actually experience the power plant from the bike path adjoining the western plant boundary, facing either south, west, or north, due to severe beach erosion from storms in 1977, which left only a very narrow strip of beach remaining. The area's principal use is as an access joining Dockweiler and Manhattan Beaches.

For purposes of convenience this area was described in the Setting discussion as three distinct image types: the ESGS as a whole; the beach itself; and a landscaped area west of Units 1 and 2. Each of these has different characteristics, affecting the potential for impacts, as follows:

ESGS

*Visual Contrast* - As seen in **VISUAL RESOURCES FIGURE 4A**, the existing contrast of the ESGS with the surrounding, highly scenic landscape is extremely strong. The two power blocks introduce strongly contrasting blocky, vertical forms against an otherwise horizontal landscape of coastal bluffs to the east, and level beaches and Bay in other directions. Texture contrast is also very strong, characterized by visually chaotic scaffolding, piping, machinery, and metallic ductwork, against a backdrop of vegetation, sky, beach and sea.

As depicted in **VISUAL RESOURCES FIGURE 4B,** the very strong degree of contrast from the main power plant structures would continue under the proposed ESPR project, or decrease slightly, depending upon the exact viewpoint, due to the lower height of the HRSGs compared to the Units 1 and 2 power block, and the spatial separation of Units 5 and 7.

The overall *change* in contrast to the ESGS as a result of the ESPR project would be negligible.

*Visual Dominance* – Existing strong dominance of Units 1 and 2 would remain strong or decrease slightly. A slight decrease in the bulk of the individual HRSGs compared to the combined Units 1 and 2 power block would be off-set by an increase in the developed site area of Units 5, 6, and 7 and thus, an increase in the duration of exposure of viewers. The overall change in dominance in the ESGS would thus be negligible to weak.

*View Blockage* - Substantial view blockage of sky as seen from the bike path occurs due to existing Units 1 and 2, and this would remain true under the proposed ESPR project. Despite the spatial separation of the two new HRSGs, the change in the overall amount of view blockage would be negligible to weak.

*Overall Impact* - Overall change in levels of impact would be negligible to weak.

*Impact Significance* – Because impact susceptibility of views of the ESGS is low to moderate, impacts would be insignificant.

Beach

The proposed ESPR project would not extend outside the existing ESGS site. Therefore views to the beach and Bay would not be affected, and change to contrast, dominance, and view blockage in this image type would be negligible. Scenic views westward would be unaffected and no overall change in impact would occur.

Landscaped Area West of ESGS Units 1 and 2

*Visual Contrast* - An approximately 450 foot long landscaped area currently adjoins the bike path west of existing Units 1 and 2, providing a modest degree of screening and a softening of the otherwise completely industrial, mechanical character of views in this portion of the path. Since this area is viewed in the immediate

foreground of the path, it has a mitigating effect on contrast and impact to viewers on the path.

Due to proposed construction of an approximately 10 foot tall seawall in the area of the existing landscaping, the landscaping would be removed, resulting in a moderate to strong contrast with the previous landscaped setting, and a resulting decline in quality of this portion of the setting. It would also, however, screen views of the ESPR in this section of the path, resulting in a decline in contrast of the ESPR project itself.

*Visual Dominance* – The proposed seawall would introduce a potentially monotonous vertical feature that would visually dominate portions of the view in the direction of the power plant as seen from the path. However, it would also serve to partially screen views of the visually distracting and chaotic HRSG and Unit 6 STG structures, resulting in a moderate reduction in contrast and dominance of the ESPR in comparison to the existing Units 1 and 2. A wall of this height and location has the effect of reducing dominance of the power plant increasingly as the viewer draws nearer to the plant. North or south of the wall itself, it would have minimal screening effect.

*View Blockage* – The proposed seawall would result in moderate to strong blockage of views of the ESPR in the immediate vicinity of Units 5, 6 and 7, a beneficial effect. North or south of the wall itself, this screening effect would be minimal. Any increase in blockage of sky compared to the ESPR power plant itself would be negligible.

*Overall Impact and Impact Significance* – The proposed seawall would have the effect of reducing the level of incompatible contrast from power plant structures to a weak degree through screening as seen from a portion of the path in the immediate vicinity of the proposed units, a weakly beneficial change. It would also introduce a strong degree of adverse visual change through replacement of 450 feet of existing landscaping with a monotonous concrete wall. Concern has also been expressed by the City of El Segundo for the wall's ability to attract graffiti. Overall, these changes would represent a moderately adverse visual change. With the moderate to high impact susceptibility of this view, impacts would be adverse but less than significant.

With staff recommended Conditions of Certification VIS-2 and VIS-1, the adverse effects of landscape removal and wall construction would be minimized, and overall impacts would be beneficial.

Tank Farm

A portion of the bike path abuts the existing SCE tank farm. Potential impacts to the bike path due to the use and mitigation of the tank farm would be essentially as already discussed under KOP 2. With recommended Condition of Certification VIS-1, overall impacts in this section of the path would be beneficial.

***KOP 2 – Manhattan Beach.*** **VISUAL RESOURCES FIGURES 6A and 6b** represent views from Manhattan Beach State Park at a distance of approximately 1/2-mile from Units 1 and 2.

Existing ESGS Units 1 and 2

Visual contrast, dominance, and view blockage of existing Units 1 and 2 from this viewpoint are weak due to screening by the intervening Units 3 and 4. Overall impact of the existing ESGS as a whole is moderate to strong, although it remains visually subordinate to the existing tank farm.

Form, line, color and texture contrast of the existing tank farm is strong. The storage tanks contrast strongly in form and color against the sky and surrounding landscaping, and are co-dominant with other development to the east. They cause minor blockage of views of the sky. Due to the strong visual attraction of the Bay, they are considered subordinate within the overall view. Overall impact of the tanks from this KOP is strong.

Proposed ESPR

*Visual Contrast* - Contrast in form, line, color and texture of the proposed power plants from this viewpoint would be weak to negligible, due to screening by intervening, existing Units 3 and 4. Though the ESPR stacks would be slightly taller than those of existing Units 1 and 2, this increased contrast would be generally unnoticed. Overall change in contrast from the existing ESGS would thus be negligible.

Ultimate removal of oil storage tanks at the tank farm site after construction would eliminate the existing contrast in character between these prominent industrial features in the immediate foreground and the existing beach, sky, and landscaping. The long-term impact of this change (after completion of construction and tank removal as proposed) would thus represent a strong decrease in contrast from the existing condition.

*Visual Dominance* – Similarly, the change in visual dominance due to the proposed Units 5, 6 and 7 compared to existing Units 1 and 2 from this viewpoint would be negligible. Visual dominance of the storage tanks would be eliminated.

*View Blockage* – The proposed project stacks would continue to block a small portion of the view of sky. The change in degree of blockage between the existing and proposed plants from this KOP would be negligible. The change in blockage of sky views by the tanks would be eliminated.

*Overall Impact* – Overall impact from this KOP would thus be reduced from moderate or strong levels, to weak levels.

*Impact Significance* – Anticipated visual impacts from this KOP would thus be beneficial. With removal of revetment as proposed by the applicant in the proposed Tank Farm Plan, and installation of perimeter landscaping as depicted in the

conceptual landscape plan (ESPR 2000rr), and as described under Condition of Certification VIS-1, overall impacts from this viewpoint would be beneficial.

***KOP 8*** – ***Vista del Mar***. **VISUAL RESOURCES FIGURES 8A and 8B** represent views from the project visual foreground as seen by southbound motorists on Vista del Mar.

Existing ESGS

*Visual Contrast* - The Unit 2 coastal open space landscape is characterized by panoramic views of broad, horizontal lines formed by the marine horizon, mountain ridges enclosing the Bay to the north and south, and beaches which can be seen extending to background distances from elevated viewpoints such as Vista del Mar. Against this background, the existing ESGS, characterized by strongly vertical, blocky, often sky-lined forms of the power blocks and exhaust stacks and, at close distances, by completely unscreened, visually intricate and chaotic views of piping and ducts, machinery, scaffolding and other metallic features, presents very high levels of contrast in form, line, color, and texture.
*Visual Dominance* - The existing power blocks exhibit strong visual dominance within the visual foreground as well, looming approximately 70 to 134 feet above the adjacent roadway, although existing Units 1 and 2, due to their position in relation to Vista del Mar, tend to fall outside a motorist's normal cone of vision at the point of greatest prominence (roughly 500' distance or less).
*View Blockage* - Blockage of motorists' views to the Bay is total within the immediate foreground of the plant.

*Overall Impact* – Overall, the existing impact of the ESGS from this KOP is strong to very strong.

Proposed ESPR

*Visual Contrast* - As depicted in **VISUAL RESOURCES FIGURE 8B**, contrast in form, line, color, and texture would be similar to those of the existing facility. That is, anticipated levels of contrast of the ESPR project would remain very high. The level of change between the existing and proposed projects would thus be weak.

*Visual Dominance* - From KOP 8, the proposed Units 5 and 7, in comparison to the existing ESGS, would result in an overall increase in visual dominance from strong to very strong levels. This would result from an increased area of project surface exposed to view, due partly to the rotated orientation of the HRSG structures, which exposes their long dimension to full view of on-coming motorists; to slightly increased overall height; to the increased spatial separation of Units 5 and 7, causing them to occupy a wider portion of the field of view than the existing units and to occupy those views for a slightly longer duration of time; and most importantly, due to their closer proximity to the roadway in comparison to the existing Units 1 and 2, causing a larger proportion of both units to fall within a motorist's normal field of view. They would thus appear more dominant from a greater distance than the existing power plant. This increased dominance would be

experienced primarily by motorists for relatively brief durations of time within the visual near-foreground of the plant. The change in dominance would be moderate.

*View Blockage* - Due to the spatial separation of the two tall HRSG and stack structures of the proposed units, increased views to the Bay could be visible between the two units as motorists passed by, if existing landscaping in the area were also to be removed or made shorter. Blockage of high quality views could thus be reduced to a minor degree. However, the nearly perpendicular angle of such views to motorists, and their extremely short duration (approximately 2 – 3 seconds at 45 miles per hour), would not, in staff's view, compensate for the increased exposure to extremely dominant, visually chaotic views of unscreened industrial machinery at very short distances.

*Overall Impact* – Overall, impact would be very strong. The anticipated change in level of impact between the existing and proposed projects would be weak to moderate.

*Impact Significance* – The moderate overall impact, taken with the moderate to high level of susceptibility in this location, would result in an adverse but less than significant impact from this KOP.

### LANDSCAPE UNIT 3 - EL PORTO COASTAL RESIDENTIAL

***KOP 9*** – **VISUAL RESOURCES FIGURE 9** depicts the view toward the tank farm from residences on 45th Street in Manhattan Beach directly south of the existing tank farm proposed as the project staging and laydown area.

The primary impacts of concern from this KOP are construction-related and discussed later, under **CONSTRUCTION IMPACTS**.

However, removal of the existing tanks after construction, though visually beneficial in itself, would increase visibility of Units 3 and 4 from the vicinity of some residences. The resulting moderate adverse increase in a visual contrast due to visibility of the tank farm grounds and the ESGS would be off-set by a substantial decrease in blockage of Bay views. The overall change in impact would thus be negligible or slightly beneficial.

Under the applicant's proposed perimeter landscape plan, as further described in Condition of Certification VIS-1, tanks would be removed, landscape screening would be installed at the perimeter in order to soften views of the site without blocking views, and ultimate post-construction impacts from this KOP would be beneficial. Under the applicant's proposed Tank Farm Plan, tanks would be removed at the end of construction, resulting in enhanced Bay views and additional beneficial effects.

***KOP 3 – Vista del Mar, Manhattan Beach.*** VISUAL RESOURCES FIGURES **10A and 10B** represent views from Vista del Mar in Manhattan Beach, northbound, from approximately ½- mile distance from Units 1 and 2.

Existing ESGS

Existing contrast, dominance, view blockage and thus, overall impact of the existing ESGS in this distance zone are strong.

Proposed ESPR

*Visual Contrast* – Overall contrast of the ESGS with the proposed ESPR project would remain strong from these viewpoints. Overall change in contrast would generally be weak. In the immediate vicinity of the proposed Units 5, 6 and 7, project contrast would increase to a moderate degree due to the increased prominence of the HRSGs as a result of their location nearer the roadway than the existing Units 1 and 2. However, the portion of the view so affected, directly adjacent to the power plant, would affect passing motorists only, who would experience this change for brief durations, and not more distant residents in Manhattan Beach.

*Visual Dominance* - Scale and spatial dominance of the proposed project would increase somewhat in comparison to the existing Units 1 and 2 but would remain subordinate to Units 3 and 4 for northbound motorists. Proposed Units 5 and 7 would have noticeably increased dominance in the portion of roadway adjacent to the new facilities, as discussed under KOP 8, above, but the duration of these views would be very brief.

*View Blockage* – Blockage of Bay views would be unchanged as a result of the ESPR project. Blockage of sky would increase slightly due to the more prominent location of the HRSGs, but overall change would be weak.

*Overall Impact and Impact Significance* – Overall impact from the ESPR would increase from strong to very strong due to an increase in visual dominance, a generally weak level of overall change. With the setting's moderate to high impact susceptibility, this weak degree of change in overall levels of impact would be somewhat adverse, but less than significant.

## *CONSTRUCTION IMPACTS*

### CONSTRUCTION ACTIVITIES AT TANK FARM LAYDOWN AREA FROM KOP 9 -

Construction activities proposed at the tank farm staging and laydown site are a primary concern of residents in Manhattan Beach. The period of construction could extend for up to 3-1/2 years, and result in significant adverse effects if unmitigated. Under the applicant's proposed Tank Farm Plan (ESPR, 2000x) the existing abandoned storage tanks would be converted into dome structures, which would

visually shield and contain most construction activities and lighting to less than significant levels. The applicant has also proposed related construction measures, such as control of vehicle head light glare at night. With these measures, as described under recommended applicant's Tank Farm Plan, together with perimeter landscaping as described in applicant's conceptual landscape plan (ESPR, 2000rr) and specified in recommended Condition of Certification VIS-1, visual effects of construction from 45th Street would be reduced to less than significant levels.

#### CONSTRUCTION FROM KOPS 3 AND 8 (VISTA DEL MAR)

Although construction of upper portions of the proposed Units 5 and 7 would be visible from Vista del Mar, these activities would not be expected to be more visually adverse than the existing or proposed facilities themselves, which currently have and would continue to have strong to very strong levels of impact. Expected change to this level of impact due to construction activities would be weak and less than significant.

#### CONSTRUCTION FROM KOPS 2 AND 7 (MANHATTAN BEACH, BIKE PATH)

As described under KOP 9, principal visible construction activities from these locations would be those at the tank farm staging area. With implementation of the proposed Tank Farm Plan, visual impacts of construction would be minimal less than significant.

#### CONSTRUCTION FROM KOP 1 (DOCKWEILER BEACH)

Although construction activities would be visible from this location, these activities would not be expected to be more visually adverse than the existing or proposed facilities themselves, which currently have and would continue to have a visually chaotic character and strong to very strong levels of impact. Expected change to this level of impact due to construction activities would be noticeable but weak and less than significant.

### *CUMULATIVE IMPACTS*

No reasonably foreseeable future cumulative projects were identified. The only available parcel capable of future development in the vicinity is the SCE tank farm site. Future development of that site is not currently anticipated.

Potential project contributions to cumulative visible vapor plume impacts when combined with existing plumes of Units 3 and 4 and the Scattergood Plant, are sufficiently infrequent that staff considered these to be *de minimis* and less than significant.

## COMPLIANCE WITH APPLICABLE LORS

### *CITY OF EL SEGUNDO*

The City of El Segundo Coastal Zone Specific Plan/Local Coastal Program, adopted by the City in 1980 and certified by the Coastal Commission in 1982, Section VI.L. Visual Resources and Special Communities, states that the City General Plan contains policies which apply to industrial areas and which "are fully adequate to

protect scenic and visual resources in the coastal zone." Applicable policies of the General Plan include:

***Policy LU5-2.1.*** New industrial developments shall provide landscaping in parking areas and around the buildings. This landscaping is to be permanently maintained.

The conceptual landscape plan submitted by the applicant on May 24, 2001 depicts enhanced perimeter landscape treatments on all four boundaries of the ESGS. With inclusion of this measure, as further described under recommended Condition of Certification VIS-1, the proposed project would comply with this policy. As described under recommended Condition of Certification VIS-1, the applicant would be required to maintain the proposed landscaping.

***Policy LU5-2.2.*** All outdoor storage shall be properly screened by masonry walls and landscaping.

The applicant has proposed that temporary construction-related outdoor storage of materials and equipment would be screened by conversion of existing tanks on the proposed tank farm laydown area into dome enclosures for the duration of construction activities.

A segment of the bike path southwest of the existing Units 3 and 4 is currently screened only by chain link fence, exposing open views into the ESGS site.

With applicant's proposed perimeter landscaping as specified under recommended Condition of Certification VIS-1, the project would be in conformance with the intent of this policy.

***Objective LU5-3.*** Encourage the rehabilitation of existing substandard blighted industrial areas through the combined efforts of private and public sectors.

***Policy LU5-3.1.*** Revitalize and upgrade industrial areas which contain aesthetic or functional deficiencies in such areas as landscaping, off-street parking, or loading areas.

The existing and proposed facilities, due to their heavy industrial character within the scenic coastal zone and within foreground views of the ocean as viewed from heavily traveled Vista del Mar, represent an industrial area of substandard, blighted appearance with aesthetic deficiencies in the areas of landscaping and general architectural treatment. These deficiencies would be addressed through implementation of the conceptual landscape plan as submitted by the applicant and called for in recommended Condition of Certification VIS-1, and would be addressed most fully with additional recommended Conditions of Certification VIS-3 and VIS-4.

### *CITY OF MANHATTAN BEACH*

The proposed ESPR project would take place entirely within the City of El Segundo, thus polices of the City of Manhattan Beach would not apply. However, the following

policy indicates the City's intent with regard to the potentially affected residential area south of the ESGS.

***Land Use Policy 5.2.***

Require the separation or buffering of low-density residential areas from businesses that produce noise, odors, high traffic volumes, light or glare, and parking through the use of landscaping, setbacks, and other techniques.

***LU Goal 7.*** Protect existing residential neighborhoods from the intrusion of inappropriate and incompatible uses.

As discussed previously, with implementation of the proposed Tank Farm Plan and recommended Conditions of Certification VIS-1 and VIS-5, the project would conform with the visual aspects of these policies.

## *CALIFORNIA COASTAL ACT*

Section 30251 of the State Coastal Act states,

"Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas."

The existing ESGS and proposed ESPR plants are not regarded by staff as visually compatible with their coastal setting. Not only do they represent the only features between the City of Manhattan Beach and the northern limit of the viewshed to intrude upon views of the Bay from Vista del Mar, neither the existing ESGS nor an unmitigated ESPR would be of a comparable level of visual quality to other industrial development in the surrounding viewshed. For example, the adjoining Chevron refinery is substantially screened from views on Vista del Mar by tall, heavily landscaped berms; the Scattergood power plant is housed within an architectural enclosure that emulates the appearance of a building, lowering its potential visual impact; and the machinery and equipment of the Hyperion waste treatment facility are substantially screened by exterior architectural housing which enhances the visual unity of the facility as seen from the road. Further, the redevelopment of the ESGS provides a rare opportunity to feasibly 'restore and enhance visual quality in visually degraded areas.' Therefore staff recommends adoption of Condition of Certification VIS-3, calling for architectural panels to screen interior machinery of the proposed Units 5 and 7, and VIS-1, specifying perimeter landscape screening, to restore and enhance this visually degraded area pursuant to Section 30251 of the Coastal Act.

In a letter addressed to the Energy commission dated May 21, 2001, the City of El Segundo stated that "the project would be significantly improved by the inclusion of (removable screening) panels in the design of the new units." (City of El Segundo, 5/21/2001).

## RECOMMENDED MITIGATION MEASURES:

To feasibly restore and enhance visual quality in the visually degraded area of the ESGS pursuant to Section 30251 of the Coastal Act, staff recommends the addition of architectural screening to enhance visual unity and reduce adverse visual contrast in character of the project due to exposed mechanical equipment, as depicted in Visual Resources Figures14 (view from KOP 8, with recommended mitigation) and 15 (view from KOP 7, with recommended mitigation). Such screening may consist of pop-off panels, wire mesh or other opaque or semi-transparent cladding as feasible, to cover the outer framework of the HRSG structures and reduce visibility of mechanical equipment (refer to Condition of Certification VIS-3).

To partially screen vertically prominent features from off-site foreground viewpoints, applicant should implement a perimeter landscape plan, as depicted in applicant's Conceptual Landscape Plan (ESP II, 2001rr) and modified as agreeable to the Cities of El Segundo and Manhattan Beach. At a minimum such plan shall include: continuous tree canopies on the eastern roadside perimeter to enhance visual unity of the road corridor, compatibility of the ESPR project with its coastal setting, and at least partial long-term screening of upper portions of the HRSGs; shrub plantings to screen views of the structures, while preserving perpendicular view corridors to the Bay, if desired by the City of El Segundo; landscape screening along 45$^{th}$ Street agreeable to the City of Manhattan Beach to provide long term screening of the tank farm site; and, if feasible, landscape planting in the vicinity of the proposed seawalls, in order to mitigate loss of landscaping in that area (refer to Condition of Certification VIS-1). For similar mitigation purposes, the applicant should paint exterior portions of the project not screened by exterior paneling described under VIS-3 in a harmonizing color or colors with a low gloss finish to blend with the surroundings and eliminate potential reflective glare to motorists (Condition of Certification VIS-4).

To mitigate adverse effects of the loss of 450 feet of existing landscaping west of existing Units 1 and 2, project applicant should replace landscaping where feasible as described under recommended Condition of Certification VIS-1; and treat proposed seawall in this location with mitigating surface texture treatment as described under Condition of Certification VIS-2 in order to enhance design quality, reduce visual monotony, and reduce likelihood of attracting graffiti.

To mitigate potential night lighting impacts, the applicant should implement shielding and controls of night lighting as described in Condition of Certification VIS-5.

## FACILITY CLOSURE

## INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure, and unexpected permanent closure.

## PLANNED CLOSURE

Planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to obsolescence. At the end of the ESPR Units 5, 6 and 7 economic, mechanical, or operational life, the project owner shall prepare and submit a closure plan describing procedures and timetable for the complete removal of the power plant structures and the transmission poles to reduce visual impacts.

## UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

## UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare shall address removal of the power plant structures to reduce visual impacts in the event of unexpected permanent closure.

# CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

Because potential project impacts have been evaluated against the baseline of strong existing visual impacts of the ESGS, few significant impacts were identified. With recommended Condition of Certification VIS-5, potentially significant adverse night lighting impacts would be reduced to less than significant levels.

However, staff does not regard either the existing ESGS or unmitigated ESPR projects as visually compatible with their coastal setting as viewed from sensitive foreground viewpoints. Therefore, staff recommends adoption of Conditions of Certification VIS-1, -2, -3, and -4 to restore and enhance this visually degraded area pursuant to Section 30251 of the Coastal Act.

With implementation of applicant's proposed Tank Farm Plan and staff's recommended Conditions of Certification, project impacts from sensitive foreground viewpoints would be improved.

With implementation of proposed Tank Farm Plan and staff-recommended Conditions of Certification, the project would conform with all applicable LORS.

## RECOMMENDATIONS

The Energy Commission should adopt the following conditions of certification if it approves the project.

## PROPOSED CONDITIONS OF CERTIFICATION

**VIS-1**. Perimeter landscaping. Prior to start of commercial operation the applicant shall prepare and implement an approved perimeter landscape screening plan.

The screening shall, at a minimum, utilize landscape opportunities on all four boundaries of the project site. If feasible, landscape screening shall include planting on the path (west) side of all new concrete walls constructed along the existing bike path. Final plant selection shall be made in consultation with the CPM and the Cities of Manhattan Beach and El Segundo. Suitable irrigation shall be installed to ensure survival and desired rate of growth. The landscape screening and irrigation system shall be monitored for a period of five years to ensure survival. During this period all dead plant material shall be replaced.

To achieve year-round screening, evergreen species shall be used. If required, a berm will be utilized to raise tree roots above the water table. Ultimate screening at maturity shall achieve canopy heights of at least 50 feet – 70 feet tall except where transmission line clearance requires shorter trees. Spacing of trees shall be sufficiently dense to ensure substantial screening by the tree canopy at maturity.

Protocol: Prior to start of commercial operation, the project owner shall submit a perimeter landscape plan to the Cities of Manhattan Beach and El Segundo for review and comment, and to the CPM for review and approval. The plan shall include, but not be limited to:

1) A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives. A list of potential tree species which would be viable in this location shall be prepared by a qualified professional arborist familiar with local growing conditions, with the objective of providing the widest possible range of species from which to choose. The plan shall demonstrate how the screening conditions called for above shall be met, including evidence provided by a qualified professional arborist that the species selected is both viable and available.
2) Elevation views or visual simulations of the landscape screening at maturity, in order to show the extent of screening that the landscaping is expected to achieve from 45th Street and from Vista del Mar.
3) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and

4) A procedure for monitoring for and replacement of unsuccessful plantings.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM.

**Verification:** At least 120 days prior to start of commercial operation, the project owner shall submit the perimeter landscape plan to the Cities of Manhattan Beach and El Segundo for comment, and the Compliance Project Manager (CPM) for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 15 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

**VIS-2** Design treatment of seawall. Prior to start of commercial operation, the project owner shall construct the proposed seawall with architectural design treatment to reduce visual monotony, enhance design quality and interest, and discourage graffiti. Techniques may include pre-cast or cast-in-place texturing, split-faced concrete block, or other methods as feasible to produce a textured surface.

Protocol: The project owner shall submit a design plan for the seawall to the City of El Segundo for review and comment, and to the CPM for review and approval. The treatment plan shall include:

1) specification, and 11” x 17” color elevations, of the treatment proposed for use on the seawall;
2) a detailed schedule for completion of construction; and,
3) a procedure to ensure proper maintenance, including graffiti removal, for the life of the project.

Seawall construction shall not commence until the design plan has been approved by the CPM.

**Verification:** Not later than 90 days prior to construction of the seawall, the project owner shall submit the seawall design plan to the City of El Segundo for review and comment and to the CPM for review and approval.

If the CPM notifies the project owner of any revisions that are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

Not less than thirty 30 days prior to the start of commercial operation, the project owner shall notify the CPM that the seawall is ready for inspection.

The project owner shall provide a status report regarding screening maintenance in the Annual Compliance Report.

**VIS-3** Architectural screening of power plant. Prior to start of commercial operation, the project owner shall install architectural screening to cover the outer framework of the HRSG structures and reduce visibility of mechanical equipment. Such screening may consist of pop-off panels, wire mesh or other opaque or semi-transparent cladding as feasible.

Protocol: The project owner shall submit an architectural screening plan to the City of El Segundo for review and comment, and to the CPM for review and approval. The screening plan shall include:

1) specification, and 11" x 17" color simulations at life-size scale, of the treatment proposed for use on project structures;
2) a detailed schedule for completion of the treatment; and,
3) a procedure to ensure proper treatment maintenance for the life of the project.

**Verification:** Not later than 120 days prior to start of commercial operation, the project owner shall submit the architectural screening plan to the CPM for review and approval.

If the CPM notifies the project owner of any revisions that are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

Not less than thirty 30 days prior to the start of commercial operation, the project owner shall notify the CPM that the architectural screening is ready for inspection.

The project owner shall provide a status report regarding screening maintenance in the Annual Compliance Report.

**VIS-4** Prior to the start of commercial operation, the project owner shall paint or treat portions of Units 5, 6 and 7 structures visible to the public and not screened by exterior paneling described under VIS-3 in a harmonizing color or colors with a low gloss finish to blend with the surroundings and eliminate potential reflective glare to motorists.

Protocol: The project owner shall submit a treatment plan for the project to the Cities of El Segundo and Manhattan Beach for review and comment, and to the CPM for review and approval. The treatment plan shall include:

1) specification, and 11" x 17" color simulations at life-size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;

2) a detailed schedule for completion of the treatment; and,
3) a procedure to ensure proper treatment maintenance for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors, and shall not perform the final treatment on any structures on site until the project owner receives notification of approval of the treatment plan by the CPM.

**Verification:** Not later than 90 days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit the treatment plan to the CPM for review and approval.

If the CPM notifies the project owner of any revisions that are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

Not less than thirty 30 days prior to the start of commercial operation, the project owner shall notify the CPM that all treated structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

**VIS-5** The project owner shall design and install new lighting for Units 5, 6 and 7, and modify existing lighting on Units 3 and 4, to minimize potential night lighting impacts, as follows:

a) All lighting shall be of minimum necessary brightness consistent with operational safety.
b) All lighting shall be shielded and directed downward to prevent all uplighting and all direct light trespass (direct lighting extending outside the boundaries of the facility).
c) Wherever feasible and safe, lighting shall be kept off when not in use. Motion detectors shall be employed wherever feasible and safe to control lighting.
d) A lighting complaint resolution form (following the general format of that in Attachment 1) shall be maintained by plant operations, to record all lighting complaints received and to document the resolution of that complaint.
e) All construction-related lighting will be completely shielded or screened so as not to be visible to residents of 45th Street in Manhattan Beach. Construction lighting in the tank farm area shall be limited to the hours of 7:30 a.m. to 6:00 p.m except as necessary for safety or security purposes.

Protocol: The project owner shall develop separate lighting plans for both modification of existing units and installation of the new units of the project incorporating the above measures and submit it to the CPM for review and approval.

**Verification:** At least 60 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation and modification that the lighting is ready for inspection.

The project owner shall report any lighting complaints and documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

## REFERENCES


City of El Segundo, 1980. Coastal Zone Specific Plan/Local Coastal Program.

City of El Segundo, 2001. Letter from City of El Segundo, dated 5/21/2001.

City of Manhattan Beach, 1988. General Plan.

ESPR (El Segundo Power Station) 2000a. Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000p – Visual and Noise Data Response Submitted to the California Energy Commission on April 16, 2001.

ESPR (El Segundo Power Station) 2000x – Response to CEC Data Requests, Set 4 – POS (including proposed Tank Farm Plan)

Submitted to the California Energy Commission on May 04, 2001

ESPR (El Segundo Power Station) 2000rr – 5 copies of the Landscape Concept Plan - POS

Submitted to the California Energy Commission on May 29, 2001

Smardon, R., J. Palmer and J. Felleman, 1986, Foundations of Visual Project Analysis.

Walters, W. 2001. El Segundo HRSG Exhaust Visible Plume Analysis.

# VISUAL RESOURCES APPENDIX A

### Staff's Visual Impact Significance Assessment Process

The following table was used to determine preliminary levels of project impact significance based on impact susceptibility and impact severity.

| | VISUAL IMPACT SUSCEPTIBILITY | | | | |
|---|---|---|---|---|---|
| **VISUAL IMPACT SEVERITY** | **High** | **Moderate to High** | **Moderate** | **Low to Moderate** | **Low** |
| **Very Strong** | Significant | Significant | Significant | Less than significant | Less than significant |
| **Strong** | Significant | Significant | Less than significant | Less than significant | Insignificant |
| **Moderate** | Significant | Less than significant | Less than significant | Insignificant | Insignificant |
| **Weak** | Less than significant | Less than significant | Insignificant | Insignificant | Insignificant |
| **Negligible** | Less than significant | Insignificant | Insignificant | Insignificant | Insignificant |

Attachment 1:
LIGHTING COMPLAINT RESOLUTION FORM

| |
|---|
| EL SEGUNDO POWER STATION<br>Los Angeles County, California |
| Complainant's name and address:<br><br><br>Phone number: |
| Date complaint received:<br>Time complaint received: |
| Nature of lighting complaint: |
| Definition of problem after investigation by plant personnel:<br><br><br>Date complainant first contacted: |
| Description of corrective measures taken:<br><br>Complainant's signature: _____ Date: |
| Approximate installed cost of corrective measures: $<br><br>Date installation completed:<br>Date first letter sent to complainant: _____(copy attached)<br>Date final letter sent to complainant: _____(copy attached) |
| This information is certified to be correct:<br><br>Plant Manager's Signature: |

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

# EL SEGUNDO HRSG EXHAUST VISIBLE PLUME ANALYSIS
# TESTIMONY OF WILLIAM WALTERS

The following provides the assessment of the El Segundo Modernization (ESM) Project heat recovery steam generator (HRSG) exhaust stack visible plume modeling analyses conducted by the Applicant. Staff conducted a separate modeling analysis for comparison.

## HRSG PLUME ANALYSIS

The Applicant's Data Request Responses (#110 and 111) were evaluated and an independent psychrometric analysis and dispersion modeling analysis was performed to determine the validity of the Applicant's response. The Combustion Stack Visible Plume (CSVP) model was used to estimate the potential plume frequency, and provide data on predicted plume length, width, and height. This project has two separate HRSG stacks, and the plume data presented below represents plume frequencies and dimensions for each stack individually. Some minor plume interaction may occur, but it would be limited due to the separation of the stacks.

## HRSG PARAMETERS

The Applicant modeled three turbine operating conditions (100% load w/duct firing and power augmentation; 100% load w/o duct firing and power augmentation; and 50% load, w/o duct firing and power augmentation) for an entire year each. The Applicant stated in the response to Data Request #110 that these conditions represent the range of worst case operating conditions for the proposed plant. The AFC did not provide enough data to confirm the Applicant's contention that the conditions modeled were in fact conservative for use under all potential operating conditions; therefore, staff asked the Applicant if a 100% load w/power augmentation and no duct firing operating condition could occur. The Applicant identified that this operating condition was possible and identified the exhaust conditions for this operating scenario; however, they also noted that this operating condition was unlikely to occur on a regular basis. Table 1 provides exhaust parameters for the identified operating conditions.

**Table 1 - HRSG Exhaust Parameters**

Provided by the Applicant

| | HRSG Exhaust Parameters | | | |
|---|---|---|---|---|
| Parameter | **100% Load, Duct Firing & Power Augmentation** | **100% Load, no Duct Firing, no Power Augmentation** | **50% Load, no Duct Firing, no Power Augmentation** | **100% Load, Power Augmentation, no Duct Firing[b]** |
| Stack Height | 75 meters | 75 meters | 75 meters | 75 meters |
| Stack Diameter | 5.8 meters | 5.8 meters | 5.8 meters | 5.8 meters |
| Exhaust Temperature | 442.39°K | 368.56°K | 352.78°K | 365°K |
| Exit Velocity (calculated) | 24.04 m/s | 19.90 m/s | 12.08 m/s | 21.56 m/s |
| Exhaust mass flow rate | 3,819,342 lbs/hr | 3,895,776 lbs/hr | 2,462,156 lbs/hr | 4,168,727 lbs/hr |
| Moisture Content (% by vol.) | 15.53% | 8.00% to 9.01%[a] | 7.79% to 8.55%[a] | 12.0% to 14.26%[a] |

[a] – Values are interpolated based on the ambient temperature.

[b] – Determined through e-mail and telephone contact with Gary Rubinstein of Sierra Research, May 2001.

## METEOROLOGICAL DATA SUMMARY

The Applicant provided one year of meteorological data, which was a combination of the SCAQMD Lennox 1981 data set and 1981 relative humidity data from the LAX meteorological station. This data set did not include weather phenomena data (i.e. occurrence of fog, rain, etc.).

## APPLICANT DATA REQUEST RESPONSES SUMMARY

The Applicant modeled the first three HRSG stack conditions provided above with a modified version of the ISCST3 model and three other modules (CLAUSIUS, DISTANCE, AND COUNT) as explained in Data Request Response #110. The following is a summary of their results:

**Table 2- Applicant Predicted HRSG Steam Plume Frequency Summary 1981 Lennox/LAX Meteorological Data**

| | **Full Load w/Duct Burner and Power Augmentation** | | **Full Load w/o Duct Burner and Power Augmentation** | | **50% Load w/o Duct Burner and Power Augmentation** | |
|---|---|---|---|---|---|---|
| | **Hours** | **Frequency** | **Hours** | **Frequency** | **Hours** | **Frequency** |
| Day | 2 | 0.05% | 1 | 0.02% | 4 | 0.09% |
| Night | 3 | 0.07% | 2 | 0.05% | 15 | 0.34% |
| Total | 5 | 0.06% | 3 | 0.03% | 19 | 0.22% |

It can be seen that the Applicant's modeling results indicate that plumes will occur very rarely. It should also be noted that the meteorological file provided by the applicant did not indicate fog, rain or other hours with impaired visibility conditions. The Applicants predicted plume size characteristics are as follows:

Table 3 - Applicant Predicted Daylight HRSG Steam Plume Dimensions (meters)

| | 100% Load, Duct Firing & Power Augmentation | 100% Load, w/o Duct Firing & Power Augmentation | 50% Load, w/o Duct Firing & Power Augmentation |
|---|---|---|---|
| **Plume Length** | **No data** | **No data** | **No data** |
| Plume Height | | | |
| Maximum | [a] | [a] | 162 |
| Average[b] | [a] | [a] | 8 |
| **Plume Width (diameter)** | | | |
| Maximum | 41-83[c] | 41-83[c] | 53 |
| Average[b] | 24-35[c] | 24-35[c] | 3 |

[a] – Theoretical unlimited plume height.
[b] - The average values reflect the average dimensions when plumes occur.
[c] – Range of nominal values for a similar project.

## STAFF CSVP MODELING ASSESSMENT

Initially, the conditions that the Applicant used for modeling the HRSG exhaust were reviewed. The 1981 Lennox/LAX meteorological data set provided by the Applicant was used to model the HRSG plume potential using the CSVP model. The plume frequency results were determined as follows:

**Table 4- Staff Predicted HRSG Steam Plume Frequency Summary 1981 Lennox/LAX Meteorological Data**

| | Full Load w/Duct Burner and Power Augmentation | | Full Load w/o Duct Burner and Power Augmentation | | 50% Load w/o Duct Burner and Power Augmentation | | Full Load w/o Duct Burner, w/Power Augmentation | |
|---|---|---|---|---|---|---|---|---|
| | **Hours** | **Frequency** | **Hours** | **Frequency** | **Hours** | **Frequency** | **Hours** | **Frequency** |
| Day | 1 | 0.02% | 0 | 0% | 2 | 0.05% | 120 | 2.70% |
| Night | 2 | 0.05% | 0 | 0% | 7 | 0.16% | 644 | 14.91% |
| Total | 3 | 0.03% | 0 | 0% | 9 | 0.10% | 744 | 8.49% |

Staff's plume frequency results are slightly lower than the Applicant's results for the three cases they modeled and agree with the overall finding that there will be a very low frequency of plume formation considering the exhaust conditions and meteorological conditions modeled. The potential visible plume frequency when operating at full load with power augmentation is much higher than the other three cases modeled, and can be considered the worst case operating condition for visible plume formation.

Staff obtained a six year (1990 to 1995) met data set for LAX from the National Climatic Data Center (NCDC), which was formatted for use with CSVP. This multi-year data set is believed to provide more representative results. Additionally, this met data set included weather phenomena data (i.e. rain and fog). Using this met data the following plume frequencies were determined:

**Table 5- Staff Predicted HRSG Steam Plume Frequency Summary 1990-1995 LAX Meteorological Data[1]**

| | Full Load w/Duct Burner and Power Augmentation | | Full Load w/o Duct Burner and Power Augmentation | | 50% Load w/o Duct Burner and Power Augmentation | | Full Load w/o Duct Burner, w/Power Augmentation | |
|---|---|---|---|---|---|---|---|---|
| | **Hours** | **Frequency** | **Hours** | **Frequency** | **Hours** | **Frequency** | **Hours** | **Frequency** |
| Day | 19 | 0.07% | 2 | 0.01% | 40 | 0.15% | 1,299 | 4.87% |
| Day nf/nr | 2 | 0.01% | 0 | 0% | 2 | 0.01% | 418 | 1.74% |
| Night | 97 | 0.37% | 14 | 0.05% | 202 | 0.78% | 6,340 | 24.45% |
| Total | 116 | 0.22% | 16 | 0.03% | 242 | 0.46% | 7,639 | 14.53% |

[1] - Summary of all six years plume frequencies (52,577 total hours).
nf/nr – no fog no rain hours

Staff's predicted plume frequencies using the 1990-1995 LAX met data are marginally higher than those obtained from using the 1981 Lennox/LAX met data set provided by the Applicant. However, the plume frequencies predicted are still very low.

The plume frequencies predicted for the full load case with power augmentation and without duct firing are significantly higher than the other cases; therefore, a seasonal frequency analysis was also performed for plumes during daylight no fog no rain conditions.

The results of the seasonal frequency analysis are as follows:

**Table 6 - Staff Predicted Worst-Case HRSG Steam Plume Seasonal Frequency**
**Full Load w/o Duct Burner, w/Power Augmentation**
**1990-1995 LAX Meteorological Data[1]**

| Year | | Spring | Summer | Fall | Winter | Annual |
|---|---|---|---|---|---|---|
| 1990 | Hours | 15 | 0 | 5 | 72 | 92 |
| | Frequency | 1.28% | 0.00% | 0.55% | 8.14% | 2.21% |
| 1991 | Hours | 34 | 0 | 2 | 41 | 77 |
| | Frequency | 2.88% | 0.00% | 0.24% | 4.81% | 1.94% |
| 1992 | Hours | 2 | 0 | 4 | 38 | 44 |
| | Frequency | 0.17% | 0.00% | 0.45% | 4.45% | 1.09% |
| 1993 | Hours | 11 | 1 | 9 | 43 | 64 |
| | Frequency | 0.94% | 0.09% | 1.00% | 5.24% | 1.58% |
| 1994 | Hours | 22 | 0 | 14 | 24 | 60 |
| | Frequency | 1.99% | 0.00% | 1.52% | 2.66% | 1.46% |
| 1995 | Hours | 37 | 2 | 5 | 37 | 81 |
| | Frequency | 3.36% | 0.18% | 0.64% | 4.93% | 2.18% |
| Average | Hours | 20 | 1 | 7 | 43 | 70 |
| | Frequency | 1.75% | 0.04% | 0.74% | 5.04% | 1.74% |

[1] – Frequencies based on the seasonal daylight no fog no rain hours.

These results show that even when modeling the most conservative operating condition the plume occurrence frequency for daylight no fog no rain hours is predicted to be less than 10% seasonally.
The ambient conditions that occur during predicted plume events are characterized by cool ambient temperatures with high relative humidities.

The range of ambient conditions where HRSG plumes are predicted are given as follows:

Table 7 - Ambient Conditions During Hours with Predicted HRSG Plumes

LAX Meteorological Data 1990 - 1995

| **ALL HOURS** | **Temperature** | **Relative Humidity** |
|---|---|---|
| **FULL LOAD W/DUCT BURNER AND POWER AUGMENTATION** | | |
| MAXIMUM | 49.7°F | 100% |
| Minimum | 39.6°F | 86% |

| | | |
|---|---|---|
| Average | 47.8°F | 99% |
| Median | 48.6°F | 100% |
| **FULL LOAD W/O DUCT BURNER AND POWER AUGMENTATION** | | |
| MAXIMUM | 46.7°F | 100% |
| Minimum | 43.8°F | 100% |
| Average | 46.0°F | 100% |
| Median | 46.2°F | 100% |
| **50% LOAD W/O DUCT BURNER AND POWER AUGMENTATION** | | |
| MAXIMUM | 51.7°F | 100% |
| Minimum | 39.6°F | 83% |
| Average | 49.0°F | 99% |
| Median | 49.7°F | 100% |
| **FULL LOAD W/O DUCT BURNER, W/POWER AUGMENTATION** | | |
| MAXIMUM | 66.6°F | 100% |
| Minimum | 34.8°F | 16% |
| Average | 54.1°F | 90% |
| Median | 54.8°F | 93% |

Plume frequencies during clear daytime hours are the most important issue when determining potential significance. The temperature and relative humidity conditions necessary to cause visible plume formation under the four operating cases modeled are very infrequent, particularly during the daytime.
The CSVP predicted plume size characteristics for daylight no fog no rain hours are as follows:

Table 8 - Staff Predicted HRSG Steam Plume Dimensions (meters)

Daylight No Fog No Rain Hours

| **Full Load w/Duct Burner and Power Augmentation** | **Length** | **Height** | **Width** |
|---|---|---|---|
| Maximum | 240 | 172 | 31 |
| Average | 223 | 153 | 29 |
| **Full Load w/o Duct Burner and Power Augmentation** | | | |
| Maximum | * | * | * |
| Average | * | * | * |
| 50% Load w/o Duct Burner and Power Augmentation | | | |
| Maximum | 131 | 111 | 18 |
| Average | 121 | 103 | 16 |
| **FULL LOAD W/O DUCT BURNER, W/POWER AUGMENTATION** | | | |
| Maximum | 465 | 659 | 57 |
| Average | 166 | 150 | 25 |

* - model results do not show plumes forming during daylight no fog no rain hours for this exhaust condition.

## EXISTING CONDITIONS

Currently, El Segundo Units 3 and 4 operate with the following estimated exhaust conditions:

## TABLE 9 – UNIT 3 AND 4 STACK EXHAUST PARAMETERS

Provided by the Applicant

| PARAMETER | HRSG EXHAUST PARAMETERS |
|---|---|
| Stack Height | 65.55 meters |
| Stack Diameter | 6.452 meters |
| Exhaust Temperature | 390.78°K |
| Exit Velocity (calculated) | 15.39 m/s |
| Exhaust mass flow rate | 3,071,202 lbs/hr |
| Moisture Content (% by volume) | 15.55% |

The Unit 1 and 2 Stack Exhaust Parameters can be considered to be similar to those for Unit 3 and 4. Using the LAX 1990 to 1995 met data the following plume frequencies were determined for Units 3 and 4:

**Table 10 - Staff Predicted Unit 3 and 4 Steam Plume Frequency Summary 1990-1995 LAX Meteorological Data[1]**

| | Full Load w/Duct Burner and Power Augmentation | |
|---|---|---|
| | Hours | Frequency |
| Day | 786 | 2.95% |
| Day nf/nr | 194 | 0.81% |
| Night | 4107 | 15.84% |
| Total | 4893 | 9.31% |

[1] - Summary of all six years plume frequencies (52,577 total hours).
nf/nr – no fog no rain hours

The CSVP predicted plume size characteristics for daylight no fog no rain hours are as follows:

***TABLE 11 - STAFF PREDICTED UNIT 1 AND 2 STACK STEAM PLUME DIMENSIONS*** (meters)

**DAYLIGHT NO FOG NO RAIN HOURS**

| | Length | Height | Width |
|---|---|---|---|
| Maximum | 433 | 609 | 57 |
| | | 1 | |
| | 16 | 5 | 2 |
| Average | 9 | 6 | 5 |

The modeling results show that the plumes from the existing Unit 1 and 2 stack are significantly more frequent and somewhat larger than the predicted plumes from the ESM project Unit 5 and 7 HRSG stacks under most operating conditions. Therefore, the replacement of Units 1 and 2 with new Units 5 and 7 will likely reduce the existing visible plume impacts from the plant.

## CONCLUSIONS AND RECOMMENDATIONS

Visible plumes from the HRSG exhausts will occur from the ESM Project during periods of cold and wet weather. The actual frequency of occurrence is weather dependent and will vary from year to year. The results of the plume modeling are dependent on both the exhaust condition inputs and the meteorological data. If the exhaust conditions modeled do not properly reflect the most conservative exhaust temperature and moisture conditions then the plume frequencies may be underestimated.
The results of the staff CSVP modeling analysis show slightly less frequent plumes than the applicant. This difference in part may be differences in the modeling programs used and in part may be due to slightly different mathematical representations of the saturation curve.

The plume modeling results indicate that visible plumes from the Unit 5 and 7 HRSG stacks will not cause a significant visual impact.

# WASTE MANAGEMENT

Alvin Greenberg, Ph.D.

## INTRODUCTION

This staff assessment presents an analysis of the issues associated with managing wastes generated from constructing and operating the proposed El Segundo Power Redevelopment Project (ESPR 2000a). It evaluates 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 (including demolition of existing structures) 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 constructing and operating the proposed project will be managed in an environmentally safe manner; and
- Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

## 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.

## LOCAL

Hazardous waste is regulated locally by the City of El Segundo in its 1992 General Plan. El Segundo Municipal Code, Title 6 Chapter 6.22 regulates petroleum underground storage tank cleanup. The Certified Unified Program Agency for hazardous wastes at the ESPR Project is the El Segundo Fire Department and has authority to administer the state and local programs.

The Los Angeles County Wastewater Treatment plant in Carson issues permits for sanitary discharges.

## SETTING

## PROJECT AND SITE DESCRIPTION

EL Segundo Power II LLC (ESP II), is seeking approval to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 natural gas-fired, combined cycle electric generation facility. ESGS Units 3 and 4 located adjacent to Units 1 and 2 will not be modified by this project. The new facility is expected to generate 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and replacement with Units 5, 6, and 7 in the location previously occupied by Units 1 and 2.

The ESPR site is located at 301 Vista Del Mar in the City of El Segundo. The site is bordered by Vista Del Mar and the Chevron Refinery to the eat, 45$^{th}$ St. in the City of Manhattan Beach on the south, Santa Monica Bay on the west, and the Chevron Marine Terminal to the north. The site is 33 acres and an existing tank farm comprises ~9 of those acres.

Sanitary wastes will be collected and transferred via a new sewer connection to the City of Manhattan Beach Public Works Department, in accordance with the city's discharge requirements. Facility process wastewater will be sent to the existing retention pond on facility property and discharged to Santa Monica Bay in accordance with the current NPDES permit.

A Phase I Environmental Site Assessment (ESA) was prepared in 1997 (CH2M Hill 1997). The purpose of the ESA was 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 Phase I ESA identified a number of environmental conditions at the site (summarized in AFC §5.14.1.1) including:

- Total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) have been detected in soils and groundwater beneath the ESGS. Cleanup is conducted pursuant to Chevron's Cleanup and Abatement Order issued by the LARWQCB.

- TPH, VOCs, and metals were found in groundwater beneath the retention basins. Southern California Edison conducts quarterly monitoring pursuant to a Consent Order with DTSC.

- TPH was detected in soil and groundwater under tank farm.

- Oil staining was found around the transformers adjacent to Units 1 through 4.

- VOCs were detected in soil and groundwater near the hazardous waste storage area.

The Phase I ESA provided the basis for additional sampling and analysis of soil and groundwater performed as part of several Phase II ESAs and other site assessments to further define the extent of existing contamination. The results of these investigations and a new investigation are summarized in a 1998 report (Woodward-Clyde 1998). This report identified remediation issues for several identified localized areas at the ESGS. The contaminants identified include TPH, VOCs, SVOCs, metals, and in soil and groundwater. TPH-impacted soils were found in four areas at the ESGS, VOC-impacted soil in two areas, and metal-impacted soil at five areas. TPH was found in groundwater at five areas, VOCs throughout the ESGS (particularly benzene in five areas), SVOCs in nine areas, and metals were generally found in groundwater throughout the site.

Staff has reviewed the Phase I and II ESAs and has concerns about the lack of remedial investigations conducted beneath existing structures which are to be demolished. Angle borings beneath these structures were not obtained and thus investigations will not occur until the structures are removed. Staff has proposed a condition of certification (WASTE-6) which would require the applicant to prepare a Remedial Investigation Workplan (RI Workplan) prior to demolition. This plan would include a detailed site characterization plan with soil and groundwater sampling and analysis to determine the extent and nature of contamination existing beneath these structures. The RI Workplan would be provided to the Los Angeles County Fire Department, the California Department of Toxic Substances Control, the LARWQCB, the City of El Segundo Fire department, and the CEC CPM for review and approval. If contaminated soil or groundwater were found to exist, the project owner would contact representatives of the above-named agencies for further guidance and possible oversight. The applicant has indicated that it will provide this workplan (ESPR 2000y).

No request for designation of an administering agency to oversee site investigation and remedial action has been made pursuant to California Health and Safety Code section 25260 et seq., by the applicant. Therefore, there is no lead agency and DTSC and the LARWQCB have separate and equal jurisdiction on this site.

## IMPACTS

## PROJECT SPECIFIC IMPACTS

### *CONSTRUCTION AND DEMOLITION*

Demolition, site preparation, and construction of the generating plant and associated facilities will generate both nonhazardous and hazardous wastes. Individual contractors are considered to be the generators of construction wastes, and as part of its contract specifications for construction contractors, the ESPR will require that materials be handled and disposed in accordance with applicable LORS. Tables 5.14-4 and 3.4-6 provide descriptions of construction and demolition waste streams and management methods.

Site preparation will also include dewatering of the soil after removal of the foundations of existing Units 1 and 2. Groundwater levels will be lowered as much as 14 feet below average levels. Because TPH and VOCs have been detected in groundwater, treatment to meet the waste discharge requirements of the LARWQCB will be required prior to discharge to Santa Monica Bay. A pump test will be performed according to a test protocol developed by the applicant to ensure adequate treatment and flow rates (ESPR 2000y).

Nonhazardous waste streams from construction include paper, scrap wood, glass, metal, plastics, concrete, asphalt, oil absorbent mats, and oily rags (AFC Table 5.14-4). The applicant estimates that about 20-40 cubic yards of these types of wastes will be generated on a weekly basis plus ~1000 sq. feet of oily mats and three to four 55-gallon drums of oily rags per month during the construction period. Most if not all of these wastes would be sent to a waste disposal facility.

Demolition, dewatering, and construction are expected to generate both solid and liquid hazardous wastes (AFC Tables 5.14-2, 5.14-3, and 5.14-4). Hazardous wastes associated with Asbestos Containing Materials (ACM), lead-based paint, contaminated soil, and groundwater is expected. Much ACM has already been removed (~60% of that identified as ACM) but the quantity of materials containing lead-based paint is unknown (AFC p.5.14-8). Estimates of ACM and lead-based paint materials are provided in Tables 5.14-2 and 5.14-3 and are as high as 163,000 sq. feet of materials. During demolition, as much as 40,000 cubic yards of soil will be excavated and managed. More may be encountered in other areas including soils beneath the footprints of Units 1 and 2 and other structures to be demolished. All excavated soil will be characterized and managed according to the Draft Waste Management Plan prepared as Appendix S to the AFC and Appendix N-3, Hazardous Materials and Hazardous Waste Management Plan. If soils are classified as hazardous wastes, the City of El Segundo Fire department and the Los Angeles County Hazardous Materials Division will be notified. The soil will be transported to a soil recycling facility or a Class I landfill. It is also estimated that dewatering will generate as much as 13 to 65 million gallons of contaminated groundwater for treatment and discharge according to the permit conditions of an NPDES permit.

Table 5.14-4 also lists wastes typically generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, and start-up cleaning of the HRSG. The 200,000 gallons generated during this process can mostly be recycled. This table additionally lists the management methods of the wastes.

### *OPERATION*

The proposed facility will generate both nonhazardous and hazardous wastes under normal operating conditions. These waste streams are identified in Table 5.14-5.

Nonhazardous wastes generated during plant operation of Units 5, 6, and 7 are expected to be similar to those generated by the present facility and include trash, paper, wood, plastic, cardboard, broken and rusted metal and machine parts,

defective electrical materials, empty containers, and other typical worker-generated solid wastes. The quantities of nonhazardous wastes generated from gas-fired facilities are typically minor and operation of the new units is expected to generate the same amount as currently generated. Nonhazardous solid waste at the existing facility is routinely segregated according to recyclable content to minimize the quantity disposed offsite (AFC p.5.14-20). This practice will continue for operation of the proposed ESPR.

Hazardous wastes likely to be generated during routine project operation include oily water, CTG washwater, heat recovery steam generator (HRSG) washwater, spent selective catalytic reduction (SCR) catalysts, and minimal amounts of used cleaning solvents. About 50 gallons per year (g/y) of oily water, 7200 g/y of CTG washwater, 50,000 gallons of HRSG washwater per cleaning (2 cleanings every 5 years), and 50 cubic meters of SCR catalyst (containing heavy metals such as vanadium) are expected to be generated on an annual basis from the new combined cycle units (Table 5.14-5).

Solid wastes will be disposed of at either Class I, II, or III landfills (depending on the waste type) while liquid wastes will be either discharged to municipal sewage treatment plants or transported to hazardous waste treatment or disposal facilities.

## IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

The AFC identifies three nonhazardous waste disposal facilities in the area (Table 5-14-1). They are located in Corona, Ca. (permitted disposal capacity of 4000 tons per day and is expected to remain operational until 2050), Simi Valley (4000 tons per day through 2020-2050), and Orange County (8500 tons per day through 2024). Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amounts of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Ken County, and Laidlaw in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of 22 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 will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from ESPR would be a very small fraction (less than one percent) of existing capacity and not significantly impact the capacity or remaining life of any of the state's Class I landfills.

## CUMULATIVE IMPACTS

Additional waste management impacts which could contribute to those from construction and operation of the ESPR project include those associated with the demolition of the existing fuel oil storage tanks with related environmental remediation, and installation of selective catalytic reduction (SCR) pollution control to the new units.

Demolition of fuel oil storage tanks is a separate phase due to the planned use of two tanks as construction areas and wastes generated by demolition could significant, including hazardous and nonhazardous wastes. Much of this waste can be recycled or used on-site. Once the tanks are removed, soil or groundwater contamination may be present, and remediation may be required. Until the tanks are removed, the extent of potential contamination is unknown.

Installation of SCR pollution control will not result in any significant waste related impacts. Periodically, the catalysts must be replaced to maintain operating efficiency, and are typically recycled.

The quantities of wastes generated during construction and operation of the ESPR project will not result in any significant waste management related impacts. Quantities of wastes associated with the activities described above, including continued operation of units three and four, site preparation, demolition of existing units one and two, and installation of SCR catalyst, although significant, are mitigatable. However, considering the lack of impacts on individual disposal facilities and the availability of additional regional landfills and the efforts made to recycle, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

## 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 require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must

provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, ESPR 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)

Energy Commission staff concludes that the applicant will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during site preparation, demolition, construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the LARWQCB or the CAL EPA Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, the applicant has indicated that it has an existing EPA identification number as a hazardous waste generator. The applicant also indicated that they will apply to Cal/EPA for a hazardous waste generator number and a treatment permit. Accordingly, ESPR 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 which meets the requirements of SB-14 will be required. Neither waste management plans found in the AFC (Appendixes N-3 or S) provide this plan.

## MITIGATION

Based on the analysis of impacts and the design and operational features that have been incorporated into the project, the applicant has proposed mitigation measures beyond those already in place at the ESGS (AFC §5.14.4). The applicant will develop and submit waste management plans that will include details on the handling, packaging, labeling, storage, treatment, and disposal of wastes (proposed Condition of Certification WASTE-3). The applicant has also stipulated to four Conditions of Certification (Waste 1 through 4).

In order to address concerns about the lack of remedial investigations conducted beneath existing structures which are to be demolished, staff has proposed a condition of certification (WASTE-6) which would require ESPR to prepare a Remedial Investigation Workplan prior to demolition. This plan would be provided to the LA County, El Segundo Fire Department, the California Department of Toxic Substances Control, the LA Regional Water Quality Control, and the CEC CPM for review and approval. If contaminated soil or groundwater is found to exist, the project owner would contact representatives of those agencies for further guidance and possible oversight.

Staff has examined the waste management related measures proposed by the Applicant and concluded that, together with applicable LORS and the additional measure proposed by staff, they will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

## CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during site preparation, demolition, construction, and operation of ESPR will not result in any significant adverse impacts if ESPR implements the waste management measures proposed in the Application for Certification (00-AFC-14) and the proposed conditions of certification.

## CONDITIONS OF CERTIFICATION

**WASTE –1** The project owner shall obtain a hazardous waste generator number and hazardous waste treatment permit for neutralization facilities from the Department of toxic Substances Control prior to generating any hazardous wastes.

**Verification:** At least 30 days prior to site preparation; the project owner shall provide the generator number and a copy of the treatment permit to the CPM.

**WASTE-2** Upon becoming aware of any impending waste management-related enforcement action, the project owner shall notify the CPM of any such action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.

**Verification:** The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action.

**WASTE-3** Prior to the start of site preparation, demolition, construction and operation, the project owner shall prepare and submit to the CEC CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all expected waste streams, including projections of frequency 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 60 days prior to the start of site preparation or construction, the project owner shall submit the construction waste management

plan to the City of El Segundo and the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

**WASTE-4** If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the registered professional engineer or geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the registered professional engineer or geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the registered professional engineer or geologist, significant remediation may be required, the project owner shall contact representatives of the LA County Department of Hazardous Materials and the Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.

**Verification:** The project owner shall submit any reports filed by the registered professional engineer or geologist to the CPM within 5 days of their receipt.

**WASTE-5** The project owner shall have a registered professional engineer or geologist with experience in remedial investigation and feasibility studies available for consultation during soil excavation and grading activities. The registered professional engineer or geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

**Verification:** At least 30 days prior to the start of construction, the project owner shall submit the qualifications and experience of the registered professional engineer or geologist to the CPM for approval.

**WASTE-6** Before demolition of the fuel oil tanks, the existing generator buildings, and any other building, the project owner shall prepare a Remedial Investigation Workplan (RI Workplan). This plan shall include a detailed site characterization plan with soil and groundwater sampling and analysis to determine the extent and nature of contamination existing beneath these structures. The RI Workplan shall be provided to the Los Angeles County Fire Department, the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control, the City of El Segundo Fire Department, and the CEC CPM for review and approval. If contaminated soil or groundwater is found to exist, the project owner shall contact

representatives of the above-named agencies for further guidance and possible oversight.

**Verification:** At least sixty (60) days prior to commencement of tank or structure demolition, the project owner shall provide the RI Workplan to the San Luis Obispo County Environmental Health Department, the California Department of Toxic Substances Control, the Central Coast Regional Water Quality Control, and the CEC CPM for review and approval. Within thirty (30) days of completion of the sampling and analysis and prior to the initiation of any construction activities, the project owner shall provide the results of the sampling and analysis to the San Luis Obispo County Environmental Health Department, the California Department of Toxic Substances Control, and the Central Coast Regional Water Quality Control, and the CPM for review and guidance on possible remediation.

## REFERENCES


CH2M Hill (1997). Phase I Environmental Site Assessment, ESGS.

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000e – Water Quality and Waste Management Information Submitted to California Energy Commission on December 21, 2000.

ESPR (El Segundo Power Station) – 2000r – Applicant's Response to Staff's Data Requests, Sets One and Two
Submitted to the California Energy Commission on April 20, 2001.

ESPR (El Segundo Power Station) – 2000w – Spill Prevention Control and Countermeasure Plan, Emergency Preparedness and Emergency Response Plan, Hazardous Materials and Hazardous Waste Management Plan

ESPR (El Segundo Power Station) – 2000y – Response to CEC Data Requests, Set 5, May 18, 2001

Woodward-Clyde 1998. Additional Buyer's Due Diligence Investigations: ESGS

# SOIL & WATER RESOURCES

Testimony of Tim Landis, Joe Crea, Dominique Brocard, and Rich Sapudar

## INTRODUCTION

This section of the Staff Assessment (SA) analyzes potential effects on soil and water resources by the El Segundo Generating Station (ESGS), specifically focusing on the potential for the project to adversely affect surface and groundwater supplies, degrade ocean, inland surface and groundwater quality, and to induce erosion and sedimentation. This assessment also addresses the project's ability to comply with all applicable federal, state and local laws, ordinances, and regulations and standards. Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends conditions of certification.

Flooding and drainage issues are addressed in the Facility Design section of this document. Biological issues associated with cooling water intake and discharge are addressed in the Biological Resources section and aspects of sediment and soil contamination are addressed in the Waste Management section of this SA. References to these sections are made in the appropriate discussions.

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

## FEDERAL

### *CLEAN WATER ACT*

The Clean Water Act (33 USC § 1251), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States.

The Clean Water Act requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated by the National Pollutant Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards.

For the ESPR project, the local board is the Los Angeles Regional Water Quality Control Board (LARWQCB), Region 4. It has permitting authority to administer the currently approved NPDES for the project. This permit also covers stormwater runoff from the existing project as well as any runoff during construction. Specific issues relating to the NPDES permits are discussed in the Los Angeles Regional Water Quality Control Board section below.

## STATE

### *PORTER - COLOGNE WATER QUALITY CONTROL ACT*

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the *Basin Water Quality Control Plan – Los Angeles Region – Basin Plan for Coastal Watersheds of Los Angeles and Ventura Counties.*

The Porter-Cologne Water Quality Control Act also requires the SWRCB and the 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, Section 2200 et seq. These regulations require that the RWQCB issue a Waste Discharge Requirement regarding the discharge of waste (soil) into surface waters resulting from land disturbance. The Waste Discharge Requirement regarding the protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls is covered under the California Water Code, Sections 13260 -13269.

### *STATE WATER RESOURCES CONTROL BOARD*

#### STATE WATER RESOURCES CONTROL BOARD POLICY 75-58

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the State Board, 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 specifically discourages the use of fresh inland waters for power plant cooling and gives priority to the use of ocean water for this purpose. This SWRCB policy recommends that power plant cooling water should, in order of priority, come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland wastewaters of low total dissolved solids, and other inland waters. This policy also defines cooling water discharge prohibitions.

#### ENCLOSED BAYS AND ESTUARIES

The principal policy of the State Board, which addresses enclosed bays and estuaries, is the “Water Quality Control Policy for the Enclosed Bays and Estuaries of California” (adopted by the Board on May 16, 1974 by Resolution 74-43). This policy contains a number of prohibitions on waste discharges including chemical, biological and petroleum related waste.

#### CALIFORNIA WATER CODE

California Water Code § 461 encourages the reuse of wastewaters. The administering agency is the SWRCB.

California Water Code §§ 8571 and 8608; and Title 22. California Code of Regulations (CCR) Chapter 4 sets water standards and treatment criteria for water recycling. This includes bacteriological water quality. It requires disinfected tertiary treatment for waters that have potential for contact with the public.

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 THERMAL PLAN

In 1972, the State Water Resources Control Board adopted the "Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California," more commonly known as the Thermal Plan. The Thermal Plan, which was later amended in 1975, sets limits on the discharge of wastewaters with elevated temperatures into coastal, estuarine and interstate waters in order to meet water quality objectives. A major aim of the Thermal Plan is to protect marine resources in the ocean, enclosed bays and estuaries from the adverse impacts of thermal waste.

Thermal waste is defined as cooling water and industrial process water used to carry waste heat from such large point sources as power plants. Two categories of discharges exist: "existing" which are discharges in place or under construction prior to the plan's 1971 adoption, and "new" which are discharges developed after the plan was adopted. The project would be discharging to Santa Monica Bay using the existing El Segundo Generating Station discharge channel. Under the Thermal Plan, Santa Monica Bay is considered to be coastal waters.

Therefore, the applicable water quality objective in the Thermal Plan is:

- Elevated temperature wastes shall comply with limitations necessary to assure protection of the beneficial uses and areas of special biological significance.
- The Thermal Plan provides the authority for the RWQCB to grant exceptions to the specific water quality objectives in accordance with Section 316(a) of the Clean Water Act. Such exemptions also require the approval of the SWRCB.

### CALIFORNIA OCEAN PLAN

In 1997, the SWRCB (Resolution 97-026) adopted the latest version of the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan). The California Ocean Plan establishes beneficial uses and water quality objectives for the state's ocean waters outside of enclosed bays, estuaries and lagoons. The plan also sets forth effluent limitations, management practices and prohibitions. Every three years the plan is reviewed and, if necessary, updated.

## *LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD (LARWQCB)*

### NPDES PERMIT

Pursuant to Division 7 of the California Water Code, the LARWQCB adopted Order 00-084 at a June 29, 2000 public hearing. This order serves as the operating NPDES (No. CA0001147, CI 4667) permit for the ESGS and expires May 10, 2005. Included in this permit are the facility waste discharge requirements (Order No. 94-129) that were adopted December 5, 1994. The permit was originally issued to SCE, the previous owner of the facility. The current Applicant acquired the ESGS in April 1998. The permit includes the following findings:

- A tiered treatment unit (TTU) permit from the DTSC that allows for treatment of hazardous wastes on-site. The treated metal cleaning wastes and other low volume wastes are stored in the retention basin prior to discharge to the Ocean through Outfall No. 2.
- Stormwater runoff and floor drain wastes, which are passed through oil/water separators and then combined with the cooling water and treated sanitary wastes prior to discharge to the Ocean through Outfall Nos 1 and 2. The Stormwater runoff from upslope of the facility flows into an easement conveyance and then to the beach without commingling with the industrial activity's associated runoff.
- The 1998 California (d) List of impaired water bodies (EPA approved May 1999), identified Santa Monica Bay (Offshore, Nearshore and Dockweiler Beach) as impaired with regards to certain pollutants which include: polychlorinated biphenyls (PCBs); polycyclic aromatic hydrocarbons (PAHs); selected heavy metals including lead, copper, and zinc; and debris.
- The monitoring program in this Order has not been changed from that of the 1994 permit. The Regional Board will complete a comprehensive review of this monitoring program in conjunction with other monitoring efforts including the Los Angeles County Municipal Storm Water permit renewal. This review is scheduled to be completed in 2001/2002.
- Finally, Finding No 30 states "*The requirements contained in the Order, as they are met, will be conformance or in compliance with the goals of the aforementioned water quality control plans and statues."* The Applicant continues to separate the outflow point discharges, when in fact they will be mixed with the other site discharges, the largest of which obviously will be the sea water for the once through cooling system. Staff agrees that the current NPDES permit is valid for all pre and post construction. However, considering the various monitoring requirements that will potentially effect this facility in the near future, the statement from Data Request No. 126 that *"no …..new, amended, or revised NDPES permit will be needed"* (ESPR 2000aa) may not be correct, and is obviously subject to implementation of future LORES which may require changes in the permit conditions.

### SPILLS, LEAKS, INVESTIGATION & CLEANUP

The Spills, Leaks, Investigation & Cleanup (SLIC) Program involves investigation and corrective action at sites not regulated by the Underground Tank Program and the Well Investigation Program. The Regional Board oversees site investigation and cleanup after determining that an unauthorized discharge is polluting or has potential to pollute regional waterbodies. Guidelines for this program are defined in State Board Resolution No. 92-49 entitled *Policies and Procedures For Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304.*

According to the Phase I Environmental Site Assessment dated November 2000, "total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) have been detected in soil and groundwater beneath ESGS. Quarterly groundwater monitoring is conducted by Chevron in accordance with the Los Angeles Regional Water Quality Control Board (LARWQCB) requirements stipulated in Chevron's Cleanup and Abatement Order 88-055" (ESPR 2000a).

### *CALIFORNIA COASTAL ACT OF 1976*

Coastal Resources Planning and Management Policies. Chapter 3. Article 4. Marine Environment. Section 30231. This section requires that the "…biological productivity and the quality of coastal waters, wetlands, estuaries and lakes shall be maintained by minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater…"

### *DEPARTMENT OF TOXIC SUBSTANCES CONTROL*

The Department of Toxic Substances Control (DTSC), under the authority of the Resource Conservation and Recovery Act, must approve remediation at the site before any site closure or clearance. Workplans and reports regarding site remediation must be submitted to DTSC, Southern California Permitting Branch, 1011 North Grandview Avenue, Glendale, California 91201 in addition to other agencies overseeing the project.

According to the Phase I Environmental Site Assessment dated November 2000, "TPH, VOCs, and metals have been detected in groundwater beneath the retention basins. Quarterly groundwater monitoring is conducted by Southern California Edison (SCE) in accordance with DTSC requirements stipulated in SCE's Consent Order for the retention basins" (ESPR 2000a).

## LOCAL

### *LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS*

The Hydrology Manual establishes the LA County Department of Public Works' hydrologic design procedures and standards. The manual serves as a guide that establishes steps involved in converting precipitation to runoff in accordance with Public Works standards. The techniques contained within the manual are applicable to design and evaluation of hydrologic facilities. Since the City of El

Segundo does not contain design procedures and standards that govern stormwater, the Applicant would need to comply with provisions set forth by the LA County Department of Public Works Hydrology Manual.

### *EL SEGUNDO ORDINANCE 1329 (CHAPTER 6.28) – STANDARD URBAN STORMWATER MITIGATION PLAN IMPLEMENTATION*

Ordinance 1329 of the City of El Segundo Stormwater and Urban Runoff Pollution Control serves as a model for the City of El Segundo to use to address stormwater pollution from new development and redevelopment projects. All persons engaging in earthmoving activities are required to demonstrate proof of compliance regarding stormwater discharge requirements mandated by the California Regional Water Quality Control Board, Los Angeles Region.

Chapter 6.28 of the aforementioned ordinance is to ensure that Best Managment Practices (BMPs) are implemented to reduce pollution from stormwater runoff during pre and post construction activities. The purpose of Chapter 6.28 is to enhance and protect the water quality of the Santa Monica Bay and receiving watercourses of the U.S. through the prohibition of non-stormwater discharges into storm sewers and the reduction of pollutant loads in stormwater and urban runoff to the maximum extent practicable.

### *EL SEGUNDO GENERAL PLAN – CONSERVATION ELEMENT*

The General Plan for the City of El Segundo contains a conservation element. The conservation element addresses goals for Beach Preservation, Water Supply, Groundwater Contamination, and Urban Landscape. The objectives and policies for each goal are to preserve water quality and water quantity within the El Segundo City and coastal limits.

### *CALIFORNIA BUILDING CODE CHAPTER 33*

The City of El Segundo enforces the California Building Code Chapter 33 for grading and excavation activities within the City limits. The Applicant would be required to obtain a grading permit from the Department of Building Safety prior to construction activities.

### *CITY OF EL SEGUNDO WORK IN PUBLIC STREET PERMIT*

A permit for the installation of water lines in the public street right-of-ways is required from the Public Works Department via the Engineering Division. The Applicant must submit plans that are designed by a Professional Engineer.

A permit for the actual construction in public streets must be obtained by the contractor from the Department of Public Works via the Engineering Division.

### *CITY OF MANHATTAN BEACH STREET EXCAVATION PERMIT*

A portion of the sanitary sewer line would connect to an existing sewer line within the City of Manhattan Beach. Therefore, the Applicant must obtain a Street Excavation Permit. Permit provisions require the submittal of pipeline plans to the Community Development Department that include pipeline location(s) and flow

estimates. The Applicant must comply with the City of Manhattan Beach Standard Urban Storm Water Mitigation Plan (SUSMP) requirements, which are identical to those of the City of El Segundo.

## SETTING

## REGIONAL

The ESPR Project would be located on the northern portion of the existing ESGS site within the City of El Segundo, Los Angeles County. The surrounding areas to the north, east and south are urbanized and developed. The Santa Monica shoreline and bay, which are part of the Pacific Coast, border the project immediately to the west. The City of Manhattan Beach shoreline lies to the immediate south of the ESPR site. All adjacent properties are zoned for Heavy Industrial Use with the exception of beach and residential properties located in the City of Manhattan Beach.

The Palos Verdes Peninsula and Santa Monica Mountains are located south and north of the project, respectively. The project is located in the western portion of the Los Angeles Structural Basin. This geographic feature is the transition zone between the southern portion of the Transverse Ranges Physiographic Provinces and the northern portion of the Transverse Ranges Physiographic Provinces.

Mild winters and dry summers characterize the Mediterranean climate of the Los Angeles area. The average daily temperatures range from 56°F in January to 73°F in August. The annual rainfall average as measured at the Los Angeles Airport is 12.01 inches, but can be highly variable depending on regional effects such as El Nino. Precipitation events equal to or greater than 1-inch occur at an annual average of 3 days per year. Most of the precipitation occurs between October and April. The summer months are relatively dry with precipitation occurring at less than 0.35 inches (ESPR 2000a).

## LOCAL

### *SURFACE WATER HYDROLOGY*

The project area encompasses approximately 33 acres. Existing stormwater runoff and floor drain wastes drains to a system of catch basins (inlets) via a closed pipe system. The flow is routed to oil/water separators before combining with the cooling water and treated sanitary wastes which discharge to the Santa Monica Bay through Outfall Nos. 001 and 002. The off-site storm water flows are from upslope street drainage only. This system was observed during a 3/28/01 site visit. All offsite drainage is routed via a closed pipe and concrete swale system around the outer perimeter of the tank farm, through a 24” corrugated metal pipe (CMP) at the southwest corner of the site, and eventually onto the adjacent beach without commingling with the ESGS runoff. The existing tank area is currently bermed and any stormwater that collects within the tank farm is pumped to nearby inlets (ESPR 2000a).

Quantities of stormwater runoff to the Unit 1 & 2 Power Block and Tank Farm areas collection facilities (Supplemental Data Request Nos. 136 and 142). Sketch Nos. 098496-051801- 1 and 2 do show these areas. However the entire site is not shown on any of these maps. Staff had several conversations with Brian Frieze, Project Engineer with Black & Veatch, who explained how the two drainage areas are tied together. However with the addition of the current Tank Farm Plan and the new phases, the materials from this data request will need to be updated and the entire site drainage plan shown on a figure. Data Request No. 136, showing the existing and planned site drainage plan will be needed. The location of the existing in-line oil and water separators and a detail of how the existing system is combined with the two outfalls will also be necessary. While no impact assessment can be finalized until this material is completed and furnished to staff, several Conditions of Approval address this issue.

Santa Monica Bay is the only surface water body in the vicinity of the project. It is an open embayment with approximately 266 square miles of surface area. Tides are semi-diurnal with large diurnal inequality, i.e. two tides of unequal amplitude per 24.8 hour period.

Currents in Santa Monica Bay are affected by the California Current, wind and tides. The California Current flows to the south and spawns the California Counter Current, which flows to the north inshore of the Channel Islands. Nearshore currents are strongly influenced by the tides, with a net current typically to the south, due to the predominant winds from the west-northwest. Nearshore current speeds are on the order of 5 to 10 cm/s, with a net speed on the order of 0 to 2 cm/s. The tidal current component is to the north during flood and to the south during ebb.

Beneficial uses of the bay identified by the RWQCB (1994) are:

- water contact recreation
- non-contact water recreation
- industrial service supply
- navigation
- commercial and sport fishing
- marine habitat
- wildlife habitat
- preservation of biological habitat
- preservation of rare and endangered species
- migration of aquatic organisms
- spawning, reproduction and/or early development

Santa Monica Bay Nearshore and Offshore Zones have been designated as impaired and placed on the 303(d) list of the Clean Water Act. Stormwater discharges have been identified as a major source of contaminants to Santa Monica Bay (Bay et al , 1999).

### *GROUNDWATER HYDROLOGY*

The ESPR site is located within the Old Dune Aquifer, Gage Aquifer, and Silverado Aquifer systems that primarily consist of sand and gravel. These shallow aquifers are separated by the presence of aquitards, which primarily consist of clay material. However, the Old Dune Sand and Gage Sand Aquifers are not separated at the ESPR site due to the absence of the Manhattan Beach Aquitard in the project area. The El Segundo Aquitard underlies the Old Dune Sand and Gage Sand Aquifers. Studies conducted in 1998 reveal that the El Segundo Aquitard may not separate the Old Dune Sand and Gage Sand Aquifers but isolates both of them from the Silverado Aquifer (ESPR 2000a).

The depth of the aquifers is considered shallow extending to about 100 feet below ground surface. Groundwater elevations at the ESPR site have been found at approximately 12 feet below ground surface under unconfined conditions. The expected groundwater levels are estimated to occur at about 7 feet below the bottom elevations of proposed structures. An approximate 0.3-foot elevation change on the western side of the site indicates that the water levels are tidally influenced. Measurements taken for direction of groundwater flow for the Old Dune Sand/Gage Sand Aquifers and within the sand layers of the El Segundo Aquitard suggest a northwest and southeast gradients, respectively. No groundwater information has been provided for the tank farm area.

Because of the poor water quality within the aquifers, the groundwater is not used for domestic and certain agricultural purposes. The proposed ESPR site would not use groundwater as part of the project (ESPR 2000a).

### *SOILS*

The existing ESGS site in the area of the proposed Units 5, 6, and 7 occurs at about 20 feet above Mean Lower Low Water (MLLW) level and is relatively flat. The Santa Monica Bay, which is located west of the ESPR site, is at an elevation of about 0.0 MLLW. Vista Del Mar highway borders the eastern portion of the ESGS site and occurs at an approximate elevation of 94.0 MLLW. The steep slope between the power units and Vista Del Mar is at a 1 (horizontal) to 1 (vertical) and is kept stable via 3 retaining walls that extend approximately 6 feet high. The power plant and onsite facilities are located within the Oceano soil mapping association. Its very slow runoff, rapid permeability, and high susceptibility to wind erosion characterize this soil's association. As a result, substantial available water capacity and chemical properties for nutrient retention are low.

The majority of the site has been previously graded and is covered with asphalt with the exception of the steep slope between the power units and Vista Del Mar, which is landscaped with vegetation. Grading for the proposed Units 5, 6, & 7 would be relatively flat, close to existing grade, and sloped to drain towards the site stormwater system. The proposed final elevation would be approximately 20 feet MLLW (ESPR 2000a).

The existing fuel tank storage area, which is proposed for construction laydown/staging/ parking and a new access road, occurs at an elevation of

approximately 39 feet MLLW. The tank area is flat and is surrounded by an asphalt berm (ESPR 2000a).

All proposed construction activities within the offsite pipelines and all parking and staging areas (with the exception of the Kramer and Federal Express sites) are located within the Oceano Association. Over time, this soil has been disturbed as part of the development activities. Because the proposed project would occur in existing developed areas, the Oceano Association does not exhibit its original properties.

The worker parking areas occur on the Ramona-Placentia associations. This association is mapped on slopes ranging from 2 –5 percent. The Ramona-Placentia association, which is moderately well drained, exhibits slow runoff and therefore results in a slight erosion hazard. However, the subsoil exhibits slow permeability that can result in increased runoff and erosion. Because the Ramona-Placentia association consists of fine textured loam material, it exhibits moderate fertility and high shrink – swell properties. Vegetation practices are limited and most uses for this soil are for industrial and residential purposes.

The off site staging areas would be located on the Cropley soil association. This soil association is located on valley floors and alluvial plains. The upper soil horizons are well drained; therefore, runoff is slow and the erosion hazard is slight. The subsoil characteristics consist of clay, which creates slow permeability, increased runoff and erosion. Although this soil association exhibits high natural fertility, the high shrink – swell potential poses limitations for certain vegetation practices (ESPR 2000aa).

### *CONTAMINATED SOILS AND GROUNDWATER*

A Phase I Environmental Site Assessment was conducted on October 25, 2000 to identify "recognized environmental conditions "that may exist on the ESGS site and along the proposed pipelines. In addition, an environmental database review was conducted to identify areas of environmental concern within a 1-mile radius of the ESPR project site while previous subsurface investigation reports were reviewed (ESPR 2000a).

According to the November 2000 Phase I ESA and the AFC, five recognized environmental conditions have been identified and are as follows (ESPR 2000a):

- ESGS Site: The soil and groundwater below ESGS contains total petroleum hydrocarbons (THP) and volatile organic compounds.
- Retention Basins: The groundwater below the retention basins contain TPH, VOCs, and metals.
- Aboveground Storage Tanks (ASTs): The soil and water below the above ground storage tanks contain TPH.
- Transformers: Oil staining was evident in the bedding material below and surrounding the transformers adjacent to Units 1 through 4.
- Hazardous Waste Storage Area: The soil and groundwater near the Hazardous Waste Storage area contains VOCs.

- A Phase II Environmental Site Assessment (ESA) was conducted on October 21, 22, and 23 1996, and January 31, 1997 at the ESGS to evaluate soil and groundwater conditions at areas identified as "recognized environmental conditions" (RECs) or "areas of potential concern" (AOPCs). The objectives of this ESA were to determine if any actions are required to address the hazardous materials occurring at the facility and to obtain details on the nature and amount of contaminants identified (Southern California Edison 1997).
- The following is a list of RECs or AOPCs that were identified during the investigation, how each was addressed, and the conclusions developed for each one (Southern California Edison 1997):
- Chevron USA Inc. Refinery: Petroleum hydrocarbons were identified in the soil and groundwater beneath the ESGS site from a release at the Chevron Refinery. Chevron is remediating the soil and groundwater by vapor extraction and pump and treat methods. No further actions are recommended.
- Gasoline Vapors under Structures: Gasoline vapors near the displacement oil tank were encountered and sampled. Indoor air samples were taken inside the administration building, which indicated that no gasoline vapors were present. No further action was recommended.
- Displacement Oil Tank: Previous surveys identified petroleum hydrocarbon-impacted soil beneath the displacement oil tank. Because the soil was characterized prior to the Phase II ESA, sampling was not conducted and no further action was recommended. Further sampling and/or remediation may be necessary as part of facility decommissioning.
- Aboveground Storage Tanks (ASTs): Petroleum hydrocarbon-impacted soil was encountered beneath the south fuel oil storage tank during prior investigations. The California Regional Water Quality Control Board approved the plan of leaving the soil in place until the tank is decommissioned or removed from the site. No further action was recommended, however, further sampling and/or remediation may be necessary as part of facility decommissioning.
- Prior sampling resulted in de minimis detection of petroleum hydrocarbon-impacted soil around the perimeter of the north fuel oil storage tank. However, restricted access limited the investigation. No further action was recommended, however, further sampling and/or remediation may be necessary as part of facility decommissioning.
- Prior sampling resulted in de minimis conditions surrounding the perimeter of the lube-oil tanks. No further action was recommended, however, further sampling and/or remediation may be necessary as part of facility decommissioning.
- Transformers: Sampling results indicated that the transformers east of the powerblocks contain oil that contains less than 50 parts per million (ppm) polychlorinated biphenyls (PCBs), thus indicating only de minimis conditions. No further action is recommended.
- Powerblocks: Sampling results indicated de minimis conditions occurring within the soils around the powerblocks. No sampling was conducted beneath the powerblock because of restricted access. No further action was recommended, however, further sampling and/or remediation may be necessary as part of facility decommissioning.
- Pipelines: Soil sampling around the underground pipelines indicated de minimis conditions. No further action was recommended.

- Oil/Water Separators: Soil sampling around the three oil/water separators indicated de minimis conditions. No further action was recommended.
- Retention Basins: According to the Phase II ESA, "Edison is in the process of implementing a Groundwater Quality Monitoring Program in the vicinity of the retention basin and boiler chemical cleaning basin. Quarterly monitoring reports will be submitted to the Department of Toxic Substances Control (DTSC)" (Southern California Edison 1997). No further assessment was conducted.
- Switchyard Perimeter: Soil sampling resulted in de minimis conditions around the perimeter of the switchyard. Restricted access limited the investigation. No further action was recommended, however, further sampling and/or remediation may be necessary as part of facility decommissioning.
- Drains and Sumps: Results indicated de minimis conditions at each drain and sump, with the exception of the demineralizer sump. An independent investigation is testing conditions surrounding the demineralizer sump. No further action was recommended.
- Underground Storage Tanks (USTs): Soil sampling from the former location of the previously removed USTs indicated de minimis conditions. No further action was recommended.
- Acid Tank and Caustic Tank: Soil sampling adjacent to the acid tank and caustic tank indicated de minimis conditions. No further action was recommended.
- Hazardous Materials Storage Area: Soil sampling adjacent to the hazardous materials storage area indicated de minimis conditions. No further action was recommended.
- Hazardous Waste Storage Area: Soil sampling adjacent to the hazardous waste storage area indicated de minimis conditions. No further action was recommended.
- These existing site conditions will be addressed in the Impacts discussion, Contaminated Soil and Groundwater below. Please refer to the Waste Management section for a full discussion of these potential impacts.

## EXISTING POWER PLANT

The ESPR project would be located on the northern portion of the existing ESGS site within the City of El Segundo, Los Angeles County. The site is approximately 33 acres in size. The ESGS is a nominally rated 350 MW facility currently comprised of four (Units 1 – 4) gas-fired conventional, electric power generating units. The technology used at the existing plant produces high-pressure steam in a boiler fueled by natural gas that directs that steam to a steam turbine generator that produces electricity (ESPR 2000a).

Units 1 and 2 are the existing power blocks that are proposed for demolition and replacement. The total disturbance for the power block would be approximately 5.5 acres. Units 3 and 4, located adjacent to Units 1 and 2, would continue to operate using their existing facilities. The Applicant is proposing to replace Units 1 and 2 with state-of-the-art combined cycle units (Units 5, 6 and 7) that would increase the new station net power output approximately 280 MW (ESPR 2000a).

A Southern California Edison (SCE) tank farm occupies approximately 9.0 acres of the southern end of the ESGS site. The tank farm is flat and surrounded by an

asphalt berm. ESP II, the project proponent, has purchased this parcel from SCE. The farm consists of two large tanks that are used to store fuel oil and one smaller displacement tank (ESPR 2000a). A four phase Tank Farm Plan, involving the two larger tanks, has been proposed by ESP II to accommodate the ESPR project as a laydown/staging area during construction. The two larger tanks are currently empty. The smaller displacement tank will remain in place and functioning (ESPR 2000aa).

## EXISTING WATER NEEDS

ESGS currently utilizes sea water, potable water, and reclaimed water for its plant processes. A discussion of these water uses and amounts used within the plant follow.

### *POTABLE WATER, RECLAIMED WATER, AND SEA WATER*

The ESGS is supplied with potable water from the City of El Segundo, which receives its water from the Metropolitan Water District of Southern California. The AFC accounted for approximately 0.18 mgd of potable water usage at the ESGS during 1999 (ESPR 2000a).

Tertiary treated reclaimed water is supplied to the ESGS by the West Basin Municipal Water District, which receives its water from the Hyperion Treatment Plant. Reclaimed water is primarily used at ESGS for landscape irrigation and to supplement "seal water." Seal water acts as a lubricant and coolant for the cooling water circulation equipment. The seal water is discharged through the ocean outfall. The AFC accounts for approximately 0.08 mgd of reclaimed water usage at the ESGS during 1999 (ESPR 2000a).

Cooling water for the ESGS is supplied by the Santa Monica Bay through two separate ocean water intakes. The maximum volume of cooling water currently used at the existing facility is 206 mgd. Once the water travels through the intake structures and is passed through screens for debris removal, it is directed to four vertical wet pit type circulating water pumps. For plant equipment cooling purposes, these pumps supply water to the main condensers and auxiliary heat exchangers. The circulating water pumps located in the two existing generators pump the cooling water to the condensers. The temperature of the water is raised 23.7 °F at maximum load as it passes through the condenser tubes at 7.0 feet per second (fps). The flows from the two condensers then join and are discharged to the ocean at 5.1 fps (ESPR 2000a).

## EXISTING COOLING SYSTEM

### *COOLING WATER WITHDRAWAL*

The existing ocean water intakes, discussed above, withdraw cooling water from Santa Monica Bay from about 2,600 ft offshore through two submerged intakes for Units 1 & 2 and Units 3 & 4. The intakes are open ended vertical conduits which were retrofitted with velocity caps to reduce fish entrainment. The intake structure characteristics and flows are summarized in Soil & Water Resources Table 1 below.

The cooling water withdrawal can affect the biological community of Santa Monica Bay through impingement and death of fish on the traveling screens and entrainment of fish eggs and larvae into the cooling system. These items are covered in the Biological Resources section of this Staff Assessment.

**SOIL & WATER RESOURCES TABLE 1**
**El Segundo Generating Station Cooling System Characteristics**

| | **Units 1 & 2** | **Units 3 & 4** | **Units 5, 6 & 7** (1) |
|---|---|---|---|
| Capacity (MW) | 350 | 670 | 647 |
| Cooling water flowrate (mgd) | 207 | 398 | 207 |
| Waste heat loading (BTU/day) | $46.49 \times 10^9$ | $73.33 \times 10^9$ | $33.3 \times 10^9$ |
| Discharge temperature rise ($^oF$) | 27 | 22 | 19.3 |
| | | | |
| **Intake** | | | |
| Distance offshore (ft) | 2,590 | 2,595 | 2,590 |
| Dimension (ft) | 14.6 x 17.3 x 2 (H) | 16 x 21 x 2 (H) | 14.6 x 17.3 x 2 (H) |
| Intake velocity (ft/s)(2) | 0.64 | 0.92 | 0.64 |
| Height above bottom (ft) | 10 | ~10 | 10 |
| | | | |
| **Discharge** | | | |
| Distance offshore (ft) | 1,990 | 2,090 | 1,990 |
| Water depth at MLLW (ft) (3) | 29 | 31 | 29 |
| Height above bottom (ft) | 8.2 | ~10 | 8.2 |
| Dimensions (ft) | $\phi$ 14 | 23 x 18 | $\phi$ 14 |
| Discharge velocity (ft/s) | 2.1 | 1.5 | 2.1 |

(1) Proposed in El Segundo Redevelopment Project $\phi$ -Inside Diameter
(2) Horizontal velocity at edge of intake
(3) Mean Lower Low Water

## *COOLING WATER DISCHARGE*

Currently, the El Segundo Generating Station discharges cooling water to Santa Monica Bay through two single port, submerged outfalls, for Units 1 & 2 and 3 & 4 respectively. The outfalls discharge the cooling water vertically upward at about one third of the water depth from the bottom. The characteristics of these outfalls are summarized in Soil and Water Resources Table 1.

A characterization of the thermal plume was conducted in 1972-73 and summarized in a report entitled Thermal Effect Study (Benson et al and ESPR 2000a). The plume characterization was based on vertical temperature profiles at a grid of fixed locations, and temperature measurements at a vertical array of sensors towed by a small boat. Limitations of this characterization include the fact that plant loads for the times of the surveys are not mentioned, and measured temperatures at a point 1,500 ft from the discharge were assumed to represent natural ambient conditions. General experience with thermal plumes, simple heat balance calculations, and the modeling described below indicate that a distance greater than 1,500 ft is needed to reach ambient temperatures. This assumption had the effect of raising the ambient temperature and decreasing reported temperature rises.

The AFC and the Thermal Effects Study state that "*considerable cold water is entrained by the rising water is evident from the diameter of the surface manifestations and from their temperatures, which may be only 5$^{o}$F above natural"* (ESPR 2000a and Benson et al). However, temperature measurements in the boil itself are not presented, and the reported temperature rises are distorted by the ambient temperature assumption. Realistically, dilution in the mixing zone can be expected to be relatively small because of the small distance between the discharge and the water surface. This distance is less than the length of the *zone of flow establishment* of the discharge jet (about 6.3 times the discharge diameter) indicating that the temperature at the center of the jet would be essentially equal to the discharge temperature. Some entrainment occurs at the periphery of the jet, but that entrainment is limited because of the short travel distance, and the fact that near the surface the fluid surrounding the jet is the thermal plume itself. A short distance away from the surface impingement zone, a circular internal hydraulic jump develops, where additional entrainment takes place (Lee and Jirka 1981and Wright et al 1990). Estimates of overall dilution in the vertical jet and the internal hydraulic jump can be made from graphs developed from experimental data and theoretical analyses (Wright et al 1990). These lead to an average dilution factor of about 1.9 for both Units 1 & 2 and 3 & 4.

Beyond the zone of initial dilution, in an area called the farfield, the AFC and the Thermal Effect Study provides information on the 4$^{o}$F and 1$^{o}$F isotherms. Because of the assumption of ambient temperatures at 1,500 ft from the discharge, these results are underestimates. Therefore, to provide information which could be used to evaluate the thermal plume impacts, Energy Commission staff developed a two-dimensional model of the thermal plume (CEC Memorandum - May 8, 2001, Thermal Discharge Analysis). The model was principally applied to the proposed conditions and it is described in the environmental impact section below. The 1972/73 thermal plume assessment established that the thickness of the thermal plume in the farfield was on the order of 5 to 10 ft. This observation is independent of the ambient temperature assumption and therefore valid.

## EXISTING WASTEWATER DISCHARGES

Approximately 607 mgd of wastes consisting of once-through cooling water, treated chemical metal cleaning wastes, storm water, non-chemical metal cleaning wastes, low volume inplant wastes and treated sanitary wastes are discharged from the

ESGS into Santa Monica Bay. The treated metal cleaning wastes and other low volume wastes are stored in a retention basin prior to discharge to the bay.

Units 1 and 2 discharge wastewater through Outfall No. 001 and Units 3 and 4 discharge through Outfall No. 002. Outfall No. 001 is located approximately 1,989 feet offshore and Outfall No. 002 is located approximately 2,091 feet offshore. All wastewater disposed to the Santa Monica Bay is approved under an existing NPDES permit (ESPR 2000a).

## ENVIRONMENTAL IMPACTS

## STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

The staff relied on compliance with applicable laws, ordinances, regulations, and standards (LORS) to determine whether the construction and operation of the ESPR project would cause a significant impact. The following is a list of the general criteria used for determining impact significance resulting from the construction and operation of the ESPR project and the primary LORS that regulate each parameter. Impacts were also assessed by the comparison of the existing facility's water resource and supply needs and functions as compared to the proposed project's water resources and requirements.

- Erosion and Sedimentation - *California Water Code, Sections 13260 -13269*. The Waste Discharge Requirement regarding the protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls.
- Contaminated Soils and Groundwater - *State Water Resources Control Board Resolution 74-43*. This resolution contains a number of prohibitions against waste discharges including chemical, biological and petroleum related waste. *The General Plan for the City of El Segundo*. The General Plan requires the preservation of water quality and quantity by outlining conservation policies for Beach Preservation, Water Supply, Groundwater Contamination, and Urban Landscape.
- Stormwater Runoff - *NPDES Permit*. Stormwater discharges during construction are addressed through compliance with the General Construction Activities NPDES permit. *LA County Department of Public Works Hydrology Manual*. The manual establishes the LA County Department of Public Works' hydrologic design procedures.
- Water Quality - *California Ocean Plan, California Water Code Section 13170.2.* This provision requires the State Board to formulate and adopt a water quality control plan for the waters of California. This includes evaluation of the effect of municipal and industrial waste.
- The specific requirements for the operation and construction of the ESPR project are discussed in the Compliance with LORS section.

## EROSION AND SEDIMENTATION

Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction of the ESPR. Activities that expose and disturb the

soil leave soil particles vulnerable to detachment by wind and water. The Los Angeles metropolitan area, being a semi-arid environment, may encounter rainstorms of short duration and high intensity. Runoff from these storm events coupled with earth disturbance activities can potentially accelerate onsite erosion eventually resulting in increased sediment load within nearby receiving waters.

Site excavation work would consist of the removal, storage, and/or disposal of earth, sand, gravel, vegetation, organic matter, loose rock, boulders, and debris to the lines and grades necessary for construction. Embankments would be graded no steeper than 2:1 and would be reinforced to meet geotechnical requirements (refer to Geologic Resources within this Staff Assessment). The Applicant has not indicated surficial slope stabilization procedures, and would need to comply with Local LORS regarding grading and excavation. Refer to Staff Proposed Mitigation below for further discussion of erosion control measures.

The Applicant has identified the tank farm area as the onsite stockpile location. Excess non-hazardous material not capable of being stored onsite would be hauled to an approved offsite Class III landfill (ESPR 2000a). Refer to the subsection below for details regarding the four phase Tank Farm Plan.

Backfilling activities would involve the removal of unsuitable material and rocks, followed by proper compaction techniques. Embankments, dikes, bedding for buried piping, and backfill surrounding structures would be compacted to a minimum of 90 percent of the maximum dry density. General backfill placed in remote or unsurfaced areas would be compacted to a minimum of 85 percent dry density. Road subgrades, sub bases and base courses would be prepared and compacted in accordance with California Department of Transportation (CalTrans) standards (ESPR 2000a).

During construction, approximately 43 acres of land associated with the ESPR project would be disturbed. The project would not impact the beach and therefore, would not effect beach erosion. To minimize erosion and potential sedimentation from construction activities, a Storm Water Pollution Prevention Plan would be implemented. Standard erosion runoff and sedimentation techniques, in accordance with the California NPDES General Permit for Storm Water Discharge Associated with Construction Activity, would be developed and implemented for construction, post-construction, and operational phases (ESPR 2000a). The project would also be required to comply with the California Water Code, Sections 13260 - 13269, which would provide adequate mitigation for potential impacts.

## SITE DRAINAGE

The proposed storm drain facilities cannot be assessed for potential impacts until Data Requests discussed both in previous sections and in Conditions for Certification are furnished. From a preliminary review of the potential for site flooding from storm and wave action, it appears that the proposed perimeter wall design will be adequate to reduce and impacts from a large storm. Please see the Geology section for a complete discussion and Conditions of Certification for this mitigation.

## CONTAMINATED SOILS AND GROUNDWATER

According to the AFC, dewatering would be conducted during demolition of the existing Unit 1 and 2 foundations and during construction of the new project because the high groundwater conditions found on this site have potential for contamination. To comply with the applicable regulatory requirements set forth by the Los Angeles Regional Water Quality Control Board (LARWQCB) for the treatment and disposal of the dewatering wastes, a Waste Management Plan has been developed for removal of the hydrocarbon plume occurring in the vicinity of the ESGS from operations from the adjacent Chevron refinery (ESPR 2000a).

Please refer to the Waste Management section of this Staff Assessment for further discussion related to contaminated soils.

## PROJECT SPECIFIC IMPACTS

### *POWER BLOCK*

The site for the proposed Units 5, 6, and 7 is currently developed and generally flat. No significant grade changes are anticipated for the final grading of this site. Upon demolition of Units 1 and 2, excavation depths would range from approximately 5 to 20 feet. Structural fill to be used as foundation support would be compacted and graded. The newly graded area would result in a surface that is smooth, compacted, free from irregular surface changes, and sloped to drain towards stormwater facilities. The total disturbance for the power block would be approximately 5.5 acres (ESPR 2000a). The Applicant has indicated approximate excavation and fill amounts would be 43,000 and 33,000 cubic yards (cy), respectively (ESPR 2000aa).

Significant impacts resulting from the proposed construction and operation of the power block would be mitigated to less than significant by adherence to both the construction Storm Water Pollution Prevention Plan and the Remedial Investigation Plan for handling of contaminated soils and groundwater.

### *TANK FARM LAYDOWN & STORAGE AREA*

The tank farm would be utilized as a laydown/staging area. The expected acreage to be disturbed for the laydown/storage area is approximately 7 acres. According to Figure 3.5-1B (ESPR 2000r), earthmoving activities would occur within the existing Southern California Edison tank farm area and along its western slope.

Energy Commission staff noted conflicting information between Supplemental Data Response No. 146 and the (SWPPP) (ESPR 2000aa and ESPR 2000ab) regarding the tank farm area. Supplemental Data Response No. 146 referred to a four-phased tank farm plan that identifies the storage of material in the tanks until their removal at a latter phase. The SWPPP provides a two-phased power plant construction activity schedule. Phase I of construction activity schedule identifies the removal of the two large fuel tanks (each 219 ft in diameter and 48 ft high) and related excavation prior to the excavation of the power block areas.

On June 4, 2001, Energy Commission staff conducted a phone conversation with John McKinsey, Counsel - Livingston & Mattesich, for clarification regarding the correct information for the tank farm area. According to Mr. McKinsey, the tank farm plan information provided in Supplemental Data Response No. 146 referred to Attachment 25 (Tank Farm Plan) Docketed on May 4, 2001 (ESPR 2000x). Mr. McKinsey stated that the proposed Tank Farm Plan was developed to avoid impacts to the El Porto community of the City of Manhattan Beach. Mr. McKinsey informed staff that if the Committee finds the Tank Farm Plan proposal to be acceptable, the Applicant would utilize this plan (Personal Communication, John McKinsey, June 4, 2001). Therefore, staff would evaluate soil and water related impacts based on the Tank Farm Plan and request that the SWPPP be amended to include this plan. Refer to the Conditions of Certification section of this Staff Assessment for further discussion on clarification of the tank farm area.

Phase I of the Tank Farm Plan would involve tank preparation and the installation of an access ramp. The west and north berms would be removed, and an access ramp would be constructed on the west face of the berm. Other than a general location depiction, the Applicant has not provided grading and infrastructure information for the Phase I access road.

Phase II would involve the use of the tanks to store excavated concrete and soil from the Units 1 and 2 area. Additional material would be stored around the north tank. All stored material would be covered when not in use.

Phase III would involve the removal of the stored concrete and soil material to be used as fill for proposed Units 5, 6, and 7. When the soil stock piles are removed, the north tank would be removed and its site used for construction laydown and storage. The south tank would provide a dome and shield for construction operations.

Phase IV identifies the removal of the remaining south tank subsequent to construction of Units 5, 6, and 7. Contaminated soil would be removed from the tank farm area and sent to an approved offsite disposal location. The Applicant has indicated that imported soil would fill the tank farm area to match the existing elevation. This phase also identifies another change in the access road that would be located as a spur that extends from the existing tank farm access road to the southwest portion of the tank farm area.

Other than a general location depiction, the Applicant has not provided grading and infrastructure information for the Phase IV access road. As part of Phase IV, the Applicant has indicated a proposed public access area, which would be located between the west berm of the tank farm and the existing bike path. Grading and landscaping activities would be required for the public access area. The Applicant has not provided grading information for this activity (ESPR 2000aa). These details are requested from the Applicant under Conditions for Certification.

### *ANCILLARY FACILITIES*

Earth disturbance for the installation of tanks and a gas compressor would be 0.5 acres and 0.15 acres, respectively. An administration building would be constructed between the tank farm and existing retention basin. The building would be constructed on an existing level elevation of 25 feet; however, a portion of the building would extend into an existing slope. This will also be part of the Phase IV Tank Farm Plan.

The mapping on Figure 3.5-1B (ESPR 2000a) depicts a proposed access road to be cut and filled along the tank farm's western slope. The road would be pitched at 1% in an easterly direction so as to direct runoff into a proposed roadside ditch. The overall slope of the roadway would be 2.8%. Side slopes above and below the roadway would consist of a 2 horizontal to 1 vertical arrangement. Both cut and fill slopes are designed to drain into concrete lined v-shaped ditches. The Applicant has indicated approximate excavation of contaminated material would be 10,000 cy. Non-contaminated excavation of the west berm would be approximately 6,000 cy. The fill required for this area would be approximately 18,000 cy. The fill would consist of excess material from the power block, reclaimed/potable water lines areas, and the west berm areas (ESPR 2000aa).

The Applicant has not provided detailed grading and excavation information for these activities (ESPR 2000a). These details are requested from the Applicant under Conditions for Certification.

### *LINEAR FACILITIES*

Temporary and permanent disturbances related to construction of linear facilities (pipelines) are expected to occur within the existing ESGS site as well as offsite (City of El Segundo and City of Manhattan Beach). Proposed offsite pipelines would be located in developed areas, including corridors that are typical of urbanized settings. Offsite pipelines would consist of reclaimed water, potable water, sanitary sewage, and aqueous ammonia lines. Storm water pipelines would be constructed on site and would require reconnections at the site boundary (ESPR 2000a).

Pipeline construction would entail the removal of any vegetated or paved areas within the pipeline right-of-ways. Total earth disturbance during the installation of the pipelines would be approximately 13 acres. Linear and width disturbance activities would be 1.88 miles X 45-feet, respectively. Pipeline construction would consist of trenching, pipe installation/interconnection, backfilling, and permanent surface reclamation (paving or sod materials) (ESPR 2000a).

The following subsections discuss any potential impacts associated with the construction activity of each pipeline.

### NATURAL GAS PIPELINE

Proposed Units 5, 6, and 7 would utilize the existing onsite natural gas pipeline; therefore, no new pipelines or new impacts would be required for natural gas transmission (ESPR 2000a).

### ELECTRIC TRANSMISSION LINE

The primary onsite linear interconnections for electric transmission would be via three proposed transformers that would hook-up to the existing 230 kV switchyard. Earthwork would be required for the installation of tubular steel pole structures and associated foundations. These overhead line structures would be located within the existing onsite transmission corridors (ESPR 2000a). The Applicant has not identified the extent of earthmoving and any Best Management Practices (BMPs) to be used for this activity in order to avoid impacts. According to information provided by the California Independent System Operator (Cal ISO) in a transmission system impacts study report, it appears that no earthmoving would be needed for offsite transmission connections (CAISO, 2000a). No significant impacts are expected from this activity.

### WATER PIPELINES

The West Basin Municipal Water District would provide reclaimed water. ESPR would install a 10-inch high density polyethylene (HDPE) pipe that would extend approximately 1.55 miles from the site to the tie-in point. According to the AFC, the reclaimed water pipeline route would extend from a tie-in point near Richmond Street and El Segundo Boulevard, continue west along El Segundo Boulevard, through Grand Avenue and Vista Del Mar, and finally under a Vista Del Mar overpass to the ESGS site. Total reclaimed water pipeline disturbance would be approximately 8.48 acres(ESPR 2000a).

The proposed potable water supply pipeline would consist of a 14-inch HDPE pipe that would extend approximately 1.75 miles to its tie-in point at the Eucalyptus Drive and El Segundo intersection; 1.55 miles of the 1.75 miles would be installed in the same trench as the reclaimed water line. Therefore, since the potable pipeline would share the same trench as the reclaimed water line, total additional disturbance created by the installation of the potable water pipeline would be approximately 0.20 acres (ESPR 2000a). Trench excavation and fill for the potable and reclaim water lines would be approximately 5,500 cy and 5,000 cy, respectively. The filling operation requires select fill material; therefore, 1,500 cy of imported fill would constitute a portion of the total fill material (ESPR 2000aa).

The City of El Segundo requested that the Applicant assess alternative locations for reclaimed and potable waterline routes to avoid excavation impacts to historical and biological resources around the streets of Richmond and El Segundo, respectively. See the Alternatives Analysis section below for further details on alternative waterline routes.

The AFC lists hazardous waste disposal areas in the vicinity of the ESGS that can accommodate the potential for waste soil. The waste soil is not expected to significantly impact landfill capacity or induce significant impacts (ESPR 2000a).

#### SANITARY SEWER PIPELINE

The sanitary sewer line would tie-in with an existing pipeline located in the City of Manhattan Beach. The 3-inch PVC pipeline would be routed through a proposed onsite lift station to through the south portion of the ESGS property and ultimately an additional 150 feet to the tie-in point at the intersection of The Strand and 45th Street. The approximate disturbance associated with the installation of the sanitary sewer line would be 0.15 acres (ESPR 2000a). The sanitary line should be sized for workers and visitors. Total excavation and fill amounts would be approximately 50 cy and 45 cy, respectively. Approximately 10 cy of imported fill would constitute a portion of the total fill material (ESPR 2000aa). No significant impacts are expected from this activity.

#### AQUEOUS AMMONIA PIPELINE

The aqueous ammonia line is proposed to tie-in with an existing facility at the Chevron Refinery. The proposed 3 inch carbon steel pipeline would be constructed above ground (ESPR 2000a). The Applicant has indicated that the aqueous ammonia line would be placed on existing pipe racks; therefore, earthmoving activities would not be required for this pipeline (ESPR 2000aa).

Please refer to the Hazardous Materials section of this Staff Assessment for details regarding BMPs to prevent accidental spills.

### *OFFSITE LAYDOWN, PARKING, AND STORAGE AREAS*

Temporary earthmoving affiliated with offsite laydown, parking, and storage areas would be approximately 18 acres (ESPR 2000a). The earthmoving required for the Kramer and Fed Ex areas would consist of preparation and potential surface excavation (ESPR 2000aa). Maps detailing the proposed locations for laydown, parking, and storage areas are depicted as Figure 3.2-1 in the AFC. A description of the Best Management Practices (BMPs) implemented to prevent erosion and sedimentation impacts is discussed in the Mitigation section below.

### *PROPOSED WATER SUPPLY NEEDS*

#### POTABLE WATER

Potable water from the City of El Segundo (Metropolitan Water District of Southern California) would be supplied to the ESGS for the makeup water for the evaporative coolers, HRSG blowdown quench water, and miscellaneous plant uses. According to the AFC, potable usage for the new Units 5, 6, and 7 of the proposed project is estimated at 0.09 mgd (ESPR 2000a).

It was proposed in the AFC that each of the combustion turbine generators (CTG) would be equipped with an evaporative cooling system. The coolers would function to reduce the inlet air temperatures when the ambient air exceeds 50° F. This

system is intended to reduce the impact of ambient temperature on electrical output during the warmer seasons when the consumer's electrical usage peaks (ESPR 2000a).

HRSG would function to transfer heat produced from the exhaust gas of the CTG to the feedwater in the HRSG, which would produce steam for the steam turbine (ESPR 2000a). HRSG blowdown quench water would be supplied to the system for cooling purposes and to reduce emissions.

Staff and the applicant believe further evaluation is necessary to determine if reclaimed water can be substituted for potable water for additional plant processes to remain in compliance with the California Water Code. This alternative water supply study is discussed in the Alternatives section below.

### RECLAIMED WATER

The tertiary treated water from West Basin Municipal Water District, described in the Existing Water Needs section above, would continue to supply the site with irrigation and seal water.

The Data Responses dated May 30, 2001 (ESPR 2000aa) state that West Basin Municipal Water District would provide single-pass RO product water to the ESPR site via a new pipeline (see Water Pipelines above). The reclaimed water would be directed to the steam cycle and to the combustion turbines for steam injection. The AFC estimated that approximately 0.064 mgd of reclaimed water would be needed for operation of proposed Units 5, 6, and 7(ESPR 2000a).

The steam cycle chemical feed system would further treat the water by automatically feeding an oxygen scavenger chemical and a neutralizing amine to the feedwater to control corrosion and scale formation. Sodium phosphate would be manually fed to the HRSG steam drum to control pH and scale formation (ESPR 2000a).

Steam cycle wastewater would be discharged through Discharge No. 001. Wastewater from the HRSG blowdown tank would be routed to the existing retention basin. Wastewater collected from the auxiliary cooling system would be discharged through Discharge No. 001. Reclaimed water used for the combustion turbine steam injection would exit the system via evaporation (ESPR 2000a).

The Applicant has proposed to maximize the use of reclaimed water. This would have a positive impact by diminishing the potable water demand at the ESPR. Nonetheless, the CEC Staff believes it may be feasible to use the tertiary treated reclaimed water for all of the plant processes, including plant and equipment drains, makeup to the evaporative cooler, and quench water. Refer to the Alternatives Analysis and Conditions of Certification sections below for further discussion regarding alternative water supply to ESPR.

### SEA WATER

The cooling water is extracted from the Santa Monica Bay from the existing intake structures for the new combined cycle facility's once-through component cooling water system heat exchangers and once-through condenser. Chlorine as sodium hypochlorite may be fed, for a maximum of two hours per unit per day, to the condenser tubes to control biological growth (ESPR 2000a). The Applicant should confirm that this addition would not exceed the 0.4 mg/L NPDES maximum. Refer to Conditions for Certification below for details concerning compliance with the NPDES permit.

To minimize chemical usage for biological control, the plant would "heat treat" the seawater approximately every six weeks. Heat treatment is conducted by reversing the flow through the intake and outfall pipes to remove the marine organisms encrusting the system. The AFC estimates that 206 mgd of sea water is needed for the proposed project (ESPR 2000a). Because this demand is equal to that of the existing Units 1 and 2, no significant impact is expected from the continued use of sea water.

## *PROPOSED COOLING SYSTEM*

### COOLING WATER WITHDRAWAL

The proposed power redevelopment project would replace the existing Units 1 & 2 by combined cycle units made of two gas turbines (Units 5 and 7) followed by a conventional steam turbine (Unit 6). The new combined cycle units would utilize the same cooling water intake and discharge as the current Units 1 & 2, with the same flowrate but a reduced temperature rise (see Soil and Water Resources Table 1). Refer to the Biological Resources section of this Staff Assessment for entrainment and impingement issues.

### COOLING WATER DISCHARGE

The proposed redevelopment project involves the replacement of Units 1 & 2 by combined cycle units, Units 5,6 &7, which would utilize the same outfall as Units 1 & 2. The flow rate would remain the same, but the temperature rise at peak load would decrease from 27$^{o}$F to 19.3$^{o}$F. Thus, the thermal load, at peak power production would decrease by 28%. However, because the existing Units 1 & 2 often operate below peak capacity, and the new units would likely provide base load, the actual thermal loading to Santa Monica Bay may actually increase over currently existing conditions. Characteristics of the thermal discharge are summarized in Soil and Water Resources Table 1.

A Mixing Zone Analysis was conducted by ESPR for this application using the UM model of the U.S. EPA PLUMES package to calculate dilution at the surface (ESPR 2000a). The modeling indicates a centerline dilution at the surface of 1.0, i.e. no dilution, and an average dilution of up to 1.7. The reason for these small dilution values is that the discharge depth below the water surface is small. However, the modeling did not account for the fact that, as it nears the surface, the jet is surrounded by the thermal plume and considerable re-entrainment occurs.

Therefore, the calculated dilutions at the surface are overestimates. On the other hand, the modeling did not take into account the mixing which occurs just outside of the surface impingement zone, in a horizontal internal hydraulic jump (Lee and Jirka 1981and Wright et al 1990). Therefore, the Applicant's mixing zone analysis is inaccurate.

Estimates of mixing zone dilutions were developed by staff for the existing plant based on experimental data and theoretical analyses of vertical round jets in shallow water (Wright et al 1990). The discharge from the proposed project would have the same flowrate as the existing Units 1 & 2 with a lower temperature rise. This decreases the buoyancy of the discharge jet. However, because the plume in the mixing zone is primarily controlled by momentum, rather than buoyancy, these dilution estimates remain valid. Thus, average plume dilution at the edge of the mixing zone would be on the order of 1.9. The corresponding temperature rise, at peak power capacity, is $10^{o}$F. The temperatures rise at the center of the boil itself can be expected to be essentially equal to the discharge temperature rise, i.e. $19.3^{o}$F. This is confirmed by measurements conducted on August 10, 1971 (Eliason and Foote, 1972), which substantially support the results obtained by staff.

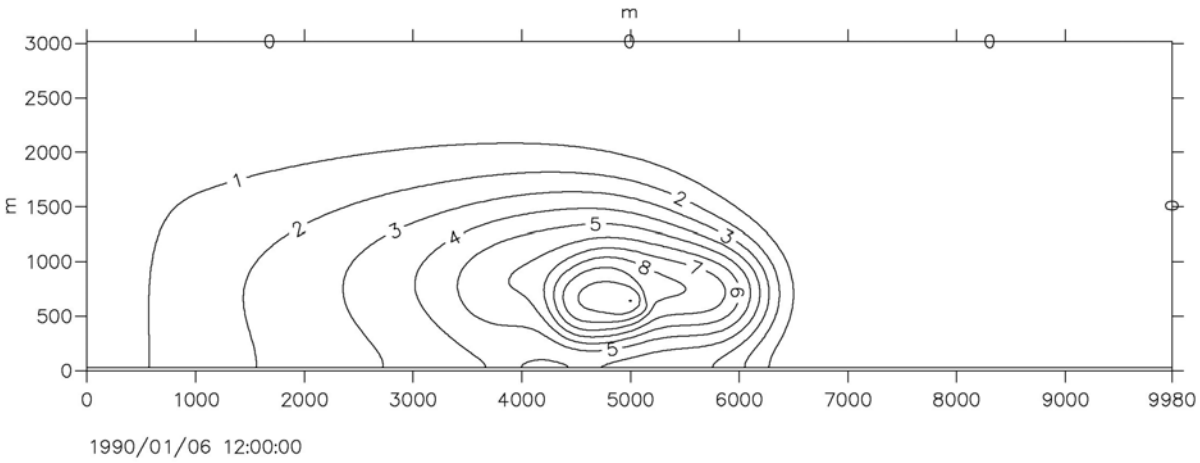
Those measurements give a maximum surface temperature rise of 21°F, which is equal to the discharge temperature rise, and indicates no dilution at the center of the boil. Moving away from the center of the boil, the temperature rise decreases rapidly, within the zone of initial dilution, then more slowly, as temperature reductions are due to surface heat transfer. The temperature rise at the edge of the zone of initial dilution is about 11°F, indicating a nearfield dilution of about 1.9, consistent with the above calculations. The word "about" is used, because the edge of the zone of initial dilution is a transition zone rather than a clear point. These measurements clearly contradict the Applicant's claim that the initial dilution is on the order of 10 (ESPR 2000aa).

Beyond the mixing zone, the thermal plume spreads radially with little additional dilution and a relatively uniform thickness. The thermal plume is then carried by currents, and the waste heat is transferred to the atmosphere, resulting in a gradual reduction of temperature rises. To provide estimates of the thermal plume characteristics for environmental impact evaluation, for the proposed plant alone and together with the Scattergood thermal discharge, a two-dimensional modeling analysis was conducted by CEC staff using the MIKE 21 software package (DHI 1995).

The MIKE 21 model solves the complete, two-dimensional, transient flow and transport equations using a sophisticated finite differences algorithm with a rectangular grid. For this application, a grid extending 33,000 ft along shore and 10,000 ft offshore was developed with a 65 ft square grid spacing. A uniform depth was specified, equal to the thickness of the thermal plume. Depths of 5 ft and 10 ft were used and found to have minimal impacts on the predicted temperatures. Along shore currents were specified with a net southerly current of 0.03 ft/s and a tidal component of 0.15 ft/s. These currents are representative of conditions in the area.

The discharge from El Segundo Generating Station was simulated as inflows spreading radially from the two intakes, with a dilution factor of 2, i.e. the flows and temperature rises were those listed in Table 2 respectively multiplied and divided by 2. A surface heat transfer coefficient of 220 BTU/ft$^2$/$^o$F/day was used, corresponding to summer conditions. During winter a smaller heat transfer coefficient can be expected. Calculated temperature rises for the proposed El Segundo Generating Station (Units 3 & 4 and 5, 6 & 7) at full capacity are shown in Soil and Water Resources Figure 1. These temperature rises correspond to quasi-steady state conditions, i.e. the contours vary during the tide cycle, moving up and down shore, without significant changes in shape or size.

**SOIL & WATER RESOURCES FIGURE 1**
**Predicted Temperature Rises for El Segundo Plant at Full Capacity**




The calculated 4$^o$F temperature isotherm extends 6,300 to 8,900 ft from the discharge point depending on the time in the tide cycle, with an area of about 800 acres. The 4°F temperature rise isotherm intersects the beach over a length of 2,000 to 3,000 ft. Contrary to statements in the AFC, the foregoing results show that the thermal plume would violate the following requirements of the California Thermal Plan for a new discharge:

> *The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4$^o$ F at (a) the shoreline, (b) the surface of any ocean substrate, or (c) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.*

The LARWQCB has determined that thermal discharge from the ESPR project would be classified as an "existing discharge" (California Regional Water Quality Control Board 2001). Because the discharge is presently permitted under NPDES and would remain so under the conditions of the proposed project, the numerical data described above would not need to be met.

### *WASTEWATER DISCHARGES*

The proposed project involves a new sanitary wastewater connection pipeline, which would transport sanitary waste from the ESGS offsite to the local municipal wastewater treatment facility, thereby eliminating discharge of sanitary waste to the bay (ESPR 2000a).

Sanitary waste and equipment washwater would be generated during demolition activities. Construction related sanitary wastes would be collected onsite in portable toilets and transported to a sanitary wastewater treatment facility. Equipment washwater has the potential for contamination. The wash water would either be collected and contained onsite at designated wash areas and transported to a wastewater treatment facility or it would be directed to the construction stormwater runoff collection system. The latter would be addressed through NPDES permit requirements (ESPR 2000a).

According to the AFC, an existing retention basin would collect approximately 0.15 mgd of wastewater discharged from the HRSG blowdown, evaporative cooler blowdown, and effluent from the oil/water separator collected from the plant and equipment drains. The discharge from the retention basin would be routed to the existing Discharge No. 001, when Units 3 and 4 are not in operation, and combined with approximately 206 mgd of cooling water discharge. When Units 3 and 4 are in operation, the discharge would be combined with the cooling water discharge and directed to Discharge No. 002 (ESPR 2000a).

The Applicant has not provided adequate chemical and physical information on the quality of the plant process wastewater streams. The staff requests additional information to evaluate the potential impacts associated with the waste streams. Please see the Conditions for Certification section below.

## SPILL PREVENTION

The Applicant has indicated that hazardous materials stored onsite during construction will consist of, but are not limited to, fossil fuels, paint, solvents, welding materials, adhesives, oil and lubricants. The Applicant has identified that all construction-related hazardous materials would be stored onsite in small volumes. In the event of a large spill, the spill area will be contained, and contaminated soil would be excavated, placed in barrels, and hauled to a proper disposal area (ESPR 2000a).

During operation, major hazardous materials stored onsite during operation of the proposed ESPR includes but is not limited aqueous ammonia, natural gas, hydrogen gas and other gases. With the exception of underground storage for aqueous ammonia, all hazardous materials will be stored in aboveground facilities. The structures will be surrounded by containment structures with a volume at or greater than tank capacity, plus the volume for a 50-year frequency, 24-hour duration runoff event. Surface coatings and concrete curbs will be used for protection/containment, respectively (ESPR 2000a). Refer to the Hazardous Materials Management section of this Staff Assessment for additional information on this topic.

## CUMULATIVE IMPACTS

### *EROSION AND SEDIMENTATION*

Construction and operational activities related to the ESPR project may cause accelerated wind and water erosion. Implementation of the proposed mitigation measures would ensure that erosion and potential sedimentation is minimized. See the Mitigation section below.

### *THERMAL DISCHARGE*

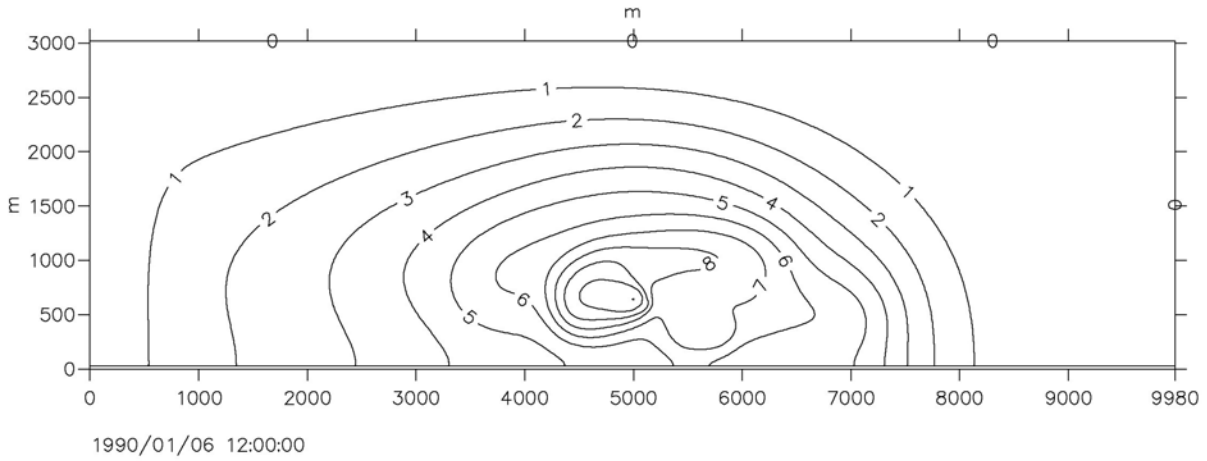
The Scattergood Generating Station, operated by the Los Angeles Department of Water and Power, withdraws and discharges cooling water in Santa Monica Bay about ½ mile north of the El Segundo Generating Station. CEC staff modeled the thermal plume with the addition of the Scattergood power plant data when operating at full capacity. The corresponding discharge flow and temperature rise were 495 MGD and 16$^{o}$F respectively. All other parameters were kept unchanged. The resulting calculated temperature rises are plotted in Soil and Water Resources Figure 2. The cumulative 4$^{o}$F temperature rise isotherm has an area of about 1,500 acres and intersects the beach over a length of about 13,000 ft consistently during the tide cycle.

The results obtained by staff are consistent with the measurements conducted on August 10, 1971 by others (Eliason and Foote 1972). Those measurements indicate that the 4$^{o}$F temperature isotherm extends about 2,200 ft from the El Segundo discharge, with an area of about 600 acres. These are somewhat smaller than the above predictions. The difference can be attributed to the fact that Scattergood was only running at 43% of capacity, that both plants were running at lower loads until 7 hours prior to the survey, and on the definition of the "ambient" temperature used to calculate temperature rises. Nevertheless, the 1971 results also contradict the Applicant's claim that the 4$^{o}$F temperature rise isotherm is generally reached within 1,000 ft of the discharge (ESPR 2000aa).

The results of the staff thermal modeling were furnished to the marine biology team to be used in their impact analysis. Please see the Biological Resources section for a discussion of the cumulative effect of the thermal discharges.

As previously stated, the current NPDES permit requirements are being met for the existing permit conditions, and the numerical results of the staff's cumulative model are not relevant to the Water Resources section.

**SOIL & WATER RESOUCES FIGURE 2**
**Calculated Thermal Plume for El Segundo and Scattergood Generating Stations**




### *SANTA MONICA BAY CLEAN WATER ACT SECTION 303(D) LISTING*

As discussed previously, Santa Monica Bay is listed as impaired for several chemical constituents which may or may not be discharged by the project. staff has requested information from the LARWQCB on how the recently renewed NPDES permit addresses this issue, but a response has not been received. A Condition of Certification has been developed to obtain information from the project owner, and submit them to the LARWQCB for consideration for NPDES permit modifications.

### *CLEAN WATER ACT 316(A) AND (B)*

Please see the Biological Resource section for further discussion and Conditions of Certification for addressing the potentially significant impacts from the ESPR project related to impingement and entrainment losses related to project operation. Any additional data obtained as a result of activities discussed in the Biological Resources section will be provided to the LARWQCB for consideration for NPDES permit modifications.

## ALTERNATIVES ANALYSIS

### *WATER PIPELINES*

A meeting between the El Segundo Planning Division and members from the West Basin Municipal Water District on Friday April 20, 2001, revealed that the proposed water pipeline route through El Segundo Avenue would be difficult to construct and maintain due to existing underground utility congestion. The City of El Segundo also indicated that Standard, Main and Richmond Streets should be avoided by pipeline construction due to present constraints.
The Applicant's Response to Data Requests dated May 18, 2001, indicated that the "Grand Avenue to Eucalyptus to El Segundo path is the one path through the

alternate pipeline study area that has no objections. As such, the Applicant suggests that the Energy Commission permit the project for that path and that path only" (ESP II 2001). Some of these issues will be resolved in the Alternative Water Supply Study requested in a Condition of Certification. Please see Land Use for more discussion and resolution of these issues. Potential impacts to soil and water resources will be mitigated by compliance with the General Construction NPDES permit required as a Condition of Certification.

### *RECLAIMED WATER*

As discussed above, a Condition of Certification will be to perform an Alternative Water Supply study to maximize the use of reclaimed water for plant processes. After a preliminary analysis, the staff believes reclaimed water may be used for additional plant processes than those proposed by ESPR (ESPR 2000a). The ESPR project must comply with the provisions set forth in the California Water Code, which require the use of reclaimed water where available. Therefore, the Applicant must consider using both non-RO treated and single pass RO water for additional plant processes including plant and equipment drains, makeup to the evaporative cooler, and quench water. The project has access to several grades of reclaimed water.

The use of reclaimed water for these processes would eliminate the demand of 0.143 mgd of potable water required for the operation of the proposed plant (ESPR 2000a). In addition, a substantial financial benefit would be realized by using reclaimed instead of potable water. According to a telephone conversation with Paul Shoenberger, Chief Engineer at West Basin Municipal District, the tertiary treated water is approximately 25% less costly than the potable water. A reevaluation of this plan is necessary for determination of LORS compliance. Please see the Conditions of Certification section below for details.

### *ALTERNATIVE COOLING WATER DISCHARGE FACILITY*

No alternative cooling water discharge was examined in the AFC. However, for over 20 years, most if not all, new power projects in the United States using once through cooling with discharge to the ocean have used multiport diffusers. For example, the San Onofre Nuclear Generating Station, Units 2 and 3, which were built in the late 1970s each use a 2,500 ft long multiport diffuser starting 3,500 and 6,000 ft offshore, for a power capacity of 1140 MW each, which is only 10% more that of El Segundo. Because the plant has been designated as an existing discharge these numerical criteria do not need to be met. However, the proposed project cannot be considered to qualify as a new facility using BTA relative to its cooling water disposal as stated in the AFC. Please see the Biological Resources section for an additional discussion of BTA.

The design of a multiport diffuser for any given application depends on numerous factors including discharge flowrate, water depths, currents, stratification and required performance. For preliminary evaluation for the El Segundo Project, a cost of $10,000 per ft (including engineering design and construction supervision) can be assumed for an offshore outfall. The offshore extent of the outfall would need to be

determined by detailed studies. Assuming a 4,000 ft extent gives a cost of $40 Million.

Based on the determination made by the LARWQCB (Los Angeles Regional Water Quality Control Board, 2001), the project is considered an "existing" discharge. A new offshore discharge is not required; therefore, the desirability of a diffuser discharge must be established based on the magnitude of the environmental impacts of the current discharge.

A determination of potential impacts is discussed in the Biological Resources section of this Staff Assessment.

## MITIGATION

## APPLICANT'S PROPOSED MITIGATION

### *EROSION AND SEDIMENT CONTROL*

The Applicant has provided a draft Stormwater Pollution Prevention Plan (SWPPP) that identifies temporary and permanent erosion control and stormwater Best Management Practices (BMPs). The Applicant has identified a number of potential BMPs for the construction and operation of the ESPR project (ESPR 2000aa and ESPR 2000ab), as follows:

Erosion and Sediment control measures during construction include but are not limited to: silt fence, straw bales, mulches, temporary or permanent geotextiles or aggregate surfacing, dust preventative measures and additional BMPs referenced from the California Stormwater Best Management Practice Handbook for Construction Activity.

- Stormwater management BMPs.
- Non-stormwater management BMPs.
- A Waste Management Plan that addresses dewatering procedures regarding the volume of water and how it would be treated to remove hydrocarbons.
- Containment for hazardous material delivery and storage areas to prevent spills of leakage of liquid materials from contaminating soil and stormwater.
- Storage areas for construction wastes, hazardous materials, paints, and related products along with covered dumpsters and containers for waste and recyclables.
- Implementation of a Spill Prevention Containment Contingency plan.
- Monitoring programs that include maintenance, inspection, and repair.
- Specialized drainage systems such as an oil/water separator to trap oily materials.

### *WATER SUPPLY, COOLING AND WASTEWATER DISCHARGE*

The Applicant has stipulated to standard conditions required by the Energy Commission, which ensure that basic needed mitigation is provided. The following conditions are intended to provide mitigation and enhancements (ESPR 2000a):

- Owner shall implement and utilize sufficient dewatering control methods to ensure dewatering volumes do not impact groundwater conditions.
- Upon operation of new sanitary waste pipeline system, sanitary waste for ESGS shall be directed to the pipeline and not to the ocean.
- Owner shall utilize maximum volumes of reclaimed water onsite and reduce potable water use to extent practicable.

The Applicant anticipates that these items would be further developed during the certification process (ESPR 2000a).
No surface or groundwater mitigation measures are proposed. The applicant claims that no impacts would occur in fresh or marine water environments and the ESPR operation would not increase the maximum cooling water flows or heat loads.

## STAFF'S PROPOSED MITIGATION

### *EROSION AND SEDIMENT CONTROL*

Staff finds the Applicant's proposed mitigation measures for erosion and stormwater to be incomplete. These measures, however, should be included in the final SWPPP required within the proposed conditions of certification.

The following measures need to be included within the SWPPP in the form of a detailed Erosion and Sedimentation Control Plan:

The Erosion and Sediment Control drawings should include all final proposed and existing onsite/offsite features such as: pipeline construction, laydown (staging) areas, transmission structures and soil stockpile location(s) accommodated with supporting BMPs. The drawings should also address the proposed road network around Units 5, 6, and 7; the tank farm area; public access area; and the proposed Administration building. Grading information would include mapping that depicts existing versus proposed contours. Where applicable, the contours should be arranged in two-foot intervals.

- Soil use limitations associated with construction and revegetation need to be acknowledged and resolutions should be provided to assist the contractor in overcoming any limitation (refer to the soil survey for specific soils information).
- The limit of construction boundary (onsite and offsite) should include the project facility, all pipeline areas, stockpile areas, pipeline and transmission structures, and laydown areas. The limit of construction ensures all work is confined to the proposed ESPR project in order to protect all surrounding areas not involved in construction or operation of the proposed project.

- Silt fence and straw bales should be installed on level grade and parallel to the existing contour. Silt fence and straw bales should be used to trap sediment, and not as runoff conveyance facilities.
- Pipeline excavation should be limited to an area that can be excavated and backfilled within a day. Exposed soil should be stabilized upon backfilling the open trench. Spoil material should not be located near any stormwater inlets and should be hauled to an approved disposal area. Erosion and Sediment Control drawings need to provide specific BMPs for pipeline construction.
- Stormwater inlets need to be protected from potential sediment-laden runoff.
- Dust suppression methods need to be provided on the drawings and narrative.
- Areas with contaminated soil determined to be hazardous waste shall be excavated by personnel who have been trained through the OSHA recommended 40-hour safety program (29CFR1910.120) with an approved plan for excavation, control of contaminant releases to the air, water and off-site transport or on-site treatment.
- Stormwater Management calculations within accordance with the LA County Department of Public Works Hydrology Manual. Calculations need to be provided for the proposed roadside swales to demonstrate efficiency for capacity. Calculations are also needed for any proposed riprap at stormwater outfalls.
- Drawings that depict BMPs, swale, and riprap details need to be provided. Instructions for BMP installation also need to appear on the drawings.

### *WATER SUPPLY, COOLING AND WASTEWATER DISCHARGE*

To meet the LORS requirements for use of reclaimed water where possible for energy facilities will require that an Alternative Water Supply Analysis needs to be performed. Please see Condition **Soil & Water 6** for further discussion of this study.

To access potential impacts from the inplant waste streams and their associated discharges to the retention basin will require responses to Data Request No. 148 to document all facility process flows quantity and quality.

Theses two submittals must be made prior to the Evidentiary Hearings to become part of the record.

## FACILITY CLOSURE

The ESPR project is expected to operate approximately 30 years. Closure options range from “mothballing,” with the intent of a restart at some time, to the removal of all equipment and facilities. The “mothballing” effect is a temporary closure due to unforeseen circumstances. The facility would be able to restart operations upon cessation of the temporary closure. Permanent closure is a planned closure that is conducted as a gradual process usually at the terminus of the power facility life or due to technological issues.

At the time of the ESPR facility closure, the decommissioning plan would be submitted to the Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans would be required. The plan would address all concerns in regard to potential water quality issues (ESPR 2000a).

## COMPLIANCE WITH LORS

The project would be required to comply with all applicable LORS presented above. Staff evaluated the LORS pertaining to water resources and soils and concludes that the Applicant would comply with all applicable LORS if additional actions are implemented, as discussed under the CEC Staff's Conditions for Certification and Mitigation sections.

The Applicant is expected to comply with the provisions of the Clean Water Act, which regulates discharges through the National Pollutant Discharge Elimination System (NPDES). Based on correspondence from the LARWQCB, the Outfall No. 001 and 002 would be considered an "existing" discharge under the Thermal Plan. Therefore, the project is currently in compliance with the NPDES permit. See Conditions for Certification for details.

In addition, the Applicant must comply with the California Water Code, which requires the use of reclaimed water where available. The potential use for reclaimed water for all plant processes requires further evaluation. Considering the variety, volume and accessibility of reclaimed water supplies in the vicinity of the project, it appears that it is likely that the project will be able to use more reclaimed water in place of potable water now proposed for nonpotable purposes. However, as previously discussed, ESPR has not completed the reclaimed water use analysis requested in staff data requests. Therefore, compliance with California Water Code Section 13550 may be only marginal at best, and the project may not be in compliance at worst. The use of potable water for nonpotable uses when recycled water is available may be considered a waste or unreasonable use of water according to Article X, Section 2 of the California Constitution. The Applicant shall provide at minimum a draft study prior to the Evidentiary Hearings. CEC staff has proposed a Condition of Certification to obtain sufficient data to enable compliance to be determined.

## CONCLUSIONS AND RECOMMENDATIONS

Site preparation, demolition, construction, and operation of ESPR would not result in any significant adverse impacts to the soil and water resources if ESPR complies with all applicable LORS and implements the actions specified in the proposed Conditions of Certification section below.

The current NPDES Permit has been approved by the LARWQCB for current operating conditions and for pre and post stormwater runoff conditions (LARWQCB Letter dated May 31, 2001). The Board has not ruled on any post construction operation requirements. Staff believes that there will be some additional monitoring

or waste discharge requirements that would, at a minimum require an Administrative change to the permit. There is a condition below to address this potential issue, **(Soil & Water 3).** With the operational and construction NPDES permit and associated plans in place, staff believes that mitigation for potential impacts to soil and water resources from the ESPR discussed in this assessment will be reduced to less than significant.

There is significant existing soil and water point source contamination on the site, which would cause significant impacts from excavation and drainage construction activities. These impacts will be mitigated to below a level of significance by the above Construction NPDES permit and by the Conditions of Certification discussed in the Waste Management section.

Staff was not able to completely assess the potential impacts from the facility process waters. This data will be needed for future TMDL developments and a COC to get process stream chemical analysis that will be reported to the LARWQCB. The project appears to be in compliance with NPDES permit. This data will be in support of the monitoring and other LORS compliance requirements.

Staff's preliminary water supply assessment confirms the availability of at least two forms of reclaimed water that could be used for all facility water supply with the exception of the once though cooling sea water and the public utility needs of the facility. Staff also concluded that the reclaimed water would not be adequate for fire usage due to pressure requirements. There could be a potential cost savings of 25% by using reclaimed rather than potable water for the facility. Data Request 148 contained insufficient information to conduct a feasibility analysis. However, staff concludes that the Alternative Water Supply study will address the data request as well as assess both the non-RO and RO availability of reclaimed water from West Basin Reclamation district. Additionally Supplemental Data Response 130 addressed such a study as well. See also the LORS compliance discussion above.

Staff has also concluded that the Tank Farm Plan is incomplete and would result in significant runoff impacts from the removal of the West Berm, which could allow flows down unvegetated slopes and/or to the 24 inch CMP surface drain to the beach.

Staff recommends that the applicant shall provide all outstanding plans to include the final Tank Farm Plan, Storm Water Pollution Prevention Plan or the Alternative Water Supply Study Protocol. To ensure compliance with all LORS, these documents shall be delivered no less than 10 days prior to the start of Evidentiary Hearings.

## CONDITIONS OF CERTIFICATION

**SOIL & WATER 1:** Prior to site mobilization for the proposed project and any ground disturbance activities associated with construction of any on and offsite project elements, including linear facilities, the project owner shall obtain CEC Staff approval for a Storm Water Pollution Prevention Plan

(SWPPP) as required under the General Stormwater Construction Activity Permit for the project. The SWPPP will contain all recommendations contained in the STAFF PROPOSED MITIGATION section of this SA. The SWPPP will also include final drainage and facility design for all on and off site ESPR project facilities. This includes final site drainage plans, showing all of the detail necessary to evaluate the impacts of stormwater runoff and on to the ESPR project facilities. These final plans will also be consistent with all other documents provided by the Applicant. Approval of the plan by the Energy Commission CPM must be received prior to the initiation of any site mobilization activities associated with construction of any project element.

**Verification:** Thirty days prior to the start of any site mobilization activities and/or ground disturbing activities associated with construction of the project or any linear element, the project owner would submit a copy of the SWPPP to the Energy Commission Compliance Project Manager (CPM) for review and approval.

**SOIL & WATER 2:** Prior to beginning any site mobilization activities and/or ground disturbance activities associated with construction of the project or any linear element, the project owner shall obtain Commission approval for a final erosion and sedimentation control plan and stormwater management plan that addresses all project elements. The SWPPP will also include final drainage and facility design for all on and off site ESPR project facilities. This includes final site drainage plans, showing all of the detail necessary to evaluate the impacts of stormwater runoff and on both the existing and ESPR project facilities. These final plans will also be consistent with other documents provided by the Applicant. The final plan to be submitted for Energy Commission's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project. The plan will contain all recommendations contained in the CEC Staff's Mitigation section of this Staff Assessment. The final erosion and sedimentation control plan will include final provisions for the tank farm area that are consistent with all other documents provided by the Applicant.

The erosion and sedimentation control plan and the stormwater management plan shall be submitted to the Energy Commission CPM no later than 30 days prior to site mobilization and/or ground disturbance associated with construction of any project element, including linear facilities. The final plan shall contain all of the elements of the draft plan along with changes made to address staff comments provided in the mitigation section (above) of the SA and the final design of the project. Approval of the final plan by the Energy Commission CPM must be received prior to the initiation of site mobilization activities associated with construction of any project element, including linear facilities.

**SOIL & WATER 3:** The project owner shall maintain in effect the National Pollutant Discharge Elimination System (NPDES) Permit from the LARWQCB for the ESPR project prior. The project owner shall comply with all provisions of the NPDES Permit. The project owner shall notify the Energy Commission CPM of any proposed changes made to this permit and

provide copies of materials related to permit amendment, modification and renewal. The project will not operate without this permit in place.

**Verification:** Within 30 days following receipt of a new, amended, or modified NPDES Permit from the LARWQCB, the project owner shall submit a copy of the permit to the Energy Commission CPM. The project owner shall submit to the Energy Commission CPM in the annual compliance report a copy of the annual monitoring report submitted to the LARWQCB. The project owner shall notify the Energy Commission CPM in writing of any changes made to this permit.

**SOIL & WATER 4:** The project owner shall obtain all necessary permits and approvals from the City of El Segundo with regards to the Standard Urban Stormwater Mitigation Plan program, a grading permit from the Department of Building Safety prior to construction activities, and permits for the installation of water lines in the public street right-of-ways from the Public Works Department.

**Verification:** The project owner shall submit all plans and permit applications to the Energy Commission CPM 30 days prior to submitting them to the City of El Segundo. Within 30 days of receiving plan and permit approvals from the City of El Segundo, the Applicant shall submit copies of the approvals and permits to the Energy Commission CPM.

**SOIL & WATER 5:** The project owner shall obtain a Street Excavation Permit from the City of Manhattan Beach Community Development Department for the installation of the sanitary sewer line within the public street right-of-way.

**Verification:** The project owner shall submit all plans and permit applications to the Energy Commission CPM 30 days prior to submitting them to the City of Manhattan Beach. Within 30 days of receiving plan and permit approvals from the City of Manhattan Beach, the Applicant shall submit copies of the approvals and permits to the Energy Commission CPM.

**SOIL & WATER 6:** Sixty days prior to completion of final design, the project Applicant will complete an Alternative Water Supply study. To complete Data Request 130, a study protocol will be furnished to Energy Commission Staff for approval 10 days prior to the Evidentiary Hearing. Upon approval of the study protocol, the Applicant will complete the Evaluation and furnish to Energy Staff. Final process design data and information will be used to complete this study.

**Verification:** The project owner shall submit a draft Alternative Water Supply Study to the Energy Commission CPM 30 days prior to submitting the Final study. The approved final study will be submitted at least 30 days prior to the start of any construction activities. The final project design shall include the additional use of reclaimed water to the extent recommended in the aforementioned study.

**Soil & Water 7:** Ninety days after the project begins operating, chemical analytical data and volume of flow data will be provided for all in-plant wastewater streams and the discharge from the retention basin prior to mixing with cooling water flows. Samples will be collected from each waste stream prior to mixing with any other waste stream. Analysis will include all constituents for which Santa Monica Bay is listed as impaired under CWA 303(d). Metals

and trace elements will have detection limits comparable with USEPA Method 200.8, ICP-MS, as described in Data Request 148.

An analytical report summarizing the analytical results and flows for each in-plant waste stream and the discharge from the retention basin prior to mixing with cooling water flow will be provided to the CPM after the plant has been in operation for at least 60 days. Samples will be obtained at a time when the plant has been operating at greater than 80% of capacity, and the operating capacity at the time of sampling will be stated.

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# WORKER SAFETY AND FIRE PROTECTION

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

## INTRODUCTION

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 El Segundo Power Redevelopment (ESPR) Project and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during demolition, construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

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

## 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 this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The 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 addition of the Uniform Building Code;
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code § 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

## LOCAL

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

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

Similarly, the Uniform Fire Code (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 El Segundo adopted the 1998 Uniform Fire Code in July 1998. The City of El Segundo Fire Department administers the UFC.

Applicable local (or locally enforced) requirements include:

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

- Uniform Fire Code, 1998

## SETTING

The proposed project is located in the City of El Segundo in Los Angeles County.

The El Segundo Power Redevelopment (ESPR) Project involves demolition of the existing power blocks of Units 1 and 2 and subsequent 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 El Segundo Fire Department. Fire Station No. 1 is the closest station to the site and is located at 314 Main Street. The response time to the project site is estimated to be less than 3-5 minutes. Station 2 is located at 2161 El Segundo Boulevard; estimated response time 4-5 minutes (ESFD 2001).

Station 1 is also assigned as the off-site hazardous materials first responder for the El Segundo Power Plant. Station 1 has two designated hazmat personnel and is equipped with a hazmat engine. Station 1 firemen are also hazmat trained (ESFD 2001).

## IMPACTS

## WORKER SAFETY

Industrial environments are potentially dangerous during demolition, 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 El Segundo Power Redevelopment 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.

A unique proposal made by the applicant at the May 2, 2001 workshop involves the use of one of the former oil storage tanks as an on-site indoor work area to minimize noise impacts to the surrounding community. In order to ensure protection of the health and safety of the workers who will use this structure, additional mitigation beyond the LORS listed above is in order.

## FIRE HAZARDS

During demolition, construction and operation of the proposed El Segundo Power Redevelopment 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.

## CUMULATIVE IMPACTS

Staff reviewed the potential for the demolition, construction and operation of El Segundo Power Redevelopment project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City of El Segundo Fire Department and found that cumulative impacts were insignificant.

# APPLICANT'S PROPOSED MITIGATION

## WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during demolition, 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 demolition, construction and operational phases of the project.

### *DEMOLITION & CONSTRUCTION SAFETY AND HEALTH PROGRAM*

The El Segundo Power Redevelopment project encompasses demolition of existing power blocks of Units 1 and 2 and 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 demolition, 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 demolition and 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 demolition of existing power blocks of Units 1 and 2 and construction of the El Segundo Power Redevelopment project, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-1**.

### *OPERATIONS AND MAINTENANCE SAFETY AND HEALTH PROGRAM*

Upon completion of construction and prior to operations at the El Segundo Power Redevelopment 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 El Segundo Power Redevelopment project will ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (AFC Table 5.17-4). Prior to operation of the El Segundo Power Redevelopment 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 Demolition & 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 Demolition, Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to demolition, 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 program;
- new, transferred, or promoted employees;
- new processes and equipment;
- supervisors;
- 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 5.17-4).

- 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 California Energy Commission Compliance Project Manager (CPM) and the City of El Segundo Fire Department 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 which, 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 El Segundo Power Redevelopment project operational environment will likely require PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and California Department of Health and Human Services 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 Demolition and 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 (AFC Section 5.17, Worker Safety) 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 El Segundo Fire Department.

During demolition and 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 demolition and construction phase.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Elements include both fixed and portable fire extinguishing systems.

The existing fire water supply is to be upgraded as part of the project. The interim fire protection system will include mobile fractionation tanks to store firewater and a firewater pump. As backup to the interim system, the facility will rely on existing 6-inch water mains from the city water systems of El Segundo and Manhattan Beach. Upon project completion, two sources of firewater will be available: the primary source will be either a new tank or the existing fire/service water storage tank relocated to a new site and the secondary source will be the new water main line from the City of El Segundo.

This fire water supply and an on-site electric fire-water pumping system (with diesel generator back-up) will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems. The motor driven fire pump will be capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

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.

A deluge spray system will be provided for the generator transformers and auxiliary power transformer in the event of a fire. Deluge water is fed from the firewater storage and supply system.

Fire hydrants and hose stations will supplement the plant fire protection system using water from the plant underground fire water/domestic water system. Fire hydrants with hose houses will be placed at approximately 250-foot intervals around the new fire loop; hydrants will be located and hose houses equipped 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 El Segundo Fire Department, prior to demolition, construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

## FACILITY CLOSURE

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.

## CONCLUSION AND RECOMMENDATIONS

## CONCLUSIONS

If the Applicant for the proposed El Segundo Power Redevelopment project provides a Project Demolition & Construction Injury and Illness Prevention 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. The proposed facility is located within an existing power plant facility that is currently served by the local

fire department. The fire risks of the existing facility are similar and thus pose no new or added demands on local fire protection services. In order to ensure that workers who use one of the empty oil storage tanks as a work building are adequately protected, staff has proposed condition of certification **WORKER SAFETY 3**.

## RECOMMENDATIONS

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 Demolition and Construction Injury and Illness Prevention 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

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

- A Demolition and Construction Safety Program;
- A Demolition and Construction Personal Protective Equipment Program;
- A Demolition and Construction Exposure Monitoring Program;
- A Demolition and Construction Emergency Action Plan; and
- A Demolition and Construction Fire Protection and Prevention Plan.

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

**Verification:** At least 30 days prior to the start of demolition, the project owner shall submit to the CPM for review and approval a copy of the Project Demolition and Construction Injury and Illness Prevention Program. The project owner shall provide a letter from the City of El Segundo Fire Department stating that they have reviewed and commented on the Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan.

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

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;

- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

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

**Verification:** At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operations and Maintenance Safety & Health Program. It shall incorporate Cal/OSHA Consultation Service's comments, stating that they have reviewed and accepted the specified elements of the proposed Operations and Maintenance Safety and Health Plan.

**WORKER Safety-3** Before using one of the fuel oil storage tanks as a work area, the project owner shall ensure that the integrity of the floor has not been compromised by cracks or holes, that surface residues of the tanks contents do not exceed any health-based criteria as determined by a protocol reviewed and approved by the CPM and DTSC, and that ventilation of the tank meets or exceeds levels approved by Cal/OSHA Consultation Service.

**Verification:** At least 30 days prior to the start of operations within the tank, the project owner shall submit to the CPM and DTSC a report verifying the integrity of the floor and describing the results of surface residue anaylses within the tank compared to health-based criteria. Also, at least 30 days prior to the start of operations within the tank, the project owner shall submit to the CPM a letter from Cal/OSHA Consultation Service stating that the ventilation within the tank is adequate to protect workers.

## REFERENCES

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.

El Segundo Fire Department (ESFD). 2001. Personal communication with Rosemarie Radomsky, Administrative Specialist. April 25, 2001.

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

# ENGINEERING ASSESSMENT

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# FACILITY DESIGN

Testimony of Shahab Khoshmashrab, Al McCuen and Steve Baker

## INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the engineering LORS and any special design requirements.

## FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision ….which includes…(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state and federal standards, ordinances, or laws…" (Pub. Resources Code, §25523).

## SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

## SETTING

El Segundo Power Company, LLC proposes to construct and operate a 630 megawatt combined cycle power plant (ESP II 2000a). The project will be located

in El Segundo, Los Angeles County. The site is approximately 32.8 fenced acres located southwest of Los Angeles International Airport adjacent to Santa Monica Bay and lies in seismic zone 4. For more information on the site and related project description, please see the **Project Description** section of this document.

The two Heat Recovery Steam Generators (HRSGs) will be installed in a vertical arrangement instead of the typical horizontal arrangement. The HRSG exhaust stacks will reach 250 feet above grade. Each HRSG will have a steel frame superstructure. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices A through E (ESP II 2000a).

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

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (ESP II 2000a, Appendices A through E and Table 3.12-1). 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 Boiler Manufacturers Association (ABMA).

## ANALYSIS

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 A through E 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 (ESP II 2000a, § 5.19.6) 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 powerplant. 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 of El Segundo or Los Angeles County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

## FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans, and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

## RESPONSE TO PUBLIC AND AGENCY COMMENTS

Currently there are no comments that will impact facility design.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.

3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the General Conditions portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

### RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;

2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

## CONDITIONS OF CERTIFICATION

**GEN-1** The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable 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 TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: 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 California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy].

**GEN-2** Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

**Verification:** At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List, and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the

major structures and equipment listed in **Table 1** below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

**Table 1: Major Structures and Equipment List**

| Equipment/System | Quantity (Plant) |
|---|---|
| Combustion Turbine (CT) Foundation and Connections | 2 |
| HP/IP Steam Turbine (ST) Foundation and Connections | 1 |
| LP Steam Turbine (ST) Foundation and Connections | 1 |
| Combustion Turbine Generator Foundation and Connections | 2 |
| Steam Turbine Generator Foundation and Connections | 1 |
| Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections | 2 |
| Auxiliary Transformer Foundation and Connections | 2 |
| CT Inlet Air Plenum Structure, Foundation and Connections | 2 |
| Inlet Air Evaporative Cooler Structure, Foundation and Connections | 2 |
| HRSG Exhaust Stack, Foundation and Connections | 2 |
| Isolated Phase Bus Duct | 2 |
| HRSG Transition Duct from CTG — Structure | 2 |
| Secondary Unit Substation/Transformer | 2 |
| Electrical/Control Center | 2 |
| Condenser Structure, Foundation and Connections | 1 |
| Feed Water Pump Foundation and Connections | 4 |
| Condensate Pump Foundation and Connections | 2 |
| Feed Water Heater Foundation and Connections | 2 |
| Air Compressor Foundation and Connections | 2 |
| CT Water Injection Skid Foundation and Connections | 2 |
| CT Static Starter Skid Foundation and Connections | 2 |
| CT Mechanical Accessory Compartment Foundation and Connections | 2 |
| Switchgear Equipment Building Structure, Foundation and Connections | 2 |
| CT Generator Step-up Transformer Foundation and Connections | 2 |
| ST Generator Step-up Transformer Foundation and Connections | 1 |
| HRSG Blowdown Tank Foundation and Connections | 2 |
| Boiler Circulating Pump Connections | 8 |
| Condensate Circulating Pump Foundation and Connections | 4 |
| Fuel Gas Heater Foundation and Connections | 2 |
| ST Lube Oil Package Foundation and Connections | 1 |
| Drain Cooler Foundation and Connections | 1 |
| Air Receiver Foundation and Connections | 1 |
| Air Dryer Foundation and Connections | 1 |
| Closed Cycle Cooling Water Heat Exchanger Foundation and Connections | 2 |

| Equipment/System | Quantity (Plant) |
|---|---|
| Closed Cycle Cooling Water Pump Foundation and Connections | 2 |
| CT Electrical/Control Center | 2 |

**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 TSE-1, TSE-2 and TSE-3 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.

Protocol: 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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**GEN-5** Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of powerplant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1,

TSE-2 and TSE-3 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, powerplant 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.

Protocol: 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 [1998 CBC, Section 104.2, Powers and Duties of Building Official].

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.

Protocol: 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.

Protocol: B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;

2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;

4. Recommend field changes to the civil engineer and RE;

5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and

6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations [1998 CBC, section 104.2.4, Stop orders].

Protocol: C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with LORS;

4. Evaluate and recommend necessary changes in design; and

5. Prepare and sign all major building plans, specifications and calculations.

Protocol: D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

Protocol: E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The

project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**GEN-6** Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

**Verification:** At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

**GEN-7** The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

**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].

**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.

**GEN-9** The project owner shall file a closure/decommissioning plan with Los Angeles County and the City of El Segundo for review and comment, and the CPM for review and approval, at least 12 months (or other time mutually agreed to by the project owner and the CPM) prior to commencing the closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

Protocol: The closure plan shall include a discussion of the following:

1. The proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
2. All applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

3. Activities necessary to restore the site if the MVPP decommissioning plan requires removal of all equipment and appurtenant facilities; and

4. Closure/decommissioning alternatives, other than complete restoration of the site.

**Verification:** At least 12 months (or other period of time mutually agreed to by the project owner and the CPM) prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with Los Angeles County and the City of El Segundo for review and comment, and the CPM for review and approval. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

**CIVIL-1** Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;

2. An erosion and sedimentation control plan;

3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. Soils report as required by the 1998 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report].

**Verification:** At least 15 days prior to the start of site grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

**CIVIL-2** The resident engineer shall, if appropriate, stop all earthworks and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [1998 CBC, Section 104.2.4, Stop orders].

**Verification:** The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

**CIVIL-3** The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site grading operations for which a grading permit is required shall be subject to inspection by the CBO.

Protocol: If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

**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 review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from Table 1, above):

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and

5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

Protocol: 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 90 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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction of any structure or component listed in Table 1 of Condition of Certification **GEN-2**, above the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

**STRUC-2** The project owner shall submit to the CBO the required number of sets of the following:

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. 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 Occupancy Category 2 of the 1998 CBC.

**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 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 review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**MECH-1** Prior to the start of any increment of major piping construction, the project owner shall submit, for CBO review and approval, the proposed final design, specifications and calculations for each plant major piping system. (Major piping is defined here as piping other than domestic water, plumbing and refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches.) The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping 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].

Protocol: The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when the proposed final design, specifications and calculations for all of the major piping systems subject to the CBO review and approval have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards [Section 106.3.4, Architect or Engineer of Record], including but not 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); 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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of major piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of major piping systems. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**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].

Protocol: 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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

**MECH-3** Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

Protocol: 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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

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-4** Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design, specifications and calculations for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, 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].

Protocol: The project owner shall design, fabricate and install:

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Part 5 (the California Plumbing Code); and

2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Part 6 (the California Energy Code).

The final design, specifications and calculations shall clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with all of the applicable LORS.

**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 construction of any of the above systems, the project owner shall submit to the CBO the final design, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and 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.

**ELEC-1** For the 480 volts and higher systems, the project owner shall not begin any increment of electrical 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 [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 TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The following activities shall be reported in the Monthly Compliance Report:

- receipt or delay of major electrical equipment; and
- testing or energization of major electrical equipment.

**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 electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

**ELEC-2** The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C [CBC 1998, Section 106.3.2, Submittal documents]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;

3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

Protocol: 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;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

Protocol: C. 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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

## REFERENCES

ESPR (El Segundo Power Station). 2000 a. Application for Certification for the El Segundo Power Redevelopment Project (00-AFC-14). Submitted to the California Energy Commission, December 18, 2000.

# GEOLOGY AND PALEONTOLOGY

Testimony of Dr. Dal Hunter

## INTRODUCTION

The geology and paleontology section discusses the projects potential impacts regarding geological hazards, geological and paleontological resources. The purpose of this analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological, and paleontological resources and surface water hydrology, with the inclusion of twelve Conditions of Certification.

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

The applicable LORS are listed in the AFC, in sections 5.3, 5.5, and 5.8 (El Segundo 2000a). A brief description of the LORS for surface water hydrology is presented in the **Soils And Water Resources** section of the staff assessment. A brief description of the LORS for paleontological resources, and geological hazards and resources follows

### FEDERAL

There are no federal LORS for geological hazards and resources, paleontological resources, or grading for the proposed project.

### STATE AND LOCAL

*The California Building Code (CBC*) 1998 edition is based upon the *Uniform Building Code* (*UBC*), 1997 edition, which was published by the International Conference of Building Officials. The *CBC* is a series of standards that are used in investigation, design (Chapters 16 and 18) and construction.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (Society of Vertebrate Paleontologists 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (SVP).

## SETTING

The El Segundo Power Redevelopment Project is located on the Torrance Plain of the Peninsular Range geologic province at 33.911 degrees north latitude by 118.424 degrees west longitude. The project is flanked by a bike path along a beach and the Pacific Ocean to the west and a dune sand cut slope to the east. The El Segundo oil field lies approximately one mile east of the project. Two inactive 13∀-million-gallon oil tanks are located just north of the El Segundo Generating Station (ESGS).

The project will involve the demolition of existing units 1 and 2 at the ESGS. No existing natural gas pipelines, water pipelines, or electrical transmission lines are to be rebuilt, or added to the site as a result of the redevelopment project. It is understood that excavation for removal of the foundations for units 1 and 2 will be approximately 10 feet below existing grade and then 10 feet of engineered fill will be placed in the excavation. It is understood that the two large oil tanks south of ESGS will be modified and used to temporarily store soil and crushed concrete generated by demolition of units 1 and 2.

The project is not crossed by known active faults. The depth to ground water varies with the tide but may be encountered at ten feet below existing grade. Site near-surface geology consists of artificial fill, alluvium and semi-consolidated dune sand. The character of the fill is unknown. Since the plant was constructed in the early 1950□s, construction records documenting fill material and compaction may or may not be available. Borings from the early foundation reports for the project (1953; 1962; ESP-II, 2000, Appendix G) do not indicate the presence of fill. The alluvium is made up of Quaternary to Recent age sands, silts, clays, and gravel beneath existing fill. Underneath the alluvium are Tertiary age marine and continental units of sandstone, conglomerate, and clays. A 1.75:1 (horizontal to vertical) cut slope makes up the eastern border of the site. This slope is heavily vegetated and is made up of semi-consolidated dune sand. The slope is approximately 70 feet high and is not terraced along most of its length. The toe of the slope is supported by an approximately 3-foot-high concrete retaining wall, which also bears a number of pipes associated with the facility. The southern end of the 1.75:1 slope includes two additional retaining walls, each about 5 feet high, stepped up the slope. These higher walls appear to terminate to the north just about at the southern end of units 1 and 2. North of existing units 1 and 2, the slope steepens to 1.5:1.

The project site lies at an elevation of approximately 19 to 20 feet above mean sea level. Existing grade at the power plant site is approximately 1%. The existing site drainage is sheet flow in nature and drains locally via on-site drainage channels into a retention basin to the north. A more complete discussion of on-site drainage is included in the **Soils and Water Resources** section of this staff assessment.

## ANALYSIS AND IMPACTS

## GEOLOGICAL HAZARDS

### *FAULTING AND SEISMICITY*

The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the *California Building Code*. Energy Commission staff reviewed the California Division of Mines and Geology publications Geologic Map of the Long Beach Sheet dated 1985 (CDMG 1985) and the Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, dated 1994 (CDMG 1994). The footprint where the bulk of the redevelopment project will take place is covered by units 1 and 2 of the El Segundo Generating Station (ESGS). Energy Commission staff visited the ESGS on March 13, 2001, and on May 2, 2001, and did not observe any surface faulting at the project site. No active faults are known to cross the power plant footprint. A number of active faults lie within a 25-mile radius of the site. All of these faults are classified as Type B seismic sources, as defined in the 1997 *Uniform Building Code* and the *California Building Code* (1998). These codes define 3 seismic source types: A, B, C. Type A faults, such as the San Andreas Fault System, are those with an average annual slip rate greater than 5 mm per year and the potential to generate a moment magnitude earthquake of at least 7.0. Type C faults are those with a slip rate of 2 mm or less per year and a maximum moment earthquake of less than 6.5. Type B faults, the largest grouping, are all faults not defined as Type A or C.

The closest active faults to the project are the Palos Verdes-Coronado Fault (2.1 miles southwest of the ESPR) and the North Branch of the Newport Inglewood Fault Zone (7.3 miles northeast of the ESPR). The North Branch of the Newport-Inglewood Fault Zone is a right lateral strike slip fault with a slip rate of approximately 1 mm/year (International Conference of Building Officials, 1998, Page XV). The Newport-Inglewood Fault Zone has the potential to generate a magnitude 6.9 or greater. The Palos Verdes-Coronado Fault is a northwest-trending, right-lateral strike-slip fault capable of generating a moment magnitude 7.1 earthquake and has an average slip rate of 3 millimeters per year. Other faults near the project site include the Santa Monica Fault and the Whittier segment of the Elsinore Fault. The Santa Monica fault, and the Whittier segment of the Elsinore fault are capable of earthquakes with a magnitude similar in size to the Newport-Inglewood Fault Zone. The Santa Monica trends northeast and lies approximately 12 miles north of the ESPR. The Whittier segment of the Elsinore fault, which trends northwest, is located over 23 miles east of the ESPR. The Whittier segment of the Elsinore fault has shown right-lateral strike-slip displacement with an average

slip rate of 2.5 mm per year. The Santa Monica fault has a slip rate of 1 mm per year with left-lateral reverse-oblique movement.

CEC staff understand that the existing power plant was in operation during both the Sylmar moment magnitude 6.4 earthquake and Northridge moment magnitude 6.7 earthquake. Furthermore, the plant was not damaged in the Sylmar earthquake and only had minor damage to a wall adjacent to the bike path during the Northridge earthquake. The applicant has estimated that the peak horizontal ground acceleration for the design earthquake (with a 10 percent probability in 50 year return interval) is 0.46g (El Segundo 2000a, page 5.3-21). CEC staff have reviewed a recent publication by the Seismological Society of America (Field, 2000) related to estimating the ground acceleration in southern California. Although many theories and ideas are presented, none are sufficiently developed yet for use in engineering design. Consequently, the proposed peak horizontal ground acceleration of 0.46 remains appropriate. A peak horizontal ground acceleration of this intensity could cause instability of the existing cut slope and liquefaction of ESPR foundation soils, depending on the soil conditions actually present. These concerns will be addressed as a result of proposed Conditions of Certification **GEO-2** and **GEO-3** below. The ESPR proposes to replace structures designed under much older building codes with structures designed under current earthquake standards.

## *LIQUEFACTION, HYDROCOMPACTION, SUBSIDENCE, AND EXPANSIVE SOILS*

Liquefaction is a condition in which a cohesionless or even slightly plastic soil may lose shear strength due to a sudden increase in pore water pressure. Four of the parameters used to assess the potential for liquefaction are the density, depth to groundwater, texture, and the peak horizontal ground acceleration estimated for the site. The depth to groundwater at the project is approximately 10 feet below existing grade. The applicant has estimated that the peak horizontal ground acceleration for the design earthquake (with a 10% chance in 50 year return interval) is 0.46g, which may be high enough, when combined with the shallow ground water and locally loose sands, to trigger liquefaction at the project site. The Applicant has acknowledged that the site is located in an area with moderate to high liquefaction potential. The project site is located in an area mapped as liquefaction hazard zone (CDMG, *Venice Quadrangle*, 1999). It is recommended by Energy Commission staff that the Applicant conduct a detailed liquefaction analysis of the project site and linear facilities prior to the completion of the final design for the project. This is the subject of the proposed Conditions of Certification **GEO-2** below.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The fill at the site varies in consistency from loose to dense and is saturated below the water table. The potential for significant compaction due to hydrocompaction is considered remote since the ground water table at the site is shallow.

Subsidence of surficial and near surface soil units may be induced at the site by either strong ground shaking due to a large nearby earthquake, by consolidation of loose or soft soils due to heavy loading of the soils by large structures, or by the

extraction of fluids from the subsurface. Subsidence due to fluid withdrawal (oil extraction) is a regional problem that has been partially mitigated by the injection of water into the subsurface. The injection of water into the subsurface has also been regionally used to prevent the intrusion of sea water into local aquifers north of the project. Both subsidence stabilization and the salt-water intrusion mitigation have been moderately successful. Water injection is not anticipated as part of the proposed ESPR project.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. No test results for the potential for the shrink-swell potential, expansive index potential, or the consolidation or bearing capacity of the soils have been submitted to the CEC. The Applicant has indicated in the AFC that the only suspected expansive clay soils lie well below the water table making shrink-swell very unlikely. Prior to the final design of the foundation for the SCR the Applicant should have a foundation investigation report conducted and reviewed by the CBO at the time that the construction plans for the SCR are to be reviewed by the CBO, per Conditions of Certification **GEO-5**.

### *LANDSLIDES*

No landslides were observed on or adjacent to the proposed power plant footprint during a staff site visit on March 13, 2001, and a second site visit on May 2, 2001. A shallow, minor, slump was observed in the cut slope near the project administration building. The applicant proposes to evaluate slope stability during conduct of engineering geological/geotechnical investigations. This is the subject of the proposed Condition for Certification, **GEO-3**.

## GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

The project is located approximately one mile west of the El Segundo Oil Field and one-half mile south of a single producing oil well owned by Occidental Petroleum. The project location is designated as Mineral Resources Zone-3, an area of undetermined mineral resources potential (CDMG Special Report 143). No mineral resources are known to have been identified at the present site and there are no significant sand or gravel mines in the area.

Energy Commission staff has reviewed the paleontological resources technical report (El Segundo 2000, AFC Appendix L) and section 5.8. The project site is highly disturbed and partially covered by artificial fill. No significant paleontological resources were reported by the applicant□s paleontologist during the paleontological archive and literature reviews. The paleontologist did assign the power plant a □high sensitivity□ rating. No paleontological resources were observed by Energy Commission staff at the project site during site visits on March 13 and May 2, 2001. Energy Commission staff has proposed conditions of certification, below, that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be

encountered during construction, operation, and closure of the project. The primary area of concern is the proposed 1.5:1 cut slope around the foundation zone of units 1 and 2.

## SURFACE WATER HYDROLOGY

The site and the entire El Segundo area is located in an area designated as Zone C by the Federal Emergency Management Agency (Community I.D. No. 060118). The designation means that the site is located in an area of minimal flooding potential. Minimum grade for the power plant area will be 1 per cent and all drainage will be directed away from structures. The design storm event is the 100-year 24-hour storm (NOAA 1973), with a precipitation of approximately 7 inches. Drainage at the site is sheet flow to the south where it is collected into a general-purpose retention basin. The proposed surface water drainage system is anticipated to be able to accommodate the surface water run-off from the project site.

### *TSUNAMI*

A tsunami is a wave of water that may be generated by an earthquake or a large underwater landslide. The epicenter of the 1933 Long Beach earthquake was located in the Pacific Ocean, approximately 3.5 miles southwest of Newport Beach (39 miles southwest of the project site). Wood (Wood 1933) recorded that no tsunami was observed after the March 10, 1933, Long Beach earthquake. Studies cited by the applicant predict that tsunami upwelling would be between 5.5 and 9.4 feet, respectively, for the 100 and 500 year return periods. At high tide the tsunami run-up could be as high as +12 to +16 feet above MLLW. Since the site lies at approximately 19 feet above MLLW, and might be afforded some protection by the existing sea wall, no significant impacts from a tsunami are anticipated at ESGR.

## SITE SPECIFIC IMACTS

No known geological resources will be impacted by the construction and operation of the project. Since there is to be little new grading, Energy Commission staff consider that the probability that significant paleontological resources will be encountered during the retooling of the power plant is minimal. Some regarding (cut and fills) will be required for a new access road along the western side of the tank farm. Cut and fill slopes and grading requirements should be addressed in the design-level engineering geologic report recommended as Condition of Certification **GEO-5**.

## CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely, if the project is constructed according to the proposed conditions of certification. It is noted that the site is located near the El Segundo Oil Field.

## FACILITY CLOSURE

A definition and general approach to closure is presented in the **General Conditions** section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction and operation of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

## RESPONSE TO PUBLIC AND AGENCY COMMENTS

Energy Commission staff received one set of comments from the California Coastal Commission. These comments are related to:

- Stability of the cut slope on the east edge of the plant.
- Coastal erosion
- Liquefaction
- Flooding and the western containment wall.

The applicant has addressed these concerns specifically in Data Response dated April 18 and May 4, 2001.

## MITIGATION

No mitigation for geological hazards, surface water hydrology and paleontological resources are proposed, other than the Conditions of Certification presented below.

## CONCLUSIONS AND RECOMMENDATIONS

The applicant will be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources and surface water hydrology. To ensure compliance with applicable LORS for geological hazards and surface water hydrology, staff proposes the adoption of the proposed conditions of certification listed below. No Conditions of Certification for geological resources are proposed since there are no known surficial geological resources at the site.

## PROPOSED CONDITIONS OF CERTIFICATION

**GEO-1** Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the *California Building Code* (*CBC*) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the Compliance Project manager (CPM). The functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

**GEO-2** Prior to the completion of the final design of the project, the owner shall have a liquefaction analysis conducted for the power plant site and adjacent existing cut slope to the east. The liquefaction analysis shall be implemented by following the recommended procedures contained in Recommended Procedures for Implementation of California Division of Mines and Geology Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California dated March 1999. (The document is available through the Southern California Earthquake Center at the University of Southern California.)

**Verficiation:** The project owner shall include in the application for a grading permit (see Condition of Certification **GEO-5** below) a report of the liquefaction analysis and a summary of how the results of this analysis were incorporated into the project foundation and grading plan design for the CBO's review and comment.

**GEO-3** Prior to completion of the final design of the project, the owner shall have a slope stability analysis conducted for the existing cut slope east of units 1 and 2. The analysis shall consider both static and earthquake conditions, as well as the effects of any liquefaction of the foundation soils. Since cohesionless soils may be present, the proposed 1.5:1 perimeter excavation should also be evaluated for stability, but only for static conditions.

**Verification:** The project owner shall include in the application for a grading permit (see Condition of Certification **GEO-5** below) a report of the slope stability analysis and a summary of how the results of this analysis were incorporated into the project foundation and grading plan for the CBO's review and comment.

**GEO-4** Applicant shall designate and use a Coastal or Geotechnical Engineer, or geologist familiar with geomorphology to conduct a shoreline monitoring program, and assess erosion on the beach area and at the foot of the revetment on an annual basis. Applicant shall report such results to the California Coastal Commission, and the CPM annually.

Protocol: A detailed baseline survey is required with some historical research including air photos, a summary of past beach nourishment and shoreline damage is needed. Sand sampling and testing shall be conducted.

A series of onshore/offshore shore-normal transects every few hundred feet shall be conducted 4 times per year.

Annually, photos from set positions can be taken (from the groin and from a high elevation in the plant).

Shoreline response during and after a major storm will be documented.

**Verification:** 30 Days prior to commencing construction applicant shall designate the geologist and submit for approval the engineer or geologist to the CPM and California Coastal Commission. The engineer or geologist should be experienced in shoreline monitoring, and understand coastal processes.

Applicant shall submit as part of its annual compliance report the results of the assessment. Applicant shall also, at that time, forward results to the California Coastal Commission.

During the first 3 years following commencement of construction, the applicant shall submit quarterly reports.

**GEO-5** The assigned engineering geologist(s) shall carry out the duties required by the 1998 *CBC*, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 - Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 *CBC* Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions, and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 *CBC* Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

**Verification:** (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 *CBC* Appendix Chapter 33, Section 3318 Completion of Work, to the CBO and to the CPM on request.

**PAL-1** Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities of native soils), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do no satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

**Verification:** At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

**PAL-2** Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout the project construction.

Protocol: The Paleontological Resources Monitoring and Mitigation Plan that shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;

- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;

- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;

- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;

- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of

Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and

- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

**Verification:** At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Paleontological Resources Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

**PAL-3** Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

**Verification:** At least thirty (30) days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

**PAL-4** The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

**Verification:** The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

**PAL-5** The project owner, through the designated paleontological resource specialist, shall ensure recover, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

**Verification:** The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

**PAL-6** The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of

paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

**Verification:** The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

**PAL-7** The project owner shall include in the facility closure plan a description regarding facility closure activities' potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

**Verification:** The project owner shall include a description of closure activities described above in the facility closure plan.

## REFERENCES


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# POWER PLANT EFFICIENCY

Testimony of Steve Baker

## INTRODUCTION

The Energy Commission makes findings as to whether energy use by the El Segundo Power Redevelopment Project (the Project) 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 Project's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

### FEDERAL

No federal laws apply to the efficiency of this project.

### STATE

#### *CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES*

CEQA Guidelines state that the environmental analysis "…shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

### LOCAL

No local or county ordinances apply to power plant efficiency.

## SETTING

El Segundo Power II LLC (ESPR) proposes to construct and operate a (nominal) 630 MW combined cycle merchant power plant to generate baseload and peaking power, selling directly to customers through bilateral contracts or on the spot market (ESPR 2000a, AFC §§ 1.1, 3.1, 3.10.2, 4.2, 4.3, 4.5.1). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity will differ from, and may exceed, this figure.) The Project will consist of two General Electric PG7241FA combustion turbine generators with evaporative inlet air coolers and steam injection producing approximately 172 to 183 MW each, two heat recovery steam generators (HRSGs) with duct burners, and one 288 MW reheat steam turbine generator, arranged in a two-on-one combined cycle train, totaling approximately 630 MW. The gas turbines and HRSGs will be equipped with dry low-NOx combustors and selective catalytic reduction to control air emissions (ESPR 2000a, AFC §§ 1.1, 1.3.2, 3.4.1, 3.4.3.1, 3.4.3.2, 3.10.2.1, 5.19.7). The Project includes demolition and removal of El Segundo Generating Station (ESGS) Units 1 and 2, a pair of 1950s vintage 175 MW steam boiler units (ESPR 2000a, AFC §§ 1.1, 1.2, 1.3.2, 3.1, 3.4.1).

## ANALYSIS

## ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

### *PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY*

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The Project will burn natural gas at a nominal rate up to 108 billion Btu per day LHV[1] (ESPR 2000a, AFC Figure 3.4-1). 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 up to approximately 55.4 percent LHV (ESPR 2000a, AFC Table 5.19-1; § 5.19.7.1); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

[1] Lower heating value.

### *ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES*

The applicant has described its sources of supply of natural gas for the Project (ESPR 2000a, AFC §§ 1.1, 3.1, 3.4.6, 5.19.4.1). The project will burn natural gas from the existing Southern California Gas Company (SoCalGas) pipeline that currently serves the ESGS. The SoCalGas gas supply infrastructure is extensive, offering access to vast reserves of gas from California, the Rocky Mountains, Canada and the Southwest. This source represents far more gas than would be required for a project this size. Energy Commission predictions are that natural gas supplies will be adequate for many years into the future. 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 existing 20-inch diameter pipeline by which SoCalGas serves the ESGS (ESPR 2000a, AFC §§ 1.1, 3.1, 3.4.6, 5.19.4.1). SoCalGas claims that this line should provide adequate access to natural gas fuel. There is no real likelihood that the Project will require the development of additional energy supply capacity.

### *COMPLIANCE WITH ENERGY STANDARDS*

No standards apply to the efficiency of the Project or other non-cogeneration projects.

### *ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION*

The Project 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 Project will be configured as a compound-train 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 (ESPR 2000a, AFC §§ 1.1, 1.3.2, 3.1, 3.4.1, 4.5, 5.19.7). 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 number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back.

Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one gas turbine. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as load-following and peaking duty. Loads down to 50 percent of full load allow one gas turbine, operating at full load, and the steam turbine to operate at peak efficiency.

#### EQUIPMENT SELECTION

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the Project represent some of the most modern and efficient such machines now available. The applicant will employ two General Electric PG7241FA (Frame 7FA) gas turbine generators in a two-on-one combined cycle power train (ESPR 2000a, AFC §§ 1.1, 1.3.2, 3.1, 3.4.1, 5.19.7). Known as the S207FA, this configuration is nominally rated at 530 MW and 56.5 percent efficiency LHV at ISO[2] conditions (GTW 1999b).

One possible alternative machine is the ABB Alstom Power KA 24, an F-class gas turbine nominally rated at 271 MW and 57.6 percent efficiency at ISO conditions in a one-on-one combined cycle configuration (GTW 1999b).

Another alternative is the Siemens-Westinghouse 501F, nominally rated in a two-on-one combined cycle at 550 MW and 55.8 percent efficiency LHV at ISO conditions. This machine is functionally equivalent to the GE Frame 7FA.

While the KA 24 promises slightly higher fuel efficiency (57.6 percent at ISO conditions) (GTW 1999b) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft, generating a nominal 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage.

#### EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The project objectives include the flexibility to generate baseload and peaking power for sale on the spot market or via bilateral contracts (ESPR 2000a, AFC §§ 1.1, 3.1, 3.10.2, 4.2, 4.3, 4.5.1).

### *Alternative Generating Technologies*

The applicant addresses alternative generating technologies in its application (ESPR 2000a, AFC §§ 4.3, 4.5, 4.7). Natural gas- and coal-burning, nuclear fission, solar, wind, hydroelectric, biomass, fuel cell and geothermal technologies are all considered. One of the project's stated objectives is to compete as a merchant

[2] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

plant (ESPR 2000a, AFC §§ 3.1, 4.2, 4.3). 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 large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is a G-class machine, such as the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. While the 501G is rated at 58 percent efficiency (GTW 1999b), 1.5 percentage points higher than the 7FA, the G machine in a one-on-one combined cycle produces 365 MW to the 7FA's two-on-one configuration at 530 MW. A 630 MW (nominal) power plant would thus be impractical; a 365 MW power plant, without redundant gas turbines, would restrict operating flexibility. Additionally, the 501G is still new; the first such machine only recently began operation at a site in Florida owned by Lakeland Electric and Water, and at PG&E Generating's Millennium project in Charlton, Massachusetts (Power 1999). Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant may frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class gas turbine is an H-class machine. The first such plant is now in the permitting stage; Sithe Energies will build an 800 MW facility in Scriba, New York, based on two General Electric Frame 7H gas turbine generators in a two-on-one configuration (GTW 1999a). Claimed fuel efficiency is 60 percent LHV at ISO conditions (GTW 1999b). This high efficiency is achieved through a higher pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. This first Frame 7H application is not expected to enter service until the end of 2002. Given the lack of proven performance, and the reduction in operating flexibility from fewer gas turbines (one 7H combined cycle would produce 400 MW), staff agrees with the applicant's decision to employ F-class machines.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler 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 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 cooling (ESPR 2000a, AFC §§ 1.3.2, 3.4.1, 3.4.3.1, 3.10.2.1). 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 (F-class gas turbines) 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. California's electric power will be generated by those power plants that bid most successfully to sell their output to California's electricity market. Since no significantly more efficient power plants are envisioned to compete against the Project, no indirect impacts are likely.

## FACILITY CLOSURE

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

### CONCLUSIONS

The Project, if constructed and operated as proposed, would generate 630 MW of electric power at an overall project fuel efficiency around 55 percent. 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

From the standpoint of energy efficiency, staff recommends certification of the Project. No Conditions of Certification are proposed.

## REFERENCES


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# POWER PLANT RELIABILITY

Testimony of Steve Baker

## INTRODUCTION

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 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 El Segundo Power Station, LLC (ESPR) has predicted a level of reliability for the power plant (see below), staff believes ESPR should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

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

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project 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

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 newly 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 (Mavis 1998, pers. comm.).

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 (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. 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.

ESPR proposes to operate the 630 MW (nominal output) El Segundo Power Station (ESGS) at baseload, selling energy and capacity on the market and via bilateral contracts (ESPR 2000a, AFC §§ 1.2, 3.1, 3.10.2, 4.3, 5.19.2). The project is expected to operate at an overall availability in the mid-90 percent range (ESPR 2000a, AFC § 5.19.1.1), and at a capacity factor, over the life of the plant, of 60 to 65 percent (ESPR 2000a, AFC § 5.19.2).

## ANALYSIS

A reliable power plant is one that is available when called upon to operate. Throughout its intended life, the ESGS will be expected to perform reliably in baseload duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment

availability, plant maintainability, 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 ESGS 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).

### *QA/QC PROGRAM*

ESPR describes a QA/QC program (ESPR 2000a, AFC §§ 5.19.6, 5.19.6.2) 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.

ESPR plans to provide appropriate redundancy of function for the combined cycle portion of the project (ESPR 2000a, AFC §§ 1.1, 1.2, 3.1, 3.10.2.6.1, 3.10.2.7, 5.19.3.1, 5.19.3.2, 5.19.3.3; Appendix F). 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 boiler feed pumps;
- two 100 percent condensate pumps;
- four 25 percent ocean water cooling system pumps;
- two 100 percent demineralized water storage pumps;
- three 50 percent fuel gas compressors;

- two 100 percent fuel gas scrubber filters;
- two 100 percent service air compressors; and
- two 100 percent instrument air dryers.

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*

ESPR proposes to establish a plant maintenance program typical of the industry (ESPR 2000a, AFC §§ 3.10.2.2, 5.19.1.1, 5.19.1.2.2, 5.19.1.4, 5.19.6.3.1). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. For example, each gas turbine will be scheduled for annual inspections and cleaning at times of low electricity demand. Every third year, each gas turbine will undergo a hot gas path inspection. Every sixth year, each gas turbine will undergo a major maintenance turnaround. 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 ESGS will burn natural gas from the Southern California Gas Company (SoCalGas) system. Gas will be transmitted to the plant, via a new connection to the existing on-site metering station, from SoCalGas's existing 20-inch diameter pipeline (ESPR 2000a, AFC §§ 1.2, 3.4.6, 3.10.3, 5.19.4.1). This natural gas system, which provides access to gas from the Rocky Mountains, Canada and the Southwest, represents a resource of considerable capacity. This system offers access to adequate supplies of gas (ESPR 2000a, AFC § 5.19.4.1). 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 ESGS will obtain water for cooling and other plant uses from three sources. Condenser cooling, which represents 99 percent of the plant's water consumption, will be via the existing ESGS Units 1 & 2 once-through ocean water cooling system. Potable water will be obtained from the City of El Segundo's municipal water system. HRSG makeup water will be from reclaimed water supplied by the West Basin Municipal Water District (ESPR 2000a, AFC §§ 1.2, 1.3.4, 3.1.3.4.4, 3.4.7, 3.7.2, 3.7.3, 3.10.3, 4.7.5.1, 5.19.5). Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see that portion of this document entitled **Water Resources**.)

## POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation.

### *FLOODING*

The site elevation is 20 feet above mean sea level. Combined with a proper grading and drainage plan and a new wall to the west of the site, there should be no credible threat of flooding (ESPR 2000a, AFC §§ 3.3.1, 3.5.10; Figure 3.5-1). For further discussion, see that portion of this document entitled **Geology and Paleontology**.

### *SEISMIC SHAKING*

The site lies within Seismic Zone 4 (ESPR 2000a, AFC §§ 3.3.2.2, 3.5.10, 3.12.3; Table 3.12-1); see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS. 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 mid-90 percent range (ESPR 2000a, AFC § 5.19.1.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. 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

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

## CONCLUSION

ESPR predicts an equivalent availability factor in the mid-90 percent range, which staff believes is achievable in light of the industry norm of 91 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.

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# TRANSMISSION SYSTEM ENGINEERING

Testimony of Linda Davis

## INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's certification process. This staff analysis indicates 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.

Under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the project," which may include facilities not licensed by the Energy Commission (CCR, tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system. This staff assessment indicates whether or not the applicant has accurately identified all interconnection facilities and conformance with applicable LORS[1].

The El Segundo Power II LLC (the applicant) proposes to connect their EL Segundo Power Redevelopment Project (the project), to the existing 230 kV transmission system. Staff's TSE analysis evaluates the power plant switchyard, outlet line, termination facilities and outlet alternatives identified by the applicant.

## PROJECT DESCRIPTION AND EXISTING FACILITIES

The El Segundo project utilizes an existing site, increasing generation at the site by 280 megawatts (MW) for the purpose of TSE analysis. The full plant output after redevelopment will be 630 MW for purpose of transmission system analysis. New transmission facilities are limited to those on site that will connect the new generating facilities with the on-site El Segundo substation. No new transmission lines are required for the project. Two new generator lead lines will connect the switchyard to the existing El Segundo substation, located on site. The 230 kV lead lines will connect the 230 kV transformers in the switchyard with existing 230 kV equipment in the El Segundo substation. Due to the use of existing on-site facilities, CEC staff concludes no alternatives would be feasible at the site that would vary significantly from the applicant's proposed transmission interconnection.

[1] LAWS, ORDINANCES, REGULATIONS AND STANDARDS: California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction"; National Electric Safety Code, Title 8 of the California Code and Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders"; National Electric Code, CPUC Rule 21 and utility standards for the reliable connection of generating stations; Western Systems Coordinating Council (WSCC) Reliability Criteria; North American Electric Reliability Council (NERC) Planning Standards; Cal-ISO Reliability Criteria, Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria and other industry standards.

No new or modified transmission facilities beyond the project's interconnection with the existing transmission system have been identified to be required as a result of the power plant addition to the California transmission system. Other than the described interconnection facilities, no new facilities are expected to be required to accommodate the project's online date. Power flow analysis shows that thermal overloads occur on existing lines in the vicinity under stressed conditions before the power plant addition; however the project will not trigger newly identified overloads that require significant new transmission facilities. Thermal overloads attributable directly to the project have been identified that may be mitigated through ISO operation (Remedial Action Schemes or Congestion Management) which reduces the output of the project and avoids physical upgrades to the system. Reduction of the output of the El Segundo generating units is well established as a mitigation measure to relieve local thermal overloads. The applicant states a commitment to RAS and project re-design to avoid overload conditions that would trigger the need for new upgrades. (ESPR 2001.)

## ANALYSIS

## INTERCONNECTION FACILITIES

This staff assessment indicates whether or not the applicant has accurately identified all interconnection facilities and that the project will conform to all applicable LORS required for safe and reliable electric power transmission. Major new interconnection facilities include three new 18/230 kV generator step-up transformers and two new 230 kV overhead generator lead lines extending from the step up transformers to the existing El Segundo substation. No major new equipment is required for the El Segundo substation to accommodate the project. The onsite facilities will be owned, operated and maintained by the project owners. (ESPR 2000a)

### *SWITCHYARD/SUBSTATION*

The on site switchyard will be designed with applicable industry standards and will include three new generator step-up transformers. The 230 kV breakers, disconnect switches and surge arrestors will be appropriately sized as determined by the Detailed Facilities Study. No major new equipment is required for the El Segundo substation to accommodate the project. The onsite facilities will be owned, operated and maintained by the project owners and are to be designed to meet or exceed the requirements of G.O. 95. (ESPR 2000a.)

### *TRANSMISSION LINE*

Two new generator lead lines will connect the project switchyard to the existing El Segundo substation, located on site. The 230 kV lead lines will connect the 230 kV transformers in the switchyard with existing 230 kV equipment in the El Segundo substation. The lead lines will be designed to meet or exceed the requirements of G.O. 95. The conductor is to be bundled 765-kcmil ACSR, which carry a maximum load of 607 MVA for each lead line, which is appropriate for the project requirements. No new off site transmission facilities are required to interconnect the

project. Reduction of the output of the old El Segundo generating units is well established as a mitigation measure to relieve local thermal overloads. If triggered, physical upgrades are most likely to comprise re-conductor and rerate of existing overhead and underground lines and equipment within existing utility right of way and within the fence lines of existing substations. (ESPR 2000a.)

### *DOWNSTREAM IMPACTS*

The project impacts on the transmission system downstream of the interconnection facilities are discussed in the System Reliability section. No new or modified transmission facilities beyond the project's interconnection with the existing transmission system are identified as a result of the power plant addition to the California transmission system.

## SYSTEM RELIABILITY

### *INTRODUCTION*

A system reliability study is performed to determine the affects of connecting a new power plant to the existing electric grid. The study identifies impacts and also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities, required to connect a project to the grid are considered part of the project and are subject to the full Application for Certification review process.

### *SYSTEM RELIABILITY STUDY*

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations) under normal (N-O) conditions. In addition to the above analysis, studies may be performed to verify that sufficient reactive power (see Definition of Terms) is available. The reliability evaluation must be conducted for all credible "emergency" conditions. Emergency conditions could include the loss of a single (N-1) or double circuit (N-2) line, the loss of a transformer or generator, or a combined loss of these facilities. A Preliminary Facilities Study is conducted in advance of potential system changes, such as the addition of the project into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria. The reliability implications of the project and the need for additional facilities are determined by the Cal-ISO based on the Detailed Facilities Study. A preliminary determination of compliance with applicable reliability criteria has been provided by the Cal-ISO (Cal-ISO 2001).

### *SCOPE OF RELIABILITY STUDIES*

Power flow, short circuit and stability studies with and without the project are performed to determine conformance with reliability criteria. The project is modeled in the studies with an additional plant delivery of 280 MW for power flow analysis. These studies model conditions that place significant stress on the relevant transmission system facilities to evaluate the effect of the project power on the existing system. The study results provide snapshots of highly stressed operation

and are not illustrative of month to month or day to day operation. Power flow studies included generators and expansion plans for facilities and were based on the assumption that the project would be completed and generating power in the late spring of 2003. As a result, the 2003 cases used as a basis for the studies are considered valid for the purpose of the ISO and TSE analysis.

## *POWER FLOW STUDY RESULTS*

The power flow study results indicate that under the stressed conditions studied for this analysis an extensive list of existing line overloads are slightly increased due to the project. In addition, a limited number of heavily loaded facilities reach overload conditions with the addition of the project. However, no new or modified transmission facilities beyond the project's interconnection with the existing transmission system are identified to be required as a result of the power plant addition. New and increased overloads are listed in the summary that follows:

<u>Load flow analysis for Spring 2003 Transmission System Planning Model conditions</u>

1. Under N-O conditions, addition of the project increases four pre-existing overloads:

    - Alamitos-Barre #2 230 kV line loading increases from 180% to 184%
    - Del Amo-Hinson 230 kV line loading increases from 117% to 123%
    - Hinson-Lighthipe 230 kV line loading increases from 104% to 109%
    - Lighthipe-Mesa 230 kV line loading increases from 107% to 113%

2. The project triggers three new overloads for N-1 contingencies:

    - Chevmain-El Segundo 230 kV line for N-1 El Nido-El Segundo 230 kV(92% to 118%)
    - (2) El Nido-La Fresa #3 and #4 230 kV line for N-1 El Nido-La Fresa #4 and #3 230 kV (wavetrap 70% to 146%)

3. The project increases seven existing overloads for N-1 contingencies:

    - Chevmain-El Segundo 230 kV line for N-1 El Nido-El Segundo 230 kV line
    - El Nido-El Segundo 230 kV line for N-1 Chevmain-El Segundo 230 kV line
    - La Fresa-Laguna Bell 230 kV line for N-1 Mesa-P170 230 kV line
    - Mesa-P170 230 kV line for N-1 Lighthipe-Mesa 230 kV line
    - Barre-Lewis 230 kV line for N-1 Barre-Villa Park 230 kV line
    - Barre-Villa Park 230 kV line for N-1 Barre-Lewis 230 kV line
    - Center-Olinda 230 kV line for N-1 Mesa-Walnut 230 kV line

4. The project triggers two new overloads for N-2 contingencies:

    - El Nido-La Cienega 230 kV line for N-2 El Nido-La Fresa #3 and #4 230 kV
    - La Fresa-Hinson 230 kV line for N-2 Mesa-P170 & La Fresa-Laguna Bell 230 kV

5. The project increases five existing overloads for N-2 contingencies. They are:

- Center-Del Amo 230 kV line for N-2 Mesa-P170 and Lighthipe-Mesa 230 kV
- Del Amo-Ellis 230 kV line for N-2 Alamitos-Barre #1 and #2 230 kV
- Harbor-Hinson 230 kV line for N-2 Del Amo-Hinson and Hinson-Lighthipe 230 kV
- Harbor-Long Beach 230 kV line for N-2 Del Amo-Hinson & Hinson-Lighthipe 230 kV
- Long Beach-Lighthipe 230 kV line for N-2 Del Amo-Hinson & Hinson-Lighthipe 230 kV

<u>Load flow analysis for Heavy Summer 2003 conditions</u>

1. Under N-O conditions, addition of the project increases two pre-existing overloads:

- Alamitos-Barre #2 230 kV line loading increases from 177% to 182%
- Del Amo-Hinson 230 kV line loading increases from 110% to 115%

2. The project triggers three new overloads for N-1 contingencies:

- Chevmain-El Segundo 230 kV line for N-1 El Nido-El Segundo 230 kV (91% to 116%)
- La Fresa-Laguna Bell 230 kV line for N-1 Del Amo-Hinson 230 kV (99% to 112%)
- Mesa-Walnut 230 kV line for N-1 Center-Olinda 230 kV (106% to 110%)

3. The project increases three existing overloads for N-1 contingencies:

- Chevmain-El Nido 230 kV line for N-1 El Nido-El Segundo 230 kV line
- El Nido-El Segundo 230 kV line for N-1 Chevmain-El Segundo 230 kV line
- Center-Olinda 230 kV line for N-1 Mesa-Walnut 230 kV

4. The project triggers one new overload for N-2 contingencies:

- El Nido-La Cienega 230 kV line for N-2 El Nido-La Fresa #3 and #4 230 kV

5. The project increases five existing overloads for N-2 contingencies:

- Harbor-Hinson 230 kV line for N-2 Del Amo-Hinson and Hinson-Lighthipe 230 kV
- Harbor-Long Beach 230 kV line for N-2 Del Amo-Hinson and Hinson-Lighthipe 230 kV
- Long Beach-Lighthipe 230 kV line for N-2 Del Amo-Hinson and Hinson-Lighthipe 230 kV

The above list shows that the project increases already existing and heavy loading and overloads on a great number of lines that are already expected to be required

to be upgraded or rerated to meet existing overloads, or that are already operated to avoid overload conditions. Overloads that are directly attributable to the project are limited to those circuits for which reduction of the output of the El Segundo generating units is well established as a mitigation measure to relieve local thermal overloads. Staff concludes that the implications are that the project will not require major system additions beyond the interconnection facilities, which would trigger the need for environmental review. (ESPR 2000i.) The applicant states a commitment to RAS and project re-design to avoid overload conditions that would trigger the need for significant new physical upgrades. (ESPR 2001.)

### *SHORT CIRCUIT STUDY RESULTS*

Short circuit analyses are conducted to assure that existing and proposed breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The short circuit duty analysis found that the El Segundo Project increases three-phase short circuit duties by 0.1 kA or more and have duty levels above 60% of name plate three-phase rating at thirteen 230 kV busses. Analysis of single-phase-to-ground short circuit duty for the El Segundo Project will be conducted in the Facility Study. All post transient voltages were within planning criteria for the critical contingencies tested. Breaker work and any substation equipment replacement will occur inside the fence lines of the existing substation. The fault duty studies were based on parameters provided by the applicant. The results could be significantly different if the actual parameters differ substantially from the data used in the Facilities Study. However, since circuit breaker replacement and new relays are considered a “within the fence” change for the project, the determination of actual parameters until after the Energy Commission’s decision on project certification is acceptable. (ESPR 2000i.)

### *STABILITY STUDY RESULTS*

Stability studies were performed to ensure that the transmission system remains stable during normal and abnormal operating conditions with the project connected to the system. Dynamic stability analysis found no new unstable system condition with addition of the project for either spring or summer cases. (ESPR 2000i.)

### *CAL-ISO REVIEW*

The Cal-ISO review of the applicant’s submittals supports the CEC staff’s analysis, states preliminary interconnection approval, and recommends development of a Facilities Study for the EL Segundo Project. The Facility Study will develop Remedial Action Schemes to determine the generation reduction required to mitigate overloads. In the event that physical reinforcements are required to alleviate overloads, the facilities study will list all the generation projects that contribute to the problem for development of cost sharing among those generators responsible for the overloads. That is, the project will be required to contribute to cost sharing of system reinforcements, however will not be considered to have solely triggered the need for physical reinforcements. No significant new downstream project facilities are likely to be identified as required to accommodate the project in the additional studies. The Cal-ISO will provide testimony as required on the Facilities Study Report and Supplemental Studies, will discuss the conclusions and analysis of the additional information requested in the preliminary

approval letter, and will provide conclusions and findings in the Energy Commission's hearings. The Cal-ISO final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. (Cal-ISO 20001.)

### *ALTERNATIVE TRANSMISSION LINE ROUTES*

Due to the use of existing on-site facilities, CEC staff concludes no alternatives would be feasible at the site that would vary significantly from the applicant's proposed transmission interconnection. (ESPR 2000a.)

## CONCLUSIONS

Staff's findings indicate no new major transmission facilities will be required to accommodate the project. The project switchyard, 230 kV generation leads, and interconnection equipment at the El Segundo substation are located onsite and are planned to meet NERC, WSCC, and Cal-ISO reliability criteria. No significant new downstream facilities are identified to be required as a result of the project. The Cal-ISO has issued a preliminary letter of approval and will confirm staff's conclusion upon issuance of the final interconnection approval letter. The power plant switchyard and termination are acceptable and will comply with LORS. The Transmission System Engineering analysis provides the basis for the findings in the Energy Commission's decision for certification.

## CONDITIONS OF CERTIFICATION

**TSE-1** The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

**Verification:** At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment in **Table 1: Major Equipment and Structure List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

**Table 1: Major Equipment and Structure List**

| QTY | DESCRIPTION | SIZE/CAPACITY | COMMENTS |
|---|---|---|---|
| | Breakers | Voltage, Amps | |
| | Step-up transformer | kV | |
| | Switchyard | | |
| | Busses | | |
| | Surge Arrestors | | |
| | Disconnects | | |
| | Take off facilities | | |
| | Electrical Control Building | | |
| | Switchyard control building | | |
| | Transmission Pole/Tower | | |
| | Other | | |

(1) All sizes and capacities are approximate and may change during final design.

**TSE-2** Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**TSE-3** The project owner shall keep the CBO informed regarding the status of engineering design and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification.

**Verification**: The project owner shall submit monthly construction progress reports to the CBO and CPM to be included in response to **GEN-7**. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

**TSE-4** For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

a) receipt or delay of major electrical equipment;
b) testing or 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 compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

**TSE-5** The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The substitution of Compliance Project Manager (CPM) and CBO approved "equivalent" equipment and equivalent substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

a. The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", National Electric Safety Code (NEC) and related industry standards.
b. Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
c. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
d. Termination facilities shall comply with CPUC Rule 21 and applicable interconnection standards (Southern California Edison).
e. The project conductors shall be sized to accommodate the full output from the 630 MW plant (280 MW project increase).
f. The project owner shall provide:
    i. The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Remedial Action Scheme (RAS) sequencing and timing if applicable,
    ii. Executed Facility Interconnection Agreement.

**Verification:** At least 60 days prior to the start of construction of transmission facilities, the project owner shall submit to the CBO for approval:

a. Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, CPUC Rule 21, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.
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"[2] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, CPUC Rule 21, applicable interconnection standards, and related industry standards.

c. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.

d. The Facilities Study and signed letter from the applicant stating that mitigation is acceptable shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO approval.

**TSE-6** The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

**Verification:** At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

**TSE-7** The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, 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

[2] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", CPUC GO-21, and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

b. An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

c. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in responsible charge.

## REFERENCES


Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator) 2001. California ISO's comments regarding the System Impact Studies and Detailed Facilities Study Report. Letter from Jeff Miller, dated April 4, 2001. Revised May 10, 2001.

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000h – Supplement information areas: Project Description, Biological Resources, Water Resources, Traffic and Transportation, Visual Resources, Transmission System Engineering, Socioeconomic and Worker Safety Submitted to California Energy Commission on January 18, 2001.

ESPR (El Segundo Power Station) – 2000i – System Interconnect Study submitted to the California Energy Commission on February 8, 2001.NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

ESPR (El Segundo Power Station) – 2001 – Record of Telephone conversation between CEC staff and the legal counsel for the applicant, John McKinsey. The applicant reports that RAS is planned to avoid overloads over upgrades of the overhead/underground or other transmission lines, and in the event

that RAS developed for the full plant output will not meet required criteria for transmission system reliability, the project is committed to modification of the generation project design to make RAS work and thereby avoid physical upgrades to transmission lines. April 26, 2001.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

## DEFINITION OF TERMS

| | |
|---|---|
| AASS | Aluminum cable steel supported. A composite conductor made up of aluminum wire with a steel core, which supports the conductor. |
| ACSR | Aluminum cable steel reinforced. A composite conductor made up aluminum wire with a steel core, which reinforces the conductor. |
| Ampacity | Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations. |
| Ampere | The unit of current flowing in a conductor. |
| Bundled | Two wires 18 inches apart. |
| Bus | Conductors that serve as a common connection for two or more circuits. |
| Conductor | The part of the transmission line (the wire) which carries the current. |
| Congestion Management | Congestion management is a scheduling protocol, which provides that dispatched generation, and transmission loading (imports) will not violate criteria. |
| Emergency Overload | See Single Contingency. This is also called an L-1. |
| Kcmil or 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. |
| L-1 | The outage of a single circuit. |

| | |
|---|---|
| Loop | An electrical cul de sac. A transmission configuration, which interrupts an existing circuit, diverts it to another connection and returns a different circuit forming a loop or cul de sac. |
| Megavar | One megavolt ampere reactive. |
| Megavars | Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. |
| Megavolt ampere | MVA. A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000. |
| Megawatt | MW. A unit of power equivalent to 1,341 horsepower. |
| Normal Operation/ Normal Overload | When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating. |
| N-1 Condition | See Single Contingency. Also called an L-1. |
| 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 motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system. |
| Remedial Action Scheme (RAS) | A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload. |
| SF6 | Sulfur hexafluoride is an insulating medium. |
| Single Contingency | Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service. |
| Solid dielectric cable | Copper or aluminum conductors that are insulated by solid |

| | |
|---|---|
| | polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket. |
| Thermal rating | See ampacity. |
| TSE | Transmission System Engineering. |
| 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 James W. Reede, Jr.

## INTRODUCTION

The California Environmental Quality Act (CEQA) allows a state agency, such as the California Energy Commission, to utilize its own "regulatory program" review process in lieu of the "environmental impact report" (EIR) review process specified in CEQA. However, to do so the agency's regulatory program must be "certified" by the Secretary of the Resources Agency. (Public Resources Code Section 21080.5). The Energy Commission's Power Plant Siting Regulatory Program is such a "certified regulatory program" under CEQA.

With regard to the "Alternatives" analysis required in a certified siting proceeding such as the El Segundo Power Redevelopment Project (ESPR) application, the CEQA Guidelines (Cal. Code Regs., tit. 14, Section 15252) state that:

> " The document used as a substitute for an EIR or negative declaration in a certified program shall include at least the following items:
>
> (b) Either:
>
> (1) Alternatives to the activity and mitigation measures to avoid or reduce any significant or potentially significant effects that the project might have on the environment, or
>
> (2) A statement that the agency's review of the project showed that the project would not have any significant or potentially significant effects on the environment and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment. This statement shall be supported by a checklist or other documentation to show the possible effects that the agency examined in reaching this conclusion."

The Warren-Alquist Act specifies that a party filing an "Application for Certification" of a natural gas fired power plant "modification" (such as the ESPR project) is not required to provide any information *in its application* on alternative *sites* for the proposed facility. (Public Resources Code Section 25540.6(a) and (b)). However, the Energy Commission's Siting Regulations (Cal. Code Regs., tit. 20, Section 1765) require that:

> "At the hearings . . . on an application exempt from the [Notice Of Intent] requirements pursuant to Public Resources Code section 25540.6, the parties shall present information on the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment."

In light of these provisions, staff presents information in this section on the "feasibility of available site and facility alternatives to the applicant's proposal that substantially lessen the significant adverse impacts of the proposal on the

environment" (Cal. Code Regs., tit. 20, §1765). Staff also analyzes whether there are any feasible alternative designs or alternative technologies, including the "no project alternative," that may be capable of reducing or avoiding any potential impacts of the proposed project while achieving its major objectives.

## SCOPE AND METHOD FOR THIS ALTERNATIVES ANALYSIS

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 this alternatives analysis, staff used the methodology summarized below:

- Identify the basic objectives and potential significant impacts of the 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 at alternative sites and the degree to which any significant impacts of the project would be substantially lessened at such alternative sites.
- Identify and evaluate *facility design and related facilities alternatives* to the project as proposed.
- Identify and evaluate *technical alternatives* to the project. The principle project alternatives examined that do not require the construction of a natural gas-fired facility are 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*).

## STAFF'S ALTERNATIVES ANALYSIS

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 ESPR project. These alternatives were developed in response to information received from the 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 :

- produce cost-effective electricity to compete in California's deregulated electricity markets;
- improve the overall environmental performance and reliability of the electrical generating sector in Southern California;
- produce electricity with minimal environmental impacts;
- alleviate the consequences of today's capacity shortage in Southern California; and
- assist in meeting the projected energy demand growth in Los Angeles County;

Staff recognizes that applicant's stated objectives include taking "advantage of the existing site and area infrastructure" (ESPR 2000a, AFC page 2-9). Existing infrastructure in the immediate vicinity of the project site does include adequate natural gas supplies for the needs of the project. For this reason, staff has determined that making use of local infrastructure *to the extent feasible* is a clearer statement of the project's objectives.

## PROJECT DESCRIPTION AND SETTING

A more complete description of the project and its setting is presented in the **Project Description** section of this document.

### *PROJECT SITE*

The applicant proposes to modify an existing power plant in El Segundo, California, an incorporated city in Los Angeles County. This facility consists of 3 contiguous parcels approximately 34 acres in size. The site is bordered by Vista Del Mar Boulevard and the Chevron Refinery on the east, Santa Monica Bay on the west, 45$^{th}$ Street of the City of Manhattan Beach on the south and the Chevron Marine terminal on the north. The facility is located at Township 3 South, Range 15 West, of the Venice USGS Quadrangle Map. See **Project Description Figure 1.**

### *POWER PLANT*

The new combined cycle facility is expected to generate 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and their replacement with Units 5, 6, and 7 in the footprint of Units 1 and 2. The steam cycle heat rejection system, which utilizes cooling water from Santa Monica Bay, will remain and be used for the new equipment. The existing ESGS Units 3 and 4 located adjacent to Units 1 and 2 will not be modified by this project.

Units 5 and 7 will be General Electric PG7241FA combustion turbine generators. These natural gas fired generators will each have a base load gross output of 171.7MW. The gross output will be increased to 183.4 MW for peak loads by using steam injection. The combined cycle configuration will be accomplished with the addition a Heat Recovery Steam Generator (HRSG) to the exhaust outlets of both Units 5 and 7. The addition of a General Electric Steam Turbine Generator (STG) will complete the combined cycle configuration. The STG will have a peak generating output of 280MW.

The project will use Selective Catalytic Reduction (SCR), a dry, low NOx combustor and an oxidation catalyst system to reduce air emissions. An ammonia pipeline will be installed into the directly adjacent Chevron marine terminal property to deliver ammonia to the site for SCR.

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 will look on the site. **Project Description Figure 4** shows elevations of the power plant facilities.

## *RELATED FACILITIES*

### TRANSMISSION SYSTEM INTERCONNECTION

The project site is located adjacent to an existing SCE-owned 230 kilovolt (kv) switchyard. ESPR plans to connect directly to this switchyard through new connections. Three new generator step-up transformers will be installed and connected to the existing 230 kV switchyard. The connections to the switchyards will be made via aboveground lead lines and new steel support poles. No new transmission lines or transmission line upgrades are planned as part of this project (ESPR 2000a, AFC page X.

### NATURAL GAS SUPPLY PIPELINE

The existing natural gas supply pipeline owned by Southern California Gas has sufficient capacity to supply the needs of the proposed plant site.

### RAW WATER SUPPLY

Water requirements for the project are estimated at 207 million gallons per day at full operation and will be supplied from a combination of sources. The new units will use the existing seawater cooling system without modifying the intake or outfall structures and lines, and without modifying the flow rates and capacity. The applicant has proposed use of a pilot project to ascertain the viability of reducing fish kill.

The City of El Segundo, through purchases from the Metropolitan Water District, will supply potable water. The plant will be using approximately 180,000 gallons per day.

The West Basin Municipal Water District will supply approximately 86,000 gallons of reclaimed water per day for both irrigation and for pumps and bearings seal water augmentation.

### WASTEWATER DISPOSAL

Wastewater discharge falls into two categories, process and sanitary. Process wastewater will be routed through the existing circulating water system ocean outfall and the sanitary wastewater discharges will be directed to the City of Manhattan Beach Municipal Sanitary Sewer System.

## POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

In the Issues Identification Report (IIR), staff identified potential significant environmental effects of the proposed project on air quality, biological resources, visual resources and water resources (CEC 2000a). Since that time, additional information has caused staff to revise its assessment of some potential impacts. Staff's current assessment of the expected environmental consequences of the proposed project is summarized below for technical areas where issues have been identified. Staff's assessment is presented in more detail in the individual sections of this document.

### *AIR QUALITY*

Staff initially identified air quality issues relating to emission reduction credits (ERCs) and Best Available Control Technology (BACT) that could have resulted in significant impacts or affected the project schedule. When staff filed the IIR, a portion of the necessary ERCs for the El Segundo Power Plant remained inadequately identified. Staff is currently satisfied that ESPR is making the progress needed to obtain sufficient ERCs to offset the project's emissions.

Staff also expressed concern in the IIR that ESPR's BACT analysis would not be considered sufficient by the U.S. Environmental Protection Agency (EPA). Staff worked with the ESPR, the air district, and the EPA during the Discovery and Analysis Processes to resolve these issues.

### *BIOLOGICAL RESOURCES*

The proposed project may directly impact a variety of species known to occur in the project vicinity. The applicant has developed a mitigation strategy that seeks to maximize avoidance of impacts to species and their habitat (ESPR 2000a). While ESPR has proposed mitigation measures that include items such as avoidance of habitat, implementation of a worker environmental awareness program, and the design of features to protect species from harm, staff has determined that ESPR's recommended impact avoidance measures have not gone far enough in reducing potential impacts. Consequently, staff has imposed Conditions of Certification that will mitigate potential impacts. Finally, additional biological surveys at the power plant must be completed prior to, during, and after construction, and appropriate mitigation implemented if significant impacts are found. More information on these issues in provided in the **Biological Resources** section of this document.

### *CULTURAL RESOURCES*

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed ESPR project has the potential to adversely affect both known and unknown cultural resources. ESPR has proposed mitigation measures to avoid significant impact to cultural resources. Staff concurs with the mitigation measures proposed by the applicant in the AFC and associated filings. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

### *LAND USE*

The Federal Aviation Administration and the California Department of Transportation, Aviation Division have determined that the location of the stacks at the project site does not pose a hazard to navigation at the Los Angeles International Airport.

#### *NOISE*

During the course of the staff workshops concerns and questions were raised regarding the potential impacts of noise generated by the project. Staff required the applicant to perform additional monitoring and has included that information in the SA. Staff has addressed the requirements of the Cities of El Segundo and Manhattan Beach and have made Conditions of Certification to preclude impacts due to the generation of noise.

### *TRAFFIC AND TRANSPORTATION*

The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases causing the LOS for various roadways to increase beyond LOS thresholds established by local and regional authorities. During the construction phase, increased commuter traffic caused by the workforce could also result in some traffic congestion. ESPR has proposed ways to reduce traffic impacts. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal. The water supply line construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. Although all of these impacts are expected to be short-term they have the potential to be significant. In the AFC, ESPR proposed to provide appropriate traffic control mitigation measures to avoid significant impacts from this construction activity. Based on staff's analysis, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur.

### *VISUAL*

Current staff analysis had identified potentially significant visual impacts from numerous key observation points. ESPR included in its application mitigation measures for visual impacts, including its intention to work with the Cities of El

Segundo and Manhattan Beach to further refine the landscape/grading plan to screen views of the project (ESPR 2000a, AFC section 5.13). Based on the information gathered to date, staff believes the visual impacts of the project can be mitigated to less than significant levels through the appropriate use of landscaping and screening treatments. A more detailed analysis of these impacts and their potential mitigation is discussed in the staff assessment VISUAL RESOURCES section.

## ALTERNATIVES TO THE PROJECT

As discussed above, the Energy Commission siting regulations require the parties in a siting case exempt from the Notice of Intention proceedings to present "information on the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment" (Cal. Code Regs., tit. 20 §1765).

### *SITE ALTERNATIVES*

Consistent with the CEQA Guidelines, the scope of staff's consideration of alternative sites was guided by consideration of whether most project objectives could be accomplished at alternative sites, and whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project (Cal. Code Regs., tit. 14 §15126.6(a)). As discussed below, staff has determined that locating the project at an alternative site would not achieve one of the major objectives of the project and would not substantially lessen currently identified significant impacts of the project. Under these circumstances, staff has applied the "rule of reason" and decided that it need not perform a detailed analysis of alternative *sites*.

#### MEETING MAJOR OBJECTIVES OF THE PROJECT

ESPR's basic objectives are to provide economically competitive electricity in Southern California while minimizing impacts and costs by making use of an existing power plant site and related infrastructure to the extent feasible. The project as proposed in the AFC would make use of much of the infrastructure of the existing site, including the existing water supply, former oil storage tanks, natural gas supply line, and access to the adjacent SCE switchyard to connect to the transmission grid. The project will include the addition of two new combined cycle power plant units, the construction of a pipeline to supply aqueous ammonia, a new pipeline to supply both potable and reclaimed water, and a new wastewater pipeline connection. As such, the project is a "modification" that will make substantial use of the existing site and infrastructure, but will also require key new infrastructure.

Based on this analysis, staff has determined that the proposed project makes substantial use of the existing infrastructure. A "stand-alone" combined cycle power plant at an alternative site that makes no use of the infrastructure at the existing site is possible. However, this alternative would not achieve one of the major objectives of this project, namely the avoidance of the significant impacts and costs of the project by using existing on-site infrastructure to the extent feasible.

## REDUCING SIGNIFICANT ENVIRONMENTAL IMPACTS

Staff's review of the proposed project has identified some potentially significant impacts. Staff's analysis of these impacts is discussed below. Staff's assessment has not identified any significant impacts that would be substantially lessened by locating the project at an alternative site.

### *Air Quality*

Staff identified two air quality issues in the IIR. At the time the AFC was accepted, ESPR had not adequately identified the ERCs needed for the project, and staff was not satisfied that EPA would find ESPR's BACT analysis sufficient. Both issues have since been resolved, and neither would be affected substantially by locating the project at an alternative site.

### *Biological Resources*

The most significant direct effect on coastal resources due to current and proposed facility operations appears to be the ongoing mortality of marine species due to the facility's ocean water intake and discharge system. The main reasons for the mortality are entrainment and impingement caused by water intake and thermal discharges from the facility, including heat treatment used to clear marine organisms from the intake pipe.

The current and proposed project operations would require intake and discharge of approximately 207 million gallons per day (mgd), resulting in entrainment and impingement of numerous marine species. While the proposed redevelopment would result in a more effective use of ocean water (i.e., increased power production while using the same amount of ocean water for cooling), it would also continue the ongoing unmitigated loss of marine resources that is occurring under current operations.

Information provided in the AFC largely compares proposed project impacts to the existing ESGS operations and states that impacts will be the same or will decrease. By describing existing levels of the facility's impacts as the baseline, we are not provided adequate understanding of the full effect of current operations on the various affected marine species, nor are we able to adequately determine alternatives that may be available and necessary to avoid, reduce, or compensate for these impacts. This is of further concern given that the findings regarding entrainment and impingement effects of the ocean intake are based largely on a 316(b) study done in the 1982 for another nearby coastal power plant (Scattergood), along with some more recent monitoring data obtained in 1997 showing ongoing effects to marine species. It is not likely that the methodologies and findings of this nearly twenty-year old study are adequate to review the impacts of the current or proposed facility operations, given the developments in sampling techniques and methodologies, increased understanding of marine ecosystems, and other scientific advances that have occurred in the past several decades.

Our concerns are increased given the existing conditions of Santa Monica Bay. As described in the AFC, "the biological community in Santa Monica Bay has been

identified as being imbalanced, severely stressed, or known to contain toxic substances in concentrations that are hazardous to human health." (p. 5.5-11). Additionally, Santa Monica Bay is described as impaired on the current 303(d) list due to levels of mercury, cadmium, copper, lead, nickel, silver, zinc, chlordane, DDT, and PCBs. Even though the AFC did not adequately describe the cumulative impacts of current or proposed ESGS operations when evaluated alongside these other above-mentioned impacts, staff has proposed mitigations that will reduce any impacts below the level of significant.

Staff has identified issues that remained unresolved at this time. The U.S. Fish and Wildlife Service (USFWS) is expected to issue a Letter of Concurrence after completion of the applicant's Biological Assessment and informal consultation, but a formal Section 7 consultation may still be necessary. In addition, the need for the state Incidental Take Permit, which would be issued by the California Department of Fish and Game, has not yet been determined. Finally, additional aquatic biological surveys at the power plant site must be completed prior to, during and after construction, and appropriate mitigation implemented if significant impacts are found.

While staff understands that marine issues could be a potentially significant impact, staff has also reviewed the potential for terrestrial biological impacts that resulted from previous Commission-reviewed greenfield and brownfield sites and concludes that the magnitude of biological impacts would be similar in nature at alternative sites.

### *Cultural Resources*

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed ESPR project has the potential to adversely affect both known and unknown cultural resources. Staff has determined that appropriate implementation of the mitigation measures proposed by ESPR will avoid significant impact to cultural resources.

### *Traffic and Transportation*

The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases causing the LOS for various roadways to increase beyond LOS thresholds established by local and regional authorities. The water supply line construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. Although all of these impacts are expected to be short-term they have the potential to be significant. In the AFC, ESPR proposed to provide appropriate traffic control mitigation measures to avoid significant impacts from this construction activity. Based on staff's analysis, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur.

### *Visual*

Staff has identified potentially significant visual impacts from numerous key observation points. In the AFC, ESPR proposed to develop a landscape/grading

plan to screen views of the project as a visual mitigation measure. Based on the information gathered to date, staff believes the visual impacts of the project can be mitigated to less than significant levels through implementation of this landscape/grading plan. A more detailed analysis of the degree to which ESPR's proposed mitigation will reduce these impacts is discussed in detail in the Visual Resources staff analysis section.

#### *Water Resources*

The project as proposed in the AFC does not impose potentially significant impacts on water supply through the use of large volumes of Santa Monica Bay water for once-through cooling. The most feasible means of substantially reducing these impacts would be by identifying alternative water supplies or by reducing the project's use of water. Developing the project at an alternative site would require identification and use of substantial alternative water supplies. Therefore, the water resources impacts of the original proposal do not require analysis of alternative sites.

#### *"Site" Alternatives Conclusion*

Staff's analysis of alternative sites, presented above, is based on a review of the major objectives of the project, and the impacts identified in this document. Staff first considered whether the project's objectives could be accomplished at alternative sites. Staff found that while developing a similar project at an alternative site is possible, this would not minimize impacts and costs by making use of the existing site and infrastructure, which is one of the major objectives of the project. Staff also considered whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project. Locating a similar project at an alternative location would not substantially reduce any of the impacts of the project identified to date. Based on these two factors, staff has applied the "rule of reason" and determined that a detailed alternative sites analysis is not needed.

### *FACILITY DESIGN ALTERNATIVES*

ESPR analyzed six facility design alternatives to its proposed project that made use of the existing facility but represented significant design differences from the proposal. Staff has considered those six alternatives as well, namely: plant configurations / arrangements, simple replacement of the existing boilers, other base-load combined cycle capacity, alternative wastewater disposal, alternative cooling technologies, and alternative air emission control technologies. These alternatives are discussed in detail in the various engineering sections of the SA. Staff has determined that the alternative facility designs are inferior to the proposed design and would not lessen the impacts of the proposed project.

### *RELATED FACILITIES ALTERNATIVES*

#### NATURAL GAS SUPPLY PIPELINE

The current natural gas supply to the existing plant is sufficient to supply the proposed combined cycle units.

### WASTEWATER DISPOSAL

ESPR proposes to discharge wastewater through a new 12-inch water pipeline into the City of Manhattan Beach Sanitary Sewer system. No alternatives for the wastewater disposal were considered in this analysis.

### TRANSMISSION LINES

ESPR proposes to connect to the regional electric transmission grid through the adjacent SCE switchyard. No additional transmission lines and no transmission line upgrades are required to accommodate the output of the proposed facility.

#### *Guidance Pertaining to Transmission Line Siting*

Senate Bill 2431 (Garamendi, 1988) specifies that planning and siting of new transmission facilities be pursued in the following order (CEC 1992):

1. The use of existing right-of-way should be encouraged by upgrading existing transmission facilities where technically and economically feasible.
2. Expansion of existing right-of-way should be encouraged whenever construction of new transmission lines is required.
3. New right-of-way should be created when justified by environmental, technical, or economic reasons, as determined by the appropriate licensing agency.
4. Agreement among all interested utilities should be sought on efficient use of new transmission capacity whenever there is a need to construct such capacity.

Following this guidance, no alternative transmission connections to the proposed project are feasible.

## *TECHNOLOGY ALTERNATIVES*

### DEMAND SIDE MANAGEMENT

One alternative to a power generation project could be programs to reduce energy consumption. These programs are typically called “energy efficiency,” “conservation,” or “demand side management” programs. One goal of these programs is to reduce overall electricity use; some programs also attempt to shift such energy use to off-peak periods.

The Energy Commission is responsible for several such programs, the most notable of which are energy efficiency standards for new buildings and for major appliances. The California Public Utilities Commission supervises various demand side management programs administered by the regulated utilities, and many municipal electric utilities have their own demand side management programs. The combination of these programs constitutes the most ambitious overall approach to reducing electricity demand administered by any state in the nation.

The Energy Commission is also responsible for determining what the state’s energy needs are in the future, using 5 and 12 year forecasts of both energy supply and

demand. The Commission calculates the energy use reduction measures discussed above into these forecasts when determining what future electricity needs are, and how much additional generation will be necessary to satisfy the state's needs.

Having considered all of the demand side management that is "reasonably expected to occur" in its forecasts, the agency then determines how much electricity is needed. The most recent estimation of electricity needs is found in the 1996 Electricity Report.

The Warren-Alquist Act prohibits the agency, in its alternatives analysis, from considering such conservation programs to be alternatives to a proposed generation project (Pub. Resources Code, Section 25305(c)). This is because the approximate effect of such programs has already been accounted for in the agency's "integrated assessment of need," and the programs would not in themselves be sufficient to substitute for the additional generation calculated to be needed.

The Warren-Alquist Act was amended in 1999 to delete the necessity of a Commission finding of "need" in power plant licensing cases. Nevertheless, the Commission's most recent need determination, adopted in 1997, makes it abundantly clear that conservation programs alone can not displace the need for power generation for California's growing economy.

## GENERATION TECHNOLOGY ALTERNATIVES

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies that do not burn fossil fuels such as geothermal, solar and wind. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions.

### *Renewable Energy Alternatives*

Solar and wind resources require large land areas in order to generate 630 MW of electricity. Specifically, utility scale solar thermal projects require between four and ten acres per megawatt depending on the type of system (parabolic trough, parabolic dish, or central receiver) (CEC 1996, pp. B.15.1-2). A project comparable to ESPR's proposed 630 MW would require more than 2,800 acres, or more than 80 times the amount of space taken by the proposed plant site. Wind generation "farms" generally require about 17 acres per megawatt, with 630 MW requiring more than 10,000 acres, more than 300 times the amount of space taken by the proposed plant site and linear facilities (CEC 1996, pp. B.16.1). The alternative technologies discussed above have the potential for significant land use impacts due to the large land areas required. Consequently, staff does not believe that solar and wind technologies present feasible alternatives to the proposed project.

### *Geothermal Resources*

Geothermal resources are available in limited areas of California. The primary geothermal resources in southern California are present in Imperial County, primarily in the Imperial Valley (CEC 2000). Sixteen geothermal power plants with a combined online capacity of approximately 480 MW are present in Imperial County (CEC 2000). While development of additional geothermal resources in southeastern California is possible, geothermal power is not a feasible alternative at the scale of the proposed 630 MW El Segundo Power Redevelopment Project.

## *THE "NO PROJECT" ALTERNATIVE*

CEQA Guidelines and Energy Commission regulations require consideration of the "no project" alternative. This alternative assumes that the project is not constructed, and is compared to the proposed project. A determination is made whether the "no project" alternative is superior, equivalent, or inferior to the proposed project.

In the AFC, ESPR evaluated the "no project" alternative and determined that it would make less efficient use of the region's infrastructure and energy resources (ESPR 2000a, AFC page 5-1). Without construction of the new units, the existing ESPR would operate the existing power plant at times of peak demand. Electricity demand, which is expected to grow in Southern California in particular, would be met either by increased use of existing facilities or the development of other new power plants.

Staff views the "no project" alternative as feasible. If this project is not built, the same market conditions that encouraged it to be proposed will encourage other similar projects. It is quite feasible that a substantial amount of additional generating capacity will be proposed even in the absence of this project. Staff can reasonably expect California's need for new plants to be filled with or without the proposed project. There is no reason to assume that the total amount of capacity actually built would differ with or without this project.

It follows then, that the extent to which nuclear and older fossil generation resources will be replaced by new resources can be expected to be the same with or without this project. The extent to which generation from existing power plants would consume fuel and emit pollutants would be the same with or without this project. And whatever effect new plants might have insulating ratepayers and taxpayers from risk will occur whether or not the proposed plant is included among the new plants actually built.

The "no project" alternative would eliminate the expected economic benefits which the proposed project would bring to City of El Segundo and Los Angeles County. These include estimated property tax revenues of approximately $5 million per year to be split between the city, county, and various local districts (ESPR 2000a). Construction equipment and materials purchases are estimated to be between $250 million and $290 million, with approximately $20 million in sales tax revenues generated for the City of El Segundo and Los Angeles County. ESPR estimates an operations payroll staring at approximately $2 million per year for the first year of operation (ESPR 2000a).

Staff has determined that the “no project” alternative is environmentally inferior to the project as originally proposed. This is because the original proposal would have reduced environmental impacts. Not constructing and operating an (unmitigated) power plant would continue these impacts. However, as stated above, staff believes that use of the Conditions of Certification and other mitigations described in the SA will reduce any impacts to less than significant levels. In addition, staff recognizes potential economic benefits will be derived from the project. Therefore, staff believes that, overall, the “no project” alternative is not the preferred alternative.

## CONCLUSIONS REGARDING ALTERNATIVES

Staff has analyzed in detail alternatives to the project design and related facilities, alternative technologies, and the “no project” alternative. Staff did not analyze in detail alternative sites for the project. Staff determined that developing the project at an alternative site would not allow ESPR to make use of infrastructure at the existing site, one of the objectives of the project, and would not substantially lessen the impacts of the project identified in the staff’s assessment.

Staff has determined that the preferable alternative is the proposed project. Staff does not believe that energy efficiency measures and alternative technologies (geothermal, solar, wind, and hydroelectric) present any feasible alternatives to the proposed project.

## REFERENCES


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CEC 2000. Map of Geothermal Resources in California, http://www.energy.ca.gov/maps/geothermal_map.html, accessed March 16, 2000.

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# GENERAL CONDITIONS
# INCLUDING
# COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Donna Stone

## INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:

   a) set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;

   b) set forth the requirements for handling confidential records and maintaining the compliance record;

   c) state procedures for settling disputes and making post-certification changes;

   d) state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and

   e) establish requirements for facility closure plans.

2. Specific conditions of certification:

Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

## GENERAL CONDITIONS OF CERTIFICATION

## DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

**SITE MOBILIZATION:**

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is therefore not considered construction.

**GROUND DISTURBANCE:**

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

**GRADING:**

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

**CONSTRUCTION:**

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

a. The installation of environmental monitoring equipment.
b. A soil or geological investigation.
c. A topographical survey.
d. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility.
e. Any work to provide access to the site for any of the purposes specified in a., b., c., or d.

**START OF COMMERCIAL OPERATION**

a. The project startup team has completed work.
b. The plant manager accepts control from the construction manager.
c. Expenses for the project are switched from construction to operation.
d. The facility has reached steady state with reliability at the rated capacity.
e. Financing accounting switches from construction (capital costs) to operations (Income-producing expenses) financing.

## COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and,
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

### *PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING*

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements and milestones contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence

and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

### *ENERGY COMMISSION RECORD*

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and,
4. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

## PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

### *ACCESS*

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

### *COMPLIANCE RECORD*

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

## *COMPLIANCE VERIFICATIONS*

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Compliance Project Manager**
**California Energy Commission**
**1516 Ninth Street (MS-2000)**
**Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

## *COMPLIANCE REPORTING*

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

### COMPLIANCE MATRIX

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area,
2. the condition number,
3. a brief description of the verification action or submittal required by the condition,
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
5. the expected or actual submittal date,
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable,
7. the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”), and
8. the project’s preconstruction and construction milestones, including dates and status.

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

### PRE-CONSTRUCTION MATRIX

Prior to commencing construction a compliance matrix addressing <u>only</u> those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner’s **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

## TASKS PRIOR TO START OF CONSTRUCTION

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

## MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction and milestones 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 preconstruction and construction milestones (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions 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.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

### ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].

10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

### *CONFIDENTIAL INFORMATION*

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

### *DEPARTMENT OF FISH AND GAME FILING FEE*

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars ($850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

### *REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS*

Prior to the start of construction, the project owner must send a letter to property owners living within 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 www.energy.ca.gov/sitingcases. 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 on the following page.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

**COMPLAINT LOG NUMBER _____**
Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):
Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:
Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:
If not, explain:

Other relevant information:

If corrective action necessary, date completed:
Date first letter sent to complainant: _____(copy attached)
Date final letter sent to complainant: _____(copy attached)

This information is certified to be correct.
Plant Manager's Signature: _____ Date:

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

## CONSTRUCTION MILESTONES

The following is the procedure for establishing and enforcing milestones, which include milestone dates for pre-construction and construction phases of the project. Milestones, and method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after project approval, the date of docketing. If this deadline is not met, the CPM will establish the milestones.

I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION WITHIN ONE YEAR OF CERTIFICATION

1. Obtain site control.
2. Obtain financing.
3. Develop a demolition schedule for power blocks 1 and 2.
4. Develop a demolition schedule for the tank farm.
5. Mobilize site.
6. Begin rough grading for permanent structures (start of construction).

II. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION

1. Begin pouring major foundation concrete.
2. Begin installation of major equipment.
3. Complete installation of major equipment.
4. Begin gas pipeline construction.
5. Complete gas pipeline interconnection.
6. Begin T-line construction.
7. Complete T-line interconnection.
8. Begin commercial operation.

The CPM will negotiate the above-cited pre-construction and construction milestones with the project owner based on an expected schedule of construction. The CPM may agree to modify the final milestones from those listed above at any time prior to or during construction if the project owner demonstrates good-cause for not meeting the originally-established milestones. Otherwise, failure to meet milestone dates without a finding of good cause is considered cause for possible forfeiture of certification or other penalties.

III. A finding that there is good cause for failure to meet milestones will be made if any of the following criteria are met:

1. The change in any milestone does not change the established commercial operation date milestone.
2. The milestone is changed due to circumstances beyond the project owner's control.
3. The milestone will be missed, but the project owner demonstrates a good-faith effort to meet the project milestone.

4. The milestone is missed due to unforeseen natural disasters or acts of God which prevent timely completion of the milestones.

If a milestone date cannot be met, the CPM will make a determination whether the project owner has demonstrated good cause for failure to meet the milestone. If the determination is that good cause exists, the CPM will negotiate revised milestones.

If the project owner fails to meet one or more of the established milestones, and the CPM determines that good cause does not exist, the CPM will make a recommendation to the Executive Director. Upon receiving such recommendation, the Executive Director will take one of the following actions.

1. Conclude that good cause exists and direct that revised milestones be established; or
2. Issue a reprimand, impose a fine, or take other appropriate remedial action and direct that revised milestones be established; or
3. Recommend, after consulting with the Energy Facility Siting and Environmental Committee, that the Commission issue a finding that the project owner has forfeited the project's certification.

The project owner has the right to appeal a finding of no good cause, or any recommended remedial action, to the Energy Facility Siting and Environmental Committee, and to the full Commission.

## FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which that exist at the time of closure. 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, unexpected temporary closure and unexpected permanent closure.

## 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.

## UNEXPECTED TEMPORARY CLOSURE

An unplanned unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

## UNEXPECTED PERMANENT CLOSURE

An unplanned unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

# GENERAL CONDITIONS FOR FACILITY CLOSURE

## PLANNED CLOSURE

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission. The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.

2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;

3. identify 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.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

## UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency

plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

## UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

## DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion, as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

## ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforeseeable events, and other factors the Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

## NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

## INFORMAL DISPUTE RESOLUTION PROCEDURE

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

### *REQUEST FOR INFORMAL INVESTIGATION*

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

### *REQUEST FOR INFORMAL MEETING*

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,

4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

## FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution

process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

## POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

### AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

### INSIGNIFICANT PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does <u>not</u> require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

### VERIFICATION CHANGE

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

# KEY EVENT LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

| EVENT DESCRIPTION | DATE |
|---|---|
| Certification Date | |
| Online Date | |
| **POWER PLANT SITE ACTIVITIES** | |
| Start Site Mobilization | |
| Start Ground Disturbance | |
| Start Rough Grading | |
| Start Construction | |
| First Combustion of Gas Turbine | |
| Start Commercial Operation | |
| Complete All Construction | |
| **TRANSMISSION LINE ACTIVITIES** | |
| Start T/L Construction | |
| Synchronization with Grid | |
| Complete T/L Construction | |
| **FUEL SUPPLY LINE ACTIVITIES** | |
| Start Fuel Supply Line Construction | |
| Complete Fuel Supply Line Construction | |
| **WATER SUPPLY LINE ACTIVITIES** | |
| Start Water Supply Line Construction | |
| Complete Water Supply Line Construction | |

# EL SEGUNDO POWER PROJECT
# PREPARATION TEAM

Executive Summary ..... James W. Reede, Jr.

Introduction ..... James W. Reede, Jr.

Project Description ..... James W. Reede, Jr.

Air Quality ..... Joseph Loyer

Public Health ..... Obed Odoemelam

Worker Safety and Fire Protection ..... Alvin Greenberg / Rick Tyler

Transmission Line Safety and Nuisance ..... Obed Odoemelam

Hazardous Materials Management ..... Ramesh Sundareswaran

Waste Management ..... Alvin Greenberg

Land Use ..... Mark Hamblin / Michael Berman

Traffic and Transportation ..... Steve Brown

Noise ..... Jim Buntin

Visual Resources ..... Wm. Kanemoto

Cultural Resources ..... Dorothy Torres / Jeanette A. McKenna

Socioeconomic Resources ..... Amanda Stennick / Michael Fajans

Biological Resources ..... Dr. Noel Davis, Dr. Mike Foster,
..... Shari Koslowsky and Rick York

Soil and Water Resources ..... Joe Crea / Dominique Brocard
..... Tim Landis / Rich Sapudar

Geology and Paleontology ..... Dal Hunter

Facility Design ..... Shahab Khoshmashrab, Al McCuen and Steve Baker

Power Plant Reliability ..... Steve Baker

Power Plant Efficiency ..... Steve Baker

Transmission System Engineering ..... Linda Davis

Alternatives.....James W. Reede, Jr.

Compliance Monitoring and Facility Closure..... Donna Stone

Project Secretary .....Luz Manriquez / Matthew Gallien