DOCKETED

Docket Number:	15-AFC-01
Project Title:	Puente Power Project
TN #:	214712
Document Title:	Final Staff Assessment, Part 1 of 2
Description:	N/A
Filer:	Cenne Jackson
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	12/8/2016 4:29:08 PM
Docketed Date:	12/8/2016

PUENTE POWER PROJECT

Final Staff Assessment Part 1

CALIFORNIA
ENERGY COMMISSION
Edmund G. Brown, Jr, Governor

December 2016
CEC-700-2016-006-FSA

DOCKET NUMBER 15-AFC-01

CALIFORNIA
ENERGY COMMISSION
1516 Ninth Street
Sacramento, CA 95814

http://www.energy.ca.gov/sitingcases/
puente/

SHAWN PITTARD
Project Manager

CHRIS DAVIS
Siting Office Manager

ERIC KNIGHT
Environmental Office Manager

MATT LAYTON
Engineering Office Manager

MICHAEL D. LEWIS, P.E.
Deputy Director
Siting, Transmission and
Environmental Protection Division

ROBERT P. OGLESBY
Executive Director

PUENTE POWER PROJECT (15-AFC-01)
FINAL STAFF ASSESSMENT

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Testimony of Shawn Pittard

INTRODUCTION

On April 15, 2015, NRG Oxnard Energy Center (applicant or project owner), a wholly-owned subsidiary of NRG, Inc., submitted an Application for Certification (AFC) to develop and operate a nominal 262-megawatt (MW) electric power project on a 3-acre portion of the 36-acre Mandalay Generating Station (MGS) at 393 North Harbor Boulevard, Oxnard, Ventura County. The Puente Power Project (Puente or project) comprises one gas-fired combustion turbine generator (CTG), a 188-foot tall exhaust stack, and miscellaneous improvements necessary to either extend or reuse existing site structures and utilities. If Puente is approved and developed, the existing MGS Units 1 and 2 would be decommissioned. The power blocks and exhaust structure would be demolished and removed. The existing MGS Unit 3 would continue to operate. The existing wastewater outfall structure to the Pacific Ocean would no longer be used and would be demolished and the beach restored.

This Final Staff Assessment (FSA) contains staff's final, independent, objective evaluation and testimony for the proposed Puente Power Project. The FSA examines engineering, environmental, public health and safety, and environmental justice aspects of the proposed Puente project, based on the information provided by the applicant, government agencies, interested parties, independent research, and other sources available at the time the FSA was prepared. The FSA contains analyses and responses to comments similar to those normally contained in a Final Environmental Impact Report required by the California Environmental Quality Act (CEQA).

Approval (certification of a license) for a thermal power plant with a generating capacity of 50 MW or greater falls under the regulatory oversight of the California Energy Commission (Pub. Resources Code, § 25500 et seq.). As such, the Energy Commission is the lead agency under CEQA. The Energy Commission's certified regulatory program provides the environmental analysis that satisfies CEQA requirements. In fulfilling this responsibility, Energy Commission staff provides an independent assessment of the project's engineering design, evaluates its potential effects on the environment and on public health and safety, considers environmental justice populations, and determines whether the project is in conformance with all applicable local, state, and federal laws, ordinances, regulations and standards (LORS).

LORS compliance and determinations of key federal Clean Air Act and Clean Water Act requirements are made by staff's active coordination with, and incorporation of, other regulatory agencies and their findings (such as the Ventura County Air Pollution Control District and its Final Determination of Compliance [FDOC]). The result of staff's research, collaboration, and comprehensive process of discovery and analysis are recommendations for measures (conditions of certification) to mitigate any significant adverse environmental effects resulting from the proposed project and ensure project compliance with applicable LORS.

For the ease of the reader, this FSA provides a description of the environmental setting of the entire project. Specific details of the project are explained in the **Project Description** and other technical sections of this FSA. A summary of the project's components is provided below:

- A single General Electric (GE) Model 7HA.01 CTG, with a maximum 271-net MW capability, with a 262-net-nominal MW generating capacity, that would operate as a modern, rapid response, fast-ramping, simple-cycle facility;
- A 188-foot-tall exhaust stack, oriented in location towards the westerly (beach) side of the site;
- A single gen-tie connection, which would require one mono-pole structure and one 220-kilovolt (kV) take-off structure. This segment would be owned, operated and maintained by the applicant. The remainder of the transmission interconnection would be owned by Southern California Edison (SCE). It would consist of double gen-tie transmission lines connecting the proposed take-off structure to the existing SCE lattice tower located east of Harbor Boulevard, bypassing the existing Mandalay switchyard; and
- Extensions of existing water, storm drain, fire water loop, septic, and gas lines to service the CTG and support buildings.

This FSA is not the decision document for these proceedings, nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local, state, and federal LORS. Rather, the FSA will serve as staff's testimony during evidentiary hearings to be held by an assigned Committee of two Energy Commissioners (Commissioner Janea Scott is the Presiding Member and Commissioner Karen Douglas the Associate Member). During evidentiary hearings, the Committee will consider testimony, comment, and input provided and presented by staff, the applicant, intervenors, governmental agencies, and the public. The Committee will then engage in deliberation and review of the record before writing and submitting the Presiding Member's Proposed Decision (PMPD) for a 30-day public comment period and then to the full Energy Commission for consideration and action. Following a public hearing, most likely during a monthly Business Meeting, the full Commission will make a final decision on the Puente Power Project proposal.

PROJECT BACKGROUND

Puente is proposed as a replacement project for the majority of power currently generated by the existing MGS, which serves the Moorpark subarea of the Big Creek/ Ventura local reliability area in the Greater Los Angeles basin. Puente would replace the 430-MW generating capacity of MGS Units 1 and 2 with a new, single 262-MW CTG. MGS Units 1 and 2 are subject to the California State Water Resources Control Board's Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, also referred to as the Once-Through Cooling (OTC) Policy. Irrespective of the proposed development of Puente, pumping of ocean water for cooling MGS Units 1 and 2 must be reduced or eliminated as of the OTC Policy compliance date of December 31, 2020. If Puente is approved and developed, MGS Units 1 and 2 would be retired by the completion of commissioning of Puente. The

decommissioned facilities and structures would be demolished to existing grade, and the existing 200-foot tall exhaust stack, and Units 1 and 2 boilers, turbines, and other power block structures would be removed. The existing outfall structure to the Pacific Ocean would no longer be used and would be demolished and the beach restored. Demolition of the outfall would occur through plugging the circulating water pipes that connect to the outfall with concrete and removing the outfall, wing walls, riprap, and chain link fencing. Demolition of the outfall would occur during demolition of Units 1 and 2, using similar equipment.

PROPOSED PROJECT LOCATION AND DESCRIPTION

Puente would be located on a 3-acre portion of the 36-acre MGS property, at the northwest corner which borders the McGrath Lake State Park and Beach. The MGS property is accessed from South Harbor Boulevard via a driveway located north of the Edison Canal. Lands around the project site support some existing energy generation and petroleum transport and storage structures, although lands immediately to the north and west are protected open space (state park, beach and a habitat mitigation area). The project site has previously been graded and compacted, and in the past was used to store fills dredged on a periodic basis from the Edison Canal. The remainder of the MGS property is fully developed with paving, structures and landscaping.

PROJECT OBJECTIVES

The AFC describes the applicant's objectives for the Puente proposal, which are summarized as follows:

- Fulfill NRG's obligations under its 20-year Resource Adequacy Purchase Agreement (RAPA) with SCE requiring development of a 262-MW nominal net output of newer, more flexible and efficient, natural-gas generation[1];
- Provide an efficient, reliable, and predictable power supply by using a simple-cycle, natural gas–fired combustion turbine to replace the existing once-through cooling (OTC) generation;
- Support the local capacity requirements of the California Independent System Operator (CAISO) Big Creek/Ventura local capacity reliability (LCR) area;
- Develop a 262-MW nominal net power-generating plant that provides operational flexibility with rapid-start and fast-ramping capability;
- Be designed, permitted, built, and commissioned by June 1, 2020;
- Minimize environmental impacts and development costs by developing on an existing brownfield site and reusing existing infrastructure;
- Site the project on property that has an industrial land use designation with consistent zoning[2]; and

[1] On May 26, 2016 the California Public Utilities Commission approved a 20-year contract between SCE and NRG to provide electrical generating power from the P3.

- Safely produce electricity without creating significant environmental impacts.

PROJECT ALTERNATIVES

Project alternatives developed for Puente are fully discussed in the **Alternatives** section of this FSA and include an evaluation of the following:

- The **No-Project Alternative** would avoid several environmental impacts relating to Puente operations; however, it would not meet any of the proposed project's basic objectives. The No-Project Alternative would cause a significant impact on biological resources (special-status birds nesting near the site); this impact would remain significant and unavoidable if MGS Units 1 and 2 remained nonoperational on the site. Staff concludes that the No-Project Alternative is not considered environmentally superior to the proposed project.
- The **Del Norte/Fifth Street Off-site Alternative** would avoid the significant impact identified for Puente relating to the risk of inundation by tsunami, but use of this site would result in significant and unavoidable impacts on aircraft and pilot safety. This off-site alternative is not considered environmentally superior to Puente.
- The **Ormond Beach Area Off-site Alternative** would avoid three potentially significant effects of the proposed project. Impacts that would be avoided include filling of 2.03 acres of Coastal Commission defined wetlands, risk of inundation by tsunami, and temporary water quality impacts during demolition. Staff concludes that this off-site alternative is environmentally superior to Puente.
- **Conceptual Site Reconfigurations 1 and 2** would rearrange Puente on the project site to avoid filling 2.03 acres of Coastal Commission defined wetlands without causing other significant environmental impacts. Either on-site reconfiguration is considered environmentally superior to Puente. However, the impact pertaining to the risk for inundation by tsunami would not be avoided by reconfiguring the proposed project on the site.

The two off-site alternatives could potentially satisfy half of the project's basic objectives; however, their feasibility is uncertain given that the applicant does not have site control over either site. Assumptions for the off-site alternatives do not necessarily include removing MGS Units 1 and 2, which is considered a benefit of the proposed project. The two site reconfigurations could potentially attain the project's basic objectives, although redesigning the site plan to avoid the wetlands would delay the project schedule.

[2] On June 7, 2016 the Oxnard City Council voted 5-0 to approve an amendment to the city's Oxnard General Plan to prohibit power generation facilities greater than 50 MW in areas subject to coastal hazards (which includes the MGS and Puente sites). The general plan amendment became effective July 7, 2016. Staff addresses project compliance with local land use plans arising from approval of the general plan amendment in the **Land Use** section of this Final Staff Assessment.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Below is a summary of environmental consequences and mitigation proposed in this FSA.

Executive Summary Table 1-2
Environmental and Engineering Assessment

Technical Area	Complies with LORS	Impacts Mitigated	Additional Information Required
Air Quality/Greenhouse gases	Yes	Yes	No
Biological Resources	Yes	Yes	No
Cultural Resources	Yes	Yes	No
Hazardous Materials	Yes	Yes	No
Land Use	No	N/A	No
Noise and Vibration	Yes	Yes	No
Public Health	Yes	Yes	No
Socioeconomics	Yes	N/A	No
Soil and Water Resources	Yes	Yes	No
Traffic & Transportation	Yes	Yes	No
Transmission Line Safety/Nuisance	Yes	Yes	No
Visual Resources	Yes	Yes	No
Waste Management	Yes	Yes	No
Worker Safety and Fire Protection	Yes	Yes	No
Facility Design	Yes	Yes	No
Geology & Paleontology	Yes	Yes	No
Power Plant Efficiency	Yes	Yes	No
Power Plant Reliability	Yes	Yes	No
Transmission System Engineering	Yes	Yes	No

AIR QUALITY/GREENHOUSE GASES

Staff's evaluation of the proposed project with proposed mitigation measures indicates that air quality impacts would pose no significant impact to the public. In response to comments, staff performed an additional independent analysis using the non-adjusted u* option[3] in Atmospheric Dispersion Modeling (AERMOD) (the regulatory default option). Staff's analysis evaluates impacts of the proposed Puente project with the existing cumulative sources during construction, commissioning, normal operations, and startups/shutdowns. Staff's additional analysis includes the SCE McGrath facility. These results are used as part the FSA.

With adoption of the proposed conditions of certification, the proposed project would comply with all applicable LORS. The project would comply with applicable Ventura County Air Pollution Control District (District) rules and regulations including New Source Review, Best Available Control Technology (BACT) and offset requirements.

[3] The Adjusted u* (surface friction velocity) option is one of the beta options that U.S. EPA has proposed as future default options of AERMOD. Staff believes that the Adjusted u* option improves AERMOD performance by reducing the overestimation of air quality impacts during low wind speed conditions. See more details in appendices **AIR-2** and **AIR-3**.

Staff recommends the inclusion of the District's conditions as provided in its Final Determination of Compliance, Conditions of Certification **AQ-1** through **AQ-61** for the main facility, and **AQ-DE1** through **AQ-DE12** for the emergency diesel engine.

If all mitigation measures proposed by the applicant and staff are required and implemented, the air quality impacts would not be considered a significant impact to the environment. Staff proposes several additional conditions of certification for CEQA purposes. The project's construction and demolition activities, including the demolition and removal of the outfall, if unmitigated, would likely contribute to significant adverse PM10 and ozone impacts. Therefore, staff recommends Conditions of Certification **AQ-SC1** to **AQ-SC5** and **AQ-SC11** to mitigate these potentially significant impacts.

In the Preliminary Staff Assessment (PSA), staff identified the need for additional emission reductions to fully mitigate emissions of particulate matter less than 10 microns (PM10) and its precursor (SOx) impacts. The applicant has agreed to staff's Condition of Certification **AQ-SC9**, recommended in the PSA, which would include suitable mitigation to reduce Puente's direct and cumulative air quality impacts to a less than significant level. In the FSA, staff recommends air quality Condition of Certification **AQ-SC9,** which includes some minor edits, to ensure that significant impacts of PM10 and its precursors would be adequately mitigated and to ensure agency consultation if substitutions are made to the proposed emission reduction credits.

Staff recommends Condition of Certification **AQ-SC12** to ensure that the applicant gets a determination from U.S. EPA on whether Prevention of Significant Deterioration (PSD) is applicable to Puente. Even though staff does not expect Puente to trigger any PSD requirements, the applicant should request the U.S. EPA to determine whether or not the current federal PSD regulations apply to Puente.

Staff concludes that Puente, with staff's proposed mitigation, would have less than significant air quality impacts and does not expect an adverse impact to air quality or to members of the public, off-site nonresidential workers, recreational users or any environmental justice community. Staff does not expect any disproportionate air quality impacts.

BIOLOGICAL RESOURCES

The proposed Puente Power Project would replace, and be constructed on the site of the existing Mandalay Generating Station (MGS), an operating power plant in the city of Oxnard, California. Vegetation on the Puente site is largely limited to invasive species such as slenderleaf iceplant; however, one rare plant species, woolly seablite (rare within California), occurs on site. No special-status wildlife are expected to occur on site; however, immediately adjacent dune habitat associated with the existing MGS process and storm water outfall structure and other natural areas support special-status species including critical habitat for the western snowy plover (federally-listed threatened) and nesting habitat for the California least tern (federally and state-listed endangered). Additionally, the proposed project site supports approximately two acres of wetlands as defined by the California Coastal Commission.

Construction, demolition, and operation of the project would result in various effects to biological resources on and near the site. Staff concludes, that with implementation of the proposed conditions of certification, direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels and the project would comply with all applicable LORS. **Biological Resources Table 7** in the "Conclusions" subsection of the **Biological Resources** section contains a summary of the proposed project's impacts, applicable conditions of certification, and determination of significance for each impact area.

CULTURAL RESOURCES

Staff concludes that Puente could result in significant, direct impacts to a known archaeological site that is recommended by staff as eligible for the California Register of Historical Resources under criterion 4, and thus is a historical resource under CEQA. Impacts to this site would be less than significant with adoption and implementation of Condition of Certification **CUL-9**.

Staff also concludes that Puente could result in significant, direct impacts to buried archaeological resources, which may qualify as historical or unique archaeological resources under CEQA. The adoption and implementation of Conditions of Certification **CUL-1** through **CUL-8** would ensure that the applicant would be able to respond quickly and effectively in the event that archaeological resources are found buried beneath the project site during construction-related ground disturbance.

Staff's analysis of the proposed project with regard to ethnographic and built environment historical resources concludes that no ethnographic or built environment historical resources are present in the project areas of analysis and therefore, no ethnographic or built environment historical resources would be impacted by the construction or operation of the project.

Staff has considered environmental justice populations in its analysis of the project. Staff has not identified any Native American environmental justice populations that either reside within 6 miles of the project or that rely on any subsistence resources that could be impacted by Puente.

EFFICIENCY

Puente Power Project would generate 262 MW (net output[4]) of electricity at an overall project fuel efficiency of 41 percent lower heating value (LHV[5]) at maximum full load and average design conditions[6]. While it would consume substantial amounts of energy, it would do so in a sufficiently efficient manner to satisfy the project's objectives of producing peak-load electricity and ancillary load-following services. It would not

[4] Net output is the facility's gross electricity generation minus its parasitic electricity (load) requirements, or the amount of electricity that the facility delivers to the electricity grid.

[5] LHV is lower heating value, or a measurement of the energy content of a fuel correcting for post-combustion water vapor.

create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, nor would it 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.

ENVIRONMENTAL JUSTICE

Staff concludes that construction and operation of the Puente Power Project would not cause significant direct, indirect, or cumulative environmental justice impacts with the inclusion of proposed conditions of certification (see technical sections). Staff also concludes that project impacts would not disproportionately affect the environmental justice population represented in **Environmental Justice Figure 1** and **Table 3** of the **Environmental Justice** section.

FACILITY DESIGN

Staff has evaluated the proposed engineering LORS, design criteria, and design methods for the project, and concludes that the project would comply with applicable engineering LORS. The **Facility Design** conditions of certification would ensure that the Puente project is completed in accordance with these LORS.

GEOLOGY AND PALEONTOLOGY

Because of its geologic setting, the site could be subject to very strong levels of earthquake-related ground shaking. The significant effects of strong ground shaking on the Puente structures must be mitigated through structural designs required by the most recent edition of the California Building Code (currently CBC 2013). CBC 2013 requires that structures be designed to resist seismic stresses from anticipated maximum ground acceleration.

Puente is bounded by, but is not currently located in, a tsunami inundation zone. Staff concludes the potential for major flooding and structural impact from tsunami is insignificant. However, the best estimates of sea level rise near the end of the life of the facility, coupled with the maximum estimated tsunami wave height, suggest there may be less than one vertical foot of separation between the minimum site elevation and mapped inundation zone. Staff is concerned that there could be limited flooding that would present a health and safety threat to employees and visitors. Staff recommends the applicant implement Condition of Certification **GEO-1** requiring the implementation of a Tsunami Hazard Mitigation Plan to protect employees and visitors.

In addition to strong seismic shaking, Puente may be subject to soil failure caused by liquefaction and/or dynamic compaction. A design-level geotechnical investigation required for Puente by the CBC 2013 in accordance with proposed Conditions of Certification **GEO-2** and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**, would present standard engineering design requirements for

[6] At site average annual conditions of 59°F and relative humidity of 60 percent (PPP 2015a, § 2.7.1, Table 2.7-1, Case 3.)

mitigation of strong seismic shaking, liquefaction and potential excessive settlement due to dynamic compaction.

Petroleum is the only economic geologic resource in the vicinity of Puente. Other than petroleum, there are no known viable mineralogical or geologic resources at the proposed project site.

The near surface of Puente is flat lying covered with low-lying vegetation. Surface soils consist of active younger Holocene fine to medium grain windblown (dune) sand. These near-surface soils are not likely to contain fossils. At depth, these young deposits are underlain by older native soils that have a high potential to contain fossils.

While significant paleontological resources are not anticipated to be discovered during construction of the proposed project, potential impacts to paleontological resources due to construction activities would be mitigated through worker training and monitoring by qualified paleontologists, as required by proposed Conditions of Certification **PAL-1** through **PAL-8**.

Proposed construction dewatering operations can be conducted such that they would not cause offsite groundwater impacts. Staff recommends Condition of Certification **SOIL&WATER-3** requiring review and approval of the dewatering plan prior to excavation of the power block foundation. With implementation of this condition of certification, in addition to requirements to ensure any contaminated groundwater collected during dewatering would be properly disposed, the impacts of Puente construction on groundwater quality and quantity would be less than significant.

Based on this information, staff concludes that the potential adverse cumulative impacts to project facilities from geologic hazards during its design life are less than significant. Similarly, staff concludes the potential adverse cumulative impacts to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project, if any, are less than significant. It is staff's opinion that the proposed project can be designed and constructed in accordance with all LORS, and in a manner that both protects environmental quality and assures public safety.

HAZARDOUS MATERIALS MANAGEMENT

Staff's evaluation of the proposed project with proposed mitigation measures indicates that hazardous material use would pose no significant impact to the public. Staff's analysis also shows that there would be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project would comply with all applicable LORS. In response to California Health and Safety Code, section 25531 et seq., the applicant would be required to develop a Risk Management Plan (RMP). To ensure the adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by the Oxnard Fire Department and by Energy Commission staff. In addition, staff's proposed Condition of Certification **HAZ-2** requires the review and approval of the RMP by staff prior to the delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia, in addition to site security matters.

Staff recommends that the Energy Commission impose the proposed conditions of certification to ensure that the project would be designed, constructed, and operated to comply with all applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release. If all mitigation measures proposed by the applicant and staff are required and implemented, the use, storage, and transportation of hazardous materials would not present a significant risk to the public.

Staff concludes that the hazardous material management practices at Puente would have a less than significant impact on the EJ population with the adoption of the Conditions of Certification **HAZ-4**, **-5**, and **-6**, and would have no disproportionate impacts.

LAND USE

Puente would not comply with all applicable state and local LORS related to land use. The project is consistent with coastal public access provisions of Warren-Alquist Act section 25529, the California Coastal Act, and the Oxnard Local Coastal Program, but is in conflict with the city of Oxnard's Chapter 6, Safety and Hazards Policy 3.5 of the 2030 General Plan. Although the project, if approved, would conflict with Safety and Hazards Policy 3.5, the project would not be incompatible with surrounding land uses and the nonconformance would not be considered a significant impact under CEQA. There is not an EJ population residing within one mile of the project's land use impact area. Thus, staff concludes the project's land use impacts would not have an effect on any population, including the EJ population during construction, decommissioning, and demolition. No land use impacts would occur during operations.

NOISE AND VIBRATION

If built and operated in conformance with the proposed conditions of certification, Puente would comply with all applicable noise and vibration LORS and would produce no significant direct or cumulative adverse noise impacts on people within the project area, including the environmental justice population. It would not contribute to disproportionate noise and vibration impacts to the EJ population.

Staff recommends conditions of certification addressing worker and employee noise protection (**NOISE-3** and **NOISE-5**), measurement and verification that noise performance criteria are met at the project's noise-sensitive residential receptors (**NOISE-4**), and restrictions on construction and demolition activities (**NOISE-6** and **NOISE-7**). Also, **NOISE-1** and **NOISE-2** establish a public notification and noise complaint process to resolve any noise complaints regarding project construction, demolition, or operation.

Staff retains the responsibility to monitor the enforcement of these conditions of certification. Staff would work under the authority of the compliance project manager to monitor and review the reporting of project performance during construction, demolition, and the full term of operation, including facility closure.

PUBLIC HEALTH

Staff has analyzed the potential public health risks associated with construction/demolition and operation of the Puente Power Project using a highly conservative methodology that accounts for impacts on the most sensitive individuals in any given population. Staff concludes that there would be no significant health impacts from the project's air emissions. Exposure to off-site nonresident workers or recreational users would be lower with correspondingly lower health risks. According to the results of staff's Health Risk Assessment, both construction/demolition and operating emissions from the project would not contribute significantly or cumulatively to morbidity or mortality in any age or ethnic group residing in the project area.

Staff concludes that Puente's public health impacts would be less than significant and would not contribute to disproportionate impacts to the EJ population.

RELIABILITY

Staff concludes that the Puente Power Project would be built to operate in a manner consistent with industry norms for reliable operation and would be able to achieve the equivalent availability factor of between 94 and 98 percent predicted in the AFC. (The equivalent availability factor of a power plant is the percentage of time it is available to generate power, accounting for both planned and unplanned outages.)

SOCIOECONOMICS

Staff concludes that construction and operation of the Puente Power Project would not cause significant adverse direct, indirect, or cumulative socioeconomic impacts on the project area's housing, law enforcement services, or parks. Staff also concludes the project would not induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services. Staff-proposed Condition of Certification **SOCIO-1** would ensure project compliance with applicable LORS. Economic benefits would accrue to the city of Oxnard and Ventura and Los Angeles counties due to construction and operation of Puente and demolition of MGS Units 1 and 2.

STAFF CONCLUDES THAT THE PROJECT'S SOCIOECONOMIC IMPACTS ON THE ENVIRONMENTAL JUSTICE POPULATION WOULD BE LESS THAN SIGNIFICANT AND WOULD NOT BE DISPROPORTIONATE. SOIL AND WATER RESOURCES

The proposed project could potentially impact soil and water resources. Staff compared the project to the existing baseline conditions and evaluated the potential for Puente to: cause accelerated wind or water erosion and sedimentation; exacerbate flood conditions in the vicinity of the project; adversely affect surface or groundwater supplies; degrade surface or groundwater quality; and comply with all applicable LORS and state policies. Staff also discusses the present and future flood risks in terms of the severity of consequences from flood hazards. Using significance criteria based on the CEQA Guidelines, staff concludes that the project would not result in significant adverse impacts that cannot be avoided or mitigated. Staff also concludes that Puente would not result in the indirect impact of inducing population growth in the vicinity, and the

project's incremental effects on regional water supply or the quality of surface water and groundwater would not be cumulatively considerable.

Staff also concludes that, with implementation of recommended conditions of certification, the project would comply with relevant federal, state, and local LORS with the exception of Policy SH-3.2 of the 2030 Oxnard General Plan. In addition, the project would not comply with the California Coastal Commission's recommendation to relocate to an alternative site. However, if the Energy Commission determines that there is no feasible alternative site for relocation, the project would meet the provisions related to soil and water resources that were identified in the Coastal Commission report.

Staff also analyzed Puente's potential effects of water quality impacts and flooding risks on EJ populations in the project's six-mile radius. Staff concludes that Puente would not individually or cumulatively contribute to disproportionate flooding impacts and that mitigated water quality impacts would not disproportionately affect EJ populations. Soil and water resource impacts on the EJ population would be reduced to less than significant with adoption of conditions of certification.

TRAFFIC AND TRANSPORTATION

The construction and operation of the project could result in significant impacts to the nearby traffic and transportation system. Staff has determined that with implementation of staff's proposed conditions of certification, Puente's impacts to the surrounding traffic and transportation system would be less than significant. Condition of Certification **TRANS-2** would require implementation of a Traffic Control Plan that would reduce the potential for accidents caused by construction traffic exiting the project site to travel northbound on Harbor Boulevard. Conditions of Certification **TRANS-6** and **TRANS-7** would mitigate potentially significant impacts to aviation from the thermal plumes that Puente's combustion turbine generator (CTG) stack would generate. Condition of Certification **TRANS-6** would require obstruction marking and lighting of the CTG stack to alert pilots of the location of the plume. Condition of Certification **TRANS-7** would require the project owner to work with the Federal Aviation Administration, the Oxnard Airport Manager, and the Ventura County Department of Airports to notify all pilots using the Oxnard Airport and airspace above the Puente site of potential plume hazards.

With implementation of the proposed conditions of certification, the project would comply with all applicable LORS related to traffic and transportation and would result in less than significant impacts to the traffic and transportation system. In addition, the project's traffic impacts on the EJ population would be less than significant with staff's proposed conditions of certification and would not be disproportionate.

TRANSMISSION LINE SAFETY AND NUISANCE

The applicant proposes to build a 220-kilovolt (kV) transmission line to connect the proposed Puente Power Project to the existing SCE transmission system, bypassing the existing Mandalay Switchyard. The portion of transmission line between the gas turbine and a take-off structure to be located at the Mandalay property would be owned, operated and maintained by the applicant while the portion between the take-off

structure and the SCE transmission system lattice tower would be owned, operated and maintained by SCE.

The proposed lines would lie mainly within the boundaries of the Puente and MGS site, but a short section of off-site line would be necessary. Since the proposed 220-kV lines would be operated within the SCE service area, it would be designed, constructed, operated, routed, and maintained according to SCE's guidelines for line safety and field management. The lines would conform to all applicable LORS. Since the proposed transmission lines would be short in length with no nearby residences, there would be no potential for residential electric and magnetic field exposures. With the proposed conditions of certification, any safety and nuisance impacts from construction and operation of the proposed lines would be less than significant and would not contribute to disproportionate impacts to the EJ population.

TRANSMISSION SYSTEM ENGINEERING

The proposed Puente Power Project facilities between the new generator and SCE's existing 220-kV transmission structure, the step-up transformer, the 220 kV overhead transmission line, and the termination, are acceptable and would comply with all applicable LORS. The Puente interconnection with the transmission grid would not require additional downstream transmission facilities (other than those proposed by the applicant) that require CEQA review.

- Interconnection of Puente would not trigger any downstream transmission system upgrades.
- The existing breakers are adequate, no breaker upgrades are required.
- Any upgrades would occur inside the substation and no downstream environmental impacts are anticipated.

VISUAL RESOURCES

Staff evaluated if the Puente Power Project would have a significant effect on the environment according to the CEQA Guidelines and if the project would be in conformance with applicable visual resources-related laws, ordinances, regulations, and standards. Staff concluded the following:

- The proposed project would not have a substantial adverse effect on a scenic vista.
- The proposed project would not substantially damage a scenic resource.
- The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings at Key Observation Points (KOPs) 1, 2, 4, and 5. At KOP 3, visual character or quality of the existing site and surroundings would be degraded – a potentially significant effect on the environment. The applicant has proposed mitigation measures, incorporated into staff's proposed Condition of Certification VIS-1, to treat project structures in colors that would help to blend the project into its coastal setting and to use non-reflective materials to the extent feasible. In addition, in November 2015, the applicant revised the project description to include above-grade removal of MGS Units 1 and 2 in 2022. With the removal of units 1 and 2, existing levels of contrast and dominance would be

substantially reduced, baseline conditions would be improved, and impacts at KOP 3 would be less than significant. The applicant's recent proposal to remove the ocean outfall would further improve the visual conditions of the beach.

- The proposed project would not create a new source of substantial glare or light that would adversely affect daytime or nighttime views in the area. Conditions of Certification VIS-2 and VIS-3 would ensure no significant impacts occur from lighting during the construction, demolition, and operation phases of the project.
- The proposed project's incremental visual effect is not cumulatively considerable.
- Proposed mitigation measures and conditions of certification would reduce visual impacts to less than significant for all populations, including environmental justice populations. Impacts to environmental justice populations would not be disproportionate.
- The project as currently proposed would be in conformance with applicable, state and local LORS pertaining to visual resources, with the effective implementation of the applicant's proposed mitigation measures and staff's proposed conditions of certification.

WASTE MANAGEMENT

Puente would be located on approximately 3 acres within the existing 36-acre MGS site. The MGS site is a highly disturbed brownfield site that requires remediation. The owner, NRG, or previous owner SCE, would ensure that impacted or contaminated areas on the Puente site are remediated where necessary. The applicant would also implement a Soil Management Plan to provide guidance for proper identification, handling, disposal and containment of contaminated soil during demolition, construction and ground-disturbing activities. Puente's proposed waste management methods and mitigation measures, along with the proposed conditions of certification and demolition waste recycling and diversion requirements, would ensure that wastes generated by the proposed project would not result in a significant impact to local waste management and disposal facilities.

WORKER SAFETY AND FIRE PROTECTION

Staff concludes that the proposed project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. Staff recommends the project owner provide a Project Construction Safety and Health Program, a Project Operations and Maintenance Safety and Health Program, and a Demolition Safety and Health Program as required by Conditions of Certification **WORKER SAFETY-1** and **-2**, and to fulfill the requirements of Conditions of Certification **WORKER SAFETY-3** through **-7**. The proposed conditions of certification require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

The Oxnard Fire Department has stated that its ability to respond to emergency calls would not be significantly impacted by the construction and operation of the Puente project.

CUMULATIVE IMPACTS

Preparation of a cumulative impact analysis is required under CEQA. In the CEQA Guidelines, “a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts” (Cal. Code Regs., tit. 14, § 15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is “cumulatively considerable” (Cal. Code Regs., tit. 14, § 15130(a)(2)). Such incremental effects are to be “viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects” (Cal. Code Regs., tit. 14, § 15164(b)(1)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, “but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact” (Cal. Code Regs., tit. 14, § 15130(b)).

DEFINITION OF THE CUMULATIVE PROJECT SCENARIO

Cumulative impacts analysis is intended to identify past, present, and probable future projects that are closely related either in time or location to the project being considered, and consider how they have harmed or may harm the environment. Most of the projects on the Master Cumulative Project List below are required to undergo their own independent environmental reviews under CEQA. Staff developed the list by contacting planning staff with the city of Oxnard, and conducting a review of project information from other agencies, including the cities of Ventura and Port Hueneme, the California Department of Transportation, and the CEQANet database to develop a list of past, present, and reasonably foreseeable projects.

Under CEQA, there are two acceptable and commonly used methodologies for establishing the cumulative impact setting or scenario: the “list approach” and the “projections approach.” The first approach would use a “list of past, present, and probable future projects producing related or cumulative impacts.” (Cal. Code Regs., tit. 14, § 15130(b)(1)(A)). The second approach is to use a “summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact.” (Cal. Code Regs., tit. 14, § 15130(b)(1)(B)). This FSA uses the “list approach” for purposes of state law to provide a tangible understanding and context for analyzing the potential cumulative effects of the proposed project. All projects used in the cumulative impacts analyses for this FSA are listed in the cumulative projects table (**Executive Summary Table 1**), and locations are shown on **Executive Summary Figure 1**.

APPROACH TO CUMULATIVE IMPACT ANALYSIS

This FSA evaluates cumulative impacts within the analysis of each resource area, following three steps:

- Define the geographic scope of cumulative impact analysis for each discipline, based on the potential area within which impacts of the Puente project could combine with those of other projects.
- Evaluate the effects of the Puente project in combination with past and present (existing) projects within the area of geographic effect defined for each discipline.
- Evaluate the effects of the Puente project with foreseeable future projects that occur within the area of geographic effect defined for each discipline.

Executive Summary Table 1
Puente – Master Cumulative Project List

Label ID #	*Project Title*	*Description*	*Location*	*Distance to Project (Miles)*	*Status*
1	Beach walk on the Mandalay Coast (formerly North Shore Subdivision)	183 single-family homes, 109 detached condos, and on-site amenities.	NE corner of W Fifth St and Harbor Blvd, Oxnard	0.83	Plan Check, Dirt, gravel and rock movement. Submitted plans for off-site improvements for Harbor Boulevard - widening, etc. No active permits pulled for houses yet
2	Oxnard Shores Mobile Home Park Expansion	Modification of existing condition of approval to allow for the development of three new mobile home sites.	5540 W Fifth St, Oxnard	0.83	Approved
3	Avalon Homes Subdivision	Coastal Development Permit for 64 single-family homes and a tentative tract map for 16 parcels (4 houses per parcel) on an 8.1-acre property.	Catamaran St, Oxnard	1.34	Proposed - City currently preparing Draft EIR
4	Anacapa Townhomes	Coastal Development Permit for 70 condominiums in 5 buildings on a 3.5 acre property, and variance for setbacks.	5001 W Wooley Rd, Oxnard	1.44	Plan Check - On hold due to lack of funds. Owner may sell project.
5	Rancho Victoria Plaza Shopping Center	Major modification to revise site plan and architecture for approved shopping center, and revision to approved tentative subdivision map to create and accommodate 11 commercial buildings on 11 separate parcels.	3600 & 3700 W. Fifth St, Oxnard	2.00	Plan Check
6	Victoria/Hemlock	116 condominium dwelling units.	1830 S Victoria Ave, Oxnard	2.48	Plan Check
7	Holiday Inn Express Hotel (PROJ-7630)	40-room addition to existing Holiday Inn Express & Suites Hotel, consisting of 3 stories over 23,961 sq. ft.	1080 Navigator Dr, Ventura	2.64	Approved
8	Sondermann-Ring - Amendment (PROJ-6237)	300 Apartment Units and 20,292 sq. ft. commercial retail. Includes private indoor and outdoor recreational facilities and 2.44-acre park	Ventura Harbor adjacent to Anchors Way & Navigator Dr,	2.74	All planning approvals

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
		and waterfront promenade (3 stories).	Ventura		
9	Teal Club Specific Plan	990 residential units of varying density, single-family, townhomes, condominium, and apartment units; 21 ac. community park; 8 ac. school site; 60,000 sq. ft. mixed use and retail; 132,000 sq. ft. business research park; 1 ac. fire station site.	SE corner of Doris Ave and N Patterson Rd, Oxnard	2.84	Resubmitted; Draft EIR in preparation.
10	Ventura Harbor Marina and Yacht Yard Expansion	Increase number of boat slips from 40 to 80 (40 new boat slips). Expansion involves removing the existing dock structure, concrete ramps, a portion of the existing pier, and fuel docks; construction of expanded dock structure; relocation of fuel dock; onshore parking improvements; and other related facility improvements. Expanded dock would extend further into main channel of Ventura Harbor, but consistent with June 2014 Ventura Port District Commission channel limits. Parking improvements require removal of several mature palm trees and other landscape elements.	Anchors Way Dr/ Beachmont St, Oxnard	3.04	Mitigated Negative Declaration published Aug. 2015.
11	Victoria Corporate Center (PROJ-03617)	7 single-story industrial office buildings.	NE corner Victoria Ave and Olivas Park Dr, Ventura	3.28	Phased construction (1 building at a time). Amendment for first building approved Oct.2015. Earliest estimate to break ground on first building spring 2016.
12	Silver Bay Foods (PROJ-7318)	2-story fish processing building 62,000 sq. ft.	Transport St, Ventura	3.38	Plan check
13	Kaiser (PROJ-8479)	72,000 sq. ft. medical center.	NW corner Market St and Valentine Rd, Ventura	3.71	In Planning Process

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
14	Golf Course Self Storage (PROJ-8647)	Self-storage facility.	Golf Course Dr and Leland St, Ventura	3.78	Proposed
15	Oralia's Bakery	1825 sq. ft. addition to existing bakery, landscaping, site improvements.	942 W Wooley Rd, Oxnard	3.86	Plan Check
16	Bruton Industries Group Inc.	Two-story 6,400 sq. ft. office building.	4107 E Main St, Ventura	3.89	All planning approvals
17	Olivas Park Drive Extension Project	(1) Extend Olivas Park Drive as 4-lane Secondary Arterial between Golf Course Dr and Auto Center Dr; (2) construct levee/floodwall approximately 5,400 linear ft. along north side of Santa Clara River that terminates 350 feet S of Southern Pacific Railroad; (3) General Plan amendments for land use changes for parcels within 139-acre project boundary, (4) Specific Plan amendment to revise boundaries of Auto Center Specific Plan; and (5) zone changes for amendment to revise boundaries of Auto Center Specific Plan; and (5) zone changes for parcels within project boundaries. Project also includes a pre-zone and annexation of one county parcel. Proposed zoning and land use amendments could accommodate maximum of 1,258,000 sq. ft. commercial and 75,000 sq. ft. industrial. Roadway extension transition to join existing improvements at Johnson Dr/U.S. 101 southbound ramps interchange. No improvements other than the transition proposed as part of this project at Johnson Dr/U.S. 101 interchange. Montalvo Community Services District (MCSD) to abandon and remove existing MCSD wastewater treatment plant components and wastewater treated at this facility diverted to city of Oxnard's wastewater facility.	Between Golf Course Dr and Johnson Dr, Ventura	3.89	Local Agency Formation Commission hearing Sept. 16, 2015
18	KIA Dealer Addition (PROJ-8641)	3,382 sq. ft. addition and building remodel.	6424 Auto Center Dr, Ventura	3.92	Proposed
19	Marriott-Residence Inn (PROJ-5616)	New four-story hotel with 128 Rooms covering 87,000 sq. ft.	770 S Seaward Ave, Ventura	3.94	Plan Check

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
20	Union Bank	4,860 sq. ft. bank.	NE corner Mills and Main St, Ventura	3.95	Plan Check
21	Santa Clara River Levee Improvements Downstream of Union Pacific Railroad (SCR-3) Project	Structural improvements to existing SCR-3 levee for FEMA certification. Between Bailard Landfill and N Ventura Rd two options considered. Option 1A (Full Levee System) adds fill material and riprap to raise existing levee (8,875 feet) with one tie-in to Bailard Landfill. Option 1B (Minimum Levee System) adds fill material along portion of existing levee (3,575 feet), with tie-ins to Bailard, Coastal, and Santa Clara Landfills. Fill in existing River Ridge Golf Course swale. Between N Ventura Rd and UPRR bridge (Reach 4), construct 950-foot long floodwall on river side of road with visible height of 6 feet; install flood gate across N Ventura Rd; and construct 4- to 6-foot floodwall south side of N Ventura Rd for 860 ft.	N Ventura Rd, N of W Vineyard Ave, Oxnard	3.95	Unknown
22	Global Building	Four new commercial buildings (3,000 sq. ft.)	S Mills Rd, Ventura	3.96	Plan Check
23	Broome (The Grove) (PROJ-00723)	198-250 apartment units, courtyard. Stacked units consisting of 2.5 stories.	Vacant land between Copland & Telephone Rd, between the 126 and 101 Freeways, Ventura	3.96	Proposed
24	Anastasi Dev. (PROJ-00756)	138 Condominiums and 20,230 sq. ft. of mixed use commercial (3-stories).	SW corner of Seaward Ave and Harbor Blvd, Ventura	4.03	All planning approvals
25	The Grove Specific Plan	Specific Plan and a Vesting Tentative Tract Map enabling future development of residential neighborhood ranging between 200 and 250 dwellings on approximately 26.51 acres (density of 9.43 per units per acre) bounded by Thille Community Neighborhood, on south by Telephone Rd and Copland D, and on west by La Posada mobile home park, and farther to west by 101/126 highway interchange. Property currently within unincorporated area, but within the city of Ventura's Sphere of Interest.	Thille St and Copland Dr, Ventura	4.15	Unknown

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
26	Island View Apartments-Westwood Communities (PROJ-2008)	Four-story apartment complex with 154 units.	Alameda at 8th St behind Montalvo Square, Ventura	4.15	Under construction
27	Ravello Holdings (PROJ-6811)	5-story mixed-use structure with 306 apartment units and 10,000 sq. ft. commercial.	Johnson Dr and Northbank Dr, Ventura	4.20	Proposed
28	Vallero (PROJ-4627)	912 sq ft. automatic carwash and canopy.	2121 Harbor Blvd, Ventura	4.24	All planning approvals
29	The Lofts Affordable Senior Apartments	Conversion of existing 52,000 sq. ft. industrial building into 115 affordable senior apartments.	300 W Ninth St, Oxnard	4.26	Approved
30	Paseo Azteca	New multi-tenant retail building with 10 spaces.	618 South A St, Oxnard	4.30	Plan Check
31	Castillo Del Sol (PROJ-6187)	40 affordable housing units for special needs residents, on-site manager's unit, and supportive services.	3005 E Main St, Ventura	4.33	Under Construction
32	Surf Thru Carwash	Construct drive-thru car wash: 3,831 sq. ft. car wash building, 591 sq. ft. pay building, self-service vacuum stations on 1.57 acre lot.	1971 N Oxnard Blvd, Oxnard	4.35	Proposed
33	Chemical Building	New building to hold 2 chemical tanks to treat desalted water.	251 S Hayes Ave, Oxnard	4.38	Approved
34	Ventura Ophthalmology	10,313 sq. ft. medical ophthalmology building.	3114 Telegraph Rd , Ventura	4.39	In Planning Process
35	Tentative Subdivision Map for Tract 5745 for Approved Village Specific Plan	Final Tentative Subdivision Map for Tract No. 5745 request to subdivide The Village Specific Plan area in substantial conformance with previously adopted specific plan by creating 17 numbered lots and 19 lettered lots for development, public improvements, and open space.	Oxnard Blvd and Wagon Wheel Rd, Oxnard	4.40	Unknown
36	Community Memorial Hospital Parking Structure	5 1/2-story parking structure with 571 parking spaces and 1,399 sq. ft. retail liner.	City Parking Lot, N of 29 N Brent St and S of new Community Memorial Hospital building, Ventura	4.45	Proposed
37	Wagon Wheel Development Project (PA18)	219 market-rate apartments, recreation/meeting room, tot lot, and landscaped paseos. Construct commercial area (16,303 sq. ft.)	Wagon Wheel Rd and Winchester Dr, Oxnard	4.50	Proposed

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
38	Community Memorial Hospital	New hospital building. Adaptive reuse of existing hospital (121,000 sq. ft.). New street extensions, new public plaza.	S of Loma Vista Rd, W of Brent St, and N of Main St, Ventura	4.54	Under construction
39	Redevelopment of the Food 4 Less Site	Redevelop 14.47 acre Food 4 Less site, including demolition of former Target building, construction of new building to be occupied by Food 4 Less, fuel station associated with Food 4 Less, rehabilitation of existing on-site buildings, and 2 new retail buildings, for net building area of 159,954 sq. ft.	150 W Esplanade Dr, Oxnard	4.59	Under construction
40	Skyview Apartment Complex	240-unit affordable (100% affordable) housing apartment.	1250 S Oxnard Blvd, Oxnard	4.65	Proposed
41	Third Tower	15-story office tower in Esplanade Financial Square. Approx. 300,000 sq. ft.	E Esplanade Dr, Oxnard	4.70	Approved
42	RiverPark Senior	166,000 sq. ft., 136-unit senior living facility.	SE corner of Ventura Rd and Clyde River Dr, Oxnard	4.78	Proposed
43	Goldberg (PROJ-04296)	Five condominiums.	1837 E Thompson Blvd, Ventura	4.79	All planning approvals
44	Hughes (PROJ-04590)	Three condominiums.	1511 Vista Del Mar Dr, Ventura	4.79	All planning approvals
45	The Container Store	Single-story, 25,000 sq. ft. commercial building within "The Collection" at "RiverPark Shopping Center".	450 Town Center Dr, Oxnard	4.81	Under construction
46	Special Use Permit and Zone Variance	Employee parking lot, trash enclosure, and lunch area within 15,630 sq. ft. undeveloped site.	931 Richmond Ave, Oxnard	4.84	Plan Check
47	Café Scoop (PROJ-00687)	10 condominium units and 5,554 sq. ft. commercial space.	2170 E Main St, Ventura	4.84	All planning approvals
48	Buildings 1100A and B The Collection at RiverPark	40,000 sq. ft, single-story, multi-tenant commercial building within The Collection at RiverPark Shopping Center.	601-691 Collection Blvd, Oxnard	4.85	Plan Check
49	Thompson Village (PROJ-7910)	26 units of multi-family residential.	1570 E Thompson Blvd, Ventura	4.87	Proposed
50	RiverPark Retail	Single-story, multi-tenant commercial building with drive thru for WSS Shoe Warehouse and Krispy Kreme Doughnuts.	Riverpark Blvd and Vineyard Ave, Oxnard	4.88	Plan Check

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
51	Ventura/Vineyard Homes	152 residential dwelling units.	N corner Riverpark Blvd and E Vineyard Ave, Oxnard	4.88	Plan Check
52	Las Cortes	301 affordable housing units, 4 manager's units, parks, streets and sidewalks, landscaping and community buildings	Near Colonia Park, Oxnard	4.91	Phase 1 Under Review
53	Oxnard Crossroads	Two new commercial buildings.	481-491 Ventura Blvd, Oxnard	4.94	Approved
54	Sanjon Village (PROJ-7224)	34 condominium units.	SW corner of Thompson Blvd and Sanjon Rd, Ventura	4.99	In Planning Process
55	RiverPark: Sonata Apartments	53 apartments (3 story buildings) with garages and recreation facilities.	2905 Danvers River St, Oxnard	5.03	Under construction
56	RiverPark: Tempo Apartments	235 apartments (3 story buildings) with garages and recreation facilities.	443 Forest Park Blvd, Oxnard	5.05	Under construction
57	Hemlock Apartments (PROJ-1126)	23 apartments.	264/274 S Hemlock St, Ventura	5.06	Plan Check
58	Gill's Onions Plant Expansion	Three new buildings and improvements associated with parking, stormwater and street improvements for existing food processing and manufacturing facility operating within a 13.72-acre site.	1051 S Pacific Ave, Oxnard	5.06	Plan Check
59	Terraza de Las Cortes	Four 16-unit multifamily buildings with total of 64 affordable apartments, and one 1,080 sq. ft. community building, parking and landscaping on a 3.56 acre site.	Carmelita Ct, Oxnard	5.06	Under construction
60	Channel Islands Business Center	90,414 sq. ft. speculative industrial building.	1425 Mariner Dr, Oxnard	5.09	Approved
61	Rincon Recycling	Convert warehouse to recycling facility.	720 Pacific Ave, Oxnard	5.10	Under construction
62	World Oil (PROJ-6018)	Three apartment units and 2,438 sq. ft. of commercial space.	1571 E Main St, Ventura	5.14	In Planning Process
63	Trailer Hotel (PROJ-7213)	New 34 unit airstream trailer park.	398 S Ash St, Ventura	5.16	All planning approvals
64	Saint John the Baptist Coptic	1-story church facility on a vacant 35,000 sq. ft. lot.	1200 Pacific Ave, Oxnard	5.17	Plan Check

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
	Church				
65	Santa Clara Apartments (PROJ-6263)	Eight apartments.	1254 & 1268 E Santa Clara St, Ventura	5.18	All planning approvals
66	The Bluffs at Vista Del Mar	Luxury apartment community with clubhouse, open space areas, and bluff-top public promenade.	Triangle Site - Ash St and Front St, Ventura	5.19	In Planning Process
67	J Street Drain Project	Increased flow capacity of existing J Street Drain to accommodate runoff from 100-year storm event, reducing potential flooding of residential and commercial areas in cities of Oxnard and Port Hueneme.	J St and Redwood Ave to S of Hueneme Rd, Oxnard and Port Hueneme	5.19	Approved
68	Rexford (PROJ-03198)	25 condominiums.	918 E Thompson Blvd, Ventura	5.21	All planning approvals
69	Amoretti	27,760 sq. ft. industrial building and lot merger to combine two lots into one.	1551 Pacific Ave, Oxnard	5.21	Under construction
70	Westerly II RiverPark Dist H-2	69 single family detached homes.	Nile River Dr, Oxnard	5.22	Plan Check
71	Veranda RiverPark Dist H-3	95 detached single family homes.	Owens River Dr, Oxnard	5.26	Plan Check
72	Best Western (PROJ-6702)	Remodel of 2 existing motel rooms into a gym and meeting room and replace the 2 rooms within a new 2nd story addition. All occurring in 555 sq. ft. area.	708 E Thompson Blvd, Ventura	5.27	Proposed
73	Trinity Plaza	Construct 7,400 sq. ft. church on 43,136 sq. ft. proposed parcel; a 2,999 sq. ft. fast food (Carl's Jr) restaurant with drive thru on 31,768 sq. ft. proposed parcel; and a 6,100 sq. ft. multi-tenant retail building on 26,094 sq. ft. proposed parcel.	SE corner of N Rose Ave and Camino Del Sol, Oxnard	5.29	Approved
74	St. Paul Baptist Church	18,000 square foot sanctuary with 788 seats.	1777 Statham Blvd, Oxnard	5.34	Plan Check
75	Hilton - Harbor and Figueroa (PROJ-8165)	160 room hotel: 5,242 sq. ft. retail space, a 5,337 sq. ft. restaurant, and a 1,555 sq. ft. upper roof lounge (covered area only). Total project 4-stories and 156,160 sq. ft.	SE corner Harbor & Figueroa, Ventura	5.40	Proposed

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
76	Starbucks with Drive Thru	Single-story Starbucks coffee shop with a drive thru on a 20,603 sq. ft. lot (after lot merger).	1921 N Rose Ave, Oxnard	5.40	Proposed
77	Matilija Investment Group (PROJ-04315)	15 condominiums.	11 S Ash St, Ventura	5.41	In Plan Check
78	Ventura Downtown Housing (PROJ-5085)	5-story, 255 unit, apartment complex.	120 E Santa Clara St, Ventura	5.43	Proposed
79	Lion's Gate Annex	Self-storage & RV storage.	2751 Statham Blvd, Oxnard	5.44	Approved
80	Daly Project: Channel Islands	72 attached apartments (15% affordable).	E Channel Islands Blvd and Statham Blvd, Oxnard	5.49	Proposed
81	V2V Ventures	34 condominium units and 6,175 sq. ft. commercial space.	300 E Santa Clara St, Ventura	5.51	All planning approvals
82	The Axis (Sienna) RiverPark Dist H-5	91 detached single family homes.	Tiber River Way, Oxnard	5.53	Under construction
83	The District (Morning View) RiverPark Dist H-4	113 detached single family homes.	Tiber River Way, Oxnard	5.53	Under construction
84	Retail building	One-story 11,400 sq. ft. retail building.	105 W. Pleasant Valley Rd, Oxnard	5.58	Proposed
85	Mar-Y-Cel (Previously PROJ-00823)	138 units mixed use commercial (6,142 sq. ft.).	NE corner Thompson Blvd and Ventura, Ventura	5.59	All planning approvals
86	Anacapa Courts (PROJ-8105)	25 condominium units and 4,250 sq. ft. retail space.	299 E Main St, Ventura	5.61	In Planning Process
87	La Barranca (PROJ-6098)	9 single family residences.	5533 Foothill Rd, Ventura	5.65	Under construction
88	Santa Clara Courts (PROJ-7290)	24 condominium units.	72 W Santa Clara St, Ventura	5.66	Under construction
89	Pacific Water Conditioning	Single story 25,158 sq. ft. warehouse building.	2040 Eastman Ave, Oxnard	5.69	Under construction
90	Condominiums (PROJ-03676)	16 condominium units and 1,200 sq ft. commercial space.	SW corner of Palm and Poli St., Ventura	5.70	All planning approvals
91	Fire Station No. 8	New 13,036 sq. ft. fire station and a 15,960 sq. ft. training yard. Zone change to Community Reserve (C-R), additional height with a special	3000 S Rose Ave, Oxnard	5.77	Under construction

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
		use permit, and a lot line adjustment for 3 parcels.			
92	Raven Ridge (PROJ-8101)	30 condominiums.	117 N Ventura Ave, Ventura	5.84	In Planning Process
93	Ventura Botanical Gardens (PROJ-5810)	New botanical gardens and support facilities within Grant Park.	Grant Park, Ventura	5.84	All planning approvals
94	Vista Pacifica	Multi-family condominium complex with 40 units in 5 buildings with community park.	5527 Saviers Rd, Oxnard	5.86	Proposed
95	Ventura Cannery Apartments	78 condos and 2,156 sq. ft. mixed use commercial.	130 N Garden St, Ventura	5.86	Under Construction
96	Emerald Professional Bldg.	Two-Story Commercial Building.	5587 Saviers Rd, Oxnard	5.92	Approved
97	Matilija (PROJ-03865)	28 condominiums.	221 N. Garden St, Ventura	5.94	All planning approvals
98	Pacifica Senior Living at East Village	Convert existing 57-room hotel to 80 assisted living and memory care senior living facility. Addition of 10,392 sq. ft. memory care wing, 3,556 sq ft. assisted living, and 2,020 sq. ft. kitchen/dining area. Site is 2.26 ac and existing building with proposed addition is 54,073 sq. ft.	2211 E Gonzales Rd, Oxnard	6.01	Under construction
99	New Apartments (PROJ-7920)	3 new apartment units.	162 W Park Row Ave, Ventura	6.01	In Planning Process
100	Gold Coast Maintenance Facility	Construct an operations and maintenance facility: 49,533 sq. ft. facility including 17,935 sq. ft. office building, 24,330 sq. ft. maintenance building, 2,105 sq. ft. fuel service station with fueling bays, and 5,163 sq. ft. wash building. Outdoor parking for 125 buses with landscaping and parking improvements.	NW corner of Auto Center Dr and Paseo Mercado, Oxnard	6.04	Proposed
101	Chapman, Mike (PROJ-04691)	7 apartments	95 E Ramona St, Ventura	6.18	Under Construction-Duplex constructed, 5 units pending construction
102	4 Way Meat Market	2,039 sq. ft. office.	724 N Ventura Ave, Ventura	6.22	In Planning Process
103	Voelker Property	18 single family homes.	8324 Telegraph Rd,	6.41	In Planning

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
	(PROJ-8150)		Ventura		Process
104	Riverside Apartments (PROJ-7529)	2-story, 24-Unit apartment complex.	691 Riverside St, Ventura	6.51	Proposed
105	Westview Village (PROJ-7951)	Redevelopment of 180 public housing apartments and addition of 140 new apartments.	Between Barnett and Vince and Riverside and Snow streets, Ventura	6.56	Proposed
106	Coastal Apartment Homes and Coastal Senior/Assisted Living	Approximately 101 apartments and 70 unit senior living units.	N corner of Butler Rd and E Pleasant Valley Rd, Oxnard	6.78	Proposed
107	New Urban Ventures (PROJ-04182)	80 condominium units and 1,779 sq. ft. commercial space.	1995 N Ventura Ave, Ventura	6.90	All planning approvals
108	Logue (Revision to Project-1200) PROJ-7125	Mixed use structure with 125 Condominium Units and 7,300 sq. ft. commercial space.	2055 N Ventura Ave, Ventura	6.94	All planning approvals
109	Northbank (PROJ-6270)	117 single family, 31 affordable for sale triplex/quadplex, and 50 apartments.	Eastern end of N Bank Dr, Ventura	6.96	In Planning Process
110	Industrial Building	10,200 sq. ft. industrial building.	255 W Stanley Ave, Ventura	6.98	In Planning Process
111	Westside Renaissance (PROJ-04154)	120 single family residence and 36 condominiums, three stories.	2686 N. Ventura Ave, Ventura	7.14	All planning approvals
112	Westside Renaissance (PROJ-4677)	50 affordable senior apartments.	2686 N Ventura Ave, Ventura	7.14	Proposed
113	Westside Villas	35 condominium units, live/work units and 1,573 sq. ft. mixed use commercial.	N Ventura Ave, Ventura	7.24	In Planning Process
114	Enclave at North Bank (PROJ-4184)	Vesting Tentative Map for subdivision of 12.61 acres into 84 residential lots with two open space lots. Design Review and Density Bonus Concessions for 91 residential units with 84 single-family units and 7 duplexes with adjacent park space (EIR- 5-12-10586)(EIR-2473)	SE corner Saticoy Ave and N Bank Dr, Ventura	7.27	In Plan Check

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
115	The Farm; UC Hansen SP (PROJ-8446)	131 single family homes, 34 townhomes, 2 parks and 3 mini parks. (PROJ-03826 for affordable component of this project)	SE corner of Telegraph Rd and Saticoy Ave, Ventura	7.44	In Planning Process
116	UC Hansen Trust SP (PROJ-03826)	24 farm worker apartments as part of specific plan (see PROJ-8446)	SE corner Saticoy and Telegraph, Ventura	7.45	All planning approvals
117	Jenven Village SP Amendment (PROJ-1857)	51 condominium units.	SE of Well Rd and Darling Rd, Ventura	7.80	Under Construction
118	Darling Apartments	43 apartment and live/work units	Darling & Wells, Ventura	7.80	All planning approvals
119	Citrus II (PROJ-7772)	80-unit apartment complex.	S of Citrus/E of Wells Rd, Ventura	7.87	In Planning Process
120	Westwood/ Parklands (PROJ-03829)	216 detached homes and 110 attached homes.	SW corner Wells and Telegraph Rd, Ventura	7.87	All planning approvals
121	Citrus II (PROJ-8427)	78-unit 3-story apartment building.	11156-1172 Citrus Dr, Ventura	7.87	In Planning Process
122	Parklands Apartments (PROJ-4222)	173 apartment units with community building.	SW corner Telegraph Rd and Wells Rd, Ventura	7.88	In Plan Check
123	East Village Residential (PROJ-4154)	50 low income apartments.	Snapdragon and Los Angeles Ave, Ventura	7.90	Under construction
124	11101 Carlos Street (PROJ-7771)	47-unit apartment complex.	11101 Carlos St, Ventura	7.98	In Planning Process
125	Gisler Ranch Mixed Use (PROJ-8428)	Three-story mixed use with 43 apartments and 1,200 sq. ft. retail space.	11101 Carlos St, Ventura	7.98	In Planning Process
126	Citrus Place (PROJ-6355)	59 single family and 60 townhomes.	Citrus & Peach, Ventura	8.17	Under construction
127 not shown on map	North Pleasant Valley (NPV) Treatment Facility	Construction/operation of a groundwater treatment facility, including drilling and production of two new wells, installation of pipelines for distribution of raw well water, product water and brine. Facility would provide treated water to Camarillo's existing service area, with average design capacity of 7,500 acre feet year of production water.	Las Posas Rd/Lewis Rd, Camarillo	13.74	Unknown

Label ID #	Project Title	Description	Location	Distance to Project (Miles)	Status
128 not shown on map	East Area 1 Specific Plan Amendment	501 acres site for up to: (1) 1,500 residential dwelling units, (2) 240,000 sq. ft. commercial and light industrial, (3) 9.2 acres of civic uses for school facilities, and 225.3 acres open space and park uses.	Telegraph Rd and Padre Lane, Santa Paula	16.21	Unknown
129 not shown on map	Santa Barbara County Reliability Project	(1)Reconstruct existing 66 kV subtransmission facilities within existing and new utility rights-of-way between the existing Santa Clara Substation in Ventura County and the existing Carpinteria Substation located in the city of Carpinteria in Santa Barbara County (Segments 4 and 3B); (2) Modify subtransmission, substation, and/or telecommunications equipment within the existing Carpinteria, Casitas, Getty, Goleta, Ortega, Santa Barbara, Santa Clara, and Ventura Substations; and (3) Install fiber optic telecommunications equipment for the protection, monitoring and control of subtransmission and substation equipment along Segments 1,2, and 4 and at Carpinteria, Casitas, Santa Clara, and Ventura Substations.	City of Ventura, Ventura County to city of Carpenteria, Santa Barbara County	20.46	In review with CPUC. Final EIR published May 2015. Two erratas followed. Coastal development permit necessary from Santa Barbara County. Estimated 2 year construction
130 not shown on map	Moorpark Newbury 66 kV Subtransmission Line Project	New 66 kV subtransmission line and related facilities within portion of SCE's existing Moorpark-Ormond Beach 220 kV Transmission Line right-of-way (ROW) and portion of SCE's Moorpark-Newbury-Pharmacy 66 kV Subtransmission Line ROW. New subtransmission line between SCE's Moorpark Substation and Newbury Substation and construction of 1,200 ft. underground line, 5 miles new 66 kV line, 2 miles new 66 kV line within Moorpark-Newbury-Pharmacy 66 kV subtransmission line, and 1 mile new 66 kV subtransmission line into Newbury Substation.	E Los Angeles Ave, W Los Angeles Ave, and Gabbert Rd, Moorpark	20.67	Draft CPUC Decision published May 20, 2016. Final hearing June 23, 2016. Permit to construct received Aug 18, 2016. Estimated 10-month construction beginning mid November 2016.

RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

The following table presents the comments received related to the Executive Summary and staff's response.

Executive Summary		
Source of Comment	***Comment***	***Staff Response***
Applicant (TN 213683)	1. Comment 15- Socioeconomics. Page 1-09. Puente will provide economic benefits; however, Energy Commission staff does not acknowledge this in the Executive Summary.	1. While analyzing the economic benefits of a project is not a requirement under CEQA or part of Socioeconomic-related LORS, staff acknowledges that Puente would generate economic benefits and has made changes to the text.
	2.	2.

CONCLUSION

Staff has concluded that the proposed Puente Power Project would have no significant impacts to the environment after the implementation of all feasible mitigation, but that the project does not comply with all applicable LORS, specifically city of Oxnard's Chapter 6, Safety and Hazards Policy 3.5 of the 2030 General Plan. If the Committee agrees that this is an applicable LORS, and the project would not comply with Policy 3.5,the committee must decide whether to recommend that the Commission make specific findings that "the facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving public convenience and necessity" (Pub. Resources Code, § 25525).

REFERENCES

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015y – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2015ll – Applicant's Alternative Site Summary Paul Kihm Lathem & Watkins LLP (TN 207096). Submitted on December 21, 2015. CEC/Docket Unit on December 21, 2015.

PPP 2015mm - Socioeconomics Revised Environmental Justice Review Latham & Watkins LLP (TN 207111). December 23, 2015. CEC/Docket Unit on December 23, 2015.

INTRODUCTION

Shawn Pittard

PURPOSE OF THIS REPORT

This Final Staff Assessment (FSA) is the California Energy Commission staff's independent analysis of the proposed Puente Power Project (Puente or project). This FSA is a staff document. It is not promulgated by the siting Committee (two Energy Commission Commissioners who have been assigned to this project), nor is it a draft decision.

The FSA is an informational document and describes the following:

- the proposed project;
- the existing environment;
- staff's analysis of 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;
- the potential cumulative impacts of the project in conjunction with other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies, local organizations, and intervenors which may lessen or eliminate potential impacts;
- staff's proposed conditions of certification (conditions) under which the project should be constructed and operated, if it is certified; and
- project alternatives.

The analyses contained in this FSA are based upon information from the: 1) Application for Certification (AFC); 2) responses to data requests; 3) supplementary information from the applicant, federal, state and local agencies, interested organizations and individuals; 4) existing documents and publications; 5) independent research by Commission staff; 6) comments at public hearings and workshops; and (7) comments on the Preliminary Staff Assessment (PSA).

The FSA presents staff's conclusions about potential environmental impacts and conformity with laws, ordinances, regulations and standards (LORS), as well as proposed conditions that apply to the design, construction, operation and closure of the project. The analyses for most technical areas include discussions of proposed conditions. The conditions contain staff's recommended measures to mitigate the project's environmental impacts and to ensure conformance with LORS. Each proposed condition is followed by a proposed means of "verification" to ensure the condition is implemented.

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

ORGANIZATION OF THE PRELIMINARY STAFF ASSESSMENT

The FSA begins with an Executive Summary, Introduction, and Project Description. The next 21 chapters contain the environmental, engineering, public health and safety and alternatives analyses of the proposed project. The following chapter outlines the standards for assuring compliance with the Energy Commission license during project development, operation and closure. The final chapter is a list of staff that contributed to preparing this FSA.

Each of the 21 technical area assessments includes a discussion of:

- applicable LORS;
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for demolition, construction and operation.

ENERGY COMMISSION SITING PROCESS

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

The Energy Commission's siting regulations require staff to independently review the AFC, assess whether all of the potential environmental impacts have been properly identified, and whether additional mitigation or other more effective mitigation measures are necessary, feasible, and available (Cal. Code Regs., tit. 20, § 1742). In addition, this section requires staff to assess the completeness and adequacy of the measures proposed by the applicant to ensure compliance with health and safety standards, and the reliability of power plant operations. Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable LORS are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No additional environmental impact report (EIR) is required because the Energy Commission's site certification program has been certified by the Secretary of the California Natural Resources Agency as meeting all requirements of a certified regulatory program (Pub. Resources Code, § 21080.5 and Cal. Code Regs., tit. 14, § 15251 (j)). The Energy Commission is the CEQA lead agency.

Commission staff prepares an FSA that presents to the applicant, intervenors, organizations, agencies, other interested parties, and members of the public, staff's analysis, conclusions, and recommendations regarding the project. Where it is appropriate, the FSA incorporates comments received from agencies, the public, and other parties to the siting case and comments made at public meetings.

Following the publication of a Preliminary Staff Assessment (PSA), Energy Commission regulations establish a mandatory 30-day public comment period. In the case of Puente, the PSA was published on June 17, 2016 and the Committee issued a scheduling order that provided a longer, 45-day, comment period. (Cal. Code Regs., tit. 20, § 1742(c).) In response to requests for additional time to review the PSA, the Committee extended the review period to 90 days in total. The comment period is used to: 1) elicit input on the PSA analysis; 2) resolve issues between parties to the project; and 3) where consensus on issues exists, narrow the scope of issues to be adjudicated in subsequent evidentiary hearings. During the public comment period, staff conducted a workshop in the Oxnard community to discuss the conclusions, proposed mitigation measures, and verification measures in the PSA. Based on the workshop dialogue and the written comments received, staff refined its analysis, corrected errors, and finalized conditions of certification to reflect any changes agreed to between the parties. In response to comments, staff also added an Environmental Justice section. These revisions and changes are presented in this FSA.

The FSA is only one piece of evidence that will be considered by the Committee in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public evidentiary 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 Member's Proposed Decision (PMPD). Following publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. At the close of the comment period for any revised PMPD, the PMPD is submitted to the full Energy Commission for a decision.

AGENCY COORDINATION

As noted above, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Commission staff typically seeks comments from, and works closely with, other regulatory agencies that administer LORS that are applicable to proposed projects. The agencies associated with the Puente Power Project siting review include the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, California Coastal Commission, State Lands Commission, State Water Resources Control Board/Los Angeles Regional Water Quality Control Board, California Department of Fish and Wildlife, Caltrans, Naval Base Ventura County, the Ventura County Air Pollution Control District, County of Ventura Department of Airports, County of Ventura Department of Planning, County of Ventura Transportation Department, Ventura County Transportation Commission, and the city of Oxnard.

OUTREACH

The Energy Commission's outreach program is primarily facilitated by the Public Adviser's Office (PAO). This is an ongoing process and efforts are discussed in the **Environmental Justice** section of this FSA.

LIBRARIES

On April 24, 2015, Energy Commission staff sent the Puente AFC to local libraries in Oxnard, and to the state libraries in Eureka, Sacramento, Fresno, San Francisco, Los Angeles and San Diego. Staff sent its PSA to these same libraries on June 20, 2016.

INITIAL OUTREACH EFFORTS

Energy Commission staff and the Public Advisor's Office coordinated closely on public outreach early in the review process. A Notice of Receipt of the AFC and Notice of Public participation were docketed and mailed to the project mail list on April 27, 2015. Public notices for the project in both English and Spanish were published in local newspapers on May 24, 2015 and May 28, 2015. The PAO made a presentation to the Oxnard City Council on July 14, 2015, outlining the Commission's review process and avenues for public participation.

The PAO contacted local elected officials, Native American tribal groups, and community groups, including Central Coast United for a Sustainable Economy (CAUSE), Mixteco Indigena Community Organizing Project (MICOP), and the United Farm Workers. PAO also published notices in English and Spanish in the local newspapers prior to the August 27, 2015 Site Visit, Informational Hearing and Environmental Scoping Meeting. Spanish-language interpreters facilitated public comment at the hearing.

Energy Commission staff held a public workshop to take comments on its PSA in Oxnard, on July 21, 2016. The workshop notice was published in both English and Spanish. The PSA Executive Summary was translated into Spanish and made available

on-line and in hard copy at the workshop. Spanish-language interpreters facilitated public participation and comment at the workshop.

NOTIFICATION OF PROPERTY OWNERS

Energy Commission regulations require staff to notice, at a minimum, property owners within 1,000 feet of a project and 500 feet of a linear facility (such as transmission lines, gas lines, and water lines). This was done for the project, and the property owners list has been augmented to include the surrounding political jurisdictions, school districts, state and federal agencies, and interest groups.

PROJECT DESCRIPTION

Testimony of Shawn Pittard

INTRODUCTION

The Final Staff Assessment (FSA) for the Puente Power Project (Puente or project) contains 22 technical analyses of potential environmental effects and engineering factors associated with the development and operation of the project. The owner and applicant, NRG Energy Center Oxnard, LLC, an indirect, wholly owned subsidiary of NRG Energy, Inc., proposes to construct a 262-megawatt (MW) gas-powered electrical generating facility and related site improvements on a 3-acre portion of the 36-acre Mandalay Generating Station (MGS) site located at 393 North Harbor Boulevard in the coastal city of Oxnard, Ventura County. This section includes information and figures from the applicant's Application for Certification (AFC) to the California Energy Commission and supplemental information filed in support of the AFC, which are part of the project docket and can be accessed by selecting "Dockets for this Proceeding" at the following web address for reference: http://www.energy.ca.gov/sitingcases/puente/index.html.

PROJECT OVERVIEW

Puente would replace two aging gas-fired steam-generating units (Units 1 and 2) at the existing MGS with a new General Electric (GE) Frame 7HA.01 single-fuel combustion turbine generator (CTG) and associated auxiliaries. The project would be developed on approximately 3 acres of previously disturbed vacant brownfield land located within the existing boundaries of MGS. All construction laydown and parking areas would also be within the existing MGS site. To minimize environmental impacts associated with the construction of new operations, maintenance, warehouse, and transmission interconnections, existing ancillary systems would be upgraded and repurposed to serve Puente to the extent feasible. If Puente is approved and developed, MGS Units 1 and 2 would be retired by the completion of commissioning of Puente. A Site Plan of the project is provided in **Project Description Figure 1.**

The generator output from Puente would be stepped-up to 220-kilovolt (kV) transmission voltage from the CTG operating in simple-cycle mode. The power block would provide peaking power and is expected to operate at up to approximately 30 percent capacity factor. Full-load output of the unit under expected operating and ambient (temperature/ relative humidity) conditions would range from approximately 241 net megawatts (MW) to a peak of 271 net MW. The new generating unit would be connected to a single gen-tie connection, which would require one mono-pole structure and one 220 kilovolt (kV) take-off structure. This segment would be owned, operated and maintained by the applicant. The remainder of the transmission interconnection would be owned by Southern California Edison (SCE). It would consist of a double gen-tie connection between the proposed take-off structure and the existing SCE lattice tower located east of Harbor Boulevard, bypassing the existing Mandalay switchyard.

Puente would use natural gas supplied by Southern California Gas Company (SoCalGas) and connect to a new gas metering station adjacent to the Puente site. A new natural gas pipeline of approximately 500 feet would extend from the new gas metering station through a new gas compressor to the combustion turbine interface.

Total estimated average annual water use for Puente is expected to be approximately 19 acre-feet per year (AFY), with approximately 3 AFY for personnel use and approximately 16 AFY for industrial process use. Puente's water source would be potable water from the city of Oxnard; the point of connection would be to the existing MGS potable water supply. Sanitary wastewater would be discharged to the MGS existing septic system. Process wastewater would be stored in one of the MGS existing basins, and ultimately discharged to the Edison Canal. Storm water runoff from the project site would be directed through new storm water conveyance lines to either the service water tank for reuse (to offset potable water use), or to the existing North and South retention basins north of MGS Units 1 and 2 that would discharge to the Edison Canal.

Construction of Puente is expected to occur over a 21-month period, from October 2018 through June 2020. Construction is expected to cost approximately $235 to $270 million (in 2015 dollars). Commercial operation of Puente is expected by June 2020, with an assumed operating life of 30 years. Decommissioning of MGS Units 1 and 2 is anticipated to begin by January 2021, and take approximately 6 months. Demolition of MGS Units 1 and 2 and other related structures would commence by July 2021 and take approximately 15 months.

The Puente Power Project would be a modern, rapid response, fast-ramping, simple-cycle facility, intended to provide contingency support in the Moorpark subarea of the California Independent System Operator (California ISO)-designated Big Creek – Ventura local capacity area, and facilitate the integration of renewable (solar and wind) energy while minimizing greenhouse gas (GHG) emissions. Integrating large quantities of variable-output renewable generation requires far less natural-gas fired generation to operate around the clock (baseload); more of it must be able to follow load over the day, including total shut downs and/or quick starts. This would be increasingly the case over time as more and more solar is deployed. Load-following resources have traditionally been asked to increase and then decrease output gradually over the course of the day (allowing the unloaded portion of a combined–cycle facility to efficiently provide this service); they must now be able to suddenly and sharply increase and decrease output twice a day or more. Puente's provision of these services as a modern rapid–response, simple-cycle combustion turbine unit requires the following characteristics, in order to economically respond to changes in renewable output and demand:

- The ability to start quickly, so as to be available in real-time and hour-ahead markets, and respond to changes in solar production and provide contingency services when loads increase without having to start a day ahead, or spend anytime idling at low output where the unit is inefficient.

- The ability to turn on and shut off multiple times per day; turning off at mid-day reduces the likelihood of over-generation during mid-day hours, which would require the curtailment of solar generation.
- The ability to operate at near normal efficiency over a range of output levels, increasing the range (in MW) over which the project can operate economically, and to increase and decrease output ("ramp") quickly. This allows the project to provide a greater response to expected and unanticipated changes in demand and solar output, meeting system needs for "flexible capacity." While traditional peaking units can start as quickly as the Puente Power Project, and can turn on and shut off several times each day, their efficiency declines substantially at less than full output meaning they are not competitive load followers.
- High efficiency relative to traditional peaking units at full output, reducing GHG emissions per megawatt hour (MWh).

PROJECT SETTING, LOCATION AND SITE DESCRIPTION

A Project Location Map is provided in **Project Description Figure 2**. The project site is in an oceanfront area containing a mix of energy generation, oil storage and conveyance, agricultural, recreational and conservation land uses. The immediate area includes SCE-owned power-generating and transmission facilities. Puente would be sited on approximately 3 acres of the northern portion of the existing MGS property, which is identified as Assessor's Parcel Number 183-0-022-025. The project site is part of the historic Rio De Santa Clara Mexican Land Grant, being un-sectioned land outside of the township - range system, but near to Township 2 North, Range 23 West, on the U.S. Geological Survey Oxnard/Oxnard OE Topographic Map Quadrangles.

The site is bordered by sand dunes and the Pacific Ocean to the west, McGrath Lake State Park and land owned by SunCal to the north, industrial uses to the north, south, and east (consisting of petroleum distribution, and electric power and distribution facilities), and agricultural uses farther to the east across Harbor Boulevard. The closest existing residential neighborhood is the Oxnard Shores Mobile Home Park, approximately 0.75 mile (or approximately 3,900 feet) south from the proposed Puente stack, south of W. 5th Street and west of Harbor Boulevard. The North Shore at Mandalay Bay is an approved residential development scheduled to commence construction in 2016, located on the east side of Harbor Boulevard, to the south and east of MGS and SCE's McGrath Peaker Plant. The distance from the proposed Puente stack to the closest North Shore at Mandalay Bay development boundary is approximately 0.47 mile, or approximately 2,460 feet.

The existing MGS property, including the 3-acre Puente site, was graded during the development of the MGS in the 1950s, and is currently at an approximate elevation of 14 feet mean lower low water (MLLW) level. The top of the dunes to the west of the Puente site ranges from an approximate elevation of 20 to 30 feet MLLW. An artificial berm was constructed along the northern and eastern edges of the property in the early 1970s to protect the facility from flooding. The

top of the engineered berm is at an elevation of approximately 20 feet MLLW. The current site topography is depicted in **Project Description Figure 3.**

The site is underlain by aeolian and alluvial deposits consisting predominantly of sand and silty sand with some interbedded sandy silt and clay. Groundwater levels near the site are influenced by tidal fluctuation, precipitation, irrigation, and groundwater pumping. During a recent geotechnical investigation, groundwater was detected at approximately 9 feet below ground surface (bgs) (AFC Volume II, Appendix A-9, pg. 11), and historically has been reported as high as 5 feet bgs. The portion of the MGS property where Puente would be located was originally slated for development of future steam- generating units (identified in previous plans as MGS Units 3 and 4); however, these were never constructed at this location, although an alternative MGS Unit 3 (discussed in the "Project Components" subsection below) was constructed on-site immediately south of Units 1 and 2.

A 30-inch-diameter gas line traverses the Puente site that was intended to be the fuel supply for the future steam-generating units. This line would be capped and either left in place, or removed if necessitated by Puente construction.

APPLICANT'S PROJECT PURPOSE AND OBJECTIVES

As described in the AFC, Puente would be owned and operated by NRG Energy Center Oxnard, LLC. The Executive Summary (section 1.0) of the AFC describes the applicant's objectives for the Puente proposal as follows:

- Fulfill NRG's obligations under its 20-year Resource Adequacy Purchase Agreement (RAPA) with SCE requiring development of a 262-MW nominal net output of newer, more flexible and efficient, natural-gas generation at the site of the existing MGS;
- Provide an efficient, reliable, and predictable power supply by using a simple-cycle, natural-gas–fired combustion turbine to replace the existing once-through cooling (OTC) generation;
- Support the local capacity requirements of the California Independent System Operator (California ISO) Big Creek/Ventura Local Capacity Reliability (LCR) area;
- Develop a 262-MW nominal net power-generating plant that provides efficient operational flexibility with rapid-start and fast-ramping capability to allow for efficient integration of renewable energy sources in the California electrical grid;
- Be designed, permitted, built, and commissioned by June 1, 2020;
- Minimize environmental impacts and development costs by developing on an existing brownfield site and reusing existing transmission, water, wastewater, and natural-gas infrastructure;
- Site the project on property that has an industrial land use designation with consistent zoning;; and
- Safely produce electricity without creating significant environmental impacts.

PROJECT COMPONENTS

Existing MGS

The existing MGS is a natural-gas–fired steam electric generating facility owned by NRG California South LP, consisting of two conventional steam turbine units (Units 1 and 2) and one gas combustion turbine unit (Unit 3). Existing site components are identified on the Plot Plan attached as Figure 4.

MGS Units 1 and 2 were constructed in the 1950s and have a combined generating capacity of 430 MW. Cooling water for Units 1 and 2 is ocean water conveyed via the 2.5-mile-long Edison Canal from the Channel Islands Harbor (also referred to as the Mandalay Canal). The generating station intake is in the Edison Canal. At maximum capacity, MGS maintains a total pumping capacity rated at 254 million gallons per day. MGS discharges up to 255.3 million gallons per day of wastewater consisting of OTC water and other process wastewaters into the Pacific Ocean via a concrete-and-rock -lined structure at a point immediately offshore of the facility. MGS has a National Pollutant Discharge Elimination System (NPDES) permit for withdrawal and discharge from the Los Angeles Regional Water Quality Control Board (LARWQCB, 2001).

MGS Units 1 and 2 are subject to the California State Water Resources Control Board's Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, also referred to as the Once-Through Cooling (or OTC) Policy.

Irrespective of the proposed development of Puente, pumping of ocean water for cooling MGS Units 1 and 2 must be reduced or eliminated as of the OTC Policy compliance date of December 31, 2020. If Puente is approved and developed, MGS Units 1 and 2 would be retired by the completion of commissioning of Puente and removed. A detailed description of demolition activities is provided below.

MGS Unit 3 is a jet-engine–powered unit that was commissioned in 1970 and has a generating capacity of approximately 130 MW. Unit 3 is connected to the neighboring SCE 66-kV switchyard and provides local reliability. Unit 3 will continue to operate and will not be affected by Puente or the demolition of MGS Units 1 and 2.

[1] On June 7, 2016 the Oxnard City Council voted 5-0 to approve an Amendment to the city's Local General Plan to prohibit power generation facilities greater than 50 MW in areas subject to coastal hazards (which includes the MGS and Puente sites). The General Plan Amendment became effective July 7, 2016. Staff addresses project compliance with local land use plans arising from approval of the General Plan Amendment in the **Land Use** section of this Final Staff Assessment.

MGS Facilities to be Decommissioned and Removed

If Puente is approved and developed, MGS Units 1 and 2 would be retired, decommissioned, and demolished to existing grade after Puente is completed and commissioned. The decommissioning and demolition process and the potential environmental impacts are addressed in a supplement to the AFC titled "Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2," docketed November 19, 2015 (TN #206698, referred to in this FSA as the Supplement). The existing outfall structure to the Pacific Ocean would no longer be used, and would be demolished. This process is described in a supplement titled "Project Enhancement – Outfall Removal and Beach Enhancement," docketed September 26, 2016 (TN #213802).

Decommissioning Activities

Decommissioning will consist of the following activities:

- De-energize electrical equipment;
- Purge gases (e.g., natural gas, hydrogen) from equipment;
- Remove oil from all pumps, motors, pipes, oil reservoirs, transformers, and other equipment;
- Electrically isolate equipment;
- Physically isolate equipment by disconnecting from piping systems or other means;
- Operate and maintain equipment as required for environmental permit compliance (e.g., storm drainage system);
- Remove from service the backup diesel generator; and
- Verify that all facilities are left in a safe condition.

MGS Units 1 and 2 and certain existing ancillary facilities would be removed to accommodate development of Puente, while other structures would be repurposed for future use in connection with Puente. These activities, and any environmental impacts associated with them, are reasonably foreseeable consequences of Puente, and are described and analyzed in this FSA.

Demolition Activities

Applicant proposes to demolish all above-grade structures associated with MGS Units 1 and 2 following their retirement and decommissioning. The demolition of Units 1 and 2 would generally occur in the western portion of the MGS property, south of the three basins and north of the water storage tanks area. All construction laydown and parking areas would be within the existing MGS site, and are the same ones to be used during construction of Puente (see **Project Description Figure 1 – Site Plan**, and **Project Description Figure 5 – Demolition Areas**).

The specific sequencing of demolition activities would provide for coordinated removal of MGS Units 1 and 2 and continued operation and maintenance of Puente and MGS

Unit 3. Decommissioning of Units 1 and 2 and the outfall structure would commence upon retirement of both units (January 2021), and is anticipated to take approximately 6 months.

Asbestos abatement and above-grade demolition work for MGS Units 1 and 2 is anticipated to take approximately 15 months following completion of decommissioning, and would be completed by late 2022. A simulation depicting the completed Puente facility and site conditions after demolition of MGS Units 1 and 2 is contained in **Project Description Figure 6 – Project Finished Conditions**.

Demolition would proceed in a series of tasks associated with each of the following major parts of MGS Units 1 and 2:

- Asbestos removal;
- Demolition to grade of the Units 1 and 2 turbine plant equipment and building;
- Demolition to grade of the Units 1 and 2 boiler plant equipment and structures;
- Demolition to grade of the 200-foot-tall exhaust stack;
- Removal of empty hazardous-materials-contaminated equipment;
- Removal of transformers and associated electrical equipment up to the SCE switchyard; and
- Demolition and removal of the existing ocean outfall structure.

These tasks are described below.

- Asbestos Removal: Asbestos-containing materials (ACM) are prevalent throughout the MGS plant equipment and structures. Past surveys would be verified and a new survey conducted, if necessary, to identify the presence of ACM. Asbestos removal will take place in compliance with all federal, state, and local requirements, including those for personnel protection.
- Turbine plant equipment and buildings: MGS Units 1 and 2 steam turbine generators were constructed as outdoor units served by a concrete operating floor, under which are housed turbine cycle components. These structures would be demolished to an “at-grade” condition. Approximately 500 linear feet of abandoned 10-inch-diameter fuel oil pipeline south of MGS Unit 2 near the water storage tanks would be removed to make room for auxiliary equipment for Puente. Existing storm water sumps in the area would be maintained during and following demolition activities. Subgrade infrastructure that could present a safety risk if not filled would be filled with crushed concrete derived from demolition activities.
- Boiler plants equipment and structures: MGS Units 1 and 2 boilers were constructed as outdoor units. The structures and systems would be demolished to an “at-grade” condition, with the core steel structures felled by implosion using explosive charges placed per an engineered blast plan. Existing storm water sumps in the area will be maintained during and following demolition activities. Subgrade infrastructure that could present a safety risk if not filled would be filled with crushed concrete derived from demolition activities.

- Exhaust stack: The 200-foot-tall stack shared by MGS Units 1 and 2 would be demolished to an "at-grade" condition, with the core structure felled by implosion using explosive charges placed per an engineered blast plan. Subgrade infrastructure that could present a safety risk if not filled would be filled with crushed concrete derived from demolition activities.
- Contaminated equipment: All chemicals, hazardous materials, and contaminated equipment associated exclusively with MGS Units 1 and 2 would be removed from site and disposed of in appropriate facilities as part of the decommissioning process.
- Transformers and associated equipment: Transformers and associated electrical equipment (such as isolated-phase buses, breakers, and transmission lines) will be removed up to an interface with the SCE switchyard.
- Ocean outfall structure: Demolition of the outfall would occur through plugging the circulating water pipes that connect to the outfall with concrete, and removing the outfall, wing walls, riprap, and chain link fencing. Demolition of the outfall would occur during demolition of Units 1 and 2, using similar equipment.

Existing Equipment and Structures to be Reused or Repurposed for Puente

The major MGS equipment and features to be re-purposed for the Puente project are described below:

- The existing MGS service water storage tank and demineralized water/reverse osmosis (RO) equipment, storage tanks, and systems would be retained and used as the source for evaporative cooling water for Puente's CTG. A new 3-inch-diameter water pipeline would be installed from Puente to the connection with the existing demineralized water storage tanks.
- The existing MGS firewater pumps and tank (lower portion of the Service Water Tank) would be retained, and used to service the new facility. The firewater loop would be extended to service the new plant. The power supply to these two electric fire pumps would be changed. One pump would be connected to the new Puente switchgear and backed up by a new emergency diesel generator. The other would be connected to MGS Unit 3 switchgear, which is fed from the SCE 66-kV system, and would become the emergency backup fire pump.
- The existing ammonia receiving and storage system and tanks would be retained and reused, but the ammonia changed from 29 percent to 19 percent aqueous ammonia concentration. The ammonia line would be extended as required to interconnect to Puente's ammonia distribution system.
- A portion of the existing MGS warehouse would be reconfigured to add a control room for the new plant, including all required heating, ventilation, and air conditioning (HVAC) modifications.
- The three existing MGS retention basins would be reused to retain storm water from the Puente project area and the rest of the MGS site, and store the wastewater generated from Puente.

- The existing MGS administration building would continue to be used as the administration building for the new Puente facility and the existing MGS Unit 3. Upgrades are likely to include new wall and roof insulation, new windows, new low-flow plumbing fixtures, new electrical lighting, and new heating, ventilation, and air conditioning units.
- The existing MGS septic system would continue to be used.

New Puente Generation Facility

If approved, Puente would consist of a 262-MW (nominal net) electric generating facility operating in simple-cycle mode. The combustion-gas turbine would connect to an electric generator. The combustion turbine generator (CTG) would connect to the transmission system tie line via a generator step-up (GSU) transformer. The 220-kV single-circuit transmission line interconnection would be approximately 250 feet in total length, from the GSU to the 220-kV tie-in-point at the take-off structure (PPP 2016w). The 220-kV double-circuit transmission line interconnection would be approximately 565 feet, from the take-off structure to the SCE transmission structure across Harbor Blvd. Puente would interconnect to the California ISO's transmission grid, and power generated by the facility made available to serve energy needs throughout California, and more specifically the capacity needs of the Moorpark sub-area of the Big Creek/ Ventura Local Reliability Area (LRA).

PROCESS DESCRIPTION

If approved, Puente would consist of one GE 7HA.01 natural-gas–fired combustion turbine generator (CTG). The actual output of the CTG would vary in response to ambient air temperature conditions and the use of evaporative coolers. Full load output of the unit under expected operating and ambient (temperature/relative humidity) conditions would range from approximately 241 net MW to a peak of 271 net MW. The overall annual availability, as measured by equivalent availability factor (EAF) of the unit, is expected to be approximately 94 to 98 percent.

The simple-cycle CTG would be equipped with an emissions control system to include selective catalytic reduction (SCR) and oxidation catalyst, an ammonia system, a continuous emission monitoring system (CEMS), and a 188-foot-tall exhaust stack.

MECHANICAL SYSTEM

Major mechanical equipment for Puente comprises three main systems – the combustion turbine generator, the cooling system for heat rejection, and noise control features.

ELECTRICAL SYSTEM

The bulk of the electric power produced by the facility would be transmitted to the grid. A small amount of electric power would be used on site to power auxiliaries such as pumps and fans, control systems, and general facility loads, including

lighting, heating, and air conditioning. Some power would also be converted from alternating current (AC) to direct current (DC), which would be used as backup power for control systems and other uses.

Uninterruptible Power Supply System

The CTG would also have an essential service 120 volt AC, single-phase, 60 hertz uninterruptible power supply (UPS) to supply AC power to essential instrumentation, to critical equipment loads, and to unit protection and safety systems that require uninterruptible AC power.

Emergency Power System

The Emergency Power System would provide power via a diesel generator to plant auxiliaries that are required to shut down the plant in the unlikely event of a total loss of the normal AC system. The new diesel generator would be 500 kilowatts (kW), with Tier 4 certification (Caterpillar 500 kW, 625 kilovolts, C15 ATAAC or similar).

FUEL GAS SUPPLY AND USE

The project would be fueled with pipeline-quality natural gas delivered by SoCalGas. Gas supplies would be acquired from gas providers in supply regions accessible through the SoCalGas transmission system. Nominal full-load fuel consumption would be approximately 2,500 million British Thermal Units (MMBtu) per hour, higher heating value (HHV).

Total annual fuel consumption would be 6,790,000 MMBtu (HHV), based on a 30 percent dispatch. Fuel consumed during start-ups and shutdowns is expected to be 78,000 MMBtu (HHV), based on a total of 200 annual start-up/shutdown events.

The natural gas would be delivered to the site, and be routed from the new gas metering station area to the gas compression enclosure, where it would pass through the compressor to reach the required operational pressure of approximately 500 pounds per square inch. The location of the proposed gas compressor enclosure (labeled Gas Metering Station) is shown on **Project Description Figure 4**.The new gas line route is shown on **Project Description Figure 7**. The maximum depth of excavation for the gas line would be approximately 4 feet.

WATER SUPPLY AND TREATMENT

The power plant’s various water uses would include water for the CTG inlet air evaporative coolers, service water system users, and potable water. The simple-cycle combustion turbine would use dry low NOx burners; therefore, NOx injection water will not be necessary.

Water Source and Quality

Puente would use potable water from the city of Oxnard. The city already supplies potable water to MGS. Depending on availability, Puente's storm water may be reclaimed and stored in the existing service water tank, thereby displacing a corresponding amount of potable water usage.

Puente would use the existing MGS service water storage tank. This 445,000 gallon storage tank provides storage capacity for service water and fire water. Approximately 100,000 gallons of the 445,000-gallon service water storage tank would be reserved for firefighting water usage. The remaining 345,000 gallons of water storage would be available for process/utility service. This equates to approximately 91 hours of capacity at maximum demand. New service water and demineralized water supply lines would be extended to Puente from the existing MGS system. No additional pumps are required. Project Description Figure 8 shows the points of connection and routes of the extended water supply lines to Puente. The new service water line and the new demineralized water line would each be approximately 1,450 feet long; these lines would be installed in the same trench and are both expected to be a 3 inch-diameter high-density polyethylene (HDPE) pipe. In addition, a new 2 inch- diameter, 630 foot-long domestic water line would be installed to connect to the existing MGS domestic water supply tie-in. The maximum depth of excavation for the pipeline installation would be approximately 4 feet.

Water Treatment Requirements

Water treatment requirements for the project would vary depending on the specific use of the water. The following describes the main water treatment requirements:

- Demineralized water would be produced on site by a membrane-based production facility comprising a 2 pass RO system preceded by a softener.
- Demineralized water would be stored in the two demineralized water storage tanks. Each tank would provide sufficient capacity for approximately 96 hours of peak-load operation coinciding with an outage of the water treatment system. The primary user of demineralized water would be the evaporative cooler, which is used for power augmentation.

Consumptive Water Requirements

The simple-cycle Puente unit is expected to operate less than 30 percent of the time, during peak power demand periods. Therefore, total estimated annual water use at Puente is expected to be approximately 19 AFY, with approximately 16 AFY for industrial process use and approximately 3 AFY for personnel use.

The following sections describe Puente's water uses.

- CTG Evaporative Coolers

Makeup water for the CTG evaporative coolers would be a 50/50 blend of demineralized and service water. The blowdown would be discharged to the

existing MGS wastewater system. From there, it would be pumped to the existing North and South Basins, and discharged to the Edison Canal. As required, water would be added to the evaporative cooler to replace the water that is lost to evaporation and blowdown.

- Potable Water

The facility would require potable water for personnel consumption, eyewash stations, showers, and sanitary needs. Potable water would tie into an existing potable water line on the MGS property, and no onsite treatment would be required.

WASTE MANAGEMENT

This section describes the waste management processes leading to proper collection, treatment, and disposal of wastes. Wastes include process wastewater, solid nonhazardous waste, and hazardous waste. Additional information on waste management is provided in Section 4.14, Waste Management and Section 4.10, Soil and Water Resources (for wastewater and storm water runoff).

Wastewater

Puente's process wastewater would consist of softener-regeneration waste, reject from the first pass reverse-osmosis (RO) unit, evaporative-cooler blowdown, and condensation drains from the intercoolers. Reject from the second pass RO would be recycled within the plant, and consequently would not generate wastewater. Process wastewater would pass through a new oil-water separator (OWS) and be pumped to the existing East Basin, which would be segregated from the storm water collected in the North or South Basin. Process wastewater from the East Basin would flow into a new underground discharge vault, where it would mix with surplus storm water from the North and South Basins for ultimate discharge to the Edison Canal. Existing and proposed components of the process wastewater system are identified in **Figure 9.**

The existing domestic waste system collects discharge from sinks, toilets, and other sanitary facilities in the Administration building, which is discharged to the MGS' existing sanitary sewer collection system, which consists of septic tanks and leach field. The amount of domestic water used, and sanitary wastewater generated, is expected to be approximately the same as current operations, and no modifications to the existing septic system are anticipated.

Storm Water Runoff

Storm water runoff from Puente would be directed via a new conveyance system to either the service water tank for reuse onsite, or to the existing North and South Basins. Storm water runoff from the existing MGS facility would continue to be collected through its existing storm water system and also conveyed to the existing North or South Basins. The combined basins maximum storage capacity, with no freeboard, would be approximately 2.5 AF. Up to an estimated 400,000 gallons per year of rain water (depending upon precipitation pattern) could be collected and

used as service water and irrigation water to reduce the amount of potable water used by Puente.

All equipment that has potential for leakage of oil or hazardous chemicals would be situated in spill containment areas. The oil from the oil containment chambers of the OWS would be collected and shipped off site for recycling. The water from the clear effluent chamber of the OWS would be directed to the East Basin. Wastewater from the East Basin would flow into a new underground discharge vault, where it would mix with surplus storm water from the North and South Basins for ultimate discharge to the Edison Canal. Existing and proposed components of the process wastewater system are identified in **Project Description Figure 9.**

Solid Nonhazardous Waste

The construction, operation, and maintenance of Puente would generate nonhazardous solid wastes typical of power generation facilities. Construction wastes generally would include soil, scrap wood, excess concrete, empty containers, scrap metal, paper products, and insulation. Typical wastes generated during operation and maintenance would include scrap metal and plastic, insulation material, paper, glass, empty containers, and other miscellaneous solid wastes. These materials would be collected for recycling or transfer to landfills in accordance with applicable regulatory requirements.

Hazardous Waste

Hazardous wastes would be generated as a result of project construction, operation, and maintenance, as discussed in the Waste Management section of this FSA.

Construction

Interface with existing equipment, as well as demolition/removal of an abandoned fuel oil pipe, would generate hazardous waste, including asbestos-containing material from equipment and pipeline insulation. The majority of hazardous waste generated during construction/demolition would be liquid wastes such as waste oil and other lubricants from machinery operations; solvents used for cleaning and materials preparation; waste paints; and other material coatings as well as residual fuel oil from the aforementioned demolition.

Operation

Hazardous wastes generated by Puente would include spent SCR and oxidation catalyst, used oil filters, used oil, and chemical cleaning wastes. Spent SCR and oxidation catalyst would be recycled by the catalyst supplier, if possible, or disposed in a Class I landfill. Used oil filters would be drained and disposed of in an offsite disposal facility. Used oil would be recovered and recycled by a waste-oil recycling contractor.

Chemical cleaning wastes would consist of acid and alkaline cleaning solutions and washwater used in periodic cleaning of the CTG. These wastes, which may have elevated concentrations of metals, would be tested and disposed of in accordance with applicable laws, ordinances, regulations, and standards (LORS).

HAZARDOUS MATERIALS MANAGEMENT

Construction

Hazardous materials used during construction of the project would be kept in a designated area in the proposed laydown areas shown on **Project Description Figure 1**. The area designated for construction office facilities would include areas designated for construction equipment fueling, maintenance, and parking. Appropriate measures would be provided, including approved dual-walled fuel tanks, fueling equipment, containment, supply of absorbent material, and disposal containers for waste lubricants. The Emergency Action Plan developed for the project would include a section that addresses accidental releases of hazardous materials.

Operation

A variety of hazardous reagents and materials would be stored and used at Puente in conjunction with operation and maintenance of the project. In general, the number of materials would be less than those currently used for the operation of MGS Units 1, 2, and 3, because there would no longer be a steam cycle as part of the generation facility. The type and character of other materials would be the same as, or comparable to, those used in the current operations. Hazardous materials that may be routinely stored in bulk and used in conjunction with the project would include, but are not limited to, petroleum products, flammable and/or compressed gases, acids and caustics, aqueous ammonia, water treatment and cleaning chemicals, paints, and some solvents.

Curbs, berms, and concrete pits would be used where accidental release of hazardous chemicals may occur, constructed in accordance with the applicable LORS. Containment areas would be drained to appropriate collection sumps or neutralization tanks for recycling or offsite disposal. Piping and tanks exposed to potential traffic hazards would be protected by traffic barriers.

Puente would use existing hazardous materials storage and handling facilities on the MGS site, as described in the HMBP. Additional facilities specific to the new Puente project would also be provided. All materials would be segregated and regulated independently.

FIRE PROTECTION

The project proposes to use the existing MGS firewater pumps and service water tank to service the new facility. The existing firewater loop would be expanded as shown on **Project Description Figure 8**. The system would include a multi-zone water-mist fire protection system for the CTG furnished by the CTG manufacturer (GE), fire hydrants, and portable fire extinguishers. The primary source of fire protection water would be water stored in the existing MGS Service Water Storage Tank. Approximately 100,000 gallons of water are reserved in the tank for fire water use.

CIVIL FEATURES

Roads and Fencing

The power plant site would be accessed by one of the existing MGS entrances on North Harbor Boulevard. Approximately 4 inches of gravel would be placed on the existing unpaved roads. Chain-link security fencing is already in place around the existing plant site.

Sanitary Wastewater System

Sanitary wastes would continue to be discharged to the MGS' existing septic system.

Site Drainage

The proposed grading and drainage plan is shown on **Project Description Figure 10**. The drainage areas and flows are based on the proposed grading and drainage scheme discussed in the previous **"**Storm Water Runoff" **sub**section**.**

Earthwork and Foundation

Proposed earthwork on the power plant site would consist of excavation and compaction of earth to create the plant grade, and excavation for foundations and underground systems. Materials suitable for compaction would be stored in stockpiles at designated locations using proper erosion prevention methods. Any contaminated materials encountered during the excavation would be disposed of in accordance with applicable LORS.

The project intends to reuse or recycle as much of the excess soil as appropriate. The excess soil would be characterized so that clean soils can be reused. Soil that cannot be reused would be transported to an appropriate landfill site. The maximum excavation depths in feet below ground surface (bgs) for the following project components are:

- 7 feet bgs for Puente turbine block;
- 5 feet bgs for the reminder of Puente foundations;
- 5 feet bgs for transmission poles; and

- 4 feet bgs for all requisite piping.

In addition to these excavations, piles would be driven to support the foundation for the turbine block to a depth of 70 feet bgs. Because the existing soils are composed of sand, and because groundwater occurs at between 5 to 9 feet bgs, no predrilling for the pile installation is proposed. Instead, the piles would be driven to their maximum depth.

Project Construction

Site mobilization, grading, construction, and start-up/commissioning are estimated to take approximately 21 months. Decommissioning of Units 1 and 2 is expected to occur from January 2021 to June 2021. Demolition of MGS Units 1 and 2 is expected to occur from July 2021 through late 2022. The project construction schedule, construction staff, craft manpower, and average frequency of vehicle traffic are detailed in the sections below.

Power Generation Facility

Site mobilization for the project is expected to ensue should the Energy Commission certify Puente. The engineering, procurement and construction (EPC) contractor construction force would be expected to mobilize and begin onsite construction in October 2018. Construction and startup of Puente would be completed by June 2020. The schedule has been estimated based on a single-shift, 10-hour day and 50-hour week. The majority of construction operations are expected to take place between 7:00 a.m. and 6:00 p.m. However, longer workdays or work weeks may be necessary to make up schedule delays or complete critical construction activities, such as extended concrete pours for plant foundations, provided the limits of the local Noise Ordinance are not exceeded. During the start-up and testing phase of the project, some activities may continue 24 hours per day, 7 days per week. The onsite workforce is expected to reach its peak of 90 individuals in May 2019. Construction access to the site would be via North Harbor Boulevard.

Construction Plan

The project would be executed by an EPC contractor that would be responsible for the design, procurement, construction, and start-up of the facility. The EPC contractor would select subcontractors for certain specialty work as required. Site preparation work would include site grading and storm water control. Crushed rock would be used for temporary roads, laydown, and work areas that are not currently paved.

Approximately 5.7 acres in the MGS would be used for construction laydown, offices, and parking. Approximately 0.9 acre of the 5.7 acres is currently paved. The remaining unpaved areas to be used for construction laydown and parking areas would be graded (as necessary), and surfaced with 4 inches of crushed rock.

At the end of construction, these areas would be cleaned up, but the crushed rock surfacing and fencing would remain in place. No additional restoration would be required at the end of construction.

Construction Materials and Equipment Delivery

Construction materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables would be delivered to the Puente site by truck. The heavy equipment, such as the combustion turbine, generator step-up (GSU) transformer, and associated components would be transported by rail, and then trucked to the site.

Gas Pipeline Construction

The natural gas pipeline connection would be completed in time to support the construction interface in March 2019.

If required, the existing 10-inch and 30-inch underground gas lines serving MGS Unit 3, and Units 1 and 2, respectively, would be relocated prior to the start of construction. These two gas lines currently run through the proposed Puente site.

Construction Land Disturbance Control Measures

The EPC contractor would be responsible for implementing fugitive dust control measures during construction at the project site to minimize the formation of fugitive dust.

As discussed in the **Air Quality section** of this FSA, required fugitive dust mitigation measures are expected to control more than 90 percent of the fugitive dust that occurs during onsite construction.

In addition, a construction storm water pollution prevention plan (SWPPP) incorporating construction best management practices (BMPs) would be prepared and implemented.

Site-Specific Health and Safety Plan

A site-specific health and safety plan (HSP) would be developed by the EPC contractor for its scope of work. The HSP would incorporate information and procedures to be followed by onsite personnel for the completion of the work.

The HSP would outline requirements and provide guidance for control of construction safety hazards in compliance with safety standards and protection of public health.

Demolition Plan – Site Fuel Lines

If the project is approved, demolition and removal of the abandoned fuel oil pipe would begin. The demolition and removal would occur between MGS Unit 2 and the former fuel oil tank. If required, the existing 10-inch and 30-inch underground gas lines serving MGS Unit 3, and Units 1 and 2, respectively, may need to be relocated prior to the start of construction. These two gas lines currently run through the proposed project site.

To reduce demolition impacts, best management practices (BMPs) will be employed. The BMPs include maintaining and using all concrete and asphalt pavement, sweeping and dampening pavements as necessary to prevent dust nuisances, watering for dust suppression, and covering all truck loads prior to exiting the demolition work zone area.

Project Operation

Plant operation would require approximately 17 full-time permanent personnel, with 12 employees working a day shift and 5 employees working a standard 8-hour day. The plant will be staffed 7 days a week, 24 hours a day. When the plant would not be operating, personnel would be present as necessary for maintenance and to prepare the plant for start-up. Puente would use existing MGS staff. Power produced by Puente would be sold into the California wholesale power market to support local reliability and serve electric demand in Southern California. Peak-load operation most likely would occur during summer peak hours, and minimum-load operation during off-peak hours. Shutdown periods for annual maintenance would be scheduled during extended periods of low demand, which typically occur in the autumn or spring.

The design of Puente provides for a wide range of operating flexibility; that is, an ability to start up quickly and operate efficiently across its dispatch range. Overall annual availability of the power plant is expected to be in the range of 94 to 98 percent.

Facility Closure

Facility closure can be temporary or permanent. See the **Compliance Conditions section** of this FSA for a description of temporary, short-term, and long-term closure plans that would be required if the project is approved.

SCHEDULE

Construction of Puente is expected to occur over a 21-month period, and demolition of MGS Units 1 and 2 is expected to take an additional 18 months. Table 3-1 below outlines the basic phases of construction, decommissioning and demolition.

Table 3-1
Project Schedule by Phase

PROJECT PHASE	2018	2019	2020	2021	2022
P3 Construction - Site mobilization, minor demolition and site preparation, development of the CTG and SCR foundations and structures; March 30, 2018 through November 19, 2019					
P3 Start-Up - Start-up testing and commissioning; November 20, 2019 through June 1, 2020					
MGS Units 1 and 2 Decommissioning - De-energize electrical equipment, purge/remove all gasses and fluids from equipment, remove backup gnerator, isolate equipment and disconnect from piping and fuel systems; June 2020 through June 2021					
MGS Units 1 and 2 Demolition - Asbestos and HBM removal, Demolish MGS Units 1 and 2 turbine and bouler equipment/buildings and SCR; June 2021 through 2022					

REFERENCES

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015x – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

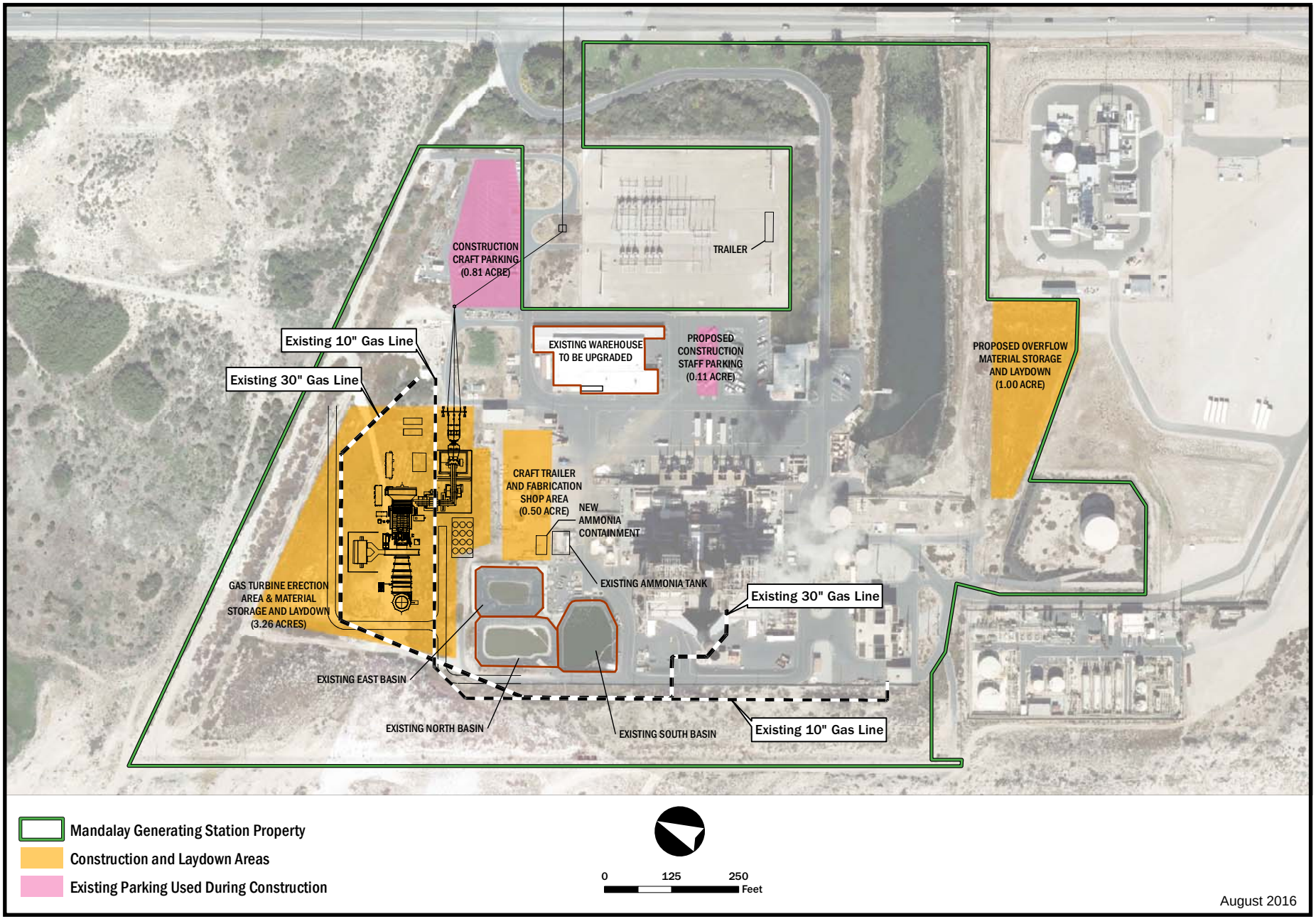
PPP 2015ii – Revised Air Quality Emissions and Modeling Results for the Enhancement and Refinement Demolition of Mandalay Units 1 and 2 Latham & Watkins LLP. Submitted on December 16, 2015. CEC/Docket Unit on December 16, 2015.

PPP 2016w-- Refinement to Transmission Interconnection Latham & Watkins LLP, (TN21300) dated August 26, 2016. Submitted to CEC/Docket Unit on August 26, 2016.

PPP 2016z-- Puente Power Project, Project Enhancement â€ Outfall Removal and Beach Restoration ,Latham & Watkins LLP, (TN 213802) dated September 26, 2016. Submitted to CEC/Dockets Unit on September 26, 2016.

PROJECT DESCRIPTION - FIGURE 1

Puente Power Project - Site Plan



PROJECT DESCRIPTION

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

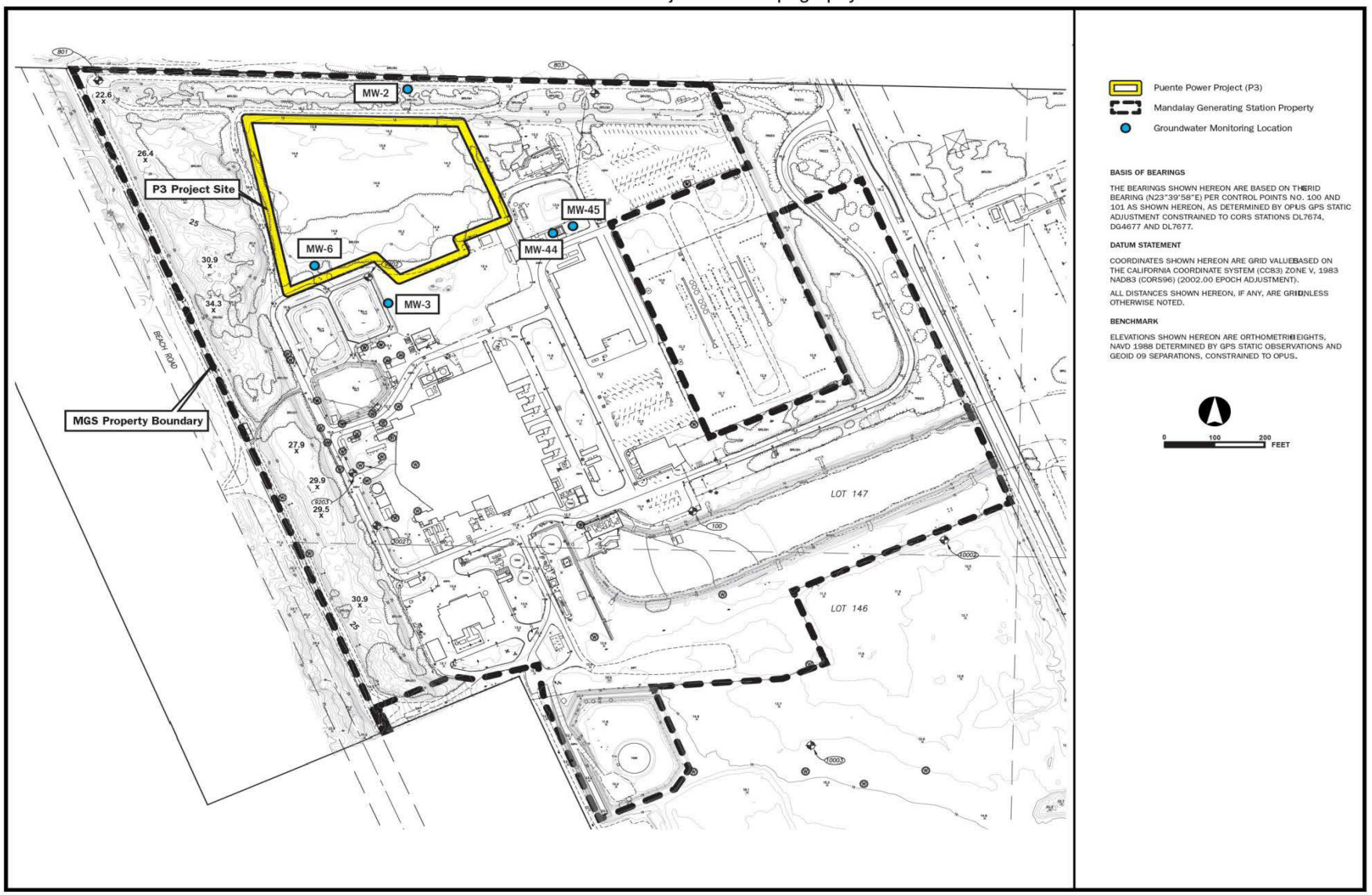
SOURCE: Refinement to Transmission Interconnection - Revised Figure 2.1-1

PROJECT DESCRIPTION - FIGURE 2
Puente Power Project - Project Location

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: AFC Figure 2.4-1

PROJECT DESCRIPTION - FIGURE 3

Puente Power Project - Site Topography

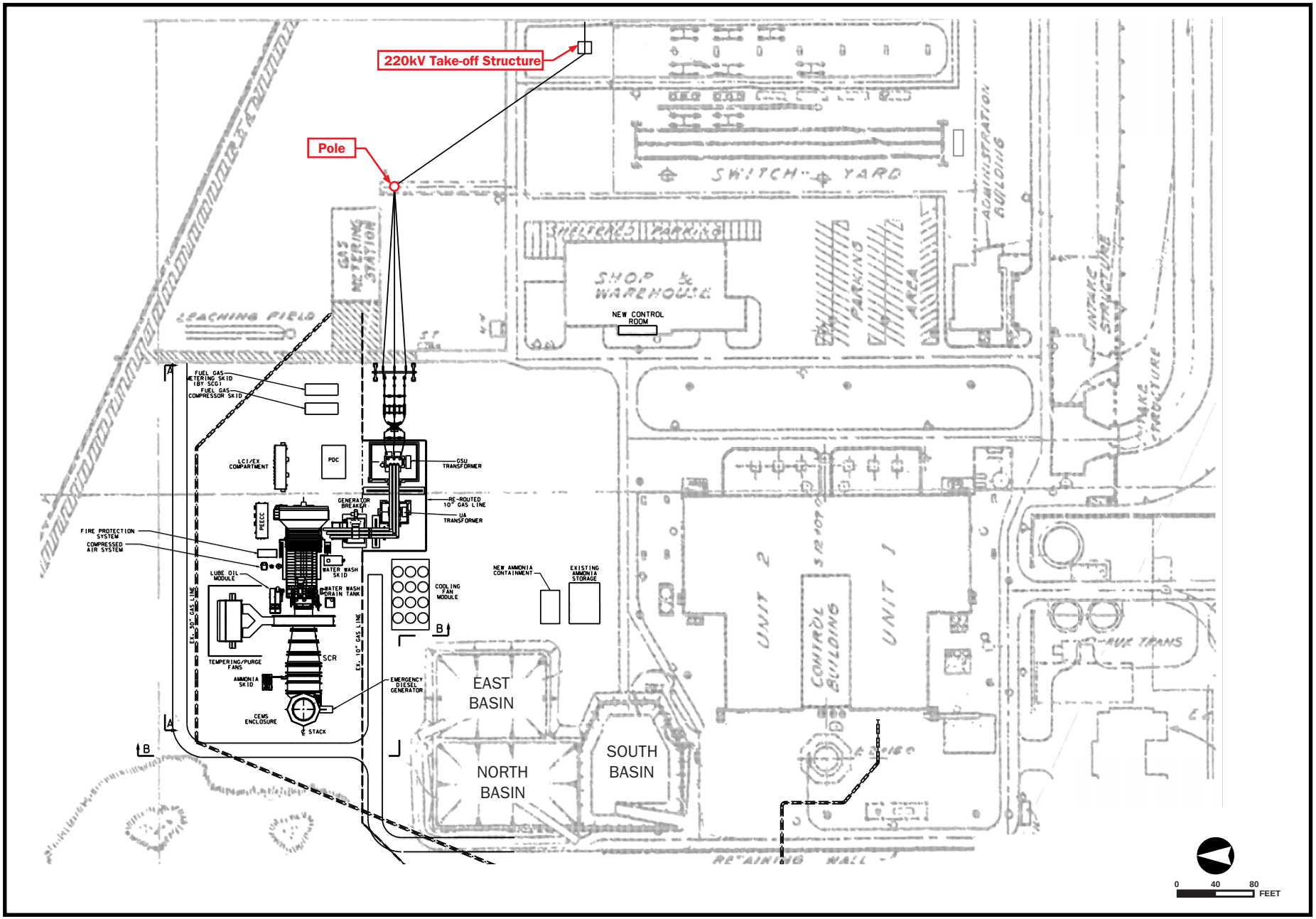


CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 2.4-2

PROJECT DESCRIPTION - FIGURE 4

Puente Power Project - Plot Plan

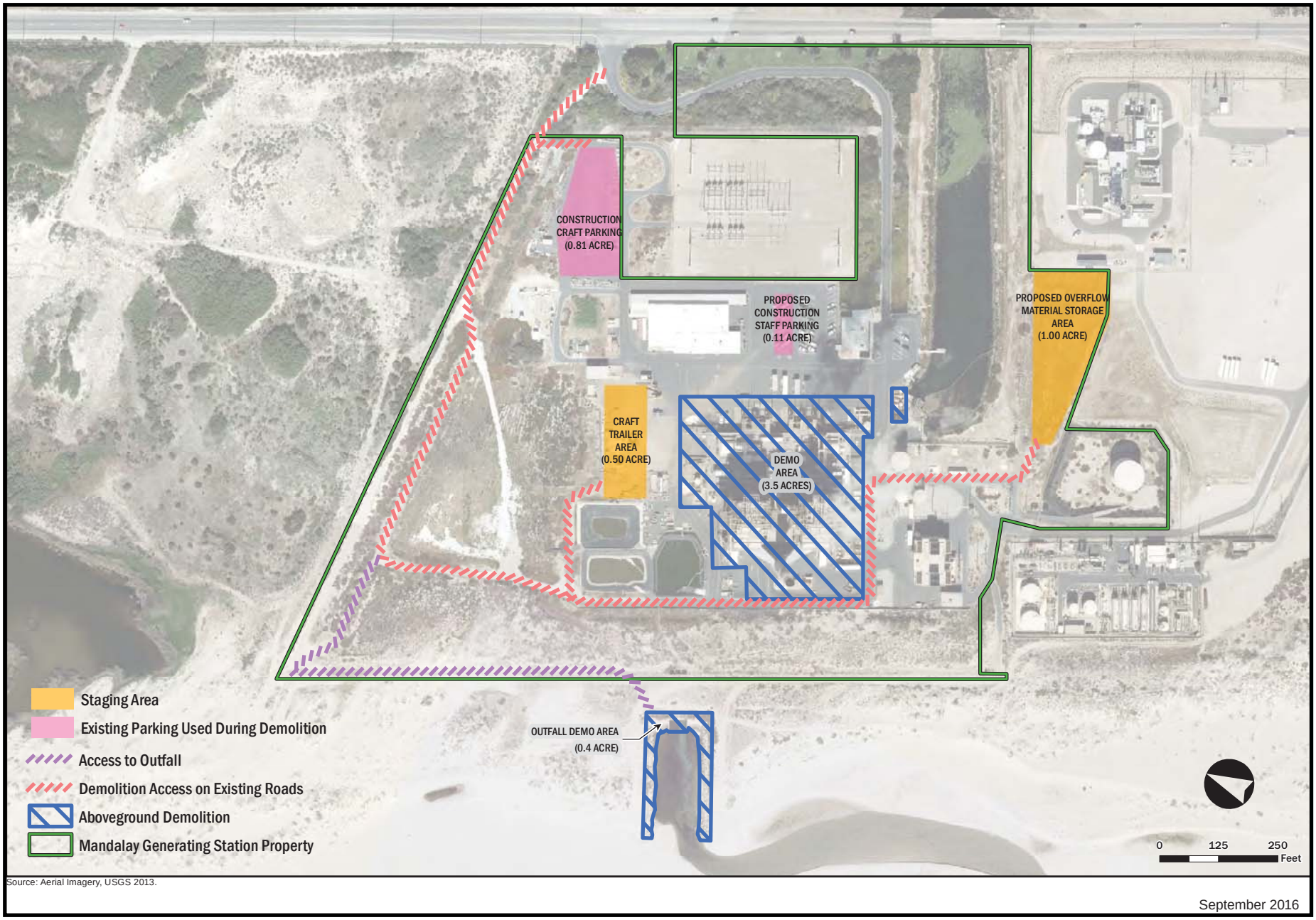


CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Refinement to Transmission Interconnection - Revised Figure 3-1

PROJECT DESCRIPTION - FIGURE 5

Puente Power Project - Demolition Area



Source: Aerial Imagery, USGS 2013.

September 2016

PROJECT DESCRIPTION

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Project Enhancement - Outfall Removal and Beach Restoration - Figure 2-2

PROJECT DESCRIPTION - FIGURE 6

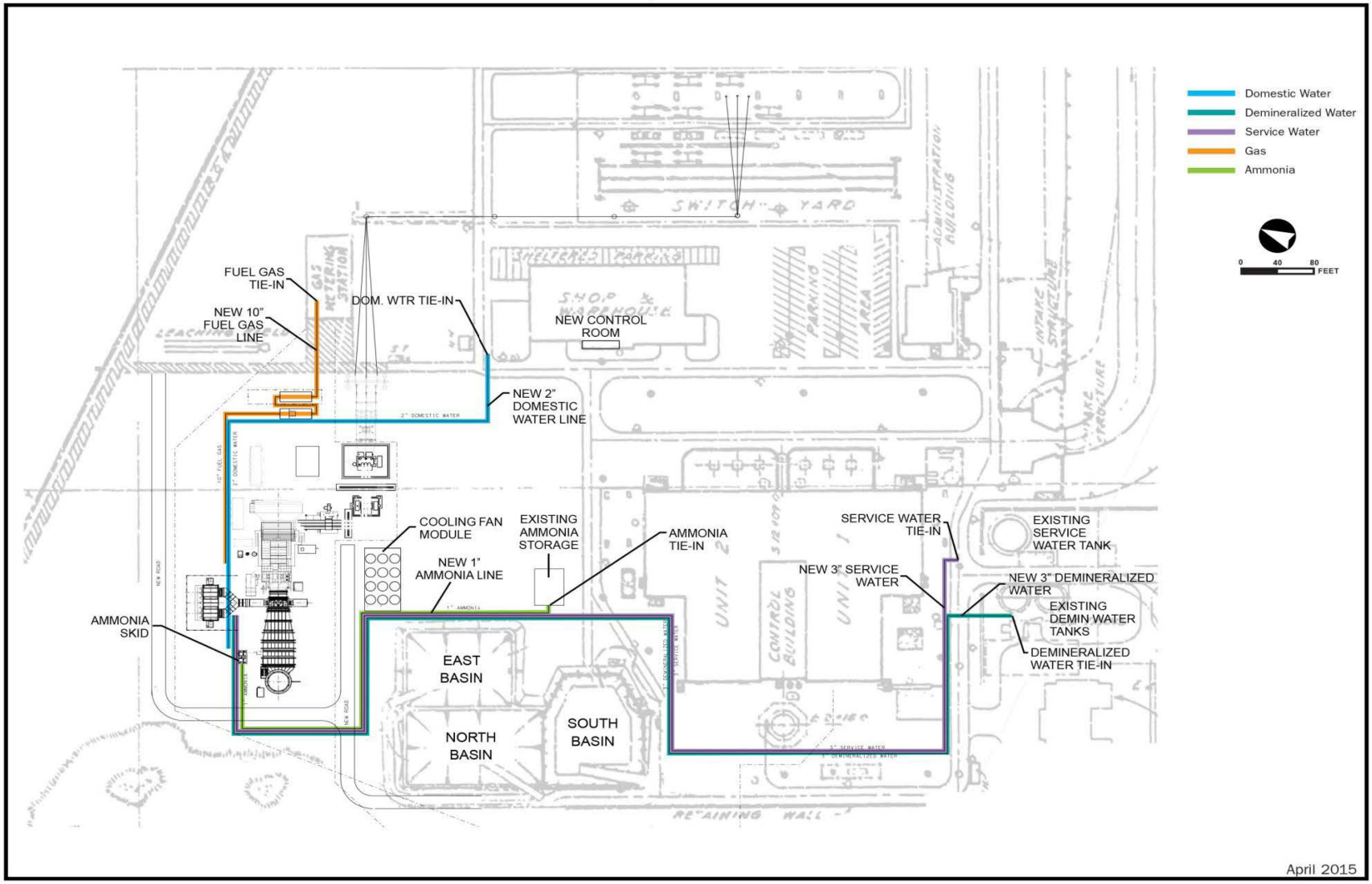
Puente Power Project - Project Finished Conditions

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Puente Power Project (P3) Project Enhancement with Outfall Removal and Beach Restoration September 2016.

PROJECT DESCRIPTION - FIGURE 7

Puente Power Project - Gas and Water Lines



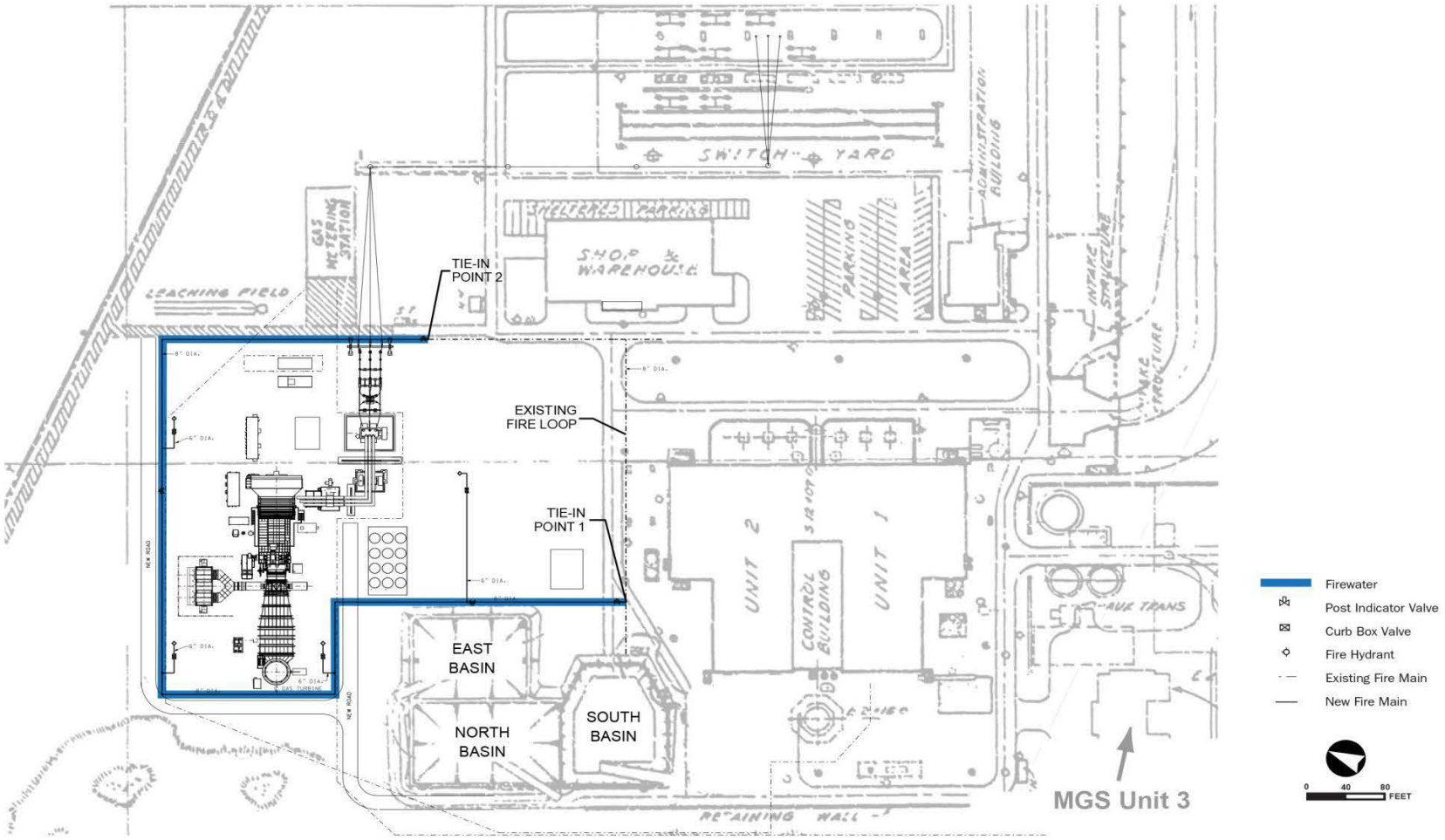
April 2015

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 2.7-8

PROJECT DESCRIPTION - FIGURE 8

Puente Power Project - FireWater Loop



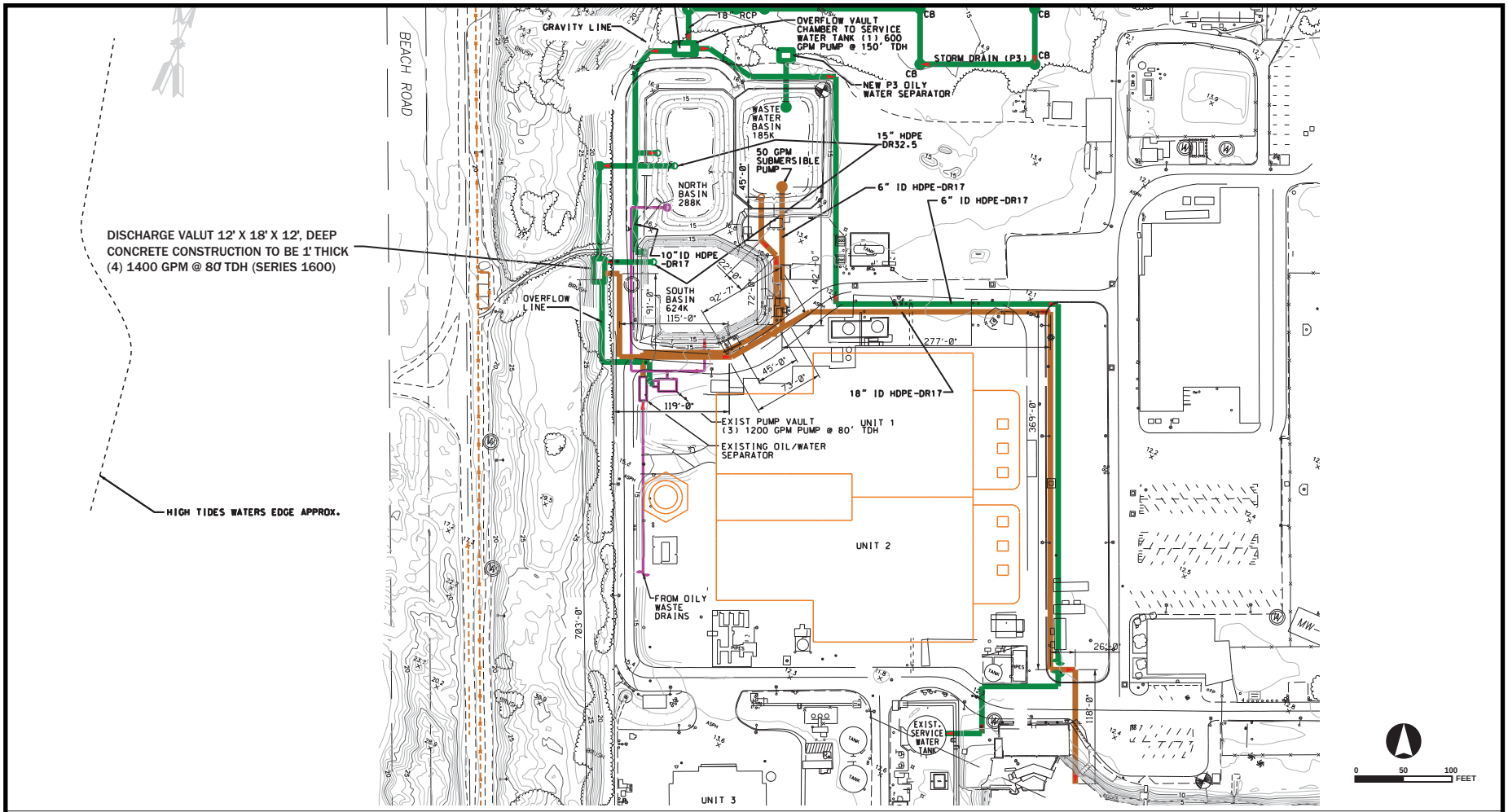
April 2015

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 2.7-9

PROJECT DESCRIPTION - FIGURE 9

Puente Power Project - Storm Water/Wastewater System



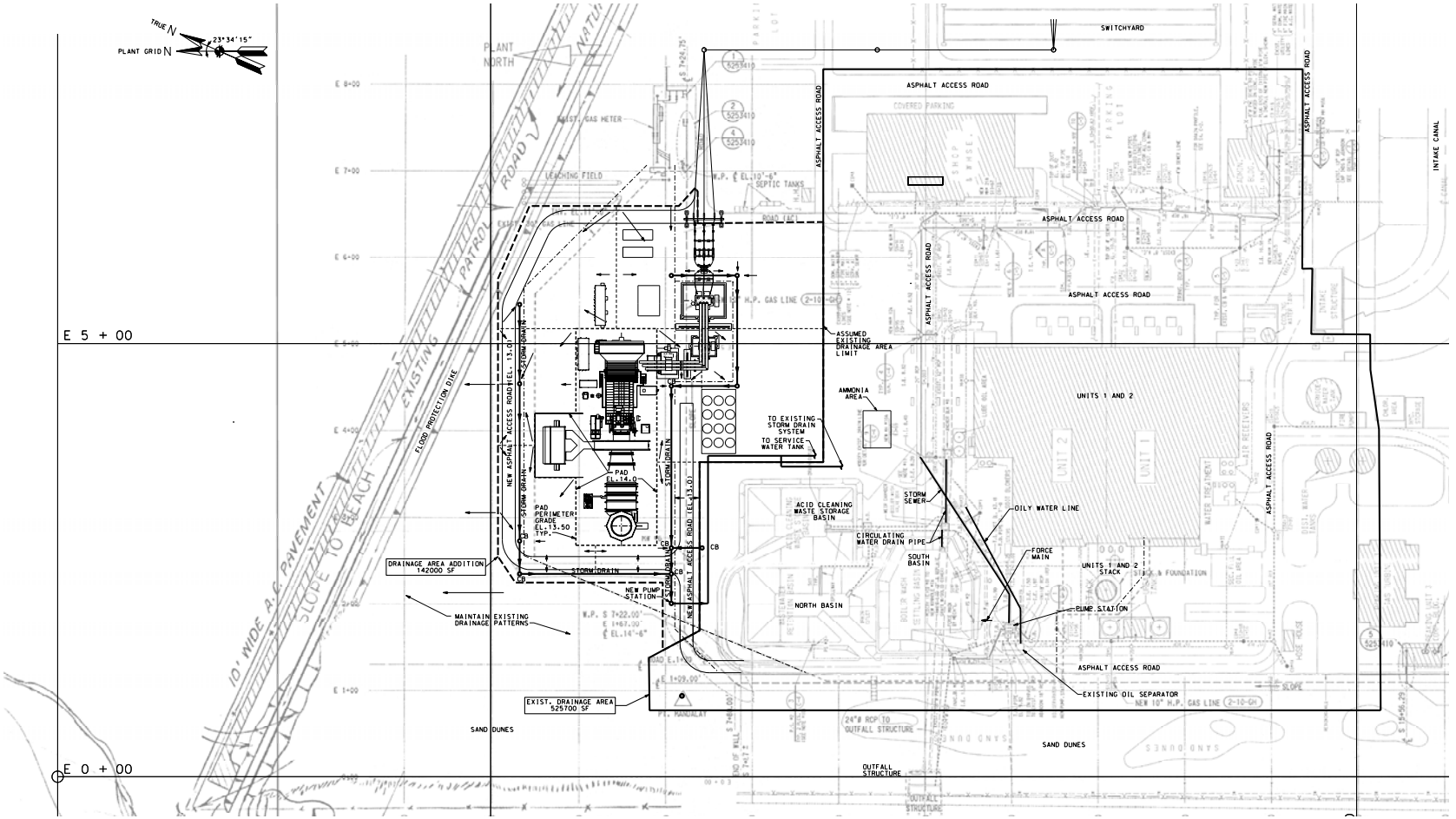
September 2016

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Outfall Removal and Beach Restoration - Figure 2-1

PROJECT DESCRIPTION - FIGURE 10

Puente Power Project - Site Grading and Drainage



PROJECT DESCRIPTION

April 2015

CALIFORNIA ENERGY COMMISSION-SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 2.8-1

AIR QUALITY

Testimony of Jacquelyn Record & Gerry Bemis

SUMMARY OF CONCLUSIONS

With the adoption of the attached conditions of certification, the proposed Puente Power Project (Puente or project) would conform to applicable federal, state, and Ventura County Air Pollution Control District (District) air quality laws, ordinances, regulations, and standards, and the proposed Puente Power Project would not result in significant air quality related impacts.

Air quality issues related to the project are addressed through staff's analysis, additional staff recommended conditions of certification, and in the Ventura County Air Pollution Control District's (VCAPCD) Final Determination of Compliance (FDOC) for the project. The Puente applicant has identified specific emissions reduction credits (ERCs) they would use to mitigate the proposed project's air quality impacts to meet the requirements of the VCAPCD District Rules and Regulations. The applicant has agreed to staff's recommended Condition of Certification **AQ-SC9** for the project's nonattainment pollutant and precursor emissions to be mitigated to less than significant (PPP 2016y). Staff made some minor edits to **AQ-SC9** to address comments made regarding staff's estimated future capacity factor of 10 percent. Staff is recommending a few modifications to **AQ-SC9** that would create a mechanism to pay for California Environmental Quality Act (CEQA) related mitigation up to a threshold determined by staff in order to mitigate nonattainment pollutants and their precursors at a minimum ratio of one-to-one. Staff has also made changes as to the appropriate location of where mitigation funding should be applied, based on CalEnviroScreen 2.0 census tracts with a score of 75 percent or higher as determined by the **Environmental Justice** section of this FSA.

To respond to the intervenors' comments, staff performed an additional independent analysis using the non-adjusted u* option[1] in AERMOD (regulatory default option). Staff's analysis evaluates impacts of the proposed Puente project with the existing cumulative sources during construction, commissioning, normal operations, and startups/shutdowns. Staff's additional analysis now also includes the Southern California Edison (SCE) McGrath facility. These results are used as part of staff's Final Staff Assessment (FSA) responses to comments on the Preliminary Staff Assessment (PSA), which can be found throughout this document in revised modeling tables, and also in a new appendix titled, **Air Quality Appendix AIR-3**. In all modeling scenarios, the construction and operations of Puente, conclusions did not change between the PSA and the FSA whether the adjusted u* or non-adjusted u* option is used in AERMOD.

[1] The Adjusted u* (surface friction velocity) option is one of the beta options that U.S. EPA has proposed as future default options of AERMOD. Staff believes that the Adjusted u* option improves AERMOD performance by reducing the overestimation of air quality impacts during low wind speed conditions. See more details in appendices **AIR-2** and **AIR-3**.

Staff also considered the environmental justice population, local farm workers, and recreational activities. Staff has assessed both the potential for localized impacts and regional impacts for the project's construction and operation, including the proposed demolition of the Mandalay Generating Station (MGS) Units 1 and 2, and the outfall structure. Staff has recommended mitigation and monitoring requirements that should be sufficient to reduce the adverse construction, demolition, and operating emission impacts to less than significant.

Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in **Air Quality Appendix AIR-1**. Puente would replace less efficient existing facilities with a modern, flexible, dispatchable, lower emission of carbon dioxide per megawatt hour (CO_2/MWh) unit, which would emit approximately 0.508 metric tonnes of carbon dioxide per net megawatt hour (MTCO2/MWh). Puente would be permitted for 2,150 hours of operation per year, but would be expected to operate at a lower fraction of those maximum permitted hours due to the fact that simple-cycle generators are generally only dispatched when needed to meet short-term capacity needs. The facility would emit over 25,000 metric tonnes of carbon dioxide equivalent (MTCO2E) emissions and therefore would be subject to mandatory state and federal GHG reporting requirements. The project, as a modern, simple-cycle combustion turbine as described in the **Project Description** with an enforceable operating limitation less than 60 percent of capacity, is not subject to the requirements of Senate Bill 1368 (Perata, Chapter 598, Statutes of 2006), the State's Emission Performance Standard.

If built, Puente would be required to participate in California's greenhouse gas cap-and-trade program. This cap-and-trade program is part of a broad effort by the State of California to reduce GHG emissions as required by Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006) (AB 32), which is being implemented by the California Air Resources Board (ARB). Market participants, such as Puente, would be required to report their GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. Thus, Puente, as a GHG cap-and-trade participant, would be consistent with California's landmark AB 32 program, which is a statewide program coordinated with a region-wide Western Climate Initiative program to reduce California's GHG emissions to 1990 levels by 2020. These requirements are extended to at least 2030 under the requirements of Senate Bill 32, described more fully below.

Staff received several comments and concerns regarding actual emissions from the Puente Facility. Staff offers some context and a comparison of Puente to everyday pollutants in the Ventura County area. Please see the comments matrix in the Response to Comments section for further details on a context comparison to relate local impacts to the Puente project.

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions due to the construction and operation of the proposed Puente project by NRG, LLC (applicant). Puente would be located in Oxnard and developed within the existing boundaries of the NRG-owned Mandalay Generating Station (MGS). The project would be located on approximately 3 acres of previously disturbed vacant land in the northern portion of the existing MGS site adjacent to the Pacific Ocean.

The analysis in this section focuses on the impacts of the proposed project's criteria air pollutant emissions, while the climate change/greenhouse gases emissions impact analysis is provided in **Appendix AIR-1**, and the air toxics emissions health impacts are analyzed separately in the **Public Health** section. Criteria air pollutants are defined as those air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health. The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), respirable particulate matter (PM10), and fine particulate matter (PM2.5). In addition, volatile organic compound (VOC), also called reactive organic compound (ROC), emissions are analyzed because they are precursors to both O_3 and particulate matter. Because NO_2 and SO_2 readily react in the atmosphere to form other oxides of nitrogen and sulfur respectively, the terms nitrogen oxides (NOx) and sulfur oxides (SOx) are also used when discussing these two pollutants.

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

- Whether Puente is likely to conform with applicable federal, state and District air quality laws, ordinances, regulations and standards (LORS) (Title 20, California Code of Regulations, section 1742 (d));
- Whether Puente is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards (Title 20, California Code of Regulations, section 1744.5); and
- Whether the mitigation proposed for Puente is adequate to lessen the potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

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

Applicable LORS	Description
Federal	
Title 40 CFR Part 51 (New Source Review) Title 40 CFR Part 52 (Prevention of Significant Deterioration Program)	Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and offsets. Prevention of Significant Deterioration (PSD) requires major sources or major modifications of major sources to obtain permits for attainment pollutants. Puente would be a modification of an existing major source, the Mandalay Generating Station, and thus the trigger levels are emissions increases of 40 tons per year of NOx, VOC or Sox; 15 tons per year of PM10; or 100 tons per year of CO. Puente is not expected to trigger a major modification under this rule.
Title 40 CFR 60, Subpart IIII	New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for compression ignition internal combustion engines, including emergency generators and fire water pump engines.
Title 40 CFR Part 60, Subpart KKKK (Standards of Performance for Stationary Combustion Turbines)	New Source Performance Standard for Stationary Combustion Turbines: 15 parts per million (ppm) NOx at 15 % O_2 and fuel sulfur limit of 0.060 lb SOx per million Btu heat input. BACT would be more restrictive.
Title 40 CFR Part 60, Subpart TTTT (Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units)	This rule establishes, effective October 23, 2015, standards for emissions for carbon dioxide (CO_2) for newly constructed, modified, and reconstructed affected fossil fuel-fired electricity utility generating units (EGUs).
Title 40 CFR Part 63 Subpart YYYY (National Emission Standards for Hazardous Air Pollutants [NESHAPs] for Combustion turbines)	Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs) from facilities in specific categories. Projects would be subject to the Title 40 CFR, Part 63 requirements if the HAP Potential to Emit (PTE) is greater or equal to 25 tons per year (tpy) for total HAPs or 10 tpy for individual HAPs. 40 CFR Part 63 Subpart YYYY requires combustion turbines to comply with a formaldehyde emission limit of 91 parts per billion by volume dry basis (ppbvd) measured at 15 percent O2. In addition, 40 CFR Part 63 Subpart YYYY requires an operating limitation such that the operator of the equipment maintains the 4-hour rolling average of the catalyst inlet temperature within the range suggested by the catalyst manufacturer.
Title 40 CFR Part 64 (Compliance Assurance Monitoring [CAM])	The CAM regulation applies to major stationary sources, which use control equipment to achieve a specified emission limit. The rule is intended to provide “reasonable assurance” that the control systems are operating properly to maintain compliance with the emission limits. This subpart rule applies to new turbines because the NOx and CO emissions are subject to Best Available Control Technology (BACT) limits and are achieved with added equipment, i.e., selective catalytic reduction (SCR) and an oxidation catalyst.
40 CFR Part 70	Title V: Federal permit. Title V permit application is required within one year of start of operation. See **Rule 33**.
40 CFR Part 72	Acid Rain Program. Requires permit and obtaining sulfur oxides credits. See **Rule 34**.
State	
Health and Safety Code (HSC) section 40910-40930	Permitting of source needs to be consistent with Air Resource Board (ARB) approved Clean Air Plans.

Applicable LORS	Description
HSC section 41700 (Nuisance Regulation)	Restricts emissions that would cause nuisance or injury.
California Public Resources Code §25523(a); 2300-2309:CEC & ARB Memorandum of Understanding	Requires that an Energy Commission Decision on an AFC to assure protection of environmental quality.
Title 13 California Code of Regulations, §2449	In-Use Off-road Diesel Vehicle Regulation. Imposes idling limits of five minutes, requires a plan for emissions reductions for medium to large fleets, requires all vehicles with engines greater than 25 horsepower (HP) to be reported to the California Air Resources Board (ARB) and labeled, and restricts adding older vehicles into fleets.
Title 13, California Code of Regulations, §2485	Prohibits idling longer than five minutes for diesel fueled commercial motor vehicles.
Title 17, California Code of Regulations, §93115 (Airborne Toxic Control Measure for Stationary Compression Ignition Engines)	Limits types of fuels allowed, establishes maximum emission rates and establishes recordkeeping requirements for stationary compression ignition engines, including diesel-fueled emergency generator and fire water pump engines.
Local – Ventura County Air Pollution Control District (VCAPCD) Rule and Regulations	
Regulation II – Permits, Operating and Construction, New Source Review	This regulation sets forth the regulatory framework of the application for, and issuance of, construction and operation permits for new, altered, and existing equipment. Included in these requirements are the federally delegated requirements for New Source Review, Title V Permits, and the Acid Rain Program. Regulation II, Rule 26, establish the review requirements for new, replacements, modified or relocated facilities, in conformance with the federal New Source Review regulation to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in Ventura County is not unnecessarily restricted. This regulation establishes Best Available Control Technology (BACT) and emission offset requirements. **Rule 10** – Specifies permitting requirements. **Rule 26.9** – Establishes a procedure for coordinating VCAPCD review of power plant projects with the Energy Commission process. **Rules 26.1** through **26.12** – Implements new source review programs as well as the new source review requirements of the California CAA. **Rule 26.13** – Adopts the federal PSD program. This rule has not yet been approved by the US EPA. **Rule 33.1** through **33.10** – Implements the Title V federal operating permit. **Rule 34** – Acid Deposit Control

Applicable LORS	Description
Regulation IV – Prohibitions, General and Source Specific Regulations	**Rules 50** to **Rule 57.1** - This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, and fuel contaminants. This regulation also specifies additional performance standards for stationary combustion turbines and other internal combustion engines. **Rule 50** – Limits visible emission to no darker than Ringlemann No. 1 for periods greater than 3 minutes in any hour. **Rule 51** – Prohibits emissions in qualities that adversely affect public health, other business, or property. **Rule 54** – Limits sulfur emissions on site and off site. **Rule 55** – Limits visible dust emissions from construction activities. **Rule 57.1** – Limits PM emissions from stationary sources. **Rule 64** – Limits the sulfur content of fuels combusted in stationary sources. **Rule 72** – Adopts the federal standards of National Standards of Performance (NSPS) for New Stationary Sources. **Rule 73** – Requires units to comply with federal NESHAP standards. **Rule 74.9** – Limits CO, NOx, and ROC emissions from stationary reciprocating engines greater than or equal to 50 bhp. **Rule 74.23** – Limits NOx emissions from stationary combustion turbines.
Regulation VI – Source Testing and Stack Monitoring	**Rule 101** – Requires sampling and testing at facilities required to comply with this rule. **Rule 102** – Requires source tests necessary to verify compliance with emission limits. **Rule 103** – Requires project owner to maintain in good working order, and operate a Continuous Monitoring System in accordance with this provision.

SETTING

METEOROLOGICAL CONDITIONS

Ventura County has a Mediterranean climate, typical of most coastal California cities and is known to experience Santa Ana winds off the Transverse Ranges on occasion, which can increase temperatures. The area is controlled by a subtropical high-pressure system often located off the Pacific coast. In the summer, this strong high-pressure system results in clear skies, high temperatures, and low humidity. Very little precipitation occurs during the summer months of June through August because storms are blocked by the high-pressure system. Beginning in the fall and continuing through the winter, the high pressure system weakens and moves south, allowing storm systems to move through the area. Temperature, winds, and rainfall are more variable during these months and stagnant conditions occur more frequently than during summer months. Weather patterns include periods of stormy weather with rain and gusty winds, clear weather that can occur after a storm, or persistent marine layer conditions, with or without ground fog, that can occur during extended parts of the year. The city of Ventura receives an average of 17.5 inches of rain annually (WC 2015).

Temperature, wind speed, and wind direction data collected at the Oxnard Airport monitoring station, located about 2.1 miles east of the project site, were processed and an eleven-year data set (1998-2008) was provided with the Application for Certification (AFC) air dispersion modeling files (PPP 2015a), and the Revised Air Quality Modeling Files (CEC 2015jj). These data were used in this analysis. The specific location of this meteorological station is approximately two miles from the surf zone, and should represent the local weather patterns, including persistent marine layer and fog conditions, nearly identical to the project site. The most predominant annual wind direction from this monitoring site is onshore from the west-northwest with a strong secondary northeast to east-northeast offshore component. Onshore winds are the most predominant during both the second and third quarters. The winds during the first and fourth quarters have a more predominate offshore component. In all cases, annual and quarterly, the wind direction frequencies outside the previously stated predominate onshore and offshore directions are fairly low. The average wind speed is 3.2 meters per second and dead calm hours occur infrequently, about 2.7 percent of the time. The wind speeds are generally higher during daylight hours, and are highest during the first and second quarters of the year.

Along with wind flow, atmospheric stability and mixing heights are important factors in the determination of pollutant dispersion. Atmospheric stability refers to the amount of atmospheric turbulence and mixing. In general, the less stable an atmosphere, the greater the turbulence, which results in more mixing and better dispersion. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. Good ventilation results from a high mixing height and at least moderate wind speeds within the mixing layer. In general, mixing is more limited at night and in the winter in Ventura County when there is a higher potential for the presence of lower level inversion layers along with low speed surface winds.

EXISTING AIR QUALITY

The project is located within the jurisdiction of the Ventura County Air Pollution Control District. The applicable federal and California ambient air quality standards (AAQS) are presented in **Air Quality Table 2**. As indicated in this table, the averaging times for the various air quality standards (the duration over which they are measured) range from one hour to annual average. The standards are read as a mass fraction, in parts per million (ppm), or as a concentration, in milligrams or micrograms of pollutant per cubic meter of air (mg/m^3 or $\mu g/m^3$).

The U.S. Environmental Protection Agency (U.S. EPA) and the ARB classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data is available, or non-compliance with the ambient air quality standards, respectively. The Puente project site is located within the South Central Coast Air Basin (SCCAB). This area is designated as nonattainment for both the federal and state ozone standards and the state PM10 and PM2.5 standards. **Air Quality Table 3** summarizes federal and state attainment status of criteria pollutants for the SCCAB.

Air Quality Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.070 ppm (147 µg/m^3) [a]	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.03 ppm (57 µg/m^3)
	1 Hour	100 ppb (188 µg/m^3) [b]	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO_2)	24 Hour	—	0.04 ppm (105 µg/m^3)
	1 Hour	75 ppb (196 µg/m^3) [c]	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	12.0 µg/m^3 [d]	12 µg/m^3
	24 Hour	35 µg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Rolling 3-Month Average	0.15 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Source: ARB 2015a.

Notes:

a - Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

b - This one-hour federal standard is based on the 98th percentile of maximum daily peak hourly values, unlike the state one-hour standard that is a not to be exceeded standard.

c - This one-hour federal standard is based on the 99th percentile of maximum daily peak hourly values, unlike the state one-hour standard that is a not be exceeded standard.

d - There is also a secondary standard of 15 µg/m^3.

Air Quality Table 3
Federal and State Attainment Status for Ventura County within the SCCAB [a]

Pollutant	Attainment Status	
	Federal	State
Ozone	Marginal Nonattainment (8-hr)	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Attainment	Attainment

Source: ARB 2015b, U.S. EPA 2015a, U.S. EPA 2015b, PDOC 2016, FDOC 2016
Note: a – The term Attainment is used for all designations, such as unclassifiable, that are functionally the same as an Attainment designation.

The operating monitoring stations closest to the proposed project site with long-term records for ozone, PM10, PM2.5 and NOx are the El Rio -- Rio Mesa School #2 (El Rio) monitoring station, which is located at Rio Mesa High School, seven miles northeast of the project site. For CO, the Goleta – Fairview monitoring station, located 36 miles northeast of the project site is used. For SOx, the UC Santa Barbara monitoring station, which is located around 40 miles northwest of the project site is used. The coastal locations of the Oxnard, Goleta and Santa Barbara County monitoring stations make them more representative of conditions in Oxnard than other monitoring stations nearby.

Ozone

In the presence of ultraviolet radiation, both nitrogen oxides (NOx) and volatile organic compounds (VOC) go through a number of complex chemical reactions to form ozone. **Air Quality Table 4** summarizes the most project representative ambient ozone data collected from the El Rio Mesa School #2 (El Rio) monitoring station. The table includes the maximum one-hour and eight-hour ozone and the number of days above the California ambient air quality standards (CAAQS). Ozone formation is higher in spring, summer, and early fall and lower in the winter. The Ventura County portion of the SCCAB was classified as an attainment area for the previous federal one-hour ozone standard (no longer applicable) and is now classified as a marginal nonattainment area for the federal eight-hour ozone standard. Ventura County portion of the SCCAB is also classified as a nonattainment area for the state ozone standards.

The yearly trends from 1990 to 2014 for the maximum one-hour and eight-hour ozone concentrations, referenced to the most stringent standard, and the number of days exceeding the California one-hour and eight-hour standards for the El Rio –Rio Mesa School #2 (1990-2014) monitoring station can be seen in **Air Quality Table 4**. On the first figure, the normalized concentration of 1.00 indicates the standard is not exceeded.

Air Quality Table 4
Ozone Air Quality Summary, 1990-2014 (ppm)

Year	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg. (ppm)	Days Above CAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg. (ppm)
El Rio – Rio Mesa School #2						
1990	9	SEP	0.120	16	SEP	0.089
1991	12	SEP	0.120	42	SEP	0.108
1992	17	APR	0.141	26	APR	0.111
1993	8	MAY	0.138	22	MAY	0.100
1994	7	JUN	0.115	13	AUG	0.088
1995	7	OCT	0.124	16	OCT	0.104
1996	8	MAY	0.121	24	APR	0.098
1997	2	MAR	0.102	6	MAR	0.089
1998	1	JUL	0.106	7	JUL	0.085
1999	1	OCT	0.103	1	OCT	0.081
2000	0	JUN	0.084	1	JUN	0.072
2001	0	OCT	0.094	2	OCT	0.073
2002	0	JUL	0.086	0	JUN	0.067
2003	0	OCT	0.081	3	MAY	0.072
2004	0	SEP	0.084	1	SEP	0.079
2005	0	MAY	0.076	0	MAY	0.068
2006	0	SEP	0.089	0	SEP	0.070
2007	0	SEP	0.089	1	SEP	0.072
2008	0	JUN	0.086	1	JUN	0.075
2009	1	AUG	0.099	1	AUG	0.077
2010	0	SEP	0.083	1	SEP	0.073
2011	0	OCT	0.081	0	OCT	0.069
2012	0	OCT	0.082	0	OCT	0.065
2013	0	MAY	0.067	0	MAY	0.063
2014	1	OCT	0.112	2	OCT	0.077

California Ambient Air Quality Standard (CAAQS): One-Hr, 0.09 ppm, 8-Hr, 0.070 ppm
National Ambient Air Quality Standard (NAAQS): Eight-Hr, 0.070 ppm, days above standard based on old standard of 0.080 ppm through 2007.
Source: ARB 2015 and ARB 2015c.

As this table shows, the one-hour and eight-hour ozone concentrations were highest in early 1990's and the number of exceedances was highest in 1992. Maximum concentrations and the number of CAAQS exceedances have declined significantly since 1990. The Ventura County portion of the air basin cannot be redesignated as attainment of the federal and state ozone concentration standards until all monitoring stations within the county show no official exceedances of these standards for three consecutive years. Federal redesignation requires an official request for redesignation and the approval of an attainment or a maintenance plan.

Respirable Particulate Matter (PM10)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx, and VOC from turbines, and ammonia from NOx control equipment, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the wintertime are a significant portion of the total PM10, and are likely even a higher contributor to particulate matter of less than 2.5 microns (PM2.5). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) and some as sodium nitrate. If the ammonium and the sodium ions associated with the nitrate ion are taken into consideration, PM nitrate contributions to the total PM are even more significant.

As **Air Quality Table 5** indicates, the representative monitoring stations annually experience occasional violations of the state 24-hour PM10 standard (days above daily CAAQS) and continue to exceed the state annual PM10 standard of 20 $\mu g/m^3$. The Ventura County portion of the SCCAB is classified as an attainment area for the federal PM10 standard and as a nonattainment area for the state PM10 standards.

As shown in **Air Quality Table 5**, the highest PM10 concentrations are generally measured in the fall and winter; this is when there are frequent low-level inversions. During the wintertime high PM10 episodes, the contribution of ground-level releases to ambient PM10 concentrations is disproportionately high.

Air Quality Table 5
PM10 Air Quality Summary, 1990-2014 (µg/m^3)

Year	Measured Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg. (µg/m^3)	Annual Arithmetic Mean (µg/m^3)
El Rio – Rio Mesa School #2				
1990	10	OCT	102	34.9
1991	4	JAN	59	32.3
1992	5	OCT	58	29
1993	4	OCT	63	29
1994	2	OCT	54	--
1995	3	NOV	62	25.9
1996	1	AUG	64	25.3
1997	3	OCT	58[a]	32.0
1998	2	OCT	69	23.3
1999	0	OCT	50	28.5
2000	1	AUG	52	27.6
2001	3	OCT	53	28.8
2002	2	AUG	100	28.5
2003	5	MAR	126.1[a]	29
2004	1	APR	59	28.8
2005	2	JUL	54	25.5
2006	4	JUL	119	27.8
2007	2	APR	65[a]	29.7
2008	3	JUL	80	26.2
2009	2	OCT	100	25.6
2010	1	MAR	62	21.7
2011	1	AUG	52	22.2
2012	1	AUG	57	21.0
2013	4	JUN	47	24.3
2014	7	MAR	51	27.4

California Ambient Air Quality Standard: 24-Hr, 50 µg/m^3; Annual Arithmetic, 20 µg/m^3
National Ambient Air Quality Standard: 24-Hr, 150 µg/m^3
* Days above the state standard (calculated), rounded to nearest whole day: PM10 is monitored approximately once every six days. This value is a mathematical estimate of how many days the PM10 concentrations would have been greater than the ambient air quality standard had each day been monitored.
-- Data not available
[a] Excludes 1997, 2003 and 2007 firestorm events, second and third highest values are shown.
Source: ARB 2015, VCAPCD 2016c, and ARB 2015c.

The 1990 to 2014 yearly trends for the maximum 24-hour PM10 and Annual Arithmetic Mean PM10, referenced to the most stringent standard, and the number of days exceeding the California 24-hour PM10 standard for the Oxnard – Rio Mesa School (1990-2014) monitoring station are shown in Air Quality Table 5. As the table shows, there is an overall gradual downward trend for annual PM10 concentrations and the number of violations of the California 24-hour standard since 1990; however, there has been little progress in the 24-hour PM10 concentrations since 1998.

Fine Particulate Matter (PM2.5)

The Ventura County portion of the SCCAB is classified as attainment for the federal and state fine particulate matter (PM2.5) standards. As shown in **Air Quality Table 6**, the highest PM2.5 concentrations are generally measured in the winter. The relative contribution of wood-smoke particles to the PM2.5 concentrations may be even higher

than its relative contribution to PM10 concentrations, considering that most of the wood-smoke particles are smaller than 2.5 microns.

As **Air Quality Table 6** indicates, the 24-hour (three-year average 98th percentile) PM2.5 concentration levels and the annual average concentration levels have been declining from 1999 through 2014. These concentrations were at or above the current federal standards as of 2003, but the 24-hour concentrations have been below the federal standard since 2001 and the area is classified as attainment of that federal and state standards. The PM2.5 concentration data at the El Rio – Rio Mesa School #2 monitoring station has also been below the state standard since 2004 and possibly prior; however there was insufficient data prior to that year at the monitoring station for the state annual average.

Air Quality Table 6
PM2.5 Air Quality Summary, 1999-2014 (µg/m^3)

Year	National Maximum Daily (µg/m^3)	Month of Maximum Daily	98th Percentile Maximum Daily (µg/m^3)	State Annual Average (µg/m^3)	National Annual Average (µg/m^3)
El Rio – Rio Mesa School #2					
1999	36.7	NOV	--	--	--
2000	45.7	NOV	--	--	--
2001	41.0	NOV	32.4	--	13.1
2002	29.4	AUG	27.9	--	12.9
2003	81.7[a]	OCT	28.7	--	11.7
2004	28.5	OCT	27.0	11.3	11.3
2005	35.2	MAR	23.8	10.5	10.5
2006	29.8	NOV	23.5	9.8	9.8
2007	39.9[a]	OCT	27.5	10.6	10.6
2008	23.4	NOV	19.7	10.1	10.0
2009	19.7	APR	18.9	10.2	10.2
2010	21.4	DEC	16.5	8.5	8.4
2011	18.3	MAY	17.4	11.4	8.8
2012	30.8	DEC	17.0	--	8.7
2013	19.9	OCT	17.7	--	9.4
2014	22.2	FEB	17.8	9.4	9.3

California Ambient Air Quality Standard: Annual Arithmetic Mean, 12 µg/m^3
National Ambient Air Quality Standards: 24-Hr Avg. Conc., 35 µg/m^3 (based on 98 percent of the daily concentrations, average over three years); Annual Arithmetic Mean, 12 µg/m^3
"--" = unavailable data.
[a] Excludes 2003 and 2007 firestorm events
Source: ARB 2015

Carbon Monoxide (CO)

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as a

stable boundary layer. These conditions occur frequently in the wintertime, late in the afternoon, persist during the night, and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main source of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during rush hour traffic in the mornings and afternoons. CO concentrations in Ventura County and the rest of the state have declined significantly due to two statewide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all areas of California are in attainment with CO ambient air quality standards.

Air Quality Table 7 shows the maximum one-hour and eight-hour CO concentrations monitored in Goleta, which would be expected to have very similar CO concentrations as at the project site in Oxnard due to its similar location. CO is considered a local pollutant, as it is found in high concentrations near the source of emission. High levels of CO emissions can also be generated from fireplaces and wood-burning stoves. According to the data recorded at the Goleta – Fairview air monitoring station, there have been no exceedances of CO ambient air quality standards since 1992 (see **Air Quality Table 7**).

Air Quality Table 7
CO Air Quality Summary, 1992-2014 (ppm)

Year	Month of Max. 8-Hr Average	Maximum 8-Hr Average (ppm)	Maximum 1-Hr Average (ppm)
Goleta – Fairview			
1992	--	3.9	5.0
1993	--	3.4	4.0
1994	JAN	2.6	4.7
1995	JAN	1.8	4.0
1996	FEB	1.6	3.4
1997	DEC	2.0	3.5
1998	NOV	2.2	4.6
1999	FEB	1.9	3.5
2000	APR	1.6	3.1
2002	JAN	1.1	2.8
2003	OCT	1.1	1.9
2004	JAN	1.0	2.0
2005	JAN	0.8	1.8
2006	DEC	0.8	1.1
2007	NOV	1.1	2.2
2008	JAN	0.6	1.4
2009	DEC	0.6	1.6
2010	JAN	0.6	2.0
2011	DEC	0.6	2.0
2012	MAR	0.7	1.6
2013	--	--	1.0
2014	--	--	0.9

Source: ARB 2015, U.S. EPA 2015.
California Ambient Air Quality Standard: One-Hr, 20 ppm; Eight-Hr, 9.0 ppm
National Ambient Air Quality Standard: One-Hr, 35 ppm; Eight-Hr, 9.0 ppm

Nitrogen Dioxide (NO_2)

As shown in **Air Quality Table 8,** the maximum one-hour and annual concentrations of NO_2 at the El Rio – Rio Mesa School #2 monitoring station are lower than the California and national ambient air quality standards and typically occurred in winter or fall.

Approximately 75 to 90 percent of the NOx emitted from combustion sources is Nitric Oxide (NO), while the balance is NO_2. NO is oxidized in the atmosphere to NO_2 by oxygen and ozone. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) generally disperse pollutants, preventing the accumulation of NO_2 to levels approaching the California one-hour ambient air quality standard. Additionally, NO_2 concentrations are reduced during summer daylight conditions through consumption in the photochemical reaction that creates ozone. The formation of NO_2 in the presence of ozone is according to the following reaction: $NO + O_3 \rightarrow NO_2 + O_2$

Air Quality Table 8
NO_2 Air Quality Summary, 1990-2014 (ppm)

Year	Month of Max. 1-Hr Average	Maximum 1-Hr Average (ppm)	Annual Average (ppm)
El Rio – Rio Mesa School #2			
1990	JAN	0.1	0.017
1991	FEB	0.09	0.016
1992	NOV	0.063	0.013
1993	NOV	0.079	0.014
1994	NOV	0.104	0.015
1995	AUG	0.127	0.016
1996	JAN	0.11	0.015
1997	NOV	0.072	0.014
1998	JAN	0.088	0.013
1999	JAN	0.099	0.014
2000	NOV	0.074	0.014
2001	DEC	0.068	0.012
2002	DEC	0.048	0.010
2003	OCT	0.057	0.011
2004	JAN	0.063	0.011
2005	AUG	0.070	0.011
2006	DEC	0.050	0.010
2007	JUN	0.053	0.010
2008	NOV	0.052	0.008
2009	SEP	0.051	0.008
2010	AUG	0.060(0.037)	0.007
2011	AUG	0.090 (0.037)	0.007
2012	SEP	0.057 (0.033)	0.007
2013	JAN	0.040 (0.033)	0.007
2014	JAN	0.039 (0.030)	0.006

California One-Hr Ambient Air Quality Standard: 0.18 ppm
California Annual Arithmetic Mean Ambient Air Quality Standard: 0.03 ppm
National One-Hr 98th Percentile Ambient Air Quality Standard: 0.100 ppm
National Annual Arithmetic Mean Ambient Air Quality Standard: 0.053 ppm
Values in "()" are the last three year 98th percentile values
Source: ARB 2015, U.S. EPA 2015.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of combustion of a fuel containing sulfur. Natural gas contains very little sulfur and consequently has very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content, such as coal, emit very large amounts of SO_2 when combusted.

Sources of SO_2 emissions within the Ventura County portion of the SCCAB come from every economic sector and include a wide variety of fuels: gaseous, liquid and solid. The Ventura County portion of the SCCAB is designated attainment for all SO_2 state and federal ambient air quality standards. **Air Quality Table 9** shows the historical one-hour, 24-hour, and annual average SO_2 concentrations collected from the UC Santa Barbara West Campus, Santa Barbara County monitoring station. As **Air Quality Table 9** shows, concentrations of SO_2 are far below the state and federal SO_2 ambient air quality standards.

Air Quality Table 9
SO_2 Air Quality Summary, 2004-2014 (ppm)

Year	Maximum 1-Hr Avg.[a]	Month of Max. 24-Hr Avg.[b]	Maximum 24-Hr Avg.[b]	Annual Average
Santa Barbara – UCSB West Campus				
2004	0.006	JAN	0.001	0.000
2005	0.006	JAN	0.002	0.000
2006	0.009	JAN	0.001	0.000
2007	0.005 (0.004)	OCT	0.001	0.000
2008	0.006 (0.004)	OCT	0.001	0.000
2009	0.004 (0.004)	JAN	0.001	0.000
2010	0.005 (0.004)	DEC	0.001	0.000
2011	0.003 (0.002)	APR	0.001	0.000
2012	0.002 (0.002)	NOV	0.001	0.001
2013	0.002 (0.002)	MAY	0.002	0.000
2014	0.004 (0.001)	*	0.003	0.000

California Ambient Air Quality Standard: One-Hr, 0.25 ppm; 24-Hr, 0.04 ppm
National Ambient Air Quality Standard: One-Hr, 0.075 ppm, 99th percentile of maximum daily values
[a] Maximum 1-hr average is from the U.S. EPA website
[b] Maximum 24-hr average is from ARB website.
* data was not available
Values in "()" are the last three year full years of data 99th percentile values
Source: ARB 2015, U.S. EPA 2015.

Visibility

Visibility in the region of the project site depends upon the area's natural relative humidity and the intensity of both particulate and gaseous pollution in the atmosphere. The most straightforward characterization of visibility is probably the visual range (the greatest distance that a large dark object can be seen). However, in order to characterize visibility over a range of distances, it is more common to analyze the changes in visibility in terms of the change in light-extinction that occurs over each additional kilometer of distance (1/km). In the case of a greater light-extinction, the visual range would decrease.

The Ventura County portion of the SCCAB is currently designated as unclassified for visibility reducing particles.

Summary

In summary, staff recommends the background ambient air concentrations in **Air Quality Table 10** for use in the modeling and impacts analysis. The maximum criteria pollutant concentrations from the past three years of available data collected at the monitoring stations within Ventura County are typically used to determine these recommended background values. For this project we are using data from 2012 to 2014 to determine the background concentrations, as determined by the Ventura County Air Pollution Control District (VCAPCD or District), since these values correspond to the meteorological and hourly background concentration data used by the District in their Air Quality Impact Analysis for Puente.

Air Quality Table 10
Staff Recommended Background Concentrations (µg/m^3)

Pollutant	Averaging Time	Recommended Background	Limiting Standard	Percent of Standard
NO_2	1 hour	107	339	32%
	1 hour NAAQS	68*	188	36%
	Annual	13	57	22%
PM10	24 hour	**56.9**	**50**	**114%**
	Annual	**24**	**20**	**120%**
PM2.5	24 hour	17.8	35	50%
	Annual	9.4	12	78%
CO	1 hour	4,582*	23,000	20%
	8 hour	1,265*	10,000	12.6%
SO_2	1 hour	11	655	1.6%
	1 hour NAAQS*	8	196	4%
	3 hour	11	1,300	0.84%
	24 hour	5.2	105	5%

Source: VCAPCD 2016a, VCAPCD 2016c, highest value of the past three years
*The background value is from the PDOC and FDOC modeling evaluation

Where possible, staff prefers that the recommended background concentrations come from nearby monitoring stations with similar site characteristics. For this project, the El Rio – Rio Mesa School #2 monitoring station (Ozone, PM10, PM2.5 and NO_2) is located reasonably close to the project site, approximately seven miles to the northeast. The Goleta – Fairview (CO) and Santa Barbara - UCSB (SO_2) monitoring stations are located further from the site, but considering similar climate and area as Ventura County where Puente would be located, these sites should provide conservative background concentrations for the project site location.

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

The pollutant modeling analysis was limited to the pollutants listed above in **Air Quality Table 10**; therefore, recommended background concentrations were not determined for other criteria pollutants (ozone, lead, visibility, etc.).

PROJECT DESCRIPTION AND EMISSIONS

Puente would consist of one General Electric 7HA.01 Frame natural-gas-fired combustion turbine generator (CTG) in a simple-cycle configuration, a diesel-fueled emergency generator, a repurposed electric fire water pump, and one natural gas compressor. The project would employ air cooling and would not include any other stationary criteria pollutant emission sources. The existing MGS, including boiler Units 1 and 2, along with ancillary equipment, would be removed from service after the new power plant facilities are constructed, commissioned, and begin commercial operation. The applicant has proposed to keep MGS Unit 3, which is a jet-engine–powered unit that was commissioned in 1970, and has a generating capacity of approximately 130 MW. MGS Unit 3 would continue to operate. Additionally, MGS Units 1 and 2 decommissioning is anticipated to be completed by June 2021. Demolition of MSG Units 1 and 2 is anticipated to commence in July 2021 and would be completed by December 2022. On November 19, 2015 (PPP 2015y), the applicant submitted a document called “Project Enhancement and Refinement Demolition of Mandalay Generating Station” as part of the Puente project design. On September 26, 2016, the applicant docketed, “Project Enhancement Outfall Removal and Beach Restoration” (PPP 2016z).

The Project Enhancement would change the method of handling wastewater and surplus storm water from Puente; the applicant now proposes that these would be discharged to the Edison Canal instead of to the ocean via the existing outfall. MGS Unit 3 wastewater and storm water from the MGS property beyond the Puente site would also be discharged to the Edison Canal. The applicant also proposes to demolish and remove the outfall, including wing walls, riprap, and the fencing around the outfall (PPP 2016z).

Demolition would consist of: (1) asbestos removal (PPP 2015y); (2) demolition to grade of MGS Units 1 and 2 turbine plant equipment and building; (3) demolition to grade of MGS Units 1 and 2 boiler plant equipment and structures; (4) demolition to grade of the 180-foot-tall stack; (PPP 2015y); (5) removal of empty hazardous-materials-contaminated equipment; and (6) removal of transformers and associated electrical equipment up to the switchyard. The specific sequencing of demolition activities would provide for coordinated removal of MGS Units 1 and 2 and continued operation and maintenance activities related to Puente and continued use of MGS Unit 3 (PPP 2015y). If Puente is approved and developed, MGS Units 1 and 2 would be decommissioned by the commercial online date of Puente. Staff would like to note, MGS Unit 1 may be operational after the new CTG is operational, but would be permanently shut down within 90 days, but no later than 180 calendar days, after the start of commissioning period for the proposed new gas combustion turbine generator. Both MGS Units 1 and 2 would be shut down prior to December 31, 2020. Further details on the impacts and analysis will be covered later in this Air Quality section.

The project would maximize the use of existing linear lines; therefore, little or no off-site construction is necessary for transmission, gas supply, or sewer/industrial wastewater lines for this project.

The nearest sensitive receptor to the Puente site is the Leite Family Daycare on Reef Way, approximately 1 mile (5,500 feet) to the southeast. The closest existing residential

neighborhood is the Oxnard Shores Mobile Home Park, approximately 0.75 mile (or approximately 3,900 feet) to the south. The North Shore at Mandalay Bay residential development (recently re-named Beach Walk on the Mandalay Coast) is scheduled to commence vertical construction in 2016. The closest distance from the proposed Puente stack to this development boundary is approximately 0.47 mile to the southeast (approximately 2,460 feet) (PPP 2015a, Section 4.9.1). There are also agricultural farm workers in fields near the project site located approximately 800 feet north east of Puente's easterly fence line.

CONSTRUCTION

Construction of Puente would consist of multiple phases or milestones (PPP 2016y):

1. Phase I - Construction and Initial Commissioning of Puente (~21-months and 6 weeks, respectively) – beginning October 2018 to June 2020

2. Phase II - Retirement and Decommissioning of MGS Units 1 and 2 (3-months and 3 months, respectively) – completed by June 2021

3. Phase III - MGS Units 1 and 2 Demolition, including demolition of outfall (~18-months) – commencing July 2021 and completed by December 2022

Phase I and II were requested by the applicant in their AFC, and Phase III was requested in the applicant's subsequent filing titled, Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (PPP 2015y). Phases I and II include the construction and initial commissioning of the Puente combustion turbine that are described separately in the following subsection. None of the construction/demolition phases overlap with each other. Puente operation would overlap with Phase III.

During the construction and demolition periods, most heavier construction and demolition activities, including truck trips, would occur between 6:00 a.m. and 6:00 p.m., five days per week. The use of heavy off-road equipment on-site would occur between the hours of 7:00 a.m. and 6:00 p.m., Mondays through Saturday. However, there would be times when additional hours of construction may be necessary to make up for construction delays due to weather or other unforeseen events, provided the activities comply with the local noise ordinance. Some activities would be continuous 24 hours per day, seven days per week, during some construction or demolition periods and during startup and commission of the units.

Construction laydown, along with construction worker parking areas for this project, would occupy approximately 5.7 acres in the MGS site location which would be used for construction laydown, offices, and parking. Approximately 0.9 acre of the 5.7 acres is currently paved. The remaining unpaved areas to be used for construction laydown and parking areas would be graded (as necessary), and surfaced with 4 inches of crushed rock. Construction materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables would be delivered to the Puente site by truck. The heavy components, such as the combustion turbine, transformers and associated components would be transported by rail, and then trucked to the site. Union Pacific

Railroad has a switchyard approximately 5 miles east of the site near Highway 1, 3rd Street, Rose Avenue, and 5th Street (PPP 2015a, page 2-25).

Fugitive dust emissions during the construction of Puente power plant and MGS Units 1 and 2 demolition would result from dust entrained during demolition, site preparation and grading activities, on-site and off-site travel on paved and unpaved surfaces, and aggregate and soil loading and unloading operations, as well as wind erosion of areas disturbed during construction activities. The largest fugitive dust emissions are often generated during site preparation activities, where work such as clearing, grading, excavation of footings and foundations, and backfilling operations occur. These types of activities require the use of large earth moving equipment, which generate combustion emissions, along with creating fugitive dust emissions. Fugitive dust emissions resulting from on-site soil disturbances, such as dozing and grading, and from on-site and off-site traffic also were estimated.

Combustion emissions during the construction of Puente and demolition of MGS Units 1 and 2 would also result from off-road and on-road equipment exhaust sources, such as diesel construction equipment used for site preparation, water trucks used to control dust emissions, cranes, excavators, diesel-powered welding machines, electric generators, air compressors, water pumps, diesel trucks used for deliveries and demolition waste hauling, trains used for deliveries, and automobiles and trucks used by workers to commute to and from the construction sites. Construction/demolition emissions were estimated by the applicant for all three primary construction and demolition work phases as described below.

Phase I – Construction and Initial Commissioning of Puente

Construction of Puente would take 18 months of the 21 month schedule of this phase. The peak daily and the peak annual emissions, (based on the peak 12-month period out of a proposed project schedule of 18-months) on-site, off-site and total exhaust and fugitive emissions estimated for construction of Puente are shown in **Air Quality Tables 11** and **12**.

Applicant estimates for the highest emissions during construction, which occur during initial site grading, are provided in **Air Quality Table 11**. The maximum daily emissions shown below were used for modeling maximum short-term construction period air quality impacts. The total emissions during construction based on the peak 12-month period, including onsite and offsite emissions are summarized in **Air Quality Table 12** and are shown in tons per year.

Air Quality Table 11
Summary of Onsite Construction Maximum Daily Emissions, lbs/day

Activity	NO_x	CO	VOC	SO_x	PM10	PM2.5
Onsite Emissions						
Equipment Combustion Emissions	73.6	141.7	3.7	0.2	0.4	0.4
Construction Eq. and Onsite Vehicles (Fugitive Dust)	--	--	--	--	6.3	1.9
Wind Erosion (Fugitive Dust)	--	--	--	--	0.15	0.05
Offsite Emissions						
Delivery and Haul Truck Travel	3.4	1.9	0.2	0.01	0.06	0.05
Worker Travel	1.4	14.4	0.5	0.05	0.03	0.02
Delivery and Haul Truck Travel (Fugitive Dust)					4.0	1.1
Total Maximum Daily Emissions	78.4	158.1	4.4	0.26	10.9	3.5

Source: PPP 2015a.

Air Quality Table 12
Summary of Maximum Total Annual Construction Emissions, tons per year

Activity	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Emissions						
Equipment Combustion Emissions	8.8	17.1	0.45	0.03	0.05	0.05
Construction Eq. and Onsite Vehicles (Fugitive Dust)	--	--	--	--	0.51	0.09
Wind Erosion (Fugitive Dust)	--	--	--	--	0.02	0.01
Offsite Emissions						
Delivery and Haul Truck Travel	0.5	0.3	0.02	0.002	0.01	0.01
Worker Travel	0.2	1.7	0.06	0.006	0.003	0.003
Delivery and Haul Truck Travel (Fugitive Dust)	--	--	--	--	0.5	0.13
Total Maximum Daily Emissions	9.6	19.1	0.58	0.04	1.09	0.29

Source: PPP 2015a.

Initial commissioning, which would cover the last 6 weeks of this phase, is described below in the "Initial Commissioning" subsection.

Phase I - Initial Commissioning

The initial commissioning of a power plant refers to the time between the completion of construction and the reliable production of electricity for sale on the market. The initial commissioning of Puente is scheduled to occur during the last three months of Phase I. For most power plants, normal operating emission limits usually do not apply during the initial commissioning activities. The SCR with ammonia injection and oxidation catalyst control systems will not be fully operable during all of the commissioning period as the control systems are going through a commissioning period as well. These systems do not alter the PM or SOx emissions; therefore, only the ROC, NOx, and CO emissions would be affected. The commissioning period is needed, in part, to ensure the facility's operation is fine-tuned to minimize emissions during normal operations.

Commissioning of the single combustion turbine is estimated to require 6 weeks and is estimated to require 366 firing hours for the combustion turbine, 82 of which would be without the pollution control catalysts in operation; the last 284 hours would be with the pollution control catalysts in operation (PPP 2015z, Revised Table C-2.4). After completing the commissioning period, the new unit is expected to be available for commercial operation, with pollution control catalysts fully operational and meeting all emission limit requirements. During the commissioning period, the existing MGS Units 1 and 2 as well as MSG Unit 3 would be also available for operation as needed. The MGS Units 1 and 2 would decommissioned directly after the successful commissioning of Puente and release for commercial operation in June 2020 (PPP 2015z). MGS Unit 1 would continue to operate for a limited period after the new CTG is operational, but would be permanently shut down prior to December 31, 2020.

The project would have a total of 13 major commissioning test types, and the maximum emissions potentials are summarized in **Air Quality Table 13**. The emission rates for PM and SO_2 are not presented as they are fuel-flow based which are not controlled by the control systems and are not expected to be higher during any of the commissioning period activities than during normal operation. The emissions from the commissioning process would be accounted for in the total annual emissions from the CTG and are shown in **Air Quality Table 13**.

Air Quality Table 13
Puente Initial Commissioning Maximum Short-Term Emissions

Time Period	NOx	CO	VOC
Maximum Hourly (lbs/hr)	246	1,973	164
Maximum Annual (tpy)	11.7	31.7	3.5

Source: PPP 2015z, GE estimates and Tables C-2.8 and C-2.9, PDOC (VCAPCD 2016a), FDOC (VCAPCD 2016c)

The short-term air pollutant emissions estimates from **Air Quality Table 13** were used in air dispersion modeling impacts analysis, presented in the “Impacts” subsection, to determine the worst-case air quality impacts during initial commissioning.

Phase II – Complete Decommissioning of MGS Units 1 and 2

This phase would start after the completion of initial commissioning and the start of commercial operation of Puente. This phase is estimated to require 6 months and would consist of the permanent shutdown and decommissioning MGS Units 1 and 2 and is expected to be complete by June 2021 (PPP 2015y). Other activities to be performed during this phase, that would be required prior to the initiation of MGS Units 1 and 2 demolition, would include the removal of MGS materials and equipment that would be reused, sold, or recycled, and the removal of hazardous materials. In addition, all of the District air permits for the MGS Unit 1 and 2 boilers would be retired at the beginning of this phase.

The applicant-provided emissions estimate for decommissioning of MGS Units 1 and 2, maximum daily emissions in pounds per day, can be seen in **Air Quality Table 14** (lbs/day). The applicant originally estimated, in the AFC, decommissioning of MGS Units 1 and 2 would be expected to be around a 3-month period. However, in the supplemental filing titled Project Enhancement and Refinement Demolition (PPP 2015y), the applicant stated decommissioning would take 6 months as shown in **Air**

Quality Table 15. The emissions are estimated using a 6-month period, which would occur concurrently with Puente operation. However, due to the substantially lower level of activity required, this phase would have emissions that would be substantially lower than the emissions during the MGS Units 1 and 2 demolition.

Air Quality Table 14
MGS Units 1 and 2 Decommissioning
Maximum Daily Emissions, lbs/day

Onsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
MGS Units 1 and 2 Decommissioning, equipment and onsite vehicles	11.29	21.71	0.60	0.04	0.06	0.06
Fugitive Dust (Onsite Vehicles)[a]	--	--	--	--	4.0E-4	1.0E-4
Offsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
Maximum emissions (haul, travel, delivery)[b]	0.15	1.5	0.05	0.01	0.003	0.003
Fugitive Dust (Offsite Vehicles)[a]	--	--	--	--	0.42	0.11
Total Emissions (Onsite and Offsite)	**11.44**	**23.21**	**0.65**	**0.05**	**0.48**	**0.17**

Source: AFC Table C-6-3, PPP 2015a, Notes: a. VMT is calculated using 60 miles roundtrip using CalEEMod Table C-6-15 (PPP 2015a). b. estimation is for paved road emissions.

Air Quality Table 15
MGS Units 1 and 2 Decommissioning
Maximum Daily Emissions (6-month period), tons

Onsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
MGS Units 1 and 2 Decommissioning, equipment and onsite vehicles	0.88	1.7	0.04	0.002	0.004	0.004
Fugitive Dust (Onsite Vehicles)[a]	--	--	--	--	3.2E-5	8.6E-6
Offsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
Maximum emissions (haul, travel, delivery)[b]	0.02	0.1	0.004	4.2E-4	2.4E-4	2.4E-4
Fugitive Dust (Offsite Vehicles)[a]	--	--	--	--	0.04	0.008
Total Emissions (Onsite and Offsite)	**0.9**	**1.8**	**0.044**	**0.002**	**0.044**	**0.012**

Source: Supplemental Filing Table C-6-16 (Revised 11/18/2015), PPP 2015 y
Notes: a. VMT is calculated using 60 miles roundtrip using CalEEMod (PPP 2015a)
b. estimation is for paved road emissions

Phase III – MGS Units 1 and 2 Demolition

The 15-month demolition of the MGS Units 1 and 2 would occur after the decommissioning of the two boiler units and is expected to be completed by December 2022 (PPP 2015y). While there is no regulatory requirement that specifically forces the demolition of MGS Units 1 and 2, there are requirements that would have to be followed related to the use of the ocean cooling, one of which could be the decommissioning and demolition of MGS Units 1 and 2. However, this is only one compliance option.

Demolition activities would include the use of diesel-fueled heavy equipment to demolish and remove the existing boilers, boiler building, stack and other MGS facilities. The types of direct emission sources are similar to those required for Puente construction, namely, off-road equipment, heavy haul trucks, and employee commute trips. In this case the off-road equipment is needed to demolish the structures rather

than build structures, to handle demolition waste, to restore/re-grade the site; and on-road heavy truck trips are needed to haul the waste/recycled materials away rather than bring in structure components and raw construction materials.

The applicant has recently proposed demolition of the outfall structure in a document submitted as part of the Project Enhancement and Refinement, docketed on September 26, 2016. The demolition of the outfall structure would affect approximately 0.4 acre, including demolishing the wing walls and removing the riprap and fencing. Emissions are expected to slightly increase above values shown in these tables, but the increases are expected to be minimal, and would occur at the same time as demolition of MGS Units 1 and 2.

The demolition of the outfall is not expected to substantially change the types of demolition activity, numbers or types of demolition equipment used, and/or the demolition workforce. The demolition of the outfall structure is not expected to change the emission levels and/or ambient impacts already analyzed in the PSA for demolition activities (PPP 2016z).

A MGS demolition asbestos/lead removal permit would be required by the District prior to MGS demolition. The project-specific emissions estimate would need to account for site specific factors, such as schedule and intensity of this demolition project, the trip distances required for demolition waste/recycle haul off, and the effectiveness of project specific mitigation measures required by the District. Regardless of the exact duration and activity of the MGS demolition activities, the emissions and ambient air quality impacts would be short-term, a few years at most, and would be mitigated as considered appropriate by the District.

In addition to the short-term demolition emissions, the re-use of the MGS property after demolition and property restoration could create both short-term and long-term emissions. It is speculative at this point to declare what would be the emissions changes from site re-use, but any such emission increases are assumed to be well below the direct emissions that would occur during MGS demolition. If new construction is involved, staff recommends the District consider mitigation measures as stringent as recommended Conditions of Certification **AQ-SC3** and **AQ-SC4** for fugitive dust control and **AQ-SC5** for off-road diesel fueled engine emission control.

The peak daily and the and peak annual (based on the peak 15-month period), total and on-site construction equipment exhaust and fugitive emissions estimated for MGS demolition are shown in **Air Quality Tables 16** and **17**. For comparison, the construction-period emissions estimates are shown above in **Air Quality Tables 11** and **12**.

Air Quality Table 16
Phase III – MGS Units 1 and 2 Demolition Maximum Daily Emissions, lbs/day[a]

Onsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
MGS Units 1 and 2 Demolition, equipment and onsite vehicles	59.45	110.16	2.97	0.18	0.83	0.41
Offsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
Maximum emissions (haul, travel, delivery)	5.28	14.67	0.67	0.07	3.8	1.1
Total (onsite and offsite)	**64.7**	**124.8**	**3.6**	**0.25**	**4.6**	**1.5**

Source: (TN 206698) Table 4.1-2,
a TN 213802, Demolition of the outfall would be approximately 0.4 acre, demolishing the wing walls and removing the riprap and fencing. Emissions are expected to increase, but these emissions are expected to be minimal, and would occur at the same time as demolition of MGS Units 1 and 2.

Air Quality Table 17
Phase III – MGS Units 1 and 2 Demolition Peak Annual Emissions, tons/year[a]

Onsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
MGS Units 1 and 2 Demolition, equipment and onsite vehicles	7.39	13.74	0.37	0.02	0.11	0.06
Offsite Emissions:	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**PM2.5**
Peak emissions (haul, worker travel, deliveries)	0.6	1.6	0.06	0.007	0.46	0.13
Total (onsite and offsite)	**8.0**	**15.3**	**0.4**	**0.027**	**0.57**	**0.19**

Source: (TN 206698) Table 4.1-13
a TN 213802, Demolition of the outfall would be approximately 0.4 acre, demolishing the wing walls and removing the riprap and fencing. Emissions are expected to increase, but these emissions are expected to be minimal, and would occur at the same time as demolition of MGS Units 1 and 2.

As can be seen in air pollutant emissions estimates provided in **Air Quality Tables 11** and **12**, Puente construction has higher estimated emissions than those estimated for MGS demolition due to the intensity of activities and length of the construction time for the construction period as compared to the demolition time period.

OPERATIONAL PHASE

Equipment Description

Puente would consist of one simple cycle combustion turbine, with the following major components, providing a total generating capacity of 262 MW net: (AFC PPP 2015a):

- One GE 7HA.01 combustion turbine equipped with dry low NOx (DLN) burners for NOx control, inlet air filters, inlet air evaporative coolers, and natural gas compressor intercooler;
- The combustion turbine would be equipped with a selective catalytic reduction (SCR) system with 19-percent aqueous ammonia injection to further reduce NOx emissions, and an oxidation catalyst to reduce CO emissions;
- One approximately 180-foot tall, 22-foot inside diameter exhaust stack;
- A continuous emission monitoring (CEM) system installed on the stack to record concentrations of NOx, CO, and oxygen in the flue gas;
- A 779 brake-horsepower (bhp) emergency generator engine;

- An existing electric fire pump engine; and
- One natural gas-driven 100 percent capacity fuel gas compressor.

Facility Operation

The facility would be capable of operating seven days a week, 24 hours per day, and is being permitted for a maximum of 2,150 hours per year at full load operation of the combustion turbine. This is equivalent to an annual full load capacity factor of approximately 24 percent. This is an upper bound because the applicant is not able to determine the exact operating schedule for Puente since the operation profile as a modern simple-cycle combustion turbine as described in the **Project Description**, would change depending on variable demand in the service area. The MGS is permitted to operate with an annual full-load capacity factor of 100 percent[2].

Annual readiness testing (non-emergency operation) of the emergency engine would be limited to 50 hours per year. The emissions estimates assume that the total annual operation, engine testing, and emergency operation, is 200 hours per year for each emergency engine.

Puente operations would require a 17-person total workforce including operators on rotating shifts and maintenance technicians. The project would require 10 plant operators, and 2 technicians, rotating 12-hour shifts, two employees per shift, and 7 days per week. The remaining administration personnel would have standard 8-hour workdays, 5 days per week. However, Puente operation would not change staffing level because Puente uses a 17-person workforce identical to the 17-person workforce which operates the existing MGS.[3]

Emission Controls

The exclusive use of pipeline-quality natural gas, a relatively clean-burning fuel, would limit the formation of VOC, PM10, and SO_x emissions. Natural gas contains very little noncombustible gas or solid residues and a small amount of reduced sulfur compounds, including mercaptan. One combustion turbine with inlet air coolers and post-combustion Dry Low NOx (DLN) control with a selective catalytic reduction (SCR) system would be provided to control NOx concentrations in the exhaust gas. The SCR system would use 19 percent aqueous ammonia to reduce NOx emissions to no greater than 2.5 parts per million by volume, dry (ppmvd) adjusted to 15 percent oxygen from the combustion turbine/SCR system, averaged over a 1-hour period. Ammonia slip would be limited to 5 ppmvd at 15 percent oxygen on a dry basis. Staged combustion of a pre-mixed fuel/air charge would reduce CO and VOC emissions, and a CO oxidizing catalyst would be used to further reduce CO and VOC concentrations in the exhaust gas emitted to the atmosphere to 4.0 ppmvd and 2.0 ppmvd, respectively, adjusted to 15 percent oxygen.

---

[2] MGS Units 1 and 2 are permitted with the VCAPCD at full load, 8760 hours per year, using natural gas with a higher Heating Value (HHV) of 1050 Btu/scf.

[3] The project owner did not provide emissions data for vehicles required during the operation phase, including the trucks required for the trailer mounted water filters. Therefore, staff has not presented emissions from these mobile sources. The emissions from these sources would be minimal, and do not impact staff's analysis of the operations emissions.

Particulate emissions would be controlled through the use of best combustion practices, the use of a high-efficiency inlet air filter, and the use of pipeline quality natural gas as the sole fuel source. SOx emissions would be controlled using natural gas as the sole fuel for the combustion turbine. Compliance with Best Available Control Technology requirements are described in the "Compliance with LORS" subsection.

The applicant has proposed to replace the existing emergency diesel generator engine with a new engine which would be controlled by the purchase of engines meeting the best available U.S. EPA/ARB Tier engine rating and using California low sulfur (15 ppm sulfur) diesel fuel. The emergency generator engine would be certified to meet U.S. EPA diesel non-road Tier 4 (final) requirements.

One approximately 180-foot tall, 22-foot inside diameter stack would release the combustion turbine exhaust gas into the atmosphere. A continuous emission monitoring (CEM) system would be installed on the combustion turbine stack to monitor flue gas flow rate, NOx and CO concentration levels, and percentage of oxygen in the flue gas to assure adherence with the proposed emission limits. The CEM system would generate reports of emissions data in accordance with permit requirements and send alarm signals to the control room in the plant when the level of emissions approaches or exceeds pre-selected limits.

Project Operating Emissions

Expected maximum emission rates during startup and shutdown events are summarized in **Air Quality Table 18**. Hourly cold startup emissions rates reflect 30 minutes of elevated emissions followed by 30 minutes of normal operating emission levels. During shutdown, the emissions rates reflect 12 minutes of elevated emission levels preceded by 48 minutes of normal operating emissions. The applicant also expects that there could be periodic cases that would have a cold startup, a shutdown, and a warm restart event, all occurring within one hour. This case represents the worst-case hourly emissions, reflecting 48 minutes of higher emissions levels in startup and 12 minutes of higher emissions levels in shutdown in one hour; however, it is expected that this would occur very infrequently. PM10 and SO_2 emissions are not shown in the **Air Quality Table 18**, since the emissions for these pollutants are not estimated to be higher or lower during startup and shutdown events than during normal operation.

Air Quality Table 18
Puente Maximum Short-Term Event Emissions, lbs/hr

Startup/Shutdown	NOx	CO	VOC
Cold Startup	98.6	178.3	20.2
Shutdown	22.5	163.0	30.2
Startup/Shutdown/Warm Restart	143.2	412.2	52.2

Source: PPP 2015z, Table 4.1-19 revised Nov 18, 2015; PDOC (VCAPCD 2016a), FDOC (VCAPCD 2016c)

The maximum hourly normal operating emission rates for the combustion turbine and other equipment is provided in **Air Quality Table 19.** The maximum hourly normal operating emission rates reflect the average ambient temperature full load operating case.

Air Quality Table 19
Puente Maximum Normal Operation Emission Rates, lb/hr

Puente Operating Unit	NOx	CO	VOC	SOx[a]	PM[b]
Combustion turbine	22.9	22.3	6.4	5.5	10.1
Emergency Generator Engine	0.86	4.5	0.24	0.01	0.04
Natural Gas Compressor	--	--	0.12	--	--
Puente Maximum Emissions	23.76	26.8	6.76	5.5	10.14

Source: PPP 2015z, Table 5.1B-12; and PDOC (VCAPCD 2016a), FDOC (VCAPCD 2016c)
[a] SO_2 short-term emissions are based on worst-case natural gas sulfur content of 0.75 grains/100 dry standard cubic feet. Actual likely long-term worst-case sulfur content is less than 0.25 grains/100 dry standard cubic feet.
[b] This is a short-term limit to determine maximum hourly and daily emissions limits.
[C] PM=PM10=PM2.5

The existing MGS Unit 3 CTG would continue to be operated as a set of modern simple-cycle combustion turbines. **Air Quality Table 20** shows MGS Unit 3 permitted levels based on maximum normal operating emissions. These permitted emissions represent a permit operational limit of approximately 83 hours per year. According to the Energy Commissions' Energy Almanac, Quarterly Fuel and Energy Report (QFER) Database, over the past 5 years (2011 – 2015) MGS Unit 3 operated on average about 16.5 hours per year. The highest annual number of hours of operation was in 2015, at 31 hours. The least number of hours was in 2014 with 6.9 operational hours.

Air Quality Table 20
Existing MGS Unit 3 Permitted Emission Rates

Pollutant	Emissions Factor (lb/mmbtu)	Pounds per Hour[a]	Tons per Year
VOC	0.00756	18.07	0.75
NOx	0.462	1104.41	45.64
PM10	0.0203	48.53	2.01
Sox	0.0006	1.43	0.06
CO	0.1155	276.10	11.41

Source: PDOC (VCAPCD 2016a), FDOC (VCAPCD 2016c)
[a] hourly emissions are based on emission factors and maximum heat input of 2,510 mmbtu/hr

Air Quality Table 21a summarizes the maximum (worst-case) estimated hourly and annual emissions for Puente. It provides the maximum hourly commissioning emissions for comparison. The Puente combustion turbine has different emission factors associated with the various states of operation. NRG has proposed operation limits for the facility based on 200 startups, 200 shutdowns, and 1,750 hours of normal full load operation on an annual basis. The worst case combustion turbine daily operations may have four startup/shutdown cycles with the rest of the day at full load operation. The worst hourly emissions would occur when there is a cold startup then shutdown then another warm startup or restart all within the same hour. While this worst case scenario is possible, it would be infrequent (VCAPCD 2016c).

Air Quality Table 21 summarizes the estimate for the maximum annual emissions for Puente, the existing MGS annual emissions baseline emission reductions as determined by VCAPCD through a review of recent emissions data (for years 2012 to 2013), and the expected maximum annual project emission decrease from the MGS

Unit 2 baseline and the project's net emission increase. MGS Unit 2 would be permanently shut down at the end of the commissioning period for the proposed Puente combustion turbine. MGS Unit 1 would operate for a short time after the new CTG is operational, but would be permanently shut down no later than December 31, 2020. Even though MGS Unit 1 would eventually be shut down, this evaluation assumes MGS Unit 1 remains operational and the emissions associated with MGS Unit 1 are accounted for in the stationary source emissions for this project. The existing MGS existing 201 and 154 BHP emergency engines would also be replaced as part of the project.

Air Quality Table 21a
Puente Worst-Case Hourly and Annual Emissions

Operating Units	Emissions (lbs)			
	SOx	NOx	CO	PM10/PM2.5
Commissioning – Maximum Hourly Emissions				
Combustion turbine	5.5	246.3	1,973	10.1
Normal Operation – Maximum Hourly Emissions				
Combustion turbine	5.5	143.2	412.2	10.1
Diesel Emergency Engine	0.008	0.86	4.48	0.03
Total	5.5	144.1	416.7	10.1
Normal Operation – Maximum Annual Emissions				
Combustion turbine	11,820	65,900	108,840	21,360
Diesel Emergency Engine	2	172	896	6
Total	11,822	66,072	109,736	21,366

Source: PDOC (VCAPCD 2016a), FDOC (VCAPCD 2016c), PPP 2015z
[a] SO_2 annual emissions are based on an annual average sulfur content of 0.75 grains/100 dry standard cubic feet.
[b] The PM10 short-term limit to determine maximum hourly and daily emissions limits is 10.1 lbs/hour.

Air Quality Table 21
Puente Maximum Annual Emissions

Emission Source	Pollutant (tons/year)				
	NOx	CO [a]	VOC	SOx	PM [b]
Puente Expected Maximum Annual Emissions [c]	32.97	54.53	10.85	7.87	10.68
Mandalay Generating Station (MGS Unit 2 only) Emissions Baseline [d]	-3.04	-25.96	-0.91	-0.39	-1.62
MGS Existing 154 BHP Emergency Engine	-0.05	-0.01	0.0	0.0	0.0
MGS Existing 201 BHP Emergency Engine	-0.07	-0.01	0.0	0.0	0.0
Puente Net Emissions Change	+29.8	+28.55	+9.94	+7.48	+9.06

Source: FDOC (VCAPCD 2016c),
Notes:
[a] This represents normal operating years. For the initial commissioning year the annual CO emissions would be permitted to 102.1 tons, which for that one year of initial commissioning would result in an emission decrease of 20.0 tons.
[b] PM=PM10=PM2.5
[c] Potential emissions include the new CTG turbine and the new 779 BHP emergency engine.
[d] This baseline represents the average annual values determined by VCAPCD using their approved 2012 and 2013 annual emissions estimates for the MGS Unit 2 only. Based on Rule 26.6C, this two consecutive year period was determined to be the most representative as it best reflects current electricity market. The fuel records are from the VCAPCD Appendix D-Historical Fuel Records.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses three kinds of impacts: construction/demolition, operation, and cumulative effects. As the name implies, construction/demolition impacts result from the emissions occurring during the construction or demolition phases of the project. The operation impacts result from the emissions of the proposed project during operation. Cumulative impacts analysis assesses the impacts that result from the proposed project's incremental effect viewed over time, together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. (Pub. Resources Code § 21083; Cal. Code Regs., tit. 14, §§ 15064(h), 15065(c), 15130, and 15355). Additionally, cumulative impacts are assessed in terms of conformance with the District's attainment or maintenance plans.

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Staff used two main significance criteria in evaluating this project. First, all project emissions of nonattainment criteria pollutants and their precursors (NOx, VOC, PM10, and SO_2) are considered significant cumulative impacts that must be mitigated. Second, any AAQS exceedance or any contribution to any existing AAQS exceedance caused by any project emissions is considered to be significant and must be mitigated. For construction/demolition emissions, the mitigation that is considered is limited to controlling both construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, the mitigation includes both feasible emission controls (BACT) and the use of emission reduction credits to offset emissions of nonattainment criteria pollutants and their precursors.

The ambient air quality standards that staff uses as a basis for determining project significance are health-based standards established by the ARB and U.S. EPA. They

are set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality impacts such as the aged, people with existing illnesses, children, and infants, including a margin of safety.

DIRECT/CUMULATIVE IMPACTS AND MITIGATION

While the emissions are the actual mass of pollutants emitted from the project, the impacts are the concentration of pollutants from the project that reach the ground level. When emissions are exhausted at a high temperature and velocity through the relatively tall stack, the pollutants would be diluted by the time they reach ground level. The emissions from the proposed project are analyzed through the use of air dispersion models to determine the potential impacts of the plume at ground level.

Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions to provide theoretical maximum offsite pollutant concentrations for short-term (one-hour, three-hour, eight-hour, and 24-hour) and annual periods. The model results are generally described as maximum concentrations, often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu g/m^3$). Modeling was conducted outside the boundary of MGS.

U.S. EPA-approved screening (AERSCREEN) and refined air dispersion models (AERMOD version 14134 are used to estimate the direct impacts of the project's NOx, PM10, CO, and SOx emissions resulting from project construction/demolition and operation. Additionally, the District completed an analysis of the project's operating emissions using the AERSCREEN and AERMOD (version 15181) air dispersion models in their Air Quality Impact Analysis, which was provided as Appendix G of the District's Final Determination of Compliance (FDOC).

The applicant has used the AERSCREEN fumigation model, versus the previous fumigation modeling which used the SCREEN3 model. Also, in response to Energy Commission Data Request Number 59 (PPP 2015z), the revised fumigation modeling includes the impacts for the new emergency generator engine and MSG Unit 3. The maximum modeled impacts during fumigation are combined with the maximum background ambient levels and compared with the federal ambient air quality standards and results can be seen in **Air Quality Table 26**.

Staff revised the background concentrations provided by the applicant, replacing them with the ambient background concentrations determined by the District in their Air Quality Impact Analysis (AQIA); recommended background values are shown in **Air Quality Table 10**.

To respond to the intervenors' comments, staff performed additional independent analysis using the non-adjusted u* option in AERMOD (regulatory default option). Staff's independent analysis evaluates impacts of the proposed Puente project with the existing cumulative sources during construction, commissioning, normal operations, and startups/shutdowns. The PSA analysis included cumulative impacts from MGS Units 1,

2, and 3. Staff's additional independent analysis reported in this FSA includes these units and also includes the McGrath facility. See **Revised Air Quality Table 22** through **27**.

The inputs for the air dispersion models include stack information (exhaust flow rate, temperature, and stack dimensions), specific turbine emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For this project, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at the Oxnard Airport Station, which is the closest complete meteorological data source to the project site, and is meteorological data both compiled by and approved for use by the VCAPCD. The applicant modeled using data from 2009 through 2013, while the District used data from 2010 to 2014 in their Air Quality Impact Assessment (AQIA), which included reprocessing of the meteorological data using the newest version of AERMET, which is a program that process meteorological data for use in AERMOD.

Construction Impacts and Mitigation

The following section discusses the project's short-term direct and cumulative construction ambient air quality impacts, as estimated by the applicant with background concentrations from the local monitoring stations, and provides a discussion of appropriate mitigation. Staff reviewed the construction emissions estimates and air dispersion modeling procedures. Staff considers the analyses to provide an adequately conservative prediction of project construction impacts. Please see the "Cumulative Impact Analysis" section for a description of the current status of the impact analysis for the MGS demolition.

Construction Impact Analysis

The applicant used the U.S. EPA Regulatory Model (AERMOD) to estimate ambient impacts. The District does not analyze construction impacts in the AQIA in the Determination of Compliance. Therefore, for construction, the applicant's modeling analysis is analyzed. The AERMOD "OLMGROUP ALL" option was used to estimate ambient impacts from construction emissions. The modeling options and meteorological data described above were used for the modeling analysis. A NO_2/NOx ratio of 11% was used for modeling diesel construction equipment, as specified in CAPCOA's 2011 guidance document (CAPCOA, 2011).

The construction site is represented as both a set of volume sources and a separate set of area sources in the modeling analysis. Emissions are divided into three categories: exhaust emissions, mechanically generated fugitive dust emissions, and wind-blown fugitive dust emissions. Exhaust emissions and mechanically generated fugitive dust emissions (e.g., dust from wheels of a scraper) are modeled as volume sources with heights of 6 meters (for exhaust emissions) and 3 meters (for mechanically generated dust). Wind-blown fugitive dust emissions and sources at or near the ground that are at ambient temperature and have negligible vertical velocity are modeled as area sources with a vertical height of 1 meter (PPP 2015a).

The construction impact analysis also included the emissions from the MGS boilers and combustion turbine emissions as point sources, since these units could be operating

concurrently with Puente project construction activities. Values are shown in **Revised Air Quality Table 22**.

The federal 1-hour NO_2 standard is based on three-year average of the 98th percentile daily maximum values. The construction phase would take 18 months, followed by 6 weeks of commissioning followed by 6 months of decommissioning, and then 10 out of a total 15 months would be for demolition of MGS Units 1 and 2. In **Revised Air Quality Table 22**, the federal NO_2 1-hour NAAQS is not shown in the modeling results. For this standard, the basis of the standard is a 3-year average and given the limited length of a construction period, the applicant did not model. Staff does not expect Puente to have a significant impact for the federal 1-hour NO_2 standard during the construction period due to limited duration of the peak construction period compared to the three year averaging period for this standard.

To determine the construction impacts on short-term ambient standards (i.e. one-hour through 24-hours), the worst-case daily on-site construction emission levels were modeled. For pollutants with annual average ambient standards, the annual on-site emissions levels were added to a conservatively estimated "background" of existing emissions to determine the cumulative impact. For the modeling analysis, per the assumptions provided in the applicant's construction emissions impact analysis, it is assumed that all of the equipment would operate between 6:00 a.m. and 6:00 p.m., five days per week; and the use of heavy off-road equipment on-site would occur primarily between the hours of 7:00 a.m. and 4:00 p.m., five days per week. **Revised Air Quality Table 22** provides the results of this modeling analysis.

During the construction of Puente and the demolition of MGS Units 1 and 2 it will be necessary to control exhaust emissions from diesel heavy equipment, and potential emissions of fugitive dust during construction and likewise demolition activities. These measures will be implemented, as needed, to avoid and/or reduce project-related impacts to air quality to less-than-significant levels.

In response to comments received on the PSA, staff did an independent analysis to include Puente maximum onsite construction impacts, to now incorporate the non-adjusted U* option. Staff's additional independent construction impacts analysis also includes emissions from McGrath, in addition to MGS Units 1, 2, 3, and construction emissions from Puente. The **Revised Air Quality Table 22** shows the construction impacts of the proposed Puente project with concurrent operation of existing MGS Units 1, 2, and 3 using AERMOD with Adjusted u* option.

Revised Air Quality Table 22
Puente Maximum Onsite Construction Impacts, (µg/m^3)[a]
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3)	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2 [b]	1 hour	216.2	107	323.2	339	CAAQS	95%
	Annual	10.0	13	23.0	57	CAAQS	40%
PM10	24 hour	17.6	**56.9**	**74.5**	50	CAAQS	**149%**
	Annual	1.3	**24**	**25.3**	20	CAAQS	**127%**
PM2.5	24 hour	5.9	17.8	23.7	35	NAAQS	68%
	Annual	0.3	9.4	9.7	12	CAAQS	81%
CO	1 hour	2,029	4,582	6,611	23,000	CAAQS	29%
	8 hour	459.7	1,265	1724.7	10,000	CAAQS	17%
SO_2	1 hour	3.4	11	14.4	655	CAAQS	2.2%
	1 hour NAAQS	3.4	8	11.4	196	NAAQS	5.8%
	24 hour	0.3	5.2	5.5	105	CAAQS	5.3%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff's independent analysis of Puente impacts during construction included impacts from **MGS Units 1, 2, 3, and McGrath** operating in parallel with construction activities.
[b] Consistent with applicant's analysis, staff's independent analysis of 1-hour NO_2 impacts during Puente construction used the Ozone Limiting Method (OLM), and the annual NO_2 impacts are based on the ambient NO_2/NOx ratio of 0.8.

To see the comparative results (using Adjusted u* option vs. non-adjusted u* option) please see **Air Quality Appendix AIR-3** which shows that the impacts of Puente during construction with existing cumulative using the non-adjusted u* option (regulatory default option). **Revised Air Quality Table 22** shows that: the maximum NO_2, PM2.5, CO, and SO_2 impacts would still remain below the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS); the background PM10 values alone are greater than both the 24-hour and annual PM10 standards; the construction impacts have the potential to worsen the existing violations of the 24-hour and annual PM10 ambient air quality standard and are, therefore, potentially significant; the NOx and VOC emissions from construction, when considering their potential secondary ozone formation added to the existing ozone "background," have the potential to contribute to existing exceedances of the ozone standard and are, therefore, potentially significant. See more details regarding construction mitigation measures under the **Construction Impacts and Mitigation** section in **AIR QUALITY**. The above conclusions regarding the Puente construction impacts would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

Construction Mitigation

Staff recommends that construction PM10 and ozone precursor emission impacts be mitigated, including all required measures from the District's rules and regulations, as well as other measures considered necessary by staff to mitigate the construction emissions.

Applicant's Proposed Mitigation

The applicant's construction and demolition emissions estimates are presented in **Air Quality Tables 11** through **17**. These were used to determine the construction and modeling impact results shown in **Revised Air Quality Table 22**. Values assume the use of fugitive emission control measures, as well as the use of construction equipment that meets U.S. EPA/ARB Tier 4/4i non-road diesel engine standards starting with Puente construction phase.

The applicant's proposed mitigation measures are similar to the mitigation measures of other licensed Energy Commission projects. The applicant proposes the following mitigation measures to reduce the exhaust emissions from the diesel heavy equipment and fugitive dust emissions during the construction of Puente and the demolition of MGS Units 1 and 2, and removal and demolition of the outfall to MGS 1 and 2. (Appendix C-6 Construction/Decommissioning Emissions):

- Unpaved surface travel and disturbed areas in the project construction site will be watered as frequently as necessary to prevent fugitive dust plumes.
- The frequency of watering can be reduced or eliminated during periods of precipitation.
- The vehicle speed limit will be 15 miles per hour within the construction site.
- The construction site entrances shall be posted with visible speed limit signs.
- Construction equipment vehicle tires will be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
- Gravel ramps of at least 20 feet in length will be provided at the tire washing/cleaning station.
- Unpaved exits from the construction site will be graveled or treated to prevent track-out to public roadways.
- Construction/decommissioning vehicles will enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the Compliance Project Manager.
- Construction areas adjacent to any paved roadway will be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.
- Paved roads within the construction site will be cleaned at least once per day (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
- At least the first 500 feet of any public roadway exiting from the construction site shall be cleaned at least once daily when dirt or runoff from the construction site is visible on public roadways.
- Soil storage piles and disturbed areas that remain inactive for longer than 10 days will be covered or treated with appropriate dust suppressant compounds.
- Vehicles used to transport solid bulk material on public roadways and having the potential to cause visible emissions will be provided with a cover, or the materials

will be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

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

The applicant proposes to have an on-site construction mitigation manager who would be responsible for the implementation of, and compliance with, the construction mitigation program. Documentation of the ongoing implementation and compliance with the proposed construction mitigations would be provided on a periodic basis.

Adequacy of Proposed Mitigation

Staff generally concurs with the applicant's proposed mitigation measures, which are consistent with staff's mitigation recommendations from other siting cases and appropriate for this case. Staff is recommending to incorporate these requirements with minor changes to clarify them where needed. In addition, staff recommends incorporating off-road equipment mitigation measures beyond those proposed by the applicant to ensure emissions are reduced and impacts are minimized during the construction and demolition phases of the project.

Staff Proposed Mitigation

Additional measures recommended by staff would reduce construction-phase impacts to a less than significant level by further limiting construction emissions of particulate matter and combustion contaminants. Staff concludes that the short-term and variable nature of construction and demolition activities warrants a qualitative approach to mitigation. Construction and demolition emissions and the effectiveness of mitigation varies widely depending on variable levels of activity, the timing of specific work taking place, the specific equipment, soil conditions, weather conditions, and other factors, making precise quantification of emissions and air quality impacts difficult. Despite this uncertainty, there are a number of feasible control measures that can and should be implemented to significantly reduce construction and demolition period emissions. Staff proposes that prior to the beginning of construction the facility owner should provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies all mitigation measures used to limit air quality impacts during construction and demolition. Staff proposes Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement these requirements. These conditions update the applicant's proposed mitigation measures. Compliance with these conditions mitigates the air quality impacts to less than significant during construction of Puente and demolition of MGS Units 1 and 2.

Staff recommends Conditions of Certification **AQ-SC1**, **AQ-SC2**, and **AQ-SC4** to apply to both construction of Puente and demolition of MGS Units 1 and 2 to emphasize that these are part of the license.

For Condition of Certification **AQ-SC3,** staff recommends incorporation of the Applicant's requested text additions, to include a number of mitigation measures for the

construction phase of Puente. These include the requirement to clean both onsite and offsite paved roads.

Staff recommends the revision of Condition of Certification **AQ-SC4** as proposed by the applicant to include a number of dust mitigation measures for the construction phase of Puente. The Applicant is requesting a change to clarify that the mitigation measures are specific to dust emissions.

Staff is proposing, with the changes requested by the applicant, Air Quality Condition of Certification **AQ-SC5** to mitigate off-road engine impacts. Staff is recommending the base engine requirement from U.S. EPA/ARB non-road diesel engine Tier 4 or 4i. This recommendation would require the applicant to use the cleanest engines available and provides clear direction on the steps the applicant would take if a Tier 4 or 4i engine was not available. This could potentially reduce the PM10, diesel particulate emissions and NOx emission from the off-road equipment. This is a standard requirement proposed by staff on all current projects.

Staff recommends condition **AQ-SC11** to ensure that specific major construction, demolition, and commissioning events are not performed concurrently. Staff's impact analysis conclusions are based on these events being sequential, which is how they have been identified and analyzed by the applicant.

Implementation of staff's recommended construction/demolition emission mitigation measures contained in the recommended conditions of certification would substantially reduce fugitive dust and tailpipe emissions during Puente construction and demolition phases and reduce the potential for significant air quality impacts from these temporary emission sources.

Operation Impacts and Mitigation

The following section discusses the project's direct and cumulative ambient air quality impacts, as estimated by the applicant, the District, and evaluated by staff. Additionally, this section discusses the recommended mitigation measures.

The applicant performed direct impact modeling analyses, including operations, startup and shutdown, fumigation, decommissioning of MGS Units 1 and 2, and an initial commissioning impact analysis. The District performed these analyses in their Air Quality Impact Analysis (AQIA) that is included as an appendix in the FDOC. Due to comments received on the PSA regarding modeling results, staff performed an independent analysis for the impacts of Puente which now includes AERMOD non-adjusted u* option (regulatory default option) along with continued operation of MGS Units 1 and 3. Staff's cumulative impacts results shown in several Revised Air Quality Tables now includes McGrath, in addition to Puente and MGS Units 1 and 3.

Operational Modeling Analysis

The applicant used the AERMOD model to estimate ambient impacts during normal operation and higher short-term emissions events, such as worst-case initial commissioning and start-up and shutdown emissions events (PPP 2015a). The District

validated this modeling analysis in the FDOC AQIA (VCAPCD 2016c, Appendix G) using AERMOD version 15181. The NOx emissions from internal combustion sources, such as combustion turbines, are primarily in the form of NO rather than NO_2. The NO converts into NO_2 in the atmosphere, primarily through the reaction with ambient ozone. The District based their modeling of NOx emissions on Section 5.2.4 of Appendix W, which recommends a three-tiered screening approach for NO_2 modeling. The District ran the model assuming full conversion of NO to NO_2, which is the first of the three-tiered approaches. If the analysis indicates a likely exceedance of an AAQS, the analysis proceeds to the next tier. Actual monitored hourly background ozone and NO_2 concentration data from the Oxnard Airport monitoring station (2010 to 2014 data that corresponds with the meteorological file surface data source) were used for the modeling results.

The District performed an independent analysis comparing the impacts of Puente from AERMOD using Adjusted u* option and default options (without using Adjusted u*). The FDOC shows that AERMOD predicts lower impacts with Adjusted u* option than default options, which agrees with other evaluations.

In response to comments received by several intervenors, in the FSA staff is showing Revised Air Quality Tables that now include results with the Non-adjusted u* option along with the cumulative operation of the SCE McGrath Peaker. **Revised Air Quality Tables 23** through **27** show results using the Non-adjusted u* option. To see the adjusted u* option project impacts, please see **Air Quality Appendix AIR-3** for comparison between the PSA tables and the revised tables shown in this FSA. The analysis shows that the conclusion that the project would not cause new violations of ambient air quality standards remains valid whether the Adjusted u* option is used or the default (non-Adjusted u*) is used to perform the analysis.

Revised Air Quality Table 23 shows the Puente impacts only, which includes the normal operation of the proposed new turbine and new emergency engine. Due to comments received on the PSA, **Revised Air Quality Table 24** now shows combined impacts for simultaneous operation of Puente with existing cumulative sources. For comparison purposes, staff presents results from staff's independent analysis for the impacts of Puente only in **Revised Air Quality Table 23** and cumulative impacts in **Revised Air Quality Table 24**. Both Air Quality tables below now include AERMOD non-adjusted u* option (regulatory default option). **Revised Air Quality Table 24** includes impacts from Puente with continued operation of MGS Units 1 and 3. Staff's cumulative impacts results shown in **Revised Air Quality Table 24** now include McGrath, in addition to Puente, MGS Units 1 and 3. To see a comparison with the PSA Air Quality tables with the adjusted u* option, please see **Air Quality Appendix AIR-3** which includes the PSA **Air Quality Tables 23** and **24** under **Air Quality Appendix Air-3 Tables 2** and **3** respectively for comparison purposes.

Revised Puente Air Quality Table 23
Puente Normal CTG Operating Impacts, and Emergency Engine
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2 [a]	1 hour	61.5	107	168.5	339	CAAQS	50%
	1 hour NAAQS [b]	61.5	68	129.5	188	NAAQS	69%
	Annual	0.0	13	13.0	57	CAAQS	23%
PM10	24 hour	0.2	**56.9**	**57.1**	50	CAAQS	**114%**
	Annual	0.0	**24**	**24.0**	20	CAAQS	**120%**
PM2.5	24 hour	0.2	17.8	18.0	35	NAAQS	51%
	Annual	0.0	9.4	9.4	12	CAAQS	78%
CO	1 hour	356.4	4,582	4,938	23,000	CAAQS	21%
	8 hour	71.8	1,265	1336.8	10,000	CAAQS	13%
SO_2	1 hour	0.9	11	11.9	655	CAAQS	1.8%
	1 hour NAAQS	0.9	8	8.9	196	NAAQS	4.5%
	24 hour	0.1	5.2	5.3	105	CAAQS	5.0%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used Plume Volume Molar Ratio Method **(**PVMRM) to model the 1-hour NO_2 impacts and the annual NO_2 impacts are based on the ambient NO_2/NOx ratio of 0.8.
[b] Staff conservatively computed the total1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background.

The combined impacts for simultaneous operation of all sources were modeled by staff and combined results are shown in Revised **Air Quality Table 24**.

Revised Air Quality Table 24
Puente Normal CTG Operating Impacts,
Emergency Generator, MGS Units 1 and 3, and McGrath

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
Cumulative impacts from AERMOD with non-adjusted u* option (regulatory default option)							
NO_2 [a]	1 hour	178.8	107	285.8	339	CAAQS	84%
	1 hour NAAQS [b]	-	-	170.9	188	NAAQS	91%
	Annual	0.0	13	13.0	57	CAAQS	23%
PM10	24 hour	1.4	**56.9**	**58.3**	50	CAAQS	**117%**
	Annual	0.0	**24**	**24.0**	20	CAAQS	**120%**
PM2.5	24 hour	1.4	17.8	19.2	35	NAAQS	55%
	Annual	0.0	9.4	9.4	12	CAAQS	79%
CO	1 hour	357.9	4,582	4,940	23,000	CAAQS	21%
	8 hour	86.5	1,265	1351.5	10,000	CAAQS	14%
SO_2	1 hour	1.7	11	12.7	655	CAAQS	1.9%
	1 hour NAAQS	1.7	8	9.7	196	NAAQS	5.0%
	24 hour	0.2	5.2	5.4	105	CAAQS	5.1%
Fumigation impacts of McGrath from AERSCREEN							
PM10	24 hour	2.3	**56.9**	**59.2**	50	CAAQS	**118%**
PM2.5	24 hour	2.3	17.8	20.1	35	NAAQS	57%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used PVMRM to model the 1-hour NO_2 impacts and the annual NO_2 impacts are based on the ambient NO_2/NOx ratio of 0.8.

The PSA Air Quality tables used AERMOD with Adjusted u* option to evaluate the cumulative impacts of Puente during normal operations with existing sources. Additionally, because fumigation could cause high impacts, the staff performed an analysis to evaluate the fumigation impacts of Puente and the existing sources using AERSCREEN (the regulatory model approved for fumigation impacts analysis). The worst-case short-term cumulative impacts (except for 1-hour NO_2 NAAQS impacts) shown in the PSA **Air Quality Table 24** were due to the fumigation impacts modeled from AERSCREEN, which are higher than those modeled in the PSA from AERMOD with Adjusted u* option. The worst-case cumulative impacts for the 1-hour NO_2 NAAQS and annual standards shown in **Revised Air Quality Table 24** were modeled using AERMOD with non-adjusted u* option.

Revised Air Quality Table 24 shows the cumulative impacts of Puente during normal operations with the existing sources (MGS Units 1 and 3, and McGrath) from staff's independent analysis using AERMOD with non-adjusted u* option. In addition, staff performed an AERSCREEN analysis to evaluate the fumigation impacts of McGrath since the applicant's fumigation impacts analysis did not include McGrath. Staff's analysis shows that the fumigation impacts of McGrath would be less than those modeled using AERMOD with non-adjusted u* option, except for the 24-hour PM impacts. For comparison purposes, staff also presented the 24-hour PM impacts of McGrath due to fumigation in the same **Revised Air Quality Table 24**.

Comparing results (using AERSCREEN or AERMOD with Adjusted u* option) shown in the PSA **Air Quality Table 24**, to results in this FSA **Revised Air Quality Table 24,** the

cumulative impacts of Puente during normal operations with existing sources would be lower using AERMOD non-adjusted u* option (regulatory default option), except for the 1-hour NO_2 NAAQS and CO impacts. The higher impacts shown in PSA **Air Quality Table 24** were fumigation impacts modeled using AERSCREEN. For the 1-hour NO_2 NAAQS, PSA **Air Quality Table 24** used the Ozone Limiting Method (OLM) option in AERMOD with Adjusted u* option and pairing of modeled impacts with monthly hour-of-day NO_2 backgrounds. For the additional analysis, staff used the Plume Volume Molar Ratio Method (PVMRM) option in AERMOD with non-adjusted u* option and pairing of modeled impacts with monthly hour-of-day NO_2 backgrounds. See more details of the NO_2 modeling options in the **NO_2 IMPACTS ANALYSIS** section below. **Revised Air Quality Table 24** shows that the 24-hour PM impacts of McGrath due to fumigation modeled using AERSCREEN would be slightly higher than the cumulative impacts modeled using AERMOD with non-adjusted u* option and those shown in PSA **Air Quality Table 24**.

Similar to the differences between PSA **Air Quality Table 23** and PSA **Air Quality Table 24**, the differences between **Revised Air Quality Table 23** and **Revised Air Quality Table 24** show that the existing cumulative sources (especially MGS Unit 3), instead of the proposed Puente project, dominate the air quality impacts, except for CO impacts. Nonetheless, the results shown in **Revised Air Quality Table 23** and **Revised Air Quality Table 24** indicate that the project's normal operational impacts (with or without existing cumulative sources) would not create new exceedances of NO_2, SO_2, or CO standards, but could further exacerbate currently-occurring exceedances of the PM10 standards. In light of the existing state PM10 non-attainment status for the project site area, staff considers the modeled impacts to be significant and, therefore, staff is recommending appropriate mitigation. Additionally, the NOx and VOC emissions from operation, when considering their potential secondary ozone formation added to the existing ozone "background", have the potential to contribute to existing exceedances of the ozone standard and are therefore potentially significant. Therefore, staff is recommending appropriate mitigation. See more details regarding operations mitigation measures under the **Operations Impacts and Mitigation** section in this FSA.

As the differences in **Air Quality Table 23** and **Air Quality Table 24** show, the MGS Units 1 and 3, when operating, have a much higher short-term, near-field impact potential for NOx than P3 during normal operations. The majority of the impact contribution in **Air Quality Table 24** is due to presumed ongoing operation of the existing MGS Units 1 (until December 31, 2020) and Unit 3. In each modeling scenario in **Air Quality Table 23** and **Table 24**, the results indicate that the project's normal operational impacts would not create exceedances of NO_2, SO_2, or CO standards, but could further exacerbate violations of the PM10 standards. In light of the existing state PM10 non-attainment status for the project site area, staff considers the modeled impacts to be significant and, therefore, staff is recommending appropriate mitigation. Additionally, the NOx and VOC emissions from operation, when considering their potential secondary ozone formation added to the existing ozone "background," have the potential to contribute to existing exceedances of the ozone standard and are therefore potentially significant. Therefore, staff is recommending appropriate mitigation.

Startup/Shutdown Event Modeling Impact Analysis

PSA **Air Quality Table 25** showed Puente impacts during the turbine startup/shutdown (without cumulative sources) modeled using AERMOD with Adjusted u* option. Staff's independent analysis evaluated the impacts of Puente during startup/shutdown with existing cumulative sources using non-adjusted u* option. Due to comments received on the PSA, staff has revised the PSA **Air Quality Table 25** and is now titled **Revised Air Quality Table 25**, which shows impacts of Puente during startup/shutdown with and without cumulative sources from staff's independent analysis using the non-adjusted u* option.

For the 1-hour NO_2 impacts during Puente startup/shutdown, PSA **Air Quality Table 25** used full conversion of NOx to NO_2 (see more details regarding different tier methods for NO_2 modeling in the **NO_2 impacts analysis** of **Air Quality Appendix AIR-3**). Staff's independent analysis used PVMRM option to model the 1-hour NO_2 impacts during Puente startup/shutdown with cumulative sources. For Puente impacts only (turbine and emergency engine), staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background. Staff was able to demonstrate compliance with the1-hour NO_2 NAAQS with this conservative approach. Therefore, no further analysis is required for the Puente impacts without the cumulative sources. However, for the cumulative impacts analysis, staff used a more refined approach by pairing the modeled impacts with monthly hour-of-day NO_2 backgrounds. See more details of the NO_2 modeling options in the **NO_2 impacts analysis** of **Air Quality Appendix AIR-3**. Also, if you would like to see the comparison between the PSA **Air Quality Table 25** and this FSA **Revised Air Quality Table 25**, please see **Appendix AIR-3**.

Revised Air Quality Table 25
Puente Startup/Shutdown Impacts, (µg/m3)
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3)	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
Puente turbine startup/shutdown with emergency engine							
NO_2 [a]	1 hour	61.6	107	168.6	339	CAAQS	50%
	1 hour NAAQS [b]	61.6	68	129.6	188	NAAQS	69%
CO	1 hour	356.8	4,582	4,939	23,000	CAAQS	21%
	8 hour	71.8	1,265	1336.8	10,000	CAAQS	13%
Puente turbine startup/shutdown with emergency engine, MGS Units 1, 3, and McGrath							
NO_2 [a]	1 hour	181.8	107	288.8	339	CAAQS	85%
	1 hour NAAQS [c]	-	-	173.2	188	NAAQS	92%
CO	1 hour	358.3	4,582	4,940	23,000	CAAQS	21%
	8 hour	86.5	1,265	1351.5	10,000	CAAQS	14%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used PVMRM to model the 1-hour NO_2 impacts.
[b] For Puente impacts only, staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background.

Compared to the results (using Adjusted u* option) shown in the PSA **Air Quality Table 25**, the impacts of Puente (turbine and emergency engine) during startup/shutdown shown in the upper half of **Revised Air Quality Table 25** is higher using the non-adjusted u* option (regulatory default option), except for the 8-hour CO. The cumulative 1-hour NO_2 impacts shown in the lower half of **Revised Air Quality Table 25** are dominated by the existing MGS Unit 3. However, **Revised Air Quality Table 25** shows that the proposed Puente project's maximum startup/shutdown emission impacts (with or without the cumulative sources) would not cause any new adverse impacts of NO_2 and CO.

This conclusion would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD. If you would like to see a comparison between the PSA **Air Quality Table 25** and this FSA **Revised Air Quality Table 25**, please see **Air Quality Appendix AIR-3**.

Fumigation Modeling Impact Analysis

There is the potential that higher short-term concentrations may occur during fumigation conditions. 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 would also be vertically mixed, bringing some of those emissions down to the 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 event, called fumigation, usually lasts approximately 30 to 90 minutes.

As described above, fumigation conditions are short-duration events and are generally compared to one-hour standards. Two types of fumigation are analyzed using the AERSCREEN model: inversion breakup and shoreline. Inversion breakup fumigation occurs under low-wind conditions when a rising morning mixing height caps a stack (i.e., is at or right above the stack height) limiting plume rise and mixing, which fumigates the air below. Shoreline fumigation occurs near a large water body shoreline when both a roughness boundary and more dominant thermal boundary cause turbulent dispersion to be much more enhanced near the ground, fumigating air below. Currently, AERSCREEN is the only regulatory model approved by EPA for shoreline fumigation and inversion breakup modeling. AERSCREEN calculates fumigation due to inversion break-up and shoreline fumigation for point sources with release heights (above ground level) of 10 m or more.

The District modeled the worst-case operating cases to determine the maximum fumigation impacts from the combustion turbine. The results of the District's fumigation modeling analysis are shown in **Air Quality Table 26**.

Air Quality Table 26
Maximum Puente Fumigation Impacts, (µg/m^3)

Pollutant	Averaging Period	Project Impact[1] (µg/m^3)	Background[2] (µg/m^3)	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2	1 hour	63.1	107	170	339	CAAQS	50%
NO_2	1 hour	63.1	68	131	188	NAAQS	69%
PM10	24 hour	0.4	**56.9**	57.3	50	CAAQS	**114%**
PM2.5	24 hour	0.4	17.8	18.2	35	NAAQS	52%
CO	1 hour	181.6	4,582	4763	23,000	CAAQS	21%
	8 hour	42.1	1,265	1307	10,000	CAAQS	13%
SO_2	1 hour	1.3	8	9.3	196	NAAQS	5%
	24 hour	0.2	5.2	5.4	105	CAAQS	5%

Source: VCAPCD 2016a, Appendix G Table 5-16
1 Fumigation modeled impact reported as the higher of the shoreline fumigation or inversion breakup fumigation concentrations.
2 Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.
Bold is used to show values greater than the limiting standard.

Maximum inversion breakup fumigation impacts for the turbine are higher than normal operating impacts predicted by AERMOD for NOx. The impacts under shoreline inversion fumigation conditions were found to be lower than the maximum concentrations for CO calculated under normal combustion turbine operations (see **Air Quality Table 23**). All fumigation project impact concentration levels were found to be below the CAAQS and NAAQS.

Initial Commissioning Short-Term Modeling Impact Analysis

PSA **Air Quality Table 27** provided Puente impacts during the turbine initial commissioning (without cumulative sources) modeled using AERMOD with Adjusted u* option. Staff's independent analysis evaluated the impacts of Puente during initial commissioning with existing cumulative sources using AERMOD non-adjusted u* option. A **Revised Air Quality Table 27,** below shows results of Puente during initial commissioning with and without cumulative sources from staff's independent analysis.

Similar to the startup/shutdown impacts analysis, PSA **Air Quality Table 27** used full conversion of NOx to NO_2 to evaluate the 1-hour NO_2 impacts of Puente during initial commissioning. Staff's independent analysis used PVMRM option to model the 1-hour NO_2 impacts of Puente during initial commissioning with cumulative sources. For Puente impacts only, staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background. Staff was able to demonstrate compliance with the1-hour NO_2 NAAQS with this conservative approach. Therefore, no further analysis is required for the Puente impacts without the cumulative sources. However, for the cumulative impacts analysis, staff used a more refined approach by pairing the modeled impacts with monthly hour-of-day NO_2 backgrounds. See more details of the NO_2 modeling options in the **NO_2 IMPACTS ANALYSIS** section of the **Air Quality Appendix Air-3**.

Comparing results (using Adjusted u* option) shown in the PSA **Air Quality Table 27**, the impacts of Puente during initial commissioning (without cumulative sources) shown

in the upper half of **Revised Air Quality Table 27** would be higher using the non-adjusted u* option (regulatory default option). However, **Revised Air Quality Table 27** shows that the project's maximum initial commissioning emission impacts (with or without cumulative sources) would be below the most stringent ambient air quality standards for NO_2, PM2.5, and CO. The commissioning impacts have the potential to worsen the existing violations of the 24-hour PM10 ambient air quality standard and are, therefore, potentially significant. The background values alone are greater than the 24-hour PM10 California Ambient Air Quality Standards (CAAQS).

The above conclusions would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

Revised Air Quality Table 27
Maximum Puente Initial Commissioning Impacts
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
Puente commissioning impacts only							
NO_2 [a]	1 hour	48.1	107	155.1	339	CAAQS	46%
	1 hour NAAQS [b]	48.1	68	116.1	188	NAAQS	62%
PM10	24 hour	0.2	**56.9**	**57.1**	50	CAAQS	**114%**
PM2.5	24 hour	0.2	17.8	18.0	35	NAAQS	51%
CO	1 hour	425.1	4,582	5007.1	23,000	CAAQS	22%
	8 hour	117.1	1,265	1382.1	10,000	CAAQS	14%
Puente commissioning with MGS Units 1, 2, 3, and McGrath							
NO_2 [a]	1 hour	186.1	107	293.1	339	CAAQS	86%
	1 hour NAAQS [c]	-	-	177.0	188	NAAQS	94%
PM10	24 hour	1.6	**56.9**	**58.5**	50	CAAQS	**117%**
PM2.5	24 hour	1.6	17.8	19.4	35	NAAQS	56%
CO	1 hour	446.6	4,582	5028.6	23,000	CAAQS	22%
	8 hour	126.1	1,265	1391.1	10,000	CAAQS	14%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used PVMRM to model the 1-hour NO_2 impacts.
[b] For Puente impacts only, staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background.

Staff modeling analysis indicates that the project's maximum initial commissioning emission impacts are below the most stringent ambient air quality standards for NO_2 and PM2.5 and CO. The impacts in **Revised Air Quality Table 27** do not include the impacts with emergency generator readiness testing, and the impacts are unknown at this time. Staff issued Data Requests noting the modeling for commissioning did not include the impacts associated with the emergency generator. In Data Responses (PPP 2015u) the applicant proposed a condition of certification that would limit readiness testing the emergency engine. This condition would ensure readiness testing of the engine would not occur during times of CTG commissioning. Because the impacts of simultaneous readiness testing of the emergency engine and the commissioning of the

CTG are unknown, staff recommends **AQ-SC8** to make sure the project does not cause an exceedance of a limiting health-based ambient air quality standard.

Chemically Reactive Pollutant Impacts

Ozone Impacts

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

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

PM2.5 Impacts

Secondary particulate (i.e., PM2.5) formation is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SOx and NOx emissions are converted into sulfuric acid and nitric acid first and then react with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely and irreversibly to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate phase will tend to fall out; however, the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air. There are two conditions that are of interest, described as *ammonia rich* and *ammonia poor*. The term ammonia rich indicates that there is more than enough ammonia to react with all the sulfuric acid and to establish a balance of nitric acid-ammonium nitrate. Further ammonia emissions in this case would not necessarily lead to increases in ambient PM2.5 concentrations. In the case of an ammonia poor environment, there is insufficient ammonia to establish a balance and thus additional ammonia would tend to increase PM2.5 concentrations.

U.S. EPA issued guidance on May 20, 2014 that requires secondary PM2.5 impacts be addressed for sources seeking PSD permits. This guidance provides several methods, or tiers, that can be used to analyze secondary PM2.5 impacts; including refined air dispersion modeling methods. Puente is not expected to trigger a major modification for PSD, so this type of modeling analysis is not required.

Impact Summary

The project owner is proposing to mitigate the proposed project's NOx, VOC, SOx, and PM10 emissions through the use of BACT and ERCs. BACT includes limiting the

ammonia slip emissions to 5 ppm. The equipment description, equipment operation, and emission control devices are provided in the Project Description and Emissions Section (above).

Operations Mitigation

The proposed Puente project would mitigate air quality impacts by limiting emissions to the maximum extent feasible with the Best Available Control Technology (BACT) and by providing emission reduction credits ERCs) to mitigate impacts. The equipment descriptions and operations, and proposed emission control devices are provided in **Air Quality Project Description**.

Applicant's Proposed Mitigation

Emission Controls

As discussed in the project description section, the applicant proposes to employ a combustion turbine equipped with dry low-NOx combustors and an SCR with ammonia injection for NOx control, CO catalyst for CO and VOC control, and operate exclusively on pipeline quality natural gas to limit turbine emission levels. The FDOC (VCAPCD 2016c) provides the following BACT emission limits, for the combustion turbine:

- NOx: 2.5 ppmvd at 15 percent O_2 (one-hour average, excluding startup/shutdown) and 23.7 lbs/hr
- VOC: 2.0 ppmvd at 15 percent O_2 (one-hour rolling average, excluding startup/shutdown) and 6.6 lbs/hr
- PM10: 10.1 lbs/hr (10.68 tons per year)
- SO_2: 5.5 lbs/hr with fuel sulfur content of 0.75 grains/100 scf
- NH_3: 5 ppmvd at 15 percent O_2 and 17.5 lbs/hr

CO emissions do not require BACT; however, the applicant's use of a CO catalyst would control CO emissions to 4.0 ppmvd at 15 percent O_2 (one-hour rolling average, excluding startup/shutdown) and 23.1 lbs/hr. The District's FDOC conditions include provisions to meet these control emissions limits during normal operation and provide separate emission limits for startup, shutdown, and initial commissioning consistent with Puente emission levels shown in **Air Quality Tables 13, 18** and **19**.

A new diesel-fueled 779 BHP emergency engine meeting U.S. EPA/ARB Tier 4 Nonroad Diesel Engine Emission Standards is proposed. The proposed emission guarantees for the emergency engine are as follows in **Air Quality Table 28**.

Air Quality Table 28
Proposed 779 BHP Emergency Engine Emission Rates [a]

Pollutant	Emergency Engine	
	g/bhp	lb/hr[b]
NOx	0.50	0.86
CO	2.6	4.48
VOC	0.14	0.24
PM10/PM2.5	0.02	0.03

From PPP 2015a, PDOC 2016.
[a] SO_2 emissions do not have emission guarantees and are based on the use of California low sulfur content diesel fuel (15 ppm sulfur) for the engine.
[b] Emergency engine readiness testing would be limited to 50 hours per year, by **AQ-DE1**.

Emission Offsets

District Rule 26.2 Section B requires NOx and VOC offsets for a new, replacement, modification, or relocated emissions unit, in this case the MGS Units 1 and 2 being replaced by Puente. This rule requires offsets if net emissions increase more than 5 tons per year for NOx or VOC and more than 15 tons per year for PM10 and SOx. The FDOC would limit Puente emissions to a level that allows Puente to be exempt from District requirements to offset new emissions of VOC. The net emissions increase from Puente would not exceed these thresholds for VOC, PM10 and SOx, therefore, SOx, PM10 and VOC offsets are not required per District rules.

Any surplus ERCs held by Puente for NOx can be used to reduce impacts remaining after meeting VCAPCD requirements.

Adequacy of Proposed Mitigation

Emission Controls

As discussed in the project description section, the applicant proposes to employ dry lo-NOx burners, SCR with ammonia injection, CO catalyst, and operate exclusively on pipeline quality natural gas to limit combustion turbine emission levels. The emission controls meet the District rules and are adequate.

Emission Offsets

District Rule 26.6.D requires calculations of all emission increases for NOx, PM10 and VOC for new major stationary sources to determine if emission reduction credits (ERCs) are required. Net emissions are calculated by subtracting the MGS Unit 2 reduction from Puente increases, MGS Unit 1 would be allowed to continue operating until 2020 and therefore no credit is given, even though it will be required to shut down no later than December 31, 2020. Applicant has proposed the use of their currently owned facility ERCs (tons/year) to meet this District required offset obligation for NOx. The facility would be required to provide NOx offsets at a tradeoff ratio of 1.3:1 per Rule 26.2.B.2.a. Because there were no emission increases for PM10 and VOC, per District Rule 26.6.D.2 the project would not be required by District rules to provide any ERCs for these criteria pollutants.

The applicant has agreed to staff's proposed **AQ-SC9** which would mitigate otherwise significant impacts of PM10 and precursors (SOx) (PPP 2016y). However, staff has since revised the condition.

Staff Proposed Mitigation

The data shown in **Air Quality Figure 1** and **Air Quality Table 29** were generated using the Energy Commission Almanac, QFER Database for the Big Creek Local Reliability Area (LRA) which consists of Mandalay Generating Station, McGrath Peaker, Ormond Beach Gas Power Plant, and Elwood Energy Facility. Each of these facilities is considered an aging boiler facility, with the exception of McGrath which is a set of simple-cycle combustion turbines. Over the past few years, these facilities have been dispatched intermittently similar to the way peaking facilities are dispatched in the Local Reliability Area (LRA).

Several intervenors commented on the staff's proposed capacity factor to be used for CEQA evaluations. The main argument is Puente would be functionally replacing the MGS Units 1 and 2. Although it is not certain that Puente would have been dispatched in the same manner as MSG Units 1 and 2 had it been in operation, for comparison purposes staff now includes a new row with the capacity factor at which Puente would have had to operate to provide the same amount of energy that was generated by Mandalay Units 1 and 2 over the 2009 to 2015 period. The result is shown in a new row shown as "Puente/Mandalay Equivalent Total", and in **bold** in **Air Quality Table 29**.

Energy Commission staff analyzed the QFER data and found that the Puente/MGS Units 1 and 2 equivalent would have operated a maximum capacity factor in 2009 of around 13.3 percent and around 11 percent in 2015. The Puente/MGS Units 1 and 2 equivalent would have had an average over the past 5 year period of around 7.86 percent, and any two years average over the past 5 years still averaged below 11 percent. However, staff has calculated new values to try to accommodate the near future with a perceivable capacity factor, shown below in the assumptions section. Note that dispatch can vary due to local reliability concerns and regional issues such as a drought/limited hydro (i.e., the most recent years on the figure and table).

Air Quality Table 29
Capacity Factors in Big Creek LRA 2009 to 2015

	QFER Generation Based Capacity Factor						
Facility Name	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Mandalay Unit 1	7.57%	1.35%	1.41%	5.40%	4.87%	3.64%	5.88%
Mandalay Unit 2	8.22%	2.82%	2.19%	5.66%	6.48%	4.01%	7.11%
Puente/Mandalay Equivalent Total*	**13.3%**	**3.6%**	**3.1%**	**9.3%**	**9.5%**	**6.4%**	**11.0%**
McGrath	--	--	--	1.62%	5.56%	6.22%	9.69%
Ellwood Generating Station	0.31%	0.43%	0.32%	0.25%	0.22%	0.22%	1.30%
Ormond Beach Unit 1	2.21%	0.71%	0.00	2.58%	2.62%	0.81%	2.52%
Ormond Beach Unit 2	1.93%	0.95%	0.28%	0.97%	5.51%	2.42%	3.22%
Average	4.0%	1.3%	0.8%	2.7%	4.2%	2.9%	5.0%

Source QFER 2016, Notes: * this is not an additive value, capacity factor comes from QFER database showing sum of net MWh divided by Puente capacity (262 MW) to determine an equivalent capacity factor.

Due to the similar function of these facilities to the proposed Puente, staff recommends using this data to estimate Puente's expected annual capacity factor to allow an estimate of the reasonably worst-case operations. **Air Quality Table 29a** summarizes the staff's expected estimate for the expected maximum annual emissions for Puente[4], based on **Air Quality Figure 6** and **Air Quality Table 29**. The following assumptions were used by staff in determining the expected maximum annual emissions as follows:

- An 11 percent capacity factor, equivalent to approximately 964 hours per year.
- The turbine undergoes 200 startups.
- The turbine undergoes 200 shutdowns.
- The turbine operates at controlled steady state for 564 hours.
- Emergency Engines operate the same as under maximum permit basis.

Air Quality Table 29a
Estimated Reasonable Worst Case Annual Emissions
(CEQA Mitigation Basis Only, not intended as an impacts analysis)[5], tons

	Hours/ year	NOx (tpy)	CO (tpy)	VOC (tpy)	PM10[a] (tpy)	SOx[b] (tpy)
New GT Start-Up	200	9.9	17.8	2.0	0.9	0.2
New GT Normal Operation	564	6.5	6.3	1.8	2.8	0.5
New GT Shutdown	200	2.3	16.3	3.0	1.0	0.2
New GT Total	*964*	*18.7*	*40.4*	*6.8*	*4.7*	*0.9*
New Emergency Engine	50	0.0215	0.112	0.006	0.001	0.00025
New Natural Gas Compressor				0.00		
Reductions from MGS Unit 2		-3.04	-25.96	-0.91	-1.62	-0.39
Total to be Mitigated for CEQA Purposes		**15.7**	**14.5**	**5.9**	**3.1**	**0.48**

[a] PM10 is assumed to be equivalent to PM2.5, [b] Staff assumed a long term sulfur content of 0.25 grains per standard cubic feet. Note: This is a CEQA Mitigation only, and should not be used as an impacts analysis. For Project and cumulative impacts, please see **Air Quality Tables 22** through **27**, and **Air Quality Table 31**.

The applicant has agreed to fund emission reductions through the Carl Moyer Fund or similar mechanism as proposed by the applicant in Responses to Data Requests Set 2, if appropriate (PPP 2015z). As can be seen in **Air Quality Figure 6** and **Air Quality Table 29**, the Big Creek LRA capacity factors for all projects within the associated Local Reliability Area have a capacity factor of less than 11 percent. Staff calculated mitigation based on reasonable worst case operations for Puente, and mitigation provide by MGS Unit 2 shutdown. Even though MGS Unit 1 would eventually be shut down, this evaluation assumes MGS Unit 1 remains operational and the emissions associated with MGS Unit 1 are still accounted for in the stationary source emissions for

[4] The applicant has applied for a District permit of 1,750 normal operating hours with 200 startups and 200 shutdowns. For CEQA purposes, staff is recommending a 11 percent capacity factor as a mitigation basis.

[5] CEQA mitigation for PM is based on PM10 emissions. No mitigation is recommended for CO since it is an attainment pollutant and the project would not impact the CO attainment status.

this project (VCAPCD 2016c). Therefore, only actual emissions[6] for MGS Unit 2 were used as a reduction credit in determining the total CEQA mitigation.

For this project, the District's regulations would not require any offset mitigation for VOC, SOx, and PM10. As can be seen in **Air Quality Table 29a**, the total for all non-attainment pollutants (NOx and PM10) and their precursors (ROC and SOx) is in highlight and bold. Staff recommends CEQA mitigation in these amounts.

Air Quality Table 30
Puente, District Offset Requirements and Puente Offset Holdings (tpy)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Total New GT Expected Annual Maximum (Air Quality Table 29a)	18.7	6.8	4.7	40.4	0.9
Diesel Emergency Engine and Natural Gas Compressor	0.02	<0.01	0.02	0.11	< 0.01
Shutdown of MGS Unit 2	-3.04	-0.91	-1.62	-25.96	-0.39
Puente Expected Emissions to Mitigate for CEQA (from Air Quality Table 29a)	**15.7**	**5.9**	**3.1**	**14.5**	**0.48**
Offset Requirements					
VCAPCD Offset Requirements	38.91 [a]	0 [b]	0 [c]	0 [d]	0 [e]
Puente Offset Holdings Certificate					
ERC Certificate Nos. 1078, 1079, 1080, 1083, 1085, 1091, 1092, 1094, 1097, 1104, and 1107.	50.66	---	---	---	---
Puente ERCs to Surrender to District Total	**38.91**	**---**	**---**	**---**	**---**
Puente Mitigation as per AQ-SC9	**--**	**--**	**Carl Moyer or Equivalent**	**--**	**Carl Moyer or Equivalent**
Reasonably-Foreseeable Emissions					
Expected Annual Emissions (from Table 29a)	**15.7**	**5.9**	**3.1**	**---**	**0.48**
Fully Offset for CEQA?	**Yes**	**Yes**	**Yes**	**---**	**Yes**

Source: Independent Staff Assessment; Condition **AQ-2** (VCAPCD 2016a), FDOC (VCAPCD 2016c);
Notes:
a. VCAPCD offset requirements for NOx for Puente include an offset ratio of 1.3-to-1. In VCAPCD, VOC (or precursor organic compounds) offsets may be used to offset emission increases of NOx.
b. Offsets are not required by VCAPCD for VOC (ROC) since Puente would not increase emissions per Rule 26.2.B.2.b
c. Offsets are not required by VCAPCD for PM10 or PM2.5 since Puente would not increase emissions per Rule 26.2.B.2.b
d. Offset are not required by VCAPCD for CO since the area is designated as an area that attains the CO ambient air quality standards and Puente would not be subject to PSD review for CO. This Staff Assessment demonstrates that Puente would not cause or contribute to a violation of the CO ambient air quality standards.
e. Offsets are not required by VCAPCD for SO_2 since Puente would not exceed 15 tons per year.

[6] The historical fuel use was determined from fuel records from the baseline period (2012-2013). Based on Rule 26.6.C, this two consecutive year period was determined to be the most representative as it best reflects current electricity market (VCAPCD 2016c).

Summary of Mitigation for Ozone Impact

Both NOx and VOC emissions are recognized precursors to the formation of ambient ozone, and NOx is also a recognized precursor to the formation of the nitrate fraction of fine particulate matter. Puente would comply with District's offset requirements and would provide ERCs for the proposed ozone precursor emissions at an offset ratio of at least one-to-one. This would satisfy the CEQA mitigation requirements for ozone impacts.

Air Quality Table 30 shows that the total amount of NOx ERCs available (50.66 tpy) which the district requires at a 1.3:1 offset ratio exceeds staff's recommended offset requirements based on the revised potential to emit and MGS background total ozone precursor emissions increase of 15.7 for NOx and 5.9 tpy for VOC required at a 1.0:1 ratio, equating to around 21.6 tpy total.

Air Quality Table 30 shows that the District does not require offsets, per their rules, for particulate matter or SOx, which is a recognized precursor to the formation of the sulfate fraction of fine particulate matter. Additionally, the applicant did not identify any offsets for mitigating the particulate matter impacts. There are no separate offset requirements for the proposed PM2.5 emissions from the applicant. Purchasing and surrendering ERCs for PM10 or SO_2 would be one optional approach for offsetting the impact, if the applicant demonstrates control of sufficient PM10 or SO_2 ERCs. The applicant would need to surrender at least 3.58 tons per year of PM10 and SO_2 combined ERCs. Aside from surrendering ERCs, certain emission-reduction programs may be funded by the applicant to achieve reductions from non-traditional sources (i.e., routinely exempt or non-stationary sources).

Based on Data Response Set 2 question 62, the applicant has suggested the use of a program, such as the Carl Moyer Program, which can achieve reductions at a cost as low as $18,030 per ton including administration fees (PPP 2015u). Although Carl Moyer Program traditionally focuses on NOx rather than PM10, the cost data for that program indicates that $76,165[7] could be sufficient to provide about 3.58 tons per year of particulate matter and precursor reductions (i.e., PM10 and SOx) through the Carl Moyer Program.

Adequacy of Proposed Mitigation

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

For this project, the District's offset requirements for ozone would meet or exceed that minimum offsetting goal, while staff-recommended mitigation for particulate matter

[7] Includes an 118% processing fee

impacts would exceed the District's requirements (**Air Quality Table 30**). In the PSA, staff had identified the need for additional emission reductions to fully mitigate particulate matter greater than 10 microns (PM10) and its precursor (SOx) impacts under CEQA. The Applicant has agreed to the previously recommended staff condition of certification **AQ-SC9** which would include suitable mitigation to reduce Puente's direct and cumulative Air Quality impacts to a less than significant level. Staff recommends, along with some minor edits, Air Quality Condition of Certification **AQ-SC9** to ensure that significant impacts of PM10 and its precursors would be adequately mitigated and to ensure agency consultation if substitutions are made to the proposed emission reduction credits. (**Air Quality Tables 29a** and **30**).

Staff proposes Condition of Certification **AQ-SC6** to ensure that, if needed, the license would be amended as necessary to incorporate future changes to the air quality permits. Staff also proposes mitigation to ensure ongoing compliance during routine operation through quarterly reports (**AQ-SC7**).

Staff recommends **AQ-SC8** to make sure the project does not perform readiness testing during commissioning periods to make sure Puente would not cause an exceedance of a limiting standard during commissioning. Condition of Certification **AQ-SC10** establishes appropriate guidelines on what would be considered a significant change. Staff is also recommending **AQ-SC11** which specifies major construction and any demolition work phases would not occur concurrently so that project impacts are not higher than those evaluated.

Staff recommends a new condition of certification **AQ-SC12** to ensure that the applicant gets a determination from EPA on whether PSD is applicable to Puente. Even though staff does not expect Puente to trigger any PSD requirements, the applicant should request the U.S. EPA to determine whether or not the current federal PSD regulations apply to Puente. However, the VCAPCD's PSD Rule 26.13 is not yet in force because it has not been approved by EPA in a State Implementation Plan (SIP) revision. However, the U.S. EPA is reviewing Rule 26.13 for SIP approval and working with the District to obtain additional information prior to its approval. Once the rule is approved in the California SIP, local PSD actions such as Rule 26.13 will be federally enforceable and the district would then be "acting in the role of" U.S. EPA. At that time, PSD evaluations would be conducted by the district and future applicants would be subject to this review under VCAPCD Rule 26.13.

Staff's review of the offset package was conducted solely based on the merits of this case, including the local air district offset requirements, the project's emission limits, the specific ERCs proposed, and ambient air quality considerations of the region, and does not in any way provide a precedence or obligation for the acceptance of offset proposals for any other current or future licensing cases.

CUMULATIVE IMPACTS

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts" (CEQA Guidelines § 15355). "A cumulative impact consists of an impact that is

created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts" (CEQA Guidelines § 15130[a][1]). Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

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

Much of the preceding discussion is concerned with cumulative impacts. The "Existing Ambient Air Quality" subsection describes the air quality background in the South Central Coast Air Basin, including a discussion of historical ambient levels for each of the significant criteria pollutants. The "Construction Impacts and Mitigation" subsection discusses the project's contribution to the local existing background caused by project construction. The "Operation Impacts and Mitigation" subsection discusses the project's contribution to the local existing background caused by project operation. The following subsection and **Air Quality Appendices** include three additional analyses:

- a summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution (see **Air Quality Appendix Air-2** and **Air-3**);
- an analysis of the project's *localized cumulative impacts*, the project's direct operating emissions combined with other local major emission sources (see **Air Quality Appendix Air-2** and **Air-3**);
- A discussion of greenhouse gas emissions and global climate change impacts (see **Air Quality Appendix Air-1**).

Summary of Projections

The District has developed several plans to implement the federal Clean Air Act and state law as it addresses the cumulative air impacts of criteria pollutants in the South Central Coast Air Basin. These plans evaluate the regional context of air pollution in the air basin, and provide the air district strategies for addressing these cumulative impacts and eventually achieving "attainment" with various federal and state health-based ambient air quality standards.

The adopted air quality plans are summarized below.

Final Ventura County Triennial Assessment and Plan Update 2006- 2008
Link:
http://www.vcapcd.org/pubs/Planning/2011FinalVenturaCountyTriennialAssessment.pdf

2009 Reasonably Available Control Technology State Implementation Plan (2009 RACT SIP) Revision

Link: http://www.vcapcd.org/pubs/Planning/Final2009RActSIP.pdf

Final Ventura County 2007 Air Quality Management Plan

Link: http://www.vcapcd.org/pubs/Planning/AQMP/FinalVenturaCounty2007AQMP.pdf

Final VCAPCD 2006 Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) Revision

Link: http://www.vcapcd.org/pubs/Planning/AQMP/FinalRACTSIP.pdf

Final Ventura County Triennial Assessment and Plan Update 2006-2008

The California Clean Air Act (CAA) requires that once every three years beginning in 1994, the State's air districts are to assess their progress towards attaining the state clean air standards, the amount of emission reductions achieved over the three-year period, correct any deficiencies in meeting progress goals, and incorporate new data and projections into their state clean air plans. The most recent assessment period is 2006 through 2008.This plan does not propose any new rules or regulations or other control measures that are applicable to Puente. The existing measures from the previously approved State Implementation Plans (SIPs) are included in the District's rules and regulations and ARB vehicle emission regulations. Therefore, compliance with these rules and regulations would ensure that the project conforms to this plan.

2009 Reasonably Available Control Technology State Implementation Plan (2009 RACT SIP) Revision

This plan is prepared to determine progress and measures needed to attain CAAQS for ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide. Ventura County is in attainment with all of these state standards except ozone. This plan describes the extent of ozone air quality improvement during the previous three years, provides a discussion of actual versus forecasted ozone precursor emission rates, and evaluates the need for further control measures in order to achieve attainment with the state ozone ambient air quality standards. None of the emission reduction measures proposed in this plan, which includes a Reasonably Available Control Technology (RACT) measure would apply to Puente. In Ventura County, Rule 26, New Source Review, defines major stationary VOC and NOx sources as those with a potential to emit 25 tons or more of VOC or NOx, and would apply to the new combustion turbine and internal combustion engines. However Puente's combustion turbine would fall under the District Rule 26.1.29 as a replacement emissions unit. Therefore, compliance with these rules and regulations would ensure that the project conforms to the eight-hour ozone maintenance plan.

Final Ventura County 2007 Air Quality Management Plan (AQMP)

Building on previous Ventura County AQMPs, the 2007 AQMP presents a combined local and state clean air strategy based on concurrent reactive organic compounds

(ROG) and nitrogen oxides (NOx) emission reductions to bring Ventura County into attainment of the federal 8-hour ozone standard. ROG and NOx emitted by both anthropogenic and natural sources react in the atmosphere to produce photochemical smog, of which ozone is the principal constituent. Several of the local control measures from the 1994 AQMP are not in the 2007 AQMP. In each case, District staff determined that the measure is either obsolete or infeasible for Ventura County based on technological or economic considerations. However, no control measure from previous AQMPs would be deleted from the 2007 AQMP that would slow the county's progress towards attaining either the federal 8-hour ozone standard or the state ozone standards. The primary requirements include attainment as soon as practicable; a major new source threshold of 50 tons per year (down from 100 tons per year); a conformity threshold of 50 tons per year (also down from 100 tons per year); new source review (NSR) emission offset ratios of 1.2 to 1; and, rate of progress ROG/NOx emissions reductions of 18 percent by 2008, 27 percent by 2011, and 30 percent by 2012. The proposed Puente would be in compliance with this plan since it is required to meet all VCAPCD rules and regulations.

Final VCAPCD 2006 Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) Revision

The CAA require that states achieve the NAAQS by specified dates, based on the severity of an area's air quality problem. Ventura County is currently designated a moderate ozone nonattainment area for the new federal 8-hour ozone standard, which replaced the federal one hour ozone standard. It also required the district to review the list and adopt implementation schedules for selected measures. The VCAPCD analysis identified rules already implemented by the VCAPCD, measures that had no affected sources, measures to be analyzed and potentially implemented and measures requiring further evaluation. The proposed Puente would be in compliance with this plan since it is required to meet all VCAPCD rules and regulations.

These applicable air quality plans do not outline any new control measures applicable to the proposed project's operating emission sources. Therefore, compliance with existing District rules and regulations would ensure compliance with all local air quality plans.

Localized Cumulative Impacts

Since the power plant air quality impacts can be reasonably estimated through air dispersion modeling (see the "Operational Modeling Analysis" subsection) the project contributions to localized cumulative impacts can be estimated. To represent *past* and, to an extent, *present projects* that contribute to ambient air quality conditions, the Energy Commission staff recommends the use of ambient air quality monitoring data (see the "Environmental Setting" subsection), referred to as the *background*. Staff takes the following steps to estimate what are additional appropriate "present projects" that are not represented in the background and "reasonably foreseeable projects."

- First, the Energy Commission staff or the applicant works with the air district to identify all projects that have submitted, within the last year of monitoring data, new applications for an authority to construct (ATC) or permit to operate (PTO) and applications to modify an existing PTO within six miles of the project site. Based on staff's modeling experience, beyond six miles there is no statistically significant

concentration overlap for non-reactive pollutant concentrations between two stationary emission sources.

- Second, the Energy Commission staff or the applicant works with the air district and local counties to identify any new area sources within six miles of the project site. As opposed to point sources, area sources include sources like agricultural fields, residential developments or other such sources that do not have a distinct point of emission. New area sources are typically identified through draft or final Environmental Impact Reports (EIRs) that are prepared for those sources. The initiation of the EIR process is a reasonable basis on which to determine what is "reasonably foreseeable" for new area sources.
- The data submitted, or generated from the applications with the air district for point sources or initiating the EIR process for area sources, provide enough information to include these new emission sources in air dispersion modeling. Thus, the next step is to review the available EIR(s) and permit application(s), determine what sources must be modeled, and how they must be modeled.
- Sources that are not new, but may not be represented in ambient air quality monitoring are also identified and included in the analysis. These sources include existing sources that are co-located with or adjacent to the proposed source (such as the existing Mandalay Generating Station). In most cases, the ambient air quality measurements are not recorded close to the proposed project, thus a local major source might not be well represented by the background air monitoring. When these sources are included, it is typically a result of there being an existing source on the project site and the ambient air quality monitoring station being more than two miles away.
- The modeling results must be carefully interpreted so that they are not skewed towards a single source, in high impact areas near that source's fence line. It is not truly a cumulative impact of Puente if the high impact area is the result of high fence line concentrations from another stationary source and Puente is not providing a substantial contribution to the determined high impact area.

Once the modeling results are interpreted, they are added to the background ambient air quality monitoring data and thus the modeling portion of the cumulative assessment is complete. Due to the use of air dispersion modeling programs in staff's cumulative impacts analysis, the applicant must submit a modeling protocol, based on information requirements for an application, prior to beginning the investigation of the sources to be modeled in the cumulative analysis. The modeling protocol is typically reviewed, commented on, and eventually approved in the Data Adequacy phase of the licensing procedure. Staff may assist the applicant in finding sources (as described above), characterizing those sources, and interpreting the results of the modeling. However, the actual modeling runs are usually left to the applicant to complete. There are several reasons for this: modeling analyses take time to perform and require significant expertise, the applicant has already performed a modeling analysis of the project alone (see the "Operational Modeling Analysis" subsection), and the applicant can act on its own to reduce stipulated emission rates and/or increase emission control requirements as the results warrant. Once the cumulative project emission impacts are determined,

the necessity to mitigate the project emissions can be evaluated, and the mitigation itself can be proposed by staff and/or the applicant (see the “Mitigation” subsection).

The list of possible new sources from the District included two sources within six miles of the Puente site that would have the potential to emit more than five tons per year of any criteria pollutant (PPP 2015a, Appendix C-7). The two projects are both hospital/medical center expansions. One of the projects is at the Community Memorial Hospital located in Ventura approximately 4.5 miles from the project site. This project could emit up to approximately 21 tons per year of CO, but would not emit more than 5 tons of any other pollutant. The other project is at the Ventura County Medical Center also located in Ventura approximately 4.7 miles from the project site, could emit up to approximately 13 tons per year of CO, but would not emit more than 5 tons of any other pollutant. Given the current state of CO attainment in the project area and the very localized nature of CO impacts, staff did not determine that there is a potential for significant cumulative impacts from this source and Puente.

There are other proposed construction projects near the proposed project site such as several subdivisions of single-family homes and condos, a mobile home park, and a shopping center. However, the timeframe and emissions from these projects is unknown and these construction projects would be limited in duration. Meanwhile, emissions from existing mobile emission sources, including emissions generated from vehicles on nearby freeways, and emissions from construction emission sources, are forecast to have long-term emission reductions or significantly reduced emission potentials for most pollutants through improvements in on-road and off-road vehicle engine technology and vehicle turnover, respectively.

Considering that there are no major off-site cumulative stationary sources, or other nearby projects with known emissions estimates that could cause cumulative impacts with Puente, the only quantitative cumulative analysis that can be performed is the concurrent emissions from various on-site emissions sources within the Mandalay property. The applicant prepared a cumulative air dispersion modeling analysis that included concurrent on-site emissions sources. This analysis shows the operations of Puente and the MGS Units 1 and 3. The results of this analysis are presented in **Air Quality Table 24**.

After the MGS Units 1 and 2 are decommissioned, they would undergo demolition. The applicant performed a modeling analysis on impacts during the demolition phase and the operation phase overlap. The results of this modeling analysis are shown below in **Air Quality Table 31**.

Air Quality Table 31
Maximum Impacts for MGS Demolition and Puente Operation
Impacts Modeling Results (µg/m^3)

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3) [a]	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2 [b]	1 hour	161.6	107	268.6	339	CAAQS	79%
	1 hour NAAQS	137.7	68	171.8[b]	188	CAAQS	91%
	Annual	8.0	13	21	57	CAAQS	37%
PM10	24 hour	2.0	**56.9**	58.9	50	CAAQS	**117%**
	Annual	0.3	**24**	24.3	20	CAAQS	**121%**
PM2.5	24 hour	0.8	17.8	18.6	35	NAAQS	53%
	Annual	0.1	9.4	9.5	12	CAAQS	79%

Source: PPP 2015z
[a] Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.
[b] NO_2 impacts provided are presented with background.

Phase I and II explained in the Demolition portion of this analysis were requested by the applicant in their AFC, and the last phase for Puente was requested in their subsequent filing titled, Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (PPP2015y). Phases I and II include the construction and initial commissioning of the Puente combustion turbine and are described separately in the following subsection. None of the construction/demolition phases overlap with each other. Puente operation would overlap with Phase III. Staff recommends **AQ-SC11** which specifies the major construction and demolition work phases that are not allowed to occur concurrently so that project impacts are not higher than evaluated.

The results of this modeling analysis do not show significant cumulative effects during the MGS demolition period. All pollutant concentrations other than annual PM10 were determined to remain below AAQS, and the increase in annual PM10 concentrations would be negligible. Given this finding and the other cumulative impacts analysis performed, staff concludes that Puente, with the recommended conditions of certification, would not have significant cumulative impacts.

ENVIRONMENTAL JUSTICE

As discussed in the **Environmental Justice** section of this FSA, the minority population in the six-mile radius around the proposed project constitutes an environmental justice (EJ) population. **Environmental Justice Figure 1** shows the presence of an EJ population based on race and ethnicity within the six-mile radius of the project site. **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitutes an EJ population based on poverty.

There are a number of farm workers within the vicinity of the proposed site at any given time. Ventura County's agricultural commissioner estimates that 17,000 to 24,000 immigrant workers come to the county each year at peak growing seasons (COO 2011). Due to the presence of an EJ population among residents and farm workers, this

analysis must identify whether the construction and operation of the proposed Puente facility and the demolition of MGS could have significant, unmitigated impacts or disproportionate impacts on an EJ population.

The preceding subsections found the proposed project would not cause impacts to air quality and would be mitigated to less than significant. With respect to ozone and particulate matter of particles less than 2.5 microns in size (PM2.5), staff's evaluation concludes that air quality for ozone and PM2.5 impacts would be less than significant. This subsection discusses impacts on the EJ populations on the overall population within the project area.

DISADVANTAGED COMMUNITIES

The CalEnviroScreen indicators are used to measure factors that affect the potential[8] for pollution impacts in communities (CalEPA 2014a). Staff used CalEnviroScreen 2.0 to identify disadvantaged communities[9] in the vicinity of the proposed project that may have been missed when screened by race/ethnicity and poverty (see **Environmental Justice Figure 1**). Because a CalEnviroScreen score evaluates multiple pollutants and factors collectively, staff examined individual contributions of indicators that are relevant to air quality (see **Environmental Justice Table 1**). Values are shown as percentiles, which indicate the percent of all census tracts with a lower score. A higher percentile indicates a higher potential relative burden.[10]

[8] It is important to note that CalEnviroScreen is not an expression of health risk and does not provide quantitative information on increases of impacts for specific sites or project. CalEnviroScreen uses the criteria of "proximity" to a hazardous waste site, a leaking underground tank, contaminated soil, an emission stack (industry, power plant, etc.) to determine that a population is "impacted". It does not address general principles of toxicology: dose/response and exposure pathways. For certain toxic chemicals to pose a risk to the public, offsite migration pathways must exist (through ingestion, inhalation, dermal contact, etc.) and contact to a certain amount – not just any amount – must exist.

[9] The California Environmental Protection Agency (CalEPA), for purposes of its Cap-and-Trade Program, has designated "disadvantaged communities" as census tracts having a CalEnviroScreen score at or above the 75th percentile (CalEPA 2014b). As a comparative screening tool, it is not intended to be used as a health or ecological risk assessment for a specific area or site.

[10] Each census tract was assigned a score based on the relative concentrations of different contaminants and whether multiple contaminants are present. A census tract with a drinking water contaminant score in the 75 percentile indicates that its burden is higher than 75 percent of all California census tracks.

Air Quality Table 32
CalEnviroScreen 2.0 Indicator Percentile Scores

Census Tract[1]	Overall Score Range[2]	Ozone Concentration[3] (µg/m^3)	Ozone Percentile[4] (%)	PM2.5 Concentration[5] (µg/m^3)	PM2.5 Percentile[4] (%)
6111004902	96-100%	0.00002	0.1	8.9	36.5
6111009100	91-95%	0.00000	0.0	8.9	36.3
6111004715	91-95%	0.00000	0.0	9.1	39.5
6111003900	81-85%	0.00000	0.0	8.9	36.9
6111004503	76-80%	0.00000	0.0	9.0	37.9

(Source: CalEnviroScreen 2.0 Data, www1.oehha.ca.gov/calenviroscreen/maps-data/download-data)
Notes:

1. Census tract locations are shown in **Environmental Justice Figure 1**.
2. Overall Score Range incorporates all indicators shown in **Environmental Justice Table 1**.
3. Ozone concentrations are below the 8-hour ambient air quality standard of 0.070 ppm.
4. Census tracts were ordered by concentration values and assigned a percentile based on the statewide distribution of values. Only concentrations over the federal standard from 2009-2011 were used by CalEnviroScreen to determine a percentile.
5. PM2.5 concentrations are all below the Annual Mean ambient air quality standard of 12 µg/m^3.

The indicator scores presented in **Air Quality Table 32** are somewhat similar among census tracts.

OZONE IMPACTS

Ozone is known to cause numerous health effects which can potentially affect EJ communities due to:

- Adverse effects of ozone, including lung irritation, inflammation and exacerbation of existing chronic conditions, can be seen at even low exposures (Alexis *et al.* 2010, Fann *et al.* 2012, Zanobetti and Schwartz 2011).;

- Studies have shown that the increased risk of asthmas is higher among children under 2 years of age, young males, and African American children that have been exposed to ambient ozone concentrations (Lin *et al*., 2008, Burnett *et al*., 2001); and,

- Increases in ambient ozone have also been associated with higher mortality, particularly in the elderly, women and African Americans (Medina-Ramon, 2008).

Ambient air quality standards (AAQS) define clean air, and are established to protect the health of even the most sensitive individuals in our communities. An air quality standard defines the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health. Both the Air Resources Board (ARB) and the U.S. Environmental Protection Agency (U.S. EPA) are authorized to set ambient air quality standards. **Air Quality Table 32**, identifies five census tracts near the proposed project site that have been determined to have a higher than 75% CalEnviroScreen score range. Even though ozone is not directly emitted from fossil fuel emission sources such

as Puente, the precursor pollutants that create ozone such as nitrogen oxides (NOx) and volatile organic compounds (VOCs) are expected to be emitted.

For CalEnviroScreen, the indicator ozone is determined by the amount of daily maximum 8-hour ozone concentration over the California 8-hour standard (0.070 parts per million (ppm)), averaged over three years (2009-2011). According to CalEnviroScreen data from 2009- 2011, ozone concentrations in the census tracts in **Air Quality Table 32** were all below the 8-hour ozone health based standard of 0.070 ppm.

For this reason, the proposed project would not individually or cumulatively contribute to disproportionate air quality impacts, as it relates to ozone, to the EJ population.

PM2.5 IMPACTS

Particulate matter (PM) is a complex mixture of aerosolized solid and liquid particles including such substances as organic chemicals, dust, allergens and metals. These particles can come from many sources, including cars and trucks, industrial processes, wood burning, or other activities involving combustion. The composition of PM depends on the local and regional sources, time of year, location and weather[11].

PM2.5 refers to particles that have a diameter of 2.5 micrometers or less. Particles in this size range can have adverse effects on the heart and lungs, including lung irritation, exacerbation of existing respiratory disease, and cardiovascular effects.

Air Quality, PM2.5 is known to cause numerous health effects which can potentially affect EJ communities.

For CalEnviroScreen, the indicator PM2.5 is determined by the Annual mean concentration of PM2.5 (average of quarterly means), averaged over three years (2009-2011). According to CalEnviroScreen data from 2009-2011, PM2.5 concentrations in the census tracts in **Air Quality Table 32** were all below the annual mean PM2.5 health based ambient air quality standard of 12 $\mu g/m^3$.

For this reason, the proposed project would not individually or cumulatively contribute to disproportionate air quality impacts, as it relates to PM2.5, to the EJ population.

[11] California Communities Environmental Health Screening Tool, Version 2.0 (CalEnviroScreen 2.0) Guidance And Screening Tool, October 2014.

ENVIRONMENTAL JUSTICE CONCLUSION

Staff has considered the minority population surrounding the site and reviewed **Environmental Justice Figure 1** and **Environmental Justice Table 3** (see the **Environmental Justice** section of this document for further discussion of environmental justice), which shows the minority population within portions of the 6-mile radius around the proposed site. As long as all staff-recommended conditions of certification are implemented, staff does not expect an adverse impact to members of the public, off-site nonresidential workers, recreational users or any environmental justice community.

CalEnviroScreen 2.0 only includes two criteria pollutants; ozone and PM2.5. Air Quality impacts for all criteria pollutants including ozone and PM2.5 would not contribute impacts to the EJ population, and would be considered less than significant with the adopted conditions of certification. Also, air quality impacts for other pollutants emitted from the project on the EJ population would be less than significant with the adopted conditions of certification.

COMPLIANCE WITH LORS

The District issued a Preliminary Determination of Compliance (PDOC) for Puente on May 25, 2016, with public notice occurring from May 25, 2016 through June 29, 2016 (VCAPCD 2016a). The District issued a Final Determination of Compliance (FDOC) for Puente on October 13, 2016 (VCAPCD 2016c). The District's FDOC conditions are presented in the conditions of certification in this Final Staff Assessment.

FEDERAL

The District is responsible for issuing the Federal New Source Review (NSR) permit but is not currently delegated enforcement for the Prevention of Significant Deterioration (PSD) permitting process and has not yet been delegated enforcement of the applicable New Source Performance Standard (NSPS Subpart KKKK – Stationary Combustion Turbines). The applicant has stipulated to emission levels that ensure that the project's net emission increase of pollutants would be below PSD permit trigger levels. The District's FDOC permit conditions have been designed based on the assumption that the District may be delegated enforcement of NSPS Subpart KKKK prior to their enforcement applicability for the project. The U.S. EPA evaluated the District's Preliminary Determination of Compliance and had no further comments on the District's analysis. While the District does not have federal PSD authority, they still evaluated compliance with their approved PSD rules.

On November 10, 2015, the Air Pollution Control Board adopted revisions to Rule 26.13, New Source Review – Prevention of Significant Deterioration (PSD). The Board adopted revisions to four sections including the addition of several new subsections to Rule 26.13. The revisions were requested by US EPA to address deficiencies identified in the original rule. District staff added additional minor editorial revisions. The overall intent of Rule 26.13 is to adopt 40 CFR Section 52.21, the federal PSD regulation, by reference.

The revisions to Rule 26.13 will facilitate delegation of PSD permitting authority from US EPA to VCAPCD. The revisions include updates required as a result of court decisions and clarifications regarding enforceability and responsible parties. New requirements address interagency notification requirements, application completeness determination, applicant notification requirements, public participation requirements, greenhouse gas requirements and options for PSD permitting of power plants regulated by the California Energy Commission.

In Staff's Record of Conversion (ROC) dated August 2, 2016 (CEC 2016x), both Region 9 Representatives and Energy Commission staff agreed the PSD provision of this rule is not federally enforceable until the rule has been adopted into the State Implementation Plan (SIP). EPA is reviewing Rule 26.13 for SIP approval and working with the District to obtain additional information prior to approval. Once the rule is approved into the California SIP, local PSD actions will be federally enforceable and the district will be "acting in the role of" EPA. At that time, future applicants will be subject to VCAPCD's Rule 26.13 and any future DOC will include this analysis.

U.S. EPA did not provide comments on the District's PDOC and/or the Preliminary Staff Assessment (PSA).

Title 40 Code of Federal Regulations Part 60 Standards of Performance for New Stationary Sources

40 CFR Part 60 Subpart A –General Provisions

Any source subject to an applicable standard under 40 CFR Part 60 is also subject to the general provisions of Subpart A. Subpart A outlines general provisions for the proposed Puente including notification, work practice, monitoring and testing requirements.

40 CFR Part 60 Subpart IIII –Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The proposed 779 BHP Caterpillar emergency diesel-fired engine is subject to the Compression Ignition Internal Combustion Engine NSPS (Subpart IIII).

This section contains emission standards for the engine. The emergency engine is required to comply with the emission standards for non-road compression ignition engines. For engines in this power range and model year, these standards require the engine be certified to standards of 4.0, 3.5 and 0.20 g/kW-Hr (3.0, 2.6, 0.15 g/BHP-hr) for NMHC+NOx, CO and PM respectively, which are known as "Tier 3" standards. The proposed engine is a "Tier 4" certified engine with emission levels below these values, therefore the proposed engine meets this requirement.

Additional requirements include the use of a non-resettable hour meter, fuel standards met by using an ultra-low sulfur diesel fuel, operational requirements met by following manufacturer's procedures and record keeping provisions. Maintenance and readiness testing is limited to up to 50 hours per year. Proposed permit conditions allow the emergency engine to operate in emergency situations and for up to 50 hours per year for maintenance and readiness testing operations.

40 CFR Part 60 Subpart KKKK –Standards of Performance for Stationary Combustion Turbines

This subpart establishes NOx and SO_2 emission limits for new combustion turbines. New combustion turbines with a rated heat input greater than 850 MMBtu/hr are required to meet NOx emission limits of 15 ppm at 15 percent O_2. The fuel sulfur would be limited to 0.060 lbs SO_2 per MMBtu.

The proposed natural gas fired turbine is over 850 MMBTU/Hr, therefore the NOx limit is 15 ppmvd at 15 percent O_2 or 0.43 lb/MW-Hr. This Subpart KKKK NOx limit is less stringent than District Rule 74.23 limit (9 ppmvd NOx) and the District Rule 26.2.A NSR BACT limit of 2.5 ppmvd NOx for the unit. Therefore, new turbine compliance with the District NSR BACT requirements will comply with the Subpart KKKK.

The turbine will be fired on PUC-regulated natural gas. Therefore the SO_2 emissions limits are either 0.90 lbs- SO_2/MWh discharge based on gross output (Section 60.4330 (a)(1)) or 0.060 lbs- SO_2/MMBTU potential in the fuel (Section 60.4330 (a)(2)). The natural gas sulfur content of the fuel will be limited to 0.75 grain per 100 scf (0.0021375 lbs- SO_2/MMBTU). This sulfur content is lower than the fuel sulfur standard. Therefore, the new turbine will comply with this section.

40 CFR Part 60 Subpart TTTT –Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units (EGU)

This subpart applies to stationary combustion turbines that commence construction after January 8, 2014.

Section 60.5520 (a) requires the turbine to meet the applicable standard for CO_2 emissions as determined in either table 1 or 2 of the subpart. In this case the Puente turbine must meet the table 2 emission standard of 50 kg CO_2 per gigajoule (GJ) of heat input (120 lb CO_2/MMBTU).

Table 2 of NSPS Subpart TTTT
CO2 Emission Standards for Stationary Combustion Turbines

Affected EGU	CO_2 Emission Standard
Newly constructed or reconstructed stationary combustion turbine that supplies its design efficiency or 50 percent, whichever is less, times its potential electric output or less as net-electric sales on either a 12-operating month or a 3-year rolling average basis and combusts more than 90% natural gas on a heat input basis on a 12-operating-month rolling average basis	50 kg CO_2 per gigajoule (GJ) of heat input (120 lb CO_2/MMBTU).

“Design efficiency” is defined in the rule as “the rated overall net efficiency (e.g., electric plus useful thermal output) on a lower heating value basis at the base load rating, at ISO conditions ….”

“Potential electric output” is defined in the rule as “33 percent or the base load rating design efficiency at the maximum electric production rate …, whichever is greater,

multiplied by the base load rating (expressed in MMBTU/h) of the EGU, multiplied by 106 BTU/ MMBTU, divided by 3,413 BTU/KWh, divided by 1,000 kWh/MWh, and multiplied by 8,760 h/yr…" Based on the current ISO heat rate of 8,317 BTU/kWh (electrical) (LHV) and a conversion factor of 3412.1416 BTU/kWh (thermal), it takes 2.4375 kWh (thermal) input to produce 1 kWh (electrical) output (8317 BTU/kWh ÷ 3412.1416 BTU/kWh = 2.4375). The base load rating design efficiency for the Puente CTG is therefore 1 kWh (electrical) / 2.4375 kWh (thermal) = 41 percent.

The percentage electric sales threshold that distinguishes base load and non-base load units is based on the specific turbine's design efficiency (commonly known as "the sliding-scale approach") and varies from 33 to 50 percent. Specifically, all units that have annual average electric sales (expressed as a capacity factor) greater than their net lower heating value (LHV) design efficiencies (as a percentage of potential electric output), are base load units. All units that have annual average electric sales (expressed as a capacity factor) less than or equal to their net LHV design efficiencies are non-base load units. As discussed above, it is expected that on an annual average basis the new Puente CTG would supply less than one-third of its potential electric output to a utility power distribution system. Because this expected potential annual average electric sales rate is less than the 41 percent design efficiency, the new Puente CTG would be a non-base load unit under the final CPS. As a non-base load unit, under the final CPS, the potential electric output for Puente is calculated as follows:

Potential electric output =

$$= Design\ efficiency\ (\%) \times\ Heat\ Input\ Rate, \frac{MMBtu}{hr} \times \frac{10^6 Btu}{MMBtu} \times \frac{1\ kWh}{3412.1416\ Btu} \times \frac{1\ MWh}{1{,}000\ kWh} \times 8{,}760 hrs/yr$$

$$= 0.41 \times 2{,}567.81 \frac{MMBtu}{hr} \times \frac{10^6 Btu}{MMBtu} \times \frac{1\ kWh}{3412.1416\ Btu} \times \frac{1\ MWh}{1{,}000\ kWh} \times 8{,}760 hrs/yr$$

$$= 2{,}702{,}862 \text{ MWh per year}$$

As long as the Puente CTG has net electric sales of less than 0.41 * 2,702,862 MWh, or 1,108,173 MWh per year, it will be subject to the 120 lb CO_2/MMBTU limit for non-base load combustion turbines. The new Puente CTG is expected to operate with an annual capacity factor of no more than 25 percent. With a full load net nominal output of approximately 262 MW, the Puente unit would supply a maximum of approximately 25 percent x 8760 hrs/year x 262 MW/Hr = 573,780 MWh per year to a utility power distribution system. Since this output is less than the allowable level of 1,108,173 MWh per year, the Puente CTG would be a non-base load unit under this rule.

The Puente turbine is limited to burning natural gas resulting in a consistent emission rate of 120 lb CO_2/MMBTU. Therefore, the facility will be required to maintain fuel purchase records of the natural gas.

40 CFR Part 63 Subpart ZZZZ –National Emission Standards for Hazardous Air Pollutant for Stationary Reciprocating Internal Combustion Engines

This subpart is applicable to owners and operators of stationary compression ignition internal combustion engines. The subpart outlines requirements for the emergency diesel engine. The emergency engine would comply with this subpart by complying with 40 CFR Subpart IIII.

40 CFR Part 64 - Compliance Assurance Monitoring (CAM)

The Compliance Assurance Monitoring (CAM) regulation applies to emission units at a major stationary source required to obtain a Title V permit, which use control equipment to achieve a specified emission limit. The section is intended to provide "reasonable assurance" that the control systems are operating properly to maintain compliance with the emission limits. CAM is applicable to the turbine because the potential to emit for the stationary source exceeds the major source thresholds (25 tons per year for ROC or NOx, and 100 tons per year for PM, SOx, or CO) for NOx and CO. However, based on section 64.2(b)(1)(vi), NOx and CO emissions are exempt from CAM since the Part 70 permit for the turbine already requires a continuous compliance determination method for both NOx and CO. The turbine will have a CEMS installed which will comply with this requirement.

40 CFR Part 68, List of Regulated Substances and Thresholds for Accidental Release Prevention

This regulation addresses the risk management plan (RMP) requirements of section 112(r) of the federal Clean Air Act. 40 CFR Part 68 applies to regulated substances that are contained in a process at this facility that exceed the threshold quantity, as presented in 40 CFR Part 68.130. The Selective Catalytic Reduction (SCR) system for NOx control at the CTG uses aqueous ammonia with a concentration of less than 20 percent by weight. However, aqueous ammonia must be greater than or equal to 20 percent by weight ammonia in order to be one of the regulated toxic substances listed in 40 CFR Part 68.130. Therefore, Puente is not subject to 40 CFR Part 68.

40CFR Part 75 – Continuous Emission Monitoring (CEMS)

The applicant is required to monitor NOx and CO_2 (or O_2) and has the choice of monitoring SOx or may use fuel flow monitoring and default sulfur emission factors to calculate emissions. Additionally Subpart C of this part contains requirements for operating and maintaining the CEMS to ensure that accurate, valid data is collected. The CEMS is required to be initially certified and requires recertification if certain modifications are made. Required QA activities include linearity checks, 7-day calibration error tests, and relative accuracy test audits (RATA). Linearity and calibration error tests ensure that the monitors are measuring emissions accurately. RATA compare the CEMS readings to the results determined using a source test. The RATA must be conducted annually except in certain situations where the turbine does not operate for more than 168 hours per calendar quarter. Finally, this part contains

requirements for substituting data in a conservative manner for any hour when the CEMS does not record valid data, and these requirements are specified in the proposed permit conditions. Additionally the facility is required to operate according to an approved CEMS protocol, which will contain the above requirements and specific procedures in detail.

STATE

The applicant would demonstrate that the project would comply with section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury, with the issuance of the District's Final Determination of Compliance and the Energy Commission's affirmative finding for the project.

The District has evaluated compliance of the 779-BHP emergency engine with Air Toxic Control Measure (ATCM) requirements under Title 17 of the California Code of Regulations. The District has determined with their FDOC permit conditions that the engine will comply with the ATCM requirements.

LOCAL

The applicant provided an air quality permit application to the District in March 2015 (PPP 2015a), and Responses to Energy Commission Data Request Set 2 with revised air quality data along with revised modeling to the Energy Commission and the District in November 2015 (PPP 2015z); and the District issued a PDOC (VCAPCD 2016a) and an FDOC (VCAPCD 2016c), which states that the project is expected to comply with all applicable District rules and regulations.

The District rules and regulations specify the emissions control and offset requirements for new sources such as Puente. Best Available Control Technology would be implemented, and ERCs for NOx based on the permitted emission levels for this project. Compliance with the District's new source requirements would ensure that the project would be consistent with the strategies and future emissions anticipated under the District's air quality attainment and maintenance plans.

Regulation II – Permits

VCAPCD Rule 26.2 through 26.13 - New Source Review Requirements

This rule establish the review requirements for new, replacements, modified or relocated facilities, in conformance with the federal New Source Review regulation to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in Ventura County is not unnecessarily restricted. Conditions **AQ-4, AQ-38, AQ-44, AQ-47, AQ-48, AQ-50,** and **AQ-51** would ensure the project remains in compliance with Rule 26.

Rule 26.2.A requires any application for new, replacement, modified, or relocated emissions units which have a potential to emit criteria pollutants to install Best Available Control Technology for such pollutant. This rule has a zero threshold for BACT for ROC, NOx, PM10, and SOx. BACT is not required for CO. The District has determined the following normal operations BACT requirements for the combustion turbines:

NOx: 2.5 ppm @15% O_2, one-hour average

VOC: 2.0 ppm @15% O_2, one-hour average

PM10: Natural gas fuel with 10.1 lbs/hour

SOx: Pipeline quality natural gas with fuel sulfur content of 0.75 gr/100 scf on a short term basis

The District also concluded that the combustion turbine start-up and shutdown emissions limits and durations proposed by the applicant meet BACT.

Rule 26.2.B details the emission offset requirements for new, replacement, modified, or relocated emissions units. There are offset requirements for ROC, NOx, PM10, and SOx. Emission offsets are not required for CO or NH_3. The offset thresholds of Rule 26.2 are exceeded for ROC, NOx and PM10. Therefore, offsets will be required for any emission increases in ROC, NOx, and PM10 as calculated pursuant to Rule 26.6, New Source Review - Calculations. There are no offsets required by the District for any SOx emission increases as the offset threshold will not be exceeded.

Rule 26.7 specifies the cases in which notification shall be provided of the Air Pollution Control Officer's preliminary decision to grant an Authority to Construct, or issue a Certificate of Emission Reduction Credit. In addition, this Rule specifies the process by which such notification shall be made. This portion of the rule requires the District to publish a notice of the proposed action in at least one newspaper of general circulation in Ventura County and requires sending notices to the U.S. EPA and the ARB. The District must allow at least 30 days for public comment and consider all comments submitted. The District must also make all information regarding the evaluation available for public inspection.

The official public notice and comment period for Puente started after a newspaper notice publication was issued on May 25, 2016 and ended on July 29, 2016. The District considered all comments received and included a “Response to Comments” section in the Final DOC.

Rule 26.11 provides for the evaluation by the District of emission reduction credits for reactive organic compounds (ROC) and nitrogen oxides (NOx) at the time that the Authority to Construct (in this case a Determination of Compliance) is issued. As the Puente Power Project is required to provide NOx offsets as calculated above, the District shall evaluate the proposed offsets per Rule 26.11 Section B.

Pursuant to Rule 26.2.B.2.d and Rule 26.11.C.6 these NOx offsets are <u>not</u> required to be surplus at the time of use since the most recent report of the Rule 26.11 Annual Equivalency Demonstration Program shows a positive balance for NOx.

Rule 26.12 establishes what is defined as a major modification. The Puente results in a major modification for NOx only. Major modifications are also federal major modifications unless there is a less than significant emissions increase or no increase in an existing plant-wide applicability limit.

This project results in a significant emissions increase for NOx. Additionally the facility does not have an existing plant-wide applicability limit. Therefore, this project is a federal major modification for NOx emissions.

Rule 29 – Conditions on Permits

Section A of this rule requires conditions to permits which are necessary to assure that a stationary source and all emissions units at the stationary source will operate in compliance with applicable state and federal emission standards and with District Rules, including permit conditions required by Rule 26, New Source Review.

Several Air Quality conditions of certification will limit the amount of air contaminants a stationary source may emit. These emission limits are called permitted emissions and shall be expressed in pounds per hour and tons per year. In addition, conditions may include restrictions on production rates, fuel use rates, raw material use rates, hours of operation or other reasonable conditions to insure that the permitted emission limits are not exceeded.

Rule 33.5 Part 70 Permits – Timeframes for Applications, Review and Issuance

This rule contains the requirements for federal Title V Operating Permits. The applicant is required to submit a revised Title V Operating Permit application no later than 12 months after initial operation of the combustion turbine. The MGS currently has a Title V Operating Permit and the applicant will be required to submit an application to the District to modify its Title V operating permit to decommission the MGS and to cover Puente. Condition of Certification **AQ-1** is to ensure the facility submits a Part 70 modification application prior to operation of the new equipment.

Rule 34 Acid Deposition Control

This rule contains the requirements for participation in the federal Acid Rain Program 40 CFR Part 72 which is incorporated into the rule. The applicant is required in the DOC conditions to submit an Acid Rain Program application to the District 24 months prior to initial startup of the combustion turbine. Condition of Certification **AQ-1** would require that project owner submit the Title IV Acid Rain permit application prior to operating the new turbine

Regulation IV – Prohibitions

Rule 50 – Opacity

Rule 50 limits visible emissions to an opacity of less than 20 percent (Ringlemann No. 1), as published by the United States Bureau of Mines. Visible emissions are not expected under normal operation from the turbine, emergency diesel engine, or ammonia tank, but will be limited by Condition of Certification **AQ-DE3**.

Rule 51 – Nuisance

This rule prohibits the discharge of air contaminants that cause or have a tendency to cause injury, detriment, and nuisance or annoyance to people and/or the public or damage to any business or property. Compliance with this requirement is expected for

the combustion turbine and emergency engines and by Conditions of Certification **AQ-DE7** and **AQ-DE9**.

Rule 54 - Sulfur Compounds

Rule 54 requires compliance with sulfur dioxide (SO_2) emission limits of 300 ppmv and compliance with ground level concentration limits of SO_2 (0.25 ppmv averaged over 1 hour, 0.04 ppmv averaged over 24 hours, and 0.075 ppmv 1-hour average design value). The combustion of PUC natural gas results in compliance with the 300 ppmv emission limit. Emissions from the project result in maximum modeled ground level concentrations of 1.3 $\mu g/m^3$ (0.0004 ppmv) on a 1 hour average and 0.2 $\mu g/m^3$ (0.00008 ppmv) on a 24 hour average. These concentrations are below the limits of Rule 54. See the air dispersion modeling results in Appendix G of the FDOC. Therefore, this rule does not apply.

Rule 55 Fugitive Dust

The provisions of this rule shall apply to any operation, disturbed surface area, or man-made condition capable of generating fugitive dust, including bulk material handling, earth-moving, construction, demolition, storage piles, unpaved roads, track-out, or off-field agricultural operations. This rule places limits on visible dust, opacity, and track out from activities subject to the rule.

Staff proposed Conditions of Certification **AQ-SC1** through **AQ-SC5** are mitigation measures during the construction phase of Puente Power Project that will assure compliance with this rule. Compliance with this rule is expected during the routine operation of the Puente Power Project.

Rule 57.1 Particulate Matter Emissions From Fuel Burning Equipment

The rule requires that particulate matter emissions from the turbine not exceed 0.12 pounds per million BTU of fuel input. At the manufacturer's guaranteed particulate matter emission rate of 10.1 pounds per hour (which is greater than the EPA AP-42 emission factor) and the maximum fuel input rate of 2,572 MMBTU/Hr, the particulate matter emissions are 0.004 lb per MMBTU, which is significantly less than the Rule 57.1.B limit of 0.12 lb per MMBTU. Therefore, compliance with the rule is expected.

Rule 64 Sulfur Content of Fuels

This rule prohibits the combustion of gaseous fuels that contain sulfur compounds in excess of 50 grains per 100 cubic feet (788 ppmv), calculated as hydrogen sulfide at standard conditions. The turbine will be required to burn CPUC regulated natural gas, which meets this requirement. Conditions of Certification **AQ-20** and **AQ-21** would ensure the project remains in compliance with this rule.

Rule 72

This regulation adopts federal New Source Performance Standards (NSPS, 40 CFR, Part 60) by reference. The relevant criteria pollutant NSPS subparts for Puente are Subpart KKKK (Stationary Combustion Turbines) and Subpart IIII (Stationary Compression Ignition Internal Combustion Engines). The emission limits from Subpart KKKK are less stringent than the BACT/LAER requirement of Rule 26.2 for normal operation. The applicant is proposing newer diesel engines that meet appropriate regulation-specified U.S. EPA engine tier emissions standards (Tier 4 for the emergency generator engine) that would meet the performance requirements of Subpart IIII. Conditions of certification **AQ-DE4**, **AQ-DE8**, **AQ-DE10**, and **AQ-DE11** would ensure compliance with the monitoring and record-keeping requirements of this regulation.

Rule 73

This rule adopts federal standards for hazardous air pollutants (HAPs) by reference. The project, being part of a major source of HAPs emissions, is subject to Subpart YYYY (Stationary Combustion Turbines) and Subpart ZZZZ (Compression Ignition Internal Combustion Engines). The District has incorporated conditions to ensure compliance with the emissions and operating limitations and monitoring requirements of the two applicable subparts of this regulation.

Rule 74.9, Stationary Internal Combustion Engines

The applicant proposes to install a 779 BHP Caterpillar emergency diesel fired internal combustion engine. The engine would provide emergency power when there is a grid electricity power failure. The applicant has indicated that it will be operated less than or equal to 50 hours per year for non-emergency use such as engine maintenance and readiness testing. A non-resettable elapsed hour meter and a limited amount of hours of non-emergency use will be limited by Condition of Certification **AQ-DE1**.

Rule 74.23 Stationary Combustion turbines

This rule requires an annual source test to verify compliance with the NOx limit. The required NOx continuous emission monitor will also verify compliance with the NOx emission limit between source tests. This rule requires records to be kept and available upon request for District inspection for 2 years. However, District Rule 103, Continuous Monitoring Systems, requires records to be kept for 5 years. The facility will be required to keep records for 5 years. It also requires the facility to provide the District with reports and data identifying the annual usage (e.g., fuel consumptions, operating hours, etc.) of the turbine and the annual compliance verification source test.

The turbine is also subject to the 20 ppmvd ammonia (NH_3) limit of Rule 74.23.B.4. The proposed ammonia limit of 5 ppmvd @ 15% oxygen is more stringent than the Rule 74.23 limit. Compliance with this ammonia limit will be verified by an annual source test and will be limited by several Air Quality conditions of certification.

Regulation VI – Source Testing and Stack Monitoring

Rule 101 Sampling and Testing Facilities

This rule requires sampling and testing of facilities that require a Permit to Operate. These facilities shall maintain and have conveniently located test openings in the stack and systems in order to measure permitted emission limits of air containment or for indicating other operating parameters. This rule is limited by Condition of Certification **AQ-8**.

Rule 102 Source Tests

This rule requires source testing in order to verify compliance with several conditions of certification. This rule requires testing shall be completed within 30 days and submitted to the District within 45 days after. This rule will be limited by Conditions of Certification **AQ-8** and **AQ-37**.

Rule 103 Continuous Monitoring System

This rule requires the project owner of an emission source required by federal regulation to install, maintain in good working order, and operate a continuous monitoring system in accordance with this rule. This rule will ensure compliance with several Air Quality conditions of certification.

PUENTE - RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

Air Quality		
Source of Comment	***Comment***	***Staff Response***
Puente Committee	1. Will Staff Condition (**AQ-SC8**), which requires emergency engine readiness testing other than during startup/shutdown and commissioning, need to be adjudicated?	Response to Comment: This condition was proposed by the Applicant in their Responses to Data Request Set 2, Data Request number 58, docket TN#206614. Staff does not anticipate Air Quality Condition of Certification **AQ-SC8** would need to be adjudicated. However, since the PSA, staff has modeled the concurrent operation of the emergency engine during commissioning activities (which often have higher emissions due to partial or no post-combustion control equipment operating) and has determined that readiness testing that might occur during commissioning would not cause any exceedance with any state of federal ambient air quality standards. Therefore, staff now recommends that the term "commissioning" be removed from **AQ-SC8**, as shown in this FSA.
The Applicant TN#213683	2. The applicant discovered minor discrepancies between the District Permit Conditions and Staff's PSA conditions of certification.	Response to Comment: Staff has incorporated these changes; please see the Air Quality conditions of certification (AQ COCs).
The Applicant TN#213683	3. The Applicant has requested clarifying changes to **AQ-SC3** and **AQ-SC4** which refer to construction dust emissions that would occur during any constriction phase or demolition phase of the project.	Response to Comment: Staff agrees with these clarifying modifications to the conditions. Please see **AQ-SC3** and **AQ-SC4** in the AQ COCs.
The Applicant TN#213683	4. The Applicant has made various comments to the text of the PSA, to correct errors and include clarifications to the document. Table 2 Comment number 35-39, and 41-42.	Response to Comment: Staff agrees with these clarifying comments to the text of the document. Staff has made the appropriate changes in this FSA section where applicable.
The Applicant TN#213683	5. The Applicant has made various comments to the text of the PSA, to correct errors and include clarifications to the document. Table 2 Comment number 40.	Response to Comment: Staff does not agree with this clarifying comment to the text of the document. **Air Quality Table 20** discusses MGS Unit 3, not the Puente Combustion Turbine Generator (CTG). Footnote is correct as it is written in the PSA and FSA.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard TN#213681	6. "[The PSA's Evaluation of Air Quality and Public Health Impacts Is Inadequate. A. The PSA Uses an Incorrect CEQA Baseline for Evaluating the Project's Environmental Impacts. "a description of the physical environmental conditions in the vicinity of the project, as they exist . . . at the time the environmental analysis begins."]"	Response to Comment: Staff disagrees with this assertion. Staff determined the baseline or the current environment of the project site by assessing the background air monitoring data (see in **Air Quality Table 3** through **Air Quality Table 10**). The comment may be referring to the baseline period that was used as part of District Rule 26.4c for the District, where the District did an evaluation per this rule. For air quality impact assessments, staff modeled Puente's incremental impact and added appropriate background air monitoring data. Results demonstrate that Puente would not cause new exceedances of health-based ambient air quality standards and existing exceedances would be fully mitigated.
City of Oxnard TN#213681	7. "B. The PSA's Analysis and Mitigation of the Project's Air Quality Impacts Is Deficient. NRG is seeking approvals to operate the Puente plant roughly 24 percent of the year (2,150 hours per year). PSA 4.1-27. But the PSA fails to analyze the air quality impacts associated with this level of Project operations. Instead, the PSA claims that the Project is more likely to operate 10 percent of the year and therefore limits its air quality impact analysis to this 10 percent capacity factor."	Response to Comment: Staff disagrees with this comment. The proposed Puente facility was evaluated for two different operating profiles: (1) VCAPCD regulatory requirements using the maximum potential to emit based on operating Puente for 2,150 hours per year, and (2) for CEQA purposes, assuming Puente would operate at a capacity factor that is "reasonably expected to occur," or a 10 to 11 percent capacity factor. For the FSA, to respond to comments staff has evaluated historical operating energy production from the combined MGS Units 1 and 2 to develop an estimate of the hours that Puente would have to run to replace the annual energy production of both MGS Units 1 and 2. Therefore, staff increased this value to an 11 percent capacity factor for the CEQA mitigation portion of the evaluation. This is assumed to be a "reasonable worst case" for the Local Reliability Area. Annual air quality impacts for district rule evaluation purposes are based on a 24.5 percent capacity factor, equivalent to of 2,150 hours of operation per year. However, short-term air quality impacts are determined by assuming the facility would operate every hour of the 5-year period of metrological data to identify worst-case impacts. **Air Quality Table 20a** and **Air Quality Table 21** show worst case annual emissions. Corresponding air quality impacts can be found in **Air Quality Tables 22** through **27**. The 11 percent capacity factor is only used to evaluate adequacy of CEQA emissions offsets.
City of Oxnard TN#213681	8. "C. The PSA Fails to Evaluate Impacts to the Sensitive Receptors that Will Live Closest to the Power Plant."	Response to Comment: Please see the **Public Health** section of the FSA.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard TN#213681	9. "D. The PSA Fails to Evaluate the Project's Consistency with Federal PSD Permitting Requirements."	Response to Comment: Staff concurs with the local air District, which stated: *"As a District rule that implements a federal regulation, Rule 26.13 is not considered to be an applicable District rule, and is not considered to be an applicable federal regulation, since EPA has not approved Rule 26.13 into the California State Implementation Plan (SIP) through a final notice in the Federal Register.* *If a PSD permit is required, the PSD permit application would be submitted to, evaluated by, and issued by EPA Region 9. The PSD Permit would be a separate permit and would not be included as a part of the VCAPCD's Determination of Compliance (DOC) issued pursuant to VCAPCD Rule 26.9, "New M-25 Source Review – Power Plants".* A similar situation occurred recently with the air permitting for the Pio Pico Energy Center in Otay Mesa, California. The San Diego County APCD issued a Final Determination of Compliance and US EPA Region 9 issued a PSD Permit. Similar to VCAPCD Rule 15, San Diego County APCD Rule 20, "Standards For Granting Permits", also requires compliance with PSD as it specifically refers to San Diego County APCD Rule 20.3, "New Source Review Major Stationary Sources and PSD Stationary Sources". Although the VCAPCD is on the record as recommending to the Energy Commission that the Puente Power Project obtain a PSD applicability determination from the US EPA, the VCAPCD now understands that *"… such an applicability determination approved by EPA is not required by PSD regulations"* (VCAPCD TN 214005-15). Staff has modified the FSA to reflect this understanding and added a condition of certification to ensure that the applicant would obtain any needed PSD review from the US EPA prior to beginning construction.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard, Dr. Fox TN#213649	10. "II. THE PROJECT TRIGGERS PSD REVIEW FOR PM2.5. A. Background on the PSD Netting Analysis."	Response to Comment: Staff concurs with the District's PSD Review. The district stated: *"The PDOC was not intended to be a PSD applicability determination".* The VCAPCD is not making a PSD applicability determination at this time as the VCAPCD does not have federal authority to do so, as described above. However, the lack of a PSD applicability determination in the Determination of Compliance does not necessarily mean the project is not required to obtain a PSD permit. It would be a violation of section 165 of the federal Clean Air Act to commence construction of a project subject to the PSD program without first obtaining a PSD permit.
City of Oxnard, Dr. Fox TN#213649	11. "ii. Generic Emission Factors Should Not Be Used to Determine Actual Emissions".	Response to Comment: Staff has no evidence that EPA AP-42 Table 1.4-3 for large utility boilers greater than 100 BTU/hr heat input's emission factors should not be used to determine baseline emissions for MGS Units 1 and 2. A link from Dr. Fox's docketed letter, contained in the city of Oxnard's comment, states: *"….test data from individual sources are not always available and, even then; they may not reflect the variability of actual emissions over time. Thus, emission factors are frequently the best or only method available for estimating emissions, in spite of their limitations"* (https://www3.epa.gov/ttnchie1/ap42/c00s00.pdf). Energy Commission staff has no comment on what emissions factor or other method might be used by US EPA when and if they evaluate Puente's compliance with PSD requirements.
City of Oxnard, Dr. Fox TN#213649	12. "1. The Applicant Incorrectly Determined the MGS Unit 2 Baseline - a. MGS Unit 2 Baseline Emissions Must Be Actual Emissions"	Response to Comment: Staff concurs with the District's baseline period: The baseline period selected for the Puente Power Project PSD PM2.5 applicability determination is not regulated by the VCAPCD Rule 26.4.C definition of "actual emissions" but is regulated by the PSD definition of "baseline actual emissions". These definitions are not necessarily the same. The major difference in these definitions is that the 5-year period for evaluating PM2.5 is based on the date of application (Rule 26.4.C) while the PSD baseline is based on the timing of actual construction of the project (PSD Regulation). The definition in Rule 26.4.C of "actual emissions" requires a "representative" period while the PSD definition of "baseline actual emissions" requires "any" period.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard, Dr. Fox TN#213649	13. "1. The Applicant Incorrectly Determined the MGS Unit 2 Baseline – b. PM2.5 Emission Factor. Testing should be used to estimate actual emissions"	Response to Comment: Please see response to comment 9.
City of Oxnard, Dr. Fox TN #213649	14. "I. 2012-2013 Are Not Representative of Normal Operation"	Response to Comment: Staff concurs with the District, which states*: "Rule 26.4.C definition of 'actual emissions' requires a 'representative' period and the PSD definition of 'baseline actual emissions' requires 'any' period"* (VCAPCD 2016c).

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard, Dr. Fox TN #213649	15. "ii. Non-Compliant Emissions Were Not Excluded"	Response to Comment: The VCAPCD (and Energy Commission staff) disagrees with the comment that MGS Unit 2 violated its "PM permit limit" of 4.74 pounds per hour. For the purposes of PM10 emission offsets (Rule 26.2.B) and PM10 actual emissions (Rule 26.4.C) emissions are measured and regulated in the units of "tons per year". In addition, the PSD pollutant emissions rates are also measured in the units of "tons per year". "Pounds per hour" emissions are not regulated by Rule 26 and are defined by Section C of VCAPCD Rule 29, "Conditions on Permits", as follows: *"For all emissions units, hourly permitted emissions shall be calculated based on the maximum quantity of each air pollutant which may be emitted from the emissions unit during a one hour period, as limited by any applicable rules or permit conditions. Hourly permitted emissions shall be expressed in the units of pounds per hour"* The PM pounds per hour permitted emissions for MGS Unit 2 have been calculated to be 4.74 pounds per hour and are not limited by an applicable rule or permit condition, but rather they were calculated based on the steam boiler nameplate heat input rating of 1990 one million British Thermal Units (MMBTU) per hour and an "assumed" natural gas heating value of 1,050 MMBTU per millions of standard cubic feet (MMCF). These pounds per hour permitted emissions are not a "limit" that are subject to "violation" as Rule 29.B.3.c allows the pounds per hour permitted emissions to be increased as follows: *"Upon annual renewal, the APCO may revise the permitted emissions of any emissions unit based on better emission rate information if the correction will not result in the violation of any applicable federal, state or district laws, rules, regulations, agreements or orders. The permittee shall be notified in writing of any revisions to permitted emissions, made pursuant to this subsection. Such notice shall be given at the time of notification of the renewal fee due."* Specifically for MGS Unit 2, the pounds per hour permitted emissions of PM of

Air Quality		
Source of Comment	***Comment***	***Staff Response***
		4.74 pounds per hour are not a limit and may be increased to their "maximum quantity" (Rule 29.C) pursuant to Rule 29.B.3.c based on "better emission rate information" such as the MGS Unit 2 maximum heat input rating and the minimum heating value of the natural gas combusted by MGS Unit 2]" (VCAPCD 2016c).

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard, Dr. Fox TN#213649	16. "1. Vendor Guarantee - The PM10/PM2.5 potential to emit of 10.68 ton/yr for the new gas turbine used in the PSD netting analysis in the PDOC and PSA is based on an hourly PM2.5 emissions rate of 10.1 lb/hr under all operating conditions, including startup, shutdown, and normal operation. This emission rate is based on a one paragraph letter from the turbine vendor."	Response to Comment: Vendor guarantees are often used during permitting process to establish "not to exceed" emission limits or emission caps in enforceable permit conditions. COC **AQ-29** requires a PM10 emissions limit of 10.10 pounds per hour as verified by initial and annual source testing with California ARB or EPA-approved methods (all PM emissions are assumed to be PM2.5 emissions). This limit applies at all times and at all ambient temperatures and would apply at all times into the future. At this time, the VCAPCD and Energy Commission staff concluded the Puente Power Project would be able to comply with this PM10 emissions limit. In addition, if the facility cannot comply with this requirement it would be in violation of both VCAPCD and Energy Commission permit conditions and would be subject to enforcement actions by either or both agencies.
City of Oxnard, Dr. Fox TN#213649	17. "Production Limit - Any issued permit must limit the potential to emit of all pollutants, because the proposed emission limits do not reflect the maximum emissions of the new turbine operating at full design capacity."	Response to Comment: Staff disagrees with Dr. Fox's comment that the proposed emission limits do not reflect the emissions of the new turbine operating at full capacity. The project's applicant has requested 2,150 hours of operation per year (not 8,760 hours per year, asserted by comment), and this value is what the air quality impact analyses and air permits by the Energy Commission staff and VCAPCD are based on in the PSA, FSA and DOCs.
City of Oxnard, Dr. Fox TN#213649	18. "Enforceability - As previously explained, the potential to emit must be federally enforceable"	Response to Comment: COC **AQ-48** limits the number of hours of operation including startups and shutdowns to 2,150 hours per year, with no more than 200 starts and 200 shutdowns. The emissions calculations in the Air Quality analysis have based potential emissions on these values. The District and Energy Commission staff did not make the applicant's requested change to **AQ-48**, which would have limited the project to a fuel heat input limit rather than hours of operation.
City of Oxnard, Dr. Fox TN#213649	19. "a. PM10/PM2.5 During Startups And Shutdowns - The proposed limits on PM10, ROC, NOx, and CO emissions during new turbine startups and shutdowns in the PDOC and Revised PSA are not practically enforceable as they do not require any monitoring."	Response to Comment: Staff disagrees with this comment. COC **AQ-48** limits the number of hours of operation including startups and shutdowns to 2,150 hours per year, with no more than 200 starts and 200 shutdowns. Continuous Emission Monitoring Systems (CEMS) measurements are also required and the facility is required to meet ppm limits for those pollutants measured by the CEMS. The emissions calculations in the Air Quality analysis are based on the values in **AQ-48** to determine potential emissions.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
City of Oxnard, Dr. Fox TN#213649	20. "a. PM10/PM2.5 During Normal Operations - In the case of the annual limit, the lb/hr emission rate measured in the stack test is used with annual operating hours to calculate ton/yr"	Response to Comment: Staff concurs with the District, stating *"Condition 29, [**AQ-29**] requires a PM10 emissions limit of 10.10 pounds per hour as verified by initial and annual source testing with EPA-approved methods (all PM emissions are assumed to be PM2.5 emissions)"* (VCAPCD 2016c). Energy Commission staff agrees that the facility can comply with this limit. In addition, if the facility cannot comply with this requirement it would be in violation of both VCAPCD and Energy Commission permit conditions and would be subject to enforcement actions by either or both agencies.
City of Oxnard, Dr. Fox TN#213649	21. "c. Other Issues - The PDOC and PSA both assume that PM10 equals PM2.5. While this is generally true for natural gas combustion in isolation, it is not universally true. The PDOC's proposed stack test methods are ambiguous. The conditions specify "EPA Method 5 (front half and back half) or EPA Method 201A.	Response to Comment: The requested change by Dr. Fox has been made in **AQ-38** to now include the front and back half of this test to include EPA Method 201A and 202. Also, the requested change by Dr. Fox has been made to various Air Quality COCs to now include PM2.5.
City of Oxnard, Dr. Fox TN#213649	22. "The proposed limits are neither federally nor practically enforceable. Thus, the potential to emit must be based on full capacity and year-round operation."	Response to Comment: Staff disagrees with this comment. The applicant has requested 2,150 hours of operation per year (not 8,760 hours per year, as implied by comment), and this value is what the air quality impact assessments and permit conditions prepared by district and Energy Commission staff. The Air Quality Condition of Certification that would enforce this limit of 2,150 hours of operation per year is **AQ-48**.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
Environmental Defense Center TN#213635	23. "The PSA Fails to Adequately Disclose and Mitigate the Project's Impact on Air Quality. a. The PSA Inappropriately Relies on a Non-Approved Ambient Air Quality Model Variation, which Drastically Understates Puente's Air Quality Impacts."	Response to Comment: Staff reviewed comments on the PSA and PDOC from intervenors: Environmental Coalition, Sierra Club, and Environmental Defense Center (TN#213635, TN#212635-1), and expert report from Lindsey Sears (TN#212635-2) regarding air quality modeling. In addition to the **Air Quality Appendix Air-2** that staff already included in the PSA, and **Air Quality Appendix Air-3** now included in the FSA along with **Air Quality Appendix Air-2**, staff provides the following supplemental responses to the comments on air quality modeling. Staff's additional independent analyses show that the conclusions regarding the Puente impacts would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD. The conclusions regarding the Puente construction, operations and demolition impacts, along with cumulative and local sources, such as SCE McGrath, would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD. For more information on the modeling and further responses, please see both **Air Quality Appendix AIR-2** and **Air Quality Appendix AIR-3**.
Environmental Defense Center TN#213635	24. "b. The PSA Underestimates Localized Cumulative Air Quality Impacts By Omitting the Impacts of the McGrath Facility from Ambient Air Quality Analysis."	Response to Comment: Staff revised Air Quality Impact assessment results to include the McGrath facility, and did additional analysis with the non-adjusted u* option, which produces greater incremental project impacts compared to the Adjusted u* analysis. The conclusions did not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD, for all air quality impact assessments.
Environmental Defense Center TN#213635	25. "c. The PSA Bases its Proposed Mitigation on Calculations that Insupportably Reduce Puente's Expected Run Time."	Response to Comment: For the FSA, to respond to comments, staff has evaluated historical energy produced from both MGS Units 1 and 2 to develop a capacity factor value that would produce the same amount of energy from Puente as MSG Units 1 and 2 historically produced. As a result, staff has increased the expected capacity factor to be used for CEQA purposes from 10 to 11 percent to estimate a "reasonable worst case" for the Local Reliability Area. Air Quality Impact evaluations are based on a full 24.5 percent capacity factor of 2,150 hours of operation, and can be seen **Air Quality Table 21a** and Air **Quality Table 21** for worst case annual emissions. Corresponding air quality impacts can be found in **Air Quality Tables 22** through **27**. For short-term worst-case impacts, staff assumed the facility could operate any of the 8,760

Air Quality		
Source of Comment	***Comment***	***Staff Response***
		hours in a year. The 10 to 11 percent capacity factor is only used to evaluate adequacy of CEQA emissions offsets.
Environmental Defense Center TN#213635	26. "d. The PSA Does Not Adequately Identify Emission Reduction Credits."	Response to Comment: For the FSA, staff modified **AQ-SC9** due to the applicant stipulating to the mechanism to be used to develop mitigating emissions of PM10 and its precursors. These must be procured before beginning construction and **AQ-SC9** describes the mitigation that staff recommends would be acceptable. The mitigation only needs to be in place prior to construction. The applicant still needs to agree to new language staff proposes to be included in **AQ-SC9** for CEQA purposes.
California Environmental Justice Alliance (CEJA) TN#213682	27. "The PSA fails adequately to describe the air quality impacts the P3 project because the PSA's descriptions of P3's capacity factor range from 10% to 24.5% to 30% up to 31%. With this range of capacity factor, project emissions are simply too varied to allow the CEC or the public to assess the potential impacts."	Response to Comment: Staff disagree with a portion of this comment and agree with the remaining portion. The 30 percent and 31 percent capacity factors in the PSA were incorrectly used in the document based on other technical sections. The greenhouse gas section has been corrected to fix this error. The project description has also been corrected to match a permitted capacity factor of 24.5 percent as submitted in the revised November 18, 2015 data requested responses Set 2, Docket TN#206791. The Puente capacity factor of 10 percent, used in the PSA only for CEQA mitigation evaluation, was used to determine the hours of operation that would be reasonably likely to occur within the local reliability area (LRA). For the FSA, to respond to comments staff has combined historical annual energy production from MGS Units 1 and 2 to develop a capacity factor value based on this historical energy production to estimate future Puente operation such that Puente operation equates to historical energy produced by both MGS Units 1 and 2. As a result, staff has increased the capacity factor value from 10 to 11 percent for CEQA mitigation purposes to be used as a "reasonable worst case" for the LRA. Air Quality impacts are based on a full 24.5 percent capacity factor of 2,150 hours of operation, and can be seen **Air Quality Table 21a** and **Air Quality Table 21** for worst case annual emissions. Corresponding air quality impacts can be found in **Air Quality Tables 22** through **Air Quality Table 27**. Worst case, short-term impact assessments are determined by assuming the facility operates every hour of the year, to isolate worst-case impacts.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
California Environmental Justice Alliance (CEJA) TN#213682	28. "Emission Reduction Credits ("ERCs") are not measures that are likely to mitigate the P3 air quality impacts. The PSA requires that the ERCs be from within the local air basin… the PSA does not provide information about the likely sources of the ERCs."	Response to Comment: Staff made an effort to focus mitigation measures as part of **AQ-SC9**, with changes made to the wording of this condition to require funding to be used when possible in Disadvantaged Communities that have been identified with CalEviroScreen 2.0. However, mitigation for ozone and PM2.5 precursors can be obtained from a wider area in the air basin because both ozone formation and PM2.5 formation occur regionally, not just locally.
California Environmental Justice Alliance (CEJA) TN#213682	29. "The PSA fails accurately to describe the GHG emissions from the P3 project, let alone their impact. CEJA agrees with, and for the sake of efficiency incorporates by reference the Comments of Center for Biological Diversity regarding the PSA GHG analysis."	Response to Comment: Please see response to comment in the **GHG Appendix** of this FSA.
California Environmental Justice Alliance (CEJA) TN#213682	30. "Since the PSA was issued, California's SB 32 was enacted, requiring greater GHG emissions after 2020."	Response to Comment: Staff agrees with this comment. Please see the **GHG Appendix** of this FSA for further details on incorporating California's SB 32 requiring greater GHG emissions after 2020.
Robert Sarvey TN#213668	31. "The statement that P3 does not need a PSD permit or that it has been determined that a PSD permit is not needed is not supported by the PDOC or by a PSD non applicability determination by USEPA."	Response to Comment: Staff agrees with this comment; the FSA now reflects the fact that the PSD requirements for the project have not yet been determined. The consideration of PSD requirements are the responsibility of the US EPA, not the VCAPCD or the Energy Commission. However, staff continues to expect that the US EPA would not impose a major modification to permit conditions for PSD. Please see **Air Quality** page 4.1-51. Condition **AQ-SC12** has been added to ensure PSD requirements are addressed before construction would be allowed to proceed.
Ventura County Air Pollution Control District TN#213699	32. General Comment regarding attainment status should show throughout the document as Ventura County within the South Coast Air Basin.	Response to Comment: Staff clarified the attainment status throughout the FSA. The term "South Central Coast Air Basin" has been replaced by the term "Ventura County within the South Central Coast Air Basin".
Ventura County Air Pollution Control District TN#213699	33. General Comment regarding incorrect values in Air Quality Tables 1 through 9, and Figures 1 through 5.	Response to Comment: Staff made corrections to the tables and figures where appropriate.

Air Quality		
Source of Comment	***Comment***	***Staff Response***
Ventura County Air Pollution Control District TN#213699	34. 4.1-17, Nitrogen Dioxide discussion seems to be missing.	Response to Comment: Staff made corrections and added this discussion back into the FSA text. It was inadvertently left out.
Ventura County Air Pollution Control District TN #213699	35. 4.1-23, Phase I – Initial commission should be revised to say phase I instead of phase II.	Response to Comment: Staff made corrections to the FSA text.
Ventura County Air Pollution Control District TN #213699	36. General Comment about the data tables and figures.	Response to Comment: Staff made edits to the tables to account for data if obtained from multiple sources.
Gloria Roman and William Terry TN#212489	37. "Air quality, the environment is not static, in a computer model shows three perfect circles of, One mile, three miles and six miles. What was the wind direction and velocity, was it sustained, and for how long?"	Response to Comment: The comment is correct. Air quality is definitely not static; it does not know boundaries and it goes where it wants. The staff analysis is consistent with a dynamic atmosphere, not a static one. At the workshop there was a six mile radius circle shown, which was used to represent the area for the environmental justice data gathering representation. This is used to describe the maximum distance where impacts are expected to occur, with a margin of safety. Staff does not expect to find discernable, much less worst-case, air impacts beyond a 6-mile radius of the stack. Computer models used for such analyses are based on a dynamic atmosphere. Staff and applicant both used the model approved by US EPA for regulatory purposes, AERMOD. It does not generate perfect circles around a one mile, three mile, or six mile radius, or any other distance. The model outputs are called isopleths, which are similar to contour lines that connect data points of the same value. The modeled isopleths are determined based on model input and are intended to present highest impact data. The models take into account 5 years of historical meteorological data, which include wind speed, wind direction, atmospheric stability and temperature. For the Puente Power Project, the average wind speeds were taken from the Oxnard Airport, which is about 2.1 miles away from the proposed site. The most predominate annual wind direction from this monitoring site is onshore from the west-northwest with a strong secondary northeast to east-northeast offshore component. Onshore winds are the most predominate during both the second and third quarters. The winds during the first and fourth quarters have a more predominate offshore

Air Quality		
Source of Comment	***Comment***	***Staff Response***
		component. In all cases, annual and quarterly, the wind direction frequencies outside the previously stated predominate onshore and offshore directions are fairly low. The average wind speed is 3.2 meters per second and dead calm hours occur infrequently, about 2.7 percent of the time.
Grace Chang Comments: No on the Puente Power Project TN # 214026	38. "Similarly, it seems that many greedy corporations--instead of actually having to clean up or reduce emissions of their own local projects--have been allowed to buy credits to offset their pollution impacts from projects run by another company elsewhere."	Response to Comment: The commenter is suggesting the cap-and-trade program is allowing projects to buy credits to offset their pollution impacts from projects by another in other areas of California. Because GHGs are on a large state-wide scale, the discussion of the cap-and-trade program was included in the PSA to indicate California's commitment to reducing GHG emissions, and should not be taken to mean that it is a necessary condition for Puente to reduce GHG emissions.
Daniel Chavez Jr. (Public comment from PSA workshop on July 21, 2016)	39. "Use accurate numbers for operation of the plant."	Response to Comment: Air Quality impacts are based on a full 24.5 percent capacity factor of 2,150 hours of operation, and can be seen **Air Quality Table 21a** and **Air Quality Table 21** for worst case annual emissions. Corresponding air quality impacts can be found in **Air Quality Tables 22** through **Air Quality Table 27**. Worst case, short-term impact assessments are determined by assuming the facility operates every hour of the year, to isolate worst-case impacts.
Michael Stubblefield, Air Quality Chair, Los Angeles Padres Chapter, Sierra Club; Member, CNRCC Energy Climate (Public comment from PSA workshop on July 21, 2016)	40. "Consider the cumulative impacts on the community".	Response to Comment: Staff's additional independent analyses show that the conclusions regarding the Puente impacts would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD. The conclusions regarding the Puente construction, operations and demolition impacts, along with cumulative and local sources, such as SCE McGrath, would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD. For more information on the modeling and further responses, please see both **Air Quality Appendix AIR-2** and **Air Quality Appendix AIR-3**.
Wendy Loftland (Public comment from PSA workshop on July 21, 2016)	41. "Air Quality, Mitigation with District, change the baseline."	Response to Comment: The proposed Puente facility was evaluated for two different operating profiles: (1) VCAPCD regulatory requirements using the maximum potential to emit based on operating Puente for 2,150 hours per year, and (2) for CEQA purposes, assuming Puente would operate at a capacity factor that is "reasonably expected to occur," or a 10 to 11 percent capacity factor. For the FSA, to respond to comments staff has evaluated historical operating energy production from the combined MGS Units 1 and 2 to develop

Air Quality		
Source of Comment	***Comment***	***Staff Response***
		an estimate of the hours that Puente would have to run to replace the annual energy production of both MGS Units 1 and 2. Therefore, staff increased this value to an 11 percent capacity factor for the CEQA mitigation portion of the evaluation. This is assumed to be a "reasonable worst case" for the Local Reliability Area. Annual air quality impacts for district rule evaluation purposes are based on a 24.5 percent capacity factor, equivalent to of 2,150 hours of operation per year. However, short-term air quality impacts are determined by assuming the facility would operate every hour of the 5-year period of metrological data to identify worst-case impacts. **Air Quality Table 20a** and **Air Quality Table 21** show worst case annual emissions. Corresponding air quality impacts can be found in **Air Quality Tables 22** through **27**. The 11 percent capacity factor is only used to evaluate adequacy of CEQA emissions offsets.
Various Comments	42. Staff received several comments and concerns regarding actual emissions from the Puente Facility.	Response to Comments/Concerns: Staff offers some context and a comparison of Puente to everyday pollutants in the Ventura County area. The proposed Puente facility is expected to emit, at an expected 11% capacity factor, approximately 18.7 tpy of NOx, 40.4 tpy of CO, 4.7 tpy of PM10/PM2.5, 0.9 tpy of SOX and 6.8 tpy, of VOCs, respectively. To compare Puente's expected emissions to typical automobile traffic, staff computed emissions for a stretch of Hwy 101 in Ventura County extending from the Caltrans Post Mile marker at Almond Drive in Oxnard to the Caltrans Post Mile marker in Ventura County at Junction Route 33 (around 11.7 miles). Staff found that approximately 120,000[12] light-duty vehicles commute through this stretch of freeway on an average day. Staff compared annual average emissions from the Puente project to annual average emissions along this highway segment, and determined the project would be expected to emit around 14 percent, 3 percent, 19 percent, 32 percent, and 4 percent, respectively as much emissions on an annual basis as the commuter traffic on this freeway segment. Results for SOx are relatively high compared to other pollutants because California's reformulated gasoline is especially low in sulfur content. Staff also compared Puente's expected emissions to the existing stationary

[12] Traffic Data comes from the Caltrans Traffic Data Branch 2014 All Traffic Volumes on California State Highways (CSHS).

Air Quality		
Source of Comment	***Comment***	***Staff Response***
		sources within the Ventura County APCD using annual average emissions from the CEPAM: 2013 Almanac – Standard Emissions Tool.[13] to compare Puente to existing stationary sources within the Ventura County APCD in the most recent base year, 2012. Staff found that existing stationary sources in the District emit 707.4 tpy of NOx, 985.1 tpy of CO, 81.4 tpy of PM10/PM2.5, 22.3 tpy of SOx, and 83.6 tpy of VOCs. Staff determined the project would be expected to emit around 3 percent, 4 percent, 6 percent, 4 percent, and 8 percent, of the total stationary sources in the Ventura County APCD.

[13] https://www.arb.ca.gov/app/emsinv/fcemssumcat2013.php

CONCLUSIONS

Staff concludes that:

- The project would comply with applicable District rules and regulations, including New Source Review Best Available Control Technology (BACT) and offset requirements. Staff recommends the inclusion of the District's FDOC conditions as Conditions of Certification **AQ-1** through **AQ-61** for the main facility and **AQ-DE1** through **AQ-DE12** for the emergency diesel engine.
- The project's construction and demolition activities, including the demolition and removal of the outfall, if unmitigated, would likely contribute to significant adverse PM10 and ozone impacts. Therefore, staff recommends Conditions of Certification **AQ-SC1** to **AQ-SC5,** and **AQ-SC11** to mitigate these potential impacts.
- The project's operation would not cause new exceedances of any NO_2, PM10, PM2.5, SOx, or CO ambient air quality standards; therefore, the project's direct operation NOx, PM2.5, and CO emission impacts are less than significant.
- With the mitigation proposed by staff and compliance with applicable air district rules, no significant direct, indirect, or cumulative adverse impacts to air quality should occur from the demolition of MGS Units 1 and 2, or the outfall structure.
- With the conditions of certification recommended by staff, including all requirements in the District's FDOC, the project will comply with all applicable LORS.
- The project's direct, or secondary, emissions contribution to existing violations of the ozone and PM10 ambient air quality standards are potentially significant if unmitigated. District rules do not require offsets to mitigate the permitted PM10 emission increase; therefore, to comply with CEQA requirements, staff recommends Condition of Certification **AQ-SC9** to mitigate the potential combined PM10/SOx emission increase; nonattainment pollutant and precursor emissions would be mitigated.
- Puente would replace less efficient power plant generation in the Big Creek - Ventura LRA, reducing the GHG emissions associated and facilitating the retirement of units at the Mandalay Generating Station and Ormond Beach Generating Station which are aging, and high GHG-emitting resources in the LRA
- Staff has considered the demographics of the population surrounding the site (see **Environmental Justice Figure 1** and **Table 3**). Since the project's direct and cumulative air quality impacts have been reduced to less than significant, staff does not expect an adverse impact to air quality of the members of the public, off-site nonresidential workers, recreational users or any environmental justice community. Staff does not expect any disproportionate air quality impacts.

Staff proposes a number of conditions of certification that are in addition to the permit conditions that the District has proposed. Conditions of Certification **AQ-1** through **AQ-5** implement construction mitigation requirements. Condition of Certification **AQ-SC6** provides the administrative procedure requirements for project modifications. Condition of Certification **AQ-SC7** is a requirement for the project owner to submit quarterly Operation Reports at the end of each calendar quarter. Condition of Certification **AQ-**

SC8 is quarterly compliance reporting to ensure the emergency generator is not operated for nonemergency use whenever the combustion turbine is undergoing commissioning.

Staff has revised Condition of Certification **AQ-SC8** from wording used in the PSA due to results of new modeling that was performed in **Revised Air Quality Table 25** (Startup and Shutdown Emissions). Staff determined the emergency generator readiness testing would not cause a violation if tested at the same time as a startup or shutdown event. Therefore, staff has made the modification accordingly and **AQ-SC8** is different than the PSA version . Condition of Certification **AQ-SC10** establishes appropriate guidelines on what would be considered a significant change in a condition of certification. This condition is compatible with many air district rules and regulations which already have established mechanisms approved by ARB and U.S. EPA to make minor changes that do not involve significant change to existing monitoring, reporting or recordkeeping requirements or require a case-by-case determination of any emission limitation. This would allow the Energy Commission's CPM to approve administrative changes (such as typographical errors, facility name or owner) and other minor changes. The condition requires the project owner to apply for approval of the change and grants authority for the CPM to approve the change before the change would become effective. Condition of Certification **AQ-SC11** specifies the major construction and demolition work phases that are not allowed to occur concurrently so that project impacts are not higher than those evaluated.

Staff proposes Condition of Certification **AQ-SC12** to ensure that the project will comply with Prevention of Significant Deterioration pre-construction requirements.

Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in **Appendix AIR-1**. Puente, as a modern simple-cycle combustion turbine as described in the **Project Description**, with an enforceable operating capacity factor of less than 60 percent, is not subject to the requirements of SB1368, California's Emission Performance Standard. Additionally, the new Puente CTG is permitted to operate with an annual capacity factor of approximately 25%. Puente would be a non-base load unit under the final rule. This turbine is limited to burning natural gas resulting in a consistent emission rate of 120 lb CO_2/MMBTU or less. Puente would replace less efficient power plant generation in the Big Creek - Ventura LRA, reducing the GHG emissions associated with, and facilitating the retirement of, units at the MGS and Ormond Beach Generating Station which are aging, and high GHG-emitting resources in the LRA. The project would be licensed to emit as much as 0.296 million metric tons of carbon dioxide equivalent emissions and therefore it would be subject to the state cap-and-trade regulation and mandatory state and federal GHG reporting requirements.

PROPOSED CONDITIONS OF CERTIFICATION

Staff recommends the following conditions of certification to address the impacts associated with the construction and operation of the Puente Power Project (Puente) and demolition of MGS Units 1 and 2. These conditions include the District proposed conditions from the FDOC, with appropriate staff-proposed verification language added for each condition, as well as Energy Commission staff-proposed conditions. The temporary activities covered under the demolition of MGS Units 1 and 2 would be subject to the construction/demolition conditions only, while the temporary and long-term operation activities of Puente are subject to all of the proposed conditions of certification.

CEC STAFF CONDITIONS

AQ-SC1 Air Quality Construction/Demolition Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions **AQ-SC3**, **AQ-SC4**, and **AQ-SC5** for the entire project site and linear facility construction/demolition. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities and shall have the authority to stop any or all construction/demolition activities as warranted by applicable construction/demolition mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the compliance project manager (CPM).

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

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

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

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

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

b) No vehicle shall exceed ten miles per hour on unpaved areas within the project and laydown construction/demolition sites.

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

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

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

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

g) All construction/demolition vehicles shall enter the construction/demolition site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

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

i) All paved roads within the construction/demolition site shall be swept at least once daily or more often if necessary (or less during periods of precipitation) to prevent track-out, and to prevent visible dust from crossing the property line on days when construction/demolition activity occurs and dirt, track-out, or run-off is visible on the onsite paved roadways.

j) At least the first 500 feet of any public roadway exiting the construction/demolition site shall be swept visually clean, using wet sweepers or air filtered dry vacuum sweepers, at least once daily or more often if necessary (or less during periods of precipitation) to prevent track-out, and to prevent visible fugitive dust on days when

construction/demolition activity occurs or on any other day when dirt, track-out, or runoff from the construction/demolition site is visible on the public roadways.

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

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

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

n) Disturbed areas will be re-vegetated as soon as practical.

The fugitive dust requirements listed in this condition may be replaced in the Construction Fugitive Dust Control Plan with as stringent or more stringent methods as required by VCAPCD Rule 55.

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

AQ-SC4 Dust Plume Response Requirement: The AQCMM or Delegate shall monitor all construction/demolition activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported**:** (1) off the project site**,** (2) 200 feet beyond the centerline of the construction of linear facilities, (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes, are observed:

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

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

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

Verification: The AQCMM shall provide to the CPM in the MCR:

1. A summary of all actions taken to maintain compliance with this condition;

2. Copies of any complaints filed with the District in relation to project construction; and

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

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction/demolition mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction/demolition-related emissions. The following off-road diesel construction/demolition equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**, and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

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

b) All construction/demolition diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 4 or 4i California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 4 or 4i engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 3 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 3 equivalent emission levels and the highest level of available control using retrofit or Tier 2 engines is being used for the engine in question; or

2. The construction/demolition equipment is intended to be on site for ten working days or less.

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

c) The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within ten working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "b" occurs within ten days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists:

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

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

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

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

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

e) All diesel heavy construction/demolition equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

f) Construction/demolition equipment will employ electric motors when feasible.

Verification: The AQCMM shall include in a table in the Monthly Compliance Report the following to demonstrate control of diesel construction/demolition-related emissions:

A. A summary of all actions taken to control diesel construction/demolition-related emissions;

B. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

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

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

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

AQ-SC7 The project owner shall submit to the CPM Quarterly Operation Reports, following the end of each calendar quarter that include operational and emissions information as necessary to demonstrate compliance with the conditions of certification herein. The Quarterly Operation Report will specifically state that the facility meets all applicable conditions of certification or note or highlight all incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operation Reports to the CPM and District, if requested by the District, no later than 30 days following the end of each calendar quarter.

AQ-SC8 The emergency generator shall not be operated for nonemergency use (testing or maintenance) whenever the GE 7HA.01 combustion turbine is undergoing commissioning operation.

Verification: The project owner of this engine shall maintain a monthly operating log containing, at a minimum, the following:

a) Dates and times of emergency generator engine operation; whether the operation was for maintenance and readiness testing purposes or emergency use; and the nature of any emergency, if known;

b) Hours of operation for all uses other than those specified above and identification of the nature of that use.

The project owner shall submit to the CPM a copy of the monthly emergency generator engine operating log data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-SC9 The project owner shall mitigate 3.1 tons per year (tpy) of PM10/PM2.5 and 0.48 tpy of SOx emissions by using any a combination of the following:

a. The project owner may provide ERC's for either or both pollutants satisfying the requirements of the VCAPCD. Such ERC's shall be from emission reductions occurring within the VCAPCD air basin. The applicant must obtain these ERCs within the census track areas provided in **Environmental Justice – Figure 1** or demonstrate a good faith effort to do so before using ERCs not within these census tract areas. These ERCs shall be at a minimum 1:1 offset ratio.

b. Diesel emission reduction projects funded by the Ventura County Air Pollution Control District with the funds contributed by the project owner shall be weighted for evaluation, qualification, and selection, in accordance with the California Air Resources Board's Carl Moyer Program Guidelines. Other emission reduction projects with the cost-effectiveness of $18,030 per tpy, or equivalent, may be selected by the Ventura County Air Pollution Control District.

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

Verification: The project owner shall submit to the CPM confirmation that the appropriate initial funding has been provided within 90 days after the issuance of the Authority to Construct (ATC) by the District, and within 90 days after the beginning of a calendar year thereafter. The project owner shall provide quarterly summaries of the emission reduction project selection information to the CPM for review until such time that all funds have been committed by the Ventura Air Pollution Control District to qualifying projects. The project owner shall submit to the CPM confirmation that the appropriate funding has been provided to the District, and/or ERC's have been surrendered at least 30 days prior to turbine first fire.

AQ-SC10 The project owner shall comply with all staff (**AQ-SC**) and district (**AQ**) conditions of certification. The CPM, in consultation with the District, may approve any change to a Condition of Certification regarding air quality, as a staff approved modification, provided that: (1) the Project remains in compliance with all applicable laws, ordinances, regulations, and standards, (2) the requested change clearly will not cause the Project to result in a significant environmental impact, (3) no additional mitigation or offsets will be required as a result of the change, (4) no existing daily, quarterly, or annual permit limit will be exceeded as a result of the change, and (5) no increase in any daily, quarterly, or annual permit limit will be necessary as a result of the change.

Verification: The project owner shall submit a petition to amend for any proposed change to a condition of certification pursuant to this condition and shall provide the CPM with any additional information the CPM requests to substantiate the basis for approval.

AQ-SC11 The project owner shall not allow the overlap of specific construction and demolition phase activities. The following activities shall not be conducted concurrently with any of the other listed activities:

1. Puente Construction

2. MGS Units 1 and 2 demolition, and outfall structure

In addition, the combustion turbine's initial commissioning activity and the EPS demolition activity shall not be performed concurrently.

Verification: The project owner shall identify the start and conclusion of the work phases described above in the Monthly Compliance reports.

AQ-SC12 The Project Owner shall provide proof of applying to the U.S. EPA for a Prevention of Significant Deterioration (PSD) Permit for Puente or provide certification from the U.S. EPA that no such permit is required.

Verification: The project owner shall document compliance with this condition before beginning construction.

District Final Determination of Compliance Proposed Permit Conditions (VCAPCD 2016c)

Combustion Turbine Conditions

AQ-1 Prior to completion of construction, the project owner shall submit an application for a revised Title V Part 70 Permit for the Mandalay Generating Station. The application shall also include the Title IV Acid Rain Permit application, VCAPCD Permit to Operate application, and all applicable supplementary forms and filing fees. (Rules 10, 33, 34)

Verification: The project owner shall submit to the CPM copies of the acid rain permit application within five working days of its submittal by the project owner to the District.

AQ-2 Prior to operation of the new CTG, the project owner shall surrender NOx emission reduction credits (ERCs) in the amount of 38.91 tons per year. The project owner shall cancel the permit for Mandalay Generating Station (MGS) Unit 2 prior to the start of commissioning of the new Puente Power Project CTG. The project owner shall cancel the permit for MGS Unit 1 within 90 operating days, but no later than 180 calendar days, after the start of the commissioning period for the new Puente Power Project CTG. (Rule 26.2 and 26.8)

Verification: The project owner shall submit to the CPM, within 30 days of ERC surrender to the District, information demonstrating compliance with this condition.

AQ-3 The project owner shall use any of the following ERC Certificates to satisfy the NOx emission offset requirements of Rule 26.2: ERC Certificate Nos. 1078, 1079, 1080, 1083, 1085, 1091, 1092, 1094, 1097, 1104, and / or 1107.

Verification: The project owner shall submit to the CPM confirmation that the appropriate quantity of ERCs have been provided at least 30 days prior to turbine first fire.

AQ-4 The combustion turbine generator (CTG) lube oil vents and the electrical generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents to no greater than 5% opacity, except for no more than three minutes in any one hour. (Rule 26)

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

AQ-5 The CTG shall be operated with a continuously recording fuel gas flowmeter. The flowmeter shall be installed, calibrated, maintained, and operated according to the manufacturer's instructions. Alternatively, a gas fuel flowmeter that meets the installation, certification, and quality assurance requirements of Appendix D to 40 CFR Part 75 is acceptable for use. (Rules 26.2 and 74.23, 40 CFR Part 60 Subpart KKKK and 40 CFR Part 75)

Verification: The project owner shall submit to the CPM the natural gas usage data from the fuel flow meters as part of the Quarterly Operation Report (**AQ-SC7**).

AQ-6 The CTG exhaust after the SCR (selective catalytic reduction) unit shall be equipped with continuously recording emissions monitors (CEM) for NOx, CO, and O_2. Continuous emissions monitors shall meet the requirements of Rule 74.23, Rule 103, 40 CFR Part 60, Appendices B and F, 40 CFR Part 60 Subpart KKKK, and 40 CFR Part 75, Appendices A and B, as applicable, and shall be capable of monitoring emissions during startups, shutdowns, and unplanned load changes as well as normal operating conditions. (Rules 74.23 and 103, 40 CFR Part 60 Subpart KKKK, and 40 CFR Part 75)]

Verification: The project owner shall submit to the CPM for review and the District for approval a turbine operation monitoring protocol in compliance with this condition at least 90 days prior to the initial startup of the combustion turbine.

AQ-7 CEM cycling times shall be those specified in 40 CFR Part 60, Subpart KKKK and 40 CFR, Part 51, Appendix P, Sections 3.4, 3.4.1 and 3.4.2, or shall meet equivalent specifications established by mutual agreement of the District, the ARB and the EPA. For NOx monitoring for 40 CFR Part 60 Subpart KKKK, during each full unit operating hour, both the NOx monitor and the diluent monitor must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each 15-minute quadrant of the hour, to validate the hour. For partial unit operating hours, at least one valid data point must be obtained with each monitor for each quadrant of the hour in which the unit operates. For unit operating hours in which required quality assurance and maintenance activities are performed on the CEMS, a minimum of two valid data points (one in each of two quadrants) are required

for each monitor to validate the NOx emission rate for the hour. (Rule 103 and 40 CFR Part 60 Subpart KKKK)

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

AQ-8 The exhaust stack of the CTG shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O_2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Source Emission Monitoring and Testing. (Rules 74.23, 101, and 102)

Verification: The project owner shall submit to the CPM for review and District for approval a stack test port and platform plan at least 90 days before the construction of the turbine stacks.

AQ-9 Results of the NOx, CO, and O_2 continuous emissions monitoring shall be reduced according to the applicable procedure established in 40 CFR Part 60, Subpart KKKK (for NOx CEMS), 40 CFR Part 75 Appendix F (for NOx and O_2 CEMS), and 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3.3 (for CO CEMS), or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the U.S. EPA. (Rule 103, 40 CFR Part 60 Subpart KKKK, and 40 CFR Part 75)

Verification: None required.

AQ-10 In accordance with the applicable sections of 40 CFR Part 60, Appendix F, the CO CEMS shall be audited at least once each calendar quarter by conducting cylinder gas audits (CGA) or relative accuracy audits (RAA). CGA or RAA may be conducted during three of four calendar quarters, but no more than three calendar quarters in succession. The NOx and O_2 CEMS shall be audited in accordance with the applicable requirements of 40 CFR Part 75. The District and CPM shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District upon request. (Rule 103)

Verification: The project owner shall submit to the CPM for review and the District for approval the periodic RATA and source test protocols, and RATA source test reports within the timeframes specified in Condition **AQ-11.**

AQ-11 For the CO CEMS, the project owner shall perform a relative accuracy test audit (RATA) as specified by 40 CFR Part 60, Appendix F at least once every four calendar quarters. For the NOx and O_2 CEMS, the project owner shall perform a relative accuracy test audit (RATA) as specified by 40 CFR Part 75, Appendix B at least once every two calendar quarters unless the project owner achieves 7.5% or below relative accuracy. If the project owner meets the incentive of 7.5% or better relative accuracy, then the project owner shall

perform a RATA once every four calendar quarters. For the CO CEMS, the project owner shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. (Rule 103 and 40 CFR Part 75)

Verification: The project owner shall submit to the CPM for review and the District for approval the periodic RATA and source test protocols, and RATA source test reports within the timeframes specified in this condition**.**

AQ-12 The project owner shall report any violation of the NOx and CO emissions limit of this permit, as measured by the CEMS, in writing to the District and CPM within 96 hours of each occurrence. (Rule 103)

Verification: The project owner shall notify the District and CPM within 96 hours of each occurrence regarding any emission standard violation and shall document all such occurrences in each Quarterly Operation Report **(AQ-SC7)**.

AQ-13 The project owner shall maintain permanent continuous monitoring records, in a form suitable for inspection, for a period of at least five (5) years. Such records shall be made available to the Air Resources Board or the District upon request. The report shall include the following:

1. Time intervals of report,

2. The date, time and duration of any startup, shutdown or malfunction in the operation of the gas turbine and CEMS,

3. The results of performance testing, evaluations, calibrations, checks, adjustments, and maintenance of the CEMS,

4. Emission Measurements, and

5. Net megawatt-hours produced. (Rule 103)

Verification: The project owner shall submit to the District the CEMS reports as required in this condition and shall make the site available for inspection of records and equipment by representatives of the District, ARB, and the Energy Commission.

AQ-14 Upon written request of the APCO, the project owner shall submit a written CEM report for each calendar quarter to the APCO. The report is due on the 30th day following the end of the calendar quarter and shall include the following:

1. Time intervals of report,

2. The date, time, duration and magnitude of excess emissions of NOx and/or CO, the nature and cause of the excess (if known), the corrective actions taken, and the preventive measures adopted,

3. The averaging period used for data reporting corresponding to the averaging period specified in the emission test period used to determine compliance with an emission standard,

4. The date, time and duration of each period during which the CEMS was inoperative, except for zero and span checks, and a description of the system repairs and adjustments undertaken during each period, and,

5. A negative declaration when no excess emissions occurred. (Rule 103)

Verification: The project owner shall provide CEMS emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-15 For the purposes of 40 CFR Part 60, Subpart KKKK, excess emissions shall be defined as any unit operating period in which the 4-hour rolling average NOx concentration exceeds the applicable concentration limit or, alternatively, as elected by the permittee, the 4-hour rolling average NOx emission rate exceeds the applicable lb/MWh emissions rate limit, as defined in Part 60.4320, Table 1. The 4-hour rolling average NOx concentration limit for any operating hour is determined by the arithmetic average of 15 ppmvd at 15% O_2 for each hour in which the unit operated above 75% of peak load for the entire hour, and 96 ppmvd at 15% O_2 for each hour in which it did not. The 4-hour rolling average NOx lbs/MWh emission limit for any operating hour is determined by the arithmetic average of 0.43 lb/MWh for each hour in which the unit operated above 75% of peak load for the entire hour, and 4.7 lb/MWh for each hour in which it did not. The 4-hour rolling average is the arithmetic average of the average NOx concentration in ppm measured by the CEMS for a given hour (corrected to 15 percent O_2) or lb/MWh if elected by the permittee and the average NOx concentrations or lb/MWh emission rates during the three unit operating hours immediately preceding that unit operating hour. A period of monitor downtime shall be any unit operating hour in which sufficient data are not obtained to validate the hour for either NOx or O_2. (40 CFR Part 60 Subpart KKKK)

Verification: The project owner shall submit to the CPM for review and the District for approval a CEMS protocol, as required by **AQ-37**, which includes description of the methods of compliance with the requirements of this condition. The project owner shall make the site available for inspection of records and equipment by representatives of the District, ARB, and the Energy Commission.

AQ-16 For the purposes of 40 CFR Part 60, Subpart KKKK, the project owner shall submit reports of NOx excess emissions and monitor downtime, in accordance with 40 CFR 60.7(c) on a semi-annual basis. In addition, the project owner shall submit the results of the initial and annual source test for NOx. All semi-annual reports of excess emissions and monitor downtime shall be postmarked by the 30th day following the end of each six-month period, or by the close of business on the 60^{th} day following the completion of the source test. (40 CFR Part 60 Subpart KKKK)

Verification: The project owner shall submit to the District and the CPM all semi-annual reports of excess emissions and monitor downtime shall be postmarked by the 30th day following the end of each six-month period, or by the close of business on the 60th day following the completion of the source test.

AQ-17 For the purposes of 40 CFR Part 60, Subpart KKKK, if the total duration of)NOx excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and CEMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form in 40 CFR Part 60.7(d) shall be submitted and the excess emission report described in 40 CFR Part 60.7(c) need not be submitted unless requested by the U.S. EPA or the VCAPCD. (40 CFR Part 60 Subpart KKKK)

Verification: The project owner shall provide CEMS emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-18 The ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. All data shall be reduced to hourly averages. (Rule 74.23 and 40 CFR Part 60 Subpart KKKK)

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

AQ-19 The project owner shall monitor and record exhaust gas temperature at the oxidation catalyst inlet and the selective catalytic reduction (SCR) catalyst inlet. All data shall be reduced to hourly averages. (Rule 74.23 and 40 CFR Part 60 Subpart KKKK)

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

AQ-20 The CTG shall be fired exclusively on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as sulfur) per 100 dry scf of natural gas. (Rules 26.2 and 64, 40 CFR Part 60 Subpart KKKK)

Verification: The project owner shall submit the quarterly fuel sulfur content values, as verified by **AQ-21**, in the Quarterly Operation Reports **(AQ-SC7)** and make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-21 The natural gas sulfur content shall be: (i) documented in a valid purchase contract, supplier certification, tariff sheet or transportation contract or (ii) monitored weekly using ASTM Methods D4084, D5504, D6228, or Gas Processors Association Standard 2377, or verified using an alternative method approved by the District. If the natural gas sulfur content is less than 0.75 gr/100 scf for 8 consecutive weeks, then the monitoring frequency shall be once every six (6) months. If any six (6) month monitoring shows an exceedance, weekly monitoring shall resume. (Rules 26.2 and 64 and 40 CFR Part 60 Subpart KKKK)

Verification: The project owner shall submit the quarterly fuel sulfur content values in the in the Quarterly Operation Reports **(AQ-SC7)** and make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-22 Startup is defined as the period beginning with turbine initial firing. Shutdown is defined by the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Unplanned load change is defined as the automatic release of power from the turbine and the subsequent restart. For an unplanned load change, the loss of power during the release must exceed forty (40) percent of the turbine rating. Startup, shutdown, and unplanned load change durations shall not exceed 60 minutes (1 hour) for a startup, 60 minutes (1 hour) for a shutdown, and 60 minutes (1 hour) for an unplanned load change, per occurrence. For failed start-ups, each restart shall begin a new exemption period. (Rules 26.2, 29, and 74.23)`

Verification: The project owner shall provide CEMS emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-23 The CTG, air pollution control equipment, and monitoring equipment shall be operated in a manner consistent with good air pollution control practice for minimizing emissions at all times including during startup, shutdown, and malfunction. (40 CFR Part 60 Subpart KKKK)

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

AQ-24 The project owner shall submit to the District and CPM information correlating the NOx control system operating parameters to the associated measured NOx output. The information must be sufficient to allow the District and CPM to determine compliance with the NOx emission limits of this permit when the CEMS is not operating properly. (Rules 26.2, 29, and 74.23)

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

AQ-25 The HHV (higher heating value) and LHV (lower heating value) of the natural gas combusted shall be determined upon request using ASTM D3588, ASTM 1826, ASTM 1945, or an alternative method approved by the District. (Rules 26.2, 29, and 74.23)

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

AQ-26 When the CTG is operating, ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 300 degrees F. The project owner shall monitor and record catalyst temperature during periods of startup. (Rules 26.2 and 74.23)

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

AQ-27 During startup of the CTG, emissions (in pounds = lbs) from the CTG in any one hour shall not exceed any of the following limits:

ROC = 20.30 lbs,
NOx (as NO_2) = 98.87 lbs,
PM10/PM2.5 = 8.75 lbs,
SOx (as SO_2) = 5.50 lbs, and
CO = 178.55 lbs

For the purpose of this condition, all PM10 emissions are assumed to be PM2.5 emissions.

If the CTG is in startup mode during any portion of a clock hour, the facility will be subject to the aforementioned limits during that clock hour.

Compliance with the ROC, and PM10/PM2.5 emission limits shall be verified by CTG manufacturer's emission data. Compliance with the SOx emission limit shall be verified by complying with the natural gas sulfur content limit of this permit. In addition, compliance with the NOx and CO emission limits shall be verified by continuous emissions monitors (CEMS) as required by this permit. If the CEMS is not operating properly, as required below, the CEMS missing data procedures required by **AQ-55** shall be implemented. (Rules 26.2, 29, and 74.23)

Verification: The project owner shall provide CEMS emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-28 During shutdown of the CTG, emissions (in pounds = lbs) from the CTG in any one hour shall not exceed any of the following limits:

ROC = 30.28 lbs,
NOx (as NO_2) = 22.98 lbs,
PM10/PM2.5 = 9.58 lbs,
SOx (as SO_2) = 5.50 lbs, and
CO = 163.48 lbs

For the purpose of this condition, all PM10 emissions are assumed to be PM2.5 emissions.

If the CTG is in shutdown mode during any portion of a clock hour, the facility will be subject to the aforementioned limits during that clock hour.

Compliance with the ROC, and PM10/PM2.5 emission limits shall be verified by CTG manufacturer's emission data. Compliance with the SOx emission limit shall be verified by complying with the natural gas sulfur content limit of this permit. In addition, compliance with the NOx and CO emission limits shall be verified by continuous emissions monitors (CEMS) as required by this permit. If the CEMS is not operating properly, as required below, the CEMS

missing data procedures required by **AQ-55** shall be implemented. (Rules 26.2, 29, and 74.23)

Verification: The project owner shall provide CEMS emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-29 During normal operation of the CTG, emission concentrations and emission rates from the CTG, except during startup, shutdown, and/or unplanned load change, shall not exceed any of the following limits:

ROC = 6.60 pounds per hour and 2.0 ppmvd @ 15% O_2,
NOx (as NO_2) = 23.73 pounds per hour and 2.5 ppmvd @ 15% O_2,
PM10/PM2.5 = 10.10 pounds per hour,
SOx (as SO_2) = 5.50 pounds per hour,
CO = 23.10 pounds per hour and 4 ppmvd @ 15% O_2,
Ammonia (NH_3) = 17.53 pounds per hour and 5 ppmvd @ 15%O_2.

For the purpose of this condition, all PM10 emissions are assumed to be PM2.5 emissions.

ROC and NOx (as NO_2) ppmvd and pounds per hour limits are expressed as a one-hour rolling average limit. All other ppmvd and pounds per hour limits are three-hour rolling averages. If the CTG is in either startup or shutdown mode during any portion of a clock hour, the CTG shall not be subject to these limits during that clock hour. Startup limits and shutdown limits are listed in the above conditions.

Compliance with the ROC, NOx, PM10/PM2.5, CO, and NH_3 emission limits shall be verified by initial and annual source testing as required below. Compliance with the SOx emission limit shall be verified by complying with the natural gas sulfur content limit of this permit. Compliance with the NH_3 limits shall also be verified by monitoring the ammonia injection rate as required below. In addition, compliance with the NOx and CO emission limits shall be verified by continuous emissions monitors (CEMS) as required by this permit. If the CEMS is not operating properly, as required below, the project owner shall provide documentation, including a certified source test, correlating the control system operating parameters to the associated measured NOx and CO emissions. (Rules 26.2, 29, and 74.23)

Verification: The project owner shall provide CEMS emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-30 Emissions rates from the CTG during the commissioning period shall not exceed the following limits:

ROC = 164.10 pounds per hour and 3.52 tons per year,
NOx (as NO_2) = 246.30 pounds per hour and 11.70 tons per year, and
CO = 1973.00 pounds per hour and 31.74 tons per year.

The commissioning period is the period of time commencing with the initial startup of the turbine and ending after 366 hours of turbine operation, or the date the project owner notifies the District and CPM the commissioning period has ended. For purposes of this condition, the number of hours of turbine operation is defined as the total unit operating minutes during the commissioning period divided by 60.

Compliance with the ROC, NOx and CO emission limits shall be verified by CTG manufacturer's emission data. In addition, compliance with the NOx and CO emission limits shall be verified by continuous emissions monitors (CEMS) as required by this permit. If the CEMS is not operating properly, as required below, the project owner shall provide documentation, including a certified source test, correlating the control system operating parameters to the associated measured NOx and CO emissions. (Rules 26.2, 29, and 74.23)

Verification: A log of the dates, times, and cumulative unit operating hours when fuel is being combusted during the commissioning period shall be maintained by the project owner. The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with the requirements listed in this condition. The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date. The project owner shall also provide the reporting required by this condition to the District and CPM within 30 day of completing commissioning of the turbine. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-31 Annual emissions from the CTG calculated on a twelve consecutive calendar month rolling basis shall not exceed any of the following limits:

ROC = 10.84 tons per year,
NOx (as NO_2) = 32.95 tons per year,
PM10/PM2.5 = 10.68 tons per year,
SOx (as SO_2) = 5.91 tons per year, and
CO = 54.42 tons per year.

For the purpose of this condition, all PM10 emissions are assumed to be PM2.5 emissions.

These tons per year limits include normal operation, startups, shutdowns, unplanned load changes, and the commissioning period.

Compliance with the NOx and CO emission limits shall be verified with the CEMS. In addition, compliance with the NOx and CO emission limits shall be verified with initial and annual source testing combined with compliance with the CTG's annual operating limit in hours per year.

Compliance with the ROC and PM10/PM2.5 emission limits shall be verified with initial and annual source testing combined with compliance with the CTG's annual operating limit in hours per year.

Compliance with the SOx emission limit shall be verified by complying with the natural gas sulfur content limit of this permit combined with compliance with the CTG's annual operating limit in hours per year. (Rules 26.2 and 29)

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the 1st Quarter Operations Report to account for the previous twelve consecutive calendar months **(AQ-SC7)**.

AQ-32 Each one-hour period in a one-hour rolling average, three-hour rolling average, or four-hour rolling average shall commence on the hour. (Rules 26.2 and 29)

Verification: none.

AQ-33 Each calendar month in a twelve consecutive calendar month rolling emissions calculation will commence at the beginning of the first day of the month. The twelve consecutive calendar month rolling emissions total to determine compliance with the annual tons per year emissions limits shall be compiled for each and every twelve consecutive calendar month rolling period. (Rules 26.2 and 29)

Verification: none.

AQ-34 The ammonia (NH_3) slip emission concentration limit shall be verified by initial and annual source testing as required below, and by the continuous recording of the ammonia injection rate to the SCR system. The correlation between the gas turbine heat input rate, the SCR system ammonia injection rate, and the corresponding ammonia (NH_3) slip emission concentration shall be determined in accordance with required initial and annual ammonia source testing. Alternatively, the project owner may utilize a continuous in-stack ammonia (NH_3) slip monitor, acceptable to the District and CPM, to monitor compliance. At least 60 days prior to using an ammonia (NH_3) slip continuous in-stack monitor, the project owner shall submit a monitoring plan to the District and CPM for review and approval. (Rules 26.2, 74.23 and 103)

Verification: Source tests demonstrating compliance with this condition shall be provided to the CPM and are due within the timeframes specified as part of this condition. At least 60 days prior to using an ammonia (NH_3) slip continuous in-stack monitor, the project owner shall submit a monitoring plan to the District and CPM for review and approval. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission

AQ-35 Within 90 days after the completion of the commissioning period for the combustion turbine, the project owner shall conduct an Initial Emissions Source Test at the exhaust of the turbine to determine the ammonia (NH_3) emission concentration to demonstrate compliance with the ammonia

concentration limit. After the initial source test, the NH_3 emissions source test shall be conducted on an annual basis.

The source test shall determine the correlation between the heat input rate of the gas turbine, SCR system ammonia injection rate, and the corresponding NH_3 emission concentration at the unit exhaust. NOx emissions at the CEM shall also be recorded during the test. The source test shall be conducted over the expected operating range of the turbine (including, but not limited to, minimum and full load modes) to establish the range of ammonia injection rates necessary to achieve NOx emission reductions while maintaining ammonia slip levels. The project owner shall repeat the source testing on an annual basis thereafter. Ongoing compliance with the ammonia emission concentration limit shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. The project owner shall submit the source test results to the District and CPM within 45 days of conducting tests. (Rules 26.2, 29, and 74.23)

Verification: Within 90 days after the completion of the commissioning period for the combustion turbine, the project owner shall conduct an Initial Emissions Source Test to determine the ammonia (NH_3) emission concentration to demonstrate compliance with the ammonia concentration limit of 5 ppm. The project owner shall submit the source test results to the District and CPM within 45 days of conducting the tests. After the initial source test, the NH_3 emissions source test shall be conducted on an annual basis.

AQ-36 Within 90 days after the completion of the commissioning period for the combustion turbine, the project owner shall conduct an Initial Emissions Source Test at the exhaust of the turbine to demonstrate compliance with the ROC, NOx, PM10/PM2.5, and CO emission limits. The source test shall be conducted over the expected operating range of the turbine including, but not limited to, minimum and full load modes. This source test shall demonstrate compliance with the following short term emission limits during normal operation: ROC = ppmvd @ 15% O_2 and pounds per hour, NOx = ppmvd @ 15% O_2 and pounds per hour, PM10/PM2.5 = pounds per hour, and CO = ppmvd @ 15% O_2 and pounds per hour. The project owner shall submit the source test results to the District and CPM within 45 days of conducting tests.

After the initial source test, the ROC, NOx, PM10, and CO emissions source test shall be conducted on an annual basis. (Rules 26.2, 29, and 74.23)

Verification: Source tests demonstrating compliance with this condition shall be provided to the CPM and are due on an annual basis after the initial source test is conducted.

AQ-37 The District and CPM must be notified 30 days prior to any source test, and a source test plan must be submitted for approval no later than 30 days prior to testing. Unless otherwise specified in this permit or authorized in writing by the District and CPM, within 45 days after completion of a source test or RATA performed by an independent source test contractor, a final test report

shall be submitted to the District and CPM for review and approval. (Rule 102)

Verification: The project owner shall submit to the District and CPM for approval the initial source test protocol at least 30 days prior to the initial source test. The project owner shall the final test report to the District and the CPM within 45 days after completion of a source test or RATA.

AQ-38 The following source test methods shall be used for the initial and annual compliance verification:

ROC: EPA Methods 18 or 25,
NOx: EPA Methods 7E or 20,
PM10/PM2.5: EPA Method 5 (front half and back half) or EPA Methods 201A and 202,
CO: EPA Methods 10 or 10B,
O_2: EPA Methods 3, 3A, or 20,
Ammonia (NH_3): BAAQMD ST-1B.

For the purpose of this condition, all PM10 emissions are assumed to be PM2.5 emissions.

EPA approved alternative test methods as approved by the District and CPM may also be used to address the source testing requirements of this permit. (Rules 26, 29, and 74.23 and 40 CFR Part 60 Subpart KKKK)

Verification: The project owner shall submit to the CPM operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**.

AQ-39 An initial and annual source test and a periodic NOx and CO Relative Accuracy Test Audit (RATA) shall be conducted on the CTG and its CEMS to demonstrate compliance with the NOx and CO emission limits of this permit and applicable relative accuracy requirements for the CEMS systems using District approved methods. The annual source test and the NOx CEMS RATA shall be conducted in accordance with the applicable RATA frequency requirements of 40 CFR75, Appendix B, Sections 2.3.1 and 2.3.3. The annual source test and CO CEMS RATAs shall be conducted in accordance with the applicable RATA frequency requirements of 40 CFR 60, Appendices B and F. The initial and annual RATA may be conducted during the initial and annual emission source tests required above and shall be conducted in accordance with a protocol complying with all the applicable requirements of an approved source test protocol. (Rule 74.23 and 103, 40 CFR Part 60 Subpart KKKK, and 40 CFR Part 75)

Verification: The project owner shall submit to the CPM for review and the District for approval the RATA certification test protocol at least 60 days prior to the RATA test and shall notify the CPM**,** and District of the RATA test date at least 45 days prior to conducting the RATA and other certification tests. The project owner will submit all

RATA or source test reports to the CPM for review and the District for approval within 45 days of the completion of those tests.

AQ-40 Relative Accuracy Test Audits (RATAs) and all other required certification tests shall be performed and completed on the NOx CEMS in accordance with applicable provisions of 40 CFR Part 75 Appendix A and B and 40 CFR Part 60 Subpart KKKK; and on the CO CEMS in accordance with applicable provisions of 40 CFR Part 60 Appendix B and F. (Rules 74.23 and 103, 40 CFR Part 60 Subpart KKKK, 40 CFR Part 60, and 40 CFR Part 75)

Verification: The project owner shall submit to the CPM for review and the District for approval the periodic RATA and source test protocols, and RATA source test reports within the timeframes specified in Conditions **AQ-39**.

AQ-41 The project owner shall maintain hourly records of NOx, CO, and NH_3 emission concentrations in ppmvd @15% oxygen. NOx and CO concentrations are measured by the CEM; NH_3 emission concentrations are determined and demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of the ammonia injection rate as required above and below. The project owner shall maintain records of NOx and CO emissions in pounds per hour, tons per month, and tons per rolling 12 month periods. (Rules 26.2 and 29)

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

AQ-42 The project owner shall maintain records that contain the following: the occurrence and duration of any start-up, shutdown, unplanned load change or malfunction, performance testing, evaluations, calibrations, checks, adjustments, any periods during which a continuous monitoring system or monitoring device is inoperative, maintenance of any CEM system that has been installed pursuant to District Rule 103, and emission measurements. (Rules 74.23 and 103)

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

AQ-43 The APCO or an authorized representative shall be allowed to inspect, as determined to be necessary, the monitoring devices required by this permit to ensure that such devices are functioning properly. (Rule 103)

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

AQ-44 The project owner shall maintain a stationary gas turbine system operating log that includes, on a daily basis, the actual local startup and stop time, length and reason for reduced load periods, total hours of operation, amount of natural gas consumed, and duration of each start-up, each shutdown, and each unplanned load change time period. (Rules 26 and 74.23)

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

AQ-45 All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District and CPM inspection upon request. (Rules 33 and 103)

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

AQ-46 For purposes of determining compliance with emission limits based on source testing, the average of three subtests shall be used. For purposes of determining compliance with emission limits based on a Continuous Emission Monitoring System (CEMS), data collected in accordance with the CEMS protocol shall be used and the averages for averaging periods specified herein shall be calculated as specified in the CEMS protocol. (Rules 26.2 and 74.23)

Verification: The project owner shall provide emissions summary data in compliance with this condition as part of the Quarterly Operation Reports **(AQ-SC7)**. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-47 For purposes of determining compliance with emission limits based on CEMS data, all CEMS calculations, averages, and aggregates shall be performed in accordance with the CEMS protocol approved in writing by the District and CPM. (Rules 26, 74.23, and 103)

Verification: The project owner shall maintain a copy of the CEMS protocol on site and provide it for inspection on request by representatives of the District, ARB, and the Energy Commission.

AQ-48 The number of annual operating hours (including startup and shutdown) for the CTG shall not exceed 2,150 hours per year. The number of startup periods occurring shall not exceed 200 per year. The number of shutdown periods occurring shall not exceed 200 per year.

The CTG shall be equipped with an operating, non-resettable, elapsed hour meter. The project owner shall maintain a log that differentiates normal operation from startup operation and shutdown operation. These hours of operation records shall be compiled into a monthly total. The monthly operating hour records shall be summed for the previous 12 months and reported to the District and CPM on an annual basis. (Rules 26 and 74.23)

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

AQ-49 Not later than 90 calendar days prior to the installation of the selective catalytic reduction (SCR)/oxidation catalyst emission control systems, the project owner shall submit to the District and CPM the final selection, design parameters and details of the SCR and oxidation catalyst emission control systems for the CTG including, but not limited to, the minimum ammonia injection temperature for the SCR; the catalyst dimensions and volume,

catalyst material, catalyst manufacturer, space velocity and area velocity at full load; and control efficiencies of the SCR and the oxidation catalyst CO at temperatures between 100 ºF and 1000 ºF at space velocities corresponding to 100% and 25% load. (Rules 26.2 and 74.23)

Verification: The project owner shall submit to the CPM for review and District for approval final selection, design parameters and details of the SCR and oxidation catalyst emission control systems at least 90 days prior to the start of construction of the SCR or oxidation catalyst.

AQ-50 Continuous monitors shall be installed on SCR system prior to their initial operation to monitor or calculate, and record the ammonia solution injection rate in pounds per hour and the SCR catalyst temperature in degrees Fahrenheit for each unit operating minute. The monitors shall be installed, calibrated and maintained in accordance with a District and CPM approved protocol, which may be part of the CEMS protocol. This protocol, which shall include the calculation methodology, shall be submitted to the District and CPM for written approval at least 90 days prior to installation of the SCR system. Following the initial operation of the SCR system, the monitors shall be in full operation at all times when the turbine is in operation. (Rules 26 and 103)

Verification: The project owner shall submit to the CPM for review and the District for approval a turbine operation monitoring protocol in compliance with this condition at least 90 days prior to the initial startup.

AQ-51 Except during periods when the ammonia injection system is being tuned or is in manual control for compliance with applicable permit conditions, the automatic ammonia injection system serving the SCR system shall be in operation in accordance with manufacturer's specifications at all times when ammonia is being injected into the SCR system. Manufacturer specifications shall be maintained on site and made available to District and CPM personnel upon request. (Rules 26 and 74.23)

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

AQ-52 The concentration of ammonia solution used in the SCR ammonia injection system shall be less than 20% ammonia by weight. Records of ammonia solution concentration shall be maintained on site and made available to District and CPM personnel upon request. (40 CFR Part 68)

Verification: The project owner shall maintain on site and provide on request of the CPM or District the ammonia delivery records that demonstrate compliance with this condition.

AQ-53 A continuous emission monitoring system (CEMS) shall be installed and operated on the CTG and properly maintained and calibrated to measure, calculate, and record the following, in accordance with the District and CPM approved CEMS protocol:

a. Hourly average concentration of oxides of nitrogen (NOx) uncorrected and corrected to 15% oxygen, in parts per million (ppmvd), necessary to demonstrate compliance with the NOx limits of this permit;
b. Hourly average concentration of carbon monoxide (CO) uncorrected and corrected to 15% oxygen, in parts per million (ppmvd), necessary to demonstrate compliance with the CO limits of this permit;

c. Percent oxygen (O_2) in the exhaust gas averaged over each operating hour;

d. Hourly mass emissions of oxides of nitrogen (NOx) calculated as NO_2, in pounds;

e. Cumulative mass emissions of oxides of nitrogen (NOx) calculated as NO_2 in each startup and shutdown period, in pounds;

f. Daily mass emissions of oxides of nitrogen (NOx) calculated as NO_2, in pounds;

g. Calendar monthly mass emissions of oxides of nitrogen (NOx) calculated as NO_2, in pounds;

h. Rolling 4-hour average concentration of oxides of nitrogen (NOx) corrected to 15% oxygen, in parts per million (ppmvd);

i. Rolling 4-hour average oxides of nitrogen (NOx) calculated as NO_2, in pounds per megawatt-hour (MWh);

j. Calendar month, calendar year, and rolling 12-calendar-month period mass emissions of oxides of nitrogen (NOx), calculated as NO_2 in tons;

k. Hourly mass emissions of carbon monoxide (CO), in pounds;

l. Cumulative mass emissions of carbon monoxide (CO) in each startup and shutdown period, in pounds;

m. Daily mass emissions of carbon monoxide (CO), in pounds;

n. Calendar monthly mass emissions of carbon monoxide (CO), in pounds;

o. Calendar month, calendar year, and rolling 12-calendar-month period mass emissions of carbon monoxide (CO), in tons;

p. Average concentration of oxides of nitrogen (NOx) and carbon monoxide (CO) uncorrected and corrected to 15% oxygen, in parts per million (ppmvd), averaged over each unit operating hour;

q. Average emission rate in pounds per hour of oxides of nitrogen (NOx) calculated as NO_2 and pounds per hour of carbon monoxide (CO) during each unit operating hour.

Verification: The project owner shall submit to the CPM for review and the District for approval a CEMS protocol, as required by **AQ-54**, which includes description of the methods of compliance with the requirements of this condition. The project owner shall make the site available for inspection of records and equipment by representatives of the District, ARB, and the Energy Commission.

AQ-54 No later than 90 calendar days prior to initial startup of the CTG, the project owner shall submit a CEMS protocol to the District, for written approval that shows how the CEMS will be able to meet all of the monitoring requirements of this permit. (Rules 74.23 and 103)

Verification: The project owner shall submit to the CPM for review and the District for approval a CEMS operating protocol at least 90 days prior to the initial startup of each combustion turbine.

AQ-55 When the NOx CEMS is not recording data and the CTG is operating, hourly NOx emissions for purposes of rolling 12-calendar-month period emission calculations shall be determined in accordance with 40 CFR 75 Subpart C. Additionally, when the CO CEMS is not recording data and the CTG is operating, hourly CO emissions for purposes of rolling 12-calendar-month period emission calculations shall be determined using CO emission factors to be determined from source test emission factors, and hourly fuel consumption data. Emission calculations used to determine hourly emission rates shall be reviewed and approved by the District and CPM, in writing, before the hourly emission rates are incorporated into the CEMS emissions data. (Rules 26.2 and 29)

Verification: The project owner shall provide the District for approval and the CPM for review all emission calculations required by this condition, in a manner and time required by the District, and shall provide notation of when such calculations are used in place of operating CEMS data in the Quarterly Operation Reports **(AQ-SC7)**.

AQ-56 The CTG shall be equipped with continuous monitors to measure, calculate, and record unit operating days and hours and the following operational characteristics and operating parameters (Rule 74.23):

a. Date and time;

b. Natural gas flow rate to the CTG during each unit operating minute, in standard cubic feet per hour;

c. Total heat input to the combustion turbine based on the natural gas higher heating value (HHV) during each unit operating minute, in Million British Thermal Units Per Hour (MMBTU/Hr);

d. Higher heating value (HHV) of the fuel on an hourly basis, in Million British Thermal Units Per Standard Cubic Foot (MMBTU/SCF);

e. Stack exhaust gas temperature during each unit operating minute, in degrees Fahrenheit;

f. Combustion turbine energy output during each unit operating minute in megawatts hours (MWh)

Verification: The project owner shall submit to the CPM for review and the District for approval a turbine operation monitoring protocol in compliance with this condition and within the timeframes specified in **AQ-58** and the project owner shall make the site available for inspection of records and equipment required in this condition by representatives of the District, ARB, and the Energy Commission.

AQ-57 The values of these operational characteristics and parameters shall be reduced to hourly averages. The monitors shall be installed, calibrated, and maintained in accordance with a turbine operation monitoring protocol, which may be part of the CEMS protocol, approved by the District and CPM, which shall include any relevant calculation methodologies. The monitors shall be in full operation at all times when the combustion turbine is in operation. Calibration records for the continuous monitors shall be maintained on site and made available to the District and CPM upon request. (Rule 74.23)

Verification: The project owner shall submit to the CPM for review and the District for approval a turbine operation monitoring protocol in compliance with this condition and within the timeframes specified in **AQ-58** and the project owner shall make the site available for inspection of records and equipment required in this condition by representatives of the District, ARB, and the Energy Commission.

AQ-58 At least 90 calendar days prior to initial startup of the CTG, the project owner shall submit a CTG operating parameter monitoring protocol to the District and CPM for written approval. This may be part of the CEMS protocol.

Verification: The project owner shall submit to the CPM for review and the District for approval a turbine monitoring protocol in compliance with this condition at least 90 days prior to the initial startup of each combustion turbine.

AQ-59 Thirty (30) calendar days after the end of the commissioning period for the CTG, the project owner shall submit a written report to the District and CPM. This report shall include, a minimum, the date the commissioning period ended, the startup and shutdown periods, the emissions of NOx and CO during startup and shutdown periods, and the emissions of NOx and CO during steady state operation. This report shall also detail any CTG or emission control equipment malfunction, upset, repairs, maintenance, modifications, or replacements affecting emissions of air contaminants that occurred during the commissioning period. All of the following continuous monitoring information shall be reported and averaged over each hour of operation, except for cumulative mass emissions. (Rules 26.2 and 29):

Concentration of oxides of nitrogen (NOx) uncorrected and corrected to 15% oxygen, in parts per million (ppmvd);

a. Concentration of carbon monoxide (CO) uncorrected and corrected to 15% oxygen, in parts per million (ppmvd);

b. Percent oxygen (O_2) in the exhaust gas;

c. Mass emissions of oxides of nitrogen (NOx) calculated as NO_2, in pounds and tons;

d. Cumulative mass emissions of oxides of nitrogen (NOx) calculated as NO_2 in each startup and shutdown period, in pounds and tons;

e. Cumulative mass emissions of carbon monoxide (CO) in each startup and shutdown period, in pounds and tons;

f. Mass emissions of carbon monoxide (CO), in pounds and tons;

g. Total heat input to the combustion turbine based on the fuel's higher heating value, in Million British Thermal Units Per Hour (MMBTU/Hr);

h. Higher Heating Value (HHV) of the natural gas fuel on an hourly basis, in Million British Thermal Units Per Standard Cubic Foot (MMBTU/SCF);

i. Gross electrical power output of the CTG, in megawatts hours (MWh) for each hour;

j. SCR catalyst temperature, in degrees Fahrenheit.

Verification: A log of the dates, times, and cumulative unit operating hours when fuel is being combusted during the commissioning period shall be maintained by the project owner. The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with the requirements listed in this condition. The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date. The project owner shall also provide the reporting required by this condition to the District and CPM within 30 day of completing commissioning of each turbine. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-60 Upon request of the APCO, the hourly average information required by this permit shall be submitted in writing and /or in an electronic format approved by the District and CPM. Upon request of the APCO, the minute-by-minute information required by this permit shall be submitted in an electronic format approved by the District and CPM. (Rules 26.2, 74.23, and 103)

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

AQ-61 The CTG shall comply with 40 CFR Part 60, Subpart TTTT, Standards of Performance for Greenhouse Gas Emissions From New, Modified, and

Reconstructed Stationary Sources: Electric Utility Generating Units. As defined by the annual hours of operation limits, and the natural gas fuel only requirements, of this permit, the CTG is subject to a CO_2 emission standard of 120 lb CO_2 per MMBTU, averaged over a 12 operating month rolling average.

To verify compliance with this condition, as required above by this permit, the project owner shall record and maintain written monthly records of the CTG natural gas consumption and the CTG net electrical sales supplied to the utility grid.

Verification: To verify compliance with this condition, as required above by this permit, the project owner shall record and maintain written monthly records of the CTG natural gas consumption and the CTG net electrical sales supplied to the utility grid and submit to the District and CPM in the Quarterly Compliance Reports (**AQ-SC7**).

779 BHP Tier 4-Final Emergency Diesel Engine

AQ-DE1 The annual hours of operation for maintenance and readiness testing of the 779 BHP Emergency Diesel Engine shall not exceed 50 hours per year. This limit does not include emergency operation when electrical grid power line service has failed. When not being operated for maintenance or readiness testing, the emergency engine shall only be used during a failure or loss of all or part of normal electrical power service to the facility.

The engine shall be equipped with an operating, non-resettable, elapsed hour meter. The project owner shall maintain a log that differentiates operation during maintenance and testing from operation during emergency use. These hours of operation records shall be compiled into a monthly total. The monthly operating hour records shall be summed for the previous 12 months and reported to the District and CPM after every calendar year by February 15. (Rule 74.9 and ATCM)

Verification: The project owner shall submit to the CPM the emergency diesel engine operating data demonstrating compliance with this condition as part of the Quarterly Operation Report **(AQ-SC7)**. The monthly operating hour records shall be summed for the previous 12 months and reported to the District and CPM after every calendar year by February 15.

AQ-DE2 Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight shall be used to fuel the Emergency Diesel Engine. (ATCM)

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

AQ-DE3 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which are as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart as published by the United States Bureau of Mines, or 20% opacity. (Rule 50)

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

AQ-DE4 The emergency engine shall be EPA-certified to the applicable emissions requirements for emergency engines of 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, based on the power rating of the engine and the engine model year. The ROC, NOx, and PM10 emission limits below have been applied as BACT pursuant to Rule 26.2 and are more stringent than this condition. (Rule 26.2, ATCM, and NSPS IIII)

Verification: The project owner shall provide to the CPM for review and approval engine documentation demonstrating compliance with the condition at least 30 days prior to purchasing the engine.

AQ-DE5 ROC emissions shall not exceed the EPA Tier 4-Final Standard for NMHC of 0.14 g/bhp-hr. The project owner shall maintain documentation certifying that the emergency diesel engine meets this emission standard. (Rule 26.2)

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

AQ-DE6 NOx emissions shall not exceed the EPA Tier 4-Final Standard for NOx of 0.50 g/bhp-hr. The project owner shall maintain documentation certifying that the emergency diesel engine meets this emission standard. (Rule 26.2)

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

AQ-DE7 PM10 emissions from the engine shall not exceed shall not exceed the EPA Tier 4-Final Standard for PM of 0.02 g/hp-hr. The project owner shall maintain documentation certifying that the emergency diesel engine meets this emission standard. (Rules 26.2 and 51)

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

AQ-DE8 CO emissions from the engine shall not exceed the EPA Tier 4-Final Standard for CO of 2.6 g/bhp-hr. The project owner shall maintain documentation certifying that the emergency diesel engine meets this emission standard. (ATCM and NSPS IIII)

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

AQ-DE9 The exhaust stack of the Emergency Diesel Engine shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. A flapper type rain cap that is open while the engine is operating may be used. (Rule 51)

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

AQ-DE10 The Emergency Diesel Engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. (ATCM and NSPS IIII)

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

AQ-DE11 Project owner shall monitor the operational characteristics of the engine as recommended by the engine manufacturer or emissions control system supplier. (ATCM and NSPS IIII)

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

AQ-DE12 The existing 154 BHP emergency fire pump engine and 201 BHP emergency generator engine at the Mandalay Generating Station shall be removed from service prior to operation of this new 779 BHP Emergency Diesel Engine. (Rules 26.2)

Verification: The project owner shall provide to the CPM for review and approval documentation demonstrating compliance with this condition at least 30 days prior to operating the new 779 BHP emergency diesel engine.

REFERENCES

ARB 2015 - California Air Resources Board. California Ambient Air Quality Data Statistics available on ARB website. http://www.arb.ca.gov/adam/index.html. Accessed January 2016.

ARB 2015a - California Air Resources Board. California Ambient Air Quality Standards available on ARB Website. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed December 2015.

ARB 2015b - California Air Resources Board. Air Designation Maps available on ARB website. http://www.arb.ca.gov/desig/adm/adm.htm. Accessed November 2015.

ARB 2015c - California Air Resources Board. California Ambient Air Quality Data Statistics available on ARB website. http://www.arb.ca.gov/adam/index.html. Accessed November 2015.

ARB 2015d - California Air Resources Board. Carl Moyer Memorial Air Quality Standards Attainment Program Webpage. http://www.arb.ca.gov/msprog/moyer/moyer.htm. Accessed December 2015.

CalEPA 2014a – California Communities Environmental Health Screening Tool, Version. 2.0 (CalEnviroScreen 2.0), Guidance and Screening Tool, October 2014, <http://oehha.ca.gov/ej/ces2.html>.

CalEPA 2014b – California Environmental Protection Agency, *Designation of Disadvantaged Communities Pursuant to Senate Bill 535 (De Leon),* October 2014, <http://www.calepa.ca.gov/EnvJustice/GHGInvest/>

CEC 2015i – California Energy Commission/Jon Hilliard (TN 205389). Data Request Set 1 (Nos. 1-47), dated July 17, 2015. Submitted to John Chillemi, NRG Oxnard Energy Center, LLC/CEC/Docket Unit on July 17, 2015

CEC 2015z –Puente Power Project Data Request Set 2 (TN 206363). Submitted to John Chillemi, October 14, 2015. CEC/Docket Unit on October 14, 2015

CEC 2016x, — California Energy Commission, Record of Conversation between EPA and AQ Staff (TN 212939) dated August 21, 2016. Submitted to CEC/Docket Unit on August 25, 2016.

COO 2011 – City of Oxnard, Development Services Department, Planning Division. 2030 General Plan: Goals and Policies. Adopted October 2011. Amended June 2016.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015c – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), Dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015.

PPP 2015u – Applicant's responses to CEC Data Requests, Set 2 (48-74) (TN 206614). Latham & Wilkins LLP Submitted on November 13, 2015. CEC/Docket on November 13, 2015.

PPP 2015y – Latham & Watkins LLP Project Enhancement and Refinement, demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2015z – Latham & Watkins LLP Applicant's Responses to CEC Data Request, Set 2 (TN 206791). Submitted on November 30, 2015. CEC/Docket Unit on November 30, 2015.

PPP 2015jj – Revised Air Quality Emissions and Modeling Results for the Enhancement and Refinement Demolition of Mandalay Units 1 and 2 Latham & Watkins LLP. Submitted on December 16, 2015. CEC/Docket Unit on December 16, 2015.

QFER 2016 - Power Plant Owner Reporting Database. http://energyalmanac.ca.gov/electricity/web_qfer/ . Accessed October 2016.

U.S. EPA 2015a - Air Quality Maps http://www.epa.gov/region09/air/maps/maps_top.html. Accessed December 2015.

U.S. EPA 2015b – AirData Monitor Values Report website. http://www.epa.gov/airquality/airdata/ad_rep_mon.html. Accessed September 2015.

VCAPCD 2016a – Ventura County Air Pollution Control District (TN 211570). Preliminary Determination of Compliance – Puente Power Project. Submitted May 19, 2016.

VCAPCD 2016c – Ventura County Air Pollution Control District (TN 214005-1 through 15). Final Determination of Compliance – Puente Power Project. Dated October 14, 2016.

WC 2015 - Weather Channel. Averages and records for Ventura, California. Website: http://www.weather.com. Accessed December 2015.

ACRONYMS

AAQS	Ambient Air Quality Standard
AERMOD	ARMS/EPA Regulatory Model
AFC	Application for Certification
APCD	Air Pollution Control District (VCAPCD)
AQCMM	Air Quality Construction Mitigation Manager
AQCMP	Air Quality Construction Mitigation Plan
AQMP	Air Quality Management Plan
AQIA	Air Quality Impact Assessment
ARB	California Air Resources Board
AST	Aboveground Storage Tank
ATC	Authority to Construct
ATCM	Airborne Toxic Control Measure
BACT	Best Available Control Technology
BARCT	Best Available Retrofit Technology
bhp	brake horsepower
Btu	British thermal unit
CAAQS	California Ambient Air Quality Standard
CCR	California Code of Regulations
CEC	California Energy Commission (or Energy Commission)
CEQA	California Environmental Quality Act
CEM	Continuous Emission Monitor
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CO	Carbon Monoxide

CO_2	Carbon Dioxide
CTG	Combustion Turbine Generator
CPM	(Energy Commission) Compliance Project Manager
DAHS	Data Acquisition and Handling System
DPM	Diesel Particulate Matter
dscf	dry standard cubic foot
dscm	dry standard cubic meter
EIR	Environmental Impact Report
EPA	Environmental Protection Agency (same as U.S. EPA)
FDOC	Final Determination of Compliance
MGS	Mandalay Generating Station
ERC	Emission Reduction Credit
DOC	Final Determination Of Compliance
GHG	Greenhouse Gas
gpm	Gallons per minute
gr	Grains (1 gr $\cong$ 0.0648 grams, 7000 gr = 1 pound)
HAP	Hazardous Air Pollutant
hp	horsepower
H_2S	Hydrogen Sulfide
LAER	Lowest Achievable Emission Rate
lbs	pounds
LORS	Laws, ordinances, regulations and standards
MCR	Monthly Compliance Report
mg/m^3	milligrams per cubic meter
MMBtu	Million British thermal units
MW	Megawatts (1,000,000 Watts)

NAAQS	National Ambient Air Quality Standard
NH_3	Ammonia
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_3	Nitrates
NOx	Oxides of Nitrogen *or* Nitrogen Oxides
NSPS	New Source Performance Standard
NSR	New Source Review
O_2	Oxygen
O_3	Ozone
OLM	Ozone Limiting Method
Puente	Puente Power Project
PDOC	Preliminary Determination Of Compliance
PM	Particulate matter
PM10	Particulate matter less than 10 microns in diameter
PM2.5	Particulate matter less than 2.5 microns in diameter
ppm	Parts per million
ppmv	Parts per million by volume
ppmvd	Parts per million by volume, dry
PSA	Preliminary Staff Assessment
PSD	Prevention of Significant Deterioration
PTO	Permit to Operate
RATA	Relative Accuracy Test Audit
ROC	Reactive Organic Compound
SCCAB	South Central Coast Air Basin

scf	Standard cubic feet
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_3	Sulfate
SOx	Oxides of sulfur
ULN	Ultra Low NOx
U.S. EPA	United States Environmental Protection Agency
$\mu g/m^3$	Microgram per cubic meter
VCAPCD	Ventura County Air Pollution Control District
VOC	Volatile organic compounds

APPENDIX AIR-1

AIR QUALITY APPENDIX AIR-1

Greenhouse Gas Emissions

Testimony of Jacquelyn Record and David Vidaver

SUMMARY

The Puente Power Project (Puente) is a proposed addition to the state's electricity system. It would be an efficient, dispatchable, natural gas-fired simple-cycle power generation unit with fast-start capability, but would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. Its addition to the system would displace other less efficient, higher GHG-emitting generation, and would facilitate the retirement of units at the Mandalay Generating Station (MGS) and the Ormond Beach Generating Station and would also facilitate the integration of renewable resources. Because the project would displace less-efficient generation resources, the addition of Puente would contribute to a reduction in California GHG emissions and the average GHG emission rate.

Electricity for California is produced by operation of an interconnected system of generation sources. Operation of one power plant, like Puente, affects all other power plants in the interconnected system. The relative efficiency of Puente and the system build-out of renewable resources in California would result in a net cumulative reduction of GHG emissions from new and existing fossil sources of electricity. While Puente would burn natural gas for fuel and thus would produce GHG emissions that contribute cumulatively to climate change, it would have a beneficial impact on system operation and facilitate a reduction in GHG emissions in several ways:

- When dispatched,[14] Puente would displace less efficient (and thus higher GHG-emitting) generation. Because the project's GHG emissions per megawatt-hour (MWh) would be lower than those of the power plants that the project would displace, the addition of Puente would contribute to a reduction of California and overall Western Electricity Coordinating Council system GHG[15] emissions and the average GHG emission rate.
- Puente would replace capacity and generation provided by aging, high GHG-emitting power plants, which are expected to retire in order to comply with the State Water Resource Control Board's (SWRCB) policy restricting the use of sea water for once through cooling (OTC).

[14] The entity responsible for balancing a region's electrical load and generation will "dispatch" or call on the operation of generation facilities. The "dispatch order" is generally dictated by the facility's electricity production cost, efficiency, location or contractual obligations.

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

- Puente would replace less efficient generation in the California Independent System Operator (California ISO) designated Big Creek-Ventura Local Capacity Area (LCA), reducing GHG emissions associated with providing local reliability services and facilitating retirement of units at the MGS and Ormond Beach Generating Station--aging, high GHG-emitting resources--in the LCA.
- Puente would provide fast start and dispatch flexibility capabilities necessary to integrate expected additional amounts of variable renewable generation[16] to meet the state's Renewable Portfolio Standard (RPS) and GHG emission reduction targets.

INTRODUCTION – JACQUELYN RECORD

GHG emissions are not criteria pollutants[17]; they are discussed in the context of cumulative impacts. In December 2009, the U.S. Environmental Protection Agency (EPA) declared that greenhouse gases (GHGs) threaten the public health and welfare of the American people (the so-called "endangerment finding"), and this became effective on January 14, 2010.

Federal rules that became effective December 29, 2009 (40 CFR 98) require federal reporting of GHGs. Staff focuses on analyzing the ability of the project to comply with existing federal- and state-level policies and programs for GHGs. The state has demonstrated a clear willingness to address global climate change though research, adaptation,[18] and GHG inventory reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements.

Generation of electricity using any fossil fuel, including natural gas, can produce greenhouse gases along with the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. For fossil fuel-fired power plants, the GHG emissions include primarily CO_2, with much smaller amounts of nitrous oxide (N_2O, not NO or NO_2, which are commonly known as NOx or oxides of nitrogen), and methane (CH_4, often from unburned natural gas). Also included are sulfur hexafluoride (SF_6) from high voltage equipment, and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled, reused or recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials.

[16] Variable and intermittent are often used interchangeably, but variable more accurately reflects the integration issues of renewables into the California grid. Winds can slow across a wind farm or cloud cover can shade portions of a solar field, temporarily reducing unit or facility output, but not shut down the unit or facility

[17] Criteria pollutants are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), respirable particulate matter (PM10), and fine particulate matter (PM2.5).

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

Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO2E) for ease of comparison.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

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

Applicable Law or Regulation	Description
Federal	
40 Code of Federal Regulations (CFR) Parts 51 and 52	A new stationary source that emits more than 100,000 tons per year (TPY) of greenhouse gases (GHGs) is also considered to be a major stationary source subject to Prevention of Significant Deterioration (PSD) requirements. As of June 23, 2014, the US Supreme Court has invalidated this requirement as a sole PSD permitting trigger. However, PSD still applies to GHGs if the source is otherwise subject to PSD (for another regulated New Source Review (NSR) pollutant) and the GHG emissions exceed this value. Staff recommends that the applicant obtain a determination on PSD applicability from Region 9 of the US EPA since the local district's Rule 26.2 has not yet been approved in California's State Implementation Plan. Staff has proposed Condition of Certification **AQ-SC 12** to ensure that any such review would occur prior to commencing facility construction.
Title 40 CFR Part 60, Subpart TTTT (Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units)	This rule, effective October 23, 2015, establishes standards for emissions for carbon dioxide (CO_2) for newly constructed, modified, and reconstructed affected fossil fuel-fired electricity utility generating units (EGUs).
40 Code of Federal Regulations (CFR) Part 98	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2-equivalent (CO2E) emissions per year. This requirement is triggered by this facility.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code, sections 38500 et seq.)	This act requires the California Air Resource Board (ARB) to enact standards to reduce GHG emission to 1990 levels by 2020. Electricity production facilities are included. A cap-and-trade program became active in January 2012, with enforcement beginning in January 2013. Cap-and-trade is expected to achieve approximately 20 percent of the GHG reductions expected under Assembly Bill (AB) 32 by 2020.

Applicable Law or Regulation	Description
California Code of Regulations, Title 17, Subchapter 10, Article 2, sections 95100 et. seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code, sections 38500 et seq.)
Title 20, California Code of Regulations, Section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 MTCO2/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO_2/MWh). Puente would not be a base load facility and this regulation would not apply.
Local	
City of Oxnard Energy Action Plan	The EAP builds upon existing energy conservation efforts and identifies energy conservation and production programs consistent with 2030 General Plan goals and policies, utility company programs, and state and federal legislation and initiatives.

GREENHOUSE GAS ANALYSIS

California is actively pursuing policies to reduce GHG emissions that include adding low-GHG emitting renewable electricity generation resources to the system. GHG emissions are not included in the class of pollutants traditionally called “criteria pollutants.” Since the impact of the GHG emissions from a power plant’s operation has global rather than local effects, those impacts should be assessed not only by analysis of the plant’s emissions, but also in the context of the operation of the entire electricity system of which the plant is an integrated part. Furthermore, the impact of the GHG emissions from a power plant’s operation should be analyzed in the context of applicable GHG laws and policies, especially Assembly Bill (AB) 32, California’s Global Warming Solutions Act of 2006.

GLOBAL CLIMATE CHANGE AND CALIFORNIA

Each of the first six months of 2016 set a record as the warmest respective month globally in the modern temperature record, which dates to 1880, according to scientists at NASA's Goddard Institute for Space Studies (GISS) in New York. The six-month period from January to June was also the planet's warmest half-year on record, with an average temperature 1.3 degrees Celsius (2.4 degrees Fahrenheit) warmer than the late nineteenth century (NASA/Goddard 2016). October 2016 was the second warmest October in 136 years of modern record-keeping, according to a monthly analysis of global temperatures by scientists at NASA's Goddard Institute for Space Studies (GISS) in New York[19]. According to “The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California,” an Energy Commission document, the American West is heating up faster than other regions of the United States (CEC 2009c). The California Climate Change Center (CCCC) reports that, by the end of this century, average global surface temperatures could rise by 4.7°F to 10.5°F due to increased GHG emissions.

[19] http://data.giss.nasa.gov/gistemp/news/20161115/

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without these natural GHGs, the earth's surface would be approximately 61°F (34°C) cooler (CalEPA 2006); however, emissions from fossil fuel combustion for activities such as electricity production and vehicular transportation have elevated the concentration of GHGs in the atmosphere above natural levels. ARB estimated that the mobile source sector accounted for approximately 37 percent of the GHG emissions generated in California from 2009 through 2012, while the electricity generating sector accounted for approximately 20 to 22 percent of the 2009 to 2012 California GHG emissions inventory, with just more than half of that on average from in-state generation sources (ARB 2014).

The Fourth U.S. Climate Action Report concluded, in assessing current trends, that CO_2 emissions increased by 20 percent from 1990 to 2004, while methane and nitrous oxide emissions decreased by 10 percent and 2 percent, respectively. The Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that stabilization of GHGs at 450 ppm carbon dioxide equivalent concentration is required to keep the global mean warming increase below 3.8°F (2.1°C) from year 2000 base line levels (IPCC 2007a).

GHGs differ from criteria pollutants in that GHG emissions from a specific project do not cause direct adverse localized human health effects. Rather, the direct environmental effect of GHG emissions is the cumulative effect of an overall increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. The impacts of climate change include potential physical, economic, and social effects. These effects could include inundation of settled areas near the coast from rises in sea level associated with melting of land-based glacial ice sheets, exposure to more frequent and powerful climate events, and changes in suitability of certain areas for agriculture, reduction in Arctic sea ice, thawing permafrost, later freezing and earlier break-up of ice on rivers and lakes, a lengthened growing season, shifts in plant and animal ranges, earlier flowering of trees, and a substantial reduction in winter snowpack (IPCC 2007b). For example, current estimates include a 70 to 90 percent reduction in snow pack in the Sierra Nevada mountain range. Current data suggests that in the next 25 years, in every season of the year, California could experience unprecedented heat, longer and more extreme heat waves, greater intensity and frequency of heat waves, and longer dry periods.

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature found that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Cal. Health & Safety Code, sec. 38500, division 25.5, part 1).

The state has demonstrated a clear willingness to address global climate change (GCC) through research, adaptation, and GHG emission reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG

emissions related to electricity generation (see **Electricity System GHG Impacts** below), and describes the applicable GHG policies and programs.

In April 2007, the U.S. Supreme Court held that GHG emissions are pollutants within the meaning of the Clean Air Act (CAA). In reaching its decision, the Court also acknowledged that climate change results, in part, from anthropogenic causes (Massachusetts et al. v. Environmental Protection Agency 549 U.S. 497, 2007). The Supreme Court's ruling paved the way for the regulation of GHG emissions by U.S. Environmental Protection Agency (U.S. EPA) under the CAA.

As federal rulemaking evolves, staff at this time focuses on analyzing the ability of the project to comply with existing federal- and state-level policies and programs for GHGs. As of June 23, 2014, the US Supreme Court has validated that GHG emissions should continue to be regulated, but only for those facilities that are already regulated under Prevention of Significant Deterioration (PSD) for NSR pollutants.

In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p. 5). In 2003, the Energy Commission recommended that the state require reporting of GHGs, or global climate change[20] emissions, as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the ARB to adopt standards that will reduce 2020 statewide GHG emissions to 1990 levels.

AB 32 includes a number of specific requirements:

> **ARB shall prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020 (Health and Safety Code (HSC) §38561).** The scoping plan, approved by the ARB on December 12, 2008, provides the outline for actions to reduce greenhouse gases in California. The approved scoping plan indicates how these emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms, and other actions. In early 2014, ARB completed its 5-year update to the Scoping Plan, tracking progress towards the 2020 emission goals and proposing new measures as appropriate.
>
> The adopted Scoping Plan anticipates that four-fifths of the planned reductions will come from cost-effective programs and regulations, with the remainder provided by economy-wide cap and trade. Measures that affect the electricity sector directly include a 33 percent Renewable Portfolio Standard by 2020, alternative transportation fuels such as vehicle and ship electrification, building energy efficiency, and combined heat and power. Most of these measures have been implemented, such as Senate Bill X1-2 (Simitian, Chapter 1, Statutes of 2011),

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

which established a firm goal requiring all retail providers to procure an amount equal to 33 percent of their electricity sales from renewable sources by 2020. In January 2015, Governor Brown declared a goal of reaching 50 percent renewable energy by 2030; this goal was codified in SB 350 (De León, Chapter 547, Statutes of 2015).

Identify the statewide level of greenhouse gas emissions in 1990 to serve as the emissions limit to be achieved by 2020 (HSC §38550). In December 2007, the ARB approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (MMTCO2E) of greenhouse gases. In 2013, ARB used EPA's updated information to re-calculate that level to 431 million metric tons. SB 350 established an emissions limit for 2030 of 261 million metric tons; the set of programs and measures needed to reach this limit is the subject of ARB's 2030 Target Scoping Plan Update proceeding.

Adopt a regulation requiring the mandatory reporting of greenhouse gas emissions (HSC §38530). In December 2007, the ARB adopted a regulation requiring the largest electric power generation and industrial sources to report and verify their greenhouse gas emissions. The reporting regulation serves as a solid foundation to determine greenhouse gas emissions and track future changes in emission levels. Facilities that emit more than 25,000 metric tons per year are covered. That includes most emitting power plants of 5 megawatts or larger. Reported emissions from individual facilities may be found on the Mandatory Reporting website, http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

Adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, applicable from January 1, 2012, to December 31, 2020 (HSC §38562(c)). In 2011, the ARB adopted the cap-and-trade original regulation. The cap-and-trade program covers major sources of GHG emissions in the state such as refineries, power plants, industrial facilities, and transportation fuels. The cap-and-trade program includes an enforceable emissions cap that will decline over time. The state will distribute allowances, which are tradable permits, equal to the emissions allowed under the cap. Sources under the cap will need to surrender allowances and offsets equal to their emissions at the end of each compliance period.

Individual in-state generating facilities and the first deliverers of imported electricity are the point of regulation. They are responsible for measuring and reporting their GHG emissions under ARB and U.S. EPA regulations, and purchasing either carbon allowances or offsets to meet their emissions obligation. Third party verification is required. If facilities find that it is not economic to operate and to purchase sufficient compliance instruments to cover its GHG obligations, facilities must lower their annual energy output. Further information on cap-and-trade may be found at: http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

The first mandatory compliance period[21] with cap-and-trade requirements commenced on January 1, 2012, although enforcement was delayed until January 2013.

Convene an Environmental Justice Advisory Committee (EJAC) to advise the Board in developing the Scoping Plan and any other pertinent matter in implementing AB 32 (HSC §38591). The EJAC met between 2007 and 2010, providing comments on the proposed early action measures and the development of the scoping plan, public health issues, and issues for impacted communities and cap-and-trade. To advise the ARB on the 2013 Scoping Plan Update, ARB reconvened a new EJAC on March 21, 2013. The committee met three times in 2013 and again in April 2014.

In 2015, the ARB opened a proceeding intended to develop a 2030 target for GHG emission reductions, as well as programs necessary to reach that target. The EJAC met on ten occasions between December 2015 and August 2016 to develop recommendations for the AB 32 2030 Target Scoping Plan Update.

It is likely that GHG reductions mandated by ARB will be non-uniform or disproportional across emitting sectors, in that most reductions will be based on cost-effectiveness (i.e., the greatest GHG reduction for the least cost). It is possible that percentage reductions in GHG emissions from the electricity sector will be higher than those from other sectors of the state's economy as decarbonizing the electricity sector may prove to be among the least-cost pathways to overall reductions. The Draft 2030 Target Scoping Plan calls for the electricity sector to reduce GHG emissions by 67 to 73 percent from 1990 levels by 2030 (ARB 2016).

SB 1368,[22] enacted in 2006, and regulations adopted by the Energy Commission and the California Public Utilities Commission (CPUC) pursuant to that bill, prohibits California utilities from entering into long-term commitments with any base load facilities that exceed the Emission Performance Standard (EPS) of 0.5 metric tonnes CO2 per megawatt-hour[23] (1,100 pounds CO2/MWh). Specifically, the SB 1368 EPS applies to new California utility-owned power plants, new investments in existing power plants, and new or renewed contracts with terms of 5 years or more, including contracts with power plants located outside of California, where the power plants are "designed or intended" to operate as base load generation.[24] If a project, in state or out of state, plans to sell electricity or capacity to California utilities, those utilities will have to demonstrate that the project meets the EPS. *Base load* units are defined as units that

[21] A compliance period is the time frame during which the compliance obligation is calculated. The years 2013 and 2014 are known as the first compliance period and the years 2015 to 2017 are known as the second compliance period. The third compliance period is from 2018 to 2020. At the end of each compliance period each facility will be required to turn in compliance instruments, including allowances and a limited number of ARB offset credits, equivalent to their total GHG emissions throughout the compliance period. (http://www.arb.ca.gov/cc/capandtrade/guidance/chapter1.pdf)

[22] Public Utilities Code § 8340 et seq.

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

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

are expected to operate at a capacity factor higher than 60 percent. Compliance with the EPS is determined by dividing the annual average carbon dioxide emissions by the annual average net electricity production in MWh. This determination is based on capacity factors, heat rates, and corresponding emissions rates that reflect the *expected* operations of the power plant and not on full load heat rates [Chapter 11, Article 1 §2903(a)].

Puente would be required to participate in California's GHG cap-and-trade program. This cap-and-trade program is part of a broad effort by the State of California to reduce GHG emissions as required by AB 32, which is being implemented by ARB. As currently implemented, market participants, such as Puente, are required to report their GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. As new participants enter the market and as the market cap is ratcheted down over time, GHG emission allowance and offset prices will increase encouraging innovation by market participants to reduce their GHG emissions. Thus, Puente, as a GHG cap-and-trade participant, would be consistent with California's AB 32 Program.

On October 23, 2015, the U.S. EPA published a final rule (U.S. EPA 2015) under Clean Air Act section 111(b) that would limit greenhouse gas emissions (specifically, CO2) from new, base load natural gas fueled turbines built after January 8, 2014 (for facilities with new turbines) and June 18, 2014 (for facilities with reconstructed turbines) to 1,000 lb CO2 per MWh, gross (or 1,030 lb CO2 per MWh, net), expressed at three digits of precision. The rule would also apply to non-base load natural gas fueled turbines by limiting CO2 emissions to 120 lb CO2 per million Btus of natural gas heat input, expressed at two digits of precision.

According to the U.S. EPA final rule (U.S. EPA 2015), a "base load" natural gas fired turbine is defined as one that has a capacity factor in percentage above the lower heating value efficiency of the turbine, expressed as a percentage. Correspondingly, a "non-base load" natural gas fired turbine is one that has a capacity factor less than or equal to the lower heating value efficiency of the turbine, expressed as a percentage, with the value capped at 50 percent. Compliance is determined over a 12-month rolling average using a continuous emissions monitoring system or by measuring actual fuel use, including start-up, shut-down and periods of malfunction.

Also on October 23, 2015, the U.S. EPA published a final rule under Clean Air Act section 111(d) that principally applies to existing electricity generators but may also apply to new natural gas fired turbines. This requirement may be triggered if the state chooses to meet the 111(d) requirements under a mass-based option and chooses to include both existing and new units in its plan, rather than implementing a rate-based option. States have until 2016 (with optional extensions to 2018) to choose which option to use for section 111(d), so the applicability of this requirement cannot be determined for the Puente project at this time. However, the Puente project would be required to participate in the AB32 cap-and-trade program (or its successor program), which imposes compliance obligations for its greenhouse gas emissions, and would likely help to ensure that the facility complies with potentially applicable section 111(d)

requirements. On February 9, 2016, the Supreme Court stayed implementation of the so-called “Clean Power Plan” pending judicial review.

On May 22, 2014, The Air Resources Board (ARB) released its first update to their AB32 Scoping Plan. On April 29, 2015, Governor Brown issued Executive Order B-30-15, directing state agencies to implement measures to reduce GHG emissions 40 percent below their 1990 levels by 2030 and to achieve the previously-stated goal of an 80 percent GHG reduction by 2050. In response, ARB is again updating the AB32 Scoping Plan. If this project is built after 2020, the GHG regulatory landscape could be different than today.

On June 17, 2016, ARB released a concept paper addressing four options for updating the Scoping Plan that focus on extending AB32 requirements beyond the year 2020. There are four alternatives listed in the concept paper, described as Concepts 1 to 4. These are summarized as follows:

1. Extending cap-and-trade and other complementary programs,

2. Expand complementary programs without extending cap-and-trade,

3. Aggressively expand transportation-related programs and other complementary programs without extending cap and trade, and

4. Replace cap-and-trade with a carbon tax and expanded complementary programs.

Staff’s GHG analysis assumes the cap-and-trade provisions of AB32 would continue as envisioned in Concept 1. If a carbon tax replaces cap-and-trade as envisioned in Concept 4, the effect on Puente is expected to be approximately the same, depending on how the carbon tax is levied. However, if the cap-and-trade approach is abandoned as in Concepts 2 and 3, the only programmatic approach currently in place would apply to reducing GHG emissions from power plants would be the federal New Source Performance Standard requirements being developed by the U.S. EPA. As currently proposed, Puente would comply with these federal GHG requirements.

ARB has initiated a process to obtain public input on which of these options to pursue. They plan on adopting the updated scoping plan in 2016. On September 8, 2016, Senate Bill 32, codified as Section 38566 of the Health and Safety Code, was enacted. It extends California’s commitment to reduce GHG emissions by requiring the state to reduce statewide emissions to below 1990 levels by 2030.

Puente would be expected to supply less than the design efficiency times the potential electric output as net-electric sales on a 3-year rolling average basis and would therefore be considered a non-base load unit. The single turbine would be subject to a heat input limit of 120 lbs CO2/MMBtu. The facility would be required to maintain fuel purchase records of the natural gas (VCAPCD 2016c).

ELECTRICITY GREENHOUSE GAS EMISSIONS

While electricity use can be as simple as turning on a switch to operate a light or fan, the system to reliably deliver electricity to California is complex and ever-changing. It operates as an integrated whole to reliably and effectively meet demand, i.e., to provide

electricity when and where needed at all points in time. Within the system, power plants not only generate electricity (energy), but also provide generating capacity and ancillary services needed to stabilize the system and thus reliably deliver energy over the transmission grid during stressed conditions (periods of very high demand, for example, or after the sudden failure of major power plants or transmission lines). *Capacity* is the instantaneous output of a resource, in megawatts. *Energy* is the capacity output over a unit of time, for example an hour or year. Ancillary services[25] include regulation, spinning reserve, non-spinning reserve, voltage support, and black start capability. Individual generation resources may provide one specific service, or may be operated so as to provide several. The set of ancillary services that a generator provides will depend upon the generation technology, how the power plant is operated, and constantly-changing system needs and operation.

The dispatch of a new generation resource most likely would displace energy from one or more existing resources; however there is a possibility the project could dispatch concurrently with any power generation available to the grid. The stability of the electricity system requires that supply and demand balance at all points in time; generation from a new resource at any point in time must result in the curtailment of one or more existing resources at that same moment. This has implications for the change in GHG emissions resulting from dispatching new resources.

GHG EMISSIONS FROM THE PROPOSED FACILITY

The specifics of the Puente project that are being evaluated, including the differences with the existing MGS Units 1 and 2, are described more fully within the **Air Quality Section**.

Project Construction of Puente and Demolition of MGS Units 1 and 2

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The concentrated on-site activities result in temporary, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of the Puente project would involve many milestones of construction, decommissioning and demolition of MGS Units 1 and 2 as follows: 1) Puente construction; 2) Puente commercial online date (by June 2020); 3) a 6-month MGS retirement and decommissioning during initial operation of Puente (by June 2021); and 4) the MGS Units 1 and 2 demolition (by late 2022) that would occur after Puente is built and operating as proposed under the applicants filing “Project Enhancement and Refinement – Demolition of Mandalay Generating Station” (PPP 2015y). The project owner provided GHG emissions estimates for each of these construction/demolition phases.

The GHG emissions estimate for project construction is presented below in **Greenhouse Gas Table 2a**. The term CO2E represents the total GHG emissions after weighting by the appropriate global warming potential.

[25] See CEC 2009d, page 95.

Greenhouse Gas Table 2a
Puente Estimated Construction Greenhouse Gas Emissions

Total for 18-month period	CO2 Equivalent (MTCO2E) [a]
Onsite Off-Road Equipment and Onsite Vehicle	2,947
Offsite Worker Travel [b]	444
Offsite Delivery and Haul Truck Emissions [b]	178
Puente Construction total	**3,569**

Source: (AFC PPP 2015a, Appendix C-5 Table C.6-9)
Note:
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] Offsite round trip distances are estimated to be approximately 60 miles to county line (page 4-2 project enhancements PPP 2015y)

The GHG emissions estimate for MGS Units 1 and 2 demolition is presented in **Greenhouse Gas Table 2b**. The term CO2E represents the total GHG emissions after weighting by the appropriate global warming potential. The estimated GHG emissions that would occur during construction are expected to be greater than those estimated for demolition of MGS Units 1 and 2 are mostly due to the length of time for each phase.

The specific sequencing of demolition activities will provide for coordinated removal of MGS Units 1 and 2 and operation and maintenance activities related to Puente and MGS Unit 3. At the completion of the constriction and start of commercial operating of Puente, the demolition of MGS Units 1 and 2 could then commence. The exact timing of the initiation of demolition will be driven by actual dates when Units 1 and 2 are retired and the subsequent decommissioning is complete (PPP 2015y).

Greenhouse Gas Table 2b
MGS Demolition Estimated Construction
Greenhouse Gas Emissions

15-month Demolition Period – 12 months after proposed Puente is operational	CO2 Equivalent (MTCO2E) [a]
MGS 1 and 2 Demolition Total (3 months)	143
Off-Road Equipment and Onsite Vehicles	2,383
Worker Travel [b]	352
Delivery Trucks [b]	30
Haul Trucks [b]	139
MGS Demolition total	**2,904**

Source: PPP 2015y Table 4.1-17, AFC PPP 2015a Table C.6-17
Note:
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] Offsite round trip distances are estimated to be approximately 60 miles to county line (page 4-2 project enhancements PPP 2015y)

Project Operations

Puente is a proposed natural-gas fired, simple-cycle, air-cooled, 275 megawatt (MW) gross, or 262 MW net, electrical generating facility that would replace the existing Units 1 and 2 at the Mandalay Generating Station. Puente would consist of a General Electric Frame 7HA.01 combustion turbine generator. The primary source of GHG emissions would be the natural gas-fired combustion turbine. The employee and delivery traffic GHG emissions from off-site activities are negligible in comparison with the gas turbine GHG emissions.

Greenhouse Gas Table 3 shows the estimated maximum annual CO_2 and CO2E emissions for the stationary sources and the two fugitive emissions sources (sulfur hexafluoride containing equipment leaks and methane from estimated natural gas compressor leaks). It should be noted that **Greenhouse Gas Table 3** shows values using the net MW capacity, while **Greenhouse Gas Table 4** shows values using the gross MW capacity for Puente. The applicant provided gas turbine heat rate performance data on full load operation and for an expected maximum annual operating scenario that included startup and shutdowns.

Greenhouse Gas Table 3
Puente Estimated Potential Operating Greenhouse Gas Emissions

	Project Emissions (metric tonnes [a] per year)	Global Warming Potential [b]	CO_2-equivalent (MTCO2E per year)
Carbon Dioxide (CO_2)	296,003	1	296,003
Methane (CH_4)	6.05	25	151
Methane (CH_4) - Fugitive	2.19	25	55
Nitrous Oxide (N_2O)	0.6	298	179
Hexafluoride (SF_6)	0.00042	22,800	10
Maximum estimated GHG emissions – MTCO2E per year (short tons per year)			296,398 (326,723)
Total MWh per year (net) (short tons net)			581,620 (641,126)
Estimated Annualized CO_2 Emissions Performance - $MTCO_2$/MWh [c]			**0.508**
Estimated Annualized GHG Emissions Performance - MTCO2E/MWh [c]			**0.509**

Sources: PPP 2015u and PPP 2015v and VCAPCD 2016a, FDOC (VCAPCD 2016c).
Notes:
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] The global warming potential is a measure of the chemicals' warming properties and lifetime in the atmosphere relative to CO_2.The analysis uses updated global warming potential values that became effective January 1, 2014.
[c] Based on estimated gas turbine emissions and corresponding gross energy production.

The emissions totals noted above in **Greenhouse Gas Table 3** are based on the maximum permitted air quality limits, while the actual annual emissions are likely to be well below these levels based on historical data that show that modern, simple-cycle combustion turbines do not operate at capacity factors near the 24.5 percent maximum capacity factor proposed by the applicant for permitting purposes. Puente would be more efficient than MGS Units 1 and 2, with an estimated GHG emissions performance of approximately 0.509 MTCO2E/MWh compared to calculated actual annual GHG emissions performance for MGS that ranged from 0.656 to 0.724 MTCO2E/MWh from 2008 to 2013 (CEC 2014a). However, in the recent past MGS Units 1 and 2 have had very low annual capacity factors of due to their low level of efficiency. Therefore, it is likely that Puente would have actual annual GHG emissions expressed in MTCO2E greater than MGS Units 1 and 2.

Puente would be a modern, simple-cycle combustion turbine as described in the **Project Description** that would not be subject to SB1368 Emission Performance Standard of 0.500 $MTCO_2$/MWh or the new federal NSPS of 0.454 $MTCO_2$ per MWh gross. The estimated operating gross and net efficiency for the gas turbines, not including the other emissions sources at the site that are shown in the table above, is expected to just be above these values (approximately 0.509 $MTCO_2$/MWh net

(**Greenhouse Gas Table 3**), and 0.484 $MTCO_2$/MWh gross (**Greenhouse Gas Table 4,** below) – PPP 2015u, and PPP 2015v). However, this performance is an estimate; real performance may be somewhat better or worse than this depending on the actual operating conditions.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses the cumulative effects of GHG emissions caused by both construction and operation. As the name implies, construction impacts result from the emissions occurring during the construction of the project. The operation impacts result from the emissions of the proposed project during operation.

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The CEQA guidelines provide three factors for lead agencies to consider when assessing the significance of impacts for the analysis of GHG emissions impacts (CEQA Guidelines, tit. 14, §15064.4).

- The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Staff evaluates the emissions of the project in the context of the electricity sector as a whole and the AB 32 Scoping Plan implementation efforts for the sector, including the Cap and Trade regulation that implements the state's primary approach to reducing GHG emissions from the electricity sector. The Energy Commission's assessment approach does not include a specific numeric threshold of significance for GHG emissions; rather the assessment is completed in the context of how the project will affect the electricity sector's emissions based on its proposed role and its compliance with applicable regulations and policies.

CONSTRUCTION/DEMOLITION IMPACTS

Staff determined that the small GHG emission increases from construction/demolition activities would not be significant for several reasons. First, staff is recommending a condition of certification in the **Waste Management** section (**WASTE-4**) that requires construction/demolition wastes to be recycled during Puente construction and during the MGS Units 1 and 2 demolition. Second, the intermittent emissions during the construction phase are not ongoing during the life of the project. Additionally, control measures that staff recommends to address criteria pollutant emissions, such as limiting idling times and requiring, as appropriate, equipment that meets the latest criteria

pollutant emissions standards, would further minimize greenhouse gas emissions to the extent feasible. The use of newer equipment will increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that are expected to be part of future ARB regulations to reduce GHG from construction vehicles and equipment.

DIRECT/INDIRECT OPERATION IMPACTS AND MITIGATION

Operational impacts of the proposed project are described in detail in a later section titled "**Project Impacts on Electricity System**" since the evaluation of these effects must be done by considering the project's role(s) in the integrated electricity system. In summary, these effects include reducing the operation and greenhouse gas emissions from the older, existing power plants; potentially displacing local electricity generation; the penetration of renewable resources; and accelerating generation retirements and replacements, including facilities currently using once-through cooling. Additionally, operation GHG emissions impacts are mitigated through compliance with the state's Cap and Trade regulation, which is designed to reduce electricity sector GHG emissions to meet AB 32 statewide GHG emissions reduction goals.

CUMULATIVE IMPACTS

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

This entire assessment is a cumulative impact assessment. The project alone would not be sufficient to change global climate, but would emit greenhouse gases, and therefore has been analyzed as a potential cumulative impact in the context of existing GHG regulatory requirements and GHG energy policies.

CALIFORNIA ELECTRICITY AND GREENHOUSE GASES – DAVID VIDAVER

California's commitments to dramatically reduce GHG emissions over the next four decades include moving to a high-renewable/low-GHG electricity system.
However, natural gas-fired power plants - and the GHG emissions associated with their output - will still be integral to the reliable operation of the electricity system at the outset of this period. In the long-run, zero- and low-carbon resources, including demand-side management and storage resources may provide a majority, if not all of the balancing services needed to integrate variable renewable resources. However, the technologies that are needed to do so are not expected to be available in sufficient quantities by the early- to mid-2020s to obviate the need for dispatchable, flexible, natural gas-fired electricity generation. Furthermore, the 2017–2020 retirements of natural gas-fired

generation resources that use once-through cooling (OTC) technologies in transmission-constrained regions in Southern California will require the development of natural gas-fired generation as part of the set of resources that will maintain local reliability.

The amount of new natural gas-fired capacity needed to provide reliable service to the customers of the state's investor-owned utilities, direct access providers, and community choice aggregators, over a 10-year planning horizon is determined in the California Public Utilities Commission's (CPUC's) Long-term Procurement Planning (LTPP) proceeding. The resulting portfolio of demand- and supply-side resources satisfies the state's loading order, which mandates development of cost-effective preferred resources (zero- and low-GHG emitting resources, such as energy efficiency, demand response, and renewable generation) in support of the state's climate change policies before authorizing the development/financing of conventional fossil resources.[26] It is also consistent with CPUC's direction to investor-owned utilities to procure energy storage resources in support of a high variable-generation resource system.[27]

THE ROLE OF NATURAL GAS-FIRED GENERATION IN A LOW-GHG ENVIRONMENT

The need for natural gas-fired generation to reliably operate the electricity system is well established. On October 8, 2008, the Energy Commission adopted an Order Instituting Informational Proceeding (08-GHG OII-1) to solicit comments on how to assess the greenhouse gas impacts of proposed new power plants in accordance with the California Environmental Quality Act (CEQA).[28] A report prepared as a response to the GHG OII (CEC 2009e) defines the roles that natural gas-fired power plants fulfill in an evolving high-renewables, low-GHG system (CEC 2009d, pp 93 and 94). Such new facilities serve to:

1. Provide variable generation and grid operations support;

2. Meet extreme load and system emergency requirements;

3. Meet local capacity requirements; and,

4. Provide general energy support.

[26] The loading order is set forth in California's Energy Action Plans. Energy Action Plan I was adopted by the state's energy agencies in April/May 2003 and Energy Action Plan II in September 2005. An update to these plans was issued in February 2008.

[27] D.13-10-040 (October 17, 2013) established a procurement target of 1,325 MW in total for the state's three largest investor-owned utilities.

[28] This need for gas-fired generation to reliably operate the system was reaffirmed in the CPUC decision authorizing SCE to procure from 215 MW to 290 MW of generation from any resource in the Moorpark subarea of the Big Creek/Ventura local reliability area. D.14-03-004, See Decision Authorizing Long-Term Procurement for Local Capacity Requirements Due to Permanent Retirement of the San Onofre Nuclear Generation Stations, March 13, 2014, p. 7.

Variable Generation and Grid Operations Support

California's renewable portfolio standard (RPS) requires that the state's energy service providers meet 50 percent of retail sales with renewable energy by 2030; meeting GHG emission-reduction targets for 2050 will likely require a far higher percentage of generation to come from renewable sources. Much of this energy will come from variable wind and solar resources to be developed in California, or on an "as generated" basis from neighboring states.

The California ISO has identified an increased need for regulation services, "load-following" generation, and multi-hour ramping as a result of the increase in these variable (intermittent-energy) renewable resources, whose output changes over the course of the day, often in a sudden and unpredictable fashion. Dispatchable capacity must provide "regulation," small changes in output over a 5-minute period at California ISO direction, requiring that the generator be equipped with automated generation control (AGC). "Load following" requires larger changes in output by the generation portfolio over a 5-minute to one-hour period. Multi-hour ramping needs require that units be dispatched, at California ISO direction if necessary, over time periods of one to nine hours and wider ranges of output in aggregate, requiring dispatchable generation that can start and ramp up and down quickly and be capable of operating at relatively low load levels if the amount of dispatchable capacity and associated energy needed from these resources is to be minimized.

Natural gas-fired generation is one of the few technologies that can currently provide significant quantities of new, cost-effective dispatchable capacity to meet the ramping needs caused by high penetration levels of variable energy resources. While dispatchable hydroelectric plants can also provide them, the potential for adding hydroelectric resources to the system is limited. Nuclear, coal, and geothermal facilities are generally more economic if operated at or near their design point (i.e., base loaded)[29] and, therefore, are not the preferred technologies for providing ancillary services. While demand-side resources and multi-hour battery storage may ultimately provide large quantities of ramping services in a cost-effective fashion, only pumped hydro and compressed air storage facilities are currently capable of doing so on the necessary scale.

Historically, a large share of California's load-following and ramping needs have been provided by the natural gas-fired steam turbines built on the Pacific Coast and in the San Francisco Bay Delta during the 1960s and 1970s. Very efficient when constructed, these provided base load energy through the 1980s and 1990s. However, they were supplanted in this role by newer, more efficient, combined-cycle technologies built pursuant to the energy crisis of 2000 - 2001. While these natural gas-fired steam turbine units were modified to operate successfully as load-following generation, they are not as

[29] Issues can arise from: thermal fatigue due to cycling; difficulties starting and stopping solid or geothermal fuel supplies; significant inefficiencies at low loads or standby points used to avoid full shutdowns; and, significant capital outlays that make it necessary to operate the units as much as possible.

efficient or economic as newer technologies. Several of these facilities have retired as a result of the State Water Resource Control Board's (SWRCB) policy on the use of OTC technologies; others are expected to retire during 2017 - 2022. This represents a loss of capacity capable of operating at a very wide range of output and thus providing large quantities of flexible generation and other ancillary services.

Local Capacity Requirements

The California ISO has identified numerous local capacity areas (LCA)[30] and sub-areas in which threshold amounts of generation capacity are required to ensure reliability. Transmission constraints prevent the import of sufficient energy into these areas under high load conditions to ensure reliable service without requiring specified amounts of local capacity to be generating or available to the California ISO for immediate dispatch.

Reliable service requires that the California ISO be able to maintain service under 1-in-10-year load conditions given the sequential failure of two major components (a large power plant and a major transmission line, for example); this requirement is imposed by the North American Electric Reliability Corporation (NERC). The amount of capacity needed in each of these areas (the *local capacity requirement*, or "LCR") is determined annually by the California ISO; the LCR study process culminates in an annual *Local Capacity Technical Analysis*. The incremental needs for capacity in the Greater Bay Area, Los Angeles Basin, San Diego, and Big Creek-Ventura LCAs due to OTC retirement have been too large to be met solely with non-natural gas fired generation; the renewable development scenarios compiled by the CPUC for use in the 2014 LTPP proceeding and the California ISO's 2014 - 2015 Transmission Planning Process - indicate that only a share of the new capacity needed in the large LCAs can be expected to come from new demand-side and renewable generation resources. As a result, the CPUC has found a need for new natural gas-fired generation in the Big Creek - Ventura LCA, as evidenced by the procurement authorization issued in that proceeding.

Extreme Load and System Emergency Requirements

Sufficient capacity must exist to meet demand under very high load conditions or when generator outages reduce capacity surpluses to levels low enough to threaten reliability. Historically, generation capacity and demand response programs equal to 115 percent to 117 percent of forecasted annual peak demand have been deemed sufficient to meet these system-wide reliability requirements. Due to the amount of time it takes to assess the need for, develop, permit, and construct, a large power plant, capacity needs for ten years in the future are evaluated in California's planning processes.

General Energy Support

The loading order indicates the resources that the state intends to rely on to meet energy needs while reducing GHG emissions. While energy efficiency, demand response programs, renewable generation, and combined heat and power are preferred resources that are to be developed before natural gas-fired generation, they are not

[30] Also referred to as *Local Reliability Areas* (LRA).

sufficient to meet the state's future energy demand and maintain the electric system's reliability. In addition, a significant share of the state's still-operating generation fleet is expected to shut down to comply with the SWRCB's OTC policy. Energy from natural gas-fired generation will increasingly be needed during a prolonged nuclear plant outage (for refueling, for example) or during dry years, in which hydroelectric production is reduced.

QUANTIFYING THE NEED FOR NATURAL GAS-FIRED GENERATION

Prior to the deregulation of the California electricity system during the 1990's, the Energy Commission's power plant siting process considered the need for power plant development. SB 110 (Chapter 581, Statutes of 1999) eliminated the requirement that projects licensed by the Energy Commission be in conformance with an integrated assessment of need that was conducted by the Energy Commission until that time.

The need for new generation capacity to ensure reliable service in the investor-owned utility (IOU) service territories is now determined in the CPUC's biennial LTPP proceeding.[31] This proceeding is the forum in which the state's major IOUs are authorized to finance the development of new "least-cost, best-fit" generation (on behalf of either IOU customers or all ratepayers not served by publicly-owned utilities) needed to reliably meet electricity demand.[32] This need, specified in terms of: (a) the MW of capacity needed; (b) the desired or required operating characteristics of the resource(s) to be financed; and (c) the location of proposed additions if required for local reliability, is a function of planning assumptions that reflect the state's commitment to dramatically reduce GHG emissions from the electricity sector. The MWs of capacity needed are driven by:

- Peak demand growth due to economic and demographic factors;
- Reductions in peak demand due to committed and uncommitted energy efficiency and demand response programs;
- Reserve margins (dependable capacity in excess of peak demand) needed to ensure system reliability, normally assumed to be 15 to 17 percent of peak demand, but also including any additional dispatchable capacity needed to ensure reliability given variation in the output of renewable resources (e.g., wind or solar generation);
- Capacity needed in transmission-constrained areas to ensure local reliability under extreme (1-in-10 year) weather conditions;
- Capacity needed to remedy shortfalls in system ramping and/or turndown ability, (i.e., flexible resources);

[31] The need for new generation capacity to ensure reliable service by publicly-owned utilities (POU) is determined by the governing authorities of the individual utilities.

[32] These include costs that account for environmental impacts such as the projected emissions allowance costs (those required under the AB 32 cap-and-trade program, as well as those required for criteria pollutants).

- Capacity to be provided by fossil-fired resources being developed by California-based investor-owned utilities pursuant to authorization by the CPUC in previous LTPP proceedings;
- Capacity to be provided by new renewable resources built/contracted with to meet the state's RPS; and,
- Capacity to be lost due to retirement, for example, capacity expected to cease operation as a result of the SWRCB policy regarding the use of OTC.

As noted above, this capacity need is evaluated over a ten-year planning horizon due to the length of time it takes to authorize the financing of, select, permit, and construct new power plants.

The planning assumptions adopted for use in the LTPP proceeding, and thus determinant of the amount of new capacity authorized, consider both the state's loading order for resource development, as well as the expected deployment of specific types of preferred resources, including energy efficiency, demand response, and renewable generation. In other words, in authorizing the procurement/financing of dispatchable, natural gas-fired capacity by an IOU, the CPUC assumes that cost-effective amounts of preferred resources will have been procured.

Authorization for Southern California Edison (SCE) to procure natural gas-fired generation or other least-cost (preferred) resources to replace retiring OTC capacity in the Moorpark sub-area of the Big Creek - Ventura LCA was granted in D.13-02-015 (February 13, 2013) in the CPUC's 2012 LTPP proceeding (R.12-03-014). The decision authorized SCE to procure no less than 215 MW and no more than 290 MW.

Pursuant to this authorization, SCE conducted an all-source request for offers (RFO) for capacity in the Moorpark subarea; on November 26, 2014 SCE submitted an application for approval of 11 contracts;[33] these included Puente (rated for purposes of the application at 262 MW) and nine contracts for preferred resources (energy efficiency, energy storage, and renewable distributed generation) totaling 12.16 MW.

The CPUC, on May 26, 2016 approved SCE's contract with the applicant for Puente.[34]

The Energy Commission does not require a CPUC-approved contract with a utility to accept or approve an Application for Certification, nor does a generation project require Energy Commission certification to participate in a utility RFO. Requiring the sequencing of these processes would not only lengthen the time needed to bring projects on line and thus threaten system reliability, it would reduce the number of projects that could compete in utility RFOs, potentially leading to non-competitive solicitations and unnecessarily raising ratepayer costs.

[33] A.14-11-016, Southern California Edison Company's (U 338-E) Application for Approval of the Results of its 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-Area, November 26, 2014.

[34] A.14-11-016, Decision Approving, in part Results of Southern California Edison Company Local Capacity Requirements Request for Offers for Moorpark Sub-Area Pursuant to Decision 13-02-015, Issued June 1, 2016, p. 8.

Energy Commission certification of fossil generation without a contract with a utility does not result in the development of more fossil generation than needed to reliably operate the system. It is not expected that developers of new capacity, such as the developer of Puente, would bring a project to completion without a long-term contract with a utility, which would guarantee recovery of the investment of several hundred million dollars.[35] One so-called "merchant plant" has been developed since the energy crisis (2000 - 2001) without a utility contract, and the conditions that led to that merchant plant are specific to that one facility. This merchant plant, in turn, provides energy, capacity, and ancillary services that obviates the need for these from other, new gas-fired generation and contributes to reduction in GHG emissions.[36] However, if Puente were to be built and come on line without a utility contract, it would still: (a) displace energy from higher GHG-emission facilities, and (b) not "crowd out" renewable generation and demand-side programs (i.e., requirements/targets for the procurement of preferred resources would be unaffected).

ENERGY DISPLACEMENT AND CHANGES IN GHG EMISSIONS

Any assessment of the impact of a new power plant on system-wide GHG emissions must begin with the understanding that electricity generation and demand must be in balance at all times; the energy provided by any new generation resource simultaneously displaces exactly the same amount of energy from an existing resource or resources. The GHG emissions produced by Puente would thus not be incremental additions to system-wide emissions, but would be offset by reductions in GHG emissions from those generation resources that are displaced.

At renewable penetration levels of less than 33 percent, new natural gas-fired generation such as Puente displaces less efficient natural gas-fired generation[37] in a very straightforward fashion. It is reasonable to assume that Puente would be dispatched (called upon to generate electricity) whenever it is a cheaper source of energy than an alternative, i.e., that it will displace a more expensive resource, if not the most expensive resource, that would otherwise be called upon to operate. The costs of dispatching a power plant are largely the costs of fuel, plus variable operations and maintenance (O&M) costs, with the former representing the lion's share of such costs (90 percent or more). It follows that Puente would be dispatched when it burns less fuel

[35] Nor would an investor-owned utility enter into such a contract without the CPUC approving the recovery of costs associated with the contract from ratepayers.

[36] The unwillingness of developers (and lenders) to commit capital to new facilities without a long-term contract follows from the size of the necessary investment and risk that it will prove uneconomic. While some plants built ten plus years ago that no longer have contracts are generating adequate revenue, many are not.

[37] At very low gas prices relative to coal prices, i.e., when electricity from natural gas is cheaper than that from coal, new gas-fired generation will displace coal-fired generation. In markets such as California, where GHG emissions allowance costs are a component of the market price, coal-fired generation is displaced even sooner due to its higher carbon content.

per MWh than the resource(s) it displaces, i.e., when it produces fewer GHG emissions. There are exceptions in theory, but not in practice.[38]

Holding the portfolio of generation resources constant, energy from new natural gas-fired plants displaces energy from existing natural gas-fired plants. In the longer term, the development and operation of Puente would reduce the use of less-efficient generation resources, and ultimately, to their retirement. By reducing revenue streams accruing to other natural gas-fired generators (for the provision of both energy and capacity-related services, whether through markets or under a bilateral contract), Puente would render these other facilities less profitable and riskier to operate. This follows from the fixed demand for energy and ancillary services; the developers of Puente cannot stimulate demand for energy and the other products it provides, but provide a share of the energy that is needed to meet demand and the capacity needed to reliably operate the system. In doing so, Puente both discourages the use of, and encourages the retirement of less-efficient generation.

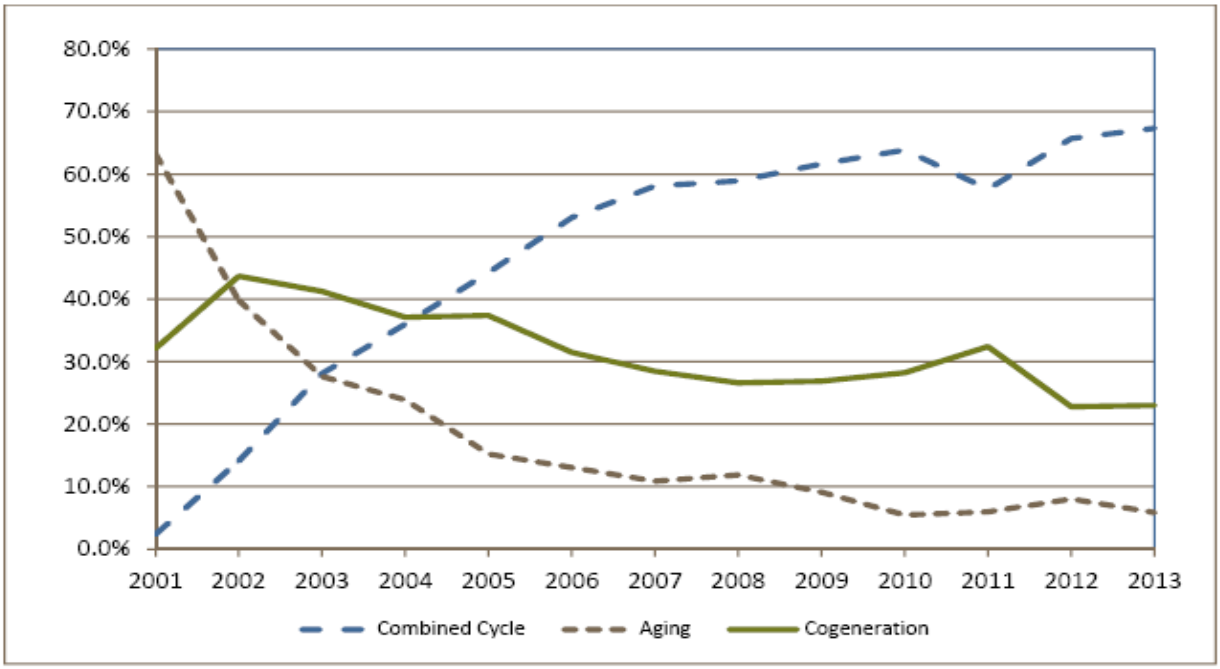
The long-run impact of the natural gas-fired fleet turnover as described here can be seen from historical changes in resources that are providing electricity in California as presented below in **Greenhouse Gas Figure 1** (data includes combined cycles and boilers only). In 2001, approximately 74,000 GWh (62.5 percent of natural gas-fired generation) in California was from pre-1980 natural gas-fired steam turbines, combusting an average of 11,268 Btu per kWh (not shown in the figure). By 2010, this share had fallen to approximately 6,000 GWh (5.4 percent); 64.1 percent of natural gas-fired generation was from new combined cycles with an average heat rate of 7,201 Btu per kWh (CEC 2011, also not shown in the figure).[39] The net change over this period was a 22 percent reduction in GHG emissions (also not shown in the figure), despite a 3.5 percent increase in generation. The post-2000 development of new combined-cycle generation has allowed for the retirement of aging natural gas-fired steam turbines along the California coast and in the San Francisco Bay Delta. Those that remain in operation have seen a dramatic reduction in their capacity factors[40] and are now used primarily as a source of dispatchable capacity.

[38] If a plant's variable O&M costs are so low as to offset the costs associated with its greater fuel combustion, a less efficient (higher GHG emission) plant may be dispatched first. There is no indication that the P3's' variable O&M costs are unusually low and that they would be dispatched before a more efficient facility. If a natural gas-fired plant's per-mmBtu fuel costs are very low, it may be less efficient (higher GHG emitting) but still be dispatched first. Natural gas costs in California, however, are higher than elsewhere in the Western Electricity Coordinating Council (WECC) and thus this scenario is unlikely to occur.

[39] The remaining 30 percent of natural gas-fired generation is largely cogeneration; slightly more than one percent is from peaking units. For a detailed discussion of the evolution of natural gas-fired generation in California since 2000, see *Thermal Efficiency of Gas-Fired Generation in California: 2014Update* (CEC-200-2013-005; September 2014)

[40] A unit's capacity factor is its output expressed as a share of potential output, the amount it would generate if it were operated continuously at 100 percent of its maximum capacity for every hour of the year.

Greenhouse Gas Figure 1
Annual California Output (GWh), Selected Natural Gas-Fired Generation Technologies, 2001 – 2013



Source: QFER CEC-1304 Power Plant Data Reporting.

Source: Thermal Efficiency of Gas-Fired Generation in California: 2014 Update, CEC-200-2014-005, September 2014 (CEC 2014b).

The dispatch of Puente would generally not result in the displacement of energy from renewable resources or large hydroelectric generation. Most renewable resources have must-take contracts with utilities, which must purchase all the energy produced by these renewable generators.[41] Even in those instances where this is not the case (e.g., where renewable generation is participating in a spot market for energy), the variable costs associated with renewable generation are far lower than those associated with Puente (e.g., fuel costs for wind, solar, other renewable generation technologies, and large hydroelectric facilities are zero or minimal); these resources can bid into spot markets for energy at prices far below Puente and other natural gas-fired generators. Puente would not displace energy from operating (zero-GHG emission) nuclear generation facilities, as these resources have far lower variable operating costs as well.

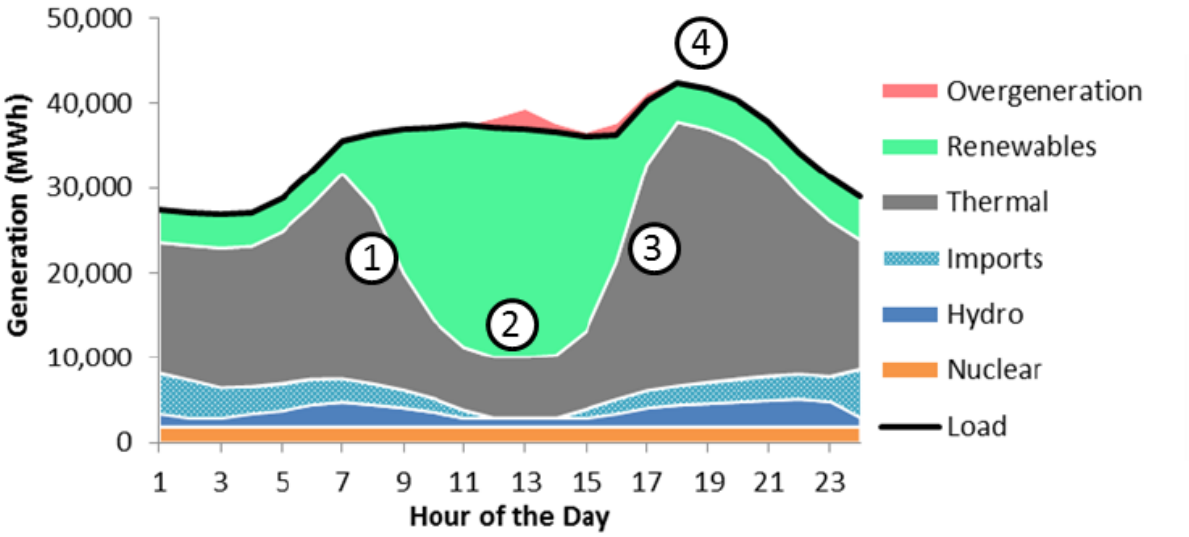
The relationship between a natural gas-fired plant's heat rate and its dispatch in the real world is in fact more complicated than that described above. While natural gas-fired plants differ in their thermal efficiency – the amount of fuel combusted, and thus GHG emissions per unit of electricity generated –gas plants that are very efficient at full output are not necessarily dispatched before less efficient ones. While this would seem

[41] While such contracts have provisions that allow for (limited) curtailment of renewable generation during over-generation conditions, the required flexibility of the P3 is intended to minimize such occurrences.

to contradict the assertion that output from a new plant will always displace a higher emitting one, a less efficient (e.g., at full output) plant may actually combust less fuel during a duty cycle than a plant with a lower heat rate, and thus produce fewer GHG emissions. Consider a 30-MW facility with a heat rate of 10,000 Btu/kWh when operated at full output that can be turned on quickly, generating approximately 15 to 30 MW in a matter of minutes. Use of this plant to meet contingency needs (e.g., demand on a hot afternoon) may result in less incremental fuel combustion than a 100-MW plant with a lower heat rate at full output if the latter requires several hours and combusts large amounts of fuel to start up, must be kept on overnight or for several hours in order to be available later the same day or the next day, and/or cannot operate at 30 MW without a marked degradation in thermal efficiency (and thus increases in GHG emissions).

At levels of renewable energy penetration in excess of 33 percent, relatively efficient fast-start, fast-ramping resources such as Puente further contribute to GHG emission reductions by increasing the amount of renewable energy that can be integrated into the electricity system. This can be seen in **Greenhouse Gas Figure 2,** which depicts the estimated operating profile of the generating resources of the increasingly high-solar electricity system that California will develop over the next 15 years as the RPS increases to 50 percent in 2030. Much of the additional renewable energy will come from solar resources even if there is limited development of utility-scale solar generation, as the residential and commercial sectors take advantage of falling distributed solar costs and new residential construction post-2020 is required to be zero-net energy, (i.e., include solar panels).

Greenhouse Gas Figure 2
California Generation Typical for a Non-Summer Day ("Duck" Chart)



Source: CA ISO 2014

The large "belly" (Number 2 in the figure) represents solar generation on a typical non-summer day; this gets larger over time as more solar is added to the system. The gray area represents necessary thermal generation, which is increasingly natural gas over time as California portfolios are divested of coal pursuant to the state's Emission Performance Standard. Note that imports are reduced to zero at midday, and hydro generation is limited to run-of-river (from hydro-generation facilities that do not have water storage, and from water that must be allowed to flow due to recreational needs, flood control, habitat preservation, etc.). A large share of midday generation must also be flexible, dispatchable natural gas as: (a) a threshold amount of thermal capacity needs to be idling (or at least readily available, not unlike a hybrid car) at mid-day at minimum output to protect against sudden component failures (major power plants and transmission lines), or drops in solar output; and, (b) a large amount of gas-fired generation will be needed 4 to 8 hours later when solar energy is unavailable, and thus must be on line and generating at minimum output at mid-day.

Greenhouse Gas Figure 2 illustrates a case of over-generation; in which renewable output at mid-day and necessary gas-fired generation jointly result in too much energy being produced. There are several ways to deal with over-generation. In theory, the surplus energy can be exported to neighboring states. But much of the over-generation expected in California will occur during the low-demand months of February to April, when similar surpluses exist in the Pacific Northwest due to the snow melt and the resulting increase in hydroelectric generation in the Columbia River basin. Under these conditions, export potential is likely to be limited and export prices would be near zero.

A long-term solution for over-generation is expected to be the development of cost-effective, multi-hour storage, allowing the surplus to be stored until it can be used in evening hours. In the interim, however, over-generation can be dealt with by curtailing

renewable generation or reducing the amount of gas-fired generation that is needed during midday and early afternoon hours. The latter is facilitated by developing gas-fired resources such as the Frame 7HA that can cycle on and off at least twice a day.[42]

While Puente is less thermally efficient than the natural gas-fired combined cycles built in California during the past decade, Puente could be off line until moments before being needed in the late afternoon and early evening, and reach full load within approximately 10 minutes following initial combustion during a start-up. It would thus provide 262 MW of capacity towards flexible resource adequacy requirements.

THE ROLE OF THE PUENTE IN LOCAL GENERATION DISPLACEMENT

As new generation capacity in the California ISO-defined Big Creek - Ventura LCA, Puente would provide local reliability services. The California ISO has determined in their *2016 Local Capacity Technical Analysis* that the Big Creek – Ventura area needs 2,398 MW of local capacity.[43] Puente would contribute up to 262-net-MW of local capacity to these areas.

As stated above, local reliability requires generation by resources located within an LCA; the LCR reflects the amount of capacity that must be generating, synchronous to the grid or available within a few minutes under 1-in-10 load conditions.[44] At lower levels of demand, a (smaller) share of local capacity must be generating, synchronous to the grid or available on a moment's notice as long as reliability cannot be maintained solely with imported energy in the event of major component failures.

The number of hours per year that Puente would be required to operate in support of local reliability needs and the amount of energy that would be generated as a result are not known, although for air quality permitting purposes Puente would be limited to a maximum of 2,150 hours per year; California ISO operating procedures that result in the dispatch of specific generating units for local reliability purposes are confidential. When called upon to generate for such purposes, however, it is reasonable to expect that Puente would be the least-cost and thus lowest-emitting natural gas-fired resource able to do so, given the duty cycle that was necessary to provide local reliability. It would thus displace less-efficient resources, reducing GHG emissions resulting from relying on the latter. Should it be dispatched for local reliability needs ahead of units that were thermally more efficient, it would likely be because, able to operate at lower levels of output, it would allow for the integration of a greater amount of renewable energy.

Greenhouse Gas Table 4 illustrates the thermal efficiency of existing peaking duty facilities in the Big Creek-Ventura LCA and provides the expected thermal efficiency for

[42] For a detailed discussion of the operational needs for a high-solar portfolio, see Energy and Environmental Economics, *Investigating a Higher Renewables Standard in California*, January 2014, available at http://www.ethree.com/public_projects/renewables_portfolio_standard.php.

[43] CA ISO, *2016 Local Capacity Technical Analysis: Final Report and Study Results*, April 30, 2015, –p. 90.

[44] 1-in-10 load conditions refer to a level of demand that is expected to be observed on only one day in ten years.

Puente for comparison. It should be noted that **Greenhouse Gas Table 3** shows values using the net MW capacity, while **Greenhouse Gas Table 4** shows Puente values using the gross MW capacity, with existing facility peaking performance based on actual data (net).

Greenhouse Gas Table 4
Heat Rates, Capacity Factors, and GHG Emissions Performance
for Big Creek-Ventura Peaking Duty Facilities, 2013 - 2014

Plant Name	Capacity (MW)	Two year Output (MWh)	Heat Rate [a] (Btu/kWh)	Capacity Factor	GHG Performance [b] ($MTCO_2$/MWh)
Ellwood	56.7	2,149	13,907	0.2%	0.735
Mandalay 1	217.6	162,229	11,525	4.3%	0.609
Mandalay 2	217.6	199,850	11,572	5.2%	0.612
Mandalay 3	138.1	2,692	34,383	0.1%	1.818
McGrath	49	50,566	10,592	5.9%	0.560
Total	**679**	**417,486**	**11,594**	**3.5%**	**0.613**
Puente Estimates	275[c]		9,149		0.484

Source: Energy Commission QFER Database (CEC 2015a); PPP 2015a
Notes:

a. Based on the Higher Heating Value or HHV of the fuel. The heat rate includes start-up and low load operations fuel use.
b. GHG performance conversion factor for natural gas of 0.529 $MTCO_2$/MW/10,000 Btu/KWh was used to derive these performance values.
c. Gross output, MWh at ISO conditions

While the net heat rate for the Puente gas turbine will be to a small degree dependent on its operating profile,[45] it has an expected heat rate that is clearly lower than all of the existing peaking duty resources in the LCA.

COMPLIANCE WITH LORS – JACQUELYN RECORD

Federal

The New Source Performance Standards Subpart TTTT-Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units (Title 40, Code of Federal Regulations, Part 60.5508) are set under the authority of the Clean Air Act section 111(b) and are applicable to new fossil fuel-fired power plants commencing construction after January 8, 2014. Puente would be expected to supply less than the design efficiency times the potential electric output as net-electric sales on a 3 year rolling average basis and would therefore be considered a non-base load unit. The single turbine would be subject to a heat input limit of 120 lbs CO_2/MMBtu.

VCAPCD determined “the new Puente CTG is expected to operate with an annual capacity factor of approximately 25%. With a full load net nominal output of

[45] The approximate 5 percent difference in full load versus the expected operating profile net heat rates, shown in **Greenhouse Gas Table 3**, are likely the effect of startups and shutdown, variations in ambient temperatures, and off design point operations on optimum full load heat rate.

approximately 262 MW, the Puente unit would supply a maximum of approximately 25% x 8760 hrs/year x 262 MW/Hr = 573,780 MW per year to a utility power distribution system. Since this output is less than the allowable level of 1,108,173 MW per year, the Puente CTG would be a non-base load unit under the final Carbon Pollution Standards (CPS) and would be subject to the Best System of Emission Reduction (BSER) established for that subcategory" (VCAPCD 2016c).

At the present time, Prevention of Significant Deterioration (PSD) compliance evaluation is conducted by the US EPA for Ventura County APCD because the local district's PSD rule (Rule 26.2) has not yet been approved in the State Implementation Plan, even though the local district has adopted it. Therefore, PSD analysis is not included in this Final Staff Assessment.

This turbine is limited to burning natural gas resulting in a consistent emission rate of 120 lb CO_2/MMBTU or less per section 60.5520(d)(1).

State

Puente would be required to participate in California's GHG cap-and-trade program, which became active in January 2012, with enforcement beginning in January 2013. This cap-and-trade program is part of a broad effort by the State of California to reduce GHG emissions as required by AB 32, which is being implemented by ARB. As currently implemented, market participants such as Puente are required to report their GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. Puente, as a GHG cap-and-trade participant, would be consistent with California's landmark AB 32 Program, which is coordinated with the region-wide Western Climate Initiative program to reduce California's GHG emissions to 40 percent below 1990 levels by 2030. ARB staff continues to develop and implement regulations to refine key elements of the GHG reduction measures to improve their linkage with other GHG reduction programs.

On September 8, 2016, Senate Bill 32 was adopted. It extends California's commitment to reduce GHG emissions by requiring the state to reduce statewide emissions to below 1990 levels by 2013.

The annual emissions cap for businesses covered by the program—including the power and natural gas industries—would fall from 334.2 million tons of carbon dioxide equivalent to 200.5 million tons in 2030, a 40 percent reduction. The amendments also call for further reductions of 6.7 tons a year after 2030 until emissions under cap-and-trade reach 66.5 million tons annually.

There are pending legal challenges to the cap-and-trade program and the Air Resources Board's authority to extend the program beyond 2020 without legislative action. The board plans to take action at a subsequent meeting in spring of 2017.

Puente, due to having a permitted capacity factor of below 60 percent, is not subject to the California's Emission Performance Standard of 1,100 lbs. of carbon dioxide per net MWh.

Local

The VCAPCD does not currently have any approved GHG emissions regulations that would apply to the project. However, the city of Oxnard has published an Energy Action Plan, but has not yet approved any of the GHG emissions reduction measures as city ordinances. Therefore, currently there are no applicable local LORS for GHG emissions/climate change.

AVENAL PRECEDENT DECISION

The Energy Commission established a precedent decision in the Final Commission Decision for the Avenal Energy Project, finding as a conclusion of law that any new natural gas-fired power plant certified by the Energy Commission "must:

- not increase the overall system heat rate for natural gas plants;
- not interfere with generation from existing renewables or with the integration of new renewable generation; and
- take into account the two preceding factors, reduce system-wide GHG emissions."[46]

The Energy Commission in the recent Final Decision for the Huntington Beach Energy Project[47] noted that the Avenal decision has been augmented by two recent developments. The first is the adoption of CEQA guidelines for the analysis of GHG emissions impacts (CEQA Guidelines, tit. 14, §15064.4). The second development is the enactment of the AB 32 cap-and-trade system that implements the state's approach to reducing GHG emissions from the electricity sector. Staff is continuing to analyze this project against that precedent, while also taking into consideration the CEQA guidelines.

The average heat rate for the Western Electricity Coordinating Council (WECC) is presented in **Greenhouse Gas Table 5**, as is California-specific data. These values are an average across all natural gas-fired units that operated in that year. It is interesting to note that the average heat rates in-state versus the average of those across the greater WECC are not that different; this is due to the large contribution of California generation to total WECC generation, and generally similar energy resources and technology types throughout the WECC.

[46] Final Commission Decision, Avenal Energy Application for Certification (08-AFC-1) December 2009, p. 114.

[47] Final Commission Decision, Huntington Beach Energy Project (12-AFC-02) November 2014, pp. 4.1-6,7.

Greenhouse Gas Table 5
Weighted Average Heat Rate for Operating Natural Gas-Fired Plants[1] in the WECC and California 2010-2013

Year	Average WECC Heat Rate [2] (MMBtu/MWh)	Average CA Heat Rate [3] (MMBtu/MWh)
2010	7,712	7,634
2011	7,954	7,881
2012	7,841	7,806
2013	7,771	7,666
2014	7,761	7,750

[1] Excludes cogeneration facilities
[2] Compiled from EIA-923 data.
[3] Compiled from Quarterly Fuel and Energy Reports submitted to the California Energy Commission.

Overall, the average heat rate for natural gas units has been declining for years, as shown in **Greenhouse Gas Figure 3** below. The improvement is the result of the deployment of modern combustion turbine units, as shown in **Greenhouse Gas Figure 1**. The relationship is exemplified by the slight drop in combined-cycle generation in 2011and a corresponding uptick in average heat rate shown in **Greenhouse Gas Figure 3**. Note also in **Greenhouse Gas Figure 1** that by 2013, combined-cycle output is almost 70 percent of the total natural gas energy production. In other words, the average heat rates shown in **Greenhouse Gas Table 5** are dominated by deployment of modern combined-cycle facilities.

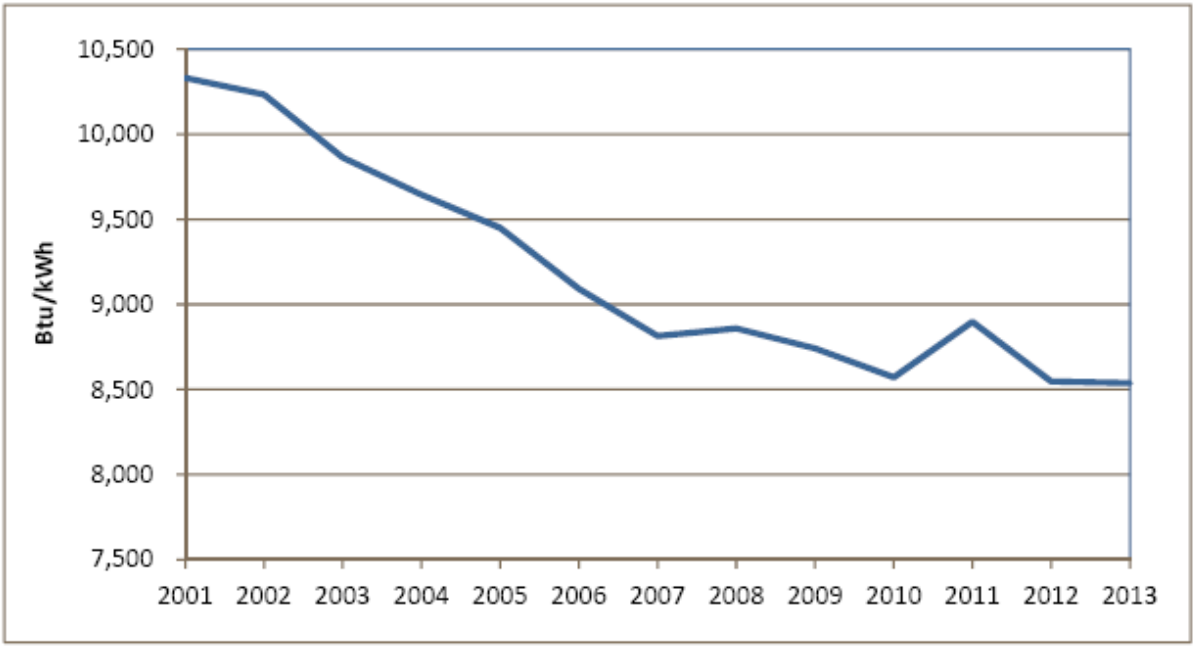
While simple-cycle combustion turbines have higher direct heat rates than combined-cycle facilities and the system average heat rates shown in **Greenhouse Gas Table 5**, simple-cycle combustion turbine facilities must be evaluated based on their function, and ultimately, their overall effect on the system. In this case, Puente is proposed to operate approximately 25 percent annual capacity factor[48]. Historically, most peakers have operated at about three to five percent capacity factor; the listing of local Big Creek-Ventura with peaking duty facilities in **Greenhouse Gas Table 4** shows an average capacity factor of 3.5 percent. If Puente displaces the local peaking duty units, it would have a much better heat rate than the displaced peaking duty units. Puente would also facilitate the decommissioning of MSG Units 1 and 2.

However, as California moves to a high renewable/low-GHG system, efficient resources like Puente may operate more than traditional, less flexible resources. As noted above, the addition of Puente would not interfere with generation from existing renewable facilities or with the integration of new renewable generation. The flexible nature of Puente would serve to facilitate the integration of additional variable renewable resources.

Puente would reduce system-wide GHG emissions as discussed above; this development is consistent with the goals and policies of AB 32 and thus is consistent with the Avenal precedent decision.

[48] Capacity factor is based on a permitted number of hours per year of 2,150 out of a total of 8,760 hours in a year which is an estimate of around 24.5 percent capacity factor.

Greenhouse Gas Figure 3
Average Heat Rates for Gas Fired Electric Generation Serving California



Source: QFER CEC-1304 Power Plant Data Reporting.

Source: Thermal Efficiency of Gas-Fired Generation in California: 2014 Update, CEC-200-2014-005, September 2014 (CEC 2014b).

Greenhouse Gases		
Source of Comment	***Comment***	***Staff Response***
Center for Biological Diversity TN#213621	1. Comment II.A: "The PSA Fails to Adequately Disclose, Analyze, Determine the Significance of, and Propose Mitigation for the Project's Greenhouse Gas Emissions and Climate Impacts – It is not clear what baseline—if any—the PSA used in assessing the Project's greenhouse gas emissions. Although the PSA's significance criterion requires the Commission to demonstrate that the Project will reduce "system-wide" emissions, the PSA does not quantify or otherwise characterize those emissions".	Response to Comment II.A: The baseline used in assessing the project's GHG emissions is the existing Western grid-wide generation system and its operation in the course of meeting electricity demand subject to reliability constraints imposed by NERC and WECC. It is not possible to establish a baseline quantity of GHG emissions associated with the operation of generation interconnected to the Western grid based on historical levels of GHG emissions (e.g., GHG emissions of interconnected generation in 2015) as they reflect conditions unique to that period of time (hydroelectricity availability, electricity demand, weather, gas prices, etc.) that cannot be controlled and will never be replicated. Such baselines are generally established using simulation modeling and assumptions about demand, weather, existing generation and its operating characteristics that represent a "typical year." Staff did not simulate the operation of the Western grid with and without Puente in order to determine whether GHG emissions would have increased or decreased with the addition of Puente, as the economic logic used by a simulation model would have resulted in a reduction in GHG emissions..

Center for Biological Diversity TN#213621	(Continued Comment II.A.) "The PSA's comparison between the Project and the units it is designed to replace (MGS 1 and 2) fails for similar reasons. The PSA concludes Puente will be more efficient than MGS 1 and 2 (.509 MTCO2E/MWh, as compared to .656-.724 MTCO2E/MWh). (PSA at 4.1-116.) This superficially suggests that the Project will reduce emissions".	(Continued Response to Comment II.A.) Staff agrees that Puente's lower full-load heat rate (compared to MGS 1 and 2) does not guarantee that the operation of Puente will lower GHG emissions compared to a future in which MGS 1 and/or 2 continue to operate. While Puente and the MGS units are in the same local California ISO reliability area (Big Creek – Ventura) and sub-area (Moorpark), and are thus likely to frequently be substitutes for each other in the provision of local reliability services, they have different operating characteristics (minimum up and down times, ramp rates, heat rate curves, etc.), and are thus unlikely to be close substitutes for energy and other (system-wide) services. As such, we do not know which resources Puente would displace (in the provision of energy) and which resources MGS 1 and/or 2 would displace (nor can simulation modeling answer the question with any degree of accuracy), and thus which alternative (Puente or both of the Mandalay units) would result in lower GHG emissions. We do know, however, that *given that the Mandalay units are retired*, the addition of Puente lowers GHG emissions.
Center for Biological Diversity TN#213621	(Continued Comment II.A.) "The impossibility of evaluating this increase is exacerbated by the PSA's inconsistent characterizations of the Project's anticipated capacity factor, which range from 24.5 percent (PSA at 4.1-116) to 30 percent (PSA at 3-1) or 31 percent (PSA at 4.1-132.)"	(Continued Response to Comment II.A.) Puente's capacity factor (assuming it is non-zero) has no bearing on whether or not the construction and operation of the facility reduces GHG emissions. While it is likely that a higher capacity factor means greater GHG emissions reductions, this assumes that the GHG emissions savings per MWh generated is the same regardless of how often Puente is dispatched and at what output levels.
Center for Biological Diversity TN#213621	2. Comment II.B. "The PSA's Reliance on California's Cap-and-Trade program Is Inadequate to Support the Document's Conclusions – "The PSA concludes that the Project complies with applicable regulations and plans for greenhouse gas reduction in part because the Project will be subject to California's cap-and-trade program. (PSA at 4.1-134.) Compliance obligations under the cap-and-trade regulation currently extend only through December 31, 2020. 17 Cal. Code Regs. § 95840(c). The Project, in contrast, is not expected to begin operating until June 2020, and has "an assumed operating life of 30 years." (PSA at 3-3.) Accordingly, a mere six months at most of the project's 30-year operating life will be subject to the current cap-and- trade program".	Response to Comment II.B: The construction and operation of Puente lowers GHG emissions (compared to a future that differs only in that Puente is not built) regardless of whether the cap-and-trade program is in force. The discussion of the cap-and-trade program is included in the staff assessment to indicate California's commitment to reducing GHG emissions, and should not be taken to mean that it is a necessary condition for Puente to reduce GHG emissions.

Center for Biological Diversity TN#213621	3. Comment II C. "The PSA Fails to Evaluate the Project's Emissions in Light of Long term, Science-based Greenhouse Gas Reduction Goals. - The PSA's LORS analysis with respect to green- house gases explicitly addresses only AB 32. (PSA at 4.1-130 to 131.) The analysis thus impermissibly omits any assessment of the Project's consistency with the science-based, long-term green- house gas reduction goals articulated in Executive Orders S-3-05 and B-30-15, which direct state agencies to undertake efforts to ensure that state- wide emissions are reduced 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. These goals reflect a broad scientific under- standing of the scale of emissions reductions necessary to stabilize the climate system".	Response to Comment II.C: California's energy policies are characterized by their consistency with the State's mid-term (through 2030) and long-term ((through 2050) GHG emission reduction goals, as witnessed by CPUC authorization of a Southern California Edison contract which enables the construction and operation of the facility. The Greenhouse Gas Appendix has been expanded to address post-2020 issues. The project's consistency with the state's GHG emissions reductions goals can most easily be seen by referring to the Pathways study commissioned by the state's energy agencies in order to describe pathways to achieving the state's goal of reducing economy-wide GHG emissions by 80 percent from 1990 levels by 2050.[49] In the "Straight Line" base case scenario, in which the transportation and industrial sectors are electrified so as to leverage the decarbonization of the electricity sector, the demand for electricity increases by 120 percent over 2015 – 2050 and natural gas-fired generation capacity serving California loads increases by almost 25,000 MW (57 percent). The development of Puente is thus consistent with a pathway of 80 percent GHG reductions economy-wide, albeit, not electricity sector-wide or city of Oxnard specifically.

[49] See https://ethree.com/public_projects/energy_principals_study.php

Center for Biological Diversity TN#213621	4. Comment II. D. "The PSA's Conclusions Regarding Displacement of Older Gas-Fired Generation and Renewable Generation Lack Evidentiary Support". "The PSA Contains Inadequate Evidence to Support a Conclusion that the Project Will Displace Only Older, Less Efficient Generation. - First, the PSA does not account for the possibility of demand growth in the local capacity area ("LCA") or the "system" as a whole. Rather, the PSA appears to depend entirely on assumptions regarding the instantaneous displacement of generation at the time of dispatch. (*See* PSA 4.1-113, 114 (dispatch of new generation "unavoidably displaces" existing generation).) If demand were to grow in the LCA or system-wide between now and 2050, it is at least reasonably foreseeable that the Project might not always displace—but may instead be dispatched concurrently with—both older, less efficient generation and newer, more efficient future generation. Even if the Project is more efficient than other generation, incremental gains in efficiency could be offset by increases in system-wide demand, leading to an increase in overall emissions compared to existing conditions".	Response to Comment II. D: Staff agrees that the PSA does not explicitly consider the impact of demand growth on the dispatch generation resources. It correctly excluded this consideration for two reasons. First, the development of Puente does not induce demand growth; the impact of Puente on the retail electricity price depends on the relative effect of lower wholesale electricity prices and the need to pay construction and fixed operating costs. Second, any increase in electricity demand must result in increased generation, and, as noted above, the GHG emissions associated with a system with Puente will have fewer GHG emissions than the same system without it (assuming a non-zero capacity factor).

Center for Biological Diversity TN#213621	(Continued Comment II. D.) – **"**Second, the PSA assumes that dispatch will always go to the cheapest resource, which according to the PSA will always be the most efficient resource. (PSA at 4.1-124 to 125.) The PSA thus assumes that the Project will by definition reduce greenhouse gas emissions. Yet the PSA itself contains a number of caveats that undermine the reasonableness of these assumptions. For example, the PSA concedes both that the ISO's dispatch procedures are confidential and that the number of hours the Project ultimately will operate are unknown. (*Ibid.*) The PSA also acknowledges that dispatch and heat rate relationships are more complicated than theory would indicate; sometimes less-efficient smaller peaker plants are dispatched before larger plants that take a longer time to start up. (PSA at 4.1-126 to 127; *see also id.* at 4.1-128 (explaining that Project will take 90 minutes to start up).) The PSA does not adequately address whether smaller, less-efficient peaker plants in the LCA can be started up more quickly. Finally, the PSA admits that the Project may operate up to ten times more often than older, less-efficient peakers in the LCA. (PSA at 4.1-132 to 133 (comparing Project's estimated 31 percent capacity factor to LCA average of 3.5 percent).)"	(Continued Response to Comment II.D.) - As noted above, the construction and operation of Puente reduces GHG emissions regardless of the capacity factor of the project (as long as it is greater than zero). The details of the California ISO's dispatch protocols are thus unimportant, *as long as it dispatches the lowest cost (i.e., most efficient/least emitting) resource(s).* As also noted above, the construction and operation of Puente reduces GHG emissions regardless of the relative efficiencies of Puente and other gas-fired resources in the system. While the dispatch of gas-fired resources is, as stated by staff, more complicated than simply starting up the plant that is most efficient at full load, this reinforces staff's conclusion rather than undermine it. Puente would be dispatched whenever the (expected) duty cycle constitutes a less expensive (i.e., most efficient/less emitting) alternative than the dispatch of other facilities.
Center for Biological Diversity TN#213621	5. Comment D.2. "The PSA's Assumption that the Project Will Never Displace Renewable Generation Is Unsupported. The PSA concludes that the Project will not displace existing renewables and will facilitate integration of new renewable generation. (PSA at 4.1-134 to 135). Again, however, the assumptions underlying this conclusion lack a sound factual basis in the document. First, the PSA contains no information about the projected availability, relative cost, or dispatch procedures for renewables in the LCA. This information is necessary in order to establish that the Project will never displace renewable generation".	Response to Comment D.2: Renewable generation resources (solar, wind, have exceptionally low variable operating costs (well below those of natural gas-fired generation) and, as such, are dispatched before natural-gas fired generation. In fact, most renewable generators offer energy on a must-take basis or its equivalent, bidding zero into California ISO markets, with curtailments only occurring due to over-generation.[50]

[50] This occurs when gas-fired and nuclear generation cannot be (further) reduced without jeopardizing reliability, hydro generation cannot be reduced without violating flow or other requirements, and some share of generation cannot be utilized due to insufficient demand or the inability to move energy to where it can be used (due to transmission congestion)

Center for Biological Diversity TN#213621	(Continued Comment II. D.2) – "Second, this section of the PSA largely ignores the changing legal landscape governing renewable generation in California. The PSA's conclusions rest on the assertion that at renewable penetration rates below 33 percent, new gas-fired generation always displaces less efficient gas-fired generation. (PSA at 4.1-124.) Starting in 2021, however, about six months after the Project begins operation, renewable penetration in California will be *required* to exceed 33 percent. Pub. Util. Code §§ 399.11(a) requiring 33 percent renewable generation by end of 2020 and 50 percent by end of 2030), 399.15 (b)(2)(B) ("For the following compliance periods, the quantities shall reflect reasonable progress in each of the intervening years sufficient to ensure that the procurement of electricity products from eligible renewable energy resources achieves 25 percent of retail sales by December 31, 2016, 33 percent by December 31, 2020, 40 percent by December 31, 2024, 45 percent by December 31, 2027, and 50 percent by December 31, 2030. The commission shall establish appropriate three-year compliance periods for all subsequent years that require retail sellers to procure not less than 50 percent of retail sales of electricity products from eligible renewable energy resources."). Indeed, renewable penetration may *exceed* 50 percent even before 2030. Pub. Util. Code"	Continued Response to Comment II.D.2: - The construction and operation of Puente will have no impact on California's ability to attain a 50 percent renewable portfolio standard in 2030. In fact, the opposite is true; see both above and below. Staff's conclusions do not "rest on the assertion that at renewable penetration rates below 33 percent, new gas-fired generation always displaces less efficient gas-fired generation." The comment implies that, at higher penetration levels, gas-fired generation displaces renewable energy. As staff states at 41-126, not only is this not the case, the integration of renewable energy operates thru a second mechanism: *At levels of renewable energy penetration in excess of 33 percent, relatively efficient fast-start, fast-ramping resources such as the Puente units, further contribute to GHG emission reductions by increasing the amount of renewable energy that can be integrated into the electricity system*.

Vicki Paul TN#212459 and TN#212504	6. I was surprised that the Air Quality report put the CO_2 emissions in metric tons. Why?	Response to Comment: The main reason why greenhouse gases are reported in metric tons is because greenhouse gases are a global issue, therefor there needs to be a standard for measuring the gases in a global manner. Using a single unit of measurement makes it easier to communicate how; for example, various sources of greenhouse gases are measured and released into the atmosphere on a worldwide measurement. Showing measurement values in metric tons of CO_2 equivalent rather than in short tons are useful in communicating various greenhouse gas strategies, assisting with reduction target, or other initiative aimed at reducing greenhouse gas emissions. Furthermore, scientists have estimated measures of both factors for many different greenhouse gases that together determine the "global warming potential" (GWP) of each gas. A GWP can then be used as a multiplier to compare emissions of different greenhouse gases based on their ability to contribute to the greenhouse effect. The GWP of a greenhouse gas is relative to the warming potential of CO_2, which is set at a value of 1. For example, the GWP value of methane is 21, which means that a metric ton of methane is approximately 21 times as effective at warming the atmosphere as is a metric ton of CO_2.[51] Staff has included greenhouse gas emissions in short tons in the FSA, please see **Greenhouse Gas Table 3**.

[51] http://www.southwestclimatechange.org/solutions/reducing-emissions/mmtco2-e

CONCLUSIONS

The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff concludes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. In addition, it would provide flexible, dispatchable, and fast-ramping power which is expected to be necessary to integrate variable-energy renewable generation on the scale projected in the CPUC and California ISO long-term planning processes.

Staff notes that mandatory reporting of GHG emissions per Federal Government and Air Resources Board greenhouse gas regulations would occur, and these reports would enable these agencies to gather the information needed to regulate the Puente project in trading markets, such as those required by regulations implementing the California Global Warming Solutions Act of 2006 (AB 32).

Staff concludes that the GHG emission increases from construction activities would not be significant for several reasons. First, construction emissions would be temporary and intermittent, and not continue during the life of the project. Additionally, the control measures or best practices that staff recommends such as limiting idling times and requiring, as appropriate, equipment that meets the latest emissions standards, would further minimize greenhouse gas emissions. Staff reasoned that the use of newer equipment would increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the California Air Resources Board (ARB) regulations to reduce GHG from construction vehicles and equipment. For all these reasons, staff concludes that the emission of greenhouse gases during construction would not be significant.

Puente is proposed as a modern, simple-cycle combustion turbine power plant, as described in the **Project Description.** The applicant is proposing to use one of the most efficient simple-cycle gas turbines known to be available. Puente would have an expected annual capacity factor well below 60 percent; therefore Puente is not subject to the Greenhouse Gases Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.). Finally, because this expected potential annual average electric sales rate is less than the 41 percent design efficiency, the new Puente CTG would be a non-base load unit under federal requirements. As a non-base load unit this turbine is limited to burning natural gas resulting in a consistent emission rate of 120 lb CO_2/MMBTU or less per section 60.5520(d)(1).

Staff has reached the following conclusions about Puente based on CEQA guidelines:

Puente would have less than significant GHG emissions impacts because it:

- is proposed as a high-efficiency, simple-cycle power plant that would be more efficient and have lower GHG emissions than other simple-cycle power plants currently operating in the Big Creek – Ventura LCA;
- would facilitate the integration of renewable energy resources, which would lower the statewide GHG emissions from the electricity sector; and

- would be more efficient and therefore would have lower GHG emissions than Mandalay Units 1 and 2 (as shown in **Greenhouse Gas Table 3**), whose retirement it would facilitate. Puente has an estimated GHG emissions performance of 0.509 MTCO2E/MWh (net, from **Greenhouse Gas Table 3**) versus the actual calculated annual GHG emissions performance for MGS Units 1 and 2 that ranged from 0.656 MTCO2E/MWh to 0.724 MTCO2E/MWh from 2008 to 2013 (net, see text below the table).
- would have less than significant impacts by complying with applicable regulations and plans related to the reduction of GHG emissions as follows:
    - Puente would be subject to compliance with the AB 32 cap and trade regulation that implements the state's regulatory plan for reducing GHG emissions from the electricity sector; and
    - Puente would recycle construction and demolition wastes to reduce GHG emissions from construction and demolition activities (as required by **WASTE-4**) to comply with state policy and local Climate Action Plans.

Additionally, staff has also determined that Puente would be consistent with all three main conditions in the precedent decision regarding GHG emissions established by the Avenal Energy Project's Final Energy Commission Decision (not increase the overall system heat rate for natural gas plants, not interfere with generation from existing or new renewable facilities, and ensure a reduction of system-wide GHG emissions). Puente is not a base-load gas-fired power plant, it is proposed as a modern, simple-cycle combustion turbine as described in the **Project Description**; consistent with the Avenal decision, it will displace higher heat rate facilities, thereby reducing the overall system heat rate. The system-wide heat rate analysis of Puente factors in the role and purpose of a modern, simple-cycle combustion turbine power plant; including the small effect on the system-wide heat rate average it would have given its expected low operating capacity factor, and the system-wide reduction in GHG emissions and fossil fueled power plant use it would help to achieve given its role in integrating non-dispatchable renewable energy resources.

PROPOSED CONDITIONS OF CERTIFICATION – JACQUELYN RECORD

Staff reviewed the currently known construction emissions related policies and goals that could be appropriate to this project and that also may provide a substantial reduction in GHG emissions. Staff's review determined that to conform to policies and goals related to recycling and waste reduction, it is reasonable to require that the construction and demolition wastes be recycled to the extent feasible. The requirement to appropriately recycle construction and demolition wastes is included in the **Waste Management** section (Condition of Certification **WASTE-4**), so no additional conditions related to construction GHG emissions reductions are proposed.

During facility operation, the facility owner would participate in California's GHG cap-and-trade program. The facility owner is required to report GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. Similarly, the proposed facility modifications would be subject to federal mandatory

reporting of GHG emissions. The facility owner may have to provide additional reports and GHG reductions, depending on the future regulations formulated by the U.S. EPA or the ARB

REFERENCES

ARB 2014 – California Air Resources Board. California Greenhouse Gas Inventory for 2000-2012 – by Category as Defined in the 2008 Scoping Plan. March 24, 2014. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-12_2014-03-24.pdf

ARB 2016 - California Air Resources Board, Public Workshop on the 2030 Target Scoping Plan, November 7, 2016. https://www.arb.ca.gov/cc/scopingplan/meetings/110716/scopingplanpresentation.pdf

CA ISO 2014 – California Independent System Operator Corporation. Flexible Resource Adequacy Capacity Requirement Amendment. August 1, 2014.

CalEPA 2006 - California Environmental Protection Agency. Climate Action Team Report to Governor Schwarzenegger and the Legislature. March 2006.

CCCC 2006 – California Climate Change Center. Our Changing Climate – Assessing the Risks to California. CEC-500-2006-077. July 2006. http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF

CEC 1998 - California Energy Commission. 1997 Global Climate Change, Greenhouse Gas Emissions Reduction Strategies for California, Volume 2, Staff Report. 1998.

CEC 2003 - California Energy Commission. 2003 Integrated Energy Policy Report. December 2003.

CEC 2009a – California Energy Commission (TN54068). Carlsbad Energy Center Project, Final Staff Assessment, dated November 12, 2009. Submitted 11/12/2009.

CEC 2009b – California Energy Commission (TN54475). Revised Sections for the Carlsbad Energy Center Project, Final Staff Assessment (Air Quality and Worker Safety and Fire Protection), dated December 12, 2009. Document available here: http://www.energy.ca.gov/sitingcases/carlsbad/documents/2009-12-17_Revised_Sections_Carlsbad_FSA.PDF. Submitted 12/17/2009.

CEC 2009c - California Energy Commission. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. May 2009. http://www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF

CEC 2009d - California Energy Commission, Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California, consultant report by MRW and Associates, LLC., submitted in in 08-GHG OII-1 (Informational Proceeding on Methods for Satisfaction of California Environmental Quality Act Requirements Relating to Greenhouse Gas Emission Impacts of Power Plants), December 2009

CEC 2009e - California Energy Commission, Order Instituting Informational Proceeding in 08-GHG OII-1(Informational Proceeding on Methods for Satisfaction of California Environmental Quality Act Requirements Relating to Greenhouse Gas Emission Impacts of Power Plants), October 8, 2008.

CEC 2011 – California Energy Commission, Thermal Efficiency of Gas-Fired Generation in California, August 2011, CEC-200-2011-008, http://www.energy.ca.gov/2011publications/CEC-200-2011-008/CEC-200-2011-008.pdf

CEC 2015a – California Energy Commission, QFER CEC-1304 Power Plant Owner Reporting Database, http://energyalmanac.ca.gov/electricity/web_qfer/. Accessed November/December 2015.

CEC 2014b – California Energy Commission, Thermal Efficiency of Gas-Fired Generation in California: 2014 Update, September 2014, CEC-200-2014-005, http://www.energy.ca.gov/2014publications/CEC-200-2014-005/CEC-200-2014-005.pdf.

IPCC 2007a - Intergovernmental Panel on Climate Change. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC. http://www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html.

IPCC 2007b - Intergovernmental Panel on Climate Change. Climate Change 2007: Synthesis Report Summary for Policymakers. November 2007. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

PPP 2015u - Applicant's responses to CEC Data Requests, Set 2 (48-74) (TN 206614). Latham & Wilkins LLP Submitted on November 13, 2015. CEC/Docket on November 13, 2015.

PPP 2015v - Appendix 74-1 to Applicant's Responses to CEC Data Requests, Set 2 (48-74) Latham & Watkins LLP (TN 206621). Submitted on November 13, 2015. CEC/Docket Unit on November 13, 2015.

PPP 2015x - Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

NASA/Goddard 2016 – National Aeronautics and Space Administration, Goddard Institute for space studies. Accessed November 2016. http://climate.nasa.gov/news/2465/2016-climate-trends-continue-to-break-records/

NCDC 2014 – National Climatic Data Center. Global Analysis website page. Accessed August 2014. http://www.ncdc.noaa.gov/sotc/global/2013/13.

VCAPCD 2016a – Ventura County Air Pollution Control District (TN 211570). Preliminary Determination of Compliance – Puente Power Project. Submitted May 19, 2016.

VCAPCD 2016c – Ventura County Air Pollution Control District (TN 214005-1 through 15). Final Determination of Compliance – Puente Power Project. Dated October 13, 2016.

ACRONYMS

AB	Assembly Bill
AGC	Automated Generation Control
ARB	Air Resource Board
CAA	Clean Air Act
CAISO	California Independent System Operator
CCCC	California Climate Change Center
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	Methane
CO_2	Carbon Dioxide
CO2E	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
EIR	Environmental Impact Report
EJAC	Environmental Justice Advisory Committee
EPA	Environmental Protection Agency
EPS	Emission Performance Standard
GCC	Global Climate Change
GHG	Greenhouse Gas
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HSC	Health and Safety Code
IEPR	Integrated Energy Policy Report
IOU	investor-owned utility
IPCC	Intergovernmental Panel on Climate Change
LCA	Local Capacity Area
LTPP	Long-term Procurement Planning
MT	Metric Tonnes
MTCO2E	Metric Tons of CO2-Equivalent
MW	Megawatt
NERC	American Electric Reliability Council
N_2O	Nitrous Oxide
NO	Nitric Oxide
OTC	Once-Through Cooling
PFC	Perflurocarbons
PPP or Puente	Puente Power Project

PSD	Prevention of Significant Deterioration
PTA	Petition to Amend
PTR	Petition to Remove
RPS	Renewable Portfolio Standard
SB	Senate Bill
SF_6	Sulfur Hexafluoride
SONGS	San Onofre Nuclear Generating Station
SWRCB	State Water Resource Control Board
VCAPCD	Ventura County Air Pollution Control District
WECC	Western Electricity Coordinating Council
U.S. EPA	United States Environmental Protection Agency

APPENDIX AIR-2

AIR QUALITY APPENDIX AIR-2

Additional Support of District Response to the Sierra Club Comment

Testimony of Wenjun Qian

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) is the computer regulatory model approved by the U.S. Environmental Protection Agency (U.S. EPA) and recommended to be used for State Implementation Plan (SIP) revisions for existing sources and for New Source Review (NSR) and Prevention of Significant Deterioration (PSD) programs (40 CFR Part 51 Appendix W), for proposed new sources, including power plants. While many of its input parameters are specified in the model's code, other parameters are allowed to be varied by the user as "beta options". The beta options can be used as long as they are approved by the regulatory agency reviewing the analysis for permitting purposes.

It is known that AERMOD, with default options, overestimates impacts during low wind speed, stable conditions (e.g. Qian and Venkatram 2011). One of the major reasons for the overestimation is due to underestimation of the surface friction velocity (u*) by the meteorological data preprocessor for AERMOD (AERMET). Research (Qian and Venkatram, 2011) found that with an empirical adjustment of the u* estimation (Adjusted u*), the overestimation of impacts during low wind speed conditions can be reduced.

The Adjusted u* option has been evaluated by researchers and the U.S. EPA for a variety of sources and conditions (Paine and Connors 2013, Paine et al 2015, U.S. EPA 2015a, etc.). Staff concludes that there is significant evidence that the use of Adjusted u* option improves AERMOD performance.

On July 14, 2015, the U.S. EPA administrator signed a proposal to revise the Guideline on Air Quality Models (40 CFR Part 51 Appendix W). In the proposed rulemaking package, the U.S. EPA proposed the Adjusted u* option, along with other beta options, as future default options of AERMOD. However, the proposed revisions to Appendix W have not been formally approved yet. The U.S EPA's December 2015 memorandum (U.S. EPA 2015b) clarified that the regulatory application of any of the beta options need formal approval as an alternative model. This is applicable for compliance demonstrations in the PSD context and State Implementation Plan development for NAAQS criteria pollutants as well as the specific use for SO_2 designations and consent decree modeling.

The U.S. EPA has approved the use of the Adjusted u* option for two projects: the Donlin Gold Limited Liability Company (DGLLC) mine facility in southwestern Alaska (Region 10) and the Schiller Station energy generating facility in New Hampshire (Region 1). For the Donlin mine facility, the primary concern regarding ambient pollutant impacts is expected to be associated with low-level fugitive emissions of particulate matter from sources with low release heights. The U.S. EPA demonstrated improvement in model performance with the Adjusted u* option for similar near-ground releases (Idaho Falls and Oak Ridge [U.S. EPA 2015a]). The U.S. EPA concluded that both the Idaho Falls and Oak Ridge studies are relevant to application of Adjusted u* option for the Donlin mine facility, therefore approved the use of Adjusted u* option for the Donlin mine facility. Similar to the low-level fugitive emissions of the Donlin mine facility, the emission sources during construction/demolition periods of Puente would be low-level and mostly fugitive particulate matter with near-source impacts. Based on the

U.S. EPA approval of the Adjusted u* option for the Donlin mine facility, staff believes that it is appropriate to use the Adjusted u* option to evaluate the impacts of Puente during construction/demolition periods.

The Schiller Station has three tall stacks (ranging from about 68-70 meters [m]) located near complex terrain (beginning at around 16 km from the source), where worst case concentrations are likely to occur under low wind, stable conditions. This modeling domain is similar to Puente's modeling domain (complex terrain beginning at around 9 km from the Puente). In the Model Clearinghouse concurrence request memorandum, Region 1 highlighted the evaluation databases (Lovett [U.S. EPA 2015a] and Mercer County [Paine et al 2015]) that directly represent the Schiller Station and surrounding terrain circumstances. Both the Lovett and Mercer County data evaluations demonstrate a significant improvement in model performance, while still conservatively overestimating project impacts, with the use of the Adjusted u* option for a facility with tall stacks located near complex terrain, particularly during low wind, stable conditions. U.S. EPA approved the use of Adjusted u* option for the Schiller Station. The proposed turbine at Puente would also have a tall stack (about 57.3 m [188 feet]) and buoyant plume (exhaust temperature of 900°F) near complex terrain, which is similar to the Schiller Station case. Staff noticed that the worst case 1-hour impact of the Puente turbine would be on the complex terrain located beyond 9 km north of the project site during low wind, stable conditions, which is similar to the Schiller Station case. Based on the U.S. EPA approval of the Adjusted u* option for the Schiller Station, staff believes that it is appropriate to evaluate the impacts of the proposed turbine at Puente using the Adjusted u* option.

To respond to the intervenors' comments on modeling, the District performed an analysis comparing the impacts of Puente from AERMOD using Adjusted u* option and default options (without using Adjusted u*). For more details and modeling results, see Appendix G, titled *Ambient Air Quality Analysis and Risk Management Review* Tables 5-13 and 5-15, of the FDOC. The FDOC shows that AERMOD predicts lower impacts with Adjusted u* option than default options, which agrees with other dataset evaluations. However, even with the potentially overestimated impacts using default options of AERMOD (without using Adjusted u* option), conclusions of the project impacts would not change, which are: emissions of CO, NOx, SOx, and PM2.5 from Puente are not expected to cause an exceedance of any state or federal ambient air quality standard. The PM10 background concentrations already exceeded the state ambient air quality standards. The PM10 emissions of Puente would contribute to the existing violations of the PM10 ambient air quality standards. Staff performed an additional analysis comparing the cumulative impacts of Puente with the existing sources from AERMOD using Adjusted u* option and default options (without using Adjusted u*). See **Air Quality Appendix Air-3** for further discussion.

REFERENCES

Paine, B. and J. Connors. 2013 – AERMOD Low Wind Speed Issues: Review of New Model Release, presentation at the 2013 EPA Regional, State, and Local (RSL) Modelers' Workshop, April 2013.

Paine. R., O. Samani. M. Kaplan, E. Knipping and N. Kumar. 2015. Evaluation of low wind modeling approaches for two tall-stack databases, Journal of the Air & Waste Management Association, 65:11, 1341-1353, DOI: 10.1080/10962247.2015.1085924.

Qian, W. and A. Venkatram 2011 – Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions, Boundary-Layer Meteorology 2011, 138: 475-491, DOI 10.1007/s10546-010-9565-1.

U.S. EPA 2015a – U.S. Environmental Protection Agency. Addendum to the User's Guide for the AMS/EPA Regulatory Model – AERMOD (EPA-454/B-03-001, September 2004) provided with AERMOD version 15181, June 2015.

U.S. EPA 2015b – U.S. Environmental Protection Agency. Clarification on the Approval Process for Regulatory Application of the AERMOD Modeling System Beta Options, December 2015.

APPENDIX AIR-3

AIR QUALITY APPENDIX AIR-3
Additional Responses to the Comments on Modeling
Wenjun Qian, Ph.D., P.E.

Staff reviewed comments on the PSA and PDOC from intervenors: Environmental Coalition, Sierra Club, and Environmental Defense Center (ECVC/SC/ED 2016c, SC 2016a), and expert report from Lindsey Sears (SC 2016a) regarding air quality modeling. In addition to the **Air Quality Appendix Air-2** that staff already included in the PSA, staff provides the following supplemental responses to the comments on air quality modeling. Staff's additional analysis shows that the conclusions regarding Puente impacts would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

ADJUSTED U* OPTION

The intervenors commented that the "*PSA Inappropriately Relies on a Non-Approved Ambient Air Quality Model Variation [the Adjusted u* option], which Drastically Understates Puente's Air Quality Impacts*" (ECVC/SC/ED 2016c). However, as stated in the **Air Quality Appendix Air-2**, staff concludes that there is significant evidence that the use of Adjusted u* option improves AERMOD performance without over predicting impacts. This is consistent with the U.S. EPA's proposed revisions to Appendix W (Federal Register Vol. 80 No. 145, dated July 29, 2015):

> *Based on studies presented and discussed at the Tenth Modeling Conference, and additional relevant research since 2010, the EPA and other researchers have conducted additional model evaluations and developed changes to the model formulation of the AERMOD modeling system to improve model performance in its regulatory applications. We propose the following updates to the AERMOD modeling system to address a number of technical concerns expressed by stakeholders:*
>
> *1. A proposed option incorporated in AERMET to adjust the surface friction velocity (u*) to address issues with AERMOD model over prediction under stable, low wind speed conditions…*

It is expected that the proposed revisions to Appendix W would be approved in 2016. In the interim, U.S EPA's December 2015 memorandum (U.S. EPA 2015b) clarified that "*the regulatory application of any of the beta options in AERMET or AERMOD versions 15181 require formal approval as an alternative model and are subject to the requirements of Appendix W, Section 3.2.2. This is applicable for compliance demonstrations in the PSD context and State Implementation Plan development for NAAQS criteria pollutants as well as the specific use for SO_2 designations and consent decree modeling*." In **Air Quality Appendix Air-2**, staff has included the above sentences from the U.S EPA's December 2015 memorandum. However, the intervenors commented that staff did not add any citation or other basis for the sentence regarding the applicability of the approval process of the beta options. Staff would like to clarify that these sentences are directly quoted from the U.S EPA's December 2015 memorandum.

The intervenors also commented that the PSA does not explain why a beta model intended to improve model performance during low wind speeds is appropriate for a project that will not experience low wind speeds. The intervenors cited PSA page 4.1-6: "*The average wind speed is 3.2 meters per second and dead calm hours occur infrequently, about 2.7 percent of the time*." However, it should be noted that the calm wind hours should not be confused with low wind speed hours. The 2.7 percent calm wind hours are associated with hours when wind speeds are below 0.28 meters per second (m/s), during which AERMOD does not produce impacts. Staff believes that the overestimation of impacts using AERMOD regulatory default option occurs during stable low wind speed conditions when AERMOD is able to produce impacts (i.e., wind speeds higher than 0.28 m/s). The air quality impacts of the project were evaluated every hour (except for the calm wind hours) of the 5-year modeling period. The worst-case short-term (e.g., hourly) impacts of the project would occur during worst-case stable low wind speed conditions, even if the percentage occurrence of such conditions is low (i.e., the worst case hourly impacts can be calculated ,but that does not mean that those impacts occur in all 8,760 hours in a year).

Staff's analysis using non-adjusted u* option

To respond to the intervenors' comments, staff performed an additional analysis using the non-adjusted u* option in AERMOD. Staff's analysis evaluates impacts of the proposed Puente project with the existing cumulative sources during construction, commissioning, normal operations, and startups/shutdowns. The PSA included cumulative impacts from MGS Units 1, 2, and 3. Staff's additional analysis now also includes the McGrath facility. These results are presented and discussed in staff's FSA in response to these comments.

Staff used the meteorological data with non-adjusted u* option (AERMOD regulatory default option) processed by the District. The source parameters and emission rates (except those for McGrath) are from the applicant's analysis. For McGrath, staff used the source parameters and emission rates from Southern California Edison (SCE 2007). Staff corrected the coordinates of the McGrath sources from North American Datum of 1927 (NAD27) to NAD83 (see more details in the **Problems in Ms. Sears' modeling analysis** section below). For construction impacts analysis, staff used the receptors that the applicant used for construction; for commissioning, normal operations, and startups/shutdowns impacts analysis (except for NO_2 impacts analysis), staff used the receptors that the District used for DOC modeling analysis; for the NO_2 impacts analysis during commissioning, normal operations, and startups/shutdowns, staff used receptors from Ms. Sears's modeling analysis (SC 2016b) and added more refined receptors with a resolution of 25 meters where potential worst-case impacts could occur. For more details of the NO_2 impacts analysis, please refer to the **NO_2 IMPACTS ANALYSIS** section below.

Results using non-adjusted u* option

The following tables show the results of staff's additional independent analysis using the non-adjusted u* option (AERMOD regulatory default option). The results can be compared to those shown in the PSA using the Adjusted u* option. For comparison purposes, staff also included the corresponding PSA tables under each impacts table from staff's independent analysis.

Construction Impacts

The PSA **Air Quality Table 22** shows the construction impacts of the proposed Puente project with concurrent operation of existing MGS Units 1, 2, and 3 using AERMOD with Adjusted u* option. Staff's construction impacts analysis also included emissions from McGrath, in addition to MGS Units 1, 2, 3, and construction emissions from Puente. Staff's independent analysis used AERMOD non-adjusted u* option (regulatory default option). **Air Quality Appendix Air-3 Table 1** shows the results of staff's construction impacts analysis. Staff also included PSA **Air Quality Table 22** below for comparison purposes.

Comparing to the results (using Adjusted u* option) shown in the PSA **Air Quality Table 22**, **Air Quality Appendix Air-3 Table 1** shows that the impacts of Puente during construction with existing cumulative sources as modeled would be higher using the non-adjusted u* option (regulatory default option), except for the 24-hour SO_2 impacts. However, **Air Quality Appendix Air-3 Table 1** shows that: (1) the maximum NO_2, PM2.5, CO, and SO_2 impacts would still remain below the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS); (2) the background PM10 values alone are greater than both the 24-hour and annual PM10 standards; (3) the construction impacts have the potential to worsen the existing violations of the 24-hour and annual PM10 ambient air quality standard and are, therefore, potentially significant; and (4) the NOx and VOC emissions from construction, when considering their potential secondary ozone formation added to the existing ozone "background," have the potential to contribute to existing exceedances of the ozone standard and are, therefore, potentially significant. See more details regarding construction mitigation measures under the **Construction Impacts and Mitigation** section in **AIR QUALITY**.

The above conclusions regarding Puente construction impacts would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

Normal Operations Impacts

The PSA included two separate tables showing Puente normal operating impacts. PSA **Air Quality Table 23** shows Puente impacts only, which includes the normal operation of the proposed new turbine and new diesel-fueled emergency engine. PSA **Air Quality Table 24** shows combined impacts for simultaneous operation of Puente with existing cumulative sources. For comparison purposes, staff presents results from staff's independent analysis for the impacts of Puente only in **Air Quality Appendix Air-3 Table 2** and cumulative impacts in **Air Quality Appendix Air-3 Table 3**. The PSA tables used AERMOD Adjusted u* option and staff's independent analysis used AERMOD non-adjusted u* option (regulatory default option). PSA **Air Quality Table 24** included impacts from Puente with continued operation of MGS Units 1 and 3. Staff's cumulative impacts results shown in **Air Quality Appendix Air-3 Table 3** included McGrath, in addition to Puente, MGS Units 1 and 3. Staff included PSA **Air Quality Tables 23** and **24** under **Air Quality Appendix Air-3 Tables 2** and **3** respectively for comparison purposes.

Comparing to the results (using Adjusted u* option) shown in the PSA **Air Quality Table 23**, **Air Quality Appendix Air-3 Table 2** shows that the modeled impacts of Puente during normal operations are higher using the non-adjusted u* option (regulatory default option), except for the 24-hour PM10/PM2.5 and 8-hour CO impacts. The 24-

hour PM10/PM2.5 impacts in the PSA **Air Quality Table 23** are higher because the District conservatively modeled the worst-case hourly emission rate of the proposed emergency engine (assuming it operates 24 hours per day), which is higher than the 24-hour averaged emission rate that staff used (assuming the emergency engine only operates one hour per day for testing). The 8-hour CO impacts in the PSA **Air Quality Table 23** are higher because the District conservatively computed the project impacts by combining the worst-case impacts from the proposed new turbine with the worst-case impacts from the proposed emergency engine, which assumes that they would occur at the same time and location. **Air Quality Appendix Air-3 Table 2** shows lower 8-hour CO impacts from staff's analysis because staff modeled the total impacts of the Puente turbine and emergency engine on each receptor for every hour of the 5-year modeling period and then computed the worst-case 8-hour and 24-hour impacts.

Air Quality Appendix Air-3 Table 1
Puente Maximum Onsite Construction Impacts, (µg/m^3)[a]
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3)	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2[b]	1 hour	216.2	107	323.2	339	CAAQS	95%
	Annual	10.0	13	23.0	57	CAAQS	40%
PM10	24 hour	17.6	**56.9**	**74.5**	50	CAAQS	**149%**
	Annual	1.3	**24**	**25.3**	20	CAAQS	**127%**
PM2.5	24 hour	5.9	17.8	23.7	35	NAAQS	68%
	Annual	0.3	9.4	9.7	12	CAAQS	81%
CO	1 hour	2,029	4,582	6,611	23,000	CAAQS	29%
	8 hour	459.7	1,265	1724.7	10,000	CAAQS	17%
SO_2	1 hour	3.4	11	14.4	655	CAAQS	2.2%
	1 hour NAAQS	3.4	8	11.4	196	NAAQS	5.8%
	24 hour	0.3	5.2	5.5	105	CAAQS	5.3%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff's independent analysis of Puente impacts during construction included impacts from MGS Units 1, 2, 3, and McGrath operating in parallel with construction activities.
[b] Consistent with applicant's analysis, staff's independent analysis of 1-hour NO_2 impacts during Puente construction used the Ozone Limiting Method (OLM), and the annual NO_2 impacts are based on the ambient NO_2/NOx ratio of 0.8.

PSA Air Quality Table 22 (Reproduced)
Puente Maximum Onsite Construction Impacts, (µg/m^3)[a]
(Using AERMOD Adjusted u* Option)

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3) [b]	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
*NO_2	1 hour	188.7	107	295.7	339	CAAQS	87%
	annual	9.9	13	23	57	CAAQS	40%
PM10	24 hour	14.0	**56.9**	**71**	50	CAAQS	**142%**
	Annual	1.0	**24**	**25**	20	CAAQS	**125%**
PM2.5	24 hour	4.8	17.8	22.6	35	NAAQS	65%
	Annual	0.2	9.4	9.6	12	CAAQS	80%
CO	1 hour	1,985	4,582	6,567	23,000	CAAQS	28%
	8 hour	448	1,265	1,713	10,000	CAAQS	17%
SO_2	1 hour	3.3	11	14.3	655	CAAQS	2.2%
	1 hour NAAQS	3.3	8	11.3	196	NAAQS	5.8%
	24 hour	0.4	5.2	5.6	105	CAAQS	5.3%

Source: PPP 2015Z Table C-6-5(Revised 11/18/2015), CEC 2015jj, VCAPCD 2016c

[a] In Energy Commission Data Request 51, Energy Commission staff requested that the construction air quality modeling analysis be revised to include the impacts for MGS Units 1, 2 and 3 operating in parallel with construction activities.

[b] Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.

[*] For the NO_2 1-hour NAAQS, because the basis of these standards are a 3-year average and given the limited length of construction period, the applicant did not remodel this value.

Air Quality Appendix Air-3 Table 2
Puente Normal CTG Operating Impacts, and Emergency Engine
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3)	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2 [a]	1 hour	61.5	107	168.5	339	CAAQS	50%
	1 hour NAAQS [b]	61.5	68	129.5	188	NAAQS	69%
	Annual	0.0	13	13.0	57	CAAQS	23%
PM10	24 hour	0.2	**56.9**	**57.1**	50	CAAQS	**114%**
	Annual	0.0	**24**	**24.0**	20	CAAQS	**120%**
PM2.5	24 hour	0.2	17.8	18.0	35	NAAQS	51%
	Annual	0.0	9.4	9.4	12	CAAQS	78%
CO	1 hour	356.4	4,582	4,938	23,000	CAAQS	21%
	8 hour	71.8	1,265	1336.8	10,000	CAAQS	13%
SO_2	1 hour	0.9	11	11.9	655	CAAQS	1.8%
	1 hour NAAQS	0.9	8	8.9	196	NAAQS	4.5%
	24 hour	0.1	5.2	5.3	105	CAAQS	5.0%

Source: Energy Commission staff independent analysis

Notes:

[a] Staff used PVMRM to model the 1-hour NO_2 impacts and the annual NO_2 impacts are based on the ambient NO_2/NOx ratio of 0.8.

[b] Staff conservatively computed the total1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background.

PSA Air Quality Table 23 (Reproduced)
Puente Normal CTG Operating Impacts, and Emergency Engine
(Using AERMOD Adjusted u* Option)

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [a]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2	1 hour	44.5	107	151.5	339	CAAQS	45%
	1 hour NAAQS	44.5	68	112.5	188	NAAQS	60%
	Annual	0.0	13	13	57	CAAQS	23%
PM10	24 hour	0.4	**56.9**	**57.3**	50	CAAQS	**114%**
	Annual	0.0	**24**	**24**	20	CAAQS	**120%**
PM2.5	24 hour	0.4	17.8	18.2	35	NAAQS	52%
	Annual	0.0	9.4	9.4	12	CAAQS	78%
CO	1 hour	207.2	4,582	4789.2	23,000	CAAQS	21%
	8 hour	80.4	1,265	1345.4	10,000	CAAQS	14%
SO_2	1 hour	0.7	11	11.7	655	CAAQS	2%
	1 hour NAAQS	0.7	8	8.7	196	NAAQS	4%
	24 hour	0.1	5.2	5.3	105	CAAQS	5%

Source: VCAPCD 2016c, Appendix G Table 5-14
[a] Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.
Bold values show the existing background greater than the limiting standard.

The applicant used AERMOD with Adjusted u* option to evaluate the cumulative impacts of Puente during normal operations with existing sources. Additionally, because fumigation conditions often produce higher impacts, the applicant performed an analysis to evaluate the fumigation impacts of Puente and the existing sources using AERSCREEN (the regulatory model approved for fumigation impacts analysis). The worst-case short-term cumulative impacts (except for 1-hour NO_2 NAAQS impacts) shown in PSA **Air Quality Table 24** were due to the fumigation impacts modeled from AERSCREEN, which are higher than those modeled from AERMOD with Adjusted u* option. The applicant did not evaluate fumigation impacts for the 1-hour NO_2 NAAQS and annual standards because fumigation is considered a short-term phenomenon and is not evaluated for long-term averaging periods, such as the 3-year averaged 1-hour NO_2 NAAQS. The worst-case cumulative impacts for the 1-hour NO_2 NAAQS and annual standards shown in PSA **Air Quality Table 24** were modeled using AERMOD with Adjusted u* option.

Air Quality Appendix Air-3 Table 3 shows the cumulative impacts of Puente during normal operations with the existing sources (MGS Units 1 and 3, and McGrath) from staff's independent analysis using AERMOD with non-adjusted u* option. In addition, staff performed an AERSCREEN analysis to evaluate the fumigation impacts of McGrath since the applicant's fumigation impacts analysis did not include McGrath. Staff's analysis shows that the fumigation impacts of McGrath would be less than those modeled using AERMOD with non-adjusted u* option, except for the 24-hour PM impacts. For comparison purposes, staff also presented the 24-hour PM impacts of McGrath due to fumigation in **Air Quality Appendix Air-3 Table 3**.

Air Quality Appendix Air-3 Table 3
Puente Normal CTG Operating Impacts,
Emergency Generator, MGS Units 1 and 3, and McGrath

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
Cumulative impacts from AERMOD with non-adjusted u* option (regulatory default option)							
NO_2 [a]	1 hour	178.8	107	285.8	339	CAAQS	84%
	1 hour NAAQS [b]	-	-	170.9	188	NAAQS	91%
	Annual	0.0	13	13.0	57	CAAQS	23%
PM10	24 hour	1.4	**56.9**	**58.3**	50	CAAQS	**117%**
	Annual	0.0	**24**	**24.0**	20	CAAQS	**120%**
PM2.5	24 hour	1.4	17.8	19.2	35	NAAQS	55%
	Annual	0.0	9.4	9.4	12	CAAQS	79%
CO	1 hour	357.9	4,582	4,940	23,000	CAAQS	21%
	8 hour	86.5	1,265	1351.5	10,000	CAAQS	14%
SO_2	1 hour	1.7	11	12.7	655	CAAQS	1.9%
	1 hour NAAQS	1.7	8	9.7	196	NAAQS	5.0%
	24 hour	0.2	5.2	5.4	105	CAAQS	5.1%
Fumigation impacts of McGrath from AERSCREEN							
PM10	24 hour	2.3	**56.9**	**59.2**	50	CAAQS	**118%**
PM2.5	24 hour	2.3	17.8	20.1	35	NAAQS	57%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used PVMRM to model the 1-hour NO_2 impacts and the annual NO_2 impacts are based on the ambient NO_2/NOx ratio of 0.8.
[b] The total impact for the 1-hour NO_2 NAAQS is the 5-year average of the 98th percentile daily modeled concentration paired with the monthly hour-of-day background concentration.

PSA Air Quality Table 24 (Reproduced)
Puente Normal CTG Operating Impacts,
Emergency Generator and MGS Units 1 and 3
(Using AERMOD Adjusted u* Option and AERSCREEN)

Pollutant	Averaging Period	Project Impact (µg/m3)	Background ($\mu g/m^3$) [a]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2	1 hour	211.4	107	318.4	339	CAAQS	94%
	1 hour NAAQS	106.3	68	137[b]	188	NAAQS	73%
	Annual	0.0	13	13	57	CAAQS	23%
PM10	24 hour	1.6	**56.9**	58.5	50	CAAQS	**117%**
	Annual	0.0	**24**	24	20	CAAQS	**120%**
PM2.5	24 hour	1.6	17.8	19.4	35	NAAQS	55%
	Annual	0.0	9.4	9.4	12	CAAQS	78%
CO	1 hour	181.6	4,582	4763.6	23,000	CAAQS	21%
	8 hour	42.1	1,265	1307.1	10,000	CAAQS	13%
SO_2	1 hour	2.5	11	13.5	655	CAAQS	2%
	1 hour NAAQS	2.5	8	10.5	196	NAAQS	5.4%
	24 hour	0.2	5.2	5.4	105	CAAQS	5%

Source: PPP 2015z, Table 4.1-29 (Revised November 18, 2015)
[a] Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.
[b] Based on AERMOD results which includes the ambient background NO_2 levels.
Bold values show the existing background greater than the limiting standard.

Comparing results (using AERSCREEN or AERMOD with Adjusted u* option) shown in the PSA **Air Quality Table 24**, to results in **Air Quality Appendix Air-3 Table 3,** the cumulative impacts of Puente during normal operations with existing sources would be lower using AERMOD non-adjusted u* option (regulatory default option), except for the 1-hour NO_2 NAAQS and CO impacts. The higher impacts shown in PSA **Air Quality Table 24** were fumigation impacts modeled using AERSCREEN. For the 1-hour NO_2 NAAQS, PSA **Air Quality Table 24** used the Ozone Limiting Method (OLM) option in AERMOD with Adjusted u* option and pairing of modeled impacts with monthly hour-of-day NO_2 backgrounds. For the additional analysis, staff used the Plume Volume Molar Ratio Method (PVMRM) option in AERMOD with non-adjusted u* option and pairing of modeled impacts with monthly hour-of-day NO_2 backgrounds. See more details of the NO_2 modeling options in the **NO_2 IMPACTS ANALYSIS** section below. **Air Quality Appendix Air-3 Table 3** shows that the 24-hour PM impacts of McGrath due to fumigation modeled using AERSCREEN would be higher than the cumulative impacts modeled using AERMOD with non-adjusted u* option and those shown in PSA **Air Quality Table 24**.

Similar to the differences between **Air Quality Table 23** and **Air Quality Table 24**, the differences between **Air Quality Appendix Air-3 Table 2** and **Air Quality Appendix Air-3 Table 3** show that the existing cumulative sources (especially MGS Unit 3), instead of the proposed Puente project, dominate the air quality impacts, except for CO impacts. Nonetheless, the results shown in **Air Quality Appendix Air-3 Table 2** and **Air Quality Appendix Air-3 Table 3** indicate that the project's normal operational impacts (with or without existing cumulative sources) would not create exceedances of NO_2, SO_2, or CO standards, but could further exacerbate currently-occurring exceedances of the PM10 standards. In light of the existing state PM10 non-attainment status for the project site area, staff considers the modeled impacts to be significant and, therefore, staff is recommending appropriate mitigation. Additionally, the NOx and VOC emissions from operation, when considering their potential secondary ozone formation added to the existing ozone "background", have the potential to contribute to existing exceedances of the ozone standard and are therefore potentially significant. Therefore, staff is recommending appropriate mitigation. See more details regarding operations mitigation measures under the **Operations Impacts and Mitigation** section in **AIR QUALITY**.

The above conclusions would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

Startup/shutdown Impacts

PSA **Air Quality Table 25** showed Puente impacts during the turbine startup/shutdown (without cumulative sources) modeled using AERMOD with Adjusted u* option. Staff's independent analysis evaluated the impacts of Puente during startup/shutdown with existing cumulative sources using non-adjusted u* option. For comparison purposes, **Air Quality Appendix Air-3 Table 4** shows impacts of Puente during startup/shutdown with and without cumulative sources from staff's independent analysis using the non-adjusted u* option.

For the 1-hour NO_2 impacts during Puente startup/shutdown, PSA **Air Quality Table 25** used full conversion of NOx to NO_2 (see more details regarding different tier methods

for NO_2 modeling in the **NO_2 IMPACTS ANALYSIS** section below). Staff's independent analysis used PVMRM option to model the 1-hour NO_2 impacts during Puente startup/shutdown with cumulative sources. For Puente impacts only (turbine and emergency engine), staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background. Staff was able to demonstrate compliance with the1-hour NO_2 NAAQS with this conservative approach. Therefore, no further analysis is required for the Puente impacts without the cumulative sources. However, for the cumulative impacts analysis, staff used a more refined approach by pairing the modeled impacts with monthly hour-of-day NO_2 backgrounds. See more details of the NO_2 modeling options in the **NO_2 IMPACTS ANALYSIS** section below.

Air Quality Appendix Air-3 Table 4
Puente Startup/Shutdown Impacts, (µg/m³)
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	Limiting Standard (µg/m³)	Type of Standard	Percent of Standard
Puente turbine startup/shutdown with emergency engine							
NO_2 [a]	1 hour	61.6	107	168.6	339	CAAQS	50%
	1 hour NAAQS [b]	61.6	68	129.6	188	NAAQS	69%
CO	1 hour	356.8	4,582	4,939	23,000	CAAQS	21%
	8 hour	71.8	1,265	1336.8	10,000	CAAQS	13%
Puente turbine startup/shutdown with emergency engine, MGS Units 1, 3, and McGrath							
NO_2 [a]	1 hour	181.8	107	288.8	339	CAAQS	85%
	1 hour NAAQS [c]	-	-	173.2	188	NAAQS	92%
CO	1 hour	358.3	4,582	4,940	23,000	CAAQS	21%
	8 hour	86.5	1,265	1351.5	10,000	CAAQS	14%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used PVMRM to model the 1-hour NO_2 impacts.
[b] For Puente impacts only, staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background.
[c] The total cumulative impact for the 1-hour NO_2 NAAQS is the 5-year average of the 98th percentile daily modeled concentration paired with the monthly hour-of-day background concentration.

PSA Air Quality Table 25 (Reproduced)
Puente Startup/Shutdown Impacts, (µg/m³)
(Using AERMOD Adjusted u* Option)

Pollutant	Averaging Period	Project Impact (µg/m³)	Background (µg/m³) [a]	Total Impact (µg/m³)	Limiting Standard (µg/m³)	Type of Standard	Percent of Standard
NO_2	1 hour	44.5	107	151.5	339	CAAQS	45%
	1 hour NAAQS	44.5	68	112.5	188	NAAQS	60%
CO	1 hour	207.2	4,582	4,789	23,000	CAAQS	21%
	8 hour	80.4	1,265	1,345	10,000	CAAQS	14%

Source: VCAPCD 2016c, Appendix G Table 5-14 Level 1 AAQA results
[a] Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.

Comparing to the results (using Adjusted u* option) shown in the PSA **Air Quality Table 25**, the impacts of Puente (turbine and emergency engine) during startup/shutdown shown in the upper half of **Air Quality Appendix Air-3 Table 4** would be higher using the non-adjusted u* option (regulatory default option), except for the 8-hour CO. The cumulative 1-hour NO_2 impacts shown in the lower half of **Air Quality Appendix Air-3 Table 4** are dominated by the existing MGS Unit 3. However, **Air Quality Appendix Air-3 Table 4** shows that the proposed Puente project's maximum startup/shutdown emission impacts (with or without the cumulative sources) would not cause any new significant ambient impacts of NO_2 and CO.

This conclusion would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

Commissioning Impacts

PSA **Air Quality Table 27** showed Puente impacts during the turbine initial commissioning (without cumulative sources) modeled using AERMOD with Adjusted u* option. Staff's independent analysis evaluated the impacts of Puente during initial commissioning with existing cumulative sources using AERMOD non-adjusted u* option. For comparison purposes, **Air Quality Appendix Air-3 Table 5** shows results of Puente during initial commissioning with and without cumulative sources from staff's independent analysis.

Similar to the startup/shutdown impacts analysis, PSA **Air Quality Table 27** used full conversion of NOx to NO_2 to evaluate the 1-hour NO_2 impacts of Puente during initial commissioning. Staff's independent analysis used PVMRM option to model the 1-hour NO_2 impacts of Puente during initial commissioning with cumulative sources. For Puente impacts only, staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98^{th} percentile background. Staff was able to demonstrate compliance with the1-hour NO_2 NAAQS with this conservative approach. Therefore, no further analysis is required for Puente impacts without the cumulative sources. However, for the cumulative impacts analysis, staff used a more refined approach by pairing the modeled impacts with monthly hour-of-day NO_2 backgrounds. See more details of the NO_2 modeling options in the **NO_2 IMPACTS ANALYSIS** section below.

Comparing results (using Adjusted u* option) shown in the PSA **Air Quality Table 27**, the impacts of Puente during initial commissioning (without cumulative sources) shown in the upper half of **Air Quality Appendix Air-3 Table 5** would be higher using the non-adjusted u* option (regulatory default option). However, **Air Quality Appendix Air-3 Table 5** shows that the project's maximum initial commissioning emission impacts (with or without cumulative sources) would be below the most stringent ambient air quality standards for NO_2, PM2.5, and CO. The commissioning impacts have the potential to worsen the existing violations of the 24-hour PM10 ambient air quality standard and are, therefore, potentially significant. The background values alone are greater than the 24-hour PM10 California Ambient Air Quality Standards (CAAQS).

The above conclusions would not change whether the Adjusted u* or non-adjusted u* option is used in AERMOD.

Air Quality Appendix Air-3 Table 5
Maximum Puente Initial Commissioning Impacts
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
Puente commissioning impacts only							
NO_2 [a]	1 hour	48.1	107	155.1	339	CAAQS	46%
	1 hour NAAQS [b]	48.1	68	116.1	188	NAAQS	62%
PM10	24 hour	0.2	**56.9**	**57.1**	50	CAAQS	**114%**
PM2.5	24 hour	0.2	17.8	18.0	35	NAAQS	51%
CO	1 hour	425.1	4,582	5007.1	23,000	CAAQS	22%
	8 hour	117.1	1,265	1382.1	10,000	CAAQS	14%
Puente commissioning with MGS Units 1, 2, 3, and McGrath							
NO_2 [a]	1 hour	186.1	107	293.1	339	CAAQS	86%
	1 hour NAAQS [c]	-	-	177.0	188	NAAQS	94%
PM10	24 hour	1.6	**56.9**	**58.5**	50	CAAQS	**117%**
PM2.5	24 hour	1.6	17.8	19.4	35	NAAQS	56%
CO	1 hour	446.6	4,582	5028.6	23,000	CAAQS	22%
	8 hour	126.1	1,265	1391.1	10,000	CAAQS	14%

Source: Energy Commission staff independent analysis
Notes:
[a] Staff used PVMRM to model the 1-hour NO_2 impacts.
[b] For Puente impacts only, staff conservatively computed the total 1-hour NO_2 NAAQS impact by combining the worst-case modeled project impact over the 5-year modeling period with the 98th percentile background.
[c] The total cumulative impact for the 1-hour NO_2 NAAQS is the 5-year average of the 98th percentile daily modeled concentration paired with the monthly hour-of-day background concentration.

PSA Air Quality Table 27 (Reproduced)
Maximum Puente Initial Commissioning Impacts
(Using AERMOD Adjusted u* Option)

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [a]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2 [b]	1 hour	26.2	107	133.2	339	CAAQS	39%
	1 hour NAAQS	26.2	68	94.2	188	NAAQS	50%
PM10	24 hour	0.1	**56.9**	**57**	50	CAAQS	**114%**
PM2.5	24 hour	0.1	17.8	17.9	35	NAAQS	51%
CO	1 hour	209.8	4,582	4,792	23,000	CAAQS	21%
	8 hour	54	1,265	1,319	10,000	CAAQS	13%

Source: VCAPCD 2016c, Appendix G Table
[a] Background values are adjusted, based on the District's evaluation in their AQIA, as presented in **Air Quality Table 10**.
[b] NO_2 1-hour impacts provided in the District's AQIA are presented with background.
Bold is used to show values greater than the limiting standard.

NO_2 IMPACTS ANALYSIS

The following responses to the Sears Expert Report (SC 2016a) are mainly about refinement of air quality impacts analysis. The normal process for doing air quality impacts analysis is to start with the most conservative, over-predicting level of analysis. If compliance with the Ambient Air Quality Standards (AAQS) is not demonstrated with

the most conservative analysis, a more refined analysis would be performed by relaxing levels of conservatism until compliance with AAQS is demonstrated. Only when further relaxation is inappropriate would staff conclude that the project would cause a violation of an AAQS.

Justifications of using Tier 3 methods for NO_2 impacts analysis

The Sears Expert Report (SC 2016a) commented that using Tier 3 methods for comparison to the NO_2 Ambient Air Quality Standards (AAQS) for the Puente project is not appropriate. Staff provides the following justifications of using Tier 3 methods for nitrogen dioxide (NO_2) impacts analysis.

The 1-hour NO_2 California Ambient Air Quality Standard (CAAQS) is attained when the 1-hour concentration does not exceed 0.18 parts per million (ppm, equivalent to 339 micrograms per cubic meter [$\mu g/m^3$]). Effective on April 12, 2010, U.S. EPA established a new 1-hour NO_2 National Ambient Air Quality Standard (NAAQS) at a level of 100 parts per billion (ppb or 188 $\mu g/m^3$), based on the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour concentrations.

When oxides of nitrogen (NOx) are emitted, they are mostly nitric oxide (NO), which is not a criteria pollutant. During atmospheric transport, NO is converted to NO_2, which is a criteria pollutant. Ozone (O_3) is usually responsible for most of the oxidation from NO to NO_2. Tier 1 method assumes full conversion of NO to NO_2. Tier 2 method (or the Ambient Ratio Method [ARM]) multiplies Tier 1 results by empirically derived NO_2/NOx ratios: 0.75 for annual NO_2 impacts and 0.8 for hourly NO_2 impacts. The Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM) are referred to as Tier 3 methods, which simulate chemistry to better estimate the NO_2 impacts.

The OLM analysis option uses a simplified approach to the reaction chemistry. It assumes that O_3 and NO react to form NO_2 in proportion to their ground-level concentrations in ppm. If O_3 concentration is greater than the NO concentration, then total NOx to NO_2 conversion is assumed; if the NO concentration is greater than the O_3 concentration, the formation of NO_2 is limited by the O_3 concentration. However, the actual reactions occur in proportion to the moles of each reactant rather than in proportion to concentration. And as plumes expand, more O_3 is available for reaction. The newer method, PVMRM, better simulates the NO-to-NO_2 conversion chemistry during plume expansion. It computes the number of moles of NOx and O_3 that are contained within a plume segment as it reaches a receptor (Hanrahan 1999a). Although the PVMRM follows the same chemical reactions as those used in the OLM, it uses both plume size and O_3 concentration to derive the amount of O_3 available for the reaction.

Page 8 of Sears Expert Report (SC 2016a) referred to the U.S. EPA 2010 Memorandum: *Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*, which said, "*application of AERMOD with the OLM or PVMRM option is no longer considered a 'preferred model' and, therefore, requires justification and approval by the Regional Office on a case-by-case basis*." Ms. Sears concluded that using Tier 3 methods for comparison to the NO_2 NAAQS and CAAQS in this case is not appropriate. But Ms. Sears performed modeling analyses applying all three tiers for comparison to the NO_2 NAAQS and CAAQS. Furthermore,

Ms. Sears' conclusion is incorrect because she did not refer to the most recent U.S. EPA guidance document (see more discussion below).

After the 2010 memorandum, U.S. EPA performed additional evaluations of OLM and PVMRM and issued a new memorandum in 2011:

> "*Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*. U.S. EPA's 2011 memorandum stated that the additional evaluations showed "*generally good performance for the PVMRM and OLM/OLMGROUP ALL options in AERMOD. We believe that these additional model evaluation results lend further credence to the use of these Tier 3 options in AERMOD for estimating hourly NO_2 concentrations, and we recommend that their use should be generally accepted provided some reasonable demonstration can be made of the appropriateness of the key inputs for these options, the in-stack NO_2/NOx ratio and the background ozone concentrations*."

U.S. EPA considers both OLM and PVMRM to be acceptable as Tier 3 options and does not indicate any preference between these two options.

In October 2011, the California Air Pollution Control Officers Association (CAPCOA) also published a guidance document: *Modeling Compliance of the Federal 1-Hour NO_2 NAAQS*. The CAPCOA guidance document provided overall justifications for the use of OLM and PVMRM as refined alternative models in accordance with the five requirements specified in Section 3.2.2, paragraph (e) of Appendix W *Guideline on Air Quality Models*. The following paragraphs are summarized from the CAPCOA guidance document. Staff also included additional justifications related to the Puente project where needed. For more detailed discussion of the overall justifications, please refer to the CAPCOA guidance document.

i. <u>The model has received a scientific peer review</u>
As noted in the U.S. EPA 2010 Memorandum: *Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*:
"*Since AERMOD is the preferred model for dispersion for a wide range of application, the focus of the alternative model demonstration for use of the OLM and PVMRM options within AERMOD is on the treatment of NO_X chemistry within the model, and does not need to address basic dispersion algorithms within AERMOD*."

The chemistry for both OLM and PVMRM has been peer-reviewed as noted by the documents posted on U.S. EPA's Support Center for Regulatory Air Modeling (SCRAM) web site entitled "Sensitivity Analysis of PVMRM and OLM in AERMOD" and "Evaluation of Bias in AERMOD-PVMRM". Both documents indicate that the models appear to perform as expected.

ii. <u>The model can be demonstrated to be applicable to the problem on a theoretical basis</u>
The document entitled "Sensitivity Analysis of PVMRM and OLM in AERMOD" by Roger W. Brode of MACTEC (now with U.S. EPA) presented

results of a sensitivity analysis of the PVMRM and OLM options for NOx to NO_2 conversion in AERMOD for several single source scenarios and a multiple source scenario. The average conversion ratios of NOx to NO_2 for the PVMRM option tend to be lower than for the OLM option and for the Tier 2 option (ARM). The sensitivity of the PVMRM and OLM options to emission rate, source parameters and modeling options appear to be reasonable and are as expected based on the formulations of the two methods. Overall the PVMRM option appears to provide a more realistic treatment of the conversion of NOx to NO_2 as a function of distance downwind from the source than OLM or the other NO_2 screening options (Hanrahan, 1999a; Hanrahan, 1999b). No anomalous behavior of the PVMRM or OLM options was identified as a result of these sensitivity tests.

Based on the above mentioned report, both OLM and PVMRM appear to be applicable to the problem of NO_2 formation and, as noted by the author, provide a better estimation of the NO_2 impacts compared to other screening options (Tier 1 and 2).

iii. <u>The data bases which are necessary to perform the analysis are available and adequate</u>

The data required to conduct an OLM/PVMRM run are: hourly meteorological data, hourly ozone data, and the in-stack NO_2/NOx ratio.

The following text in this paragraph applies to the analyses conducted for Puente and existing cumulative sources. The District provided 5 years (2010-2014) of hourly meteorological data with and without Adjusted u* option. The meteorological data include surface meteorological data recorded at the most representative Oxnard Airport monitoring station and upper air data recorded at Vandenberg AFB. Concurrent (2010-2014) hourly ozone data were collected at the most representative Oxnard (Rio Mesa School) monitoring station for air quality. The in-stack NO_2/NOx ratios for the new gas turbine at Puente are based on information provided by the gas turbine vendor (30 percent during normal operation and 40 percent during startups/shutdowns/commissioning). An in-stack NO_2/NOx ratio of 32.3 percent was used for the new diesel emergency generator engine based on U.S. EPA's In-Stack Ratio (ISR) database. An in-stack NO_2/NOx ratio of 10 percent was used for the existing MGS Units 1 and 2 based on the default ratio for natural gas-fired boilers listed in the CAPCOA 2011 guidance document. An in-stack NO_2/NOx ratio of 30 percent was used for the existing MGS Unit 3 based on the in-stack NO_2/NOx ratio used for the Puente new gas turbine during normal operations. A default in-stack NO_2/NOx ratio of 50 percent was used for both the turbine and black start engine at McGrath as suggested in the U.S. EPA's 2011 memorandum.

iv. <u>Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates</u>

As noted in the document "Evaluation of Bias in AERMOD-PVMRM" by Roger W. Brode of MACTEC (now with U.S. EPA), PVMRM has been judged to

provide unbiased estimates based on criteria that are comparable to, or more rigorous than, evaluations performed for other dispersion models.

No assessment of bias has been conducted for the OLM algorithm. However, as discussed in part ii. above, OLM provides more conservative results (higher conversion ratios from NOx to NO_2) than PVMRM. Therefore it is assumed that OLM would also provide an unbiased estimate of the modeled NO_2 concentration.

v. A protocol on methods and procedures to be followed has been established
The following text in this paragraph applies to the analyses conducted for Puente and existing cumulative sources. The applicant proposed methods and procedures are shown in the Appendix C-4 Air Quality Modeling Protocol in the AFC, which were approved by the District and the Energy Commission. The applicant used OLM with Adjusted u* option in AERMOD to evaluate the NO_2 impacts of Puente and existing sources. To respond to Ms. Sears comments, staff has performed an independent analysis of the NO_2 impacts using PVMRM and non-adjusted u* option (regulatory default option). See more details about staff's independent analysis below.

Based on the above reasons, staff believes that it is appropriate to use either OLM or PVMRM as Tier 3 methods to evaluate the NO_2 impacts of the Puente project as well as the existing cumulative sources. The Energy Commission has approved other siting projects that used either OLM or PVMRM to evaluate the NO_2 impacts (e.g. Carlsbad Energy Center AFC [CEC 2009] used OLM for construction and PVMRM for normal operations, Carlsbad Energy Center amendment [CEC 2015] used OLM, Pio Pico Energy Center (CEC 2012) used PVMRM, etc).

Staff's independent analysis of the 1-hour NO_2 impacts during construction of Puente used Ozone Limiting Method (OLM), which is consistent with the applicant's analysis. Staff computed the worst-case total impacts by combining the worst-case modeled impacts with worst-case background values. As shown in **Air Quality Appendix Air-3 Table 1**, staff was able to demonstrate compliance with the 1-hour NO_2 CAAQS. No further analysis is required. The construction phase would only take 18 months. Staff does not expect the Puente project to have a significant impact for the 1-hour NO_2 NAAQS due to limited peak construction period compared to the three year averaging period for this standard. Therefore, staff did not perform additional impacts analysis during construction of Puente with respect to the 1-hour NO_2 NAAQS.

For annual NO_2 impacts analysis during construction and normal operations of Puente, staff used the Tier 2 option (ARM) with the ambient NO_2 / NOx ratio of 0.8 (instead of 0.75 based on the District's suggestion). Staff was able to demonstrate compliance with the annual NO_2 CAAQS (as well as NAAQS). No further analysis is required.

The modeling analyses discussed in the following sections are specifically related to the 1-hour NO_2 impacts during commissioning, startups/shutdowns, and normal operations.

Problems in Ms. Sears' modeling analysis

Staff reviewed the Sears Expert Report (SC 2016a) and the accompanying modeling files (SC 2016b). Staff found the following problems in Ms. Sears' modeling that need to be corrected.

- Exit velocities
  Table 1 on page 7 of Sears Expert Report (SC 2016a) shows that Ms. Sears used an exit velocity of 47.2 meters per second (m/s) for the Puente new gas turbine during commissioning. However, the exit velocity of 47.2 m/s is for full load operations, while the applicant used a lower (usually more conservative) exit velocity of 25.6 m/s for the Puente new gas turbine during commissioning to represent the tuning and testing activities under lower load conditions. Staff believes that the exit velocity of the Puente new gas turbine during commissioning in Ms. Sears' modeling analysis should be revised from 47.2 m/s to 25.6 m/s.

  Table 1 on page 7 of Sears Expert Report also shows that Ms. Sears used an exit velocity of 13.6 m/s for the existing MGS Units 1 and 2 during commissioning of Puente. However, the exit velocity of 13.6 m/s corresponds to the assumption that MGS Unit 2 would shut down and MGS Unit 1 would continue to operate after Puente is operational (as shown in Table 2 of Sears Expert Report). During commissioning of Puente, both MGS Units 1 and 2 would still be available. Because MGS Units 1 and 2 have a joint stack, the exit velocity when both of them are operating is higher than that when only one of them is operating. The applicant used an exit velocity of 27.6 m/s for both MGS Units 1 and 2 operating during commissioning of Puente. Staff believes that the exit velocity of MGS Units 1 and 2 during commissioning of Puente in Ms. Sears' modeling analysis should be revised from 13.6 m/s to 27.6 m/s.

- NOx emission rates
  Table 2 on page 7 of Sears Expert Report (SC 2016a) shows the NOx emission rate to be 31.0 grams per second (g/s) for the Puente new gas turbine during normal operations. But Ms. Sears actually used 2.91 g/s in the modeling files for normal operations, which is consistent with what the applicant used. However, Ms. Sears did not model Puente during startups and shutdowns. Staff believes that impacts of Puente during startups and shutdowns with existing sources should also be analyzed, which the applicant did in the AFC and subsequent data responses. The applicant used a NOx emission rate of 18.0 g/s for Puente during startups and shutdowns.

- McGrath coordinates
  Footnote 5 on Page 12 of Sears Expert Report (SC 2016a) shows that the McGrath facility data were obtained from Southern California Edison, Appendix D: *Mandalay Peaker Project Air Quality Impact Analysis* (February 2007), which is available at https://www.sce.com/NR/rdonlyres/E515C7D3-0662-430F-8232-312CD5E5D966/0/EnvironmentalDocumentsMND0702Appendix.pdf. However, page D-20 of this Appendix D shows that modeling of McGrath was based on the use of Universal Transverse Mercator (UTM) North American Datum of 1927 (NAD27), which is older than North American Datum of 1983 (NAD83) currently being used by modelers including Ms. Sears, the applicant, and staff. Staff

believes that the coordinates of McGrath should be converted from NAD27 to NAD83 so that they are consistent with the coordinates used by Ms. Sears and the applicant for other sources and receptors.

Staff's NO_2 impacts analysis

As discussed in **Air Quality Appendix Air-2**, staff has determined there is significant evidence that the use of Adjusted u* option improves AERMOD performance and could be used for analyzing the impacts of this project. Nonetheless, to respond to Ms. Sears' comments, Energy Commission staff has performed an additional analysis using the non-adjusted u* option (AERMOD regulatory default option) to evaluate the project impacts against the 1-hour NO_2 standards. Since the results of either option show that the AAQS are not exceeded, staff reports the more conservative non-adjusted u* results in the FSA.

Staff's modeling analysis starts with the input files provided by Ms. Sears. Staff revised the problematic parameters mentioned above. In addition to the 73,190 receptors used by Ms. Sears, staff added more refined receptors with a resolution of 25 meters where potential worst-case impacts could occur. In addition to the commissioning and normal operations of Puente that Ms. Sears analyzed, staff also modeled impacts of Puente during startups/shutdowns with existing sources. Ms. Sears separated modeling runs with and without McGrath. Staff included McGrath, as well as Puente, MGS Units 1, 2 (during construction and commissioning only), and 3, in all the modeling runs that staff performed.

Ms. Sears showed possible exceedance of the 1-hour NO_2 CAAQS and NAAQS using Tier 1 and Tier 2 methods and possible exceedance of only the 1-hour NO_2 NAAQS using OLM (Tier 3 method). In her analysis, Ms. Sears computed the total NO_2 impacts by combining the worst-case (maximum for the 1-hour CAAQS and 98th percentile for the 1-hour NAAQS) modeled impacts with the worst-case (maximum for the 1-hour CAAQS and 98th percentile for the 1-hour NAAQS) background. It should be noted that to avoid "double counting" from the existing sources in the background concentration, Ms. Sears reduced the monitored background concentration by subtracting the modeled concentrations from existing sources.

Combining the worst-case modeled impacts with worst-case background conservatively assumes that they would occur at the same time during the worst-case meteorological conditions, which is an unlikely scenario. When compliance with AAQS cannot be demonstrated with such conservative assumptions, normally a more refined approach would be used to combine the modeled impacts with the background values. U.S. EPA's 2011 memorandum on the 1-hour NO_2 NAAQS stated,

> "*One of the important factors to consider in relation to this issue is that the standard is based on the annual distribution of daily maximum 1-hour values, which implies that diurnal patterns of ambient impacts could play a significant role in determining the most appropriate method for combining modeled and monitored concentrations. For example, if the daily maximum 1-hour impacts associated with the project emissions generally occur under nighttime stable conditions whereas maximum monitored concentrations occur during daytime convective conditions, pairing modeled and monitored concentrations based on*

hour of day should provide a more appropriate and less conservative estimate of cumulative impacts than a method that ignores this diurnal pattern."

To demonstrate compliance with 1-hour NO_2 NAAQS, the applicant combined the modeled hourly NO_2 impacts with the monthly hour-of-day NO_2 background values measured at the Oxnard (Rio Mesa School) monitoring station. The monthly hour-of-day NO_2 background concentrations are 3-year (2012-2014) averaged first highest concentrations (maximum hourly) for each hour of the day. The total impact for the 1-hour NO_2 NAAQS is the 5-year average of the 98th percentile daily modeled concentration paired with the monthly hour-of-day background concentration. This method complies with the above mentioned U.S. EPA suggestion and CAPCOA 2011 guidance document.

In order to provide more refined modeling results during commissioning, startups/shutdowns, and normal operations of Puente, staff's Tier 3 analysis used PVMRM instead of OLM. To evaluate compliance with 1-hour NO_2 NAAQS, staff combined the modeled NO_2 impacts with the monthly hour-of-day NO_2 background. Note that the monthly hour-of-day NO_2 background values did not take into account the "double counting" from the existing sources. Therefore, staff believes that combining the modeled NO_2 impacts from Puente with the existing sources and the monthly hour-of-day NO_2 background may include some double counting of existing sources and is thus still a conservative approach.

Except as mentioned above, staff used the same input files and exhaust parameters that Ms. Sears used.

NO_2 impacts results and discussions

Air Quality Appendix Air-3 Table 6 summarizes the results of staff's independent analysis of the 1-hour NO_2 cumulative impacts of Puente with existing sources with respect to the CAAQS and NAAQS. These results were already included in the corresponding tables shown above.

Air Quality Appendix Air-3 Table 6 shows that, with a more refined Tier 3 modeling analysis using PVMRM, and a more refined pairing of modeled impacts and background concentrations, Puente with existing sources would not exceed the 1-hour NO_2 CAAQS or NAAQS during commissioning, startups/shutdowns, or normal operations. Therefore, staff believes that Ms. Sears' statement that the project will cause violations of 1-hour NO_2 CAAQS and NAAQS is incorrect.

It should be emphasized that: 1) Staff's analysis used the non-adjusted u* option (AERMOD regulatory default option) as requested by Ms. Sears, but staff believes that there is significant evidence that the use of Adjusted u* option improves AERMOD performance and could be used for further refining the impacts of this project; 2) Staff's analysis included Puente with the existing sources (MGS Units 1, 2, 3, and McGrath); 3) Staff used a more refined approach, PVMRM, instead of OLM to evaluate the 1-hour NO_2 impacts; 4) For the 1-hour NO_2 NAAQS, staff combined the modeled NO_2 impacts with the monthly hour-of-day NO_2 background; 5) Staff's analysis did not take into account the potential "double counting" from the existing sources in the background concentrations, which means staff's analysis is very conservative.

Air Quality Appendix Air-3 Table 6
Cumulative One-hour NO_2 Impacts of Puente with Existing Sources[c]
(Using AERMOD Non-adjusted u* Option [Regulatory Default Option])

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
Commissioning of Puente with existing sources						
NO_2	1-hour CAAQS[a]	186.1	107	293.1	339	86%
	1-hour NAAQS[b]	-	-	177.0	188	94%
Startups/shutdowns of Puente with existing sources						
NO_2	1-hour CAAQS[a]	181.8	107	288.8	339	85%
	1-hour NAAQS[b]	-	-	173.2	188	92%
Normal operations of Puente with existing sources						
NO_2	1-hour CAAQS[a]	178.8	107	285.8	339	84%
	1-hour NAAQS[b]	-	-	170.9	188	91%

Source: Energy commission staff independent analysis
Notes:
[a] The total concentration for the 1-hour NO_2 CAAQS is the maximum impact modeled over 5 years combined with the maximum background concentration from 2012 to 2014.
[b] The total concentration for the 1-hour NO_2 NAAQS is the 5-year average of the 98th percentile daily modeled concentration paired with the monthly hour-of-day background concentration.
[c] Existing sources include MSG Units 1, 2 (during commissioning and construction only), 3, and McGrath.

Staff noticed that the 1-hour NO_2 impacts are dominated by the existing MGS Unit 3, not the Puente project. In Ms. Sears' analysis, the violations of the 1-hour NO_2 were due to the MGS Unit 3, not the Puente project. However, MGS Unit 3 is only allowed to operate about 83 hours per year under the current permit (PSA page 4.1-29). The way MGS Unit 3 is modeled may be overly conservative because the analyses all assumed MSG Unit 3 operates with worst-case hourly emissions every hour of the year over the 5-year modeling period. The modeling analysis determines the worst-case impacts when the worst-case emissions coincide with worst-case meteorological conditions. These worst-case modeled impacts could be significantly higher than what would be reasonably expected given that MSG Unit 3 could only operate 83 hours per year (less than 1 percent of the hours in a year). Therefore, the contribution of MGS Unit 3 to the statistical form of the 1-hour NO_2 NAAQS (3-year average of the 98th percentile daily maximum 1-hour concentrations) could be much lower than what was modeled. In fact, MGS Unit 3 only operated 7 hours last year. Its contribution to the 98th percentile (8th highest) maximum 1-hour concentrations would be zero from last year. In addition according to U.S. EPA's 2011 guidance, MGS Unit 3 most likely would qualify as an intermittent source. This U.S. EPA guidance suggests exclusion of certain types of intermittent emissions from compliance demonstration for the 1-hour NO_2 NAAQS or reducing the emission rate by averaging the annual emissions over the whole year (8,760 hours). According to U.S. EPA's guidance, the contribution of MGS Unit 3 to the 1-hour NO_2 NAAQS impacts would be either zero or much less than that assuming continuously operation with worst-case hourly emissions. Nonetheless, staff has

demonstrated compliance with the 1-hour NO_2 NAAQS assuming continuous operation of Puente and the existing cumulative sources, including MGS Unit 3.

Staff also noticed that MGS Unit 3 dominates the 1-hour NO_2 impacts regardless of whether Adjusted u* option is used or not. When non-adjusted u* option (regulatory default option) is used, the critical worst-case impacts of MGS Unit 3 would occur on the complex terrain that is about 9 km north of the Puente project site during low wind stable conditions when the estimated u* values were low. Meanwhile, U.S. EPA has approved the use of Adjusted u* option for Schiller Station energy generating facility in New Hampshire (Region 1), the Herbert A. Wagner Generating Station (Wagner) facility in Maryland (Region 3), and the R.M. Heskett Station (Heskett) facility in North Dakota (Region 8). These cases all include tall stacks with complex terrains. With non-adjusted u* option (regulatory default option), the most critical impacts of these facilities would all occur at receptors on the distant terrain during low wind stable conditions when u* values were substantially low. The impacts of Puente turbine and MGS Unit 3 behave similarly to the impacts of these facilities. Staff believes that U.S. EPA's approval of using the Adjusted u* option for these cases provides enough justification for using the Adjusted u* option for Puente and most importantly for the MGS Unit 3, which dominates the impacts. Nonetheless, staff has demonstrated compliance with the 1-hour NO_2 CAAQS and NAAQS of Puente with existing sources both with and without the Adjusted u* option.

It should also be noted that commissioning of Puente would only take 6 weeks. It is unlikely that the contribution of such short term activities to the statistical form of 1-hour NO_2 NAAQS (3-year average of the 98^{th} percentile daily maximum 1-hour concentrations) would be significant. However, for completeness, staff analyzed the 1-hour NO_2 impacts of Puente during commissioning with existing sources for both CAAQS and NAAQS, assuming commissioning of Puente would occur continuously during the 5-year modeling period. Similarly, assuming startups/shutdowns would occur continuously during the 5-year modeling period is also very conservative since the applicant only proposed 200 startups and 200 shutdowns annually. The reasonably expected contribution to the 1-hour NO_2 NAAQS from Puente during commissioning and during startups/shutdowns would be much smaller than those estimated from the modeling analysis. But as discussed above, the worst-case impacts are due to the existing MGS Unit 3, not the proposed Puente project.

REFERENCES

CEC 2009 – California Energy Commission, Final Staff Assessment, Carlsbad Energy Center Project, Application for Certification (07-AFC-6), November 2009.

CEC 2012 – California Energy Commission, Final Staff Assessment, Pio Pico Energy Center (11-AFC-1), May 2012.

CEC 2015 – California Energy Commission, Final Staff Assessment, Carlsbad Energy Center Project Amendment (07-AFC-06C), February 2015.

ECVC/SC/ED 2016c-- Comments on PSA--Environmental Coalition, Sierra Club, Environmental Defense Center (intervenors) (TN 213635) dated September 13, 2016. Submitted to CEC/Docket Unit on September 13, 2016.

Hanrahan, P.L., 1999a. The plume volume molar ratio method for determining NO_2/NOx ratios in modeling. Part I: Methodology, *J. Air & Waste Manage. Assoc.*, 49, 1324-1331.

Hanrahan, P.L., 1999b. The plume volume molar ratio method for determining NO_2/NOx ratios in modeling. Part II: Evaluation Studies, *J. Air & Waste Manage. Assoc.*, 49, 1332-1338.

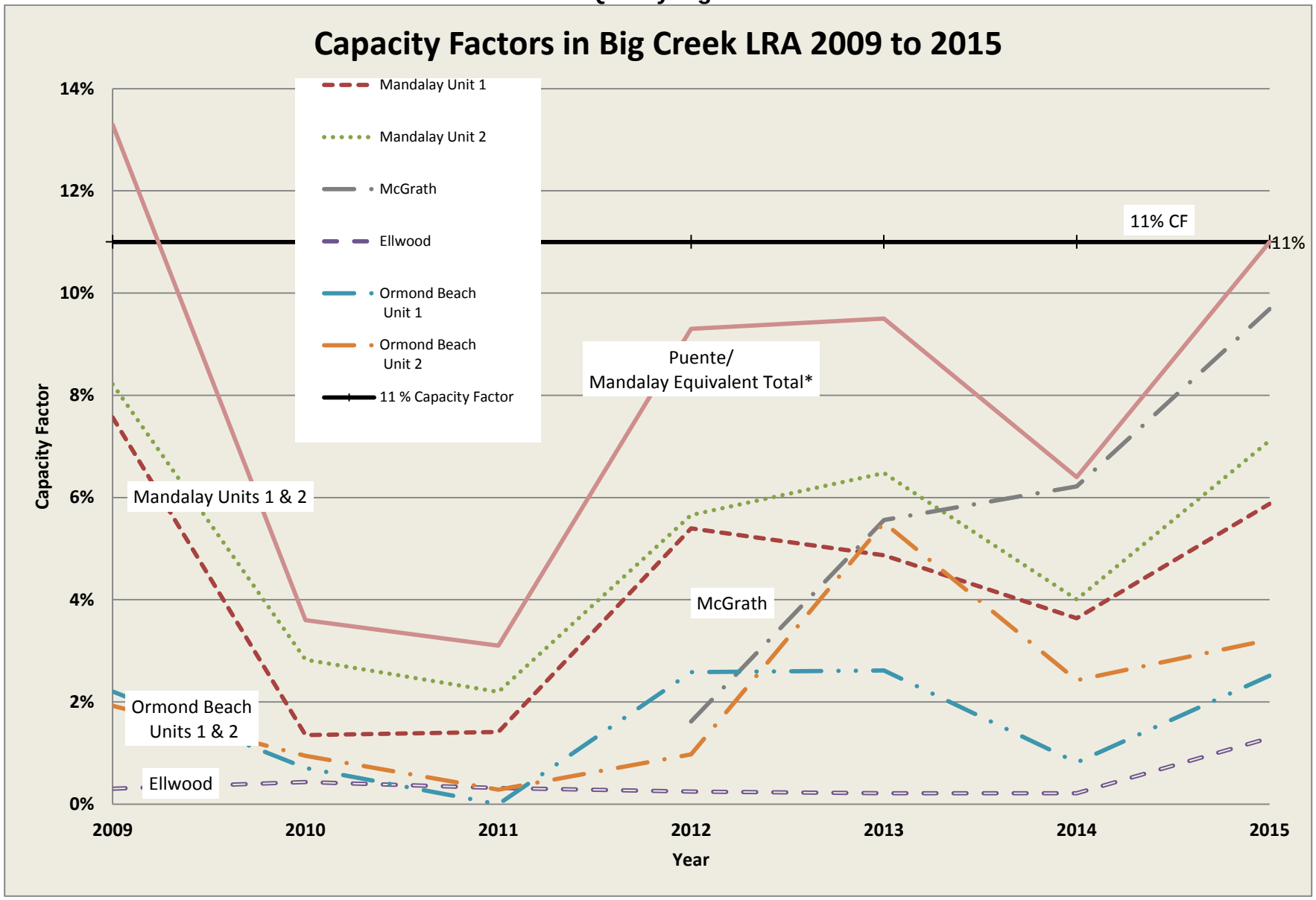
SCE 2007 - Southern California Edison, Before the Public Utilities Commission of the State of California, Assigned Commissioner's Ruling Addressing Electric Reliability Needs in Southern California for Summer 2007, Appendix D: *Mandalay Peaker Project Air Quality Impact Analysis*, February 2007, available at https://www.sce.com/NR/rdonlyres/E515C7D3-0662-430F-8232-312CD5E5D966/0/EnvironmentalDocumentsMND0702Appendix.pdf.

SC 2016a-- Sierra Club Comments on Ventura County APCD's Preliminary Determination of Compliance - Puente Power Plant (TN 212635-1-212635-4) dated July 29, 2016. Submitted to CEC/Docket Unit on August 4, 2016.

SC 2016b-- Air Modelling Files in Support of Comments on the PSA (TN 214489) dated November 11, 2016. Submitted to CEC/Docket Unit on November 11, 2016.

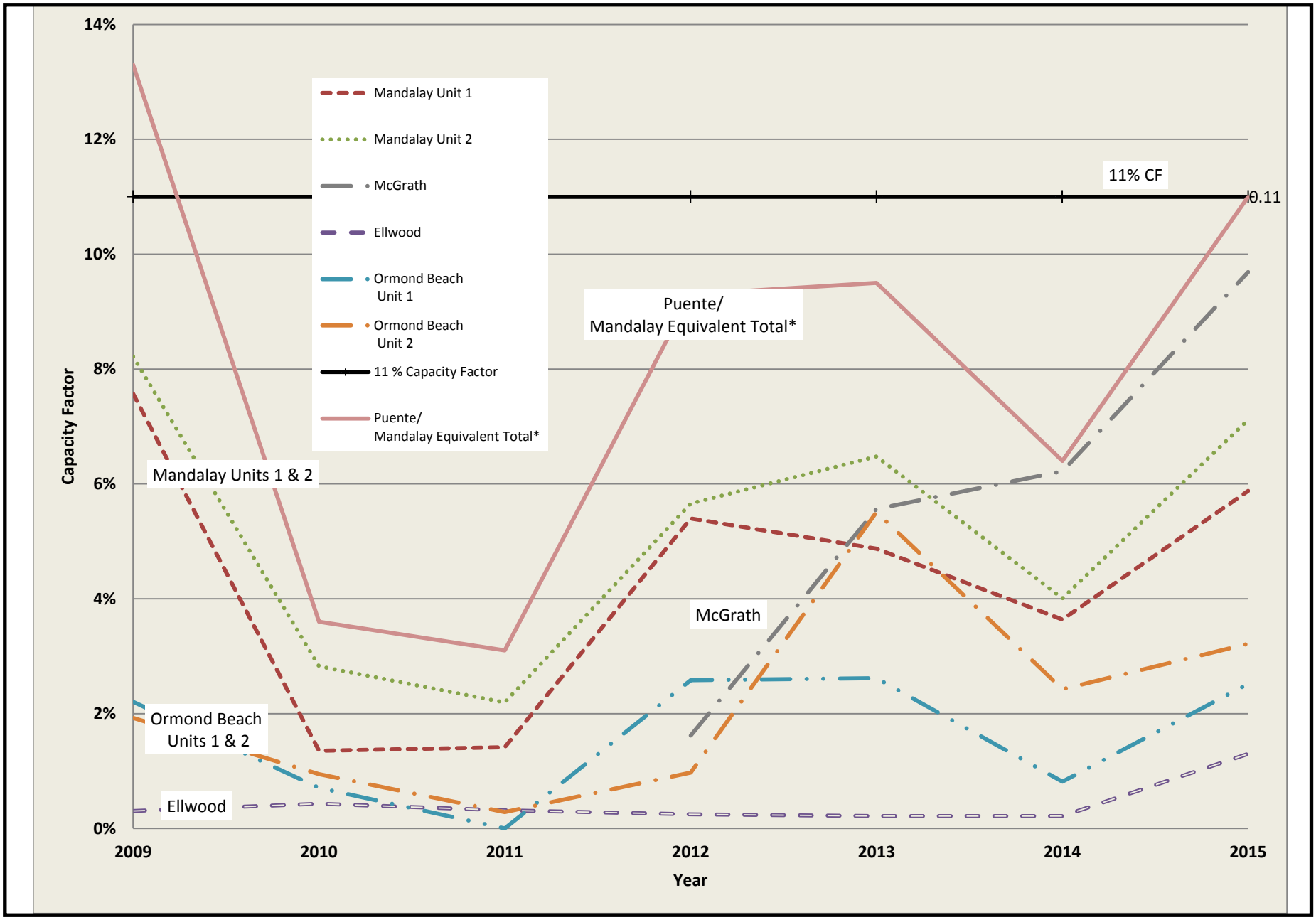
U.S. EPA 2015b – U.S. Environmental Protection Agency. Clarification on the Approval Process for Regulatory Application of the AERMOD Modeling System Beta Options, December 2015.

Air Quality Figure 1



AIR QUALITY - FIGURE 1

Puente Power Project - Capacity Factors in Big Creek LRA 2009 to 2015



AIR QUALITY

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: QFER 2016

ALTERNATIVES

Testimony of Jeanine Hinde and David Vidaver[1]

SUMMARY CONCLUSIONS

This analysis evaluates a reasonable range of potentially feasible alternatives to the proposed Puente Power Project (Puente or proposed project). These are California Energy Commission staff's encapsulated conclusions for the alternatives that are fully analyzed and compared to the proposed project, including the No-Project Alternative:

- The **No-Project Alternative** would avoid several environmental impacts relating to project operations; however, it would not meet any of the proposed project's basic objectives. The No-Project Alternative would cause a significant impact on biological resources (special-status birds nesting near the site); this impact would remain significant and unavoidable if the Mandalay Generating Station (MGS) Units 1 and 2 remained nonoperational on the site.
- The **Del Norte/Fifth Street Off-site Alternative** would avoid the significant impact relating to the risk of inundation by tsunami, but use of this site would result in significant and unavoidable impacts on aircraft and pilot safety. Assumptions for this alternative do not necessarily include demolishing and removing MGS Units 1 and 2, which is considered a beneficial visual improvement of the proposed project.
- The **Ormond Beach Area Off-site Alternative** would avoid three potentially significant effects of the proposed project. Impacts that would be avoided include filling of wetlands, risk of inundation by tsunami, and temporary water quality impacts during demolition. Assumptions for this alternative do not necessarily include removing MGS Units 1 and 2, which is considered a benefit of the proposed project.
- **Conceptual Site Reconfigurations 1 and 2** would avoid filling 2.03 acres of Coastal Commission defined wetlands without causing other significant environmental impacts. It is assumed that MGS Units 1 and 2 would be demolished and removed from the site, as proposed by the applicant for Puente.

This alternatives analysis considers many factors in comparing the project alternatives to the proposed project. The Ormond Beach Area Off-site Alternative and the two Conceptual Site Reconfigurations would avoid some of the proposed project's significant impacts.

Under variable conditions and due to its coastal location, staff concludes that the proposed project could be at risk for inundation by tsunami when combined with sea level rise. The Ormond Beach Area Off-site Alternative is outside the area that is subject to risk of inundation by tsunami; therefore, this impact is avoided at the alternative site even when combined with the effects of sea level rise. A 2.03-acre area of Coastal

[1] **Alternatives Appendix 1** lists staff contributors to the technical and environmental analyses of project alternatives.

Commission defined wetlands is located at the Puente site, whereas no wetland or other water is present at the alternative site. The Ormond Beach Area Off-site Alternative would avoid these two impacts of the proposed project, which leads staff to conclude that this off-site alternative is environmentally superior to the Puente Power Project.

The Ormond Beach Area Off-site Alternative is undeveloped, and compared to the proposed project, no temporary, demolition-related water quality impacts would occur at the alternative site.

Following publication of the preliminary staff assessment (PSA), Cultural Resources staff conducted further analysis and determined that the Ormond Beach Area Off-site Alternative could cause one potentially significant impact on a built environment historical resource, the Ventura County Railway. A final impact determination would depend on whether a railroad spur line that crosses part of the alternative site is a contributing element of the Ventura County Railway. This potential impact is analyzed below under “Impacts on Built Environment Resources” for this off-site alternative.

Because Conceptual Site Reconfigurations 1 and 2 would avoid filling 2.03 acres of Coastal Commission defined wetlands, either on-site reconfiguration could be considered environmentally superior to Puente. However, the impact pertaining to the risk for inundation by tsunami would not be avoided by reconfiguring the proposed project on the site.

The Del Norte/Fifth Street Off-site Alternative would cause significant and unavoidable impacts on aircraft and pilot safety, which are impacts that would not occur under the proposed project. Therefore, this off-site alternative is not considered environmentally superior to Puente.

The two off-site alternatives could potentially satisfy half of the project’s basic objectives. However, their feasibility is uncertain given that the applicant does not have site control over either site. The two site reconfigurations could potentially attain the project’s basic objectives, although redesigning the site plan to avoid the wetlands would delay the project schedule. Several environmental impacts of the proposed project would be avoided under the No-Project Alternative. If the existing MGS Unit 1 and 2 power block structures were removed from the site, the No-Project alternative would be environmentally superior to Puente; however, none of the project objectives would be achieved.

INTRODUCTION

Staff reviewed the alternatives analysis contained in the Puente Power Project Application for Certification (AFC) submitted by NRG Oxnard Energy Center LLC (NRG or applicant) (NRG 2015a). In addition to the No-Project Alternative, the AFC discusses alternative generation technologies and configurations, alternative emission control technologies, and alternative water sources and wastewater handling systems.

The AFC concludes that the alternatives were either infeasible or would not attain most of the basic objectives of the proposed project. In identifying, evaluating, and rejecting alternatives, NRG's analysis does not discuss whether any of the proposed project's significant effects can be avoided or substantially lessened by an alternative. Although the AFC does not consider off-site alternatives, NRG subsequently submitted an *Alternative Sites Summary* with information comparing several alternative sites suggested for analysis by city of Oxnard (city) planning staff (NRG 2015b).

The information provided in the AFC served as a starting point for the evaluation of alternatives prepared by staff. Alternatives analyzed in this staff assessment include the off-site alternatives recommended for study by the city. Staff evaluated retrofit alternative scenarios that could allow continued operation of MGS Units 1 and 2 while eliminating use of ocean water for power plant cooling. Alternatives evaluated in this staff assessment are either eliminated from further consideration or compared to the proposed project to determine their potential to avoid or substantially lessen the significant effects of the proposed project while feasibly attaining most of the project's basic objectives.

Staff's analysis assesses the characteristics of preferred resources (energy efficiency, demand response, central station and distributed renewable generation, and energy storage) that determine and limit their ability to provide the same set of services as the project applicant's proposed natural gas-fired combustion turbine.

A discussion of clutch technology and synchronous condensers is provided in this analysis, including the purpose of the technology and the potential for clutch technology to be installed at the project site.

Review and investigation of information on potential alternatives led staff to fully analyze two off-site alternatives. Staff also evaluated two conceptual site reconfiguration alternatives to avoid filling the Coastal Commission defined wetlands on the project site. And staff evaluated the No-Project Alternative.

Comments on the **Alternatives** analysis in the PSA were submitted by the Puente Siting Committee, applicant, city of Oxnard, Naval Base Ventura County Point Mugu, California Coastal Commission, environmental organizations, intervenors in this proceeding, and members of the public. Substantive comments are summarized, and staff's responses are provided in this final staff assessment (FSA) under the subsection, "Response to Comments," below.

The following subsections provide an overview of the alternatives carried forward for full analysis, starting with the No-Project Alternative.

NO-PROJECT ALTERNATIVE

No development plan or proposal for the project site has been put forth that would allow an analysis comparing the impacts of such a plan to those of the proposed project. To comply with the OTC Policy (i.e., once-through cooling of power plants), the MGS Units 1 and 2 would cease to operate on or before December 31, 2020. For the No-Project Alternative, staff considers shut down and closure of the existing MGS Units 1 and 2 the

most likely result if Puente does not go forward. Demolition and removal of Units 1 and 2 is not included in the assumptions and analysis for the No-Project Alternative. The MGS Unit 3 would continue operating. Several environmental impacts relating to project operations would be avoided under the No-Project Alternative.

Due to the potential for the existing MGS Units 1 and 2 to present nesting and perching opportunities for raptors and other predatory birds, staff concludes that the No-Project Alternative could cause a significant and unavoidable impact on special-status birds nesting near the site. This impact would persist as long as the MGS Units 1 and 2 remained nonoperational on the project site. Staff concludes that the No-Project Alternative is *not* considered environmentally superior to the proposed project. All of Puente's impacts relating to project construction and operation can be reduced to less than significant with implementation of recommended conditions of certification.

Under the No-Project Alternative, staff is unable to predict what other action might be taken that could potentially convert all or a portion of the MGS site to another use. In the absence of the Energy Commission's approval of a license to construct and operate a power plant at the site, another proposed future use of the MGS power plant site would be subject to review and approval of a coastal development permit by the city of Oxnard. It is assumed that future land use agreements or property division or sale would include removal of some of the existing power block structures and infrastructure. In this circumstance, the significant impact on biological resources from the existing MGS Unit 1 and 2 power block structures remaining on the site would not persist, and the No-Project Alternative could be considered environmentally superior to Puente. However, the No-Project Alternative would not attain any of the project's basic objectives.

DEL NORTE/FIFTH STREET OFF-SITE ALTERNATIVE

Staff evaluated the potential environmental impacts of developing a project similar to the proposed project, including ancillary buildings and other structures, and two retention basins to collect storm water and process wastewater on an approximately 12.5-acre site in an industrial area in the eastern portion of Oxnard at the intersection of S. Del Norte Boulevard and E. Fifth Street (State Highway 34). The site is located approximately 7 miles east of the coastline and 5 miles inland from the Coastal Zone boundary. The site is designated by the city of Oxnard General Plan (General Plan) as Heavy Industrial (IH), which allows industrial uses that are primarily outdoor and/or within specialized structures that may involve transportation, storage, or use of hazardous materials.

The Del Norte/Fifth Street Off-site Alternative would avoid one potentially significant geological resources impact of the proposed project. Under this off-site alternative, no impact would occur from the risk of inundation by tsunami resulting from an earthquake or local submarine landslide. Under the proposed project, this impact is reduced to less than significant with conditions of certification imposed.

The Del Norte/Fifth Street Off-site Alternative would cause a significant impact relating to Traffic and Transportation due to the potential for thermal plumes to impact aircraft and pilot safety; no feasible mitigation measures are identified to reduce the severity of

this impact, which would remain significant and unavoidable. This alternative would also cause a significant impact on aircraft and pilot safety if the Federal Aviation Administration determined that the transmission structures presented an obstruction hazard that could impact aviation safety; the impact conclusion is potentially significant and unavoidable. Because of these two impacts, the Del Norte/Fifth Street Off-site Alternative is not considered environmentally superior to the proposed project, and staff did not conduct any further environmental analysis of this site following publication of the PSA.

Similar to staff's assumptions for the No-Project Alternative, under the Del Norte/Fifth Street Off-site Alternative, the existing MGS Units 1 and 2 would remain nonoperational on the MGS power plant site and would not necessarily be demolished and removed from the site following their decommissioning. In the absence of a license from the Energy Commission for a power plant, proposed future uses of the MGS power plant site would be subject to review and approval of a coastal development permit by the city of Oxnard.

ORMOND BEACH AREA OFF-SITE ALTERNATIVE

Staff evaluated the potential environmental impacts of developing a project similar to the proposed project on an approximately 14.5-acre undeveloped industrial site in the southeast portion of Oxnard at the intersection of Arcturus Avenue and E. McWane Boulevard. The site is located approximately one-half mile inland from Ormond Beach and just east of (outside) the Coastal Zone boundary. The existing Ormond Beach Generating Station (OBGS) is located approximately three-quarter mile south of this alternative site. The site is designated by the General Plan as Light Industrial (ILT), which allows manufacturing uses where the principal activity occurs within a building, but also permits outdoor assembly, fabrication, public services, and storage.

The Ormond Beach Area Off-site Alternative would avoid three significant effects of the proposed project. Impacts that would be avoided include filling of jurisdictional wetlands and other waters, risk of inundation by tsunami, and temporary water quality impacts during demolition. Regarding potential Visual Resources impacts, staff concludes that the potential to substantially degrade the existing visual character or quality of the site and its surroundings is less than Puente, and the impact conclusion is potentially significant. Mitigation measures similar to those recommended for Puente could feasibly reduce visual impacts at this alternative site to less than significant.

Regarding Cultural Resources impacts, staff concludes that this alternative could potentially impact the Ventura County Railway, which is determined to be a historical resource pursuant to the California Environmental Quality Act (CEQA). A final impact determination would depend on whether a railroad spur line that crosses part of the site is a contributing element of the Ventura County Railway. This potential impact could likely be reduced to less than significant with implementation of appropriate mitigation measures. No built environment historical resources are identified at the Puente site; therefore, no comparative impact would occur under the proposed project.

The existing OBGS is the most visually prominent industrial-type structure in the area surrounding this alternative site (along with the high-voltage transmission lines that

parallel Edison Drive). Even though this off-site alternative is set back from the beach, construction and operation of a power plant similar to Puente at a site relatively near the OBGS site could incrementally increase its visual impact. If the OBGS was retired by the end 2020 (to comply with the OTC Policy) and subsequently removed from the site adjacent to Ormond Beach, the impact of visually prominent industrial-type facilities in the vicinity of this off-site alternative would be incrementally reduced.

For impacts relating to Traffic and Transportation, staff concludes that two potentially significant impacts on aircraft and pilot safety are less than Puente at the Ormond Beach Area Off-site Alternative, and the comparative impact conclusions are less than significant.

The Ormond Beach Area Off-site Alternative is outside the area that is subject to risk of inundation by tsunami; therefore, this impact is avoided at the alternative site even when combined with the effects of sea level rise. No wetlands or other waters are present at the alternative site, and the impact on 2.03 acres of Coastal Commission defined wetlands at the Puente site would be avoided. The Ormond Beach Area Off-site Alternative is undeveloped, and compared to the proposed project, no temporary, demolition-related water quality impacts would occur at the alternative site. Because the Ormond Beach Area Off-site Alternative would avoid these proposed project impacts, staff concludes that this off-site alternative is environmentally superior to the Puente Power Project. Staff reached this conclusion notwithstanding the potential for this alternative to impact a built environment historical resource.

Similar to staff's assumptions for the No-Project Alternative, under the Ormond Beach Area Off-site Alternative, the existing MGS Units 1 and 2 would remain nonoperational on the MGS power plant site and would not necessarily be demolished and removed from the site. In the absence of a license from the Energy Commission for a power plant, proposed future uses of the MGS power plant site would be subject to review and approval of a coastal development permit by the city of Oxnard.

CONCEPTUAL SITE RECONFIGURATION ALTERNATIVES

Conceptual Site Reconfigurations 1 and 2 would avoid filling 2.03 acres of Coastal Commission defined wetlands. No other environmental impacts would be reduced or avoided by reconfiguring the power plant facilities on the Puente site, including the impact pertaining to the risk for inundation by tsunami. Reconfiguring the site would not create any new environmental impacts compared to Puente. Because Conceptual Site Reconfigurations 1 and 2 would avoid filling the wetlands, either on-site reconfiguration is considered environmentally superior to Puente.

CEQA REQUIREMENTS

As lead agency for the Puente Power Project, the Energy Commission is required to consider and discuss alternatives to the proposed project. The guiding principles for the selection of alternatives for analysis in an environmental impact report (EIR) are provided by the California Environmental Quality Act Guidelines (CEQA Guidelines)

(Cal. Code Regs., tit. 14, § 15000 et seq.). Section 15126.6 of the CEQA Guidelines indicates that the alternatives analysis must:

- describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project;
- evaluate the comparative merits of the alternatives;
- consider alternatives that would avoid or substantially lessen any significant environmental impacts of the proposed project, including alternatives that would be more costly or would otherwise impede the project's objectives; and
- describe the rationale for selecting alternatives to be discussed and identify alternatives that were initially considered but then rejected from further evaluation.

These regulations also apply to the document used as a substitute for an EIR in a certified state regulatory program (Cal. Code Regs., tit. 14, §§ 15251 and 15252).

The range of potentially feasible alternatives selected for analysis is governed by the "rule of reason," requiring evaluation of only those alternatives "necessary to permit a reasoned choice" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)). In addressing feasibility of alternatives, factors that may be taken into account include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(1)). Under the "rule of reason," an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(3)).

Alternatives may be eliminated from detailed consideration by the lead agency if they fail to meet most of the basic project objectives, are infeasible, or could not avoid any significant environmental effects (Cal. Code Regs., tit. 14, § 15126.6, subd. (c)).

The CEQA Guidelines require analysis of a "no-project alternative" in comparison to the proposed project. "The 'no project' analysis shall discuss the existing conditions…at the time environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(2)). If the environmentally superior alternative is the "no project" alternative, the EIR shall identify an environmentally superior alternative among the other alternatives.

PROJECT OBJECTIVES AND ALTERNATIVES SCREENING

The applicant's AFC identifies several basic objectives for the development of the Puente Power Project (NRG 2015a):

- Fulfill the applicant's obligations under its 20-year Resource Adequacy Purchase Agreement (RAPA) with Southern California Edison (SCE) requiring development of

262 megawatts (MWs) nominal output of newer, more flexible and efficient natural gas generation at the site of the existing Mandalay Generating Station (MGS);

- Provide an efficient, reliable, and predictable power supply by using a simple-cycle, natural gas-fired combustion turbine to replace the existing once-through cooled (OTC) generation;
- Support the local capacity requirements of the California Independent System Operator (California ISO) Big Creek/Ventura local capacity reliability area;
- Develop a 262-MW nominal net power generation plant that provides efficient operational flexibility with rapid-start and fast-ramping capability to allow for efficient integration of renewable energy sources in the California electrical grid;
- Be designed, permitted, built, and commissioned by June 1, 2020;
- Minimize environmental impacts and development costs by developing on an existing brownfield site and reusing existing transmission, water, wastewater and natural gas infrastructure;
- Site the project on property that has an industrial land use designation with consistent zoning; and
- Safely produce electricity without creating significant environmental impacts.

The applicant's project objectives specify providing 262 MWs of natural gas-fired generation with rapid-start and fast-ramping capability. As discussed below under the subsection, "Preferred Resources," the California Public Utilities Commission (CPUC) issues decisions authorizing procurement by the state's investor-owned utilities (IOUs) based on the need for new resources. In the two most recent CPUC decisions in the Long-term Procurement Planning (LTPP) proceeding, minimal levels of procurement are specified for preferred resources, energy storage, and natural gas-fired generation for the Los Angeles Basin; these procurement authorizations are intended to ensure local reliability following the potential retirement of OTC generation facilities in the Southern California portion of the California ISO balancing authority area and permanent closure of the San Onofre Nuclear Generating Station (SONGS). (Future CPUC decisions will adjust the procurement levels according to changes in need and in response to the IOUs' progress developing preferred resources.)

Preferred resources cannot fully substitute for generating capacity in providing reliability services, the closest to an exception being event-triggered demand response. However, staff has not perfunctorily eliminated preferred resources from the alternatives analysis due to that limitation. Rather, staff discusses preferred resources and assesses the characteristics that determine and limit their ability to provide the same set of services as the project applicant's proposed natural gas-fired combustion turbine. The preferred resources analysis is important to include given that the proposed project's generating capacity is not the only way to meet local capacity needs.

The applicant's narrowly drawn project objectives address developing a specific project on the existing MGS site. These objectives would rule out any off-site alternatives with the potential to support local capacity requirements in the Big Creek/Ventura local reliability area. CEQA requires an analysis of potentially feasible alternatives, a set that

cannot be unduly limited by project objectives that can only be satisfied by the proposed project. Therefore, staff's alternatives analysis broadly interprets the applicant's project objectives to foster a robust analysis of potential alternatives to the applicant's proposed project. This approach is consistent with CEQA's purpose for an alternatives analysis.

PREFERRED RESOURCES

California is rapidly and fundamentally changing its electricity supply system. These changes are driven in large part by the state's programs addressing global climate change and the policy imperative of reducing greenhouse gas (GHG) emissions. California's transition to a low-carbon economy requires dramatically reducing GHG emissions from the electricity sector, in turn allowing other economic sectors (e.g., transportation, industry) to transition from fossil fuels to electricity as a primary fuel source. The state's Renewable Portfolio Standard (RPS) requires that providers of retail electricity procure a minimum share of energy (measured as a percentage of retail sales) from renewable sources. The RPS was established in 2002 under Senate Bill (SB) 1078 and accelerated in 2006 under SB 107. SB 2 (2011) expanded RPS to require all electricity retailers in the state to increase procurement from eligible renewable energy resources to 33 percent of total procurement by the end of 2020. SB 350 (2015) increased the RPS target to 50 percent by 2030.

State energy policies include a *loading order* for electric generation that prefers and maximizes cost-effective, reliable, and feasible energy efficiency, demand response programs and measures, and renewable generation to supplant the need for new fossil fuel-fired generation. Consistent with state law, the CPUC has held that all utility procurement must be consistent with this loading order (Pub. Utilities Code, § 454.5, subd. (b)(9)(C)).

At the same time, state policies and other factors have dramatically increased the near-term need for new resources with which to reliably meet, or reduce, the state's demand for reliably delivered electricity. The state's policy objective to phase out OTC power plants is forcing the rapid retirement of a substantial amount of dispatchable generation in coastal areas and its replacement with new generation, transmission, and demand-side resources to preserve system reliability. In addition, concerns about nuclear safety led to the permanent closure in 2012 of SONGS, a large nuclear baseload facility that was a critical source of Southern California electricity generation.

All of these factors are considered by the state's energy agencies when determining the need for new, natural gas-fired electric generation capacity (NGFG) over the 10-year horizon for which the state energy agencies undertake procurement planning. The Energy Commission considers them in developing its 10-year electricity demand forecast. The California ISO considers them as part of its efforts to maintain electric system reliability. In tandem with California ISO planning, the CPUC conducts its biennial LTPP proceeding, in which it determines how much new natural gas-fired generation is required and should be contracted by the state's IOUs. In estimating the need for new "least-cost best-fit" generation capacity or specifically for new NGFG over the 10-year planning horizon, the CPUC first assumes the timely development of all cost-effective preferred resources.

RELIABLE OPERATION OF THE ELECTRICITY SYSTEM

State law emphasizes the importance of maintaining the reliability of the electric grid, including sections of the Public Utilities Code addressing the importance of maintaining reliable electric services to the state's citizens and businesses (Pub. Utilities Code, §§ 330, subds. (g) and (h), 334, 345.5, subd. (b), and 362, subd. (a)).

In May 2010, the State Water Resources Control Board (State Water Board) adopted a statewide *Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* (OTC Policy). The OTC Policy established compliance dates for existing power plant operators to implement measures to greatly reduce impingement mortality and entrainment of marine life. Compliance with the OTC Policy is expected to lead to the retirement of a large amount of OTC capacity in transmission-constrained areas of Southern California. As a result, the CPUC devoted a share of its 2012 LTPP proceeding (Rulemaking 12-03-014) to the potential need for new NGFG to meet minimum local capacity requirements for the California ISO-controlled grid. Such generation, if necessary, would be required to meet reliability standards imposed by the North American Electric Reliability Corporation (NERC) and the Western Electricity Coordinating Council (WECC), which are based on load circumstances that are projected to occur once in 10 years and the assumption that two major component failures (generator, transmission line) occur in a transmission-constrained area nearly simultaneously.

In February 2013, as part of its 2012 LTPP proceeding, the CPUC issued a decision (D.13-02-015, referred to as the Track 1 decision) authorizing procurement to meet the local capacity requirement (LCR) in the West Los Angeles (LA) sub-area of the LA Basin local reliability area (West LA Basin) and the Moorpark sub-area of the Big Creek/Ventura local reliability area. The authorization for new capacity was done to maintain reliability after the expected retirement of approximately 7,000 MWs of OTC capacity in the LA Basin and Big Creek/Ventura local areas, including 1,946 MWs at the MGS and the Ormond Beach Generating Station.

The State Water Board set December 31, 2020, as the compliance date for the OTC generators in the LA Basin and Big Creek/Ventura local reliability areas. SCE was authorized to procure between 215 and 290 MWs of electric generation capacity to meet the LCR in the Moorpark sub-area of the Big Creek/Ventura local reliability area by 2021 (CPUC 2013a). Authorized capacity was largely based on California ISO testimony in the form of a local capacity technical study that accounts for the NERC and WECC standards stated above. The CPUC established the maximum procurement level after accounting for the likelihood of preferred resource development and/or transmission upgrades that reduce or meet LCR needs.

To satisfy authorized procurement under the Track 1 decision, SCE issued a Request for Offers (RFO) seeking new resources to meet the LCR need in the Moorpark sub-area, including energy efficiency, renewable distributed generation, energy storage, and NGFG. SCE entered into contracts with NRG to meet a share of the Moorpark sub-area LCR, including a contract for new NGFG generation at the MGS site (the Puente Power Project). On November 26, 2014, SCE submitted an application (A.14-11-016) to the CPUC seeking approval of its contracts entered into as a result of the LCR RFO for the

Moorpark sub-area, including cost recovery for those contracts (CPUC 2014a). The list of offers selected by SCE includes a 20-year contract with NRG for Puente, a new, 262-MW modern, natural gas-fired, simple-cycle facility.

On May 26, 2016, the CPUC issued a decision approving SCE's 20-year contract with NRG for Puente (D.16-05-050). In its Decision, the CPUC states that the results of the contract process regarding the selection of Puente contract are reasonable and consistent with CPUC's Track 1 decision (CPUC 2016).

PREFERRED RESOURCES AS SUBSTITUTES FOR DISPATCHABLE NATURAL GAS-FIRED GENERATION

The state's loading order established by the energy agencies in 2003 calls for meeting new electricity needs first with efficiency and demand response (jointly, demand-side management), followed by renewable energy and distributed generation, and only then with efficient, utility-scale natural gas-fired generation (Energy Commission and CPUC 2003). Section 454.5 (b)(9)(C) of the California Public Utilities Code addresses requirements for an electrical corporation's proposed procurement plan, including the requirement to "first meet its unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible." In recent years, energy storage has achieved preferred resource status due to its ability to: (a) absorb over-generation that may occur at high levels of solar penetration, and (b) obviate the need for natural gas-fired generation and associated capacity to meet ramping needs during evening hours when solar resource output declines to zero.

Preferred resources can provide many of the services provided by dispatchable, natural gas-fired generation. However, where preferred resources cannot ensure reliability, because they lack necessary operating characteristics or are not available in sufficient quantities, the CPUC has found that the procurement of clean, efficient natural gas-fired generation is necessary and consistent with the state's loading order.

The ability of individual resources (energy efficiency, demand response, utility-scale and distributed renewable generation, and storage) to provide specific services is discussed below.

Energy Efficiency

Energy efficiency entails using less energy to provide the same service such as by improving the efficiency of air conditioners or the insulation characteristics of building shells, thereby using less energy to keep the temperature of a building at desired levels. Continued development and implementation of comprehensive, long-term energy efficiency strategies and programs remains the top priority to offset increased energy demand. The CPUC oversees the IOU energy efficiency programs, and many of the state's municipal utilities administer similar programs. These efforts are funded by ratepayers and include a wide variety of initiatives aiming to move energy-efficient equipment and effective energy management practices into the marketplace at increasing scale. The CPUC issues decisions approving the electric energy efficiency budgets for the state's IOUs. For 2013–2015, the approved electricity energy efficiency

budgets for the state's three major IOUs total $2.388B (D.12-11-015 and D.14-10-046) (CPUC 2012, 2014b).

SB 350 (2015) reflects California's commitments to energy efficiency in its efforts to transition to a low-carbon economy. The bill requires the Energy Commission establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings by January 1, 2030, and requires the CPUC (for the IOUs) and local publicly owned utilities to establish efficiency targets consistent with this goal.

Energy efficiency programs can serve as substitutes for dispatchable, natural gas-fired generation such as the proposed project and partially meet the project objectives by: (1) reducing the amount of electricity that needs to be generated when targeted at consumption during high-demand hours and when flexible generation is needed most, and (2) reducing the need for natural gas-fired generation capacity, as well as the need for load-serving entities to procure such capacity to satisfy California ISO- and CPUC-imposed system-wide resource adequacy requirements. In targeting consumption in the Moorpark sub-area of the Big Creek/Ventura local reliability area, energy efficiency programs can reduce the need for conventional generation in the area and the need to procure such capacity to satisfy resource adequacy requirements for local, flexible resources. Energy efficiency programs are thus capable of reducing the need for energy and capacity-related reliability services that conventional natural gas-fired generation such as the proposed project would provide.

Demand Response

Demand response (DR) programs provide an economic incentive for end users to modify energy use, whether through direct payments to reduce consumption when requested to do so (i.e., event-triggered DR programs) or rate structures that encourage reducing energy use during hours in which generation is expensive and/or system reliability is threatened. On September 25, 2013, the CPUC authorized a new rulemaking (R.13-09-011), in part, to facilitate the participation of aggregated loads in ancillary service markets, allowing them to directly compete with generation resources in providing reliability services and to satisfy resource adequacy requirements imposed on load-serving entities in exchange for a stream of revenue (CPUC 2013b).

DR continues to play an important role in meeting California's capacity planning, including requirements for peak summer demand. These programs are operated by the state utilities; DR programs operated by the IOUs meet roughly 5 percent of total California ISO-system resource adequacy capacity requirements (California ISO 2015a).

DR has attributes that can partially meet some of the project objectives by: (1) contributing to or reducing the need for capacity-related reliability services, including an array of ancillary services (regulation and spinning reserves), and (2) reducing the need for flexible generation if called upon during hours in which ramping needs are highest. When such programs reduce loads in the Moorpark sub-area, they reduce local capacity requirements. DR programs can facilitate the integration of renewable resources by meeting incremental needs for regulation and reserves and reducing

ramping needs. Unlike natural gas-fired generation, since DR directly affects end use, it can effectively absorb load during periods of renewable over-generation (e.g., when there is surplus solar generation at midday).

Utility Scale and Distributed Renewable Generation

In 2010, Governor Brown's Clean Energy Jobs Plan established a target of 12,000 MWs of renewable distributed generation (DG) by 2020. As of July 2016, 8,200 MWs of renewable DG was operational, contracts with another 1,100 MWs had been approved, and 2,000 MWs of capacity was anticipated from various incentive programs (the Renewable Auction Mechanism, Renewable Feed-in Tariff, Bioenergy Feed-in Tariff, and utility photovoltaic programs) (Energy Commission 2016).

Utility-scale and distributed renewable generation can substitute for natural gas-fired generation as sources of energy. To the extent that these resources can be relied on to produce energy during periods of peak demand, they are also substitute sources of local capacity, thereby reducing the need to build and operate natural gas-fired generation and contributing to meeting the LCR in the Moorpark sub-area.

Energy Storage

As California increasingly relies on wind and solar resources to meet its energy needs and environmental goals, other energy resources are increasingly called upon to "balance the system." Expected changes in wind and solar output over the course of a day and random swings due to changing weather conditions require construction and operation of more flexible, dispatchable natural gas-fired generation to compensate for the variations in wind and solar output.[2]

Mature, utility-scale technologies include pumped hydroelectric and compressed air storage. Several pumped hydroelectric facilities have been operating in California for decades. The 1,212-MW Helms facility has been operated by the Pacific Gas and Electric Company since 1984.

California's energy agencies recognize the key role that storage will play in integrating wind and solar resources in a "high variable energy" system in setting an ambitious target for the procurement of energy storage capacity for 2020. On October 17, 2013, the CPUC established a target of 1,325 MWs for energy storage development, apportioning it to the transmission and distribution systems and the customer side of the meter (D.13-10-040) (CPUC 2013c).

Energy storage cannot replace generation as a source of energy because it requires injections of energy in excess of the amounts that are discharged when the stored

[2] In some systems (in the Pacific Northwest, for example), there is sufficient dispatchable hydroelectric energy to balance a wind- and solar-intensive generation fleet. The scale of wind and solar development in California, however, is such that energy storage is expected to absorb surplus generation during midday hours, as well as use energy generated during the day to reduce the need for energy and capacity from natural gas-fired generation resources during evening hours.

energy is needed. However, energy storage can replace generation capacity by being charged during non-peak hours and discharged on peak, in lieu of dispatching natural gas-fired generation. If located in a transmission-constrained area, storage can replace generation capacity needed for local reliability in the Moorpark sub-area.

CONCLUSIONS FOR PREFERRED RESOURCES

In the Track 1 decision, the CPUC's findings refer to the California ISO technical studies showing a "need for in-area generation with operational characteristics similar to retiring OTC plants in the Moorpark sub-area of the Big Creek/Ventura local area" (CPUC 2013a). The CPUC set the minimum procurement level of 215 MWs for the Moorpark sub-area stating that it is the most likely size for a power plant to replace the existing OTC units in the area (i.e., the retiring MGS units).

The Track 1 decision (D.13-02-015) discusses technological requirements for local capacity. Testimony presented by California ISO and SCE witnesses confirmed that resource procurement is guided by the need to satisfy California ISO criteria for local reliability in particular locations (e.g., the Moorpark sub-area). Flexible resources are needed to ensure system reliability.[3] California ISO testimony on the ability of different resources to satisfy local reliability is summarized in the Track 1 decision (CPUC 2013a):

> *The ISO finds that gas-fired generation meets its criteria [for the provision of local reliability services], as well as any other resources (or combination of resources) which have the same performance criteria as gas-fired generation. Demand response resources and [combined heat and power, also referred to as cogeneration] may meet the ISO's criteria, but not at this time. It is possible that other resources will pass the ISO test as well in the future. Of course, acquisition of more energy efficiency and demand side resources would reduce the LCR need.*

Selected preferred resources might meet the California ISO's criteria for contributing to local reliability. The California ISO stated that it would work with SCE and the CPUC to develop the requirements needed for resources to compete in the procurement process. The CPUC provided this directive:

> *We will require SCE to consult with the ISO regarding ISO performance characteristics (such as ramp-up time) for local reliability. In its application to procure specific resources to meet local reliability needs…SCE shall provide documentation of such efforts and how SCE meets ISO performance requirements.*

On May 26, 2016, the CPUC approved SCE's contract for a new 262-MW simple-cycle natural gas-fired facility at the project site. In approving the contract, the CPUC has effectively found that preferred resources, beyond those assumed to be developed in

[3] Flexibility is characterized, in part, by a resource's ability to be dispatched by the California ISO, and ramped up and down to produce or curtail energy production.

setting the LCR for the Moorpark sub-area, a share of which was procured by SCE in response to its RFO, could not feasibly and reliably be counted on to cost-effectively meet local reliability needs.

RELATIONSHIP OF THE POWER PLANT TO THE PROJECT SITE

The Warren-Alquist Act addresses aspects of an applicant's site selection criteria for thermal power plants and the use of an existing industrial site for such use when the project has a strong relationship to the existing industrial site. When this is the case, it is "reasonable not to analyze alternative sites for the project" (Pub. Resources Code, § 25540.6, subd. (b)). This subsection of the analysis addresses the project's strong relationship to the project site, both from a regulatory and practical standpoint, which provides part of the context for staff's analysis of alternatives to the proposed project.

USE OF THE EXISTING MANDALAY GENERATING STATION FOR ELECTRICAL POWER GENERATION

The long-term historical use of the project site for electrical power generation is applicable to the discussion of the project's strong relationship to the site. This analysis recognizes the fact that Puente would be constructed and operated at the existing MGS site. MGS Units 1 and 2 (430 MWs total capacity) were built in the 1950s and have provided local reliability to the Big Creek/Ventura local reliability area since their construction. MGS Unit 3 (130 MWs) is a gas turbine unit commissioned in 1970 that also provides local reliability. An artificial berm was constructed along the northern and eastern edges of the project site in the early 1970s to protect the facility from flooding. Southern California Edison owns the 220-kV switchyard located immediately north of the MGS site (NRG 2015a).

EXPANSION OF EXISTING COASTAL POWER PLANTS

The California Coastal Act of 1976 (Coastal Act) protects coastal resources from the major impacts of power plant siting. In 1978, the California Coastal Commission (Coastal Commission) adopted a report that satisfied a requirement of the Coastal Act to designate specific locations in the coastal zone where the location of an electric generating facility would prevent the achievement of the objectives of the Coastal Act (Pub. Resources Code § 30413(b)). The 1978 report was revised in 1984 and re-adopted in 1985. In accordance with the Coastal Act, the report designates sensitive resource areas along the California coast as unsuitable for power plant construction and provides "that specific locations that are presently used for such facilities and reasonable expansion thereof shall not be so designated." This policy encourages expansion of existing power plant sites if new plants are necessary, thereby protecting undeveloped coastal areas (Coastal Commission 1985).

In a related effort, the Energy Commission prepared a 1980 study that examined opportunities for the reasonable expansion of existing power plants in the state's Coastal Zone and reviewed the effects of the designated resource areas on expansion opportunities. The 1980 study defines "reasonable" in this context to mean the provision or maintenance of land area adequate to satisfy a specific site's share of the state's need for increased electrical power generating capacity over the Energy Commission's

planning intervals of 12 and 20 years. The study also gives practical consideration to coastal power plant expansion and siting opportunities. The ancillary support facilities already exist at the power plant sites, and the industrial-type land use has been established, which are important points to consider from a practical standpoint (Energy Commission 1980).

The expansion areas should be inside or adjacent to the existing site boundaries, or within a distance that would permit the cost effective use of the existing power plant support facilities, where necessary or advisable. The 1980 study acknowledged that other conventional siting factors (e.g., local land use plans) could affect expansion opportunities. The Energy Commission study is not intended to be used to endorse specific sites or types and sizes of power plants for expansion (Energy Commission 1980).

The 1980 study describes expansion opportunities for various combinations of plant types and sizes at 25 evaluated sites. The MGS is characterized as having on-site "expansion opportunities," while off-site expansion opportunities are constrained by endangered species habitat and wetlands (Energy Commission 1980). Puente would be located inside the existing MGS site, and no off-site expansion of power plant facilities would be required.

POTENTIAL FOR THE PUENTE POWER PROJECT TO CONTRIBUTE TO LOCAL GRID CAPACITY REQUIREMENTS

The California ISO regularly evaluates grid reliability issues in its balancing authority area for the state. The California ISO develops and publishes its annual *Transmission Plan*, which includes a comprehensive evaluation of the California ISO transmission grid identifying the upgrades required to successfully meet California's energy policy goals, maintain grid reliability requirements, and provide economic benefits to ratepayers. The California ISO's transmission planning process involves collaboration with the CPUC, the Energy Commission, and other stakeholders. The 2015–2016 Transmission Plan was adopted by the California ISO Board of Governors in March 2016.

A core responsibility of the California ISO is to identify and plan the development of solutions, transmission or otherwise, to meet future grid needs (California ISO 2016a). The 2015–2016 Transmission Plan studies for the Southern California bulk transmission system were focused on assessing the adequacy of approved transmission and resource procurement authorizations with updated *load* (i.e., energy use) forecast assumptions. The planning process also assessed whether resource procurement could effectively meet identified reliability needs in the area and potential alternatives in case approved procurement is determined to be insufficient. In its area-specific assumptions, the California ISO evaluated the long-term LCR studies for the three local reliability areas (LRAs)—Big Creek/Ventura, LA Basin, and San Diego/Imperial Valley.

In its *2025 Local Capacity Technical Analysis* from the *2015–2016 Transmission Plan*, the California ISO summarized LCR need for the Southern California LRAs. Critical

contingencies are identified for the Moorpark sub-area of the Big Creek/Ventura LRA.[4] The limiting contingency establishes an LCR need of 516 MWs in the Moorpark sub-area, which exceeds existing available resources by 234 MWs after the likely retirement of the Ormond Beach Generating Station and MGS Units 1 and 2 by the end of 2020 (California ISO 2016a). Due to the retirement of OTC generators, the use of 114 MWs of *additional available energy efficiency* assumed in the California ISO study is critical, and without it, the LCR will be higher by approximately that amount.

On May 26, 2016, the CPUC issued D.16-05-050 approving, in part, SCE's request for offers to meet LCR need in the Moorpark sub-area pursuant to its Track 1 Decision for the 2012 LTPP (D.13-02-015). SCE's selected contracts that were approved by the CPUC include 262 MWs of incremental natural gas-fired generation (i.e., new capacity) that would be provided by the proposed project. The CPUC also approved several preferred resource load reduction contracts with energy efficiency and solar generation projects totaling approximately 12 MWs. CPUC's D.16-05-050 states that with its approval of these contracts, SCE has satisfied its obligation to procure between 215 and 290 MWs in the Moorpark sub-area for local reliability purposes. In its 2025 assessment of LCR need, the California ISO concludes that no resource deficiency will occur in the Moorpark sub-area with the CPUC's approval of SCE's procurement selection for the area (California ISO 2016a).

CLUTCHES AND SYNCHRONOUS CONDENSERS

Recent Energy Commission project siting committees have asked whether and when clutches could be installed and if the technology could influence a project's impacts. Since a clutch is not proposed by the applicant in the AFC for Puente, and none of the project's significant environmental effects would be reduced or avoided by including a clutch, staff did not consider clutch technology as an alternative or addition to Puente in this alternatives analysis. Therefore, staff provides the following information on clutch technology for informational purposes only.

California has a large, geographically diverse, interconnected generation system. Ancillary services in support of the grid, such as voltage and frequency regulation, sometimes called volt-ampere reactive (var), is provided incidentally when generators are online providing capacity and energy (megawatts and megawatt hours, MW and MWhr, respectively), or through dedicated equipment including synchronous condensers or capacitors. On November 23, 2015, the California ISO sent a letter to the CPUC with a copy provided to the Energy Commission (California ISO 2015b). The California ISO recommended that the clutch technology allowing fossil fuel-fired generation units to operate temporarily as synchronous condensers be considered as a "default option in procurement decisions" by the CPUC. On August 9, 2016, the California ISO sent a letter to Energy Commissioner J. Andrew McAllister recommending that, "at a minimum, the HBEP [Huntington Beach Energy Project]

[4] The loss of Moorpark-Pardee 230-kV #3 transmission line followed by the loss of Moorpark-Pardee 230-kV #1 and #2 transmission lines, which would cause voltage collapse.

should be designed such that it could easily accommodate a clutch installation in the future should the need arise" (California ISO 2016b).

The clutch allows a generator to disconnect from its prime mover (e.g., combustion or steam turbine) and *sync up* to the electricity grid to provide voltage and frequency support. The clutches are commercially available, as are the controls to synchronize and control the generator as it operates as a synchronous condenser. The clutches and controls are feasible on a variety of turbines and appear on a small number of combustion turbines in the state. However, clutch apparatus are not generally used by California utilities to provide the ancillary services they potentially offer. To date, only the Los Angeles Department of Water and Power is using clutches it has recently installed to operate the associated generators as synchronous condensers. The legacy steam turbine generators, Huntington Beach Generating Station Units 3 are 4, are now operating as synchronous condensers. The shafts to the steam turbine were permanently disconnected, thereby avoiding the need for a clutch. New equipment was added to ramp up, sync, and control the synchronous condenser operations, and a contract is in place to pay for the services provided. Several other small peaking units in California have the ability to operate as synchronous condensers, but to date, the units have not been called up by the California ISO to provide these services.

Because vars do not travel well, it may be most efficient to install stand-alone voltage support components when they are needed and at very specific locations. This approach is consistent with transmission planning reports issued by the California ISO and reflects activities in the respective services territories of SCE and San Diego Gas and Electric. The location and timing of such installations may be moving targets as the system integrates 33 percent and then 50 percent renewable generation. The relative costs of achieving voltage support with clutches should be compared to other measures (ranging from developing stand-alone equipment, distributed generation, demand-side measures, batteries, storage, to electrifying the transportation sector). Further, as the transmission system evolves, certain assets will become "stranded" to a degree that reduces the services they can offer to the grid, or to that portion of the grid needing fewer services. Adding features to a new turbine generating unit may appear efficient, but could result in a more expensive/multipurpose facility and a stranded asset nonetheless.

POTENTIAL TO ADD CLUTCH TECHNOLOGY TO PUENTE

Puente is proposed with one new, simple-cycle combustion turbine generator (CTG). While it appears to be possible to incorporate clutch technology into the power plant, its use, and therefore its potential to realize system or environmental benefits at a given power plant occurs only under these circumstances:

1. There is a need for location specific ancillary/grid support services.

2. The power plant is not needed for (a) energy, or (b) ancillary services other than voltage support, if provision of these services requires the plant to be operating and producing energy. When needed for energy or spinning reserve, the generator and engine are connected and the plant is producing energy and providing voltage

support; the fact that it can provide the latter without generating energy is irrelevant at that point in time.

3. The synchronous condenser is needed for voltage support, but the energy and capacity that are not provided by the power plant are provided instead by a plant *that is more efficient/lower* emitting *than the local plant it replaces*. Reliance on a synchronous condenser to provide the needed voltage support would require replacing the energy it otherwise would have provided. The replacement energy might be cleaner (e.g., from a renewable generator), or it might not, depending on load levels, time of day, etc.

For the Puente CTG, the potential exists to install and use a clutch for these reasons:

- The GE 7HA.01 is compatible with a commercially available clutch.
- There could be adequate space (about 13–15 feet) to insert a clutch unit between the combustion turbine and the generator.

However, the technical feasibility does not address:

- whether there would be a need for such ancillary services at this location without conventional generation capacity;
- whether there would be a need for such ancillary services at this location once the proposed efficient, flexible, and dispatchable Puente was constructed and operating;
- whether the applicant could negotiate satisfactory terms with the CTG vendor that would warranty the CTG with the clutch installed and in use; and
- how a power purchase agreement would be crafted to allow the applicant to install and operate the clutch and control equipment while recovering costs.

In other words, technical feasibility does not address the questions of need, function, or economics. The determination of the need for vars would be no different than the consideration of need for capacity or real power—determining whether or not vars are needed at a location would be outside the Energy Commission's siting purview.

POTENTIAL EFFECTS OF CLUTCH INSTALLATION

If the Energy Commission issues a license for construction and operation of Puente, there may be a future opportunity for SCE and the project owner to agree on var procurement from the project's simple-cycle CTG. This could occur before purchase and installation of the simple-cycle CTG. Staff does not consider it workable to install a placeholder/shaft in a gap left for the clutch. The placeholder, or extended shaft, would have to be supported, making its installation nearly as complicated and expensive as the clutch itself. A decision about whether to install a clutch should be made when the CTG unit is specified for purchase and site layout is being finalized. Further, staff assumes that a proposal to add a clutch to Puente would require a project amendment, although such an amendment would be simple, and the project change would be unlikely to cause new significant impacts. Staff does not recommend fully analyzing the effects of adding a clutch because it would be speculative to assume the addition makes sense for this project at this time. For example, the project owner does not have

a contract for ancillary services that would be provided by a clutch and synchronous condenser controls.

The clutch and its housing for a 7HA.01 are no more than 15 feet long and no taller or wider than the space between the combustion turbine or generator housings where it would be located. It would require a foundation. The location of Puente at the MGS site would allow adequate space to extend the facility by about 15 feet if a clutch was added to the unit. Compared to Puente, staff does not foresee any new or increased impacts from installing and operating a clutch/synchronous condenser (e.g., impacts relating to noise, visual resources, biological or cultural resources, water use or storm water impacts, and no change in the generator unit's availability or reliability, etc.). The losses of output and efficiency would be negligible, but losses would occur nonetheless from having to *spin up* and overcome friction in the clutch and its bearings. This could result in additional fuel use and emissions or a loss of output and efficiency at Puente. However, staff estimates such changes would be small.

There would also be some electricity demand from the grid to keep the generator synchedsynced to the grid (how that electricity would be fed back from the grid, and how it would be paid for, would have to be laid out in a contract for the ancillary services). However, the amount of electricity would be low, about 1 percent of the generator rating (or 2.6 MW for the 7HA.01 nominal 262-MW generator). The California ISO is the agency primarily responsible for determining the need for voltage support in its balancing authority area, as well as the impact and effectiveness of existing or proposed resources in its provision. In comments on the need for and impact of installing synchronous condenser technology at the Amended Carlsbad Energy Center Project site, the California ISO stated:

> *The [CPUC's] Alternate Proposed Decision includes language directing SDG&E to study the addition of synchronous condenser technology, commonly referred to as a "clutch," at the Carlsbad Energy Center facility. In response to the Alternate Proposed Decision, the CAISO analyzed both peak forecast and lower load level scenarios to test whether the addition of synchronous condenser technology could enable a reduction in the amount of gas-fired generation (and associated emissions) that the Carlsbad Energy Center would otherwise be expected to produce. In recent years, the CAISO has approved significant upgrades to the Southern California transmission system to address reactive power needs and will continue to update and evaluate the adequacy of these solutions in future planning studies. The CAISO targeted these upgrades at locations that were both highly electrically efficient and feasible at times of peak system loading with some locations having expansion capabilities for even more reactive support should it become necessary. Due to the specific circumstances of localized voltage stability, the thermal limitations in the area, and the development of better-situated synchronous condensers in the area, the CAISO has not been able to confirm that the synchronous condenser technology at Carlsbad would enable any material reduction in gas-fired generation output. Assuming that the transmission system upgrades and [CPUC]-authorized procurement are realized in a timely manner, <u>synchronous condenser technology at the Carlsbad Energy Center may not provide material emission reduction</u>*

> *benefits [emphasis added].* *Therefore, based on a preliminary analysis, the CAISO has not been able to identify significant benefits to the installation of synchronous condenser technology at the Carlsbad Energy Center (California ISO 2015c).*

Avoided air emissions (i.e., emissions savings that arise when a power plant would not otherwise be operating) are complex given the interconnectedness of the modern grid. If Puente operates and thus also provides ancillary services, a generating unit elsewhere on the grid will not have to operate, thereby avoiding that generator's potential air emissions. However, operating Puente as a synchronous condenser will use some nominal amount of electricity, and air emissions associated with that small amount of electrical generation will occur. Further, the electricity that would have been provided by Puente now has to be generated elsewhere on the grid. The hope is that the project's ancillary services allow import of "emissionless" renewable generation. However, because that scenario is uncertain, it cannot be assumed that air emissions would be avoided someplace on the grid whether Puente is providing conventional generation capacity or operating as a synchronous condenser.

POTENTIAL TO REFURBISH RETIRED MGS UNITS 1 AND 2 AS SYNCHRONOUS CONDENSERS

Assuming retirement of MGS Units 1 and 2 by the end of 2020, demolition of those units down to the turbine deck would allow one or both of the existing generators to be refurbished and retrofitted to operate as permanent, not temporary/not "clutched," synchronous condensers. While deploying this technology at the MGS site is potentially feasible, its use, and therefore its potential to result in system or environmental benefits at a given location occurs only when there is a need for location specific ancillary/grid support services.

However, the technical feasibility does not address the issues relating to need, function, or economics, the same as listed above under the discussion of the potential to add clutch technology to the Puente Power Project.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED CONSIDERATION

A range of alternatives were considered by staff during the planning process for this analysis but later eliminated from detailed consideration because they could not feasibly be accomplished, would not avoid any significant impacts, or would result in new significant impacts. The subsections below discuss the following:

- Staff's analysis of online data compiled by the U.S. Environmental Protection Agency (EPA) on various sites and facilities in the project area,
- Sites suggested for analysis by city planning staff, and
- Retrofit alternative scenarios that could allow continued operation of MGS Units 1 and 2 without using ocean water as a source for power plant cooling.

The analyses that follow provide the reasons for eliminating most of these alternatives from detailed consideration, except for the city's recommended Site 4 and a portion of Site 6b.

BROWNFIELD SITES FROM ONLINE DATA

Staff worked to identify potentially feasible brownfield sites that could serve as alternative locations to construct and operate a power plant facility similar to the proposed project. In urban planning, a brownfield site (or simply a brownfield) is land previously used for industrial purposes or some commercial uses, and usually refers to disturbed lands. The AFC identifies the MGS site as brownfield land (NRG 2015a).

As discussed below under "City of Oxnard Alternative Sites," two off-site alternatives are fully analyzed: Del Norte/Fifth Street Off-site Alternative and Ormond Beach Area Off-site Alternative. Both sites are considered brownfield sites because they have been used for industrial purposes and are located in industrial areas in Oxnard. Because these sites are not listed in the EPA online database, staff assumes they are not subject to monitoring or regulation by the EPA.

Using data available through the EPA online databases, staff mapped brownfield sites based on the criteria below. The following mapping criteria were developed by staff to identify potentially feasible brownfields:

Criteria for Identifying Possible Alternative Brownfield Sites

- Located in the Moorpark sub-area of the Big Creek/Ventura local reliability area,
- Provide a potentially feasible site for development of a project similar to the proposed project while reducing one or more significant impacts of the project without causing its own impacts,
- Cover approximately 10 to 20 acres,
- Located within a mile of a natural gas pipeline (12 inches or greater in diameter) and 5 miles of a 220- to 230-kV transmission line that could connect to an SCE substation with the potential to serve the Moorpark sub-area and not cause "downstream" impacts on the transmission grid, and
- Located outside of the Coastal Zone.

Alternatives Figures 1a and 1b depict portions of the 220- to 230-kV transmission lines and natural gas pipelines staff used to assess potential alternative sites.[5]

Locating brownfield sites that satisfied the above criteria was the first step in a process to identify potential alternative brownfield locations for the proposed project. The data that was collected and assessed was at a sub-regional level, encompassing the

[5] Water pipeline data at the sub-regional scale was unavailable to assess water availability for brownfields. However, water pipeline data was available to evaluate water source availability for the alternative sites recommended for analysis by City planning staff.

southern areas of unincorporated Ventura County and the Big Creek/Ventura local reliability area.

Staff identified 85 presumed brownfields that were thought to meet the criteria listed above. Based on a review of the 85 brownfields' existing land use data, level of development, and surrounding land uses, the group of sites was reduced to 26 brownfields. Staff evaluated these brownfields at a more refined geographic scale and eliminated most of those remaining 26 sites, which appeared to be located within approximately 1 mile of residential development. For the remaining six presumed brownfields, staff attempted to confirm their locations to gather site-level data necessary for more detailed analysis (i.e., to determine site availability and identify potential on-site biological resources).

However, Energy Commission staff encountered issues with the brownfield data that made it impossible to use to identify sites for further study. Staff identified these general issues, which could not be resolved:

- The brownfield data was created to be used at a scale that is not accurate enough to line up with parcel geographic information system (GIS) data needed to calculate acreage.
- The parcel and brownfield geographic information system data have different coordinate systems, and when one feature is re-projected, it distorts the location of the brownfield enough to move some of the points into nearby, incorrect parcels.
- Staff determined that the EPA brownfield data included all of the EPA's Facility Registry Service facilities, which identifies, collects, verifies, stores, and maintains a set of locational data on facilities and sites of environmental interest that are subject to regulation. Staff determined that it was not possible to isolate the brownfields in the data.

Staff's work to apply the screening criteria to the EPA data resulted in a list of six sites that were considered infeasible for study as potential off-site alternatives. These sites did not meet, or only partially met, the screening criteria and would likely cause significant impacts of their own:

- Wayne J. Sand and Gravel – This location is an existing, large-scale sand and gravel mining operation east of State Highway 23 between Bardsdale and Moorpark in Ventura County. Based on staff's review of Google Earth images, the area shows extensive bare earth mining sites in a hilly and mountainous region in the vicinity of State Highway 23, which winds through the canyons and ridgelines north of Moorpark. Staff considers it highly unlikely to present a feasible location for a power plant similar to Puente due to the existing mining land use and the site's marginal accessibility.
- Petrominerals Corporation – This location on W. Hasley Canyon Road in Castaic is identified as an oil well drilling business called Crimson Resource Management. Petrominerals Corporation is identified as a crude petroleum and natural gas extraction operation at the same address near extensive residential development in the hills west of Interstate 5 between Castaic and Castaic Junction in Los Angeles County. Hasley Canyon Road follows Hasley Canyon, and a creekbed appears to

follow the canyon. Signage along the road indicates that the area floods. Staff considers it highly unlikely to present a feasible location for a power plant due to its marginal accessibility, hilly terrain, possible vulnerability to flood events, encroaching residential uses, and uncertainties regarding its existing uses and management.

- Monitoring Station – This is a site on E. Telegraph Road (State Route 126) near its intersection with Hopper Canyon Road, in a semi-rural and agricultural area near the community of Buckhorn. Google Earth images show a relatively small developed site that is identified in an online State Water Board document as the Piru Wastewater Treatment Plant; therefore, staff assumes the site would not be available for development of a power plant facility.
- Jiffy Lube #3283 – This is a business at the intersection of Ridge Route Road and Castaic Road in the community of Castaic, just east of Interstate 5. Google Earth images show that Havoline Xpress Lube, Castaic Auto Performance, and Collision Center are businesses located at the intersection; therefore, staff assumes the site would not be available for development of a power plant facility.
- Hill Canyon Wastewater Treatment Plant – This is a developed site on Hill Canyon Fire Road south of Santa Rosa Road and north of the community of Newbury Park. The site is fully developed along a winding road in a hilly region near the Arroyo Conejo Open Space and hillside residential development. Staff does not consider this location to present a feasible location for a power plant due to the existing wastewater treatment plant and its marginal accessibility even if the site was available.
- Danny Terry Painting – This site and business is on Ventura Road immediately adjacent to the Santa Clara River and the Ventura Highway. Google Earth images show the area to be developed with commercial uses on both sides of the Ventura Highway; therefore staff considers it unlikely that the site is available for development of a power plant. Residential development in Oxnard ("South Bank" neighborhood) is located across the river along N. Ventura Road. Because of the site's proximity to the Santa Clara River, existing commercial uses at the site, and location adjacent to open space and residential areas, a power plant at this location is likely to cause its own potentially significant impacts.

CITY OF OXNARD ALTERNATIVE SITES

At the August 27, 2015, Energy Commission environmental scoping meeting and informational hearing in Oxnard, city of Oxnard (city) planning staff presented five alternative sites for staff to consider in its evaluation of project alternatives for the proposed project (City of Oxnard 2015a). The city later added another site ("Ormond Beach area along SCE line"), which consisted of 12 parcels in the area of Edison Drive and Hueneme Road, in the south area of Oxnard (City of Oxnard 2015b). Staff aggregated the parcels into two separate sites (6a and 6b), for a total of seven alternative sites evaluated by staff. The city's alternative sites are shown as Sites 1–5 and 6a and 6b on **Alternatives Figures 1a and 1b**; these figures also show portions of natural gas pipelines and 220- to 230-kV transmission lines in the vicinity of the alternative sites.

The sites are as follows:

1 – Ventura County Sanitation District Site (commonly referred to as the “flower field”)

2 – Beedy Street Site and County Two Parcel Site

3 – Power Machinery Site

4 – S. Del Norte/Fifth Street Site

5 – Mission Rock Energy Center Site

6a – Ormond Beach Area Sites East of Edison Drive

6b – Ormond Beach Area Sites West of Edison Drive

The information provided by the city for each of the seven alternative sites included aerial images, land use and zoning, acreages, assessor parcel numbers, and ownership. The sites are privately owned. Staff initiated its evaluation knowing that NRG does not have site control of these alternative sites. Acquiring site control would entail negotiating a lease agreement or land purchase before any of these sites would present viable alternatives to the proposed project.

Staff assessed each of the seven alternative sites and all but two were eliminated from further evaluation—Site 4 and a portion of Site 6b. In its evaluation, staff considered surrounding land uses, environmental constraints, proximity to linear infrastructure, and the potential for NRG to gain site control. Key technical staff provided assistance in the areas of biological resources, land use, water resources, and transmission system engineering. In December 2015, NRG submitted an *Alternative Sites Summary* with information comparing the alternative sites suggested by Energy Commission and city planning staff. Based on Energy Commission staff’s technical input and additional information from city planning staff and NRG’s *Alternative Sites Summary*, Sites 1, 2, 3, 5, and 6a were eliminated from further evaluation. (Although staff’s numbering of the sites does not correspond to NRG’s numbering of sites in the *Alternative Sites Summary*, the site names closely correspond.) Staff’s screening analyses for these sites are provided below.

Annexation/Site Control

Sites 1, 2, and 6a are located in Oxnard’s sphere of influence just outside its boundary. Site 1, an approximately 20-acre agricultural property, lies west of and immediately adjacent to Victoria Avenue, a portion of which is owned by Oxnard. According to information provided by the applicant in its *Alternative Sites Summary* (NRG 2015b), Site 1 is classified as prime farmland. Site 2 consists of two adjacent groups of parcels located in the area of Beedy Street and East Vineyard Road (State Highway 232). The parcel group situated adjacent to Oxnard’s boundary is composed of two county-owned parcels totaling approximately 20 acres. A portion of this land is currently used by the Ventura County Juvenile Justice Complex. The second group of parcels is situated immediately southeast of the county-owned properties; the group consists of at least 30 small, privately-owned parcels totaling approximately 30 acres along Beedy Street.

Several of the parcels have been cleared of structures, while a few are used for trucking and transit/transportation-related activities.

Site 6a, consisting of eight of the aforementioned 12 parcels, is located east of Edison Drive and adjacent to Hueneme Road. The parcels appear to be in agricultural use, and four of the eight parcels are adjacent to Oxnard's boundary. As indicated in the applicant's *Alternative Sites Summary*, three of the Site 6a agricultural parcels are owned by SCE, which would make site control of these properties very unlikely for the applicant.

According to city planning staff, parcels immediately adjacent to Oxnard's boundary could be annexed without voter approval. Before Site 1 could be annexed, Oxnard would first need to expand its boundary to include a portion of the Victoria Avenue right-of-way adjacent to the site; once annexed, agricultural parcels could be considered developable as industrial-type uses under the city's land use policy. (The EIR on the city of Oxnard General Plan (General Plan) identified the conversion of Important Farmland to be a significant and unavoidable impact of build-out under the General Plan.) For Sites 5 and 6a, the parcels that do not abut Oxnard's boundary could not be annexed without voter approval.

The annexation process, which is governed by local agency formation commissions, or LAFCOs, could result in a prolonged regulatory process that could delay a project for an indeterminable amount of time. The agricultural properties in unincorporated areas could theoretically be developed as industrial uses without annexation. However, the process of converting agricultural lands in the county to other uses presents a potentially lengthier regulatory process involving consideration by local voters, multiple city councils, and the Ventura County Board of Supervisors.

Site 5 is an industrial-type property located in the county at 1025 Mission Rock Road. The site is owned by Mission Rock Energy Center, LLC, and the assessor parcel number (APN) is 0900190165. The site is being used for recreational vehicle and boat storage. Since the time that the city recommended this site as an alternative location for a project like Puente, an AFC was submitted to the Energy Commission by Mission Rock Energy Center, LLC, proposing construction and operation of a natural gas-fired generating station at the site (Mission Rock Energy Center, 15-AFC-02); the AFC is currently under review. The Mission Rock site is assumed to be unavailable to NRG for development of a project like Puente due to the fact that Mission Rock Energy Center, LLC, has site control and is proposing a power plant project at the site. Given the status of site ownership and the proposal before the Energy Commission, the Mission Rock site is unlikely to provide a feasible alternative to Puente.

Site 6b consists of the remaining four of the 12 parcels. These parcels are located in Oxnard on the north side of E. McWane Boulevard between Arcturus Avenue and Edison Drive. Two of the four parcels, located on the west side of Edison Drive, are being used for major manufacturing, including Aluminum Precision Products and Irwin Industries. Based on staff's observation of the existing development and uses on these two parcels, the project applicant would not likely be able to secure site control to construct and operate a power plant similar to Puente on these properties.

The two remaining Site 6b parcels are located at the intersection of Arcturus Avenue and E. McWane Boulevard. The two contiguous parcels are privately owned by the same owner and could potentially be merged to form one, approximately 14-acre parcel for development of a project similar to Puente. The site is in an industrial area approximately one-half mile inland from Ormond Beach. Early in 2016, the site was completely graded and surfaced with gravel. As of April 2016, it is being used as a parking area for rows of new automobiles.

According to the applicant's *Alternative Sites Summary*, the two Site 6b parcels at Arcturus Avenue and E. McWane Boulevard are not available for site control and development. In July 2013, the applicant offered a "reasonable, market-based offer" to the owner of the parcels, which was declined (NRG 2015b). It is unknown whether the owner would reconsider an offer to sell or lease some of the properties to NRG.

Site 4 is located in the eastern edge of Oxnard in a semi-rural area at the intersection of S. Del Norte Boulevard and E. Fifth Street (State Highway 34). The privately-owned site is located on a single, approximately 25-acre parcel. The north half of the property is in agricultural use. An asphalt recycling center (could include a concrete batch plant) is located on the south half of the site. Land uses and businesses in the surrounding area include warehouse commercial, industrial, and agricultural uses. It is unknown whether the property owner would consider an offer to sell or lease the property to NRG for development of a power plant project like Puente.

Potentially Significant Environmental Impacts

In addition to the site control and annexation issues outlined above, the construction and operation of a project like Puente at Site 1 or 2 would result in potentially significant impacts relating to biological, visual, agricultural, and soil and water resources. Site 1 is situated immediately south of the Santa Clara River. As stated in the applicant's *Alternative Sites Summary*, this river's ecosystem is one of the most biologically significant in Southern California and supports numerous threatened and endangered species (NRG 2015b). Development of a project at Site 1 would have an adverse effect on the river's critical habitat and, because of the site's agricultural use, on habitat common to agricultural lands.

Should the site be converted to an industrial use, resource agencies would request mitigation for the loss of agricultural lands, which provide foraging habitat for raptors and other avian species. Although this type of impact is mitigable, the process would most likely add time and complexity to the project. In addition, Site 1 could cause visual impacts on residential areas located within approximately one-half mile south and east (depending, in part, on the orientation of residences and whether intervening landscape elements or built structures blocked views toward the site), as well as a public golf course located east of the site across Victoria Avenue. Development of a power plant at Site 1 would likely require construction of a new natural-gas pipeline across the golf course and adjacent to the residential area, to connect with an existing natural gas pipeline over 1 mile east of the site.

Development of a power plant at Site 2 would also entail construction of a natural-gas pipeline over 1 mile long. A potential route and transmission line interconnection point for Site 2 is undetermined.

Due to the proximity of Sites 1 and 2 to the Santa Clara River, development of a power plant at the either site could result in flood damage to the site during major storm events. Engineered levees are being constructed along the south (left bank) levees of the river, although some levee segments are not yet complete. (Staff is currently evaluating potential flooding impacts for the Mission Rock Energy Center (MREC) project near the north side of the Santa Clara River; the MREC site is approximately 4.5 miles upstream of Site 2.)

These sites could also be impacted due to migration of pollutants to the river from storm water runoff. If no municipal sewer service is available at the sites, permits for either a septic system for process wastewater or to discharge the process wastewater to the river could prove difficult to obtain. However, obtaining permits for process wastewater would require mitigation for potentially significant impacts.

Site 3 is a privately-owned, 25-acre agricultural parcel located east of N. Del Norte Boulevard and south of El Camino Avenue and State Highway 101. The surrounding area is characterized by agricultural uses. The site does not have direct, paved access to either N. Del Norte Boulevard or El Camino Avenue. According to city planning staff, for the purposes of fire vehicle access, a paved road would be required to connect the site to N. Del Norte Boulevard. The paved road would necessarily traverse an adjacent private property.

Development of a project at Site 3 would entail construction of a natural-gas pipeline over 1 mile in length to connect to an existing natural gas pipeline of sufficient capacity. A potential route and transmission line interconnection point for Site 3 is undetermined.

Site 3 is located less than 1 mile northwest of Camarillo Airport. Traffic and Transportation staff indicated that aircraft from the airport would be impacted by the high-velocity thermal plumes that would be emitted by a power plant like Puente at the site. Aircraft would be unable to avoid the thermal plumes, which could be hazardous to aircraft and pilots.

Conclusions for City of Oxnard Alternative Sites

Based on an evaluation of the city's alternative sites, staff dismissed Site 5, two parcels at Site 6b, and Site 6a due to issues relating to existing or proposed on-site land uses or site jurisdiction. The Site 6b parcels adjacent to Edison Drive are developed industrial sites. The presence of existing land uses and the site control issue would probably preclude development of a project similar to Puente at these locations. Even if the applicant could gain access to the parcels adjacent to Oxnard's boundaries, the annexation process would likely delay implementation of the project for an indeterminable length of time. A prolonged delay could adversely affect the potential feasibility of these sites as alternatives to Puente.

Staff dismissed Sites 1 and 2 also due to issues relating to site control and annexation, and because of their potential to impact environmentally sensitive resources. Development of a project like Puente at Sites 1 and 2, because of their proximity to the Santa Clara River, could potentially impact the river's sensitive habitat and be subject to flooding during major storm events. Development of a power plant at Site 1 would convert agricultural land to an industrial use.

While development of a project like Puente at any of the alternative sites could potentially create environmental impacts such as those described above, staff cannot determine at this time the significance of foreseeable impacts and whether potential impacts could feasibly be reduced to less than significant with implementation of mitigation measures. Because of the proximity of Sites 1 and 2 to the Santa Clara River, staff concludes that potentially significant impacts at either of those sites could be greater than the impacts that would occur under the proposed project.

Site 3 was eliminated from further evaluation due to its close proximity to the Camarillo Airport (approximately three-quarter mile), which would cause significant impacts on aircraft and pilot safety that could not be reduced to less than significant.

Site 4 at the intersection of S. Del Norte Boulevard and E. Fifth Street and the two Site 6b parcels at the intersection of Arcturus Avenue and E. McWane Boulevard are privately-owned properties in Oxnard. The south half of Site 4 covers approximately 12.5 acres and could potentially be large enough to allow for construction of a project similar to Puente. Similarly, the two Site 6b parcels covering approximately 14.5 acres could potentially accommodate a project like Puente. Staff's initial environmental screening analysis of the sites did not identify impacts that would be greater than those identified for the proposed project. Therefore, Site 4 and the two Site 6b parcels are evaluated in detail under the subsections below, "Del Norte/Fifth Street Off-site Alternative" and "Ormond Beach Area Off-site Alternative." The analyses below include discussions of potential feasibility issues for these alternatives.

ORMOND BEACH GENERATING STATION

Staff also considered the Ormond Beach Generating Station (OBGS) as an alternative site for Puente. The OBGS is an existing 1,516-MW capacity natural gas-fired power plant owned and operated by NRG. The OBGS is located in Oxnard's Coastal Zone, and the beaches adjacent to the site are designated as critical habitat for the western snowy plover (*Charadrius nivosus nivosus*). The adjacent lands to the northwest and southeast contain mapped emergent and forested freshwater wetlands, some of which are designated critical habitat for tidewater goby (*Eucyclogobius newberryi*) (NRG 2015b).

According to the city and the applicant, many of the parcels surrounding the site are under the ownership of the State Coastal Conservancy, The Nature Conservancy, and the County of Ventura. The Coastal Conservancy is currently working to restore approximately 750 acres of wetlands in the vicinity of the OBGS, and a feasibility study indicates that approximately 1,750 acres surrounding the site are highly suitable for ecological restoration (NRG 2015b). The wetland restoration study is further discussed

below under the biological resources analysis for the “Ormond Beach Area Off-site Alternative.”

The *Alternative Sites Summary* explains that the Puente Power Project could be sited on approximately 3 acres of the 37-acre OBGS. The project could reuse and repurpose several existing OBGS facilities, including the administration building, warehouse, water storage tanks, and ammonia tanks situated on the OBGS site but outside of the 3-acre area. The OBGS site could also accommodate construction laydown, offices, and parking (NRG 2015b).

The proposed project at MGS would be situated adjacent to SCE’s Mandalay Substation. Similarly, a new power block at the OBGS could connect to an existing 220-kV breaker position at the Ormond Beach Substation following the possible retirement of the OBGS Units 1 and 2 by the end of 2020 to meet the OTC Policy’s compliance date schedule (the same date as for MGS Units 1 and 2 and several other generators in the LA Basin and Big Creek/Ventura local reliability areas). Like the proposed project, a new generating facility at OBGS could connect to an existing, on-site natural gas pipeline as well as an existing potable water supply for process wastewater. The process wastewater could be stored in an existing OBGS retention basin and discharged to the ocean via an existing outfall. Sanitary wastewater could be discharged to the OBGS septic system (NRG 2015b). The proposed project would also discharge sanitary wastewater to an existing septic system.

Alternatively, a new connection for recycled water could be made to the city of Oxnard Advanced Water Purification Facility (AWPF) at West Hueneme Road and South J Street, approximately 1.2 miles northwest of the site, for the purpose of supplying process wastewater at the OBGS. The process wastewater and even sanitary wastewater could be discharged to a new wastewater pipeline to the AWPF (NRG 2015b). However, construction of the recycled water connection and wastewater pipeline may result in potentially significant impacts. The proposed project does not include a proposal for a recycled water connection.

As stated above, the OBGS site is situated within the Coastal Zone. The General Plan designation is PUE Energy Facility, and the zoning designation is EC Coastal Energy Facility (same as the MGS site), which allows for siting, construction, modification, and maintenance of power-generating facilities and electrical substations. An electrical power-generating plant and its accessory facilities is considered a conditionally permitted use and is subject to a coastal development permit, except in cases where the local jurisdiction’s approval authority is subsumed by the Energy Commission’s site certification process (NRG 2015b).[6]

[6] On June 7, 2016, the City of Oxnard City Council voted unanimously to approve an amendment to the General Plan to prohibit power generation facilities greater than 50 MWs in areas subject to coastal hazards (including the MGS, Puente Power Project site, and OBGS). The General Plan amendment became effective July 7, 2016. Staff addressed inconsistencies between the proposed project and local land use plans arising from the General Plan amendment in the **Land Use** section of this FSA.

Similar to Puente, the OBGS lies in close proximity to critical habitat for western snowy plover. Development of a project like Puente at the OBGS would not reduce or avoid potential impacts on species using the beach and dune habitats. In addition, the OBGS site is situated within a historic wetland area that has been drained and filled, while surrounding lands are characterized by wetland areas, some of which are designated critical habitat for tidewater goby (NRG 2015b).

As mentioned, the wetland areas have been the subject of ecological restoration efforts led by the State Coastal Conservancy. The efforts aim to rehabilitate and preserve coastal wetlands and associated critical habitat. Should the OBGS power plant be shut down to comply with the OTC Policy and subsequently be dismantled, then the wetlands and habitat areas north and south of the site could be linked at the plant's current location into one large, contiguous coastal preserve. In addition to the environmental benefits, the construction costs may be reduced for the restoration project, as building around the power plant site would be more costly (City of Oxnard 2015b). Although development of a project like Puente at the OBGS would not prevent wetland restoration activities, it could inhibit a fuller realization of reclaiming local wetlands and critical habitat areas.

For the reasons discussed above, staff eliminated the OBGS from further detailed evaluation as an alternative site to the proposed project.

RETROFIT ALTERNATIVE SCENARIOS

Staff considered the potential feasibility of retrofitting the two, existing 215-MW MGS conventional steam boiler units to reduce impingement mortality and entrainment of marine life and comply with the OTC Policy. This analysis focuses on retrofits that would ensure compliance with the OTC Policy. It is assumed that any retrofit scenario would have a goal to continue long-term operation of MGS Units 1 and 2.

As discussed below, under the No-Project Alternative, should the applicant not achieve compliance with the OTC Policy by December 31, 2020, any assumptions other than shut down and decommissioning of these units would be based on speculation. Therefore, the retrofit alternative scenarios described below are not considered part of the No-Project Alternative as either of these retrofits is assumed to occur prior to the OTC Policy compliance date of December 31, 2020, to continue long-term operation of Units 1 and 2.

For existing power plants, the OTC Policy establishes two compliance tracks. Track 1 requires a minimum 93 percent reduction in intake flow rate (gallons per minute) for each unit compared to the unit's design capacity. Under Track 2, a power plant owner or operator must reduce impingement mortality and entrainment of marine life on a unit-by-unit basis to a level comparable under first track compliance. Compliance under Track 2 is an option if the owner or operator demonstrates to the State Water Board's satisfaction that compliance with Track 1 is infeasible. The CPUC's decision responding to the retirement of OTC power plants discusses the OTC Policy, stating that "most generators in their plans filed with the [State Water Board] have indicated that they are pursuing the first option, which implies retirement or repowering of the facility" (D.13-02-015) (CPUC 2013a).

Implementing structural and operational controls to achieve compliance with the OTC Policy under Track 2 would likely restrict operations so severely that the power plant would no longer be eligible to provide ancillary services and produce an associated revenue stream. It is also unlikely that MGS Units 1 and 2 could provide flexible generation to support renewable energy development under such restrictions. Staff acknowledges that the OTC Policy includes a mechanism to extend the compliance date set by the State Water Board. However, such an extension would need to come directly from an authorizing agency for the purpose of maintaining grid reliability. Any such extension is not considered a long-term solution for complying with the OTC Policy.

Therefore, staff evaluated the feasibility of two permanent retrofit scenarios that would allow continued, long-term operation of Units 1 and 2. In accordance with CEQA, these retrofit scenarios were also evaluated to determine if they could reduce or avoid any of the environmental impacts associated with the proposed project. Through coordination with Energy Commission engineering staff, two retrofit alternative scenarios were evaluated:

1. Retrofit MGS Units 1 and 2 to become an air-cooled facility.

2. Retrofit MGS Units 1 and 2 to use another cooling water source (other than ocean water). Under this retrofit scenario, Units 1 and 2 would continue operating using wet cooling.

For either of the retrofit scenarios, continued operation of existing MGS Units 1 and 2 would have a greatly reduced ability to meet the basic project objective to provide operational flexibility with rapid-start and steep ramping capability. Also, the retrofit scenarios would entail continued operation of an aging power plant with a lower efficiency rating compared to the proposed project.

Air Cooled Condenser Retrofit Scenario

This retrofit would require reconfiguring the existing plant to be an air-cooled facility by installing ACC infrastructure. This scenario assumes retrofitting Units 1 and 2, each with a generating capacity of approximately 215 MWs. The project applicant discussed this retrofit scenario in the AFC stating that the site would have sufficient space to accommodate separate ACC units for Units 1 and 2, each measuring approximately 290 feet long, 130 feet wide, and 100 feet tall. Using this assumption, the ACCs would cover a total of approximately 2 acres on the site. It could be feasible to locate the ACCs in the space between the power block and the SCE switchyard without affecting the existing ammonia storage facility north of the MGS Units 1 and 2. The existing shop/warehouse structure, parking area, and administration building would be displaced.

Due to the age of the existing MGS power generating Units 1 and 2 (constructed in the 1950s), retrofitting the existing boilers for air-cooling would result in a less efficient facility compared to the proposed project system (dry-cooled, simple-cycle facility). Because of decreased efficiency, such a retrofit would increase air emissions compared to Puente. Other than possibly reducing the proposed project's construction-related air

emissions impacts, the ACC retrofit scenario would fail to reduce or avoid any significant impacts of the proposed project. Therefore, staff has removed the ACC retrofit scenario from further consideration.

Wet-Cooled Retrofit Scenario

Oxnard's recycled water delivery system does not currently extend near the project site (NRG 2015a). Staff evaluated retrofitting the existing MGS to use potable water for cooling (as an alternative to ocean water) in an evaporative cooling tower. This retrofit scenario would leave the MGS as a wet-cooled facility, possibly at its existing 430-MW capacity. It is not known how often a retrofitted MGS with its old steam boiler facilities would be requested to run. Without knowing the annual capacity factor, the amount of water required for power plant cooling is unknown. When MGS Units 1 or 2 are not producing electricity, no cooling water is required. Staff estimates an upper value of approximately 5,000 acre-feet per year (afy) to cool a retrofitted MGS. If NRG retrofitted one of the MGS units and retired the other, the value would be lower. Wet cooling requires a significant quantity of water compared to the proposed project, which would require approximately 16 afy for process and service water, most of which would be for the inlet air evaporative coolers used for power augmentation (NRG 2015a).

Use of fresh water for power plant cooling is discouraged by State Water Board and Energy Commission policies relating to water consumption by power plant facilities. The proposed project would use potable water for industrial processes and domestic use. Under the wet-cooled retrofit scenario, impacts on the potable water supply would increase compared to Puente and be inconsistent with state water policies.

A wet-cooled retrofit system could cause formation of visible plumes (depending on whether such a retrofit used plume-abated cooling tower equipment). While the existing MGS generates visible plumes during steam blow-off, the proposed project would not generate visible water vapor plumes. Compared to the proposed project, a potential increase in visual impacts could occur from such a retrofit. Use of fresh water for power plant cooling would fail to reduce or avoid any significant impacts of the proposed project.

For the reasons described above, staff has removed the wet-cooled retrofit scenario from further consideration.

ALTERNATIVES EVALUATED IN DETAIL

Project alternatives evaluated in detail were selected based on their potential to attain most of the basic project objectives while reducing or avoiding any of the proposed project's significant impacts. In addition to the No-Project Alternative, staff carried forward two off-site alternatives and two conceptual site reconfiguration alternatives for analysis and comparison to the proposed project.

Summary discussions are provided below comparing the environmental effects of the project alternatives and the No-Project Alternative to the proposed project. Environmental impacts that could potentially occur under a project alternative but that would not occur under the proposed project are also discussed.

NO-PROJECT ALTERNATIVE

No development plan or proposal for the project site has been put forth that would allow an analysis comparing the impacts of such a plan to those of the proposed project. To comply with the OTC Policy, the MGS Units 1 and 2 would cease to operate on or before December 31, 2020. For the No-Project Alternative, staff considers shut down and closure of the existing MGS Units 1 and 2 the most likely result if the proposed project does not go forward. Demolition and removal of the Units 1 and 2 is not included in the assumptions and analysis for the No-Project Alternative. Although the MGS Unit 3 would continue operating, its continued operation is not part of the proposed project or the comparative analysis of the alternatives.

Shut down and decommissioning the MGS Units 1 and 2 would include initiation and completion of a prescribed list of activities to protect the public based on the requirements of applicable laws, ordinances, regulations, and standards (LORS). Examples of decommissioning activities that would be completed by the project owner over several months include the following (NRG 2015a):

- De-energize electrical equipment;
- Purge gases from equipment (e.g., natural gas, hydrogen);
- Remove oil from all pumps, motors, pipes, oil reservoirs, transformers, and other equipment;
- Electrically isolate equipment.
- Physically isolate equipment by disconnecting from piping systems or other means;
- Operate and maintain equipment as required for environmental permit compliance (e.g., storm drainage system);
- Remove the backup diesel generator from service; and
- Verify that all facilities are left in a safe condition.

Decommissioning Units 1 and 2 would not require any earth movement, soil disturbance, or work below site grade.

Hazardous chemicals would be hauled away in their own containers, such as totes. The largest hazardous fluid inventory could be the lube oil from the steam turbines and other storage tanks, which would be pumped out and hauled away by truck. Other tasks such as de-energizing and disconnecting electrical equipment, and mechanically disconnecting and capping pumps, piping, and other equipment, would be performed by manual craft personnel. It is assumed that decommissioning work would not require the use of heavy construction equipment (e.g., cranes).

Land Use Planning

Under the No-Project Alternative, the Energy Commission would not issue a license to NRG to construct and operate the project. The No-Project Alternative would not include construction of a facility or modification of an existing facility. In this circumstance, the Energy Commission would have no licensing or other discretionary authority regarding

the future use or governance of the MGS site, including demolition and removal of MGS Units 1 and 2. It is assumed that Units 1 and 2 would remain nonoperational on the site. The MGS Unit 3 natural gas combustion turbine would continue to operate. Under the No-Project Alternative, any proposed future uses of any portion of the site would be subject to review and approval of a coastal development permit by the city.

Environmental Analysis

Alternatives Table 1 summarizes the comparison of impacts of the Puente Power Project to the same or similar potential impacts under the No-Project Alternative. The comparisons of impacts to the proposed project are stated using these terms:

- Less than Puente
- Similar to Puente
- Same as Puente
- Greater than Puente

Impact conclusions for the proposed project and the comparative impacts to the alternatives are indicated using these abbreviations:

— = no impact

B = beneficial impact

LS = less-than-significant impact, no mitigation required

SM or PSM = significant or potentially significant impact that can be mitigated to less than significant

SU or PSU = significant and unavoidable or potentially significant and unavoidable impact that cannot be mitigated to less than significant

Comparative discussions for each environmental topic area listed below follow **Alternatives Table 1**.

Alternatives Table 1
Summary Comparison of Impacts of the Proposed Project to the No-Project Alternative

Environmental Effect	Proposed Project	No-Project Alternative
Air Quality		
Construction and demolition-related emissions	PSM	—
Project operations emissions	PSM	—
Greenhouse Gases (construction- and demolition-related impacts)	PSM	—
Biological Resources		
Project construction and demolition impacts		
Impact on jurisdictional wetlands and other waters	SM	—
Impacts on common vegetation species	LS	—
Impacts on common wildlife species	LS	—
Impact of noise on nesting birds	PSM	—
Impacts on special-status plants and habitat	PSM	—
Impacts on special-status wildlife *(see note)*	PSM	—
Impacts on special-status birds with MGS Units 1 and 2 left on site	—	Greater than Puente (PSU)
Impacts of dust, nighttime lighting, and invasive weeds on biological resources	PSM	—
Biological resources note: excluding nesting birds		
Project operations impacts		
Impacts on biological resources relating to nitrogen deposition	LS	—
Impact relating to potential electrocution of avian species	PSM	—
Cultural Resources		
Impacts on surficial archaeological and ethnographic resources	—	—
Impacts on buried archaeological resources	PSM	Less than Puente (B)
Impacts on built environment resources	—	—
Geology and Paleontology		
Risk of damage to paleontological resources	PSM	—
Potential impacts on geological or mineralogical resources	—	—
Risk of surface fault rupture	LS	Similar to Puente (LS)
Risk of liquefaction, dynamic compaction, and lateral spread from strong seismic shaking	PSM	Similar to Puente (PSM)
Risk of potential excessive settlement or expansion of soils causing an impact on structures	PSM	Similar to Puente (PSM)
Risk of inundation by tsunami resulting from an earthquake or local submarine landslide when combined with sea level rise	PSM	Same as Puente (PSM)
Hazardous Materials Management		
Risk of fire or explosion off-site from natural gas usage during project operation	PSM	Less than Puente (LS)
Risk of hazardous materials spill impact en route (off-site) from hazardous materials transport to the project site	PSM	Less than Puente (LS)
Risk of hazardous materials spill or migration off-site from hazardous materials storage and use on-site	PSM	Less than Puente (LS)

Alternatives Table 1
Summary Comparison of Impacts of the Proposed Project to the No-Project Alternative

Environmental Effect	Proposed Project	No-Project Alternative
Risk of significant drawdown of emergency response services causing off-site impact	LS	Same as Puente (LS)
Noise and Vibration		
Potential noise impacts at noise-sensitive locations	PSM	—
Public Health		
Construction-related diesel particulate matter (DPM) emissions	LS	—
Project operations-related toxic air contaminants (TACs) emissions	LS	—
Socioeconomics		
Induce substantial population growth in an area, either directly or indirectly	LS	—
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere	LS	—
Adversely impact acceptable levels of service for police protection and parks and recreation	LS	—
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees	B	—
Soil and Water Resources		
Water quality impacts during project construction	PSM	—
Water quality impacts during demolition	PSM	—
Potential impacts from on-site and off-site flooding	PSM	—
Potential flooding hazard based on Federal Emergency Management Agency floodplain delineation maps *(see note)*	LS	Same as Puente (LS)
Water quality impacts from wastewater discharge	SM	Less than Puente (LS)
Water quality impacts from power plant operations	PSM	Same as Puente (PSM)
Potential impacts on potable water supplies	—	—
Traffic and Transportation		
Potential impacts from increased construction workforce traffic that is substantial compared to the existing traffic load and capacity of the street system	PSM	Less than Puente (LS)
Potential for increased workforce traffic to cause driver safety impacts during project demolition and/or construction	PSM	Less than Puente (LS)
Potential for increased workforce traffic to damage roads and bridges during project demolition and/or construction	PSM	Less than Puente (LS)
Potential impacts from increased traffic during project operation (i.e., post-construction traffic) that is substantial compared to the existing traffic load and capacity of the street system	LS	Less than Puente (LS)
Potential impacts from thermal plumes on aircraft and pilot safety	PSM	Less than Puente (Indeterminate)
Impacts on aviation safety relating to location of transmission lines	LS	—
Transmission Line Safety and Nuisance		
Interference with radio-frequency communication	LS	—
Potential for transmission lines to cause audible noise	LS	—
Potential fire hazards	PSM	—

Alternatives Table 1
Summary Comparison of Impacts of the Proposed Project to the No-Project Alternative

Environmental Effect	Proposed Project	No-Project Alternative
Potential for hazardous shocks	PSM	—
Potential for nuisance shocks	PSM	—
Potential for electric and magnetic (EMF) exposure	PSM	—
Visual Resources		
Substantial adverse effect on a scenic vista	—	—
Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	—	—
Substantially degrade the existing visual character or quality of the site and its surroundings		
KOPs 1, 2, 4, and 5	LS	—
KOP 3	SM	—
Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	PSM	Indeterminate
Waste Management		
Potential for impacts on human health and the environment relating to waste discharges	PSM	Less than Puente (LS)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	PSM	Less than Puente (LS)
Potential for impacts on human health and the environment relating to past or present soil or water contamination	PSM	Less than Puente (LS)
Worker Safety and Fire Protection		
Risk of fire or explosion impact off-site resulting from natural gas usage during construction and operation	PSM	Less than Puente (LS)
Risk of significant drawdown of emergency response services causing off-site impact	LS	Less than Puente (LS)

Air Quality

Under the No-Project Alternative, there would be no emissions associated with the existing MGS Units 1 and 2 operations after 2020. It is assumed that the existing MGS Units 1 and 2 would be mothballed, and the structures would remain on the site. There could be negligible air emissions associated with operation of equipment required to close and secure the site. The MGS Unit 3 would continue as a permitted generating unit.

Under the No-Project Alternative, **no impacts** on air quality would occur compared to the proposed project, and **no impact** would occur relating to GHG emissions.

Biological Resources

Under the No-Project Alternative, potential impacts on biological resources from construction and operation of the proposed project would not occur. There would be no grading of the site and no loss of on-site disturbed vegetation communities, including

approximately 2.03 acres of Coastal Commission defined wetlands. The work required to decommission the existing MGS Units 1 and 2 (e.g., removing stored hazardous chemicals from parts of the facility) would not be expected to impact biological resources. The No-Project Alternative would have **no impact** on common vegetation and wildlife species from project demolition and construction. (**Tables 4.2-2** and **4.2-3** in the AFC list plant species observed at the site and wildlife species on and near the site, respectively.) Similarly, the No-Project Alternative would have **no impact** on special-status plant species at the project site (see **Biological Resources Table 3** in this staff assessment for a list of species). The No-Project Alternative would avoid filling the Coastal Commission defined wetlands in the Puente footprint, and **no impact** would occur on the wetlands. The No-Project Alternative would avoid construction-related noise impacts on nesting birds.

As stated in the AFC for the proposed project, critical habitat for western snowy plover is designated on the beaches and dunes west, northwest, and southwest of the project site (NRG 2015a). No critical habitat is located on the project site. The proposed project would entail demolishing MGS Units 1 and 2 whereas under the No-Project Alternative, Units 1 and 2 would be retired and decommissioned but would remain standing on the site for the foreseeable future. The existing power plant structures would present potential nuisance nesting and perching opportunities for raptors and other predatory birds, which could lead to depredation of western snowy plover and California least tern nests on adjacent beaches and dunes. This potential impact would be **greater than Puente** for special-status avian species. With implementation of mitigation measures, the impact could be reduced to less than significant; however, under the No-Project Alternative, the Energy Commission would not have the authority to require implementation of measures to reduce or avoid impacts on special-status avian species, and the impact would remain potentially significant and unavoidable. The city would retain its discretionary authority over land uses at the MGS site.

Cultural Resources

Under the No-Project Alternative, the site would remain an industrial facility with bordering uses ranging from natural parkland to oil production, agricultural uses, undeveloped open space, and residential development. All work required to decommission the MGS Units 1 and 2 would be conducted above grade, and no earth movement, excavations, or heavy construction would be required.

The archaeological and ethnographic setting presented in **Cultural Resources Appendix A** of this staff assessment applies also to this alternative.

Impacts on Surficial Archaeological and Ethnographic Resources

The No-Project Alternative would not involve construction of the proposed project or any linear facilities. As such, the applicant would not conduct excavations or other ground disturbance at the site, or alter the existing MGS beyond decommissioning Units 1 and 2. No surficial archaeological sites or ethnographic resources were recorded in the project area, and there would be no impacts on surficial archaeological sites or ethnographic resources from the No-Project Alternative. The impact conclusion for

potential damage to surficial archaeological resources and ethnographic resources is **no impact**.

Impacts on Buried Archaeological Resources

The No-Project Alternative would have a lesser impact on buried archaeological resources compared to the proposed project because no below-grade disturbance would occur under the No-Project Alternative. Under the proposed project, significant ground disturbance would occur and could potentially impact as yet undiscovered buried archaeological resources. Therefore, impacts on buried archaeological resources under the No-Project Alternative would be **less than Puente**. Because no ground disturbance would be necessary under this alternative, the lack of potential to damage buried archaeological resources is considered a beneficial impact of the No-Project Alternative.

Impacts on Built Environment Resources

As described in the **Cultural Resources** section of this staff assessment, no impacts on potential built environment historical resources have been identified for Puente. Under the No-Project Alternative, it is assumed the existing MGS would be shut down and decommissioned, and not demolished as it would under Puente. The MGS is considered ineligible for listing on the California Register of Historical Resources (CRHR); therefore, the impact conclusion for potential impacts on built environment historical resources is **no impact** for the proposed project and the No-Project Alternative.

Conclusion

The No-Project Alternative overall would have **no impact** on cultural resources, and compared to the proposed project, the impacts overall would be **less than Puente**.

Geology and Paleontology

Under the No Project Alternative no new structures or foundations would be constructed on the site, and no excavations or major earth work would be required. Therefore, no new structures or foundations would be at risk from seismic shaking events. The existing facility would remain on the site, and potential impacts relating to seismic risks would be **similar to Puente**. Construction of the proposed project could damage paleontological resources at the site, if such resources are present in sedimentary materials underlying the site. Because the No-Project Alternative involves no excavations or construction, **no impact** on paleontological resources could occur. No geological or mineralogical resources are identified on the site that could be impacted by any alternative. Under variable conditions and due to its coastal location, the proposed project could be at risk for inundation by tsunami. Under the proposed project, this impact is potentially significant. Under the No-Project Alternative, the risk of inundation by tsunami would be the **same as Puente**.

Hazardous Materials Management

Continued compliance with LORS relating to hazardous materials management would be required under the No-Project Alternative during the remaining years of operation of Units 1 and 2. During the shut down, all hazardous materials would be taken off site according to all applicable LORS. There would be no potentially significant impacts on the public or environment resulting from the No-Project Alternative. Compared to the proposed project, hazardous materials management impacts are generally **less than Puente**.

Noise and Vibration

The No-Project Alternative would cause no construction noise. Under the No-Project Alternative there would be no operational noise associated with operation of Units 1 and 2 after 2020. Therefore, compared to the proposed project, **no impact** would occur under the No-Project Alternative.

Public Health

Under the No-Project Alternative, there would be no emissions of toxic air contaminants (TACs) from the existing MGS Units 1 and 2 after 2020. It is assumed that Units 1 and 2 would be closed and decommissioned and the structures would remain nonoperational on the site. No heavy construction equipment would be required (e.g., cranes); however, staff assumes that a negligible level of toxic air emissions would result from operation of equipment required to close and secure the facility. Construction-related diesel particulate matter emissions would be negligible. The MGS Unit 3 would continue to be operated as a permitted air emissions unit, and its continued operation is not part of the proposed project or the comparative impacts of the alternatives. For project operations-related toxic air contaminants, **no impact** on public health would occur following shut down of Units 1 and 2 under the No-Project Alternative.

Socioeconomics

Under the No-Project Alternative, shut down and decommissioning activities would require a few workers who would likely be supplied by the existing MGS operations workforce. As a result, the No-Project Alternative would not induce substantial population growth, induce substantial increases in demand for parks or police protection services, or displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere. Shut down activities would not have impacts relating to socioeconomics; therefore, **no impact** would occur.

The estimated fiscal benefits of the proposed project would not be realized under the No-Project Alternative.

Soil and Water Resources

Water Quality Impacts from Construction and Demolition

Because the No-Project Alternative would not include any construction or demolition activities, **no impact** would occur.

Potential Impacts from On-site and Off-site Flooding

On-site flooding impacts could occur if construction of a project substantially altered the existing drainage patterns of the site (due to site grading, increasing impervious surfaces, or placing the project in a location that would alter the course of a stream or river). The No-Project Alternative would not involve construction of new structures, paving of surfaces, or site grading. None of the work to decommission MGS Units 1 and 2 would have the potential to cause off-site flooding. Therefore, **no impact** would occur.

Potential Flooding Hazard Based on Federal Emergency Management Agency Floodplain Delineation Maps

Flooding hazard is determined by project location. The No-Project Alternative would not involve project construction at the existing site. The potential for flooding hazard at the site would be exactly the **same as Puente**, and the impact is less than significant.

Water Quality Impacts from Wastewater Discharge

Decommissioning of MGS would prepare Units 1 and 2 for complete shut down and bring the site to a safe and stable condition. Wastewater could be generated from the process of purging oil and other liquids from equipment for long-term dormancy. Wastewater that is not properly disposed could potentially contaminate groundwater through soil infiltration, as well as a nearby water body through direct discharge or contact runoff.

The MGS wastewater and septic systems would continue operating after Units 1 and 2 are shut down and Unit 3 continues to operate. Therefore, disposal of wastewater generated during decommissioning activities would follow existing MGS discharge permits. Discharges of hazardous or toxic materials into the wastewater and septic systems are prohibited. These discharges would be disposed off-site to the appropriate licensed facility in accordance with applicable LORS. Because the No-Project Alternative would not have a new power plant generating wastewater, and MGS decommissioning would use existing permitted wastewater systems, wastewater discharge impacts would be **less than Puente**, and the impact conclusion is less than significant.

Water Quality Impacts from Power Plant Operations

Because MGS decommissioning activities are included in both the proposed project and the No-Project Alternative, associated impacts on water quality would be the same for both situations and potential impacts would be mitigated to less than significant. Although the No-Project Alternative would not have any impacts associated with a new power plant, the proposed project's impacts would be reduced to less than significant through LORS compliance. Therefore, the overall impacts on water quality would be mitigated to less than significant for both situations, meaning impacts under the No-Project Alternative would be the **same as Puente**.

Potential Impacts on Potable Water Supplies

Staff determined that the proposed project would have no impact on potable water supplies. For the No-Project Alternative, total water use over the 3-month decommissioning period would be minimal (approximately 0.3 acre-feet). Compared to the proposed project, the No-Project Alternative would also have **no impact** on potable water supplies.

Traffic and Transportation

For all potential roadway traffic related impacts, decommissioning of MGS Units 1 and 2 would not be expected to generate additional traffic greater than existing conditions. An estimated nine members of the existing MGS workforce would perform the work intermittently over 3 months while overseen by power plant staff, and no heavy construction equipment would be required. A small workforce would disconnect electrical components. Truck trips would likely be limited to those needed for removal of hazardous materials. Potential impacts relating to traffic level of service (LOS) would be less than significant, and no mitigation measures would be needed. Therefore, temporary impacts on traffic LOS from the No-Project Alternative would be **less than Puente** and less than significant. Similarly, impacts relating to driver safety and damage to roads and bridges would be **less than Puente** and less than significant.

For potential project operations roadway traffic impacts, the No-Project Alternative would include intermittent trips to operate and maintain systems (such as the storm drainage system) as required for environmental permit compliance. These trips would be extremely minimal. Therefore, permanent impacts on traffic LOS relating to operations and maintenance under the No-Project Alternative would be **less than Puente** and less than significant.

Under the No-Project Alternative and the proposed project, MGS Units 1 and 2 could operate until the end of 2020. MGS Units 1 and 2, which are natural gas-fired, might generate thermal plumes that could be hazardous to aircraft passing directly overhead. Staff has no data on these plumes. The Energy Commission did not license these units and has no regulatory authority over existing MGS operations. Hypothetically, any plume hazards from the MGS units could be mitigated to less than significant by adding a remark to applicable Federal Aviation Administration (FAA) aviation maps and documents and by issuing a Notice to Airmen warning pilots to avoid overflight of the MGS.

Operation of Puente would add an additional thermal plume to the area. Staff calculated that the project's thermal plume would have a peak vertical velocity of 10.6 meters per second or more, one of the thresholds of significance used to determine hazards to aircraft, at heights up to approximately 2,375 feet above ground level. Pilot safety impacts from the No-Project Alternative, which would include potential plumes from MGS Units 1 and 2 until 2020, would be **less than Puente**. The comparative impact conclusion is indeterminate because staff does not have plume data for MGS Units 1 and 2.

Transmission Line Safety and Nuisance

Staff analyzed the potential for field and non-field impacts from the physical presence of the existing SCE 220-kV line and the interactive effects of the generated electric and magnetic fields. These impacts are discussed in the **Transmission Line Safety and Nuisance** section of this staff assessment in terms of interference with radio-frequency communication, audible noise, fire hazards, hazardous shocks, nuisance shocks, and electric and magnetic field (EMF) exposure. Staff's four recommended conditions of certification of this staff assessment would reduce potential impacts to less than significant.

The proposed project would require one single-circuit 220-kV transmission line with a direct connection to SCE's 220-kV transmission system. The 220-kV single circuit would be designed and constructed to comply with the requirements of CPUC's General Order (GO) 95, "Rules for Overhead Line Construction," and other applicable state and local codes.

At 262 net MWs, Puente's generating capacity would be less than the 430 net MWs for the existing MGS Units 1 and 2, meaning that there would be a net reduction in power and current flowing in the transmission lines exiting the power plant site. Since the power lines would be operated at 220-kV whether with the Puente Power Project or the existing MGS Units 1 and 2, the resulting electric fields and related impacts would remain the same. Only the magnetic fields would be reduced with operation of Puente, since it is the only field component that directly depends on current levels.

Under the No-Project Alternative, there would be no operation of MGS Units 1 and 2 after 2020. Therefore, because no electricity generation would occur to replace those operating units, there would be **no impacts** pertaining to transmission line safety and nuisance.

Visual Resources

Under the No-Project Alternative, MGS Units 1 and 2 would be shut down and decommissioned but would remain nonoperational on the site. No on-site demolition or construction would occur, and MGS Unit 3 would continue operating. Leaving the decommissioned power plant structures on the site would perpetuate an aesthetic nuisance from viewpoints at Mandalay State Beach, McGrath State Beach, and other more distant areas within the project's viewshed. It is unknown whether the surfaces of power plant structures would deteriorate to some degree. However, in general, the existing visual environment at the MGS site and in the surrounding area where views of the site are possible would not be substantially different under the No-Project Alternative.

Staff concludes that the proposed project would cause no impacts relating to its potential to adversely impact a scenic vista or substantially damage scenic resources. Under the No-Project Alternative, no change would occur relating to these visual resources impact criteria; therefore, **no impacts** are identified.

Under the proposed project, visual impacts were assessed, in part, by evaluating changes in the visual environment that would occur compared to the baseline conditions for visual resources with the MGS Units 1 and 2 on the site. For each of the key observation points (KOPs) selected for analysis, staff evaluated the potential for the proposed project to substantially degrade the existing visual character or quality of the site and its surroundings (see the **Visual Resources** section of this staff assessment). For KOPs 1, 2, 4, and 5, staff identified less-than-significant impacts on visual resources for this criterion. Under the No-Project Alternative, the existing visual resources condition would not change substantially, and **no impact** is identified.

For KOP 3, staff identified a significant impact relating to Puente's potential to substantially degrade the existing visual character or quality of the site and its surroundings. Staff recommends Condition of Certification **VIS-1** requiring preparation and implementation of a surface treatment plan for project buildings, structures, and equipment. Under the No-Project Alternative, the Energy Commission would have no discretionary authority to implement conditions or measures to reduce the impact or avoid the possible long-term deterioration of decommissioned power plant structures that are visible from public use areas. However, the existing visual resources condition would not change substantially under the No-Project Alternative, and **no impact** is identified.

Staff has identified a potentially significant impact pertaining to a new source of substantial light or glare adversely affecting day or nighttime views in the area in the vicinity of the proposed project. Staff recommends Condition of Certification **VIS-2** requiring preparation and implementation of a permanent exterior lighting management plan. Lighting of the decommissioned MGS structures would presumably be needed for safety and security purposes. Under the No-Project Alternative, the Energy Commission would have no discretionary authority regarding future use or management of the MGS site's permanent exterior lighting and glare. Staff considers the potential impacts from light and glare under the No-Project Alternative to be **indeterminate**.

Waste Management

LORS are enforced at the local level to ensure recycling and safe disposal of solid and hazardous waste, and these LORS would apply also to wastes generated under the No-Project Alternative (see the **Waste Management** section of this staff assessment for a discussion of applicable LORS). No mitigation measures beyond LORS compliance would be required for waste disposal under the No-Project Alternative.

Because there would be no waste generated from construction and operation of a new facility, the potential for project materials to have an effect on waste disposal or diversion facilities is **less than Puente**. Due to the significant reduction in waste quantities generated under the No-Project Alternative, a less-than-significant impact would occur compared to the proposed project.

Staff considered potential site contamination as a factor for determining impacts from the No-Project Alternative. Since there would be no ground disturbance from the No-Project Alternative, there would be no potential impact on human health and the

environment from existing site contamination. Although LORS compliance would be required for remediation of site contamination for construction and operation of Puente, the potential impacts on human health and the environment would be **less than Puente**. Based on staff's analysis, overall impacts pertaining to waste management under the No-Project Alternative would be **less than Puente**.

Worker Safety and Fire Protection

Continued compliance with LORS relating to worker safety and fire protection would be required under the No-Project Alternative during the remaining years of operation of Units 1 and 2. Once shut down of the facility was started, all of the on-site fire suppression systems would remain in operation pursuant to applicable LORS. There would be no potentially significant impacts on the public or environment resulting from the No-Project Alternative, and potential impacts on worker safety and fire protection are **less than Puente**.

DEL NORTE/FIFTH STREET OFF-SITE ALTERNATIVE

Staff evaluated the potential environmental impacts of developing a project similar to the proposed project, including ancillary buildings and other structures, and two retention basins to collect storm water and process wastewater on an approximately 12.5-acre site in an industrial area in the eastern portion of Oxnard. The site address is 390 S. Del Norte Boulevard near the intersection with E. Fifth Street (State Highway 34) (**Alternatives Figure 2**). Both roadways are major travel corridors (City of Oxnard 2006). The Union Pacific Railroad freight line parallels E. Fifth Street along the southern boundary of the site with an at-grade controlled crossing at S. Del Norte Boulevard. This rail line also provides Amtrak and Metrolink passenger service. The site is located approximately 7 miles east of the coastline and 5 miles inland from the Coastal Zone boundary.

The approximately 12.5-acre site being evaluated under this alternative is located on the south half of an approximately 25-acre parcel with APN 2160160295. An asphalt recycling center (could include a concrete batch plant) and possibly another industrial-type use are located on the south half of the parcel. The north half of the parcel is in agricultural use and is not being evaluated as part of this alternative. The property west of the site includes vacant land and a regional recycling facility. The vacant property may be developed as a biowaste-to-energy conversion center for organic material. An oil refinery is located on the property south of the site across State Highway 34. Areas east and north of the site include industrial, agricultural, and warehouse commercial uses. The property line along the site's east side coincides with the city boundary.

A single-family residence is located on Sturgis Road one-quarter mile northeast of the approximate center point of the site. The closest residential neighborhood is located approximately 1.25 miles west/northwest of the site.

A 30- to 36-inch diameter natural gas pipeline parallels S. Rice Avenue approximately 1 mile west of the site (see **Alternatives Figure 1b**). Providing natural gas to the site would likely require constructing a natural gas pipeline along E. Fifth Street to connect

to the existing pipeline. The city's eastern trunk sewer line parallels S. Del Norte Boulevard along the west side of the site (City of Oxnard 2006). Like the proposed project, total estimated water use would be approximately 16 acre-feet per year. Oxnard's water distribution system shows a water pipeline paralleling Sturgis Road approximately 970 feet north of the site's north boundary (City of Oxnard 2006).

This alternative would require construction of an on-site power plant switchyard. Connecting the switchyard to the closest substation (Ormond Beach) or tower along the Mandalay-Santa Clara 220-kV transmission line would require installing transmission structures and an overhead 220-kV transmission line along an approximate 6- to 8-mile-long linear alignment. Although it could be feasible for segments of the transmission line to be installed along or within existing rights-of-way (ROWs), a potential route for the transmission line under this alternative is unknown.

Land uses in the areas between this off-site alternative and each of the two substations include agricultural, industrial, and residential uses. Construction and installation of the transmission line could cause temporary impacts on air quality, noise, traffic, and water quality. Construction-related impacts could also affect biological resources. Depending on the types and sensitivity of nearby land uses, a new transmission line could require analyses of potential impacts relating to visual resources and transmission line nuisances. Construction-related impacts would be reduced to less than significant with implementation of mitigation measures or by avoiding sensitive resources. Potential specific impacts relating to transmission line installation are indeterminate for this off-site alternative (e.g., impacts on visual resources).

The Puente Power Project Siting Committee commented on the **Alternatives** section of the PSA, including a request that additional information be added to the FSA to complete the **Alternatives** analysis. (See the "Response to Comments" section of this FSA, below.) In preparing the analysis of the Del Norte/Fifth Street Off-site Alternative, staff relied on a general level of information on the potential for cultural resources to be impacted by this alternative. Without the specific information typically acquired during a records search and site survey for a project, Cultural Resources staff was unable to reach comparative impact conclusions without speculating as to the nature of potential resource impacts. Similarly, Biological Resources staff could not determine whether the drainage ditch across part of the north half of this alternative site would be considered a water of the state without further study.

Based on the proximity of the Del Norte/Fifth Street Off-site Alternative to the Camarillo Airport, Traffic and Transportation staff identified a significant and unavoidable impact on aircraft and pilot safety from thermal plumes that would be emitted by a project like Puente at this alternative site. Staff also identified a potentially significant and unavoidable impact on aircraft from transmission structures that is considered less than significant under Puente (see **Alternatives Table 4**, below, and the "Traffic and Transportation" analysis following the table). Both of these impacts are determined to be greater than the corresponding impacts at the Puente site.

The Del Norte/Fifth Street Off-site Alternative would avoid the impact relating to the risk of inundation by tsunami resulting from an earthquake or local submarine landslide. Under the proposed project, this impact is reduced to less than significant with conditions of certification imposed. However, because of two significant impacts on aircraft and pilot safety identified during preparation of the PSA, this off-site alternative is not considered environmentally superior to the proposed project, and staff has not conducted any further comparative impact analyses of resources potentially affected at this site. Similarly, staff has not conducted further comparative analyses for potential impacts on the Environmental Justice (EJ) population for this off-site alternative. However, staff has added data from *CalEnviroScreen* to the characterization of the Del Norte/Fifth Street Off-site Alternative (below).

Land Use Planning

To determine potential consistency of the Del Norte/Fifth Street Off-site Alternative with land use LORS, staff reviewed the 2030 Oxnard General Plan. The site is designated by the General Plan as Heavy Industrial (IH), which allows industrial uses that are primarily outdoor and/or within specialized structures that may involve transportation, storage, or use of hazardous materials. Public services are permitted under the IH land use designation (City of Oxnard 2011). Goal ICS-17 (Infrastructure & Community Services) of the General Plan addresses providing adequate and efficient public utilities (including electric facilities) that meet the needs of the residents of Oxnard.

This alternative site is not located within the Coastal Zone and would not be subject to review of potential impacts on coastal resources. The zoning designation for this alternative site is Light Manufacturing Planned Development (M1-PD). The Light Manufacturing zone district (M1) allows wholesaling, manufacturing, processing, fabrication, public/private service uses and other similar uses the planning and environmental services manager finds to be consistent with the purpose and intent of this zone. Public services uses permitted in the M1 zone include electrical transmission and distribution substations and public utility service yards with incidental buildings. The Planned Development Additive zone district (PD) is intended to ensure the orderly development of land in conformance with the General Plan and to permit departures from the restrictions imposed within the basic zones.

A newly proposed power generation facility in the M1-PD zone district would normally require a conditional use permit. To approve a power generation facility at this alternative site, Energy Commission staff would have to determine that the proposed use is in conformance with the General Plan and other adopted standards. Special conditions that would be considered by staff and potentially imposed on the project could include the following (verbatim from Section 16-531 of the Oxnard Zoning Code addressing requirements for granting a special use permit):

- The nature, condition and development of adjacent uses, buildings and structures shall be considered, and no proposed special use permit shall be granted if the approval body finds such use will adversely affect or be materially detrimental to such adjacent uses, buildings or structures or to the public health, safety or general welfare.

- The site that is subject to the special use permit shall be adequate in size and shape to accommodate the yards, walls, fences, parking and loading facilities, landscaping and other items which may be required.
- The site that is subject to the special use permit shall be served by highways adequate in width and improved as necessary to carry the kind and quantity of traffic such use would generate.
- The site that is subject to the special use permit shall be provided with adequate sewage, water, fire protection and storm drainage facilities.

Although the Energy Commission would have in lieu permitting authority for an electric generating facility at the Del Norte/Fifth Street Off-site Alternative, section 25506 of the Warren-Alquist Act requires the Energy Commission to request comments and recommendations from appropriate government agencies (e.g., a local municipality) regarding the design, operation, and location of the facilities in relation to environmental quality, public health and safety, and other factors on which an agency may have expertise.

The Del Norte/Fifth Street Off-site Alternative could be designed to be consistent with applicable land use LORS. City of Oxnard planning staff has presented the site as a suitable alternative site for the project (City of Oxnard 2015b).

Similar to the No-Project Alternative, under the Del Norte/Fifth Street Off-site Alternative, the existing MGS Units 1 and 2 would remain nonoperational on the MGS power plant site and would not necessarily be demolished and removed from the site following their decommissioning. In the absence of a license from the Energy Commission for a power plant at the MGS site, the Commission would have no authority over the site and proposed future uses of the MGS power plant site would be subject to review and approval of a coastal development permit by the city.

Environmental Justice

The **Environmental Justice** section of this staff assessment discusses California's state policy requirements for decision-makers to consider environmental justice (EJ) if their actions could cause impacts on the environment.

Demographic Screening

Similar to staff's analysis for the proposed project, staff considered the potential impacts on the EJ population residing within 6 miles of the Del Norte/Fifth Street Off-site Alternative and whether any impacts would disproportionately affect the EJ population.

The **Environmental Justice** section explains the demographic screening methodology used to determine the presence of an EJ population. Staff identifies an EJ population based on race and ethnicity when one or more U.S. Census blocks in the 6-mile radius have a minority population greater than or equal to 50 percent. Staff identifies an EJ population based on poverty when there is a comparatively larger population within the

6-mile radius living below the federal poverty level compared with other appropriately scaled reference geographies.

CalEnviroScreen – More Information About An EJ Population

California Communities Environmental Health Screening Tool: CalEnviroScreen Version 2.0 (CalEnviroScreen) is a tool used by the California Environmental Protection Agency (CalEPA) to identify disadvantaged communities pursuant to Senate Bill (SB) 535. As required by SB 535, disadvantaged communities are identified based on geographic, socioeconomic, public health and environmental hazard criteria. CalEnviroScreen assesses communities at the census tract level in California to identify the communities most burdened by pollution from multiple sources and most vulnerable to its effects, taking into account socioeconomic characteristics and underlying health status (CalEPA 2014a). The CalEnviroScreen score derived for a given place is relative to other places in the state (CalEPA 2014a). The **Environmental Justice** section of this FSA has more information about CalEnviroScreen, including limitations of this tool and the pollution burden and population characteristics contributing to the overall CalEnviroScreen score.

When a technical area has identified impacts that could combine with any of the indicators that make up the CalEnviroScreen score, staff in that technical area assesses the CalEnviroScreen data and other data specific to the project alternative. Staff considers where impacts from the alternative would potentially occur and the extent to which that area is currently burdened. With this combined information, staff then assesses the extent of the alternative's impact on these disadvantaged communities and whether, or how, the alternative would impact the population.

Demographic Screening for the Del Norte/Fifth Street Off-site Alternative

Alternatives Figure 3 (using a 1-, 3-, and 6-mile radius) shows that the population residing in the area of the Del Norte/Fifth Street Off-site Alternative constitutes an EJ population based on race and ethnicity (minority) as defined by the federal guidance document, *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality 1997).

Staff used the cities of Camarillo, Oxnard, and Port Hueneme to determine the relative poverty levels within the 6-mile radius and the county as the reference geography. **Alternatives Table 2** shows the percentages of population living below the federal poverty level in the 6-mile radius and the comparative data for the county. Staff concludes that when compared to the poverty data for the county, the cities of Oxnard and Port Hueneme have higher percentages of people living below the poverty level than the county and thus are considered EJ populations based on poverty.

Alternatives Table 2
Poverty Data within the Del Norte/Fifth Street Off-site Alternative Area

	Total Population (see note)	Population Below Poverty Level	Percent Below Poverty Level (%)
	Estimate	Estimate	Estimate
Cities in a 6-mile Radius			
Camarillo	65,353 ± 210	3,616 ± 682	5.50 ± 1.0
Oxnard	200,076 ± 394	31,956 ± 2,320	16.00 ±1.2
Port Hueneme	21,020 ± 310	3,848 ± 838	18.30 ± 4
Reference Geography			
Ventura County	824,329 ± 959	91,912 ± 3,350	11.10 ± 0.4

Note: Population for whom poverty is determined.

Staff's analysis of the 2010–2014 estimates returned coefficient of variation values less than 15, indicating the data is reliable.

Source: U.S. Census 2015

CalEnviroScreen Results for the Del Norte/Fifth Street Off-site Alternative

Alternatives Figure 3 presents the minority data at the census block geographic level and marks the census tract boundaries of the tracts identified in CalEnviroScreen as disadvantaged communities. CalEPA identifies disadvantaged communities as the 25 percent (75 to 100 percentile) highest scoring census tracts in California (CalEPA 2014b).

By layering the minority data at the census block level with the census tract boundaries identified as disadvantaged communities, the minority block level data shows the census blocks where people live. Areas within the census tract boundaries without any shading are areas without residences. The size of the census block correlates with the number of residences in the block; the same is true of census tracts. For example, the smaller the census block or tract, the more densely populated that block or tract is. Likewise, the larger the block or tract, the less densely populated that block or tract is. The census block is the smallest census geographic entity.

Alternatives Figure 3 shows that the closest residence to the Del Norte/Fifth Street Off-site Alternative within a disadvantaged census tract is on Sturgis Road, just east of S. Del Norte Boulevard, approximately 0.3 mile northwest of the site. There are a few houses approximately 0.6 mile east of the site on the south side of E. Fifth Street at S. Wolff Road. The closest residential development is approximately 1.3 miles northwest of the site at the intersection of Camino Del Sol and Graves Avenue. There are a few residences along S. Rice Avenue, south of W. Fifth Street, approximately 1.4 miles southwest of the site. This figure indicates there are one or more residences at the corner of Rice Avenue and W. Fifth Street; however, after reviewing Google Earth aerial images taken before the 2010 census and then reviewing a current aerial, the residence that was near this intersection before 2010, has since been removed.

Alternatives Table 3 presents the CalEnviroScreen data for the disadvantaged community census tracts in a 6-mile radius of the Del Norte/Fifth Street Off-site Alternative site. Where percentiles for CalEnviroScreen indicators are 90 and above, the percentile is shown in bold. These relatively higher percentiles could be seen as drivers for the census tract's identification as a disadvantaged community. Two of the census tracts in the 6-mile radius have percentiles above 90 percent for population characteristics. All of the disadvantaged census tracts have percentiles above 90 for pesticides. All but two disadvantaged census tracts have indicators in both the pollution burdens and population characteristics groups of indicators with percentiles above 90.

Alternatives Table 3
CalEnviroScreen Scores for Disadvantaged Communities by Census Tract in the Del Norte/Fifth Street Off-site Alternative 6-Mile Radius [1]

Census Tract Number		6111004902	6111009100	6111004715	6111003900	6111004503	6111004704	6111000500
Total Population		5,091	5,279	5,020	7,533	4,387	1,469	1,867
CES 2.0 Percentile Range [2]		96-100	91-95	91-95	81-85	76-80	81-85	76-80
Ozone	PERCENTILES	0.10	0	0	0	0	0	19.48
PM 2.5		36.54	36.33	39.30	36.95	37.89	38.73	32.23
Diesel PM		53.95	43.86	28.91	40.74	49.82	34.25	15.92
Drinking Water		38.41	38.91	54.48	38.91	38.91	54.51	76.06
Pesticides		**99.83**	**98.54**	**99.67**	**96.88**	**97.84**	**99.93**	**96.11**
Toxic Release		61.30	69.08	88.61	77.24	**96.51**	64.54	35.26
Traffic		71.92	36.57	24.65	47.57	53.09	21.77	63.39
Cleanup Sites		0	64.78	**92.91**	42.59	42.64	39.52	10.47
Groundwater Threats		85.12	**92.68**	88.36	85.01	0	88.18	80.70
Hazardous Waste		86.51	75.34	69.91	50.42	25.63	68.85	82.08
Impaired Water Bodies		**97.27**	0	80.63	0	0	97.27	63.56
Solid Waste		86.34	23.19	**95.83**	0	0	69.12	75.96
POLLUTION BURDEN		88.21	68.33	89.71	61.39	56.50	79.12	79.08
Age		85.80	57.47	49.23	54.93	33.04	58.53	**95.97**
Asthma		81.30	81.13	58.19	60.16	58.18	58.82	40.85
Low Birth Weight		74.09	75.39	81.90	44.55	78.53	32.10	16.96
Education		**99.10**	**98.81**	84.61	**92.96**	89.99	**95.05**	**92.23**
Linguistic Isolation		**91.43**	**93.49**	77.38	**97.41**	82.25	**93.65**	65.73
Poverty		89.90	**94.16**	67.75	89.38	81.23	51.75	46.22
Unemployment		26.96	82.51	58.54	66.14	78.08	73.46	66.05
POPULATION CHARACTERISTICS		**93.65**	**97.57**	80.65	86.68	85.73	77.47	68.94

[1] Disadvantaged Communities census tracts that intersect or are within a 6-miles radius of the site. Indicators with percentiles that are shown as bold text are in the 90 percentile or higher.

[2] Overall CalEnviroScreen score percentile range.

Source: CalEPA 2014a

Potential Impacts of the Del Norte/Fifth Street Off-site Alternative on the EJ Population

Staff recommends conditions of certification to reduce potential environmental impacts of the proposed project relating to Air Quality, Hazardous Materials Management, Noise and Vibration, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, and Waste Management. With implementation of similar mitigation measures, potentially significant environmental impacts of the Del Norte/Fifth Street Off-site Alternative on populations in the area of this off-site alternative, including the EJ population, could be reduced to less than significant. Public Health and Socioeconomics staff concludes that the project impacts relating to their technical areas would be less than significant and therefore would have less-than-significant impacts on populations in a 6-mile radius of the Del Norte/Fifth Street Off-site Alternative, including the EJ population. Staff concludes that environmental impacts from the Del Norte/Fifth Street Off-site Alternative would not disproportionately impact the EJ population living in this alternative's 6-mile radius.

Cultural Resources staff considers impacts on Native American populations. Staff does not know whether Native Americans currently use or reside in the Del Norte/Fifth Street Off-site Alternative area. Therefore, staff does not know if there are any currently used hunting and gathering areas that could be impacted by this alternative. Impacts are **indeterminate**, including whether a disproportionate impact would occur.

Potential to Attain the Project Objectives

The applicant's project objectives specify developing a 262-MW natural gas-fired power plant at the MGS site and fulfilling its 20-year agreement with SCE (NRG 2015a). As discussed above, the CPUC issued its final decision approving most of SCE's energy resource contracts for the Moorpark sub-area, including a contract with NRG for a 262-MW natural gas-fired simple-cycle facility at the project site (the Puente Power Project). The applicant includes a project objective to design, permit, build, and commission Puente by June 2020. The CPUC's Track 1 decision addresses procurement of resources to replace retiring OTC generators and meet LCR needs by 2021. An alternative site in the Moorpark sub-area could, in theory, provide a location to develop a project similar to Puente. However, it is unknown whether NRG could obtain site control and complete environmental review and licensing to have a project built and commissioned at the Del Norte/Fifth Street alternative site by 2020 or 2021 to meet LCR needs.

If construction and operation of the Del Norte/Fifth Street Off-site Alternative was feasible, this alternative could potentially satisfy four of the applicant's eight project objectives:

- Provide an efficient, reliable, and predictable power supply by using a simple-cycle, natural gas-fired combustion turbine to replace the existing OTC generation;
- Support the local capacity requirements of the California ISO's Big Creek/Ventura local capacity reliability area;

- Develop a 262-MW nominal net power generation plant that provides efficient operational flexibility with rapid-start and fast-ramping capability to allow for efficient integration of renewable energy sources in the electrical grid; and
- Site the project on property that has an industrial land use designation with consistent zoning.

This off-site alternative could be designed and built to safely produce electricity; however, staff has determined that high velocity thermal plumes could cause a significant and unavoidable impact on pilot and aircraft safety due to the site's location near Camarillo Airport (see the discussion below under the subsection, "Traffic and Transportation," for this alternative). This off-site alternative might not meet the project objective to safely produce electricity without creating a significant environmental impact.

Potential Feasibility Issues

Addressing feasibility of an alternative takes into account several factors, including whether the project proponent can reasonably acquire, control, or otherwise have access to the alternative site (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(1)). The applicant does not have control of the Del Norte/Fifth Street Off-site Alternative site, which is owned by Todd Industrial Park, LLC (NRG 2015b). Developing a project similar to Puente at this site would require NRG to negotiate a property purchase or lease agreement with the owner. Depending on the outcome of such a negotiation, project viability could be affected.

Another factor affecting feasibility of an alternative addresses availability of infrastructure. Constructing and operating a project similar to Puente at the Del Norte/Fifth Street Off-site Alternative site would require a new power plant design proposal for the site with plans and analyses for off-site utility connections. This off-site alternative would require constructing an on-site power plant switchyard and transmission line connection to a tower along the Mandalay-Santa Clara 220-kV transmission line. Although connecting to a 220-kV tower would require constructing a 6- to 8-mile-long transmission line, the interconnection would be similar to the proposed project because either would connect to the same transmission line leading to the Santa Clara Substation. The connection would not cause "downstream" impacts on the transmission grid. In other words, the connection would not cause significant transmission impacts beyond the first point of interconnection with the existing grid.

The possible retirement of 1,500 MWs of generating capacity at the Ormond Beach Generating Station could allow the Del Norte/Fifth Street Off-site Alternative to interconnect with the grid at the Ormond Beach Substation without causing "downstream" impacts on the transmission grid. This interconnection scenario would entail constructing a 6- to 7-mile-long transmission line from the alternative site to the substation.

Either of these interconnection scenarios would require additional planning and analysis to identify a linear route and possible ROW for the new transmission line. It is unknown

whether the applicant could feasibly gain site control of the Del Norte/Fifth Street Off-site Alternative. If the applicant did have site control, the work to conduct site planning and analysis and plan its grid interconnection would delay the project and could affect its viability as an alternative.

Environmental Analysis

Alternatives Table 4 presents a summary comparison of impacts of the proposed project to the same or similar potential impacts of the Del Norte/Fifth Street Off-site Alternative. Comparative discussions for each environmental topic area follow the table.

Alternatives Table 4
Summary Comparison of Impacts of the Proposed Project to the Del Norte/Fifth Street Off-site Alternative

Environmental Effect	Proposed Project	Del Norte/Fifth Street Off-site Alternative
Air Quality		
Construction and demolition-related emissions	PSM	Similar to Puente (PSM)
Project operations emissions	PSM	Similar to Puente (PSM)
Greenhouse Gases (construction- and demolition-related impacts)	PSM	Similar to Puente (PSM)
Biological Resources		
Project construction and demolition impacts		
Impact on jurisdictional wetlands and other waters	SM	Indeterminate
Impacts on common vegetation species	LS	Similar to Puente (LS)
Impacts on common wildlife species	LS	Similar to Puente (LS)
Impact of noise on nesting birds	PSM	Less than Puente (PSM)
Impacts on special-status plants and habitat	PSM	Less than Puente (LS)
Impacts on special-status wildlife *(see note)*	PSM	Less than Puente (PSM)
Impacts on special-status birds with MGS Units 1 and 2 left on site	—	Greater than Puente (PSU)
Impacts of dust, nighttime lighting, and invasive weeds on biological resources	PSM	Less than Puente (PSM)
Biological resources note: excluding nesting birds		
Project operations impacts		
Impacts on biological resources relating to nitrogen deposition	LS	—
Impact relating to potential electrocution of avian species	PSM	Similar to Puente (PSM)
Cultural Resources		
Impacts on surficial archaeological and ethnographic resources	—	Indeterminate
Impacts on buried archaeological resources	PSM	Indeterminate
Impacts on built environment resources	—	Indeterminate
Geology and Paleontology		
Risk of damage to paleontological resources	PSM	Similar to Puente

Alternatives Table 4
Summary Comparison of Impacts of the Proposed Project to the Del Norte/Fifth Street Off-site Alternative

Environmental Effect	Proposed Project	Del Norte/Fifth Street Off-site Alternative
		(PSM)
Potential impacts on geological or mineralogical resources	—	—
Risk of surface fault rupture	LS	Similar to Puente (LS)
Risk of liquefaction, dynamic compaction, and lateral spread from strong seismic shaking	PSM	Similar to Puente (PSM)
Risk of potential excessive settlement or expansion of soils causing an impact on structures	PSM	Similar to Puente (PSM)
Risk of inundation by tsunami resulting from an earthquake or local submarine landslide when combined with sea level rise	PSM	—
Hazardous Materials Management		
Risk of fire or explosion off-site from natural gas usage during project operation	PSM	Same as Puente (PSM)
Risk of hazardous materials spill impact en route (off-site) from hazardous materials transport to the project site	PSM	Same as Puente (PSM)
Risk of hazardous materials spill or migration off-site from hazardous materials storage and use on-site	PSM	Same as Puente (PSM)
Risk of significant drawdown of emergency response services causing off-site impact	LS	Same as Puente (LS)
Noise and Vibration		
Potential noise impacts at noise-sensitive locations	PSM	Greater than Puente (PSM)
Public Health		
Construction-related diesel particulate matter (DPM) emissions	LS	Similar to Puente (LS)
Project operations-related toxic air contaminants (TACs) emissions	LS	Similar to Puente (LS)
Socioeconomics		
Induce substantial population growth in an area, either directly or indirectly	LS	Similar to Puente (LS)
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere	LS	Similar to Puente (LS)
Adversely impact acceptable levels of service for police protection, schools, and parks and recreation	LS	Similar to Puente (LS)
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees	B	Similar to Puente (B)
Soil and Water Resources		
Water quality impacts during project construction	PSM	Similar to Puente (PSM)
Water quality impacts during demolition	PSM	Less than Puente (PSM)
Potential impacts from on-site and off-site flooding	PSM	Similar to Puente (PSM)
Potential flooding hazard based on Federal Emergency Management Agency floodplain delineation maps *(see note)*	LS	Same as Puente (LS)
Water quality impacts from wastewater discharge	SM	Similar to Puente (SM)
Water quality impacts from power plant operations	PSM	Similar to Puente (PSM)

Alternatives Table 4
Summary Comparison of Impacts of the Proposed Project to the Del Norte/Fifth Street Off-site Alternative

Environmental Effect	Proposed Project	Del Norte/Fifth Street Off-site Alternative
Potential impacts on potable water supplies	—	—
Traffic and Transportation		
Potential impacts from increased construction workforce traffic that is substantial compared to the existing traffic load and capacity of the street system	PSM	Less than or similar to Puente (PSM)
Potential for increased workforce traffic to cause driver safety impacts during project demolition and/or construction	PSM	Less than or similar to Puente (PSM)
Potential for increased workforce traffic to damage roads and bridges during project demolition and/or construction	PSM	Less than Puente (PSM)
Potential impacts from increased traffic during project operation (i.e., post-construction traffic) that is substantial compared to the existing traffic load and capacity of the street system	LS	Similar to Puente (LS)
Potential impacts from thermal plumes on aircraft and pilot safety	PSM	Greater than Puente (SU)
Impacts on aviation safety relating to location of transmission lines	LS	Greater than Puente (PSU)
Transmission Line Safety and Nuisance		
Interference with radio-frequency communication	LS	Greater than Puente (PSM)
Potential for transmission lines to cause audible noise	LS	—
Potential fire hazards	PSM	Similar to Puente (PSM)
Potential for hazardous shocks	PSM	Similar to Puente (PSM)
Potential for nuisance shocks	PSM	Similar to Puente (PSM)
Potential for electric and magnetic (EMF) exposure	PSM	Greater than Puente (PSM)
Visual Resources		
Substantial adverse effect on a scenic vista	—	—
Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	—	—
Substantially degrade the existing visual character or quality of the site and its surroundings *(see note)*	SM	Less than or similar to Puente (PSM)
Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	PSM	Similar to Puente (PSM)
Visual resources note: Staff identifies a significant impact at KOP 3, which is less than 1,000 feet from the proposed project site. For the other KOPs, staff identifies less-than-significant impacts.		
Waste Management		
Potential for impacts on human health and the environment relating to waste discharges	PSM	Same as Puente (PSM)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	PSM	Similar to Puente (PSM)
Potential for impacts on human health and the environment relating to past or present soil or water contamination	PSM	Same as Puente (PSM)

Alternatives Table 4
Summary Comparison of Impacts of the Proposed Project to the Del Norte/Fifth Street Off-site Alternative

Environmental Effect	Proposed Project	Del Norte/Fifth Street Off-site Alternative
Worker Safety and Fire Protection		
Risk of fire or explosion impact off-site resulting from natural gas usage during construction and operation	PSM	Same as Puente (PSM)
Risk of significant drawdown of emergency response services causing off-site impact	LS	Same as Puente (LS)

Air Quality

The Del Norte/Fifth Street Off-site Alternative is located in the same air basin as Puente, the South Central Coast Air Basin. The proposed project and this off-site alternative are located in the same local air district, the Ventura County Air Pollution Control District (VCAPCD). The existing ambient air quality is the same for the alternative site and the Puente site, and the same air quality LORS pertain to this off-site alternative.

Under the Del Norte/Fifth Street Off-site Alternative, approximately 262 MWs of natural gas-fired generation would be constructed and operated at the alternative site. The proposed project would not be constructed at the MGS site. Construction of a considerably longer transmission line for this alternative would result in additional construction-related air emissions; however, no additional mitigation measures would be required for this alternative compared to Puente. Both construction- and operations-related impacts on air quality for this alternative would likely be **similar to Puente**, and the same air quality rules and regulations would apply to the off-site alternative. Impacts relating to GHG emissions would also be **similar to Puente**. Potentially significant impacts on air quality would be reduced to less than significant with implementation of the same mitigation measures as those recommended for the proposed project.

Biological Resources

Staff attended a site visit in April 2016 and viewed the site from the fenced property boundary along E. Fifth Street and S. Del Norte Boulevard. A single on-site drainage ditch along the southern edge of the site is mapped as a riverine wetland by the National Wetland Inventory; however, staff observed during the site visit that this drainage ditch appears to be filled. Another natural bottom drainage ditch exists inside the northern third of the site, perpendicular to E. Fifth Street. The U.S. Fish and Wildlife Service has not designated or mapped critical habitat in the vicinity of this off-site alternative. The site is primarily developed for an industrial use; it is surrounded by vacant land and other industrial uses. Areas north and east of the site include agricultural uses. Overall, the site appears to be heavily graded and substantially disturbed.

The Del Norte/Fifth Street Off-site Alternative does not have the existing facilities present at the Puente site (i.e., retention basins and pads for other ancillary facilities). Additional construction would be required to install and operate a power plant at this

alternative site. This off-site alternative would require a 6- to 8-mile-long transmission line. It would require construction of a new natural gas pipeline to an interconnection point approximately 1 mile west of the site. Biological surveys have not been performed along potential linear routes or at the alternative site; however, biological constraints appear low according to NRG's preliminary analysis of the site (NRG 2015b).

Construction and Demolition Impacts

Because this site appears to have long been disturbed and/or used for industrial purposes, on-site vegetation is primarily ruderal and/or ornamental, and its disturbance or removal would not likely cause a significant impact. The natural bottom drainage ditch across part of the north half of the site is approximately 250 feet long and could have been associated in the past with agricultural operations to the north and east. This feature may be considered a water of the state, pursuant to the Porter-Cologne Act and subject to regulation by the State Water Resources Control Board.

The Del Norte/Fifth Street Off-site Alternative covers approximately 12.5 acres. This off-site alternative would require more acreage for project construction compared to the proposed project, and it is unknown whether a site plan could be devised that would avoid impacting the on-site drainage ditch. Construction of the natural gas pipeline would cross a vegetated canal approximately one-half mile west of the site. It is assumed that the pipeline could be installed using construction methods that allow placement under the canal, thus eliminating any potential impacts on waters of the state. Because a site configuration for the Del Norte/Fifth Street Off-site Alternative is not known, it is not possible to conclude whether a project at this site could be designed to avoid the potential waters of the state (i.e., the on-site drainage ditch). Therefore, staff concludes that the potential for this alternative to effect waters of the state is **indeterminate**. This alternative would avoid filling the Coastal Commission defined wetlands on the project site.

Similar to Puente, development of a power plant at the Del Norte/Fifth Street Off-site Alternative would have less-than-significant impacts on common vegetation and wildlife species that could be present on the site. On-site habitat is degraded, and the general character of the area is either developed or in use for agricultural production. Special-status species (plants, habitat, and wildlife, but excluding nesting birds) have limited potential to occur on the site; a review of the California Natural Diversity Database revealed no documented occurrences of listed species on or near the alternative site. There is a low likelihood for special-status plants, animals, or habitat to be present in the developed and agricultural areas immediately surrounding the site. Staff concludes that potential impacts on these resources would be **less than Puente**. For potential impacts on special-status wildlife during project construction, staff would require on-site biological monitors to reduce the impact to less than significant.

Construction of the proposed project would include demolishing the MGS Units 1 and 2. Under the Del Norte/Fifth Street Off-site Alternative, it is assumed that no license would be issued by the Energy Commission to construct and operate a power plant at the MGS site. Without a license from the Energy Commission, the existing MGS Units 1 and 2 would not necessarily be demolished and removed from the site following their

decommissioning. Under this circumstance, MGS Units 1 and 2 would present potential nuisance nesting and perching opportunities for raptors and other predatory birds, which could lead to depredation of the federally endangered western snowy plover and California least tern nests on the dunes and beaches immediately northwest of the project site. Under this off-site alternative, impacts on special-status nesting birds would be **greater than Puente**. Assuming mitigation measures were not imposed to reduce the impact to less than significant, the impact on special-status birds would remain potentially significant and unavoidable.

Construction activities at this alternative site would be similar to the proposed project. This alternative would require installation of facilities and other site improvements that are already present at the MGS site. Although no power plant structures would need to be demolished and removed from the alternative site, various structures relating to the existing industrial uses would have to be cleared from the site. Compared to the proposed project, staff assumes the same types of equipment would be used to prepare the alternative site and construct the power plant facilities.

Given the sparsely vegetated nature of the Del Norte/Fifth Street Off-site Alternative, and the fact that surrounding land uses are mostly agricultural and developed or vacant disturbed land, staff considers the site and surrounding areas to have limited nesting potential for birds. Common species such as house finches (*Carpodacus mexicanus*) and mourning dove (*Zenaida macroura*) may nest in neighboring trees or buildings. These species are known to acclimate to noises of human activities; therefore, impacts from construction and demolition noise could be reduced to less-than-significant with implementation of mitigation measures. Special-status species, including western snowy plover and California least tern nest on the beaches and dunes northwest of the project site, but not on the project site. Construction and demolition noise impacts on these species are considered potentially significant; these impacts can be reduced to less than significant with implementation of mitigation measures.

Given the intensively developed character of the Del Norte/Fifth Street Off-site Alternative, no special-status species are expected to be present on the site; therefore, noise impacts on nesting birds would be **less than Puente**. These potentially significant impacts could be reduced to less than significant with implementation of mitigation measures.

General construction and demolition impacts relating to dust, nighttime lighting, and the potential to spread invasive weeds could occur at either site; however, there is no known sensitive habitat within a range of the Del Norte/Fifth Street Off-site Alternative where potential impacts on biological resources could occur. At the proposed project site, critical habitat and sensitive wetlands occur in the immediate vicinity of the site, whereas habitat adjacent to this off-site alternative does not appear to be sensitive. Therefore, general impacts on biological resources from construction and demolition activities are considered **less than Puente**. These impacts could be reduced to less than significant with implementation of mitigation measures.

Project Operations Impacts

The proposed project would deposit less-than-significant levels of nitrogen oxides (NOx) at the closest sensitive habitats such as the dunes west of the site and wetland habitat surrounding McGrath Lake, immediately north of the proposed project site. The project site and vegetation within 1,000 feet of the site were mapped by the applicant and included in the AFC (NRG 2015a). While no similar mapping has occurred for this off-site alternative, staff's review of Google Earth imagery identified no other sensitive habitat within several miles of the site. Staff concludes there would be **no impacts** from nitrogen deposition at the Del Norte/Fifth Street Off-site Alternative.

This alternative would require installing an approximately 6- to 8-mile-long 220-kV transmission line, which could pose an electrocution hazard for large raptors if not constructed according to applicable guidelines, specifically the Avian Power Line Interaction Committee guidelines to protect raptors (Avian Power Line Interaction Committee 2006). This off-site alternative would be required to comply with the same guidelines to reduce potentially significant impacts on avian species to less than significant. Therefore, potential impacts on raptors from electrocution hazards would be **similar to Puente**.

Cultural Resources

The Del Norte/Fifth Street Off-site Alternative is just north of the historic Southern Pacific (now Union Pacific) Montalvo Line. The line services freight as well as Amtrak and Metrolink passengers. The railroad tracks parallel Fifth Street (State Highway 34). According to historical imagery from Google Earth, the site was a tank farm in 1989. By 2006, the tank farm was mostly removed and a gravel/construction materials operation began on the site. A large area of the 12.5-acre site does not appear to be in use. A review of archival Google Earth imagery, circa 1989 to present, suggests that the northeast-east portion of the site has experienced less ground disturbance compared to the rest of the site.

Connecting to the transmission grid would require installing transmission structures and overhead lines along an approximate 6- to 8-mile-long linear alignment. Although it could be feasible for segments of the transmission line to be installed along or within existing rights-of-way (ROWs), the route for the transmission line under this alternative is unknown.

A 30- to 36-inch diameter natural gas pipeline is located approximately 1 mile west of the site. The gas line connection could possibly be aligned along or in the Fifth Street ROW, which could require excavation below the railroad tracks to reach Fifth Street and then excavation in the ROW to connect with the existing natural gas pipeline that parallels Rice Avenue.

The archaeological and ethnographic setting presented in **Cultural Resources Appendix A** of this staff assessment applies also to this alternative.

Impacts on Surficial Archaeological and Ethnographic Resources

A review of historic topographic maps, archival Google Earth imagery, and maps of ethnographic villages did not reveal any surficial archaeological resources or ethnographic resources. The 1949 and 1951 U.S. Geological Survey (USGS) 7.5 minute topographic maps show oil tanks on the north side of the railroad tracks, which were likely at this alternative site in the past but were removed sometime after 1951. However, this general examination is not sufficient to reach conclusions regarding the presence, or lack thereof, of surficial archaeological resources and ethnographic resources. Therefore, it is **indeterminate** if any surficial archaeological resources or ethnographic resources could be impacted at the site and how such an impact (if it occurred) would compare to the proposed project site where no impact is identified.

Impacts on Buried Archaeological Resources

The Del Norte/Fifth Street Off-site Alternative and the proposed project are both located on the large coastal alluvial fan of the Oxnard Plain. Alluvial fans are generally low-energy; depositional environments that often preserve intact archaeological deposits. Without more specific information regarding the geomorphological character of the site and previous cultural resources work near and at the site, potential impacts on buried archaeological resources are unknown but are more likely to be found in the less disturbed northeastern portion of the site. Therefore, it is **indeterminate** if any buried archaeological resources could be impacted at the site and how such an impact (if it occurred) would compare to the proposed project site where this impact is considered potentially significant but mitigable.

Impacts on Built Environment Resources

No built environment resources of historic age have been identified at the Del Norte/Fifth Street Off-site Alternative or along pipeline routes. Although a transmission line route for this alternative would likely be located along existing ROWs to the extent feasible, a potential route is unknown, and staff has no survey data from which to draw conclusions. Without the benefit of survey information about the transmission and pipeline routes and the precise locations of the transmission towers and pipelines, staff has insufficient information from which to draw conclusions on the potential for impacts on built environment resources to occur. It is unknown what potential impacts on the historical built environment could occur under the Del Norte/Fifth Street Off-site Alternative and whether impacts could be reduced to less-than-significant levels. Therefore, it is **indeterminate** if any built environment historical resources could be impacted under this alternative and how such an impact (if it occurred) would compare to the proposed project site where no impact is identified.

Conclusion

It is unknown if the Del Norte/Fifth Street Off-site Alternative would have the potential to cause impacts on surficial archaeological resources, buried archaeological resources, or known archaeological or ethnographic resources. Although no built environment resources of historic age are identified on the alternative site, it is unknown if impacts on built environment historical resources could occur due to the lack of survey data and

unknown locations for constructing off-site linear facilities. Impacts on surficial archaeological resources, buried archaeological resources, known archaeological and ethnographic resources, and built environment historical resources from this off-site alternative are **indeterminate** compared to Puente.

Geology and Paleontology

The Del Norte/Fifth Street Off-site Alternative is located approximately 7 miles east of the coastline and the proposed project site. Topography of the site appears to be generally flat and is underlain by sediments similar to the proposed project site. Land use in the site vicinity is largely industrial and agricultural. Under this alternative, ground disturbance would be somewhat greater than that required to construct the proposed project; increased ground disturbance would occur during construction of foundations for transmission line structures and off-site trenching for natural gas and water pipelines.

Similar to Puente, this alternative would have the potential to encounter and damage buried paleontological resources. Although the sedimentary materials underlying this off-site alternative have a limited potential to contain paleontological resources, if such resources are present, potential impacts could be significant. Implementation of a paleontological resources monitoring program such as the one described in the **Geology and Paleontology** section of this staff assessment would be required to reduce the impact to less than significant (see Conditions of Certification **PAL-1** through **PAL-8**). Staff concludes that the relative potential for paleontological resources to be damaged under this off-site alternative would be **similar to Puente**.

Like the proposed project, this alternative would have **no impact** on mineralogical or geological resources because these resources are not present at the site or in areas where construction of linear facilities would occur.

Similar to Puente, there are no known active faults on the alternative site or crossing areas where linear facilities would be installed. The potential risk relating to surface fault rupture under this alternative is less than significant, and the impact conclusion is the same for the proposed project at the MGS site.

The Del Norte/Fifth Street Off-site Alternative would be subject to the same, very strong levels of earthquake-related ground shaking as the proposed project. The potential risk of soil failure caused by liquefaction and/or dynamic compaction would be **similar to Puente** for this off-site alternative. These potential impacts could be reduced to less than significant with implementation of a mitigation measure such as the one recommended in the **Geology and Paleontology** section of this staff assessment (see Condition of Certification **GEO-2**).

This off-site alternative is subject to a risk of potential excessive settlement or expansion of soils that would be **similar to Puente**. These potential impacts could be reduced to less than significant with implementation of a mitigation measure similar to Condition of Certification **GEO-2**.

Under variable conditions and due to its coastal location, the proposed project could be at risk for inundation by tsunami. Under the proposed project, this impact is potentially significant. The Del Norte/Fifth Street Off-site Alternative is outside the coastal area that is subject to risk of inundation by tsunami; therefore, **no impact** would occur compared to the proposed project.

Hazardous Materials Management

The Del Norte/Fifth Street Off-site Alternative would present a nearly identical hazardous materials risk profile as at the proposed project site. Both would use natural gas as fuel and ammonia for selective-catalytic reduction of oxides of nitrogen in the combustion exhaust. Since the hazardous risk profiles are similar, the Del Norte/Fifth Street Off-site Alternative would present potentially significant impacts that could be mitigated to less than significant the **same as Puente**.

Noise and Vibration

Staff evaluated the potential impacts of the proposed project's construction and operational noise on the new, residential community that is planned for development approximately 2,620 feet southeast of the MGS site. The nearest noise-sensitive receptor to the Del Norte/Fifth Street site is a residence that is located on Sturgis Road, approximately 900 feet northeast of the center of this alternative site. Therefore, the construction and operational noise impact would be **greater than Puente** for this off-site alternative. Additional mitigation measures would be needed to lower power plant noise at this off-site alternative and reduce the potentially significant impact to less than significant.

Public Health

Construction and operation of a 262-MW natural gas-fired, simple-cycle power plant at the Del Norte/Fifth Street Off-site Alternative would cause the same or similar impacts as Puente. Under this alternative, construction of buildings and structures would include water storage tanks, retention basins, ammonia tanks, a 220-kV switchyard and transmission line, and administration and warehouse/lab buildings. This off-site alternative is located in the same air basin as the proposed project, the South Central Coast Air Basin. The proposed project and this off-site alternative are located in the same local air district, the VCAPCD. The Del Norte/Fifth Street Off-site Alternative would be subject to the same public health LORS as those that apply to the project site; a health risk assessment would be needed to ensure compliance with applicable LORS.

Construction-related impacts of Del Norte/Fifth Street Off-site Alternative would be generally **similar to Puente**. Operations-related impacts would also be **similar to Puente** because the same air emissions rules and regulations would apply at this off-site location. The impact conclusion for the proposed project and this off-site alternative is less than significant. The MGS Unit 3 would continue operations as a permitted unit.

Socioeconomics

Unlike Puente, the Del Norte/Fifth Street Off-site Alternative would require construction of a 6- to 8-mile-long transmission line, a new 1-mile section of natural gas pipeline, a new 220-kV switchyard, and two retention basins. This construction would require an additional workforce and would extend the construction schedule beyond what would be required under the proposed project. The additional workers and lengthened schedule would likely be minimal compared with the workforce needs and length of work for the proposed project. Because this alternative does not include demolition of MGS Units 1 and 2, but requires new linear components, the workers needed and length of work would largely balance out. If any additional workforce was needed, it would be easily met with the large labor pool in the Oxnard-Thousand Oaks-Ventura Metropolitan Statistical Area (Ventura County MSA) and Los Angeles-Long Beach-Glendale Metropolitan District (Los Angeles MD).

In 2012, there were over 124,500 construction and extraction trades workers in the Ventura County MSA and Los Angeles MD combined, with projections for a workforce increase of almost 25 percent by 2022. There were approximately 1,500 electric power line installation and repair workers in 2012 in the Ventura MSA and Los Angeles MD, combined, and a projected growth of almost 15 percent by 2020.

With the ample workforce, there would be no substantial population growth or substantial increases in demand for parks or law enforcement services. This alternative would not displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere. The impacts for this alternative would be less than significant and **similar to Puente**.

Expenditures for additional equipment and construction labor necessary for construction at this alternative site would be slightly greater than those for the proposed project. However, the estimated fiscal benefits of this alternative would be **similar to Puente**.

Like the proposed project, construction and operation of a power plant at this site would require Condition of Certification **SOCIO-2** to ensure payment of the one-time statutory school facility development fee to the Oxnard School District and to the Oxnard Union High School District and compliance with LORS.

Soil and Water Resources

The Del Norte/Fifth Street Off-site Alternative is located within the city limits of Oxnard, and it is serviced by Oxnard's potable water system and municipal wastewater system. Both the Puente site and this alternative site are in the jurisdictional region of the Los Angeles Regional Water Quality Control Board, but the Del Norte/Fifth Street Off-site Alternative is located within the Calleguas Creek Wastershed. The site is well inland, approximately 7 miles east of the ocean and roughly 6 miles south of the Santa Clara River. The Revolon Slough is about a mile east and the nearest water resource to this off-site alternative. Revolon Slough primarily contains storm water and agricultural runoff; it flows from north (in the Camarillo Hills) to south (into Mugu Lagoon) and drains to the ocean.

Connecting to the transmission grid would require installing transmission structures and a 220-kV transmission line along an approximate 6- to 8-mile-long linear alignment. The route for the transmission line under this alternative is unknown. This off-site alternative would require constructing a natural gas line large enough to accommodate a 262-MW power plant. Connecting to the 30- to 36-inch diameter natural gas line approximately 1 mile west of the site would require underground pipeline installation, likely along State Highway 34.

Water Quality Impacts during Project Construction

Staff assumes that the entire 12.5-acre site would require light grading for site preparation and construction laydown. Similar to the Puente site, excavation would occur to construct the reinforced concrete foundations for the power block, but the Del Norte/Fifth Street Off-site Alternative does not have the same coastal requirement for deep foundations such as piles to support the foundation. This off-site alternative also does not have the existing infrastructure found at the Puente site, so additional construction would be required for new administration and warehouse/lab buildings, pads for various ancillary facilities (water storage tanks, firewater pump, ammonia tanks, etc.), and two retention basins to collect stormwater and process wastewater. Trenching to install underground pipelines would take place on-site to connect to Oxnard's potable water and municipal wastewater systems, and off-site to connect to the natural gas line approximately 1 mile away.

Compared to the Puente site, construction activities at this alternative site could require more earth work and a longer construction timeframe. As with the Puente site, construction activities are subject to construction-related storm water permit requirements of the federal Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permits, including California's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). Impacts on water quality would be reduced through compliance with the Construction General Permit and other applicable NPDES permits. Required implementation of specific best management practices (BMPs) for erosion control and wastewater management, in addition to numeric action levels (NALs) to evaluate the effectiveness of BMPs, would achieve minimum water quality standards. Although the larger construction area and longer construction time increases the potential for significant impacts at the Del Norte/Fifth Street Off-site Alternative, these impacts would be reduced to less than significant, **similar to Puente**.

Water Quality Impacts during Demolition

Approximately half of this off-site alternative is undeveloped and the other half is occupied by existing industrial land uses spread over two lots. A concrete batch plant is located on one lot, and the other (signage indicates it is a paint yard) contains a large warehouse/shop building and two smaller structures. Potential impacts due to demolition and removal activities are similar to potential impacts from construction activities: erosion and sedimentation of disturbed soil, contaminated water runoff, and improper management of wastewater.

Compared to the Puente site which proposes aboveground demolition of MGS Units 1 and 2, demolition activities at the Del Norte/Fifth Street Off-site Alternative would take much less time and produce significantly less demolition material. Therefore, impacts would be **less than Puente**, but because both sites would be subject to requirements of the Construction General Permit, which also regulates demolition activities, impacts on water quality would be reduced to less than significant.

Potential Impacts from On-site and Off-site Flooding

Development at the Del Norte/Fifth Street Off-site Alternative would not impact the course of a stream or river. For on-site storm water drainage, a similar storm water collection system proposed at the Puente site (which covers about 15.3 acres, including the MGS site) could likely manage storm water at this 12.5-acre off-site alternative. Although a site-specific drainage study would be needed to fully evaluate the adequacy of on-site drainage management, compliance with LORS would reduce impacts to less than significant, **similar to Puente**.

Potential Flooding Hazard Based on Federal Emergency Management Agency Floodplain Delineation Maps

The Federal Emergency Management Agency (FEMA) flood hazard map shows that a large storm event would likely cause the Revolon Slough to flood adjacent land. However, this off-site alternative is located a distance far enough to be outside both the 1 percent and 0.2 percent annual chance flood hazard (also referred as the 100- and 500-year event floodplain, respectively). In comparison, the Puente site is located just outside the mapped 100-year floodplain and the 500-year floodplain encroaches into the southwest corner of the Puente site. Although this alternative site is well outside the 500-year floodplain, the Oxnard Plain is relatively flat with a remote chance of flooding. The site's less-than-significant impact of 1 percent annual chance flood hazard due to river flooding is comparable to the proposed project's less-than-significant impact of 1 percent annual chance flood hazard occurring from coastal flooding. Therefore, the potential flooding hazard is the **same as Puente**, and the impact conclusion is less than significant.

Water Quality Impacts from Wastewater Discharge

The Del Norte/Fifth Street Off-site Alternative and the proposed project would use the same technology to achieve the same generating capacity. Therefore, the quantity and quality of generated wastewater are expected to be the same at both sites.

This off-site alternative is serviced by Oxnard's municipal wastewater system, which is expected to accept sanitary waste. Assuming the on-site system that manages process wastewater and storm water runoff can treat these flows to a water quality level acceptable to Oxnard, these flows would also discharge to the municipal wastewater system. Because the wastewater treatment plant is licensed and regulated under Waste Discharge Requirements (WDRs) issued by the Regional Water Quality Control Board (RWQCB), impacts would be reduced to less than significant.

Because the Puente site is not serviced by the municipal wastewater system, sanitary waste is managed through an existing septic system. Process wastewater and storm water runoff would be managed through a wastewater collection system for treatment prior to discharge to the Edison Canal. Both of these existing systems are currently operating under project-specific WDRs issued by the RWQCB, which reduce impacts to less than significant.

Although the proposed method of wastewater disposal is different at each site, the discharge of both sites would be regulated under their respective WDR permits requiring that treatment meet minimum water quality standards. Because wastewater of this off-site alternative would discharge to the municipal wastewater system, impacts would be reduced to less than significant, **similar to Puente**.

Water Quality Impacts from Power Plant Operations

Potential impacts on water quality at the Del Norte/Fifth Street Off-site Alternative would be less than Puente mainly due to its relative distance to water resources. Potential impacts on groundwater would also be less because this alternative would require an off-site connection to the municipal wastewater system. Despite a lower potential to impact water quality, this off-site alternative would need to comply with the same requirements imposed on Puente such as a hazardous materials management program, spill control and prevention, and other measures to avoid or reduce the discharge of contaminants. With these requirements implemented, potential impacts on water quality would be **similar to Puente**.

Potential Impacts on Potable Water Supplies

This off-site alternative and the proposed project would use the same technology to achieve the same generating capacity, therefore, operational water use is expected to be equal. Water use at this off-site alternative would constitute a new use (maximum 19 acre-feet per year), while the combination of the proposed development of Puente and MGS decommissioning would be a net reduction of current water use at the MGS facility. The city of Oxnard's "Water Neutrality Policy" requires that all new development offset its water demand. The decommissioning of MGS Units 1 and 2 could theoretically provide water to fully offset the new use at this off-site alternative. Therefore, **no impact** on water supply would occur.

Traffic and Transportation

Construction Workforce Traffic

The Del Norte/Fifth Street Off-site Alternative would involve construction of additional ancillary buildings and structures, a new 220-kV switchyard, and demolition of existing on-site structures. Construction workers would travel through an already congested area, State Highway 101 at N. Del Norte Boulevard, to access the site. According to the Ventura County Traffic Commission's Congestion Management Plan, traffic flow in this area drops to LOS F during commute hours (Ventura County Transportation Commission 2009). Furthermore, under this off-site alternative, some construction traffic

would likely cross the signalized railroad crossing at S. Del Norte Boulevard, and train movements could contribute to traffic congestion.

As with the Del Norte/Fifth Street Off-site Alternative, the existing traffic flow along the route to the Puente site is congested, falling to LOS F at certain locations during certain times of the day. Although the Del Norte/Fifth Street Off-site Alternative would involve construction of additional buildings and structures and vehicular crossing of the railroad tracks, Puente could have greater construction-related traffic impacts due to the large number of temporary vehicle trips during demolition of MGS Units 1 and 2. However, this off-site alternative would also require demolition and removal of existing structures from the site. Staff concludes the Del Norte/Fifth Street Off-site Alternative's temporary construction-related impacts on traffic LOS would be **less than or similar to Puente**. Traffic impacts under this alternative could be mitigated to less than significant by implementing a traffic control plan and obtaining applicable encroachment permits.

Driver Safety

The existing access at the Del Norte/Fifth Street Off-site Alternative site is on S. Del Norte Boulevard. It appears to be unsignalized. Most construction vehicles would likely exit directly right onto northbound S. Del Norte Boulevard to access Highway 101 and would not need to cross lanes of opposing traffic. However, some vehicles might exit left onto southbound S. Del Norte Boulevard, where they would cross a lane of northbound traffic and could be at greater risk of a collision. Additionally, these vehicles turning left would encounter the signalized railroad crossing at S. Del Norte Boulevard just north of Fifth Street. There is a small risk at rail crossings of inattentive or reckless drivers becoming caught on the railroad tracks and colliding with a train. However, given that the crossing is signalized, the risk of collision is reduced.

Many drivers exiting the Puente site would turn left onto northbound Harbor Boulevard, where they would need to cross a lane of southbound traffic and would be at higher risk of accidents. Furthermore, demolition of MGS Units 1 and 2 under the proposed project could generate more worker trips that could cross a lane of opposing traffic. Driver safety impacts for the Del Norte/Fifth Street Off-site Alternative would be **less than or similar to Puente**. A traffic control plan would reduce any potentially significant impacts to less than significant.

Damage to Roads and Bridges

Construction at the Del Norte/Fifth Street Off-site Alternative site would require truck trips that could potentially damage roads. Impacts would be potentially significant but could be reduced to less than significant with preparation and implementation of a traffic control plan, including a requirement to repair and restore damaged roads. Because Puente would require additional truck trips associated with demolition of MGS Units 1 and 2, the potential for damage to roads from the Del Norte/Fifth Street Off-site Alternative would be **less than Puente**.

Operations Traffic

The same number of operations workers (17 workers) and truck deliveries would be used for the Del Norte/Fifth Street Off-site Alternative and the proposed project. The location of Puente would enable it to use existing MGS workers, while the location of this off-site alternative would add new project operations vehicle trips to the area. However, the number of operations workers and deliveries would be relatively small and would not generate significant impacts on traffic LOS. Due to the small number of operations workers and deliveries, impacts would be **similar to Puente** and less than significant.

Potential Impacts of Thermal Plumes on Aircraft and Pilot Safety

The Del Norte/Fifth Street Off-site Alternative is located approximately 1.4 miles southwest of Camarillo Airport and 4 miles east of Oxnard Airport. Aircraft directly overflying the alternative site could be subject to hazards from a power plant's high-velocity thermal plumes, which could potentially pose hazards to aircraft up to approximately 2,375 feet above ground level. The potential hazard assumes worst-case conditions, such as during full operation of the power plant in cool weather conditions with calm winds.

Aircraft from the Oxnard Airport, given its location approximately 4 miles from this off-site alternative, would be less likely to pass directly over the site, and any overflights would be at higher altitudes relative to the potential plume height. Staff concludes that this off-site alternative would not cause a significant impact relating to the use of the Oxnard Airport and its aircraft operations.

From the Camarillo Airport, arrival and departure tracks shown in Exhibits 2F and 2G of the Airport Comprehensive Land Use Plan for Ventura County, it appears that arriving aircraft and arriving and departing helicopters often pass very close to, if not directly over, the Del Norte/Fifth Street Off-site Alternative site (Ventura County Airport Land Use Commission 2000). The Puente site is located approximately 1.8 miles northwest of the Oxnard Airport, slightly further than the distance between the Del Norte/Fifth Street Off-site Alternative and the Camarillo Airport. Aircraft following the Oxnard Airport's left-hand traffic pattern would not be expected to fly regularly over the Puente site, although an occasional overflight could occur and does occur according to FAA tracking data. Because of the expected more regular aircraft overflight of the Del Norte/Fifth Street Off-site Alternative and its closer proximity to an airport, pilot safety impacts from the Del Norte/Fifth Street Off-site Alternative would be greater than Puente. This alternative would introduce a new hazard for pilots to avoid near the traffic pattern and in an area commonly overflown by pilots as they arrive at and depart from the airport. For this reason, impacts on aircraft and pilot safety would be **greater than Puente**, and the impact conclusion is significant and unavoidable.

Impacts on Aviation Safety Relating to Location of Transmission Lines

Staff assessed the potential for aviation hazards with regard to: a) the height of the transmission structures, and b) distances and orientation with respect to identified runways. According to Title 14 of the Code of Federal Regulations, Section 77.9(b)(1),

for construction or alterations within 20,000 feet (3.8 miles) of an airport with a runway more than 3,200 feet in length, the FAA shall be notified if the height of the construction or alteration exceeds an imaginary surface extending outward and upward at a slope of 100 to 1 from the nearest point of the nearest runway of the airport.

The Del Norte/Fifth Street Off-site Alternative is approximately 7,392 feet (1.4 miles) southwest of Camarillo Airport, which has a runway longer than 3,200 feet. Therefore, the FAA regulations apply, and the threshold for FAA notification at the site would be a structure height of 73.9 feet. The 80- to 90-foot-tall transmission structures would exceed this threshold, requiring the applicant to file a "Notice of Proposed Construction or Alteration" (Form 7460-1) with the FAA to initiate the FAA's obstruction hazard review of the structures. Impacts on the safety of aircraft would be potentially significant and unavoidable for this off-site alternative, depending on whether the FAA determined that the transmission structures presented an obstruction hazard. Therefore, impacts relating to aviation safety from the Del Norte/Fifth Street Off-site Alternative are **greater than Puente** and potentially significant and unavoidable.

Transmission Line Safety and Nuisance

The transmission line for the Del Norte/Fifth Street Off-site Alternative would be designed and constructed in conformance with applicable LORS.

Interference with Radio-Frequency Communication

Connecting to the grid would require installing a 220-kV transmission line along an approximate 6- to 8-mile-long linear alignment. A potential route for the transmission line under this alternative is undetermined, but the area between this off-site alternative and either the Ormond Beach Substation or a tower along the Mandalay-Santa Clara 220-kV transmission line includes rural agricultural and residential uses. Noise and interference are generally not problems for well-maintained transmission lines; however, because of the distance and undetermined transmission line route (compared to Puente), the potential for corona-related radio-frequency interference or complaints under this off-site alternative could be **greater than Puente**. Mitigation measures similar to those recommended for the proposed project would reduce potential impacts to less than significant.

Potential for Transmission Lines to Cause Audible Noise

Audible noise is not generally expected at significant levels from transmission lines less than 345 kV. Therefore, staff would not expect the transmission line for this off-site alternative to add significantly to current background noise levels, and **no impact** would occur.

Potential Fire Hazards

Like the proposed project, the Del Norte/Fifth Street Off-site Alternative would comply with "Fire Prevention Standards for Electric Utilities" (Cal. Code Regs., tit. 14, § 1250 et seq.). This impact is potentially significant and **similar to Puente**. Compliance with applicable LORS and implementation of mitigation measures would reduce the impact

to less than significant (see Condition of Certification **TLSN-3** in the **Transmission Line Safety and Nuisance** section of this staff assessment).

Potential for Hazardous and Nuisance Shocks

The transmission line for this off-site alternative would be constructed in conformance with the requirements of CPUC's GO-95, "Rules for Overhead Line Construction," and minimum standards for installation, operation, and maintenance of electrical installation and equipment to provide practical safety and freedom from danger ("High Voltage Electrical Safety Orders") (Cal. Code Regs. tit. 8, § 2700, et seq.). Therefore, hazardous shocks are highly unlikely to occur from construction and operation of the Del Norte/Fifth Street Off-site Alternative. The potential for nuisance shocks around the transmission line would be reduced through standard industry grounding practices. Impacts relating to hazardous and nuisance shocks are **similar to Puente**, and implementation of mitigation measures would reduce impacts to less than significant (see Conditions of Certification **TLSN-1** and **TLSN-4** in the **Transmission Line Safety and Nuisance** section of this staff assessment).

Potential for Electric and Magnetic (EMF) Exposure

The potential impact relating to EMF exposure is **greater than Puente**. However, implementation of mitigation measures like those recommended under the proposed project would reduce the impact to less than significant (see Conditions of Certification **TLSN-1** and **TLSN-2** in the **Transmission Line Safety and Nuisance** section of this staff assessment).

Visual Resources

Staff concludes that the proposed project would cause no impacts relating to its potential to adversely impact a scenic vista or substantially damage scenic resources. No scenic vistas are identified near the Del Norte/Fifth Street Off-site Alternative. This off-site alternative is not near a state-designated scenic highway. Under the Del Norte/Fifth Street Off-site Alternative, no change would occur relating to these visual resources impact criteria; therefore, **no impacts** are identified.

The central and northwestern portions of the approximately 12.5-acre Del Norte/Fifth Street Off-site Alternative are developed with industrial uses. Utilitarian single-story buildings, storage areas, and other structures are located on the site. The concrete batch plant includes a powder material storage system (silo), which stands approximately 120 feet tall on the center of the site (**Alternatives Figure 4**). The visual character of the area surrounding the site is both semirural and industrial. The oil refinery on the south side of E. Fifth Street includes an estimated 150-foot-tall oil derrick (**Alternatives Figure 5**). To the northwest is a large regional recycling center. The nearby areas west and north of the site are almost completely developed with a mixture of warehouse commercial, research and development, and industrial uses. Nevertheless, Oxnard includes Fifth Street and Del Norte Boulevard on its list of scenic routes (City of Oxnard 2006). Large acreage agricultural operations are located in the surrounding area to the south and east. The closest residential area is likely the East Village development approximately 1.25 miles northwest of the alternative site.

The Del Norte/Fifth Street Off-site Alternative would modify existing visual conditions and increase the bulk, mass, and height of industrial-type structures at the site that would be visible from the surrounding area. Major structural elements of the proposed project include the combustion turbine generator (107 feet long, 52 feet wide, and 79 feet high); nitrogen oxide removal equipment (87 feet long, 33 feet wide, and 99 feet high); and the stack (22 feet in diameter and 188 feet high) (NRG 2015a). Other structures would include 80- to 90-foot-tall transmission structures. A power plant similar to Puente at this alternative site would strongly attract the attention of viewers in the surrounding area, and especially from the vicinity of S. Del Norte Boulevard and E. Fifth Street (State Highway 34).

Alternatives Figure 6 provides a view of the landscape looking northwest toward the site from E. Pleasant Valley Road; this viewpoint is approximately 1 mile from the Del Norte/Fifth Street Off-site Alternative. Built structures in the background primarily include low, horizontal buildings in agricultural areas. The oil derrick on the property south of the alternative site is visible in this view. The concrete batch plant silo on the site is barely visible in the background. Foreground views in the area are mostly characterized by flat, cultivated and fallow fields and associated structures. The estimated visual absorption capability (VAC)[7] of the landscape is *moderate* (using a general comparative scale of low, moderate, and high). Constructing a power plant similar to Puente at this alternative site would add to the overall mass of industrial structures for views toward the site. For views of the site inside an approximately 1-mile radius, construction of a power plant similar to Puente at the Del Norte/Fifth Street Off-site Alternative would likely become the tallest, most visually dominant industrial facility in the landscape.

Based on staff's observations during a site visit in April 2016, primary viewer groups near the site include motorists in passenger vehicles and truck drivers traveling in the area to conduct business, deliver and purchase goods and supplies, and workers in the agricultural fields and at businesses near the site. These local viewers could be *moderately* sensitive to the character and quality of views in the area of this alternative site. Although the upper portion of the stack could be visible from the East Village residential area north of Camino del Sol, a power plant at this alternative site is unlikely to dominate the view from residential neighborhoods that are a mile or more from the site. There are no recreational use areas near this off-site alternative.

Staff compared this off-site alternative to the proposed project and assessed its potential to substantially degrade the existing visual character or quality of the site and its surroundings. In assessing the proposed project's visual impact, it is necessary to consider baseline visual conditions at the MGS site, which includes aging power plant structures adjacent to Mandalay State Beach (also called Mandalay County Park) and McGrath State Beach. The existing MGS is the most visually dominant built structure

[7] VAC is an estimate or measure of the capacity of a landscape to absorb a visual alteration without significantly affecting visual character.

along several miles of the coast extending north and south of the site. The estimated VAC of the landscape is *low* for the project site. The proposed project would generally entail construction of a power block with less mass and height compared to the existing MGS Units 1 and 2, which would be demolished and removed from the site under the proposed project. The primary viewer groups in public use areas near the project site are residents, recreationists, and visitors at nearby open space areas. The nearest residential development is approximately one-half mile south of the project site. In general, visual sensitivity of the viewing public is expected to be *high* at the Puente site.

Staff's comparative analysis considers the following major points:

- The proposed project at the MGS site would be less visually imposing compared to the existing MGS Units 1 and 2, which would be demolished and removed from the site.
- Staff assumes that visual sensitivity is *high* in the coastal area where Puente would be constructed and operated, and the landscape's VAC is *low*.
- Using the Del Norte/Fifth Street Off-site Alternative to construct and operate a project similar to Puente would replace existing industrial uses with a power plant that would increase the mass and height of existing structures on a site bordered by major travel corridors.
- Staff assumes that visual sensitivity is *moderate* in the area surrounding the Del Norte/Fifth Street Off-site Alternative site, and the landscape's VAC is *moderate*.

In comparing the potential impact on visual character or quality, staff concludes that the impact at the Del Norte/Fifth Street Off-site Alternative could be **less than Puente**; however, the analysis must also account for the relatively high level of viewer exposure given that the site is adjacent to heavily traveled roadways.

Although many properties in the vicinity of this off-site alternative are used for industrial purposes, and visual sensitivity is considered *moderate*, construction and operation of a power plant at the Del Norte/Fifth Street Off-site Alternative would likely become the most visually prominent industrial-type facility in the area. Staff conservatively concludes the potential for this off-site alternative to substantially degrade the existing visual character or quality of the site and its surroundings is **less than or similar to Puente**, and the impact conclusion is potentially significant. Implementation of mitigation measures requiring surface treatments and possibly other visual screening measures would reduce the impact to less than significant for this off-site alternative. Mitigation measures could include constructing a decorative fence or wall to screen street-level views of the site and architectural screening for the upper portions of the power block structures.

Exterior permanent lighting of a power plant similar to Puente at the Del Norte/Fifth Street Off-site Alternative would be limited to areas required for safe and secure operations. Light sensors or switches would control lighting not required continuously during nighttime hours so that lighting would be on only when needed. Light fixtures would be directed downward and shielded to avoid off-site backscatter and glare. Staff

considers the potential for the new source of substantial light or glare to adversely affect day or nighttime views in the area of this off-site alternative to be **similar to Puente**. Mitigation measures similar to those proposed for Puente would reduce the impact to less than significant.

Waste Management

LORS are enforced at the local level to ensure recycling and safe disposal of solid and hazardous waste, and these LORS would apply also to wastes generated under the Del Norte/Fifth Street Off-site Alternative. Therefore, the potential for impacts on human health and the environment from potential waste discharges relating to this off-site alternative would be the **same as Puente**.

Under this off-site alternative, the demolition of structures would cause an increase in the generation of waste; however, more than 75 percent of the demolition waste would be recycled as required under Assembly Bill (AB) 341. Ancillary buildings and structures, such as water storage tanks, retention basins, ammonia tanks, and an administration and warehouse/lab buildings would need to be constructed. A new 220-kV switchyard would need to be constructed at the site. This work would also generate additional construction waste. The applicant would be required to comply with the waste management mitigation measures and applicable LORS to reduce impacts on waste disposal facilities; therefore, the potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities would be **similar to Puente**.

The Del Norte/Fifth Street Off-site Alternative consists of two lots; one lot contains a concrete batch plant, and the other (signage indicates it is a paint yard) contains a large warehouse/shop building and two smaller structures. Land uses in the site vicinity include industrial and agricultural. A portion of the Del Norte/Fifth Street Off-site Alternative is considered a brownfield due to the commercial/industrial use on the site. Ground disturbance similar to construction for Puente would be required for this alternative. Given past land uses, demolition of existing buildings and project construction could encounter site contamination that would require remediation; therefore, the potential impacts on human health and the environment would be the **same as Puente**.

The Del Norte/Fifth Street Off-site Alternative would have potentially significant impacts on waste management, but all of those impacts can be reduced to less than significant with implementation of mitigation measures and through LORS compliance.

Worker Safety and Fire Protection

The Del/Norte Fifth Street Off-site Alternative would have the same worker safety and fire protection requirements as the proposed project. Since the requirements are the same, this off-site alternative would present potentially significant impacts that could be mitigated to less than significant the **same as Puente**.

ORMOND BEACH AREA OFF-SITE ALTERNATIVE

Staff evaluated the potential environmental impacts of developing a project similar to the proposed project, including ancillary buildings and other structures, and two retention basins to collect storm water and process wastewater on an approximately 14.5-acre undeveloped industrial site in the southeast portion of Oxnard. The site is located approximately one-half mile inland from Ormond Beach and just east of (outside) the Coastal Zone boundary. The site address is 5980 Arcturus Avenue near the intersection with E. McWane Boulevard (**Alternatives Figure 7**). The site is composed of two parcels owned by one landowner (APNs 2310093155 and 2310093135).

The site topography is flat. Historical Google Earth images through 2009 show an industrial development covering the majority of the site. A railroad spur extended into the site's northeast border, which must have served to transport materials to and from the industrial area on the southern portion of the site. As of 2011, the site had been cleared of most structures, except for the old railroad spur. Early in 2016, the site was graded and surfaced with gravel or other similar material. Based on staff's observations during site visits in April and November 2016, the site is being used by KIA Motor Corporation to park new vehicles off-loaded from cargo ships at the Port of Hueneme.

The utility corridor bordering the east side of Edison Drive approximately one-quarter mile east of the Ormond Beach Area Off-site Alternative includes an existing 220- to 230-kV transmission line that extends south to SCE's Ormond Beach Substation adjacent to the Ormond Beach Generating Station (OBGS) (see **Alternatives Figures 1b** and **7**). A 30- to 36-inch diameter natural gas pipeline is located in the same utility corridor along Edison Drive. Providing natural gas to the site would likely require constructing a natural gas pipeline along E. McWane Boulevard to connect to the existing pipeline. The natural gas pipeline would require constructing the buried pipeline to cross under Edison Drive and the transmission line that parallels Edison Drive. Oxnard's system of wastewater (eastern trunk sewer line) and potable water pipelines border the site along Arcturus Avenue and E. McWane Boulevard (City of Oxnard 2006). Like the proposed project, total estimated water use would be approximately 16 acre-feet per year.

The immediate surrounding area is characterized by industrial-type uses to the east and west. Businesses on the properties immediately east of the Ormond Beach Area Off-site Alternative include Aluminum Precision Products and Irwin Industries, which fabricates energy and industrial infrastructure. The property west of the site is occupied by Arcturus Manufacturing Corporation, which provides customized product and material solutions for aerospace and power generation. A large BMW vehicle distribution center is located north of the site. The area south of the site includes open space and agricultural lands.

The closest residential neighborhood is located approximately one-half mile northwest of the approximate center point of the off-site alternative, on the north side of E. Hueneme Road between Saviers Road and Arcturus Avenue.

The Ormond Beach Area Off-site Alternative would require constructing an on-site power plant switchyard. The Ormond Beach Substation is located less than 1 mile south of this off-site alternative and adjacent to the OBGS. A connection from the site to the Ormond Beach Substation would require installing transmission structures and an overhead 220-kV transmission line, possibly extending east along a short segment of E. McWane Boulevard and then south along or within the utility corridor that parallels the east side of Edison Drive.

The area between this off-site alternative and the Ormond Beach Substation is undeveloped. However, construction and installation of the transmission line would require implementation of mitigation measures to reduce or avoid potential impacts to less than significant (e.g., construction-related impacts on water quality, air quality, and biological resources). Potential specific impacts relating to transmission line installation are indeterminate for this off-site alternative (e.g., impacts on visual resources from the addition of transmission line structures in the landscape).

The Puente Power Project Siting Committee commented on the **Alternatives** section of the PSA, including a request that additional information be added to the FSA to complete the **Alternatives** analysis. (See the "Response to Comments" section of this FSA, below.) In response to this comment, staff has added information and analysis comparing impacts of this off-site alternative to corresponding impacts under Puente. Additional comparative analyses are provided below addressing potential impacts on cultural resources. Additional analysis has been provided regarding the possibility that past or present on-site soil or water contamination could impact human health and the environment for this alternative site. See **Alternatives Table 8**, below, and the "Cultural Resources" and "Waste Management" subsections following the table. The EJ analysis for this alternative has been expanded to include use of CalEnviroScreen to determine potential environmental effects on the EJ population.

Land Use Planning

To determine potential consistency of the Ormond Beach Area Off-site Alternative with land use LORS, staff reviewed the 2030 Oxnard General Plan. The site is designated by the General Plan as Light Industrial (ILT), which allows manufacturing uses where the principal activity occurs within a building, but also permits outdoor assembly, fabrication, public services, and storage (City of Oxnard 2011). Goal ICS-17 (Infrastructure & Community Services) of the General Plan addresses providing adequate and efficient public utilities (including electric facilities) that meet the needs of the residents of Oxnard.

This alternative site is not located within the Coastal Zone and would not be subject to review of potential impacts on coastal resources. The zoning designation for this alternative site is Heavy Manufacturing Planned Development (M2-PD). The M2-PD zone district allows chemical processing and manufacturing (acetylene, acids alcohols, ammonia, bleach, etc.), manufacturing of building materials (asphalt, brick, cement, etc.), petroleum refining, and other similar uses the planning and environmental services manager finds to be consistent with the purpose and intent of this zone. The Planned Development (Additive) zone (PD) is intended to ensure the orderly

development of land in conformance with the General Plan and to permit departures from the restrictions imposed within the basic zones. A narrow area inside the southern boundary of the Ormond Beach Area Off-site Alternative is zoned Heavy Manufacturing (M2) without the Planned Development (Additive) zone, which includes “steam electric generating stations operated by gas or fuel oil” among the permitted uses for that zone. The Ormond Beach Area Off-site Alternative contains two parcels; development of a facility at the site would require the applicant to comply with the setback requirements specified for the underlying zone district to avoid constructing over parcel lines.

A proposal for a power generating facility in the M2-PD zone district would normally require a conditional use permit. To approve a power generation facility at this alternative site, Energy Commission staff would have to determine that the proposed use is in conformance with the General Plan and other adopted standards. Special conditions that would be considered by staff (in lieu of the city of Oxnard City Council) and potentially imposed on the project would include the following (verbatim from Section 16-531 of the Oxnard Zoning Code addressing requirements for granting a special use permit):

- The nature, condition and development of adjacent uses, buildings and structures shall be considered, and no proposed special use permit shall be granted if the approval body finds such use will adversely affect or be materially detrimental to such adjacent uses, buildings or structures or to the public health, safety or general welfare.
- The site that is subject to the special use permit shall be adequate in size and shape to accommodate the yards, walls, fences, parking and loading facilities, landscaping and other items which may be required.
- The site that is subject to the special use permit shall be served by highways adequate in width and improved as necessary to carry the kind and quantity of traffic such use would generate.
- The site that is subject to the special use permit shall be provided with adequate sewage, water, fire protection and storm drainage facilities.

Although the Energy Commission would have in lieu permitting authority for an electric generating facility at the Ormond Beach Area Off-site Alternative, Section 25506 of the Warren-Alquist Act requires the Energy Commission to request comments and recommendations from appropriate government agencies (e.g., a local municipality) regarding the design, operation, and location of the facilities in relation to environmental quality, public health and safety, and other factors on which they may have expertise.

The Ormond Beach Area Off-site Alternative could be designed to be consistent with applicable land use LORS. City of Oxnard planning staff has presented the site as a suitable alternative site for the project (City of Oxnard 2015b).

Similar to the No-Project Alternative, under the Ormond Beach Area Off-site Alternative, the existing MGS Units 1 and 2 would remain nonoperational on the MGS power plant site and would not necessarily be demolished and removed from the site. In the

absence of a license from the Energy Commission for Puente, the Commission would not have authority over the MGS power plant site and proposed future uses of the MGS site would be subject to review and approval of a coastal development permit by the city of Oxnard.

Environmental Justice

The **Environmental Justice** section of this staff assessment discusses California's state policy requirements for decision-makers to consider EJ if their actions could cause impacts on the environment. The demographic screening methodology and CalEnviroScreen tool is described previously in this section under the EJ analysis for the Del Norte/Fifth Street Off-site Alternative. Like the analysis for that alternative, staff considered the potential impacts on the EJ population residing within 6 miles of the Ormond Beach Area Off-site Alternative and whether any impacts would disproportionately affect the EJ population.

Demographic Screening for the Ormond Beach Area Off-site Alternative

Alternatives Figure 8 (using a 1-, 3-, and 6-mile radius) shows that the population residing in the area of the Ormond Beach Area Off-site Alternative constitutes an EJ population based on race and ethnicity (minority) as defined by the federal guidance document, *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality 1997).

Staff used the cities of Oxnard and Port Hueneme to determine the relative poverty levels within the 6-mile radius and the county as the reference geography. **Alternatives Table 5** shows the percentages of population living below the federal poverty level in the 6-mile radius and the comparative data for the county. Staff concludes that when compared to the poverty data for the county, the cities of Oxnard and Port Hueneme have higher percentages of people living below the poverty level than the county and thus are considered EJ populations based on poverty.

Alternatives Table 5
Poverty Data within the Ormond Beach Area Off-site Alternative Area

	Total Population (see note)	Population Below Poverty Level	Percent Below Poverty Level (%)
	Estimate	Estimate	Estimate
Cities in a 6-Mile Radius			
Oxnard	200,076 ± 394	31,956 ± 2,320	16.00 ± 1.2
Port Hueneme	21,020 ± 310	3,848 ± 838	18.30 ± 4
Reference Geography			
Ventura County	824,329 ± 959	91,912 ± 3,350	11.10 ± 0.4

Note: *Population* for whom poverty is determined.

Staff's analysis of the 2010–2014 estimates returned coefficient of variation values less than 15, indicating the data is reliable.

Source: U.S. Census 2015

CalEnviroScreen Results for the Ormond Beach Area Off-site Alternative

Alternatives Figure 8 presents the minority data at the census block geographic level and marks the census tract boundaries of the tracts identified in CalEnviroScreen as disadvantaged communities. CalEPA identifies disadvantaged communities as the 25 percent (75 to 100 percentile) highest scoring census tracts in California (CalEPA 2014b).

By layering the minority data at the census block level with the census tract boundaries identified as disadvantaged communities, the minority block level data shows the census blocks where people live. Areas within the census tract boundaries without any shading are areas without residences. The size of the census block correlates with the number of residences in the block; the same is true of census tracts. For example, the smaller the census block or tract, the more densely populated that block or tract is. Likewise, the larger the block or tract, the less densely populated that block or tract is. The census block is the smallest census geographic entity.

When staff assessed impacts of this alternative that could affect an EJ population, staff reviewed **Alternatives Figure 8** and considered the associated data in their alternatives impact analysis for the EJ population.

A review of **Alternatives Figure 8** shows that the closest residential development to the Ormond Beach Area Off-site Alternative within a disadvantaged census tract extends north and west from the intersection of East Hueneme Road and Salvador Drive (near the Oxnard drainage channel), approximately 0.5 mile northwest of this alternative site. (See **Environmental Justice Figure 1** showing the disadvantaged communities within the 6-mile radius of the Puente site.) There is a single home approximately 0.7 mile northeast of the site on E. Hueneme Road, just east of Edison Drive. The closest residence east of this alternative, approximately 1.2 miles away, is just east of Arnold Road and south of E. Hueneme Road. This figure indicates there are one or more residences west of this alternative, west of the railroad track and south of E. Hueneme Road; however, a review of the 2010 census population data and aerials taken before the 2010 census, and then reviewing a current aerial, there are no residences in either vintage aerial. The land is industrial and open space. It is possible that the decennial census data is incorrect or that at the time of the count, a small (52) transient population was counted as residing in this area.

Alternatives Table 6 presents the CalEnviroScreen data for the disadvantaged community census tracts in a 6-mile radius of the Ormond Beach Area Off-site Alternative. Where percentiles for CalEnviroScreen indicators are 90 and above, the percentile is shown in bold. These relatively higher percentiles could be seen as drivers for the census tract's identification as a disadvantaged community. Two of the census tracts in the project's 6-mile radius have percentiles above 90 percent for population characteristics. All of the disadvantaged census tracts have percentiles above 90 for pesticides. All but two disadvantaged census tracts have indicators in both the pollution burdens and population characteristics groups of indicators with percentiles above 90.

Alternatives Table 6
CalEnviroScreen Scores for Disadvantaged Communities by Census tract in the Ormond Beach Area Off-site Alternative 6-Mile Radius [1]

Census Tract Number		6111004902	6111009100	6111004715	6111003900	6111004503	6111004704
Total Population		5,091	5,279	5,020	7,533	4,387	1,469
CES 2.0 Percentile Range [2]		96-100	91-95	91-95	81-85	76-80	81-85
Ozone	PERCENTILES	0.10	0	0	0	0	0
PM 2.5		36.54	36.33	39.30	36.95	37.89	38.73
Diesel PM		53.95	43.86	28.91	40.74	49.82	34.25
Drinking Water		38.41	38.91	54.48	38.91	38.91	54.51
Pesticides		**99.83**	**98.54**	**99.67**	**96.88**	**97.84**	**99.93**
Toxic Release		61.30	69.08	88.61	77.24	**96.51**	64.54
Traffic		71.92	36.57	24.65	47.57	53.09	21.77
Cleanup Sites		0	64.78	**92.91**	42.59	42.64	39.52
Groundwater Threats		85.12	**92.68**	88.36	85.01	0	88.18
Hazardous Waste		86.51	75.34	69.91	50.42	25.63	68.85
Impaired Water Bodies		**97.27**	0	80.63	0	0	**97.27**
Solid Waste		86.34	23.19	**95.83**	0	0	69.12
POLLUTION BURDEN		88.21	68.33	89.71	61.39	56.50	79.12
Age		85.80	57.47	49.23	54.93	33.04	58.53
Asthma		81.30	81.13	58.19	60.16	58.18	58.82
Low Birth Weight		74.09	75.39	81.90	44.55	78.53	32.10
Education		**99.10**	**98.81**	84.61	**92.96**	89.99	**95.05**
Linguistic Isolation		**91.43**	**93.49**	77.38	**97.41**	82.25	**93.65**
Poverty		89.90	**94.16**	67.75	89.38	81.23	51.75
Unemployment		26.96	82.51	58.54	66.14	78.08	73.46
POPULATION CHARACTERISTICS		**93.65**	**97.57**	80.65	86.68	85.73	77.47

[1] Disadvantaged Communities census tracts that intersect or are within a 6-miles radius of the site. Indicators with percentiles that are shown as bold text are in the 90 percentile or higher.

[2] Overall CalEnviroScreen score percentile range.

Source: CalEPA 2014a

Potential Impacts of the Ormond Beach Area Off-site Alternative on the EJ Population

The following describes potential impacts of this project alternative on the EJ population. The technical areas of Cultural Resources, Hazardous Materials Management, Land Use, Noise and Vibration, Socioeconomics, Transmission Line Safety and Nuisance, and Visual Resources would not cause impacts that could combine with any of the indicators that make up the CalEnviroScreen score. Impacts relating to Air Quality, Public Health, Soil and Water Resources, Traffic and Transportation, and Waste Management could combine with the indicators that make up the CalEnviroScreen score.

Alternatives Figure 8 shows that this alternative site is located within a 3-mile radius of four disadvantaged communities (census tracts), as identified by CalEnviroScreen. An additional two disadvantaged communities are included when the radius extends to 6 miles. Although the Puente site is at least 3 miles further from all of these disadvantaged communities, they were also evaluated for EJ impacts due to their proximity to the proposed project (see **Environmental Justice Figure 1**).

Air Quality

The overall CalEnviroScreen score evaluates multiple pollutants and factors collectively; therefore, staff examined individual contributions of indicators that are relevant to air quality: ozone and PM2.5 (see **Alternatives Table 6** for indicator scores).

The Ormond Beach Area Off-site Alternative is in the same air basin as Puente, the South Central Coast Air Basin. Puente and this off-site alternative are located in the same local air district, the Ventura County Air Pollution Control District. The existing ambient air quality is the same for this alternative site and the proposed Puente site, and the same air quality LORS pertaining to Puente also pertain to this off-site alternative (see the **Air Quality** section of this FSA).

For the Ormond Beach Area Off-site Alternative, approximately 262 MWs of natural gas-fired generation would be constructed and operated at the alternative site. Both construction- and operations-related impacts on air quality for this alternative would likely be similar to Puente. Impacts relating to GHG emissions would also be similar to Puente. Potentially significant impacts on air quality would be reduced to less than significant with implementation of the same mitigation measures as those proposed for Puente.

The Ormond Beach Area Off-site Alternative is in census tract 6111004715. Staff concludes that the air quality impacts of a power plant similar to Puente at the alternative site could be reduced to less than significant (see **Alternatives Table 8**). To evaluate ozone, staff used CalEnviroScreen data; the factor for determining an indicator score is the amount of daily maximum 8-hour ozone concentration over the California 8-hour standard (0.070 parts per million (ppm)), averaged over 3 years (2009–2011). According to CalEnviroScreen data for the 3-year period, ozone concentrations in the disadvantaged census tracts within the 6-mile radius of the alternative site were all below the 8-hour ozone health based standard of 0.070 ppm. Similarly, to determine the contribution of PM2.5 to the indicator score of a disadvantaged census tract, CalEnviroScreen uses the annual mean concentration of PM2.5 (average of quarterly means), averaged over the 3-year period. According to the data, PM2.5 concentrations in the disadvantaged census tracts within the 6-mile radius of the Ormond Beach Area Off-Site Alternative were all below the annual mean PM2.5 health-based ambient air quality standard of 12 $\mu g/m^3$.

Therefore, neither ozone nor PM2.5 concentrations currently affect EJ populations in these disadvantaged census tracts. For this reason, ozone and PM2.5 precursor emissions for a power plant similar to Puente at the alternative site would not

individually or cumulatively contribute to disproportionate ozone or PM2.5 air quality impacts on the EJ population in these census tracts.

Air quality impacts for all criteria pollutants, including ozone and PM2.5, would not cause adverse impacts on EJ populations, and all impacts would be considered less than significant with implementation of mitigation measures like those recommended by staff for the proposed project.

Public Health

As discussed in the **Environmental Justice** section of this FSA, the minority population in the 6-mile radius around the Puente site constitutes an EJ population. **Alternatives Figure 8** shows the presence of an EJ population based on race and ethnicity within a 6-mile radius of the Ormond Beach Area Off-site Alternative. **Alternatives Table 5** shows that the below-poverty-level population in Oxnard and Port Hueneme constitutes an EJ population based on poverty.

Due to the presence of an EJ population, this analysis must identify whether construction and operation of the proposed project (including demolition of MGS Units 1 and 2) or a power plant like Puente at the alternative site, could have significant unmitigated impacts or disproportionate impacts on an EJ population. There are also a number of farm workers, at least some of whom are likely to be considered either minority and/or low income, within the vicinity of the Ormond Beach Area Off-site Alternative site at any given time. Ventura County's agricultural commissioner estimates that 17,000 to 24,000 immigrant workers come to the county each year at peak growing seasons (City of Oxnard 2011).

Construction-related impacts of the Ormond Beach Area Off-site Alternative would be generally similar to Puente. Operations-related impacts would also be similar to Puente because the same air emissions rules and regulations would apply at this off-site location. Staff generally concludes that this off-site alternative would cause less-than-significant impacts on public health. However, staff would recommend conducting a quantitative analysis for a power plant project at the Ormond Beach Area Off-site Alternative to confirm staff's conclusion. Staff cannot conduct such an analysis without site-specific source location and off-site receptor information. Therefore, staff cannot determine whether there would be a disproportionate impact on the EJ population.

Disadvantaged Communities

CalEnviroScreen indicators are used to measure factors that affect the potential for pollution impacts in communities (CalEPA 2014a).[8] Staff used CalEnviroScreen 2.0 to

[8] It is important to note that CalEnviroScreen is not an expression of health risk and does not provide quantitative information on increases of impacts for specific sites or project. CalEnviroScreen uses the criteria of "proximity" to a hazardous waste site, a leaking underground tank, contaminated soil, an emission stack (industry, power plant, etc.) to determine that a population is "impacted." It does not address general principles of toxicology: dose/response and exposure pathways. For certain toxic

identify disadvantaged communities in the vicinity of the alternative site that may have been missed when screening by race/ethnicity and poverty (see **Alternatives Figure 8** and **Alternatives Table 5**).[9]

CalEnviroScreen Overall Scores

Census tracts are identified as disadvantaged communities if they have CalEnviroScreen scores above the 75th percentile. Census tracts near the Ormond Beach Area Off-site Alternative site with scores at 75 percent or above are shown in **Alternatives Table 7**. Values are shown as percentiles, which indicate the percent of all census tracts with a lower score. Bolded values indicate the highest value for each indicator in these six census tracts. A higher percentile indicates a higher potential relative burden. However, as shown in **Alternatives Figure 8**, most of these census tracts are located more than 1 mile away from the alternative site. As discussed in the "Cumulative Impacts and Mitigation" subsection of the **Public Health** section of this FSA, public health impacts are usually not significant unless the emitting sources are extremely close to receptors, within a few blocks, not within a few miles. Therefore, staff concludes that the Ormond Beach Area Off-site Alternative would not affect most of these disadvantaged communities. However, a health risk assessment (HRA) would be needed to verify this conclusion.

Alternatives Table 7
CalEnviroScreen 2.0 Indicator Percentile Scores (%)

Census Tract [1]	Total Population	Overall Score Range [2] (%)	Diesel PM (%)	Pesticide Use (%)	Toxic Releases from Facilities	Age: Children and Elderly (%)	Asthma ER Visits (%)	Low Birth Weight Infants (%)
6111004902	5091	**96–100**	**53.95**	**99.83**	61.30	**85.80**	**81.30**	74.09
6111009100	5279	91–95	43.86	**98.54**	69.08	57.47	**81.13**	75.39
6111004715	5020	91–95	28.91	**99.67**	88.61	49.23	58.19	**81.90**
6111003900	7533	81–85	40.74	**96.88**	77.24	54.93	60.16	44.55
6111004503	4387	76–80	49.82	**97.84**	**96.51**	33.04	58.18	78.53
6111004704	1469	81–85	34.25	**99.93**	64.54	58.53	58.82	32.10

Source: CalEnviroScreen 2.0 Data, www1.oehha.ca.gov/calenviroscreen/maps-data/download-data

[1] Census tract locations are shown in **Alternatives Figure 8**

[2] Overall Score Range incorporates all indicators shown in **Environmental Justice Table 1**

---

chemicals to pose a risk to the public, off-site migration pathways must exist (through ingestion, inhalation, dermal contact, etc.) and contact to a certain amount—not just any amount—must occur.

[9] The CalEPA, for purposes of its Cap-and-Trade Program, has designated "disadvantaged communities" as census tracts having a CalEnviroScreen score at or above the 75th percentile (CalEPA 2014b). As a comparative screening tool, it is not intended to be used as a health or ecological risk assessment for a specific area or site.

CalEnviroScreen Indicators Relating to Public Health

Because a CalEnviroScreen score evaluates multiple pollutants and factors collectively, staff further examined individual contributions of indicators that are relevant to Public Health (see **Environmental Justice Table 1**). These individual contributions of indicators and their scores are presented in **Alternatives Table 7**. They fall into two categories: exposures to pollution burden (diesel particulate matter, pesticide use, and toxic releases from facilities) and sensitive populations in population characteristics (children and elderly, asthma emergency room (ER) visits, and low birth weight infants).

- Diesel PM – This indicator represents how much diesel particulate matter (PM) is emitted into the air within and near the census tract. The data are from 2010 California Air Resources Board (ARB) emission data from on-road vehicles (trucks and buses) and off-road sources (ships and trains, for example). Census tract 6111004902 has the highest potential relative burden among the six census tracts in **Alternatives Table 7**. Sources of diesel PM within and near this census tract emit 15.33 kilograms (kg) per day; while diesel emissions in all census tracts in California range between 0 and 164 kg per day. The diesel PM percentile for this census tract is 54, meaning it is higher than 54 percent of the census tracts in California. The diesel PM emitted from the project (either from the diesel-fueled equipment during construction/demolition or from emergency equipment undergoing weekly readiness testing during operation) would not have a cumulative impact on the disadvantaged community of Census Tract 6111004902 because: (1) census tract 6111004902 is more than 4 miles away from the alternative site, and (2) the impacts decrease rapidly as the diesel PM is transported from the site. The diesel PM scores of other census tracts are all below 75 percent, showing that diesel PM is not a large contributor to the overall CalEnviroScreen score. Therefore, the diesel PM emitted from the off-site alternative would not have a cumulative impact on these disadvantaged communities.
- Pesticide Use – Because farmland and farming activities are located in this area, the scores for pesticide applications for all six census tracts are relatively high. This indicator represents the reported use of 69 hazardous and volatile pesticides in 2009–2011 collected by the California Department of Pesticide Regulation. Only pesticides used on agricultural commodities are included in the indicator. Please note that this indicator does not measure exposure, only proximity to use (i.e., it uses pounds per acre as a surrogate). Therefore, it only presents potential exposure, not actual exposure to pesticides. Census Tract 6111004704 has an estimated 67,452.866 pounds of active ingredients used per square mile (sq. mi.). Census Tract 6111004902 has an estimated 48,370.408 pounds of active ingredients used per sq. mi. Census Tract 6111004715 has an estimated 34,690.814 pounds of active ingredients used per sq. mi. The percentiles for these three census tracts are more than 99, meaning they are among the highest ranking census tracts for pesticides in California. The pesticides in highest uses in these tracts are: (a) Chloropicrin, (b) Methyl Bromide, (c) 1 3 Dichloropropene, (d) Metam Sodium, and (e) Chlorpyrifos or Potassium N Methyldithiocarbamate. Census Tracts 6111004704 and 6111004902 are at least 2 miles away from the alternative site, so any toxic air pollutants that would be emitted from the alternative site would not have

cumulative impacts on these two disadvantaged communities within these two census tracts with existing potential burden on pesticides. However, this alternative site location is within Census Tract 6111004715 and within a 1-mile radius of Census Tract 6111004503. Therefore, staff cannot conclude whether or not there could be cumulative adverse impacts without doing a quantitative analysis, which is beyond the scope of the alternative analysis. Therefore, the conclusion for potential cumulative effects of pesticides is **indeterminate**.

- Toxic Releases from Facilities – The indicator represents modeled air concentration of chemical releases from large facility emissions in and nearby the census tract. The EPA provides public information on the amount of chemicals released into the environment from many facilities. This indicator uses the air concentration and toxicity of the chemical to determine the toxic release score. The data are from 2010. Census Tract 6111004503 has the highest potential relative burden among the six census tracts in **Alternatives Table 7**. The score for this census tract is 14,067.59, while the toxic release indicator scores range from 0 to 750,000. The toxic release percentile for this census tract is 97.84, meaning it is higher than 97.84 percent of all the census tracts in California. Since this alternative site is within a 1-mile radius of this census tract, staff cannot conclude at this time whether or not any toxic pollutants emitted from a power plant at this location could have cumulative health impacts without doing a quantitative analysis, which is beyond the scope of the alternative analysis. Therefore, the conclusion for potential cumulative effects of toxic pollutants is **indeterminate**.
- Age (Children and Elderly) – The age indicator measures the percent of children under age 10 and elderly over age 65 in the census tract. The data are from 2010. Census Tract 6111004902 has the highest potential relative burden among the six census tracts in **Alternatives Table 7**. Of its total 5,091 people, 20 percent are under age 10, and 10 percent are over age 65. Therefore, a total 29 percent of the people in this census tract are children or elderly. The percentile for this census tract is 86, meaning the percent of children and elderly is higher than 86 percent of the census tracts in California. This census tract is about 4 miles away from the Ormond Beach Area Off-site Alternative location. Therefore, staff does not expect any toxic pollutants emitted from a power plant at this alternative location to have significant health effects on children and elderly people in this disadvantaged community.
- Asthma ER Visits – This indicator is a representation of an asthma rate. It measures the number of ER visits for asthma per 10,000 people from 2007 to 2009. The information was collected by the California Office of Statewide Health Planning and Development. In Census Tract 6111004902 (5,091 people), 61 people per 10,000 people in this census tract visited the ER due to asthma. The asthma percentile for this census tract is 81, meaning the asthma ER visit rate is higher than 81 percent of the census tracts in California. In Census Tract 6111009100 (5,279 people), 61 people per 10,000 visited the ER for asthma. The asthma percentile for this census tract is also 81, meaning the asthma rate is higher than 81 percent of the census tracts in California. Both census tracts are more than 3 miles away from the Ormond Beach Area Off-site Alternative. Therefore, staff does not expect any toxic pollutants emitted from the project at this alternative site would have significant health effects

on this disadvantaged community with existent potential burden on asthma. For a more detailed discussion regarding the existing asthma concern, refer to **Public Health Appendix A**.

- Low Birth Weight Infants – This indicator represents the percent of low birth weight babies in the census tract. It measures the percentage of babies born weighing less than 2,500 grams (about 5.5 pounds) out of the total number of live births from 2006 to 2009. The information was collected by the California Department of Public Health. Census Tract 6111004715 has the highest potential relative burden among the six census tracts in **Alternatives Table 7**. In its total, 5,020 people or 5.43 percent of births in this census tract were of a low birth weight. The low birth weight percentile for this census tract is 82, meaning the percent low birth weight is higher than 82 percent of the census tracts in California. This alternative site is located within Census Tract 6111004715. Therefore, any toxic pollutants emitted from a power plant at this location could have health effects on this disadvantaged community with existent potential burden on low birth weight infants. Staff cannot conclude whether or not there could be adverse health impacts without doing a quantitative analysis, which is beyond the scope of the alternatives analysis. Therefore, impacts of toxic air pollutants emitted by a power plant at this location on the disadvantaged community are **indeterminate**.

Summary Conclusion

Public health impacts from a power plant similar to Puente on the EJ population if built at the Ormond Beach Area Off-site Alternative location cannot be determined without a quantitative HRA to evaluate potential impacts. Therefore, it cannot be determined whether a disproportionate impact on an EJ population would occur. Previous quantitative analyses for similar projects and settings have generally found that project impacts are well below significance thresholds, although high levels of short-term construction impacts are sometimes predicted to occur. As for the other census tracts of concern identified in **Alternatives Table 7**, the impacts would be expected to be less than significant because project emissions are low relative to significance thresholds established for public health impact evaluations.

Based on the results of staff's quantitative analysis conducted for Puente, and quantitative analyses conducted for similar facilities, staff concludes that a power plant similar to Puente at the Ormond Beach Area Off-site Alternative would be unlikely to cause adverse impacts on public health or an increase in health risks associated with construction and operation of a project because the incremental contributions from a project are expected to be less than significant. If a quantitative analysis concluded that adverse health-based impacts could occur, further mitigation measures would be recommended to reduce the impacts to less than significant. Therefore, consistent with staff's conclusions for Puente, no one (including the public, off-site nonresidential workers, recreational users, and EJ populations) would experience any acute or chronic cancer or non-cancer effect of health significance due to operation of a power plant similar to Puente at the Ormond Beach Area Off-site Alternative site. An assessment of construction-related impacts cannot be completed without doing a quantitative health risk assessment.

Staff concludes that the Ormond Beach Area Off-site Alternative is far enough away from most census tracts of concern that the facility would not affect the disadvantaged communities that are already burdened by public health-related indicators. The first exception could be Census Tract 6111004715 with potential burdens from pesticide use and low birth weight of infants. This is the census tract where the Ormond Beach Area Off-site Alternative is located. The second exception could be Census Tract 6111004503 with potential burdens from pesticide use and toxic releases from facilities. This census tract is within a 1-mile radius of the Ormond Beach Area Off-site Alternative. Public health impacts are usually not significant unless the emitting sources are extremely close to receptors, within a few blocks, not miles. The calculated point of maximum impact (PMI) is usually located within the boundaries of a project where there are no residences, farm workers, or members of the public. However, for Census Tracts 6111004715 and 6111004503, the nearest receptor could be very near the project (at the facility fence line) and the significance of impacts this close to the alternative site can be determined only by conducting a quantitative analysis. With the possible exception of construction impacts, previous quantitative analyses for similar projects and settings have not identified a significant adverse impact on the public, even at the project fence line. If a power plant similar to Puente was proposed at the alternative site, staff would recommend developing a preliminary site layout and conducting a quantitative HRA to evaluate the potential for adverse health impacts on sensitive receptors in Census Tract 6111004715. If the HRA identified potential adverse health risks, additional mitigation measures would be recommended to reduce these risks to acceptable levels. The nature and scope of additional mitigation measures would depend on the magnitude and scope of the predicted adverse impacts.

Soil and Water Resources

Staff concludes that water quality impacts of the Ormond Beach Area Off-site Alternative could be mitigated to less than significant (see **Alternatives Table 8**). However, these mitigated water quality impacts could potentially cause disproportionate impacts on EJ communities by contributing to the cumulative risks of existing pollution sources or through unique exposure pathways (e.g., subsistence fishers, farming communities). Furthermore, environmental risks could potentially burden those of the community who are vulnerable due to health conditions or socioeconomic factors.

The overall CalEnviroScreen score evaluates multiple pollutants and factors collectively, so staff examined individual contributions of the three indicators that are relevant to soil and water resources: groundwater threats, impaired water bodies, and drinking water contaminants (see **Soil and Water Resources Table 10** for indicator scores).

CalEnviroScreen data indicate that five census tracks have very high Groundwater Threats scores, which range from 85 to 93 percentile. The score is based on the number of storage tanks that are leaking pollutants on land or underground, the type and status of the cleanup sites, and the distance to the census tract. The high score of 93 corresponds to the tract having 11 sites nearby.

CalEnviroScreen data also indicate that the Ormond Beach Area Off-site Alternative is located near three impaired water bodies, ranking its census track in the 81 percentile.

The Ormond Beach shoreline, roughly one-half mile southwest of the site, is impaired due to the amount of indicator bacteria detected. Oxnard Drain No. 2 and Oxnard Drain No. 3, agricultural drains located southeast and approximately 1 mile from the site, are each impaired due to the presence of seven identified pollutants that exceed established standards.

By comparison, the scores for Drinking Water Contaminants of all six census tracts show lower numbers. Four tracts score approximately in the 39 percentile and the other two tracts score in the 55 percentile due to the presence of total coliform bacteria. Although these scores are much lower than scores for Groundwater Threats and Impaired Water Bodies, the community exposure to Drinking Water Contaminants reaches each individual person on a daily basis.

Staff concludes that the Ormond Beach Area Off-site Alternative would not contribute to the following environmental risks:

- Groundwater Threats – This off-site alternative is within the service area of Oxnard's municipal wastewater system. Assuming the quantity and quality of generated wastewater is acceptable for disposal to the municipal system, these wastewater discharges would not contribute to groundwater threats.
- Drinking Water Contaminants – The cities of Oxnard, Port Hueneme, and Camarillo all supply municipal potable water to their respective service areas by blending imported water with local groundwater. Again, assuming that generated wastewater would be disposed to the municipal system, the project's wastewater effluent would not enter the groundwater and, therefore, the off-site alternative would not contribute to drinking water contaminants.
- Impaired Water Bodies – This off-site alternative could potentially contribute sediment from water runoff during project construction or from storm water runoff during normal operations. Although local LORS would require that all runoff impacts be reduced to less than significant, actual impacts are difficult to estimate especially without a site-specific drainage study to evaluate on-site drainage management. When considering the annual rainfall of the area and the site's distance to these three impaired water bodies, staff expects the likelihood of this occurring to be rare (e.g., during a very extreme flood event).
- Flooding Risks – Although CalEnviroScreen does not evaluate flood risks, disadvantaged communities could be disproportionately impacted. The ability to remain safe or evacuate high-risk areas during a flood event is largely affected by factors such as quality of residential structures, access to transportation, availability of emergency supplies, effective service by emergency responders, and exposure to environmental hazards. This off-site alternative would not cause these communities to flood nor exacerbate flood impacts during a flood event and, therefore, would not contribute to flooding impacts.

Impacts relating to soil and water on the EJ population would be reduced to less than significant and would not be disproportionate.

Traffic and Transportation

Staff's recommended conditions of certification for the Puente project, including **TRANS-2** to implement a Traffic Control Plan (TCP), and **TRANS-3** to restore all public roads/easements/rights-of-way, would be appropriate mitigation measures to reduce traffic and transportation impacts of the Ormond Beach Area Off-site Alternative to less than significant for the population in general, including the EJ population represented in **Alternatives Figure 8** and **Alternatives Table 6**.

Staff also found that the census tracts in **Alternatives Figure 8** that are identified as disadvantaged communities by CalEPA, as part of the CalEnviroScreen scoring for traffic density, are in the areas that would reasonably be expected to experience project-generated traffic. CalEnviroScreen scores traffic density as the number of vehicles (adjusted by road segment lengths in kilometers) per hour per kilometer of roadways (vehicles-km/hr/km) within a buffered census tract. Major roadways, with increased traffic densities, are associated with a variety of effects on communities, including noise, vibration, injuries, and local land use changes. In addition, vehicle speed is directly associated with risk of pedestrian fatality, and speeds along major roadways tend to be higher than normal speeds on residential streets (CalEPA 2014a).

Project-generated traffic in the area of the Ormond Beach Area Off-site Alternative would be expected to occur along Rice Avenue and E. Pleasant Valley Road, which provide direct access to the alternative site from U.S. Route 101, where there are disadvantaged communities (see **Alternatives Figure 8)**. Specifically, the roadway route from U.S. Route 101 along Rice Avenue would traverse one disadvantaged community and border another, and the route along E. Pleasant Valley Road borders two disadvantaged communities. The traffic density scores for census tracts in the area of this alternative site are all below 75 percent, showing that traffic density is not a large contributor to the overall CalEnviroScreen score. Therefore, traffic generated to and from the site would not have a cumulative impact on these disadvantaged communities.

Staff concludes that the Ormond Beach Area Off-site Alternative's traffic and transportation impacts would not disproportionately affect the EJ population, as these types of impacts would affect the EJ population just as they would affect any population living in the study area. In addition, staff concludes that this alternative's traffic and transportation impacts would not cause cumulative impacts on disadvantaged communities because traffic density in the area is sufficiently low such that a large contribution to the overall CalEnviroScreen score would not occur. Overall, staff concludes that this alternative would not increase traffic and transportation impacts that could disproportionately affect the EJ population.

Waste Management

Staff concludes that impacts relating to waste management for the Ormond Beach Area Off-site Alternative could be reduced to less than significant (see **Alternatives Table 8**). However, there are discernible differences in impacts to the environmental justice population that existed prior to the consideration of the Puente project or the Ormond Beach Area Off-site Alternative.

The overall CalEnviroScreen score evaluates multiple pollutants and factors collectively, so staff examined individual contributions of the three indicators that are relevant to waste management: cleanup sites, hazardous waste generators and facilities, solid waste sites and facilities (see **Waste Management Table 4** for indicator scores).

Although the Ormond Beach Area Off-site Alternative is slightly closer to the same disadvantaged communities as the Puente project, staff concludes potential impacts from this alternative are similar to those of the Puente project. As with the proposed project, staff evaluated the risks and impacts of this alternative on nearby EJ communities, by reviewing **Alternatives Figure 8** and **Waste Management Table 4** which contain the information found in CalEnviroScreen. Multiple factors increase the vulnerability of EJ communities to sites that require cleanup, increase exposure to hazardous waste sites, and increase exposure to illegal dumps sites. The Ormond Beach Area Off-site Alternative would not exacerbate these conditions or cause disproportionate exposure to the EJ community. The site has been remediated and regulated under the authority of the Department of Toxic Substances Control (DTSC). A project under the authority of the Energy Commission would comply with LORS governing management of hazardous and nonhazardous wastes and would use certified hazardous and nonhazardous waste sites. Therefore, the Ormond Beach Area Off-site Alternative would not impact the EJ population. Also, there would be no disproportionate impacts.

Other Technical Areas

Staff has recommended conditions of certification to reduce potential environmental impacts of the proposed project relating to Hazardous Materials Management, Noise and Vibration, Visual Resources, and Transmission Line Safety and Nuisance. With implementation of similar mitigation measures, potentially significant environmental impacts of the Ormond Beach Area Off-site Alternative on populations in the area of this off-site alternative, including the EJ population, could be reduced to less than significant. Socioeconomics staff concludes that proposed project impacts would be less than significant and therefore would have less-than-significant impacts on populations in a 6-mile radius of the Ormond Beach Area Off-site Alternative, including the EJ population. Staff concludes that impacts from this alternative would not disproportionately impact the EJ population living in this alternative's 6-mile radius.

Cultural Resources staff considers impacts on Native American populations. Staff reviewed the ethnographic and historical literature to determine whether any Native American populations use or reside in the Ormond Beach Area Off-site Alternative area. Staff concludes that because there are no known currently used hunting and gathering areas that could be impacted by this alternative, Native Americans are not considered members of the EJ population for this alternative. Therefore, staff concludes there would be no impacts on Native American populations, and likewise, no disproportionate impacts.

Potential to Attain the Project Objectives

An alternative site in the Moorpark sub-area such as the Ormond Beach Area Off-site Alternative could, in theory, provide a location to develop a project similar to Puente. However, it is questionable whether NRG could obtain site control and complete environmental review and permitting to have a project built and commissioned at this alternative site by 2020 or 2021 to satisfy LCR needs.

If construction and operation of this off-site alternative was feasible, it could potentially satisfy five of the applicant's eight project objectives:

- Provide an efficient, reliable, and predictable power supply by using a simple-cycle, natural gas-fired combustion turbine to replace the existing OTC generation;
- Support the local capacity requirements of the California ISO's Big Creek/Ventura local capacity reliability area;
- Develop a 262-MW nominal net power generation plant that provides efficient operational flexibility with rapid-start and fast-ramping capability to allow for efficient integration of renewable energy sources in the electrical grid;
- Site the project on property that has an industrial land use designation with consistent zoning; and
- Safely produce electricity without creating significant environmental impacts.

This off-site alternative would likely meet the last project objective listed above. Staff's analyses of this off-site alternative (below) describe environmental impacts that are generally similar to the proposed project. Mitigation measures similar to the conditions of certification for Puente would reduce potentially significant impacts to less than significant.

Potential Feasibility Issues

The applicant does not have control of the Ormond Beach Area Off-site Alternative site, which includes two parcels under single ownership (NRG 2015b). The applicant states in its *Alternative Sites Summary* that a reasonable, market-based offer was made to the property owner in July 2013, but the offer was declined (NRG 2015b). Developing a project similar to Puente at this site would require NRG to attempt again to negotiate a property purchase or lease agreement with the owner. Depending on the outcome of such a negotiation, project viability could be affected.

Constructing and operating a project similar to Puente at the Ormond Beach Area Off-site Alternative site would require a new power plant design proposal for the site with plans and analyses for off-site utility connections. Assuming capacity is available, Oxnard's water system could supply potable water to the site from the water line that extends along the west and south boundaries of the site. Similarly, Oxnard's eastern trunk sewer line borders the site.

The Ormond Beach Area Off-site Alternative would require constructing an on-site power plant switchyard and 220-kV transmission line connection to SCE's Ormond

Beach Substation next to the OBGS approximately 1 mile south of the site. The possible retirement of 1,500 MWs of generating capacity at the OBGS could allow this off-site alternative to interconnect with the grid at the Ormond Beach Substation. Connecting to an existing 220-kV breaker position at the Ormond Beach Substation would be unlikely to cause "downstream" impacts on the transmission grid.

This interconnection scenario would require a much shorter transmission line compared to the Del Norte/Fifth Street Off-site Alternative, but it would require additional planning and analysis relating to ROW acquisition for the new transmission line and other linears. It is unknown whether the applicant could feasibly gain site control of the Ormond Beach Area Off-site Alternative. If the applicant did have site control, the work to conduct site planning and analysis and plan its grid interconnection would delay the project and could affect its viability as an alternative.

Environmental Analysis

Alternatives Table 8 presents a summary comparison of impacts of the proposed project to the same or similar potential impacts of the Ormond Beach Area Off-site Alternative. Comparative discussions for each environmental topic area follow the table.

Alternatives Table 8
Summary Comparison of Impacts of the Proposed Project to the Ormond Beach Area Off-site Alternative

Environmental Effect	Proposed Project	Ormond Beach Area Off-site Alternative
Air Quality		
Construction-related emissions	PSM	Similar to Puente (PSM)
Project operations emissions	PSM	Similar to Puente (PSM)
Greenhouse Gases (construction- and demolition-related impacts)	PSM	Similar to Puente (PSM)
Biological Resources		
Project construction and demolition impacts		
Impact on jurisdictional wetlands and other waters	SM	—
Impacts on common vegetation species	LS	Similar to Puente (LS)
Impacts on common wildlife species	LS	Similar to Puente (LS)
Impact of noise on nesting birds	PSM	Less than Puente (PSM)
Impacts on special-status plants and habitat	PSM	Less than Puente (PSM)
Impacts on special-status wildlife *(see note)*	PSM	Less than Puente (PSM)
Impacts on special-status birds with MGS Units 1 and 2 left on site	—	Greater than Puente (PSU)
Impacts of dust, nighttime lighting, and invasive weeds on biological resources	PSM	Less than Puente (PSM)
Biological resources note: excluding nesting birds		
Project operations impacts		

Alternatives Table 8
Summary Comparison of Impacts of the Proposed Project to the Ormond Beach Area Off-site Alternative

Environmental Effect	Proposed Project	Ormond Beach Area Off-site Alternative
Impacts on biological resources relating to nitrogen deposition	LS	Similar to Puente (LS)
Impact relating to potential electrocution of avian species	PSM	Similar to Puente (PSM)
Cultural Resources		
Impacts on surficial archaeological and ethnographic resources	—	—
Impacts on buried archaeological resources	PSM	Similar to Puente (PSM)
Impacts on built environment resources	—	Greater than Puente (PSM)
Geology and Paleontology		
Risk of damage to paleontological resources	PSM	Similar to Puente (PSM)
Potential impacts on geological or mineralogical resources	—	—
Risk of surface fault rupture	LS	Similar to Puente (LS)
Risk of liquefaction, dynamic compaction, and lateral spread from strong seismic shaking	PSM	Similar to Puente (PSM)
Risk of potential excessive settlement or expansion of soils causing an impact on structures	PSM	Similar to Puente (PSM)
Risk of inundation by tsunami resulting from an earthquake or local submarine landslide when combined with sea level rise	PSM	—
Hazardous Materials Management		
Risk of fire or explosion off-site from natural gas usage during project operation	PSM	Same as Puente (PSM)
Risk of hazardous materials spill impact en route (off-site) from hazardous materials transport to the project site	PSM	Same as Puente (PSM)
Risk of hazardous materials spill or migration off-site from hazardous materials storage and use on-site	PSM	Same as Puente (PSM)
Risk of significant drawdown of emergency response services causing off-site impact	LS	Same as Puente (LS)
Noise and Vibration		
Potential noise impacts at noise-sensitive locations	PSM	Similar to Puente (PSM)
Public Health		
Construction-related diesel particulate matter (DPM) emissions	LS	Similar to Puente (LS)
Project operations-related toxic air contaminants (TACs) emissions	LS	Similar to Puente (LS)
Socioeconomics		
Induce substantial population growth in an area, either directly or indirectly	LS	Similar to Puente (LS)
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere	LS	Similar to Puente (LS)
Adversely impact acceptable levels of service for police protection, schools, and parks and recreation	LS	Similar to Puente (LS)
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees.	B	Similar to Puente (B)
Soil and Water Resources		

Alternatives Table 8
Summary Comparison of Impacts of the Proposed Project to the Ormond Beach Area Off-site Alternative

Environmental Effect	Proposed Project	Ormond Beach Area Off-site Alternative
Water quality impacts during project construction	PSM	Similar to Puente (PSM)
Water quality impacts during demolition	PSM	—
Potential impacts from on-site and off-site flooding	PSM	Similar to Puente (PSM)
Potential flooding hazard based on Federal Emergency Management Agency floodplain delineation maps *(see note)*	LS	Same as Puente (LS)
Water quality impacts from wastewater discharge	SM	Similar to Puente (SM)
Water quality impacts from power plant operations	PSM	Similar to Puente (PSM)
Potential impacts on potable water supplies	—	—
Traffic and Transportation		
Potential impacts from increased construction workforce traffic that is substantial compared to the existing traffic load and capacity of the street system	PSM	Less than Puente (PSM)
Potential for increased workforce traffic to cause driver safety impacts during project demolition and/or construction	PSM	Less than Puente (PSM)
Potential for increased workforce traffic to damage roads and bridges during project demolition and/or construction	PSM	Less than Puente (PSM)
Potential impacts from increased traffic during project operation (i.e., post-construction traffic) that is substantial compared to the existing traffic load and capacity of the street system	LS	Similar to Puente (LS)
Potential impacts from thermal plumes on aircraft and pilot safety	PSM	Less than Puente (LS)
Potential for the exhaust stack to obstruct the airspace above the site	PSM	Less than Puente (LS)
Impacts on aviation safety relating to location of transmission lines	LS	Less than Puente (LS)
Transmission Line Safety and Nuisance		
Interference with radio-frequency communication	LS	Similar to Puente (LS)
Potential for transmission lines to cause audible noise	LS	—
Potential fire hazards	PSM	Similar to Puente (PSM)
Potential for hazardous shocks	PSM	Similar to Puente (PSM)
Potential for nuisance shocks	PSM	Similar to Puente (PSM)
Potential for electric and magnetic (EMF) exposure	PSM	Similar to Puente (PSM)
Visual Resources		
Substantial adverse effect on a scenic vista	—	—
Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	—	—
Substantially degrade the existing visual character or quality of the site and its surroundings *(see note)*	SM	Less than Puente (PSM)
Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	PSM	Similar to Puente (PSM)

Alternatives Table 8
Summary Comparison of Impacts of the Proposed Project to the Ormond Beach Area Off-site Alternative

Environmental Effect	Proposed Project	Ormond Beach Area Off-site Alternative
Visual resources note: Staff identifies a significant impact at KOP 3, which is less than 1,000 feet from the proposed project site. For the other KOPs, staff identifies less-than-significant impacts.		
Waste Management		
Potential for impacts on human health and the environment relating to waste discharges	PSM	Same as Puente (PSM)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	PSM	Similar to Puente (PSM)
Potential for impacts on human health and the environment relating to past or present soil or water contamination	PSM	Same as Puente (PSM)
Worker Safety and Fire Protection		
Risk of fire or explosion impact off-site resulting from natural gas usage during construction and operation	PSM	Same as Puente (PSM)
Risk of significant drawdown of emergency response services causing off-site impact	LS	Same as Puente (LS)

Air Quality

The Ormond Beach Area Off-site Alternative is located in the same air basin as Puente, the South Central Coast Air Basin. Puente and this off-site alternative are located in the same local air district, the Ventura County Air Pollution Control District (VCAPCD). The existing ambient air quality is the same for the alternative site and the Puente site, and the same air quality LORS pertain to this off-site alternative.

Under the Ormond Beach Area Off-site Alternative, approximately 262 MWs of natural gas-fired generation would be constructed and operated at the alternative site. The proposed project would not be constructed at the MGS site. Both construction- and operations-related impacts on air quality for this alternative would likely be **similar to Puente**, and the same air quality rules and regulations would apply to the off-site alternative. Impacts relating to GHG emissions would also be **similar to Puente**. Potentially significant impacts on air quality would be reduced to less than significant with implementation of the same mitigation measures as those recommended under the proposed project.

Biological Resources

The southeast portion of this off-site alternative was previously developed with industrial facilities. Google Earth imagery from February 2016 shows that the site was recently graded and the interior cleared of most if not all remaining vegetation. Staff attended a site visit in April 2016 and viewed the site from the fenced property boundary along E. McWane Boulevard and Arcturus Avenue. The entire site has been completely graded and is being used for parking of new automobiles on a graveled surface.

An unnamed drainage canal occurs approximately one-half mile west of the site, which drains to the Ormond Beach Wetlands southwest of the alternative site. Critical habitat

for the western snowy plover, a federally-threatened bird, is located approximately 1 mile south of the site, along the coastal beaches and dunes.

The Ormond Beach area presents a significant wetland restoration opportunity in the region, and it has been prioritized by a number of agencies for conservation and restoration. Over 1,500 acres of habitat adjacent to this alternative site are current being restored and others are planned for restoration (NRG 2015b) (Aspen Environmental Group 2009). In general, the area supports a large number of special-status plant and wildlife species, and the area has the opportunity to be expanded. The study area for restoration includes a maximum of approximately 1,750 acres, including a large property bordering the Ormond Beach Area Off-site Alternative to the south that is owned by the State Coastal Conservancy and The Nature Conservancy. **Alternatives Figure 9** shows the restoration study area.

Construction and Demolition Impacts

The Ormond Beach Area Off-site Alternative does not have the existing facilities and other site improvements that are already present at the Puente site (i.e., retention basins and pads for other ancillary facilities). Additional construction would be required to install and operate a power plant at this alternative site. However, construction activities at this alternative site would be generally similar to Puente. Compared to Puente, staff assumes the same types of equipment would be used to prepare the alternative site and construct the power plant facilities.

The site has been recently graded and cleared of any remaining vegetation, and no vegetation remains on the interior of this off-site alternative although there could be weedy (ruderal) species remaining on the site periphery. **Similar to Puente**, this alternative would have less-than-significant impacts on common vegetation and wildlife species.

Because on-site habitat is degraded or non-existent, special-status plant species and habitats have no potential to be located on the site. Special-status wildlife species have a very low potential to be on the site; animals may use the site to travel between patches of remnant native habitat or to disperse in search of new, suitable habitat. There is a low potential for special-status plants, animals, or habitat to be present on developed and agricultural lands immediately adjacent to the site. Staff concludes that potential impacts on these resources would be **less than Puente**; mitigation measures would be recommended to reduce potential impacts to less than significant.

No feature that could potentially be considered a jurisdictional wetland or other water is present on the site. This alternative is expected to have **no impact** on jurisdictional wetlands or other waters. This alternative would avoid filling the Coastal Commission defined wetlands on the Puente site.

Construction of Puente would include demolishing the MGS Units 1 and 2. Under the Ormond Beach Area Off-site Alternative, the existing MGS Units 1 and 2 would not necessarily be demolished and removed from the site following their decommissioning. Under this circumstance, MGS Units 1 and 2 would present potential nuisance nesting

and perching opportunities for raptors and other predatory birds, which could lead to depredation of the federally endangered western snowy plover and California least tern nests on the dunes and beaches immediately northwest of the Puente site. Under this off-site alternative, impacts on special-status nesting birds would be **greater than Puente**. Assuming mitigation measures were not imposed to reduce the impact to less than significant, the impact on special-status birds would remain potentially significant and unavoidable.

The site is adjacent to the Ormond Beach Restoration Study Area (Study Area). Although the wetlands expansion is still being planned, the wetlands and marshes in the vicinity of the site are expected to support diverse and abundant species in the Study Area; surveys have documented the presence of several state and federally-listed birds (e.g., the western snowy plover (*Charadrius nivosus nivosus*), California least tern (*Sterna antillarum browni*), and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) (WRA Environmental Consultants 2007). However, suitable habitat for these species, such as beaches and dunes, are not present at or immediately adjacent to this off-site alternative.

Land uses near the Ormond Beach Area Off-site Alternative are mostly agricultural and developed or vacant disturbed land (similar to the Del Norte/Fifth Street Off-site Alternative), and staff considers the surrounding areas to have limited nesting potential for birds. Common species that may nest in neighboring trees or buildings are acclimated to noises of human activities. Impacts on nesting birds during project construction are expected to be **less than Puente**; mitigation measures would reduce potentially significant impacts to less than significant.

General construction impacts relating to dust, nighttime lighting, and the potential to spread invasive weeds could occur during construction of a project similar to Puente at the Ormond Beach Area Off-site Alternative. At the Puente site, critical habitat and sensitive wetlands occur in the immediate vicinity of the project site. Although this alternative site is adjacent to the Study Area, the lands immediately abutting the west, north, and east sides of the site are intensively developed. Therefore, the area surrounding this alternative site is less biologically sensitive compared to the McGrath Lake area and wetlands north of the Puente site, or the dune habitat and beaches west of the project site. Impacts relating to construction and demolition are generally considered **less than Puente**; mitigation measures would reduce potentially significant impacts to less than significant.

Project Operations Impacts

Noise impacts from operation of the proposed project are expected to be less than significant, requiring no noise mitigation measures. There is no known on-site critical habitat, nor known off-site critical habitat within audible range of this alternative site. Potential impacts from operational noise are expected to be **similar to Puente** and less than significant.

Puente would deposit less-than-significant levels of nitrogen oxides (NOx) at the closest sensitive habitats such as the dunes west of the site and wetland habitat surrounding

McGrath Lake, immediately north of the project site. The project site and vegetation within 1,000 feet of the site were mapped by the applicant and included in the AFC (NRG 2015a). While no similar mapping has occurred for this off-site alternative, staff's review of Google Earth imagery indicates potential dune habitat approximately 1,300 feet west of the Ormond Beach Area Off-site Alternative. This distance from the site to a sensitive habitat is similar to the Puente site. Staff assumes that this off-site alternative would have the same operating profile as the proposed project. Assuming the same general wind speed and direction, this alternative's air emissions would be similar to the proposed project. Staff assumes that these emissions would have similar effects; therefore, nitrogen deposition from project operations at the Ormond Beach Area Off-site Alternative would be **similar to Puente.**

This alternative would require installing a 220-kV transmission line to connect to the Ormond Beach Substation approximately 1 mile south of the site. The new transmission line could present an electrocution hazard to large raptors if not constructed according to the Avian Power Line Interaction Committee guidelines to protect raptors (Avian Power Line Interaction Committee 2006). This off-site alternative would be required to comply with the same guidelines to reduce potentially significant impacts on avian species to less than significant. Therefore, potential impacts on raptors from electrocution hazards would be **similar to Puente**.

Cultural Resources

The Ormond Beach Area Off-site Alternative is devoid of buildings. Industrial facilities of the Reichhold Chemical Company/Oxychem were removed from the site sometime between 2009 and 2011. A segment of rail line bordering the east side of the site is a spur line of the Ventura County Railway. The southern end of the railroad spur line enters the alternative site and breaks into two separate tracks before terminating on the southwest portion of the site at two spur stops. As stated in the site description, Google Earth imagery from February 2016 shows that the site was recently graded. In November 2016, staff saw the site from Arcturus Avenue and noted the remaining on-site structures (spur stops) at the south ends of the tracks. Staff suspects the tracks are intact but wholly or partially covered by gravel. Off the site to the north, the railroad spur is actively used along the area adjacent to an automobile distribution center.

A record search at the South Central Coastal Information Center (SCCIC) at California State University at Fullerton did not identify any ethnographic or archaeological cultural resources at the alternative site; however, two sites were identified within 1 mile of the site. The area has been subject to two cultural resource surveys, and an additional 31 surveys have been conducted within 1 mile of the site.

Staff walked the boundaries of the proposed alternative site in November 2016 to identify potential areas that could be used by contemporary Native American groups for hunting or gathering activities. The entirety of the site is denuded of vegetation, and the surrounding industrial and agricultural uses of the area would likely preclude any hunting or gathering in the area.

The archaeological and ethnographic setting presented in **Cultural Resources Appendix A** of this staff assessment applies also to this alternative.

Staff investigated eight built environment resources located within one-half mile of the Ormond Beach Area Off-site Alternative (see **Alternatives Figure 10**). These resources were identified from historical maps and imagery, staff research, and the results of the literature search conducted at the SCCIC. Staff conducted a windshield survey of the resources on November 10, 2016. **Alternatives Table 9** lists the eight built environment resources 45 years or older within the one-half mile radius.

Alternatives Table 9
Built Environment Resources 45 Years Old or Older
within One-Half Mile of the Alternative Site

Description	Type	Address	Year Built	Listed on a Register	CRHR Eligible
Kaiser Aluminum & Chemical Corporation/Aluminum Precision Products	Manufacturing Complex	1001 E. McWane Blvd.	1966	No	Unlikely
Arcturus Manufacturing Corporation	Manufacturing Complex	6001 Arcturus Avenue	1964	No	
Ventura County Railroad	Railroad	Oxnard to Port Hueneme	1903–1905	Ventura County Landmark #141/CRHR 2009	Yes. CRHR Listed 2S2-A [1]
Oxnard Industrial Drain/ Ormond Lagoon Waterway	Water Conveyance	Oxnard to Ormond Beach	1951 or earlier [2]	No	Unlikely
Jeep Trail	Dirt Road	Ormond Beach area	1904 or earlier	No	Unlikely
Former Reichhold Chemical Company/Oxychem	Manufacturing Complex (removed between 2009 and 2011)	5980 Arcturus Avenue	1967	No	No
Hueneme Road Bridge	Bridge	Crosses Oxnard Industrial Drain at Hueneme Road	1969	No	Unlikely
Hoskins Brothers Trucking	Trucking Facility/ Quonset Hut	320 E. Hueneme Road	Unknown	No	Unlikely

Note: CRHR is the California Register of Historical Resources

[1] California Historical Resources Status Code 2S2-A: Eligible for National Register of Historic Places (NRHP) by Consensus through Section 106 Process. Listed on CRHR. Eligible for NRHP under Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history.

[2] U.S. Geological Survey Topographic Map Oxnard, California Quadrangle.7.5 minute. 1951

Staff's investigation concludes that only one of the eight built environment resources identified is a historical resource for the purposes of CEQA. The Ventura County

Railway (VCRR) is listed as a landmark on the Ventura County Historical Landmarks and Points of Interest. The VCRR is also listed on the California Register of Historical Resources (CRHR), and it was found to be eligible for listing on the National Register of Historic Places (NRHP) under Criterion A by the State Historic Preservation Officer (SHPO) through a Section 106 consultation process for the U.S. Bureau of Reclamation (Reclamation) (2009) Calleguas Hueneme Outfall Replacement Project (BUR090416A). None of the information obtained by staff through the literature search or by other means has described those portions of the railway and its elements that are considered historical resources, character-defining features or contributing elements, nor has a period of significance been established in the known literature. Staff does not have the benefit of a thorough survey and evaluation of the resource and its contributing elements.

In addition to identifying the contributing elements and period of significance of the historical resource, a survey and evaluation would also examine the integrity of the resource. There are seven aspects of integrity: materials, workmanship, location, setting, design, feeling and association. Railroads do not necessarily lose integrity through replacement of some original materials. However, loss of associated structures or buildings may affect integrity, as it might impact the setting, feeling and association of the railroad and its historical context (California Department of Transportation 2008). Staff does not have information available to assess the integrity of the historical resource.

Ventura County Railway

The railroad was incorporated in 1903 as the Bakersfield-Ventura Railway Company. The line from Oxnard to Hueneme was constructed in 1905. It transported sugar beets to the factory in Oxnard and provided passenger service. The Ventura Railway Company purchased the railroad in 1911, and it became a wholly-owned subsidiary of the Oxnard Sugar Beet Company. The line also carried war-related material for the Port of Hueneme. The sugar beet factory was closed in 1959 and the railway was purchased by Martin Smith and Associates (Ventura County General Services Agency 2004).

Now known as the Ventura County Railroad (VCRR), the railroad is owned and operated by Genesee & Wyoming Railroad (GWRR), which acquired it in 2012. The railroad currently consists of approximately 9 miles of track and connects to the Union Pacific interchange in Oxnard. VCRR is an integral corridor for movement of goods in the industrial areas south of Oxnard, the Port of Hueneme and the U.S. Naval Base Ventura County (GWRR 2016).

The footprint of the spur line that extends into the alternative site may date to 1967 or earlier. The distinctive arc of the spur appears in a 1967 aerial image (HistoricAerials 2016). The 1967 image also appears to show a spur line leading to the then newly completed Kaiser Aluminum and Chemical Corporation facility at 1001 E. McWane Boulevard. A single spur line enters the alternative site on the eastern boundary and splits into two tracks with both tracks ending with a steel railroad spur stop near the southwest property boundary. The spur stops are slightly different in their design. The northern spur stop has a fairly traditional four-legged trapezoidal base while the

southern stop has a triangular base with a center upright post. Staff was unable to observe the majority of the on-site spur track itself as there was no site access available.

Impacts on Surficial Archaeological and Ethnographic Resources

A review of historic topographic maps, archival Google Earth imagery, and maps of ethnographic villages did not reveal any surficial archaeological resources or ethnographic resources at the Ormond Beach Area Off-site Alternative. Due to previous intensive development and disturbance at the site, as well as the lack of recorded cultural resources from two prior on-site surveys, surficial archaeological resources or ethnographic resources are unlikely to be present, and staff concludes that **no impact** would occur.

Impacts on Buried Archaeological Resources

The Ormond Beach Area Off-site Alternative and the proposed project are both located on the large coastal alluvial fan of the Oxnard Plain, which is a geologic environment suitable for preserving intact archaeological deposits. Previous intensive development and disturbance at the alternative site suggests that the potential for impacts on buried archaeological resources is low, even though it is possible. Therefore, potential impacts on buried archaeological resources would be **similar to Puente** where this impact is considered potentially significant but mitigable.

Impacts on Built Environment Resources

Construction of a power plant project similar to Puente at the Ormond Beach Area Off-site Alternative has the potential to cause a significant impact on a built environment historical resource. The site contains portions of a railroad spur line connected to the Ventura County Railway north of the property. As mentioned above, the Ventura County Railway is a locally listed historical landmark (#141-Ventura County) and is listed on the CRHR. It was found to be eligible for listing on the NRHP under Criterion A by the SHPO through a Section 106 consultation process for Reclamation's 2009 Calleguas Hueneme Outfall Replacement Project. It is not known whether spur lines from the Ventura County Railway are considered contributing elements to the listed historical resource. The spur line in question may date to the period of Kaiser Aluminum, constructed in 1966, and the Reichhold Chemical Company, established in 1967. Or it may date to an earlier period, as staff observed a section of the spur line track near Hueneme Road stamped with a date of 1922. The difference in the design of the spur stops on the subject property may also indicate different dates of construction.

Impacts cannot be fully assessed until an evaluation of the spur line is completed to determine whether or not it is a contributing element of the Ventura County Railway. Therefore, staff concludes that this alternative has the potential to impact a built environment historical resource. Avoidance of the resource through site design may be able to reduce a potentially significant impact to less than significant. Also, if removal of the rail spur was required for site development, mitigation measures such as Historic American Engineering Record documentation, financial contributions to a local historical society or an educational documentary video of the railroad's history might reduce the

impact to less than significant. If additional research and evaluation concluded that the spur line is not a contributing element of the Ventura County Railway, then the potential to impact a historical resource would be eliminated. Therefore, the potential impact on a built environment historical resource at the Ormond Beach Area Off-site Alternative is potentially significant but can likely be reduced to less than significant with implementation of mitigation measures. Because no impact would occur on built environment historical resources at the Puente site, this impact is **greater than Puente**.

Conclusion

Staff concludes that the Ormond Beach Area Off-site Alternative would cause **no impacts** on surficial archaeological resources or known archaeological or ethnographic resources. The potential for buried archaeological resources to be found on the site is low; however, if resources were found, mitigation measures like those recommended for Puente would reduce potential impacts to less than significant, **similar to Puente**. Staff considers the spur line of the Ventura County Railway located on the site to be a potential historical resource, which could be impacted by a project at the site. Mitigation measures would likely reduce the impact, if it occurred, to less than significant. This potential impact is **greater than Puente**.

Geology and Paleontology

The Ormond Beach Area Off-site Alternative is located approximately one-half mile east of the coastline. The site is vacant of buildings. Site topography is flat and is underlain by sediments similar to the Puente site. Under this alternative, ground disturbance would be somewhat greater than that required to construct the proposed project; increased ground disturbance would occur during construction of foundations for transmission line structures and off-site trenching for natural gas and water pipelines.

Similar to Puente, this alternative would have the potential to encounter and damage buried paleontological resources. Although the sedimentary materials underlying this off-site alternative have a limited potential to contain paleontological resources, if such resources are present, potential impacts could be significant. Implementation of a paleontological resources monitoring program such as the one described in the **Geology and Paleontology** section of this staff assessment would be required to reduce the impact to less than significant (see Conditions of Certification **PAL-1** through **PAL-8**). Staff concludes that the relative potential for paleontological resources to be damaged under this off-site alternative is **similar to Puente**.

Like the proposed project, this alternative would have **no impact** on mineralogical or geological resources because these resources are not present at the site or in areas where construction of linear facilities would occur.

Similar to Puente, there are no known active faults on the alternative site or crossing areas where linear infrastructure would be installed. The potential risk relating to surface fault rupture under this alternative is less than significant, and the impact conclusion is the same for Puente at the MGS site.

The Ormond Beach Area Off-site Alternative would be subject to the same, very strong levels of earthquake-related ground shaking as the proposed project. The potential risk of soil failure caused by liquefaction and/or dynamic compaction is **similar to Puente** for this off-site alternative. These potential impacts could be reduced to less than significant with implementation of a mitigation measure such as the one recommended in the **Geology and Paleontology** section of this staff assessment (see Condition of Certification **GEO-2**).

This off-site alternative would be subject to a risk of potential excessive settlement or expansion of soils that is **similar to Puente**. These potential impacts could be reduced to less than significant with implementation of a mitigation measure similar to Condition of Certification **GEO-2**.

As stated above, Puente could be at risk for inundation by tsunami. Under the proposed project, this impact is potentially significant. Although the Ormond Beach Area Off-site Alternative is a little over one-half mile from the coastline, it is outside the area that is subject to risk of inundation by tsunami even when combined with the effects of sea level rise; therefore, **no impact** would occur compared to Puente.

Hazardous Materials Management

The Ormond Beach Area Off-site Alternative would present a nearly identical hazardous materials risk profile as at the Puente site. Both would use natural gas as fuel and ammonia for selective-catalytic reduction of oxides of nitrogen in the combustion exhaust. Since the hazardous risk profiles are similar, the Ormond Beach Alternative would present potentially significant impacts that could be mitigated to less than significant the **same as Puente**.

Noise and Vibration

The nearest noise-sensitive receptors to the Ormond Beach Area Off-site Alternative are the residences that are located approximately one-half mile northwest of the center of this alternative site. The nearest noise-sensitive receptors to the Puente site will be the new, residential community planned for development approximately one-half mile southeast of the MGS site. These distances are similar. Therefore, the construction and operational noise impacts of this off-site alternative would be **similar to Puente**; and the impacts associated with this off-site alternative would be reduced to less than significant with implementation of appropriate mitigation measures.

Public Health

Construction and operation of a 262-MW natural gas-fired, simple-cycle power plant at the Ormond Beach Area Off-site Alternative would cause the same or similar impacts as Puente. Under Puente, air emission impacts would occur from demolition of the MGS Units 1 and 2 and construction of Puente. Under this alternative, construction of buildings and structures would include water storage tanks, retention basins, ammonia tanks, a 220-kV switchyard and transmission line, and administration and warehouse/lab buildings. This off-site alternative is located in the same air basin as Puente, the South Central Coast Air Basin. The proposed project and this off-site

alternative are located in the same local air district, the VCAPCD. The Ormond Beach Area Off-site Alternative would be subject to the same public health LORS as those that apply to the project site; a health risk assessment would be needed to ensure compliance with applicable LORS.

Construction-related impacts of Ormond Beach Area Off-site Alternative would be generally **similar to Puente**. Operations-related impacts would also be **similar to Puente** because the same air emissions rules and regulations would apply at this off-site location. The impact conclusion for the proposed project and this off-site alternative is less than significant. The MGS Unit 3 would continue operations as a permitted unit.

Socioeconomics

Unlike Puente, the Ormond Beach Area Off-site Alternative would require construction of a new 220-kV switchyard, two retention basins, and a transmission line connection to the Ormond Beach Substation approximately 1 mile south of the site. This construction would require an additional workforce and would extend the construction schedule beyond what would be required under the proposed project. The additional workers and lengthened schedule would likely be minimal compared with the workforce needs and length of work for the proposed project. Because this alternative does not include demolition of MGS Units 1 and 2, but requires new linear components, the workers needed and length of work would largely balance out. If any additional workforce was needed, it would be easily met with the large labor pool in the Oxnard-Thousand Oaks-Ventura Metropolitan Statistical Area (Ventura County MSA) and Los Angeles-Long Beach-Glendale Metropolitan District (Los Angeles MD).

In 2012, there were over 124,500 construction and extraction trades workers in the Ventura County MSA and Los Angeles MD combined, with projections for a workforce increase of almost 25 percent by 2022. There were approximately 1,500 electric power line installation and repair workers in 2012 in the Ventura MSA and Los Angeles MD, combined, and a projected growth of almost 15 percent by 2020.

With the ample local workforce in the Ventura MSA and Los Angeles MD, there would be no substantial population growth or substantial increases in demand for parks or law enforcement services. This alternative site is undeveloped so there would be no displacement of substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere. Impacts for this alternative would be less than significant and **similar to Puente**.

Expenditures for additional equipment and construction labor necessary for construction at this alternative site would be slightly greater than those for the proposed project. However, the estimated fiscal benefits of this alternative would be **similar to Puente**.

Like the proposed project, construction and operation of a power plant at this site would require Condition of Certification **SOCIO-2** to ensure payment of the one-time statutory school facility development fee to the Oxnard School District and to the Oxnard Union High School District and compliance with LORS.

Soil and Water Resources

The Ormond Beach Area Off-site Alternative is located within the city limits of Oxnard with access to Oxnard's potable water system and municipal wastewater system. Both the Puente site and this off-site alternative are in the jurisdictional region of the Los Angeles Regional Water Quality Control Board, and within the same coastal drainage area. The site is approximately one-half mile east of the coastline and roughly 7.5 miles south of the Santa Clara River. A 220-kV transmission line and a 36-inch diameter natural gas line are adjacent to the east edge of the site.

Water Quality Impacts during Project Construction

Although the site has been recently graded, staff assumes that the entire 14.5-acre site would require light grading for site preparation and construction laydown. Similar to the Puente site, excavation would occur to construct the reinforced concrete foundations for the power block, but the Ormond Beach Area Off-site Alternative does not have the same coastal requirement for deep foundations such as piles to support the foundation. This off-site alternative also does not have the existing infrastructure found at the Puente site, so additional construction would be required for new administration and warehouse/lab buildings, pads for various ancillary facilities, and two retention basins to collect storm water and process wastewater. Trenching to install underground pipelines would take place on-site to connect to the underground linear facilities (potable water, municipal wastewater system, and natural gas pipeline).

Compared to the Puente site, construction activities at the Ormond Beach Area Off-site Alternative would result in more earth work and a longer construction timeframe. As with the Puente site, construction activities are subject to construction-related storm water permit requirements of the federal Clean Water Act's NPDES permits, including California's Construction General Permit. Impacts on water quality would be reduced through compliance with the Construction General Permit and other applicable NPDES permits. Required implementation of specific best management practices (BMPs) for erosion control and wastewater management, in addition to numeric action levels (NALs) to evaluate the effectiveness of BMPs, would achieve minimum water quality standards. Although the larger construction area and longer construction time increases the potential for significant impacts at the Ormond Beach Area Off-site Alternative, these impacts would be reduced to less than significant, **similar to Puente**.

Water Quality Impacts during Demolition

Demolition impacts at the Puente site would be reduced to less than significant through compliance with the Construction General Permit, which also regulates demolition activities. The Ormond Beach Area Off-site Alternative is undeveloped; therefore, no demolition would be required to develop the site. Compared to the Puente site, which proposes aboveground demolition of MGS Units 1 and 2, **no impact** would occur relating to potential impacts on water quality from demolition at this alternative site.

Potential Impacts from On-site and Off-site Flooding

Development of the Ormond Beach Area Off-site Alternative would not impact the course of a stream or river. For on-site storm water drainage, a similar storm water collection system proposed at the Puente site (which covers about 15.3 acres, including the MGS site) could likely manage storm water at this 14.5-acre off-site alternative. Although a site-specific drainage study would be needed to fully evaluate the adequacy of on-site drainage management compliance with LORS would reduce impacts to less than significant, **similar to Puente**.

Potential Flooding Hazard Based on Federal Emergency Management Agency Floodplain Delineation Maps

The FEMA flood hazard map shows that a large storm event would likely cause the Santa Clara River to flood adjacent land. Although this off-site alternative is located several miles outside the 1 percent annual chance flood hazard (also referred as the 100-year event floodplain), the 0.2 percent annual chance flood hazard (also referred as the 500-year event floodplain) encroaches into the northwest corner of the site. By comparison, the Puente site is located just outside the mapped 100-year floodplain, and the 500-year floodplain encroaches into the southwest corner of the site. Although this alternative site is well outside the 500-year floodplain, the Oxnard Plain is relatively flat with a remote chance of flooding. The site's less-than-significant impact of 1 percent annual chance flood hazard due to river flooding is comparable to the proposed project's less-than-significant impact of 1 percent annual chance flood hazard occurring from coastal flooding. Therefore, the potential flooding hazard is the **same as Puente**, and the impact conclusion is less than significant.

Water Quality Impacts from Wastewater Discharge

The Ormond Beach Area Off-site Alternative and the proposed project would use the same technology to achieve the same generating capacity. Therefore, the quantity and quality of generated wastewater are expected to be the same at both sites.

This off-site alternative is serviced by Oxnard's municipal wastewater system, which is expected to accept sanitary waste. Assuming the on-site system that manages process wastewater and storm water runoff can treat these flows to a water quality level acceptable to Oxnard, these flows would also discharge to the municipal wastewater system. Because the wastewater treatment plant is licensed and regulated under a WDR issued by the RWQCB, impacts would be reduced to less than significant.

Because the Puente site is not serviced by the municipal wastewater system, sanitary waste is managed through an existing septic system. Process wastewater and storm water runoff would be managed through a wastewater collection system for treatment prior to discharge to the Edison Canal. Both of these existing systems are currently operating under project-specific WDRs issued by the RWQCB, which reduces impacts to less than significant.

Although the proposed method of wastewater disposal is different at each site, the discharge of both sites would be regulated under their respective WDR permits

requiring that treatment meet minimum water quality standards. Because wastewater of this off-site alternative would discharge to the municipal wastewater system, impacts would be reduced to less than significant, **similar to Puente**.

Water Quality Impacts from Power Plant Operations

Potential impacts on water quality at the Ormond Beach Area Off-site Alternative would be less than Puente mainly due to its relative distance to water resources. Potential impacts on groundwater would also be less because this off-site alternative would require a connection to the municipal wastewater system. Despite a lower potential to impact water quality, the Ormond Beach Area Off-site Alternative would need to comply with the same requirements imposed on Puente such as a hazardous materials management program, spill control and prevention, and other measures to avoid or reduce the discharge of contaminants. With these requirements implemented, potential impacts on water quality would be **similar to Puente**.

Potential Impacts on Potable Water Supplies

Under the Ormond Beach Area Off-site Alternative, operational water use is expected to equal that of the proposed project. Water use at this off-site alternative would constitute a new use (maximum 19 acre-feet per year), while the combination of proposed project development and MGS decommissioning would be a net reduction of current water use at the MGS facility. The city of Oxnard's "Water Neutrality Policy" requires that all new development offset its water demand. The decommissioning of MGS Units 1 and 2 could theoretically provide water to fully offset the new use at this off-site alternative. Therefore, **no impact** on water supply would occur.

Traffic and Transportation

Construction Workforce Traffic

The Ormond Beach Area Off-site Alternative would involve construction of additional ancillary buildings and structures, a new 220-kV switchyard, and removal of the existing on-site railroad spurs, if any segment of the tracks remains on the site. However, Puente would generate more temporary vehicle trips overall due to demolition of MGS Units 1 and 2. Furthermore, for this off-site alternative, truck deliveries could potentially be reduced or eliminated if the applicant could use the existing railroad spurs for deliveries, as the tracks could be partly intact on the site.

Existing traffic LOS in the vicinity of the Ormond Beach Area Off-site Alternative appears to be less impacted than in the vicinity of the proposed project, which would also reduce this alternative's construction traffic impacts on LOS. According to the Ventura County Traffic Commission's Congestion Management Plan, traffic on State Highway 1 in the project area moves relatively smoothly, meaning that construction traffic would not travel on an already congested area of the highway, in contrast to Puente (Ventura County Transportation Commission 2009).

Due to the better existing traffic LOS in the vicinity of the Ormond Beach Area Off-site Alternative and the additional demolition trips generated by Puente, temporary impacts

on LOS from this off-site alternative would be **less than Puente**. Temporary traffic impacts from construction of this alternative would be potentially significant but could be mitigated to less than significant by implementing a traffic control plan and obtaining applicable encroachment permits for heavy loads.

Driver Safety

Construction vehicles exiting the Ormond Beach Area Off-site Alternative would likely turn right onto Arcturus Avenue to head north toward the freeway and urbanized areas. In this case, vehicles would not need to cross a lane of opposing traffic. Vehicles could also exit left onto eastbound E. McWane Boulevard, which would require crossing a lane of opposing westbound traffic. However, this opposing westbound traffic would be low volume and slow moving, as E. McWane Boulevard dead ends less than 1,000 feet west of the alternative site.

The risk of a dangerous collision would be lower under the Ormond Beach Area Off-site Alternative compared to Puente. Under the proposed project, many construction vehicles would exit the site by turning left to travel north on Harbor Boulevard, crossing an opposing lane of high-speed traffic in the process. Furthermore, the Ormond Beach Area Off-site Alternative would generate fewer vehicle trips that could potentially cross a lane of opposing traffic, as this alternative does not necessarily involve demolition of MGS Units 1 and 2. Therefore, driver safety impacts from the Ormond Beach Area Off-site Alternative would be **less than Puente**. However, the risk could still be potentially significant. Driver safety impacts from the Ormond Beach Area Alternative could be mitigated to less than significant by requiring preparation and implementation of a traffic control plan.

Damage to Roads and Bridges

Construction of the Ormond Beach Area Off-site Alternative would require truck trips that could potentially damage roads. Impacts would be potentially significant but could be mitigated to less than significant with preparation and implementation of a traffic control plan, including a requirement to repair and restore damaged roads. Because Puente would require additional truck trips associated with demolition of MGS Units 1 and 2, the potential for damage to roads from this off-site alternative would be **less than Puente**.

Operations Traffic

The same number of operations workers (17 workers) and truck deliveries would be used for the Ormond Beach Area Off-site Alternative and the proposed project. The location of Puente would enable it to use existing MGS workers, while the location of the Ormond Beach Area Off-site Alternative would add new project operations vehicle trips to the area. However, the number of operations workers and deliveries would be relatively small and would not generate significant impacts on traffic LOS. Due to the small number of operations workers and deliveries, impacts would be **similar to Puente** and less than significant.

Potential Impacts of Thermal Plumes on Aircraft and Pilot Safety

Like the proposed project, the Ormond Beach Area Off-site Alternative would generate high-velocity thermal plumes that could be hazardous to aircraft flying directly overhead at sufficiently low altitudes. Naval Base Ventura County (NBVC) Point Mugu, the nearest airport, is approximately 3 miles southeast of the Ormond Beach Area Off-site Alternative. It is unlikely that military aircraft would fly directly over the site. Aircraft from NBVC Point Mugu would likely fly west to the "Sea Range," a military training and testing area over the Pacific Ocean off the coast of California that stretches approximately from the United States/Mexico border at its southern end to the Cambria and San Simeon area at its northern end. A military training route called IR200 links the Sea Range with the military area located at China Lake (Naval Air Warfare Center Weapons Division 2014). This military training route does not pass over the Ormond Beach Area Off-site Alternative site. **Alternatives Figure 11** shows the NBVC Field Carrier Landing Practice track for Runway 09/27 and normal aviation operations for Runway 3/21. These flight tracks do not pass over the Ormond Beach Area Off-site Alternative.

However, aircraft from other airports in the region could potentially fly directly over the alternative site (e.g., aircraft using Oxnard Airport and Camarillo Airport, which are approximately 3 and 7 miles from the site, respectively). Given the distances of these airports from the Ormond Beach Area Off-site Alternative, aircraft would likely overfly the site at high altitudes and would not be significantly affected by thermal plumes from a power plant at this location. However, out of caution, staff would recommend a pilot notification condition requiring addition of a remark to applicable FAA aviation maps and documents and issuance of a Notice to Airmen warning pilots to avoid overflight of the site. Pilots would be able to avoid low altitude direct overflight of the site because it is not near any airport traffic pattern or flight corridor. Aircraft and pilot safety impacts from this off-site alternative would be **less than Puente** and less than significant, given the greater distances of airports from the Ormond Beach Area Off-site Alternative compared to Puente (less than 2 miles from the Oxnard Airport), making overflight of the alternative site at low altitudes less likely.

Potential for the Exhaust Stack to Obstruct the Airspace Above the Site

Construction of a project like Puente at the alternative site would include a 188-foot-tall exhaust stack, which would penetrate the navigable airspace for Runway 09/27 at the NBVC Point Mugu beginning at approximately 158 feet above ground level (AGL). LORS compliance would require the applicant to file Form 7460-1 requesting the FAA issue a Determination of No Hazard to Navigable Airspace.

Military training route IR200 does not pass over this alternative site. **Alternatives Figure 11** shows the NBVC Field Carrier Landing Practice track for Runway 09/27 and normal aviation operations for Runway 3/21, neither of which cross over the Ormond Beach Area Off-site Alternative site.

The proposed Puente Power Project at the MGS site is approximately 1.8 miles northwest of the Oxnard Airport. The 188-foot-tall exhaust stack would penetrate the

navigable airspace which begins at 108.45 feet AGL. The applicant filed Form 7460-1 with the FAA and received a "No Hazard to Air Navigation." However, as depicted in **Traffic and Transportation Figure 4** in this staff assessment, a small number of aircraft depart the Oxnard Airport to the west fly over the MGS site.

Aircraft piloted to arrive and depart from the Oxnard Airport are not known to fly over the Ormond Beach Area Off-site Alternative at low altitudes, and flight tracks associated with aircraft operations at the NBVC Point Mugu do not pass over this alternative site. Therefore, staff concludes that the potential risk associated with this impact for the off-site alternative is **less than Puente** and the impact conclusion is less than significant.

Impacts on Aviation Safety Relating to Location of Transmission Lines

Staff assessed the potential for aviation hazards with regard to: a) the height of the proposed transmission structures, and b) distances and orientation with respect to identified runways. According to Title 14 of the Code of Federal Regulations, Section 77.9(b)(1), for construction or alterations within 20,000 feet (3.8 miles) of an airport with a runway longer than 3,200 feet, the FAA shall be notified if the height of the construction or alteration exceeds an imaginary surface extending outward and upward at a slope of 100 to 1 from the nearest point of the nearest runway of the airport.

The Ormond Beach Area Off-site Alternative is approximately 6 miles southwest of the Camarillo Airport and 4 miles southeast of the Oxnard Airport. These distances do not require FAA notification. However, as discussed above under, "Potential Impacts of Thermal Plumes on Aircraft and Pilot Safety," NBVC Point Mugu is located approximately 3 miles (15,840 feet) southeast of this off-site alternative, within the FAA's distance for potential notification of the FAA. Staff calculated that the threshold for FAA notification at the Ormond Beach Area Off-site Alternative would be a structure height of 158 feet. The 80- to 90-foot-tall transmission structures would be below this threshold, and would therefore not require FAA notification and a subsequent FAA obstruction hazard review. The transmission structures under this alternative would be further below the FAA notification threshold height than the transmission structures for the proposed project, which, while also below the FAA notification threshold height, are closer to it.

Also, Google Earth imagery shows that the main runway at NBVC Point Mugu is oriented southwest/northeast. Based on the military training route described above, staff assumes that aircraft departing and arriving at NBVC Point Mugu would not be flying at low altitudes over the area of the Ormond Beach Area Off-site Alternative.

For the reasons discussed above, staff concludes that the potential impact on aviation safety relating to the location and height of transmission structures is **less than Puente**, and the impact conclusion is less than significant.

Transmission Line Safety and Nuisance

The transmission line for the Ormond Beach Area Off-site Alternative would be designed and constructed in conformance with applicable LORS.

Interference with Radio-Frequency Communication

The Ormond Beach Substation is located less than 1 mile south of this off-site alternative. A potential route for the 220-kV transmission line under this alternative is undetermined, but the most direct route would be along the Edison Drive ROW. Noise and interference are generally not problems for well-maintained transmission lines, and there are no residences in the area between the Ormond Beach Area Off-site Alternative and the substation. Staff would not expect any corona-related radio-frequency interference or complaints under this off-site alternative. **Similar to Puente**, this impact would be less than significant.

Potential for Transmission Lines to Cause Audible Noise

Audible noise is not generally expected at significant levels from transmission lines less than 345 kV. Therefore, staff would not expect the transmission line for this off-site alternative to add significantly to current background noise levels, and **no impact** would occur.

Potential Fire Hazards

Like the proposed project, the Ormond Beach Area Off-site Alternative would comply with "Fire Prevention Standards for Electric Utilities" (Cal. Code Regs., tit. 14, § 1250 et seq.). This impact is potentially significant and **similar to Puente**. Compliance with applicable LORS and implementation of mitigation measures would reduce the impact to less than significant (see Condition of Certification **TLSN-3** in the **Transmission Line Safety and Nuisance** section of this staff assessment).

Potential for Hazardous and Nuisance Shocks

The transmission line for this off-site alternative would be constructed in conformance with the requirements of CPUC's GO-95, "Rules for Overhead Line Construction," and minimum standards for installation, operation, and maintenance of electrical installation and equipment to provide practical safety and freedom from danger ("High Voltage Electrical Safety Orders") (Cal. Code Regs. tit. 8, § 2700, et seq.). Therefore, hazardous shocks are highly unlikely to occur from construction and operation of the Ormond Beach Area Off-site Alternative. The potential for nuisance shocks around the transmission line would be reduced through standard industry grounding practices. Impacts relating to hazardous and nuisance shocks are **similar to Puente**, and implementation of mitigation measures would reduce impacts to less than significant (see Conditions of Certification **TLSN-1** and **TLSN-4** in the **Transmission Line Safety and Nuisance** section of this staff assessment).

Potential for Electric and Magnetic (EMF) Exposure

The potential impact relating to EMF exposure is **similar to Puente**, and implementation of mitigation measures like those recommended under the proposed project would reduce the impact to less than significant (see Conditions of Certification **TLSN-1** and **TLSN-2** in the **Transmission Line Safety and Nuisance** section of this staff assessment).

Visual Resources

Staff concludes that the proposed project would cause no impacts relating to its potential to adversely impact a scenic vista or damage scenic resources. No scenic vistas are identified near the Ormond Beach Area Off-site Alternative. This off-site alternative is not near a state-designated scenic highway. Under the Ormond Beach Area Off-site Alternative, no change would occur relating to these visual resources impact criteria; therefore, **no impacts** are identified.

The approximately 14.5-acre Ormond Beach Area Off-site Alternative is an undeveloped and graded industrial site that is being used for parking of new KIA vehicles. **Alternatives Figure 12** shows the site looking northeast from Arcturus Avenue near its intersection with E. McWane Boulevard. The building associated with Aluminum Precision Products on the property east of the site is visible beyond the rows of parked automobiles. The high-voltage transmission line that parallels Edison Drive is visible in the background. **Alternatives Figure 13** provides a view east along E. McWane Boulevard from a viewpoint approximately one block west of Arcturus Avenue. The roads bordering the site are not major travel corridors and no roads near the site are listed on Oxnard's inventory of scenic routes.

Similar to the Del Norte/Fifth Street Off-site Alternative, the landscape in the vicinity of the Ormond Beach Area Off-site Alternative is characterized by large utilitarian structures and related industrial uses adjacent to agricultural fields and open space areas. The estimated VAC of the landscape is *moderate* (using a general comparative scale of low, moderate, and high). Based on staff's observations during a site visit in April 2016, the area near this off-site alternative is at the southern edge of an industrial area that is somewhat removed from areas with higher public access and use. Visual sensitivity of the viewing public in the immediate vicinity of the site is estimated to be *low to moderate*.

The open space and agricultural areas immediately south of the site do not include publicly accessible recreational use areas. Ormond Beach is a little over one-half mile from this off-site alternative. **Alternatives Figure 14** shows the view south toward the OBGS from Arcturus Avenue. Public access to Ormond Beach is provided at two places, including Perkins Road (1 mile north of the OBGS) and Arnold Road (close to 1 mile south of the OBGS). Ormond Beach is identified as an "undeveloped site" in the city of Oxnard General Plan (City of Oxnard 2006). Although the visual sensitivity of visitors to the beach is expected to be *high*, the site is set back from the beach and would not dominate views in the same way as the existing OBGS, which is prominently visible to viewers along the beach north and south of the site.

The closest residential area to the Ormond Beach Area Off-site Alternative is the Villa Cesar Chavez development, approximately one-half mile northwest of the alternative site. **Alternatives Figure 15** provides a view south-southeast in the general direction of the Ormond Beach Area Off-site Alternative. Buildings associated with the industrial and warehouse commercial businesses west of Arcturus Avenue partially block the view south from this viewpoint, although portions of the OBGS stacks are visible in the

background. The signalized crossing of the Ventura County Railway at E. Hueneme Road is visible in the foreground.

The Ormond Beach Area Off-site Alternative would modify existing visual conditions and introduce power plant structures at the site that would be clearly visible from the surrounding area. Major structural elements of the proposed project include the combustion turbine generator (107 feet long, 52 feet wide, and 79 feet high); nitrogen oxide removal equipment (87 feet long, 33 feet wide, and 99 feet high); and the stack (22 feet in diameter and 188 feet high) (NRG 2015a). Other structures would include 80- to 90-foot tall transmission structures. However, compared to Puente, this off-site alternative would be set back approximately one-half mile from the publicly accessible beach. The closest major travel corridor to the site is Hueneme Road, approximately one-half mile north of the site.

Staff compared this off-site alternative to Puente and assessed its potential to substantially degrade the existing visual character or quality of the site and its surroundings. Staff considered baseline visual conditions for the Puente Power Project at the MGS site, which includes aging power plant structures adjacent to Mandalay State Beach and McGrath State Beach. The existing MGS is the most visually dominant built structure along several miles of the coast extending north and south of the Puente site. The estimated VAC of the landscape is *low* for the Puente site. The proposed project would generally entail construction of a power block with less mass and height compared to the existing MGS Units 1 and 2, which would be demolished and removed from the site under the proposed project. The primary viewer groups in public use areas near the project site are residents, recreationists, and visitors at nearby open space areas. The nearest residential development is approximately one-half mile south of the project site, and residents have unobstructed views of the existing power plant. In general, visual sensitivity of the viewing public is expected to be *high* for the proposed project compared to the estimated *low to moderate* visual sensitivity for this off-site alternative.

Staff's comparative analysis considers the following major points:

- The proposed project at the MGS site would be less visually imposing compared to the existing MGS Units 1 and 2, which would be demolished and removed from the site.
- Staff assumes that visual sensitivity is *high* in the coastal area where the proposed project would be constructed and operated, and the landscape's VAC is *low*.
- Using the Ormond Beach Area Off-site Alternative to construct and operate a project similar to Puente would introduce a power plant at a site in an industrial area with less direct public exposure compared to the proposed project.
- Staff assumes that visual sensitivity is *low to moderate* in the area surrounding the Ormond Beach Area Off-site Alternative site, and the landscape's VAC is *moderate*.

Although many properties in the vicinity of this off-site alternative are used for industrial purposes, and visual sensitivity is considered *low to moderate*, construction and

operation of a power plant at the Ormond Beach Area Off-site Alternative could become the most visually prominent (i.e., tallest) industrial-type facility in the area. Because this alternative site is in an established industrial area with less direct public exposure compared to the proposed project, staff concludes the potential for this off-site alternative to substantially degrade the existing visual character or quality of the site and its surroundings to be **less than Puente**, and the impact conclusion is potentially significant. Implementation of mitigation measures requiring surface treatments and possibly other visual screening measures would reduce the impact to less than significant for this off-site alternative. Mitigation measures could include constructing a decorative fence or wall to screen street-level views of the site and architectural screening for the upper portions of the power block structures.

Exterior permanent lighting of a power plant similar to Puente at the Ormond Beach Area Off-site Alternative would be limited to areas required for safe and secure operations. Light sensors or switches would control lighting not required continuously during nighttime hours so that lighting would be on only when needed. Light fixtures would be directed downward and shielded to avoid off-site backscatter and glare. Staff considers the potential for the new source of substantial light or glare to adversely affect day or nighttime views in the area of this off-site alternative to be **similar to Puente**. Mitigation measures similar to those recommended under the proposed project would reduce the impact to less than significant.

Waste Management

LORS are enforced at the local level to ensure recycling and safe disposal of solid and hazardous waste, and these LORS would apply also to wastes generated under the Ormond Beach Area Off-site Alternative. Therefore, the potential for impacts on human health and the environment from potential waste discharges relating to this off-site alternative would be the **same as Puente**.

This off-site alternative would require construction of ancillary buildings and structures, such as water storage tanks, retention basins, ammonia tanks, and an administration and warehouse/lab buildings. A new 220-kV switchyard would need to be constructed at the site. This work would generate additional construction waste that would not be generated under the proposed project. The applicant would be required to comply with the waste management mitigation measures and applicable LORS to minimize impacts on waste disposal facilities; therefore, the potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities would be **similar to Puente**.

Although the Ormond Beach Area Off-site Alternative is currently undeveloped, it has recently been graded and surfaced with gravel or a similar material. The property at 5980 and 6000 Arcturus Avenue in Oxnard was investigated several years ago with oversight provided by DTSC. Starting in the 1960s, the site was used by various business operators to manufacture polymer resins. In 2002, the property was investigated and showed evidence of contamination in the soil and groundwater. Contaminants included ethybenzene, chlorinated solvents, and xylene. The site was remediated, and a *No Further Action* letter was issued in 2008. As a result of the

presence of hazardous substances/materials at the property (as defined in Health and Saf. Code, § 25260), the DTSC issued a Land Use Covenant to restrict use of the property and protect present or future human health. DTSC requires a pre-approved Soil Management Plan for any activities that would disturb the soil 5 feet or more below surface grade. Similar conditions exist at the Puente site, and staff is requiring a pre-approved Soil Management Plan for Puente. Therefore, potential impacts on human health and the environment relating to past or present soil or water contamination from this alternative would be the **same as Puente**, and the impact conclusion is potentially significant.

The Ormond Beach Area Off-site Alternative would have potentially significant impacts on waste management, but all of those impacts can be reduced to less than significant with implementation of mitigation measures and through LORS compliance.

Worker Safety and Fire Protection

The Ormond Beach Area Off-site Alternative would have the same worker safety and fire protection requirements as the proposed project. Since the requirements are the same, this off-site alternative would present potentially significant impacts that could be mitigated to less than significant the **same as Puente**.

CONCEPTUAL SITE RECONFIGURATION ALTERNATIVES

Staff created two conceptual site reconfigurations of the proposed project on the site to avoid filling 2.03 acres of Coastal Commission defined wetlands on the northwest portion of the site. Construction and operation of the proposed project inside the existing MGS site is assumed for either conceptual site reconfiguration. All municipal infrastructure and services that would serve and support the proposed project at the MGS site would be available under both site reconfigurations.

Under Conceptual Site Reconfiguration 1, the proposed project's power block would be constructed on the northeast portion of the site (**Alternatives Figure 16**). Construction parking and laydown and shop areas would be clustered in the center of the site around the existing 19,000-square-foot warehouse. Under Conceptual Site Reconfiguration 2, the power block would be constructed in the approximate center of the MGS site, which would require relocating the existing warehouse on the site (**Alternatives Figure 17**). Existing MGS Units 1 and 2 would remain operational until the end of 2020. MGS Unit 3 would continue operating. Like the proposed project, MGS Units 1 and 2 would be decommissioned, demolished, and removed from the site under either conceptual site reconfiguration alternative.

Potential to Attain Project Objectives

The applicant's basic project objectives specify developing a 262-MW simple-cycle, natural gas-fired combustion turbine at the existing MGS site that would use existing infrastructure and other MGS maintenance facilities. Staff has devised two site reconfiguration concepts, and either would require the applicant to redesign the site plan for the project, which would delay the project schedule. If moving the power block on the site to avoid the wetlands was feasible, a site reconfiguration alternative could

potentially satisfy most if not all of the applicant's project objectives. The applicant has included a project objective to design, permit, build, and commission the proposed project by June 2020. The CPUC's Track 1 decision addresses procuring resources to replace retiring OTC generators and meet LCR needs by 2021. If the process to redesign the project did not severely impact the project schedule, a site reconfiguration alternative could potentially satisfy all of the project objectives.

Potential Feasibility Issues

In addressing feasibility of alternatives, various factors may be taken into account. The two conceptual site reconfigurations would use some of the existing infrastructure on the MGS site, which is owned and controlled by NRG. Like the proposed project, a reconfigured alternative would directly connect to SCE's 220-kV transmission system. The MGS property covers 36 acres, including the 3-acre portion proposed for developing the proposed project. A large portion of the existing site is occupied by MGS Units 1, 2, and 3; the existing ammonia storage area; and the basins for wastewater and storm water runoff, and these existing facilities reduce the potential available development area. However, given the overall size of the property, redesigning the site plan to move the power block and other facilities on the site is considered potentially feasible. Redesigning the site plan to avoid the wetlands would likely delay the project schedule, although it is unknown the extent to which a project schedule delay could affect project viability.

Environmental Analysis

Alternatives Table 10 presents a summary comparison of impacts of the proposed project to the same or similar potential impacts of Conceptual Site Reconfigurations 1 and 2. The analysis below is focused on potential environmental effects that would be different under this alternative compared to Puente.

This alternative does not require new analysis, changes to conclusions, or new or revised mitigation measures for several environmental topic areas. For the following topic areas, no comparative analysis of impacts is necessary:

- Hazardous Materials Management
- Socioeconomics
- Transmission Line Safety and Nuisance
- Waste Management
- Worker Safety and Fire Protection

For other potential environmental effects, summary discussions are provided below comparing the impacts of Conceptual Site Reconfigurations 1 and 2 to the proposed project.

Alternatives Table 10
Summary Comparison of Impacts of the Proposed Project to Conceptual Site Reconfigurations 1 and 2

Environmental Effect	Proposed Project	Site Recon-figuration 1	Site Recon-figuration 2
Air Quality			
Construction-related emissions	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Project operations emissions	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Greenhouse Gases (construction- and demolition-related impacts)	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Biological Resources			
Project construction and demolition impacts			
Impact on jurisdictional wetlands and other waters	SM	—	—
Impacts on common vegetation species	LS	Similar to Puente (LS)	Similar to Puente (LS)
Impacts on common wildlife species	LS	Similar to Puente (LS)	Similar to Puente (LS)
Impact of noise on nesting birds	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Impacts on special-status plants	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Impacts on special-status wildlife *(see note)*	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Impacts on special-status birds with MGS Units 1 and 2 left on site	—	—	—
Impacts of dust, nighttime lighting, and invasive weeds on biological resources	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Biological resources note: excluding nesting birds			
Project operations impacts			
Impacts on biological resources relating to nitrogen deposition	LS	Similar to Puente (LS)	Similar to Puente (LS)
Impact relating to potential electrocution of avian species	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Cultural Resources			
Impacts on surficial archaeological resources	—	—	—
Impacts on buried archaeological resources	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Impacts on identified archaeological and ethnographic resources	—	—	—
Impacts on built environment resources	—	—	—
Geology and Paleontology			
Risk of damage to paleontological resources	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Potential impacts on geological or mineralogical resources	—	—	—
Risk of surface fault rupture	LS	Same as Puente (LS)	Same as Puente (LS)
Risk of liquefaction, dynamic compaction, and lateral spread from strong seismic shaking	PSM	Same as Puente (PSM)	Same as Puente (PSM)

Alternatives Table 10
Summary Comparison of Impacts of the Proposed Project to Conceptual Site Reconfigurations 1 and 2

Environmental Effect	Proposed Project	Site Recon-figuration 1	Site Recon-figuration 2
Risk of potential excessive settlement or expansion of soils causing an impact on structures	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Risk of inundation by tsunami resulting from an earthquake or local submarine landslide when combined with sea level rise	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Noise and Vibration			
Potential noise impacts at noise-sensitive locations	PSM	Similar to Puente (PSM)	Greater than Puente (PSM)
Public Health			
Construction-related diesel particulate matter (DPM) emissions	LS	Similar to Puente (LS)	Similar to Puente (LS)
Project operations-related toxic air contaminants (TACs) emissions	LS	Similar to Puente (LS)	Similar to Puente (LS)
Soil and Water Resources			
Water quality impacts during project construction	PSM	Same as Puente (PSM)	Similar to Puente (PSM)
Water quality impacts during demolition	PSM	Same as Puente (PSM)	Similar to Puente (PSM)
Potential impacts from on-site and off-site flooding	PSM	Same as Puente (PSM	Same as Puente (PSM)
Potential flooding hazard based on Federal Emergency Management Agency floodplain delineation maps *(see note)*	LS	Same as Puente (LS)	Same as Puente (LS)
Water quality impacts from wastewater discharge	SM	Same as Puente (SM)	Same as Puente (SM)
Water quality impacts from power plant operations	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Potential impacts on potable water supplies	—	—	—
Traffic and Transportation			
Potential impacts from increased construction workforce traffic that is substantial compared to the existing traffic load and capacity of the street system	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Potential for increased workforce traffic to cause driver safety impacts during project demolition and/or construction	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Potential for increased workforce traffic to damage roads and bridges during project demolition and/or construction	PSM	Same as Puente (PSM)	Same as Puente (PSM)
Potential impacts from increased traffic during project operation (i.e., post-construction traffic) that is substantial compared to the existing traffic load and capacity of the street system	LS	Same as Puente (LS)	Same as Puente (LS)
Potential impacts from thermal plumes on aircraft and pilot safety	PSM	Similar to Puente (PSM)	Similar to Puente (PSM)
Impacts on aviation safety relating to location of transmission lines	LS	Same as Puente (LS)	Same as Puente (LS)

Alternatives Table 10
Summary Comparison of Impacts of the Proposed Project to Conceptual Site Reconfigurations 1 and 2

Environmental Effect	Proposed Project	Site Recon-figuration 1	Site Recon-figuration 2
Visual Resources			
Substantial adverse effect on a scenic vista	—	—	—
Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	—	—	—
Substantially degrade the existing visual character or quality of the site and its surroundings			
KOPs 1, 2, 4, and 5	LS	Same as Puente (LS)	Same as Puente (LS)
KOP 3	SM	Similar to Puente (SM)	Similar to Puente (SM)
Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	PSM	Same as Puente (PSM)	Same as Puente (PSM)

Air Quality

Demolition- and construction-related impacts associated with the reconfigured site alternatives are expected to be **similar to Puente**. Although the reconfigured site alternatives would affect the project schedule, the air emissions assumptions used to predict short-term (e.g., 1-hr and 24-hr averaging times, etc.) and long-term impacts (e.g., annual averaging times) are expected to be **similar to Puente**. Construction and commissioning work and activities would occur in the same general area as the proposed project. Reconfiguring the power block on the site under either alternative reconfiguration would entail shifting the power block to just east or southeast of the proposed project's orientation on the site. Operations-related impacts are expected to be similar for both the proposed project and the reconfigured site alternatives. However, due to the relocation of emission sources on the MGS site, dispersion modeling would need to be conducted in order to quantitatively compare the impacts of the reconfigured site alternatives with the proposed project site. Staff concludes that both construction-related impacts and operations-related impacts relating to Conceptual Site Reconfigurations 1 and 2 would likely be **similar to Puente**. Impacts relating to GHG emissions would also be **similar to Puente**. Potentially significant impacts on air quality can be reduced to less than significant with implementation of the same mitigation measures as those recommended under the proposed project.

Biological Resources

Conceptual Site Reconfigurations 1 and 2 would require redesigning the plan for the power block structures and other facilities on the site. Like the proposed project, either site reconfiguration would include demolishing MGS Units 1 and 2. Under either site reconfiguration, all biological resources impacts would be **similar to Puente**, with one exception. Conceptual Site Reconfigurations 1 and 2 would avoid impacts on approximately 2.03 acres of Coastal Commission defined wetlands. Under the proposed

project, the wetlands would require habitat compensation at a mitigation ratio of 4:1. Under the two site reconfigurations, **no impact** on the wetlands would occur, and no habitat compensation would be required.

Cultural Resources

Under Conceptual Site Reconfiguration 1, the major components of the proposed project would be moved closer to Harbor Boulevard and adjacent to the existing SCE substation. The Site Reconfiguration 1 area was surveyed in January 2015, and no cultural resources were identified during the survey. The change in site layout under Site Reconfiguration 1 would not change the impact conclusions compared to the proposed project because no cultural resources have been identified on the site. For Site Reconfigurations 1 and 2, the potential to encounter buried archaeological resources is the **same as Puente**. If such resources were identified on the site, appropriate mitigation measures would reduce impacts to less than significant.

Conceptual Site Reconfiguration 2 would move the Puente power block to the middle of the site between the SCE substation and the existing MGS. And it would require relocating the existing warehouse/shop building and other small, ancillary buildings and structures on the site. No buildings on the MGS property have been identified as eligible for listing on the CRHR.

Under Conceptual Site Reconfigurations 1 and 2, potential impacts on surficial and buried archaeological resources, known archaeological and ethnographic resources, and built environment resources would be the **same as Puente**.

Geology and Paleontology

Conceptual Site Reconfigurations 1 and 2 would require relocating power block structures and other facilities on the site. MGS Unit 3 would remain in place on the site. These activities would result in an insignificant increase in site disturbance during project construction for potential impacts on geological and paleontological resources.

Similar to Puente, Conceptual Site Reconfigurations 1 and 2 would have the potential to encounter and damage buried paleontological resources. Implementation of a paleontological resources monitoring program such as the one described in the **Geology and Paleontology** section of this staff assessment would be required to reduce the impact to less than significant (see Conditions of Certification **PAL-1** through **PAL-8**). Staff concludes that the potential for paleontological resources to be damaged under either site reconfiguration is **similar to Puente**.

Like the proposed project, Conceptual Site Reconfigurations 1 and 2 would have **no impact** on mineralogical or geological resources because these resources are not present at the site.

No known active faults are located on or near the MGS and Puente site; therefore, the potential risk relating to surface fault rupture under Conceptual Site Reconfigurations 1 and 2 is the **same as Puente** and the impact is less than significant.

Conceptual Site Reconfigurations 1 and 2 would be subject to the same, very strong levels of earthquake-related ground shaking as the proposed project. The potential risk of soil failure caused by liquefaction and/or dynamic compaction is the **same as Puente**. These potential impacts could be reduced to less than significant with implementation of a mitigation measure such as the one recommended in the **Geology and Paleontology** section of this staff assessment (see Condition of Certification **GEO-2**).

The site reconfiguration alternatives would be subject to a risk of potential excessive settlement or expansion of soils that is the **same as Puente**. These potential impacts could be reduced to less than significant with implementation of a mitigation measure similar to Condition of Certification **GEO-2**.

As stated above, Puente could be at risk for inundation by tsunami. Under the proposed project, this impact is potentially significant. Under the No-Project Alternative, the risk of inundation by tsunami is the **same as Puente**.

Noise and Vibration

Conceptual Site Reconfiguration 1 would not alter the power block's approximate distances to the project's closest noise-sensitive receptors. Therefore, this site reconfiguration's noise impacts would be **similar to Puente**, and the same mitigation measures would be required to reduce potentially significant impacts to less than significant.

Conceptual Site Reconfiguration 2 would locate the power block closer to the noise-sensitive receptors nearest to the site, which is the new, residential community being planned southeast of the project site. Therefore, this site reconfiguration's noise impacts would be somewhat **greater than Puente.** Additional mitigation measures could be needed to lower power plant noise and reduce the potentially significant impact to less than significant.

Public Health

Conceptual Site Reconfigurations 1 and 2 would each include demolishing existing MSG Units 1 and 2 and would have impacts on public health that are **similar to Puente**.

Construction-related impacts associated with either site reconfiguration alternative are expected to be **similar to Puente**. Although either of the two site reconfigurations would require changing the construction schedule, assumptions for air emissions used to predict short-term (e.g., 1-hr and 24-hr averaging times, etc.) and long-term (e.g., annual averaging times) impacts from toxic air contaminants are expected to be **similar to Puente**. Additionally, project construction and commissioning activities would occur in the same general area as Puente.

Operations-related impacts for Conceptual Site Reconfigurations 1 and 2 are also expected to be **similar to Puente** because the project site footprint would be shifted just

east of the Puente site. However, due to the relocation of emission sources either to the center portion or northeast portion of the site, an updated health risk assessment would need to be conducted to ensure compliance with the public health LORS or to quantitatively compare the impacts of the reconfigured site alternatives with the Puente site. Staff concludes that for either site reconfiguration alternative, construction-related impacts and operations-related impacts would likely be **similar to Puente**, and the impact conclusions are less than significant.

Soil and Water Resources

Because both Conceptual Site Reconfigurations 1 and 2 would use the same equipment to provide the same generating capacity on the existing MGS site, nearly all impacts under either site reconfiguration would be the **same as Puente**. The exception to this is a difference of potential construction and demolition impacts of Conceptual Site Reconfiguration 2 due to the relocation of the warehouse/shop building.

Under the proposed project, the warehouse/shop building would remain in place, whereas Conceptual Site Reconfiguration 2 would require demolition of the existing building and construction of a new building elsewhere on the site. Compared to the Puente site, demolition and construction activities would result in more earth work and a longer period of soil disturbance, which would increase the potential for significant construction-related impacts on water quality to occur. However, minimum water quality standards would be achieved through required implementation of specific BMPs for erosion control and wastewater management, with NALs to monitor and evaluate their effectiveness. As a result, these impacts would be reduced to less than significant, **similar to Puente**.

Traffic and Transportation

For all potential roadway traffic related impacts, Conceptual Site Reconfigurations 1 and 2 would not change the number of construction traffic trips, construction routes, or any other feature that would temporarily affect traffic LOS compared to the proposed project. Temporary construction-related traffic impacts on LOS would be the **same as Puente**. These impacts would be potentially significant but could be mitigated by implementing a traffic control plan and obtaining applicable encroachment permits for heavy loads. Similarly, impacts relating to driver safety and damage to roads and bridges under the two site reconfiguration would be the **same as Puente**.

The two site reconfigurations would not change the number of operations trips or the routes travelled to access the site. The number of operations workers and truck trips would be minimal and would cause less than significant impacts on traffic LOS. Permanent impacts on traffic LOS relating to project operations and maintenance would be the **same as Puente** and the impact conclusion is less than significant.

Similar to the proposed project, Conceptual Site Reconfigurations 1 and 2 would generate a thermal plume that would cause a potentially significant impact on aircraft and pilot safety. However, this impact could be mitigated to less than significant by

adding a remark to applicable FAA aviation maps and documents and by issuing a Notice to Airmen warning pilots to avoid overflight of the site.

The technology used would be the same as for the proposed project, so the characteristics of the thermal plume would remain the same. The relocation of the combustion turbine generator stack from the northwest side of the property under the proposed project to either the northeast or middle portion of the property under the site reconfigurations would move the plume slightly closer to the Oxnard Airport. However, the difference in distance from the airport would be minimal and would not create appreciably greater impacts on pilot safety. Impacts on pilot safety would be **similar to Puente**.

The transmission structures for the proposed project would be below the FAA notification height, and the impact is less than significant. This impact is the **same as Puente** for either of the two site reconfiguration alternatives.

Visual Resources

Staff concludes that the proposed project would cause no impacts relating to its potential to adversely impact a scenic vista or scenic resources of a state scenic highway. Under either Conceptual Site Reconfiguration 1 or 2, no change would occur relating to these visual resources impact criteria; therefore, **no impacts** are identified.

Under Conceptual Site Reconfiguration 1, Puente's power block would be moved further away from the beach but closer to Harbor Boulevard, a primary travel route near the coast; the exhaust stack would be approximately 375 feet closer to the road compared to the proposed project. Under Conceptual Site Reconfiguration 2, the Puente power block would be moved to the central part of the site between existing MGS Units 1 and 2 and the SCE substation. The power block at the project site for either of the conceptual site reconfigurations would be prominently visible for views from adjacent travel routes and residential and recreational use areas.

Staff compared the two conceptual site reconfigurations to the proposed project and evaluated the potential for either site reconfiguration to substantially degrade the existing visual character or quality of the site and its surroundings. It is necessary to consider baseline visual conditions at the MGS site, which includes aging power plant structures at the project site. For KOPs 1, 2, 4, and 5 for the proposed project, staff concludes that the visual resources impacts are less than significant (see the **Visual Resources** section of this staff assessment). Compared to Puente, Conceptual Site Reconfigurations 1 and 2 would be the **same as Puente**, and the impact conclusion is less than significant.

KOP 3 is located on McGrath State Beach less than 1,000 feet from the project site. Staff has identified a significant impact at KOP 3 under the proposed project. Staff recommends Condition of Certification **VIS-1** requiring preparation and implementation of a surface treatment plan for project buildings, structures, and equipment. Consistent with the applicant's proposal for Puente, and assuming that MGS Units 1 and 2 would be demolished and removed if the power plant facility was reconfigured on the project

site, visual resource conditions from the KOP 3 viewpoint (and from other nearby viewpoints) would be further improved. Compared to the proposed project, the visual impact of Conceptual Site Reconfigurations 1 and 2 would be **similar to Puente,** and the impact conclusion is significant.

Under Conceptual Site Reconfigurations 1 and 2, permanent exterior lighting of the power block and other structures at the site would be essentially the same as the proposed project. Staff considers the potential for a new source of substantial light or glare to adversely affect day or nighttime views in the area to be the **same as Puente**. Mitigation measures like those recommended under the proposed project would reduce the impact to less than significant.

RESPONSE TO COMMENTS

Comments on the **Alternatives** analysis published in the preliminary staff assessment (PSA) were submitted by the Puente Power Project Siting Committee, applicant, city of Oxnard, Naval Base Ventura County Point Mugu, California Coastal Commission, environmental organizations, intervenors in this proceeding, and others. Substantive comments are summarized, and staff's responses are provided in **Alternatives Table 11**.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
Transcript of Committee Status Conference 09/27/16, TN #214006, pages 21–22	1. The Committee requested that more information be included in the final staff assessment (FSA) on the issue of site control for the two off-site alternatives, the Del Norte/Fifth Street Off-site Alternative and the Ormond Beach Area Off-site Alternative.	The city's comments on the PSA (TN #213681, pages 15 and 16) indicate that the parcels at the Ormond Beach Area Off-site Alternative are owned by the Hansen Trust. The city comments that "the property is currently subject to a month to month lease and used only for the parking of cars." The applicant does not have site control of the Keeler Trust parcels, and staff cannot predict whether, when, and under what conditions the parcels might be available for lease or sale. The applicant states in its *Alternative Sites Summary* that the Del Norte/Fifth Street Off-site Alternative site is owned by Todd Industrial Park, LLC (NRG 2015b). Staff has no information on the potential for the applicant to lease or purchase the property.
Transcript of Committee Status Conference 09/27/16, pages 21–22	2. The Committee requested that analysis be added to the FSA on the potential for cultural resources to be impacted under the Del Norte/Fifth Street Off-site Alternative.	The Del Norte/Fifth Street Off-site Alternative is located approximately 1.4 miles southwest of Camarillo Airport. The analysis of Traffic and Transportation impacts in this FSA shows that this off-site alternative would cause a significant impact due to the potential for thermal plumes to impact aircraft and pilot safety; no feasible mitigation measures are identified to reduce the severity of this impact, which would remain significant and unavoidable. This impact is potentially significant under the proposed project, and staff recommends conditions of certification to reduce the impact to less than significant. This off-site alternative would also cause a significant impact on aircraft and pilot safety if the FAA determined that the transmission structures presented an obstruction hazard that could impact aviation safety; the impact conclusion is potentially significant and unavoidable. Under the proposed project, the corresponding impact is determined to be less than significant. The Del Norte/Fifth Street Off-site Alternative would avoid the impact relating to the risk of inundation by tsunami resulting from an earthquake or local submarine landslide. Under the proposed project, this impact is reduced to less than significant with conditions of certification imposed. However, because of two significant impacts on aircraft and pilot safety, this off-site alternative is not considered environmentally superior to the proposed project. Staff did not conduct any further environmental analysis of this site following publication of the PSA, including performing additional work to obtain the specific information that would be needed to determine the potential for this off-site alternative to impact cultural resources.
Transcript of Committee Status Conference 09/27/16, pages 21–22	3. The Committee requested that analysis be added to the FSA on the potential for cultural resources to be impacted under the Ormond Beach Area Off-site Alternative.	Staff has provided additional analysis on the potential for this off-site alternative to cause impacts on cultural resources. See the new analysis (above) under the subsection, "Cultural Resources," for this alternative.
Transcript of Committee Status Conference 09/27/16, pages 21–22	4. The Committee requested that analysis be added to the FSA on the potential for soil contamination to occur at the Ormond Beach Area Off-site Alternative.	Staff has provided additional analysis on the potential for past or present soil or water contamination to cause impacts on human health and the environment for the Ormond Beach Area Off-site Alternative. Based on the new analysis, staff confirmed the conclusion in the PSA that this impact is **similar to Puente**. The impact conclusion for the proposed project and this off-site alternative is potentially significant. See the additional analysis (above) under the subsection

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
		"Waste Management" for this off-site alternative.
NRG Energy Center Oxnard, TN #213683, pages 6–7	5. Staff did not acknowledge issues associated with Conceptual Site Reconfiguration 1, including conflicts with various on-site facilities and infrastructure. The visual impact would be greater by moving the power block closer to Harbor Boulevard. Significant additional noise mitigation would be required. The unit would need to be moved roughly 75 feet west to fit into the available space. The tempering air fans and ducting are missing from the power block sketch. Placement of the northern portion of the power block would require the existing earthen dike to be rebuilt. Relocating the exhaust stack would require new air modeling. Staff's alternatives analysis is driven by the determination that 2.03 acres of the site constitutes a wetland pursuant to Coastal Act regulations; the applicant does not agree with this determination.	**Alternatives Figure 16**, "Conceptual Site Reconfiguration 1," has been modified to shift the power block approximately 75 feet west and rotate it 180°. The sketch has been repaired to include the tempering air fans and ducting, and the power block shift appears to avoid the earthen dike along the north side of the site. The exhaust stack would be oriented approximately 375 feet closer to Harbor Boulevard compared to the proposed project. Staff acknowledges that reconfiguring the site could require relocation of some of the on-site facilities and infrastructure. The discussion under "Potential Feasibility Issues" for Conceptual Site Reconfigurations 1 and 2 in this FSA has been edited to show that reconfiguring the site would likely delay the project schedule, although it is unknown the extent to which a project schedule delay could affect project viability. As discussed under "Visual Resources" for the analyses of Conceptual Site Reconfigurations 1 and 2, staff concludes that the potential for either site reconfiguration to substantially degrade the existing visual character or quality of the site and its surroundings would be the **same as or similar to** the proposed project. The impact conclusions for visual resources would not change with the modified orientation of Conceptual Site Reconfiguration 1. As discussed under "Air Quality," due to the relocation of emission sources on the MGS site, dispersion modeling would need to be conducted to quantitatively compare the impacts of the reconfigured site alternatives with the proposed project site. Without remodeling, it is not possible to know whether air emissions impacts would change. Air emissions modeling will not be conducted for any of the alternatives evaluated in this FSA. However, staff does conclude that potentially significant impacts on air quality can be reduced to less than significant with implementation of the same mitigation measures as those recommended under the proposed project. Regarding the applicant's disagreement with the determination that 2.03 acres on the site is a wetland, see **Response to Comment 14** in the **Biological Resources** section of this FSA.
NRG Energy Center Oxnard, pages 7–8	6. Staff did not acknowledge issues associated with Conceptual Site Reconfiguration 2, including conflicts with existing power plant infrastructure and the planned construction corridors for the project's electrical and water lines. The site reconfiguration would restrict access to the generator step-up transformers, unit auxiliary transformer, and other electrical equipment. Relocating the exhaust	Staff acknowledges that Conceptual Site Reconfiguration 2 would require relocating some of the on-site facilities and infrastructure. The discussion under "Potential Feasibility Issues" for Conceptual Site Reconfigurations 1 and 2 in this FSA has been edited to show that reconfiguring the site would likely delay the project schedule, although it is unknown the extent to which a project schedule delay could affect project viability. As discussed under "Air Quality," dispersion modeling would need to be conducted to quantitatively compare the impacts of the reconfigured site alternatives with the proposed project site. Without remodeling, it is not possible to know whether air emissions impacts would change. As stated in this FSA under "Potential to Attain Project Objectives," if moving the power block on the site to avoid the wetlands was feasible, a site reconfiguration alternative could potentially

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
	stack would require new air modeling. This site reconfiguration would not satisfy the project objective to reuse existing site infrastructure such as the existing warehouse.	satisfy most if not all of the applicant's project objectives. Either site reconfiguration would partially satisfy the objective to reuse existing infrastructure (e.g., the existing ammonia storage area and the basins for wastewater and storm water runoff).
NRG Energy Center Oxnard, pages 8–9	7. Staff did not acknowledge several feasibility and environmental concerns associated with the Del Norte/Fifth Street Off-site Alternative, including significant impacts associated with constructing new linear infrastructure. Additional mitigation would be required to reduce greater noise impacts on residents along Sturgis Road. Construction-related traffic impacts and visual resources impacts would be greater for this alternative compared to the proposed project. For these reasons, this off-site alternative is not feasible or environmentally superior to the proposed project. Assumptions for this alternative do not include demolishing and removing MGS Units 1 and 2, which is considered a beneficial visual impact for the proposed project.	Staff evaluated potential impacts relating to construction of off-site linear infrastructure for this alternative. The description for this alternative under the subsection "Del Norte/Fifth Street Off-site Alternative" in this FSA states that construction of an approximate 6- to 8-mile-long 220-kV transmission line could cause temporary impacts relating to air quality, biological resources, noise, traffic, visual resources, and water quality. It is assumed that all temporary impacts could be reduced to less than significant with implementation of mitigation measures. The discussion under "Air Quality" for the Del Norte/Fifth Street Off-site Alternative in this FSA has been edited to show that additional air emissions would result from construction of a considerably longer transmission line, although no additional mitigation measures beyond those required for the proposed project would be required. Construction-related impacts on air quality would be **similar to Puente**, as shown in **Alternatives Table 4**. An analysis of impacts on biological resources (construction and demolition impacts and project operations impacts) relating to linear infrastructure is included under the subsection "Biological Resources" for this alternative. Staff has determined that impacts on cultural resources are "indeterminate" without site surveys. See also **Response to Comment 2**. The analysis under the subsection "Geology and Paleontology" states that potential impacts relating to off-site linears would be **similar to Puente**. Due to the location of a nearby residence along Sturgis Road, operational noise impacts are stated to be **greater than Puente** with additional mitigation measures required (see the analysis under the subsection "Noise and Vibration" for this off-site alternative. Staff compared temporary construction-related impacts on traffic and transportation, concluding that impacts would be **less than or similar to Puente** (see the subsection "Traffic and Transportation" for this alternative). The applicant's statement that the off-site linears for this alternative would require a more extensive traffic control plan does not mean that the impacts of this alternative on traffic would necessarily be greater than the proposed project. Staff's analysis indicates that traffic flow along the routes to the proposed project site and this off-site alternative are congested, especially during commute hours. Under the subsection "Summary Conclusions" on the first page of this FSA, staff identifies demolishing and removing MGS Units 1 and 2 from the site as a beneficial visual improvement of the proposed project.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
		The analysis of "Water Quality Impacts during Project Construction" acknowledges that this alternative would require trenching for off-site linears, more earthwork overall, and a longer construction timeframe. Like the proposed project, construction activities would be subject to regulations to ensure compliance with minimum water quality standards. Under the subsection "Potential Feasibility Issues" for this alternative, staff identifies the applicant's lack of site control and plans for facilities and off-site linear infrastructure as issues potentially affecting the viability of this alternative. Due to two impacts that would occur under this alternative—1) potential for thermal plumes to impact aircraft and pilot safety, and 2) potential for transmission structures to impact aviation safety—staff concludes that the Del Norte/Fifth Street Off-site Alternative is *not* considered environmentally superior to the proposed project.
NRG Energy Center Oxnard, pages 10–11	8. Staff did not acknowledge several feasibility and environmental concerns associated with the Ormond Beach Area Off-site Alternative, including significant impacts associated with constructing new linear infrastructure. Construction-related traffic impacts and visual resources impacts would be greater for this alternative compared to the proposed project. This off-site alternative could be more susceptible to sea-level rise and tsunami-related impacts than the proposed project. Because there is no construction of off-site linears associated with the proposed project, it is environmentally superior to the Ormond Beach Area Off-site Alternative. Assumptions for this alternative do not include demolishing and removing MGS Units 1 and 2, which is considered a beneficial visual impact for the proposed project.	Staff evaluated potential impacts relating to construction of off-site linear infrastructure for this alternative. The description under the subsection "Ormond Beach Area Off-site Alternative" in this FSA describes possible alignments for off-site linears and states that the transmission line could cause temporary construction-related impacts on air quality, biological resources, and water quality. It is assumed that all temporary impacts could be reduced to less than significant with implementation of mitigation measures. No construction-related impacts are considered to be greater than Puente for this alternative. Regarding sea level rise and tsunami-related effects, FEMA's updated coastal hazard maps (released September 2016) show that both the Puente site and this off-site alternative are outside the VE Zone (1 percent chance flood hazard or base flood). Both sites are located in areas of minimal flood hazard (X Zone) except for a small corner of each property crossing into an area of 0.2 percent chance flood hazard. In this respect, both sites have similar flood risks, however, for different reasons. At the Puente site, the wide beach and dunes provide protection from potential wave impacts, while the off-site alternative is located farther away from the shoreline at roughly 1 mile inland. When future sea level rise is considered, which could conservatively add 24 inches by 2050, the base flood area is expected to increase. As indicated by the small area of each property crossing into the 0.2 percent chance flood hazard, a large percentage of both sites are not expected to flood. As before, much of the destructive wave energy of a coastal storm is dissipated by the dunes and beach before reaching the Puente site or by the travel distance before reaching the off-site alternative. Therefore, the Ormond Beach Area Off-site Alternative susceptibility to sea level rise is expected to be similar to Puente. As discussed in the **Geology and Paleontology** section of this analysis, Puente is not located within the estimated inundation zone for a tsunami based on information published by the California Geological Survey. When coupled with sea level rise, staff estimated there is potential for tsunami flooding impact at Puente because the elevation of the lowest point on the site is

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
		about the same as the level of inundation. Staff concluded that since the modeling for the inundation zone was approximate, there may be an implied level of accuracy that does not exist and the level was close enough to warrant mitigation to ensure public health and safety from potential flooding. The Ormond Beach alternative site is at an approximate elevation of 13 feet. The inundation zone in the site vicinity is mapped at an elevation of the about 5 to 7 feet. Adding an additional 2 feet of sea level rise indicates there is less potential for impact due to tsunami at the alternative site than the Puente site. Staff compared temporary construction-related impacts on traffic and transportation, concluding that impacts would be **less than Puente**, although like the proposed project, the impact conclusion is potentially significant (see the subsection "Traffic and Transportation" for this alternative). Staff concludes that routes to the Ormond Beach Area Off-site Alternative are less congested compared to the proposed project. The applicant states that the off-site linears for this alternative would require a more extensive traffic control plan, although this statement is not substantiated given the relative lack of traffic congestion in the area. Under the subsection "Summary Conclusions" on the first page of this FSA, staff identifies demolishing and removing MGS Units 1 and 2 from the site as a beneficial visual improvement of the proposed project. Under the subsection "Potential Feasibility Issues" for this alternative, staff identifies the applicant's lack of site control and plans for facilities and off-site linear infrastructure as issues potentially affecting the viability of this alternative. The proposed project would cause temporary construction- and demolition-related impacts on environmental resources that will be reduced to less than significant with implementation of conditions of certification. Similarly, the Ormond Beach Area Off-site Alternative would cause construction-related impacts. This off-site alternative would not include on-site demolition whereas the proposed project includes demolition of existing power plant structures. The proposed project does not avoid or significantly reduce temporary construction-related impacts.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
City of Oxnard, TN #213681, page 11	9. PSA failed to consider other feasible projects that could meet the only relevant project objective, which is to satisfy the local capacity requirements for the area.	The requirements for an alternatives analysis are summarized under the subsection "CEQA Requirements" in this FSA. Staff states in the "Project Objectives and Alternatives Screening" subsection of the PSA and FSA that the applicant's narrowly drawn project objectives were broadly interpreted to foster a robust analysis of potential project alternatives, including an analysis of preferred resources, two on-site reconfigurations, and a thorough review of several off-site alternatives. It is not a correct suggestion that all project objectives are invalid other than an objective to satisfy the area's local capacity requirements. The objectives of the applicant are appropriately considered by staff in determining potential feasibility issues for the alternatives and the extent to which an alternative could satisfy most of the project's basic objectives. However, no alternative was eliminated from consideration because it did not meet the applicant's specific proposal. CEQA does not require a lead agency in its alternatives analysis to disregard the applicant's proposal or the project objectives supporting that proposal.
City of Oxnard, page 12	10. PSA provides no legal or factual basis for its rationale for rejecting the Mission Rock site other than to state that the site is assumed to be unavailable.	The Mission Rock site is owned by Mission Rock Energy Center, LLC, and the owner is proposing to construct and operate a 275-MW natural gas-fired simple-cycle power plant at the site. A 25-MW battery energy storage project is also proposed for the site. An AFC for the project was submitted to the Energy Commission in December 2015 (Mission Rock Energy Center, 15-AFC-02), and the project is undergoing review by staff. Mission Rock Energy Center, LLC, has site control and has proposed a power plant at the site; therefore, it is unlikely to provide a feasible alternative for the proposed project. Factors that may be taken into account when addressing the *feasibility* of alternatives include "whether the proponent can reasonably acquire, control or otherwise have access to the alternative site" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(1)). (See also the regulatory discussion in this FSA under "CEQA Requirements.") For purposes of CEQA review, feasibility means that the alternative is "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" (Cal. Code Regs., tit. 14, § 15364). Staff considered the status of the site's ownership and the proposal to the Energy Commission for the Mission Rock Energy Center and concluded, with reason, that the Mission Rock site is unlikely to provide a potentially feasible location for an alternative to the proposed project. Staff has edited the discussion of the Mission Rock site in this FSA under the subsection "City of Oxnard Alternative Sites" to clarify and explain the feasibility issues for the site.
City of Oxnard, page 13	11. Requests a revision to the PSA to explain the rationale for rejecting six sites from the EPA brownfield database that did not meet the screening criteria.	In response to this comment, additional discussion of the six sites has been added under the subsection "Brownfield Sites From Online Data" in this FSA.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
City of Oxnard, page 13	12. PSA failed to evaluate a renewable energy alternative. The PSA assumes that all feasible preferred resources were selected as part of the CPUC's action on SCE's request for offers (RFO). This assumption is incorrect. As was extensively documented in the CPUC proceeding, SCE's RFO process did not produce a robust response for preferred resources. Preferred resources and storage comprised only 4.5 percent of SCE's Moorpark sub-area procurement. In contrast, SCE proposed to procure 500.60 MWs of energy storage and preferred resources in the LA Basin (roughly 27 percent of the total 1,882.60 MWs proposed procurement for that area).	The need for 215 to 290 MWs in the Moorpark sub-area presumes the deployment of unidentified preferred resources, including distributed solar. See also **Response to Comment 29**. The comment assumes that there are large quantities of preferred resources (including energy storage) in the Moorpark sub-area that could contribute to meeting local reliability requirements based on the fact that more of such resources were bid into the LA Basin RFO. The lack of a "robust response" to the RFO, however, indicates that such resources were not available. Should preferred resources been offered but not selected, one might assume that they were not cost-effective or did not have the operating characteristics of natural gas-fired generation (NGFG) that are necessary to provide local reliability services. (Staff does not have access to information regarding participation in the RFO.) Any assertion that the evaluation criteria used by SCE (criteria that are established and whose use is enforced by the CPUC) were biased against preferred resources raises issues whose discussion and resolution should take place in the appropriate CPUC proceeding.
City of Oxnard, pages 13–14	13. Representatives from SCE admitted during the CPUC proceeding that the lack of offers for preferred resources in the Moorpark sub-area was caused by SCE's decision to conduct a single RFO process for the Moorpark and Western LA Basin sub-areas. Consequently, the RFO process drew preferred resource offers toward the Western LA Basin and handicapped procurement of non-NGFG resources in the smaller Moorpark sub-area. The "market was focusing" on the larger LA Basin. SCE stated that when viewed together, "the Moorpark area was less attractive to source bids from, given the much smaller load opportunity as compared to the Western LA Basin." The availability of a larger quantity of	As noted in staff's **Response to Comment 23**, the CPUC, in D.16-05-050 (approving A.14-11-016, the application for the recovery of costs incurred in securing services from the Puente Power Project), ruled that SCE's RFO process and results were consistent with D.13-02-015, and thus did not preclude effective participation by resources other than NGFG. The Energy Commission's siting process is not the correct forum in which CPUC findings in quasi-judicial proceedings are relitigated.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
	preferred resources than SCE procured in the Moorpark sub-area is demonstrated by other programs for new preferred resource generation in Southern California. The PSA must evaluate the ability of additional preferred resources in the Moorpark sub-area to act as an alternative to the proposed project	
City of Oxnard, page 14	14. Even if preferred resources could not satisfy all of the LCR in the Moorpark sub-area, the Energy Commission should evaluate alternative generating options utilizing smaller natural gas-fired power plants. For instance, a smaller gas fired plant, in combination with more robust renewable procurement could satisfy the identified LCR in the Moorpark sub-area. Similarly, the Energy Commission should evaluate whether a series of smaller natural gas-fired plants strategically located to provide emergency power along the Goleta to Moorpark service area could satisfy the same need.	With regard to achieving more robust procurement of renewables, see **Response to Comment 12**. The suggested alternative to construct and operate a series of smaller natural gas-fired plants (e.g., five 50-MW power plants) to provide emergency power along the Goleta to Moorpark service area is highly speculative. No potential sites are identified, and infrastructure connections are unknown. It is reasonable to assume that five 50-MW power plants and associated linears would require a greater total acreage for development and potentially greater environmental impacts compared to a site with pre-existing linears that could accommodate one power plant with a generating capacity similar to Puente. A proposal for developing a series of sites would require a broad planning effort and involve multiple local jurisdictions. The feasibility of locating a series of smaller power plants near existing 220-kV lines or multiple substations in the Moorpark sub-area is unknown; therefore, potential impacts on the grid are undetermined. Other related feasibility issues include the improbability of gaining site control of multiple sites and a multi-year project schedule delay. See also **Response to Comment 10**, which discusses the CEQA meaning of feasibility. See the subsection "CEQA Requirements" in the PSA and FSA, which describes how under the "rule of reason" an EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(3)).
City of Oxnard, page 14	15. PSA should have evaluated an on-site alternative with a lower exhaust stack, which could reduce the potential for nesting raptors to threaten snowy plovers. A series of lower stacks with a reduced emission velocity could reduce hazards to aircraft.	According to air quality staff, lowering the stack height to 60–70 feet is not possible without significant additional project modifications that may not be feasible. According to federal performance standards for new stationary sources (Title 40 Code of Federal Regulations; Part 60, Appendix B, Performance Specifications), the recommended distance for placement of a continuous emissions monitoring system (CEMS) monitoring port requires a minimum distance of 2.5 times the stack diameter past any change such as the 90 degree angle between the end of the selective catalytic reduction (SCR) bed and the vertical stack. With a stack diameter of 22 feet, adding an additional 55 feet (2.5 x 22 = 55) requires a minimum height of 77 feet, without even allowing for the height required for the SCR bed. As proposed, the flue gas plenum expands to approximately 110 feet in height to reduce the flow rate upstream of the SCR catalyst bed. The

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
		purpose of this expansion zone is to slow the flue gases sufficiently such that they have a long enough residence time within the catalyst bed to achieve the needed emissions controls, typically a 90 percent reduction from the concentration entering the catalyst on the upstream side. Adding the additional 55 feet above the 110-foot height leads to a minimum height to the CEMS probe of 165 feet. Typically there is an additional 0.5 diameter height above the CEMS probe to the top of the stack, leading to a minimum stack exit height of about 176 feet. If there was sufficient space at the project site (and Energy Commission staff members are not facility design engineers), it might be possible to use another transition zone downstream from the SCR catalyst bed to reduce the flue gas duct diameter to 22 feet, then to transition to vertical, then to have the additional 55 feet, for a height of 77 feet, as described above. This would increase the size of the project footprint, but would lead to the stack exit being below the elevation of the SCR catalyst bed (110 feet). Another option would be to redesign the facility such that the SCR bed was in a horizontal configuration, but staff has never seen this design. However, even a horizontal SCR catalyst bed could not achieve a 70 feet or less facility height for the reasons described above. Given the probable technical infeasibility of reducing the stack height, staff assumes that an analysis of a reduced plume velocity of such an alternative is also infeasible. Regarding the potential for a lower stack height to reduce the potential for raptor nesting that threatens the western snowy plover, biological resources staff performed a literature review and was unable to corroborate this statement. References to stack height are typically in terms of the risk of collision to a suite of species being impacted such as migratory birds or raptors. No published or anecdotal evidence suggests that raptors are currently using the MGS Units 1 or 2 stacks to launch predation attempts on special-status species nesting or foraging on the beach. The human presence at the power plant site and project operations may discourage perching, or the very stack itself may discourage perching, owing to unknown causes. Staff also has no data to suggest that raptors perch on any type of stack. It is not clear that a lower stack height would in fact reduce predation on special-status species. Staff has also reviewed annual monitoring reports submitted by the California Department of Parks and Recreation, and these reports do not suggest that raptors or predatory birds such as corvids use the stack for perching. Although hatching success can be very low at the site, it may be due to human disturbance or interference, in addition to predation (California Department of Parks and Recreation 2015).
City of Oxnard, page 14	16. PSA should have evaluated an alternative that assumes removal of the beach outfall.	NRG submitted a document to the Energy Commission in September 2016 addressing removal of the outfall and beach restoration (TN #213802). This is a change to the project description rather than a project alternative. The project changes relating to outfall removal are analyzed in this FSA.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
City of Oxnard, page 15	17. PSA assumes that the Ormond Beach Generating Station would remain standing following its closure and that any new power plant in the vicinity would have an incremental and adverse impact on visual resources (PSA pages 6.1-4 and 6.1-5). The PSA also assumes that the Mandalay Generating Station Units 1 and 2 would remain standing following their closure (i.e., would not be demolished and removed).	The comment does not acknowledge the full discussion of assumptions for the OBGS site on pages 6.1-4 and 6.1-5 of the PSA (relating to the analysis of the Ormond Beach Area Off-site Alternative). On page 6.1-5 of the PSA, staff's discussion of the OBGS site states that "[I]f the OBGS was retired by the end 2020 (to comply with the OTC Policy) and subsequently removed from the site adjacent to Ormond Beach, *the impact of visually prominent industrial-type facilities in the vicinity of this off-site alternative would be incrementally reduced*." [emphasis added] Staff explains throughout this **Alternatives** analysis the assumptions for the MGS site in the absence of the Energy Commission's approval of a license to construct and operate the proposed project. On page 6.1-3 of the PSA, staff describes how another proposed future use of the MGS power plant site would be subject to review and approval of a coastal development permit by the city, stating that "[I]t is assumed that future land use agreements or property division or sale would include removal of some of the existing power block structures and infrastructure. *In this circumstance, significant impacts on biological resources and visual resources from the existing MGS Unit 1 and 2 power block structures remaining on the site would not persist*…." [emphasis added] Similar statements are made on pages 6.1-44 to 6.1-45, 6.1-71, and 6.1-103 of the PSA. The city's comments discuss its discretionary authority and ability to require removal of an abandoned facility and refer to the city's nuisance ordinance. However, the future timeline or approximate schedule for alternative uses of the MGS site in the absence of the Energy Commission's licensing of the Puente Power Project is unknown. It is also unknown at what point future circumstances would cause the city to take action on a nuisance determination, and how and when that would result in unused power plant facilities being removed according to a schedule.
City of Oxnard, page 15	18. PSA does not support its conclusion that the inland Ormond Beach Area Off-site Alternative may not be available to NRG. Page 6.1-72 of the PSA indicates that NRG made a reasonable offer to the owner for the property. The offer is not on the record; therefore, it is unknown whether it was adequate.	On page 6.1-72 of the PSA, staff states that the "applicant does not have control of the Ormond Beach Area Off-site Alternative site, which includes two parcels under single ownership (NRG 2015b)." The city's comments (TN #213681, page 16) indicate that the parcels are owned by the Hansen Trust. Staff edited the statement on NRG's reported offer to purchase the property to further clarify that the source for the statement is in the applicant's *Alternative Sites Summary*. See the discussion of "Potential Feasibility Issues" under the subsection in this FSA, "Ormond Beach Area Off-site Alternative." (See also a similar statement on page 6.1-21 of the PSA.) Staff correctly states that the applicant does not have site control of the two parcels. Staff has no other knowledge of the previous offer and cannot predict whether, when, and under what conditions the parcels might be available for lease or sale. See the subsection "CEQA Requirements" in this FSA, which summarizes the purpose and requirements for an alternatives analysis in an EIR, which also apply to the document used as a substitute for an EIR (Cal. Code Regs., tit. 14, §§ 15126.6, 15251, and 15252). See also **Response to Comment 10**, which discusses the CEQA meaning of feasibility.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
City of Oxnard, page 16	19. An additional 20 acres on two parcels (owned by the Keeler Trust) may be available adjacent to the east side of the Ormond Beach Area Off-site Alternative (owned by the Hansen Trust) because the existing business on the 20-acre site, Irwin Industries, may be relocating.	The two parcels referred to in the city's comment are among several parcels discussed in the applicant's *Alternative Sites Summary* and referred to as the "Ormond Beach Parcels (Various Locations near Edison Drive/Hueneme Road)" (NRG 2015b). The city comments that these two parcels (owned by the Keeler Trust) are very similar to the Hansen Trust properties. Staff does not agree with this characterization given that the Keeler Trust parcels are developed with large industrial type structures and the Hansen Trust properties are graded and covered with gravel (although currently used for parking of new automobiles). The applicant does not have site control of the Keeler Trust parcels, and staff cannot predict whether, when, and under what conditions the parcels might be available for lease or sale.
City of Oxnard, pages 16–17	20. PSA repeatedly assumes that any alternative power plant site would have to be online before the State Water Board's December 31, 2020, compliance date for certain OTC facilities.	Staff discusses compliance with the OTC Policy in different terms than what is stated in the City's comment. In discussing the Ormond Beach Area Off-site Alternative, staff states on page 6.1-5 of the PSA that if the Ormond Beach Generating Station was "retired by the end 2020 (to comply with the OTC Policy) and subsequently removed from the site adjacent to Ormond Beach, the impact of visually prominent industrial-type facilities in the vicinity of this off-site alternative would be incrementally reduced." On page 6.1-7 of the PSA, staff refers to the "potential retirement of OTC generation facilities in the Southern California portion of the California ISO balancing authority area…." The OTC Policy is discussed in the context of maintaining a reliable electric grid after the expected retirement of several thousand MWs of OTC capacity, including 1,946 MWs at the MGS and the Ormond Beach Generating Station (starting on page 6.1-8 of the PSA). In the discussion of the OBGS as a potential off-site alternative (PSA pages 6.1-23 to 6.1-25), staff discusses the possible retirement of the OBGS to meet the OTC Policy's compliance date schedule. The two OTC Policy compliance tracks are described on pages 6.1-25 and 6.1-26 of the PSA. As discussed on page 6.1-45 of the PSA, it is the CPUC in its Track 1 decision (D.13-02-015) that addresses procurement of resources to replace retiring OTC generators and meet local capacity requirements by 2021. Similar discussions are on pages 6.1-71 and 6.1-93 of the PSA. Staff does not state or imply that any alternative power plant site would have to be online before December 31, 2020. That argument is not used to dismiss any potentially feasible alternative to the proposed project.
Communities for a Better Environment, TN #213682, page 8	21. Regardless of whether the proposed project is approved, once MGS Units 1 and 2 are shut down to comply with the OTC Policy, the city may exercise its police power or public nuisance authority to mandate demolition. Misdefining the proposed project to include decommissioning, demolition, and removal prevents the	Staff prepared a robust analysis of potential project alternatives, including an analysis of preferred resources, two on-site reconfigurations, and a thorough review of several off-site alternatives. See also **Response to Comment 17**.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
	Energy Commission from adequately considering alternatives to the project. The project benefits of decommissioning, demolition, and removal are lacking from every alternative considered.	
Communities for a Better Environment, pages 9–10	22. The project objectives overly narrow the range of alternatives.	See **Response to Comment 9**.
Communities for a Better Environment, page 16	23. PSA asserts that because the CPUC approved NRG's contract for Puente, preferred resources are not an option. (See the subsection "Conclusions for Preferred Resources" on page 6.1-13 of the PSA.) The CPUC made no finding concerning whether preferred resources could be feasible or reliable.	D.16-05-050 found "the contract process to have been reasonable and in compliance with D.13-02-015. It also found "the results of the contract process regarding the selection of the Puente Project contract to be reasonable and consistent with D.13-02-015" (CPUC 2016). D.13-02-015 in turn, states that "[D.13-02-015] establishes criteria for review of SCE's forthcoming Applications. A significant aspect of that review will be to ensure consistency with the Loading Order" (CPUC 2013a). It also states: *SCE's procurement plan shall be consistent to the extent possible with the multi-agency Energy Action Plan, which places cost-effective energy efficiency and demand response resources first in the Loading Order, followed by renewable resources and then fossil-fuel resources. Energy storage resources should be considered along with preferred resources. SCE's procurement plan should take into account the technical reliability requirements of the California Independent System Operator.* In finding that the contract with the Puente Power Project and the process that yielded it were in compliance with D.13-02-015, the CPUC implicitly found the contract "consistent with the Loading Order." As such, it effectively found that all feasible, cost-effective, and available preferred resources had been procured by SCE, subject to the constraint that SCE's procurement meet the California ISO's reliability requirements.
Communities for a Better Environment, page 16	24. As an initial matter, the PSA errs in asserting: "In the two most recent CPUC decisions in the Long-term Procurement Planning (LTPP) proceeding, levels of procurement are specified for preferred resources, energy storage, and natural gas-fired generation…." (See page 6.1-7 of the PSA.)	Staff has amended the text in this FSA to read "*minimal* levels of procurement are specified for preferred resources, energy storage, and natural gas-fired generation *for the Los Angeles Basin*…." See the amended text under the subsection "Project Objectives and Alternatives Screening" in this FSA.
Communities for a Better	25. The CPUC concluded that preferred resources in the Moorpark	Staff agrees. Staff did not state or imply that preferred resources were excluded from the RFO or could not meet a share, or, under some circumstances, even all of the capacity needed in the

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
Environment, pages 16–17	sub-area could meet local need. The fact that it also opined that generation at the location of the retiring OTC units would meet the need did not exclude preferred resources. … After extensive briefing and evidentiary hearings regarding whether to require specific levels and sequencing of procurement efforts, the CPUC allowed SCE to conduct an RFO that was open to all sources. Indeed, SCE entered into contracts for both of the renewable distributed generation projects proposed to meet the RFO.	Moorpark sub-area to ensure local reliability.
Communities for a Better Environment, pages 16–17	26. Unlike the detailed instructions the CPUC provided regarding categories of resource procurement for SCE's LA Basin procurement, in D.13-02-015 the CPUC instructed that SCE procure "between 215 and 290 megawatts of electric capacity to meet local capacity requirements in the Moorpark sub-area of the Big Creek/Ventura local reliability area by 2021."	Staff agrees, but notes that the 215 to 290 MWs authorized was required "to meet local capacity requirements." In other words, it was to have operational characteristics similar to those of NGFG, thus eliminating (non-dispatchable) distributed solar.
Communities for a Better Environment, page 17	27. A preferred resources alternative is not only feasible, it meets the project objectives as well as satisfying many of the city's, state's, and agency goals regarding environmental justice, land use, and GHG.	See the subsection "CEQA Requirements" in this **Alternatives** analysis for a description of the basic regulatory requirements for an alternatives analysis. See also **Responses to Comments 9** and **47**. This alternatives analysis complies with CEQA requirements and does not impair or limit attainment of goals, policies, and regulations addressing environmental justice and reduction of GHG emissions. This alternatives analysis does not impact or otherwise influence the land use planning functions of local municipalities in the project region or anywhere else in the state.
Communities for a Better Environment, pages 17–18	28. As described for each preferred resource, due to the timing and circumstances of the SCE RFO, CPUC approval of a contract for Puente fails to establish a lack of available preferred resources. The	In aggregate, these comments assert that the timing and circumstances of the SCE RFO were such that preferred resources that would otherwise have participated were discouraged, if not precluded from doing so. Yet the CPUC found in ruling on SCE's application for the recovery of costs incurred under the contract for services from the Puente Power Project that "the results of the contract process regarding the selection of the Puente Project contract [were] reasonable and consistent with D.13-02-015 (CPUC 2016)." D.13-02-015, in turn, stated that SCE's procurement

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
	California ISO set out rules regarding demand response parameters after the RFO was issued, leaving demand resource providers hamstrung. The landscape for renewable resources has improved since 2013. SCE conducted its RFO simultaneously with the larger LA Basin RFO, which resulted in poor responses to the Moorpark RFO. SCE failed to conduct a targeted solicitation for renewable resources in the Moorpark sub-area's disadvantaged communities. CPUC's record shows that SCE did not express a preference for renewables in Oxnard or at any location other than Goleta—an area that has not been recognized as having environmental justice communities. SCE witness Bryson testified that SCE emphasized procurement of preferred resources at its bidder conference but never emphasized the need for preferred resources in Oxnard. SCE witness Singh acknowledged that SCE gave "qualitative preference" to renewables in general but never considered a qualitative advantage to renewable projects in disadvantaged communities like Oxnard. … As presented by EnerNOC to the CPUC, demand response providers who bid into the SCE RFO were unable to participate because the California ISO set rules excluding every project. Were a new RFO issued, DR providers would be more	effort was prohibited from including any "provisions specifically or implicitly excluding any resource from the bidding process due to resource type (except as authorized through this decision)…" and that "SCE's procurement process should have no provisions specifically or implicitly excluding any resource from the bidding process due to technology, except for specific requirements in this decision for the LA basin local area" (CPUC 2013a). D.16-05-050 has apparently addressed the issues raised here; this Energy Commission proceeding is not an appropriate venue for relitigating issues raised and the resulting findings at the CPUC. The comment also implies that distributed renewables could eliminate the need for NGFG in the Moorpark sub-area. However, in D.13-02-015 the CPUC concludes: "The ISO has shown that there is a need for in-area generation with operational characteristics similar to retiring OTC plants in the Moorpark sub-area of the Big Creek/Ventura local area" (CPUC 2013a). As distributed renewables are predominantly solar, a generation technology that is not dispatchable, they do not meet this requirement.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
	likely to participate.	
Communities for a Better Environment, page 18	29. Numerous behind the meter projects that were conceived and funded after the CPUC's local area need finding were concluded are likely to be installed prior to 2021. The Multifamily Affordable Housing Solar Rooftops Bill (AB 693) provides significant funding to install rooftop solar on multifamily affordable housing. Qualifying buildings exist in Oxnard. The program is due to launch in 2017. Parties to the AB 693 proceeding contend that, in order to maximize benefits of the program, solar installations should be paired with storage, to shift load, assisting with the flexibility function identified as a need in the local area.	The need for capacity in the Moorpark sub-area is calculated using an Energy Commission 10-year demand forecast and assumptions regarding the future deployment of additional preferred resources that are developed in the CPUC's Long-Term Procurement Planning (LTPP) proceeding. These do not anticipate the development of specific, named distributed renewable energy projects (or similar energy efficiency or demand response programs). They do, however, assume the deployment of unnamed preferred resources in quantities that are consistent with the state's efforts to mandate and promote those resources. For example, the Energy Commission forecast assumes future energy efficiency savings based on programs and measures that have yet to be funded but can be reasonably expected to occur ("additional achievable energy efficiency"). It also assumes the continued deployment of distributed solar photovoltaics in significant quantities. Assumptions in the LTPP proceeding included the future development of demand response programs that yield targeted amounts of peak demand reduction. In D.13-02-015, the CPUC assumed that the need for 430 MWs to meet the local capacity needs of the Moorpark sub-area could be reduced to 215 to 290 MWs based on "*likely preferred resource options* [emphasis added] and at least one transmission solution" (CPUC 2013a). See also **Response to Comment 28** (second paragraph). Distributed solar (constituting the majority of distributed renewables) is not dispatchable, and thus lacks the most significant operating characteristic of NGFG.
Communities for a Better Environment, page 18	30. Demand response, a preferred resource correctly identified in the PSA as having many of the attributes necessary for the local need, would likely be available were the Energy Commission to consider a preferred resource alternative.	As discussed in the PSA and FSA, demand response (DR) programs "provide an economic incentive for end users to modify energy use, whether through direct payments to reduce consumption when requested to do so (i.e., event-triggered DR programs) or rate structures that encourage reducing energy use during hours in which generation is expensive and/or system reliability is threatened." DR is a resource that allows consumers to adjust electricity use in response to forecast or actual market conditions, including high prices and reliability signals (California ISO 2015a). However, "customers are not required to shed load when called upon" to do so (CPUC 2013a). DR programs are overseen by the CPUC. The state's three investor-owned utilities (IOUs) (including SCE) sponsor the DR load management programs composing much of the state's DR. SCE's Smart Grid Deployment Plan is an example of a DR program (CPUC 2013a). In August 2014, the IOUs' estimated available DR capacity approximately equaled the CPUC's allowable resource adequacy requirements for those resources (California ISO 2015a). See also **Response to Comment 29**. CEQA requires consideration of a "reasonable range of potentially feasible alternatives that will foster informed decision making and public participation" (Cal. Code Regs., tit. 14, § 15126.6, subd. (a)). (**Response to Comment 10** discusses the CEQA meaning of feasibility.) *Infeasibility* of an alternative is among the factors that may be used to eliminate an alternative from detailed consideration in an EIR. Participation in the IOUs' load management programs is voluntary. A

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
		demand response alternative is not considered a feasible alternative given that an energy developer cannot compel participation in a demand response program.
Communities for a Better Environment, page 18	31. Energy storage provides more benefits than previously documented. As with renewable energy resources, SCE's application does not reflect the likely results of a renewed procurement effort, the capabilities storage offers to meet the local area need, or the actual availability of feasible resources. The storage contract that SCE presented for the Moorpark sub-area was tied to a non-incremental gas-fired generation project being considered by the CPUC. The PSA incorrectly asserts that NGFG power plants are the only type of new facility that can provide "ancillary" services in the quantities needed now and in the near future (page 4.1-120 of the PSA). One study documented storage use for grid services (black start capability, spinning/non-spinning reserves, energy arbitrage, and frequency regulations).	Staff agrees that multi-hour energy storage can provide many of the capacity and ancillary services provided by NGFG. Staff requested comment from the California ISO as to whether a large battery storage project could provide the services required from the capacity authorized and procured to meet a share or all of the local capacity together with reliability needs in the Moorpark sub-area, but notes that such a resource was not bid into the SCE RFO. Staff has reworded the cited passage in the PSA (page 4.1-120 of) to reflect the fact that multi-hour battery storage can be used to meet ramping needs as it provides regulation, spinning and non-spinning reserves and load-following, the subset of "ancillary services" referred to in the passage, but that it cannot currently do so cost-effectively. (See the subsection "Variable Generation and Grid Operations Support" in **Air Quality Appendix AIR-1** in this FSA.)
Communities for a Better Environment, pages 18–19	32. Behind-the-meter storage can provide benefits to the grid, address the duck curve, and allow customers to control utility bills as Time of Use rates come into effect. The Multifamily Affordable Housing Solar Roofs program may provide specific, funded opportunities in the Moorpark sub-area to deploy customer-sited storage in tandem with rooftop solar, to provide these services.	Multi-hour behind the meter storage cannot currently serve to meet local capacity needs as it cannot be dispatched by the California ISO. And, as noted in **Response to Comment 29**, the deployment of large amounts of distributed solar is (already) assumed in the Energy Commission's demand forecast, which was used to develop the estimate of the new capacity needed in the Moorpark sub-area. See also **Response to Comment 26**.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
Environmental Coalition Ventura County, Sierra Club Los Padres Chapter, & Environmental Defense Center, TN #213635, page 4	33. PSA inaccurately includes decommissioning of MGS Units 1 and 2 in the project description but no other alternatives that would meet the area's need, which poisons the well for the entire document.	Staff conducted a robust analysis of potential project alternatives, including an analysis of preferred resources, two on-site reconfigurations, and a thorough review of several off-site alternatives. See also **Response to Comment 17**.
Environmental Coalition Ventura County, Sierra Club Los Padres Chapter, & Environmental Defense Center, page 13	34. Although Puente would directly impact coastal wetlands and an Environmentally Sensitive Habitat Area, the PSA does not provide any explanation of how or why alternative sites evaluated in the PSA are not feasible.	See the subsections in the PSA and FSA, "Potential Feasibility Issues," for the Del Norte/Fifth Street Off-site Alternative and the Ormond Beach Area Off-site Alternative. As indicated, the analyses identify potential feasibility issues for these two alternative sites. The analyses of brownfield sites based on EPA data and the assessment of the sites suggested for analysis by the city of Oxnard address noteworthy feasibility issues for those various sites. This approach for assessing potential feasibility of alternatives in an EIR is consistent with the requirements of CEQA.
Robert Sarvey, TN #213668, page 3	35. All alternative sites are eliminated from consideration because staff concludes that any of the alternative sites would not include the beneficial visual improvement of removing MGS Units 1 and 2.	This comment misstates staff's analyses of alternative sites and does not accurately reflect staff's assumptions or conclusions for project alternatives. Staff's thorough review of project alternatives is evident throughout this **Alternatives** analysis, which includes a robust analysis of several off-site alternatives, including two sites in the Moorpark sub-area that were carried forward for full analysis, and two on-site project reconfigurations. See also **Response to Comment 17**.
Robert Sarvey, page 3	36. The alternatives analysis eliminates the No-Project Alternative, referring to the statement in the alternatives section that significant impacts on special-status birds nesting near the site and visual resources would result from MGS Units 1 and 2 remaining nonoperational on the site. Demolition of these units will be required by public nuisance laws.	This comment misinterprets the purpose of evaluating the no-project alternative in a CEQA alternatives analysis and does not accurately reflect staff's assumptions for the No-Project Alternative in this **Alternatives** analysis. See **Responses to Comments 17** and **53**. See also the subsection "CEQA Requirements" in this **Alternatives** section for a description of the basic regulatory requirements for an alternatives analysis.
Robert Sarvey, page 3	37. PSA relies on an alternatives analysis that was not conducted by the CPUC to determine that preferred resources are not feasible replacements for Puente.	See **Response to Comment 23**. Staff also notes that the authorization of 215 to 290 MWs of new capacity, *part of which was procured in the form of preferred resources*, presumed the development of unidentified preferred resources in the Moorpark sub-area, including energy efficiency, DR, and distributed photovoltaics; see the first paragraph of **Response to Comment 29**.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
Robert Sarvey, pages 3–4	38. Energy Commission staff does not understand the CPUC process. The CPUC does not conduct an alternatives analysis it determines whether the contracts presented by the utility are just and reasonable.	Staff does not contend that the CPUC conducts an alternatives analysis as defined by CEQA. It does, however, rule on the types and quantities of resources that an investor-owned utility is authorized to solicit in order to meet local reliability needs, whether the utility has acted reasonably in the course of that solicitation, and whether it has satisfied the loading order and other criteria in selecting resources from among the alternatives that it has been offered. Contrary to the comment's assertion, the CPUC does not rule on whether contracts are "just and reasonable." It does, however, allow for the recovery of costs (in rates) of one or more contracts from a pool of (alternative) contracts offered to a utility in response to a Request for Offers (RFO) in order to satisfy reliability requirements.
Robert Sarvey, page 4	39. Energy storage could replace or reduce the need for NGFG in Oxnard while eliminating or lowering criteria pollutant emissions in the minority neighborhood surrounding the site.	This is true if the energy storage offered meets the requirements for the provision of local reliability services together with resource adequacy. If an offer to provide 300 MWs of storage in the Moorpark sub-area was made in response to the SCE RFO (staff does not know if such an offer was made), it would have been considered for cost recovery and been rejected because (a) it did not meet the criteria for the provision of local reliability services, or (b) other projects, including Puente, were deemed to be in the ratepayers' interest. In any case, the appropriate venues for these determinations continue to be the CPUC's LTPP proceeding and the proceeding in which the CPUC ruled on SCE's application for the recovery of costs associated with the Puente contract.
Robert Sarvey, page 4	40. AES is currently permitting a 300-MW battery storage project which could replace the entire 286-MW Puente Power Project. In addition, AES is currently developing a 100-MW battery for use in Los Angeles that is expected to be deployed in 2021.	The storage project referred to by Mr. Sarvey is not located in the Moorpark sub-area and thus could not provide the local reliability services that have led to CPUC authorization of cost recovery for a contract for Puente. Construction of the project cited by Mr. Sarvey would not reduce the need for resources to provide capacity in the Moorpark sub-area.
Robert Sarvey, page 4	41. Energy storage is feasible, cost effective, and available as an alternative to Puente. Staff's use of a CPUC approved power purchase agreement to justify elimination of energy storage as a feasible alternative is contrary to CEQA.	Energy storage is evaluated in the **Alternatives** analysis in terms of its ability to replace generation capacity and help to meet resource adequacy requirements in the Moorpark sub-area. The allegation that staff used the approved power purchase agreement "to justify elimination of energy storage as a feasible alternative" is not true. See also **Response to Comment 23**.
California Coastal Commission, TN #213667, page 5	42. The Coastal Commission urges the Energy Commission to reconsider the baseline for evaluating project alternatives, taking into account the likelihood that MGS Units 1 and 2 would be removed in the absence of	See **Response to Comment 17**.

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
	Puente.	
California Coastal Commission, page 14	43. The PSA notes that NRG does not have site control at the Ormond Beach Area Off-site Alternative, indicating that uncertainties and delays could affect feasibility of this alternative. However; the PSA does not conclude that use of this site would be infeasible.	See the subsection in the PSA and FSA "Potential Feasibility Issues" for the Ormond Beach Area Off-site Alternative. As indicated, the analysis discusses potential feasibility issues for this alternative site. This approach for assessing potential feasibility of alternatives in an EIR is consistent with the requirements of CEQA.
California Coastal Commission, page 37	44. The Coastal Commission urges the Energy Commission to consider a broader range of alternatives, including locations or projects that would allow for safe siting of power generation capacity over the long term.	Staff prepared a robust analysis of potential project alternatives, including an analysis of preferred resources, two on-site reconfigurations, and a thorough review of several off-site alternatives.
Naval Base Ventura County (NBVC) Point Mugu, TN #213650	45. The Ormond Beach Area Off-site Alternative site is within the Approach-Departure Clearance Surface Area for Runway 09/27 and within the Conical Surface area for Runway 03/21 at NBVC Point Mugu. Potential impacts on aircraft and pilot safety from thermal plumes should be further evaluated for this alternative.	Staff agrees that this off-site alternative is within or near the identified Surface Areas; however, the site's location would not significantly impact aircraft operations at Runways 09/27 or 03/21. As shown in **Alternatives Figure 11** in this FSA, the Field Carrier Landing Practice track for Runway 09/27 does not pass over the alternative site. Furthermore, no flight tracks shown in the figure pass over the Ormond Beach Area Off-site Alternative site. The *Air Installations Compatible Use Zones Study* for NBVC Point Mugu includes a figure that also shows representative flight tracks, none of which pass over the Ormond Beach Area Off-site Alternative site (U.S. Department of the Navy 2015). The 188-foot-tall exhaust stack for a project similar to Puente at this site would penetrate the navigable airspace for Runway 09/27, which begins at approximately 158 feet above ground level at the alternative site. The applicant would need to file the Form 7460-1 requesting the FAA issue a Determination of No Hazard to Navigable Airspace. The discussion under "Potential Impact of Thermal Plumes on Aircraft and Pilot Safety" for the Ormond Beach Off-site Alternative in this FSA has been edited to further address the aircraft operations issues raised by NBVC Point Mugu. An impact discussion has been added to address the "Potential for the Exhaust Stack to Obstruct the Airspace Above the Site."

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
NBVC Point Mugu	46. The Ormond Beach Area Off-site Alternative raises potential concerns regarding impacts on special-status species at NBVC Point Mugu.	The Ormond Beach Area Off-site Alternative is graded and is being used for parking of new cars. While the larger project vicinity contains remnant patches of viable habitat that may serve as nesting, foraging, or other habitat for special-status species, the alternative site and immediate area does not contain habitat. Given the distance of this off-site alternative to the NBVC boundary (over 1.5 miles), implementation of a project similar to the proposed project at this site would not cause direct impacts on habitat referred to in the comment. The Ormond Beach Area Off-site Alternative is between Point Mugu to the south and the larger Santa Clara River estuary to the north, as well as McGrath Lake and associated wetlands north (and immediately north of the proposed project site). Wetland and salt water marsh areas are on and/or next to NBVC Point Mugu. It is possible that migratory and resident bird species may travel between these areas. Potential impacts on avian species relating to lighting on top of the exhaust stack and power line collisions at and near the off-site alternative would be reduced to less than significant with implementation of mitigation measures like those recommended for the proposed project, including Conditions of Certification **BIO-7** (part 3 pertaining to mitigating collision hazards with power lines) and **TRANS-6**, which specifies lights for the exhaust stack to reduce potential impacts on avian species. No new impacts would occur on biological resources for this off-site alternative compared to the proposed project.
Center for Biological Diversity, TN # 213621, page 11	47. The PSA improperly adopted the applicant's objectives without accounting for the state's and the Energy Commission's policies and goals for renewable energy production, storage, etc. The project objectives unlawfully limit the range of project alternatives.	The PSA has not "adopted" the applicant's objectives. The comment refers to the "most egregious" objective being NRG's desire to fulfill its obligations under a 20-year Resource Adequacy Purchase Agreement with SCE. Because staff is not privy to the contents of NRG's contract with SCE, staff cannot comment on whether a project alternative could satisfy any of its provisions. If staff's analysis had been limited only to alternatives that could achieve the applicant's objectives, then no reasonable project alternative would have been described and analyzed in the staff assessment. Page 6.1-7 of the PSA describes staff's treatment of the project objectives, stating that "CEQA requires an analysis of potentially feasible alternatives, a set that cannot be unduly limited by project objectives that can only be satisfied by the proposed project." (See the subsection in the FSA, "Project Objectives and Alternatives Screening.") Staff's broad interpretation of the project objectives is evident throughout this **Alternatives** analysis, which includes a thorough review of several off-site alternatives, including two sites in the Moorpark sub-area that were carried forward for full analysis, and two on-site project reconfigurations. See also **Response to Comment 9**, which states that no alternative was eliminated from consideration because it did not meet the applicant's specific proposal. The subsection "Preferred Resources" in the PSA and FSA addresses the state's mandates for increasing procurement of renewable energy resources. (See pages 6.1-7 to 6.1-13 in the PSA.) The analysis details the status of resource procurement in the Moorpark sub-area of the Big Creek/Ventura local reliability area in light of the retirement of OTC generators and state laws on maintaining a reliable electric grid. The analysis assesses the extent to which energy efficiency, demand response, distributed renewables, and energy storage can be substituted for NGFG to meet LCR needs and partially meet some of the project objectives. D.13-02-015 finds a need to

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
		procure up to 290 MWs in the Moorpark sub-area after accounting for the likelihood of preferred resources and/or transmission upgrades to reduce or meet LCR needs (CPUC 2013a). The applicant's objectives to develop a 262-MW power generation facility that provides operational flexibility and rapid-start and fast-ramping capability to support integration of renewable energy sources are not at odds with state policies and goals targeting procurement of renewables.
Center for Biological Diversity, page 11	48. CBD advocates for a broad formulation of project objectives to allow the Energy Commission to consider other energy sources (e.g., renewable technologies and efficiency and conservation) as alternatives to any power plant.	See **Responses to Comments 9** and **47**.
Center for Biological Diversity, page 13	49. The availability of large amounts of preferred resources must be considered in a revised alternatives analysis.	See **Responses to Comments 12**, **13**, **23**, **28**, and **39**.
Center for Biological Diversity, page 13	50. PSA ignores the changing legal landscape in California, specifically new legislation increasing Renewable Portfolio Standard requirements to 50 percent by 2030.	The proposed project would in no way hamper efforts to meet the requirements for renewable energy or storage. This is supported by the fact that the CPUC, which is responsible for ensuring that entities under its jurisdiction meet these targets, authorized SCE's procurement of up to 290 MWs of new NGFG capacity in the Moorpark sub-area. Long-run studies of the resources needed to reduce economy-wide GHG emissions to 20 percent of 1990 levels routinely suggest the development of very large amounts of NGFG capacity in California through 2050. A study commissioned by the state's energy agencies in 2014 and published in 2015 contains a "base case" scenario in which more than 25,000 MWs of new NGFG is added (Energy + Environmental Economics 2015, Energy Commission 2015).
Center for Biological Diversity, page 14	51. The environmental review must be revised to address a range of feasible alternatives that could avoid significant impacts on the environment based on a properly formulated set of project objectives.	See the subsection "CEQA Requirements" in this FSA, which summarizes the purpose and requirements for an alternatives analysis. This alternatives analysis was prepared in accordance with the requirements of CEQA. See the subsection "Project Objectives and Alternatives Screening" in this FSA, which describes staff's liberal interpretation of the project objectives and approach to preparing a robust analysis of alternatives. See also **Responses to Comments 9** and **47**.
Center for Biological Diversity, page 15	52. PSA provides no quantitative, comparative evidence regarding economic feasibility of the various alternatives.	CEQA does not require an EIR to discuss the economic feasibility of a project or its alternatives. As stated in the PSA and FSA under "CEQA Requirements," regulations addressing preparation of EIRs also apply to the document used as a substitute for an EIR in a certified state regulatory program (Cal. Code Regs., tit. 14, §§ 15251 and 15252).

Alternatives Table 11
Response to Comments

Comment Source	Comment	Staff Response
Center for Biological Diversity, page 15	53. PSA fails to address a range of feasible alternatives based on proper project objectives. Examples of alternatives include a "true no project alternative," distributed solar alternative, storage-based alternative, and conservation and efficiency measures. PSA must be revised and recirculated.	The comment's reference to a "true no project alternative" is not clear to staff. The basic requirement for a no-project alternative is provided on page 6.1-6 of the PSA under "CEQA Requirements." Assumptions for the No-Project Alternative are described on page 6.1-28 of the PSA. The CEQA Guidelines further describe requirements for evaluating the no-project alternative. "The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(1)). Staff's analysis of the No-Project Alternative is consistent with CEQA requirements. See also **Responses to Comments 9**, **12**, **13**, **23**, **28**, **39**, **47**, **50**, and **51**.

SUMMARY COMPARATIVE IMPACT CONCLUSIONS AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE DISCUSSION

NO-PROJECT ALTERNATIVE

Because the existing MGS Units 1 and 2 would be shut down and decommissioned to comply with the OTC Policy, the No-Project Alternative would avoid or greatly reduce significant impacts during demolition and construction and from project operations. Decommissioning Units 1 and 2 would not require any earth movement, soil disturbance, or work below site grade. Under the proposed project, these impacts are reduced to less than significant with implementation of conditions of certification and through LORS compliance.

Impacts Reduced or Avoided under the No-Project Alternative

Air Quality

- Demolition, construction, and project operations emissions would be avoided

Biological Resources

- Impact on jurisdictional wetlands would be avoided
- Impacts of noise on nesting birds; and potential impacts on special-status plants, animals, and habitats would be avoided during project demolition and construction
- Impact relating to potential electrocution of avian species would be avoided

Cultural Resources

- Impacts on buried archaeological resources would be avoided

Geology and Paleontology

- Risk of damage to paleontological resources would be avoided

Hazardous Materials Management

- Risk of fire or explosion off-site from natural gas usage during project operations would be greatly reduced
- Risk of hazardous materials spill off the site during transport to the site would be greatly reduced
- Risk of hazardous materials spill or migration off the site from storage or use on the site would be greatly reduced

Noise and Vibration

- Potential noise impact at noise-sensitive locations would be avoided

Soil and Water Resources

- Impacts on water quality during project demolition and construction would be avoided
- Potential impact from on-site and off-site flooding relating to site grading, construction of impervious surfaces, or other changes to drainage patterns would be avoided
- Impact of wastewater discharge from power plant operations would be reduced

Transmission Line Safety and Nuisance

- Impact from generated fields and non-field impacts from project operations

Waste Management

- Potential for demolition and construction wastes to impact waste disposal or diversion facilities would be avoided
- Potential impacts on human health and the environment from removal of wastes of release of on-site contaminants would be avoided

Worker Safety and Fire Protection

- Potential impact relating to the risk of off-site fire and/or explosion from use of natural gas would be avoided

Because staff cannot predict the level of lighting that could occur at the site, staff concludes that the visual resources impact relating to potential nighttime lighting of structures at the site is **indeterminate** for the No-Project Alternative.

Due to the potential for the decommissioned MGS Units 1 and 2 to present nesting and perching opportunities for raptors and other predatory birds, staff concludes that the No-Project Alternative could lead to depredation of western snowy plover and California least tern nests on beaches and dunes adjacent to the site. This impact is **greater than Puente** and the impact conclusion remains *significant and unavoidable*.

Under the No-Project Alternative, staff is unable to predict or foresee what other action might be taken that could potentially convert all or a portion of the MGS site to another use. In the absence of the Energy Commission's approval of a license to construct and operate a power plant at the site, another proposed future use of the MGS power plant site would be subject to review and approval of a coastal development permit by the city. It is assumed that future land use agreements or property division or sale would include removal of some of the existing power block structures and infrastructure. In this circumstance, the significant impact on biological resources from the existing MGS Unit 1 and 2 power block structures remaining on the site would not persist.

Under the No-Project Alternative, the potential impacts of thermal plumes on aircraft and pilot safety would be **less than Puente**. Because staff has no data on the thermal plumes generated during operation of MGS Units 1 and 2, which could continue

operating through 2020, the comparative impact conclusion for the No-Project Alternative is **indeterminate**.

DEL NORTE/FIFTH STREET OFF-SITE ALTERNATIVE

Staff compared the impacts of the Del Norte/Fifth Street Off-site Alternative to the same or similar impacts of the proposed project. This off-site alternative assumes constructing and operating a project similar to the proposed project at this alternative site. It assumes no construction and operation of the proposed project at the MGS site.

Potentially Significant Impact Avoided at the Alternative Site

Staff identifies one *potentially significant* geological resources impact under the proposed project that is avoided under the Del Norte/Fifth Street Off-site Alternative:

Geology and Paleontology

- Risk of inundation by tsunami resulting from an earthquake or local submarine landslide when combined with sea level rise

Staff concludes that under variable conditions and due to its coastal location, the proposed project could be at risk for inundation by tsunami when combined with sea level rise. The Del Norte/Fifth Street Off-site Alternative is outside the coastal area that is subject to a potential risk of inundation by tsunami (approximately 7 miles inland); therefore, *no impact* would occur compared to the proposed project.

Significant and Unavoidable Impacts That Would Occur at the Alternative Site

For one environmental impact that is considered *potentially significant* under the proposed project, the Del Norte/Fifth Street Off-site Alternative would cause a significant impact that is **greater than Puente**:

Traffic and Transportation

- Potential impacts from thermal plumes on aircraft and pilot safety

Staff concludes that arrival and departure tracks for aircraft using Camarillo Airport (approximately 1.4 miles from the site) could expose pilots and aircraft to thermal plumes that would be generated by a power plant at the Del Norte/Fifth Street Off-site Alternative. This impact is significant and no feasible mitigation measures are identified to reduce the impact on aircraft and pilot safety to less than significant; therefore, the impact would remain *significant and unavoidable*.

For one environmental impact relating to Traffic and Transportation that is considered *less than significant* under the proposed project, this off-site alternative would cause a significant impact that is *potentially significant and unavoidable*:

- Impacts on aviation safety relating to location of transmission lines

Staff concludes that the transmission structures would exceed the threshold for FAA notification (73.9 feet). Potential impacts on aircraft safety would be **greater than**

Puente. The impact conclusion is *potentially significant and unavoidable*, depending on whether the FAA determined that the transmission structures would present an obstruction hazard.

Less Than Significant Project Impact That Would Be Greater Than the Proposed Project at the Alternative Site (Reduced to Less Than Significant with Mitigation)

For one environmental impact that is considered *less than significant* under the proposed project, the Del Norte/Fifth Street Off-site Alternative would cause a potentially significant impact that is **greater than Puente**. This impact would be reduced to *less than significant* with implementation of mitigation measures similar to those recommended by staff for the proposed project and through LORS compliance:

Transmission Line Safety and Nuisance

- Potential for corona-related radio-frequency interference or complaints due to the longer 220-kV transmission line route under this alternative

Potentially Significant Project Impact That Would Be Less Than the Proposed Project (and Less Than Significant) at the Alternative Site

For one Biological Resources impact that is considered *potentially significant* under the proposed project, the corresponding impact for the Del Norte/Fifth Street Off-site Alternative would be *less than significant*:

Biological Resources

- Impacts on special-status plants and habitat

The area in the vicinity of the Del Norte/Fifth Street Off-site Alternative is either developed or in use for agricultural production. Staff's review of the California Natural Diversity Database revealed no documented occurrences of listed species on or near the alternative site. There is a low likelihood for special-status plants, animals, or habitat to be present in the developed and agricultural areas immediately surrounding the site, and staff concludes that potential impacts on these resources would be **less than Puente** and *less than significant*.

Impact Peculiar to This Off-site Alternative Assuming No Demolition and Removal of MGS Units 1 and 2

Staff identifies one environmental impact that could occur under the Del Norte/Fifth Street Off-site Alternative with Units 1 and 2 remaining nonoperational on the MGS site as part of the assumptions for this off-site alternative:

Biological Resources

- Impacts on special-status birds with MGS Units 1 and 2 left on site

Due to the potential for the decommissioned MGS Units 1 and 2 to present nesting and perching opportunities for raptors and other predatory birds, Biological Resources staff concludes that this off-site alternative (like the No-Project Alternative) could lead to

depredation of western snowy plover and California least tern nests on beaches and dunes adjacent to the proposed project site. This impact is **greater than Puente**, and the impact could remain *significant and unavoidable*.

Less Than Significant Proposed Project Impact That Would Not Occur at the Alternative Site

Biological Resources staff concludes that the proposed project would deposit *less-than-significant* levels of NOx at the closest sensitive habitats to the site. While no similar mapping has occurred for this off-site alternative, staff's review of available resources identified no sensitive habitat within several miles of the site. Staff concludes there would be *no impact* on sensitive resources from nitrogen deposition at the Del Norte/Fifth Street Off-site Alternative:

Biological Resources

- Impacts on biological resources relating to nitrogen deposition

Comparative Impacts That Are Indeterminate

Biological Resources staff has observed a natural bottom drainage ditch that appears to cross a portion of the northern third of the Del Norte/Fifth Street Off-site Alternative, perpendicular to E. Fifth Street. Staff has insufficient information to evaluate the resource and is also unable to conclude whether a project at this site could be designed to avoid the potential waters of the state (i.e., the on-site drainage ditch). Therefore, the potential for this alternative to affect waters of the state is **indeterminate**. This alternative would avoid filling the Coastal Commission defined wetlands on the proposed project site.

Potential impacts on Cultural Resources are **indeterminate** for this off-site alternative, and staff does not have the survey data needed to reach comparative conclusions.

ORMOND BEACH AREA OFF-SITE ALTERNATIVE

Staff compared the impacts of the Ormond Beach Area Off-site Alternative to the same or similar impacts of the proposed project. This off-site alternative assumes constructing and operating a project similar to the proposed project at this alternative site. It assumes no construction and operation of the proposed project at the MGS site.

Significant Impacts Avoided at the Alternative Site

Staff identifies three environmental impacts under the proposed project that are avoided under the Ormond Beach Area Off-site Alternative.

For one Biological Resources impact that is considered *significant* under the proposed project, the corresponding impact for the Ormond Beach Area Off-site Alternative would not occur:

Biological Resources

- Impact on jurisdictional wetlands and other waters

The proposed project would fill 2.03 acres of Coastal Commission defined wetlands on the northwest portion of the proposed project site. This alternative site was previously developed with industrial facilities, and it was recently graded and surfaced with gravel as a parking area for new automobiles. No jurisdictional wetland or other water is present on the alternative site; therefore, the impact on wetlands or other waters is avoided and *no impact* would occur compared to the proposed project.

Staff identifies one *potentially significant* impact relating to geological resources under the proposed project that is avoided under the Ormond Beach Area Off-site Alternative:

Geology and Paleontology

- Risk of inundation by tsunami resulting from an earthquake or local submarine landslide when combined with sea level rise

Staff concludes that under variable conditions and due to its coastal location, the proposed project could be at risk for inundation by tsunami when combined with sea level rise. Although the Ormond Beach Area Off-site Alternative is a little over one-half mile from the coastline, it is outside the area that is subject to risk of inundation by tsunami even when combined with the effects of sea level rise; therefore, this impact is avoided, and *no impact* would occur compared to the proposed project.

Staff identifies one *potentially significant* impact on water quality under the proposed project that is avoided under the Ormond Beach Area Off-site Alternative:

Soil and Water Resources

- Water quality impacts during demolition

Demolition impacts at the proposed project site would be reduced to less than significant through compliance with the Construction General Permit, which also regulates demolition activities. Because the Ormond Beach Area Off-site Alternative is undeveloped, no demolition would be required to develop the site. Therefore, *no impact* would occur relating to potential impacts on water quality from demolition at this alternative site.

Significant Impacts Reduced at the Alternative Site

Staff evaluated comparative impacts on Visual Resources. Construction and operation of a power plant at the Ormond Beach Area Off-site Alternative could become the most visually prominent industrial-type structure in areas adjacent to the site, although the existing OBGS is highly visible from this alternative site and other nearby viewpoints. However, this off-site alternative is set back approximately one-half mile from Ormond Beach, and it would be located in an industrial area with less direct public exposure compared to the proposed project site. Staff concludes the potential for this off-site alternative to significantly impact visual resources to be **less than Puente** for this impact criterion:

Visual Resources

- Substantially degrade the existing visual character or quality of the site and its surroundings

Like the proposed project, which has one *significant* impact at KOP 3, staff concludes that mitigation measures could feasibly reduce visual impacts at this alternative site to less than significant.

As discussed above, the OBGS Units 1 and 2 will possibly be retired by the end of 2020 to meet the OTC Policy compliance date schedule. If the existing OBGS was subsequently demolished and removed from its site adjacent to Ormond Beach, the overall impact of visually prominent industrial-type facilities in the vicinity of this off-site alternative would be reduced.

Traffic and Transportation

For two impacts relating to aircraft operations and pilot safety that are considered *potentially significant* under the proposed project, the corresponding impacts for the Ormond Beach Area Off-site Alternative are considered *less than significant*:

- Potential impacts from thermal plumes on aircraft and pilot safety
- Potential for the exhaust stack to obstruct the airspace above the site

The proposed project site is approximately 1.8 miles from the Oxnard Airport. Staff evaluated the potential for high-velocity thermal plumes to impact aircraft and pilot safety and concluded that thermal plumes from the power plant could be hazardous to aircraft piloted over the Puente site. The impact conclusion is *potentially significant* under the proposed project.

The military aircraft training route and flight tracks at NBVC Point Mugu do not pass over the Ormond Beach Area Off-site Alternative. Oxnard Airport is approximately 3 miles northwest of the site, and the vast majority of aircraft piloted in the airspace near the airport use the airspace to the west for approaches and departures. It is unlikely that pilots would head south at low altitudes over the Ormond Beach Area Off-site Alternative site. The same is true is true for aircraft piloted near the Camarillo Airport, which is approximately 7 miles north of this off-site alternative. Staff concludes that potential impacts from thermal plumes on aircraft and pilot safety using either airport would be *less than significant* under this off-site alternative.

Staff evaluated the potential for Puente's 188-foot-tall exhaust stack to obstruct the airspace above the MGS site and determined the impact to be *potentially significant* due to the possibility that some aircraft using the Oxnard Airport could pass over the site at relatively low altitudes. Because the military aircraft flight tracks do not cross over the Ormond Beach Area Off-site Alternative site, staff concludes that the potential risk associated with this impact is **less than Puente** and the impact conclusion is *less than significant*.

Impact That Would Be Greater Than the Proposed Project at the Alternative Site (Reduced to Less Than Significant with Mitigation)

For one potential Cultural Resources impact that would not occur under the proposed project, staff concludes that this alternative could impact the Ventura County Railway, which is determined to be a historical resource pursuant to CEQA:

- Potential impact on a built environment resource

A final impact determination would depend on whether a railroad spur line that crosses part of the site is a contributing element of the Ventura County Railway. This potential impact could likely be reduced to less than significant with implementation of appropriate mitigation measures. No built environment historical resources are identified at the Puente site; therefore, no comparative impact would occur under the proposed project.

Impact Peculiar to This Off-site Alternative Assuming No Demolition and Removal of MGS Units 1 and 2

Staff identifies one environmental impact that could occur under the Ormond Beach Area Off-site Alternative with Units 1 and 2 remaining nonoperational on the MGS site as part of the assumptions for this alternative:

Biological Resources

- Impacts on special-status birds with MGS Units 1 and 2 left on site

Due to the potential for the decommissioned MGS Units 1 and 2 to present nesting and perching opportunities for raptors and other predatory birds, Biological Resources staff concludes that this off-site alternative (like the No-Project Alternative) could lead to depredation of western snowy plover and California least tern nests on beaches and dunes adjacent to the proposed project site. This impact is **greater than Puente** and the impact could remain *significant and unavoidable*.

CONCEPTUAL SITE RECONFIGURATIONS 1 AND 2

Each of the two conceptual site reconfigurations of the proposed project would avoid filling 2.03 acres of Coastal Commission defined wetlands on the northwest portion of the site. Like the proposed project, MGS Units 1 and 2 would be decommissioned, demolished, and removed from the site under either conceptual site reconfiguration alternative.

Significant Impact Avoided With Reconfiguration of the Proposed Project Structures

For one Biological Resources impact that is considered *significant* under the proposed project, the corresponding impact would not occur under Conceptual Site Reconfigurations 1 and 2:

Biological Resources

- Impact on jurisdictional wetlands and other waters

The proposed project would fill 2.03 acres of Coastal Commission defined wetlands on the northwest portion of the proposed project site. Assuming reconfiguring the power block and some of the related structures on the site is technically feasible, either site reconfiguration would avoid filling the on-site wetlands, and *no impact* on the wetlands would occur.

Staff concludes that all other environmental impacts would be the **same as Puente** or **similar to Puente***.*

CONCLUSIONS

Several environmental impacts relating to proposed project operations would be avoided under the No-Project Alternative; however, the No-Project Alternative would not attain any of the project's basic objectives.

Due to the potential for the decommissioned MGS Units 1 and 2 to present nesting and perching opportunities for raptors and other predatory birds, staff concludes that the No-Project Alternative could cause *significant and unavoidable* impacts on special-status birds nesting near the site. Assumptions for the No-Project Alternative do not necessarily include removing MGS Units 1 and 2, which is considered a benefit of the proposed project. The significant and unavoidable impact on special-status birds would persist as long as the MGS Units 1 and 2 remained nonoperational.

Staff concludes that the No-Project Alternative is *not* considered environmentally superior to the proposed project. If MGS Units 1 and 2 were demolished and removed from the site, the No-Project Alternative would be environmentally superior to the proposed project.

The Del Norte/Fifth Street Off-site Alternative would avoid one *potentially significant* geological resources impact of the proposed project. Under this off-site alternative, *no impact* would occur from the risk of inundation by tsunami resulting from an earthquake or local submarine landslide. Under the proposed project, this impact is reduced to *less than significant* with conditions of certification imposed. This off-site alternative would cause a *significant impact* relating to Traffic and Transportation due to the potential impacts of thermal plumes on aircraft and pilot safety; no feasible mitigation measures are identified to reduce the severity of this impact, which would remain *significant and unavoidable*. This alternative would cause a *significant impact* relating to aircraft and pilot safety if the FAA determined that the transmission structures presented an obstruction hazard that could impact aviation safety; the impact conclusion is *potentially significant and unavoidable*. Therefore, the Del Norte/Fifth Street Off-site Alternative is *not* considered environmentally superior to the proposed project. This off-site alternative could potentially satisfy four of the applicant's eight project objectives.

The Ormond Beach Area Off-site Alternative would avoid three significant effects of the proposed project. Impacts that would be avoided include filling of wetlands, risk of inundation by tsunami, and temporary water quality impacts during demolition. This alternative could cause one *potentially significant* impact on a built environment historical resource, the Ventura County Railway. This potential impact is **greater than Puente** because no built environment historical resources are present at the Puente site. A final impact determination would depend on whether a railroad spur line that crosses part of the alternative site is a contributing element of the Ventura County Railway. This potential impact could likely be reduced to less than significant with implementation of appropriate mitigation measures. Regarding potential Visual Resources impacts, staff concludes that the potential to substantially degrade the existing visual character or quality of the site and its surroundings is **less than Puente**, and the impact conclusion is *potentially significant*. Mitigation measures similar to those recommended for the proposed project could feasibly reduce visual impacts at this alternative site to less than significant. For impacts relating to Traffic and Transportation, staff concludes that potential impacts from thermal plumes on aircraft and pilot safety is **less than Puente**, and the impact conclusion is *less than significant*.

This alternatives analysis considers many factors in comparing the project alternatives to the proposed project. The Ormond Beach Area Off-site Alternative is outside the area that is subject to risk of inundation by tsunami; therefore, this impact is avoided at the alternative site even when combined with the effects of sea level rise. No wetlands or other waters are present at the alternative site, and the impact on 2.03 acres of Coastal Commission defined wetlands at the Puente site would be avoided. The Ormond Beach Area Off-site Alternative is undeveloped, and compared to the proposed project, no temporary, demolition-related water quality impacts would occur at the alternative site. Because the Ormond Beach Area Off-site Alternative would avoid these proposed project impacts, staff concludes that this off-site alternative is environmentally superior to the Puente Power Project. Staff reached this conclusion notwithstanding the potential for this alternative to impact a built environment historical resource, which is a Cultural Resources impact that would only occur if the railroad spur was determined to be contributing element of the Ventura County Railway. This off-site alternative could potentially satisfy five of the applicant's eight project objectives.

Conceptual Site Reconfigurations 1 and 2 would avoid filling 2.03 acres of Coastal Commission defined wetlands. No other environmental impacts would be reduced or avoided by reconfiguring the power plant facilities on the Puente site, including the impact pertaining to the risk for inundation by tsunami. Reconfiguring the site would not create any new environmental impacts compared to Puente. Because Conceptual Site Reconfigurations 1 and 2 would avoid filling the wetlands, either on-site reconfiguration could be considered environmentally superior to Puente. The two site reconfigurations could potentially attain the basic project objectives, although redesigning the site plan to avoid the wetlands would delay the project schedule.

REFERENCES

Aspen Environmental Group 2009 — Ormond Beach Wetland Restoration Feasibility Study. October 2009. Pages ES-1 to ES-3 and 6-18. Prepared for the California State Coastal Conservancy, Oakland, CA. Prepared by Aspen Environmental Group, et al. Contract No. 03-153.

Avian Power Line Interaction Committee 2006 — Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. PIER Final Project Report CEC-500-2006-022. Edison Electric Institute, APLIC, and the California Energy Commission. Washington D.C. and Sacramento, CA.

California Department of Transportation 2008 — *Environmental Handbook*. Volume 2. Cultural Resources. Chapter 7. Page 7:19. March 2007. Revised October 2008.

CalEPA 2014a — California Environmental Protection Agency. California Communities Environmental Health Screening Tool, Version 2.0, Guidance and Screening Tool. Page 5. October 2014. Available at: http://oehha.ca.gov/ej/ces2.html.

CalEPA 2014b — California Environmental Protection Agency. Designation of Disadvantaged Communities Pursuant to Senate Bill 535 (De Leon). Page 1. October 2014. Available at: http://www.calepa.ca.gov/EnvJustice/GHGInvest/.

California Department of Parks and Recreation 2015 — *Western Snowy Plover Annual Report. 2015*. Channel Coast District. By Alexis Frangis, Environmental Scientist; Nat Cox, Senior Environmental Scientist; Federal Fish and Wildlife Permit TE-31406A-1; State Scientific Collecting Permit SC-010923. Available at: https://www.fws.gov/arcata/es/birds/wsp/documents/siteReports/California/2015%20Channel%20Coast%20District%20WSP%20Report.pdf. Accessed October 5, 2016.

California ISO 2015a — California Independent System Operator. *2014 Annual Report on Market Issues & Performance.* Department of Market Monitoring. June 2015. Pages 25, 30–32. Available: http://www.caiso.com/Documents/2014AnnualReport_MarketIssues_Performance.pdf. Accessed April 28, 2016.

California ISO 2015b — California Independent System Operator. Letter from the California ISO President Steve Berberich to CPUC President Michael Picker, November 23, 2015. TN #206824, Docket Log 12-AFC-02C for the Huntington Beach Energy Project.

California ISO 2015c — California Independent System Operator. *Comments of the California Independent System Operator Corporation on Alternate Proposed Decision* [Purchase Power Tolling Agreement with Carlsbad Energy Center, LLC], filed in California Public Utilities Commission proceeding for A.14-07-009, April 27, 2015.

California ISO 2016a — California Independent System Operator. *2015–2016 Transmission Plan*. Approved by the California ISO Board of Governors, March 28, 2016. Pages 95–

100, 126, Figure 3.1-1. *Appendix D: 2025 Local Capacity Technical Analysis for the Los Angeles Basin, Big Creek/Ventura, and San Diego Local Capacity Requirement Areas*. Pages 1–6, 16, and 19–20. Available: http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=D5EE02E2-0E3A-46DF-BDA9-52EDBD09AC8E. Accessed April 12, 2016.

California ISO 2016b — California Independent System Operator. Letter from the California ISO Executive Director Neil Millar to Energy Commissioner J. Andrew McAllister, August 9, 2016. TN #212725, Docket Log 12-AFC-02C for the Huntington Beach Energy Project.

City of Oxnard 2006 — *Draft Background Report, City of Oxnard General Plan*. Pages 5-26 and 5-41. Figures 4-2, 4-4, 4-5, 4-7, 4-8. Prepared by Matrix Design Group, Inc. in association with ESA, UCSB, and URS. April 2006. Available: http://developmentservices.cityofoxnard.org/7/76/961/. Accessed March 21, 2016.

City of Oxnard 2011 — City of Oxnard Development Services Department Planning Division. *2030 General Plan Goals & Policies*. Pages 3-16 and 4-20. Adopted October 11, 2011. Available: http://developmentservices.cityofoxnard.org/7/76/961/. Accessed March 15, 2016.

City of Oxnard 2015a — California Energy Commission Issues Hearing/Environmental Scoping Meeting, NRG Puente Project (15-AFC-01), City of Oxnard Comments Responding to CEC Issues Identification of August 10, 2015 (TN #205930). August 27, 2015. Presented by Chris Williamson, Principal Planner, City of Oxnard.

City of Oxnard 2015b — Six Alternative Sites/Areas to NRG Puente (15-AFC-01) (TN #206301). August 11, 2015. Presented by Chris Williamson, Principal Planner, City of Oxnard.

Coastal Commission 1985 — California Coastal Commission, *Designation of Coastal Zone Areas Where Construction of an Electric Power Plant Would Prevent Achievement of the Objectives of the California Coastal Act of 1976*. Adopted September 1978. Revised 1984. Re-adopted December 1985. San Francisco, CA.

Coastal Commission 2014 — California Coastal Commission, Local Coastal Program Planning Grants Joint Application. Ocean Protection Council Sea-Level Rise Grant and Coastal Commission LCP Planning Grant. July 7, 2014. Available: http://www.coastal.ca.gov/lcp/grant-apps-14-15/south-central/Oxnard_2014_LCP_Application.pdf. Accessed May 12, 2016.

Council on Environmental Quality 1997 — *Environmental Justice: Guidance Under the National Environmental Policy Act*. December 10, 1997. http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf.

CPUC 2012 — California Public Utilities Commission. *Decision Approving 2013–2014 Energy Efficiency Programs and Budgets*, Decision 12-11-015, November 8, 2012. Application 12-07-001 (Filed July 2, 2012). Date of Issuance November 15, 2012. Pages 102 and

103. Available: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M034/K299/34299795.PDF. Accessed April 28, 2016.

CPUC 2013a — California Public Utilities Commission, Decision Authorizing Long-Term Procurement for Local Capacity Requirements; Rulemaking 12-03-014, Filed March 22, 2012; Decision 13-02-015 (Track 1 Decision), Date of Issuance February 13, 2013. Pages 1–11, 53, 63, 72, 73, 124, 125, and 127–132. Available: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M050/K374/50374520.PDF. Accessed April 8, 2016.

CPUC 2013b — California Public Utilities Commission. *Order Instituting Rulemaking to Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements*. Filed September 19, 2013, Rulemaking R.13-09-011, Date of Issuance September 25, 2013. Available: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K151/77151993.PDF. Accessed April 28, 2016.

CPUC 2013c — California Public Utilities Commission. *Final Decision Adopting Energy Storage Procurement Framework and Design Program*. Rulemaking 10-12-007 (Filed December 16, 201) Decision 13-10-040, Date of Issuance October 21, 2013. Available: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=79533378. Accessed April 28, 2016.

CPUC 2014a — California Public Utilities Commission. Southern California Edison Company's (U 338-E) Application for Approval of the Results of Its 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-area. Application No. A.14-11-016. Available: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=143307496. Accessed April 27, 2016.

CPUC 2014b — California Public Utilities Commission, *Decision Establishing Energy Efficiency Savings Goals and Approving 2015 Energy Efficiency Programs and Budgets (Concludes Phase I of R.13-11-005)*, Rulemaking 13-11-005, Filed November 14, 2013; Decision 14-10-046, Date of Issuance October 24, 2014. Pages 104 and 105. Available: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M129/K228/129228024.pdf. Accessed April 28, 2016.

CPUC 2016 — California Public Utilities Commission. *Decision Approving, In Part, Results of Southern California Edison Company Local Capacity Requirements Request for Offers for Moorpark Sub-Area Pursuant to Decision 13-02-015*. Pages 2–5, 26, and 37. Decision 16-05-050. May 26, 2016. Date of Issuance June 1, 2016. Application 14-11-016 (Filed November 26, 2014). Available: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=162881082. Accessed June 15, 2016.

Energy + Environmental Economics 2015 — April 6, 2015 PowerPoint, Scenario Results, and Supporting Spreadsheets. Summary of the California State Agencies' PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios. Original Materials. CA PATHWAYS Scenarios Data. Excel file: CA_Pathways_Electricity_outputs_20150224.xlsm. Straight Line Base Case, EP, Row 62, Natural Gas. Time Stamp 2/22/2015. Available: https://ethree.com/public_projects/energy_principals_study.php. Accessed October 3, 2016.

Energy Commission 2015 — Fact Sheets on California's 2030 Climate Commitments and Related E3 Study. Summary of the California State Agency's PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios. July 9, 2015. Available: http://www.energy.ca.gov/commission/fact_sheets/climate_commitments_fact_sheets.html. Accessed October 3, 2016.

Energy Commission 2016 — Tracking Progress, Renewable Energy. Available: http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf. Last updated September 29, 2016. Accessed October 3, 2016.

Energy Commission 1980 — *Opportunities to Expand Coastal Power Plants in California*. Staff Report P700-80-001. June 1980. Sacramento, CA.

Energy Commission and CPUC 2003 — California Energy Commission, California Public Utilities Commission, and Consumer Power and Conservation Financing Authority. *Final 2003 Energy Action Plan I*. Adopted 2003. Pages 1 to 4. Available: http://www.energy.ca.gov/energy_action_plan/. Accessed June 15, 2016.

GWRR 2016 — Genesee & Wyoming Railroad. Ventura County Railroad Web page and system map. https://www.gwrr.com/railroads/north_america/ventura_county_railroad#m_tab-one-panel. February 2016. Accessed October 2016.

HistoricAerials 2016 — Nationwide Environmental Title Research, LLC. Available: http://www.historicaerials.com/. Accessed November 2016.

Naval Air Warfare Center Weapons Division 2014 — Point Mugu Sea Range and Facilities, Quick Facts, China Lake & Point Mugu, CA. Distribution Statement A. Approved for public release. NAWCWD PR 14-0100, September 2014. Available: http://www.navair.navy.mil/nawcwd/command/downloads/CL_facilities/Fact%20Sheets%204%20PAO/03_Point%20Mugu%20QuickFacts.pdf. Accessed March 1, 2016.

NRG 2015a — Application for Certification, Puente Power Project , Oxnard, CA. (15-AFC-01) (TN #204219-5 and #204219-9) April 13, 2015. Pages 1-1, 1-6, 1-14, 1-15, 4.2-13, 4.15-4, 4.15-5, and 5-1. Table 2.8-1. Figures 2.1-1 and 4.2-2. Submitted to the Energy Commission by NRG Oxnard Energy Center,LLC, San Francisco, CA. Prepared by AECOM.

NRG 2015b — Application for Certification, Puente Power Project , *Alternative Sites Summary*, Oxnard, CA. (15-AFC-01) (TN #207096) December 2015. Submitted to the Energy Commission by NRG Oxnard Energy Center, LLC, San Francisco, CA. Prepared by AECOM.

U.S. Bureau of Reclamation 2009 — *Section 106 Consultation with SHPO for Calleguas Hueneme Outfall Replacement Project*. BUR090416A. (Includes VN-02572—Maki 2007) April 22, 2009.

U.S. Census 2015 — United States Census Bureau, S1701 Poverty Status in the Past 12 Months 2010–2014 American Community Survey 5-Year Estimates, http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

U.S. Department of the Navy 2015 — Air Installations Compatible Use Zones Study for Naval Base Ventura County Point Mugu. Final – December 2015. Pages 3-15, 3-29, 3-30, and Figure 3-2. Prepared by the U.S. Department of the Navy, Naval Facilities Engineering Command Southwest. Prepared for the U.S. Department of the Navy, Naval Base Ventura County.

Ventura County Airport Land Use Commission 2000 — Airport Comprehensive Land Use Plan for Ventura County, Final Report. Prepared by Coffman Associates, Inc. for the Ventura County Airport Land Use Commission. Adopted July 7, 2000. Available: http://www.goventura.org/sites/default/files/2000-airport-land-use-for-ventura-county.pdf. Accessed March 1, 2016.

Ventura County General Services Agency 2004 — *Ventura County Historical Landmarks and Points of Interest*. April 2004.

Ventura County Transportation Commission 2009 — Ventura County Congestion Management Program, 2009 Update, Final Report. Prepared by COH & Associates, Inc. for the Ventura County Transportation Commission. Adopted by the VCTC July 10, 2009. Available: http://www.goventura.org/?q=congestion-management-program-cmp. Accessed March 1, 2016.

WRA Environmental Consultants 2007 — Final Biological Assessment, Ormond Beach, Oxnard, Ventura County, CA. July 2007. Page 1 and 4 and Figure 2. Prepared for Aspen Environmental Group, Agoura Hills, CA. Prepared by WRA Environmental Consultants, San Rafael, CA.

ALTERNATIVES APPENDIX-1: STAFF CONTRIBUTORS TO THE COMPARATIVE ANALYSIS OF ALTERNATIVES FOR PUENTE

This appendix lists staff responsible for specific technical analyses in the **Alternatives** section of this staff assessment. Staff names are listed with their area of expertise.

Technical Area	Staff
Air Quality and Greenhouse Gas Emissions	Gerry Bemis, P.E. Matthew Layton, P.E. David Vidaver
Biological Resources	Carol Watson Jon Hilliard
Cultural Resources	Thomas M. Gates, Ph.D. Matthew Braun Melissa Mourkas
Environmental	Eric Knight, Environmental Office Manager
Geology and Paleontology	Paul Marshall, CEG Garry Maurath, CEG
Hazardous Materials Management	Brett Fooks, P.E. Geoff Lesh, P.E.
Land Use	Steven Kerr Ashley Gutierrez
Noise and Vibration	Shahab Khoshmashrab, P.E.
Power Plant Engineering	Matthew Layton, P.E. Shahab Khoshmashrab, P.E. Edward Brady, P.E.
Public Health	Huei-An (Ann) Chu, Ph.D.
Socioeconomics and Environmental Justice Demographics	Lisa Worrall
Soil and Water Resources	Marylou Taylor, P.E.
Traffic and Transportation	Jonathan Fong John Hope
Transmission System Engineering	Laiping Ng Mark Hesters
Transmission Line Safety and Nuisance	Huei-An (Ann) Chu, Ph.D.
Visual Resources	Jeanine Hinde
Waste Management	Paul Marshall, CEG
Worker Safety and Fire Protection	Brett Fooks, P.E. Geoff Lesh, P.E.

BIOLOGICAL RESOURCES

Testimony of Carol Watson and Jon Hilliard

SUMMARY OF CONCLUSIONS

The proposed Puente Power Project (Puente or project) would replace, and be constructed on the site of, the existing Mandalay Generating Station (MGS), an operating power plant in the city of Oxnard, California. Vegetation on-site is largely limited to invasive species such as slenderleaf iceplant; however, one rare plant species, woolly seablite (rare within California), occurs on-site. No special-status wildlife are expected to occur on-site; however, immediately adjacent dune habitat associated with the existing MGS process and stormwater outfall structure and other natural areas support special-status species including critical habitat for the western snowy plover (federally-listed threatened) and nesting habitat for the California least tern (federally and state-listed endangered). Additionally, the proposed project site supports approximately two acres of wetlands under the jurisdiction of the California Coastal Commission.

Construction, demolition, and operation of the project would result in various effects to biological resources on and near the site. California Energy Commission staff concludes that with implementation of the proposed conditions of certification, direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels and the project would comply with all applicable laws, ordinances, regulations, and standards (LORS). **Biological Resources Table 7** in the "Conclusions" subsection below contains a summary of the proposed project's impacts, applicable conditions of certification, and determination of significance for each impact area.

INTRODUCTION

The **Biological Resources** section of this document provides staff's analysis of potential impacts to biological resources from the construction and operation of the proposed project. This analysis addresses potential impacts to special-status species, wetlands and other waters of the U.S., and areas of critical biological concern. Information contained in this document includes a detailed description of the existing biotic environment, an analysis of potential impacts to biological resources and, where necessary, specifies mitigation measures (in the form of conditions of certification) to reduce impacts to less than significant levels. Additionally, this analysis assesses compliance with applicable LORS.

This analysis is based, in part, on information provided in the project Application for Certification (15-AFC-01) (PPP 2015a), Data Adequacy Supplement (PPP 2015b), responses to staff and interveners data requests (PPP 2015c, PPP 2015f, PPP 2015j, PPP 2015m, PPP 2015t, PPP 2015y, PPP 2016d), staff's observations during site visits of the proposed project site on May 18, 2015, November 19, 2015, and September 28, 2016, comments from the Preliminary Staff Assessment (PSA) scoping period, and ongoing communications with the responsible agencies: California Department of Fish and Wildlife (CDFW), the California Coastal Commission (Coastal Commission), and the U.S. Fish and Wildlife Service (USFWS).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicant must comply with the LORS listed in **Biological Resources Table 1** during project construction, demolition, and operation.

Biological Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Take of federally listed species as defined in the Act is prohibited without incidental take authorization, which may be obtained through Section 7 consultation (between federal agencies) or Section 10 Habitat Conservation Plan. The administering agencies are the USFWS and National Marine Fisheries Service.
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26))	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (Corps) for a discharge from dredged or fill materials into Waters of the U.S., including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants.
Migratory Bird Treaty (Title 16, United States Code, sections 703 through 711)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird including nests with viable eggs). The administering agency is the USFWS.
Marine Mammal Protection Act (Title 16, United States Code, Chapter 31)	Protects all marine mammals, including cetaceans (whales, dolphins, and porpoises), pinnipeds (seals and sea lions), sirenians (manatees and dugongs), sea otters, and polar bears within the waters of the United States. The National Marine Fisheries Service is responsible for the protection of cetaceans and pinnipeds; the United States Fish and Wildlife Service is responsible for the protection of sea otters. The MMPA established a moratorium on the taking of marine mammals in U.S. waters. It defines "take" to mean "to hunt harass, capture, or kill" any marine mammal or attempt to do so.
State	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species. The administering agency is CDFW.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered. The administering agency is CDFW.
Fully Protected Species (Fish and Game Code sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also Title 14, California Code of Regulations, section 670.7). The administering agency is CDFW.
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 of any bird. The administering agency is CDFW.

Applicable LORS	Description
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds. The administering agency is CDFW.
Lake and Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process. The administering agency is CDFW.
California Coastal Act (Public Resources Code, section 30231)	The 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 waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams. The administering agency is the California Coastal Commission.
California Coastal Act (Public Resources Code, section 30233)	The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects. The administering agency is the California Coastal Commission.
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.	Designates state rare and endangered plants and provides specific protection measures for identified populations. The act also includes a salvage provision, enabling CDFW to collect rare and endangered plants from properties in advance of construction or other activities that would destroy the plants. The administering agency is the CDFW.
Porter-Cologne Water Quality Control Act	Regulates discharges of waste and fill materials to waters of the state, including "isolated" waters and wetlands.
Local	
City of Oxnard Coastal Land Use Plan policies 6d, 6e; 10a-d, 10g	Encourages preservation and management of biotic resources, including special-status species. The administering agency is the city of Oxnard.
City of Oxnard General Plan §17-20, (A)(3)	Places constraints on sensitive habitat areas, but does not supersede CDFW and USFWS requirements. The administering agency is the city of Oxnard.

SETTING

PROJECT OVERVIEW

The project would be built within the boundary of the MGS, an existing power plant and brownfield site. Currently, the MGS consists of three operating generation units; Units 1 and 2, including the 200-foot tall exhaust stack would be decommissioned and demolished following completion and commissioning of the project. Unit 3 would continue to operate and draw process water through the Edison Canal.

Natural gas delivery would be via an approximately 500-foot long new pipeline connecting to an existing gas supply pipeline on the site.

The transmission line interconnection would be approximately 250 feet in total length, from the generator step-up transformer to the 220-kV tie-in-point at the take-off structure. The interconnection would mostly lie within the Puente site, but would cross a small portion of the MGS site. The existing transmission line from the Southern California Edison's (SCE) Mandalay Switchyard to an existing transmission structure across and east of Harbor Boulevard would be rerouted/reconfigured from the new take-off structure to the transmission system, thereby bypassing the Mandalay Switchyard.

Potable process water and domestic water would be provided via an existing water line and connection on the MGS property. Process wastewater would pass through a new oil/water separator, stored in one of the existing MGS retention basins, and ultimately discharged to the Edison Canal via a new 18-inch-diameter pipeline. A new pump vault would be constructed west of the South retention basin to transfer storm water and wastewater to the Edison Canal. Storm water would be directed to one of the existing MGS retention basins, where the water would be reused on-site for industrial purposes (i.e., evaporative cooling for the project unit), and/or irrigation purposes to the extent feasible and practical. Surplus storm water would be comingled with process wastewater then discharged to the Edison Canal via a new 18-inch-diameter pipeline. Sanitary wastewater would continue to be discharged to the existing MGS septic system. The reconfigured wastewater and stormwater systems would be installed during the project construction period.

The outfall structure to the Pacific Ocean would no longer be used, and would be demolished. Demolition of the outfall would occur through plugging the circulating water pipes that connect to the outfall with concrete, and removing the outfall, wing walls, riprap, and chain link fencing. Demolition of the outfall would occur during demolition of Units 1 and 2, using similar equipment.

Approximately 4.7 acres of the MGS site would be used for construction laydown, parking, and an office building. Approximately 0.9 acre of the 4.7 acres is currently paved. The remaining unpaved areas to be used for construction laydown and parking areas would be graded (as necessary), and surfaced with 4 inches of crushed rock. A construction laydown area would be established approximately 100 feet south of the Edison Canal, in the southern portion of the MGS site. The vegetation in the overflow area exhibits signs of chronic disturbance, and is likely mowed on a periodic basis. Vegetation in this area was mapped as ruderal; and no special-status plants or wildlife are expected to occur here.

REGIONAL SETTING

The project would be sited on approximately 3 acres of the northern portion of the existing 36-acre MGS property. The existing MGS facility is in an industrial area that includes oil drilling and processing operations nearby, as well as the SCE-owned McGrath power plant and a transmission switchyard.

The primary land uses and habitat types within the area consist of agriculture, industry, and remnant native vegetation. An extensive beach-dune complex runs along the Oxnard coast. The entire region has been subject to significant human modifications, primarily intended to drain lowlands for agriculture, and other uses such as oil production. Combined with upstream dam installation, sediment yields have dropped and coastal erosion is now a significant issue in some parts of the region (see the **Soil & Water Resources** section of this Final Staff Assessment (FSA).) Extensive urban development throughout the region has replaced most of the natural open space. Wetlands within the area historically were part of a salt marsh and brackish water lagoon and dune system. These lagoons were located behind a narrow sandy barrier beach of low dunes and were fed by water from creeks, surface flow over the plain, and inundated by salt water during high tides or storms. Periodically, the barrier beach was breached by discharge of meandering river flows or the action of winter storm waves. Some of the lagoons likely remained open to the ocean for a period after the breaching event. Tidal connections have likely always been muted by a beach sill. Some high-salinity (hyperhaline) wetlands may have formed naturally, in lowland areas where occasional tidal flushing occurs.

The site receives most of its water as runoff from inland sources and, historically, from adjacent high water table at McGrath Lake. Historically, the Santa Clara River floodplain flow path to the ocean meandered back and forth, depositing alluvium and leaving small freshwater lakes such as McGrath Lake, and sometimes leaving brackish lagoons at old locations. A brackish dune of such origin exists at Seaside Park. Some of these remain closed lagoons. The Santa Clara River mouth is approximately two miles north of the project.

The project site is at the seaward edge of the broad Santa Clara River alluvial plain in the city of Oxnard, adjacent to Mandalay State Beach. The site is bordered by sandy beach, sand dunes, and the Pacific Ocean to the west, McGrath Lake State Park and land owned by SunCal to the north, industrial uses to the north, south, and east, and agricultural uses farther to the east. The site is approximately 2 miles south of the Santa Clara River mouth, and approximately 12 miles northwest of Mugu Lagoon. McGrath State Beach (which includes McGrath Lake) is approximately 450 feet from the site's northern boundary.

Historically, the shoreline between the mouth of the Santa Clara River and Mugu Lagoon consisted of sandy beaches, freshwater marshes, McGrath Lake, sand dunes, and an extensive series of mostly closed brackish to saline lagoons, seasonal ponds, salt flats, and salt/brackish marshes (Beller et al., 2011).Please see **Biological Resources Figure 1, Regional Vegetation Map**. The extent of the system has been significantly reduced, but remnants of these habitats remain. Below is a more in-depth summary of each of these nearby habitat types; excerpted from the AFC (PPP 2015a) and verified by staff.

Sandy Beach

The project site is situated in close proximity to the Pacific Ocean, and abuts a long, sandy beach and dune system. The beach adjacent to the project site varies in width, but is generally greater than 300 feet wide. Hummocks of sand dunes separate the

beach from the inland flat areas that are in cultivated agriculture or are developed. The dunes vary in height, with the highest being about 30 feet above mean sea level. The inland flats between the dunes and Harbor Boulevard are about 10 to 16 feet above mean sea level (California Department of Parks and Recreation, 1979). The beaches in the area support colonies of nesting California least tern (*Sterna antillarum browni*) (federally-endangered; state-threatened) and western snowy plover (*Charadrius nivosus nivosus*) (federally-threatened and a California Species of Special Concern).

McGrath Lake

McGrath Lake is a natural freshwater lake that occurs in a low spot between parallel ridges of sand dunes north of the project site. Currently, the southwestern tip of McGrath Lake is approximately 450 feet from the northwestern corner of the site. Tile drains were installed in the region to facilitate the development of farms, which greatly reduced the extent of flooded soils, and consequently, wetlands. In 1958, Harbor Boulevard was built east of the park and lake, further disrupting the hydrological inputs to McGrath Lake. Under current conditions, the lake receives water from tile drain discharge, irrigation runoff, and storm water from agricultural operations in the sub-watershed. An artificial discharge of lake water to McGrath State Beach occurs through the use of pumps to minimize flooding the fields east of Harbor Boulevard (California State Water Resources Control Board, 2010). Restoration opportunities exist at the Lake in the form of wetlands restoration, currently in process by SCE.

Sand Dunes

A topographic map of dunes near McGrath Lake drawn in 1855 indicates dune tussocks and alkaline grassland (probably populated by saltgrass) in the depressions, and willows on the higher portions of the dunes. Researchers have deduced that in the early 1800s, the project site itself was sand dunes, with scattered alkali meadows in the low spots between the dunes (Beller et al., 2011). Plants recorded on the dunes near Mandalay Beach in the 1930s include yellow bush lupine (*Lupinus arboreus*) and pink and red sand verbena *(Abronia umbellata* and *A. maritima*), among many others (Beller et al., 2011). The dunes currently support special-status animals, including globose dune beetle (*Coelus globosus*) and silvery legless lizard (*Anniella* sp.)

Saltwater Marsh

Saltwater marsh, vegetated by pickleweed, jaumea, and saltgrass, is present between the campground at McGrath State Beach and the river mouth. Drainage of the marsh is controlled by a flood gate at the intersection of the levee and the dunes (California Department of Parks and Recreation, 1979). The marsh supports Ventura marsh milk-vetch (*Astragalus pycnostachyus* var*. lanosissimus*), saltmarsh bird's-beak (*Chloropyron maritimum*), black rail (*Laterallus jamaicensis*), and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Lagoons

An extensive series of lagoons between the Santa Clara River mouth and Mugu Lagoon was mapped in the 1850s. These maps depict the lagoons as a series of open water/salt flat/marsh complexes separated from the ocean by tall and wide sand dunes. None of the lagoons are shown with a tidal outlet. They probably opened infrequently,

and would today be considered perched or dune-dammed lagoons. Some of them supported Ventura marsh milk-vetch and saltmarsh bird's-beak (Beller et al., 2011).

Santa Clara Estuary Natural Preserve

Within McGrath State Beach is the 133-acre Santa Clara Estuary Natural Preserve, located approximately two miles north of the project site. The Natural Preserve is primarily within the Santa Clara River bed between the Pacific Ocean and North Harbor Boulevard Bridge. Nine separate ecosystems occur at McGrath State Beach, including the river, freshwater marsh, brackish marsh, coastal dune, ocean, sandy beach, estuary, coastal freshwater back dune lake, and riparian woodland. These habitats host a wide variety of wildlife and plants. Recreation use is limited to passive activities (e.g., nature observation, hiking). The McGrath State Beach campground is closed to the public due to extensive flooding by the Santa Clara River and the resulting damage.

Santa Clara River Parkway

Proposed by the California Coastal Conservancy (2000), the restoration of the Parkway would encompass over 6,000 acres, and would include a 15-mile-long park and wildlife preserve. Located north of the project site, it would extend from the Pacific Ocean, along the river and to the South Mountain, covering riverine and estuarine habitat. This area is habitat for nine endangered species and threatened species, including the southern steelhead, least Bell's vireo, southwestern willow flycatcher, tidewater goby, western snowy plover, California least tern, and Ventura marsh milkvetch. The Santa Clara River is the "longest and potentially the most significant river in southern California because of its natural functions and restoration potential" (CA Coastal Conservancy, 2000). Additionally, the Santa Clara River mouth, including the estuary (as lagoon and mudflats), riparian vegetation, and adjacent beach and dunes are designated a California Important Bird Area (Cooper, 2001). Important bird areas carry no formal habitat designation, but are used to prioritize conservation opportunities (Cooper, 2001).

Ormond Beach

The Ormond Beach area presents a significant wetland restoration opportunity in the region, and it has been prioritized by a number of agencies for conservation and restoration. Over 1,500 acres of habitat are currently being restored and others are planned for restoration (NRG 2015b) (Aspen Environmental Group 2009). In general, the area supports a large number of special-status plant and wildlife species, and the area has the opportunity to be expanded. The study area for restoration includes a maximum of approximately 1,750 acres.

Although the wetlands expansion is still being planned, the wetlands and marshes in the vicinity of the site are expected to support diverse and abundant species in the Study Area; surveys have documented the presence of several state and federally-listed birds (e.g., the western snowy plover, California least tern, and Belding's savannah sparrow) (WRA Environmental Consultants 2007).

Environmentally Sensitive Habitat

The California Coastal Act defines “environmentally sensitive area”, or ESHA, as: “Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments” (Pub. Resources Code, § 30107.5). There are three important elements to the definition of ESHA (CCC 2003). “First, a geographic area can be designated ESHA either because of the presence of individual species of plants or animals or because of the presence of a particular habitat. Second, in order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable. Finally, the area must be easily disturbed or degraded by human activities.” Under the Coastal Act, ESHAs "shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas" (Pub. Resources Code, § 30240(a)).

Environmentally sensitive habitat in the vicinity (1-mile radius) of the project site include: Coastal and Valley Freshwater Marsh, Southern California Coastal Lagoon, Southern Coast Live Oak Riparian Forest, Southern Coastal Salt Marsh, and Southern Riparian Scrub (CDFW, 2015). These habitat types do not occur on the site, nor does the Coastal Commission consider the onsite wetlands to constitute an ESHA (CCC, 2016a). The Coastal Land Use Plan (LUP)(COO 1982) for the City of Oxnard (Figure 2.3, Sensitive Habitats Map amendment, and Figure 2.4, Coastal Access Map Amendment) shows portions of the McGrath parcel mitigation area to the north of the project as resource protection areas, but does not characterize the project site as an ESHA. Coastal and Valley Freshwater Marsh is mapped within 500 feet to the north of the project site (AFC, Figure 4.2-3, PPP 2015a); and Southern Coastal Salt Marsh has been mapped within 1.5 miles south of the site. The project would not require any work in these habitats.

Critical Habitat

Critical habitat is a formal designation under the Endangered Species Act. It is a specific geographic area that contains features essential for the conservation of a federally-threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but is needed for its recovery. Critical habitat for the following four federally-listed species is located in the regional vicinity of the proposed project. See **Biological Resources Figure 2, USFWS Critical Habitat**.

Ventura Marsh Milk-Vetch (*Astragalus pycnostachyus var. lanosissimus*)
Critical habitat for the Ventura marsh milk-vetch has been documented in four places near the project site: 1) the Santa Clara River mouth; 2) McGrath State Beach; 3) in Oxnard at the northeastern corner of West 5th Street and Harbor Blvd, 90 meters north of 5th Street; and 4) in Oxnard 150 meters northeast of the intersection of West 5th Street and Harbor Boulevard (CCH, 2015). This species was not observed on the project site during botanical surveys.

Tidewater Goby (Eucyclogobius newberryi)
Critical habitat for the tidewater goby has been documented in the Santa Clara River estuary and the Oxnard Drain ("J Street Canal"), the Ormond Beach area, and southeast of Port Hueneme (CDFW, 2015a). This species could occur in Edison Canal.

Western Snowy Plover (*Charadrius nivosus nivosus*)
Critical habitat for the western snowy plover is designated on the beaches and dunes west, northwest, and southwest of the project site (USFWS, 2012; and PPP 2015a, Figure 4.2-3; **Biological Resources Figure 2**). The beaches and sand dunes within Mandalay State Beach and McGrath State Beach in the immediate vicinity of the project site support both wintering populations and breeding populations of this species (California State Parks, 2013). There is no suitable habitat for the species on the project site. However, the northwest corner of the project site is approximately 500 feet from the closest potential nesting area.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)
Critical habitat for the southwestern willow flycatcher occurs in the riparian zone and associated marshes for the length of the Santa Clara River that is within the 10-mile buffer of the project site, as well as McGrath Lake. There is no suitable habitat for the species on the immediate project site.

PROJECT SITE AND VICINITY DESCRIPTION

The applicant used a combination of aerial photography, a literature review, and available databases to identify habitat that could support special-status plants or animals. In addition to a literature review, biological surveys were performed January 12, 2015, and botanical and wildlife surveys of the site and surrounding vicinity were conducted on March 12 and 31, 2015. Staff has reviewed and verified this information, and additionally, has performed an independent literature review, and evaluated and verified the credentials of the applicant's consultants that performed supporting biological survey efforts and reporting (PPP 2015a, Volume II, Appendix D).

Staff visited the site on March 18, 2015, November 19, 2015, and September 28, 2016, to review onsite features and confirm the findings of the applicant's biological report (AFC, Volumes 1 and 2; PPP 2015a). The following description of existing biological resources presents the results of staff and project owner's project-site specific investigations.

Vegetation/Land Cover Types

The proposed project site and laydown area are industrial. The majority of the project area is paved. The site itself has been graded and subjected to various human uses in the past, and the vegetation is significantly disturbed. Vegetation on the site was historically kept to a minimum, and at times the site was almost completely covered with stockpiles of soil.

Vegetation within 1,000 feet of the project site and laydown areas includes a variety of natural and anthropogenic vegetation communities. See **Biological Resources Figure 3, Vicinity Vegetation Map**. Some areas are unvegetated, either naturally or due to land use and restoration practices; these include open water at McGrath Lake and the

Pacific Ocean, the sandy beaches, and developed hardscape. Vegetation communities and land covers observed within 1,000 feet of the proposed site are as follows (excerpted from the AFC [PPP 2015a] and verified by staff):

Agricultural

In the vicinity of the project site, agricultural lands occur on the east side of Harbor Boulevard, north of the site. This habitat supports a variety of common plants and wildlife, and may support foraging birds and raptors.

Arroyo Willow Thickets (*Salix lasiolepis*)

Arroyo willow thickets occur on stream banks, benches, seeps, and along drainages (Sawyer et al., 2009), and are identified by the CDFW (2010) as a sensitive natural community. This community occurs north of the project site, in association with the McGrath Lake ecosystem and localized topographic depressions (ESA, 2003).

California Bulrush Marsh (*Schoenoplectus californicus*)

In the vicinity of the project site, California bulrush marsh occurs on the margins of McGrath Lake, between the open water habitats and the surrounding scrub habitats. California bulrush marsh maintains no sensitivity designation, but is generally regarded as a riparian community and afforded consideration in environmental analyses under the California Environmental Quality Act (CEQA).

California Sagebrush Scrub (*Artemisia californica*)

Within 1,000 feet of the project site, this community occurs only adjacent to the McGrath Peaker Plant as a strip of native landscaping that has been planted along Harbor Boulevard.

Developed

In the vicinity of the project site, developed areas include the existing MGS facility, the adjacent McGrath Peaker Plant, Harbor Boulevard, and other smaller structures and areas of hardscape.

Dune Mats (*Abronia latifolia-Ambrosia chamissonis*)

This community occurs west and north of the project site (ESA, 2003). Dune mats are identified by the CDFW (2010) as a sensitive natural community, and are located on dune systems.

Ice Plant Mats (*Carpobrotus edulis*)

The project site is dominated by nonnative iceplant mats, and this community also occurs on the adjacent state beach property to the north (ESA, 2003) and much of the surrounding land. In some portions of the project site, woolly seablite (*Suaeda taxifolia*) occurs as a dominant species, along with the iceplant species described above. Similarly, one area south of the MGS facility contains ice plant mats co-dominated by nonnative Mediterranean grasses.

Mock Heather Scrub (*Ericameria ericoides*)

Mock heather scrub was mapped in three areas near the project site, including one area to the north, one area to the east, and one area to the south

Mule Fat Thickets (*Baccharis salicifolia*)

Mule fat thickets occur adjacent to the northern perimeter of the MGS site, in association with the McGrath Lake ecosystem. During field surveys conducted in March 2015, habitat restoration efforts were observed to be underway in this area. This wetland community has no sensitivity designation, but is generally regarded as a riparian community and afforded consideration in environmental analysis pursuant to CEQA.

Myoporum Grove (*Myoporum laetum*)

In the vicinity of the project site, only one myoporum grove was mapped; the area occurs immediately adjacent to the eastern site boundary. Although nonnative, myoporum groves may provide suitable habitat for nesting birds.

Ornamental

In the vicinity of the project site, ornamental vegetation is present along both sides of the entry drive to the MGS facility. This vegetation likely provides limited habitat for wildlife, and is unlikely to support rare plant species.

Ruderal

In the vicinity of the project site, ruderal vegetation occurs south of Edison Canal, including throughout the proposed laydown area. Undeveloped portions of the adjacent SCE McGrath Peaker Plant site also exhibit ruderal vegetation.

Sandy Beach

Despite the absence of vegetation, sandy beaches can provide valuable habitat features for some species, such as western snowy plover and California least tern.

Wetlands and Other Jurisdictional Waters

Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates “Waters of the United States” under Section 404 of the Clean Water Act. “Waters of the U.S.” are defined broadly as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 C.F.R., § 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands stated in the Corps of Engineers Wetlands Delineation Manual (1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as “other waters” and are often characterized by an ordinary high water line. Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into “Waters of the U.S.” (including wetlands) generally requires an individual or

nationwide permit from the Corps under Section 404 of the Clean Water Act. The Edison Canal and the ocean outflow structure are a water of the U.S.

Waters of the State

"Waters of the State" are defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope, but has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404. "Waters of the State" are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act.

Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact "waters of the state," are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to waters of the state, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

Waters of the state are also regulated by the CDFW, pursuant to Section 1600 of California Fish and Game Code. The Fish and Game Code regulates activities that could divert, obstruct, or change the natural flow or the bed, bank, or channel of any river, stream, or lake. The Edison Canal is a water of the state.

Coastal Zone Wetlands

Rather than utilizing a three-parameter approach (presence of hydrophytic vegetation, wetland hydrology, and hydric soils) used at the federal level by the Corps, the Coastal Act defines "wetlands" more broadly. This definition is generally referred to as the "one parameter approach," which requires the presence of only one wetland indicator, i.e. plants, hydrology, or soils. The Coastal Act defines wetlands as:

> *"Wetland means lands within the Coastal Zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.* (Pub. Resources Code § 30121)

The California Coastal Commission has also adopted the following definition of a Wetland (Cal. Code, Regs., tit. 14 § 13577):

> *Wetlands are lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent or drastic fluctuations of surface water levels, wave action, water flow, turbidity or high*

concentrations of salt or other substance in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deepwater habitats.

The project site has been actively maintained to facilitate operation of existing power generation and has experienced varied uses such as a marine dredging spoils storage; and therefore does not support wetlands or other waters under the jurisdiction of the Corps or CDFW. The applicant delineated an area within the site and found that it potentially could be considered to contain hydrophytic vegetation, one of the three parameters for classification as a wetland under Coastal Commission regulations. Pickleweed, woolly seablite, and slenderleaf ice plant were each found on-site, are each considered hydrophytic plants, and are listed on the Corps' wetland plant list (Lichvar et al 2014). The applicant's consultant has mapped the location of approximately 1,000 occurrences of woolly seablite scattered randomly across the entire proposed 3-acre project site.

Historical soil surveys of the project area establish the fact that the area has likely not supported a wetland within recent history. The November 1969 U.S. Department of Agriculture soils map shows the greater coastal zone along Ventura County as historically consisting of Riverwash-Sandy alluvial land-coastal beaches association, with excessively drained to poorly drained soils of alluvial fans, plains, and basins. Soils specifically mapped onsite are Coastal Beaches (CnB), with soils consisting of aeolian deposits derived from beach sand, and soils immediately adjacent to the site are also CnB along with Hueneme sandy loam (Hn); derived from sedimentary rock, and are both poorly drained soils (PPP 2015a, Figure 4.11-1). In contrast, hydric soils are typically flooded or inundated for a long duration during the growing season, or have water tables no more than 1.5 feet from the surface (Wetland Training Institute 1989). Depth to groundwater at the project site is five to nine feet (PPP 2015a: page 4.15-3). The Natural Resources Conservation Service (NRCS) states that native vegetation associated with this soil type are salt-tolerant forbs and grasses (NRCS 2015). Remnant plants of historic southern dune vegetation have been documented on the site (PPP 2015a), in the general vicinity at Mandalay State Beach (CCC 2007a), and east of Harbor Boulevard adjacent to the project site (CCC 2007b). Further, the entire Oxnard coast was a complex of narrow, sandy, barrier beaches and low dunes interspersed with lagoons, marshes, and flats (Griggs et al 2005). It is this low beach dune barrier system that allows the freshwater McGrath Lake to sit on the beach, on a confined aquifer system (Griggs et al 2015).

Plants are given terms to describe the percentage of time that they occur in wetlands (Lichvar et al 2014), and only one of the three hydrophytic plants, pickleweed, is nearly always restricted to wetlands. Slenderleaf iceplant and woolly seablight may grow on upland soils as well, see **Biological Resources Table 2**. The applicant's wetland delineation (PPP 2015a: Appendix D, Wetland Determination Data Forms) also documented upland plants, such as coyote brush, within the same area. No other wetland indicators, such as hydric soils or wetland hydrology were documented during the applicant's wetland delineation.

Biological Resources Table 2
Wetland Indicator Status

Indicator Code	Indicator Status	Designation	Comment	Representative On-site Plant
OBL	Obligate Wetland	Hydrophyte	Almost always occur in wetlands	Pickleweed
FACW	Facultative Wetland	Hydrophyte	Usually occur in wetlands, but may occur in non-wetlands	Woolly seablite
FAC	Facultative	Hydrophyte	Occur in wetlands and non-wetlands	Slenderleaf iceplant
FACU	Facultative upland	Nonhydrophyte	Usually occur in non-wetlands, but may occur in wetlands	Russian thistle
UPL	Obligate upland	Nonhydrophyte	Almost never occur in wetlands	Coyote brush

Staff reviewed and confirmed the presence of woolly seablite, other on-site vegetation, and general condition of the proposed project site and immediately adjacent environs during a May 19, 2015 site visit. On November 19, 2015 staff met the Coastal Commission biologist on-site to survey potential wetlands and evaluate the project site according to Coastal Commission regulations. The Coastal Commission prepared a staff report (30413(d)) containing final analysis and jurisdictional determination (CCC, 2016). Staff has reviewed this report and found the Coastal Commission determined that approximately 2.03 acres of the project site should be classified as a wetland pursuant to Coastal Commission regulations.

The CDFW has stated that areas mapped as coyote brush scrub onsite may also be considered a type of dune swale wetland, as described in Ferren, Fiedler, and Leidy (1995) (CDFW 2016). Coyote brush (*Baccharis pilularis*) and mule fat (*Baccharis salicifolia*) are species of plants that function as phreatophytes in dune swale wetlands, pulling water from the capillary layer above the perched aquifer. Staff has confirmed that coyote brush scrub (Ferren, Fiedler, and Leidy 1995) is classified as Type 50.253: palustrine scrub-shrub broadleaved-evergreen (*Baccharis pilularis*) seasonally-saturated or phreatophytic dune swale wetland, and approximately 0.52 acre of coyote brush scrub occur on the project site, immediately adjacent to the Coastal Commission defined wetlands. No hydric soils or hydrology exists here, so this vegetation type does not qualify as a state or federally-regulated wetland; Ferren Fiedler and Leidy also note that wetland type 50.253 does not qualify as a defined wetland. Staff notes the presence of the vegetation type as indicative of a mosaic of habitat types potentially present in the area absent anthropogenic interference.

Wildlife

The majority of the MGS site is composed of impervious surfaces (i.e., buildings, tanks, and paved lots/roads) that have little to no wildlife value. In combination with the frequency and intensity of disturbance from operation of the MGS, the proposed project site does not provide important habitat for native wildlife. Species observed within the proposed project site include California ground squirrel (Otospermophilus beecheyi), house finch (Carpodacus mexicanus), house sparrow (Passerculus domesticus), and western fence lizard (Sceloporus occidentalis). Other birds protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code, but without other special-status listing, such as killdeer (Charadrius vociferous), doves (Zenaida sp.), and sparrows (*Passerculus* sp.) may nest in open areas and in unused structures on the MGS site; ruderal areas on the site may provide limited foraging and nesting habitat for these species.

The adjacent offsite McGrath Lake and adjacent wetlands provide habitat for a great diversity of common wildlife species. Species observed in this habitat include American crow (*Corvus brachyrhynchos*), barn swallow (*Hirundo rustica*), common yellowthroat (*Geothlypis trichas*), double-crested cormorant (*Phalacrocorax auritus*), European starling (*Sturnus vulgaris*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), gull (*Larus sp.*), killdeer (*Charadrius vociferous*), mourning dove, rock pigeon (*Columba livia*), snowy egret (*Egretta thula*), and turkey vulture (*Cathartes aura*).

The open water of Edison Canal may provide habitat for common coastal saltwater fishes. Freshwater aquatic species such as the western pond turtle (*Actinemys marmorata*) are not expected to occur in the canal due to elevated salinity levels, but may disperse through the area, and the tidewater goby (*Eucyclogobius newberryi*) is not expected in the canal due to high salinity levels. The Edison Canal may also provide foraging habitat for sensitive birds such as California least tern and a variety of water fowl, including mallards (*Anas platyrhynchos*) and American coot (*Fulica americana*). No aquatic habitat occurs in the project site or proposed laydown areas, and aquatic species are not expected to occupy these areas.

The site is a former dune location that is currently dominated by iceplant and other non-native vegetation. Wildlife species that could be present include western toad (*Bufo boreas*), Baja California treefrog (*Pseudacris hypochondriaca hypochondriaca*), Blainville's horned lizard (*Phrynosoma blainvillii*), terrestrial gopher snake (*Pituophis catenifer*), common garter snake (*Thamnophis sirtalis*), western rattlesnake (*Crotalus viridis*), western fence lizard (*Sceloporus occidentalis*), side-blotched lizard *(Uta stansburiana*), mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), song sparrow (*Melospiza melodia*), white-crowned sparrow (*Zonotrichia leucophrys*) and western scrub jay (*Aphelocoma californica*), among others. Large and medium-sized mammals are not expected to occur on site, due to the existing facility fencing.

SPECIAL-STATUS SPECIES

Special-status species are plant and wildlife species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique

habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Federally or state-listed, proposed, or candidate for listing, as rare, threatened or endangered under the Endangered Species Act or California Endangered Species Act;
- Protected under other state or federal regulations (e.g., Migratory Bird Treaty Act);
- Identified as a California Species of Special Concern by the CDFW;
- California Fully Protected Species;
- A plant species considered by the California Native Plant Society and CDFW to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1A, 1B, and 2) as well as CRPR 3 and 4 species;
- A plant listed as rare under the California Native Plant Protection Act;
- A locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region or is so designated in local or regional plans, policies, or ordinances; or
- Any other species receiving consideration during environmental review under CEQA.

Biological Resources Table 3 identifies the nearest occurrences of special-status species reported in the California Natural Diversity Database (CDFW 2013) and California Native Plant Society's (CNPS 2013) Inventory of Rare and Endangered Plants. The majority of the species would not be likely to occur on the project site.

Biological Resources Table 3
Special-status Species Known to Occur or Potentially Occurring in the Project Area

Common Name (*Scientific Name*)	**Status Fed/State/CRPR/ G-Rank/S-Rank**	**Potential for Occurrence in Project Impact Area***
PLANTS		
Ventura Marsh Milk-Vetch (*Astragalus pycnostachyus* var. *lanosissimus*)	**__/__/1B.1/G2T1 /S1**	**Low.** The iceplant and coyote brush on the project site are not suitable habitats for the species. Species was not observed during botanical surveys. Nearest documented occurrences were across the road from McGrath State Beach, the mouth of the Santa Clara River, northeast of the intersection of Harbor Boulevard and West 5th Street near McGrath State Beach, and Mandalay Beach.
Coulter's Saltbush (*Atriplex coulteri*)	**__/__/1B.2/G2/S 2**	**Low.** The remnant dunes on the site are marginally suitable habitat, but species was not detected during botanical surveys. The nearest documented occurrence was on a Coastal Bluff 1.5 miles west of the Ventura River.
South Coast Saltscale (*Atriplex pacifica*)	**__/__/1B.2/G3G4 /S2**	**Moderate.** The remnant dunes on the site are marginally suitable habitat, but species was not detected during botanical surveys. The nearest documented occurrence was 1.5 miles west of the Ventura River.
Davidson's Saltscale (*Atriplex*	**__/__/1B.2/G5T1**	**Moderate.** This species might occur along the road

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area*
serenana var. *davidsonii*)	**/S1**	edges and in other unvegetated parts of the site. Species was not detected during botanical surveys. The nearest documented occurrence was on the roadside of Ventura Boulevard north of Highway 101.
Salt Marsh Bird's Beak (*Chloropyron maritimum*)	**FE/SE/ 1B.2/G4T1/S1**	**Low.** This species occurs in natural wetlands and alkali flats. Species was not detected during botanical surveys. The nearest documented occurrences were near the mouth of the Santa Clara River, near McGrath State Beach, and Ormond Beach alkali flats.
Mexican Malacothrix (*Malacothrix similis*)	**__/__/2A/G2G3/ SH**	**Low.** Suitable habitat is not present on the site. Species was not detected during botanical surveys. The nearest documented occurrence was in the vicinity of Port Hueneme Beach Park in 1925. Likely extirpated.
Woolly Seablite (*Suaeda taxifolia*)	**__/__/4.2/G/S4**	**High.** Species was detected on-site during botanical surveys.
Red (Sticky) Sand Verbena (*Abronia maritima*)	**__/__/4.2/G4/S2 S4**	**Low.** The only marginally suitable habitat on-site is the loose sand along the edge of the road near the northern perimeter of the site, but species was not detected during floristic surveys. The nearest documented occurrences are at Mandalay Beach and McGrath State Beach.
Dunedelion (*Malacothrix incana*)	**__/__/4.3/G4/S4**	**High.** The species might occur in dunes adjacent to the site, but was not observed during site botanical surveys. The nearest documented occurrence was in the project vicinity.
Aphanisma (*Aphanisma blitoides*)	**__/__/1B.2/G3G4 /S2**	**Low.** Suitable habitat is not present on the site. Species was not detected during botanical surveys.
Coulter's Goldfields (*Lasthenia glabrata ssp. Coulteri*)	**__/__/1B.1/G4T2 /S2**	**Low.** Suitable habitat is not present on the site. Species was not detected during botanical surveys.
Estuary Seablite (*Suaeda esteroa*)	**__/__/1B.2/G3/S 2**	**Low.** Suitable habitat is not present on the site. Species was not detected during botanical surveys.
WILDLIFE		
Sandy Beach Tiger Beetle (*Cicindela hirticollis gravida*)	**__/__/__/G5T2/S 1**	**Low.** Suitable habitat is not present on the site. The nearest documented occurrence was McGrath State Beach just south of the mouth of the Santa Clara River.
Globose Dune Beetle (*Coelus globosus*)	**__/__/__/G1G2/S 1S2**	**Moderate.** The remnant dunes on the site might support this species. The nearest documented occurrences were near Point Mugu Naval Air Station, Ventura, Hueneme, and Ormond Beach.
Tidewater Goby (*Eucyclogobius newberryi*)	**FE/__/__/G3/S3**	**Low.** Suitable aquatic habitat is not present on the site. The nearest documented occurrences are Santa Clara River estuary, Oxnard drain (J Street canal), Ormond Beach Area, and southeast of Port Hueneme.
Western Pond Turtle (*Actinemys marmorata*)	**__/__/__/G3G4/S 3**	**Moderate.** Suitable habitat is not present on the site. The nearest documented occurrences include McGrath Lake and the Santa Clara River Estuary. The species may disperse through the site or occasionally cross the Edison Canal.
Silvery Legless Lizard (*Anniella pulchra* or *A. stebbinsii*)	**__/CSC/__/G3G4 T3T4Q/S3**	**Moderate.** Sparsely vegetated sandy soils could support this species. Most of the site is not suitable habitat. This species was not detected during wildlife

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area*
		surveys. The nearest documented occurrences were north of the MGS and east of McGrath Lake, and in loose sandy soils at the northern and southern boundaries of McGrath Lake (L. Hunt, unpub. data)
Coastal Whiptail (*Aspidoscelis tigris stejnegeri)*	**__/__/__/G5T3T4/S2S3**	**Low.** Could occur in the coyote brush scrub.
Blainville's (Coast) Horned Lizard (*Phrynosoma blainvillii*)	**__/__/__/G3G4/S3S4**	**Moderate.** Sparsely vegetated sandy soils could support this species. Most of the site is not suitable habitat. Species was not detected during wildlife surveys. The nearest documented occurrences were south of the Santa Clara River and southwest of intersection of Leland St./Auto Center Dr./Ventura Road; also within dune habitat north, east, and south of the project site (L. Hunt, unpub. Data).
Two-striped Garter Snake (*Thamnophis hammondii*)	**__/__/__/G4/S3S4**	**Moderate.** Shrub habitats could support this species. Most of the site is not suitable habitat. Species was not detected during wildlife surveys. The nearest documented occurrence was 0.28 mile west of the Ventura River, and this species may forage around McGrath Lake (L. Hunt, unpub data).
Tri-colored Blackbird (*Agelaius tricolor*)	**__/__/__/G2G3/S1S2**	**Low.** Suitable habitat is not present on the site. Emergent vegetation surrounding McGrath Lake could be suitable, but biology of this area has been monitored heavily with no records of tricolored blackbird.
Burrowing Owl (*Athene cunicularia*)	**__/__/__/G4/S3**	**Low.** Open, grassy areas and edges of dunes could support this species. Most of the site is not suitable habitat. Species was not detected during wildlife surveys. The nearest documented occurrences were 500 feet south of McGrath State Beach campgrounds, a burrow at the edge of gravel pile at end of service road, and Point Mugu Naval Air Station.
Ferruginous Hawk (*Buteo regalis*)	**__/__/__/G4/S3S4**	**Low.** Open, grassy areas could support this species. No suitable habitat on-site. Species was not detected during wildlife surveys.
Western Snowy Plover (*Charadrius nivosus nivosus*)	**FT/__/__/G3T3/S2**	**Low.** Suitable habitat is not present on the site. The nearest documented occurrences were Mandalay State Beach, McGrath State Beach, Ormond Beach, Oxnard Beach, Ventura Beach, and the mouth of the Santa Clara River.
Western yellow-billed Cuckoo (*Coccycus americanus occidentalis*)	**FT/SE/__/G5T2T3/S1**	**Low.** Suitable habitat is not present on-site.
California Horned Lark *(Eremophila alpestris)*	**__/__/__/G5T3Q/S3**	**Low.** Suitable habitat is not present on the site. Species was not detected during wildlife surveys.
Belding's Savannah Sparrow *(Passerculus sandwichensis Beldingi)*	**__/SE/__G5T3/S3**	**Low.** Suitable habitat is not present on-site.
California Brown Pelican *(Pelecanus occidentalis californicus)*	**D/D/__/G4T3/S3**	**Low.** Suitable habitat is not present on-site.

Common Name (*Scientific Name*)	**Status Fed/State/CRPR/ G-Rank/S-Rank**	**Potential for Occurrence in Project Impact Area***
Light-footed Ridgeway's Clapper Rail *(Rallus obsoletus levipes)*	**FE/SE/__/G5T1T 2/S1**	**Low.** Suitable habitat is not present on-site.
Southwestern Willow Flycatcher (*Empidonax traillii extimus)*	**FE/SE/__/G5T2/ S1**	**Low.** Suitable habitat is not present on the site. Species was not detected during wildlife surveys.
Bank Swallow *(Riparia riparia)*	**__/ST/__/G5/S2**	**Low.** Suitable habitat is not present on the site. Species was not detected during wildlife surveys.
California Least Tern (*Sterna antillarum browni*)	**FE/SE/__/G4T2T 3Q/S2**	**Low.** Suitable habitat is not present on the site. The nearest documented occurrences were the Santa Clara River mouth, McGrath Lake, and Ormond Beach between Ormond Beach Generating Station and Perkins Road.
California Black Rail (*Laterallus jamaicensis coturniculus*).	**__/ST/__/G3G4T 1/S1**	**Low.** Suitable habitat is not present on the site. The nearest documented occurrence was the mouth of the Santa Clara River.
Least Bell's Vireo *(Vireo bellii pusillus)*	**F3/SE/__/G5T2/S 2**	**Low.** Suitable habitat is not present on-site.
Pallid Bat *(Antrozous pallidus)*	**__/__/__/G5/S3**	**Low.** Suitable habitat is not present on-site.
Mexican Long-tongued Bat *(Choeronycteris Mexicana)*	**__/__/__/G4/S1**	**Low.** Suitable habitat is not present on-site.
Western Mastiff Bat *(Eumops perotis)*	**__/__/__/G5T4/S 3S4**	**Low.** Suitable habitat is not present on-site.
South Coast Marsh Vole *(Microtus californicus Stephensi)*	**__/__/__/G5T1T1 /S1S2**	**Low.** Suitable habitat is not present on-site.

Biological Resources Table 2 – Notes

*The project impact area includes areas that could be affected directly or indirectly by project impacts.

STATUS CODES:

State

CSC: California Species of Special Concern. Species of concern to CDFW because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

SE: State listed as endangered

ST: State listed as threatened

SFP: Fully protected

D: Delisted taxon that is considered recovered

SA: Special Animal. Species is tracked in the CNDDB (due to rarity, limited distribution in California, declining throughout the range, etc.) but holds no other special status at the state or federal level.

Federal

FE: Federally listed endangered: species in danger of extinction throughout a significant portion of its range

FT: Federally listed, threatened: species likely to become endangered within the foreseeable future

BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf

California Rare Plant Ranking (CRPR)

1A Presumed extirpated in California and either rare or extinct elsewhere

1B: Rare or endangered in California and elsewhere

2A: Presumed extirpated in California but more common elsewhere

2B: Rare or endangered in California but more common elsewhere

3: Plants for which we need more information- Review list

4:Plants of limited distribution – Watch list

0.1: Seriously threatened in California (over 80 of occurrences threatened/high degree and immediacy of threat)

0.2: Moderately threatened in California (20-80% of occurrence threatened/moderate degree and immediacy of threat)

0.3: Not very threatened in California (<20% of occurrence threatened/low degree and immediacy of threats or no current threats known)

Global Rank/State Rank

Global rank (G-rank) is a reflection of the overall condition of an element throughout its global range. Subspecies are denoted by a T-Rank; multiple rankings indicate a range of values

G1 = **Critically Imperiled** – At very high risk of extinction due to extreme rarity (often 5 or fewer populations)., very steep declines or other factors..

G2 = **Imperiled**- At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines or other

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area*
factors. G3 = **Vulnerable** - At moderate risk of extinction due to very restricted range, relatively few populations (often 80 or fewer), recent and widespread declines or other factors. G4 = **Apparently Secure**- Uncommon but not rare; some cause for long-term concern due to declines other factors.G5 = Secure-Common; widespread and abundant. **State rank (S-rank)** is assigned much the same way as the global rank, except state ranks in California often also contain the imperilment status only within California's state boundaries S1 = Critically Imperiled in state because of extreme rarity (often 5 or fewer populations) or because of other factors such as deep declines making it extremely vulnerable to extirpation from state. S2 =Imperiled in the state because of rarity due to very restricted range, few populations (often 20 or fewer) , steep declines , or other factors machining vulnerable to extirpation from state. S3 =Vulnerable in state due to restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state. S4 = Apparently secure – Unknown but not rare in the state; some cause for long-term concern due to declines or other factors. S5 = Secure – Common, widespread, and abundant in the state. **Potential Occurrence:** **High** – Suitable habitat is present within or near the proposed site: occurrence records exist for species in proximity to the site; species expected to occur on or near site **Moderate** – Low quality habitat is present within or near the proposed site; species was not identified during reconnaissance surveys of the site; species may occur on or near site **Low** – Marginal habitat is present on or adjacent to site; no recent records within 10 miles of the site **Not Likely to Occur** – No recent records within 10 miles; no suitable habitat occurs on or near site		

Special-Status Plant Species

One special status plant species was detected on the site during the applicant's surveys (woolly seablite, described further below)(**Biological Resources Figure 3**), and also observed by staff during site visits in 2015 and 2016. Nine special status species are known to occur within 6 miles of the project site. The following special-status plant accounts are taken from the AFC (PPP 2015a), and verified by staff.

Woolly Seablite (*Suaeda taxifolia*)

Woolly seablite maintains no federal or state listing designation, but is a CNPS Rank 4.2 species, meaning it has limited distribution or it is infrequent throughout a broader area in California; it is moderately threatened; and its status should be monitored regularly (CNPS, 2015). The species is a perennial shrub, and typically occurs in coastal dune scrub. It was recorded at the MGS site, along the eastern side of Harbor Boulevard between Edison Canal and West 5th Street (CCH, 2015). During botanical surveys conducted by the applicant, approximately 1,100 individuals were observed within the project site. The species does not occur in the laydown area or location of the planned office building on the MGS site.

Ventura Marsh Milk-Vetch (*Astragalus pycnostachyus var. lanosissimus*)

Ventura marsh milk-vetch is a federally and state-listed endangered plant, and a CNPS Rank 1B.1 species, meaning it is rare throughout its range and seriously threatened in California (CNPS, 2015). It occurs in coastal upland terraces, coastal dunes, wetland transition zones and river edges, as well as recently disturbed sites (Meyer, 2007). There are four known occurrences of the species near the project site, including: 1) the Santa Clara River mouth; 2) McGrath State Beach; 3) in Oxnard at the northeastern corner of West 5th Street and Harbor Blvd, 90 meters north of 5th Street; and 4) in Oxnard 150 meters northeast of the intersection of West 5th Street and Harbor Boulevard (CCH, 2015). This species was not observed on the project site during botanical surveys.

Coulter's Saltbush (*Atriplex coulteri*)

Coulter's saltbush maintains no federal or state listing designation, but is a CNPS Rank 1B.2 species, meaning it is rare throughout its range and moderately threatened in California (CNPS, 2015). It occurs in sand dunes on the coast. The closest documented location is on a sandy-calcareous slope about 1.5 miles west of the Ventura River (CDFW, 2015a). This species was not observed on the project site during botanical surveys.

South Coast Saltscale (*Atriplex pacifica*)

South coast saltscale maintains no federal or state listing designation but is a CNPS Rank 1B.2 species (CNPS, 2015). It occurs on alkali soils on cliffs, bluffs, and in coastal strand vegetation. The closest known location is adjacent to Highway 101 about 1.5 miles west of the Ventura River (CCH, 2015). This species was not observed on the project site during botanical surveys.

Davidson's Saltscale (*Atriplex serenana var. davidsonii*)

Davidson's saltscale maintains no federal or state listing designation, but is a CNPS Rank 1B.2 taxon (CNPS, 2015). It occurs on alkali soils along roads and highways, and disturbed places. The closest location is in Oxnard in a disturbed area beside Ventura Boulevard north of Highway 101 (CCH, 2015). This species was not observed on the project site during botanical surveys.

Salt Marsh Bird's Beak (*Chloropyron maritimum*)

Salt marsh bird's beak is state and federally endangered, and CNPS Rank 1B.2 species (CNPS, 2015). It occurs in the upper areas of salt marshes, on beaches, and on alkali flats. The closest locations are McGrath State Beach; Ormond Beach on alkali flats northeast of the intersection of Arnold Road and Perimeter Road; and near Point Mugu (CCH, 2015). This species was not observed on the project site during botanical surveys.

Mexican Malacothrix (*Malacothrix similis*)

Mexican malacothrix maintains no federal or state listing designation, but is a CNPS Rank 1A species, meaning it is presumed extirpated or extinct because it has not been seen or collected in the wild in California for many years (CNPS, 2015). This species used to occur in sand dunes at the back of beaches. It was last documented in 1925 in the vicinity of Port Hueneme Beach Park, and is assumed to be extirpated (CDFW, 2015a). This species was not observed on the project site during botanical surveys.

Red (Sticky) Sand Verbena (*Abronia maritima*)

Red sand verbena maintains no federal or state listing designation, but is a CNPS Rank 4.2 species (CNPS, 2015). The species occurs on coastal dunes. It is not mapped in the CNDDB (Figure 4.2-1), but it is known to occur on Mandalay State Beach, McGrath State Beach, and other nearby locations (CCH, 2015). This species was not observed on the project site during botanical surveys, but was observed off-site on Mandalay State Beach property.

Dunedelion (*Malacothrix incana*)

Dundelion is a CNPS Rank 4.3 species (CNPS, 2015), meaning it has limited distribution or is infrequent throughout a broader area in California; it is not very threatened in California, but its status should be monitored regularly (CNPS, 2015). The species occurs on coastal dunes. It is not mapped in the CNDDB (Figure 4.2-1), but it is reported to occur in the vicinity of the project site (California Coastal Commission 2009). This species was not observed on the project site during botanical surveys.

Special-Status Wildlife

The applicant conducted general reconnaissance surveys of the project site during January 2015, and March 2015; staff visited the site on March 18, 2015, November 19, 2015, and September 28, 2016. No protocol or focused surveys were performed as the potential for special-status wildlife species to occur within the proposed project site and construction laydown and parking areas is low. The following accounts focus on species with a moderate or high potential to occur on or near the project site, and that could be affected by project construction, demolition, or operation.

Globose Dune Beetle (*Coelus globosus*)

Globose dune beetle is designated by the CDFW (2015b) as a Special Animal. It occurs in foredunes and sand hummocks; and is most common under native dune vegetation. This species has been documented at Hueneme, Ventura, and Point Mugu (CDFW, 2015a). Suitable habitat is not present on-site. However, this species could occur in the dunes adjacent to the site's western boundary.

Western Pond Turtle (*Actinemys marmorata*)

Western pond turtle is a California Species of Special Concern. It occurs in permanent slow-moving fresh water such as creeks, ponds, lakes, and irrigation canals. The closest documented occurrence is the Santa Clara River estuary (CDFW, 2015a), and the species occurs in freshwater reaches of the Santa Clara River, as well. There is no suitable habitat for this species on the project site. Western pond turtles could occur in McGrath Lake and the surrounding riparian habitats, and may disperse across the project site, or move across the Edison Canal.

Silvery Legless Lizard (*Anniella pulchra* or *A. stebbinsii*)

Silvery legless lizard is not listed as threatened or endangered, but has been identified by the CDFW as a California Species of Special Concern. The taxonomy of the species in the project region of California has not been determined; therefore, the uncertainty of the species name. Silvery legless lizards occur in sand dunes, loose soil, and leaf litter. The nearest documented location is immediately north of the site, east of McGrath Lake (CDFW, 2015a), and at the southern edge of the project site. The highly compacted soil on the site is not suitable habitat for this species, and much of the site is unsuitable habitat. There is a moderate potential for this species to occur on the project site.

Blainville's Horned Lizard (*Phrynosoma blainvillii*)

Blainville's horned lizard is a California Species of Special Concern. It occurs in shrub vegetation, often on sandy soil. It is known from about 3.5 miles northeast of the site

near the Santa Clara River (CDFW, 2015a). This species could occur on the site, but it is unlikely given the highly compacted soil.

Two-striped Garter Snake (*Thamnophis hammondii*)

Two-striped garter snake is a California Species of Special Concern which occurs in creeks and in scrub habitat. The closest documented locality is 0.28 mile west of the Ventura River (CDFW, 2015a), approximately 6 miles upcoast (northwest) of the project site. The species could occur near the project site in McGrath Lake and the surrounding mule fat scrub, due to the presence of suitable habitat; but it is unlikely to occur on the project site, although it may occasionally disperse through the site.

Western Snowy Plover (*Charadrius nivosus nivosus*)

Western snowy plover is a federally-listed threatened species and a California Species of Special Concern. Critical habitat for western snowy plover is designated on the beaches and dunes west, northwest, and southwest of the project site (USFWS, 2012; AFC Figure 4.2-3, and **Biological Resources Figure 2**). The beaches and sand dunes within Mandalay State Beach and McGrath State Beach in the immediate vicinity of the project site support both wintering populations and breeding populations of this species (California State Parks, 2013). The nesting areas are delineated with semi-permanent or seasonal symbolic fencing. Predators (crows, opossums, raccoons, and coyotes) and people and their unleashed dogs are the most significant threats to western snowy plovers at these state beaches (California State Parks, 2013). There is no suitable habitat for the species on the project site. However, the northwest corner of the project site is approximately 500 feet from the closest potential nesting area.

California Least Tern (*Sterna antillarum browni*)

California least tern is a federally-listed endangered and state-listed endangered species. This species nests on relatively open beaches where vegetation is limited by tidal scouring and forages over open water. It nests in the immediate vicinity of the project between the Santa Clara River mouth and McGrath Lake; and Ormond Beach between Ormond Beach Generating Station and Perkins Road (CDFW, 2015a). Suitable nesting habitat is not present on site, but this species is known to nest on the beach in the immediate vicinity of the project site. It may also forage over Edison Canal.

California Black Rail (*Laterallus jamaicensis coturniculus*).

The California black rail is a state listed threatened species. California black rail inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. They require a constant water depth of approximately 1 inch, surrounded by dense vegetation for nesting. There is no suitable habitat for this species on the project site. This species is reported to occur between the McGrath State Beach campground and the Santa Clara River mouth, and could occur at McGrath Lake.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

A significant impact is defined in the CEQA Guidelines as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (Cal. Code Regs. tit. 14, § 15382). In this analysis, the following impacts to biological resources are considered significant if the project would result in:

- a substantial adverse effect to wildlife species that are federally-listed or state-listed or proposed to be listed; a substantial adverse effect to wildlife species of special concern to CDFW, candidates for state listing, or animals fully protected in California;
- a substantial adverse effect to plant species considered by CDFW, USFWS, or CNPS to be rare, threatened, or endangered in California or with strict habitat requirements and narrow distributions; a substantial impact to a sensitive natural community (i.e., a community that is especially diverse; regionally uncommon; or of special concern to local, state, and federal agencies);
- substantial adverse effects on habitats that serve as breeding, foraging, nesting, or migrating grounds and are limited in availability or that serve as core habitats for regional plant and wildlife populations;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- substantial adverse effect on federally-protected wetlands as defined by section 404 of the Clean Water Act, (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

The CEQA Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place as project activities. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the operation of the project. Direct or indirect impacts on biological resources could be permanent or temporary in nature. All impacts that result in the irreversible removal of biological resources are considered permanent. Any impact considered to have reversible effects on biological resources can be viewed as temporary.

This subsection evaluates the potential direct and indirect impacts (both temporary and permanent) to biological resources from proposed project construction and associated demolition activities, operation, and maintenance. This section also details the applicant's proposed mitigation measures and staff's recommended conditions of certification, as necessary, to reduce impacts to less-than-significant levels.

Construction and Demolition Impacts to Vegetation

Construction and demolition impacts to vegetation could occur through the direct removal or crushing of plants by equipment or vehicles. As these impacts are generally localized and are primarily temporary, they are not usually considered significant unless the habitat type is regionally unique or is known to support special-status species. **Biological Resources Table 4** below shows the acre amounts of vegetation communities that would be permanently and temporarily removed as a result of construction of the project.

Construction and demolition would mechanically remove 0.47 acre of non-native ice plant mats, and approximately 2.03 acres of woolly seablite/ice plant mats. The approximately 4.7-acre laydown areas and planned office space are previously disturbed, and construction of office and temporary construction laydown and staging would remove ruderal vegetation. Outfall demolition and removal would temporarily impact 3.54 acres of native and anthropogenically disturbed habitat.

Project impacts to on-site vegetation would not require compensatory mitigation, including woolly seablite as discussed below under “Construction and Demolition Impacts to Special-Status Plant Species.”

Biological Resources Table 4
Direct Surface Disturbance per Affected Vegetation Community and Project Component*

Vegetation Communities/Cover Types	Location			
	Power Plant Site (acres)	**Construction Laydown Areas (acres)**	**Office Space (acres)**	**Total (acres)**
Permanent Impacts				
Ice plant mats	0.47	0.97	0	1.44
Woolly seablite/ice plant mats	2.03	0	0	2.03
Ruderal/developed	0.23	0.03	0	0.26
Coyote brush scrub	0.52	0	0	0.52
Myoporum grove	<0.01	0	0	<0.01
Total	3.26	1.0	0	4.26
Temporary Impacts (Associated with Outfall Removal)				
Land Cover Types	Construction Impacts (acres)	Access to Outfall (acres)	Total (acres)	
Culverted Water	0.09	0	0.09	
Developed	0.39	0	0.39	
Ice plant mats	0.09	0.12	0.21	
Ruderal	0	0.003	0.003	
Dune mats	0.3	0.37	0.67	
Open water++	2.14	0	2.14	
Sandy Beach	0.04	0	0.04	
Total	1.14	0.49	3.54	

++ includes construction and post construction conversion of habitat to sandy beach habitat
*impacts associated with the transmission line are temporary only

Construction and Demolition Impacts to Special-Status Plant Species

Construction and demolition would mechanically remove vegetation on-site. On-site vegetation is highly disturbed, with little native vegetation remaining. Special-status

plants recorded within the vicinity of the project site include Ventura marsh milk vetch (CRPR 1B.1), dundelion (CRPR 4.3), and others; see **Biological Resources Table 2**. Offsite impacts at the generation transmission line interconnection point would be temporary only, and with implementation of preconstruction surveys would not be expected to affect special status species. Only one potentially special-status species occurs on the project site, woolly seablite. Woolly seablite in the project area is interspersed with the invasive ice plant, forming thick mats. These thick mats are of diminished value to wildlife, and the presence of woolly seablite may be facilitated through the history of the project-- the project site may be artificially saline, due to historical storage of ocean-dredged sediment (see above subsection titled "Coastal Zone Wetlands"), or may be in part a remnant system before anthropological effects largely enacted throughout the 1900s. The Coastal Commission regulates wetlands within the Coastal Zone, and although woolly seablite may serve as an indicator species, that is, a species that may associate with wetlands, it is not in itself considered significant under CEQA guidelines for several reasons discussed further below.

While not state or federally-listed, woolly seablite occurs on the California Native Plant Society's (CNPS) Rare Plant Ranking System (CRPR) list 4.2. Impacts to plants with a CNPS rank may be considered under CEQA; however, staff typically does not consider impacts to plants of list 3 or 4 as significant, as these plants are on a CNPS watch list. Further, the CNPS has several factors to consider when evaluating the significance of impacts to CNPS list 3 and 4 plants, including whether the project would affect plants at the fringes of known spatial distribution, or if a project affects a type locality.

Approximately 1,000 woolly seablite plants would be removed by construction of the proposed project. This species is known to occur along the California coast from San Luis Obispo to Tijuana, Mexico, including Catalina Island and the Channel Islands. Removal of this population would not impact a population on the fringes of its spatial distribution, nor is this population a known type locality—impacts which could be considered significant under CEQA (CNPS 2015). Therefore, staff has determined that the project would not have significant impacts to the special-status woolly seablite plant species, and no mitigation is required for this plant. The plant does, however, indicate the presence of a wetland under the jurisdiction of the Coastal Commission. The loss of wetlands are mitigated under CEQA, as they constitute a significant impact due to the role they play within an ecosystem. See the subsection "Construction and Demolition Impacts to Jurisdictional Wetlands," below.

Construction and Demolition Impacts to Wildlife

Direct loss of small mammals, reptiles, and other less mobile species could occur during construction of the proposed project and demolition of existing facilities. This would result primarily from the use of vehicles and equipment at the project site, which could collapse underground burrows or drive over animals. Additionally, construction and demolition activities and increased human presence may temporarily disrupt breeding or foraging activities of some common wildlife species.

Construction and Demolition Impacts to Special-Status Wildlife

On-site vegetation provides little foraging value to wildlife, although it may be used occasionally for movement between patches of suitable habitat. Several special-status

wildlife species such as the western pond turtle, Blainville's horned lizard, two-striped garter snake, least tern, western snowy plover, and California black rail may occasionally move through on-site wetlands, or attempt to forage in this habitat. Loss of the forage or other uses of the 2.03-acre wetlands under Coastal Commission jurisdiction would be mitigated through the acquisition of habitat compensation at a 4:1 ratio, as required by staff's proposed Condition of Certification **BIO-9**. See the subsection "Construction and Demolition Impacts to Jurisdictional Wetlands," below. Offsite impacts at the generation transmission line interconnection point would be temporary only, and with implementation of preconstruction surveys would not be expected to affect special status species.

Immediately adjacent habitat such as McGrath Lake and surrounding habitat may support the sandy beach tiger beetle, globuse dune beetle, western pond turtle, silvery legless lizard, Blainville's horned lizard, and two-striped garter snake. The outfall structure and surrounding immediate adjacent habitat may support silvery legless lizard and globose dune beetle. These species may occasionally traverse the project site and laydown areas while moving between surrounding riparian or dune habitat. These species may also be subject to crushing or burying by increased traffic during construction and demolition. While there is a low potential for these impacts to special-status species, staff recommends the implementation of the following conditions to minimize and avoid impacts to special-status species. Staff proposes Condition of Certification **BIO-7**, General Impact Avoidance and Minimization Measures. This condition contains a number of protective measures, including specific provisions for installing silt fencing along the northern boundary of the project site adjacent to McGrath Lake, and along the southern boundary of the project site adjoining Mandalay State Beach. Silt fencing was also proposed by the applicant (AFC; PPP 2015a). The applicant recommended fencing along the Edison Canal, and around sensitive habitat on-site. Staff agrees with installment of silt fencing as an appropriate impact avoidance measure for the project. Implementation of silt fencing would prevent and minimize terrestrial-based movement of small special-status wildlife from adjacent dune and riparian habitat onto the project site. Terrestrial-based movement from the west onto the project site (and off) is expected to be minimal given the developed nature of the site, and the noise, perimeter fencing, and human presence would also likely discourage animal presence. While the western boundary of the project site is also primarily ice plant mats and dune habitat elevated above the adjacent beach; staff determined that silt fencing is appropriate for this area, as a best management practice.

Nesting special-status birds in the adjacent dunes and riparian habitat could be directly impacted by construction and demolition activities. Both the western snowy plover and California least tern are federally–listed, and are known to nest on the beaches and dunes north of the project site, and to the south of the project site along Mandalay State Beach. Staff recommends implementation of Condition of Certification **BIO-8**, which applies specifically to breeding birds and requires pre-construction surveys as well as ongoing monitoring during breeding season.

Indirect impacts could occur to special-status wildlife in the dunes and riparian habitat adjacent to the project site during construction and demolition, and these are considered ESHAs (environmentally sensitive areas) under Oxnard's local coastal plan. These include disturbance from lighting, as well as degradation of habitat from invasive

weeds, or storm water runoff. These impacts are discussed under “General Construction and Demolition Impacts,” below.

Staff recommends that a Designated Biologist be assigned to ensure implementation of all avoidance and minimization measures. The Designated Biologist may be assisted by one or more Biological Monitors as necessary. Staff’s proposed Conditions of Certification **BIO-1** through **BIO-4** specify the qualifications for the Designated Biologist and Biological Monitor(s) and their duties and authorities.

Staff also recommends implementation of a Worker Environmental Awareness Program (WEAP), which is a mechanism for training the workers on protection of the biological resources described in this document. Staff’s proposed Condition of Certification **BIO-5** requires the applicant to develop, in consultation with the Designated Biologist, and implement a WEAP during all construction and demolition activities.

Condition of Certification **BIO-6** would require a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), which contains all protective measures, survey guidelines, permit requirements, etc., that apply to sensitive habitat and species. The Designated Biologist would prepare the BRMIMP, and it would be used by the Biological Monitor(s) and other on-site personnel in daily activities. Condition of Certification **BIO-10** would require fencing of dune mats, and pre-construction plant and wildlife surveys over the dunes (outfall removal area) and within 500 feet of any construction-related activities.

Outfall Removal

Removal of the outfall, wing walls, riprap, and fencing could result in direct impacts to plants and wildlife. These activities may also have indirect impacts such as noise and lighting. Please refer to the “General Construction and Demolition Impacts” section for a discussion of indirect impacts associated with removal of the outfall structure.

Special Status Plants

The outfall structure lies within an area containing open water (the Pacific Ocean and the mouth of the outfall), sandy beaches, and dune mats. Dune mats are located between the outfall structure and the Mandalay Generating Station, and along the access road (see PPP 2016a, Figure 2-2 and **Biological Resources Figure 3**). The following special status plants may occur in the area of the outfall: dundelion and south Coast salt scale. Other plants, such as red sand verbena, Mexican malocothrix, and Coulter’s saltbush may also occur in the sand dunes and adjacent sandy beaches in the vicinity of the outfall structure and associated riprap and fencing. These plants may be subject to disturbance such as direct crushing by construction equipment or removal. These impacts may be considered significant in the absence of avoidance, minimization, and/or or mitigation. Staff recommends implementation of Condition of Certification **BIO-10**, Outfall Removal Impacts Avoidance Plan. This plan calls for pre-construction surveys, and would avoid impacts to special-status plants within the vicinity of the outfall structure.

Special Status Wildlife

Other wildlife known to occur in the vicinity are the California least tern, the western snowy plover, California sea lions, and harbor seals. Other small insects and crustaceans in the vicinity of the outfall would include kelp flies (*Coelopa* spp.), sand crabs (*Emerita* spp.), beach hoppers (*Megalorchestia* spp.), and beach pillbugs (*Tylos* spp.), which are unlisted species, yet serve an important role in the beach and dune ecosystem. The outfall removal is not expected to impact California grunion (*Leuresthes tenuis*), a species of fish whose extraordinary life cycle includes laying eggs in the sand. This species spawns from March through August, and deposits eggs at specific times, at high tide and during full moons. At the next set of high tides, the eggs hatch and the young grunion are washed out to sea. This season coincides with nesting season of western snowy plover, and would be avoided as stated by the applicant (PPP 2016a) and per condition **BIO-10**, which avoids nesting season of birds (March 1 through August 30). It is unlikely that this species would move far enough inland, over the wide beach, to lay eggs near the outfall structure. Similarly, grunion traveling up-current through the outfall water path would likely not be able to make it over steep sides of the outfall water flow path, and so no spawning is expected to occur in the vicinity of the outfall structure or related appurtenances.

Pinniped is a term which refers to seals and sea lions. Both the harbor seal and sea lions may occur in the vicinity of the outfall structure. Pinniped are protected under the Marine Mammal Protection Act, which prohibits “take”. Take is defined as “harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal”, and “harass” is defined as “any act of pursuit, torment, or annoyance which—

(i) has the potential to injure a marine mammal or marine mammal stock in the wild; or

(ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.”

Removal of the outfall could result in take of pinniped in the vicinity through direct contact or crushing by construction equipment, or harassment that could disrupt feeding or sheltering patterns. California sea lions breed in the ocean surrounding the Channel Islands of California, from May to August each summer. Harbor seals, also a pinniped under the protection of the Marine Mammal Protection Act, have pups and breed in the summer (May through August). They are not known to breed or have resting “haulout” sites, where they come out of the water in large groups, within the project vicinity (although the site is known for haulout of small numbers of animals at any time). Haulout and breeding sites for the larger population are documented in the Channel Islands and also Point Reyes Beach.

Permanent impacts from removal of the beach outfall are considered beneficial to the entire system in the project vicinity. Removal of the outfall would remove potential impacts to nesting California least tern, western snowy plover, and western snowy plover critical habitat. Temporary direct impacts such as crushing or burying by construction activities could occur to special status wildlife. Indirect and temporary impacts could include fugitive dust, noise, and spread of weeds. Temporary impacts to

listed species are considered significant in the absence of avoidance, minimization, and or mitigation. Staff recommends implementation of condition **BIO-10**, Outfall Removal Impacts Avoidance Plan. This plan requires preconstruction surveys to determine if any special-status species are in the area, monitoring throughout demolition and cleanup activities, fencing around sensitive dune habitat, avoidance of pinniped, and avoidance of bird nesting season. With implementation of staff's recommended Condition of Certification **BIO-10**, all impacts to special status species would be mitigated below significance. Indirect impacts stemming from fugitive dust, noise, and spread of weeds would be reduced if staff's recommended conditions **BIO-1** though **BIO-7** are implemented.

Construction and Demolition Impacts to Jurisdictional Waters and Wetlands

Waters of the State

The Edison Canal and outfall structure are subject to CDFW jurisdiction. In an email dated November 2, 2016, CDFW advised the applicant both the removal of the existing outfall above the mean high tide line, and new inputs/drainage features interfacing with the Edison Canal, may be within the Department's jurisdiction pursuant to section 1602 of the Fish and Game Code.

CDFW further stated that the typical process would be for the applicant to notify CDFW under section 1602 prior to undertaking any work; and the CDFW would then make a determination of jurisdiction at that time. Under Warren-Alquist Act (Pub. Resources Code) § 25500, the Energy Commission's certificate for a thermal power plant (50 megawatts and larger) is "in lieu of" other state, local, and regional permits. Energy Commission staff has coordinated its environmental review with CDFW such that the conditions of certification contained in this section of the FSA would satisfy Fish and Game Code sections 1600 et seq. and take the place of terms and conditions that, but for the Commission's exclusive authority, would have been included in a CDFW 1600 permit. Staff's proposed Conditions of Certification **BIO-1** through **BIO-10** contain general and specific provisions that would mitigate impacts to waters of the state to less than significant.

Waters of the United States

Both the Edison Canal and the water flowing from the outfall structure meet the definition of waters of the U.S. under the Clean Water Act, as well as a navigable water of the U.S. under the federal Rivers and Harbors Act. For the Edison Canal, no fill material would be placed within the high tide line, so no permits are necessary. For the water flowing out of the outfall structure, however, work would be conducted within the high tide line, and therefore a permit is necessary under the Clean Water Act Section 404, as well as Section 10 of the Rivers and Harbors Act. Such work may be authorized via individual or nationwide permits--in this case, the work qualifies under Nationwide Permit 7, which regulates activity related to outfall structures. A Clean Water Act Section 401 water quality certification is not necessary for the Edison Canal, however, if the removal of the outfall triggers a 404 permit, then a 401 certification from the RWQCB would also be necessary.

Staff has amended condition **BIO-6** from the PSA to require that all mitigation measures or conditions of the federal permits be included in the BRMIMP and implemented.

Total process water consumption for the project is projected to be 16 acre-feet per year (AFY), and estimated domestic water use would be 3 AFY. Currently, the MGS has a maximum withdrawal from the Edison Canal of 254 million gallons per day, however, the plant has operated at only 3.9 percent of maximum capacity for the last several years (AFC page 1-4). Discharges of water to the outfall structure are around 255.3 million gallons per day. With the implementation of the project, water would continue to be utilized from the canal for Unit 3 only., Discharges from Puente would also be routed into the canal, and the outfall removed, with subsurface components plugged with riprap and concrete slurry (TN 213802).

The discharge point for wastewater from the project and MGS Unit 3, and for storm water from the MGS property (including the Puente site), would be either an existing concrete structure or a new culvert pipe connecting to the canal. The decision about which alternative to implement would be made during final project design. It may be necessary to place a limited amount of additional riprap to support the new discharge structure. If the culvert method is used for the discharge, and if additional erosion control is needed, energy dissipation measures (i.e., flow diffuser at end of pipe) could be installed in lieu of adding riprap. In any case, no new structures or fill, including riprap, would be placed below the high tide line or mean high water line (PPP 2016d) .

Water Quality

Discharges of storm and process water would be treated to avoid adverse impacts to plants and wildlife in the canal; treatment is in accordance with several plans, including the Los Angeles Regional Water Quality Control Board's Basin Plan (LARWQCB 1994). This plan controls the release of sediments. Within the Basin Plan, beneficial uses are established, as well as Areas of Special Biological Significance. The Edison Canal is not listed as an Area of Special Biological Significance, however, it does have beneficial uses LARWQCB, page 2-31) of serving as an:

1. "industrial service supply", or uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization;

2. "marine habitat", or uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, "wild" uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians);

3. "rare" means rare, threatened, or endangered species, or uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered. invertebrates), or wildlife water and food sources;

4. “wild”, meaning wildlife habitat uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

The Basin Plan states that the release of sediments shall “not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.” The Basin Plan also assumes that Early Life Stage fish are present in estuaries, and has special limits on sediments to avoid adverse impacts on Early Life Stage fish. The Edison Canal is listed in the Basin Plan as the “Edison Canal Estuary”.

The State Water Resources Control Board has adopted a Thermal Plan (SWRCB 1975) which, in concert with the Basin Plan, is incorporated into a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit would dictate that releases of process and stormwater into the Edison Canal would be in compliance with the Thermal Plan as well as the Basin Plan, incorporating these two effluent plans into a single permit. Process water discharges are anticipated to have effluent levels as shown in Table 2.7-6 (AFC page 2-45), which meets the identified standard. With the incorporation of the NPDES permit, (Condition of Certification **SOIL & WATER-4**)(NPDES No. CA0001180) all impacts to the Edison Canal are expected to be mitigated below the level of significance.

On-site Jurisdictional Wetlands

Implementation of the proposed project would remove approximately 2.03 acres of wetlands under jurisdiction of the Coastal Commission. These wetlands contain three plants common to wetlands (woolly seablite, pickleweed, and slenderleaf iceplant) but lack the remaining two important characteristics common to wetlands such as hydrology and hydric soils, and also contain plants common to upland habitat.

The Coastal Commission uses a broad approach (i.e. a one-parameter approach) in determining wetland extent as a conservative means of defining and conserving wetlands, including conserving upland habitat surrounding a wetland. This conservative approach is intended to identify and conserve the form and function of a wetland in its entirety, including preserving areas immediately adjacent a wetland, which provide critical uses such as dispersion of overland water flow forces, habitat for wildlife, and backwater inundation/absorption zones.

Because the wetlands on-site are degraded and contain plants suited to upland growth, there is little to no differentiation between upland habitat surrounding the wetland, and the wetland, itself. There is no tidal influence to cause increased salinity, and water inputs are only from rainfall. Therefore, the approximately 2.03-acre wetland has diminished value, form, and function.

Typically, the Coastal Commission has recommended mitigation of wetlands under its jurisdiction at a 4:1 ratio ((CC, 2016). In its report to the Energy Commission prepared pursuant to section 30413(d) of the Coastal Act, the Coastal Commission references (CCC, 2016) the inherent difficulty in achieving successful wetland mitigation, and also notes that the emergence of vegetation “native to this historical landscape” may be in part due to decreases in site disturbance. Staff acknowledges that this may be an

accurate characterization of the site. As referenced in Beller, et al (2011, Figure 6.23), the site may have been artificially drained via an approximate five-mile long canal, in the early 1900s, and it is possible that a wetland was on or near the site, or that the site experienced overland flows from McGrath Lake.

Staff has also reviewed the California Coastal Commission (1994) “Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone” to determine the appropriate mitigation ratio. This document states that mitigation ratios above 1:1 are appropriate. Staff therefore has accepted and incorporated the Coastal Commission compensatory ratio of 4:1 for the site. A 4:1 ratio would achieve the goals of the CDFW and the federal government in achieving “no net loss” of wetlands, and would simultaneously satisfy the Coastal Commission regulations in appropriately mitigating for development of the site.

The site contains three plants indicative of wetlands: woolly seablite, pickleweed, and slenderleaf iceplant, each potentially suited to somewhat saline conditions. Appropriate mitigation therefore consists of preservation of an equivalent saline (i.e. not freshwater) system at a 4:1 mitigation ratio. Estuarine systems are saline, experiencing both tidal flushing as well as surface (freshwater) flows, and therefore can have a wide variety of salinity values from high (hyperhaline, salinity greater than 40 parts per thousand) to low (oligohaline, salinity less than five parts per thousand). Habitat considered estuarine wetlands include estuaries, lagoons, and salt marshes; and would replace the loss of on-site salt marsh species such as pickleweed. Therefore, staff recommends Condition of Certification **BIO-9**, Wetland Mitigation, as appropriate compensation for the loss of the on-site Coastal Commission jurisdictional wetland at a ratio of 4:1. Mitigation should ideally take place within the affected watershed (Santa Clara-Calleguas Creek Watershed), but may take place elsewhere if suitable mitigation opportunities are not found within the appropriate watershed. With implementation of **BIO-9**, impacts to Coastal Commission jurisdictional wetlands would be mitigated to less than significant.

The CDFW has commented (CDFW 2016) that areas mapped as coyote brush scrub onsite are also considered a type of dune swale wetland, as described in Ferren, Fiedler, and Leidy (1995), and further commented that a focus on salt marsh restoration may not offset all the project-related direct and indirect impacts. Coyote brush scrub is also a common plant community, and within the project site itself is not located in an area displaying hydric soils or hydrology, which are indicators necessary to call the area a wetland jurisdictional under CDFW or the Army Corps of Engineers. This area therefore does not require mitigation under CEQA; however, since the project site and greater vicinity has been documented (Beller et al 2011) as a mosaic of dune habitats, and has experienced significant anthropogenic alteration, staff has modified **BIO-9** to include mitigation of dune swale wetlands, as well as salt marsh wetland species. The overall mitigation ratio remains at 4:1.

Off-site Jurisdictional Wetlands

The proposed project site is immediately adjacent to McGrath Lake and associated freshwater wetlands (California bulrush marsh, arroyo willow thickets, and mulefat scrub). Indirect impacts may result if construction contaminants, sediment, or untreated storm water effluent from the proposed project area enter these sensitive areas. The applicant has committed to implementing best management practices (BMPs) to control

site runoff during construction and demolition activities in accordance with the project's Storm Water Pollution Prevention Plan (SWPPP); this requirement is subsumed as a requirement of Condition of Certification **SOIL&WATER-1**. With implementation of these measures, indirect water quality impacts to adjacent wetland habitats would be less than significant. This site may also be considered an "environmentally sensitive area" (ESHA) as defined by the Coastal Act and all construction activities must maintain a 100-feet buffer from ESHA, as specified by condition **BIO-7**.

General Construction and Demolition Impacts

Noise

Noise from construction and demolition activities could discourage special-status wildlife from foraging and nesting near the proposed project area, due to interference with communication, disturbance or disruption of activities, or startling from loud noises. Avian species are most likely to be adversely impacted by construction and demolition noise. Many bird species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from construction could adversely affect nesting behavior and other activities.

Studies have shown that elevated noise levels can affect the behavior of certain bird species and could interfere with acoustic communication (e.g., Dooling and Popper 2007). Noise may affect birds in several ways, including reducing reproductive success; raising the level of stress hormones; interfering with sleep; causing permanent injury to the auditory system; and interfering with acoustic communication by masking important sounds, such as an approaching predator (Halfwerk et al 2011; Dooling 2006; Kight and Swaddle 2011). Many bird species rely on vocalizations during the breeding season to attract a mate within their territory. Francis et al. (2009) showed that noise alone reduced nesting species richness and led to a different composition of avian communities. Although some birds are able to shift their vocalizations to reduce the masking effects of noise, when shifts did not occur or were insignificant, masking could impair signaling and listening capabilities necessary for successful communication and survival (Barber et al. 2010).

Demolition and construction would generate sudden or loud startling noises, and could result in flushing birds. Flushing of nesting birds could increase the risk of predation or cause nest failure if birds repeatedly leave the nest and eggs are not properly incubated, or eggs or nestlings are knocked from the nest by a flushing parent. Foraging birds are expected to have more flexibility in avoiding areas with disruptive noise, but nesting birds would be vulnerable to these effects and take of nests protected under the MBTA and California Fish and Game Code could occur. Noise levels may be generally considered to constitute an adverse impact when above 60 dBA, however, this is a general guideline used by Energy Commission staff. Recent literature suggests that noise levels over 100 decibels may not disturb western snowy plover (USFWS 2011), and, more recently, the Energy Commission declined 60 decibels as too low a disturbance threshold to use for avian species (CEC 2014).

Special-status species may be present in the adjacent sensitive habitats such as dune habitat and western snowy plover critical habitat to the west and McGrath Lake and adjacent wetlands, and may be impacted by construction and demolition noise. These

habitats support a variety of special-status and migratory birds that may breed in these areas, including the western snowy plover (federally-listed threatened), California least tern (federally and state-listed endangered), and California black rail (state-listed threatened).

Construction impact noise would be created by installation of the air-cooled, single-fuel combustion turbine generator and auxiliary facilities, the build-out of additional office space for on-site staff, as well as grading, paving, other on-site improvements such as rerouting gas lines, removal of the ocean outfall structure, and construction of the transmission line across Harbor Boulevard. Construction equipment required onsite during a 21-month period includes heavy machinery like excavators, graders, cranes, and generators, including a month's usage of a pile driver.

Demolition noise would be generated during removal of Units 1 and 2, as well as the 200-foot tall stack, removal of transformers and other electrical equipment between Units 1 and 2 and the switchyard (PPP 2015y), and the outfall structure.

Decommissioning would begin in January 2021 and demolition would be completed by late 2022, given current projections by the applicant. Equipment required onsite during this timeframe would be similar to that used during construction.

The applicant determined noise impacts at offsite sensitive receptors, called LT-1, LT-2, and LT-3 (PPP 2015a), based on human presence. While this is a common technique for determining noise impacts, sensitive habitat occurs closer to the project site, specifically, the nesting least tern habitat on dunes north and south of the site, and critical habitat for the western snowy plover habitat on beaches immediately north, west, and south of site. Staff coordinated with Noise and Vibration staff to determine noise impacts at two additional points: LT-A and LT-B (**Biological Resources Figure 4, Offsite Noise Locations**). LT-A occurs 500 feet to the west, at the edge of the dunes and western snowy plover critical habitat, and LT-B occurs at a point 1,000 feet to the north of the site, at the edge of the ESHA wetlands adjacent McGrath Lake. These two points are considered to more accurately reflect noise at sensitive wildlife habitats, particularly those supporting special-status nesting birds. Approximate ambient noise levels were also measured at several of these locations; staff uses the most quiet noise measurements taken to establish a conservative baseline.

Each of the aforementioned locations with noise-sensitive biological resources is listed in **Biological Resources Table 5**, below, along with ambient noise levels and estimated construction and demolition noise levels at each location.

Biological Resources Table 5
Summary of Noise Levels at Locations with Noise-sensitive Biological Resources

Location	Ambient Noise Level (dBA)	Approximate distance from Power Block 1 (feet)	Construction Noise Level (dBA)	Demolition Noise Level (Worst Case) (dBA)
Ambient Beach Noise	63-78[1]	~950	N/A	N/A
Oxnard Shores West	49-62[1]	~4,000	47[3]	44[4]
LT-1	55[2]	~3,940	47[3]	45[4]
LT-2	61[2]	~4,100	47[3]	44[4]
LT-3	63[2]	~2,600	52[3]	49[4]
LT-A	N/A	500	N/A	~64[5]
LT-B	N/A	1,000	N/A	~57[5]

[1]Measurement depicted on Figure 4.7-1, PPP 2015a, page 4.7-29.
[2]Taken from PPP 2015y, page 4-25, Table 4.7-5a
[3]Taken from PPP 2015a, page 4.7-37, Table 4.7-6
[4] Taken from Table 4.7-2, PPP 2015y, page 4-22.
[5] Calculated by noise and vibration staff using PPP 2015y data.
N/A means "not available".

Demolition noises would not exceed the construction noise levels identified in the AFC (PPP 2015a), and in fact, would likely be lower than shown. This is because staff chose the most conservative, worst-case predicted sound levels, and because the construction and demolition noises reflected in **Biological Resources Table 5** are baseline numbers, with no on-site mitigation, such as noise fencing or implementation of other noise-dampening measures.

As shown in **Biological Resources Table 5**, average levels of construction and demolition noise at measuring locations range from a low of 44 dBA to a high of 64 dBA. These levels are lower than ambient levels at all monitoring stations. At point LT-A and LT-B, construction noise levels are unknown, but are assumed to be within the range of demolition noise levels. These worst-case noise levels are extremely conservative, as discussed above. At point LT-A, which is the nearest point of dune and western snowy plover critical habitat, the noise levels are within the lower range of ambient noise levels generated by surf noise, and are therefore not considered significant.

At point LT-B, the exact ambient noise levels are not known; however, the predicted construction and demolition noise level of 57 dBA is lower than staff's informal threshold of 60 dBA. Noise impacts at point LT-B are therefore considered less than significant. Construction and demolition noise impacts to birds nesting off-site are not expected to be significant because of the above-stated reasons; however, staff and the applicant have proposed conditions of certification to minimize impacts to the extent practicable. These measures would reduce these less-than-significant effects on birds. To mitigate noise impacts to birds, the applicant has incorporated additional minimization and mitigation measures into the project description. Typical noise abatement mitigation includes use of noise dampeners and utilization of high-reach excavators to shear steel,

as well as use of construction blankets and other noise-dampening devices (**NOISE-6**). Condition of Certification **NOISE-6** also requires that equipment contain current noise-reducing specifications or modifiers so that it is the best available equipment.

The loudest noise impacts would be generated by the planned explosive demolition of Units 1 and 2 and the stack; and would likely consist of several very short and loud explosions (based on consultation with Noise and Vibration staff), of around 100-110 dBA when measured at nearest human receptor LT-1 (PPP 2015y), Table 4.7-1b. Because these events last just moments, they are not represented in **Biological Resource Table 5**. The applicant has committed to dampening these effects to the extent possible (PPP 2015y; Section 4.2.2), and staff recommends that blasting be undertaken outside the nesting season of special-status avian species (**BIO-8**). Staff has also recommended (**BIO-8**) that pile-driving, the next loudest activity, also take place outside nesting season. Condition **BIO-8** would also limit any potential sound vibratory impacts to outside of the nesting season.

The applicant has also committed to monitoring snowy plovers and least terns within 0.25 mile of the project site, in order to determine if nesting behavior is adversely affected by construction and demolition activities, and furthermore, has agreed to temporarily halt any work that appears to initiate abnormal nesting behavior such as flushing or other displays of agitated behavior. Staff agrees with this recommendation, and has incorporated this into Condition of Certification **BIO-8**, Pre-construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds.

Lighting

Project construction and demolition activities are anticipated to occur as single-shift, 10 hours per day, five days a week; however, some limited construction activities could continue during a second shift. During startup and commissioning, work may continue for 24 hours per day. Bright lighting at night could disturb the nesting, foraging, or mating activities of wildlife in the adjacent marshes, beaches, and dunes (ESHA-designated areas) and make wildlife more visible to predators. Night lighting could be disorienting to migratory birds and, if placed on tall structures, may increase the likelihood of collision. Although existing operations at the MGS and nearby vehicle traffic provide an elevated ambient level of lighting to which local species have acclimated, potentially significant impacts to sensitive wildlife from increased night lighting could occur.

If night construction were required, the applicant proposes to use task-specific lighting to the extent practicable, shield and direct lighting on-site, and use switched lighting where possible (PPP 2015a). These measures are incorporated into Condition of Certification **VIS-2** (refer to the **Visual Resources** section for the full text of this condition). With implementation of these measures, impacts to wildlife from construction and demolition night time lighting would be less than significant.

Fugitive Dust

Active soil grading over the project site and laydown areas would occur over a two-month period; however, construction traffic and other activities could result in disturbance of the soil's surface during the entire construction timeframe. These activities could result in increased wind erosion of the soil, which can have deleterious physiological effects on plants, especially vegetation within sensitive habitat, such as McGrath Lake and associated wetland restoration site immediately north of the project. Modeling conducted by the applicant indicates that the site has a high potential for wind erosion (PPP2015a).

The applicant has committed to reducing soil erosion through implementation of BMPs, which include watering to suppress fugitive dust, using straw bales and silt fences (silt fencing is incorporated into **BIO-8**), and limiting exposed areas. The applicant has also prepared a draft Storm Water Pollution Prevention Plan (SWPPP) as part of the Application for Certification (PPP 2015a, Volume 2; Appendix A-8), which will guide development and deployment of such measures. Erosion control BMPs developed in accordance with the SWPPP would be used to minimize erosion at the site during project construction and demolition activities, pursuant to Condition of Certification **SOIL&WATER-1**. These erosion-control measures would maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation that destroys soil productivity and soil capacity.

Staff has further proposed conditions of certification to avoid and minimize impacts of dust generated by construction and demolition activities. Condition of Certification **AQ-SC3** requires specific measures to minimize fugitive dust, and Condition of Certification **AQ-SC4** requires construction monitoring for visible dust plumes and remediation measures in the event visible dust plumes are observed. With implementation of these conditions of certification, impacts to adjacent wetlands from construction-related dust would be less than significant.

Invasive Weeds

The spread of invasive weeds destroys wildlife habitat and forage, threatens endangered species and native plants, and increases soil erosion and groundwater loss. Construction activities and soil disturbance could introduce new invasive weeds to wetlands adjacent to the site, and could further spread weeds already present in the project vicinity. Wetlands adjacent to and near the project site support special-status species and other native plants and wildlife. The wetlands north of McGrath Lake, immediately adjacent to the northern boundary of the project site, are undergoing restoration, and are therefore particularly vulnerable to weed infestations until native vegetation is fully established. Invasive weeds can easily colonize areas of disturbance and the spread of invasive plants is a major threat to biological resources in the greater vicinity of the project site because non-native plants can displace native plants and supplant wildlife foods that are important to herbivorous species, resulting in overall habitat degradation.

Substantial populations of the invasive ice plant exist within the proposed project area. While this species is not aquatic, it may encroach upon sensitive off-site habitat at the McGrath wetlands. No other substantial populations of weedy species exist on the

project site; however, to avoid and minimize the spread of existing weeds and the introduction of new ones, weed management measures are recommended. Staff's proposed Condition of Certification **BIO-7** includes a number of weed prevention measures, including the requirement that vegetation and ground disturbance be limited to the minimum required for construction of the project, and that ingress/egress be only along defined routes. Storm water runoff would be contained and prevented from draining to adjacent sensitive habitats; therefore weed propagules would be prevented from washing into the wetlands. Further, straw bales and other sediment control features would be weed free, and invasive non-native species are prohibited from being used as landscape plantings. Implementation of Condition of Certification **BIO-7** would reduce potential impacts from introduction and spread of invasive weeds into sensitive habitat to less than significant.

Operational Impacts

Avian Collision and Electrocution

The McGrath Lake and wetlands adjacent to the project site are concentration areas for resident and migratory birds because of abundant foraging opportunities and proximity to the Pacific Ocean. This concentration of birds creates the potential for direct impacts through collision or electrocution with proposed project facilities and appurtenant structures including transmission lines and transmission support structures.

Birds can collide with transmission lines, exhaust stack, and other structures associated with the proposed project, causing injury or mortality. Bird collisions with power lines and structures generally occur when a power line or other structure transects a daily flight path used by a concentration of birds and these birds are traveling at reduced altitudes and encounter tall structures in their path (Brown 1993). Collision rates generally increase in low light conditions, during inclement weather, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing danger. Collisions are more probable near wetlands, within valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths (APLIC 2012).

Although collision may occur, it is not likely that bird mortality due to collision with the project's transmission line and facilities would significantly reduce the population numbers of any bird species or that the reduction in numbers within any population would impair its function within the local ecosystem. The proposed exhaust stack would be 188-feet tall, similar to the existing MGS exhaust stacks (which would be removed in 2022), and is therefore not expected to increase the potential for avian collisions. The project would connect to the regional electrical grid by looping into the existing transmission line across Harbor Boulevard. The project would require construction of one new 100-foot tall pole to connect into the existing SCE lines via new 220-kV lines (PPP 2016b). Direct and indirect impacts to birds from collision with structures are expected to be minimal and consistent with baseline conditions, given the project location and existing power lines, tall structures, and facilities on the site.

Osprey and other large aerial perching birds, including those afforded state and/or federal protection, are susceptible to transmission line electrocution. Because raptors

and other large perching birds often perch on tall structures that offer views of potential prey, the design characteristics of transmission towers and poles are a major factor in raptor electrocutions (APLIC 2012). Electrocution occurs when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower or pole with insufficient distance between these elements.

Raptor species that use the transmission structures for nesting could be electrocuted upon landing. Further, nests may be built in areas that are susceptible to electrical charges that may result in fire as well as electrical outage. The majority of raptor electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV. The likelihood of electrocutions occurring at voltages greater than 60-kV is low because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). Therefore, the new 220-kV transmission line that would connect the project to the off-site SCE tower has a low likelihood to result in bird electrocution.

The new project generation tie line would not appreciably increase collision risk over baseline conditions. Nonetheless, because of the presence of listed species in the adjacent habitat, and the likelihood that they and other special-status birds fly over the project site en route, staff proposes that the applicant construct the generation tie lines in accordance with Avian Power Line Interaction Committee (APLIC) standards to minimize or avoid collisions and electrocutions associated with the proposed project. With implementation of this component of Condition of Certification **BIO-7** (Impact Avoidance and Minimization Measures), this impact would be less than significant.

Air Emissions – Nitrogen Deposition

Staff addressed the potential for deposition of nitrogen to affect sensitive biological resources within six miles of the proposed project (**Biological Resources Appendix-1, Nitrogen Deposition Analysis**). Nitrogen deposition is the input of nitrogen oxides (NO_x) and ammonia (NH_3) derived pollutants, primarily nitric acid (HNO_3), directly deposited from the atmosphere to the biosphere. Nitrogen deposition sources are primarily vehicle, agriculture, and industrial emissions, including power plants. Mechanisms by which nitrogen deposition can lead to impacts on sensitive species include direct toxicity, changes in species composition among native plants, and enhancement of invasive species (Fenn et al. 2003; Weiss 2006). The increased dominance and growth of invasive annual grasses is especially prevalent in low-biomass vegetation communities that are naturally nitrogen-limited. In the project vicinity, these communities include coastal dunes and wetlands (Weiss 2006).

Nitrogen deposition artificially fertilizes the soil and creates better conditions for non-native species to persist and to ultimately displace the native species, resulting in type conversion (conversion of one habitat type to another). Proliferation of weedy species and type conversion of coastal sage scrub to nonnative grasslands are factors that have contributed to the coastal California gnatcatcher's decline, and prevention of type conversion and habitat degradation are priorities for the recovery of the species (USFWS 2007a). San Diego fairy shrimp are vulnerable to grass invasions that shorten the inundation periods of vernal pools (Weiss 2006).

Excessive nitrogen deposition is strongly correlated with the growth of non-native vegetation (Huenneke et al. 1990; Inouye and Tilman 1995; Weiss 1999; Bowman and Steltzer 1998; Brooks 2003) and field studies have found that nitrogen fertilization in sites with elevated nitrogen deposition will enhance grass invasion (Rillig et al 1998; Brooks 2003).

Both terrestrial and aquatic habitat may be sensitive to nitrogen deposition. Sensitive habitat in the greater vicinity of the project includes coastal sage scrub, wetlands and intertidal salt marshes, Mugu Lagoon, and the McGrath Lake and surrounding wetlands. The herbaceous habitat on beaches west of the site may also be sensitive to nitrogen deposition. These protected areas support state and federally-listed species, including western snowy plover (federally-listed threatened), light-footed Ridgeway's clapper rail (federally and state-listed endangered), Belding's savannah sparrow (state-listed endangered), and California least tern (federally and state-listed endangered). The McGrath State Beach and Santa Clara estuary are also included within staff's analysis.

Biological Resources staff has undertaken a qualitative analysis of nitrogen deposition impacts, for several reasons. As a peaker plant, the proposed project would only operate around five percent of the time, thereby only sporadically causing emissions. Emissions were modeled by the applicant and verified by Air Quality staff, but have numerous conservative assumptions built into the results, as discussed in **Biological Resources Appendix-1**. These assumptions result in a highly conservative level of nitrogen deposition being reported. Staff has also undertaken a qualitative approach as it mirrors the State of California's approach in identifying and reducing nitrogen emissions. This entails utilizing a region-wide approach when weighing the deposition rates of any particular project, and instead of viewing them singularly, may often view deposition in the region as a whole.

For example, the proposed project occurs within the Ventura County Air Pollution Control District (VCAPCD). The VCAPCD (under oversight of the Environmental Protection Agency) implements the federal Clean Air Act. Under this program, the VCAPCD allows for the purchase of Emission Reduction Credits (ERCs), which offset emissions for the entire region, ensuring that emissions overall continue to decrease. Finally, baseline data for nitrogen deposition is outdated, and staff only has data from 2002 for the region (Tonneson et al 2007). Since that time, the VCAPCD's region-wide approach has reduced the atmospheric load of nitrogen oxides, see **Biological Resources Appendix-1, Figure Ndep-2,** for more information.

Staff reviewed the Clean Air Act (CCA), and determined that "secondary constituents", including nitrogen oxides among other pollutants, are considered within the CCA. The CCA sets secondary national ambient air quality standards (NAAQS), standards designed to protect public welfare from any known or anticipated adverse effects of a pollutant. In this context, "public welfare" includes soils, water, wildlife, vegetation, visibility, weather, and climate, as well as effects on man-made materials, economic values, and personal comfort and well-being (U.S. EPA 2016 and U.S. EPA 2008). The EPA uses NO_2 as the indicator for the larger group of oxides of nitrogen (NOx). The project modeling of NO_2 emissions is zero (0) micrograms (TN 206791, Table 4.1-29) on an annual basis, **Table 6, Secondary Air Quality Standards**.

Table 6 Secondary Air Quality Standards

Federal NO_2 Standard	100 µg/m^3 (0.053ppm)
Modeled Maximum NO_2 emissions	0 µg/m^3

The secondary NAAQS for NO_X is identical to the primary standard set in 1971, an annual average not to exceed 0.053 ppm nitrogen dioxide (NO_2). Based on the applicant's modeling, the project would not contribute to nitrogen dioxide in the region, thereby complying with the Clean Air Act, and its protections of wildlife and vegetation.

In its Data Response, set 2, dated November 30, 2015, for data requests numbered 23-26, the applicant modeled project-specific nitrogen deposition rates (PPP 2015z). Air Quality staff performed an independent assessment of the data's accuracy, including modeling, to verify the applicant's results, see **Biological Resources Appendix-1**. The applicant used critical loads to describe modeled nitrogen deposition results (TN 206791, Table 4.2-4 (Revised 11/18/15)). Critical load is defined as the input of a pollutant (here, nitrogen and its oxides) below which no detrimental environmental effects occur. Critical loads are taken from Pardo, et al, 2007. This conservative quantitative analysis used worst-case modeled scenarios. In this context, "worst-case" means the maximum predicted operational capacity of the project, along with atmospheric conditions that encourage deposition primarily around the plant. This conservative modeling effort showed that deposition of nitrogen with Unit 1, Unit 2, and the new gas turbine, as well as an emergency turbine generator would supply 0.08 to 2.85 percent of the critical load for nitrogen, by each vegetation type. This is considered an insignificant level of deposition for each of these habitat types.

While these levels of nitrogen deposition are considered insignificant, the proposed project would exceed limits for air emissions for particulate matter (PM). Nitrogen oxides are a precursor to PM formation, and therefore, the applicant would have to provide mitigation, including provision of ERCs.

Given the extremely conservative assumptions in this modeled data, the very low percentage of nitrogen contributed to critical load, and other factors discussed above, staff does not expect any significant impacts to occur from nitrogen deposition in sensitive habitat.

Noise

Excessive noise masks auditory cues from other birds, including potential mates, and approaching predators. Chronic exposure to excessive noise has been demonstrated to negatively affect foraging behavior, reproductive success, population density, and community structure (Habib et al. 2007; Bayne et al. 2008; Barber et al. 2010). The resource agencies often use a threshold of 60 dB as a threshold for adverse noise impacts. Biological resources staff coordinated with Noise and Vibration staff to determine operational noise at points LT-A and point LT-B (**Biological Resource Figure 4, Predicted Offsite Noise**), to determine potential noise effects on sensitive habitat to the west (beaches and critical habitat for western snowy plover), and to the north (McGrath Lake and adjacent wetlands). Operational noise levels at LT-A would be

approximately 54 decibels, and operational noise levels would be approximately 55 decibels at LT-B with average wind conditions. These levels are also well within the standard of 60-65 decibel informal threshold, and are lower than the ambient noise level of the beach and ocean surf noise, measured in the area as ranging from 63-78 dB, **Biological Resources Table 5**.

Birds at the site are expected to be acclimated to the noise of the ocean, the adjacent roads, the MGS, and human development noise created by residential uses to the south of the site. Staff expects no significant impacts associated with operational noise of the project. Vibratory effects are not expected to be significant. The applicant states that the combustion turbine generator is designed and engineered to be balanced, and no vibratory effects to people are assumed. Similarly, no significant vibratory effects to wildlife are expected from operation of the proposed project.

Lighting

The project's operations lighting would conform to current standards, which require minimal lighting, directional lights, and switched lighting circuits for areas where lighting is not required for normal operation or safety. Lighting for the project would include building exteriors, entrances, equipment platforms, and at the existing parking lot. This lighting would be designed to optimize illumination of work areas while minimizing off-site illumination to nearby wetlands, marshes, and dunes. The exhaust stack would be illuminated with aviation warning lights , and the stack and structures would be treated to reduce reflectivity and potential glint or glare.

To minimize backscatter of light to the sky and ensure that lighting does not obtrude beyond the project site, staff proposes Condition of Certification **VIS-3** (refer to the **Visual Resources** section for the full text of this condition). This condition also incorporates a complaint system for operational nuisance lighting. Researchers have found that by extinguishing the steady-burning red lights (L-810) on towers, nighttime bird fatality rates can be reduced by more than 70 percent. Birds are not as likely to be attracted to and collide with towers that are lit with only red flashing lights (L-864) or white flashing lights (L-865)(MSU 2016).To minimize potential for birds to be attracted to any aviation lighting on tall structures, Condition of Certification **TRANS-6** requires red blinking L-864 lights.

CUMULATIVE IMPACTS AND MITIGATION

Under the CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR [Environmental Impact Report] together with other projects causing related impacts" (Cal Code Regs., tit.14, §15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable" (Cal Code Regs. tit. 14, §15130(a)). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (Cal Code Regs. tit. 14, §15164(b)(1)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

Staff considered numerous projects within the vicinity of the Puente project, including projects that resulted in development of native vegetation, or those that could overlap potential impacts of the project– see **Biological Resources Appendix-2**; full descriptions (where available) are available in the **Executive Summary** of this document. Examples of projects included for the biological resources cumulative analysis are the coastal project "Beachwalk on the Mandalay Coast" (approximately one-half mile to the south), and the inland "Teal Club Specific Plan" (approximately 2.8 miles to the east). Projects were excluded from analysis if they were determined to have no biological resources present on-site or immediately adjacent the project, or if they were to occur within highly developed areas of Ventura County.

Due to ongoing operation of the MGS, the proposed project site is highly disturbed, and provides limited suitable foraging habitat for special-status species. Indirect cumulative effects could include disruption from lighting, storm water runoff and spills, or spread of invasive weeds. Implementation of Conditions of Certification **BIO-1** through **BIO-7** would minimize or avoid construction-related impacts from lighting, spread of invasive weeds, and storm water runoff and spills from the project.

Noise effects in combination with project construction and demolition noise could result in cumulative impacts to birds such as western snowy plover. Condition of Certification **BIO-8** requires the project owner to take noise measurements during construction and demolition activities. With implementation of Condition of Certification **BIO-8**, the proposed project's contribution to noise impacts at locations with noise-sensitive biological resources would not contribute considerably to cumulative effects. The projects identified in staff's cumulative project list were too far from the project, or would likely have impacts that did not overlap spatially or geographically with the project. No other projects with similar indirect cumulative effects were identified during staff's cumulative analysis, and Puente's incremental impacts would not be expected to be cumulatively considerable with mitigation for effects such as lighting, noise, spread of invasive weeds, or storm water runoff and spills. These mitigation measures include Conditions of Certification **BIO-2**, **BIO-4**, **BIO-6** and **BIO-7**.

Although not identified during staff's analysis, it is possible that other projects could have related direct impacts, including loss of wetlands under Coastal Commission jurisdiction. A desktop search using Google Earth maps and the USFWS's National Wetland Inventory map did not reveal any wetland habitat associated with the cumulative projects; however, staff does not have sufficient data to be sure that small wetlands do not exist. As no wetland was large enough to be identified during staff's review, it is assumed that any wetlands lost to other development projects would be small, and that the project's incremental effects would not be cumulatively considerable with implementation of staff's recommended Condition of Certification **BIO-9**.

In conclusion, the proposed project would not contribute considerably to cumulative effects to biological resources.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The proposed project must comply with LORS that address state and federally-listed species, as well as other sensitive biological resources. The project's compliance with applicable LORS is discussed in **Biological Resources Table 7, Conformance with Laws, Ordinances, Regulations, and Standards.**

Biological Resources Table 7
Conformance with Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description	Compliance Determination	Discussion
Federal			
Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Take of federally listed species as defined in the Act is prohibited without incidental take authorization, which may be obtained through Section 7 consultation (between federal agencies) or Section 10 Habitat Conservation Plan. The administering agencies are the USFWS and National Marine Fisheries Service.	Yes	Construction and operation of the proposed project would not result in any adverse impacts to federally-listed species or their critical habitat. Conditions **BIO-1** through **BIO-10** protect and benefit threatened and endangered species.
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26))	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into Waters of the U.S., including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants.	Yes	Removal of the outfall structure would necessitate a Section 404 permit and is covered by Nationwide Permit 7.

Applicable LORS	Description	Compliance Determination	Discussion
Section 10 of the Rivers and Harbors Act of 1899	Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through the Corps of Engineers, for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable water of the United States, and applies to all structures	Yes	The project's impacts. Waters of the U.S. during removal of the outfall structure would be covered under Nationwide Permit 7, and the permit would be included in the BRMIMP, as per condition **BIO-6**,
Migratory Bird Treaty (Title 16, United States Code, sections 703 through 711)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird including nests with viable eggs). The administering agency is the USFWS.	Yes	Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-4** ensure qualified biologists are available during construction and to conduct pre-construction surveys. **BIO-8** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found. **BIO-8** prohibits explosive demolition of MGS Units 1 and 2 and the stack during nesting season.
State			
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species. The administering agency is CDFW.	Yes	Potential impacts to state-listed species would be less than significant with conditions **BIO-7**,**BIO-8**, and **BIO 10**.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered. The administering agency is CDFW.	Yes	Potential impacts to state-listed species would be less than significant with conditions **BIO-7** and **BIO-8**.

Applicable LORS	Description	Compliance Determination	Discussion
Fully Protected Species (Fish and Game Code sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also Title 14, California Code of Regulations, section 670.7). The administering agency is CDFW.	Yes	There are no fully protected species in the vicinity that could be impacted by the project.
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 of any bird. The administering agency is CDFW.	Yes	Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-4** ensure qualified biologists are available during construction and to conduct pre-construction surveys. Condition of Certification **BIO-8** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and the project is required to implement a Worker Environmental Awareness Program (WEAP) (**BIO-5**) to educate workers about compliance with environmental regulations, including Fish and Game Code. In addition implementation of **NOISE-6** through **NOISE-8** would reduce impacts to nests and eggs to less than significant.

Applicable LORS	Description	Compliance Determination	Discussion
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds. The administering agency is CDFW.	Yes	Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-4** ensure qualified biologists are onsite during construction and to conduct pre-construction surveys. Condition of Certification **BIO-8** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and the project is required to implement a WEAP (**BIO-5**) to educate workers about compliance with environmental regulations, including Fish and Game Code.
Lake and Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process. The administering agency is CDFW.	Yes	The Energy Commission permit for the project serves as an in-lieu permit for Fish and Game Code Section 1602 compliance for impacts to the Edison Canal and the removal of the ocean outfall structure.
California Coastal Act (Public Resources Code, section 30231)	The 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 waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams. The administering agency is the California Coastal Commission.	Yes	The project maintains a buffer area from riparian habitat to the north (McGrath Lake and associated marsh). Implementation of **BIO-7** would control runoff and spoils storage methods.

Applicable LORS	Description	Compliance Determination	Discussion
California Coastal Act (Public Resources Code, section 30233)	The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects. The administering agency is the California Coastal Commission.	Yes	Alternative site locations and onsite re-configurations that would avoid impacting Coastal Commission jurisdictional wetlands on the Puente site were considered; the feasibility of these alternatives is uncertain (see the **Alternatives** section of this document). Impacts to wetlands under the California Coastal Act are mitigated through adoption of staff's recommended condition **BIO-9**.
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.	The Native Plant Protection Act designates state rare and endangered plants and provides specific protection measures for identified populations. The act also includes a salvage provision, enabling CDFW to collect rare and endangered plants from properties in advance of construction or other activities that would destroy the plants. The administering agency is the CDFW.	Yes	The project has less than significant impacts upon woolly seablite, which is state rare, but not significant under CEQA. No other rare or endangered plants exist on the project site; **BIO-10** requires preconstruction surveys and flagging to avoid special-status plants.
Porter-Cologne Water Quality Control Act	Regulates discharges of waste and fill materials to waters of the state, including "isolated" waters and wetlands.	Yes	Nationwide Permit 7 would authorize discharge to the Edison Canal and outfall structure.
Local			
City of Oxnard Coastal Land Use Plan policies 6d, 6e; 10a-d, 10g	Encourage preservation and management of biotic resources, including special-status species. The administering agency is the city of Oxnard.	Yes	Conditions **BIO-1** through **BIO-9** all act to preserve and on-site and adjacent off-site habitat
City of Oxnard General Plan §17-20, (A)(3)	Places constraints on sensitive habitat areas, but do not supersede CDFW and USFWS requirements. The administering agency is the City of Oxnard.	Yes	The project does not impact any sensitive habitat areas

With implementation of staff's proposed conditions of certification, the proposed project would comply with all LORS pertaining to biological resources. Conditions of Certification **BIO-1** through **BIO-7** pertain to minimization of general construction impacts to plants and wildlife, and habitat. These conditions minimize and avoid any indirect impacts such as introduction of invasive weeds off-site. Condition of Certification **BIO-8** requires pre-construction surveys for nesting birds within the project

site, and installation of an appropriate buffer if nesting birds are found, ensuring compliance with the Endangered Species Act (ESA). Condition **BIO-8** also requires that the project owner install silt fencing to minimize impacts to terrestrial species and prevent erosion runoff from the project site into adjacent habitat. Condition of Certification **BIO-9** requires habitat mitigation at a 4:1 compensation ratio for loss of wetlands under the jurisdiction of the Coastal Commission, ensuring compliance with the California Coastal Act. Lastly, LORS specific to avian species (ESA and MBTA) are maintained through implementation of conditions **NOISE-6** through **NOISE-8** and **BIO-8**, ensuring that noise impacts do not adversely affect nesting birds. Condition of Certification **BIO-10** ensures that no adverse impacts will occur to dune vegetation or dune –associated wildlife during removal of the outfall structure.

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
USFWS	Comment 2: The USFWS comments that use of an existing outfall structure across the beach may impact western snowy plover and California least tern eggs, and further states that waste water discharge flooding from the outfall structure has resulted in the loss of western snowy plover eggs in the past.	Response 2: Currently, in order to clear the outfall of sand buildup, which diverts the channel across the beach, the Coastal Commission issues emergency permits pursuant to Section 30624(a) of the Coastal Act, which are subsequently followed by Coastal Development Permits from the city of Oxnard. This has caused problems in the past, eroding western snowy plover critical habitat, and potentially washing eggs out to the ocean. The applicant recently proposed to remove the outfall (PPP, 2016a), and additional analyses and mitigation has been added to the staff assessment. Additionally, removal of the outfall structure has the potential to impact California least tern, western snowy plover and western snowy plover critical habitat; these impacts are temporary. Please refer to the "Outfall Removal" subsection above for analysis of the impacts of removing the outfall, as well as staff's new recommended condition **BIO-10**.
USFWS	Comment 3: The presence of power plants appears to reduce use of nearby suitable breeding habitat by California least tern and western snowy plover, and construction of a new plant, or abandonment-in-place of Units 1 and 2, may impact California least tern, western snowy plover, and western snowy plover habitat.	Response 3: Staff is familiar with a powerpoint titled "Power Plant Nest Shadows"(Hartley, unpub. data), which suggests that the presence of power plants may decrease the suitability of nesting habitat, as evidenced by decreased nesting on beaches and dunes directly in front of the Mandalay and Ormond Beach generating stations. The powerpoint further suggests that causes such as lighting and mimicking natural features that are unsuitable, such as cliffs, may cause this decline in nesting suitability. Other causes, such as habitat features and vegetation type and cover may also contribute to nest shadows in front of power plants. The powerpoint suggests that the reasons for the nest shadow are poorly understood, and may not be related to the presence of power plants. Nesting in 2012 at Ormond Beach may have been related to a new, more efficient lighting regime at the facility (Cynthia Hartley, pers. comm.), which documented as occurring within the "shadow" of the facility. The Mandalay plant is an old facility, not under Energy Commission jurisdiction, and staff has no details on the lighting regime,

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
		which may cause impacts at the plant. For Puente, staff has already identified nighttime lighting as a potential impact, and developed Condition of Certification **VIS-2** to minimize and downcast nighttime lighting (refer to the **Visual Resources** section of the FSA). Other impacts such as fugitive dust and weed proliferation may also have adverse impacts on suitable breeding habitat. These impacts are fully analyzed in the FSA (see the subsection "General Construction and Demolition Impacts" above). In response to a comment letter by the Coastal Commission, modifications have been added to Condition **BIO-8**, requiring noise monitoring and further restrictions on pile driving. Staff believes that with implementation of these and other conditions of certification, along with removal of the outfall, impacts to western snowy plover and least tern would be fully mitigated.
USFWS	Comment 4: The USFWS notes that operation of the existing Mandalay power plant has already impacted western snowy plover, and western snowy plover critical habitat, and advises the applicant to obtain an Endangered Species Act Section 10(a)(1)(b) permit for incidental take.	Response 4: The legal definition of incidental take is to conduct an otherwise lawful activity that might incidentally, but not intentionally, "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) an Endangered Species Act (ESA) listed terrestrial and freshwater aquatic species. An ESA Section 10 Determination is required for non-federal entities to obtain an Incidental Take Permit, which is only necessary if there is no federal authorization or funding to the proposed project. Staff is aware of an incident where the outfall channel washed western snowy plover eggs out to sea. The potential for such direct adverse impacts would be eliminated with the removal of the outfall structure. Take of western snowy plover has occurred through loss of eggs due to outfall wave action sweeping eggs out to sea. Although removal of the outfall was not contemplated when the AFC was filed, it is currently part of the project (PPP 2016a). Currently, the applicant has not indicated that a Section 10(a)(1)(b) permit will be obtained. The decision to obtain a permit rests with the applicant, and the USFWS exercises prosecutorial discretion over violations of the law. Staff has modified condition **BIO-6** to reflect that the applicant may obtain an Incidental Take Permit: "3. all biological resource mitigation, monitoring, and compliance measures required in federal

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
		regulatory agency terms, conditions or permits, such as those provided in the National Pollution Discharge Elimination System (NPDES) Construction Activities Stormwater General Permit, or Federal Section 10 Endangered Species Act permit, etc;" Removal of the outfall structure would result in net beneficial effects to western snowy plover, California least tern, and western snowy plover critical habitat. Staff believes that with implementation of Conditions of Certification **BIO-1** through **BIO-10**, all impacts would be reduced or mitigated to below significance, and no significant impacts to critical habitat would occur.
California Coastal Commission, 30413(d) Report – Final Approved Report for Puente Power Project, dated August 26, 2016 (TN213667)	Comment 5: Coastal Commission Recommended Specific Provisions (page 13). The Coastal Commission recommends that the Energy Commission require that the proposed project be relocated to an alternative site that would not result in direct impacts to or fill of coastal wetlands. This would ensure conformance with Coastal Act sections 30231, 30233(a), and Local Coastal Plan (LCP) Policy 52.	Response 5: Staff has considered two onsite project configurations, as well as two alternative offsite project locations, that would avoid filling the onsite wetlands. However, the feasibility of these alternatives is uncertain. Please see the **Alternatives** section of the FSA for more information.
Coastal Commission	Comment 6: If the Energy Commission determines that relocating the project to an alternative site that avoids fill of coastal wetland is infeasible, consistency with Coastal Act Section 30233(a) would still require that the adverse impacts of wetland fill be minimized by the provision of feasible mitigation measures. In order to ensure the proposed mitigation fully compensates for temporal loss of wetlands, the Coastal Commission recommends modifying condition **BIO-9** to require compensatory mitigation in the form of a 4:1	Response 6: Based on Coastal Commission comments, staff understands that a proposed 4:1 mitigation ratio is supported by the fact that wetland mitigation takes time to complete successfully. A 4:1 ratio would ensure full mitigation of the loss of the habitat. Staff has incorporated a new mitigation ratio of 4:1 into the FSA.

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
	mitigation ratio.	
Coastal Commission	Comment 7: To ensure that the project conforms with LCP Policy 6, the Coastal Commission recommends that the Energy Commission modify condition **BIO-7** to require the applicant to design the project such that all project-related development is at least 100 feet, and further, if feasible, from nearby areas that meet the Coastal Commission and LCP definitions of wetlands or ESHA, and that submittal of revised project plans be required to reflect these changes in the project layout.	Response 7: Condition **BIO-7** has been modified accordingly.
Coastal Commission	Comment 8: The Coastal Commission recommends two modifications to condition **BIO-8**. First, that a Noise Monitoring Plan be developed to prevent disturbance of nesting birds during construction and demolition activities, and, secondly, that condition **BIO-8** should be modified to require that the applicant schedule and conduct all pile driving activities outside of breeding and nesting season (February 1 through August 31).	Response 8: The Coastal Commission recommends that continuous noise monitoring be conducted at the site. Energy Commission staff have previously recommended similar conditions for the Huntington Beach Energy Project (HBEP). Noise staff contend that continuous monitoring is an imprecise approach to minimizing noise effects, because noise monitoring is a snapshot in time. This is because when reviewing a day's worth of monitoring, it is very difficult to determine which combination of machinery or equipment was being used, and what combination of natural factors such as ambient ocean noise was contributing to noise effects. This makes it difficult then to assign effective noise reduction measures, or to predict if and when the same conditions may arise, and therefore replicate the noise effects. Noise staff therefore relies upon a complaint system. In the HBEP case, a similar situation arose with light-footed clapper rail and the adjacent Magnolia Marsh. Staff initially recommended monitoring with thresholds at 60 dBA or 8 dBA above ambient, similar to what the Coastal Commission has recommended for this project (CEC, 2014a). Staff later amended the condition to reflect that a "meet and confer" approach would be used, rather than discrete thresholds of 60 dBA or 8 dBA above ambient levels. During hearings, the Energy Commission relied, in part, upon testimony from Dr. Dooling, who testified that avian hearing is different from human, and

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
		that construction noise occurs at low frequencies outside of the vocalization range of birds. Thus, concluded Dr. Dooling, birds are not as impacted by construction noise as humans. Dr. Dooling also testified at the Evidentiary Hearing (TN# 202838, at p.178, lines 12-16) "… you know what would happen if we did have a bird scale. It would reduce the sound pressure level by about a 10 DB or so because birds hear much less well at low frequencies than humans do." And page 178 at lines 22-23: "A 60 DBA sound would be about the same as 45 to 50 DBA for a bird. (Corrections to transcript by Stoel Rives, 2014). In part due to this input, the Energy Commission declined to impose a noise monitoring plan, including continuous noise monitoring. Condition of Certification. **BIO-8** in the HBEP Final Decision contains weekly nest monitoring. Staff's recommended **BIO-8** for Puente, similarly, recommends weekly avian monitoring within 0.25 mile of the site, which would include all ESHA and western snowy plover critical habitat areas, as referenced by the Coastal Commission. The revised language of **BIO-8** would preserve the intent of the Coastal Commission's comments by adding continuous monitoring during all new project phases: The project owner shall monitor sound levels during the first two days of pile driving or other significant construction and demolition activities (demolition, site clearing, foundation work, steel erection, and pile driving (if necessary) located within 100 feet of established nests when such activities take place during the bird breeding season (February 1 to August 31). Sound levels shall not exceed a 65 decibel hourly Leq construction/demolition noise limit. Condition **BIO-8** requires the project owner to submit monthly compliance reports detailing the results of nesting bird surveys and mitigation measures; therefore, staff has not asked for a noise monitoring plan, which would largely be duplicative of preexisting monitoring requirements; with the exception of pile driving. Staff has modified **BIO-8** to state that should pile driving occur, a plan must first be developed in concert with the agencies. Staff adapted this modification in

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
		response to the Coastal Commission's comment regarding the use of pile driving, and the fact that the applicant believes that pile driving can be accomplished by other methods, such as use of auger cast, hydraulic or drilled piles, which would minimize noise and vibration (PPP 2016).
Environmental Defense Center Comments on California Coastal Commission Section 30413(d) Report, dated September 1, 2016 (TN 213468)	Comment 9: On behalf of the Environmental Coalition of Ventura County, Environmental Defense Center, and Sierra Club, the intervenor comments that neither the 30413(d) report nor the PSA have identified onsite wetlands as an ESHA, and the commentor asks the Coastal Commission to identify if onsite wetlands were considered for inclusion as an ESHA.	Response 9: Although not directed at the Energy Commission, staff has endeavored to answer this question as it pertains to staff's analysis of wetlands and ESHA in the FSA. Environmentally sensitive habitat areas are defined by the Coastal Act, section 30107.5: *"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.* The Coastal Commission has determined that the hydrophytic plant species found on the project site are relatively common in coastal wetlands, and the area is not known to support listed, rare or sensitive wildlife species (CCC, 2016a). The Coastal LUP for the city of Oxnard (Figure 2.3, Sensitive Habitats Map amendment, and Figure 2.4, Coastal Access Map Amendment), shows portions of the McGrath mitigation parcel to the north of Puente as an ESHA, but does not characterize the Puente site as an ESHA. Thus, the project site does not meet the definition of an "environmentally sensitive habitat area" under Section 30107.5 of the Coastal Act. Staff concurs with this assessment.
Naval Base Ventura County, Comments on the Preliminary Staff Assessment, dated September 15, 2016 (TN 213650)	Comment 10: Potential impacts to special-status species and other biological resources at the Ormond Beach alternative site should be further analyzed should the alternative site be further pursued, given the plans for wetlands restoration in the area.	Response : Please see response to Comment #5, and staff's updated discussion in the FSA of restoration opportunities in the region.
County of Ventura, Comments on Preliminary Staff Assessment, dated September 15, 2016 (TN 213654)	Comment 11: The County of Ventura recommends that the Energy Commission consider one of the site reconfigurations options as a preferred alternative to the proposed project because it avoids	Response: Please see response to Comment #5

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
	impacts to wetlands.	
County of Ventura	Comment 12: The county states that a 2:1 mitigation ratio is too low, given the temporal loss of wetland until compensatory mitigation parcels are fully restored. The county further recommends that wetlands are avoided, rather than mitigated.	Response 12: Energy Commission staff has considered this and other additional factors, and has proposed increasing the mitigation ratio to 4:1 (see revised Condition **BIO-9**). Please see the **Alternatives** section of the FSA for analysis of both on and offsite alternatives to avoid filing wetlands.
County of Ventura	Comment 13: The county maintains that the installation of four new 100-foot tall power poles could result in a significant impact to special-status wildlife, increasing perching for predatory birds and resulting in depredation of special-status nesting birds. The county recommends either undergrounding the wires, or establishment of a monitoring program.	Response 13: According to the applicant's document Refinement to Transmission Interconnection (TN 213000,PPP 2016b), the "220-kilovolt (kV) transmission interconnection for the proposed project will now consist of a single gen-tie connection, which will require one mono-pole structure and one take-off structure, providing a direct connection to SCE's transmission system and bypassing the existing Mandalay Switchyard." Staff disagrees that this would constitute a significant perching site for predatory avian species, given the distance inland from the beach and the height of the dune complex in between the beach and the power pole, and the number of other power lines in the general vicinity.
Applicant's Comments on California Coastal Commission Report to California Energy Commission on AFC 15-AFC-01—NRG Puente Power Project, dated September 12, 2016 (TN 213625)	Comment 14: The applicant disagrees that the site is a wetland and provides information regarding the previous disturbance regime at the site.	Response 14: Staff disagrees. The site meets the one-parameter rule of the Coastal Act, and further, may have historically been a wetland prior to the installation of a berm, which, according to the applicant (PPP 2016; 2016c), prevented flooding, presumably overland flooding from McGrath Lake, and was also drained in recent history (see revised "Coastal Zone Wetland" subsection above). It is not necessary to prove the origin of wetland pursuant to the Coastal Act, it is only necessary to document the presence of a single wetland indicator. In this case, salt-loving hydrophytic plants have established on a portion of the project site rendering it a wetland pursuant to Coastal Commission regulations.
Intervenors Environmental Coalition, Sierra Club, Environmental Defense Center, Comments on Preliminary Staff Assessment, dated September 13, 2016 (TN 213635)	Comment 15: The project description fails to fully describe the environmental setting, including nearby undisturbed wildlife habitat and ESHA.	Response 15: Please refer to pages 4.2-4 through 4.2-22 of the PSA for a description of the environmental setting, and to the updated subsection of the FSA titled "Environmentally Sensitive Habitat."
Environmental Coalition, Sierra Club,	Comment 16: The PSA fails to properly consider alternatives	Response 16: Please see response to

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
Environmental Defense Center	to the filling of a wetland	Comment 5.
Environmental Coalition, Sierra Club, Environmental Defense Center	Comment 17: The PSA fails to address if onsite wetlands qualify as an ESHA.	Response 17: Please see response to comment 9, and also the modified subsection of the FSA titled “Environmentally Sensitive Habitat.”
Environmental Coalition, Sierra Club, Environmental Defense Center	Comment 18: The PSA fails to consider indirect effects of project light and noise on adjacent ESHA. The PSA does not acknowledge operational light impacts, nor does it address impacts associated with dewatering, noise and vibration, and wastewater discharge onto the beach.	Please see PSA pages 4.2-28 to 4.2-32 for a discussion of indirect effects of project noise and light on adjacent habitat, including ESHA. Please see ”Operational Noise” subsection page 4.2-36 of the PSA; staff has added a subsection in the FSA on operational light. Please refer to the **Soil and Water Resources** section for a discussion of dewatering and wastewater discharge onto the beach. Please see also “Outfall Removal” within the **Biological Resources** section of the FSA, for a discussion of impacts associated with the removal of the outfall structure.
Environmental Coalition, Sierra Club, Environmental Defense Center	Comment 19: The PSA fails to consider the project’s “significant negative impact” on habitat restoration plans and opportunities.	Please refer to **Alternatives Figure 9** for a depiction of the restoration efforts associated with Ormond Beach, as well as updated information in the **Biological Resources** section of the FSA, under the “Regional Setting” subsection. The project would not have a direct effect on habitat restoration opportunities in the region. Indirect effects such as fugitive dust and noise are mitigable with implementation of staff’s recommended conditions of certification. Staff is unaware of restoration plans directly proposed for the project site; no significant impacts are expected. Please also refer to the **Soil and Water Resources** section for a discussion of potential indirect (dewatering) effects on McGrath Lake.
Environmental Coalition, Sierra Club, Environmental Defense Center	Comment 20: The PSA does not adequately support a mitigation ratio of 2:1 for onsite wetlands.	Please see response to comment 12.
Environmental Coalition, Sierra Club, Environmental Defense	Comment 21: The PSA fails to disclose the presence of coast horned lizards, pond turtles,	Response 21: Staff has updated the FSA to reflect the observations of Mr. L. Hunt (**Biological Resources Table 3**).

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
Center	horned lizards, legless lizards, and two-striped garter snakes on the project site, and other special-status species.	
Environmental Coalition, Sierra Club, Environmental Defense Center	Comment 22: The PSA does not disclose the past and future take of endangered species.	Staff has added the reference to the loss of western snowy plover eggs to the FSA. Please see response to USFWS, Comment 4, regarding incidental take, and updated information in the FSA, reflecting the removal of the outfall structure as part of the project description.
Applicant's Comments on the Preliminary Staff Assessment, dated September 15, 2016 (TN 213683)	Comment 23: The applicant proposes several language changes to **BIO-9**.	Staff rejects the change which would cap the amount of restoration money spent to compensate for impacts to 2.03 acres wetlands under the jurisdiction of the Coastal Commission. This cap of $500,000 may preclude the project owner from meeting the full obligation of wetland compensation. The Coastal Commission has recommended a different approach, to mitigate at a ratio of 4:1 through staff's recommended **BIO-9**. This would allow the project owner to mitigate through participation in a mitigation bank or other approved restoration opportunity. Staff recommends this approach. Staff has accepted other, minor revisions to the condition, but has not accepted deletion of specific goals, objectives, and performance criteria as listed in **BIO-9**, part I through VIII, as these have been reviewed and approved by the California Coastal Commission as an integral part of the condition. Staff believes removing these items would weaken the condition.
Applicant	Comment 24: The applicant proposes language changes to **BIO-7**.	Staff has incorporated the suggested edits.
City of Oxnard's Comments on the Preliminary Staff Assessment, dated September 15, 2016 (TN 213681)	Comment 25: The PSA does not disclose impacts of operation of the beach outfall structure, which may affect snowy plover and least tern nests.	Please see the subsection "Outfall Removal", above.
City of Oxnard	Comment 26: The PSA does not account for a Section 10 Incidental Take Permit or a state incidental take permit.	Response 26: Please see responses to comments 1 through 4. The applicant has not indicated that a state or federal incidental take permit would be applied for. Staff does not believe that take of state or federally-listed animals would occur, if staff's recommended Conditions of Certification **BIO-1** through **BIO-10** are implemented.
City of Oxnard	Comment 27: The city observes that the USFWS has	Response 27: Please see responses to comments 1 through 4.

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
	commented that the project may have the potential to impact special-status bird species (Least bell's vireo, California least tern, and Western snowy plover) by degrading habitat and subsidizing perching opportunities.	
Rob Simpson, Materials submitted at September 9, 2016 Coastal Commission hearing on 30413(d) Report, dated September 19, 2016 (TN 213736)	Comment 28: Commenter has presented comments, previously prepared for the Amended Carlsbad Energy Center Project, to the Coastal Commission.	Response 28: The Amended Carlsbad Energy Center Project—the focus of commenter's letter—was certified by the Energy Commission in 2015. Staff acknowledges receipt of this comment letter.
California Department of Fish and Wildlife, Comments on Preliminary Staff Assessment, dated October 13, 2016 (TN 214009)	Comment 29: Additional analysis of the perched aquifer, potential effects on subsurface flows into adjoining habitat areas, and how the aquifer may be altered by the proposed project, both during and after construction, should be included in the FSA.	Response 29: Please refer to the **Soils and Water Resources** and **Geology and Paleontology** sections of the FSA for more information about proposed project activities and the aquifer underlying the project site. No dewatering impacts are expected.
CDFW	Comment 30: The environmental analyses must be based upon sound field assessments for sensitive plants, animals, and natural communities. Plant assessments should follow the CDFW's current *Protocols for Surveying and Evaluating Impacts to Species Status Native Plant Populations and Natural Communities* (CDFW 2009). Also, the project may have cumulative effects on sand movement processes.	Response 30: Both the PSA and FSA are based on sound survey techniques. The CDFW may review the qualifications of surveying biologists in the AFC, Appendix D-2. For a discussion of sand movement corridors, please see the **Soil and Water Resources** section of the FSA.
CDFW	Comment 31: The current setback does not appear to be adequate. Additional analysis of indirect effects is necessary to better determine an appropriate buffer for the North Shore 28-acre wetland mitigation area and McGrath State Beach, to the north of the project. It may prove beneficial to include a bioswale along this northern boundary to allow more infiltration to benefit wetlands to the north.	Pursuant to Coastal Commission comment and in accordance with the city of Oxnard's LCP, the buffer for the project would be 100 feet. Additionally, the mitigation parcel for the North Shore project has its own 100-feet buffer from all edges (CCC, 2002). A berm already exists on the northern portion of the site, so there is no stormwater being directed into the northern wetlands, as suggested by the CDFW letter. It is infeasible to construct a bio swale north of the project site, owing to parcel size limitations. If a perched aquifer existed there would be a barrier between surface and groundwater replenishment. Because a perched aquifer

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
		does not exist under the site, a bioswale may have limited utility because groundwater recharge already occurs across permeable surfaces of the project site and vicinity. Please refer to the **Geology and Paleontology** section of the FSA.
	Comment 32: A focus on salt marsh restoration may not offset all project-related direct and indirect impacts, as areas mapped as coyote brush scrub onsite are also considered a type of dune swale wetland, as described in Ferren, Fiedler, and Leidy (1995). Also, "the 12 acres of mitigation proposed by the California Coastal Commission" may serve to offset wetland impacts. CDFW suggests that habitat acquisition could help offset unavoidable permanent impacts; CDFW has identified a number of areas near the project vicinity which support dune systems with remnant wetlands, which currently have no protection or invasive species management.	Please see the updated subsection titled "CDFW Jurisdictional Wetlands" and updated condition **BIO-9**. Staff has updated this condition to reflect that mitigation shall take place at a 4:1 ratio, and may include dune swale (palustrine scrub-shrub) wetlands as well as salt marsh wetlands. Staff notes that the wetland mitigation for the project would not be 12 acres. Staff is proposing that 2.03 acres of Coastal Commission-jurisdictional wetlands be mitigated at a 4:1 ratio, for a total of 8.12 acres.
	Comment 33: Weeds are present and are presumably not controlled. Weed management could be funded as an enhancement activity in local areas onsite and offsite.	Condition of Certification **BIO-7 #10** controls for weeds on the project site. Staff has modified **BIO-7** to include that the owner shall keep the northern boundary of the project site free of ice plant mats and other weeds, to eliminate the possibility of weeds escaping north of the site into the Lake McGrath (Northshore) mitigation area.
	Comment 34: Additional analyses are needed of rising sea levels and potential environmental consequences should the project require armoring or become damaged and/or inoperable.	Sea level rise is discussed in the **Soils and Water Resources** section.
	Comment 35: CDFW has determined that pumping water for cooling the existing plant has likely kept the canal water circulating and cooler in temperature, and a rise in	Soil and Water staff have concluded that any impacts from shutting down the once-through cooling pumps are less than significant, because MGS pumping is only a minor contribution to flush time and the pumps do not operate for most of the year (see impact

Subject: Biological Resources		
Source of Comment	**Comment**	**Response**
	temperature may be detrimental to aquatic organisms in the Edison Canal. A feasible alternative and methods to reduce negative project related impacts to the canal may be needed.	discussion under "Surface Water Quality – Edison Canal" in the **Soils and Water Resources** section of the FSA).
CDFW	Comment 36: CDFW requests that the FSA be afforded a 60 to 90 day comment period.	Response 36: Comment acknowledged. The committee overseeing this case sets the schedule. The committee's current schedule identifies a public workshop on the FSA during the week of January 2, 2017, and evidentiary hearings to begin the week of February 6, 2017. The committee's proposed decision, which is anticipated in mid-March 2017, will have a 30-day comment period.

CONCLUSIONS

The project site and laydown area is an industrial brownfield site with an operating power plant, the Mandalay Generating Station. Although the majority of habitat on site is disturbed with nonnative iceplant mats, one special-status species, woolly seablite, occurs on the project site. The rest of the site is developed, paved, or covered with ruderal (weedy) species, and ornamental landscaping. Special-status wildlife are not expected to occur on the site; however, dunes to the west of the site support nesting western snowy plover (federally-listed threatened) and critical habitat for western snowy plover, as well as nesting habitat for the California least tern (federally and state-listed endangered). Salt marsh habitat north of McGrath Lake and wetlands immediately north of the project site may support special-status birds including the Belding's savannah sparrow (state-listed endangered), and California black rail (state-listed threatened). Given the proximity of the proposed project to the aforementioned biological resources, construction and operation would result in the direct and indirect effects presented in **Biological Resources Table 8**. With implementation of proposed conditions of certification, compliance with LORS would be achieved and direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less-than-significant levels.

Biological Resources Table 8
Summary of Impacts to Biological Resources from the Proposed Project

Impact	Condition of Certification	Significance Determination
CONSTRUCTION IMPACTS		
Native vegetation: removal of native vegetation	• **BIO-1 through BIO-4** dictates the selection and duties of a Biological Monitor(s) and Designated Biologist to mark sensitive biological areas and oversee construction.	Less than significant
Common wildlife: disturbance and injury or mortality to common wildlife, including nesting birds	• **BIO-1 through BIO-4** dictates the selection and duties of a Biological Monitor(s) and Designated Biologist to oversee construction and coordinate mitigation • **BIO-7** limits disturbance area; • **BIO-8** requires pre-construction nest surveys and impact avoidance.	Less than significant with implementation of conditions of certification
Special-status plants: degradation from runoff of sediment or toxic substances from the project site, damage from dust, spread of invasive weeds; direct impacts during outfall demolition	• **BIO-7** controls invasive weeds; • **SOIL&WATER-1** requires a SWPPP to control runoff and prevent contamination; • **AQ-SC3** requires measures to minimize fugitive dust; • **AQ-SC4** requires construction monitoring for visible dust plumes and remediation measures in the event visible dust plumes are observed. • **BIO-10** requires pre-construction surveys prior to demolition of the outfall structure and the preparation of a mitigation plan if special-status plants are detected.	Less than significant with implementation of conditions of certification
Special-status wildlife: disturbance from noise and lighting, habitat degradation from invasive weeds, stormwater runoff, or groundwater contamination, direct impacts from crushing by construction equipment	• **BIO-1 through BIO-4** dictates the selection and duties of a Designated Biologist and Biological Monitor(s) and to oversee mitigation and perform monitoring of sensitive resources • **BIO-7** confines work to delineated areas and controls invasive weeds; • **BIO-8** requires pre-construction nest surveys and impact avoidance, including focused surveys for light-footed clapper rail; • **SOIL&WATER-1** requires a SWPPP to control runoff and prevent contamination; • **VIS-2** minimizes offsite lighting; • **BIO-8** prohibits explosive demolition of the MGS during nesting season • **BIO-10** requires pre-construction	Less than significant with implementation of conditions of certification

Impact	Condition of Certification	Significance Determination
	surveys prior to demolition of the outfall structure and the preparation of a mitigation plan if special-status wildlife are detected.	
Jurisdictional wetlands: degradation from runoff of sediment or toxic substances from the project site; loss of 2.03 acres of wetlands under Coastal Commission jurisdiction	• **SOIL&WATER-1** requires a SWPPP to control runoff and prevent contamination. • **BIO-9** requires 4:1 habitat compensation for loss of approximately 2.03 acres of wetlands	Less than significant with implementation of conditions of certification
Noise: disturbance resulting in decreased productivity of special-status birds	• **BIO-8** requires pre-construction nest surveys and impact avoidance, and prohibits explosive demolition of the MGS during nesting season • **BIO-8** requires monitoring of special status bird nests within 0.25 mile of the project site • **NOISE-6** requires all equipment to have state-of-the-art silencing or buffering mechanisms • **NOISE-7** places restrictions on steam blows • **NOISE-8** restricts use of pile driving • **BIO-10** limits demolition of outfall structure to outside of nesting bird season	Less than significant with implementation of conditions of certification
Lighting: disturbance resulting in altered behavior or increased predation	• **VIS-2** minimizes offsite lighting	Less than significant with implementation of condition of certification
Dust: decreased plant productivity or nutritional quality	• **SOIL&WATER-1** prevents soil erosion • **AQ-SC3** requires measures to minimize fugitive dust • **AQ-SC4** requires construction monitoring and remediation in the event visible dust plumes are observed.	Less than significant with implementation of conditions of certification
Invasive weeds: threaten wetland restoration, destroy wildlife habitat and forage, increase soil erosion	• **BIO-7** controls invasive weeds.	Less than significant with implementation of condition of certification
OPERATION IMPACTS		

Impact	Condition of Certification	Significance Determination
Noise: disturbance resulting in mortality or decreased productivity of special-status birds and rehabilitating wildlife	**None**	Less than significant
Lighting: disturbance resulting in altered behavior or increased predation	• **VIS-3** minimizes offsite lighting.	Less than significant implementation of condition of certification
Avian collision and electrocution: injury or mortality	• **BIO-7** minimizes risk by complying with APLIC design standards.	Less than significant with implementation of condition of certification
Nitrogen deposition: degradation of habitat by enhancing invasive weeds	**None**	Less than significant

PROPOSED CONDITIONS OF CERTIFICATION

Staff proposes the following Biological Resources conditions of certification:

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission compliance project manager (CPM) for approval .

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and

3. At least one year of field experience with biological resources found in or near the project area.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 75 days prior to the start of construction-related ground disturbance activities. No pre-construction site mobilization or construction related activities shall commence until a Designated Biologist has been approved by the CPM.

If a Designated Biologist is replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval

of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, closure, and restoration activities that may impact special-status species. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner and CPM. The Designated Biologist duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;

3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;

4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. Inspect, or direct the site personnel how to inspect, the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm’s way;

6. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification;

7. Respond directly to inquiries of the CPM regarding biological resource issues;

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Reports (MCRs) and the Annual Compliance Report (ACR);

9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits; and

10. Maintain the ability to be in regular, direct communication with representatives of CDFW, USFWS, and CPM, including notifying these

agencies of dead or injured listed species and reporting special status species observations to the California Natural Diversity Database.

Verification: The Designated Biologist shall submit in the MCRs to the CPM, copies of all written reports and summaries that document construction activities that have the potential to affect biological resources. If actions may affect biological resources during operation, the Biological Monitor(s), under the supervision of the Designated Biologist, shall be available for monitoring and reporting, and shall be present when biological resources are affected and the Designated Biologist is not onsite. During project operation, the Designated Biologist(s) shall submit record summaries in the Annual Compliance Report unless their duties cease, as approved by the CPM.

BIOLOGICAL MONITOR SELECTION

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume(s), at least three references, and contact information of the proposed Biological Monitor(s) to the CPM for approval. Biological monitor(s) may assist but do not supplant, Designated Biologists, and are not required. The resume(s) shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any construction-related ground disturbance activities. The Designated Biologist shall submit a written statement to the CPM confirming that individual Biological Monitor(s) have been trained, including the date when training was completed. If additional Biological Monitors are needed during construction, the specified information shall be submitted to the CPM for approval at least 10 days prior to their first day of monitoring activities.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification.

If required by the Designated Biologist and/or Biological Monitor(s) the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unpermitted adverse impact to any special-status biological resources (those that have significance under CEQA) if the activities continued;

2. Inform the project owner and the construction/operation manager when to resume activities; and

3. Notify the CPM if there is a halt of any activities and advise the CPM of any corrective actions that have been taken or will be implemented as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance with biological resources conditions of certification or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities with the potential to adversely impact any special-status biological resources. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem, and shall respond to any CPM verbal or written requests for information within a timely manner.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a project-specific Worker Environmental Awareness Program (WEAP). The WEAP shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, and subcontractors. The WEAP shall be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting electronic media and written material, including wallet-sized cards with summary information on special status species and sensitive biological resources, is made available to all participants;

2. Discuss the locations and types of special-status biological resources on the project site and adjacent areas, explain the reasons for protecting these resources, and the function of flagging in designating special-status resources and authorized work areas;

3. Discuss federal and state laws protecting the special-status species and explain penalties for violation of applicable laws, ordinances, regulations, and standards (e.g., Endangered Species Act);

4. Place special emphasis on the light-footed clapper rail, western snowy plover, California least tern and Belding's savannah sparrow, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection and status, penalties for violations, reporting requirements, and protection measures;

5. Include a discussion of fire prevention measures to be implemented by workers during project activities; require workers to dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;

6. Present the meaning of various temporary and permanent habitat protection measures;

7. Identify whom to contact if there are further comments and questions about the material discussed in the program; and

8. Include a training acknowledgment form to be signed by each worker indicating that they received the WEAP training and shall abide by the guidelines.

The specific WEAP shall be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 45 days prior to the start of any project-related site disturbance activities, the project owner shall provide to the CPM a copy of the draft WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program. The CPM must approve the WEAP materials prior to their use. At least 10 days prior to site and related facilities mobilization, the project owner shall provide the CPM a copy of the CPM-approved final WEAP.

The project owner shall provide in the MCRs the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

The WEAP shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel working at the project site. Upon completion of the orientation, employees shall sign a form stating that they attended the training and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to the CPM upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate indicating that they have completed the required training.

WEAP training acknowledgement forms signed during construction shall be kept on file by the project owner for at least six months after the start of commercial operation.

During project operation, the WEAP shall be repeated annually for permanent employees. Signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-6 The project owner shall develop and implement a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include the following:

1. all biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

2. all biological resource conditions of certification identified in the Commission Decision as necessary to avoid or mitigate impacts;

3. all biological resource mitigation, monitoring, and compliance measures required in federal regulatory agency terms and conditions, such as those

provided in the National Pollution Discharge Elimination System (NPDES) Construction Activities Stormwater General Permit;

4. a discussion of all special-status biological resources that could be impacted by project construction, operation, and closure;

5. a detailed description of measures that shall be taken to avoid or mitigate impacts on each special-status species potentially impacted by construction, demolition, and operation activities;

6. all locations on a map, at an approved scale, of special-status biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;

7. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction.

8. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

9. A discussion of biological resources-related facility closure measures;

10. A process for proposing plan modifications to the CPM for review and approval; and

11. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site, or during project surveys, to the California Natural Diversity Database (CNDDB) per CDFW requirements.

Verification: The project owner shall submit the BRMIMP to the CPM for review and approval at least 45 days prior to start of any project-related ground disturbing activities.

If there are any permits that have not yet been received when the BRMIMP is first submitted, copies of these permits shall be submitted to the CPM within 5 days of their receipt, and a revised BRMIMP shall be submitted to the CPM for review within 10 days of receipt of permits by the project owner.

Implementation of BRMIMP measures shall be reported in the MCRs (e.g., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed and which items are still outstanding.

GENERAL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-7 The project owner shall implement the following measures during site mobilization, construction, operation, and closure to manage their project site and related facilities in a manner to avoid or minimize impacts to special-status biological resources, including offsite environmentally sensitive habitat areas (ESHA as defined by the City of Oxnard local coastal plan):

1. The boundaries of all areas to be temporarily or permanently disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils shall be stockpiled in disturbed areas, which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, vehicles, and equipment shall be confined to the flagged areas.

2. At the end of each work day, the Designated Biologist, Biological Monitor, and/or site personnel shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If site personnel are inspecting trenches, bores, and other excavations and wildlife is trapped, they will immediately notify the Designated Biologist and/or Biological Monitor. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access. Should wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual to a safe location. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

3. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested P*ractices for Avian Protection on Power Lines* (APLIC 2006) and *Reducing Avian Collisions with Power Lines* (APLIC 2012) to reduce the likelihood of large bird electrocutions and collisions.

4. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

5. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract California least tern predators to construction sites. During construction, site personnel shall patrol these areas to ensure water does not puddle and attract crows and other wildlife to the site, and shall take appropriate action to reduce water application rates where necessary.

6. Report all inadvertent deaths of special-status species to the appropriate project representative, including road kill. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the MCRs. For special-status species, the Designated Biologist or Biological Monitor shall contact CDFW and USFWS within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. Injured animals shall be reported to CDFW and/or USFWS and the CPM, and the project owner shall follow instructions that are provided by CDFW or USFWS. During construction, injured or dead animals detected by personnel in the project area shall be reported immediately to a Biological Monitor or Designated Biologist, who shall remove the carcass or injured animal promptly. During operations, the Project Environmental Compliance Monitor shall be notified.

7. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for spills of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials or wastes. The Designated Biologist shall be informed immediately of any spills of hazardous materials or wastes. Servicing of construction equipment shall take place only at a designated area. During construction all trash and food-related waste shall be placed in containers with lids and removed weekly or more frequently from the site. Workers shall not feed wildlife, or bring pets to the project site.

8. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.

9. Standard best management practices (BMPs) from the project Storm Water Pollution Prevention Plan shall be implemented during all phases of the project (construction, demolition, operation, and decommissioning) where storm water run-off from the site could enter adjacent marshes or channels. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the jurisdictional waters. All disturbed soils within the project site shall be stabilized to reduce erosion potential, both during and following construction.

10. The project owner shall implement the following measures during construction and operation to prevent the spread and propagation of nonnative, invasive weeds:

    Limit the size of any vegetation and/or ground disturbance to the absolute minimum and limit ingress and egress to defined routes;

    Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations. Invasive non-native species shall not be used in landscaping plans and erosion control. Monitor and rapidly implement control measures to ensure early detection and eradication of weed invasions.

The project owner shall ensure that the northern boundary of the project site remains free of ice plant mats and other invasive weed species. The remainder of the site shall be kept weed-free to the extent possible.

11. During construction and operation, the project owner shall conduct pesticide management in accordance with standard BMPs. The BMPs shall include non-point source pollution control measures. The project owner shall use a licensed herbicide applicator and obtain recommendations for herbicide use from a licensed Pest Control Advisor. Herbicide applications must follow EPA label instructions. Minimize use of rodenticides and herbicides in the project area and prohibit the use of chemicals and pesticides known to cause harm to non-target plants and wildlife. The project owner shall only use pesticides for which a "no effect" determination has been issued by the EPA's Endangered Species Protection Program for any species likely to occur within the project area or adjacent wetlands. If rodent control must be conducted, zinc phosphide or an equivalent product shall be used.
12. The project owner shall install silt fencing along the northern and southern perimeter of the project site. Silt fencing shall be inspected weekly or after significant rain events by the Designated Biologist or Biological Monitor, and shall be maintained in good condition, with no holes or gaps. If sedimentation occurs along the fence due to normal sand movement processes, the silt fencing may be removed, with permission from the CPM.
13. Construction activities will maintain a 100-feet buffer from all ESHA.

Verification: All general impact avoidance and minimization measures shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported by the Designated Biologist in the MCRs. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE AND MINIMIZATION MEASURES FOR BREEDING BIRDS

BIO-8 Pre-construction nest surveys shall be conducted if construction or demolition activities will occur from February 1 through August 31. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat and substrate within the project site, and publically-accessible areas within 0.25-mile of the project boundary within potential western snowy plover and least tern nesting habitat.

2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. Pre-construction surveys shall be conducted no more than 14 days prior to initiation of construction activity. One survey

needs to be conducted within the 3-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation.

3. If active nests are detected during on-site surveys, a no-disturbance buffer zone (protected area surrounding the nest) shall be established around each nest. For special-status species, if an active nest is identified, the size of each buffer zone shall be determined by the Designated Biologist in consultation with the CPM. Nest locations shall be mapped using GPS technology. Off-site special-status nests shall be mapped and monitored, but shall not be fenced.

4. If active nests of special-status species are detected during surveys, the Designated Biologist or Biological Monitor shall inform the CPM within one business day, and shall monitor all on-site and off-site nests at least once per week, to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the Designated Biologist or Biological Monitor shall immediately implement adaptive measures to reduce disturbance in coordination with the CPM. These measures could include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, or placement of visual screens or sound-dampening structures between the nest and construction activity, where possible.

5. If active nests are detected during surveys, the Designated Biologist or Biological Monitor shall monitor the nest until he or she determines that nestlings have fledged and dispersed or the nest is no longer active. Buffer zones may be removed and monitoring may cease when the nest is deemed inactive by the Designated Biologist or Biological Monitor.

6. Sound levels shall not exceed 65 decibels at 100 feet from active bird nests (nest locations established in **BIO-8 parts #1-3**), as established by continuous noise monitoring during the first two days of any major construction milestone such as: demolition, site clearing, foundation work, or steel erection. These efforts are in addition to weekly monitoring per **BIO-8 #4**.

7. Demolition and Pile Driving: explosive demolition of Mandalay Generating Station Units 1 and 2 and associated exhaust stack are to take place outside of nesting season (February 1 through August 31st). The project owner shall schedule the noisiest activities, such as pile driving, outside of breeding season.

Verification: The project owner shall provide notification to the CPM, CDFW, and USFWS at least 2 weeks prior to initiating surveys; notification will include the name and resume of the biologist(s) conducting the surveys and the timing of the surveys. Prior to the start of any pre-construction site mobilization, the project owner shall provide the CPM, CDFW, and USFWS a letter-report describing the findings of the preconstruction

nest surveys, including the time, date, methods, and duration of the surveys; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the surveys, the reports shall include a map or aerial photo identifying the location of the nest(s) and shall depict the boundaries of the proposed no-disturbance buffer zone around the nest(s). All impact avoidance and minimization measures related to nesting birds shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the MCRs by the Designated Biologist. Should pile driving occur during nesting season, then at least 30 days before the use of pile driving, the project owner shall prepare a letter report detailing an appropriate plan to reduce project-related adverse effects on nearby ESHA and special-status avian species. The plan shall be developed in consultation with the USFWS and the CPM, and shall detail additional noise reduction measures to be implemented, along with all necessary goals, objectives, and performance standards.

WETLAND IMPACT MITIGATION PLAN

BIO-9 The project owner shall fully mitigate for permanent impacts to on-site wetlands at a 4:1 ratio. The project owner shall provide funds to acquire mitigation land at an existing, or soon to be established, salt marsh, palustrine or estuary habitat restoration project, or help fund an established salt marsh, palustrine or estuary habitat restoration project close to the site of impact as possible to fully mitigate impacts to Coastal Commission wetlands.

Mitigation shall occur using an established wetland restoration program or mitigation bank, with preference given to programs within the same watershed as the project (Santa Clara-Calleguas), or any other wetland restoration program approved by the CPM. The project owner shall provide the CPM a Wetland Compensation Plan (Plan). The Plan shall include:

a) Available information from the land owner or wetland program restoration program manager pertaining to existing physical, biological and hydrological conditions at the mitigation sites(s), including vegetation present, hydrologic regime of the site(s), known or expected fauna at the site(s), including any known or expected listed sensitive species, known or suspected contaminants that may be present at the site(s), and an analysis of existing ecological functions and values at the sites(s). The review shall also identify any known site constraints that may limit successful creation or restoration efforts.

b) A description of legal interests at the mitigation sites(s), and any landowner approval that the project owner may need to use the proposed site(s) for wetland creation or restoration.

c) Proposed goals, objectives and performance criteria for the proposed mitigation site(s) that identify specific creation or restoration measures to be implemented, including proposed habitat types to be created or restored, grading and planting plans, the timing of the mitigation measures, and monitoring that will be implemented to establish baseline conditions and to determine whether the sites are meeting performance criteria. Monitoring shall be for at least 5 years and final monitoring for

success shall take place after at least 3 years with no remediation or maintenance other than weeding. The plan shall also identify contingency measures that the project owner will implement should any of the mitigation sites not meet performance criteria.

These goals, objectives, and performance criteria shall include:

I. Creation or restoration of habitat types that will support wetland-dependent species.

II. Created or restored areas shall be provided a buffer of a size adequate to ensure protection of wetland functions and values, and at least 100 feet wide, as measured from the nearest upland edge of the transition area. The plan may propose a lesser buffer width if the mitigation area is sited within existing wetland areas that are protected by a buffer meeting these criteria.

III. Measures to be implemented if soil or groundwater contamination is found at the site(s).

IV. A planting program that includes initial and ongoing removal of invasive or non-native species and identifies the vegetation species to be planted, local sources of those plants or seeds, measures needed to protect any existing native wetland vegetation species, timing of planting, plans for irrigation if needed to establish plants, and locations of plants. The plan shall also identify soil sources and amendments to be used.

V. Formal sampling design to assess performance criteria and shall identify the means by which success will be assessed. Where statistical tests are used, the plan shall include a requirement for a statistical power analysis to demonstrate that there will be sufficient replication to enable a robust test with beta equal to alpha.

VI. Topographic drawings for the final mitigation site(s) and construction drawings, schedules, and a description of equipment to be used in the project.

VII. "As-built" plans and annual monitoring reports for no less than five years or until the sites meet performance criteria.

VIII. Identify legal mechanism(s) proposed to ensure permanent protection of the mitigation site(s) – e.g. , conservation easements, deed restrictions, or other methods.

Verification: At least 90 days prior to the start of project construction, the project owner shall submit to the CPM for approval the wetland restoration program or mitigation bank the project owner wishes to participate in. At least 60 days prior to the start of project construction, the project owner shall provide funding to support an existing, or soon to be established, salt marsh or estuary habitat restoration project. At least 90 days prior to the start of project construction, the project owner shall submit to the CPM a Restoration Management Plan or similar plan (used by the land manager, or

to be used by the land manager or restoration program manager) that discusses the details of the wetland restoration program.

No less than 30 days prior to the start of project construction, the project owner shall provide a written verification to the CPM that the funding has been paid in full to the land manager approved by the CPM. The project owner shall provide evidence that payment from the funding can be used only to assist in coastal wetland restoration to mitigate the project's effects for the loss of Coastal Commission wetlands. Thereafter, within 30 days after each anniversary date of the commencement of project operation, the project owner shall obtain an annual report from the land manager or restoration program manager administering the restoration program(s). The annual reports will document how payments from the endowment required hereunder were used and applied to provide wetland habitat restoration/enhancement at approved locations and shall describe how implementation of the mitigation conformed to the above goals, objectives, and performance criteria. The project owner shall provide copies of such reports to the CPM within 30 days of receipt. This verification shall be provided annually for the operating life of the restoration program or the project, whichever is sooner.

If after five years, the restoration has not achieved the success criteria, the project owner shall submit within 90 days (of the fifth year anniversary) a revised or supplemental plan to compensate for those portions of the original plan which did not meet the approved success criteria.

OUTFALL REMOVAL IMPACTS AVOIDANCE PLAN

BIO-10 Prior to initiation of outfall removal activities or any associated ground-disturbing activities, the project owner shall prepare an Outfall Removal Impacts Avoidance Plan. The Plan shall be developed in consultation with the Designated Biologist; and at a minimum, the shall detail the following avoidance and minimization measures:

1. Pre-construction surveys for special-status plants shall be conducted in all impact areas and within 500 feet of said areas. If special status species are found onsite or within 500 feet of the site, all individuals of these species shall be avoided.

2. Pre-construction surveys for special-status wildlife shall be conducted in all impact areas and within 500 feet of said areas. If special status species are found onsite or within 500 feet of the site, all individuals of these species shall be avoided.

3. Vegetation in the construction area shall be removed prior to March 1 (the beginning of the bird-nesting season) to avoid conflicts with nesting birds during the nesting season. Pre-construction surveys for nesting birds that are listed (including California least tern and western snowy plover) and all non-listed bird species shall be conducted in all areas within 500 feet of the perimeter of the project site. Construction during the breeding season (generally March 1 – August 30) is not allowed.

4. During demolition activities, exclusionary fencing shall be installed around the outfall structure demolition area to prevent marine mammals from using the area.

5. Prior to each day, pre-construction/demolition surveys for marine mammals shall be conducted within 500 feet of the outfall structure. If a marine mammal is sighted within or is about to enter the demolition area, work shall be halted until the animal leaves the area. Alternately, an approved biologist may immediately notify the Channel Islands Marine Resource Institute (the local approved National Marine Fisheries Service) to make every reasonable effort to rescue such an animal.

6. Protective silt fencing shall be erected around patches of sand dune mats, and inspected daily by the Designated Biologist or Biological Monitor, to ensure that no animals are entrapped, and that the fencing is in good repair. Fencing repairs shall occur within 1 business day of detection of damage.

7. Heavy equipment used during the demolition of the outfall structure shall use a soft-start (i.e. ramp-up) technique at the beginning of activities each day, or following an equipment shut-down, to allow any marine mammal that may be in the immediate area to leave before the sound source reaches full energy.

Verification: The project owner shall submit the Outfall Removal Impacts Avoidance Plan to the CPM for approval at least 30 days prior to the start of ground disturbing activities associated with the outfall removal. All impact avoidance and minimization measures related to the outfall removal shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported on the MCRs by the Designated Biologist. At the conclusion of the demolition of the outfall, the Designated Biologist shall prepare a final report detailing observations of any special status plants or wildlife, a table of common species observed, a description of any adaptive management or mitigation strategies implemented, and a discussion of the efficacy of said measures.

REFERENCES

APLIC (Avian Power Line Interaction Committee) 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission, Washington, D.C. and Sacramento, CA.

APLIC 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

Barber, J.R., K.R. Crooks, and K. Fristrup 2010. The costs of chronic noise exposure for terrestrial organisms. Trends Ecology and Evolution 25(3): 180–189.

Bayne, E.M., L. Habib and S. Boutin. 2008. Impacts of Chronic Anthropogenic Noise from Energy-Sector Activity on Abundance of Songbirds in the Boreal Forest. Conservation Biology 22(5): 1186-1193.

Bell, C. E., J. M. DiTomaso, and M. L. Brooks. 2009. Invasive Plants and Wildfires in Southern California. University of California Division of Agriculture and Natural Resources 8397.

Beller, E.E., R.M. Grossinger, M.N. Salomon, S.J. Dark, E.D. Stein, B.K. Orr, P.W. Downs, T.R. Longcore, G.C. Coffman, A.A. Whipple, R.A. Askevold, B. Stanford, J.R. Beagle, 2011. Historical Ecology of the Lower Santa Clara River, Ventura River, and Oxnard Plain: An Analysis of Terrestrial, Riverine, and Coastal Habitats. Prepared for the State Coastal Conservancy. A Report of San Francisco Estuary Institute's Historical Ecology Program, SFEI Publication #641, San Francisco Estuary Institute, Oakland, California.

Bowman WD, Steltzer H. 1998. Positive feedbacks to anthropogenic nitrogen deposition in Rocky Mountain alpine tundra. Ambio 27: 514–517.

Brooks ML. 2003. Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert. Journal of Applied Ecology 40(2): 344-353.

Brown, W.M., 1993. Avian collisions with utility structures: Biological perspectives. In: Proceedings: avian interactions with utility structures. Intern. Workshop, Miami, FL. Sponsored by APLIC and EPRI.

Burkett, E.E., R. J. Logsdon, and K.M. Fien 2007. Report to the California Fish and Game Commission: Status Review of California Brown Pelican (*Pelicanus occidentalis californicus*) in California. Calif. Dept. of Fish and Game, Wildlife Branch, Nongame Wildlife Program Report 2007-04. 26pp.+ appendices.

California Coastal Conservancy. 2000. Santa Clara River Parkway, Ventura, California. Conceptual Enhancement Plan. SCRP Conceptual Enhancement Plan and Staff Recommendation-October 26, 2000. Available at: http://scc.ca.gov/webmaster/ftp/pdf/sccbb/2008/0804/0804Board03_Santa_Clara_River_Parkway_Ex3.pdf

California Department of Parks and Recreation. 1979. McGrath State Beach General Plan.

California State Parks, 2013. Western Snowy Plover Annual Report 2013, Channel Coast District. By Nat Cox, Senior Environmental Scientist, and Alexis Frangis, Environmental Scientist. Federal Fish and Wildlife Permit TE-31406A-0, State Scientific Collecting Permit SC-010923.

California State Water Resources Control Board, 2010. Meeting Session – Division of Water Quality 2010. Staff Report Regarding Item 9: Consideration of a Resolution Approving an Amendment to the Water Quality Control Plan for the Los Angeles Region (Basin Plan) to Incorporate a Total Maximum Daily Load (TMDL) for Polychlorinated Biphenyls (PCBs), Organochlorine Pesticides (Pesticides) and Sediment Toxicity in McGrath Lake. December 14.

CCC (California Coastal Commission) 1994. Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone. Procedural Memo # 26.

CCC (California Coastal Commission 2002. “Fri 6c”. City of Oxnard Local Coastal Program Amendment, Number OXN-MAJ-1-00: North Shore at Mandalay Bay Annexation. Available at: https://documents.coastal.ca.gov/reports/2002/4/F6c-4-2002.pdf

CCC (California Coastal Commission) 2003. Memorandum: Designation of ESHA in the Santa Monica Mountains. Dated March 25, 2003.

CCC (California Coastal Commission) 2007a. Staff Report: Appeal De Novo Review. No. A-4-OXN-07-096. Filed August 10, 2007.

CCC (California Coastal Commission) 2007b.Staff Report: Adopted Findings on Appeal. No. A-4-OXN-07-096. Filed August, 2007.

CCC (California Coastal Commission). 2016. Report to Commission and Possible Commission Action Regarding the CEC’s Application for Certification Review. TN 213337. Docketed 8/31/16.

CCC (California Coastal Commission). 2016a. F10a. Addendum for 15-AFC-01 – Commission’s 30413(d) review and report on the NRG Puente Power Project (“project”).

CCH (Consortium of California Herbaria). Collection Data for Vascular Plant Specimens. Data provided by the participants of the Consortium of California Herbaria. Available online at: ucjeps.berkeley.edu/consortium/.

CDFG (California Department of Fish and Game) 2005. California Department of Fish and Game and California Interagency Wildlife Task Group. California Wildlife Habitat Relationships (CWHR) On-Line version. Accessed September 20, 2013. Available at: <http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx>

CDFW (California Department of Fish and Wildlife), 2010. Natural Communities List Arranged Alphabetically by Life Form. September. California Department of Fish and Game. Available online at

http://www.dfg.ca.gov/biogeodata/vegcamp/pdfs/natcomlist.pdf. Accessed through February 2015

CDFW (California Department of Fish and Wildlife) 2013. California Natural Diversity Database (CNDDB) Rarefind 4 Search (Government Version) of the Anaheim, Laguna Beach, Long Beach, Los Alamitos, Newport Beach, Orange, Seal Beach, and Tustin 7.5 minute USGS quadrangles. Accessed 01/09/13 and 09/16/13.

CDFWa—California Department of Fish and Wildlife. 2015., Natural Diversity Database. Special Animals List. Periodic publication. 51pp.

CDFW —California Department of Fish and Wildlife. 2015. California Department of Fish and Wildlife Letter Supplementing Previous Comments on the Presiding Member's Proposed Decision. Dated November 5, 2015. TN: 206514.

CDFW—California Department of Fish and Wildlife. 2016. Comments on the Preliminary Staff Analyses for the Puente Power Plant Project, Ventura County. TN 214009.

CEC (California Energy Commission), 2014. Huntington Beach Energy Project, Revised Presiding Member's Proposed Decision. Docket Number 12-AFC-02. October 9, 2014.

CEC 2015w. Report of Conversation (ROC) with city of Oxnard/Jon Hilliard (TN 206210). ROC with city of Oxnard via teleconference regarding Puente Power Project Alternatives. 09/25/2015.CEC/Docket Unit on September 25, 2015.

CEC 2015c– California Energy Commission/Chris Davis (TN 204526). Letter to Tom Luster/California Coastal Commission Re: Request for Coastal Commission Participation in the Review of the Puente Power Project, dated May 7, 2015. Submitted to Tom Luster/CEC/Docket Unit on May 7, 2015.

CEC 2015P– California Energy Commission (TN 203696). Final Staff Assessment. Dated February 17, 2015.

CEC 2015PP– California Energy Commission (TN 206123). Energy Commission Staff Response to Petition for Reconsideration. Dated September 16, 2015.

CEC California Energy Commission 2016. Puente Power Project 15-AFC-01 Data Requests Nos. 77-107. Dated 10/11/2016, TN 213968.

CEC (California Energy Commission), 2014a. Huntington Beach Energy Project. Final Decision. Docket Number 12-AFC-02. Dated November 4, 2014.

CCH –Consortium of California Herbaria—2015. Collection Data for Vascular Plant Specimens. Data provided by the Participants of the Consortium of California Herbaria. Available online at: ucjeps.berkeley.edu/consortium/.

CNPS (California Native Plant Society) 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Available at: <http://www.cnps.org/inventory>

CNPS—California Native Plant Society 2015. http://cnps.org/cnps/rareplants/ranking.php Accessed March 7, 2016.

Cooper, D.S., 2004. Important Bird Areas of California. Audubon CA, 87 North Raymond Avenue, Suite 700. Pasadena, CA, 91103.

Cogswell, H.L. 1977. Water Birds of California. University of California Press, Berkeley and Los Angeles, CA. 399 pp.

COO (City of Oxnard). 1982. Coastal Land Use Plan. City of Oxnard, Planning and Environmental Services. City of Oxnard 93030.

CSULB (California State University Long Beach) 2013. Huntington Beach Wetlands Restoration Project Monitoring Program Methodology and Data Summary. October.

Dooling, R.J. 2006. Estimating effects of highway noise on the avian auditory system. IN: Proceedings of the 2005 International Conference on Ecology and Transportation, Eds. Irwin CL, Garrett P, McDermott KP. Center for Transportation and the Environment, North Carolina State University, Raleigh, NC: pp. 30-31.

Dooling, R.J. and A.N. Popper 2007. The Effects of Highway Noise on Birds. Prepared for the California Department of Transportation, Division of Environmental Analysis. September 30.

ECVC/SC/ED 2016-- Comments on PSA--Environmental Coalition, Sierra Club, Environmental Defense Center (intervenors) (TN 213635) dated September 13, 2016. Submitted to CEC/Docket Unit on September 13, 2016.

Engle, 2015. Personal communication. Energy Commission staff Carol Watson and Coastal Commission staff Jonna Engle. November 19, 2015.

ESA (Environmental Science Associates), 2003. McGrath State Beach Natural Resources Management Plan. Final. Submitted to California Department of Parks and Recreation Channel Coast District. April.

Fenn, M.E., Baron, J.S., Allen, E.B., Rueth, H.M., Nydick, K.R., Geiser, L., Bowman,W.D., Sickman, J.O., Meixner, T., Johnson, D.W., P. Neitlich. 2003. Ecological effects of nitrogen deposition in the western United States. Bioscience 53(4): 404-420.

Francis, C.D., C.P. Ortega and A. Cruz. 2009. Noise Pollution Changes Avian Communities and Species Interactions. Current Biology 19: 1415–1419.

Griggs G, K. Patsch, and L. Savoy. 2015. Living with the Changing California Coast. University of California Press.

Habib, L., E.M. Bayne and S. Boutin. 2007. Chronic industrial noise affects pairing success and age structure of ovenbirds *Seiurus aurocapilla*. Journal of Applied Ecology 44: 176-184.

Halfwerk et al. 2011. Negative impact of traffic noise on avian reproductive success. Journal of Applied Ecology 48: 210-219.

Huenneke LF, Hamburg SP, Koide R, Mooney HA, Vitousek PM. 1990. Effects of soil resources on plant invasion and community structure in Californian serpentine grassland. Ecology 71: 478–491.HBEP 2012a. Huntington Beach Energy Project (tn 66003). Application for Certification Volume 1 & 2, dated June 2012. Submitted to Energy Commission/Docket Unit on 06/28/12.

Inouye R.S., Tilman D. 1995. Convergence and divergence of old-field vegetation after 11 years of nitrogen addition. Ecology 76: 1872–1887.

Jones M.M., et. al. 2004. Changes in vegetation and soil characteristics in coastal sand dunes along a gradient of atmospheric nitrogen deposition. Plant Biology 4: 598-605.

Kight C.R and Swaddle J.P. 2011. How and why environmental noise impacts animals: an integrative, mechanistic review. Ecology Letters 14: 1052–1061.

Knapp, P. and B. Peterson. 2009. Western snowy plover nesting at Bolsa Chica, Orange County, California. A report for the Fish and Wildlife Service Carlsbad Office. December.

LARWQCB (Los Angeles Regional Water Quality Control Board. 1994. Water Quality Control Plan for the Coastal Watersheds of Los Angeles and Ventura Counties. June 13.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.

Marschalek, D.A. 2008. California least tern breeding survey, 2007 season. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Unit Report, 2008-01. Sacramento, CA. 24 pp. + app.

Marschalek, D.A. 2009. California least tern breeding survey, 2008 season. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Unit Report, 2009-02. Sacramento, CA. 23 pp. + app.

Marschalek, D.A. 2010. California least tern breeding survey, 2009 season. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Unit Report, 2010-03. Sacramento, CA. 25 pp. + app.

Massey, B.W., 1974. Breeding biology of the California least tern. Proceedings of the Linnean Society 72: 1-24.

Massey, B.W. and J.L. Atwood, 1981. Second-wave nesting of the California least tern: age composition and reproductive success. Auk 98: 595-605.

Merkel and Associates, Inc. 2004. Huntington Beach Wetlands- Habitats and Sensitive Species. Prepared for: Moffatt & Nichol, Long Beach, California. August 18, 2004.

Meyer, Mary, 2007. Assessment of Experimental Outplantings of the Endangered Ventura Marsh Milkvetch (Astragalus pycnostachyus var. lanosissimus). Unpublished report submitted to the California Department of Fish and Game, South Coast Region. November 30.

MSU 2016. Fewer Lights, Safer Flights. Accessed September 26, 2016. Available at: http://fewerlights.anr.msu.edu/towers-and-birds.html.

Natural Resources Conservation Service, Soil Survey Staff, United States Department of Agriculture. 2015. Official Soil Series Descriptions [Online WWW]. Available URL: "http://soils.usda.gov/technical/classification/osd/index.html" [Accessed 20 October 2015]. USDA-NRCS, Lincoln, NE.

Pardo, LH et al. 2011. Effects of nitrogen deposition and empirical nitrogen critical loads for ecoregions of the United States. Ecological Applications 21:3049–3082

Patton, R.T. 2002. California least tern breeding survey, 2000 season. California Department of Fish and Game, Species Conservation and Recovery Program Report, 2002-03. 24 pp. + app.

Plassmann, et. al. 2009. The effects of low levels of nitrogen deposition and grazing on dune grassland. Science of the Total Environment 407: 1391-1404.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015

PPP 2015b – NRG Energy Center Oxnard LLC/George L. Piantka (TN 204859). Data Adequacy Supplemental Response, dated June 1, 2015. Submitted to Jon Hilliard/CEC/Docket Unit on June 2, 2015.

PPP 2015c – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), Dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015

PPP 2015f – Latham & Watkins LLP (TN 206009). Responses to City of Oxnard Data Requests Set 1 (1-46), dated September 2015. Submitted to CEC/Docket Unit on September 3, 2015

PPP 2015y—NRG Energy Center Oxnard LLC/Paul Kihm (TN20668). Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2. Dated November 19, 2015.

PPP 2015z–Latham & Watkins LLP Applicant's Responses to CEC Data Request, Set 2 (TN 206791). Submitted on November 30, 2015. CEC/Docket Unit on November 30, 2015.

PPP 2016—Latham & Watkins LLP. Response to Recommended Specific Provisions in August 26, 2016 proposed Report (TN 613624). CEC/Docket Unit on September 12, 2016.

PPP 2016b—Latham & Watkins LLP. Refinement to Transmission Interconnection (TN 213000). CEC/Docket Unit on August 26, 2016.

PPP 2016c—Latham & Watkins LLP. Comments on California Coastal Commission Report to California Energy Commission on AFC 15 –AFC-01 – NRG Puente (TN 213625). CEC/Docket Unit on September 12, 2016.

PPP 2016d—Latham & Watkins LLP. Applicant's Responses to CEC Data Requests, Set 4 (77-107). CEC Docket Unit on November 1, 2016.

PPP 2016e. —Latham & Watkins LLP. Puente Power Project, Project Enhancement Outfall Removal and Beach Restoration. Docketed 9/26/2016.

Rillig et. al. 1998. Plant species specific changes in root-inhabiting fungi in a California annual grassland: Responses to elevated CO_2 and nutrients. Oecologia 113: 252–259.

Sawyer, J.O., T. Keeler-Wolf, and J. Evens, 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society. Sacramento, California.

Soil Survey Division Staff. 1970. Soil Survey Ventura Area, California. Soil Conservation Service in cooperation with University of California Agricultural Experimental Station.

Stoel Rives, LLC, 2014. Applicant's Opening Brief After Evidentiary Hearing. Dated August 20, 2014. TN 202959.

SWRCB (State Water Resources Control Board). 1975. Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California. Adopted in 1971, amended in 1975.

Tonnesen, G., Z. Wang, M. Omary, and C. J. Chien. 2007. Assessment of Nitrogen Deposition: Modeling and Habitat Assessment. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-032.

USEPA. 2016. NAAQS Table. Accessed May 4, 2016. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-table.

USEPA. 2015. Integrated Science Assessment for Oxides of Nitrogen and Sulfur — Ecological Criteria. EPA/600/R08/082F. December 2008.

USDA (United States Department of Agriculture), Forest Service. 1997. Ecological Subregions of California. Scott Miles and Charles Goudey (editors). Pacific Southwest Division. R5-EM-TP-005. San Francisco.

USFWS (United States Fish and Wildlife Service), 2012. Endangered and Threatened Wildlife and Plants: Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. 50 CFR Part 17. Federal Register Volume 77, No. 118. June 19.

USFWS (United States Fish and Wildlife Service), 2011. Programmatic Biological Opinion, Vandenberg Air Force Base, Santa Barbara County, California (8-8-09-F-10). Letter #81440-2008-F-0571 to Beatrice L. Kephart 30 CES/CEVN, Vandenberg Air Force Base, California. September 22.

USFWS (U.S. Fish and Wildlife Service). 1980 – California least tern recovery plan. U.S. Fish and Wildlife Service, Region 1. Portland, OR. 58 pp

USFWS 1985 – Light-footed Clapper Rail Revised Recovery Plan. Original Plan Approved in July 1979. Portland, Oregon. x + 130 pp.

USFWS 2007a. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule. Federal Register 72(243): 72010-72213.

USFWS 2007b – Recovery plan for the Pacific Coast population of the western snowy plover (*Charadrius alexandrus nivosus*). Volume 1: Recovery Plan. August.

USFWS 2009. USFWS Spotlight Species Action Plan (2010-2014) Coastal California Gnatcatcher. Available at <http://ecos.fws.gov/docs/action_plans/doc3165.pdf>

USFWS 2012a – Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. Federal Register 77(118): 36728-36869.

USFWS 2013. National Wetlands Inventory (NWI) website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/nwi/

Ventura County 2009. The 10a. Addendum to Commission Packet For Energy, Ocean Resources, and Federal Consistency. August 13, 2009/

Weiss, SB. 1999. Cars, cows, and checkerspot butterflies: Nitrogen deposition and management of nutrient-poor grasslands for a threatened species. Conservation Biology 13: 1476–1486.

Weiss 2006. Impacts of Nitrogen Deposition on California Ecosystems and Biodiversity. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-165.

Wetland Training Institute 1989. Field Guide for Wetland Delineation, Unified Federal Method. WTI 89-1.January 10, 1989.

BIOLOGICAL RESOURCES-APPENDIX-1
NITROGEN DEPOSITION ANALYSIS

Wenjun Qian, Ph.D., P.E.

INTRODUCTION

The following provides a technical description of the nitrogen deposition analysis for the Puente Power Project (Puente or project).

PROJECT DESCRIPTION

The proposed project would replace two aging gas-fired steam-generating units (Units 1 and 2) at the existing Mandalay Generating Station (MGS) with a new state-of-the-art General Electric Frame 7HA.01 natural gas-fired simple-cycle combustion turbine generator (CTG) and associated auxiliaries. In addition, the existing diesel emergency generator engine would be replaced with a new emergency engine, and the existing diesel emergency fire pump engine would be shut down. The existing 130 MW simple cycle Mandalay Unit 3 would remain online – with permitted emission limits equivalent to approximately 83 hours per year.

NITROGEN DEPOSITION

Nitrogen deposition is the term used to describe the input of reactive nitrogen species from the atmosphere to the biosphere. The pollutants that contribute to nitrogen deposition derive mainly from oxides of nitrogen (NOx) and ammonia (NH_3) emissions. NOx emissions (a term used for nitric oxide [NO] and nitrogen dioxide [NO_2]), generally the result of industrial or combustion processes, are much more widely distributed than NH_3. Reduced forms of nitrogen (NHx) are primarily emitted from intensive animal operations (e.g., dairies) and vehicles with the introduction of catalytic converters.

In the atmosphere NOx is transformed to a range of secondary pollutants, including nitric acid (HNO_3), nitrates (NO_3) and organic compounds, such as peroxyacetyle nitrate (PAN), while NH_3 is readily absorbed by surfaces such as water and soil as well as being rapidly transformed to ammonium (NH_4) by reaction with acidic compounds. Both the primary and secondary nitrogen-based pollutants may be removed by wet deposition (scavenging of gases and aerosols by precipitation) and by dry deposition (direct turbulent deposition of gases and aerosols) on the earth's surface.

NITROGEN DEPOSITION MODELS

The applicant provided nitrogen deposition modeling analysis in the Application for Certification (AFC [PPP 2015a]) and revised nitrogen deposition analysis in data responses (PPP 2015z). The applicant used the American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD to evaluate the potential nitrogen deposition impacts of this power plant project. AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment

of both surface and elevated sources, and is applicable for use in both simple and complex terrain.

AERMOD is used for chemically inert pollutants and cannot account for transformation of the nitrogen species which are time and reaction dependent. When using AERMOD, the analysis must assume these transformations have already occurred at the exit of the stack. Therefore, it is a conservative model that overestimates transformation rates and deposition impacts. But, it is also approved for regulatory purposes for near-field impacts analyses (used by the Energy Commission and the air district), is most familiar to users and regulatory agencies, and it is generally used to estimate nitrogen deposition.

The applicant used several assumptions with regard to nitrogen formation and deposition, all of which tend to overestimate impacts. These assumptions include:

- One hundred percent conversion of oxides of nitrogen (NOx) and ammonia (NH_3) into atmospherically derived nitrogen (ADN) within the exhaust stacks rather than allowing the conversion of NOx and NH_3 to occur over distance and time within the plume and atmosphere, which is beyond the scope of AERMOD as noted above;
- Emissions rates based upon the proposed project's maximum potential to emit (with an estimated capacity factor of about 24.5 percent) as required by local air district rules, rather than annually averaged likely emissions based on previous equipment performance and expected actual operations. Staff does not expect a simple-cycle combustion turbine being installed as arapid response, fast-ramping facilityto operate more that 3 to 5 percent capacity factor on average; and
- Ammonia emissions are modeled at the permit level of 5 ppm. In reality, ammonia emissions are generally less than 1 ppm until near the end of the catalyst life. Plant operators have an extraordinary impetus to avoid exceedances of their NOx permit limits, because they can be fined. Owners keep their catalyst clean and active, which keeps NOx level low and limits unreacted ammonia in the exhaust. The permit would require the catalyst to be replaced or cleaned whenever the ammonia emissions exceed 5 ppm.

Assuming 100 percent of the NOx and NH_3 conversion to ADN within the exhaust stacks ignores the fact that the conversion process requires sunlight, moisture, and time. Since staff analyzes habitat areas within a 6-mile radius of the project, it is unlikely that there would be sufficient time for all of the emitted nitrogen to convert to ADN. Therefore, it is likely that a less than significant amount of the project's nitrogen emissions would actually deposit on these habitat areas. However, at this time staff does not have refined data on the amount of time needed for this conversion to occur. Therefore, staff has conservatively assumed total conversion at the stack for project and other power plant cases. The project would contribute to annual nitrogen deposition, but not at the levels predicted by AERMOD due to the limited time it takes for the plumes to travel to the habitat areas and the conservative assumptions used for nitrogen formation and deposition.

For average meteorological conditions, it would take the project plumes less than an hour to reach the furthest habitat of interest. However, in urban atmospheres, the oxidation rate of NOx to nitric acid (HNO_3) is approximately 20 percent per hour, with a

range of 10 to 30 percent per hour (ARB 1986). Nighttime NOx oxidation rates are generally much lower than typical daytime rates. HNO_3 is readily taken up by soil, vegetation, and water surfaces. HNO_3 also reacts with gaseous NH_3 to form ammonium nitrate (NH_4NO_3), but the reaction is reversible and dependent on temperature, relative humidity, and concentrations of other pollutants. The ambient concentration of nitrate is limited by the availability of NH_3 which is preferentially scavenged by sulfate (Scire et al 2000).

On the other hand, because NH_3 is readily taken up by damp soils and vegetation and by water bodies, a significant portion of the emitted NH_3 can be deposited to vegetation depending on the type of land cover and on meteorological conditions (Hatfield and Follett 2008). NH_3 is also readily taken up by aerosol particles of sulfuric acid (H_2SO_4) to form ammonium sulfate ($(NH_4)_2SO_4$ [Metcalfe et al 1999]). But since most $(NH_4)_2SO_4$ particles deposit to ground by rain (wet deposition), it is likely that less than a significant amount of the $(NH_4)_2SO_4$ particles would actually deposit on the habitat areas within the 6-mile radius of the project (since the average rainfall in the city of Ventura is only about 17.5 inches per year). Instead, the $(NH_4)_2SO_4$ particles may travel hundreds or even thousands of miles away from the project before they deposit on the earth's surface.

The Energy Commission's 2007 report *Assessment of Nitrogen Deposition: Modeling and Habitat Assessment* (Tonnesen et al 2007) reviewed two other air dispersion models which can represent chemically reactive emissions and formation and deposition of aerosols: CALPUFF and the Community Multiscale Air Quality (CMAQ) model. The CMAQ version used in the Tonnesen report sometimes produced relatively large numerical errors. Thus, the report concluded that CMAQ cannot be used reliably for single point source impact simulations.

CALPUFF is a non-steady-state Lagrangian Gaussian puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport, transformation, and removal. It does so by modeling parcels of air as they move along their trajectories. Different from AERMOD, CALPUFF uses simplified chemistry to attempt to represent nitrogen partitioning and transformation with relatively low computational cost compared to CMAQ. The Tonnesen report concluded that the CALPUFF model can be used to simulate nitrogen deposition, and its results were generally similar in magnitude to the CMAQ-simulated nitrogen deposition. However, CALPUFF is more appropriate for long-range transport (i.e., greater than 50 kilometers – at less than 50 km, and for complex terrain, it requires regulatory approval for its use by the relevant reviewing agency). In addition, CALPUFF allows users to define certain parameters in its meteorological processor, which makes it difficult to be standardized for regulatory review purposes at the current time.

Both AERMOD and CALPUFF have strengths and weaknesses in modeling nitrogen deposition as mentioned above. Based on staff's modeling experience and U.S. Fish and Wildlife Service's analysis on the Russell City Energy Center Project (USFWS 2010), nitrogen deposition rates at habitat areas within 6 miles of the project predicted from CALPUFF are usually an order of magnitude lower (i.e., $1/10^{th}$) than those from AERMOD. At this time, staff concludes that AERMOD, with the overlay of conservative

assumptions mentioned above, is the most conservative model to use for nitrogen deposition modeling.

However, staff does not agree with the applicant's approach on how to account for the net benefit from the discontinuation of operating the MGS Units 1 and 2. The applicant calculated the net increase of nitrogen emissions by subtracting the baseline nitrogen emissions of MGS Units 1 and 2 from the proposed nitrogen emissions for the new project gas turbine. The applicant modeled the net increase of nitrogen emissions assuming they are emitted from the new project gas turbine exhaust stack. Staff does not agree the applicant's approach is appropriate due to the following reasons:

- The exhaust stack parameters of the new project gas turbine would be different than those of the stack for MGS Units 1 and 2 boilers. The plume rise, dispersion process and maximum impacts locations would be different from the new project gas turbine than those from the MGS Units 1 and 2 boilers. The reduction in nitrogen deposition impacts due to the shutdown of MGS Units 1 and 2 would not be determined correctly assuming they were emitted from the new project gas turbine stack.
- The applicant used the most recent 5-year averaged nitrogen emissions of MGS Units 1 and 2 as the baseline for nitrogen emissions of these units. However, at their current capacity factors (less than 6 percent in recent 5 years [CEC 2016]), MGS Units 1 and 2 produce only a fraction of the maximum annual nitrogen emissions that the proposed project would be permitted to produce. But the comparison of past actual emissions to future permitted emissions is another conservative assumption, as it is unlikely that project would ever approach its permitted level of operation as California moves to a high renewable, low carbon (greenhouse gas or GHG) electricity generation system.

Based on the above mentioned reasons, staff finds it difficult to determine the baseline nitrogen deposition impacts from MGS Units 1 and 2. Staff revised the nitrogen deposition modeling to analyze the impacts from project only (the proposed new gas turbine and new emergency engine), without accounting for the net benefit from the discontinuation of operating the MGS Units 1 and 2. **Appendix Bio-1Table Ndep-1** shows the emission rates of NOx and NH_3 from the project new units staff used to model nitrogen deposition impacts.

Appendix Bio-1Table Ndep-1
project, Modeled Nitrogen Species Emissions (tons per year [tpy]) [a]

Source	NOx	NH_3	Depositional Nitrogen from NOx	Depositional Nitrogen from NH_3	Total Depositional Nitrogen
New turbine	32.14	18.41	9.78	15.16	24.94
New emergency engine	0.09	NA	0.03	NA	0.03
Total	32.23	18.41	9.81	15.16	24.97

Source: PPP 2015z, Table C-2.11 and Energy Commission staff analysis
Note: [a.] Nitrogen emissions are calculated based on the ratios between the molecular weight of nitrogen (14), the molecular weight of NOx as NO_2 (46), and molecular weight of NH_3 (17).

NITROGEN DEPOSITION IMPACTS

Staff used AERMOD with the assumptions mentioned above to conservatively estimate nitrogen deposition incremental impacts from project. Staff's analysis covers the habitat areas within the 6-mile radius from the project.

As discussed above, staff's nitrogen deposition analysis does not account for the net benefit from discontinued operation of MGS Units 1 and 2. Staff-modeled nitrogen deposition impacts of project new units would be about 10 percent higher than those modeled by the applicant. The applicant showed that the modeled nitrogen deposition impacts from the net increase of nitrogen emissions at project would be less than 2.8 percent of the critical loads of the habitat areas identified by the applicant within 6 mile radius of the project site (PPP 2015z). Without accounting for the net benefit from the discontinued operation of MGS Units 1 and 2, staff's analysis shows that the nitrogen deposition impacts from project would be about 3 percent or less of the critical loads.

Staff emphasizes that its modeling provides an overestimation of nitrogen deposition of the project, based on conservatisms layered upon conservatisms. However, it is the best tool we currently have that is accepted to provide a consistent, albeit extremely conservative result.

The conservatively modeled project nitrogen deposition impact could be added to the baseline nitrogen deposition (see more descriptions regarding baseline below) to compute the total nitrogen deposition rates on habitat areas. The results could be used to assess the extent of affected habitat to include areas where the total nitrogen deposition exceeds the critical load for each vegetation type. Staff considers that vegetation types below critical load are not significantly impacted by the project (see more details in the **Biological Resources** section).

California and Ventura County Air Pollution Control District Baseline Nitrogen Deposition

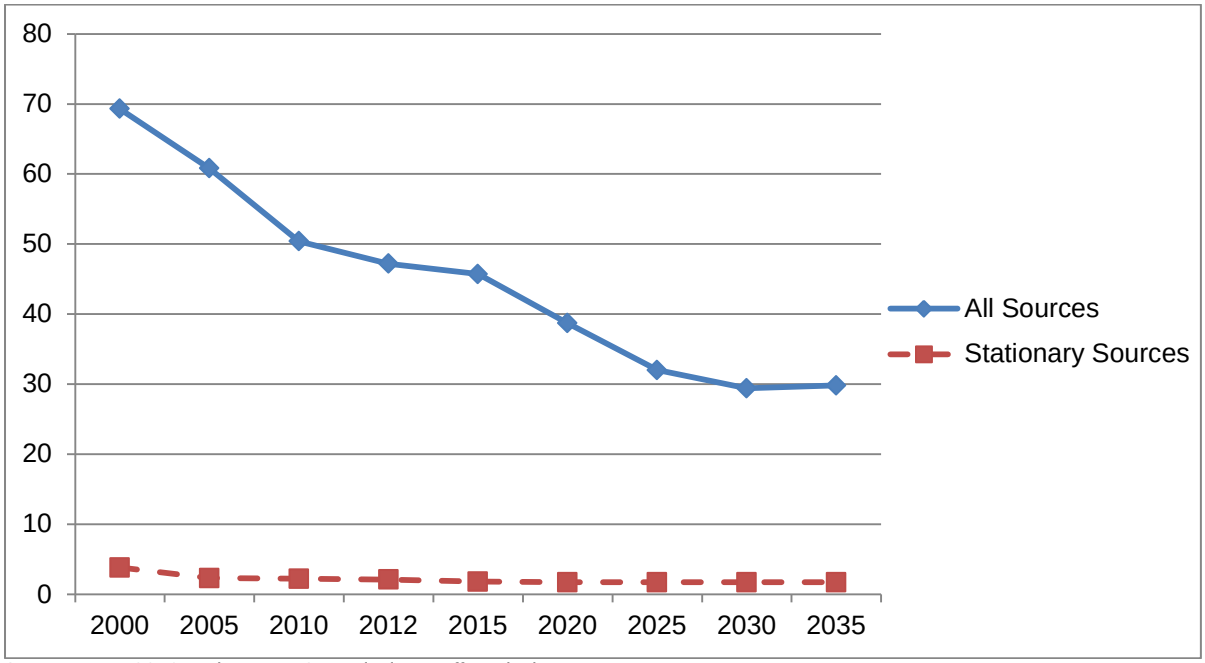
The Energy Commission's 2007 report (Tonnesen et al 2007) provides a baseline total nitrogen deposition on a 4-km (2.5-mile) grid (4 km x 4 km, or 16 km^2) throughout California. The report used emission inventory data that were previously developed through the Western Regional Air Partnership (WRAP) to simulate annual air quality and visibility for calendar year 2002. The source categories included for the calendar year 2002 include: area sources, point sources, mobile sources, non-road mobile

sources, road dust, off shore sources, Mexico emissions inventory, and biogenic emissions for Volatile Organic Compounds (VOC).

However, the U.S. EPA's enforcement efforts, implemented through the State Implementation Plan (SIP) enforced by the regional air district's Air Quality Management Plan (AQMP, see more details in the **Air Quality** section), have significantly reduced nitrogen emissions from mobile and stationary sources sectors since 2002, and these downward trends are expected to continue. **Appendix Bio-1 Figures Ndep-1** shows that both the actual and forecasted NOx emissions for all sources (blue solid line) in Ventura County APCD have decreased significantly and will continue to decrease from year 2000 to year 2035. Staff was not able to find the NH_3 emissions trends for the Ventura County APCD.

The emissions from stationary sources, including electric generation facilities, are also presented (red dashed line) in **Appendix Bio-1 Figures Ndep-1** for comparison. NOx emissions from the stationary sources only account for about 4 to 6 percent of those from all sources and show a minor decrease over the years. The majority of the NOx emissions come from mobile sources.

Appendix Bio-1 Figure Ndep-1
NOx Emissions Trends in Ventura County APCD (tons/day, annual average)

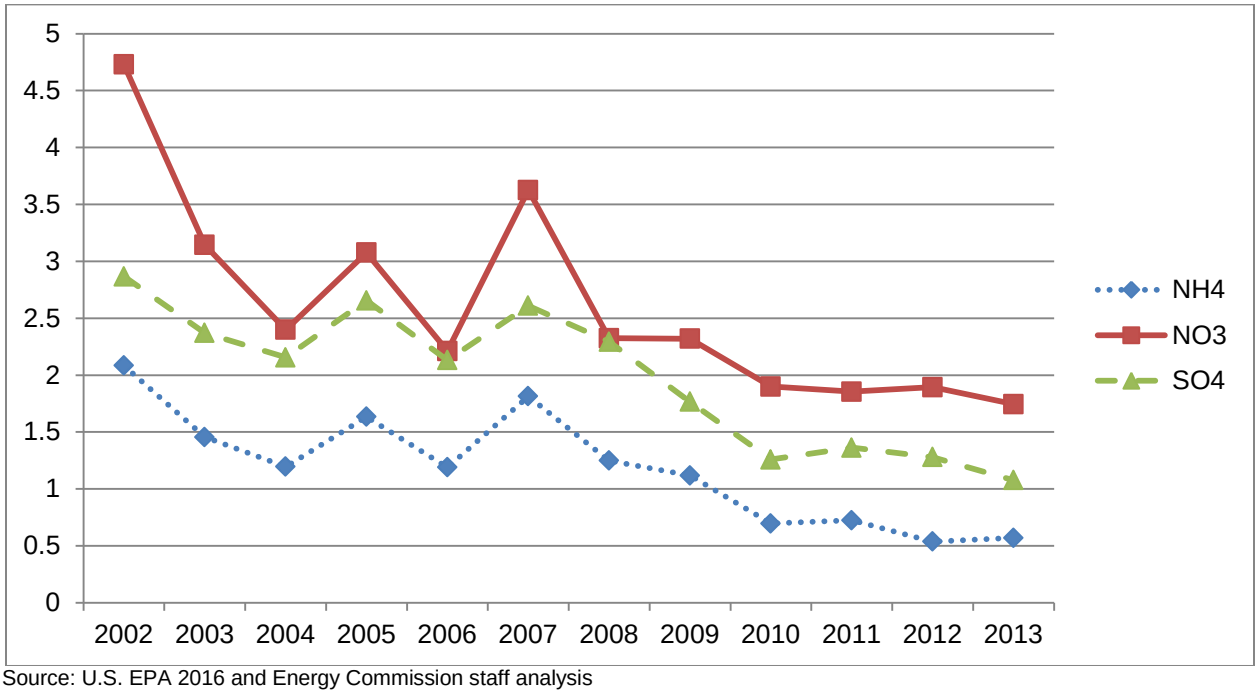


Source: ARB 2013 and Energy Commission staff analysis

Appendix Bio-1 Figures Ndep-2 shows measured annual averaged ammonium (NH_4), nitrates (NO_3) and sulfates (SO_4) concentrations of dry particles at the Simi Valley monitoring station (about 32.5 miles east-northeast of project) from the U.S. EPA PM2.5 Chemical Speciation Network (CSN [U.S. EPA 2016]). This is representative of depositional particles in ambient air at the station. The ammonium concentrations (NH_4) have decreased more than 70 percent from 2002 to 2013. The nitrates (NO_3) and sulfates (SO_4) concentrations have decreased more than 60 percent each from 2002 to 2013. This indicates that the reductions in the NOx emissions shown in **Appendix Bio-1 Figures Ndep-1** are effective in reducing the background nitrogen-containing particles

in the Ventura County APCD. The reduction in ammonium concentrations also proves that there has been a decrease in NH_3 emission inventory.

Appendix Bio-1 Figure Ndep-2
Ammonium (NH_4), Nitrates (NO_3) and Sulfates (SO_4) Concentrations ($\mu g/m^3$) Measured at Simi Valley Monitoring Station



Source: U.S. EPA 2016 and Energy Commission staff analysis

Considering the decreasing NOx emission inventory trend (an overall reduction of about 30 percent from 2002 [interpolated from 2000 and 2005 data] to 2015 for all sources), the relatively small contribution from the stationary sources, and the decreasing ammonium, nitrates and sulfates concentration measurements, the use of 2002 emissions inventory in the baseline nitrogen deposition rates probably overestimates baseline deposition by a factor of 1.4 or more. Unfortunately, the 2007 Tonnesen work for the 2002 model year has not been updated and there are not more recent background data to use.

Staff assumes that total nitrogen loading is directly proportional to NOx and ammonia inventories. Since deposition pathways are complex and dependent on components such as time, humidity, sunlight exposure, and uniform mixing of needed reactants, deposition rates at the habitat areas near the project may be reduced more than the percentage change to nitrogen inventories (as shown in **Appendix Bio-1 Figures Ndep-2**).

In addition, Energy Commission staff's position since the year 2000 for CEQA mitigation has been that all nonattainment pollutant and precursor emissions emitted from a proposed facility must be reduced by a ratio of at least one-to-one. The project area is designated as nonattainment for both the federal and state ozone standards and the state PM10 standards. NOx is a precursor for both ozone and PM10. Staff is recommending that project be required to offset its annual NOx emission increase in a

1-to-1 offset ratio. As a result, project would not result in a net increase in NOx emissions basin wide (see details in the **Air Quality** section). Therefore, the baseline nitrogen from NOx would not change due to NOx emissions from project.

CONCLUSIONS

Staff concludes that because AERMOD does not account for the transformation of the nitrogen species, which is time and reaction dependent, the nitrogen deposition impacts of the project have been overestimated by as much as a factor of 10 using AERMOD. Using emission rates based on the proposed project's maximum potential to emit, as required for air quality permitting, could overestimate the impacts of the proposed simple-cycle peaking unit at project by a factor of 5 to 8. Further, the NOx emission inventory in the Ventura County APCD has decreased about 30 percent from 2002 to 2015. The use of the 2002 emissions inventory in the baseline nitrogen deposition rates probably overestimates baseline nitrogen deposition by a factor of 1.4 or more. In addition, the project is required to offset its annual NOx emissions on a 1-to-1 offset ratio. The project would not result in a net increase in NOx emissions in the Ventura County APCD. Lastly, since staff modeled ammonia emissions at their maximum permitted level, they were modeled at a rate 5 times higher than what is reasonably expected.

While staff can calculate a nitrogen deposition rate from the project, staff believes the modeling tools and background deposition rates identify a much higher rate of nitrogen deposition than is reasonably expected to occur. For more information on this, refer to the **Biological Resources** section of this document.

REFERENCES

ARB 1986 – California Air Resources Board. The Effects of Oxides of Nitrogen on California Air Quality. By Technical Support Division State of California Air Resources Board. Report Number: TSD-85-01. March 1986, page 56.

ARB 2013 – California Air Resources Board. Almanac Emission Projection Data, http://www.arb.ca.gov/app/emsinv/2013/emssumcat.php, published in 2013.

CEC 2016 – California Energy Commission, QFER CEC-1304 Power Plant Owner Reporting Database, http://energyalmanac.ca.gov/electricity/web_qfer/. Accessed 2016.

Hatfield, Jerry L., and Ronald F. Follett, 2008. Nitrogen in the Environment Sources, Problems, and Management, Second Edition, Academic Press, 2008, pages 343-344.

Metcalfe, S.E., D. Fowler, R.G. Derwent, M.A. Sutton, R.I. Smith and J.D. Whyatt, 1999, Spatial and Temporal Aspects of Nitrogen Deposition, in The Impact of Nitrogen Deposition on Natural and Semi-Natural Ecosystems, edited by Simon J. Langan, Kluwer Academic Publishers, 1999, pages 22-23.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015

PPP 2015z – Latham & Watkins LLP Applicant's Responses to CEC Data Request, Set 2 (TN 206791). Submitted on November 30, 2015. CEC/Docket Unit on November 30, 2015.

Scire, Joseph S., David G. Strimaitis, Robert J. Yamartino, 2000. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc., Concord, MA, 2000, page 2-124.

Tonnesen, G., Z. Wang, M. Omary, and C. J. Chien, 2007. Assessment of Nitrogen Deposition: Modeling and Habitat Assessment. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-032.

U.S. EPA 2016 - United States Environmental Protection Agency. PM2.5 Chemical Speciation Network (CSN) data, available from Federal Land Manager Environmental Database website http://views.cira.colostate.edu/fed/DataWizard/Default.aspx. Accessed 2016.

USFWS 2010 - United States Fish and Wildlife Service, Endangered Species Informal Consultation on the Proposed Russell City Energy Center Project by Calpine/GE Capital, City of Hayward, Alameda County, California, dated January 25, 2010.

BIOLOGICAL RESOURCES APPENDIX-2: CUMULATIVE PROJECTS

ID #	*Project Title*	*Description*	*Location*
1	Las Cortes	Planned Residential Group (PRG) for up to 301 affordable housing units, 4 manager's units, parks, streets and sidewalks, landscaping and community buildings	Near Colonia Park
2	Fire Station No. 8, Located at 3000 South Rose Ave	New 13,036 sq. ft. fire station, a 15,960 sq. ft. training yard, and site improvements; zone change to Community Reserve (C-R); zone text amendment to permit fire stations in C-R zone, and additional height with a special use permit; and a lot line adjustment for 3 parcels.	3000 S. Rose Ave. Oxnard, CA 93033
3	Teal Club Specific Plan	990 residential units of varying density, single-family, townhomes, condominium, and apartment units; 21 ac. community park; 8 ac. school site; 60,000 s.f. mixed use and retail; 132,000 s.f. business research park; 1 ac. fire station site.	Large undeveloped area on the south east corner of Doris Ave. and N. Patterson Rd
4	Amoretti	Construction of a 27,760 sq ft industrial building and lot merger to combine two lots into one	1551 Pacific Ave. Oxnard, CA 93033
5	Pacific Water Conditioning	Construction of a single story 25,158 sq ft warehouse building.	2040 Eastman Ave. Oxnard, CA 93033
6*	Gill's Onions Plant Expansion	Construct 3 buildings; demolish 13,059 square feet; associated site improvements consisting of parking, stormwater and street improvements for existing food processing and manufacturing facility operating within a 13.72-acre site.	1051 S Pacific Ave. Oxnard, CA 93033
7	St. Paul Baptist Church	18,000 square foot sanctuary with 788 seats for St. Paul Baptist Church	1777 Statham Blvd. Oxnard, CA 93033
8	Channel Islands Business Center	Construct 90,414 square foot speculative industrial building.	1425 Mariner Drive Oxnard, CA 93033
9*	Industrial Condominium Conversion	Conversion of 36,480 sf warehouse into 3 industrial condominium units.	2311 Statham Pkwy. Oxnard, CA 93033
10	Saint John the Baptist Coptic Church	Construct a 1-story church facility on a vacant 35,000 sf lot.	1200 Pacific Ave. Oxnard, CA 93033
11	Special Use Permit & Zone Variance	Construct employee parking lot, trash enclosure, and lunch area within a 15,630 sf undeveloped site	931 Richmond Ave. Oxnard, CA 93033
12*	Chemical Building	Construction of building to hold 2 chemical tanks to treat desalted water.	251 S Hayes Ave. Oxnard, CA 93033

ID #	*Project Title*	*Description*	*Location*
13*	Rincon Recycling	Convert warehouse to recycling facility.	720 Pacific Ave. Oxnard, CA 93033
14	Lion's Gate Annex	Self-storage & RV storage.	2751 Statham Blvd. Oxnard, CA 93033
15	Daly Project: Channel Islands	72 attached apartments (15% affordable)	E. Channel Islands Blvd & Statham Blvd. Oxnard, CA 93033
16	Skyview Apartment Complex	240-unit affordable (100% affordable) housing apartment (AAHOP-Project)	1250 S. Oxnard Blvd Oxnard, CA 93030
17	Coastal Apartment Homes and Coastal Senior/Assisted Living	Construction of approximately 101 apartments and 70 unit senior living units. 14-500-04 (SUP); 14-580-01 (ZTA); 14-570-02 (ZC); 14-310-05 (LLA); 14-570-02 (Cultural)	North corner of Butler Rd and E. Pleasant Valley Rd.
18	Vista Pacifica	Multi-family condominium complex with 40 units in 5 buildings with community park. 14-300-03(Special Use Permit and Density Bonus); 14-300-004 (Tentative Tract Map)	5527 Saviers Rd Oxnard, CA 93033
19	Wagon Wheel Development Project (PA18)	Construction of 219 market rate apartments (1, 2 & 3 bedrooms), recreation/meeting room, tot lot, and landscaped paseos and 16,303 sf. Of commercial	Area between Wagon Wheel Rd. and Winchester Drive
20	Terraza de Las Cortes	Four 16-unit multifamily buildings with a total of 64 affordable apartments, and one 1,080 sq.ft. community building, parking and landscaping on a 3.56 acre site.	Carmelita Ct. Oxnard, CA 93033
21*	The Lofts Affordable Senior Apartments	Conversion of existing 52,000 sf industrial building into 115 affordable senior apartments.	300 W. Ninth St Oxnard, CA 93033
22	Avalon Homes Subdivision	Coastal Development Permit for 64 single-family homes, and a tentative tract map for 16 parcels (4 houses per parcel) on a 8.1-acre property.	On the bend of Catamaran Street
23	RiverPark: Tempo Apartments	235 apartments (3 story buildings) with garages & recreation facilities. SE corner Moonlight Park Avl & Forest Park Bl. Also APN 1320110095	443 Forest Park Blvd., Oxnard, CA 93036
24	RiverPark: Sonata Apartments	53 apartments (3 story buildings) with garages & recreation facilities. NW corner of RiverPark Blvd and Danvers Rivers Drive	2905 Danvers River St. Oxnard, CA 93036

ID #	Project Title	Description	Location
25	Anacapa Townhomes	Coastal Development Permit for 70 condominiums in 5 buildings on a 3.5 acre property, and variance for setbacks. Northeast corner of Harbor Blvd & Wooley Rd.	5001 W. Wooley Rd. Oxnard, CA 93033
26	Ventura/Vineyard Homes	Proposed project to construct 152 residential dwelling units.	North corner of Riverpark Blvd. and E. Vineyard Ave
27	The District (Morning View) RiverPark Dist H-4	113 detached single family homes. (South of Tiber Way at N. Oxnard Blvd.)	Tiber River Way Oxnard, CA 93033
28	Veranda RiverPark Dist H-3	95 detached single family homes. (NEC of Owens River Dr. & Albion Dr.)	Owens River Dr. Oxnard, CA 93033
29	The Axis (Sienna) RiverPark Dist H-5	91 detached single family homes. (N. of Tiber River Way at N. Oxnard Blvd.)	Tiber River Way Oxnard, CA 93033
30	Westerly II RiverPark Dist H-2	69 single family detached homes; Oxnard Blvd., N. of Nile River Dr.	Nile River Dr. Oxnard, CA 93033
31	Victoria/Hemlock	116 condominium dwelling units.	1830 S Victoria Av Oxnard, CA 93033
32	Oxnard Shores Mobile Home Park Expansion	Modification of existing condition of approval to allow for the development of three new mobile home sites.	5540 W. Fifth St. Oxnard, CA 93033
33	Beachwalk on the Mandalay Coast (formerly North Shore Subdivision)	183 single-family homes, 109 detached condos, and on-site amenities. Northeast corner of W. Fifth St. & Harbor Blvd.	Northeast corner of W. Fifth St. & Harbor Blvd.
34	J Street Drain Project	As Lead Agency, the Ventura County Watershed Protection District (District) prepared an environmental impact report for the J Street Drain Project (referred to herein as the "approved project"). The District proposed to increase the flow capacity of the existing J Street Drain to accommodate runoff from a 100-year storm event, thereby reducing potential flooding of residential and commercial areas in the cities of Oxnard and Port Hueneme. The Ventura County Board of Supervisors certified the J Street Drain EIR and approved the J Street Drain Project on March 27, 2012. The EIR Addendum was prepared to determine whether the proposed modified project would result in new or substantially more severe significant environmental impacts compared with the impacts disclosed in the certified EIR. The proposed modified project would result in minor changes to the approved project's design for Reaches 2, 3 and 4. Instead of an open channel, the proposed modified	J St and Redwood Avenue to south of Hueneme Road, Oxnard and Port Hueneme

ID #	Project Title	Description	Location
		project would feature buried box culverts that would allow for landscaping on top. Similar to the approved project, the channel would remain open in Reach 1 from the south side of Hueneme Road south to Ormond Beach Lagoon to avoid impacts to endangered species in the lagoon.	
35	Santa Clara River Levee Improvements Downstream of Union Pacific Railroad (SCR-3) Project	The project would implement structural improvements to the existing SCR-3 levee to allow for FEMA certification. Between Bailard Landfill and N. Ventura Rd. (reaches 1-3) two options and considered. Option 1A (Full Levee System) adds fill material and riprap to raise the existing levee (8,875 feet) with one tie-in to Bailard Landfill. Option 1B (Minimum Levee System) adds fill material along a portion of the existing levee (3,575 feet), with tie-ins to Bailard, Coastal, and Santa Clara Landfills. The existing River Ridge Golf Course swale would be filled in. Between N. Ventura Rd. and the UPRR bridge (Reach 4), a 950-foot long floodwall would be constructed on the river side of the road with a visible height of 6 feet; a flood gate would be installed across N. Ventura Rd. and then a 4- to 6-foot floodwall would be constructed on the south side of N. Ventura Rd. for 860 feet.	N Ventura Rd., North of W. Vineyard Ave.
36	North Pleasant Valley (NPV) Treatment Facility	Note: Reference SCH# 200841159 / Recirculation Construction and operation of a groundwater treatment facility, including the drilling and production of two new wells, installation of pipelines necessary for distribution of raw well water, product water and brine. The proposed facility would provide treated water to the City's existing service area, with an average design capacity of 7,500 acre feet year of production water. Treatment would include filtration, reverse osmosis and disinfection. Brine generated by treatment would be discharged to the Calleguas Regional Salinity Management Pipeline, located along Lewis Road.	Las Posas Road/Lewis Road, Camarillo

ID #	Project Title	Description	Location
37	East Area 1 Specific Plan Amendment	The Project includes amendments to the East Area 1 Specific Plan, consisting of refinements to the land use plan; an amended and restated Development Agreement; and a Master Vesting Tentative Map ("MVTM") to subdivide the Project Site. The Project implements the City's General Plan. The Project includes 501 acres that would provide for up to: (1) 1,500 residential dwelling units, (2) 240,000 square feet of commercial and light industrial uses, (3) 9.2 acres of civic uses for school facilities, and 225.3 acres of open space and park uses on the 501 acre site. Ordinance No. 1255 approving this project was introduced for first reading on February 17, 2015. The second reading and adoption occurred on March 16, 2015.	Telegraph Road and Padre Lane, Santa Paula
38	Tentative Subdivision Map for Tract 5745 for Approved Village Specific Plan	FYI Final Tentative Subdivision Map for Tract No. 5745 is a request to subdivide The Village Specific Plan area in substantial conformance with the previously adopted specific plan by creating 17 numbered lots and 19 lettered lots for development, public improvements, and open space.	Oxnard Boulevard, Wagon Wheel Road, Oxnard
39	The Grove Specific Plan	Project consists of a Specific Plan and a Vesting Tentative Tract Map that would enable the future development of a residential neighborhood ranging between 200 and 250 dwellings on approx. 26.51 acres (a density of 9.43 per units per acre) bounded by the Thille Community Neighborhood, on the south by Telephone Road and Copland Drive, and ont he west by the La Posada mobile home park, and farther to the west by the 101/126 highway interchange. The property is currently within unincorporated area, but is within the City of Ventura's Sphere of Interest, and is designated on the General Plan as Medium Density Residential; 9-20 du/ac.	Thille Street, Copland Drive, Ventura
40	Santa Barbara County Reliability Project	Note: 1 HC Southern California Edison Company (SCE, or the applicant) proposes to construct the Santa Barbara County Reliability Project (proposed project) between the City of Ventura, in Ventura County, and the City of Carpinteria, in Santa Barbara County.	City of Ventura, Ventura County to City of Carpenteria, Santa Barbara County

ID #	Project Title	Description	Location
41	Moorpark Newbury 66 kV Subtransmission Line Project	Southern California Edison (SCE) proposes to construct a new 66 kV subtransmission line an related facilities within a portion of SCE's existing Moorpark-Ormond Beach 220 kV Transmission Line right-of-way (ROW) and a portion of SCE's Moorpark-Newbury-Pharmacy 66 kV Subtransmission Line ROW. The new subtransmission line would be constructed between SCE's Moorpark Substation and Newbury Substation and includes construction of 1,200 ft. of underground line, 5 miles of new 66 kV line, 2 miles of new 66 kV line within the Moorpark-Newbury-Pharmacy 66 kV subtransmission line, and 1 mile of the new 66 kV subtransmission line into Newbury Substation.	E Los Angeles Ave & W Los Angeles Ave. & Gabbert Rd. Moorpark, CA 93021
42*	Ventura Harbor Marina and Yacht Yard Expansion	The project involves expansion and improvements of the existing Ventura Harbor Marina and Yacht Yard to increase the number of boat slips from 40 to 80 (40 new boat slips). The proposed expansion involves removing the existing dock structure, concrete ramps, a portion of the existing pier, and fuel docks; construction of an expanded dock structure; relocation of the fuel dock; onshore parking improvements; and other related facility improvements. The expanded dock would extend further into the main channel of Ventura Harbor as compared to the existing dock, but would be consistent with the channel limit considered by the Ventura Port District Commission in June 2014. The proposed parking improvements would require removal of several mature palm trees and other landscape elements.	Anchors Way Drive / Beachmont Street, Oxnard
43	RiverPark Senior	Develop a 166,000 square-foot, 136-unit senior living facility	SE Corner of Ventura Rd. & Clyde River Dr.
44	5th Banquet Hall	Convert an existing office building into a 6,210 sq. ft. banquet room with approximately 5,717 sq. ft. of related support facilities (kitchen, restroom, lobby etc…), of which, approximately 2,288 square feet is new floor area.	141 W. Fifth St.
45	Starbucks with Drive Thru	Construct a single-story Starbucks coffee shop with a drive thru on a 20,603 square foot lot (after lot merger)	1921 N. Rose Ave.
46	"RiverPark Retail"	Construct a single-story, multi-tenant commercial building featuring a drive thru anticipated for WSS Shoe Warehouse and Krispy Kreme Doughnuts.	Riverpark Bl and Vineyard Ave.
47	The Container Store	Construct a single-story, 25,000 square-foot commercial building within The Collection at RiverPark Shopping Center	450 Town Center Drive

ID #	Project Title	Description	Location
48	Pacifica Senior Living at East Village	Convert existing 57-room hotel to 80 Assisted Living and Memory Care senior living facility. Add 10,392 sf: Memory Care wing, 3,556 sf: Assisted Living addition, and 2,020 sf kitchen/dining area addition. Site is 2.26 ac and existing building with proposed addition is 54,073 sf.	2211 East Gonzales Rd.
49	Gold Coast Maintenance Facility	Construction of an operations and maintenance facility: construct a 49,533 square foot facility - 17,935 sf office building; a 24,330 sqft maintenance building; a 2,105 sf fuel service station with fueling bays; and a 5,163 sf. wash building. The project includes outdoor parking for 125 buses along with landscaping and parking improvements to serve employees and visitors.	Northwest corner of Auto Center Drive and Paseo Mercado
50	Surf Thru Carwash	Drive thru car wash with 3,831 s.f. car wash building, 591 s.f. pay building, self-service vaccum stations on 1.57 acre lot.	1971 N. Oxnard Blvd.
51	Trinity Plaza	A 7,400 sf church on a 43,136 square foot proposed parcel. A 2,999 sf fast food (Carl's Jr) restaurant with drive thru on 31,768 sf proposed parcel; and 6,100 sf multi-tenant retail building on 26,094 sf proposed parcel.	1800 Camino Del Sol, 450 N. Rose Ave.
52	Retail building	New one-story 11,400 square foot retail building	105 W. Pleasant Valley Rd.
53	Rancho Victoria Plaza Shopping Center	Major modification to revise the site plan and architecture for an approved shopping center, and a revision to the approved tentative subdivision map to create and accommodate 11 commercial buildings on 11 separate parcels.	3600 & 3700 W. Fifth St.
54*	Redevelopment of the Food 4 Less Site (former Target site)	Redevelopment of the 14.47 acre Food 4 Less site, including the demolition of the former Target building, constructing of a new building to be occupied by Food 4 Less, a fuel station associated with Food 4 Less, rehabilitation of the existing on-site buildings, and 2 new retail buildings, for a net building area of 159,954 square feet. Also PZ Nos. 12-300-01 (Map), 12-500-01 (gas station), 12-500-02 (drive-thru), 12-510-01 (off-site alcohol)	150 W. Esplanade Dr.
55	Oralia's Bakery	Construct 1825 sq.ft. addition to existing bakery, landscaping, site improvements. Also APN 2030042210	942 W. Wooley Rd., Oxnard
56	Oxnard Crossroads	2 new commercial buildings. Project has been approved by Planning Commission.	481-491 Ventura Blvd., Oxnard
57	Buildings 1100A and B The Collection at RiverPark	40,000 square-foot, single-story, multi-tenant commercial within The Collection at RiverPark Shopping Center	601-691 Collection Boulevard, Oxnard

ID #	Project Title	Description	Location
58	Emerald Professional Bldg.	2-Story Commercial Building. Veterinarian & General Office NWC Saviers Rd & Hueneme Rd.	5587 Saviers Rd.
59	Paseo Azteca	Multi-tenant Retail Building with 10 Spaces.	618 South A. St., Oxnard
60	Third Tower	Esplanade Financial Square. Proposed 15-story office tower. Approx. 300,000 sf.	E. Esplanade Drive, Oxnard
61	HOLIDAY INN EXPRESS & SUITES HOTEL PROJ-7630	40-room addition to existing Holiday Inn Express & Suites Hotel, 3 stories (23,961 s.f.).	1080 NAVIGATO, Ventura
62	SONDERMANN-RING - AMENDMENT PROJ-6237	300 Apartment Units & 20,292 s.f. Commercial Retail; private indoor and outdoor recreational facilities including a 2.44-acre park and waterfront promenade, 3 stories.	Ventura Harbor adjacent to Anchors Way & Navigator Drive, Ventura
63	MARRIOTT-RESIDENCE INN PROJ-5616	New Hotel - 128 Rooms (87,000 s.f.), 4 stories.	770 S. Seaward Ave., Ventura
64	ISLAND VIEW APARTMENTS - WESTWOOD COMMUNITIES PROJ-2008	154 Apartments, 4 stories.	Alameda at 8th St. behind Montalvo Square, Ventura
65	BROOME (THE GROVE) PROJ-00723	198-250 townhouse, apartment, courtyard, stacked units, 2.5 stories.	Vacant land between Copland & Telephone Rd., between the 126 and 101 Freeways, Ventura
66	ANASTASI DEV. PROJ-00756	Mixed Use: 138 Condominiums & 20,230 s.f. Commercial, 3 stories.	Southwest corner of Seaward Ave. and Harbor Blvd., Ventura
67	THE BLUFFS @ VISTA DEL MAR (Triangle) - Paul Sheeh	Luxury apartment community w/clubhouse; park & open space areas; bluff-top public promenade.	Triangle Site - Ash St @ Front St, Ventura
68*	BEST WESTERN - 708 E Thompson Bl - Remodel PROJ-6702	Remodel 2 existing motel rooms into a gym and meeting room and replace the 2 rooms within a new 2nd story addition. (555 s.f.).	708 E. Thompson Blvd., Ventura
69	398 S ASH ST - TRAILER HOTEL PROJ-7213	New airstream trailer park (34 units)	398 S. Ash St., Ventura
70	HILTON - Harbor & Figueroa - Formal Submittal PROJ-8165	160 Room Hotel; 5,242 s.f. Retail; 5,337 s.f. Restaurant; Upper Roof Lounge (covered area only) 1,555 s.f.; (156,160 s.f. total), 4 stories.	SEC Harbor & Figueroa, Ventura

ID #	Project Title	Description	Location
71	VENTURA DOWNTOWN HOUSING PROJ-5085	255 Apartments, 5 stories.	120 E. Santa Clara St., Ventura
72	SANTA CLARA COURTS (DALY) - 72 W SANTA CLARA ST - PROJ-7290	24 Condominium Units	72 W Santa Clara St, Ventura
73*	CMH - new hospital	New hospital building adaptive reuse of existing hospital (121,000 s.f). for non-essential hospital support services & (104,000 s.f.) for new backfill medical office reuse, new street extensions & new public plaza (320,000 s.f. - new; 230 beds)	South of Loma Vista Road, west of Brent Street and north of Main Street, Ventura
74	CMH parking structure	5-1/2 Story Parking Structure w/571 Parking Spaces and 1,399 s.f. Retail Liner	City Parking Lot North of 29 North Brent Street and south of new Community Memorial Hospital building, Ventura
75	1570 E THOMPSON BL - THOMPSON VILLAGE - CDRC- PROJ-7910	26 unit multi-family residential	1570 E. Thompson Blvd., Ventura
76	WESTSIDE RENAISSANCE (formerly Centex) PROJ-04154	120 Single Family Residence, 36 Condominiums, 3 stories.	2686 N. Ventura Av, Ventura
77	WESTSIDE RENAISSANCE - DYER SHEEHAN PROJ-4677	50 Affordable Senior Apartments	2686 N. Ventura Avenue, Ventura
78	LOGUE (Revision to Project-1200) PROJ-7125	Mixed Use: 125 Condominium Units & 7,300 s.f. Commercial	2055 N. Ventura Av, Ventura
79	WESTVIEW VILLAGE - Housing Authority - Formal-PROJ-7951	Redevelopment of 180 public housing apartments and the addition of 140 new apartments.	Between Barnett and Vince and riverside and Snow Streets, Ventura
80	RIVERSIDE APARTMENTS - 691 RIVERSIDE ST - PROJ-7529	24-Unit Apartment, 2 stories.	691 Riverside St., Ventura

ID #	Project Title	Description	Location
81	Olivas Park Drive Extension Project	Extension of Olivas Park Drive as a four-lane Secondary Arterial between Golf Course Drive and Auto Center Drive; (2) a levee/floodwall that is approximately 5,400 linear feet in length along the north side of the Santa Clara River that terminates 350 feet south of the Southern Pacific Railroad; (3) General Plan amendments for land use changes for parcels within the 110.83139-acre project boundary, (4) a Specific Plan amendment to revise the boundaries of the Auto Center Specific Plan; and (5) zone changes for amendment to revise the boundaries of the Auto Center Specific Plan; and (5) zone changes for parcels within the project boundaries. The proposed project also includes a pre-zone and annexation of one County parcel. The proposed zoning and land use amendments could accommodate a maximum of 1,258,000 square feet of commercial development and 75,000 square feet of industrial development. The proposed roadway extension will transition to join the existing improvements at the Johnson Drive/U.S. 101 southbound ramps interchange. No improvements other than the transition are proposed as part of this project at the Johnson Drive/U.S. 101 interchange. Additionally, the Montalvo Community Services District (MCSD) would abandon and remove the existing wastewater treatment plant components of the MCSD, and the wastewater treated at this facility would be diverted to the City's wastewater facility.	Between Golf Course Drive and Johnson Drive, Ventura
82	FPA LAND DEV/VICTORIA CORP C- PROJ-03617	7 industrial office buildings, 1 story.	NEC of Victoria Ave. & Olivas Park Dr., Ventura
83	GOLF COURSE SELF STORAGE PROJ-8647	NEW SELF STORAGE FACILITY	GOLF Course Dr. and Leland St., Ventura
84	6424 AUTO CENTER DR - HOFER - KIA ADDITION - PROJ-8641	KIA SHOWROOM 3,382 SQUARE FOOT ADDITION AND BUILDING REMODEL	6424 Auto Center DR., Ventura
85	RAVELLO HOLDINGS - NORTHBANK & JOHNSON - PROJ-6811	Mixed Use: 306 Apartment Units & 10,000 s.f. Commercial, 5 stories.	Johnson Drive at Northbank Drive, Ventura
86	SILVER BAY FOODS - TRANSPORT & WALTER - PROJ-7318	New fish processing building (62000 s.f.), 2 stories.	Transport St., Ventura

ID #	*Project Title*	*Description*	*Location*
87	4 Way Meat Market #2 CA	C-2 New Office (2,039 s.f.) 23' 10"(2.00)	724 N. Ventura Ave., Ventura
88	Bruton Industries Group Inc	C-2 2-story office building (6,400 s.f.) 28'(2.00)	4107 E. Main St., Ventura
89	Global Building	C-2 4 new commercial buildings - (3,000 s.f.) 075-0-224-035	S. Mills Rd., Ventura
90	UNION BANK - MILLS & MAIN PROJ	C-1A New Bank (4860 s.f.) 36' 7"(1.00)	NEC Mills and Main St., Ventura
91	VALERO PROJ-4627 Steve Bovee Drafting 1975 Maricopa Highway #11	CTO Automatic carwash and canopy (912 s.f.)	2121 Harbor Blvd., Ventura
92	KAISER - NWC MARKET & VALENTINE - Formal PROJ-8479 Kaiser Foundation Health Plan	MPD 72,000 SQ.FT. Medical Center	NWC Market St. & Valentine Rd., Ventura
93	162 W PARK ROW AV- CDRC PROJ-7920 Randall Hromadik	T4.2 3 new apartment units	162 W Park Row Ave., Ventura
94	CITRUS II - VINCE DALY PROJ-7772	80-unit apartment	South Side of Citrus/East of Wells Rd., Ventura
95	3114 TELEGRAPH RD - VENTURA OPTHALMOLOGY	CPD 10,313 square foot medical opthalmology building	3114 Telegraph Rd., Ventura
96	11101 CARLOS STREET - VINCE DALY PROJ-7771	47-unit apartment	11101 Carlos St., Ventura
97	255 W STANLEY AV	CPD 10,200 SF industrial building	255 W. Stanley Ave., Ventura
98*	VENTURA BOTANICAL GARDENS PROJ-5810	Botanical Gardens and support facilities within Grant Park	Grant Park, Ventura
99	MAR-Y-CEL - FORMAL - (Previously PROJ-00823)	Mixed Use: 138 Units & 6,142 s.f. 138 0 Commercial	NEC Thompson Blvd. and Ventura, Ventura
100	Ventura Cannery Apartments	Mixed Use: 78 Condos & 2,156 s.f. 78 0 Commercial	130 N. Garden St. , Ventura
101	WESTSIDE VILLAS - 1350 & 1490	C-2 Mixed Use: 35 Condominium Units, 5 40 0 Live/Work Units & 1,573 s.f. Commercial	N Ventura Ave., Ventura
102	DARLING APARTMENTS	Mixed Use: 43 Apartment & 2 45 2 Live/Work Units	Darling & Wells, Ventura
103	Project: V2V VENTURES - PALM & SANTA CLARA	Mixed Use: 34 Condominium Units & 6,175 s.f. Commercial	300 E. SANTA CLARA, Ventura

ID #	Project Title	Description	Location
104	2200 E MAIN ST - ANASTASI (ASBELL) - (Previously PROJ-04543) PROJ-7323	Mixed Use: 26 Condominium Units & 3,896 s.f. Commercial	2200 E. Main St., Ventura
105	Project: CAFE SCOOP - STAJEN PROJ-00687	Mixed Use: 10 Condominium Units & 5,554 s.f. Commercial	2170 E. Main St., Ventura
106	11101 CARLOS ST - GISLER RANCH MIXED USE - DALY PROJ-8428	3-story mixed use consisting of 43 apartments & 1200 s.f. retail	11101 Carlos St, Ventura
107	NEW URBAN VENTURES PROJ-04182	Mixed Use: 80 Condominium Units & 1,779 s.f. Commercial	1995 N. Ventura Ave., Ventura
108	PALM & POLI ASSOC PROJ-03676	Mixed Use: 16 Condominium Units & 1,200 s.f. Commercial	Southwest corner of Palm and Poli St., Ventura
109	ANACAPA COURTS - Formal PROJ-8105	Mixed use: 25 Condominium Units & 4,250 s.f. Retail	299 E. Main St. (Palm & Main), Ventura
110	WORLD OIL - 1571 E MAIN ST - FORMAL PROJ-6018	Mixed Use: 3 Apartment Units & 2,438 s.f. Commercial	1571 E Main St, Ventura
111	HEARTHSIDE - JENVEN VILLAGE SP AMENDMENT Village SP AMEND; TRACT NO. 5801 PROJ-1857	51Condominium Units	Southeast of Well Road and Darling Rd., Ventura
112	8324 TELEGRAPH RD - VOELKER PROPERTY PROJ-8150	18 Single Family Homes	8324 Telegraph Rd., Ventura
113	PARKLANDS APARTMENTS PROJ-4222	173 Apartments with Community Building	Southwest corner of Telegraph & Wells Rd., Ventura
114	SANTA CLARA APTS - 1254 & 1263 E SANTA CLARA ST PROJ-6263	8 Apartments	1254 & 1268 E. Santa Clara St., Ventura
115	WESTWOOD/PARKLANDS PROJ-03829	216 detached homes; 110 attached homes	Southwest corner of Wells and Telegraph Rd., Ventura
116	HEMLOCK APARTMENTS PROJ-1126	23 Apartments	264/274 S. Hemlock St., Ventura
117	MATLIJA INVESTMENT GROUP - 11 S ASH PROJ-04315	15 Condominiums	11 S. Ash St., Ventura
118	CITRUS DR - CITRUS II - DALY PROJ-8427	78-unit 3-story apartment building	11156-1172 Citrus Drive, Ventura

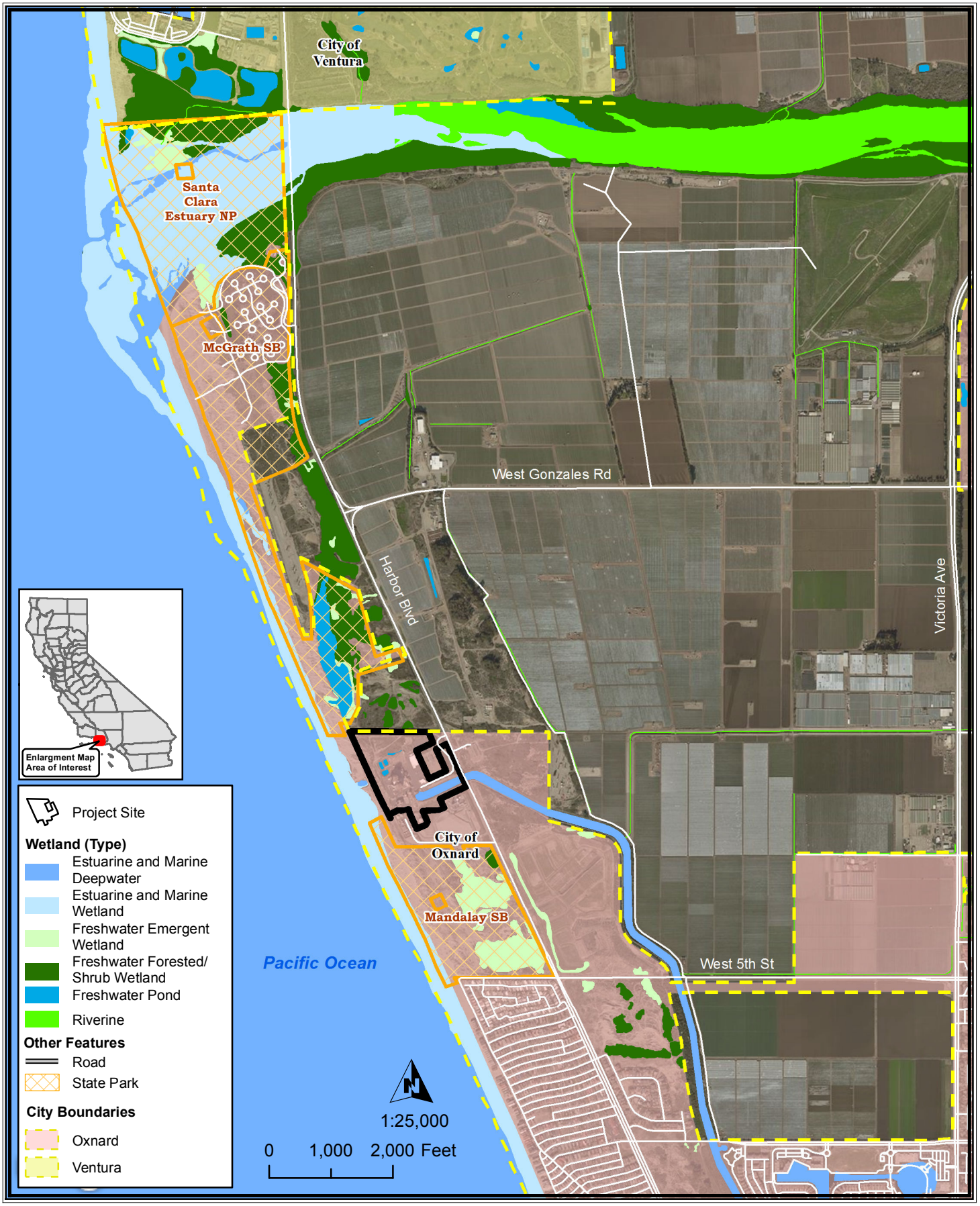
ID #	Project Title	Description	Location
119	REXFORD PROJ-03198	25 Condominiums	918 E. Thompson, Ventura
120	CASTILLO DEL SOL - 3005 E MAIN ST - HOUSING AUTHORITY PROJ-6187	40 affordable housing units for special needs residents, on-site manager's unit and supportive services	3005 E. Main St., Ventura
121	THE FARM - UC HANSEN TR SP - WH VENTURA - SEC TELEGRAPH & SATICOY PROJ-8446	UC Hansen SP (The Farm); 131 single family homes and 34 townhomes, 2 parks and 3 miniparks. SEE PROJ-03826 for affordable component of this project.	Southeast corner of Telegraph Rd. and Saticoy Ave., Ventura
122	LA BARRANCA -5533 FOOTHILL RD PROJ-6098	9 Single Family Residences	5533 Foothill Rd, Ventura
123	SANJON VILLAGE - 1230 E THOMPSON BL - FORMAL PROJ-7224	34 Condominium Units	SWC of Thompson Blvd. & Sanjon Rd., Ventura
124	CHAPMAN, MIKE PROJ-04691	7 Apartments approved (duplex constructed, 5 additional units pending construction)	95 E. Ramona St, Ventura
125	ENCLAVE AT NORTHBANK - WATT COMMUNITIES PROJ-4184	A Vesting Tentative Map for the subdivision of 12.61 acres into 84 residential lots, and two (2) open space lots and Design Review and Density Bonus Concessions for the development of 91 residential units consisting of 84 single-family units and seven (7) duplexes and adjacent park space located on a vacant site south of North Bank Drive approximately 100 feet east of South Saticoy Avenue; Watt Communities, LLC, applicant; zoned T4.10, Urban General and Parks and Open Space. The project includes Addendum #1 (EIR- 5-12-10586) to the Saticoy and Wells Community Plan and Code FEIR (EIR-2473)	SWC Saticoy Ave. & Northbank Dr., Ventura
126	GOLDBERG PROJ-04296	5 Condominiums	1837 E. Thompson Blvd., Ventura
127	RAVEN RIDGE - 117 N Ventura Av PROJ-8101	30 Condominiums	117 N. Ventura Ave., Ventura
128	HUGHES PROJ-04590	3 Condominiums	1511 Vista Del Mar Dr., Ventura
129	MATILIJA PROJ-03865	28 Condominiums	221 N. Garden St., Ventura
130	CITY VENTURES - ORCHARD COLLECTION - CITRUS PLACE PROJ-6355	59 Single Family 60 Townhomes	Citrus & Peach, Ventura
131	UC HANSEN TRUST SP PROJ-03826	SEE PROJ-8446 for Market Rate Units in this Specific Plan; 24 farmworker apartments	Southeast corner

ID #	*Project Title*	*Description*	*Location*
			Saticoy and Telegraph, Ventura
132	NORTHBANK - VINCE DALY PROJ-6270	117 Single Family 31 Affordable for sale triplex/quadplex 50 apartments	Eastern terminus of North Bank Drive, Ventura
133	EAST VILLAGE RESIDENTIAL - CEDC PROJ-4154	50 Low Income Apartments	Snapdragon & Los Angeles Ave., Ventura

*Project was excluded from final analysis due to lack of potential impacts to biological resources

BIOLOGICAL RESOURCES - FIGURE 1

Puente Power Project FSA - Regional Vegetation

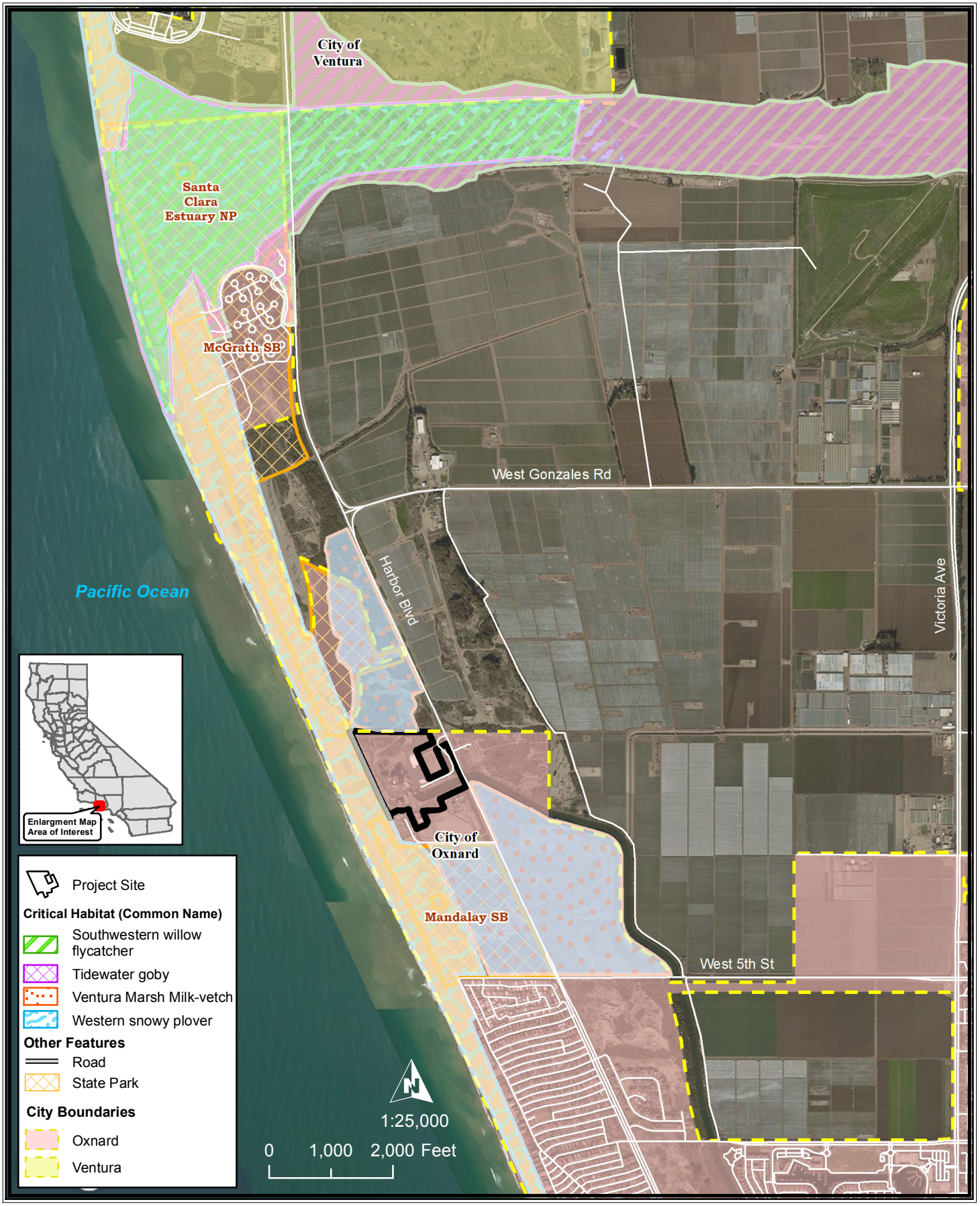


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: United States Fish and Wildlife Service ~ 2015, OpenStreetMap, Bing Aerial and ESRI.

BIOLOGICAL RESOURCES - FIGURE 2

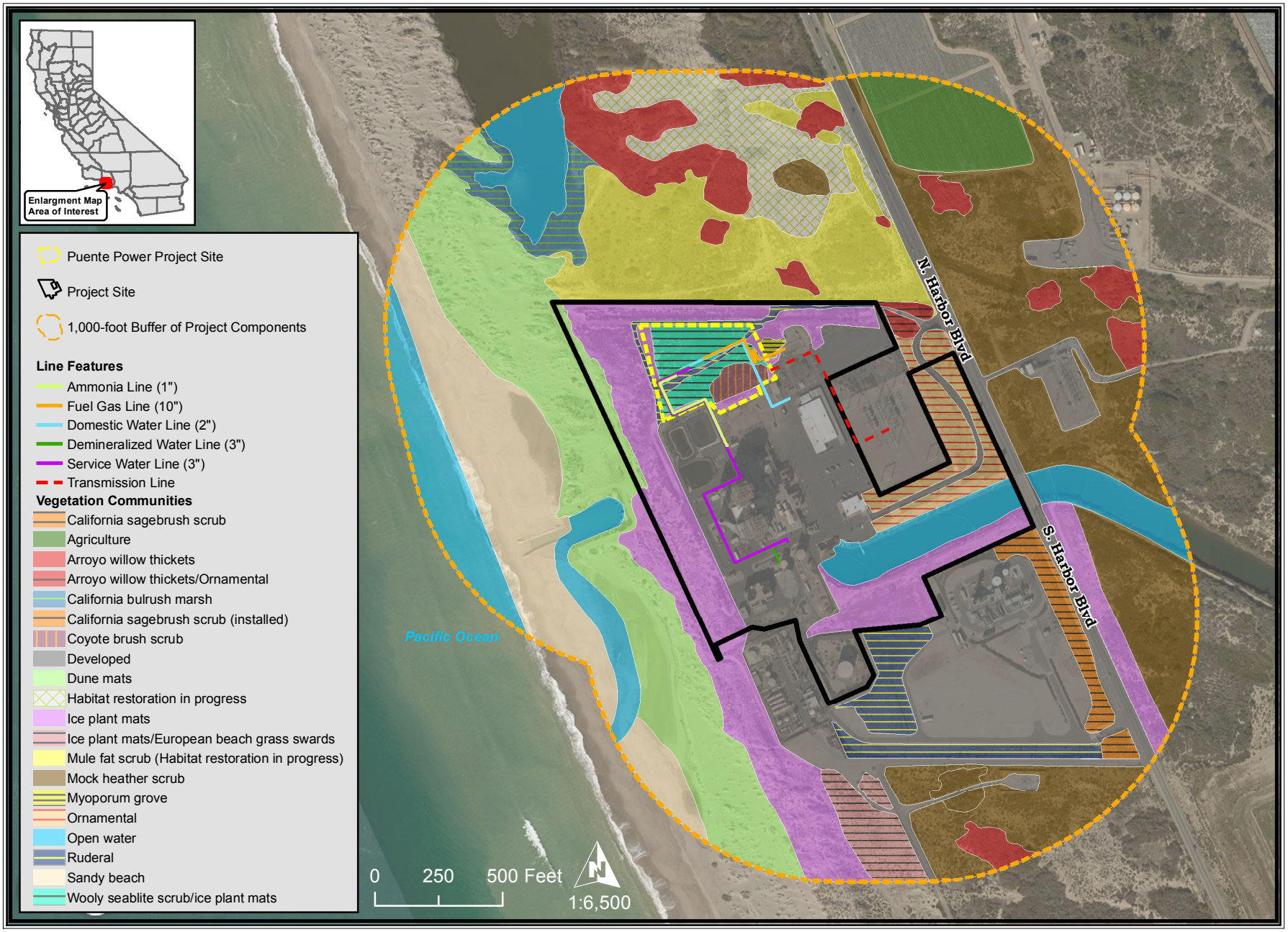
Puente Power Project FSA - USFWS Critical Habitat



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: United States Fish and Wildlife Service ~ 2015, OpenStreetMap, Bing Aerial and ESRI.

BIOLOGICAL RESOURCES - FIGURE 3

Puente Power Project FSA - Vicinity Vegetation



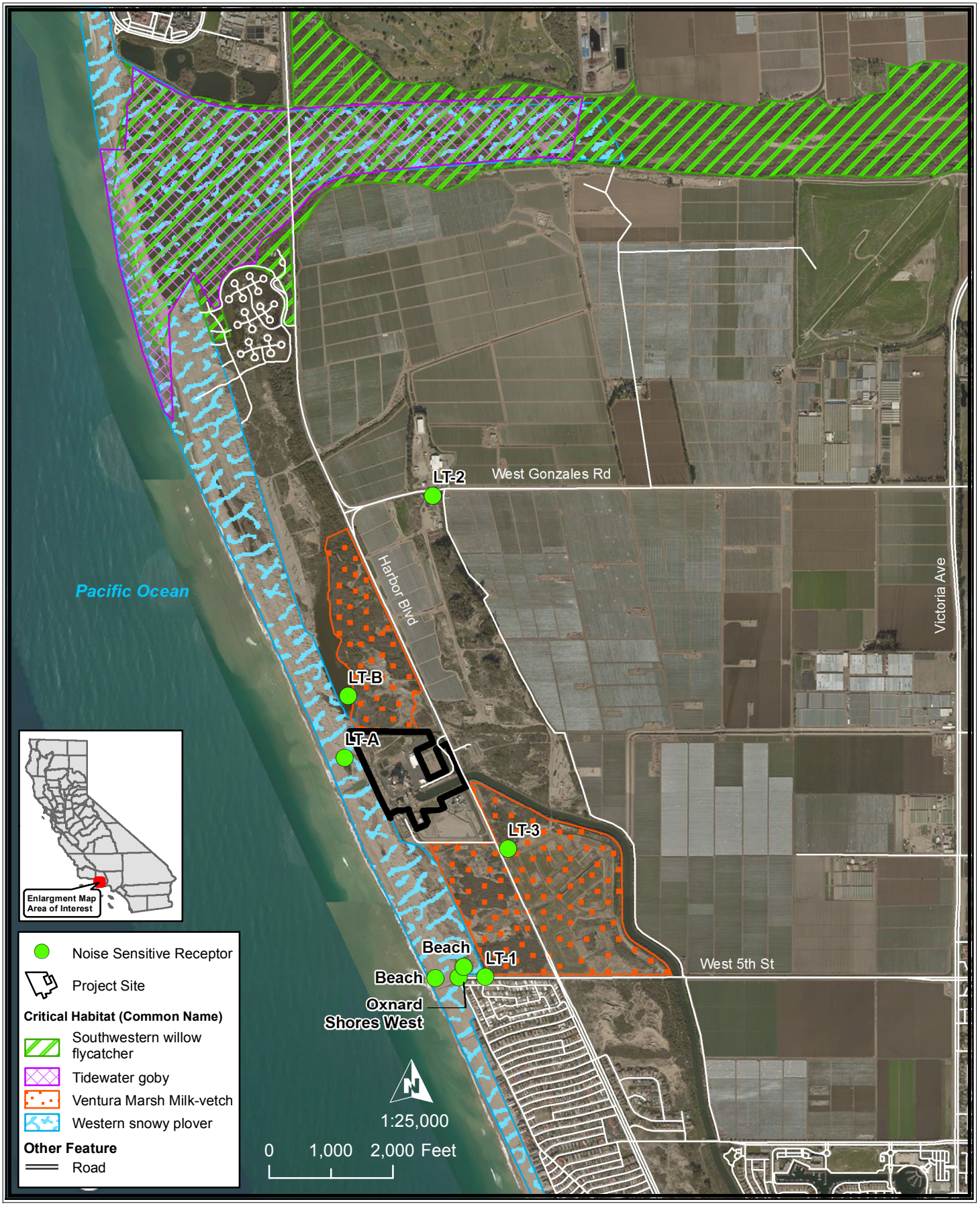
BIOLOGICAL RESOURCES

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Puente Power Project (P3) 15-AFC-01, Figure 2.7-8 and Figure 4.2-2, Bing Aerial, and ESRI.

BIOLOGICAL RESOURCES - FIGURE 4

Puente Power Project FSA - Offsite Noise Locations



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: NRG, OpenStreetMap, Bing Aerial and ESRI.

CULTURAL RESOURCES

Testimony of Melissa Mourkas and Matthew Braun[1]

SUMMARY OF CONCLUSIONS

Staff concludes that the proposed Puente Power Project (Puente or project) could result in significant, direct impacts to CA-VEN-1807, an archaeological site recommended by staff as eligible for the California Register of Historical Resources (CRHR) under criterion 4, and thus is a historical resource under the California Environmental Quality Act (CEQA). Impacts to this site would be less than significant with adoption and implementation of Condition of Certification **CUL-9**.

Staff concludes that Puente could result in significant, direct impacts to buried archaeological resources, which may qualify as historical or unique archaeological resources under CEQA. The adoption and implementation of Conditions of Certification **CUL-1** through **CUL-9** would ensure that the applicant would be able to respond quickly and effectively in the event that archaeological resources are found buried beneath the project site during construction-related ground disturbance.

Staff's analysis of the proposed project with regard to ethnographic and built environment historical resources concludes that no ethnographic or built environment historical resources are present in the project areas of analysis and therefore no ethnographic or built environment historical resources would be impacted by the construction or operation of the project.

Staff has considered environmental justice populations in its analysis of the project. Staff has not identified any Native American environmental justice populations that either reside within 6 miles of the project or that rely on any hunting and gathering resources that could be impacted by Puente.

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the proposed project on cultural resources. Three broad classes of cultural resources are considered in this assessment: prehistoric, ethnographic, and historic. Those cultural resources determined eligible to the California Register of Historical Resources (CRHR) are called historical resources and are further defined under state law as buildings, sites, structures, objects, areas, places, records, manuscripts, and tribal cultural resources (Cal. Code Regs., tit. 14, §§ 4852a, 5064.5(a)(3); Pub. Resources Code, §§ 5020.1(h, j), 5024.1[e][2, 4], 21074).

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of a particular environment. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human activity. In California, the prehistoric period began over 12,000 years ago and

[1] Mourkas – Historic built environment resources; Braun – Prehistoric and ethnographic resources.

extended through the eighteenth century until 1769, when the first Europeans settled in California.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, value-imbued landscapes, cemeteries, shrines, or ethnic neighborhoods and structures. Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their lifeways.[2]

Tribal cultural resources are a category of resources recently introduced into CEQA by Assembly Bill 52. Tribal cultural resources are resources that are any of the following: sites, features, places, cultural landscapes, sacred places, or objects that are included in or determined eligible to the CRHR, or are included on a local register of historical resources as defined in Subdivision K of section 5020.1 of the Public Resources Code. Tribal cultural resources can be prehistoric, ethnographic or historic as defined above.

Historic-period resources are those materials, archaeological and architectural, usually but not necessarily associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, trail and road corridors, artifacts, or other evidence of historic human activity. Under federal and state requirements, historical cultural resources must be greater than 50 years old to be considered of potential historic importance. A resource less than 50 years of age may be historically important if the resource is of exceptional importance. The Office of Historic Preservation (OHP 1995:2) endorses recording and evaluating resources over 45 years of age to accommodate a five-year lag in the planning process.

For the proposed project, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, an analysis of those cultural resources that staff recommends for eligibility to the CRHR and that therefore qualify as historical resources, and an analysis of the potential impacts on potential historical resources from the proposed project using criteria from CEQA. The primary analysis objective is to ensure that all potential impacts are identified and that conditions are set forth that ensure that impacts are mitigated below the level of significance.

If historical resources are identified, staff determines whether there may be a project-related impact to them. If the historical resources cannot be avoided, staff recommends mitigation measures that ensure that impacts to the identified historical resources are reduced to a less-than-significant level.

[2] A “lifeway,” as used herein, refers to any unique body of behavioral norms, customs, and traditions that structure the way a particular people carry out their daily lives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects proposed before the Energy Commission are reviewed to ensure that the proposed facilities would comply with all applicable laws, ordinances, regulations, and standards (LORS) (Pub. Resources Code, §25525; Cal. Code Regs., tit. 20, 1744[b]).

See **Cultural Resources Table 1** for a summary of cultural resources LORS applicable to the project.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
State	
Public Resources Code, §§5097.98(b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until s/he confers with the Native American Heritage Commission-identified Most Likely Descendants (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.
Public Resources Code, §5097.99	§5097.99 prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.
Health and Safety Code, §7050.5	This code prohibits the disturbance or removal of human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Public Resources Code, Division 20. California Coastal Act. Chapter 3, Article 5, Section 30244	Requires reasonable mitigation for projects that would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer.
Local	
County of Ventura General Plan September 22, 2015	Section 1.8: Paleontological and Cultural Resources. Establishes goals and policies for managing cultural resources within the county's jurisdiction.
City of Oxnard General Plan 2030 October 2011	Goal ER-11: Identification, protection, and enhancement of the city's archaeological, historical, and paleontological resources.
City of Oxnard Code Chapter 37, Section 37-3.6.0 Cultural Resources and Development	This section provides standards to avoid or minimize impacts to cultural resources in the coastal zone. Ordinance No. 2034, pt.1, 2-12-85.

SETTING

Information regarding the setting of the proposed project places the project in regional geographical and geological contexts. Additionally, the archaeological, ethnographic, and historical backgrounds provide the contexts for the evaluation of the historical significance of any identified cultural resources within the project area of analysis (PAA).

REGIONAL SETTING

The proposed project would be located in western Ventura County, in coastal Oxnard, California . As discussed in the application for certification (AFC), the proposed project site is located on the westernmost edge of the Oxnard Plain in the Ventura Basin, adjacent to the Pacific Ocean (AECOM 2015a: 3-1; Schoenherr 1992:3). The Ventura Basin is situated at the western portion of the Transverse Ranges geomorphic province, and is bounded by the Santa Ynez and Big Pine faults on the north, on the northeast and east by the San Andreas Fault, and on the south by the Santa Monica-Malibu fault system (Keller 1995:1). The proposed project would be situated in the southwestern portion of this basin. The Ventura Basin receives the bulk of its runoff and sediment from the Santa Clara River, with smaller amounts of sediment from the creeks emanating from the Santa Rosa Hills and Santa Monica Mountains (AECOM 2015a: 3-1). The Ventura Basin is an alluvial plain that contains thick, unconsolidated Holocene[3]-aged alluvial deposits which overlay basement rocks of varying age (AECOM 2015a: 3-1).

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed project site is located in the coastal city of Oxnard. The project site is bordered on the north by the Santa Clara Estuary Natural Preserve and McGrath Lake, within the McGrath State Beach; on the east by North Harbor Boulevard and agricultural fields; on the south by Mandalay State Park; and on the west by the Pacific Ocean . Current land use designations in the proposed project vicinity include residential and industrial development, wetland preserves, parklands and open space, and agriculture (AECOM 2015a: 2-3).

Environmental Setting

Identifying the kinds and distribution of resources necessary to sustain human life in an environment, and the changes in that environment over time, are central to understanding whether and how an area was used during prehistory and history. During the time that humans have lived in California, the region in which the proposed project is located has undergone several climatic shifts. These shifts have resulted in variable availability of vital resources, and that variability has influenced the scope and scale of human use of the project vicinity. Consequently, it is important to consider the historical character of local climate change, or the paleoclimate, and the effects of the paleoclimate on the physical development of the area and its ecology. The AFC cultural resources section summarizes the regional paleoenvironment (AECOM 2015c: 3-1 – 3-3). An overview is provided here for the reader, with a more detailed environmental setting in **Cultural Resources Appendix CR-1**; staff adds site-specific information below.

[3] The Holocene Epoch is a unit of time used in geology and archaeology to designate the period between the current day and 11,700 B.P. (Cohen et al. 2013). The term “B.P.” (Before Present) is an international dating convention that refers to the year 1950 as the present.

Overview

The proposed project site is situated at an elevation of 14 feet mean level low water on Santa Clara River alluvial deposits and aeolian sediments.

The modern climate of the project vicinity is influenced by the adjacent open coastline. Consequently, the local weather conditions are typically mild, with warm summers and cool winters. Precipitation is concentrated during the winter months, but summer showers do occur occasionally when onshore circulation patterns become established (AECOM 2015a: 4.3-1).

Geologically, the project site is situated on a coastal alluvial plain, with soils consisting of sand and silty sand sediments, with some inter-bedded sandy silt and clay. The deposits are defined as Qe, or Active Coastal Eolian Deposits, and are of Holocene age (AECOM 2015a: 4.8-5), and these overlie Pleistocene marine and alluvial deposits. The deposits of Holocene age are of the same time period that humans are known to be present on the California coast, which suggests that the deposits have the potential to contain cultural resources.

The archaeologist for the applicant identified sediments of an unknown depth in the portion of the project area designated for construction of the gas turbine, that consist of dredged material from previous work in the Edison Canal. Understanding the geomorphology of an area explains how and when the underlying soils and sediments at the amended project area developed, and is discussed in more detail in **Cultural Resources Appendix CR-1**.

The natural habitats most closely associated with the project area, and that would have been available to prehistoric Native Americans, are the dune habitats and scattered alkali meadows among the dunes. There are six primary vegetation communities that were present during prehistoric times, Arroyo Willow Thickets, California Bulrush Marsh, California Sagebrush Scrub, Dune Mats, Mock Heather Scrub, and Mule Fat Thickets. A host of plants and animals that were sought for food and other material cultural needs lived in these habitats and are detailed more fully in **Cultural Resources Appendix CR-1**.

Prehistoric Setting

The regional archaeological prehistory for the Oxnard region presented by Wallace (1955) and Warren (1968), and supplemented by Glassow et al. (2007:191-213) are most applicable to the project area. This sequence identifies four periods/horizons, Horizon I – Early Man/San Dieguito Tradition (ca. 12,000-8,000 B.P.); Horizon II – Millingstone Period/Encinitas (8,000-5,000 B.P.); Horizon III – Intermediate/Campbell Tradition (5,000- 1,500 B.P.); Horizon IV – Late Prehistoric (ca. 1,500 B.P. - Historic Contact). The periods are primarily separated on the basis of differences in material culture through time, e.g., projectile point technologies, use or non-use of various food-processing materials, burial practices, or ceramics. The various traditions/complexes identified within these periods are discussed in more detail in **Cultural Resources Appendix CR-1**.

Ethnographic Setting

The project site is located in the coastal portion of Chumash mainland territory. Alfred Kroeber (1976: Plate 48) provides a map of ethnographic village and camp locations. There are no mapped Chumash settlements in the immediate project area. However, about 2 miles north of the project, at the mouth of the Santa Clara River, Kroeber locates the ethnographic village of *Ishwa*, and near Port Hueneme, about 4 miles south of the project, Kroeber locates the ethnographic village of *Wene'me.* Near Point Mugu, about 11 miles south of the project*,* Kroeber identified 3 additional villages, *Muwu, Simo'mo,* and *Wihachet* (Kroeber 1976: Plate 48). McLendon and Johnson (1999: Figure 3.1) provide a map of Chumash towns at the time of European settlement that differs slightly from Kroeber's map. It appears, at least at contact, there was no evidence of a village at the mouth of the Santa Clara River, or the village Kroeber identified as *Wene'me.* However, McLendon and Johnson do identify *Muwu* in the same location, but do not mention *Simo'mo* or *Wihachet*. This map also shows a village about 5 miles inland from the project area, *Kasunalmu*; but Mclendon and Johnson provide no further information about this site. More detailed ethnographic information is included in **Cultural Resources Appendix CR-1**.

Contemporary Tribal Entities with Cultural Affiliations

There are three Chumash tribal entities culturally affiliated with the project area. One of these groups, the Santa Ynez Tribe, is federally recognized. The other two groups are not federally recognized; however, the Energy Commission consults with all tribes on the list provided by the Native American Heritage Commission (NAHC), regardless of recognition status. The NAHC letter to staff (Sanchez 2015) identified the tribal entities listed below and further described in **Cultural Resources Appendix CR-1**. Staff also contacted tribal entities not identified by the NAHC for Puente, but who were suggested by the NAHC for nearby projects in Ventura County.

Tribal Entities	Cultural Affiliation
Santa Ynez Band of Chumash Indians	Chumash
Coastal Band of Chumash Nation	Chumash
Barbareño/Ventureño Band of Mission Indians	Chumash
Beverly Salazar-Folkes	Chumash
Patrick Tumamait	Chumash
Stephen William Miller	Chumash
Randy Guzman-Folkes	Chumash
Charles S. Parra	Chumash
Richard Angulo	Chumash
Carol A. Pulido	Chumash
Melissa M. Parra-Hernandez	Chumash
Frank Arredondo	Chumash
PeuYoKo Perez	Chumash
Dr. Kote & Lin A-Lul'Koy Lotah Owl Clan	Chumash
Qun-tan Shup Owl Clan	Chumash

Historic Setting

The historic period in the vicinity of the project site can be separated into three major periods, the Spanish Period (1769–1822), the Mexican Period (1822–1848), and the American Period (1848–Present). During the Spanish Period, the first significant Euro-American settlement in the area began with the Mission San Buenaventura, founded by Junipero Serra in 1782. The Mexican Period was characterized by land grants and ranchos awarded by Mexican Governor Juan Bautista Alvarado, leading to cattle ranching and dry farming. Another notable event in the history of the area included the Oxnard Brothers' sugar beet processing facility (ca. 1897-1898) developed in Oxnard to serve the sugar beet farming in the surrounding area. Agriculture played a substantial role in the development of the Oxnard Plain and the names of other prominent agricultural families, such as the McGrath family, are memorialized in place names such as McGrath State Beach. Agriculture drove the development of railroads and ports in the region to transport goods to other markets. The city of Oxnard was incorporated in 1903 and is now Ventura County's largest city. More detailed historic period information is included in **Cultural Resources Appendix CR-1**.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Regulatory Context

California Environmental Quality Act

Various laws apply to the evaluation and treatment of cultural resources. CEQA requires the Energy Commission to evaluate cultural resources by determining whether they meet several sets of specified criteria that would make such resources eligible to the CRHR. Those cultural resources eligible to the CRHR are called historical resources. The evaluations then influence the analysis of potential impacts to the historical resources and the mitigation that may be required to ameliorate any such impacts.

CEQA and the CEQA Guidelines define significant cultural resources under two regulatory definitions: historical resources and unique archaeological resources. A historical resource is defined as a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code," 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, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record." (Cal. Code Regs., tit. 14, §15064.5[a].) Historical resources that are automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the National Register of Historic Places (NRHP) and California Registered Historical Landmarks from No. 770 onward (Pub. Resources Code, §5024.1[d]).

Under CEQA, a resource is generally considered to be historically significant if it meets the criteria for listing in the CRHR. These criteria are similar to the eligibility criteria for the NRHP. In addition to being at least 50 years old, a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, §5024.1):

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion 2, is associated with the lives of persons significant in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

In addition, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (Cal. Code Regs., tit. 14, §4852[c]).

Even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows the lead agency to make a determination as to whether the resource is a historical resource as defined in Public Resources Code, sections, 5020.1(j) or 5024.1.

In addition to historical resources, archaeological artifacts, objects, or sites can meet CEQA's definition of a unique archaeological resource, even if it does not qualify as a historical resource (Cal. Code Regs., tit. 14, §15064.5[c][3]). Archaeological artifacts, objects, or sites are considered unique archaeological resources if "it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person." (Pub. Resources Code, §21083.2[g].)

To determine whether a proposed project may have a significant effect on the environment (CEQA defines historical resources to be a part of the environment), staff analyzes the project's potential to cause a substantial adverse change in the significance of historical or unique archaeological resources. The significance of an impact depends on:

- the historical resource(s) affected;
- the specific historical significances of any potentially impacted historical resource(s);
- how any historical resource(s) significance is manifested physically and perceptually;
- appraisals of those aspects of any historical resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- how much the impact will change historical resource integrity appraisals.

Title 14, California Code of Regulations, section 15064.5(b), the State CEQA Guidelines, define a substantial adverse change as "physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

California Native American Tribes, Lead Agency Tribal Consultation Responsibilities, and Tribal Cultural Resources

Assembly Bill 52 (AB 52) amended CEQA to define California Native American tribes, lead agency responsibilities to consult with California Native American tribes, and tribal cultural resources. "California Native American tribe" means a "Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission [NAHC] for the purposes of Chapter 905 of the Statutes of 2004" (Pub. Resources Code, § 21073). Lead agencies implementing CEQA are responsible to conduct tribal consultation with California Native American tribes about tribal cultural resources within specific time frames, observant of tribal confidentiality, and if tribal

cultural resources could be impacted by project implementation, are to exhaust the consultation to points of agreement or termination.

Tribal cultural resources are either of the following:

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
   a. Included or determined to be eligible for inclusion in the CRHR.
   b. Included in a local register of historical resources as defined in the Public Resources Code, section 5020.1(k).
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in the Public Resources Code, section 5024.1(c). In applying the aforesaid criteria, the lead agency shall consider the significance of the resource to a California Native American tribe. (Pub. Resources Code, § 21074[a].)

A cultural landscape that meets the criteria of Public Resources Code, section 21074(a), is a tribal cultural resource to the extent that the landscape is geographically defined in terms of its size and scope (Pub. Resources Code, § 21074[b]).

Historical resources, unique archaeological resources, and non-unique archaeological resources, as defined at Public Resources Code, sections 21084.1, 21083.2(g), and 21083.2(h) may also be a tribal cultural resource if they conform to the criteria of Public Resources Code, section 21074(a), two paragraphs above.

This document, therefore, assesses the proposed project's impacts on historical resources, unique archaeological resources, and tribal cultural resources.

AB 52 also amended CEQA to state that a project with an impact that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code, § 21084.2).

HISTORICAL RESOURCES INVENTORY

The development of an inventory of historical resources in and near the proposed project area is the requisite first step in the assessment of whether the project might, under Public Resources Code, section 21084.1, cause a substantial adverse change in the significance of a historical resource, and could therefore have a significant effect on the environment. The effort to develop the inventory involved conducting a sequence of investigations that included doing background research, consulting with local Native American communities, conducting primary field research, interpreting the results of the inventory effort as a whole, and evaluating whether known cultural resources are historically significant. This section discusses the methods and the results of each inventory phase, develops the cultural resources inventory for the analysis of the proposed project, and interprets the inventory to assess how well it represents the potential for the PAA to contain cultural resources.

Project Area of Analysis

The PAA is a concept that staff uses to define the geographic area in which the proposed project has the potential to affect cultural resources. The effects that a project may have on historical resources can be immediate, further removed in time, or cumulative. Impacts may be physical, visual, auditory, or olfactory in character. The resultant PAAs may be contiguous, dis-contiguous or overlapping. PAAs may include the project area, which would be the site of the proposed plant (project site), the routes of requisite transmission lines and water and natural gas pipelines, and other offsite ancillary facilities, in addition to one or several dis-contiguous areas where the project could potentially affect cultural resources.

Staff defines the prehistoric PAA as comprising (a) the proposed project site and a 200-foot buffer (**Cultural Resources Figure 1)**. The built-environment (architectural) study area is defined as the area within a half-mile radius around the proposed project site (**Cultural Resources Figure 2)**.

Project refinements and enhancements (AECOM2016, AECOM 2016b) expanded the PAA to include a transmission take-off structure and tie-in at Tower 1 of the Mandalay - Santa Clara Transmission Line and the outfall structure west of the Mandalay Generating Station (MGS) and Puente site. Both of these additions to the project are outside of the established PAA boundary for archaeological resources. Data Requests 87 and 88 requested that the applicant adjust the PAA boundary based on the updated project description and conduct the necessary fieldwork and documentation.

For ethnographic resources, the area of analysis is expanded to take into account sacred sites, traditional cultural properties (places), and larger areas such as ethnographic landscapes that can be more encompassing, including viewsheds that contribute to the historical significance of such historical resources. The NAHC assists project-specific cultural resources consultants and agency staff in identifying these resources, and consultation with Native Americans and other ethnic or community groups may contribute to defining the area of analysis.

The area of analysis used by staff to identify ethnographic resources included the area from the Santa Clara River south to Port Hueneme, and inland as far as the eastern edge of the city of Oxnard. The basis for this area of analysis is information provided by King (1990: 91) and Glassow et al. (2007: 209), which suggests that Chumash groups lived in large, dense residential settlements near the coast, and utilized smaller camps based on seasonal needs.

Background Research

The background research for the present analysis employs information that the project applicant and Energy Commission staff gathered from literature and record searches, research, site visits and information that staff obtained as a result of consultation with other entities. The purpose of the background information is to help formulate the initial cultural resources inventory for the present analysis, to identify information gaps, and to inform the design and the interpretation of the field research that will serve to complete the inventory.

Literature Review and Records Search

The literature review and records search portion of the background research is conducted to gather and interpret documentary evidence of the known cultural resources in the project area of analysis. The source for the present search was the South Central Coastal Information Center (SCCIC) of the California Historica Resources Information System (CHRIS) located at California State University, Fullerton, California.

Staff also examined ethnographic sources concerning the Chumash and nearby Native American groups to ascertain any pertinent information regarding potential ethnographic resources in the PAA. Staff also examined prehistoric and historic literature to supplement their analysis.

Staff reviewed planning documents and materials provided by California Department of Parks and Recreation (Parks) staff and others. Staff also reviewed historical accounts and planning materials on file at the Oxnard Public Library.

Methods and Results

AECOM, the cultural resources consultant to the applicant, requested a records search from the SCCIC for the proposed project. The records search covered the proposed project site and a one-mile radius surrounding it. The records search conducted by SCCIC staff on January 5, 2015, included ethnographic and historic literature and maps; federal, state and local inventories of historic properties; archaeological base maps and site records; and survey reports on file at the SCCIC. AECOM also conducted subsequent archival research as shown below (AECOM 2015a: p 4.3-7 to 4.3-8; AECOM 2015c: p 3-1 to 3-2):

- NRHP listings and determinations of eligibility
- CRHR listings and determinations of eligibility
- Historic Property Data Records
- Known/recorded archaeological sites and associated Primary Forms
- Bibliography of all reports, surveys, excavations, inventories, and studies
- Historic maps
- Historic addresses
- California Points of Historical interest
- California Historical Landmarks
- California Office of Historic Preservation (OHP) Directory of Historic Properties – Records entered into the OHP computer file of historic resources, received quarterly
- California State Library
- California Historical Society
- Civil Engineering Corps/Seabee Historical Foundation
- City of Oxnard Planning Division

- City of Oxnard Building and Engineering Services
- County of Ventura Building and Safety Department
- County of Ventura Assessor's Office
- Department of the Navy, Naval Base Ventura County
- Five Views: An Ethnic Sites Survey for California (1988)
- Heritage Square Oxnard
- Historical Society of Southern California
- Huntington Library, Southern California Edison (SCE) Records
- Museum of Heritage Foundation
- Oxnard Historic District
- Oxnard College Learning Library Resource Center
- Port Hueneme Historical Society Museum
- Port Hueneme and the Friends of the Bard Mansion
- SCE Archives
- Ventura County Library

The literature review and records search indicate that 19 previous cultural resource studies have been conducted in the records search area; of these, 15 cultural resource studies have been conducted within the PAA. The records search revealed that there were no previously identified cultural resources on the Puente or MGS property. Additionally, a total of 5 cultural resources have been previously recorded in the records search area (see **Cultural Resources Table 2**). Tables detailing the entire literature review results are included in **Cultural Resources Appendix CR-1.**

Cultural Resources Table 2
Literature Review Results: Previously Recorded Cultural Resources in the Puente Power Project Area of Analysis

Resource Identifier	Site Components	Date Recorded/Updated	NRHP/CRHR Eligibility	Location relative to Puente
P-56-000667/CA-VEN-000667	Shell lenses and artifacts eroding from sand dunes; Unconfirmed reports of burial	1979/1997 update	Not evaluated	Approximately 0.3 mile southeast
P-56-001234/CA-VEN-001234	Unsubstantiated Chumash ethnographic *Juncus* spp. collection area	1979	Not evaluated	Approximately 0.2 mile southeast
P-56-001807/CA-VEN-001807	2 lithic flakes, 1 piece of groundstone, 1ceramic sherd with red slip, 2 pieces of glass insulator fragments	2010	Not evaluated	Less than 0.1 mile east
P-56-153002	Transmission tower built in 1958	2010	Recommended not eligible	Less than 0.1 mile east
P-56-152738	Historic McGrath ranch structure	1991	Recommended as not significant (Bissell 1991: 10)	Approximately 0.75 mile northeast

Additional Literature Review

Staff conducted additional research at the Energy Commission in-house library through inter-library loans services, California History Room of the California State Library in Sacramento, the Oxnard Public Library, online sources, interviews with California Department of Parks and Recreation staff and others, as well as consulted the reports contained in the applicant's records searches (AECOM 2015c). The purpose of this research was to obtain an understanding of the natural and cultural development of the land in and around the PAA, identify locations of potential historic built environment, archaeological resources, and ethnographic resources, and have a partial, chronological record of disturbances in the PAA. All consulted historic maps are presented in **Cultural Resources Appendix CR-1**.

Native American Consultation

Methods

The Governor's Executive Order B-10-11, executed on September 19, 2011, directs state agencies to engage in meaningful consultation with California Indian Tribes on matters that may affect tribal communities. The Energy Commission adopted a Tribal Consultation Policy on December 10, 2014. The Energy Commission Siting Regulations

require applicants to contact the NAHC for information on Native American sacred sites and a list of Native Americans interested in the project vicinity. The applicant is then required to notify those Native Americans on the NAHC's list about the project and include a copy of all correspondence with the NAHC and Native Americans, including any written responses received, as well as a written summary of any oral responses in the AFC (Cal. Code Regs., tit. 20, §1704[b][2], Appendix B[g][2][D]). Recent amendments to CEQA (Assembly Bill 52) require CEQA lead agencies to conduct tribal consultations in very specific ways. However this project was initiated prior to when the new consultation procedures went into effect (July 31, 2015), and therefore are not applicable to this project proceeding.

The NAHC is the primary California government agency responsible for identifying and cataloging Native American cultural resources, providing protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction, and preventing irreparable damage to designated sacred sites and interference with the expression of Native American religion in California. It also provides a legal means by which Native American descendants can make known their concerns regarding the need for sensitive treatment and disposition of Native American burials, skeletal remains, and items associated with Native American burials.

The NAHC maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans, referred to by staff as Native American ethnographic resources. The NAHC's Sacred Lands database has records for areas, places, sites and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. The NAHC Contacts database has the names and contact information for tribal entities that have expressed an interest in being contacted about projects proposed in specific tribally-affiliated areas.

Results

In an effort to conduct an independent analysis of ethnographic resources, staff also requested information from the NAHC on the presence of sacred lands in the vicinity of the proposed project, as well as a list of tribal entities to whom inquiries should be sent to identify both additional cultural resources and any concerns the they may have about the proposed project.

Staff contacted the NAHC in May of 2015 and requested a search of the Sacred Lands File and a Native American contacts list. The NAHC responded on June 16, 2015 with a list of tribal entities interested in consulting on development projects in the project area. A check of the NAHC Sacred Lands File failed to indicate any Native American traditional sites/places within the project site. Staff sent letters to all of the NAHC-listed tribal entities on July 1, 2015 inviting them to comment on the proposed project and offered to hold face-to-face consultation meetings if any tribal entities so requested. Emails were received from two groups on July 10, and both indicated that while they are interested in being updated on the project, they did not feel the need to be involved at that point in the process. A follow-up phone call and voicemail was left for the group from whom staff had not received a response on August 11, 2015.

Cultural Resources Distribution Models

One critical use of information collected during the background research for a cultural resources analysis is to inform the design and the interpretation of the field research that will complete the cultural resources inventory for the analysis. A further role of background research is to help develop models that predict the distribution of cultural resources across the PAA. Such models provide the means to tailor more appropriate research designs for the field investigations intended to complete a cultural resources inventory. These models help gauge the degree to which the results of those investigations may reflect the actual population of archaeological, ethnographic, and built-environment resources in the PAA. Such models also provide important contexts for the ultimate interpretation of the results of those investigations.

Models for predicting the distribution of prehistoric, ethnographic, and historic resources are developed here and are based upon information in the "Environmental Setting," "Prehistoric Setting," "Ethnographic Setting," and "Historic Setting" subsections of **Cultural Resources Appendix CR-1**, in addition to the information in the "Background Research" subsection of **Cultural Resources Appendix CR-1**. The discussions in the "Interpretation of Results" subsection below also employ the models.

Model for predicting Prehistoric Resources

The analysis of the information in the "Environmental Setting," "Prehistoric Setting," and "Background Research" subsections of the **Cultural Resources Appendix CR-1** leads to the conclusion that the likelihood of prehistoric deposits across the surface of the PAA is low-moderate and subsurface prehistoric deposits could be present in the PAA.

According to the *Geomorphology* subsection in **Cultural Resources Appendix CR-1**, the sandy ocean shoreline present today began to form between 6000 and 5000 B.P., and was in place by about 4000 B.P. Particularly in the last 4,000 years, sand spits and droughts periodically closed larger estuaries and open bays, producing shallow lagoons and wetlands attractive to waterfowl (Masters and Aiello 2007:40). The project area is about 1 mile south of the mouth of the Santa Clara River, an area that was one of these estuaries. Long-term human habitation with respect to the estuary would have been restricted to the higher elevations around the margins of the estuary, with resource processing (e.g., shellfish or lithics) locations located closer to the water. It should be noted that the location of estuaries, lagoons, and bolsas changed over the past 4,000–5,000 years (Engstrom 2006:852, 854). The area around the estuary, therefore, cannot be assumed to have been uninhabitable for the entirety of the last 5,000 years. The resource base provided by this estuary, and other nearby estuaries, is known to have attracted humans to use and inhabit areas that are now in the project vicinity (Horne 1980; Greenwood and Browne 1969).

The applicant's consulting archaeologist suggests that despite previous ground disturbance at the proposed project site, there is a moderate probability of encountering buried prehistoric resources (AECOM 2015c: 5-1). Hale et al. (AECOM 2015c: 4-6) describe the presence of dredged materials in the proposed construction area and the fact that this material may be up to 1 foot thick in some areas. Staff agrees that prior disturbance slightly reduces the probability of encountering intact buried prehistoric

resources, and that there is a moderate probability of encountering buried prehistoric resources.

Whether the applicant would encounter buried prehistoric deposits during construction depends on several factors, including:

- the location and depth of construction
- the depositional character and the ages of the sedimentary deposits that construction would disturb
- the presence of buried land surfaces or buried surfaces of ancient soils (paleosols)
- the duration or stability of any paleosols
- the post-depositional character of geomorphic processes in the PAA
- the nature of past human activities in the area

The information provided in the AFC, Hale et al. (AECOM 2015c), and staff's analysis indicate that the proposed project site is on a Holocene-aged alluvial fan. Any deposition would have occurred within the last 10,000 years, during the time of human occupation of the proposed project area. The *Environmental* and *Prehistoric* settings in **Cultural Resources Appendix CR-1** show that the project area contains abundant natural resources, and as evidenced by the recordation of five different cultural resources in the PAA, this area attracted humans during prehistoric times. Given these qualities of the PAA, staff suggests that the PAA is likely to contain buried prehistoric resources.

Model for predicting Ethnographic Resources

Ethnography fulfills a supporting role for other anthropological disciplines as well as providing contributions on its own merits. For example, ethnography provides a supporting role to the discipline of prehistoric archaeology by providing a cultural and historic context for understanding the people associated with the material remains of the past. By understanding the cultural milieu in which archaeological sites and artifacts were manufactured, utilized, or cherished, this ethnographic information can provide greater understanding for identification efforts, making significance determinations per the National Historic Preservation Act (NHPA) or CEQA, as applicable; eligibility determinations for the NRHP or the CRHR, as applicable; and for assessing if and how artifacts are subject to other cultural resources laws, such as the Native American Graves Protection and Repatriation Act.

In addition, ethnography has merits of its own by providing information concerning ethnographic resources that tend to encompass physical places, areas, or elements or attributes of a place or area. Ethnographic resources have overlap and affinity to historic preservation property types referred to as cultural landscapes, sacred sites, heritage resources, or historical resources that are objects, features, sites, places, areas or anything considered by affiliated tribal entities to be tribal cultural resources. There is notable overlap in terminology when referring to ethnographic resources. Studies that focus on specific ethnographic resource types may also take on names such as ethnogeography, ethnobotany, ethnozoology, ethnosemantics, ethnomusicology, etc.

While several definitions of ethnographic resources can be found in historic preservation literature, the National Park Service (NPS) provides the most succinct and commonly used definition (NPS 2007: Chapter 10):

> Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their life ways.

Ethnographic Methods

Ethnographic methods, when applied to projects of limited size and scope involve four steps.[4]

Step 1 involves reviewing the project description and mapped project location and, based upon the geographic and environmental setting, formulate preliminary guiding questions that may be asked of people with cultural affiliation to the project area.

Step 2 involves contacting, informally discussing with, (or formally interviewing) people who might have a cultural relationship or affiliation to a given area.

As Step 2 is being conducted, a parallel Step 3 involves archival “search, retrieve, and assess” process that should be undertaken to provide supporting or conflicting information to what is being discovered through the discussion process. In addition to archives, book stores, and other informational repositories (e.g., the internet), the people themselves or other ethnographers with previous experiences with the same people, may provide source materials. Findings in Step 3 may require a repetition of Step 2.

Step 4 involves field visit(s) that are intended to help the ethnographer triangulate between what people currently say, what people have written in the past, and what is actually or perceived to be in the project vicinity as a potential ethnographic resource.

Preliminary Guiding Research Domains

Based upon the project description and project location maps three preliminary Guiding Questions were developed.

- The Chumash village of *Ishwa* is located on a map (Kroeber 1976: Plate 48) in the vicinity of the mouth of the Santa Clara River. Research the location and any information regarding this village site.
- Confirm that the plant gathering location noted near the McGrath property is, or is not, a Chumash plant gathering location.

[4] See Pelto 2013, Chapter 16 for an overview of applied ethnographic methods for conducting focused inquiry conducted in limited timeframes.

- Research contemporary Chumash connections to prehistoric sites near the project site and around Oxnard.

As documented in the “Native American Consultation” subsection, staff made efforts to make preliminary contact with Native Americans affiliated with the project area.

Interviews

Staff did not conduct any interviews for inclusion in the Final Staff Assessment (FSA).

Archival Research

Staff made efforts to seek, obtain, and assess culturally relevant information from various archival sources. Information specifically sought related to *Ishwa*, the relationship between *Ishwa* and the Chumash, the plant gathering area near the McGrath property, as well as other archaeological sites in the vicinity of Oxnard. The California History Room of the California State Library, located in Sacramento, was also used for retrieving ethnographic information.

Field Visit

Ethnographic staff visited the project area and its surroundings on May 18, 2015. Staff’s visual observation of the project site and vicinity did not result in the field identification of ethnographic resources because of the paved character and industrial nature of the area.

Ethnographic Method Constraints

Constraints on the ethnographic methods described above are twofold:

1. Chumash people had minimal communication with staff, and

2. Other than Kroeber’s map of the village, staff found no available information concerning *Ishwa*.

Model of Historic Resources

Historic resources are divided into two types: historic archaeology and built environment.

Historic Archaeology model

The analysis of the information in the “Environmental Setting,” “Historic Setting,” and “Background Research” subsections of **Cultural Resources Appendix CR-1**, leads to the conclusion that historic archaeological deposits are unlikely across the surface of the PAA and there is a low potential for subsurface historic archaeological deposits as well.

The primary historic land uses in the vicinity of the proposed project include agricultural and industrial uses. Thus, potential buried historic archaeological resources in the PAA are expected to consist of refuse deposits associated with domestic, railroad, and industrial disposal.

Cultural Resources Inventory Fieldwork

The field efforts to identify cultural resources in the PAA consisted of the applicant's pedestrian archaeological and historic built-environment surveys, archaeological, built-environment, monitoring reports for other projects in the PAA, and staff's field visits and site documentation at the proposed project site and vicinity. On the basis of 1) the applicant's background research for the present analysis 2) staff investigations, and 3) the results of the field efforts that are presently available, the total cultural resources inventory for the PAA includes five archaeological and seven built-environment resources.

This section discusses the methods and the results of each field inventory phase and interprets the resultant inventory relative to the cultural resources distribution models above to assess how well the inventory represents the archaeology of the project area. Descriptions of each cultural resource in the inventory, consideration of and potential impacts on archaeological resources that may lie buried on the project site, and proposed mitigation measures for significant impacts may be found in the "California Register of Historical Resources Eligibility" and "Identification and Assessment of Direct Impacts on Built-Environment Resources and Proposed Mitigation" subsections below.

Pedestrian Archaeological Surveys

Methods

As stated in the AFC, a Secretary of the Interior qualified archaeologist surveyed the project site on January 12, 2015. The surface of the proposed project site consisted of sand and dune-related vegetation. Surface visibility was over 90 percent in the primary project locations, including the Gas Turbine Erection Area/Material Storage and Laydown in the northern portion of the PAA, as well as the Overflow Material Storage. The area along the route of the proposed waterline is mostly covered by asphalt, thus surface visibility was poor in the areas proposed for waterline installation (AECOM 2015c:4-5).

Responding to a staff data request to expand the PAA due to the project refinements and enhancements (AECOM2016, AECOM 2016b,), the applicant conducted additional survey work on October 18, 2016 in the vicinity of the take-off structure and outfall, and did not identify any new cultural resources.

However, staff disagrees with the applicant's revised PAA because it understands the PAA to also encompass the first point of interconnection at the tower east of Harbor Boulevard. Due to staff's understanding of an expanded PAA to include the first point of interconnection and because of limited time before this FSA publication, staff conducted additional archaeological survey work on November 8, 2016. As a result of the staff archaeological survey, prehistoric/historic site CA-VEN-1807 was identified within the expanded PAA. The survey work entailed locating the site and updating the site record to include additional artifacts and a slightly larger site area.

Results

No surficial prehistoric or historic resources were identified during the applicant's pedestrian survey efforts. The applicant's archaeologist did note significant amounts of

shell in some areas of the project site, but this shell appeared modern and the applicant concluded that it was likely the result of dredging from the Edison Canal.

Staff's update to site CA-VEN-1807 identified 15 total artifacts and expanded the site boundary.

Historic Built Environment Survey

Methods:

Field Survey

Built environment staff reviewed the AFC and the Project Enhancement and Refinement supplements (AECOM 2015a, AECOM 2015b, AECOM 2015c, and AECOM 2015 d, AECOM 2016, AECOM 2016b, AECOM 2016c), associated cultural resources documents and materials provided by California Department of Parks and Recreation (Parks) staff and others. Built environment staff toured the project site on June 25, 2015 and conducted a reconnaissance survey of the PAA on June 26, 2015. Six properties identified by the applicant within the PAA, including MGS, were investigated. Built environment staff also made site visits to McGrath State Beach and Mandalay State Beach along with Parks staff. The McGrath State Beach property was specifically toured because it falls within the historic built environment PAA and the applicant's consultant did not consider the property in their analysis. Built environment staff identified a total of seven properties, including MGS and McGrath State Beach, of historic age, 45 years or older, within the PAA. These are listed in **Cultural Resources Table A4 and A5** in **Cultural Resources Appendix CR-1**.

In order to gain an understanding of the listed historical resources in the vicinity of the project, built environment staff also conducted a windshield survey of the downtown historic districts and landmarks in Oxnard and made a site visit to a nearby Ventura County landmark, the Olivas Adobe. These are listed in **Cultural Resources Table A6** in **Cultural Resources Appendix CR-1**.

One-Mile Literature and Records Search Area

The SCCIC search for the proposed project included seven studies involving built environment features within the 1-mile literature and records search area. These previously recorded resources include several local Ventura County Landmarks, oil drilling operation remnants, transmission towers and a residence once belonging to Dominick McGrath (VN-00236, VN-01475, VN-01509/01733, VN-02474, VN-02901 and P-56-152738). These reports are listed in **Cultural Resources Tables A1 and A2** in **Cultural Resources Appendix CR-1**

Cultural Resources Table A6 in **Cultural Resources Appendix CR-1** lists all the built environment historical resources that are listed on the NRHP/CRHR or have been identified as landmarks by Ventura County in the vicinity of project. No listed built environment historical resources are within the one-mile literature search area or the PAA.

In addition to the literature and record search results prepared by the applicant, staff also reviewed other recent reports relative to other environmental studies in the vicinity.

The Santa Barbara County Reliability Project Final Environmental Impact Report (EIR) evaluated the Santa Clara Substation, a component of the Mandalay-Santa Clara transmission line, which originates at the MGS SCE substation. (Becker 2012).

Cultural Resource Descriptions and Eligibility Evaluations

Staff has identified a total of 10 cultural resources in the PAA. Of these, two are prehistoric sites (CA-VEN-667, and CA-VEN-1807), one is an ethnographic resource (CA-VEN-1234), and seven are built-environment resources.

Prehistoric Resources

CA-VEN-667
Originally recorded in 1979, this site consisted of lenses of midden and shell eroding from a sand dune. The site was updated in 1997 and the lenses were still extant at this time. Both recordings noted disturbance to the site from oil field-related activities. There was a note in the 1979 site form that a burial was exhumed about 200 yards north of West Fifth Street, which would be about 1,200 feet from the PAA. The site was excavated in 1998 and the information potential was exhausted by this research, thus the site is not recommended eligible for the CRHR (Whitley and Simms 1998:15).

CA-VEN-1807
This site was recorded in 2010 and consisted of a light scatter of prehistoric materials, including one piece of flaked stone, one earthenware pottery fragment, and one groundstone fragment. Two pieces of mid-twentieth century glass insulator fragments were also noted. Staff's recordation and update of the site record documents a total of 15 artifacts, 10 more than initially documented. Artifacts included 5 lithic flakes, 2 groundstone fragments, 1 mano, 1 portable metate, 4 aqua-colored glass insulator fragments, and 2 metal fragments. The earthenware fragment identified during the 2010 initial recording of the site was not relocated. The site boundary was expanded from about 594 square meters to about 825 square meters. Based on the location of the site and the representative types of artifacts, the site was likely a resource processing area. The aeolian nature of the dune area and density of artifacts suggests a moderate to high probability of additional buried artifacts and intact features. No eligibility recommendation of the site was provided in 2010.

Ethnographic Resources

CA-VEN-1234
This site was recorded in 1979 as a modern ethnographic plant-collecting area for basket weaving material, *Juncus* spp. However, upon additional consultation with Native Americans and further research (Horne 1980: 3.0-25), it was found that this is not a plant collection area, and that an area in the vicinity of Moranda Park, located about 5 miles south of the project, is preferred. Because CA-VEN-1234 was found to not be an extant plant collecting area, the site is not eligible for the CRHR.

California Register of Historical Resources Eligibility

Staff does not recommend that CA-VEN-667, or CA-VEN-1234 are eligible for the CRHR under any of the criteria for listing. Regardless of staff's recommendation, these

sites are unlikely to be impacted by the proposed project because they are not located in an area of potential direct impact.

The applicant's proposed transmission enhancement and staff's additional field survey efforts leads staff to re-evaluate the CRHR eligibility of CA-VEN-1807 and assess impacts to the site. Fifteen total artifacts were identified during staff's update and relocation of the site, 10 more than previously recorded. In an effort to expedite the FSA, staff assumes this site is a historical resource and eligible for the CRHR under criterion 4, i.e., the site has the potential to yield additional important information. It is important to note that this assumption of eligibility is not without justification; the identification of 10 more artifacts, and in particular the portable metate and mano, leads staff to believe that intensive archaeological work would likely reveal additional artifacts with data potential. Additionally, the wind-blown sand in the dune area where the site is located suggests that the potential for additional buried cultural resources is moderate to high. Staff makes this assumption of CRHR eligibility in lieu of requesting that the applicant perform a labor and time intensive CRHR site evaluation.

Built Environment Resources

As noted above in the survey and research discussion, staff identified seven historic-period built environment resources located within the PAA. These are listed in **Cultural Resources Appendix 1 Tables A4 and A5**. Six of the resources are industrial properties, including MGS, and one, McGrath State Beach, is a unit of the California State Parks and Recreation system. Staff concludes that the seven resources are ineligible for listing on the CRHR under Criteria 1–4, and therefore any potential project impacts would not be significant. A brief discussion of seven resources found ineligible for listing on the CRHR follows. A more detailed discussion of these resources may be found in **Cultural Resources Appendices 1 and 2**.

Staff conducted a reconnaissance-level windshield survey on June 26, 2015, of the McGrath State Beach adjacent to the MGS to the north. A detailed historical resource evaluation of McGrath State Beach is included in **Cultural Resources Appendix 2**.

The applicant investigated and evaluated the historic significance of six historic-age built environment resources within the PAA. Four of those were evaluated in their entirety: the Mandalay Generating Station (1956-1959), the SCE Switchyard (1959), the SCE Substation (1958) and a property known as the Jeep Trail Tank Farm (1954-1967). Two linear resources were partially evaluated only for their segments located within the PAA: the Edison Canal (1957-1959) and a portion of the Mandalay-Santa Clara Transmission Line (ca. 1958). None of the built environment resources were recommended to be eligible for the CRHR under Criteria 1-4. Staff agrees with these conclusions. More detail about these resources and related contextual information is included in **Appendix CR-1**.

Mandalay Generating Station (MGS)

Based upon the Historical Resource Evaluation (Report of Findings) filed for this AFC (AECOM 2015a, AECOM 2015c, AECOM 2016c), and staff's own independent research and analysis, staff concludes that the MGS is not an historical resource for the

purposes of CEQA. MGS does not meet the criteria for listing in the NRHP or the CRHR.

Considering MGS under Criterion 1, it has not been found to have a significant contribution in the areas of power generation, steam power plants or the history of the regional power development. While it was an important post-war component of SCE's ability to provide reliable electric generation for a growing population, it did not make a significant contribution in its own right to that development.

Considering MGS under Criterion 2, it is not associated with a historically significant person or entity. SCE was one of several power companies in California undergoing rapid expansion in the post-war period and MGS was one of many plants built by SCE to meet that need.

Considering MGS under Criterion 3, it is not historically significant for its design, architecture or construction. MGS is a utilitarian facility with no architectural distinction. While the dredging and construction of the associated Edison Canal as an intake channel for cooling water was a substantial effort, it does not rise to the level of historical significance under Criterion 3.

Considering MGS under Criterion 4, it does not appear that it would yield important information relative to history. Criterion 4 is rarely applied to the built environment and it is highly unlikely MGS as a built environment feature would yield information especially pertinent to national, regional or local history.

Therefore, the MGS as an entity with its appurtenant facilities does not rise to the level of significance as an historical resource under CEQA.

Mandalay-Santa Clara Transmission Line

The Mandalay-Santa Clara Transmission Line was constructed in 1958 to deliver power from the new MGS to communities in Ventura and Santa Barbara counties. The line is approximately 9.4 miles in length, consisting of above-ground poles, towers and wires. A single tower of this line was previously recorded (P-56-153002-Crawford 2010/AECOM 2015b). As mentioned earlier, the Santa Barbara County Reliability Project Final EIR evaluated the Santa Clara Substation, a component of the Mandalay to Santa Clara transmission line, which originates at the MGS SCE substation. It was recommended not eligible for inclusion on the NRHP/CRHR, as just one of many post-World War II substations built to supply electricity to a growing population (Becker 2012).

The applicant evaluated the four towers of the line which fall within the PAA as an update to P-56-153002 and concluded that the towers and that portion of the line within the PAA are not eligible as historical resource for the CRHR, unless further study of the entire line would find it eligible and the towers as contributors to the resource. The applicant concluded this for Criteria 1-4. Adding the conclusion of ineligibility drawn by Becker 2012 relative to the transmission line's terminus at the Santa Clara Substation, a strong case is made that the Mandalay-Santa Clara Transmission Line is not an historical resource under CEQA. Staff concurs with applicant's conclusions (AECOM 2015b:4-6, 4-7).

SCE Switchyard

The SCE Switchyard was constructed concurrently with MGS in 1959. SCE has retained ownership of the switchyard while MGS has had several owners since being spun-off by SCE. The utilitarian switchyard transmits the electric power generated by MGS to the Mandalay-Santa Clara Transmission Line. Lacking any connection to a broad pattern of history, persons of significance, creative people or designers or having imbedded information important to history or prehistory of the area, the SCE Switchyard is recommended not eligible for the CRHR under Criteria 1-4 and therefore is not an historical resource under CEQA.

SCE Substation

The SCE Substation is located across Harbor Boulevard from the MGS and the SCE Switchyard. The Substation dates to 1958 and was built in conjunction with MGS to distribute power through the Mandalay-Santa Clara Transmission Line. Buildings are strictly utilitarian and without architectural adornment, unlike some substations built earlier in the 20th Century (local examples would include Colonia, Ventura and Santa Paula Substations-[Huntington 2015]). Lacking any connection to a broad pattern of history, persons of significance, creative people or designers or having imbedded information important to history or prehistory of the area, the SCE Substation is recommended not eligible for the CRHR under Criteria 1-4 and therefore is not an historical resource under CEQA.

Jeep Trail Tank Farm

The construction of tanks and related facilities on the Jeep Trail Tank Farm dates from 1954 to 1959. Aerial imagery indicates two additional tanks were in place by 1967 (AECOM 2015c: 4-11). Two tanks were removed prior to 1977, and the property began to incorporate agricultural uses. Today the tank farm is a mix of agricultural fields, utility and farm buildings, storage tanks and naturally vegetated areas. Lacking any connection to a broad pattern of history, persons of significance, creative people or designers or having imbedded information important to history or prehistory of the area, the Jeep trail Tank Farm is recommended not eligible for the CRHR under Criteria 1-4 and therefore is not an historical resource under CEQA.

Edison Canal

The Edison Canal is associated with the construction of MGS Units 1 & 2, as it provided the source of cooling water for the power generating station. The original intake at Port Hueneme was later relocated and became the basis for the development of Channel Islands Harbor. See the resource description in **Cultural Resources Appendix CR-1** for additional contextual information. While the canal gained some local notoriety in the press as the giant dredger known as “Explorer” carved out the 140 foot-wide channel, it was not a unique or trendsetting engineering development. Lacking any connection to a broad pattern of history, persons of significance, creative people or designers or having imbedded information important to history or prehistory of the area, the Edison Canal is recommended not eligible for the CRHR under Criteria 1-4 and therefore is not an historical resource under CEQA.

McGrath State Beach

Dating to its design in 1962 and construction in 1964, the McGrath State Beach is over 50 years of age as of 2015. For the purposes of evaluating historical resources under CEQA, properties 45 years or older are generally considered for their historical significance. The state beach is located on parcel number APN 138008006-5. This parcel falls within the one-half mile minimum PAA buffer for projects in rural areas. The applicant did not record or evaluate McGrath State Beach as a historical resource, even though a large portion of the property falls within the PAA as shown on **Cultural Resources Figure 2**. The AFC states*, "In some instances, the PAA and identification efforts for historical architecture were limited to the area that is reasonably subject to visual or direct impacts and generally does not consider properties set far back from the edge/boundary of a large parcel (e.g., where there is a sliver impact), or entire complexes or rows of structures on a large parcel"* (AECOM 2015c: 3-1). Elsewhere in the AFC, the applicant states, *"As part of the field effort, several features and properties were identified in the PAA that were not recorded or evaluated. Based on background research and visual inspection, these properties consisted of primarily of buildings and structures built less than 45 years ago (and not possessing exceptional importance of an extent to be considered significant resources), or are minor, fragmentary, and ubiquitous features"* (AECOM 2015c: 4-1).

It is not clear why the applicant chose not to evaluate McGrath State Beach, even though the property lies within the established PAA and the project site is visible from several areas of the park and campground. Staff, in conducting its analysis considers architectural resources within a larger built environment context, which may range from buildings to water systems, bridges, parks and other types of human-crafted spaces. McGrath State Beach and its facilities is a park, comprising both natural areas and areas designed and built by human beings. In order for staff to fully assess the potential effects of the proposed project, all built environment resources 45 years or older within the PAA must be examined. Staff has completed a field investigation and research on McGrath State Beach, the relevance of the McGrath family in Oxnard area history and the larger central and south coast state beach system, in an effort to determine the potential for impacts to an historic-age resource. The result of that investigation is found in the *Historical Evaluation of McGrath State Beach* in **Cultural Resources Appendix CR-2** of this document. The evaluation concluded that, while McGrath State Beach is a component of the pattern of intensive development of California's State Beaches and Parks from 1960 to 1980, it is not individually of historic significance in that pattern of development and therefore not recommended as eligible under Criterion 1. The evaluation also concluded that the association with the McGrath family, a prominent farming family in the Oxnard area, is not sufficient to raise it to the level of significance required under Criterion 2. Criterion 3 was considered for the association of the state beach design with notable landscape architects and Parks staff, but concluded that the association was not significant enough to meet the requirements of Criterion 3. When considered under Criterion 4, the developed grounds and structures at McGrath State Beach, or the system as a whole, would not be likely to yield important information that is not already known. For these reasons, McGrath State Beach appears to be ineligible under Criterion 4.

Historic Age Structures within the PAA and One Mile Literature Search Area

Staff investigated historic age built environment resources in the PAA (see **Cultural Resources Figure 2**) and the One Mile Literature Search Area and have not found any properties that would be eligible as historical resources under CEQA.

California Register of Historical Resources Eligibility

Staff recommends that none of the built environment resources identified during the course of the Puente AFC process are eligible for listing in the CRHR. The MGS itself, while of historic age, is not eligible because it does not rise to the level of significance such that it would be considered a historical resource under CEQA. The additional resources identified by staff in the built environment PAA also do not meet the CRHR criteria, and thus are not considered historical resources.

Interpretation of Results

Model of Prehistoric and Historic Archaeological Resources

The AFC and associated cultural resources documentation suggest that the PAA has a low-moderate potential to contain prehistoric and historic archaeological resources on the ground surface because of the degree of surface disturbance. These expectations were borne out by the cultural resources inventory described in this document; however, it should be noted that the lack of surface manifestations of an archaeological site does not preclude subsurface deposits.

The AFC and associated cultural resource documentation states that buried archaeological resource potential is moderate based on the geomorphological character of the PAA. Staff agrees with this assessment based on staff's independent analysis of the proposed project and taking into consideration nearby sites with buried archaeological resource potentials.

DIRECT/INDIRECT IMPACTS AND MITIGATION

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and operation. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, oily sand remediation, or demolition of overlying structures. Construction can have direct impacts on historic standing structures when those structures must be demolished or removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with adjacent structures and related setting, feeling and association. New structures might also produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project

construction creates improved accessibility to resources by non-project-affiliated personnel and the potential for vandalism or greater weather exposure becomes possible.

Ground disturbance accompanying construction at a proposed plant site has the potential to directly affect archaeological resources, the significance of which is unknown at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed power plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Construction Impacts and Mitigation

The project, as described in the November 2015 Project Enhancement and Refinement (AECOM 2015d) and the subsequent Refinement and Enhancement supplements (AECOM2016, AECOM2016b), includes demolition of MGS Units 1 and 2 and the outfall structure of the Edison Canal. Demolition of Units 1 and 2 would take place within the bounds of the MGS property and would use on-site construction and laydown areas. Demolition would be to grade and would involve demolition to grade of the Units 1 and 2 turbine plants and buildings, boiler plants and related facilities, and the 200-foot-tall-stack. Additionally, there would be removal of asbestos and contaminated equipment, as well as transformers and associated electrical equipment to the switchyard. No below-grade demolition is proposed. Some filling of sub-grade infrastructure areas with crushed concrete from the demolition activities is proposed. No excavation to remove foundations or piping would be required (AECOM 2015d: 1-2, 2-1, 2-2, 4-44).

Demolition and removal of the outfall structure would occur west of the existing MGS and outside the MGS fence line. The outfall demolition area would be approximately 0.4 acre. Demolition would include removal of the concrete structure, rip-rap and fencing. The water pipes that connect to the outfall would be plugged with concrete (AECOM 2016b:2-2).

A transmission pole and 220-kV take-off structure were added to the project in August, 2016 (AECOM 2016). From the takeoff structure, the transmission line from Puente would connect to the first point of interconnection, an existing tower east of the proposed project on the east side of Harbor Boulevard. The tower is Tower No. 1 of the Mandalay to Santa Clara Transmission Line and was previously recorded as CA-VEN-2474, CA-VEN-2901and P-56-15302.

The proposed project would not have a significant impact on known significant prehistoric, ethnographic and historic resources. With the adoption and implementation of the proposed Conditions of Certification **CUL-1** through **CUL-9**, the proposed project would not have a significant impact on potentially significant prehistoric and historic archaeological resources that may be discovered during construction. Staff recommends that the Energy Commission adopt Conditions of Certification **CUL-1** through **CUL-9**. These conditions are intended to facilitate the identification and assessment of previously unknown prehistoric and historic archaeological resources encountered during construction and to mitigate any significant project impacts on any

newly found resources assessed as significant and on any known resources that may be affected by the project in an unanticipated manner. To accomplish this, the conditions provide for:

- The hiring of a Cultural Resources Specialist, Cultural Resources Monitors, and Cultural Resources Technical Specialists;
- The archaeological and Native American monitoring of ground-disturbing activities;
- The recovery of significant data from discovered archaeological deposits;
- The writing of a technical archaeological report on monitoring activities and findings;
- The curation of any recovered artifacts and associated notes, records, and reports; and
- Cultural resources surveys, if the applicant chooses to use private soil borrow or disposal site rather than a commercial one.

When properly implemented, staff believes that these conditions of certification would mitigate any impacts to unknown significant archaeological resources newly discovered in the project impact areas to a less than significant level.

Assessment of Direct Impacts on Prehistoric and Historic Archaeological Resources and Proposed Mitigation

Prehistoric and Historic Archaeological Resources on the Surface of the PAA

Direct impacts could occur to site CA-VEN-1807 because of the proximity of the site to the proposed access road. Potential impacts to this site would be mitigated to a less than significant level by avoiding the site. Avoidance would entail ensuring all equipment used in the vicinity of the site remains on the access road, and flagging and monitoring the site during proposed activities around CA- VEN-1807.

Buried Archaeological Resources in the PAA

No positive identification of buried prehistoric or historic archaeological resources has been made by staff or the applicant. The sediments under the proposed project site are of the right age to have supported the formation and preservation of archaeological resources throughout the span of human occupation in the Oxnard area. The proposed project could result in damage to buried archaeological resources, if present.

Staff concludes that expectable ground-disturbance impacts on buried archaeological resources would best be minimized by implementing a comprehensive cultural resources mitigation and monitoring program for the proposed project. Implementation of a well-planned mitigation and monitoring program would reduce the potential project impacts to a less-than-significant level.

Assessment of Direct Impacts on Ethnographic Resources

The ethnographic resource (CA-VEN-1234) has been determined to not be an extant or historic Chumash plant gathering area. Staff does not expect that the proposed project would result in impacts on ethnographic resources.

Assessment of Direct Impacts on Built-Environment Resources and Proposed Mitigation

Built environment technical staff has reviewed the literature search materials, other available studies as noted herein, engaged in independent research and performed on-site and off-site reconnaissance surveys. Based on the information available, staff concludes that the proposed project would have no direct impacts on known built environment historical resources. Therefore, staff is not recommending any mitigation measures for built environment resources.

Indirect Impacts

Neither the applicant nor staff have identified any indirect impacts on any cultural resources that qualify as historical resources or unique archaeological resources under CEQA.

Staff has reviewed the literature search materials, other available studies as noted herein, and performed on-site and off-site reconnaissance surveys. Based on the information available, staff concludes that the proposed project would have no indirect impacts on known prehistoric, ethnographic, or historic resources. Therefore, staff does not recommend any mitigation measures for indirect impacts to prehistoric, ethnographic, or historic resources.

Operation Impacts and Mitigation

The measures proposed above and below for the mitigation of impacts to previously unknown prehistoric and historic archaeological resources found during construction would mitigate impacts that occur during operation-phase repairs to unknown sites. Operation of the proposed project would have no impacts upon ethnographic or built environment resources as none have been determined to be historical resources.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130). Cumulative impacts to historical resources in the project vicinity could occur, if Puente in conjunction with other existing or proposed projects would have impacts on historical resources that, considered together, would be significant.

For the purposes of cumulative archeological impacts analysis, for both prehistoric and historic archaeological resources, staff has determined that the cumulative area of analysis for archaeological resources comprises a 6-mile-diameter semicircle from the project site (**Executive Summary Figure 1**). The cumulative projects area of analysis encompasses the project site and geographic qualities that were likely of concern to the prehistoric inhabitants of the project vicinity.

Staff identified a total of 133 cumulative projects in the 6-mile buffer. Of these 133 projects with information available concerning impacts or potential impacts to

archaeological historical resources, at least eight of these projects could contribute to a cumulative impact to archaeological resources (**Cultural Resources Appendix CR1 Table A8)**.

The previous ground disturbance from prior projects and the ground disturbance related to construction of Puente and other proposed projects in the vicinity could have a cumulative impact on buried, as-yet unknown archaeological deposits, either historical or unique archaeological resources (as defined under CEQA). However, staff-proposed Conditions of Certification **CUL-1** through **CUL-9** would reduce Puente-specific impacts to a less-than-significant level and therefore, Puente's contribution to cumulative impacts on prehistoric and historic archeological resources would be less than cumulatively considerable.

Puente would not directly impact any known built environment historical resource. Although the MGS would be demolished as part of the project, MGS is not eligible to the California Register of Historical Resources per CEQA, thus Puente would not contribute to any cumulative impacts to built environment historical resources.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1, which shows population based on race and ethnicity, and **Environmental Justice Table 3**, which displays population based on poverty, indicate that an Native American population does exist within a six-mile radius of the proposed project area (see the **Environmental Justice** section of this document for a discussion of staff's responsibilities, methods, and composition of the environmental justice population). Staff also reviewed the ethnographic and historical literature to determine whether any environmental justice populations use or reside in the project area. Staff concluded that because there are no known currently used hunting and gathering areas that could be impacted by the proposed project, Native Americans are not considered members of the environmental justice population for this project.

These efforts are documented in the "Ethnographic Setting" and "Native American Consultation" subsections, which can be found in **Cultural Resources Appendix CR-1**. Therefore, staff concludes there would be no impacts to native Americans, and likewise no disproportionate impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Cultural Resources Table 3
LORS Consistency

Applicable LORS	Description	Consistency
State		
Public Resources Code, §§5097.98(b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until s/he confers with the Native American Heritage Commission-identified Most Likely Descendants (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.	The project would comply with this LORS through adoption of **CUL-1, CUL-3, CUL-6, AND CUL-7**
Public Resources Code, §5097.99	Prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.	The project would comply with this LORS through adoption of **CUL-5, CUL-6, CUL-7, CUL-8** and **CUL9**
Health and Safety Code, §7050.5	This code prohibits the disturbance or removal of human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.	The project would comply with this LORS through adoption of **CUL-6** and **CUL-7**
Public Resources Code, Division 20. California Coastal Act. Chapter 3, Article 5, Section 30244	Requires reasonable mitigation for projects that would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer.	The project would comply with this LORS through adoption of **CUL-1** through **CUL-9**
Local		
County of Ventura General Plan September 22, 2015	Section 1.8: Paleontological and Cultural Resources. Establishes goals and policies for managing cultural resources within the county's jurisdiction.	The project would comply with this LORS through adoption of **CUL-1** through **CUL-9**

Applicable LORS	Description	Consistency
City of Oxnard General Plan 2030 October 2011	Goal ER-11: Identification, protection, and enhancement of the city's archaeological, historical, and paleontological resources.	The project would comply with this LORS through adoption of **CUL-1** through **CUL-9**
City of Oxnard Code Chapter 37, Section 37-3.6.0 Cultural Resources and Development	This section provides standards to avoid or minimize impacts to cultural resources in the coastal zone. Ordinance No. 2034, pt.1, 2-12-85.	The project would comply with this LORS through adoption of **CUL-1** through **CUL-9**

The applicable state laws, ordinances, regulations, and standards are listed above in **Cultural Resources Table 3**. Staff identified CA-VEN-1807 as a cultural resource in the PAA that qualifies as a historical resource for the purposes of CEQA, and thus can definitively state that the project would comply with all identified LORS with adoption of **CUL-1** through **CUL-9**. Impacts to as-yet-unidentified prehistoric and historic archaeological resources that qualify as historical or unique under CEQA could occur during construction and operation of the proposed project; staff-proposed Conditions of Certification **CUL-1** through **CUL-9** would mitigate such impacts to less-than-significant levels. These conditions establish the necessary protocols to constructively handle the issues identified in **Cultural Resources Table 3**: the treatment of human remains discoveries during project-related ground disturbance (**CUL-1 – CUL-9**), prevention of unauthorized removal of Native American remains or artifacts from a Native American grave or cairn (**CUL-1 – CUL-9**).

CONCLUSIONS AND RECOMMENDATIONS

Based upon staff's background research and the AFC and associated documentation, staff concludes that there would be no significant impacts from the proposed project on known prehistoric and historic archaeological resources. There is moderate potential for subsurface deposits in the PAA, and the conditions of certification would permit the impacts to these resources to remain at a level that is less than significant.

Based upon staff's investigation of a number of built environment resources of historic age within the PAA and the results of a one-mile literature search area for the project, staff concludes that there would be no significant impacts from the project on built environment resources.

As a result of ethnographic research, staff concludes that there are no ethnographic resources that will be impacted by the proposed project. The ethnographic background information included in **Cultural Resources Appendix CR-1** provides a brief context for

the prehistoric resources discussed above, and one ethnographic resource that was found to not be extant.

Staff has considered environmental justice populations in its analysis of the amended project. Staff has not identified any Native American environmental justice populations that either reside within 6 miles of the project or that rely on any hunting and gathering resources that could be impacted by Puente.

RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

Subject: Cultural Resources		
Source of Comment	***Comment***	***Staff Response***
Applicant	**61**: To be more consistent with the language elsewhere used in the PSA, suggest clarify (sic) the text by referring to significant built environment resources or built environment resources that qualify as historical resources (4.4-01). **62**: Should be California Register of Historical Resources, not California Historical Resources Register (4.4-31). **CUL-6**: Prior to the start of ground disturbance, the project owner shall notify the CPM and ~~all interested~~ Native **American monitors(s) retained as per CUL-1** of the date on which ground disturbances will ensue.	**61**: Staff has clarified language to refer to historical resources of all kinds, whether archaeological, ethnographic or built environment, as defined by CEQA Guidelines 15064.5, (a) (1)-(4). **62**: Staff incorporated the suggested edit into the FSA. **CUL-6**: Staff accepted this comment and changed **CUL-6** accordingly
Wishtoyo	1. The Wishtoyo Chumash Foundation requested that all remaining Chumash tribes, groups, bands, and clans with current and historical affiliation to the project area be consulted regarding Puente. 2. The Wishtoyo Chumash Foundation requested the use of specially trained forensic canines in combination with ground penetrating radar (GPR) to identify Native American burials.	1. Staff contacted all known Chumash tribes, groups, bands, and clans as specified by the NAHC for the latest Ventura County projects. All responses and results of consultation efforts are included in the FSA. 2. Staff understands the Wishtoyo Chumash Foundation's concern for potential impacts to Native American burials but does not agree that implementing the proposed strategy of GPR and forensic canines would be prudent for Puente. GPR and forensic canines are commonly utilized to pinpoint known or suspected sub-surface remains.

Subject: Cultural Resources		
Source of Comment	***Comment***	***Staff Response***
		There are no reports of known or suspected human remains in the vicinity of the project or archaeological site types that would indicate human remains could be present. Therefore staff asserts that monitoring by cultural resources personnel and Native American Monitor(s) are the appropriate level of precaution for handling potential inadvertent discoveries for this project. All regulations regarding encountering human remains, i.e., Health and Safety Code 7052.5c and PRC 5097.98 would be applied to this project.
	3. The Wishtoyo Chumash Foundation requested further analysis of impacts from Puente on the natural cultural resources important to the Chumash.	3. The natural cultural resources important to the Chumash are discussed in the "Ethnographic Setting" subsection and the "Native Plants and Animals in the Project Vicinity" subsection of the Cultural Resources Appendix. There are no known areas in the project vicinity that are used as hunting or gathering areas by contemporary Chumash groups. Potential impacts and mitigation for significant impacts to natural cultural resources (e.g., plants, animals, soil, and water) are discussed in the corresponding technical section.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 APPOINTMENT AND QUALIFICATIONS OF CULTURAL RESOURCES SPECIALIST

A. CULTURAL RESOURCE SPECIALIST

1. Appointment and Qualifications

The project owner shall assign a Cultural Resources Specialist (CRS) and at least one Alternate CRS to the project. The project owner shall submit the resumes of the proposed CRS and Alternative CRS(s), with at least three references and contact information, to the Energy Commission compliance project manager (CPM) for review and approval.

The CRS and Alternate CRS(s) shall have training and background that conform to the U.S. Secretary of the Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61. In addition, the CRS and Alternate CRS(s) shall have the following qualifications:

1. A background in anthropology, archaeology, history, architectural history, or a related field;

2. At least 10 years of archaeological or historical experience (as appropriate for the project site), with resources mitigation and fieldwork;

3. At least one year of field experience in California; and

4. At least three years of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The project owner may replace the CRS by submitting the required resume, references and contact information of the proposed replacement CRS to the CPM.

2. Duties of Cultural Resources Specialist

The CRS shall manage all cultural resource monitoring, mitigation, curation, and reporting activities, and any pre-construction cultural resource activities, unless management of these is otherwise provided for in accordance with the cultural resource conditions of certification (conditions). The CRS shall serve as the primary point of contact on all cultural resource matters for the Energy Commission. The CRS may elect to obtain the services of Cultural Resource Monitors (CRMs), Native American Monitors (NAMs), and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure

that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner.

After all ground disturbances are completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, after receiving approval from the CPM.

The cultural resource conditions shall continue to apply during operation of the proposed power plant, limited to those ground disturbing activities in non-fill sediments.

B. CULTURAL RESOURCES MONITORS

1. Appointment and Qualifications

The CRS may assign Cultural Resources Monitors (CRMs). CRMs shall have the following qualifications:

1. B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field; and one year of archaeological field experience in California; or

2. A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years of archaeological field experience in California; or

3. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of archaeological field experience in California.

C. NATIVE AMERICAN MONITORS

1. Appointment and Qualifications:

The project owner shall obtain the services of qualified Native American Monitors (NAMs). Preference in selecting NAMs shall be given to Native Americans with:

1. traditional ties to the area to be monitored, and

2. the highest qualifications as described by the Native American Heritage Commission (NAHC) document entitled: Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites (NAHC 2005).

D. CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialist(s), e.g., geoarchaeologist, historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the

CPM for approval. The resume of each proposed specialist shall demonstrate that their training and background meet the U.S. Secretary of Interior's Professional Qualifications Standards for their specialty (if appropriate), as published in Title 36, Code of Federal Regulations, part 61, and show the completion of appropriate graduate-level coursework. The resumes of specialists shall include the names and telephone numbers of contacts familiar with the work of these persons on projects referenced in the resumes and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research. The project owner may name and hire any specialist prior to certification. All specialists are under the supervision of the CRS.

Verification:

1. The project owner shall submit the specified information at least 75 days prior to the start of (1) ground disturbance (as defined in the Compliance Conditions and Compliance Monitoring Plan section); (2) post-certification cultural resources activities (including, but not limited to, "survey", "in-field data recording," "surface collection," "testing," "data recovery" or "geoarchaeology"); or (3) site preparation or subsurface soil work during pre-construction activities or site mobilization.

3. The project owner may replace a CRS by submitting the required resume, references and contact information to the CPM at least 10 working days prior to the termination or release of the then-current CRS. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent CRS is proposed to the CPM for consideration.

4. At least 20 days prior to ground disturbance, the CRS shall provide proof of qualifications for any anticipated CRMs and additional specialists for the project to the CPM.

5. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall inform the CPM of this situation in writing at least 30 days prior to the beginning of post-certification cultural resources field work or construction-related ground disturbance.

6. At least 5 days prior to additional CRMs or NAMs beginning on-site duties during the project, the CRS shall review the qualifications of the proposed CRMs or NAMs and send approval letters to the CPM, identifying the monitors and attesting to their qualifications.

7. At least 10 days prior to any technical specialists beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

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

9. No ground disturbance shall occur prior to CPM approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

CUL-2 INFORMATION TO BE PROVIDED TO CULTURAL RESOURCES SPECIALIST

Prior to the start of ground disturbance, the project owner shall provide the CRS with copies of the application for certification (AFC), data responses, confidential cultural resources reports, all supplements, the Energy Commission staff's Cultural Resources Final Staff Assessment, and the cultural resources Conditions from the Final Decision for the project, if the CRS does not already possess copies of these materials. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:24,000 and 1 inch = 200 feet, respectively) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

Maps shall include any National Register of Historic Places (NRHP)/California Register of Historical Resources (CRHR) -eligible cultural resources, including any historic built environment resources, identified in the project area of analysis.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

The project owner shall provide the documents described in the first paragraph of this condition to new CRSs in the event that the approved CRS is terminated or resigns.

Verification:

1. At least 40 days prior to the start of ground disturbance, the project owner shall provide the CPM notice that the AFC, data responses, confidential cultural resources documents, all supplements, FSA, and Final Commission Decision have been provided to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

4. Weekly, during ground disturbance, a schedule of the next week's anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

5. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

6. If a new CRS is approved by the CPM as provided for in CUL-1, the project owner shall provide the CPM notice that the AFC, data responses, confidential cultural resources documents, all supplements, FSA, Final Commission Decision, and maps and drawings have been provided to the new CRS within 10 days of such approval.

CUL-3 CULTURAL RESOURCES MITIGATION AND MONITORING PLAN

Prior to the start of ground disturbance, the project owner shall submit a Cultural Resources Mitigation and Monitoring Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM. The CRMMP shall be designated as a confidential document if the location(s) of cultural resources are described or mapped.

The CRMMP shall include the following elements and measures.

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the conditions of certification in this

CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A specific mitigation plan shall be prepared for any unavoidable impacts to any CRHR-eligible (as determined by the CPM) resources. A prescriptive treatment plan may be included in the CRMMP for limited data types.

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects.

7. A statement that all encountered cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms, mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's (SHRC's) *Guidelines for the Curation of Archaeological Collections* (1993, or future updated guidelines from the SHRC), into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

9. A statement demonstrating when and how the project owner will comply with Health and Human Safety Code 7050.5(b) and Public Resources Code 5097.98(b) and (e), including the statement that the project owner will notify the CPM and the NAHC of the discovery of human remains.

10. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

11. A description of the contents, format, and review and approval process of the final Cultural Resource Report (CRR), which shall be prepared according to *Archaeological Resource Management Report (ARMR)* guidelines.

Verification:

1. Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.

2. At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

3. At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, data recovery).

4. Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the State Historic Resources Commission's (SHRC) *Guidelines for the Curation of Archaeological Collections* (1993, or future updated guidelines from SHRC), to accept the cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

CUL-4 FINAL CULTURAL RESOURCES REPORT

The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for approval. The final CRR shall be written by or under the direction of the CRS and shall be provided in the Archaeological Resource Management Report (ARMR) format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and

analyses. All survey reports, DPR 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resources Information System (CHRIS) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

2. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

3. Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the CHRIS, the curating institution, if archaeological materials were collected, and to the tribal chairpersons of any Native American groups requesting copies of project-related reports.

CUL-5 CULTURAL RESOURCES WORKER ENVIRONMENTAL AWARENESS PROGRAM

Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The cultural resources part of this training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS is encouraged to include a Native American presenter in the training to contribute the Native American perspective on archaeological and ethnographic resources. During the training and during construction, the CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.

The training shall include:

1. A discussion of applicable laws and penalties under law;

2. Samples or visuals of artifacts that might be found in the project vicinity;

3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;

4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;

5. Instruction that the CRS, Alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

6. Instruction that employees, if the CRS, Alternate CRS, or CRMs are not present, are to halt work on their own in the vicinity of a potential cultural resources discovery, and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

7. An informational brochure that identifies reporting procedures in the event of a discovery;

8. An acknowledgement form signed by each worker indicating that they have received the training; and

9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the cultural resources WEAP training program draft text and/or training video, including Native American participation, graphics and the informational brochure, to the CPM for review and approval.

2. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 CULTURAL RESOURCES MONITORING

The project owner shall ensure that a CRS, alternate CRS, or CRMs shall be on site for all ground disturbance in areas slated for excavation into non-fill (native) sediments.

Prior to the start of ground disturbance, the project owner shall notify the CPM and Native American monitors(s) retained as per **CUL-1** of the date on which ground disturbance will ensue. Where excavation equipment is actively removing dirt and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than 50 feet from the location of active excavation, one monitor shall observe both the location of active excavation and inspect the dumped material.

In the event that the CRS believes that the required number of monitors is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the number of monitors shall be provided to the CPM for review and approval prior to any change in the number of monitors.

The project owner shall obtain the services of one or more NAMs to monitor construction-related ground disturbance in areas slated for excavation into non-fill (native) sediments. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the NAHC. Preference in selecting a NAM shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow construction-related ground disturbance to proceed without an NAM.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the conditions and/or applicable LORS. The daily monitoring logs shall, at a minimum, include the following information.

- First and last name of the CRM and any accompanying NAM.
- Time in and out.
- Weather. Specify if weather conditions led to work stoppages.
- Work location (project component). Provide specifics—.e.g., power block, landscaping.

- Proximity to site location. Specify if work conducted within 1000 feet of a known cultural resource.
- Work type (machine).
- Work crew (company, operator, and foreman).
- Depth of excavation.
- Description of work.
- Stratigraphy.
- Artifacts, listed with the following identifying features:
- Field artifact #: When recording artifacts in the daily monitoring logs, the CRS shall institute a field numbering system to reduce the likelihood of repeat artifact numbers. A typical numbering system could include a project abbreviation, monitor's initials, and a set of numbers given to that monitor: e.g., P3-MB-123.
- Description.
- Measurements.
- Universal Transverse Mercator coordinates.
- Whether artifacts are likely to be isolates or components of larger resources.
- Assessment of significance of any finds.
- Actions taken.
- Plan for the next work day.
- A cover sheet shall be submitted with each day's monitoring logs, and shall at a minimum include the following:
    - Count and list of first and last names of all CRMs and of all NAMs for that day.
    - General description (in paragraph form) of that day's overall monitoring efforts, including monitor names and locations.
    - Any reasons for halting work that day.
    - Count and list of all artifacts found that day: include artifact #, location (i.e., grading in Unit X), measurements, UTMs, and very brief description (i.e., historic can, granitic biface, quartzite flake).
    - Whether any artifacts were found out of context (i.e., in fill, caisson drilling, flood debris, spoils pile).

Copies of the daily monitoring logs and cover sheets shall be provided by email from the CRS to the CPM, as follows:

- Each day's monitoring logs and cover sheet shall be merged into one PDF document

- The PDF title and headings, and emails shall clearly indicate the date of the applicable monitoring logs.
- PDFs for any revised or resubmitted versions shall use the word “revised” in the title.

Daily and/or weekly maps shall be submitted along with the monitoring logs as follows:

- The CRS shall provide daily and/or weekly maps of artifacts at the request of the CPM. A map shall also be provided if artifact locations show complexity, high density, or other unique considerations.
- Maps shall include labeled artifacts, project boundaries, previously recorded sites and isolates, aerial imagery background, and appropriate scales.

From the daily monitoring logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

- The Cultural Resources section of the MCR shall be prepared in coordination with the CRS, and shall include a monthly summary report of cultural resources-related monitoring. The summary shall:
  - List the number of CRMs and NAMs on a daily basis, as well as provide monthly monitoring-day totals.
  - Give an overview of cultural resource monitoring work for that month, and discuss any issues that arose.
  - Describe fulfillment of requirements of each cultural mitigation measure.
  - Summarize the confidential appendix to the MCR, without disclosing any specific confidential details.
  - Include the artifact concordance table (as discussed under the next bullet point), but with removal of UTMs.
  - A concordance table that matches field artifact numbers with the artifact numbers used in the DPR forms shall be included. The sortable table shall contain each artifact’s date of collection and UTM numbers, and note if an artifact has been deaccessioned or otherwise does not have a corresponding DPR form. Any post-field log recordation changes to artifact numbers shall also be noted.
  - DPR forms shall be submitted as one combined PDF.
  - The PDF shall organize DPR forms by site and/or artifact number.
  - The PDF shall include an index and bookmarks.

- If artifacts from a given site location (in close proximity of each other or an existing site) are collected month after month, and if agreed upon with the CPM, a final updated DPR for the site may be submitted at the completion of monitoring. The monthly concordance table shall note that the DPR form for the included artifacts is pending.

Each MCR, prepared under supervision of the CRS, shall be accompanied by a confidential appendix that contains completed DPR 523A forms for all artifacts recorded or collected in that month. For any artifact without a corresponding DPR form, the CRS shall specify why the DPR form is not applicable or pending (i.e. as part of a larger site update).

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

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

Upon becoming aware of any incidents of non-compliance with the conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM.

The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will notify all Native Americans with whom the Energy Commission communicated during the project review of the date on which the project's ground disturbance will begin.

2. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log and information to be included in the cover sheet for the daily monitoring logs.

3. While monitoring is on-going, the project owner shall submit each day's monitoring logs and cover sheet merged into one PDF document by email within 24 hours.

4. The CRS and/or project owner shall notify the CPM of any incidents of non-compliance with the conditions and/or applicable LORS by telephone or email within 24 hours.

5. The CRS shall provide daily maps of artifacts along with the daily monitoring logs if more than 10 artifacts are found per day, or as requested by the CPM.

6. The CRS shall provide weekly maps of artifacts if there more than 50 artifacts are found per week, or as requested by the CPM. The map shall be submitted within two business days after the end of each week.

7. Within 15 days of receiving from a local Native American group a request that a NAM be employed, the project owner shall submit a copy of the request and a copy of a response letter to the group notifying them that a NAM has been employed and identifying the NAM.

8. While monitoring is on-going, the project owner shall submit monthly MCRs and accompanying weekly summary reports. The project owner shall attach any new DPR 523A forms, under confidential cover, completed for finds treated prescriptively, as specified in the CRMMP.

9. Final updated DPRs with sites (where artifacts are collected month after month) can be submitted at the completion of monitoring, as agreed upon with the CPM.

10. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

11. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

12. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-7 POWERS OF CULTURAL RESOURCES SPECIALIST / CULTURAL RESOURCES DISCOVERY PROTOCOLS

The CRS shall have the authority to halt ground disturbance in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CRS), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. If the discovery includes human remains, the project owner shall comply with the requirements of Health and Human Safety Code § 7050.5(b) and shall additionally notify the CPM and the NAHC of the discovery of human remains. No action with respect to the disposition of human remains of Native American origin shall be initiated without direction from the CPM. Monitoring, including Native American monitoring, and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere, while the halting or redirection of ground disturbance in the vicinity of the discovery shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary Record" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary Record" form shall include a recommendation on the CRHR/NRHP eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

5. Ground disturbance may resume only with the approval of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, Alternate CRS, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

2. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

3. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery, and the CRS must inform the CPM when the notifications are complete.

4. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

5. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-8 FILL SOILS

If fill soils must be acquired from a non-commercial borrow site or disposed of to a non-commercial disposal site, unless less-than-five-year-old surveys of these sites for archaeological resources are provided to and approved by the CPM, the CRS shall survey the borrow or disposal site(s) for cultural resources and record on DPR 523 forms any that are identified. When the survey is completed, the CRS shall convey the results and recommendations for further action to the project owner and the CPM, who will determine what, if any, further action is required. If the CPM determines that significant archaeological resources that cannot be avoided are present at the borrow site, the project owner must either select another borrow or disposal site or implement **CUL-7** prior to any use of the site. The CRS shall report on the methods and results of these surveys in the final CRR.

Verification:

1. As soon as the project owner knows that a non-commercial borrow site and/or disposal site will be used, he/she shall notify the CRS and CPM and provide documentation of previous archaeological survey, if any, dating within the past five years, for CPM approval.

2. In the absence of documentation of recent archaeological survey, at least 30 days prior to any soil borrow or disposal activities on the non-commercial borrow and/or disposal sites, the CRS shall survey the site(s) for archaeological resources. The CRS shall notify the project owner and the CPM of the results of the cultural resources survey, with recommendations, if any, for further action.

CUL-9 FLAG AND AVOID

The project owner shall avoid impacts to archaeological site CA-VEN-1807 by:

1. Ensuring that all equipment, including vehicles, remain on the access road to the transmission structure east of Harbor Boulevard;

2. Ensuring that a CRS or alternate CRS re-establish and flag the boundaries of CA-VEN-1807 and add as much of a buffer as is feasible without impeding use of the access road;

3. Ensuring that a CRM enforces avoidance of the flagged areas during rerouting/reconfiguring the transmission line from the take-off structure to the transmission structure east of Harbor Boulevard, and monitors any disturbance by vehicles or workers.

Verification: At least 24-hours prior to the start of rerouting/reconfiguring the transmission line from the take-off structure to the transmission structure east of Harbor Boulevard, and any additional unanticipated activities by the project owner in the vicinity of this area, the project owner shall ensure that the CRS or alternate CRS establishes the temporary site markers and that they are visible and in place on a daily basis, during work in the area of the transmission structure. The status of these boundary markers will be reported in the daily and weekly monitoring summary report and will be accompanied by pictures

.

REFERENCES

AECOM 2015a—AECOM. Application for Certification for Puente Power Project (15-AFC-01).Volume 1. TN # 204219-1 -14. Prepared for: NRG Energy Center Oxnard LLC. April 2015.

AECOM 2015b—AECOM. Application for Certification for Puente Power Project (15-AFC-01).Volume 2, Appendix E2. TN # 204220-5. Prepared for: NRG Energy Center Oxnard LLC. April 2015.

AECOM 2015c—AECOM. Confidential Archaeological Resources Technical Report for the Puente Power Project. (15-AFC-01-Appendix E). TN # 204223. Prepared for: NRG Energy Center Oxnard LLC. April 2015.

AECOM 2015d—AECOM. Puente Power Project (15-AFC-01). Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2. TN# 206698. November 19, 2015.

AECOM 2016—AECOM. Puente Power Project (15-AFC-01). Refinement to Transmission Interconnection. TN# 213000. August 26, 2016.

AECOM 2016a—AECOM. Puente Power Project. (15-AFC-01). Applicant's Comments on the Preliminary Staff Assessment. TN#213683. September 15, 2016.

AECOM 2016b—AECOM. Puente Power Project (15-AFC-01). Project Enhancement Outfall Removal and Beach Restoration. TN# 213802. September 26, 2016.

AECOM 2016c—AECOM. Puente Power Project. Applicant's Responses to CEC Data Requests, Set 4 (77-107). TN#214336. 11/1/2016.

Becker 2012—Wendy L. Tinsley Becker. *Historic Resource Analysis Report/Historic Property Report, Southern California Edison Company Santa Barbara County Reliability Project*. Urbana Preservation & Planning, LLC. Revised October 2012.

Bissell 1991—Ronald M. Bissell. *Cultural Resources Recommendations of Four Possible Sites for the California State University, Ventura Campus in Oxnard and Ventura County, California*. February 18, 1990. DPR Form 523 Recorded on March 2, 1991. CHRIS Primary Record Number 56-152738.

CAHIghway—California Highways, Trails and Roads: El Camino Real http://www.cahighways.org/elcamino.html. Accessed September 9, 2014; November 16, 2015.

CALTRANS 2014a—California Department of Transportation. *California Log of Bridges on State Highway.* District 7. October 2014.

CALTRANS 2014b—California Department of Transportation. *Structure and Maintenance Investigations. Historical Significance-Local Agency Bridges*. November 2014.

CALTRANS 2015a—California Department of Transportation. *Structure and Maintenance Investigations. Historical Significance-State Agency Bridges*. May 2015.

Cohen et al. 2013—K.M. Cohen, S.C. Finney, P.L. Gibbard, J.X. Fan. The ICS International Chronostratigraphic Chart. *Episodes* 36.3 (2013): 199-204.

Crawford 2010—K.A. Crawford/Michael Brandon Associates. Department of Parks and Recreation Primary Record 56-153002. SCE Mandalay-Santa Clara 1 and 2, MO-T1. Clearwire CA-VTA0119-A.02/18/2010.

Engstrom 2006—Wayne N. Engstrom. Nineteenth Century Coastal Geomorphology of Southern California. *Journal of Coastal Research* 22:847–861.

Glassow et al. 2007—M.A. Glassow, L.H. Gamble, J.E. Perry, G.S. Russell. Prehistory of the Northern California Bight and the Adjacent Transverse Ranges. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 191–214. Lanham, MD: AltaMira.

Greenwood and Browne 1969—A Coastal Chumash Village: Excavation of Shisholop, Ventura County, California. Memoirs of the Southern California Academy of Sciences, Vol. 8. October 1969.

Horne 1980—J. Horne. Final Report: Onshore Cultural Resources Assessment, Union Oil Company Platform Gina and Gillda Project Federal Lease OCS P-0202 and P-0216, Offshore Southern California. Prepared for Dames & Moore. February 1980.

Huntington 2015—Huntington Digital Library. Southern California Edison Photographic Archive. http://hdl.huntington.org/cdm/landingpage/collection/p16003coll2. Accessed November 20, 2015.

Keller 1995—E. Keller. Earthquake Hazard of the Santa Barbara Fold Belt, California. University of California, Santa Barbara. Institute for Crustal Studies. P. 58. Guidebook.

King 1990—C. King. Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region Before A.D. 1804. *The Evolution of North American Indians*. D.H. Thomas, ed. Garland Publishing, Inc. New York.

Kroeber 1976—A. L. Kroeber. *Handbook of the Indians of California.* New York: Dover. Reprint. Originally published in 1925 as *Bulletin 78*, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

Masters 2012—Nathan Masters. *From Roosevelt Highway to the 1: A Brief History of Pacific Coast Highway*. May 2.

Masters 2013—Nathan Masters, *How El Camino Real, California's Royal Road, was Invented.* KCET Public Television.

<http://www.kcet.org/updaily/socal_focus/history/la-as-subject/el-camino-real.html>January 4, 2013.>

Masters and Aiello 2007—Patricia M. Masters and Ivano W. Aiello. Postglacial Evolution of Coastal Environments. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 35–51. Lanham, MD: AltaMira.

McLendon and Johnson 1999 — Cultural Affiliation and Lineal Descent of Chumash Peoples in the Channel Islands and the Santa Monica Mountains. Prepared for the National Park Service. December 1999.

Myers 1983—William A. Myers. *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company.* Trans-Anglo Books.

NPS 2007—National Park Service. *NPS-28: Cultural Resource Management Guideline*. Electronic document, http://www.nps.gov/parkhistory/online_books/nps28/28intro.htm, accessed November 16, 2015.

OHP 1990—Office of Historic Preservation (California). *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format*. February. Sacramento, CA. Electronic document, http://ohp.parks.ca.gov/pages/1054/files/armr.pdf, accessed November 16, 2015.

OHP f1991—Office of Historic Preservation. *Guidelines for Archaeological Research Designs*. February. Preservation Planning Bulletin 5. Sacramento, CA. Electronic document, http://ohp.parks.ca.gov/pages/1069/files/arch%20research%20design.pdf, accessed November 16, 2015.

OHP 1995—Office of Historic Preservation. *Instructions for Recording Historical Resources*. March. Sacramento, CA. Electronic document, http://ohp.parks.ca.gov/pages/1054/files/manual95.pdf, accessed November 16, 2015.

Pelto 2013—Pertti Pelto. *Applied Ethnography: Guidelines for Field Research.* Walnut Creek, CA: Left Coast Press.

NAHC 2015a—Native American Heritage Commission/Katy Sanchez (TN). Letter to Matt Braun Re: SB 18 Consultation, Puente Power Project, Ventura County, dated June 16, 2015. Submitted to Matt Braun/CEC/Docket Unit on August 24, 2015

Sanchez 2015—K. Sanchez. Letter from the NAHC to the CEC. June 16, 2015. TN205800.

Schoenherr 1992—Allan A. Schoenherr. *A Natural History of California*. California Natural History Guides 56. Berkeley: University of California.

Wallace 1955—W.J. Wallace. “A Suggested Chronology for Southern California Coastal Archaeology”. *Southwestern Journal of Anthropology*, 11:214-230.

Whitely and Simms 1998—D.S. Whitely and J. Simms. *Phase II Test Excavation and Determining of Significance of a Portion of CA-VEN-667, Oxnard, Ventura County, California*. Prepared by W & S Consultants. June 1998.

CULTURAL RESOURCES ABBREVIATION AND ACRONYM GLOSSARY

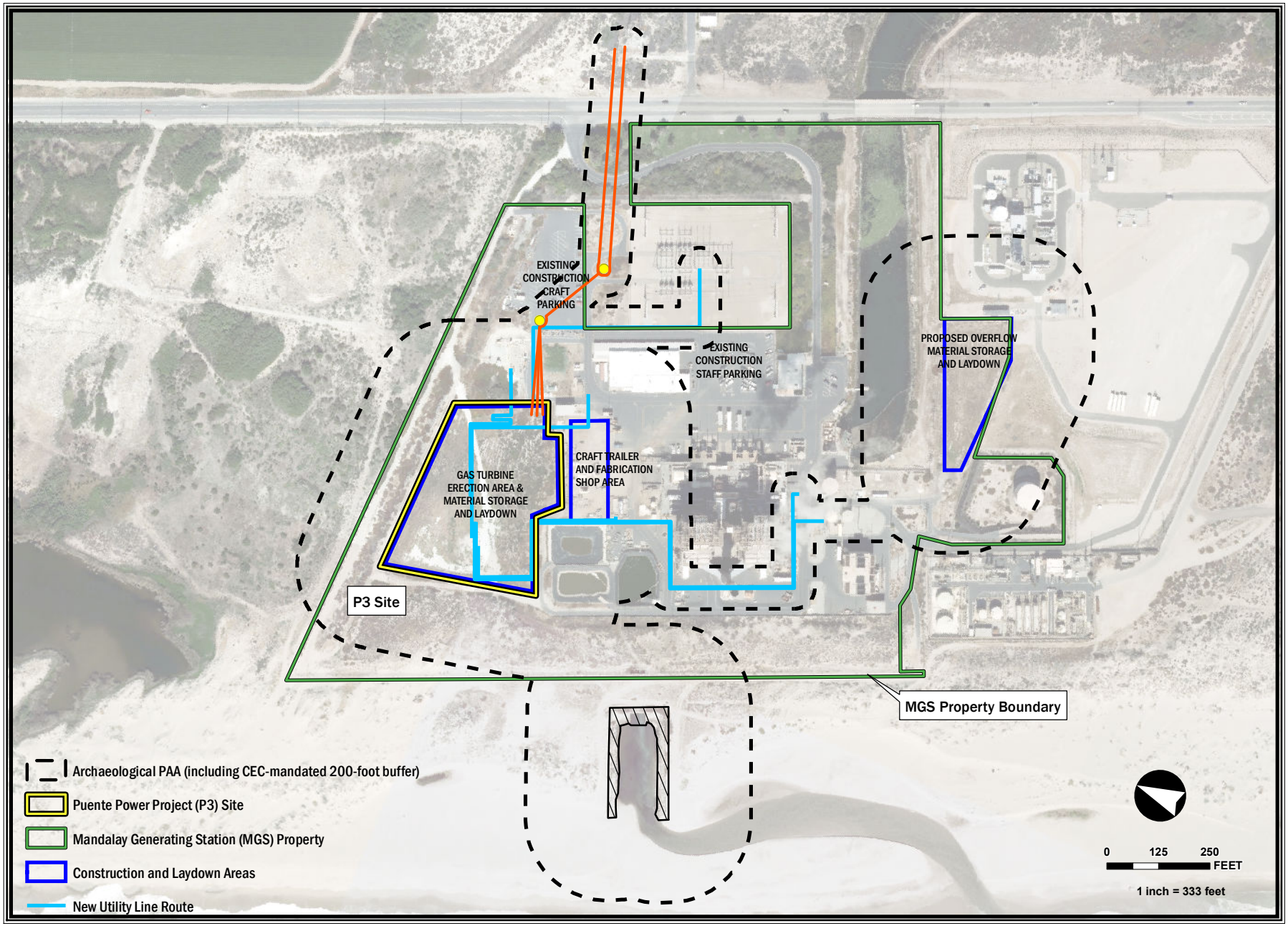
ACC	air-cooled condenser
ACHP	Advisory Council on Historic Preservation
AFC	Application for Certification
ARMR	Archaeological Resource Management Report
asl	above sea level
bgs	below ground surface
Cal. Code Regs.	California Code of Regulations
CCC	California Coastal Commission
CCGT	combined-cycle gas turbine
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CHRIS	California Historical Resources Information System
COE	Corps of Engineers, U.S. Army
Conditions	conditions of certification
CRHR	California Register of Historical Resources
CPM	Compliance Project Manager
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR	Department of Parks and Recreation (State of California)
DPR 523	Department of Parks and Recreation cultural resources recordation form
E.O.	Executive Order (presidential)

° F	degrees Fahrenheit
FSA	Final Staff Assessment
gal	gallon(s)
GLO	General Land Office
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HALS	Historic American Landscape Survey
HDP	Heritage Documentation Programs
HRSG	heat recovery steam generator
LORS	laws, ordinances, regulations, and standards
MCR	Monthly Compliance Report
MLD	Most Likely Descendent
MRS	Marine Research Specialists
NAHC	Native American Heritage Commission
NAM	Native American Monitor
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PAA	Project Area of Analysis
PCH	Pacific Coast Highway (State Route 1)
PSA	Preliminary Staff Assessment
SCCIC	South Central Coastal Information Center
SHL	State Historical Landmark
SHPO	State Historic Preservation Officer
SOI	Secretary of the Interior

SST	sea surface temperature
Staff	Energy Commission cultural resources technical staff
STG	steam turbine generator
TCP	traditional cultural property
USGS	U.S. Geological Survey
WEAP	Worker Environmental Awareness Program

CULTURAL RESOURCES - FIGURE 1

Puente Power Project - Archaeologicial Project Area of Analysis

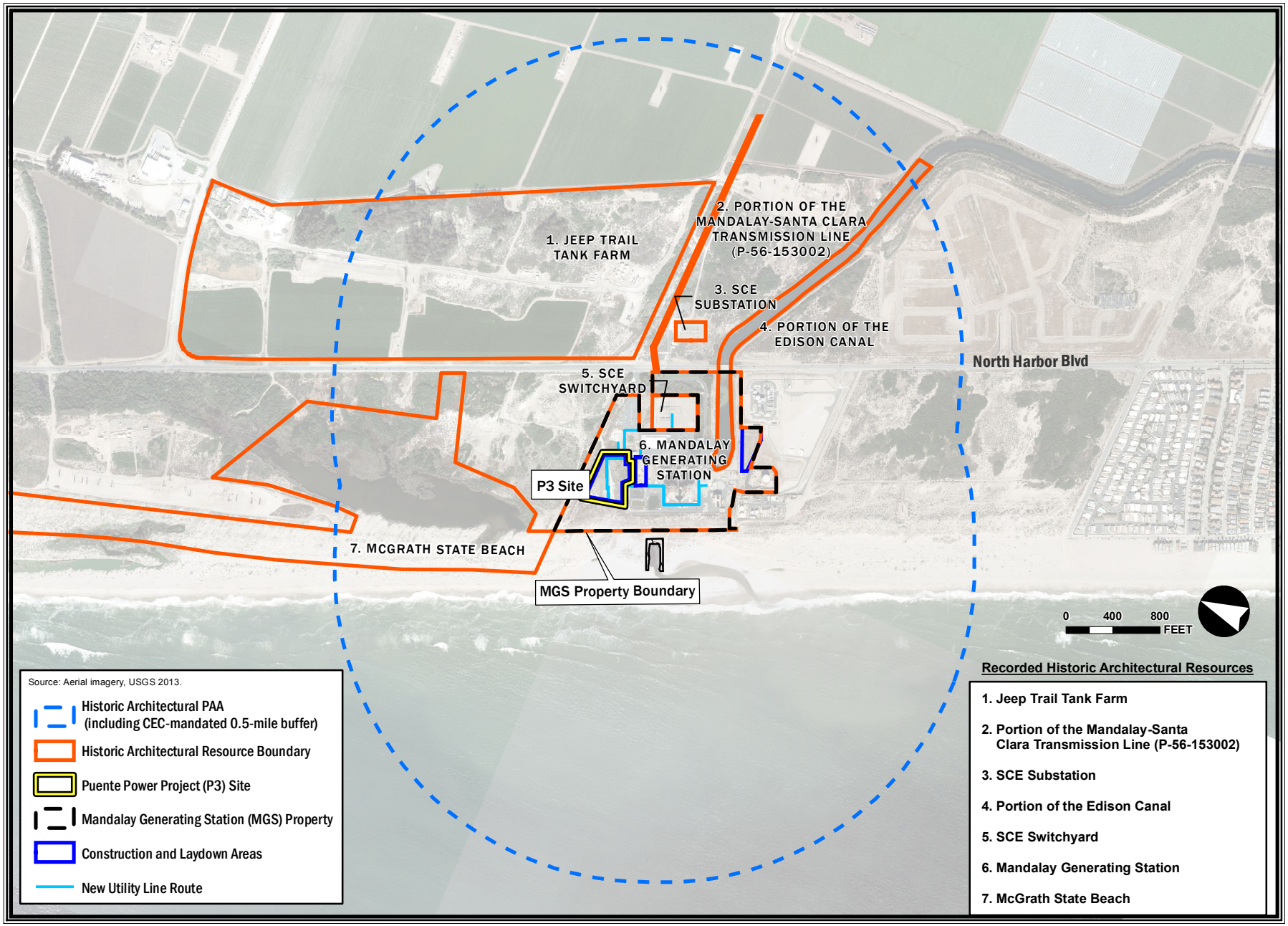


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 4.3-1

CULTURAL RESOURCES - FIGURE 2

Puente Power Project - Historic Builit Environment Resources in the Project Area of Analysis



CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE:AFC Figure 4.3-8 and CEC Staff

CULTURAL RESOURCES APPENDIX CR-1

BACKGROUND INFORMATION NOT INCLUDED IN THE FINAL STAFF ASSESSMENT

The following information in this **Cultural Resources Appendix CR-1** is included to provide the reader more context to gain a better understanding of those relevant aspects briefly mentioned in the Cultural Resources section of the Final Staff Assessment.

ENVIRONMENTAL SETTING

Overview

As explained in the Puente Power Project (Puente or project) Application for Certification (AFC), the modern "climate of the Southern California Coast is mild, with warm summers and cool winters. Rainfall is moderate, and concentrated in the winter months, although summer showers do occur when onshore air circulation patterns become established. Native vegetation in the vicinity is comprised of the Coastal sage scrub that was once common in coastal Ventura County. Coastal sage scrub is characterized by a suite of low, aromatic, drought-tolerant shrubs and sub-shrub species (Munz and Keck, 1973)" (AECOM 2015c: 3-3).

The Puente site is in the Ventura Basin, on the westernmost edge of the Oxnard Plain immediately adjacent to the Pacific Ocean. The vicinity immediately surrounding the site is characterized by a mix of agricultural, residential, and industrial development (AECOM 2015a:4.3-3). The 3-acre project site within the 36-acre Mandalay Generating Station (MGS) property is located at approximately 14 feet in elevation at mean level low water (MLLW). Groundwater is relatively high in the vicinity, at approximately nine feet below ground surface and is influenced by tidal fluctuations, precipitation, irrigation of nearby agricultural fields and groundwater pumping (AECOM 2015a: 2-3).

Paleoclimate and Ecology

The paleoclimate and ecology of the project vicinity is well described by the Applicant (AECOMc: 3-1 – 3-2). Staff summarizes those descriptions here and adds some project-specific information below. Throughout the Holocene and the preceding Pleistocene time periods, the sea level on the California Coast has fluctuated significantly and has in turn, affected the local environment. The paleoclimatic studies conducted by Masters and Aiello (2007) and Peltier (2002) yield an understanding of the project vicinity's changing landscape and ecology during the span of human habitation of the southern coastline. An accurate picture of paleoclimate and ecology provides explanations for and expectations of the range of cultural resources in the project vicinity.

At the transition from the Pleistocene Epoch's[1] Last Glacial Maximum (LGM) to the Holocene Epoch[2], mean sea level was significantly lower than present levels. While Puente is located adjacent to the coast line today, at the LGM 20,000 years ago, sea level was about 400 feet lower.

The Channel Islands were larger and closer to the mainland during the LGM–Holocene transition as well: at 12,000 B.P., Santa Cruz Island was approximately 10 miles off the coast of what is now Oxnard; two thousand years later, rising sea level increased that distance to 15 miles. Presently, the island is over 20 miles west of the PAA. (Porcasi et al. 1999: Figure 1). Additionally, under the relatively rapid sea level rise that occurred since the LGM, the dominant geomorphic process shifted from erosion to deposition, with finer sediments deposited in bays and estuaries formed at the mouths of coastal canyons rather than along the coastline. Essentially, during the Late Pleistocene and Early Holocene the shores in the project area were cold, rocky, and cobbled, punctuated by estuarine ebayments (Graham et al. 2003:35-36).

The coastal environment in the project area has undergone significant change over the last 10,000 years. Deep, well-circulated estuaries that supported fish nurseries, shellfish, shorebirds, and marine mammals characterized the coast between 10,000 and 8,200 years ago when sea level was about 35 meters below present sea level. Beaches lacked sand and shallow rocky reefs, which were productive fish habitats, were widespread (Masters and Aiello 2007: 40).

One of the impacts of intense El Niño/Southern Oscillation (ENSO) events 6,000 to 5,000 years ago was increased sediment in tidal areas. Estuaries became shoaled and less productive, and sand and mud flats expanded which marked the transition to infaunal ecosystems (Graham et al. 2003: 36; Masters and Aiello 2007: 40).

The large estuaries that formed during the earlier period were replaced with shallow wetlands and lagoons during the Late Holocene. During major drought episodes these estuaries would often close because the inland rivers were unable to break the sand barrier to the coast, thus resulting in hypersaline conditions and decreased productivity in the lagoons.

The wet winter/dry summer climate of southern California is thought to have persisted for as many as 160,000 years (Masters and Aiello 2007:40). Late Pleistocene/Early Holocene (ca. 14,000–7550 B.P.) annual precipitation appears to have been similar to twenty-first century conditions. The project vicinity appears to have experienced bimodal precipitation patterns, with precipitation occurring during summer and winter months.

The nineteenth-century climate on the southern California coast was a little different than today's climate. Northwesterly winds dominated then as today, although southeasterly winds were more frequent and intense, likened to hurricanes. The turn of

[1] The interval of time (epoch) spanning 2.588 million years ago–11,700 B.P. (Cohen et al. 2013).

[2] The Holocene Epoch is the interval from 11,700 B.P. to the present day (Cohen et al. 2013). Geoscientists divide the Holocene Epoch into three broad divisions: Early (11,500–7550 B.P.), Middle (7000–4000 B.P.), and Late (4000 B.P.–present) (see Meyer et al. 2009:ii; West et al. 2007:20–21). This PSA follows Meyer et al. (2009).

the twentieth century heralded reduced influence of southeasterly winds and the Little Ice Age (450–50 B.P.) ended with five El Niño events in a 20-year period. (Engstrom 2006:850–851.)

NATIVE PLANTS AND ANIMALS IN THE PROJECT VICINITY

The AFC describes the current suite of plants and animals of the project vicinity, with an emphasis on special-status species and sensitive ecological communities (AECOM 2015a: 4.2-2 – 4.2-13). The ecological community most closely associated with the project area, and that which was available to prehistoric Native Americans, is that associated with dune habitat and scattered alkali meadows between the dunes. The vegetation communities that were present during prehistoric times are listed here with some native species that typically occur in these areas.

- Arroyo Willow Thickets – Some of the species associated with this habitat include arroyo willow (Salix lasiolepis), (Baccharis pilularis, (Baccharis salicifolia), spiny rush (Juncus acutus), poison oak (Toxicodendron diversilobum), turkey vulture (Cathartes aura), northern harrier (Circus cyaneus), Cooper's hawk (Accipter cooperii), American crow (Corvus brachyrhynchos), and common raven (Corvus corax). These thickets occur on stream banks and benches, slope seeps, and stringers along drainages (Sawyer et al. 2009), primarily along the north side of the project site, around McGrath Lake.
- California Bulrush Marsh – Some of the species associated with this habitat include California bulrush (Schoenoplectus californicus), alkali bulrush (Bolboschoenus maritimus), hardstem bulrush (Schoenoplectus acutus), cattails (Typha spp.), northern harrier (Circus cyaneus), sora (Porzana carolina), and marsh wren (Cistothorus palustris). This marsh habitat occurs on the margins of McGrath Lake, sand between open water habitats and scrub habitats.
- California Sagebrush Scrub – Some of the species associated with this habitat include California sagebrush (Artemisia californica), coyote brush (Baccharis pilularis), bush monkey flower (Diplacus aurantiacus), California encelia (Encelia californica), western ragweed (Ambrosia psilostachya), poison oak (Toxicodendron diversilobum), turkey vulture (Cathartes aura), black phoebe (Sayornis nigricans), Say's phoebe (Sayornis saya), American crow (Corvus brachyrhynchos), northern rough-winged swallow (Stelgidopteryx serripennis), European starling (Sturmus vulgaris), song sparrow (Melospiza melodia), house finch (Haemorhous mexicanus), and western brush rabbit (Sylvilagus bachmani). This habitat occurs adjacent to the McGrath Peaker Plant.
- Dune Mats – Some of the species associated with this habitat include sand verbena (Abronia latifolia), silver beachweed (Ambrosia chamissonis), red sand verbena (Abronia maritime), pink sand verbena (Abronia umbellate), yarrow (Achillea millefolium), coyote brush (Baccharis pilularis), yellow bush lupine (upinus arboreus), coastal lotus (Acmispon maritimus var. maritimus), beach bur (Ambrosia chamissonis), big saltbrush (Atriplex lentiformis), beach primrose (Camissoniopsis cheiranthifolia), mock heather (Ericameria ericoides), dune bush lupine (Lupinus chamissonis), common raven (Corvus corax), California ground squirrel (Spermophilus beecheyi), mule deer (Odocoileus hemionus), common side-notched

lizard (Uta stansburiana), turkey vulture (Cathartes aura), western gull (Larus occidentalis). This habitat occurs west and north of the project area.

- Mock Heather Scrub – The species associated with this habitat is mock heather scrub (Ericsmeria ericoides). This habitat occurs to the north, east, and to the south.
- Mule Fat Thickets – Some of the species associated with this habitat include mule fat (Baccharis salicifolia), California sagebrush (Artemisia californica), coyote brush (Baccharis pilularis), mugwort (Artemisia douglasiana), dodder (Cuscuta salina), spiny rush (Juncus acutus), Allen's hummingbird (Selaphorus sasin), black phoebe (Sayornis nigricans), American crow (Corvus brachyrhynchos), northern rough-winged swallow (Stelgidopteryx serripennis), mule deer (Odocoileus hemionus). This habitat occurs adjacent to the northern perimeter of the MGSsite, in association with the McGrath ecosystem (AECOM 2015a: 4.2-2 – 4.2-7).

Other Local Fauna

Several animals frequent the coastal strand: western and California gulls (*Larus occidentalis* and *L. californicus*), sand crabs (*Emerita analoga*), razor clams (*Siliqua lucida*), surf and coquina clams, Pismo clams (*Tivela stultorum*), kelp flies (*Fucellia* and *Coelopa* spp.), wrack flies, rove and dune beetles, tiger beetles (Cicindelidae), pill bugs (Isopoda), and beach hoppers (*Orchestoidea californiana*) (CCC 1987:21; Johnson and Snook 1967:282, 441, 458, 460; Schoenherr 1992:635).

Coastal sand dunes and foredunes provided habitat for numerous insects and animals: San Francisco tree lupine moth (*Grapholita edwardsiana*), Morro blue butterfly (*Icaricia icarioides moroensis*), Pheres blue butterfly (*Aricia icarioides pheres*), deer mouse (*Peromyscus maniculatis*), California vole (*Microtus californicus*), black legless lizard (*Anniella pulchra nigra*), northern harrier (*Circus cyaneus*), gray fox (*Urocyon cinereoargenteus*), and striped skunk (*Mephitis mephitis*) (CCC 1987:19).

Fish, shellfish, and other aquatic animals of marshes and mudflats include California killifish (*Fundulus parvipinnis*), bay goby (*Lepidogobius lepidus*), striped bass (*Morone saxatilis*), topsmelt (*Atherinops affinis*), starry flounder (*Platichthys stellatus*), moon snails (Polinices spp.), horn snail or horn shell (*Cerithidea californica*), fiddler crabs (*Uca crenulata*), ghost shrimp (Callianassidae Family), fat innkeeper (*Urechis caupo*), pea crabs (*Pinnotheres pisum*), scale worms (*Lepidonotus melanogrammus*), gobies (Gobiidae Family) and various other crabs, shrimp, clams, and worms (CCC 1987:24).

Locally available shellfish species include abalone (*Haliotis* spp.), bean clam (*Donax gouldii*), black turban snail (*Chlorostoma funebralis*), California mussel (*Mytilus californianus*), littleneck clam or rock cockle (*Leukoma staminea*), olive snail (*Callianax biplicata*, formerly *Olivella* spp.), Pismo clam (*Tivela stultorum*), thick scallop (*Argopecten ventricosus*), and Venus clams or hardshell cockles (*Chione* spp) (Lightfoot and Parrish 2009:271–272).

Pelagic or open-ocean fish in the project vicinity include anchovies (Engraulididae Family), chub mackerel (*Scomber japonicas*), Pacific bonito (*Sarda chiliensis*), leopard shark (*Triakis semifasciata*), Pacific angel shark (*Squatina californica*), Pacific barracuda (*Sphyraena argentea*), Pacific sardine (*Sardinops sagax*), shovelnose guitarfish (*Rhinobatos productus*), soupfin shark (*Galeorhinus galeus*), and yellowtail

(*Seriola lalandi*). Near-shore fish in the area comprise cabezon (*Scorpaenichthys marmoratus*), California sheephead (*Semicossyphus pulcher*), surfperches (Embiotocidae Family), rockfishes (*Sebastes* spp.), kelp bass (*Paralabrax clathratus*), señorita (*Oxyjulis californica*), blacksmith (*Chromis punctipinnis*), bat ray (*Myliobatis californica*), and soupfin shark (*G. galeus*). (Lightfoot and Parrish 2009:273).

Prior to development of the project vicinity, the area supported various mammals. Among marine mammals there were sea lions (Otariidae Family), sea otter (*Enhydra lutris*), and northern elephant seal (*Mirounga angustirostris*). In addition to the terrestrial mammals listed previously in this section, likely inhabitants of the project vicinity included ground squirrels (*Spermophilus* spp.), hares and rabbits (Leporidae Family), mule deer (*Odocoileus hemionus*), and woodrats (*Neotoma* spp) (Lightfoot and Parrish 2009:275–277).

GEOLOGY

The geology of the project vicinity is described in several sections of the AFC (AECOM 2015a: 4.11.1.1, 4.8.1.5.1, 4.4.1, 4.2.1.1.1), the cultural resources technical study (AECOM 2015c: 3-1 – 3-2), and a geotechnical study conducted in support of the AFC (Ninyo and Moore 2013:4). These discussions are not reproduced in full here, but are summarized for the reader's convenience, followed by a discussion of geological characteristics relevant to this preliminary staff assessment's (PSA's) cultural resources analysis.

The geology of the project site has been defined on the basis of three cone penetration tests (Ninyo & Moore 2013:3), and geologic mapping by the Department of Conservation, California Geological Survey (Gutierrez et al. 2008). The proposed project site is situated on a coastal alluvial plain, with soils consisting of sand and silty sand sediments, with some inter-bedded sandy silt and clay. The deposits are defined as Qe, or Active Coastal Aeolian Deposits, and are of Holocene age (AECOM 2015a: 4.8-5). Because the deposits are of Holocene age, they are of the same time period that humans are known to be present on the California coast, suggesting that the deposits have the potential to retain cultural resources.

During the archaeological survey of the proposed gas turbine the archaeologists for the Applicant found several dense concentrations of non-cultural shell, some of which was also found in combination with torn black textiles. Additional research by the Applicant found that this area was used for processing and stockpiling sediments dredged from the Edison Canal. Dredge sediments were pumped via a pipe into a field of "Geotubes", which is the industry name for high-strength, permeable geotextile bags designed to hold such sediments. The area was graded to an unknown depth prior to placing the Geotubes, and a containment ditch was also excavated around the area's perimeter. When the dredged material had sufficiently dewatered, the Geotubes were cut open and the sediments were removed by heavy equipment, placed into dumptrucks, and hauled off-site. It is unknown how deep the dredged material is scattered across the site, but may be up to a foot thick in some locations (AECOM 2015c:4-6).

Geomorphology

The discussion of the geomorphology of the amended project area considers how and when the underlying soils and sediments developed, and provides a baseline physical context to assess whether surface and buried archaeological materials are likely to occur in the proposed project area.

The project vicinity is located on the coastal plain of the Transverse Ranges geomorphic province of Southern California. The PAA is on the Oxnard Plain of the Ventura Basin, which is largely comprised of unconsolidated, Holocene-aged alluvium overlying Pleistocene marine and alluvial deposits. Most of these alluvial sediments were brought to the area by the Santa Clara River to the north, and the rest came from smaller creeks in the Santa Rosa Hills and Santa Monica Mountains. Additionally, aeolian dunes are present along the coast, as wind-action has formed these sand dunes (AECOM 2015c:3-1).

20,000–11,000 B.P.

During this time, sea level was markedly lower than today, presenting a wider shoreline than is currently extant in southern California. As a result, many bays and estuaries were far less pronounced than today. (Porcasi et al. 1999:2, Figure 1) The coast was narrow and rocky, backed by 100–150-feet-tall sea cliffs. Stream action cut valleys onto the coastal plain, with sediment discharge lost to the ocean. The shoreline was energetic at this time owing to the action of large waves. Sea level rise increased wave energy across the continental shelf and flooded the incised valleys that formed from 20,000 to 14,000 B.P. Kelp forests developed near the break of the continental shelf. Estuaries expanded during the melt water pulses of 13,500 and 11,000 B.P., when stream flows increased considerably. Stream sediments, however, were deposited into the head of estuaries and did not reach the shore, which remained rocky. Kelp forests grew in extent and sea level sat approximately 180 feet below the present level. (Masters and Aiello 2007:40).

10,000–8200 B.P.

This interval witnessed the development of quiet-water estuaries that fostered fish nurseries, shellfish beds, shorebird foraging, and marine mammal visitation. Deposition of sediment onto the shoreline was limited at this time. Hence, the coast remained rocky with cobble beaches and supported shallow reefs and large fish communities. At this juncture the ocean had transgressed to a point about 115 feet below modern sea level. (Masters and Aiello 2007:40).

6000–5000 B.P.

Between 6000 and 5000 B.P., the southern California coast began its transition from a rocky shore coastline to a sandy beach condition, aided by shore platform-cutting waves. Shoaling estuaries became less productive and were replaced by sand and mudflats. (Masters and Aiello 2007:40).

4000 B.P.–Present

During the Late Holocene (the last 4,000 years), large estuaries were replaced by shallow wetlands and lagoons, which were periodically closed by the formation of sand

spits. During the last 2,000 years, “megadroughts” (see Stine 1998:51) lasting up to 200 years probably closed lagoons to direct ocean influence. “Megafloods” with a return period of 200–400 years reopened lagoons to the ocean. Kelp forests were limited to wave-cut platforms off rocky headlands. Shallow rocky reefs were smothered by sand on the inner shelf. Sand beaches accreted within the littoral cells, certainly during summers’ low-wave energy. (Masters and Aiello 2007:40).

PREHISTORIC SETTING

The AFC submitted by the applicant provides an historic context for prehistoric resources primarily based on the work of Wallace (1955) and Warren (1968). This context includes a useful background regarding prehistoric human occupation in Ventura County, and it is used as the basis for this section, supplemented by information from Glassow et al. (2007).

For the purposes of this project, the regional history for the south coastal region presented by Wallace (1955) and expanded on by Warren (1968) is applicable. This chronological sequence identifies four Horizons: Horizon I – Early Man/San Dieguito Tradition (ca. 12,000-8,000 B.P.); Horizon II – Millingstone Period/Encinitas (8,000-5,000 B.P.); Horizon III – Intermediate/Campbell Tradition (5,000- 1,500 B.P.); Horizon IV – Late Prehistoric (ca. 1,500 B.P. - Historic Contact).

Archaeological sites in the region around the proposed project have produced some of the earliest dates of human occupation in California. As noted above, the Northern Channel Islands are in close proximity to the Oxnard coast, and were even closer when sea levels were lower in the past. Materials recovered at Arlington Springs on Santa Rosa Island date to ca. 13,000 B.P., and dates from Daisy Cave on San Miguel Island indicate human occupation ca. 10,000 B.P. On the mainland, the earliest date in the area is ca. 10,000-9,500 B.P. from the Surf site near the mouth of the Santa Ynez River (Glassow et al. (2009:191-192). The evidence from this early period (also called the Paleo-Coastal Tradition) is sparse and it is difficult to make many definitive conclusions regarding the economy and social structure of these early Californians, other than that they collected shellfish and made flaked tone tools of local chert.

Around 8,000 B.P. California experienced an extended warm and dry period, often referred to as the Altithermal. This climactic event drastically altered the environmental resources available to prehistoric inhabitants, thus changing their subsistence efforts to focus on the procurement of plant foods supplemented with small animals. Evidence for the focus on plant foods is seen in the prevalence of metates and manos (millingstones) in archaeological deposits of this time period, and this is the earliest widespread archaeologically known occupation. These tools were used to process hard seeds into flour, and this plant-based diet was supplemented with fishing and hunting as well. The typical archaeological assemblage of sites that date to the Millingstone Period consists of millingstones, large and crudely fashioned cobble choppers and scrapers, hammerstones, fire-affected rocks often in association with millingstones, and a paucity of projectile points, other hunting tools, and faunal remains (Glassow et al. 2009:194-195).

Most of the settlements that date to the Millingstone Horizon are at or near the coast, and especially in the Santa Barbara Channel region these sites tend to be located on

elevated terraces or knolls. Data from marine sediment cores suggests that sea temperature was cooler than at present which made the productivity of the marine environment higher than it is currently. This increased marine productivity likely permitted groups to live near the coast while still maintaining their subsistence efforts focused on plant foods (AECOM 2015c:3-4; Glassow et al. 2007:194).

The Intermediate Period began ca. 5,000 B.P. and is marked by the transition to a hunting focused subsistence regime. Evidence for this transition is noted in the archaeological assemblages that date to this time period which contain more fish, terrestrial and marine mammal remains than earlier periods. Flaked stone tools from this period are more diverse than preceding periods, and include such tools as large, side notched projectile points, large blades, and flaked scrapers and drills (AECOM 2015c: 3-4). The metates and manos of the earlier Millingstone period were still used but refined mortars and pestles also are found, indicating a reliance on a greater variety of vegetal products, such as acorns, islay, and roots. Mortuary practices during this time period suggest a degree of achieved status differentiation, as evidenced by shell beads and ornaments (Glassow et al. 2007:197-203).

Later in the Intermediate Period technological shifts were made to include circular shell fishhooks, notched stone sinkers or net weights, and contracting stem points. Also during this time advances were made in the use of asphaultum for a variety of products. It is suggested that it was during this time period that the basic aspects of Chumash culture began to emerge, based on a comparison to ethnographic Chumash practices (Erlandson and Rick 2002:181). Sites from this time period evidence increased sedentism as shown by the larger size of sites, high density of artifacts and faunal remains, and floral assemblages which indicate year-round habitation (Glassow et al. 2007:202-203).

The Late Prehistoric Period is marked in particular by the introduction of the plank canoe and bow and arrow. These technological changes are reflected in significant social and political changes for the indigenous people living along the Southern California Coast, as during this time period (ca. 700 B.P.) is the one in which all major aspects of Chumash cultural systems were in place. It is also during this time period that scholars posit that the regional population reached its peak based on the presence of several large settlements along the Santa Barbara mainland coast. The plank canoe, or tomol, was an important development because it permitted groups to obtain large deep sea fish such as tuna and swordfish and to move between the Channel Islands and the coast more efficiently, increasing trade. Archaeological assemblages that date to this time period typically contain a wealth of ornamental, ceremonial and artistic items such as marine shell and stone beads, pendants, ornaments, bowls, pestles, pipes, and stone tubes inlaid with shell beads. Projectile points included both large and small varieties, the smaller, corner –notched Cottonwood series being associated with the use of the bow and arrow (AECOM 2015c:3-5; Glassow et al. 2009:205-209).

ETHNOGRAPHIC SETTING

Chumash

The Chumash people and representative tribes are the Native Americans most directly associated with the proposed project area. Traditionally, the Chumash have been split

into six subgroups based on the dialect of the Chumash language spoken and named for the closest Spanish Mission to those groups: those near the Santa Barbara Mission are the Barbareño; those near the Santa Ynez Mission are the Ynezeño; those near La Purisima Concepción are the Purisimeño; those near the San Luis Obispo Mission are the Obispeño; those from the Northern Channel Islands are the Island; and near the proposed project area, the Ventureño named for the San Buenaventura Mission (Grant 1978a:505).

The Chumash were one of the first groups of California Native Americans that the early European explorers encountered. Juan Rodriguez Cabrillo met the Chumash on October 10, 1542 when he landed on the shores of Ventura. While exploring the mainland, coast, and Channel Islands, Cabrillo noted many of the names of settlements that they encountered. The next time the Chumash had Europeans in their midst was about 60 years later when Sebastian Vizcaino explored the Santa Barbara area. The Chumash impressed their European counterparts with their material culture and craftsmanship, and these explorers cataloged these traits in their journals including information about the appearance and activities of the Native Americans (Grant 1978a: 505).

Prior to European contact and the establishment of the Mission system, Chumash territory extended from the San Luis Obispo area down the coast to Malibu and inland as far as the western edge of the San Joaquin Valley. The name “Chumash” is derived from “*Mi’ chumash*” the name that was used by some mainland groups to refer to those Chumash from the Channel Islands.

The Spanish established the first mission in region in 1772 at San Luis Obispo, and four other missions were built over the next 32 years: San Buenaventura (1782); Santa Barbara (1786); La Purisma Concepción (1787); and Santa Ynez (1804). The recruitment and absorption of the Chumash was relatively quick, and by the early 1800s the entirety of the Chumash population was either in the mission system or had fled to the Central Valley or mountains.

Trade, Settlement Patterns, Economy, Resources and Material Culture

The Chumash were part of an extensive trade network which included the Channel Islands, the mainland coast, and extended all the way into the Great Basin and Southwest. Items traded by the Chumash included steatite, wooden vessels, and beads traded to the Salinans, their neighbors to the north. Inland to Yokuts groups, the Chumash traded white pigment, shell beads, Pismo clam, abalone, olivella, limpet and cowrie shells, and dried sea urchin and starfish, for black pigment, antelope and elk skins, obsidian, salt, beads, seeds, and herbs. The Tubatulabal traded piñion nuts for Chumash asphaltum, shell ornaments, steatite, and fish. The Island Chumash traded chipped implements, fish-bone heads, baskets, and basaltic rock digging weights for seeds, acorns, and bows and arrows. The Kitanemuk received wooden and shell inlaid vessels from the Chumash as well (Davis 1961:29; Grant 1978b: 517).

The most important food source for the Chumash was the acorn. Gathered in the fall, and stored for future use, the acorn was the staple of the Chumash diet for most of the year. Other plant foods included pine nuts, wild cherry, tule, berries, mushrooms, cress,

amole, and many different types of seeds. Mollusks were one of the most important maritime subsistence foods, and included the California mussel, the horse clam, the gooseneck barnacle, the jackknife clam, the Pismo clam, and abalone. Marine mammals such as seals, sea otters and porpoises were taken by harpoons from the wood plank canoes or *tomols*. Fish were taken from the sea, using seines and nets or hook and line for shallow water fish, and harpoons for larger ones. Bows and arrows were used to hunt mule deer, coyote, and fox. Wooden throwing sticks were used to kill rabbits and game birds (Grant 1978b: 517).

The Chumash did not make pottery before the Spanish arrived, relying instead on their well-made baskets and steatite vessels for storage and cooking. Steatite was also used to craft beads, medicine tubes, smoking pipes, whale effigies, and charmstones. Asphaltum was an important resource, used to attach shells to vessels as decoration, to caulk their plank canoes, sealing water baskets, and fastening arrow and spear points to shafts. Both chert and obsidian was used for crafting projectile points and other stone tools (Grant 1978b: 515).

Chumash Burial Practices

The Chumash practiced internment of the dead and typically erected a small board and pole at the grave. Cemeteries were usually located inside the villages (Kroeber 1976: 556). Some bodies were also interred outside of cemeteries in the floors of houses, and there are reports that the deceased's house or possessions were sometimes burned (Arnold and Green 2002:764). Trophies related to the deceased were placed on the board and pole, e.g., hooks and lines if the person was a fisherman, bow and arrow if a hunter. Whale rib bones were laid in some burials; there are reports that the rib bones were either laid across the grave or lined the grave. Bodies were tied in a flex position, and lain with the head facing west and face down. Typical grave goods included bowls, pestles, beads, weapons and charmstones. Sometimes the bowls and mortars were deliberately broken before they were placed in the grave. Some infant burials were uncovered that contained small canoes made of stone, bone or wood.

Lieutenant Fages in 1775 gave a detailed account of the Chumash mourning ceremony:

> When any Indian dies, they carry the body to the adoratory, or place near the village dedicated to their idols. There they celebrate the mortuary ceremony, and watch all the following night, some of tehm gathered about a huge fire until daybreak; then come all the rest (men and women) and four of then begin the ceremony in this wise. One Indian smoking tobacco in a large stone pipe, goes first; he is followed by the other three, all passing thrice around the body; but each time he passes the head, his companions lift the skin with which it is covered, that the priest may blow upon it three mouthfuls of smoke. On arriving at the feet, they all four together stop to sing I know not what manner of laudation. Then come the near and remote relatives of the deceased, each one giving the chief celebrant a string of beads, something over a span in length. Then immediately there is

> raised a sorrowful outcry and lamentation by all the mourners. When this sort of solemn response is ended, the four ministers take the body, and all the Indians follow them singing to the cemetery (Fages 1937: 33-34 in Grant 1978b: 512).

Sources of Ethnographic Data

The earliest ethnographic sources of information can be found in the records of the Spanish explorers and later missionary records. Various documents related to Spanish exploration and subsequent colonization are available, and include accounts by Cabrillo (Wagner 1929), Vizcaino (Wagner 1929), Fages (1937), Constansó (1911), Crespi (1927), Font (1930), Palóu (1926), Longinos Martinez (1961), Vancouver (Menzies 1924). Modern ethnographies with valuable information include Horne (1981), Gamble (2008), Grant (1978a, 1978b), and McLendon and Johnson (1999).

Contemporary Tribal Entities with Ethnographic Affiliations

Coastal Band of the Chumash Nation

The Coastal Band of Chumash are based out of Santa Barbara and are not yet federally recognized. The tribe holds cultural education workshops, including language and cultural education classes.

Santa Ynez Band of Mission Indians

The Santa Ynez are the only federally recognized Chumash tribe, with a reservation in Santa Barbara County. They maintain a tribal business council with four elected memebers and a tribal chairperson, and tribal members vote on proposals made by the business council. Elections are held every two years. The tribe also has a casino and hotel, and holds an annual pow-wow.

Barbareno/Ventureno Band of Mission Indians

The Barbareno/Ventureno consists of Chumash families from Santa Barbara and Ventura Counties. The tribe is not yet federally recognized. The tribal council consists of a five-member group based out of Ojai.

HISTORIC SETTING

Spanish Period (1769 to 1822)

Father Junipero Serra, along with Gaspar de Portola, the Governor of Baja California, led the initial Spanish expedition into Alta California. The establishment of the mission system was the beginning of the Spanish period (1769 to 1822) and the forced acculturation of native peoples in this area. Ultimately, however, the entry of Spanish missionaries into the coastal region resulted in large-scale destruction of native populations (Cook and Marino 1988). Beginning in 1795 (Ventura 1996), a number of family ranchos were established.

Mission San Buenaventura

Juan Bautista de Anza entered the area now known as Oxnard in 1776. The Mission San Buenaventura was founded by Junipero Serra in 1782 nearby in what is now known as Ventura. The mission was located just north of an existing Chumash village near the Pacific Ocean and by the Ventura River. The Chumash were incorporated into mission life (AECOM 2015c: 2-1). (See ethnographic history earlier in this Appendix). The settlement of the missions by the Spanish also created an overland transportation route through California, although this route may have been discontinuous and changeable over time.

Mexican Period (1822 to 1848)

The Mexican period followed the Spanish period as Mexico gained its independence from Spain. It was during this time that land began to be granted to private citizens and the missions became secularized. Political responsibility for the region was transferred to the United States with the signing of the Treaty of Guadalupe Hidalgo on February 2, 1848. Land use during this period was characterized by cattle ranching and dry farming (Ventura 1996:9).

Land Grants and Ranchos

In the Ventura County region, a total of nineteen ranchos were granted, two by the previous Spanish government and seventeen by the Mexican government (Ventura 1996:9). Governor Juan Bautista Alvarado awarded the land known as Rancho El Rio de Santa Clara o La Colonia 44,833 acres (covering most of the Oxnard Plain) to eight Mexican soldiers. It is thought that only one of them, Rafael Gonzales, actually lived on the ranch. He had an adobe home located on present-day Gonzales Road (AECOM 2015c; 2-2).

The La Colonia Rancho was bordered by the Ranchos San Miguel, Santa Clara del Norte and Rancho Guadalasca.

American Period (1848 to present)

The Mexican-American War of 1846-1848 ended Mexico's control of Alta California. During this period, both agricultural and oil-producing industries evolved. California became a state in 1850.

European-American Settlement of the Ranchos and Agriculture in the Santa Clara Valley

Prior to the droughts of the 1860's and 1870's, dry farming of grains, livestock, and tree crops flourished. Dry farming refers to crop production during a dry season, utilizing the residual moisture in the soil from the rainy season, usually in a region that receives 20" or more of annual rainfall. Dry farming works to conserve soil moisture during long dry periods primarily through a system of tillage, surface protection, and the use of drought-resistant varieties (CAWSI 2015). The need for reliable water supplies brought about the creation of water companies that brought water from creeks and rivers and developed wells for both agricultural and community use (Ventura 1996:9).

"Ventura County was noted for its comparative lack of substantial irrigation system development relative to other Southern California regions. On the Oxnard Plain, high groundwater tables and fog reduced the need for substantial irrigation of many crops (Rothrock 1876, as referenced in SFEI 2011:40). In addition, the presence of alkali, coupled with a high groundwater table, impermeable clay subsurface soils, and extremely flat topography actually precluded irrigation over large swaths of the Oxnard Plain, since irrigation water only further saturated surface soils (Gregor 1953 as referenced in SFEI 2011:40). Early farmers on the Plain understood this, and it was observed that they do not irrigate more than they can avoid, for the reason…it brings the alkali to the surface (Rothrock 1876, as referenced in SFEI 2011:40).

For this reason, substantial crop irrigation lagged behind the development of large-scale agriculture in the county. The main crops of the 1880s—barley and beans, along with corn—were largely dry-farmed in the foggy, high groundwater table areas near the coast" (Thompson and West [1883]1961, Gregor 1952, Swanson 1994 as referenced in SFEI 2011:40).

By 1949, most of the Oxnard Plain was irrigated. This move toward irrigation had created a number of water companies and conservations districts, and construction of several dams and reservoirs. This use of irrigation water allowed for a shift into production of high-value tree crops such as citrus, walnuts and apricots (SFEI 2011:41-42).

The McGrath Family

The McGrath family's entry into local Ventura County agriculture occurred when Dominick McGrath relocated to the area in 1874 (Bodle 1977:2). Originally from Ireland, McGrath had been raising sheep in Alameda County in the San Francisco Bay Area in the 1850's and 1860's. Prior to his relocation to the Oxnard area, he acquired the rights to purchase what would become 1,337 acres from Thomas A. Scott. That purchase was completed in 1875. The main ranch house was completed in 1879 off of Gonzales Road, one mile from the ocean in Oxnard. The McGrath house, formerly located at 5701 Gonzales Road, was recorded by Bissell and is recorded as Ventura County Primary Record Number 56-152738 in the state's historic resources inventory, CHRIS (Bissell 1991). By the time of Dominick McGrath's death in 1908, over 5000 acres had been acquired. Prior to his death, those acres were incorporated into an estate in 1907, the Dominick McGrath Estate Company. The estate passed to four of Dominick's sons: Hugo, Robert, Frank and Joseph. The daughters were to receive shares of stock which could then be sold to the brothers to keep the original holdings intact (Bodle 1977:18). The extent of the estate holdings were described by Bodle as follows: "at one time, you could walk from Montalvo to Hueneme without ever leaving McGrath land" (Bodle 1977:17). The estate holdings were divided by the four sons in 1948 (McGrath 2015).

Sugar Beets and The Oxnard Brothers

Henry and John Oxnard built a sugar beet refinery in Oxnard from 1897 to 1898. The Oxnards had three other factories at other locations and wanted to locate the refinery close to the beet growing area on the Oxnard Plain. The four factories were

incorporated under the American Sugar Beet Company name in 1899 (Oxnard 2005:9-10). Sugar beets became the principal cash crop and Oxnard was known for fifty years primarily for its sugar beets and the shipping infrastructure it had developed (Oxnard 2005:14).

City of Oxnard

The Oxnard Townsite was recorded in 1898 and named after the Oxnard Brothers Sugar Beet Factory (Ventura 1996:11). Incorporated in 1903, the town had grown to a population of 1000 residents. The Colonia Improvement Company established a water system for fire and domestic use. The Ventura County Power Company installed gas pipelines in 1904. The Oxnard Light and Water Company was established in 1905. By 1912, the City of Oxnard had acquired all the water, gas and electric power companies (Oxnard 2005:13). Post World War II, the city's economic base expanded to include military operations in addition to agriculture. By 1970, the population had grown to 71,225. Oxnard continues to grow into the current century: the population in 2010 was 197,899, a 14% increase since 2000, when the population was 170, 358[3]. It is the largest city in Ventura County.

Oxnard was laid out on a grid in 1898, with a plaza at the center. Housing, hotels and commercial buildings were constructed rather quickly, and in some cases, moved in from elsewhere to accommodate the need for housing. The City acquired a Carnegie Library in 1907. The city also was granted the Plaza from the Colonia Improvement Company and landscape architect William David Cook was hired to design the plaza's transition to a park. In 1910, a pagoda was constructed in the park to conceal the irrigation system and was later renovated to be used as a bandstand (Oxnard 2005:13; 28). The pagoda was designed by Alfred J. Priest and built by Thomas H. Carroll. The pagoda was restored in the 1990's. It was designated a County Landmark (Number 17) in 1971.

The Spanish Eclectic style Oxnard Post Office was built in 1939 as part of the Works Progress Administration (WPA). Like many others built during the WPA years, the interior features a mural depicting agriculture, the sugar beet factory and the town. The artist was Daniel Marcus Mendelowitz (Oxnard 2005:14).

The central city changed dramatically over the years as early residential housing stock was replaced with commercial uses. Approximately 500 buildings were demolished in the 1950's, 30 of them in the downtown commercial district. A redevelopment agency was formed in the 1960's. The city lost virtually all of the buildings bounding Plaza Park. A pedestrian mall, typical of the 1970's redevelopment movement throughout the country, was created on A Street between Third and Sixth Streets in 1971. Buildings were removed to provide parking lots. These are through-streets once again.

[3] US Census Figures, 2000, 2010.

Transportation

Ships and Stagecoaches

Prior to the arrival of the railroads, long distance transportation to and from the region was by ship and stagecoach. Three connecting stagelines transported passengers between Los Angeles and San Francisco (Wlodarski 2010). In 1872-1873, wharves were built at both Point Hueneme and Ventura. A coast route for stagecoaches was in use by 1861 (Ventura 1996:10).

Railroads

The Transcontinental railroad was completed in 1869, connecting San Francisco to the Eastern United States. Southern California was connected to the national railroad network in 1876 by The Southern Pacific Railroad (SP) and this became the largest driver of growth in this time period. The Atchison, Topeka and Santa Fe (ATSF) completed its line to Los Angeles in 1885 and the two railroads competed with each other to bring passengers to Southern California. In 1887, the SP completed its first line into the Ventura County area (Ventura 1996:10-11). These railroad connections enabled the success of the sugar beet industry and the Oxnard Townsite (Oxnard:11)

Southern Pacific Railroad-Montalvo Branch

Although the SP was completed through the Santa Clara Valley in 1887, it did not reach into Oxnard until 1897-1898 when the Montalvo Branch line was constructed. This line crossed the Santa Clara River on a wooden trestle and provided the way for construction equipment to reach the site of the sugar beet factory. The branch line eventually was expanded to connect to Camarillo, Somis, Moorpark, and Santa Susanna by 1901. The line later connected to Los Angeles by way of a tunnel cut into the Santa Susanna Mountains (AECOM 2015c: 2-8) at the Santa Susanna Pass. This line became the primary route of the SP in 1904. This Montalvo Branch line is in use today by MetroLink as a commuter passenger line.

By 1905, another rail line was built to connect Oxnard to Point Hueneme. The Hueneme line was acquired in 1911 by the American Sugar Beet Company and renamed the Ventura County Railway. Various sidings and extensions were added over time. (AECOM 2015c: 2-8) (Oxnard 2005:11). The American Sugar Beet Company closed its Oxnard refinery in 1958, and the massive brick structure was demolished. This was partially the result of diversification in crops in the region that had occurred over the years. It was also the result of a diversified economy which now included military, food processing and Cold War industries (Oxnard 2005:16).

Oxnard is currently served by Amtrak's Coast Starlight and Pacific Surfliner passenger trains, as well as MetroLink commuter rail from Los Angleles.

Roads and Bridges

El Camino Real/Roosevelt Highway/US Highway 101/State Route 1/ Pacific Coast Highway

The first mission was established in 1769 at San Diego, when they established a fortress and a Franciscan mission. A footpath, called The El Camino Real, or Kings

Highway, was created to connect the outposts. Ultimately, El Camino Real linked 21 missions, pueblos and four presidios from San Diego to Sonoma (CAHighway 2014). An article by Nathan Masters (Masters 2013) disputes the notion that the path was a well-traveled road and suggests the path changed over time based upon weather, modes of travel and even tides.

Led by groups like the Auto Club, the California Federation of Woman's Clubs, and the Native Daughters of the Golden West, efforts to develop El Camino Real into a tourist destination highway gained traction in the first decade of the twentieth century. The El Camino Real Association succeeded in placing more than 400 roadside markers comprised of bells hung on poles along an approximation of the original footpath between 1906 and 1914 (Masters 2013).

The 1910 State Highways Act authorized construction of a paved road along the route of El Camino Real. However, construction lagged and for many years much of the historic road was only a primitive trail. Between cities there were streams to ford and steep grades to scale. Sometimes, teams of horses would rescue automobiles trapped in mud. Finally, by the mid-1920s, the highway construction was complete, and in 1925 the route was signed as US 101 (CAHighway 2014).

Pacific Coast Highway opened in the late 1920s as part of the Roosevelt Highway, a 1,400-mile road that traversed the westernmost United States. Pacific Coast Highway is a road connecting coastal towns from Ventura to San Juan Capistrano, however there are other sections which have adopted the moniker, the most obvious being the segment along the Big Sur coastlines. Passing directly through coastal towns, the Roosevelt Highway—renamed Pacific Coast Highway in much of Southern California in 1941 -- adequately met the region's transportation needs in 1929 (Masters 2012).

In 1929, the Roosevelt Highway, what we now know as State Highway 1, opened between Santa Monica and Oxnard (Ventura 1996:13). It ran through the heart of Oxnard on the main north-south arterial, Saviers Road. At that time, it was renamed Oxnard Boulevard. The highway was designated as State Route 1 in 1964 (Oxnard 2005:14).

McGrath/Harbor Boulevard

As shown in a 1951 USGS topo map McGrath Boulevard (Road) originally extended from West Fifth Street south to what would be Oxnard Boulevard today. It shown on earlier maps but is unnamed. As of 1951, Harbor Boulevard north of west Fifth Street is non-existent. What is now known as Harbor Boulevard first appears in 1959 on an aerial image, where it can be seen crossing the newly constructed Edison Canal adjacent to MGS. It would appear to be contemporaneous with the construction of the MGS power plant.

STEAM GENERATION ELECTRIC PLANTS IN CALIFORNIA

In 1879, the Brush Plant in San Francisco was the first central generating station on the west coast to produce and distribute electricity on demand to customers. Prior to Thomas Edison's invention of the incandescent electric light bulb in 1879, only the electric arc system was available, which turned out to be unsafe for indoor use (Myers 1983:11). Edison is also known for improving the generation and distribution systems

for electricity, which truly opened up the consumer market. This “central station” concept was to become the cornerstone of the electric utility industry (Myers 1983:11).

Hydroelectric power was the dominant form of electric generation in California in 1920. By 1940, it grew to 89 percent of the market in California. However, by 1960, steam generating plants became the primary source of electricity in California as hydroelectric generation had fallen to steam plants as they less-costly and closer to load centers. (JRP 2014:5-6).

Power generating plants constructed before World War II were typically housed in an architectural shell with a recognizable style of design. In the early part of the twentieth century, this was partly an outgrowth of the City Beautiful Movement. San Diego Consolidated Gas & Electric Company’s Station B (1911) and Sacramento’s PG&E Station A are examples of this early beaux arts-based Classical Revival presentation of an edifice housing the turbines, generators and various facilities of a steam generating electric plant. The original Pacific Light and Power Company steam plant at Redondo Beach, constructed in 1906, was also emblematic of the Classical Revival style. All of these featured arched fenestration, distinct cornice details, rhythmic patterns of windows, columns or piers and spacious interior volumes housing the equipment.

Later examples adopted the architectural style of their times. The City of Vernon’s Station A, built in 1932, is an excellent example of the Art Deco style of architecture popular at the time, especially in Southern California. A later addition to San Diego’s Classical Revival style Station B (1928-1939) was constructed in the Spanish Revival and Art Deco styles.

Post World War II, power plant design in Southern California transitioned to largely outdoor turbines and generating equipment, with few plants being constructed within a shell. Encina Power Station in Carlsbad is an exception to that, as are portions of Redondo Beach Generating Station Plant 1, built in the Art Moderne style.

Southern California Edison

The Edison Electric Company reincorporated as the Southern California Edison Company in 1909. In 1917, SCE purchased the Pacific Light & Power Corporation from Henry Huntington, which was operating the Big Creek Hydroelectric plant in the Sierra Nevada, and the Redondo Beach Steam Station, originally built at the current RBGS site in 1906-1907. Big Creek was the primary source of electricity for Southern California until the post-war years. On the heels of the end of WWII, SCE constructed and updated numerous power plants to meet the expansion of industry and residential development in the area it served.

Post-War (WWII) Electric Power Generation in California

After World War II, steam-generated electricity underwent a significant expansion. Beginning in 1948, with the construction of Redondo Beach Steam Station, and over the ensuing several decades, ten new multiple-unit oil and gas-fired power plants came on line at coastal and inland sites in Southern California. Seven of these were Edison projects and three were Calelectric (California Electric Power Company) projects. (Myers 1983:208–209.) Calelectric’s system was merged into Edison’s on January 1, 1964 (Myers 1983:205).

The pent-up demand for electricity and electrical appliances after World War II sent utility companies scurrying for capacity. Usage jumped 14 percent between 1946 and 1947, but power firms could not get enough equipment to meet demand as labor troubles at manufacturers and reconversion to a peace-time economy stalled deliveries. But as the immediate post-war constraints alleviated themselves, the growth rate slowed to about 8 percent per year nationally from between 1947 and 1973. At this rate, utilities doubled the amount of electricity sold every nine to ten years. (Hirsh 2002.) As noted in the previous subsection ("Southern California Edison Company"), SCE expanded and built many plants in the post-war years to accommodate the demand for electricity. The following plants were built in rapid-fire succession in Southern California: Etiwanda (1951), Redondo Beach Plant No. 2 (1952), El Segundo (1955), and Alamitos (1955). New units were added to all of these plants in the ensuing years into the mid-sixties. (JRP 2013:9.)

These new units constructed in the fifties and sixties were very similar to each other in design (JRP 2013:9). They evidenced that a transition had been made from indoor steam generating plants, with the components housed in architectural shells, to largely outdoor facilities generally lacking architectural merit or pretense. This is particularly evident at El Segundo Energy Center (ESEC), Etiwanda, Alamitos, and Huntington Beach. This is less evident at Redondo Beach, where the original 1948 Plant 1, housed in an architectural shell in a defined style (Art Moderne) based on pre-World War II standards, transitioned to the later Plants 2 and 3 with less architectural embellishment and more open construction.

Mandalay Generating Station

Constructed by Bechtel Corporation from 1956 to 1959, Mandalay Generating Station was built by SCE as part of its 10-year plan to double its generating capacity to meet Post-WW2 demands. The MGS was located on the old Patterson Ranch subdivision, a ranch once part of the Dominick McGrath Estate Company holdings (See Cultural Resources Appendix 2 for more detailed information on the McGrath Family). The Edison Canal was constructed to provide ocean water as cooling water for Units 1 and 2. Oil was delivered via tankers and connected to an offshore pipeline for distribution to storage tanks. Unit 1 came online in May, 1959.

MGS represents the typical designs of SCE's power plants in the Post-WW2 years. It is comprised of two primary operating units using natural gas. These are two outdoor steam turbine units sharing a single exhaust stack. A third power generation unit (Unit 3) was added in 1970 employing a jet-engine (gas combustion turbine unit).Units 1 and 2 are interconnected to the adjacent SCE 220-kV switchyard, which serves the Moorpark area. Unit 3 is connected to the nearby SCE 66-kV switchyard, and provides power to the local area (AECOM 2015a:2-2).

A desalination plant was part of the original design of MGS due to the poor quality of local water sources. It went online in December, 1959 and produced high-quality distilled water for use at the plant. The desalination unit, a pilot research project, was later removed and moved to Catalina Island to help with a growing water shortage

(Leitner 2012). SCE sold the MGS in 1998 to what is now known as NRG (AECOM 2015b: 2-5).

Edison Canal/Channel Islands Marina/Channel Islands Harbor Residential (1968)

Channel Islands Harbor celebrated its 50th anniversary in 2015. The following historical narrative is quoted directly from their website:

"50 years have passed since the official opening of Channel Islands Harbor in 1965. What started as a sand collection point to solve erosion problems to the south became a harbor hosting thousands of boaters, residents, and visitors. The beginning of the story is outlined here.

In 1939 there was great celebration in western Ventura County with the opening of the Port of Hueneme. The Port provided a new opportunity for trade and jobs. What was not known at the time was that the northern jetty at the Port sent the sand that flowed naturally along the coast into a submarine canyon just off the Port. As a result, sand no longer replenished the beaches south of Port Hueneme, erosion occurred quickly. The City of Port Hueneme and the adjacent naval base experienced flooding, and even loss of structures. By this time the federal government had taken over the Port as part of the World War II Pacific front. In order to address the erosion issue, Congress requested a study from the U.S. Army Corps of Engineers with the goal of identifying a solution.

The report from the Chief of Engineers recommended that a sand trap be located at what is now the entrance to Channel Islands Harbor. The development of the breakwater and jetty structure required to build the sand trap created a perfect opportunity for a harbor along the coast. A deal was struck between the County and two longtime landowners, the McGrath and Bard families, for a combination donation and purchase of land where the Harbor now sits. The federal government built the entrance structure to create the sand trap. The County funded the dredging of Channel Islands Harbor and the revetment, or sea walls, to keep the water areas open.

Construction for the new harbor didn't begin until 1959, and was completed in about 1963. In the meantime, the County began construction of the initial Harbor area. From that point forward, every two years, the Army Corps of Engineers moved sand from the sand trap at the southern end of Hollywood Beach to Hueneme Beach. Beginning there, the sand began its natural progression south, enriching the Navy base, Ormond Beach, and Mugu Naval Air Station" (Channel Islands Harbor 2015).

The canal was constructed concurrently with the Mandalay Generating Station to provide the station with cooling water. The canal originally extended as far south as Port Hueneme. The course of the canal was altered (to its current alignment) to accommodate the construction of the Channel Islands Harbor (AECOM 2015, DPR523 Edison Canal, page 4 of 11).The AFC also describes the Edison Canal in the Biological Resources section (AECOM 2015a:.2-8 to 9). It characterizes it as a Water of the US and would be considered a streambed for CDFW regulations. The AFC goes on to describe the water source for the Edison Canal as the Pacific Ocean and states that no natural freshwater inputs enter the canal. They further state that the canal conveys stormwater and nuisance runoff from adjacent developments.

Staff observed portions of the canal on a site visit on June 26, 2015. The Edison Canal is connected to the Channel Islands Harbor at the northern reach of the harbor and extends north to the MGS. The canal is largely riparian in nature, with vegetation on both sides. It is not known exactly what form the sides and bottom have taken over the years. It was originally constructed with earthen banks with a trapezoidal cross-section. Portions of the canal located west of the Harbor Drive overcrossing and closer to the intake point for MGS reveal a canal with less vegetation and a more manicured treatment of the canal's side structures. The Edison Canal ends where the cooling water used at MGS is dispensed via a concrete structure and rip-rap lined channel located west of the power plant and discharged into the Pacific Ocean.

McGrath State Beach

McGrath State Beach is located north of the MGS and Puente site between harbor Boulevard and the Pacific Ocean. McGrath State Beach was founded in 1962 and accomplished build-out in 1964. It consists of a campground with 174 campsites, three restroom/shower facilities and a small amphitheater. The campsites are laid out in a series of circles, ranging from eight to ten sites per circle. The road into the campground enters from Harbor Boulevard, curving to the north and approaches an entry kiosk. After passing the entry kiosk, the road leads to the campground, a utility area or a sanitary dump station for travel trailers and recreational vehicles. Dense vegetation screens the campground from Harbor Boulevard. The vegetation planted in the campground circles also provides some screening. There is no day use access or group camping facilities at the State Beach.

The State of California acquired 295 acres from Rita S. McGrath in 1961. This formed the basis for McGrath State Park, which was re- classified as a State Beach in 1962. The acquisition included easements for Hugo McGrath and Associates to breach the sandbar between the ocean and the embayment for the purposes of protecting adjacent agricultural lands. A second easement allows for Hugo McGrath and Associates to manage the water level in McGrath Lake. This cooperative agreement exists today. (MSB GP 1979; Cox 2015). A complete description and historic evaluation of McGrath State Beach and its significance in mid-century state beach acquisitions and designs in California is in **Cultural Resources Appendix CR-2**.

Mandalay State Park

Mandalay State Park was acquired by the state of California in 1985 (AECOM 2015c:.2-10). The 94 acre park is a devoid of much human manipulation and is largely preserved in its natural state, with the exception of several operating oil wells. It is a preserve for dunes, wildlife, plants and wetlands. It has been managed at various times by both the County of Ventura and the State of California's Department of Parks and Recreation. It is currently managed by the Ventura office of California Parks and Recreation. Access to the public beach is from adjacent side streets, as there is no direct access to the preserved areas. Staff observed remnants of the old "Beach Road" seen on historical maps and aerials while visiting the site on June 26, 2015.

BACKGROUND RESEARCH

The following tables, A-1 through A-7, represent the information and sources staff consulted in the course of conducting its independent analysis.

Cultural Resources Table A1
Literature Review Results within 1 Mile of Puente

SCCIC Report Number	Title	Author	Affiliation	Date	Proximity to Puente PAA	Resources Identified
VN-00009	Proposed Widening of Harbor Boulevard from West Fifth Street to Channel Island Boulevard	Browne, Robert O.	Ventura County Archaeological Society	1973	Outside	None
VN-00236	Final Report: Onshore Cultural Resources Assessment, Union Oil Company Platform Gina and Platform Gilda Project, Ventura County, California	Horne, Stephen	Dames & Moore	1980	Within	12
VN-00385	Archaeological Monitoring Report: Union Oil Company Platform Gina and Platform Gilda Project, Ventura County, California	Wlodarski, Robert J.	Historical Environmental Archaeological Research Team	1981	Within	None
VN-00398	Archaeological Monitoring Report for the Proposed Location of an 8 Montalvo Pipeline, Along Harbor Boulevard, Ventura County, California	Wlodarski, Robert J.	Historical Environmental Archaeological Research Team	1981	Within	None
VN-00414	An Archival and Background Cultural Resource Research Study for the Proposed Mandalay Beach Park, Ventura County, California	Wlodarski, Robert J.	Pence Archaeological Consulting	1982	Outside	1
VN-00621	An	Lopez,	Robert Lopez	1986	Within	None

	Archaeological Reconnaissance of Portions of the Area Proposed for Mandalay State Beach Recreation Park, Oxnard, Ventura County	Robert	Archaeological Consulting			
VN-00976	Cultural Resources Survey and Impact Assessment for the Proposed Realignment of the Doris Drain in the City of Oxnard, Ventura County, California	Singer, Clay A., and John E. Atwood	C.A. Singer & Associates, Inc.	1990	Outside	None
VN-00989	Cultural Resources Reconnaissance of Four Possible Sites for California State University, Ventura Campus in Oxnard and Ventura, Ventura County, California	Bissell, Ronald M.	RMW Paleo Associates, Inc.	1991	Outside	
VN-01475	Cultural Resource Survey for McGrath State Beach	Hines, Philip and Jan Timbrook	California Department of Parks and Recreation	1986	Outside	None
VN-01509	Ventura Marina Dredging Project	Sturm, Bradley L.	Army Corps of Engineers, Los Angeles District	1985	Within	None
VN-01660	Phase I Archaeological Survey and Cultural Resources Assessment for the North Shore at Mandalay Bay Study Area, Ventura County, California	Simon, Joseph M.	W & S Consultants	1997	Outside	1

VN-01733 (duplicate report of VN-01509)	Ventura Marina Dredging Project	Sturm, Bradley L.	Army Corps of Engineers, Los Angeles District	1985	Within	None
VN-02011	Phase I Archaeological Survey for the Coastal Zone/Soil Transfer Program Study Area, Coastal Berry Ranch, Ventura County, California	Unknown	W & S Consultants	2000	Outside	None
VN-02014	Phase II Test Excavation and Determination of Significance of a Portion of CA-VEN-667, Oxnard, Ventura County, California	Whitely, David S. and Joseph Simms	W & S Consultants	1998	Outside	1
VN-02474	Request for SHPO Review of FCC Undertaking; Project Identifier: 5th & Harbor/CA-7306c; Project Address: On an Existing Transmission Tower Adjacent to Harbor Boulevard North of 5th Street, Oxnard, Ventura County, California	Thal, Sean	EarthTouch, Inc.	2005	Outside	None
VN-02809	A Phase I Archaeological Study Lots 1-12, of Map 5063 Located Northeast of the Intersection of Reef Way and Harbor Boulevard, City of Oxnard, County of Ventura, California	Wlodarski, Robert J.	Historical Environmental Archaeological Research Team	2010	Outside	None

VN-02901	Cultural Resources Records Search, Site Visit Results, and Direct APE Historic Architecture Assessment for Clearwater Candidate CA-VT-0119A (Mandalay-Santa Clara North Harbor Boulevard	Bonner, Wayne, Sarah Williams and Kathleen Crawford	Michael Brandman Associates	2010	Outside	None
VN-02974	Archaeological Resource Study: Morro Bay to Mexican Border	Pierson, Larry J., Gerald Shiner, and Richard A. Siater	PS Associates	1987	Outside	None
VN-02978	Groundwater Recovery Enhancement and Treatment Program: Cultural Resources Inventory Report	Sharpe, Jim and Lori Durio	CH2MHill	2004	Outside	25
VN-03138	McGrath State Beach – Sewer Force Main and Sewer Lift Station Replacement and Wet Well Conversion	Greenway, Brendon	California Department of Parks and Recreation	2012	Outside	

Cultural Resources Table A2
Literature Review Results: Previously Recorded Cultural Resources

Resource Identifier	Site Components	Date Recorded/Updated	NRHP/CRHR Eligibility	Location relative to Puente
P-56-000667/CA-VEN-000667	Shell lenses and artifacts eroding from sand dunes; Unconfirmed reports of burial	1979/1997 update	Not evaluated	Approximately 0.3 mile southeast
P-56-001234/CA-VEN-001234	Unsubstantiated Chumash ethnographic *Juncus* spp. collection area	1979	Not evaluated	Approximately 0.2 mile southeast
P-56-001807/CA-VEN-001807	2 lithic flakes, 1 piece of groundstone, 1ceramic sherd with red slip, 2 pieces of glass insulator fragments	2010	Not evaluated	Less than 0.1 mile east
P-56-153002	Transmission tower built in 1958	2010	Recommended not eligible	Less than 0.1 mile east
P-56-152738	Historic McGrath ranch structure	1991	Recommended as not significant (Bissell 1991: 10)	Approximately 0.75 mile northeast

Cultural Resources Table A3
Historic and Aerial Maps Consulted

Map Name	Scale	Survey Date	Reference
Camarillo	1:62,500	1904	AECOM 2015c: Table 1
Hueneme	1:62,500	1904	AECOM 2015c: Table 1
Southern California Sheet 3	1:250,000	1910	AECOM 2015c: Table 1
Hueneme	1:50,000	1947	AECOM 2015c: Table 1
Oxnard	1:24,000	1949	AECOM 2015c: Table 1
Oxnard	1:24,000	1951	AECOM 2015c: Table 1
Oxnard	1:24,000	1956	AECOM 2015c: Table 1
Oxnard	1:24,000	1967	AECOM 2015c: Table 1
Aerial Overview		1947	AECOM 2015c: Table 2
Aerial Overview		1953	AECOM 2015c: Table 2
Aerial Overview		1959	AECOM 2015c: Table 2
Aerial Overview		1967	AECOM 2015c: Table 2
Aerial Overview		1977	AECOM 2015c: Table 2
Aerial Overview		1984	AECOM 2015c: Table 2
Aerial Overview		1994	AECOM 2015c: Table 2
Aerial Overview		2005	AECOM 2015c: Table 2

Map Name	Scale	Survey Date	Reference
Aerial Overview		2009	AECOM 2015c: Table 2
Aerial Overview		2010	AECOM 2015c: Table 2
Aerial Overview		2012	AECOM 2015c: Table 2

Cultural Resources Table A4
Built Environment
Properties of Historic Age in the Half-Mile PAA (Excluding MGS)

Description	Year Built	Surveyed	Evaluated/Eligible	Citation
Mandalay to Santa Clara Transmission Line (P-56-153002)	ca. 1958	Partially	Partially/No	AECOM 2015c
SCE Switchyard	ca. 1959	Yes	Yes/No	AECOM 2015c
SCE Substation	1958	Yes	Yes/No	AECOM 2015c
Jeep Trail Tank Farm	1954-1959	Yes	Yes/No	AECOM 2015c
Edison Canal	1957-1959	Partially	Partially/No	AECOM 2015c
McGrath State Beach/Campground	1962	Yes	Yes/No	Mourkas 2015

Cultural Resources Table A5
Mandalay Generating Station
Inventory of Built Environment Resources

Structures	Year Built	Surveyed	Evaluated	Citation
Unit 1-Steam	1959	Yes	Yes	AECOM 2015c
Unit 2-Steam	1959	Yes	Yes	AECOM 2015c
Unit 3-Gas Turbine	1970	Yes	Yes	AECOM 2015c
Maintenance Building	1959	Yes	Yes	AECOM 2015c
Administration Building	1959	Yes	Yes	AECOM 2015c
Outfall	1959	Yes	Yes	AECOM 2016c

Cultural Resources Table A6
Built Environment
Identified Historic Resources – City of Oxnard and Ventura County in the Vicinity of the Project

Name	Location	Description	Year	Eligibility	Survey or Listing Year
Henry T. Oxnard National Historic District	F Street and G Street, Oxnard	Craftsman Bungalows and Period Revival Residences	1991 to 1920's	NRHP	1999
Carnegie Library	5th & C Street, Oxnard	Greek Revival	1906-1923	NRHP/Ventura County Landmark #13	1971
Olivas Adobe	4200 Olivos Park Drive, Ventura	Monterey Style Adobe	1847	CRHR #115/NRHP	1979
First Church of Christ Scientist	Heritage Square, Oxnard	Mission Revival	1906-1908	Ventura County Landmark #70	1982
Justin Petit Ranch House	Heritage Square, Oxnard	Queen Anne	1896	Ventura County Landmark #100	1986
Perkins/Claberg House	Heritage Square, Oxnard	Queen Anne/Stick	1187	Ventura County Landmark #145	1992
Plaza Park Pagoda	Oxnard	Japanese Influence	1910	Ventura County Landmark #17	1971
Mission San Buenaventura; Aqueduct; Reservoir	Ventura	Spanish Colonial or Mission	1782-1809	NRHP/CRHR 114;310	1975

Cultural Resources Table A7
Summary of Cumulative Projects—Archaeological Resources

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
Teal Club Specific Plan	Large undeveloped area on the southeast corner of Doris Ave and N Patterson Rd	990 residential units of varying density, single-family, townhomes, condominium, and apartment units; 21 ac. community park; 8 ac. school site; 60,000 s.f. mixed use and retail; 132,000 s.f. business research park; 1 ac. fire station site.	As-yet-unidentified/ LTSWM	OPD 2015a
Channel Islands Business Center	1425 Mariner Drive Oxnard, CA 93033	Construct 90,414 square foot speculative industrial building.	As-yet-unidentified/ LTSWM	OPD 2011
Coastal Apartment Homes and Coastal Senior/Assisted Living	North corner of Butler Rd and E Pleasant Valley Rd	Construction of approximately 101 apartments and 70 unit senior living units	14 historic trees/LTSWM	OPD 2015b
Santa Clara River Levee Improvements Downstream of Union Pacific Railroad (SCR-3) Project	N Ventura Rd, North of W Vineyard Ave	The project would implement structural improvements to the existing SCR-3 levee to allow for FEMA certification. Between Bailard Landfill and N. Ventura Rd. (reaches 1-3) two options and considered. Option 1A (Full Levee System) adds fill material and riprap to raise the existing levee (8,875 feet) with one tie-in to Bailard Landfill. Option 1B (Minimum Levee System) adds fill material along a portion of the existing levee (3,575 feet), with tie-ins to Bailard, Coastal, and Santa Clara Landfills. The existing River Ridge Golf Course swale would be filled in. Between N. Ventura Rd. and the UPRR bridge (Reach 4), a 950-foot long floodwall would be constructed on the river side of the road with a visible height of 6 feet; a	As-yet unidentified/LT SWM	VCWPD 2015

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		flood gate would be installed across N. Ventura Rd. and then a 4- to 6-foot floodwall would be constructed on the south side of N. Ventura Rd. for 860 feet.		
North Pleasant Valley (NPV) Treatment Facility	Las Posas Road/Lewis Road, Camarillo	Recirculation Construction and operation of a groundwater treatment facility, including the drilling and production of two new wells, installation of pipelines necessary for distribution of raw well water, product water and brine. The proposed facility would provide treated water to the City's existing service area, with an average design capacity of 7,500 acre feet year of production water. Treatment would include filtration, reverse osmosis and disinfection. Brine generated by treatment would be discharged to the Calleguas Regional Salinity Management Pipeline, located along Lewis Road.	As-yet unidentified/LTSWM	Padre Associates 2014
Moorpark Newbury 66 kV Subtransmission Line Project	E Los Angeles Ave & W Los Angeles Ave & Gabbert Rd Moorpark, CA 93021	Southern California Edison (SCE) proposes to construct a new 66 kV subtransmission line an related facilities within a portion of SCE's existing Moorpark-Ormond Beach 220 kV Transmission Line right-of-way (ROW) and a portion of SCE's Moorpark-Newbury-Pharmacy 66 kV	CA-VEN-1797/LTSWM	ESA 2015

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		Subtransmission Line ROW. The new subtransmission line would be constructed between SCE's Moorpark Substation and Newbury Substation and includes construction of 1,200 ft. of underground line, 5 miles of new 66 kV line, 2 miles of new 66 kV line within the Moorpark-Newbury-Pharmacy 66 kV subtransmission line, and 1 mile of the new 66 kV subtransmission line into Newbury Substation.		
RiverPark Senior	SE Corner of Ventura Rd. & Clyde River Dr	Develop a 166,000 square-foot, 136-unit senior living facility	As-yet unidentified/LT SWM	ISI 2011
Olivas Park Drive Extension Project	Between Golf Course Drive and Johnson Drive, Ventura	Extension of Olivas Park Drive as a four-lane Secondary Arterial between Golf Course Drive and Auto Center Drive; (2) a levee/floodwall that is approximately 5,400 linear feet in length along the north side of the Santa Clara River that terminates 350 feet south of the Southern Pacific Railroad; (3) General Plan amendments for land use changes for parcels within the 110.83139-acre project boundary, (4) a Specific Plan amendment to revise the boundaries of the Auto Center Specific Plan; and (5) zone changes for amendment to revise the boundaries of the Auto Center Specific Plan; and (5) zone changes for parcels within the project boundaries. The proposed project also includes a pre-zone and annexation of one County parcel. The proposed zoning and land use amendments could accommodate a maximum	As-yet unidentified/LT SWM	Rincon 2014

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		of 1,258,000 square feet of commercial development and 75,000 square feet of industrial development. The proposed roadway extension will transition to join the existing improvements at the Johnson Drive/U.S. 101 southbound ramps interchange. No improvements other than the transition are proposed as part of this project at the Johnson Drive/U.S. 101 interchange. Additionally, the Montalvo Community Services District (MCSD) would abandon and remove the existing wastewater treatment plant components of the MCSD, and the wastewater treated at this facility would be diverted to the City's wastewater facility.		

REFERENCES

AECOM 2015a—AECOM. *Application for Certification for Puente Power Project (15-AFC-01).Volume 1. .* TN # 204219-1-14 Prepared for: NRG Energy Center Oxnard LLC. April 2015.

AECOM 2015b—AECOM. *Application for Certification for Puente Power Project (15-AFC-01).Volume 2. TN # 204220-5 Prepared* for: NRG Energy Center Oxnard LLC. April 2015.

AECOM 2015c—AECOM. *Confidential Archaeological Resources Technical Report for the Puente Power Project.* (15-AFC-01-Appendix E). TN # 204223. Prepared for: NRG Energy Center Oxnard LLC. April 2015.

AECOM 2016—AECOM. Puente Power Project (15-AFC-01). Refinement to Transmission Interconnection. TN# 213000. August 26, 2016.

AECOM 2016a—AECOM. Puente Power Project. (15-AFC-01). Applicant's Comments on the Preliminary Staff Assessment. TN#213683. September 15, 2016.

AECOM 2016b—AECOM. Puente Power Project (15-AFC-01). Project Enhancement Outfall Removal and Beach Restoration. TN# 213802. September 26, 2016.

AECOM 2016c—AECOM. Puente Power Project. Applicant's Responses to CEC Data Requests, Set 4 (77-107). TN#214336. 11/1/2016.

Arnold and Green 2002—Jeanne E. Arnold and Terisa M. Green. *Mortuary Ambiguity: The Ventureno Chumash Case.* American Antiquity, vol. 67(4), pp. 760-771.

Bissell 1991—Ronald M. Bissell. *Cultural Resources Recommendations of Four Possible Sites for the California State University, Ventura Campus in Oxnard and Ventura County, California* . February 18, 1990. DPR Form 523 Recorded on March 2, 1991. CHRIS Primary Record Number 56-152738..

Bodle 1977—Yvonne G. Bodle. The McGrath Story, 100 years of Ranching on the Oxnard Plain. The Ventura County Historical Society Quarterly. Vol. XXII, No. 4. Summer 1977.

CAHIghway 2015—California Highways, Trails and Roads: El Camino Real http://www.cahighways.org/elcamino.html . Accessed September 21, 2015.

CAWSI 2015—California Water Stewardship Initiative: *Dry Farming*. http://agwaterstewards.org/index.php/practices/dry_farming . Accessed August, 2015.

CCC 1987 - California Coastal Commission. *California Coastal Resource Guide*. Berkeley: University of California.

Channel Islands Harbor 2015—Channel Islands Harbor. *50th Anniversary*. www.channelislandsharbor.org/thingstodo/events/2015/50th Anniversary15.htm. Accessed May 27, 2015.

Cohen et al. 2013— K.M. Cohen, S.C. Finney, P.L. Gibbard, J.X. Fan. The ICS International Chronostratigraphic Chart. Episodes 36.3 (2013): 199-204.

Cook and Marino 1988 - Sherburne F. Cook and Cesare Marino. *Roman Catholic Missions in California and the Southwest*. In History of Indian-White Relations, edited by Wilcomb E. Washburne, pp. 472-480. Handbook of North American Indians, Vol.4, William C. Sturtevant, general editor. Washington D.C.: Smithsonian Institution.

Costanso 1911— M. Costanso. "The Portola Expedition of 1769-1770". A. van Hemert-Engert and F.J. Teggart, eds. In *Publications of the Academy of Pacific Coast History*. Vol. 1(4):91-159. Berkeley, California.

Cox 2015—Nathaniel Cox. California Department of Parks and Recreation. Ventura Regional Office. Interview and site visit June 26, 2015.

Crespi 1927— J. Crespi. *Fray Juan Crespi: Missionary Explorer on the Pacific Coast 1769-1774*. H.E. Bolton, ed. Berkeley, California. University of California Press.

Davis 1961 - James T. Davis. *Trade Routes and Economic Exchange Among the Indians of California*. Report 54. University of California Archaeological Survey, Berkeley.

Leitner 2012—Gordon Leitner. *Development of the MSF process, USA*. Copyright 2012, Media Analytics Ltd.(Website no longer available-accessed May, 2015).

Engstrom 2006 - Wayne N. Engstrom. Nineteenth Century Coastal Geomorphology of Southern California. *Journal of Coastal Research* 22:847–861.

Erlandson and Rick 2002— J.M. Erlandson and T.C. Rick. Late Holocene Cultural Developments Along the Santa Barbara Coast. In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, J.M. Erlandson and T.L. Jones, eds.. Pp. 166-182. Cotsen Institute of Archaeology, University of California, Los Angeles.

ESA 2015—Environmental Science Associates. *Moorpark-Newbury 68kV Subtransmission Line Project Draft Environmental Impact Report.* Prepared for California Public Utilities Commission. http://www.cpuc.ca.gov/Environment/info/esa/moorpark_newbury/deir/c05-05-cultural_moorpark.pdf. Accessed June 2, 2016.

Fages 1937— P. Fages. *A Historical, Political, and Natural Description of California, by Pedro Fages, Soldier of Spain*. H. I. Priestley, translator. Berkeley. University of California Press

Font 1930 — P. Font. *Font's Complete Diary of the Second Anza Expedition*. Pp. 97-112 in Vol. 4 of Anza's California Expeditions. H.E. Bolton, ed. Berkeley: University of California Press.

Gamble 2008 — L.H. Gamble. *The Chumash World at European Contact: Power, Trade, and Feasting Among Complex Hunter Gatherers*. Berkeley: University of California Press.

Glassow et al. 2007—Michael A. Glassow, Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. Prehistory of the Northern California Bight and the Adjacent Transverse Ranges. Chapter 13 in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 191–213. Lanham, MD: AltaMira.

Graham et al. 2003 — M.H. Graham, P.K. Dayton, and J.M. Erlandson. Ice Ages and Ecological Transitions on Temperate Coasts. *Trends in Ecology and Evolution*. Vol. 18. Pp.33-40.

Grant 1978a — C. Grant. Chumash: Introduction. In *Handbook of North American Indians*. R.F. Heizer, ed. Vol. 8, California. Pp. 505-506. Washington, D.C.: Smithsonian Institution.

Grant 1978b — C. Grant. Eastern Coastal Chumash. In *Handbook of North American Indians.* R.F. Heizer, ed. Vol 8, California. Pp. 509-519. Washington, D.C.: Smithsonian Institution.

Gregor 1953— Gregor, H.F. *Agricultural shifts in the Ventura Lowland of California.* Economic Geography. 29(4):340-361. 1953 (from SFEI 2011).

Gutierrez et al. 2008 — C.I. Gutierrez, S. S. Tan, and K.B. Clahan. *Geological Map of the East Half Santa Barbara 30' X 60' Quadrangle, California*. California Department of Conservation, California Geological Survey.

Horne 1981 — *The Inland Chumash: Ethnography, Ethnohistory, and Archaeology*. PhD. Dissertation. University of California, Santa Barbara.

Hirsh 2002—Richard F. Hirsh. *Powering The Past: A Look Back*. September. Washington, D.C.: Smithsonian Institution. Electronic document, http://americanhistory.si.edu/powering/backpast.htm, accessed January 27, 2015.

ISI 2011— Impact Sciences Incorporated. *Addendum No. 10 to the RiverPark Project Final Environmental Impact Report.* Prepared for the city of Oxnard. http://oxnard.granicus.com/MetaViewer.php?view_id=36&clip_id=1641&meta_id=100082 . Accessed June 2, 2016.

Johnson and Snook 1967 - Myrtle E. Johnson and Harry J. Snook. *Seashore Animals of the Pacific Coast*. 3rd ed. New York: Dover.

JRP 2013—JRP Historical Consulting. *Historic Resources Inventory and Evaluation Update Report for the El Segundo Energy Center, El Segundo Energy Center Petition to Amend (00-AFC-14C), El Segundo, California*. December. Davis, CA. Prepared for CH2M Hill, San Diego, CA. On file, Docket Unit, California Energy Commission, Sacramento. Docket No. 00-AFC-14C. TN 201462.

JRP 2014—JRP Historical Consulting, Inc. *Historical Resources Inventory and Evaluation Update Report for the Carlsbad Energy Center Project, Encina Power Plant Petition to Amend (07-AFC-6)*. Prepared for CH2MHill, San Diego, CA. March 2014.

Lightfoot and Parrish 2009 - Kent G. Lightfoot and Otis Parrish. *California Indians and their Environment: An Introduction*. California Natural History Guides 96. Berkeley: University of California.

Longinos Martinez 1961 — J. Longinos Martinez. Journal: Notes and Observations of the Naturalist of the Botanical Expedition in Old and New California and the South Coast, 1791-1792. L.B. Simpson, ed. and translator. San Francisco: John Howell.

Masters 2012 — Nathan Masters. *From Roosevelt Highway to the 1: A Brief History of Pacific Coast Highway*. May 2.

Masters 2013 — Nathan Masters *How El Camino Real, California's Royal Road, was Invented.* KCET Public Television http://www.kcet.org/updaily/socal_focus/history/la-as-subject/el-camino-real.html. January 4, 2013

Masters and Aiello 2007 — Patricia M. Masters and Ivano W. Aiello. Postglacial Evolution of Coastal Environments. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 35–51. Lanham, MD: AltaMira.

McGrath 2015—McGrath Family Farm History. http://www.mcgrathfamilyfarm.com/farm-history/. Accessed October 2015.

McGrath 2015a—McGrath Family Wearing of the Green, March 13-16, 2015. Title Sponsor. http://vccaregivers.org/media/wotg_flipbook/9febc3.pdf. Accessed October 2015.McLendon and Johnson 1999 — S. McLendon and J.R. Johnson. *Cultural Affiliation and Lineal Descent of Chumash Peoples in the Channel Islands and Santa Monica Mountains*. 2 vols. Prepared for the Archaeology and Ethnography Program, National Park Service, Washington, D.C. Santa Barbara Museum of Natural History, Santa Barbara.

Menzies 1924 — A. Menzies. Menzie's California Journal [1792]. *Quarterly of the California Historical Society*. Vol. 2. Pp. 265-340. San Francisco.

Meyer et al. 2009 — Jack Meyer, Jeffrey S. Rosenthal, and D. Craig Young. *A Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9*. Draft. December. Cultural Resources Inventory of Caltrans District 6/9 Rural

Conventional Highways. Far Western Anthropological Research Group, Davis, CA. Submitted to District 6, California Department of Transportation, Fresno. EA 06-0A7408 TEA Grant.

Mourkas 2015 — Melissa Mourkas. *Historical Resource Evaluation of the McGrath State Beach*. California Energy Commission. December 2016.

MSB GP 1979 —McGrath State Beach General Plan. Santa Barbara/Ventura Coastal Park System General Plan, Volume 8. Department of Parks and Recreation. State of California, The Resources Agency. Sacramento. July 1979.

Munz and Keck 1973 — P.A. Munz and D.D. Keck. *A California Flora.* Berkeley, California: University of California Press.

Myers 1983 — William A. Myers. *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company.* Trans-Anglo Books.

Ninyo and Moore 2013 — *Preliminary Geotechnical Evaluation Mandalay Generating Station Repowering Project*. November 27.

OPD 2011—Oxnard Planning Department. *Planning Commission Staff Report May 19,2011. http://oxnard.granicus.com/MetaViewer.php?view_id=36&clip_id=1618&meta_id=99276*. Accessed June 2, 2016.

OPD 2015a—Oxnard Planning Department. *Notice of Availability of an Environmental Impact Report for the Teal Club Specific Plan Project. http://oxnard.granicus.com/MetaViewer.php?view_id=47&clip_id=3160&meta_id=154529*. Accessed June 2, 2016.

OPD 2015b—Oxnard Planning Department. *Coastal Senior/Assisted Living Project PowerPoint.* http://oxnard.granicus.com/MetaViewer.php?view_id=46&clip_id=3175&meta_id=155344. Accessed June 2, 2016.

Oxnard 2005 — *Downtown Oxnard Historic Resources Survey: Final Report*. San Buenaventura Research Associates. 1328 Woodland Drive, Santa Paula, CA 95060. July.

Padre Associates 2014—Padre Associates. *Draft Environmental Impact Report Environmental Assessment for the North Pleasant Valley Groundwater Treatment Facility.* Prepared for the city of Camarillo. http://www.ci.camarillo.ca.us/docs/pw/Draft_EIR_Mar14.pdf. Accessed June 2, 2016.

Palóu 1926 — F. Palóu. *Historical Memoirs of New California*. H.E. Bolton, ed. 4 volumes. Berkeley, California: University of California Press.

Peltier 2002 — W.R. Peltier. On Eustatic Sea Level History: Last Glacial Maximum to Holocene. *Quaternary Science Reviews*, 21(1-3), 377-396.

Pelto 2013 — Pertti Pelto. *Applied Ethnography: Guidelines for Field Research.* Walnut Creek, CA: Left Coast Press.

Porcasi et al. 1999 — Paul Porcasi, Judith F. Porcasi, and Collin O'Neill. Early Holocene Coastlines of the California Bight: The Channel Islands as First Visited by Humans. *Pacific Coast Archaeological Society Quarterly* 35(2–3):1–24.

Rincon 2014—Rincon. *Olivas Park Drive Extension Project Final Environmental Impact Report, SCH# 1995081004, Volume II: Appendices*. Prepared for the city of Ventura. http://www.cityofventura.net/files/file/meetings/Misc_Posting/Olivas%20Park%20Drive%20Extension%20Project%20FEIR%20VOL%20II.pdf . Accessed June 2, 2016.

Rothrock 1876 — Rothrock JT. 1876. Appendix H5. *Report upon the operations of a special natural-history party and main field-party No.1, California section, field-season of 1875, being the results of observations upon the economic botany and agriculture of portions of southern California.* In Annual Report upon the geographical surveys west of the one hundredth meridian, in California, Nevada, Utah, Colorado, Wyoming, New Mexico, Arizona, and Montana, by George M. Wheeler, first lieutenant of engineers, being Appendix JJ of the annual report of the chief of engineers for 1876. Washington, D.C.: Government Printing Office (from SFEI 2011).

Sawyer et al. 2009 — J.O. Sawyer, T. Keeler-Wolf, and J.M. Evens. *A Manual of California Vegetation, Second Edition.* Native Plant Society, Sacramento, California. http://vegetation.cnps.org/alliance/282 . Accessed 12/21/15.

Schoenherr 1992 —Allan A. Schoenherr. *A Natural History of California*. California Natural History Guides 56. Berkeley: University of California.

SFEI 2011—San Francisco Estuary Institute. *Historical Ecology of the lower Santa Clara River, Ventura River and Oxnard Plain*: *an analysis of terrestrial, riverine and coastal habitats*. Oakland, California. August.

Stine 1998 —Scott Stine. Medieval Climatic Anomaly in the Americas. Chapter 3 in *Water, Environment and Society in Times of Climatic Change: Contributions from an International Workshop within the Framework of International Hydrological Program (IHP) UNESCO, held at Ben-Gurion University, Sede Boker, Israel from 7-12 July 1996*, edited by A. S. Issar and Neville Brown, pp. 43–67. Water Science and Technology Library 31. Dordrecht, Netherlands: Kluwer Academic.

Swanson 1994— Swanson MT. 1994*. From Spanish land grants to World War II: an overview of historic resources at the Naval Air Weapons Station, Point Mugu, California.* Statistical Research Technical Series, Tucson, Arizona. (from SFEI 2011).

Thompson and West (1883) 1961— Thompson & West. *History of Santa Barbara and Ventura Counties, California, with illustrations and biographical sketches of its prominent men and pioneers*. Berkeley, CA: Howell-North (from SFEI 2011).

VCWPD 2015—Ventura County Watershed Protection District. *Draft Environmental Impact Report Santa Clara River Levee Improvements Downstream of Union Pacific Railroad Project.* http://www.vclevees.com/doc/december_16_2015/00%20SCR-3_Draft%20EIR%20120215.pdf. Accessed June 2, 2016.

Ventura 1996 — *County of Ventura Historic Preservation Plan*. County of Ventura Resource Management Agency. 800 South Victoria Avenue, Ventura, CA 93003.

Wallace 1955 — W.J. Wallace. "A Suggested Chronology for Southern California Coastal Archaeology". *Southwestern Journal of Anthropology*, 11:214-230.

Wagner 1929 — H.R. Wagner. Spanish Voyages to the Northwest Coast of America in the Sixteenth Century. *California Historical Society Special Publications 4.* San Francisco.

Warren 1968 — C.N. Warren. Cultural Tradition and Ecological Adaptation on the Southern California Coast. *Eastern New Mexico University Contributions in Anthropology*, 1(3), 1-14. Portales, New Mexico.

West et al. 2007 —G. James West, Wallace Woolfenden, James A. Wankett, and R. Scott Anderson. Late Pleistocene and Holocene Environments. Chapter 2 in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 11–34. Lanham, MD: AltaMira.

Wlodarski 2010—Robert J. Wlodarski. *A Phase 1 Archaeological Study Lots 1-12, of Map 5063, Located northeast of the intersection of Reef Way and Harbor Boulevard, City of Oxnard, County of Ventura, California*. Prepared for Jim Mitchell, Breakers 12, LLC. January.

CULTURAL RESOURCES APPENDIX CR-2

Melissa Mourkas, M.A

HISTORICAL RESOURCE EVALUATION OF MCGRATH STATE BEACH, OXNARD, CALIFORNIA

ABSTRACT

The applicant for the Puente Power Project (Puente or project) is proposing to decommission and demolish the existing Mandalay Generating Station (MGS) Units 1 and 2 in Oxnard, California, and construct a new gas-fired electric power plant to eliminate the use of once-through ocean cooling water in the electric power generation process. The new power generating facility, Puente, would be located on the northern portion of the existing MGS property. McGrath State Beach is located north of the proposed new power plant and the existing MGS and falls within the Historical Built Environment study area of the Project Area of Analysis (PAA). The PAA is defined as a one-half mile buffer surrounding the project in rural areas [Cal. Code Regs., tit. 20, §1704[b][2], Appendix B[g][C].

To comply with various regulatory requirements, Energy Commission staff evaluated the historical significance of the McGrath State Beach and assessed its eligibility for inclusion on the California Register of Historical Resources (CRHR).

This investigation concludes that, as evaluated for significance under Criteria 1-4 of the CRHR, McGrath State Beach does not appear to be eligible for listing on the CRHR as a built environment historical resource.

CONTENTS:

1.0 DESCRIPTION OF THE RESOURCE

McGrath State beach is situated on 295 acres that the State of California acquired from Rita S. McGrath in 1961. This acquisition formed the basis for McGrath State Park, which was re-classified as a State Beach in 1962. McGrath State Beach is located on North Harbor Boulevard in Oxnard, Ventura County, California. The Assessor's Parcel Number is 138008006-5. The acquisition included easements for Hugo McGrath and Associates to breach the sandbar between the ocean and the Santa Clara River embayment for the purposes of protecting adjacent agricultural lands. A second easement allows for Hugo McGrath and Associates (now known as Coastal Berry Farms) to manage the water level in McGrath Lake. This cooperative agreement still exists today (MSB GP1979:4; Cox 2015).

McGrath State Beach is a unit of the State of California Department of Parks and Recreation (Parks). McGrath State Beach was founded in 1962 and build-out was completed in 1964. It consists of a campground with 174 single family campsites, a group camp, a hike/bike camping area, three restroom/shower facilities, a day use parking lot, and a small amphitheater. Undeveloped areas include natural sand dunes, sandy beach, the Santa Clara River Estuary Nature Preserve, and the back dune McGrath Lake. The single family campsites are laid out in a series of circles, ranging from eight to ten sites per circle. The road into the campground enters from Harbor Boulevard, curving to the north and approaches an entry kiosk. After passing the entry kiosk, the road leads in one direction to the campground, and in another direction to a day use parking lot, a utility area and a sanitary dump station for travel trailers and recreational vehicles. Dense vegetation screens the campground from Harbor Boulevard. The vegetation planted in the campground circles also provides some screening between sites.

The campground was never expanded to the 338 campsites originally designed and depicted in the 1962 plans (see **Cultural Resources Appendix CR-2 Figure 5**)[1]. The 1962 plans envisioned a sizeable day use area, which was also never realized. The state beach and campground today have undergone little change since 1964. No improvements to the facility appear to have been made. The restroom facilities are constructed of a light brown rectangular concrete block typical of the era with stucco wall accents. The stucco-clad walls feature evenly-spaced vertical wooden trim pieces, giving the stucco walls a paneled look. The concrete block walls flank each end of the front elevation and mask the entrance to both women's and men's restrooms. The hipped roof has exposed rafter tails. The restroom buildings have a central monitor-type roof vent, providing ventilation for the restroom and shower facilities. The restroom buildings have integrated raised plant beds flanking the central service door. These are constructed of the same rectangular concrete blocks that flank each end of the façade (**Cultural Resources Appendix CR-2 Figure 1**).

The amphitheater has eight rows of wooden benches, bisected by a center access aisle. A large wooden cabinet that houses a projection screen is at the front of the amphitheater. It is flanked by two electrical utility boxes. Scattered wooden picnic tables are off to the left of the rows of bench seats. A center wooden console provides a location for a screen projector or other video equipment. The amphitheater is loosely enclosed by a non-continuous perimeter of *Myroporum laetum* trees. The amphitheater is located adjacent to the restroom building in the campsite Group 2, centered in the campground. A series of interpretative panels line a pathway abutting the amphitheater (**Cultural Resources Appendix CR-2 Figure 1)**.

The campsites are arranged in three groups of six circles, with 8-10 sites each, much like spokes in a wheel or pinwheels. It is a distinctive pattern, especially when seen in plain view or in aerial imagery (See **Cultural Resources Appendix CR-2 Figures 5, 6** and **8**). Each site has an asphalt driveway, a wooden picnic table and a fire ring (see

[1] Figures in this report may not be referenced in numerical order. Figures 4, 7 and 9 are not referenced in the text and are included for informational purposes.

Cultural Resources Appendix CR-2 Figure 2). They are all single, vehicular back-in sites: there are no pull-through sites for larger recreational vehicles or fifth-wheel

trailers, although the back-in sites are long enough to accommodate larger vehicles and trailers. Some circles have more vegetative screening between sites than others. Each group has its own restroom facility. There are no electrical, water or sewer hookups. The campground has been frequently closed in recent years. Seasonal flooding from the Santa Clara River inundates portions of the campground, the utility area and sanitary sewage dump area. Flooding occurs mostly when a sandbar blocks the flow of the Santa Clara River to the ocean, its natural outlet. This closing of the embayment occurs when river flow is not strong enough to breach the sandbar naturally, generally during the drier times of the year. While upstream flows are reduced in the summer dry season (the approximately 84 mile long Santa Clara River originates in the San Gabriel Mountains), year-round flows from local agricultural irrigation runoff and treated wastewater continue to enter into the river channel and, consequently, the embayment. The closures have created a challenge for Parks in terms of maintenance of the facility. The most obvious signs of a lack of use are the overgrown grasses, small shrubs and weeds invading the campsites and growing through the cracks in the roads and parking areas. It is not clear when, or if, the campground will reopen (Cox 2015).

The original plantings are not shown on available historical plans, but it is likely that the *Myoporum laetum* shrubs in existence in the campground were part of the screening plantings. They appear to be very old, reaching mature heights of 9'-30'. *Myoporum laetum* is listed as a weedy, invasive species by the California Invasive Plant Inventory (CAL-IPC 2015). According to Parks staff, the myoporum are not thriving as a result of repeated seasonal flooding. Parks staff mentioned that wetland species of plants are beginning to take hold in areas of the campground which have been subject to flooding (Cox 2015). The 1979 General Plan also identifies Hottentot Fig (*Carpobrotus edulis*) as being present in dense stands in the center islands of each campsite circle (MSB 1979:14). Hottentot Fig is more commonly known in California as Iceplant and was planted in the past along freeway embankments and on sand dunes and bluffs. Iceplant is also listed as a weedy, invasive species by the California Invasive Plant Inventory (CAL-IPC 2015) and it is rarely used today. Parks staff identified areas in the sand dune areas of the state beach where the Iceplant is being systematically eliminated and native sand dune plant species, such as Red Sand Verbena (*Abronia martima*) are reappearing (see **Cultural Resources Appendix CR-2 Figure 3**).

The state beach also features within its borders McGrath Lake. McGrath Lake is largely fed by upstream irrigation runoff. The level is maintained by the use of an onsite pump. The lake is also covered by the deed restriction (easement) allowing Hugo McGrath and Associates (now known as Coastal Berry Farms) to operate the pump in order to maintain water levels. The water is drained to the beach through an underground pipe under the dunes. On the day of the site visit, Parks staff showed Energy Commission staff the location of the outlet to the outflow pipe and noted that he had never seen it dry before (Cox 2015). This is an indication of the drought conditions that existed in Southern California in 2015.

There is an oil producing field adjacent to the eastern boundary of the property, situated generally between McGrath Lake and the dunes to the west and to Harbor Boulevard to

the east. The McGrath State Beach parcel partially envelops the oil producing field, giving it the feel of an inholding (**Cultural Resources Appendix CR-2 Figure 3**). It is assumed this has been operational as long as the state beach has been in existence. Standard Oil discovered oil in the area in 1947. The balance of the property is undeveloped and consists of naturally occurring sand dunes and beaches, and the riparian environment along the banks of the Santa Clara River.

To the south of the state beach is the Mandalay Generating Station and the Puente site. Mandalay Generating Station was constructed between 1956 and 1959, and pre-dates the establishment of the state beach by a few years. MGS is visible from campsites in Group 1, particularly sites 45-48. On the day of the site visit, it appeared on the horizon as a boxy shadow and a stack with a visible plume. The oil production facilities are also visible from this vantage point. Views of MGS from other parts of the campground are largely screened by intervening vegetation or topography (**Cultural Resources Appendix CR-2 Figures 2 and 3**).
Immediately north of the state beach is the Santa Clara River and estuary and Ventura Harbor. To the east, across Harbor Boulevard, are agricultural fields producing strawberries and other crops.

2.0 HISTORIC CONTEXT

2.1 California Coastal State Beaches and the Design Team

Beginning in the 1930's, the state embarked on a concerted effort to acquire land holdings along the southern coast of California, and coastal acquisitions were ramped up from the 1950's to 1970's. Governor Edmund 'Pat' Brown's administration (1959-1967) provided significant funding for state parks as well as recreation facilities for state water projects and reservoirs. The Goleta, California State Park design office did much of the planning and design work for coastal parks from San Luis Obispo County to San Diego County. The Goleta office coordinated acquisitions and planning with the headquarters office in Sacramento. State Park headquarters generally managed the construction and bidding (Deering 2015b; Sutliff 2015). Several notable landscape architects were involved with the design of the state beaches, including Robert Deering and Dale Sutliff.

According to Dale Sutliff's recollections, California Department of Parks and Recreation had four design and planning satellite offices in the 1960's, located in Carmichael (Central Valley and Sierra Region projects); Sacramento (construction documents and special projects); Monterey (Northern California; Monterey County and north); and Goleta (Southern California, San Luis Obispo to Mexico, including the desert region). The satellite design offices were closed and consolidated to Sacramento in 1968 to 1969 (Sutliff 2015).

Robert Deering
Robert Deering, FASLA, was known early in his career for being the inaugural chair of the landscape architecture program at University of California at Davis, beginning in 1950, and later as a pioneer in site cooling and heating through design. Robert Deering, CA LA #49, earned a Masters in Landscape Architecture (MLA) and a Ph.D. from

Cornell University in 1949. In 1950, he was hired as the inaugural chair of the nascent Landscape Architecture program (Bachelor of Science in Agriculture) at University of California, Davis. Robert Deering was known for studying the relationships of plant and site design for achieving shading and passive solar gain. In 1954, he travelled to the Netherlands on a Fulbright scholarship. Dr. Deering returned to Davis, California, and began a private landscape architecture practice. His practice included private residential gardens, parks and commercial sites. In partnership with architects Dreyfuss & Blackford, Robert Deering was the original landscape architect for the award-winning Mansion Inn in Sacramento, California and the Nut Tree complex in Vacaville, California. Robert Deering also collaborated with Ken Anderson of Roseville, California, on various projects, including a master plan for Sierra College in Rocklin, California.

Robert Deering then went on to a 17-year career as landscape architect with the California Department of Parks and Recreation (Parks). Robert Deering joined the Southern California Regional Office of Planning and Development in Goleta as Regional Supervisor and Senior Landscape Architect in 1963. The office was responsible for preparation of feasibility studies for the acquisition and development of parks, beaches, trail systems and historical sites. He supervised the design and development of park units (Deering 2015b). This required coordination and cooperation with other local, state, and federal agencies in the design and development process. In 1966, the Goleta Office received a State of California Governor's Good Design Award for the South Carlsbad Beach Development. Dr. Deering was active in this supervisory capacity from 1963 through September, 1971 (Deering 2015b). From 1971 to 1979, Dr. Deering was Senior Landscape Architect and Project Manager, in charge of resource analysis studies, environmental impact studies, park acquisition projects for bond financing and development of individual park units. He was involved in park design as well as real estate acquisitions for the Parks system. Upon his retirement from California State Parks in 1979, he went on to teach at King Faisal University in Saudi Arabia. He continued his work in passive solar cooling at the University. Later, Robert Deering designed private gardens in the greater Sacramento and Davis, California region. Robert Deering died at his home in Davis, California, on December 1, 2010.

Dale Sutliff

Dale Sutliff, ASLA, earned a Bachelor of Science in Landscape Architecture (BSLA) from California Polytechnic State University (Cal Poly), Pomona, California and a Master of Regional Planning (MRP) from the University of Pennsylvania. He was a member of the state parks team at the Goleta office. During his tenure with Parks, Sutliff worked on many coastal parks, the first draft of the California Coastal Plan, and a Plan for the Redwood Region. Sutliff subsequently joined the faculty at California Polytechnic University (Cal Poly), San Luis Obispo, California, in 1973. Concurrently, he established the first private landscape architecture firm in San Luis Obispo in 1975 with Jerry Emery. Their work included both private clients (Emery) and public projects (Sutliff). He was department head of the Landscape Architecture department at Cal Poly from 2001-2004 and retired from the university in 2008 (O'Hara 2012:21). As of September 30, 2015, Dale Sutliff maintains his California landscape architecture license, CA LA # 1205, issued June 29, 1968.

Other State Parks Personnel

Other members of the Goleta office included Robert Rothhaupt, Bob Kline, Ken Kolsbun, Ed Comport and Bob Baker. Little information about these landscape architects or their careers beyond state parks has been found. Robert Rothhaupt graduated in 1957 from Michigan State University with a degree in Landscape Architecture and Urban Planning. Mr. Rauthhaupt signed the 1962 plan for McGrath State Beach as the designer (**Cultural Resources Appendix CR-2 Figure 5**). Richard Paine, who worked on a preliminary design for San Buenaventura State Beach, was located in the Sacramento office and retired from Caltrans as a Senior Landscape Architect in 1994. Investigations to date have not been able to find additional definitive information about the careers of the others involved with park design at that time.

Other personnel who were involved with the approval of the McGrath State Beach plans in 1962 include Edward Dolder, Chief, Division of State Beaches and Parks (appointed in 1961). He was later appointed by Governor Edmund "Pat" Brown as Deputy Director of the new Department of Parks and Recreation, holding that post from 1965 to 1967. Lloyd Lively was also a signatory to the 1962 McGrath State Beach plan. His career is largely unknown but he was a Superintendent of the Parks district that included Saddleback Butte State Park at its inception in 1960 (SaveSaddleback 2015; CSPR 1991, p.6) and was Superintendent of District 5 by July, 1970. It is unknown whether these districts are one and the same: districts have since been renamed and updated and offices closed over time.

Some of the park units developed in the middle part of the 20th Century in Central and Southern California coastal areas are: Doheny State Beach (established 1935); Carpinteria State Beach (established 1941); El Capitan State Beach (1953-1967); Moonlight State Beach (1960's); McGrath State Beach (established 1962); Refugio State Beach (established 1963); Seacliff and New Brighton State Beaches (by 1969), and San Buenaventura (dates unknown).

One of the more interesting aspects of the design of the state beaches in the 1960s and 1970s is that all appear to be unique. There doesn't appear to be a pro-forma design. For instance, McGrath State Beach's campground, arranged in pinwheel-like circular units, is not repeated in any of the other park designs. Dale Sutliff indicated it was the first of its type in California (Sutliff 2015).

Records from Robert Deering's photograph collection (Deering 2015a) and staff correspondence with Dale Sutliff (Sutliff 2015) indicate the designers listed in **Cultural Resources Appendix CR-2 Table 1** below were associated with the various state beaches under development by the Goleta Regional Office. It is likely that Robert Deering was involved in many of those projects in a supervisory capacity, as his archive includes plans and photographs from many state parks under development in the 1960's and 1970's.

Cultural Resources Appendix 2 Table 1

Park Unit	Date Established	Designers	Year Built
Carpenteria State Beach	1932	Civilian Conservation Corps; Design for new entry and campground expansion Ken Kolsbun.	1941/late1960s
Doheny State Beach	1935	Bob Baker et al	Ca. 1980
Doheny State Beach Day Use Area	unknown	R. Paine/Dale Sutliff/Bob Baker	unknown
El Capitán State Beach	1953/1967/2002	unknown	unknown
McGrath State Beach	1962	Bob Rothhaupt	Ca. 1962-1964
Moonlight State Beach	1960s		Ca. 1971
Refugio State Beach	1950/1963	Design for beachfront and east campground Dale Sutliff	Expansion and entrance corresponded to highway/railroad alignment in 1970s
San Buenaventura State Beach	ca. 1960s-1970s	Dale Sutliff, Ed Comport	Early 1960s, expanded over time
Seacliff and New Brighton State Beaches	1931/1933	Campgrounds and staircases to the beach Ken Kolsbun	By 1969

2.2 McGrath Family

The McGrath family's entry into local Ventura County agriculture occurred when Dominick McGrath relocated to the area in 1874 (Bodle 1977:2). Originally from Ireland, McGrath had been raising sheep in Alameda County in the San Francisco Bay Area in the 1850s and 1860s. Prior to his relocation to the Oxnard area, he acquired the rights to purchase 1,337 acres from Thomas A. Scott. That purchase was completed in 1875. The main ranch house was completed in 1879 off of Gonzales Road in Oxnard, one mile from the ocean. The McGrath house, formerly located at 5701 Gonzales Road, was recorded by Bissell on March 2, 1991 and is recorded as Ventura County Primary Record Number 56-152738 in the state's historical resources inventory, CHRIS[2] (Bissell 1991). By the time of Dominick McGrath's death in 1908, over 5000 acres had been acquired. Prior to his death, those acres were incorporated into an estate, known as the Dominick McGrath Estate Company. The estate passed to four of Dominick's sons: Hugo, Robert, Frank and Joseph. The daughters were to receive shares of stock which could then be sold to the brothers to keep the original holdings intact (Bodle 1977:18). The extent of the estate holdings were described by Bodle as follows: "at one time, you could walk from Montalvo to Hueneme without ever leaving McGrath land" (Bodle 1977:17). The estate holdings were divided by the four sons in 1948 (McGrath 2015).

Joseph McGrath ended up with the outer ranches: Camarillo, Montalvo, and the furthest portion of the Patterson Ranch, which is now where the Channel Islands Marina is located. In 1971, Joseph and his three siblings again divided their holdings. Camarillo is where the McGrath Family Farms, to this day, own two contiguous ranches, offering organic produce since 1995. The farm operates a farm stand at 1012 West Ventura Boulevard in Camarillo, California, and also provides restaurant deliveries, Community Supported Agriculture (CSA) boxes and sells at local farmer's markets (McGrath 2015).

[2] California Historical Resources Information System.

The McGrath house on Gonzales Road, recorded by Bissell in 1990, is no longer extant. It appears to have been removed between July and December of 2003, according to historical imagery on Google Earth. It was described as two-story rectangular building sheathed in wide clapboard siding featuring arched windows on the second floor, and was accompanied by several outbuildings. The Bissell documentation also shows an addition of an enclosed front porch when compared with earlier photographs. The approximate date of construction was 1879 (Bodle 1977:6). At the time of Bissell's 1991 recording, it was surrounded by agricultural land. While this building is no longer extant, Bissell wrote that another McGrath Family compound was located about ¼ mile east of 5701 Gonzales and was occupied and in good condition in 1991. This appears to be extant from reviewing historic and current imagery and maps. Accounts vary between Bissell and Bodle in their locational descriptions, as to which was the original ranch house.

A 2011 mailing list for a water rights resolution listed the property owner of 5701 Gonzales Road as C B South (Coastal Berry Co., L.L.C, former Hugo McGrath Assoc.)[3]. Therefore it appears that Coastal Berry Company was still in possession of the property as of 2011.

South of the Mandalay Generating Station, and located adjacent to or within the Mandalay State Park are several small parcels owned by R H McGrath Farms. These parcels (APNs 1830010505, 1830010365, and 1830010515) are classified by the Ventura County Assessor as "Producing Oil Wells" on privately-owned land. Staff observed two of these wells on a site visit in June, 2015. They are also easily viewed in Google Earth. It is unconfirmed, but these two wells may be the wells referred to in Bodle's article, where she writes: "The Home Ranch is the one on which two oil producing wells were brought in by the Standard Oil Company" (Bodle 1977:20). Further validating this historical account, San Buenaventura Research Associates writes that, "In 1947, Standard Oil made a major oil find on the western end of the Oxnard Plain on property owned by the McGrath Family. It is described as the West Montalvo Field and is located immediately south of the Santa Clara River and extends into the state tidelands…Four leases are located within the onshore portion of the oil field: the McGrath #4 lease, the McGrath #5 lease, Patterson Ranch lease, Parcel 1 and Parcel 2" (SBRA 2014:71, 73). This locational description places it in the vicinity of the existing oil producing wells north and south of Mandalay Generating Station.

Detailed property record searches would be required to establish the boundaries of the McGrath holdings over time. Several sources (Bodle 1977, McGrath 2015) show a historical plot map of the holdings but the image quality of the reproduction is so poor that it is difficult make out the landmarks and text. What is known is that the holdings were quite extensive, maxing out at 5,020 acres, and that the family farm continues to this day, albeit at a much reduced size. Therefore, the McGrath Family's contributions to the development of Oxnard in terms of agriculture and, to a lesser degree, oil production, should be considered somewhat important. That Rita McGrath entered into

[3] PROPOSED RESOLUTION NO. 2011·XX REPEALING AND REPLACING GRANDFATHERING RESOLUTION NO. 97·02, Fox Canyon Groundwater Management Agency, January 26, 2011.

a land sale to the State of California in 1961 is also a notable contribution of the McGrath family to Oxnard's development.

3.0 SIGNIFICANCE EVALUATION OF MCGRATH STATE BEACH

Under CEQA, a resource is generally considered to be historically significant if it meets the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the National Register of Historic Places (NRHP). In addition to being at least 45 years old, a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, §5024.1):

- Criterion 1: is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion 2: is associated with the lives of persons significant in our past;
- Criterion 3: embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;
- Criterion 4: has yielded, or may be likely to yield, information important to history or prehistory.

In addition, historical resources must also possess enough integrity of location, design, setting, materials, workmanship, feeling, and association to express its original historical intent (Cal. Code Regs., tit. 14, §4852[c]). Generally, evaluations are made of historical resources that are 45 years or older in accordance with Energy Commission siting regulations requiring recording of potential historic resources [(Cal. Code. Regs. ,tit. 20, § 1704 (b)(2), Appendix B(g)(2) (B) and (C)]. The State Office of Historic Preservation (OHP) also uses the 45 year threshold for evaluating historical resources (OHP 1995; p.2). These thresholds take into account the potential lag time between evaluation of a resource and the timeframe in which planning decisions are made.

CRHR Criterion 1:
While McGrath State Beach is a component of the pattern of developing California's State Beaches and Parks, it is not in itself of historic significance in that pattern of development. While McGrath State Beach has a high degree of integrity to the period of significance, 1962-1964, McGrath State Beach was neither a vanguard nor a key element of the ongoing acquisition and development of the state beaches in the middle of the 20th Century and does not appear to be eligible for listing on the CRHR under Criterion 1.

CRHR Criterion 2:
McGrath State Beach is related contextually to the McGrath family, which had significant agricultural holdings in the Oxnard area, but only in the sense that Rita McGrath, one of the heirs of the McGrath estate, sold the land to State Parks and the park was consequently named for the McGrath family. Therefore, McGrath State Beach does not appear to be associated with the lives of persons significant in our past and does not appear to be eligible for listing on the CRHR under Criterion 2.

CRHR Criterion 3:
McGrath State Beach is associated with a group of designers and landscape architects in the former Goleta office of California Department of Parks and Recreation, two of whom, Robert Deering and Dale Sutliff, had notable careers. The association of landscape architect Robert Deering with McGrath State Beach is not clear. The park design in 1962 appears to pre-date Dr. Deering's involvement with the development of the state beaches that occurred from 1963 to 1979. The design also doesn't appear to involve the work of landscape architect Dale Sutliff. Therefore, it does not appear to represent the work of an important creative individual or individuals. While the campground's pinwheel design appears unique among the central and south state beaches developed contemporarily, it does not seem to embody the distinctive characteristics of a type, period, or method of construction, or possess high artistic values articulated in material or design choices. Therefore, McGrath State Beach does not appear to be eligible for listing on the CRHR under Criterion 3.

CRHR Criterion 4:
The developed grounds and structures at McGrath State Beach would not be likely to yield important information that is not already known through this investigation, which includes traditional avenues of research, such as reviewing plans and published literature. None of the developed grounds or structures is the principle source of information for study of mid-century park acquisition and development in California, the impact of the McGrath family on the development of the Oxnard region or the body of work of the designers involved. For these reasons, McGrath State Beach appears to be ineligible for the CRHR under Criterion 4.

4.0 CONCLUSION

The results of this investigation conclude that, as evaluated for significance under Criteria 1-4 of the CRHR, McGrath State Beach is not recommended eligible for listing on the CRHR as an historical resource. Investigation of the relevant themes of trends in California's development, persons important to that development, and creative individuals and design styles have not found the resource to be significant in those thematic areas. While McGrath State Beach has a high degree of integrity to the period of significance, 1962-1964, it does not individually attain the historic significance to make it eligible for listing on the CRHR.

5.0 REFERENCES

Bissell 1991—Ronald M. Bissell. *Cultural Resources Recommendations of Four Possible Sites for the California State University, Ventura Campus in Oxnard and Ventura County, California. February 18, 1990. DPR Form 523 Recorded on March 2, 1991. CHRIS Primary Record Number 56-152738.*

Bodle 1977—Yvonne G. Bodle. *The McGrath Story, 100 years of Ranching on the Oxnard Plain*. The Ventura County Historical Society Quarterly. Vol. XXII, No. 4. Summer 1977.

CAL-IPC 2015—California Invasive Plant Council. http://www.cal-ipc.org/ip/inventory/index.php. Accessed 2015.

Cox 2015—Nathaniel Cox. California Department of Parks and Recreation. Ventura Regional Office. Interview and site visit June 26, 2015.

CSP 2010—California State Parks. *Dolder, Edward F*. http://www.museumcollections.parks.ca.gov/code/emuseum.asp?emu_action=searchrequest&moduleid=2&profile=people&currentrecord=1&searchdesc=Dolder,%20Edward%20F.&style=single&rawsearch=constituentid/,is/,/16363/,/false/,/true. Accessed July 2015.

CSPR 1991—California State Park Ranger. *Special News and Views Looks Back on California State Park Ranger's 125th Anniversary: 1866-1991*. A publication of the California Department of Natural Resources. 1991.

Deering 2010—Roberta Deering. *Biography of Robert Deering 1920-2010*. The Cultural Landscape Foundation. https://tclf.org/pioneer/robert-deering/biography-robert-deering. Accessed April 2015.

Deering 2011—Paul Deering. *Bob Deering–Landscape Architect*. Deering Design. http://dd-land.blogspot.com/2011/01/bob-deering-landscape-architect and http://www.asla.org/land/LandArticle.aspx?id=30359. Accessed April, 2015.

Deering 2015a—Archival Collection of Plans and Photographs by Robert Deering. In private collection of Alice Deering. Accessed 2015.

Deering 2015b—Roberta Deering. Correspondence and Interviews. April to July, 2015.

DOMA 2015—Downtown Oxnard Merchants Association. *General Historical Overview to 1898*. http://oxnarddowntowners.org/downtown-history.html. Accessed October 16, 2015.

McGrath 2015—McGrath Family Farm History. http://www.mcgrathfamilyfarm.com/farm-history/. Accessed October 2015.

McGrath 2015a—McGrath Family Wearing of the Green, March 13-16, 2015. Title Sponsor. http://vccaregivers.org/media/wotg_flipbook/9febc3.pdf. Accessed October 2015.

MSB GP 1979 —McGrath State Beach General Plan. *Santa Barbara/Ventura Coastal Park System General Plan, Volume 8*. Department of Parks and Recreation. State of California, The Resources Agency. Sacramento. July 1979

O'Hara 2012—Christine
Edstrom O'Hara. *Celebrating 40 Years. A History of the Landscape Architecture Department. Cal Poly, San Luis Obispo*. Highlights in the History of Cal Poly. March 10, 2012.

OHP 1995—California Office of Historic Preservation. *Instructions for Recording Historical Resources.* Sacramento, California. March 1995.

Peace 2015—PeaceSymbol.com. http://www.peacesymbol.com/. © 2015 Ken Kolsbun.

SaveSaddleback 2015—Save Saddleback Butte State Park. http://www.savesaddleback.org/html/history.shtml. Accessed July 2015.

SBRA 2014—San Buenaventura Research Associates. *Historic Context Statement and Reconnaissance Survey for the Eastern Oxnard Plain*. November 2014.

Sutliff 2015—Dale Sutliff. E-mail correspondence between Dale Sutliff and Melissa Mourkas, California Energy Commission. October 2015.

Wolcott 2000—Holly J. Wolcott. *Kathleen M.H. Knapper: Activist, Scion of Pioneers*. Los Angeles Times. January 19, 2000.

CULTURAL RESOURCES APPENDIX 2 - FIGURE 1
Puente Power Project - Staff Photos

Restroom facilities at McGrath State Beach.

View of Amphitheater at McGrath State Beach.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: Staff Photo June 26, 2015

CULTURAL RESOURCES APPENDIX 2 - FIGURE 2
Puente Power Project - Staff Photos

View of typical campsite arrangement at McGrath State Beach.

View south from McGrath State Beach Group 1, Campsites 45-48, toward oil field and Mandalay Generating Station.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: Staff Photo June 26, 2015

CULTURAL RESOURCES APPENDIX 2 - FIGURE 3
Puente Power Project - Staff Photos

Oil field adjacent to McGrath State Beach with MGS in the background and sand dunes to the right.

Red sand verbena growing on top of dead ice plant on sand dunes at McGrath State Beach.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: Staff Photo June 26, 2015

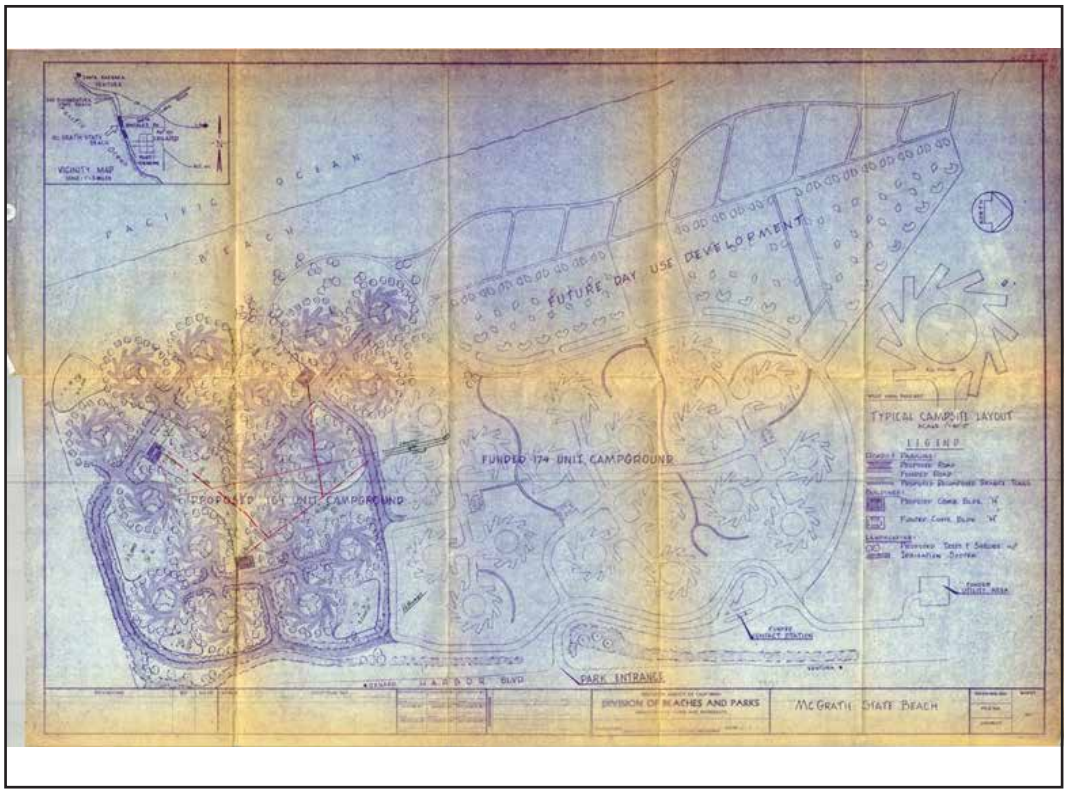
CULTURAL RESOURCES APPENDIX 2 - FIGURE 4

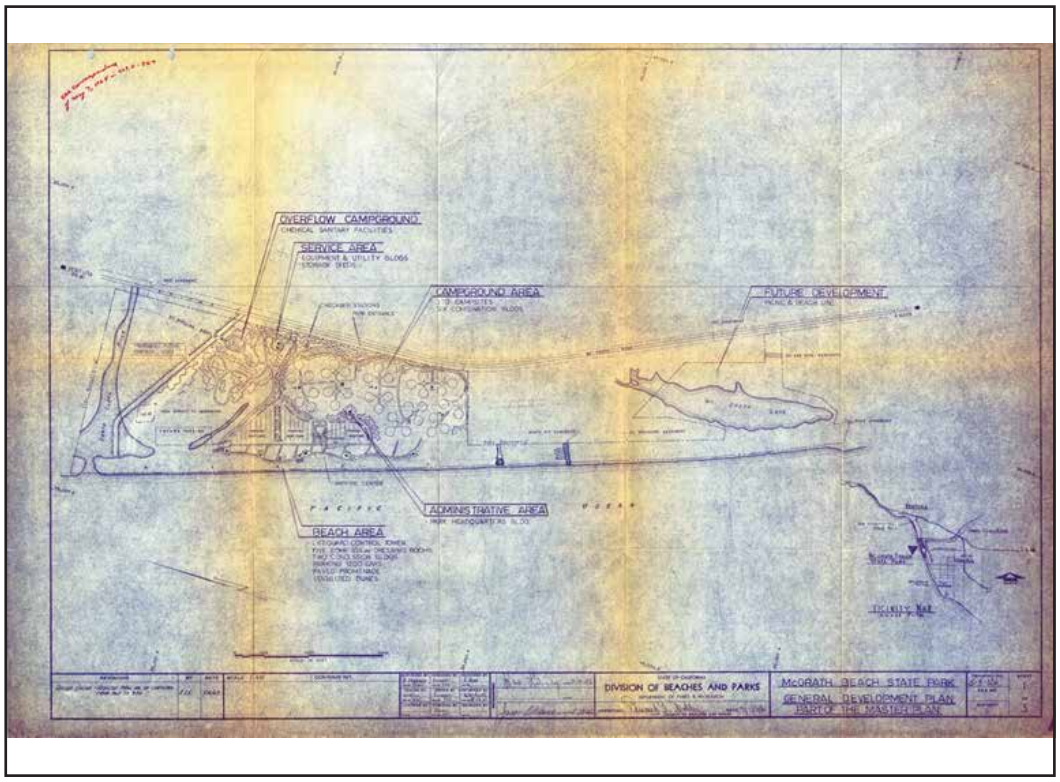
Puente Power Project - View of McGrath Lake, looking north. Transmission lines in background are running parallel to Harbor Boulevard.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Staff Photo June 26, 2015

CULTURAL RESOURCES APPENDIX 2 - FIGURE 5
Puente Power Project - 1962 Plan for McGrath State Beach.





CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: California State Parks.

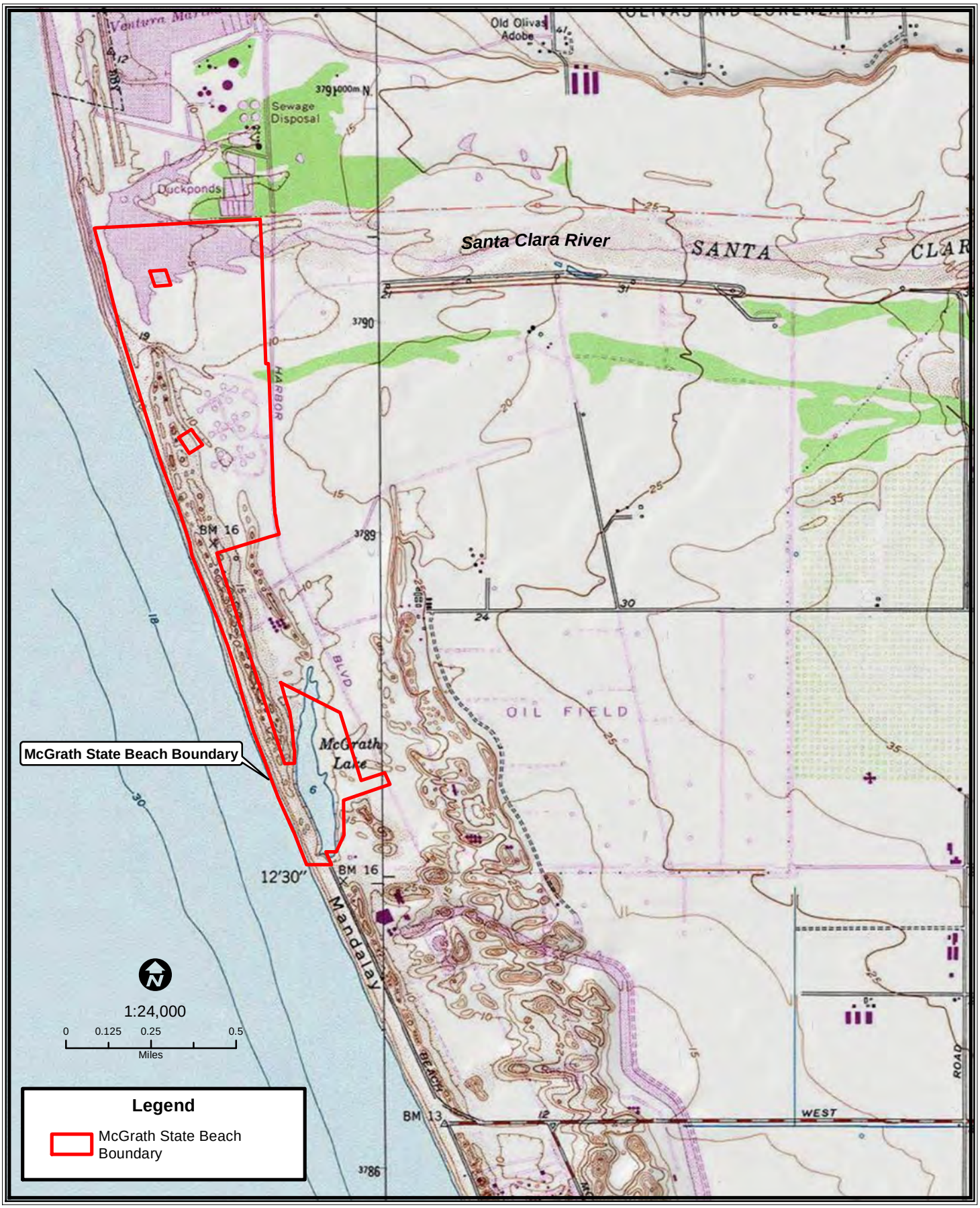
CULTURAL RESOURCES APPENDIX 2 - FIGURE 6

Puente Power Project - 1962 Plan for McGrath State Beach with Signatures. California State Parks

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: McGrath S.B.CA '71, Goleta Regional Office-design by Bob Rothhaupt, Photo by R. (Robert) Deering. Courtesy of Alice Deering.

CULTURAL RESOURCES - APPENDIX 2 - FIGURE 7
Puente Power Project - McGrath State Beach



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: USGS and NRG

CULTURAL RESOURCES APPENDIX 2 - FIGURE 8

Puente Power Project - McGrath State Beach Aerial View 2015

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Google Earth

CULTURAL RESOURCES APPENDIX 2 - FIGURE 9
Puente Power Project - Current McGrath State Beach

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: California State Park Brochure

ENVIRONMENTAL JUSTICE

Lisa Worrall and Shawn Pittard[1]

SUMMARY OF CONCLUSIONS

Energy Commission staff concludes that construction and operation of the Puente Power Project (Puente or project) would not cause significant direct, indirect, or cumulative environmental justice impacts with the inclusion of proposed conditions of certification (see technical sections). Staff also concludes that project impacts would not disproportionately affect the environmental justice population.

INTRODUCTION

Staff's environmental justice impact analysis evaluates the project's direct, indirect, and cumulative impacts on the environmental justice population living within a six-mile radius of the project site, and whether any impacts would disproportionately affect the environmental justice (EJ) population. Staff uses a six-mile radius around the proposed site, based on the parameters for dispersion modeling used in staff's air quality analysis, to obtain data to gain a better understanding of the demographic makeup of the communities potentially impacted by the project.

WHAT IS ENVIRONMENTAL JUSTICE?

The U.S. Environmental Protection Agency (EPA) defines environmental justice as, "the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies (US EPA 2015, pg. 4)."

The "Project Outreach" subsection discusses the Energy Commission's outreach program specifically as it relates to the proposed project. The "Environmental Justice Screening" subsection describes the methodology used to identify an EJ population. The "Project-Specific Demographic Screening" subsection presents the demographic data for those people living in a six-mile radius of the project site and determination on presence or absence of an EJ population. When an EJ population is identified, staff in 12 technical disciplines [2] considers the project's impacts on this population and whether any impacts would disproportionately affect the EJ population.

ENVIRONMENTAL JUSTICE IN THE ENERGY COMMISSION SITING PROCESS

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the

[1] Refer to the end of this section for a list of staff who contributed to the Environmental Justice analysis.
[2] The 12 technical disciplines are Air Quality, Cultural Resources, Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, and Waste Management. Cultural Resources staff considers impacts to Native American populations.

environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of their mission. The order requires the U.S. 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.

The California Natural Resources Agency recognizes that EJ communities are commonly identified as those where residents are predominantly minorities or live below the poverty level; where residents have been excluded from the environmental policy setting or decision-making process; where they are subject to a disproportionate impact from one or more environmental hazards; and where residents experience disparate implementation of environmental regulations, requirements, practices, and activities in their communities. Environmental justice efforts attempt to address the inequities of environmental protection in these communities.

An EJ analysis is composed of the following:

- Identification of areas potentially affected by various emissions or impacts from a proposed project;
- Providing notice in appropriate languages (when possible) of the proposed project and opportunities for participation in public workshops to EJ communities;
- A determination of whether there is a significant population of minority persons, or persons below the poverty level, living in an area potentially affected by the proposed project; and
- A determination of whether there may be a significant adverse impact on a population of minority persons or persons below the poverty level caused by the proposed project alone, or in combination with other existing and/or planned projects in the area.

California law defines EJ as “the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies” (Gov. Code, §65040.12; Pub. Resources Code, §§ 71110-71118). All departments, boards, commissions, conservancies and special programs of the Resources Agency must consider EJ in their decision-making process if their actions have an impact on the environment, environmental laws, or policies. Such actions that require EJ consideration may include:

- adopting regulations;
- enforcing environmental laws or regulations;
- making discretionary decisions or taking actions that affect the environment;
- providing funding for activities affecting the environment; and
- interacting with the public on environmental issues.

ENVIRONMENTAL JUSTICE SCREENING

SCREENING STEPS

Demographic Data - Identifying an EJ population

Staff uses demographic data to identify presence or absence of an EJ population within a six mile radius of project. Staff's demographic screening is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (US EPA 1998). The intention is to identify minority and below-poverty-level populations potentially affected by the proposed project. Due to the changes in the data collection methods used by the US Census Bureau, Energy Commission staff's screening process relies on 2010 decennial US Census data to determine the number of minority populations and the most current data from the American Community Survey (ACS) to evaluate the presence of individuals living below the federal poverty level.

Minority Populations

According to *Environmental Justice: Guidance Under the National Environmental Policy Act*, minority individuals are defined as members of the following groups:

- American Indian or Alaskan Native
- Asian or Pacific Islander
- Black, not of Hispanic origin
- Hispanic

Staff identifies an EJ population when one or more U.S. Census blocks in the six-mile radius have a minority population greater than or equal to 50 percent.

Below-Poverty-Level Populations

The official poverty thresholds do not vary by geography (e.g. state, county, etc.), but are updated annually to allow for changes in the cost of living. The population for whom poverty status is determined does not include institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old. The Council on Environmental Quality (CEQ) and U.S. EPA guidance documents identify a 50-percent threshold to determine whether minority populations are considered EJ populations, but do not provide a similar threshold for below-poverty-level populations. In the absence of thresholds, staff looks at the below-poverty-level populations in the six-mile radius and compares them to other appropriate reference geographies, such as Census County Divisions (CCDs), the county, or the state, to determine whether the below-poverty-level populations are less than, more than, or about the same as the populations in the comparison geographies. U.S. EPA guidance notes that a demographic comparison to the next larger geographic area or political jurisdiction should be presented to place population characteristics in context (US EPA

1998, pg. 12). This is consistent with staff's approach to identify below-poverty-level populations that constitute an EJ population.

Demographic Data Background - Using the US Census Bureau's Decennial Census and American Community Survey in Staff Assessments

After the 2000 decennial Census, the detailed social, economic, and housing information previously collected on the decennial census long form became the American Community Survey (ACS) (US Census 2013a). The U.S. Census Bureau's ACS is a nationwide, continuous survey that will continue to collect long-form-type information throughout the decade. Decennial census data is a 100 percent count collected once every ten years and represents information from a single reference point (April 1st). The main function of the decennial census is to provide counts of people for the purpose of congressional apportionment and legislative redistricting.

ACS collects data from a sample of the population based on information compiled continually and aggregated into one- and five-year estimates ("period estimates") released every year. The primary purpose of the ACS is to measure the changing social and economic characteristics of the U.S. population. As a result, the ACS does not provide official population counts in between censuses.

ACS collects data at every geography level from the largest level (nation) to the smallest level available (block group (BG)).[3] Census Bureau staff recommends the use of data no smaller than the census tract level.[4,5] ACS one-year estimates cannot reliably capture data from smaller geographical areas, as the population size does not allow for an adequate sample size. The aggregated five-year estimates provide sufficient sample size to yield reliable data in smaller geographies (e.g. less populated cities). Thus, Energy Commission staff uses data from the five-year estimates in the analysis to better represent a wider range of populated areas. A certain level of variability is associated with the estimates because they come from a sample population. This variability is expressed as a margin of error (MOE) which is used to calculate the coefficient of variation (CV). CVs are a standardized indicator of the

[3] Census Block Group - A statistical subdivision of a census tract. A BG consists of all tabulation blocks whose numbers begin with the same digit in a census tract; for example, for Census 2000, BG 3 within a census tract includes all blocks numbered between 3000 and 3999. The block group is the lowest-level geographic entity for which the Census Bureau tabulates sample data from the decennial census. **Source:** http://www.census.gov/dmd/www/glossary.html.

[4] Census Tract - A small, relatively permanent statistical subdivision of a county or statistically equivalent entity, delineated for data presentation purposes by a local group of census data users or the geographic staff of a regional census center in accordance with Census Bureau guidelines. Census tracts are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions at the time they are established. Census tracts generally contain between 1,000 and 8,000 people, with an optimum size of 4,000 people. Census tract boundaries are delineated with the intention of being stable over many decades, so they generally follow relatively permanent visible features. **Source:** http://www.census.gov/dmd/www/glossary.html.

[5] Census Workshop: Using the American Community Survey (ACS) and The New American Factfinder (AFF) hosted by Sacramento Area Council of Governments on May 11 & 12, 2011. Workshop presented by Barbara Ferry, U.S. Census Partnership Data Services Specialist.

reliability of an estimate. While not a set rule, the US Census Bureau considers the use of estimates with a CV more than 15 percent a cause for caution when interpreting patterns in the data (US Census 2009). When CVs for estimates are high, the reliability of an estimate improves by using estimates for a larger geographic area (e.g. city or community versus census tract) or combining estimates across geographic areas.

CalEnviroScreen - More information about an EJ Population

California Communities Environmental Health Screening Tool: CalEnviroScreen Version 2.0 (CalEnviroScreen) is a science-based mapping tool used by the California EPA to identify disadvantaged communities[6] pursuant to Senate Bill 535. As required by SB 535, disadvantaged communities are identified based on geographic, socioeconomic, public health and environmental hazard criteria. CalEnviroScreen assesses communities at the census tract level in California to identify the communities most burdened by pollution from multiple sources and most vulnerable to its effects, taking into account socioeconomic characteristics and underlying health status (CalEPA 2014b, pg. 1).

The CalEnviroScreen score derived for a given tract is relative to other tracts in the state (CalEPA 2014a, pg. 5). Values for the various indicators are shown as percentiles, which rank the percent of all census tracts with a lower score. A higher percentile indicates a higher potential relative burden. CalEnviroScreen scores are calculated by multiplying the pollution burden and population characteristics categories together into a single unified score (Pollution Burden X Population Characteristics = CalEnviroScreen Score) (CalEPA 2014a). Each group has a maximum score of 10, thus the maximum CalEnviroScreen score is 100. **Environmental Justice Table 1** lists the indicators that go into the pollution burden score and the population characteristics score to form the unified CalEnviroScreen score. These indicators are used to measure factors that affect the potential for pollution impacts in communities.

[6] The California Environmental Protection Agency (CalEPA), for purposes of its Cap-and-Trade Program, has designated “disadvantaged communities” as census tracts having a CalEnviroScreen score at or above the 75th percentile (CalEPA 2014a).

Environmental Justice Table 1
Components that form the CalEnviroScreen 2.0 Score

Pollution Burden	
Exposure Indicator	Environmental Effects Indicators
Ozone concentrations	Cleanup sites
Particulate Matter (PM) 2.5 concentrations	Groundwater threats
Diesel PM emissions	Hazardous waste
Pesticide Use	Impaired water bodies
Drinking water contaminants	Solid waste sites and facilities
Toxic releases from facilities	
Traffic density	
Population Characteristics	
Sensitive Populations Indicators	Socioeconomic Factors Indicators
Children (under age 10) and elderly (over age 65)	Educational attainment
Low birth-weight births	Linguistic isolation
Asthma emergency department visits	Poverty
	Unemployment

There are several limitations with CalEnviroScreen that are important to note (CalEPA 2014). Some limitations of CalEnviroScreen include the following:

- The score is not an expression of health risk.
- The score does not provide quantitative information on increase of cumulative impacts for specific sites or projects.
- The score provides a relative ranking of communities based on a select set of available datasets through a summary score, but does not provide a basis for determining when differences between scores are significant in relation to public health or the environment.
- The score is not intended to be used as a health or ecological risk assessment for a specific area or site.
- The score cannot be used in lieu of performing analysis of the potentially significant impacts, including the cumulative impacts, of a specific project.
- There are no new programs, regulatory requirements, or legal obligations created by the publication of CalEnviroScreen and no mandates to use the tool or the underlying data.
- The score provides a broad environmental snapshot of a given region.

Based on CalEnviroScreen data and other data specific to the project area, staff considers where project impacts would potentially occur and the extent to which that area of potential project impact is currently burdened. With this combined information, staff then assesses the extent of the project's impact on the EJ population. Because a CalEnviroScreen score evaluates multiple pollutants and factors collectively, staff examined individual contributions of indicators that are relevant to their technical area.

Not all of the technical areas that consider project impacts to an EJ population have relevant CalEnviroScreen indicators to their technical area.

Part of staff's assessment of how, or if, the project would impact an EJ population includes a review of CalEnviroScreen data for the project area. Staff uses CalEnviroScreen to better understand the characteristics of the areas where the impact would occur and ensure that disadvantaged communities in the vicinity of the proposed project have not been missed when screened by race/ ethnicity and poverty.

PROJECT OUTREACH

As a part of the U.S. EPA's definition of environmental justice, meaningful involvement is an important part of the siting process. Meaningful involvement occurs when:

- those whose environment and/or health would be potentially affected by the decision on the proposed activity have an appropriate opportunity to participate in the decision;
- the population's contribution can influence the decision;
- the concerns of all participants involved would be considered in the decision-making process; and,
- involvement of the population potentially affected by the decision on proposed activity is sought. (US EPA 2016)

The Energy Commission's outreach program is primarily facilitated by the Public Adviser's Office (PAO). This is an ongoing process that to date has involved the following efforts related to the project.

LIBRARIES

On June 20, 2016, Energy Commission staff sent the Puente Power Project Preliminary Staff Assessment (PSA) to local libraries in Oxnard, and to the state libraries in Eureka, Sacramento, Fresno, San Francisco, Los Angeles and San Diego. The FSA will be sent to the same libraries.

INITIAL OUTREACH EFFORTS

Energy Commission staff and the PAO coordinated closely on public outreach early in the review process. A Notice of Receipt of the Puente Application for Certification (AFC) and Notice of Public Participation were docketed and mailed to the project mail list on April 27, 2015. Public notices for the project in both English and Spanish were published in local newspapers on May 24, 2015 and May 28, 2015. The PAO made a presentation to the Oxnard City Council on July 14, 2015, outlining the Energy Commission's review process and avenues for public participation.

The PAO contacted local elected officials, Native American tribal groups, and community groups, including Central Coast United for a Sustainable Economy (CAUSE), Mixteco Indigena Community Organizing Project (MICOP), and the United Farm Workers. PAO also published notices in English and Spanish in the local newspapers prior to the August 27, 2015 Site Visit, Informational Hearing and Environmental Scoping Meeting. Spanish-language interpreters facilitated public comment at the hearing.

Energy Commission regulations require staff to notice, at a minimum, property owners within 1,000 feet of a project and 500 feet of a linear facility (such as transmission lines, gas lines, and water lines). This was done for the project, and the property owners list has been augmented to include the surrounding political jurisdictions, school districts, state and federal agencies, and interest groups.

Energy Commission staff held a public workshop for the PSA in the city of Oxnard on Thursday July 21, 2016 at the Oxnard Performing Arts Center. Headsets with simultaneous Spanish translation were available for the workshop. The **Executive Summary** section of the PSA was translated into Spanish. The **Executive Summary** section of the FSA will also be translated in Spanish.

The Energy Commission Committee assigned to conduct proceedings on the AFC held a Status Conference in Oxnard on Tuesday September 27, 2016 at the Oxnard Performing Arts Center. The committee provided feedback on the PSA, discussed case progress and schedule, and heard public comments. Headsets with simultaneous Spanish translation were available for the Status Conference.

PROJECT-SPECIFIC DEMOGRAPHIC SCREENING

Puente is located in the city of Oxnard, Ventura County, within the boundaries of the existing Mandalay Generation Station (MGS) industrial site (393 North Harbor Boulevard).

Environmental Justice Figure 1 (using a one-, three-, and six-mile radius) shows that the population in these census blocks represents an EJ population based on race and ethnicity as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*. The population in the six-mile radius lives primarily within the cities of Oxnard, Port Hueneme, and San Buenaventura (Ventura) and portions of Ventura County.

In an effort to update population data since the 2010 decennial U.S. Census, staff has included **Environmental Justice Table 2** to provide the reader a comparison of decennial and ACS data for minority populations. As shown in the table below, the percent of minority populations in the cities of Oxnard and San Buenaventura have remained consistent since 2010, while there has been about a five percent increase in minority populations in Port Hueneme.

Environmental Justice Table 2
Minority Population Data Within the Project Area

Cities in the six-mile radius		Total Population	Not Hispanic or Latino: White alone	Minority	Percent Minority (%)
Oxnard	April 1, 2010 Census [1]	197,899	29,410	168,489	85.14
	2010-2014 Estimate [2]	201,744 ±157	28,493 ±1,301	173,25 ±1,310	85.88 ±0.65
Port Hueneme	April 1, 2010 Census	21,723	7,291	14,432	66.44
	2010-2014 Estimate	21,949 ±63	6,263 ±631	15,686 ±634	71.47 ±2.88
San Buenaventura (Ventura)	April 1, 2010 Census	106,433	63,879	42,554	39.98
	2010-2014 Estimate	108,449 ±55	64,312 ±1,295	44,137 ±1,296	40.70 ±1.20
Notes: Staff's analysis of the 2010 – 2014 estimates returned CV values less than 15, indicating the data is reliable. **Sources:** [1] US Census 2010a and [2] US Census 2015a.					

Low Income Populations

Staff identified the below-poverty-level population in the project area using place level data (city) from the ACS Five-Year Estimates[7] (US Census 2015b). **Environmental Justice Table 3** shows poverty data for the cities of Oxnard, San Buenaventura (Ventura), and Port Hueneme, and for Ventura County. The cities are situated in the six-mile radius of the project site, while Ventura County is the reference geography.

7 Staff determined that data at the place (city) level is the lowest level available that retains reasonable accuracy. The data represents a period estimate, meaning the numbers represent an area's characteristics for the specified time period.

Environmental Justice Table 3
Poverty Data within the Project Area

Cities in the six-mile radius	Total	Income in the past 12 months below poverty level	Percent below poverty level (%)
	Estimate*	Estimate	Estimate
Oxnard	200,076 ±394	31,956 ±2,320	16.00 ±1.2
Port Hueneme	21,020 ±310	3,848 ±838	18.30 ±4
San Buenaventura (Ventura)	106,870 ±262	11,532 ±1,399	10.80 ±1.3
Reference geography			
Ventura County	824,329 ±959	91,912 ±3,350	11.10 ±0.4
Notes: * Population for whom poverty status is determined. Staff's analysis of the 2010 – 2014 estimates returned CV values less than 15, indicating the data is reliable. **Source:** US Census 2015b.			

The cities of Oxnard and Port Hueneme have a higher percent of people living below the federal poverty level (approximately five and seven percent higher, respectively) when compared with Ventura County. Staff concludes that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitutes an EJ population based on poverty as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*.

PROJECT-SPECIFIC CALENVIROSCREEN RESULTS

Environmental Justice Figure 1 presents the minority data at the census block geographic level and marks the census tract boundaries of the tracts identified in CalEnviroScreen 2.0 as disadvantaged communities. CalEPA identifies disadvantaged communities as the 25 percent (75 to 100 percentile) highest-scoring census tracts in California (CalEPA 2014b).

By layering the minority data at the census block level with the census tract boundaries identified as disadvantaged communities, the minority block level data shows the census blocks where people live. Areas within the census tract boundaries without any shading are areas without residences. The size of the census block correlates with the number of residences in the block; the same is true of census tracts. For example, the smaller the census block or tract, the more densely populated that block or tract is. Likewise, the larger the block or tract, the less densely populated that block or tract is. The census block is the smallest census geographic entity.

When the staff from the 12 technical areas identified impacts from the project that could affect an EJ population, staff reviewed **Environmental Justice Figure 1** and considered the associated data in their project impact analysis for the EJ population.

A review of **Environmental Justice Figure 1** shows that the closest residences to the project site within a disadvantaged census tract are at the southeast corner of the intersection of Pacific Coast Highway and West Fifth Street, approximately 4.5 miles due east from the project site.

Environmental Justice Table 4 presents the CalEnviroScreen data for the disadvantaged community census tracts in a six-mile radius of the Puente site. Where percentiles for CalEnviroScreen indicators are 90 and above, the percentile is shown in bold. These relatively higher percentiles could be seen as drivers for the census tract's identification as a disadvantaged community. Two of the census tracts in the project's six-mile radius have percentiles above 90 percent for population characteristics. All of the disadvantaged census tracts have percentiles above 90 for pesticides. All but two disadvantaged census tracts have indicators in both the pollution burdens and population characteristics groups of indicators with percentiles above 90.

Environmental Justice Table 4
CalEnviroScreen Scores for Disadvantaged Communities

Disadvantaged Communities by Census tract in the Project's Six-Mile Radius[1]						
Census Tract Number		61110049002	6111009100	6111004715	6111003900	6111004503
Total Population		5,091	5,279	5,020	7,533	4,387
CES 2.0 Percentile Range[2]		96-100	91-95	91-95	81-85	76-80
Ozone	PERCENTILES	0.10	0	0	0	0
PM 2.5		36.54	36.33	39.30	36.95	37.89
Diesel PM		53.95	43.86	28.91	40.74	49.82
Drinking Water		38.41	38.91	54.48	38.91	38.91
Pesticides		**99.83**	**98.54**	**99.67**	**96.88**	**97.84**
Toxic Release		61.30	69.08	88.61	77.24	**96.51**
Traffic		71.92	36.57	24.65	47.57	53.09
Cleanup Sites		0	64.78	**92.91**	42.59	42.64
Groundwater Threats		85.12	**92.68**	88.36	85.01	0
Hazardous Waste		86.51	75.34	69.91	50.42	25.63
Impaired Water Bodies		**97.27**	0	80.63	0	0
Solid Waste		86.34	23.19	**95.83**	0	0
POLLUTION BURDEN		88.21	68.33	89.71	61.39	56.50
Age		85.80	57.47	49.23	54.93	33.04
Asthma		81.30	81.13	58.19	60.16	58.18
Low Birth Weight		74.09	75.39	81.90	44.55	78.53
Education		**99.10**	**98.81**	84.61	**92.96**	89.99
Linguistic Isolation		**91.43**	**93.49**	77.38	**97.41**	82.25
Poverty		89.90	**94.16**	67.75	89.38	81.23
Unemployment		26.96	82.51	58.54	66.14	78.08
POPULATION CHARACTERISTICS		93.65	97.57	80.65	86.68	85.73

Notes: [1]Disadvantaged Communities census tracts that intersect or are within a six-mile radius of the project site. Indicators with percentiles that are shown as **bold** text are in the 90 percentile or higher. [2]Overall CalEnviroScreen Score Percentile Range.
Source: CalEPA 2014a

PROJECT IMPACTS TO THE ENVIRONMENTAL JUSTICE POPULATION

The following is a summary of the conclusions on project impacts to the EJ population from each of the 12 technical areas. For more information refer to the subject technical area section of the Final Staff Assessment. The technical areas of cultural resources,

hazardous materials management, land use, noise and vibration, socioeconomics, transmission line safety and nuisance, and visual resources would not have the type of impacts that would combine with any of the indicators that make up the CalEnviroScreen score.

AIR QUALITY

Staff concludes that the proposed project's air quality impacts would be mitigated to be less than significant, including ozone precursor and PM2.5 impacts. Both ozone and PM2.5 impacts are regional, not local, and require both time and space for these pollutants to form. As a result, mitigation measures are regional, not local. To evaluate the impacts on nearby EJ communities, staff reviewed **Environmental Justice Figure 1** and **Environmental Justice Table 3** and information found in CalEnviroScreen. With the proposed mitigation measures, EJ communities would not be exposed to increases in ozone or PM2.5 concentrations. Therefore, the project would not individually or cumulatively contribute to disproportionate impacts to the EJ population. Staff concludes that air quality impacts from the project on the EJ population would be less than significant.

CULTURAL RESOURCES

Environmental Justice Figure 1, which shows population based on race and ethnicity, and **Environmental Justice Table 3**, which displays population based on poverty, indicate that an environmental justice population does exist within a six-mile radius of the proposed project area. Staff also reviewed the ethnographic and historical literature to determine whether any Native American populations use or reside in the project area. Staff concluded that because there are no known currently used hunting and gathering areas that could be impacted by the proposed project, Native Americans are not considered members of the environmental justice population for this project. Therefore, staff concludes there would be no impacts to Native American populations and likewise, no disproportionate impact.

HAZARDOUS MATERIALS MANAGEMENT

Staff concludes that while the transportation, storage, and use of hazardous materials at the project could potentially pose a risk of impact to the Environmental Justice (EJ) population represented in **Environmental Justice Population Figure 1** and **Table 3**, such an occurrence would be very unlikely and would not be expected during the lifetime of the proposed project.

Two plausible yet very unlikely incidents include (1) a worst-case release of the entire contents of the aqueous ammonia storage tank and (2) an accident involving an aqueous ammonia delivery truck severe enough to release its contents. Staff's analysis shows that both of these incidents are highly unlikely. With the adoption of staff's proposed Conditions of Certification **HAZ-4, -5**, and **-6**, the use, storage, and transportation of hazardous materials at the project would not present a significant risk of impact to the surrounding EJ population. Similarly, the risk of a potential hazardous materials management impact would not disproportionately affect the EJ population.

LAND USE

Potential land use impacts for a project on an EJ population would be predominantly driven by physical land use incompatibilities or the division of an established community. Staff concluded that the construction, demolition, and operation of Puente would not result in physical land use incompatibilities or division of an established community. The project's land use impact area includes the proposed site and immediately adjacent and nearby land uses. There is not an EJ population residing within one mile of the project's land use impact area. Thus, the project's impacts would not have an effect on any population, including the EJ population during construction, decommissioning, and demolition. No impacts would occur during operations.

Staff concluded that the project's land use impacts would not disproportionately affect the EJ population, as the project impacts would not affect any population living in the impact area. The land use impacts from the project on the EJ population would be less than significant.

NOISE AND VIBRATION

Staff reviewed **Environmental Justice Figure 1** and **Table 3** in the **Environmental Justice** section to examine whether the construction and operation of Puente would have significant, unmitigated impacts or disproportionate impacts on an EJ population.

Staff has prepared Conditions of Certification **NOISE-1** through **NOISE-7** to ensure noise impacts are reduced to less than significant for all the area's population, including the EJ population.

The nearest EJ population is located approximately four miles east of the proposed project site, but noise impacts may occur within only one mile from the project site. The nearest residential receptors (future Beach Walk Subdivision) would be approximately 0.5 mile from the project, but would not be an EJ population. Farm workers are present within approximately 800 feet of the project fence line but restrictions on construction and demolition activities described in Conditions of Certification **NOISE-6** and **NOISE-7** would reduce the noise impact. In addition, these workers would be protected through their employer's OSHA requirements for hearing protection and Condition of Certification **NOISE-1** requiring the project owner to notify the farm workers' employer of the start of construction. Due to the distance between the project and where the nearest EJ population resides, noise impacts would not be disproportionate. Therefore, noise produced by project construction and operation would not cause significant, unmitigated impacts to noise-sensitive receptors and would not contribute to disproportionate impacts to the EJ population, individually or cumulatively.

PUBLIC HEALTH

Staff concludes that the proposed project would not cause impacts to public health, and health risks associated with construction, demolition and operation of the project would be less than significant. Therefore, no one (including the public, off-site nonresidential workers, recreational users, and EJ populations) would experience any acute or chronic cancer or non-cancer effects of health significance due to construction and operation of the proposed Puente facility and the demolition of MGS units 1 and 2. To evaluate the

risks and impacts on nearby EJ communities, staff reviewed **Environmental Justice Figure 1** and **Table 3**, and the information generated by CalEnviroScreen 2.0. Upon further analysis on the CalEnviroScreen indicators related to public health, staff concluded that the Puente Power Project would not affect the EJ disadvantaged communities which are already burdened by some public health-related indicators. Also, public health impacts are usually not significant unless the emitting sources are extremely close to each other, within a few blocks, not miles. Therefore, staff concluded that Puente Power Project would not affect the EJ disadvantaged communities identifed by CalEnviroScreen and staff EJ evaluations.

SOCIOECONOMICS

Staff concludes that construction and operation of Puente would not cause significant adverse direct, indirect, or cumulative socioeconomic impacts on the project area's housing, law enforcement services, or parks. Staff also concludes the project would not induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services.

Impacts to housing supply could disproportionately affect minorities and low income populations. In the case of Puente's impacts, the few construction workers seeking lodging during project construction and demolition would result in a negligible reduction of the housing supply that would not disproportionately impact the EJ population living in the study area.

None of the socioeconomic impacts from Puente would disproportionately affect the EJ population.

Staff concludes that the project's socioeconomic impacts would be less than significant on the EJ population represented in **Environmental Justice Figure 1** and **Table 3**. In addition, these effects would not disproportionately impact the EJ population living in the study area.

SOIL AND WATER RESOURCES

Staff concludes that the proposed project would not cause impacts to groundwater quality or potable water supplies, and impacts on surface water quality would be mitigated to less than significant. Staff's evaluation of flood risks concludes that present-day flood risks are low and future flood risks could be between low and moderate. To evaluate the risks and impacts on nearby EJ communities, staff reviewed **Environmental Justice Figure 1** and **Table 3**, and the information found in CalEnviroScreen. Upon further analysis, staff concluded that Puente's wastewater would be managed to meet minimum water quality standards that would not affect potable water supplies. Impacts would not increase existing impairments to water resources and, therefore, would not individually or cumulatively contribute to disproportionate impacts to the EJ population. Soil and water resources impacts from the project on the EJ population would be less than significant.

TRAFFIC AND TRANSPORTATION

Staff identified one traffic impact that could potentially affect the EJ populations represented in **Environmental Justice Figure 1** and **Table 3**. With staff's proposed condition of certification (**TRANS-2**) implementing a Traffic Control Plan (TCP) and (**TRANS-3**) restoring all public roads, easements, and rights-of-way, the impact would be less than significant on any population, including the EJ population. **TRANS-2** would reduce the potential for accidents caused by construction traffic exiting the project site to travel northbound on Harbor Boulevard. **TRANS-3** would require the project owner to restore all public roads, easements, rights-of-way, and any other transportation infrastructure damaged due to project-related construction and demolition activities and traffic.

Staff reviewed **Environmental Justice Figure 1** and using the best reasonable estimate of where the less-than-significant project impacts would occur, compared the location of these impacts to the census tracts in the figure that are identified as disadvantaged communities by CalEPA. There are no disadvantaged communities in the vicinity of the project site and extending north on Harbor Boulevard and Victoria Avenue to Highway 101, where the less than significant project impacts are expected to occur.

Staff concluded that the project's traffic and transportation impacts would not disproportionately affect the EJ population, as these types of impacts would affect the EJ population just as they would affect any population living in the impact area. The traffic and transportation impacts from the project on the EJ population would be less than significant with staff's proposed condition of certification.

TRANSMISSION LINE SAFETY AND NUISANCE

Staff concludes that since the proposed transmission lines would be short in length with no nearby residences, there would be no potential for residential electric and magnetic field exposures, which have been of some health concern for previous projects. Short-term exposures have negligible health concerns. In addition, with the four proposed conditions of certification, any safety and nuisance impacts from construction and operation of the proposed lines would be less than significant. Any off-site workers, such as farm workers, would usually be in the vicinity of potential **TLSN** impacts only for a short period of time.

VISUAL RESOURCES

Staff's proposed mitigation would reduce visual resource impacts to less than significant for the population in general, including the EJ population represented in **Environmental Justice Figure 1** and **Table 3**. The project would occupy a very small portion of the field of view from EJ populations because of the distance to the project site. Overall, changes to the visual resource environment would not disproportionally affect individuals in EJ populations because of the low degree of visual change.

Staff concluded that the project's visual resource impacts would not disproportionately affect the EJ population, as these types of impacts would affect the EJ population just

as they would affect the population living in the study area. The visual resource impacts from the project on the EJ population would be less than significant with staff's proposed conditions of certification.

WASTE MANAGEMENT

To evaluate the risks and impacts of the Puente project on nearby communities, staff reviewed **Environmental Justice Figure 1** and **Table 3**, and the information found in CalEnviroScreen. Although multiple factors increase the vulnerability of EJ communities to sites that require cleanup, increase exposure to hazardous waste sites, and increase exposure to illegal dump sites, the proposed Puente project would not exacerbate these conditions or cause disproportionate exposure to the EJ community from the perspective of waste management.

Staff believes that Puente would not result in any additional environmental impacts related to waste management that would disproportionately affect an EJ community. Staff has added conditions of certification that would reduce the risk associated with contaminated soils, and disposal of non-hazardous or hazardous waste, to a less than significant level. Staff concludes that there would be no significant impact from demolition, construction, or operation of the power plant on EJ populations.

STAFF CONTRIBUTORS TO THE ENVIRONMENTAL JUSTICE ANALYSIS

The following staff are responsible for specific topics and technical analyses in the **Environmental Justice** section of this staff assessment. Staff names are listed with their area of technical expertise.

Topic	**Staff**
Demographics	Lisa Worrall
Public Outreach	Shawn Pittard
Technical Area	**Staff**
Air Quality	Jacquelyn Record
Cultural Resources	Matt Braun
Hazardous Materials Management	Brett Fooks, P.E.
Land Use	Steven Kerr Ashley Gutierrez
Noise and Vibration	Shahab Khoshmashrab, P.E. Ed Brady, P.E.
Public Health	Huei-An (Ann) Chu, Ph.D.
Socioeconomics	Lisa Worrall
Soil and Water Resources	Marylou Taylor, P.E.
Traffic and Transportation	Andrea Koch-Eckhardt Jonathan Fong
Transmission Line Safety and Nuisance	Huei-An (Ann) Chu, Ph.D.
Visual Resources	Eric Knight
Waste Management	Ellie Townsend-Hough Paul Marshall

REFERENCES

CalEPA 2014a – California Communities Environmental Health Screening Tool, Version. 2.0 (CalEnviroScreen 2.0), Guidance and Screening Tool, October 2014, <http://oehha.ca.gov/ej/ces2.html>.

CalEPA 2014b – California Environmental Protection Agency, *Designation of Disadvantaged Communities Pursuant to Senate Bill 535 (De Leon),* October 2014, <http://www.calepa.ca.gov/EnvJustice/GHGInvest/>.

CEQ 1997 – Council on Environmental Quality, Environmental Justice: Guidance Under the National Environmental Policy Act, December 10, 1997. <http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceqa1297.pdf>.

US Census 2000 – United States Census Bureau, P001: Total Population [1] – Universe: Total population, Census 2--- Summary File (SF 1) 100-percent Data, <http:factfinder2.censuc.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2009 – United States Census Bureau, Compass for Understanding and Using American Community Survey Data: What State and Local Governments Need to know, Issued February 2009, <http://www.census.gov/ace/www/guidance_for_data_users/handbooks/>.

US Census 2010a – United States Census Bureau, QT-PL-Race, Hispanic or Latino, Age, and Housing Occupancy: 2010 – Census Redistricting Data (Public Law 94-171) Summary File, Tables P1, P2, P3, P4, H1, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2010b – United States Census Bureau, QT-H1: General Housing Characteristics: 2010 – 2010 Census Summary File 1, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2013a – United States Census Bureau, American Community Survey Information Guide, Issued April 2013, <http://www.census.gov/acs/www/Downloads/ACS_Information_Guide.pdf>.

US Census 2015a – United States Census Bureau, DP05: ACS DEMOGRAPHIC AND HOUSING ESTIMATES -2010 – 2014 American Community Survey 5-Year Estimates, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2015b – United States Census Bureau, S1701 POVERTY STATUS IN THE PAST 12 MONTHS- 2010 – 2014 American Community Survey 5-Year Estimates, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

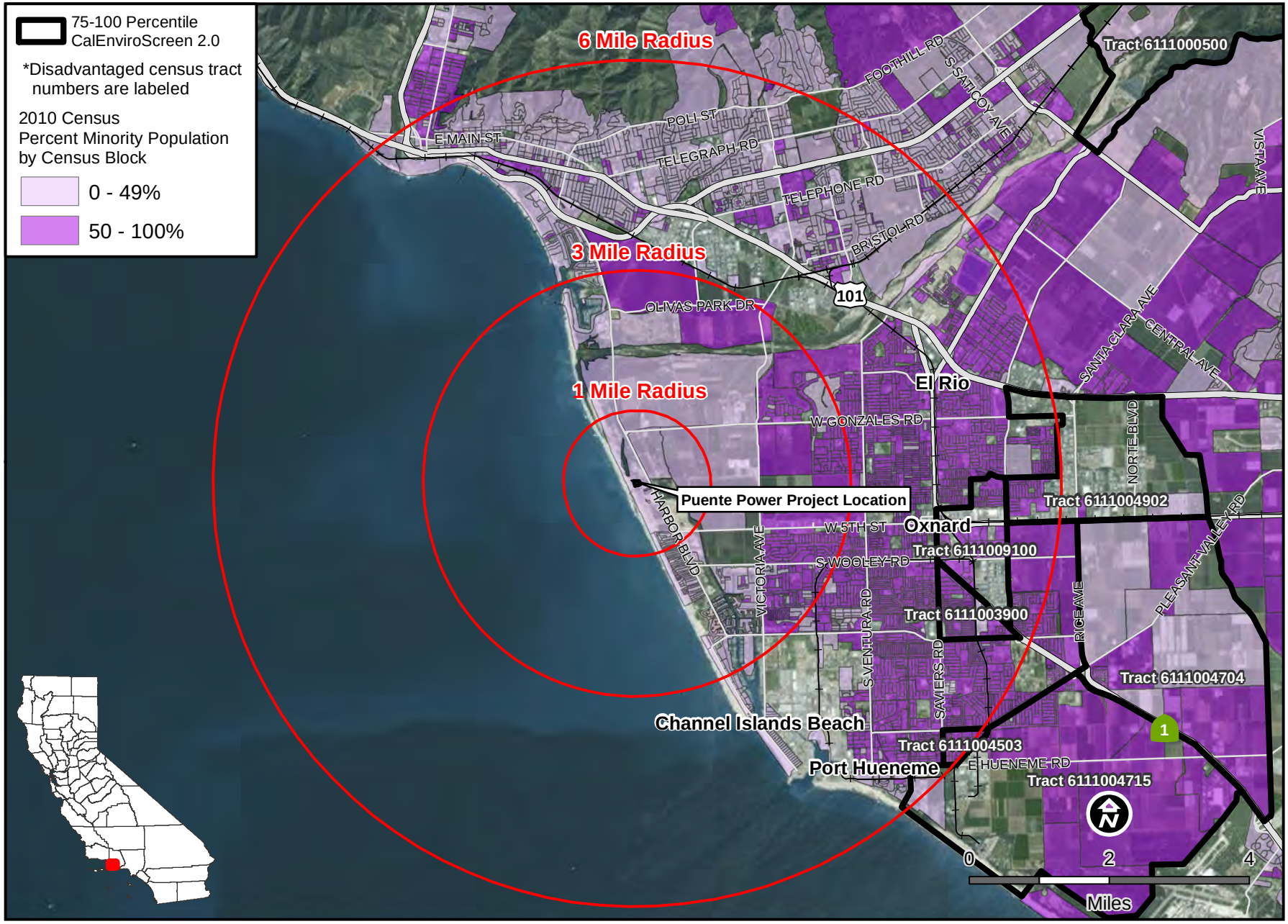
US Census 2015c – United States Census Bureau, B01003: TOTAL POPULATION – Universe: Total population, 2010 – 2014 American Community Survey 5-Year Estimates, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

US EPA 1998 – United States Environmental Protection Agency, Final Guidelines for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis, April 1998, <http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa)epa0498.pdf>.

US EPA 2016 – United States Environmental Protection Agency, Technical Guidance for Assessing Environmental Justice in Regulatory Analysis, June 2016, <https://www.epa.gov/environmentaljustice/technical-guidance-assessing-environmental-justice-regulatory-analysis>.

ENVIRONMENTAL JUSTICE - FIGURE 1

Puente Power Project (P3) - Census 2010 Minority Population by Census Block with CalEnviroScreen Disadvantaged Communities by CensusTracts



ENVIRONMENTAL JUSTICE

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCES: Census 2010 PL 94-171 Data and CalEnviroScreen 2.0 CalEPA 2014

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Brett Fooks, PE and Geoff Lesh, PE

SUMMARY OF CONCLUSIONS

Staff concludes, based on its evaluation of the proposed Puente Power Project (Puente or project), along with staff's proposed mitigation measures, that hazardous materials use at the site would not present a significant risk of impact to the public. With adoption of the proposed conditions of certification, the proposed project would comply with all applicable laws, ordinances, regulations, and standards. In response to California Health and Safety Code, section 25531 et seq., NRG Energy Center Oxnard, LLC (NRG or applicant), would be required to develop a risk management plan. To ensure the adequacy of this plan, staff's proposed conditions of certification require that the risk management plan be submitted for concurrent review by the city of Oxnard Fire Department (OFD) and Energy Commission staff. In addition, staff's proposed conditions of certification require staff review and approval of the risk management plan prior to delivery of any bulk hazardous materials to the Puente project site. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia and site security.

INTRODUCTION

The purpose of this hazardous materials management analysis is to determine if the proposed Puente project has the potential to cause significant impacts on the public as a result of the use, handling, storage, or transportation of hazardous materials at the proposed site. If a significant risk of impact on the public is identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce those impacts to the extent feasible.

This analysis does not address the potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and provide them with special personal protective equipment (PPE) and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **Worker Safety and Fire Protection** section of this document describes applicable requirements for the protection of workers from these risks.

Aqueous ammonia (19 percent ammonia in aqueous solution) would be used to control oxides of nitrogen (NOx) emissions from the combustion turbine by means of a process called selective catalytic reduction. The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with the use of the more hazardous anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the anhydrous form, which is stored as a liquefied gas at high pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations.

Spills associated with the aqueous form are much easier to contain than those associated with anhydrous ammonia, and the slow mass transfer from the surface of the spilled material limits emissions from such spills.

Other hazardous materials, such as mineral and lubricating oils, cleaning detergents, and welding gasses would be present at the proposed Puente project. No acutely toxic hazardous materials would be used on site during construction, and none of these materials pose significant risk of off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Handling of hazardous materials during construction would follow best management practices (BMPs) to minimize environmental effects (PPP 2015a, Section 4.5.2).

Although no natural gas is stored, the project would involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. The proposed project would connect to a new Southern California Gas Company (SoCalGas) gas metering station on the site. Approximately 500 feet of new natural gas pipeline would be installed on site from the new metering station to the new gas compressor enclosure. The compressor would boost the natural gas to 500 pounds per square inch for the combustion turbine (PPP 2015a, Section 2.7.4). Puente would also require the transportation of aqueous ammonia to the facility. This document addresses all potential impacts associated with the use and handling of hazardous materials.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

Hazardous Materials Management Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r))	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.

Applicable LORS	Description
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written spill prevention, control, and countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Title 49, Code of Federal Regulations, Part 190	Outlines gas pipeline safety program procedures.
Title 49, Code of Federal Regulations, Part 191	Addresses transportation of natural and other gas by pipeline: annual reports, incident reports, and safety-related condition reports. Requires operators of pipeline systems to notify the DOT of any reportable incident by telephone and then submit a written report within 30 days.
Title 49, Code of Federal Regulations, Part 192	Addresses transportation of natural and other gas by pipeline and minimum federal safety standards, specifies minimum safety requirements for pipelines including material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. This part also contains regulations governing pipeline construction (which must be followed for Class 2 and Class 3 pipelines) and the requirements for preparing a pipeline integrity management program.
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
State	
Title 8, California Code of Regulations, section 5189	Requires facility owners to develop and implement effective safety management plans that ensure 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 Risk Management Plan (RMP) process.
California Health and Safety Code, section 25531 to 25543.4	The California Accidental Release Program (CalARP) requires the preparation of a Risk Management Plan (RMP) and off-site consequence analysis (OCA) and submittal to the local Certified Unified Program Agency for approval.
California Health and Safety Code, section 41700	Requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
Title 19, California Code of Regulations, Division 2, Chapter 4.5, Articles 1-11	Sets forth the list of regulated substances and thresholds, the requirements for owners and operators of stationary sources concerning the prevention of accidental releases, the accidental release prevention programs approved under Section 112 of the federal Clean Air Act (CAA) Amendments of 1990 and mandated under the CalARP Program, and how the CalARP Program relates to the state’s Unified Program.
Title 22, California Code of Regulations, Chapter 14, Article 10	The design requirements set forth for new tank construction and secondary containment requirements for hazardous chemicals and waste.

Applicable LORS	Description
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
California Public Utilities Commission General Order 112-E and 58-A	Contains standards for gas piping construction and service.
Local (or locally enforced)	
City of Oxnard Municipal Code Chapter 14: Building Regulations, Article XV: Fire Codes, Section 14-24	The city has adopted the 2013 California Fire Code.
City of Oxnard Municipal Code Chapter 14: Building Regulations, Article XV: Fire Codes, Section 14-25	The city has adopted amendments to the 2013 California Fire Code.
City of Oxnard Municipal Code Chapter 14: Building Regulations, Article XVI: Fire Sprinklers, Section 14-26	The city has adopted amendments to the 2013 California Fire Code, Section 903, and Automatic Sprinkler Systems.

The Certified Unified Program Authority (CUPA) with the responsibility to review the Hazardous Materials Business Plans (HMBP), Risk Management Plans (RMP), and Spill Prevention Control and Countermeasures (SPCC) filed by businesses located within the city is the city of Oxnard Fire Department (OFD). The OFD is responsible for all other CUPA programs including underground storage compliance. Construction and design of the buildings and vessels storing hazardous materials would meet the appropriate seismic requirements of the latest adopted (2013 or later) California Building Code and the latest adopted (2013 or later) California Fire Code.

SETTING

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

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

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction, and air temperature, affect both the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects

the potential magnitude and extent of public exposure to such materials, as well as their associated health risks. When wind speeds are low and the atmosphere stable, dispersion is severely reduced but can lead to increased localized public exposure.

Recorded wind speeds and directions are described in the **Air Quality** section 4.1 of the Application for Certification (AFC) (PPP 2015a). Staff agrees the applicant's proposed meteorological input assumptions for modeling of potential accidental hazardous material releases that would use the U.S. Environmental Protection Agency's *RMP Offsite Consequence Analysis Guidance* document which assumes environmental conditions of F stability (stagnated air, very little mixing), wind speed of 1.5 meters per second, and the maximum temperature recorded in the area in the last three years, is appropriate for conducting the worst-case off-site consequence analysis (PPP 2015a, Section 4.5.2.3.2).

TERRAIN CHARACTERISTICS

The location of elevated terrain is often an important factor in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The existing Puente topography is virtually flat, sloping seaward and bounded on the west by sand dunes along the coastline. The existing site is on relatively level ground at an elevation of 14 feet mean lower low water (MLLW). The sand dunes and flood protection berm that border the facility range in elevation from 20 to 30 feet MLLW (PPP 2015a).

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a major bearing on health risk. The nearest sensitive receptor would be a family childcare facility on Reef Way, approximately one mile to the southeast (PPP 2015a, Section 4.9.1). The nearest residents would be approximately 0.74 miles to the south. There is also a scheduled residential development to start construction at the end of 2016, which would be approximately 0.47 miles to the southeast of the site (PPP 2015a, Section 4.9.1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. The chemicals listed in the AFC (PPP 2015a, Table 4.5-1 & Table 4.5-2) were evaluated. Staff's analysis addresses the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. To accomplish this goal, staff

utilized the current public health exposure levels (both acute and chronic) that are established to protect the public from the effects of an accidental chemical release.

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

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

Staff reviewed and evaluated the applicant's proposed use of hazardous materials as described by the applicant which are shown in Appendix B of this FSA. Staff's assessment followed the five steps listed below.

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Appendix B of this **Hazardous Materials Management** section of this FSA and determined the need and appropriateness of their use.
- Step 2: Those chemicals proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off site and impact the public were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different-sized transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the theoretical impacts on the public of a worst-case spill of hazardous materials, as reduced by the mitigation measures proposed by the applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to an insignificant level, staff would propose

additional prevention and response controls until the potential for causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 that some hazardous materials, although present at the proposed facility, pose a minimal potential for off-site impacts since they would be stored in a solid form or in smaller quantities, have low mobility, or have low levels of toxicity. These hazardous materials, which were eliminated from further consideration, are briefly discussed below.

During the construction phase of the project, the hazardous materials proposed for use are paints, paint thinners, cleaners, solvents, sealants, gasoline, diesel fuel, motor oil, hydraulic fluid, lubricants, and welding gases. Any impact of spills or other releases of these materials would be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards even in larger quantities.

During operations, hazardous chemicals such as cleaning agents, lube oil, mineral insulating oil, and other various chemicals (see **APPENDIX B** of this **Hazardous Materials Management** section for a list of all chemicals proposed to be used and stored at Puente) would be used and stored in relatively small amounts and represent limited off-site hazards because of their small quantities, low volatility, and/or low toxicity).

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials, natural gas and aqueous ammonia. However, the project would be limited to using, storing, and transporting only those hazardous materials listed in **APPENDIX B** of the section as per staff's proposed condition **HAZ-1**.

Large Quantity Hazardous Materials

Natural Gas

Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. Although methane is colorless, odorless, tasteless, and lighter than air, odorant is added to natural gas to make even small quantities easily noticed. Methane can cause asphyxiation above 90 percent in concentration. Methane is flammable when mixed in air at concentrations of 5-14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However,

it should be noted that, due to its tendency to disperse rapidly (Lees 2012), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas. Natural gas can explode under certain confined conditions as demonstrated by the natural gas explosion at the Kleen Energy power plant in Middletown, Connecticut in February 2010 (Chemical Safety Board (US CSB 2010).

While natural gas would be used in significant quantities, it would not be stored on site. It would be delivered by SoCalGas via a new gas metering station (PPP 2015a, Section 2.7.4). The pipeline and new onsite metering station are, and would continue to be, owned and operated by SoCalGas.

The existing SoCalGas metering station, located on-site near the northern end of the existing site, would remain in service during Puente construction for continued operation of the existing Mandalay Generating Station (MGS) Units 1 & 2 until they are decommissioned. The existing metering station would continue to serve MGS Unit 3 on the site.

The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85 requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures would significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start up, thereby precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas, and would significantly reduce the potential for equipment failure due to either improper maintenance or human error.

Staff concludes that existing LORS are sufficient to ensure minimal risks of failure of a new interconnection pipeline. Additionally, the new and existing gas metering stations are located entirely on-site, which greatly reduces the risks of impacts to the public from a rupture or failure.

On June 28, 2010, the United States Chemical Safety and Hazard Board (US CSB) issued Urgent Recommendations to the United States Occupational Safety and Health Administration (OSHA), the NFPA, the American Society of Mechanical Engineers (ASME), and major gas turbine manufacturers, to make changes to their respective regulations, codes, and guidance to require the use of inherently safer alternatives to natural gas blows for the purposes of pipe cleaning (US Chemical Safety Board 2010). Recommendations were also made to the 50 states to enact legislation applicable to power plants that prohibits flammable gas blows for the purposes of pipe cleaning.

In accordance with those recommendations, staff proposes Condition of Certification **HAZ-9**, which prohibits the use of flammable gases for pipe cleaning (gas blows) at the facility, including during construction and after the start of operations. Fuel gas pipe cleaning and purging shall adhere to the provisions of the latest edition of NFPA 56, the Standard for Fire and Explosion Prevention during Cleaning and Purging of Flammable

Gas Piping Systems, with special emphasis on sections 4.4.1 (written procedures for pipe cleaning and purging) and 6.1.1.1 (prohibition on the use of flammable gas for cleaning or purging at any time).

Aqueous Ammonia

Aqueous ammonia would be used to control the emission of oxides of nitrogen (NO_x) from the combustion of natural gas at Puente. The accidental release of aqueous ammonia without proper mitigation can result in significant down-wind concentrations of ammonia gas. Puente would have 19-percent aqueous ammonia solution in an existing 14,650-gallon horizontal above ground storage tank (PPP 2015a, Section 4.5.2.3.1). Actual storage contents would be limited to 12,450 gallons or 85 percent of tank capacity. Based on staff's analysis described above, aqueous ammonia is the only hazardous material that may pose a risk of off-site impact. The use of aqueous ammonia can result in the formation and release of toxic gases (Lees 2012) in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia that would be used and stored on site. However, the use of aqueous ammonia poses less risk than the use of the more hazardous anhydrous ammonia.

To assess the potential impacts associated with an accidental release of aqueous ammonia, staff uses four benchmark exposure levels of ammonia gas occurring offsite. These include:

1. the lowest concentration posing a risk of lethality, 2,000 parts per million (ppm);

2. the immediately dangerous to life and health level of 300 ppm;

3. the emergency response planning guideline level 2 of 150 ppm, which is also the RMP level 1 criterion used by US EPA and California; and,

4. the level considered by staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm (considered by staff to be a level of significance).

If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff assumes that the potential release poses a risk of significant impact. However, staff then also assesses the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact. A detailed discussion of the exposure criteria considered by staff, as well as their applicability to different populations and exposure-specific conditions, is provided in **Appendix A** of this section.

Section 4.5.2.3.2 and Appendix F of the AFC (PPP 2015a) describe the modeling parameters that the project proposes to use for the worst-case accidental release of aqueous ammonia in the applicant's off-site consequence analysis (OCA). A new OCA analysis (PPP 2016h) with a new secondary containment location was docketed that superseded the description contained in the original AFC. Pursuant to the California

Accidental Release Program (CalARP) regulations, (federal RMP regulations do not apply to sources that store or use aqueous ammonia solutions below 20 percent), the OCA would be performed for the worst-case release scenario, which would involve the failure and complete discharge of the storage tank. Ammonia emissions from the potential release scenario would be calculated following methods provided in the RMP off-site consequence analysis guidance (US EPA, April 1999). Potential off-site ammonia concentrations would be estimated indicating the distance from the source release point to the benchmarks of ammonia concentration.

Staff reviewed the applicant's revised proposed aqueous ammonia storage facility description and updated OCA results (PPP 2016h).The applicant proposes placing a single layer of high density polyethylene (HDPE) balls inside a new secondary containment structure to limit the exposed surface area from 700 square feet to 65 square feet. The HDPE balls, which are small plastic balls that are approximately 6 inches in diameter, would reduce the effective surface area of the secondary containment by 90 percent limiting the evaporation rate of the aqueous ammonia. Staff verified the applicant's updated OCA results using the Areal Locations of Hazardous Atmospheres (ALOHA) modeling software. Staff's modeling using ALOHA indicated that in the event of a worst-case release, there would be a very small potential that ammonia concentrations of 75 ppm could reach just beyond the fence line of the project site, but would not extend to any off-site sensitive receptors. Staff's modeling has also demonstrated that even the worst case scenario would not have a significant impact on farm workers in the fields closest to the project site and any potential exposure would be at a de minimis level. Staff concurs with the applicant's ALOHA modeling and determination that a potential worst-case spill of aqueous ammonia would not pose a significant risk to off-site members of the public.

Staff's proposed Condition of Certification **HAZ-4** ensures that the aqueous ammonia secondary containment structure would include essential design elements to prevent a worst-case spill from producing significant off-site impacts. **HAZ-4** would also require that the applicant adopt best management practices for the maintenance of the HDPE balls.

Furthermore, the potential for accidents resulting in the release of hazardous materials is greatly reduced through implementation of a safety management program that would include the use of both engineering and administrative controls. Elements of both facility controls and the safety management plan are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the Puente project include:

- construction of secondary containment areas surrounding each of the hazardous materials storage areas, designed to contain accidental releases that might happen during storage or delivery;

- physical separation of stored chemicals in isolated containment areas with a non-combustible partition in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- installation of a fire protection system for hazardous materials storage areas;
- construction of a concrete containment area surrounding the aqueous ammonia storage tank, capable of holding the entire tank volume plus the water associated with a 24-hour period of a 25-year storm;
- construction of a sloped ammonia delivery truck unloading pad that drains into the storage tank's secondary containment structure;
- process protective systems including continuous tank level monitors, automated leak detectors, temperature and pressure monitors, alarms, and emergency block valves; and
- a single layer of HDPE balls to reduce the effective surface area and evaporation rate of any aqueous ammonia in the secondary containment.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from occurring and moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all applicable health and safety laws, ordinances, and standards.

A worker health and safety program would be prepared by the applicant and would include (but not be limited to) the following elements (see the **Worker Safety and Fire Protection** section for specific regulatory requirements):

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

At the facility, the project owner would be required to designate an individual with the responsibility and authority to ensure a safe and healthful work place. The project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community in the event of a violation of the health and safety program.

The applicant would be required to develop a safety management plan for the delivery of all liquid hazardous materials, including aqueous ammonia. Staff considers that an accidental release of aqueous ammonia during transfer from the delivery truck to the

storage tank, although likely much smaller in spilled volume than a worst-case spill, would be the most probable accident scenario and therefore proposes Condition of Certification **HAZ-3** requiring the development of a safety management plan. A safety management plan addressing the delivery of all liquid hazardous materials during construction, commissioning and operations would further reduce the risk of any accidental release not addressed by the proposed spill-prevention mitigation measures and the required RMP. This plan would additionally prevent the mixing of incompatible materials that could result in toxic vapors.

The applicant would also prepare a risk management plan for aqueous ammonia, as required by both CalARP regulations and Condition of Certification **HAZ-2**. This condition also includes the requirement for a program for the prevention of accidental releases and responses to an accidental release of aqueous ammonia. A hazardous materials business plan would also be prepared by the applicant and would incorporate California requirements for the handling of hazardous materials. Other administrative controls would be required in proposed Conditions of Certification **HAZ-1** (limitations on the use and storage of hazardous materials and their strength and volume) and condition of Certification **HAZ-4** would require that the final design drawings for the aqueous ammonia storage (and secondary containment) facility be submitted to the compliance project manager (CPM) for review and approval.

On-Site Spill Response

In order to address the issue of spill response, the facility would prepare and implement an emergency response plan that would include information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, and prevention equipment and capabilities, as well as other elements. Emergency procedures would be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

The emergency first responders to a hazardous materials incident at Puente would be from Station No. 6 of the OFD. If needed, a full hazardous materials response team would be provided from OFD Station No. 7. Staff finds that the OFD response team would be capable of responding to a hazardous materials emergency call from Puente.

Transportation of Hazardous Materials

Hazardous materials, including aqueous ammonia, would be transported to the facility by tanker truck. While many types of hazardous materials would be transported to the site, staff believes that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport.

Staff reviewed the applicant's proposed transportation route for hazardous materials delivery. Trucks would travel on US Highway 101, exiting on Victoria Avenue and traveling south to Gonzales Road, then west on Gonzales Road to Harbor Boulevard, then south on Harbor Boulevard to the Puente entrance (PPP 2015a, Section 4.5.2.3.1).

Ammonia can be released during a transportation accident and the extent of impact in the event of such a release would depend upon the location of the accident and the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent upon three factors:

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

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main freeway US Highway 101. Staff believes it is appropriate to rely upon the extensive regulatory program that applies to the shipment of hazardous materials on California highways to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law 49 USC §5101 et seq., DOT regulations 49 CFR subpart H, §172–700, and California Department of Motor Vehicles (DMV) regulations on hazardous cargo). These regulations also address the issue of driver competence.

To address the issue of tanker truck safety, aqueous ammonia would be delivered to the proposed facility in DOT-certified vehicles with design capacities of less than 7,000 gallons. These vehicles would be designed to meet or exceed the specifications of MC307/DOT 407. These are high-integrity vehicles designed to haul caustic materials such as ammonia. Staff has, therefore, proposed Condition of Certification **HAZ-5** to ensure that, regardless of which vendor supplies the aqueous ammonia, delivery would be made in a tanker that meets or exceeds the specifications prescribed by these regulations.

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

Staff used the data from the Harwood studies (Harwood 1990 & Harwood 1993) to determine that the truck accident rate for the transportation of materials in the U.S. is between 0.64 and 13.92 per 1,000,000 miles traveled on well-designed roads and highways. The applicant estimated that routine operation of the proposed Puente would require one to two ammonia deliveries per month, each delivering about 7,000 gallons (PPP 2015a, Section 4.5.2.3.1). Each delivery would travel approximately 4.95 miles from US Highway 101 to the facility.

This would result in a maximum of 10 miles of tanker truck travel in the project area per month during peak operation (with a full load) and an average of approximately 119 miles of tanker truck travel per year (assuming two deliveries per month). Staff has determined that the risk over this distance is insignificant.

In addition, staff used a transportation risk assessment model (Harwood 1993, Brown 2000 & Guidelines for Chemical Transportation Risk Analysis 1995) in order to calculate the probability of an accident resulting in a release of a hazardous material due to delivery from the highway to the facility via Victoria Avenue to North Harbor Boulevard. Results show a risk of about one in 298,000 for one trip from US Highway 101 and a total annual risk of about one in 12,000 for 24 deliveries over a year. This risk was calculated using accident rates on various types of roads (in this case, urban multilane undivided and multilane divided) with distances traveled on each type of road computed separately. Although it is an extremely conservative model in that it includes accident rates per million mile of highway trucking as a mode of transportation and does not distinguish between a high-integrity steel tanker truck and other less secure modes, the results still show that the risk of a transportation accident is insignificant.

Staff therefore has determined that the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility is insignificant because of the remote possibility that an accidental release of a sufficient quantity would be very unlikely. The transportation of similar volumes of hazardous materials on the nation's highways is neither unique nor infrequent. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT and studies) demonstrates that the risk of accident and exposure is less than significant.

In order to further ensure that the risk of an accident involving the transport of aqueous ammonia to the power plant is insignificant, staff proposes Condition of Certification **HAZ-6**, which would require the use of only the specified and California Highway Patrol-approved route for delivery of hazardous materials to the site.

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

Seismic Issues

It is possible that an earthquake could cause the failure of a hazardous materials storage tank. An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in a vapor cloud of hazardous materials that could move off site and affect residents and workers in the surrounding community. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995, heightened concerns about the earthquake safety of power plants.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused both to several large storage tanks and to smaller tanks associated with the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while the newer tanks sustained displacements and failures of attached lines. Staff reviewed the impacts of

the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks failed as a result of that earthquake. Staff has also reviewed the impacts of the recent earthquakes in Haiti (January 12, 2010; magnitude 7.0) and Chile (February 27, 2010; magnitude 8.8). The building standards in Haiti are not as stringent as California while those in Chile are similar to California building seismic codes. Reports show a lack of impact on hazardous materials storage and pipelines infrastructure in both countries. For Haiti, this most likely reflects a lack of industrial storage tanks and gas pipelines; for Chile, this most likely reflects the use of strong safety codes. Staff also conducted an analysis of the codes and standards which should be followed when designing and building storage tanks and containment areas to withstand a large earthquake. Staff notes that the proposed facility would be designed and constructed to the standards (including seismic) of the most recent (2013 or later) California Building Code (PPP2015a, Section 4.4 & Appendix 2C).

Therefore, on the basis of what occurred in Northridge (with older tanks) and the lack of failures during the Nisqually earthquake (with newer tanks) and in the 2010 Chilean earthquake (with rigorous seismic building codes), and given that the construction of Puente would comply with stringent California Building Codes, staff determines that tank failures during seismic events are not probable and do not represent a significant risk to the public.

Site Security

The applicant proposes to use hazardous materials identified by the U.S. EPA as requiring the development and implementation of special site security measures to prevent unauthorized access. The U.S. EPA published a Chemical Accident Prevention Alert regarding site security (EPA 2000a) and the U.S. Department of Justice published a special report entitled *Chemical Facility Vulnerability Assessment Methodology* (US DOJ 2002). The North American Electric Reliability Corporation (NERC) published an updated *Security Guideline for the Electricity Sector: Physical Security* (2011) and the U.S. Department of Energy (U.S.DOE) published the draft *Vulnerability Assessment Methodology for Electric Power Infrastructure* in 2002 (DOE 2002).

The energy generation sector is one of 14 areas of critical infrastructure listed by the U.S. Department of Homeland Security. On April 9, 2007, the U.S Department of Homeland Security published in the Federal Register (6 CFR Part 27) an interim final rule requiring that facilities that use or store certain hazardous materials conduct vulnerability assessments and implement certain specified security measures. This rule was implemented on November 2, 2007, with the publication of the list of chemicals in Appendix A to the rule. While the rule applies to aqueous ammonia solutions of 20 percent or greater, and this proposed facility plans to utilize a 19 percent aqueous ammonia solution, staff maintains that all power plants under the jurisdiction of the Energy Commission should implement a minimum level of security consistent with the guidelines listed here.

The applicant has stated that a security plan would be prepared for the proposed facility and would include a description of perimeter security measures and procedures for evacuating, notifying authorities of a security breach, monitoring fire alarms, conducting site personnel background checks, site access, and a security plan and background checks for hazardous materials drivers. Perimeter security measures utilized for this facility may include security guards, security alarms, breach detectors, motion detectors, and video or camera systems (PPP 2015a, Section 4.5.4).

In order to ensure that neither this project nor a shipment of hazardous material is the target of unauthorized access, staff's proposed Conditions of Certification **HAZ-7** and **HAZ-8** address both construction security and operation security plans. These plans would require implementation of site security measures consistent with the above-referenced documents.

The goal of these conditions of certification is to provide for the minimum level of security for power plants necessary for the protection of California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for Puente is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of the consequences of that event. The results of the off-site consequence analysis prepared as part of the RMP would be used, in part, to determine the severity of consequences of a catastrophic event.

In order to determine the level of security, Energy Commission staff used an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the North American Electric Reliability Corporation's (NERC) 2011 guidelines, the U.S. DOE VAM-CF model, and the U.S. Department of Homeland Security regulations published in the Federal Register (Interim Final Rule 6 CFR Part 27). Staff determined that this project would fall into the category of medium vulnerability due to the urban setting and close proximity to sensitive receptors. Staff therefore proposes that certain security measures be implemented but does not propose that the project owner conduct its own vulnerability assessment.

These security measures include perimeter fencing and breach detectors, alarms, site access procedures for employees and vendors, personnel background checks, and law enforcement contacts in the event of a security breach. The perimeter fencing should include slats or other methods to reduce and restrict the visibility of the site from off-site locations. Site access for vendors shall be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors would have to maintain their transport vehicle fleet and employ only properly licensed and trained drivers. The project owner would be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements for hazardous materials vendors to prepare and implement security plans (as per 49 CFR 172.800), and to ensure that all hazardous materials drivers are in compliance through personnel background security checks (as per 49 CFR Part 1572, Subparts A and B). The CPM may authorize

modifications to these measures or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. DOE, or the NERC, after consultation with both appropriate law enforcement agencies and the applicant.

CUMULATIVE IMPACTS AND MITIGATION

Staff analyzed the potential for the existence of cumulative impacts. A significant cumulative hazardous materials impact is defined as the simultaneous uncontrolled release of hazardous materials from multiple locations in a form (gas or liquid) that could cause a significant impact where the release of one hazardous material alone would not cause a significant impact. Existing locations that use or store gaseous or liquid hazardous materials, or locations where such facilities might likely be built, were both considered. Staff has determined that while cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control an uncontrolled release. The chances of one uncontrolled release occurring are remote. The chance of two or more occurring simultaneously, with resulting airborne plumes comingling to create a significant impact, are even more remote. Staff concludes that the risk to the public is insignificant.

The applicant would develop and implement a hazardous materials handling program for Puente independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the applicant and with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in off-site impacts. It is unlikely that an accidental release that has very low probability of occurrence (about one in one-million per year) would independently occur at the Puente site and another facility at the same time. Therefore, staff concludes that the facility would not contribute to a significant hazardous materials-related cumulative impact.

ENVIRONMENTAL JUSTICE

As discussed in the **Environmental Justice** section of this FSA, the minority population in the six-mile radius around the proposed project constitutes an environmental justice (EJ) population based on race and ethnicity (**Environmental Justice Figure 1**). **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitute an EJ population based on poverty.

Additionally, much of the land located east of the Puente site has agricultural uses. There are a number of farm workers within the vicinity of the proposed site at any given time. Due to the presence of an EJ population among residents and farm workers, this analysis must identify whether the construction and operation of the proposed Puente facility and the demolition of MGS could have significant, unmitigated impacts or disproportionate impacts on an EJ population.

Under hazardous materials management, the two potential incidents that could affect the EJ population would be a worst case release from the aqueous ammonia storage

tank and the transportation of hazardous material by truck from Highway 101 to the project site. Although a highly unlikely event, the worst case release would not impact the farm workers or any off-site receptors because the proposed Condition of Certification **HAZ-4** would mitigate that risk to less than significant and would not have a disproportionate impact on the EJ population.

Trucks delivering hazardous materials would be travelling through EJ communities along Gonzales Road. While an accident could potentially occur involving either an aqueous ammonia or other hazardous material delivery truck, an accidental release of the hazardous materials cargo would still be unlikely. The proposed Conditions of Certification **HAZ-5** and **HAZ-6** combined with the hazardous materials risk analysis staff presents earlier in this technical section demonstrate that the risk of impact resulting from hazardous materials transportation to the Puente site is less than significant to the EJ population and would not have a disproportionate impact.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the Puente project would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the area of hazardous materials management.

RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

The following are the comments staff received on the PSA in the area of **Hazardous Materials Management** and the staff's responses to those comments.

Hazardous Materials Management		
Source of Comment	***Comment***	***Staff Response***
Applicant	1. Applicant would like to change the Condition of Certification **HAZ-8** to include the language "as appropriate" for the background checks of project personnel.	1. Staff does not agree with adding the language "as appropriate" to **HAZ-8**. Staff does not know who would make the determination for when background checks could be waived and believes that unless all project personnel are subject to a background check, the program would be ineffective.
	2. Applicant asked staff to remove amines and ammonia (400 gallon) from Table 4.5-3.	2. Staff has removed these chemicals from Table 4.5-3 which lists hazardous materials proposed by the applicant for use at Puente because these chemicals would have been used for a boiler water treatment which the current project would not have.
City of Oxnard (Fire Department)	3. The OFD does not have adequate information regarding the decommissioned MGS or proposed on-site security equipment and procedures to offer a review statement as to fire warning and suppression equipment and procedures for critical electric generation and grid facilities with hazardous chemicals stored on site. OFD requests that CEC require NRG to submit security plans and fees for security review to the OFD for review and that the CEC incorporate OFD's	3. Puente would be required to provide physical security for the site and all hazardous materials storage during construction and operations per Conditions of Certification **HAZ-7** and **8** which would require a minimum security level commensurate with federal NERC standards and requirements. (*Please refer to the **Worker Safety** section for staff's response on fire protection.)* Although the security plans documentation will be kept on site, OFD is encouraged to review and provide comment on

Hazardous Materials Management		
Source of Comment	***Comment***	***Staff Response***
	conditions of approval in the AFC permit, should an AFC permit be issued.	the facility's security implementation. The CPM will inspect and approve the security implementation.
Robert Sarvey	4. The intervenor states that the project owner should use urea pellets in place of aqueous ammonia for the selective catalyst reduction process to prevent impacts from the transportation and storage of ammonia	4. Staff analysis and Conditions of Certification **HAZ-3** - **6**, **7** and **8** specifically address the transportation, construction, and storage of aqueous ammonia. **HAZ-7** and **-8** address the security of the hazardous materials on site during construction and operations. Their adoption and implementation would ensure that the use of aqueous ammonia would not present a significant risk to the public. Therefore, the use of urea pellets would not be required.

CONCLUSIONS

Staff's evaluation of the proposed project with proposed mitigation measures indicates that hazardous material use would pose no significant impact to the public. Staff's analysis also shows that there would be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project would comply with all applicable LORS. In response to California Health and Safety Code, section 25531 et seq., the applicant would be required to develop a Risk Management Plan (RMP). To ensure the adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by the OFD and by Energy Commission staff. In addition, staff's proposed Condition of Certification **HAZ-2** requires the review and approval of the RMP by staff prior to the delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia, in addition to site security matters.

Staff recommends that the Energy Commission impose the proposed conditions of certification to ensure that the project would be designed, constructed, and operated to comply with all applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release. If all mitigation measures proposed by the

applicant and staff are required and implemented, the use, storage, and transportation of hazardous materials would not present a significant risk to the public.

Staff proposes nine conditions of certification mentioned throughout the text above, and listed below. Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in **Appendix B** of this staff assessment, unless there is prior approval by the Energy Commission CPM. Condition of Certification **HAZ-2** requires that an RMP be submitted and approved prior to the delivery of aqueous ammonia.

Condition of Certification **HAZ-3** would require the development of a safety management plan for the delivery of all liquid hazardous materials, including aqueous ammonia. Condition of Certification **HAZ-4** requires that the aqueous ammonia storage tank be designed to appropriate standards. The transportation of hazardous materials is addressed in Conditions of Certification **HAZ-5** and **HAZ-6**. Site security during both the construction and operations phases is addressed in Conditions of Certification **HAZ-7** and **HAZ-8.** Condition of Certification **HAZ-9** addresses the use of natural gas and prohibits its use to clear pipes.

Staff concludes that the hazardous material management practices at Puente would have a less than significant impact on the EJ population with the adoption of the Conditions of Certification **HAZ-4**, **-5**, and **-6**, and would have no disproportionate impacts.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix B, below, or in greater quantities or strengths than those identified by chemical name in Appendix B, below, unless approved in advance by the compliance project manager (CPM).

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, the Hazardous Materials Business Plan's list of hazardous materials and quantities contained at the facility.

HAZ-2 The project owner shall concurrently provide a Hazardous Materials Business Plan (HMBP), a Spill Prevention Control and Countermeasure Plan (SPCC), and a Risk Management Plan (RMP) to the city of Oxnard Fire Department (OFD) and the CPM for review. After receiving comments from the OFD and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final Hazardous Materials Business Plan and RMP shall then be provided to the OFD for information and to the CPM for approval.

Verification: At least 30 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final HMPB and SPCC to the CPM for approval.

At least 30 days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final RMP to the Certified Unified Program Agency (the city of Oxnard Fire Department) for information and to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia and other liquid hazardous materials by tanker truck. The plan shall include procedures, protective equipment requirements, training, and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials including provisions to maintain lockout control by a power plant employee not involved in the delivery or transfer operation. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 30 days prior to the delivery of any liquid hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed to the ASME Code for Unfired Pressure Vessels, Section VIII, Division 1. The storage tank shall be protected by a secondary containment vault capable of holding precipitation from a 24-hour, 25-year storm event plus 100 percent of the capacity of the largest tank within its boundary. The containment vault shall contain one layer of high-density polyethylene (HDPE) balls that would serve as the passive mitigation. The final design drawings and specifications for the ammonia storage tank and secondary containment basin shall be submitted to the CPM. A Best Management Practices (BMPs) plan for the maintenance of the HDPE balls shall also be submitted to the CPM.

Verification: At least 30 days prior to start of construction of the aqueous ammonia storage and transfer facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank, ammonia pumps, ammonia detectors, and secondary containment basin along with the BMP plan to the CPM for review and approval. In the Annual Compliance Report, the project owner shall include a report on the annual HDPE ball inspection and how many damaged balls were replaced.

HAZ-5 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles, which meet or exceed the specifications of MC-307/DOT-407.

Verification: At least 30 days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-6 Prior to initial delivery, the project owner shall direct vendors delivering bulk quantities (>800 gallons per delivery) of hazardous material (e.g., aqueous ammonia, lubricating and insulating oils) to the site to use only the route

approved by the CPM (from US Highway 101 along Victoria Avenue to Gonzales Road via North Harbor Boulevard to the facility). The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least 60 days prior to initial receipt of bulk quantities (>800 gallons per delivery) of hazardous materials (e.g., aqueous ammonia, lubricating or insulating oils) and at least 10 days prior to a new vendor delivery of bulk quantities (>800 gallons per delivery), the project owner shall submit a copy of the letter containing the route restriction directions that were provided to the hazardous materials vendor to the CPM for review and approval.

HAZ-7 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. perimeter security consisting of fencing enclosing the construction area;

2. security guards;

3. site access control consisting of a check-in procedure or tag system for construction personnel and visitors;

4. written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;

5. protocol for contacting law enforcement and the CPM in the event of suspicious activity, incident or emergency; and,

6. evacuation procedures.

Verification: At least 30 days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-8 The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that would be available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC Security Guideline for the Electricity Sector: Physical Security v1.9).

The Operation Security Plan shall include the following:

1. permanent full perimeter fence or wall, at least eight feet high and topped with barbed wire or the equivalent (and with slats or other methods to restrict visibility if a fence is selected);

2. main entrance security gate, either hand operated or motorized;

3. evacuation procedures;

4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;

5. written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;

   A. a statement (refer to sample, **Attachment A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;

   B. a statement(s) (refer to sample, **Attachment B**), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;

6. site access controls for employees, contractors, vendors, and visitors;

7. a statement(s) (refer to sample, **Attachment C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.880, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;

8. closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view 100 percent of the perimeter fence, the ammonia storage tank, the outside entrance to the control room, and the front gate; and,

9. additional measures to ensure adequate perimeter security consisting of either:

   A. security guard(s) present 24 hours per day, seven days per week; **or**

   B. power plant personnel on site 24 hours per day, seven days per week, and perimeter breach detectors **or** on-site motion detectors.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power plant components—transformers, gas lines, and compressors—depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Corporation, after consultation with both appropriate law enforcement agencies and the project owner.

Verification: At least 30 days prior to the initial receipt of hazardous materials on site, the project owner shall notify the CPM that a site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include signed statements similar to Attachments A and B that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a signed statement similar to Attachment C that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-9: The project owner shall not allow any fuel gas pipe cleaning activities on site, either before placing the pipe into service or at any time during the lifetime of the facility, that involve “flammable gas blows” where natural (or flammable) gas is used to blow out debris from piping and then vented to atmosphere. Instead, an inherently safer method involving a non-flammable gas (e.g. air, nitrogen, steam) or mechanical pigging, shall be used as per the latest edition of NFPA 56, Standard for Fire and Explosion Prevention during Cleaning and Purging of Flammable Gas Piping Systems. A written procedure shall be developed and implemented as per NFPA 56, section 4.4.1.

Verification: At least 30 days before any fuel gas pipe cleaning activities begin, the project owner shall submit a copy of the Fuel Gas Pipe Cleaning Work Plan (as described in the 2014 NFPA 56, section 4.4.1) which shall indicate the method of cleaning to be used, what gas will be used, the source of pressurization, and whether a mechanical PIG will be used, to the CBO for information and to the CPM for review and approval.

SAMPLE CERTIFICATION (Attachment A)

Affidavit of Compliance for Project Owners

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for employment at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment B)

Affidavit of Compliance for Contractors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for contract work at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment C)

Affidavit of Compliance for Hazardous Materials Transport Vendors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.880 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

_____

(Company name)

for hazardous materials delivery to

_____

(Project name and location)

as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

REFERENCES

Brown, D.F., W.E. Dunn, and A.J. Policastro. 2000. A National Risk Assessment for Selected Hazardous Materials in Transportation. Decision and Information Sciences Division, Argonne National Laboratory, ANL/DIS-01-1: 28-35.

California Air Resources Board. 2001. “Guidance for the Permitting of Electrical Generation Technologies”. November 15, 2001.

Center For Chemical Process Safety of the American Institute of Chemical Engineers. Guidelines for Chemical Transportation Risk Analysis. New York: American Institute of Chemical Engineers, 1995. Print. Chapter 2.

Environmental Protection Agency (EPA). 2000a. Chemical Accident Prevention: Site Security. Environmental Protection Agency, Office of Solid Waste and Emergency Response. February 2000.

Harwood, D.W., J. G. Viner, and E.R. Russell. 1990. Truck Accident Rate Model for Hazardous Materials Routing. Transportation Research Record. 1264: 12-23.

Harwood, D.W., J. G. Viner, and E.R. Russell. 1993. Procedure for Developing Truck Accident and Release Rates for Hazmat Routing. Journal of Transportation Engineering. 119(2): 189-199.

Lees, F.P. 2012. Loss Prevention in the Process Industries, pg. 489-490, 1536, 1951-1956, & 2005-2020, Fourth Edition, Butterworths.

NERC - North American Electric Reliability Council. 2011. Security Guideline for the Electricity Sector: Physical Security, Version 1.9, November 10, 2011.

NRC - National Research Council. 1979. Ammonia. Subcommittee on Ammonia. Committee on Medical and Biologic Effects of Environmental Pollutants. Division of Medical Sciences, Assembly of Life Sciences, National Research Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2016h - Robert L. Dickson Jr. Latham & Watkins LLLP, Application for Certification, Puente Power Project, Oxnard, CA Refinement to Ammonia Tank Design (TN 210502). Submitted to CEC/Docket Unit on February 22, 2016.

US Chemical Safety Board (US CSB). 2010. Final Report Kleen Energy Natural Gas Explosion: U.S. Chemical Safety and Hazard Investigation Board Urgent Recommendations. U.S. Chemical Safety Board, Washington D.C. June 28, 2010.

U.S. Department of Energy (US DOE). 2002. Draft Vulnerability Assessment Methodology, Electric Power Infrastructure. Office of Energy Assurance, September 30, 2002.

U.S. Department of Justice (US DOJ). 2002. Special Report: Chemical Facility Vulnerability Assessment Methodology. Office of Justice Programs, Washington, D.C. July 2002.

HAZARDOUS MATERIALS
APPENDIX A

Basis for Staff's Use of 75 Parts Per Million Ammonia Exposure Criteria

BASIS FOR STAFF'S USE OF 75 PARTS PER MILLION AMMONIA EXPOSURE CRITERIA

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

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

Hazardous Materials Appendix A Table-1
Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH[2]	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 minutes	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible Injury, or impairment of the ability to escape.
IDLH/10[1]	EPA, NIOSH	Work place standard adjusted for general population factor of ten for variation in sensitivity	30 ppm	30 minutes	Protects nearly all segments of general population from irreversible effects.
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 minutes, 4 times per 8-hour day	No toxicity, including avoidance of irritation.
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 minutes	Significant irritation, but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one-time exposure.
STPEL[4]	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 minutes 30 minutes 10 minutes	Significant irritation, but protects nearly all segments of general population from irreversible acute or late effects. One-time accidental exposure.
TWA[2]	NIOSH	Adult healthy male workers	25 ppm	8 hours	No toxicity or irritation on continuous exposure for repeated eight-hour work shifts.
ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	150 ppm	60 minutes	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin).

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

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

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

REFERENCES FOR HAZARDOUS MATERIALS APPENDIX A, TABLE 1

AIHA. 1989. American Industrial Hygienists Association, Emergency Response Planning Guideline, Ammonia, (and Preface) AIHA, Akron, OH.

EPA. 1987. U.S. Environmental Protection Agency, Technical Guidance for Hazards Analysis, EPA, Washington, D.C.

NRC. 1985. National Research Council, Criteria and Methods for Preparing Emergency Exposure Guidance Levels (EEGL), Short-Term Public Emergency Guidance Level (SPEGL), and Continuous Exposure Guidance Level (CEGL) documents, NRC, Washington, D.C.

NRC. 1972. Guideline for Short-Term Exposure of the Public to Air Pollutants. IV. Guide for Ammonia, NRC, Washington, D.C.

NIOSH. 1994. National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Washington D.C., Publication numbers 94-116.

WHO. 1986. World Health Organization, Environmental Health Criteria 54, Ammonia, WHO, Geneva, Switzerland.

ABBREVIATIONS - HAZARDOUS MATERIALS APPENDIX A, TABLE 1

ACGIH	American Conference of Governmental and Industrial Hygienists
AIHA	American Industrial Hygienists Association
EEGL	Emergency Exposure Guidance Level
EPA	Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines
IDLH	Immediately Dangerous to Life and Health Level
NIOSH	National Institute of Occupational Safety and Health
NRC	National Research Council
STEL	Short Term Exposure Limit
STPEL	Short Term Public Emergency Limit
TLV	Threshold Limit Value
WHO	World Health Organization

HAZARDOUS MATERIALS
APPENDIX B

Hazardous Materials Proposed for Use at Puente
Hazardous Materials Appendix B

Table 4.5-3 (From AFC) Hazardous Materials Use and Storage during Operations				
Hazardous Material	**Purpose**	**Maximum Stored**	**Storage Type**	**Storage Location**
Acetylene	Welding	540 cubic feet	Cylinder	Maintenance/warehouse building
Antiscalant	RO system	400 gallons	Aboveground tote	Water treatment building
Aqueous ammonia (19 percent)	NO_X reduction in SCR	20,000 gallons	Aboveground tank	Ammonia storage area
Carbon dioxide	Fire suppression for CTG	500 gallons	Aboveground tank	Fire-suppression systems near CTG
Citric acid	Cleaning of HRSG interior piping	5,000 gallons	Chemical storage bags	TBD
Cleaners/Detergents	Combustion turbine cleaning	1,000 gallons	Manufacturer containers	Water treatment building
Cleaning chemicals	Reverse osmosis cleaning	150 gallons	Manufacturer containers	Water treatment building
Cleaning chemicals	Cleaning	<25 gallons or 100 pounds	Manufacturer containers	Admin/Control building, maintenance/ warehouse building
Diesel No. 2 or Ultra-low Sulfur Diesel	Black-start generator/fire pump	500 gallons	Tanks	Fire-pump area
USEPA Protocol gases	Calibration gases	1,000 cubic feet	Cylinder	TBD
Hydraulic oil	High-pressure combustion turbine starting system	700 gallons	Equipment/Steel drum	Equipment/maintenance/warehouse building
Hydrogen	Cooling for generator	100 gallons	Aboveground tank	TBD
Laboratory reagents	Water/wastewater laboratory analysis	10 gallons	Manufacturer container	Laboratory chemical storage cabinet
Lubrication oil	Lubrication for rotating equipment	1,500 gallons	Lubricating oil reservoirs/ steel drums	Rotating equipment
Mineral-insulating oil	Insulating	3,500 gallons	Transformers	Transformers

Table 4.5-3 (From AFC) Hazardous Materials Use and Storage during Operations (Continued)				
Hazardous Material	**Purpose**	**Maximum Stored**	**Storage Type**	**Storage Location**
Natural gas	Fuel for power plant	Not stored on site	Pipeline	Continuous by pipeline
Nitrogen	Nitrogen blanketing of HRSG layup	Truck load	N/A	Near HRSG
Oxygen	Welding	540 cubic feet	Cylinder	Maintenance/warehouse building
Paint	Painting	25 gallons	Can/bucket	Maintenance/warehouse building
Phosphoric acid (70 percent)	Ultrafilter membrane cleaner	400 gallons	Aboveground tote	Water treatment building
Propane	Torch gas	200 cubic feet	Cylinder	Maintenance/warehouse building
Sodium bisulfite	RO system	400 gallons	Aboveground tote	Water treatment building
Sodium hydroxide (<30 percent)	Circulating water	200 gallons	Aboveground tote	Water treatment building
Sodium hydroxide (<30 percent)	Boiler-water pH control	55 gallons	Drum	Boiler-chemical feed area
Sodium hypochlorite (12 to 14 percent, trade)	Membrane cleaner	500 gallons	Aboveground tote	Water treatment building
Sodium nitrite	Corrosion inhibitor	55 gallons	Drum	Water treatment building
Trisodium phosphate	Boiler-water pH control	400 gallons	Aboveground tote	Boiler-chemical feed area
Waste oil	Oil waste from various plant machinery	150 gallons	Drum	Hazardous waste storage area
Various hazardous wastes	Waste	TBD	Drum	Hazardous waste storage area

Table 4.5-3 (From AFC)
Hazardous Materials Use and Storage during Operations (Continued)

Hazardous Material	Purpose	Maximum Stored	Storage Type	Storage Location

Notes: Quantities are based on presumed operation conditions. Use and storage would be optimized during final design.

CTG = combustion turbine generator
HRSG = heat recovery steam generator
N/A = not applicable
NO_X = oxides of nitrogen
RO = reverse osmosis
SCR = selective catalytic reduction
TBD = to be determined
USEPA = U.S. Environmental Protection Agency

LAND USE

Testimony of Ashley Gutierrez and Steven Kerr

SUMMARY OF CONCLUSIONS

The proposed Puente Power Project (Puente or project) would not comply with all applicable state and local laws, ordinances, regulations, and standards (LORS) related to land use. The project is consistent with coastal public access provisions of Warren-Alquist Act section 25529, the California Coastal Act (Coastal Act), and the Oxnard Local Coastal Program (LCP), but is in conflict with the city of Oxnard's Chapter 6, Safety and Hazards Policy 3.5 of the 2030 General Plan.

Land uses in the Coastal Zone are governed by the LCP. Puente is consistent with the current development patterns for the area established by the LCP, which consists of the Coastal Land Use Plan (CLUP) and the Coastal Zoning Ordinance (CZO). In addition, the project would be consistent with design standards of the EC (Coastal Energy Facilities) sub-zone.

The city of Oxnard's recently adopted Chapter 6, Safety and Hazards Policy 3.5 of the 2030 General Plan, prohibits development of electric generating facilities of 50 megawatts (MWs) or greater in areas subject to coastal and other environmental hazards. Although the policy has not been incorporated into the LCP, the California Coastal Commission Deputy Chief Counsel issued a clarifying letter which states, "this portion of the General Plan amendment is effective in the coastal zone despite not having been incorporated into the City's LCP" (CCC 2016d).

Land Use staff has verified that with the implementation of staff's recommended conditions of certification, Puente would not result in any physical land use incompatibilities with the existing surrounding land uses in the following impact areas: **Air Quality, Hazardous Materials Management, Noise and Vibration, Public Health, Soil and Water Resources, Traffic and Transportation, and Visual Resources**.

Therefore, while the project would not be consistent with all local LORS, it would not result in a significant environmental impact under the California Environmental Quality Act (CEQA) guidelines because it would be compatible, as conditioned, with surrounding land uses.

Staff has not identified any significant adverse direct or cumulative land use impacts resulting from the demolition, construction, or operation of the proposed project, including disproportionate impacts to the environmental justice population. Therefore, there are no land use environmental justice issues related to this project and no minority or low-income populations would be significantly or adversely impacted.

INTRODUCTION

This land use analysis addresses project compatibility with existing and reasonably foreseeable[1] land uses; consistency with applicable city of Oxnard and state LORS; and potential project-related direct, indirect, and cumulative environmental effects.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Land Use Table 1 lists the state and local land use LORS applicable to the proposed project. The proposed project's consistency with these LORS is analyzed under the "Assessment of Impacts and Discussion of Mitigation" subsection and summarized in **Land Use Table 2**. The project site does not involve federally managed lands, therefore, there are no applicable federal land use-related LORS.

Land Use Table 1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Description
Federal	None
State	
Warren-Alquist Act Public Resources Code, section 25529	Pursuant to Public Resources Code section 25529, when a facility is proposed to be located in the coastal zone, the California Energy Commission shall require that an area be established for public access and use of coastal resources.
California Coastal Act of 1976, Public Resources Code Division 20, Chapter 3, section 30200 et seq. (Coastal Act)	The Coastal Act establishes a comprehensive scheme to govern land use planning along the entire California coast. The heart of the Coastal Act, Chapter 3, contains the policies by which both the Local Coastal Programs and all new development projects are assessed (COO 1982, pg. I-2). The Act requires that new development not interfere with the public's right of access to the shoreline. It also encourages the use of existing coastal-dependent industrial sites within the coastal zone instead of using undeveloped areas of the coastal zone.
Local	
Ventura County Airport Comprehensive Land Use Plan (ACLUP)	The Puente site is located within the Oxnard Airport Study Area as defined by the ACLUP for Ventura County.
Oxnard Coastal Zone	Established by the Coastal Act, the boundary of the Oxnard Coastal Zone generally extends 1,000 yards inland from the Pacific Ocean and includes the Channel Islands Harbor and the Edison Canal. Land Uses in the Oxnard Coastal Zone are governed by the Oxnard Local Coastal Program pursuant to the Coastal Act and certified by the California Coastal Commission. (COO 2011, pg. 1-5)
Oxnard Local Coastal Program (LCP)	Two documents, Oxnard Coastal Land Use Plan and Oxnard Coastal Zoning Ordinance, apply in selected regulatory areas in the Coastal Zone and are subject to the Coastal Act and certification and review by the California Coastal Commission (COO 2011, pg. 3-4).
Oxnard Coastal Land Use Plan (CLUP)	The CLUP, adopted February 1982 and last amended May 2002, guides development in the Oxnard Coastal Zone (COO 2011 pg. 1-23). The CLUP contains the coastal land use maps, which contain

[1] Whether a project is reasonably foreseeable (i.e., a probable future project) for purposes of cumulative impact analysis depends on the nature of the resource in question, the location of the project, and the type of project (Title14, California Code of Regulations, section 15130(b)(2)).

	the land use designations for the coastal zone of the city, and policies, which are the standards by which future projects in the coastal zone are evaluated. Amendments to the plan are permitted in accordance with the Public Resources Code sections 30514 and 30515. If there are any conflicts between the policies or land use designations of the CLUP and the existing General Plan, the Coastal Plan shall prevail. (COO 1982, pgs. II-1 and III-1)
Oxnard Coastal Zoning Ordinance (CZO) (Chapter 17 of the City Code)	The CZO applies only to properties within the city's coastal zone. Its purpose is to implement the policies of the Coastal Act as identified in the CLUP as well as the following policies: (A) The purpose of this article is to implement the policies of the Coastal Act, as amended, as identified in the CLUP as well as the following policies: (1) To assure orderly balance utilization and conservation of coastal zone resources taking into account the social and economic needs of the residents of this city and of the state; (2) To assure priority for coastal-dependent and coastal-related development over other development on the coast; and (3) To provide a specific city program to implement development so as to guide the future growth of the city within the coastal zone. (B) The intent of this article is to effectively integrate the CLUP with the officially adopted Oxnard General Plan and Zoning Ordinance, as applied to the defined coastal zone. The CZO in terms of this chapter and related official city zoning maps has a boundary as determined by the Coastal Act. (COO 2005, sections 17-1 and 17-2)
City of Oxnard 2030 General Plan (2030 General Plan)	The 2030 General Plan sets out a vision to guide future development in the city (COO 2011, pg. 1-6 and 3-1). The 2030 General Plan was adopted on October 11, 2011 and the operative documents consist of the Background Report (2006), and the Goals and Policies (COO 2016e). Selected General Plan land use designations and related policies are not effective in the Coastal Zone until certified by the California Coastal Commission and are included in the Oxnard 2030 General Plan to indicate the city's intent and direction leading to future CLUP amendments (COO 2011, pg. 1-5).

SETTING

PROJECT SITE

The project site is located in the city of Oxnard at 393 North Harbor Boulevard in Ventura County. Puente would be located entirely within the parcel boundaries of the currently operating Mandalay Generating Station (MGS). The project would be sited on approximately 3 acres within the 36-acre MGS property. The Ventura County Assessor's Parcel Number (APN) for the MGS property is 183-0-022-025. The APN for the outfall structure and discharge channel is 183-0-023-015. The primary access to the Puente facility would be from the existing MGS entrance off of North Harbor Boulevard, south of the intersection of Gonzales Road and North Harbor Boulevard.

PROPOSED PROJECT

Puente would be a natural gas-fired, simple-cycle, dry-cooled, 262-net-MW electrical generating facility consisting of a single independently operating, single-fuel combustion turbine generator, natural gas compressor station, new underground fire loop, and back-up generator. Water would be provided by the city of Oxnard through an existing connection on the MGS property. Storm water would be stored in the north and south retention basins and discharged into the Edison Canal or re-used onsite for plant operations, while process wastewater would pass through an oil/water separator and be pumped to the east wastewater retention basin. All retention basins are located on the MGS property.

If Puente is licensed, the applicant would demolish MGS units 1 and 2, including the 200-foot tall exhaust stack and the outfall structure located to the west. The outfall structure is currently used to discharge wastewater from MGS units 1, 2, and 3 to the Pacific Ocean. The demolition area associated with the outfall is approximately 0.4 acre (PPP 2016z). Demolition of MGS units 1 and 2 would include removing the auxiliary mechanical and electrical equipment associated with the MGS units up to the switchyard, but not the removal of the electric switchyards, which are owned and operated by Southern California Edison (SCE) (PPP 2015e). Refer to the **Project Description** section of this document for additional details regarding demolition activities.

Construction Laydown and Parking Areas

All construction laydown and construction parking areas would be located within the existing MGS site. According to the application for certification (AFC), approximately 5.7 acres would be used for construction laydown and parking. During project construction, all construction equipment and supplies would be trucked directly to the project site (PPP 2015a, Section 2.9.2.3).

Transmission Lines and Infrastructure

Puente would utilize existing potable water, natural gas, storm water, process wastewater and sanitary pipelines, and electrical transmission facilities. The 220 kilovolt (kV) transmission interconnection for the project would consist of a single gen-tie connection that would require one mono-pole structure and one take-off structure providing a direct connection to the SCE transmission system (PPP 2016y).

LAND USE AND ZONING DESIGNATIONS

AFC Figure 4.6-2 (Existing Land Uses in the Area Surrounding the Site), AFC Figure 4.6-3 (Designated Future Uses), and AFC Figure 4.6-4 (Zoning Designations) illustrate the land use and zoning designations of the proposed power plant site and the land use and zoning designations of lands within the one-mile buffer of the project site. The land use and zoning designations of the areas surrounding the proposed project are presented to help illustrate the city of Oxnard’s existing and planned pattern of land use development in the project area.

Surrounding Area

The existing land uses surrounding the project site include McGrath State Beach, McGrath Lake, oil wells and processing operations, and a habitat restoration area to the north. The SCE McGrath Peaker Plant and Mandalay Beach County Park are both south of the project site. Oil wells and processing operations in addition to agriculture are located east of the project site. Mandalay State Beach borders the project site to the west extending to the Pacific Ocean.

CLUP land use designations immediately adjacent to and nearby the Puente site include (COO 1982, Exhibit 2.5):

- North: Recreation Area & Resource Protection Area
- East: Energy Facility
- South: Energy Facility, Recreation Area & Resource Protection Area
- West: Coastal Recreation

The city of Oxnard 2030 General Plan Map notes that certain Coastal Zone land use designations indicate desired changes to the LCP and are not effective until certified by the Coastal Commission (COO 2011 pg. 3-5, COO 2014). 2030 General Plan land use designations immediately adjacent to and nearby the Puente site include:

- North: Recreation Area (Coastal Zone Area) & Resource Protection (Coastal Zone Area)
- East: Public Utility/Energy Facility (Coastal Zone Area) & Resource Protection (Coastal Zone Area)
- South: Public Utility/Energy Facility (Coastal Zone Area) & Resource Protection (Coastal Zone Area)
- West: Recreation Area (Coastal Zone Area), Resource Protection (Coastal Zone Area)

Project Site

The Puente site is located within the Oxnard Coastal Zone. Land uses in the Oxnard Coastal Zone are governed by the LCP (COO 2011, pg. 1-5, CCC 2016b). The LCP is comprised of the CLUP and the CZO (COO 2011, pg. 3-4, CCC 2016c).

The land use maps in the CLUP contain the land use designations for the Oxnard Coastal Zone (COO 1982, pg. II-1). The land use designation for the Puente site is Energy Facility and the beach parcel to the west where the outfall is located is designated Recreation Area (COO 1982, Exhibit 2.5).

The Oxnard Coastal Zone is divided into sub-zone districts (COO 2005, section 17-4). The Puente site is within the EC (Coastal Energy Facilities) sub-zone. The purpose of the EC sub-zone is to provide areas that allow for siting, construction, modification, and maintenance of power generating facilities and electrical substations consistent with the CZO, and with Policies 51, 52, 54, and 56 of the CLUP (COO 2005, section 17-20).

The beach parcel to the west is within the RC (Coastal Recreation) sub-zone. The purpose of the RC sub-zone is to provide open space for various forms of outdoor recreation of either a public or private nature. The intent is to encourage outdoor recreational uses which will protect and enhance areas which have both active and passive recreation potential. Such uses should offer recreational activities which complement and are appropriate to the area because of their natural resources and beauty. This sub-zone is designed to implement the recreational policies of the CLUP. (COO 2005, section 17-22).

As stated in the 2030 General Plan, the Oxnard LCP land use designations are included in the 2030 General Plan for reference purposes and land use changes in the Coastal Zone indicate legislative intent but are not effective until and unless certified by the Coastal Commission (COO 2011, pg. 3-14, CCC 2016c). The Puente site is designated in the 2030 General Plan as Public Utility/Energy Facility (COO 2014). The 2030 General Plan states that this land use applies to large electrical generating and transmission facilities. Due to the uniqueness of these types of facilities, the development intensity is established on an individual basis (COO 2011, pg. 3-16). The 2030 General Plan designation for the beach parcel where the outfall is located remains identified as Recreation Area, consistent with the CLUP.

City of Oxnard Planning Conflicts

On July 1, 2014 the Oxnard City Council adopted Ordinance No. 2882, imposing a 45-day moratorium on the approval of a special use permit, coastal development permit, or any other discretionary city permit or approval for the construction, expansion, replacement, modification or alteration of any facilities for the on-site generation of electricity on any property located within the Oxnard Coastal Zone (COO 2016e). The moratorium was adopted in anticipation of SCE selecting the Puente proposal. (In late November 2014, SCE selected the Puente proposal and filed with the California Public Utilities Commission for approval of their long-term power purchase contract. [COO 2015b, pg. 2]).

On July 7, 2014, city staff submitted a joint grant application to the Ocean Protection Council and the Coastal Commission for a total of $150,000 in grant money. The funding would be used to prepare a comprehensive sea-level rise (SLR) analysis, adaptation report, and provide the necessary funding required for an LCP update. The grants were approved in late 2014.

On July 29, 2014 and May 19, 2015 the Oxnard City Council adopted Ordinance Nos. 2884 and 2891 extending the moratorium to June 30, 2016.

On February 2, 2016, the Oxnard City Council adopted a resolution of intention to amend and update the Oxnard LCP, Planning and Zoning Permit (PZ) No. 15-410-03, and authorized that select amendments related to urgency Ordinance 2891 that prohibit the expansion of existing or development of new electrical generating facilities within the Oxnard Coastal Zone be adopted in advance of the comprehensive LCP update.

On June 7, 2016 the Oxnard city council approved an amendment to the city of Oxnard General Plan to prohibit power generation facilities with capacity greater than 50 MWs

in areas subject to coastal and other environmental hazards, including the MGS and Puente site. The amendment to the General Plan became operative on July 7, 2016.

On September 9, 2016, by a unanimous vote, the Coastal Commission, at a public hearing, approved forwarding the Coastal Commission's 30413(d) Report for Puente to the Energy Commission. The report assessed Puente's conformity with the Chapter 3 policies of the Coastal Act and the policies of the city of Oxnard's certified LCP. The assessment provided findings and recommended conditions intended to allow the proposed project to be constructed and operated consistent, to the extent feasible, with those policies. The Coastal Commission explained that the city has indicated it will seek an amendment to its certified LCP that would incorporate the prohibition of electric generating facilities with capacity greater than 50 MWs in areas subject to coastal and other environmental hazards. However, no proposed LCP amendment has been submitted to or approved by the Coastal Commission. Therefore, the Coastal Commission report concluded that Puente remains a conditionally-permitted use of the EC sub-zone, and existing LCP policies governing coastal hazards still apply for the purposes of the Coastal Commission's review under Coastal Act Section 30413(d) (CCC 2016a).

On November 28, 2016, staff received a letter from Coastal Commission Deputy Chief Counsel Louise Warren stating that the portion of the city of Oxnard's 2030 General Plan Amendment PZ 16-620-01 that affects siting of electrical generating facilities over 50 MWs takes effect in the city's coastal zone without certification of an LCP amendment from the Coastal Commission. (CCC 2016d)

In the letter, Ms. Warren states that, although in most circumstances land use changes that affect the coastal zone must be incorporated into the LCPs and certified by the Coastal Commission before they may take effect, new Policy SH-3.5 affects development that does not require a coastal development permit because it is under the exclusive permitting jurisdiction of the Energy Commission. Chapter 6, Power Facility and Site Certification of the Warren-Alquist Act, Public Resources Code section 25500, Authority; necessity of certification, states the following:

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

Ms. Warren's letter concludes that Policy SH-3.5 only affects development that by statute is outside of the permitting jurisdiction of the city and Coastal Commission, so it need not be incorporated into the LCP to take effect.

City of Oxnard 2030 General Plan

The city of Oxnard 2030 General Plan (2030 General Plan) sets out a vision to guide future development in the city (COO 2011, pg. 1-6 and 3-1). The 2030 General Plan was adopted on October 11, 2011 and the operative documents consist of the Background Report (2006), and the Goals and Policies (COO 2016e). Selected 2030 General Plan land use designations and related policies are not effective in the Coastal Zone until certified by the California Coastal Commission and are included in the Oxnard 2030 General Plan to indicate the city's intent and direction leading to future CLUP amendments (COO 2011, pg. 1-5).

The following describes the general applicability of the city of Oxnard's 2030 General Plan in the Coastal Zone:

1. Land uses in the Coastal Zone are governed by the certified LCP.

2. The LCP consists of the CLUP and CZO.

3. The city of Oxnard's recently adopted and amended 2030 General Plan contains several different land use designations and policies than their certified LCP, including a prohibition on electric generating facilities with capacity greater than 50 MWs in areas subject to coastal and other environmental hazards as determined by the city.

4. An LCP's CLUP may be the relevant portion of the local general plan, including any maps necessary to administer it, and ordinances, zoning district maps, and other legal instruments necessary to implement the land use plan (CCC 2016c).

5. No proposed LCP amendment has yet been submitted to or approved by the Coastal Commission.

6. Amendments to the CLUP and LCP generally become effective after approval by the Coastal Commission.

7. CLUP Local Coastal Policy 2 states that if there are any conflicts between the policies or land use designations of the Coastal Plan and the existing General Plan, the Coastal Plan shall prevail (COO 1982, pg. III-3).

Accordingly, staff initially concluded that the 2030 General Plan designation for the project site is Public Utility/Energy Facility is not effective, because the applicable CLUP designation for the project site remains Energy Facility. However, in the November 28, 2016 letter, the Coastal Commission Deputy Chief Counsel acknowledges that, in most circumstances, land use changes that affect the coastal zone must be incorporated into LCPs and certified by the Coastal Commission before they may take effect. However, the letter concludes that Policy SH-3.5 affects development that is under the exclusive permitting jurisdiction of the California Energy Commission, and, therefore, the city and the Coastal Commission do not have permitting jurisdiction over the affected development, and so the policy does not be incorporated into the LCP to take effect.

Staff provides the following analysis of relevant policies in the 2030 General Plan. Each policy is followed by staff's analysis in italics.

Community Development Chapter

The 2030 General Plan designation for the project site is Public Utility/Energy Facility (PUE) (not effective (COO 2011, pg. 3-5, COO 2015b)), which applies to large electrical generating and transmission facilities (COO 2011, pg. 3-13). The project site is referenced in the 2030 General Plan as the Mandalay Generating Station. Chapter 3.5 (Land Use Designations and Standards) of the Oxnard General Plan states that because these types of industrial facilities are unique, development intensity is established on an individual basis.

Policy CD-16.5Industrian and Commercial development Standards; requires high quality development standards that increase the efficient use of existing industrial and commercial development areas so as to preserve agricultural land and minimize adverse environmental impacts.

The project would be located within the site boundaries of an existing power generation facility and would rely on available services including potable water, natural gas, storm water, process wastewater and sanitary pipelines, and electrical transmission facilities. The project is consistent with the current development patterns for the area established by the LCP, and would not impact agricultural land. The project would provide energy to support existing and future residents, businesses, and recreation. Puente would not require the use of ocean water for cooling like MGS units 1 and 2. Furthermore, the RC sub-zone parcel would be restored and benefit public access with the removal of the outfall structure. The project would be consistent with this policy.

Policy CD-5.1 Industrial Clustering: Encourage the clustering of industrial uses into areas that have common needs and are compatible in order to maximize their efficiency.

Policy CD-5.2 Compatible Land Use: Ensure adequate separation between sensitive land uses (residential, educational, open space, healthcare) to minimize land use incompatibility associated with noise, odors, and air pollutant emissions.

Policy CD-5.3 Available Services: Encourage industrial activities to locate where municipal services are available including adequate storm drainage and water facilities, as well as easy access to multiple modes of transportation.

Puente would be constructed within the existing MGS site, which has been utilized for energy generation since the 1950s. The project would be interconnected to the adjacent existing SCE 220 kV lines. The project would use natural gas supplied to the MGS site by the Southern California Gas Company (SoCal Gas) and would connect to a new gas metering station adjacent to the project site. The process water source and potable water source is already supplied by the city to the MGS property. Staff has verified that the project would not result in any physical land use incompatibilities with the existing surrounding land uses in the areas of ***Air Quality, Hazardous Materials Management, Noise and Vibration, Public Health, Soil and Water Resources, Traffic and Transportation, and Visual Resources,*** *nor would it divide or disrupt an existing community. Staff notes, these policies are directives of the city to itself and would not obligate a project applicant to take action. In any case, staff concludes that the project would be consistent with these policies.*

A memo from the city of Oxnard, docketed on October 17, 2016 (COO 2016f), stated that it is the city's position that the Height Overlay District (HOD) established in the Land Use Designation and Standards section of the Community Development chapter of the 2030 General Plan (COO 2011, section 3.5), applies to Puente and the project cannot exceed six stories without city council approval. Staff disagrees with the city's position. The justification in the city's memo does not take into consideration that:

1. Section 3.5 states, the Oxnard LCP land use designations are included for reference purposes and land use changes in the Coastal Zone indicate legislative intent but are not effective until and unless certified by the Coastal Commission (COO 2011, pg. 3-14).

2. Table 3.2 General Plan/Zoning Consistency within section 3.5 (referred to in the city's memo) shows which zone designations implement the 2030 General Plan land use categories and whether the HOD is applicable. The General Plan Land Use Designation column of the table clearly notes that its applicability is limited to "non-Coastal Zone" designations (COO 2011, pgs. 3-18 to 3-19).

3. The subheading "General Plan/Zoning Consistency" above Table 3.2 in section 3.5, which explains the applicability of the table states, "Zone designations are created within Chapter 16 of the Oxnard City Code and are intended to implement the 2030 General Plan through the zoning ordinance." Chapter 16 of the Oxnard City Code is the Zoning Ordinance, which is applicable to areas of the city outside of the Coastal Zone. Section 16-1 of the Zoning Ordinance states that the area within the Coastal Zone, as established by the Coastal Commission, shall be governed by chapter 17 of the code (the CZO).

Staff concludes the HOD is not applicable to the project and therefore, the project could exceed six stories without city council approval because the CZO does not contain height restrictions for the EC sub-zone of the Coastal Zone. The project's compliance with the city's applicable design standards is discussed below in the "Oxnard Coastal Zoning Ordinance" subsection.

Infrastructure and Community Services Chapter

Policy ICS-17.1 Electric Facilities: Ensure that public and private, replacement and/or refurbished, electric generation and/or transmission facilities are built in accordance with the California Coastal Commission Sea Level Rise Policy Guidance, California Public Utilities Commission and/or California Energy Commission policies and regulations and incorporate feasible solar, wind, and other renewable sources of energy.

This policy is a directive of the city to itself and would not obligate a project applicant to take action. Implementation of this policy would require the city and Coastal Commission to update the LCP. The applicant states that Puente would be sited, designed, constructed, and operated in accordance with California Public Utilities Commission regulations, which are listed in Chapter 2.0 of the AFC. For an analysis and discussion of sea level rise refer to the ***Soil and Water Resources*** *section of this staff assessment. Puente would not incorporate solar, wind, or other renewable sources of energy. See the* ***Alternatives*** *section of this document for a discussion of "preferred resources."*

Environmental Resources Chapter

Policy ER-2.3 Promote Areas for Open Space: Reserve, preserve, and promote areas particularly suited for open space/recreational uses. Appropriate public access to these resources shall be preserved, enhanced, restored, and properly controlled.

This policy is a directive of the city to itself and would not obligate a project applicant to take action. However staff notes, 1,800 feet of beach frontage between McGrath State Park (to the north) and Mandalay Beach City/County Park (to the south) is owned by the applicant. The applicant submitted a project enhancement for the removal of the outfall structure and the reconfiguration of wastewater and storm water systems. By doing so the project would restore, enhance, and provide additional public access in an area suited for open space/recreational uses consistent with this policy.

Safety and Hazards Chapter

Policy SH-3.5 Development of Electricity Generating Facilities of 50 Megawatts or More in Areas Subject to Coastal and Other Environmental Hazards: The city recognizes that the authority of new electricity generation facilities of 50 MWs or more rests with the California Energy Commission. The city also recognizes that electricity generation facilities are especially susceptible to coastal and other hazards, particularly considering existing and expected sea-level-rise, and the resultant increased risks of tidal inundation, storm wave run-up, beach and dune erosion and retreat, and tsunami inundation. Therefore, in areas where the city has documented that the location of such facilities is threatened by seismic hazards, wildfire, flooding, or coastal hazards including tidal inundation, storm wave run-up, beach and dune erosion or retreat, and/or tsunami inundation, the following uses are prohibited: (1) the construction of new electricity generation facilities of 50 MWs or more, (2) modifications, including alteration, replacement, or improvement of equipment that result in a 50 MW or more increase in electric generation capacity of an existing generation facility, and (3) construction of any facility subject to the California Energy Commission's jurisdiction under Public Resources Code 25500.

This policy does not need to be incorporated into the LCP to be applicable to the project within the Coastal Zone. See the analysis under the "City of Oxnard Planning Conflicts" and "City of Oxnard 2030 General Plan" subsections above for additional information.

Many of the above policies are directives to the city itself, not obligations of project applicants. However, the project would:

- Provide and enhance an area for public use and opportunities for coastal-related recreation by the removal of the outfall structure and restoration of the beach parcel.
- Substantially reduce visual contrast and dominance with the removal of units 1 and 2, and further improve the visual conditions of the beach by removing the outfall structure.
- Reuse existing infrastructure and utility properties of the MGS to support existing and future residents, businesses, recreation, etc. by providing electricity to those uses.

Therefore, it is staff's position that the project would be consistent in many ways with these general plan policies. However, Puente remains in conflict with the prohibition of development of electric generating facilities of 50 megawatts (MWs) or greater in areas subject to coastal and other environmental hazards contained in Policy SH-3.5.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff has analyzed the information provided in the AFC and information acquired from other sources to determine consistency of the proposed project with applicable land use LORS and the proposed project's potential to have significant adverse land use-related impacts.

Significance criteria used in this document are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines and performance standards or thresholds identified by staff, as well as applicable LORS utilized by other governmental regulatory agencies.

An impact may be considered significant if the proposed project results in:

- Conversion of Farmland or Forest Land.
- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use.[2]
- Conflict with existing zoning for agricultural use, or a Williamson Act contract.
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Pub. Resources Code §12220(g)), timberland (as defined by Pub. Resources Code §4526), or timberland zoned Timberland Production (as defined by Gov. Code §51104(g)).
- Loss of forest land or conversion of forest land to non-forest use.
- Changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use[3] or conversion of forest land to non-forest use.
- Physical disruption or division of an established community.
- Conflict with any applicable habitat conservation plan, natural community conservation plan, or biological opinion.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project adopted for the purpose of avoiding or mitigating environmental effects. This includes, but is not limited to, a general plan, redevelopment plan, or zoning ordinance.

[2] FMMP defines "land committed to non-agricultural use" as land that is permanently committed by local elected officials to non-agricultural development by virtue of decisions which cannot be reversed simply by a majority vote of a city council or county board of supervisors.

[3] A non-agricultural use in this context refers to land where agriculture (the production of food and fiber) does not constitute a substantial commercial use.

Incremental impacts that, although individually limited, are cumulatively considerable when viewed in connection with other project-related effects or the effects of past projects, other current projects, and probable future projects.[4] An unmitigated noise, odor, public health or safety hazards, visual, or adverse traffic effect on surrounding properties.

DIRECT/INDIRECT IMPACTS AND MITIGATION

This section discusses the applicable potential project impacts and associated methods and thresholds of significance referenced above.

AGRICULTURE AND FOREST

Would the project convert Farmland to non-agricultural use?

The proposed project site does not contain, and would therefore not convert any farmland with FMMP designations of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance to non-agricultural use. The project would have no impact with respect to farmland conversion.

Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

The California Land Conservation Act, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses. (Chapter 7, Agricultural Land, Gov. Code, §§ 51200-51297.4) There are no existing agricultural uses present on the proposed project site. The project is not located on land that is under a Williamson Act contract and as a result would not conflict with any Williamson Act contracts.

Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Pub. Resources Code, §12220(g)), timberland (as defined by Pub. Resources Code, §4526), or timberland zoned Timberland Production (as defined by Gov. Code, §51104(g))?

The project site is not zoned for forest land, timberland, or for timberland production. In addition, there is no land zoned for such purposes within one mile of the project site. Therefore, there would be no conflict with, or cause for, rezoning of forest land or timberland and as a result there would be no impact to forest land or timberland.

Physical Disruption or Division of an Established Community

Puente would be located entirely within the site boundaries of an existing power plant that has operated in its current location since the late 1950s. Access to the project would be through an existing right-of-way off North Harbor Boulevard, just south of the intersection of Gonzales Road and North Harbor Boulevard. No on-street parking is

[4] Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects and can result from individually minor, but collectively significant actions taking place over a period of time (CEQA Guidelines §15355).

anticipated. There would not be a need to relocate any residences as a result of the project. In addition, the project would not involve the displacement of any existing development or result in new development that would physically divide an existing community. Furthermore, the discontinued use and restoration of the legal non-conforming outfall structure and its associated coastal recreational parcel would physically improve pedestrian circulation and public access west of the project site thus eliminating an existing division to the beach. Therefore, the project would not physically divide or disrupt any community.

Conflict with Any Applicable Habitat or Natural Community Conservation Plan

The project site is not located within any Habitat Conservation Plan or Natural Community Conservation Plan and there would be no conflicts as a result of the proposed project.

Conflict with Any Applicable Land Use Plan, Policy or Regulation

Staff evaluates the information provided by the applicant in the AFC (and any supplemental information), project design, site location, and operational components to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's exclusive authority (Cal. Code Regs., tit. 20, § 1744).

As part of the licensing process, the Energy Commission must determine whether a proposed facility complies with all applicable state, regional, and local LORS (Pub. Resources Code § 25523(d)(1)). The Energy Commission must either find that a project conforms to all applicable LORS or make specific findings that a project's approval is justified even where the project is not in conformity with all applicable LORS (Pub. Resources Code, § 25525). When determining LORS compliance, staff is required to give "due deference" to an agency's assessment of whether a proposed project is consistent with LORS under the agency's jurisdiction (Cal. Code Regs., tit. 20, § 1714.5(b)).

Staff's analysis of the project's consistency with applicable land use-related LORS is presented below. **Land Use Table 2** provides a summary of staff's analysis of applicable LORS.

Warren-Alquist Act (Public Resources Code, section 25529)

Section 25529 of the Warren-Alquist Act discusses the Energy Commission's statutory requirement for a public use area for facilities proposed in coastal zones. The Energy Commission shall require the establishment of an area for public use as a condition of certification of a facility proposed in a coastal zone as follows:

> "When a facility is proposed to be located in the Coastal Zone or any other area with recreational, scenic, or historic value, the [Energy] Commission shall require, as a condition of certification of any facility contained in the application, that an area be established for public use, as determined by the Commission. Lands within such area shall be acquired and maintained by the applicant and shall be available for

public access and use, subject to restrictions required for security and public safety. The applicant may dedicate such public use zone 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 the public use zone for the benefit of the public, the applicant may dedicate such zone to the state. The [Energy] Commission shall also require that any facility to be located along the coast or shoreline of any major body of water be set back from the shoreline to permit reasonable public use and to protect scenic and aesthetic values."

If Puente is licensed, the applicant plans to decommission and demolish MGS units 1 and 2, as well as the outfall structure. Demolition activities for units 1 and 2 include the removal of boilers, turbines, power block structures, and a 200-foot tall exhaust stack. The demolition of the outfall structure (including the wing walls, riprap, and fencing) would occur during the demolition of units 1 and 2 and would take place outside of the snowy plover nesting season. Beyond the demolition activities described above, the applicant plans to reconfigure the wastewater and storm water systems to discharge to the Edison Canal. MGS unit 3 would continue to operate. Refer to the **Project Description** and **Biological Resources** sections of this staff assessment for additional details regarding demolition activities and sensitive species.

The project as proposed would cease operation of the outfall, demolish the outfall structure and restore the beach parcel to better accommodate public access along the beach. By doing so the project would satisfy the requirements of Warren-Alquist Act section 25529.

California Coastal Act (Public Resources Code, sections 30000-30900)

Section 30200 of the California Coastal Act states that Chapter 3, Coastal Resources Planning and Management Policies, contains the policies that "constitute the standards by which…the permissibility of proposed developments subject to the provisions of this division [of the Public Resources Code] are determined." While the project is under the exclusive jurisdiction of the Energy Commission, sections 30413(d) and (e) of the Coastal Act expressly authorize the Coastal Commission to participate in Energy Commission siting proceedings for any thermal power plant to be located within the coastal zone and provide findings with respect to specific measures needed to bring a project into conformity with the policies of the Coastal Act as well as policies of the certified LCP.

On September 15, 2016, the Coastal Commission submitted its final "30413(d)" report for Puente. The Coastal Commission found that the project would interfere with public access to the beach with the continued use of the outfall structure for wastewater and processwater discharge (CCC 2016a, pg. 8). The Coastal Commission recommended that Condition of Certification LAND-1, previously recommended in the Preliminary Staff Assessment (PSA), be modified to require the full or partial removal of the outfall structures (CCC 2016a, pg. 44). The full removal of the outfall structure would satisfy the Coastal Act, policies 52 and 54 of the CLUP, and would significantly improve coastal access and recreation opportunities on the beach west of the project. On September 26, 2016 the applicant submitted a project enhancement for the decommissioning and demolition of the outfall structure and the restoration of its associated beach parcel.

Below, staff has provided its analysis of the project's conformity with the applicable Coastal Act Chapter 3 policies in Article 2 (Public Access), Article 5 (Land Resources), and Article 6 (Development). The project's conformity with policies in Article 4 (Marine Environment) is addressed in the **Biological Resources** section of this document.

Public Access Policies

Coastal Act section 30211 states: "Development shall not interfere with the public's right of access to the sea where acquired through the use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation."

Coastal Act section 30212 (a) states: "Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources; (2) adequate access exists nearby; or (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway."

The use of the outfall structure to serve Puente would have resulted in the continuation of a non-conforming use within the RC sub-zone of the Oxnard Coastal Zone which currently interferes with beach access west of the project site. To address the recommendations and concerns of the Coastal Commission and other agencies, the applicant included the project enhancement to remove the outfall structure and restore the beach parcel. With the incorporation of the project enhancement, Puente would not interfere with the public right of access to the sea and would provide for public access consistent with public access policies of the Coastal Act.

For analysis of the project's consistency with Coastal Act policies relevant to environmentally sensitive habitat areas and scenic and visual qualities refer to the **Biological Resources** and **Visual Resources** sections of this staff assessment.

Land Resources Policies

Coastal Act section 30240 (b) states: "Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas."

Since the 36-acre MGS parcel is adjacent to McGrath Lake, McGrath State Beach, and sensitive biological habitat along the northern property line, the **Biological Resources** section of this document provides analysis of how the project would comply with this section of the Coastal Act. The **Visual Resources** section of this document addresses the project's visual impacts on surrounding land uses (including recreational resources).

Puente would be entirely within the perimeter of the MGS and the discontinued use of the outfall would prevent future impacts to environmentally sensitive habitat areas located with the RC sub-zone. Therefore, from a land use perspective, decommissioning, demolition of MGS Units 1 and 2, the removal of the outfall, and construction and operation activities of the project would not significantly impact

environmentally sensitive habitat areas, parks, or recreation areas including the McGrath Lake or McGrath State Beach.

Development Policies

Coastal Act section 30250 states: “New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.”

Consistent with Section 30250, Puente would be located within an existing developed industrial area with adequate resources to accommodate it. The project would be on 3 acres within the 36-acre site of the existing developed MGS. The MGS site has been used for energy generation purposes since the 1950s. No off-site expansion or use of additional property beyond the MGS site would be necessary for either the construction or operation of the project. Adequate public services are available in the area to accommodate the project, including existing potable water, natural gas, storm-water, process wastewater, sanitary pipelines, and electrical transmission facilities. Additionally, Puente would not create unmitigated significant adverse impacts, either individually or cumulatively in **Air Quality, Hazardous Materials Management, Noise and Vibration, Public Health, Transmission Line Safety and Nuisance, and Visual Resources,** and therefore would not result in any physical land use incompatibilities with the existing surrounding land uses. Each of these sections has proposed conditions of certification to reduce potential impacts to less than significant.

Therefore, the project would be consistent with Section 30250 because it would be located in an existing developed area able to accommodate it and would not have significant adverse effects, either individually or cumulatively, on coastal resources.

Ventura County Airport Comprehensive Land Use Plan

The Puente site is located within the Oxnard Airport Study Area as defined by the Airport Comprehensive Land Use Plan (ACLUP) for Ventura County. The land use study area is within the Title 14 of the Code of Federal Regulations, Part 77, navigable airspace around the Oxnard Airport. The Federal Aviation Administration determined the height of the 188 foot exhaust stack “does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition is met: “It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be filed any time the project is abandoned or within 5 days after the construction reaches its greatest height (7460-2, Part 2)” (PPP 2015bb). While the project site is located within the land use study area of the Oxnard Airport, it is not located within the runway protection zone, outer safety zone, traffic pattern zone, nor the extended traffic pattern zone identified in the Adopted Land Use Compatibility Standards in Safety Zones for Civilian Airports, Table 6B of the ACLUP (ACLUP 2000a). The project’s land use would be consistent and compatible with the ACLUP for Ventura County. For analysis and discussion of the project’s effects on airport operations refer to the **Traffic and Transportation** section of this staff assessment.

Oxnard Local Coastal Program

As stated above, land uses in the Oxnard Coastal Zone are governed by the LCP and the LCP consists of the CLUP and CZO.[5] The EC sub-zone allows for the siting and construction of power generating facilities consistent with Policies 51, 52, 54 and 56 of the CLUP and the CZO.

Oxnard Coastal Land Use Plan

Policies 51, 52, 54, and 56 of the CLUP are applicable to the proposed project within the EC sub-zone (COO 2005, section 17-20). Recreational policy 72 is applicable to the proposed removal of the outfall within the RC sub-zone. The project's consistency with these policies is analyzed below.

Policy 51 states: All new industrial energy related development shall conform to the air quality regulations set forth by the Ventura County Air Pollution Control District, the air quality management plan, and New Source Review Rule 26.

*Conditions of certification ensuring compliance with the air quality regulations set forth by the Ventura County Air Pollution Control District, the air quality management plan, and New Source Rule 26 are included in the **Air Quality** section of this document.*

Policy 52 states: Energy related development shall not be located in coastal resource areas including sensitive habitats, recreational areas, and archeological sites. All development adjacent to these resource areas or agricultural areas shall be designed to mitigate any adverse impacts.

The project would be constructed within the boundaries of the existing MGS power generating facility that has been in operation since the 1950s and would not encroach into any adjacent sensitive habitats, recreational areas, and archeological sites. In addition, the project includes the removal of the outfall structure that is located within the RC sub-zone, which would eliminate the existing use of a legal non-conforming structure on a parcel designated for recreational use. The project would discontinue the use of once-through cooling technology at the site and reduce impacts to surrounding sensitive habitats. The project is not immediately adjacent to any agricultural areas and would not harm existing agricultural uses within the immediate vicinity. With the inclusion of the removal of the outfall, restoration of the beach parcel, and staff's proposed conditions of certification, the project is designed to mitigate any impacts to sensitive habitats, recreational areas, and archeological sites.

*For analysis of the project's consistency with Coastal Act policies relevant to environmentally sensitive habitat areas refer to the **Biological Resources** section of this staff assessment. For analysis for the project's consistency with Coastal Act policies relevant to archeological sites refer to the **Cultural Resources** section.*

[5] Additionally, the city of Oxnard's Chapter 6, Safety and Hazards Policy 3.5 of the 2030 General Plan also applies to land uses in the Coastal Zone. This policy does not need to be incorporated into the LCP to be applicable. See the analysis under the "City of Oxnard Planning Conflicts" and "City of Oxnard 2030 General Plan" subsections above for additional information.

Policy 54: All new energy related development shall be located and designed to minimize adverse effects upon public access to the beach.

Puente would be constructed within the boundaries of the existing MGS and would have no adverse *effects on public access. Further, the project would enhance public access, with the removal of the outfall structure, satisfying requirements of the Coastal Act, CLUP, and the Warren-Alquist Act.*

Policy 56: No energy related development shall be located seaward of the 100 year flood/wave run-up line as designated by the U.S. Department of Housing Insurance Program Administration and the Land Use map.

The project owner is not proposing to construct the Puente facility within the designated 100 year flood/wave run-up line. Discussion and analysis of the designated 100 year flood/wave run-up line is contained in the ***Soil and Water Resources*** *section of this document.*

Policy 72: Pubic access to and along the shoreline and Inland Waterway shall be required as a condition of permit approval for all new developments between the shoreline and the first public roadway inland from the shore.

The removal of the outfall structure located west of the project site would satisfy Policy 72.

In consideration of the above analysis, staff concludes that the project would be consistent with the applicable policies of the CLUP.

Oxnard Coastal Zoning Ordinance

Staff has analyzed the proposed project using design standards from the CZO that would be required for projects located within the coastal zone (section 17-20(C)(3), Article IV 17-46 (B)(1-12) “Design Standards”). Analysis of whether the project meets the required findings is provided in italics below.

(1) The proposed development will be of a quality and character which is compatible with the surrounding area and harmonizes with existing development.

(2) The design will improve the community's appearance by avoiding excessive variety and monotonous repetition.

The Puente Power Project proposes to demolish both MGS Units 1 and 2 and remove the outfall structure. As stated in the ***Visual Resources*** *section of this document, the existing exhaust stack, which does not match or harmonize with the surrounding area, would also be demolished. The new facility would have a smaller footprint, a lower profile, and a slightly shorter stack (188 feet); the project would not be considered monotonous because of the varying heights, masses, and densities of the power generation facility, ancillary structures, switchyards, and exhaust stack. In addition, the removal of the outfall structure would improve the overall appearance of the project from the beach.*

(3) Proposed signage will be an integral architectural feature which does not overwhelm or dominate the structure or object it is attached to.

The existing MGS facility currently has an existing monument sign at the entrance of the facility surrounded with landscaping. No new signage is being proposed.

(4) Lighting will be stationary and deflected away from adjacent properties.

(5) Mechanical equipment, storage and trash areas and utilities will be architecturally screened from view.

*The **Visual Resources** section of this document concludes that lighting impacts on adjacent properties would be minimized and mechanical equipment, storage and trash areas, and utilities for the project would be screened.*

(6) The plans show proper consideration for the relationship between the existing and finished grades of the site to be improved and adjacent properties;

*The **Visual Resources** analysis states that the topography of the Puente site is almost entirely flat, sloping seaward and bounded by sand dunes along the coastline. The existing MGS facility is on relatively level ground at an elevation of approximately 14 feet mean lower low water (MLLW). Sand dunes and a flood protection berm border the facility and range in elevation from 20 to 30 feet MLLW. The project would be constructed with a lower profile and smaller footprint than the MGS facility, therefore improving the relationship between the existing and finished grades of the site to be improved and the adjacent properties.*

(7) The proposed development or modification will not, in its exterior design and appearance, be so at variance with the appearance of existing buildings and development in the neighborhood as to cause the nature of the local environment to materially depreciate in appearance;

The EC sub-zone of the CZO allows power generation facilities. The Puente facility would be located within the boundaries of an existing power plant that has operated in its current location since the late 1950s and would reuse existing ancillary facilities within the MGS site. The project would be significantly smaller in size and occupy a smaller footprint than the existing MGS when demolition of Units 1 and 2, the 200-foot tall exhaust stack, and the removal of the outfall structure occurs. The proposed stack (188 feet tall) would be slightly shorter than the existing stack. Furthermore, the removal of the beach outfall would cause the nature of the local environment to materially appreciate in appearance. Staff's analysis shows that the project would comply with all applicable development standards of the EC sub-zone.

(8) The proposed design is compatible with existing development in the area in terms of scale, height, bulk, materials, cohesiveness, colors and the preservation of privacy;

(9) The proposed design promotes a harmonious transition in terms of scale and character between areas of different land use designations;

*The EC sub-zone of the CZO allows power generation facilities; additional analysis for materials, cohesiveness, and colors is provided in the **Visual Resources** section of this document. The project owner is proposing demolition of the existing MGS Units 1 and 2 including the 200-foot tall exhaust stack as well as the removal of the outfall structure. The Puente facility would be significantly smaller in size, and occupy a smaller footprint than the existing MGS and provide a public use area for public access. The project would be compatible in terms of preservation of privacy as there are no nearby existing neighbors requiring "privacy". Staff's analysis shows that the project would comply with all applicable development standards of the EC sub-zone.*

(10) All building elevations have been architecturally treated in a uniform manner, including the incorporation within the side and rear building elevations of some or all of the design elements used for the primary facades;

*This design standard would not be applicable to power generation facilities or combustion gas turbines. However, surface treatments would be applied to make the facility harmonious with the natural environment and limit reflectivity, as analyzed in the **Visual Resources** section of this document.*

(11) The plans provide for adequate on-site vehicular and pedestrian circulation.

*The project would be required to provide adequate on-site vehicular and pedestrian circulation, as it relates to worker safety and hazardous conditions that are typically associated with a power generation facility. The analysis contained in the **Worker Safety and Fire Protection** section of this document addresses on-site and vehicular and pedestrian circulation.*

(12) The main entrance to the dwelling unit or commercial or industrial building provides independent access for the physically impaired.

The project proposes to use the existing on-site administration buildings, which are required by law to provide handicapped access consistent with California Uniform Building Code Standards.

Staff concludes that the proposed project would be consistent with the design standards required by CZO section 17-20 (C)(3), 17-46 Article IV (B)(1-12). The removal of the outfall structure and restoration of the beach parcel would also be consistent with CZO section 17-39, Coastal Access and Recreation, by providing additional lateral public access along the coast.

Coastal Development Permit Findings

Electrical power generating plants and accessory uses normally associated with said power generating facilities, such as Puente, are permitted in the EC sub-zone subject to the approval of a coastal development permit (COO 2005, section 16-20(B)(2)).

The Coastal Act requires each local government with land area located within the coastal zone to prepare an LCP for management of such land areas. Once the Coastal Commission certifies an LCP, the authority to issue coastal development permits for development within the coastal zone is delegated to the local jurisdiction. (Pub. Resources Code, § 30519(a)). But for the exclusive authority of the Energy Commission to license Puente, the city of Oxnard would make certain findings to approve a coastal development permit (COO 2005, section 17-57 (C)(5)(b)). Analysis of whether the project meets the required findings is provided in italics below.

1. The proposed use is conditionally permitted within the subject sub-zone and complies with all of the applicable provisions of this chapter.

   The project site is located in the EC sub-zone. As stated above, electrical power generating plants and accessory uses normally associated with said power generating facilities are permitted in the EC sub-zone subject to the approval of a coastal development permit. Staff analyzed the proposed project using applicable design standards from the CZO chapter of the city of Oxnard Municipal Code. See the analysis contained in the "Coastal Zoning Ordinance" subsection above. Prior to the receipt of the November 28, 2016 letter from Coastal Commission Deputy Chief Counsel, Staff concluded that Puente is a conditionally-permitted use of the EC sub-zone of the Coastal Zone. However, based on the clarifying information provided in the letter, Puente is not a conditionally permitted use within the EC sub-zone. The letter states that the new Safety and Hazards Policy 3.5 of the 2030 General Plan Amendment PZ 16-620-01 applies to land uses in the Oxnard Coastal Zone without incorporation into the LCP, and, therefore, new electricity generation facilities of 50 MW or more, such as Puente, are prohibited in areas subject to coastal and other environmental hazards. See the analysis under the "City of Oxnard Planning Conflicts" and "City of Oxnard 2030 General Plan" subsections above for additional information.

   The original Puente application proposed the reuse of the outfall structure for wastewater discharge to the ocean. The applicant has since submitted a project enhancement that includes the removal of the outfall and restoration of the beach to provide a public use area. The outfall structure is located in the RC sub-zone and is a legal non-conforming structure; licensing of the project would eliminate this non-conformity. Staff has analyzed the proposed project using design standards from the CZO to determine consistency with the RC sub-zone. See the analysis contained in the "Coastal Zoning Ordinance" subsection above. Based on the analysis of the design standards in the CZO, staff has concluded that the project would be consistent with the intent of the city of RC sub-zone.

2. The proposed use would not impair the integrity and character of the subject sub-zone.

   *The project is located within the boundaries of an existing power generation facility that has been in service since the 1950s and, as shown above, would be consistent with the design standards required for projects located in the EC-sub-zone. Areas of concern for **Visual Resources** and **Worker Safety and Fire Protection** have been addressed under required design standards. Both technical areas have concluded*

*that no significant impacts associated with the proposed project would impair the integrity and character of the EC sub-zone**.***

3. The location and intensity of use of the subject site would be physically suitable and would protect and maintain adjacent coastal resources.

   *With the incorporation of appropriate mitigation measures, no adjacent coastal resources would be negatively affected by the proposed project as analyzed in the **Biological Resources** section of this document. In addition, the Puente facility would be significantly smaller in size, and occupy a smaller footprint than the existing MGS once Units 1 and 2 are demolished and the outfall structure is removed. The project would eliminate the use of ocean water for once-through cooling at the site. Staff's analysis shows that that the project would comply with all applicable development standards of the EC sub-zone.*

4. The proposed use would be compatible with the land uses presently on the subject site.

   *The project would be constructed within the boundaries of the existing MGS power generation facility that has been in service since the 1950s. The project would be compatible with the land uses presently on the subject site. In addition there would be no significant impacts in **Worker Safety and Fire Protection, Waste Management, Hazardous Materials Management, Public Health, Soil and Water Resources, Traffic and Transportation, Visual Resources, and Transmission Line Safety and Nuisance** that would cause an incompatibility with existing on-site land uses.*

5. The proposed use would be compatible with existing and future land uses within the sub-zone and the general area in which the proposed use would be located.

   Staff's analysis in subsection "Coastal Zoning Ordinance" shows that the proposed project would be compatible with existing land uses within the sub-zone and the general area in which the proposed use would be located. The MGS site would provide the existing infrastructure necessary to operate a power generating facility. Other heavy industrial uses (SCE McGrath Peaker Plant and oil wells) are located in the immediate vicinity of the project site.

6. There are adequate public services for the proposed use, including, but not limited to, fire and police protection, water, sanitation and public utilities and services to ensure that the proposed use would not be detrimental to public health and safety.

   *The **Socioeconomics** and **Worker Safety and Fire Protection** sections of this document show that adequate public services are available in the area to accommodate the project. The project would utilize existing potable water, natural gas, storm water, process wastewater and sanitary pipelines, and electrical transmission facilities. The proposed project at the existing location would not be detrimental to public health and safety as analyzed in the following areas: **Traffic and Transportation, Worker Safety and Fire Protection, Waste Management, Hazardous Materials Management, Public Health, Soil and Water Resources, and Transmission Line Safety and Nuisance.***

7. The proposed use will provide a type and level of public access consistent with the access policies and standards of the certified Oxnard Coastal Land Use Plan.

   On September 26, 2016 the applicant filed a project enhancement that would discontinue the use of outfall for wastewater discharge. Furthermore, the outfall structure would be removed and the beach parcel would be restored to accommodate safe pedestrian travel. The restoration of the beach parcel would satisfy the requirement of the Warren-Alquist Act and be consistent with the policies and standards of the Coastal Act and the CLUP.

8. The proposed use would be appropriate in light of an established need, based upon the underlying goals and objectives of specific Oxnard Coastal Land Use Plan policies, applicable to the proposed location.

   The existing MGS power generation facility has been in-service since the 1950s at the present location; construction and operation of Puente would be a continuation of the existing use of the site. The project would be an appropriate use based on the consistency determinations made with the CLUP and CZO.

9. The proposed use would be consistent with all of the applicable policies of the certified Oxnard Coastal Land Use Plan.

   Staff has analyzed policies 51, 52, 54, 56, and 72 of the CLUP and concluded that the proposed project would be consistent with the applicable policies of the CLUP, as discussed under the subsection "Oxnard Coastal Land Use Plan".

COMPLIANCE WITH LORS

Staff concludes that the project would not comply with all applicable LORS. The project is in conflict with the city of Oxnard's Chapter 6, Safety and Hazards Policy 3.5 of the 2030 General Plan.

Land Use Table 2 summarizes the project's conformance with applicable LORS.

Land Use Table 2
Project Compliance with Applicable Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description of Applicable LORS	Consistency Determination	Basis for Consistency
State			
Warren-Alquist Act, Public Resources Code (PRC) section 25529	The Energy Commission shall require public access to coastal resources as a condition of certification of a facility proposed in the Coastal Zone.	Yes	The removal of the outfall structure proposed in the project enhancement would satisfy this requirement.
Coastal Act (PRC, section 30200, et seq.)	The Coastal Act establishes a comprehensive scheme to govern land use planning along the entire California coast.	Yes	The basis for consistency for the applicable Coastal Act sections is discussed below.
PRC, section 30211	Development shall not interfere with the public's right of access to the shoreline.	Yes	The project would be constructed within the existing MGS site and would not interfere with coastal access. Removal of the outfall structure proposed in the project enhancement would significantly improve coastal access and recreation opportunities on the beach west of the project site.
PRC, section 30212(a)	Public access…shall be provided…except where it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources; adequate access exists nearby; or agriculture would be adversely affected.	Yes	Public access to the beach exists near the site at West 5th Street to the south, and McGrath Beach State Park to the north. The removal of the outfall structure would improve pedestrian circulation and public access west of the site.
PRC, section 30240(b)	Development in areas adjacent to environmentally sensitive habitat areas, parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.	Yes	Puente would be located entirely within the MGS site and would use infrastructure in an existing developed industrial area. In addition, the applicant would remove the outfall structure and restore a beach parcel located within the RC sub-zone. For analysis of the project's consistency with Coastal Act policies relevant to environmentally sensitive habitat areas refer to the **Biological Resources** section of this analysis.
PRC, section 30250	New development shall be located within, contiguous with, or in close proximity to, existing developed areas	Yes	The project would be consistent with Section 30250 because it would be located in an existing developed area able to accommodate it and would not have significant adverse effects,

Applicable LORS	Description of Applicable LORS	Consistency Determination	Basis for Consistency
	able to accommodate it.		either individually or cumulatively, on coastal resources.
LOCAL			
Ventura County Airport Comprehensive Land Use Plan (ACLUP)	The Puente site is located within the Oxnard Airport Study Area as defined by the ACLUP for Ventura County.	Yes	While the project site is located within the land use study area of the Oxnard Airport, it is not located within the runway protection zone, outer safety zone, traffic pattern zone, nor the extended traffic pattern zone identified in the Adopted Land Use Compatibility Standards in Safety Zones for Civilian Airports, Table 6B of the ACLUP (ACLUP 2000a). The project would be consistent and compatible with the ACLUP for Ventura County.
City of Oxnard 2030 General Plan Land Use Element Policy SH-3.5	The public utility/energy facility land use designation applies to large electrical generating and transmission facilities. These policies address various land use compatibility issues and other standards.	No	Public utility/energy facility are allowed uses; however, as defined in Chapter 6, Policy SH-3.5 of the General Plan, Puente is not an allowed use in areas where the city has documented that location of such facility is threatened by coastal or other environmental hazards. Based on a letter addressed to staff from the Coastal Commission Deputy Chief Counsel, staff concludes that the project is inconsistent with General Plan Policy SH-3.5. While Puente is prohibited by the General Plan, the project is consistent with several goals and objectives in the CLUP and CZO. It should be noted that the direction provided in the Deputy Chief Counsel's letter states that General Plan Policy SH-3.5 applies to Puente despite the policy's inconsistency with the CLUP and the CZO.
City of Oxnard Coastal Land Use Plan (CLUP) Policies 51, 52 54, 56 & 72	The CLUP policies are the standards by which future projects in the coastal zone are evaluated.	Yes	Staff's analysis of the applicable policies of the CLUP in subsection "Oxnard Coastal Land Use Plan" shows the project is consistent with these policies.
City of Oxnard Zoning Ordinance (CZO) Chapter 17: Coastal Zoning Ordinance	The EC sub-zone is established by this chapter with prescribed findings for coastal development. The purpose of the EC sub-zone is to provide areas that allow for siting, construction, modification, and maintenance of power generating facilities consistent with the CLUP.	Yes	Staff analyzed the proposed project using the design standards from the CZO for projects located within the coastal zone (Chapter 17-20(C)(3), Article IV 17-46 (B)(1-12) "Design Standards") and concluded the project meets the design standards.

Applicable LORS	Description of Applicable LORS	Consistency Determination	Basis for Consistency
Section 17-20: EC Coastal Energy Facilities, sub-zone Section 17-22: RC Coastal Recreation, sub-zone	The purpose of the RC sub-zone is to provide open space for various forms of outdoor recreation consistent with the CLUP.	Yes	The removal of the outfall structure would eliminate the legal-nonconforming structure and use from the RC sub-zone. Restoration of the beach would result in an allowed use in the RC sub-zone.
Section 17-57 (C)(5)(b) Conditionally Permitted Uses	States that electrical power generating facilities are permitted subject to approval of a coastal development permit.	Yes	Staff's analysis in the "Coastal Development Permit Findings" subsection above shows the project would be consistent with these findings.
Section 17-20(C)(2), Article III 17-39(B)(2)(a): Coastal Access and Recreation	Requires public access be provided from the nearest public roadway to the shoreline for new development along the coast unless the access would be inconsistent with public safety or protection of fragile coastal resources.	Yes	The removal of the outfall structure proposed in the project enhancement would satisfy this requirement.

LAND USE COMPATIBILITY

Puente would be located entirely within the boundary of the existing MGS facility. The MGS property has been used as a power generation facility since the 1950s. The project is consistent with the CLUP land use designations and CZO and would not constitute a change in the current development pattern of the city of Oxnard. Furthermore, the project is compatible with the existing ancillary facilities of the MGS, which would be reused to support Puente, including existing potable water, natural gas, storm water, process wastewater and sanitary pipelines, and electrical transmission facilities.

As noted in the discussion above under the subsection titled “Physical Disruption or Division of an Established Community”**,** development of the proposed project and its associated facilities would not divide an established community.

A power plant may be an incompatible land use if it would cause an unmitigated noise, odor, public health or safety hazard, visual, or traffic effect on surrounding properties.

Staff has conferred with other technical staff in the following areas: **Air Quality, Hazardous Materials Management, Public Health, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Waste Management, and Worker Safety and Fire Protection**. Each has incorporated specific conditions of certification where applicable to avoid or mitigate potential negative environmental impacts. Therefore, staff concludes that the proposed project would not result in any physical land use incompatibilities with the existing surrounding land uses.

CUMULATIVE IMPACTS

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, section 15065(a)(3)).

The cumulative land use and planning analysis considers past, current and probable future projects that are relatively near the proposed project that would contribute to cumulative impacts by impacting agricultural or forest lands, disrupting or dividing an established community, conflicting with applicable land use plans, policies or regulations, or conflicting with an applicable habitat conservation plan or natural community conservation plan.

Land Use Table 3 displays the reasonably foreseeable, significant-sized development projects within approximately one-mile of the project site in the city of Oxnard.

Land Use Table 3
Cumulative Projects

Project Title	Location	Project Description	Status of Project
Beachwalk on the Mandalay Coast (formerly North Shore Subdivision)	NE corner of W Fifth St and Harbor Blvd, Oxnard	183 single-family homes, 109 detached condos, and on-site amenities.	Plan Check, Dirt, gravel and rock movement. Submitted plans for off-site improvements for Harbor Boulevard - widening, etc. No active permits pulled for houses yet.
Avalon Homes Subdivision	Catamaran St, Oxnard	Coastal Development Permit for 64 single-family homes and a tentative tract map for 16 parcels (4 houses per parcel) on an 8.1-acre parcel.	Proposed - City currently preparing Draft Environmental Impact Report.
Anacapa Townhomes	5001 W Wooley Rd, Oxnard	Coastal Development Permit for 70 condominiums in 5 buildings on a 3.5 acre property, and variance for setbacks.	Plan Check - On hold due to lack of funds. Owner may sell project.

*Source**: Executive Summary**Table1 Puente - Master List of Cumulative Projects*

The following topics have been analyzed with regard to cumulative land use impacts.

AGRICULTURE AND FOREST

Puente as proposed would not have any impacts to agricultural or forest lands or conflict with any land that is zoned for agricultural purposes and therefore, would not contribute to cumulative impacts related to this land use topic.

PHYSICAL DISRUPTION OR DIVISION OF AN ESTABLISHED COMMUNITY

The project would be located entirely within the boundaries of an existing power plant facility that has been in operation since the 1950s. The project is situated on land designated and zoned for public utility uses, including electrical generation facilities. The project would not physically disrupt or divide an established community and would not contribute to a cumulative impact in this land use topic.

CONFLICT WITH ANY APPLICABLE HABITAT OR NATURAL COMMUNITY CONSERVATION PLAN

Puente would not conflict with any habitat or natural community conservation plans and would not contribute to any cumulative impacts in this land use topic.

CONFLICT WITH ANY APPLICABLE LAND USE PLAN, POLICY OR REGULATION

Staff's analysis shows that the project would not conflict with any other applicable land use plan, policy, or regulation of an agency with jurisdiction.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows the presence of an environmental justice (EJ) population based on race and ethnicity within a six-mile radius of the project site. **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme are considered an EJ population based on poverty.

Potential land use impacts for a project on an EJ population would be predominantly driven by physical land use incompatibilities or the division of an established community. The project's land use impact area includes the proposed site and immediately adjacent and nearby land uses.

Staff concluded that the construction, demolition, and operation of Puente would not result in adverse direct, indirect, or cumulative physical land use incompatibilities or the division of an established community within the land use impact area. There is not an EJ population residing within one mile of the project's land use impact area. Thus, the project's impacts would not have an effect on any population, including the EJ population during construction, decommissioning, and demolition. No impacts would occur during operations.

Staff concluded that the project's land use impacts would not disproportionately affect the EJ population, as the project impacts would not affect any population living in the impact area. The land use impacts from the project on the EJ population would be less than significant.

NOTEWORTHY PUBLIC BENEFITS

On September 26, 2016 the applicant submitted a project enhancement which included the decommissioning and demolition of the outfall structure. The implementation of the project enhancement would improve pedestrian circulation and public access on the beach west of the site, which would be a public benefit.

RESPONSE TO PSA COMMENTS

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
Shute Mihaly and Weinberger LLP (Intervenor Representative), City of Oxnard PSA Comments, TN 213681, September 15, 2016	1. The PSA does not adequately consider continued operation of the MGS beach outfall.	1. On September 26, 2016 the applicant submitted a project enhancement that would reconfigure the project's process and storm water system. The water reconfiguration would be completed in May 2020 and the removal of the outfall structure would be completed late 2022. The project enhancement would restore a beach parcel west of the project site by removing a legal non-conforming structure from the public beach thus improving public access.
	2. PSA suggests that project activities will be limited to the MGS property boundary, but continued use of the outfall structure will create additional foreseeable environmental impacts that will occur outside the project site.	2. See response to comment 1.
	3. The PSA should acknowledge the use of a public right of way (Mandalay Beach Road) which is part of the California Coastal Trail and evaluate sand maintenance operations potential to interference with public access.	3. See response to comment 1. In addition, construction operations associated with the removal of the outfall would be temporary and the future need for sand maintenance operations would be eliminated.
	4. PSA should consider impacts	4. MGS Units 1, 2, and 3 currently

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
	related to other regulatory permits that the applicant will likely need to operate the project such as incidental take permits from U.S. Fish and Wildlife Service, California Department of Fish and Wildlife and permits from the Ventura County Watershed Protection District if reduced water intake from the Edison Canal impacts water quality.	operate under LA RWQCB order No. R4-2015-0201 which expires on December 31, 2020. The applicant included a project enhancement that would remove the outfall structure. For analysis of Puente's consistency with regulatory permits related to water quality and special-status species, refer to the **Biological Resources and Soil and Water Resources** sections of this staff assessment.
	5. The PSA should list required regulatory permits in its project description.	5. Refer to the **Project Description** section of this staff assessment for a discussion of regulatory permits.
	6. The PSA fails to acknowledge conflicts between the project and the state and local land use regulations.	6. See the "Conflict with Any Applicable Land Use Plan, Policy or Regulation" subsection of this staff assessment for an analysis of the project's consistency with applicable LORS.
	7. The project is inconsistent with the City's land use regulations such as the recent General Plan Amendment policies SH 3.5 and ICS 17.1.	7. A letter from Coastal Commission Deputy Chief Counsel submitted after the publication of the PSA states that General Plan Amendment policy SH 3.5 is effective despite not being incorporated into the LCP. This section has been changed accordingly. See the subsections "City of Oxnard Planning Conflicts" and "City of Oxnard 2030 General Plan." General Plan Amendment policy ICS 17.1 is not an applicable LORS to the project. See the subsection "City of Oxnard 2030 General Plan."

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
	8. The project conflicts with the city of Oxnard's moratorium which was adopted before SCE sought CPUC approval for the Puente contract and was in effect when the PSA was in released.	8. The moratorium expired on June 30, 2016.
	9. The Puente Power Project conflicts with the Oxnard General Plan Policies CD-21.1 and CD-21.2.	9. Policies CD 21.1 and CD 21.2 are not included in the LCP, therefore are not applicable to the project.
	10. The PSA fails to address the General Plan's height limit for the Public Utilities/Energy Facility land use designation.	10. Oxnard General Plan Table 3.2 General Plan/Zoning Consistency confirms the height overlay district is applicable to the Public Utilities/Energy Facility land use designation; however, the table specifies this land use designation is applicable to the "non-Coastal Zone" only. Staff reviewed the applicable CLUP and the CZO and confirmed height restrictions do not apply to the Energy Facilities land use designation or EC sub-zone. See the "Community Development Chapter" subsection above for additional discussion.
	11. Intervenors and members of the public assert that the	11. The project is consistent with the language of the LCPs

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
	project is not coastal-dependent and therefore construction at the proposed site is not consistent with the California Coastal Act.	coastal zoning ordinance which permits within the EC-subzone the "siting, construction, modification and maintenance of power generating facilities and electrical substations…" There is no requirement in the LCP that energy facilities in the EC-subzone must be coastal dependent. Puente is not designed to use once through cooling systems, however, the project proposes to discharge storm water and process water into the Edison Canal. The Edison Canal is an extension of the Pacific Ocean, thus, the project could be considered coastal dependent although coastal dependency is not a requirement of development.
	12. Puente is inconsistent with the city's interpretation of its own LCP policies. Specifically the LCP and coastal zoning which allow for a power plant at the Mandalay site.	12. The Coastal Commission disagrees with the city's interpretation of the LCP, and on previous occasions found that the power generating facilities and electrical substations allowed under the EC zoning designation are not limited to coastal dependent facilities (CCC 2016a). Staff concurs with the Coastal Commission's position.
	13. The PSA fails to note the project's conflicts with adjacent land uses, including McGrath State Beach, Mandalay Beach Park, and state tidelands along the shoreline. The area is not considered a brownfield. California Coastal	13. While the area surrounding the project site is not considered a brownfield, the site in which Puente is proposed has been an operating energy facility for over 50 years constituting it as a brownfield site, and the project is an allowed use within the EC subzone. The applicant

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
	Conservancy has expressed interest in the acquisition of properties in the project vicinity for habitat protection and restoration. The project will interfere with the public use of public lands and the coastal conservancy's long term restoration efforts along the Ventura coast.	has included the demolition and full removal of the outfall structure, which would improve public access and prevent future impacts to sensitive habitat on the beach parcel. While the Coastal Conservancy has shown interest in the acquisition of SCE/NRG property, the applicant continues to reserve its right and ownership to the property.
	14. The PSA should be recirculated with an analysis of conflicts with land use regulations.	14. The PSA serves as a draft of staff's direct testimony in the licensing proceeding. It is not a decision of the Energy Commission. The FSA contains an analysis of conflicts with land use regulations. See the "City of Oxnard Planning Conflicts" subsection.
Environmental Defense Center, (Intervenor Representative), Additional Scoping Comments on Staff ID Report, TN 206231, September 29, 2015	15. Intervenors and members of the public assert that the project is not coastal-dependent and therefore construction at the proposed site is not consistent with the California Coastal Act.	15. See response 11
Environmental Defense Center, Environmental Coalition and the Sierra Club (Intervenors), Comments on the PSA, TN 213635, September 13, 2016	16. The PSA fails to adequately disclose and mitigate inconsistencies with land use plans and polices.	16. See the "City of Oxnard Planning Conflicts" subsection. The project is consistent with many applicable land use LORS.
	17. Puente conflicts with the Oxnard General Plan prohibition on power plant construction in designated coastal hazard areas.	17. See response to comment 7.
	18. The project conflicts with the	18. See response to comment 9.

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
	Oxnard General Plan goal CD-21. 19. Puente conflicts with the CLUP policies 52 and 54.	 19. Puente is consistent with CLUP policies 52 and 54. See the "Oxnard Coastal Land Use Plan" subsection.
California Coastal Commission (Public Agency), 30413 (d) Final Approved Report, TN 213667, September 15, 2016	20. The proposed reuse of the outfall structure to serve the project would represent the extension of a non-conforming use and would interfere with public access to the beach. Furthermore the continued use would conflict with Coastal Act sections 30210 and 30211, and CLCP policies 52, 54, and 64.	20. The applicant submitted a project enhancement that commits to the full removal of the legal non-conforming outfall structure as well as the restoration of the beach parcel in which it is located. The removal of the outfall structure would achieve consistency with the public access and recreation policies of the Coastal Act and the LCP. Refer to the **Soil and Water Resources** section of this staff assessment for additional information regarding wastewater reuse.
Los Angeles Regional Water Quality Control Board (TN 212794, august 15, 2016	21. Will there be changes in beach access as a result of the discharges from Puente?	21. See response to comment 1.
Ventura County Resource Management Agency, (TN213654), September 15, 2016	22. The project is adjacent to Ventura County jurisdictional boundaries and within the sensitive resource area of the coastal zone. Due to its proximity to county jurisdictional boundaries and potential environmental impacts, the planning division requests that Ventura County General Plan policies 1.6.2.6 and 1.10.2-1 be considered and	22. Puente would be located within the site boundaries of an existing power generating facility that has been in operation since the 1950s. The project would not conflict with the use of adjacent agricultural lands and would be consistent with Ventura County General Plan Policy 1.6.2.6. The project applicant has proposed the full removal of the legal non-conforming outfall structure,

LAND USE COMMENTS		
Source of Comment	***Comment***	***Staff Response***
	evaluated.	which would significantly improve public access on the beach west of the project site in conformance with the policies of the CLUP. For analysis of the project's consistency with policy 1.10.2-1 refer to the **Biological Resources** and **Soil and Water Resources** sections of this staff assessment.
Ventura County Transportation Commission (TN 213676), September 15, 2016	23. The land use section of the PSA does not consider consistency with the ACLUP for Ventura County. The PSA should include a discussion of Puente in relationship to its land use and impacts to the Oxnard airport and a discussion of compatibility or consistency.	23. See the "Ventura County Comprehensive Airport Land Use Plan" subsection of this staff assessment for a discussion of the project's consistency with the ACLUP.

CONCLUSIONS AND RECOMMENDATIONS

Puente would be located entirely within the existing MGS, an operating power plant site, in the city of Oxnard.

Staff concludes Puente:

- Would not convert any farmland (as classified by the Farmland Mapping and Monitoring Program) to non-agricultural use, conflict with existing agricultural zoning or Williamson Act contracts or convert forest land to non-forest use.
- Would not conflict with existing zoning for agricultural use or a Williamson Act contract.
- Would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production.
- Would not result in the loss of forest land or conversion of forest land to non-forest use.
- Would not directly or indirectly divide an established community or disrupt an existing or recently approved land use.
- Would be consistent with development standards of the EC (Coastal Energy Facilities) sub-zone.

- Would be consistent with the current development patterns for the area established by the Oxnard Local Coastal Program, which includes the Coastal Land Use Plan, and Coastal Zoning Ordinance.
- Would conflict with the recently amended 2030 General Plan, Safety and Hazards, Policy 3.5, which prohibits: (1) construction of new electricity generation facilities of 50MW or more; (2) modifications, including alteration, replacement, or improvement of equipment that result in a 50MW or more increase in the electric generation capacity of an existing generation facility; and (3) construction of any facility subject to the California Energy Commission's jurisdiction under Public Resources Code section 25500 The project would not result in any physical land use incompatibilities with the existing surrounding land uses and would not create unmitigated significant adverse impacts in the following impact areas: **Air Quality, Hazardous Materials Management, Noise and Vibration, Public Health, Soil and Water Resources, Traffic and Transportation, and Visual Resources**. . Although the project, if approved, would conflict with Safety and Hazards Policy 3.5, the project would not be incompatible with surrounding land uses and the nonconformance would not be considered a significant impact under CEQA.
- Would be consistent with California Coastal Act policies pertaining to coastal resources and land use.
- Would not result in any physical land use incompatibilities with the existing surrounding land uses.
- Would not conflict with any applicable habitat conservation plan or natural community conservation plan.
- Would not result in incremental impacts that, although individually limited, are cumulatively considerable when viewed in connection with other project-related effects or the effects of past projects, other current projects, and probable future projects.
- Would have less than significant land use impacts on the EJ population, with no disproportionate impacts.

REFERENCES

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015b – NRG Energy Center Oxnard LLC/George L. Piantka (TN 204859). Data Adequacy Supplemental Response, dated June 1, 2015. Submitted to Jon Hilliard/CEC/Docket Unit on June 2, 2015.

PPP 2015n – Applicant's Responses to City of Oxnard Data Request Set 3 (68-79). (TN 206458). Submitted on October 30, 2015.CEC/Docket Unit October 30, 2015.

PPP 2015w – Request that the California Coastal Commission Revoke Grant Funding Provided to the City of Oxnard Due to Improper Use of Funds Latham & Watkins LLP (TN 206681). Submitted on November 18, 2015. CEC/Docket Unit on November 18, 2015.

PPP 2015x – Letter to Chris Williamson re Opposition to Proposed Zoning Amendments Targeted at NRG's Coastal Power Plants (TN 20668) Latham & Watkins LLP. Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2015y – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2015bb – Federal Aviation Administration Determination of No Hazard to Air Navigation. (TN 206297). Submitted Latham & Watkins LLP CEC/Docket Unit on October 7, 2015.

PPP 2016z – Puente Power Project (Puente), Project Enhancement – Outfall Removal and Beach Restoration, Latham & Watkins LLP, (TN 213802) dated September 26, 2016. Submitted to CEC/Dockets Unit on September 26, 2016.

PPP 2016y – Applicant's Comments on the Preliminary Staff Assessment, Latham & Watkins LLP, and (TN 213683) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

California Energy Commission

CEC 2016b – Report of Conversation (ROC) with city of Oxnard Planning Services. ROC between CEC staff and city of Oxnard Principal Planner Chris William regarding status of Puente, Oxnard's Local Coastal Plan (LCP) update, and draft Flood Maps (TN 207181). Submitted to CEC/Docket Unit on January 5, 2016.

CEC 2016d – California Energy Commission Staff Data Request Set 3 Applicant NRG Oxnard Energy Center, LLC (TN 207313). Submitted to CEC/Docket Unit on January 14, 2016.

CEC 2016g – Email from Applicant (NRG Puente) Clarifying the Schedule for Decommissioning and Demolition of Existing Mandalay Generating Station Units 1

and 2 as Proposed as Part of Puente Activities (TN 208186). Submitted to CEC/Docket Unit on January 20, 2016.

CEC 2015bb – Report of Conversation (ROC)-CEC and staff and city of Oxnard staff. ROC between CEC planning staff and city of Oxnard Staff. October 27, 2015. (TN 206441). CEC/Docket Unit October 27, 2015.

CEC 2015dd – Report of Conversation between Jon Hilliard of the CEC and Chris Williamson, from the city of Oxnard Planning Services (TN 206507). Submitted on November 3, 2015. CEC/Docket Unit on November 3, 2015.

CEC 2015ff – Report of Conversation with CEC Staff and Kathleen Mallory from city of Oxnard Planning Department. (TN 206648). Submitted on November 16, 2015. CEC/Docket Unit on November 17, 2015.

CEC 2015ii – Report of Conversation between CEC Staff and Chris Williamson, Principal Planner, city of Oxnard re: Site Alternatives (TN 206666). Submitted on November 18, 2015. CEC/Docket Unit on November 18, 2015.

City of Oxnard

COO 1982 – Oxnard Coastal Plan, February 1982. Last revised May 2002. https://www.oxnard.org/wp-content/uploads/2016/03/CoastalLandUsePlan.pdf. Accessed on October 14, 2016.

COO 2005 – City of Oxnard Coastal Zoning Ordinance, Chapter 17 of the City Code. http://library.amlegal.com/nxt/gateway.dll/California/oxnard/oxnardcaliforniacodifiedordinances?f=templates$fn=default.htm$3.0$vid=amlegal:oxnard_ca. Accessed May 2015.

COO 2006 – City of Oxnard 2030 General Plan Background Report. April 2006. https://www.oxnard.org/wp-content/uploads/2016/08/OxnardDraftBackgroundReport2006_04.21.06.pdf. Accessed on October 19, 2016.

COO 2011 – City of Oxnard 2030 General Plan Goals and Policies. October 2011. https://www.oxnard.org/wp-content/uploads/2016/08/2030GeneralPlanGoalsPoliciesOctober2011W.pdf. Accessed on October 19, 2016.

COO 2014 – City of Oxnard 2030 General Plan Map. Adopted October 2011. Revised September 2014. http://www.oxnard.org/wp-content/uploads/2016/03/203020GENERAL20PLAN2030x402009.14V3-1.pdf. Accessed on November 02, 2016.

COO 2015a – City of Oxnard Development Services Staff Report to the Planning Commission for Proposed Local Coastal Plan Amendment, Coastal Zone Text Amendment (TN 206616). Submitted on November 13, 2015. CEC/Docket Unit on November 13, 2015.

COO 2015b – Oxnard Local Coastal Comprehensive Update Scope and Schedule. June 30, 2015. http://www.bidnet.com/bneattachments?/358000066.pdf. Accessed on November 16, 2015.

COO 2016a – City of Oxnard PZ 16-620-01 2030 General Plan Amendment. City Council, June 7, 2016. http://oxnard.granicus.com/MetaViewer.php?view_id=44&clip_id=3382&meta_id=162784. Accessed June 9, 2016.

COO 2016e – City of Oxnard, Oxnard City Council Resolution 14.925 (TN 211847). Submitted to CEC/ Dockets Unit on June 16, 2016.

COO 2016f – City of Oxnard, Memo City of Oxnard for the Puente AFC (TN 214071). Submitted to CEC/ Dockets Unit on October 17, 2016.

California Coastal Commission

CCC 2016a – California Coastal Commission 30413(d) Report -- Final Approved Report (TN 213667) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

CCC 2016b – California Coastal Commission. Local Coastal Programs. 2016. https://www.coastal.ca.gov/lcps.html. Accessed on November 16, 2016.

CCC 2016c – California Coastal Commission. Our Mission – Key Statutory Responsibilities. 2016. https://www.coastal.ca.gov/whoweare.html. Accessed on November 16, 2016.

CCC 2016d – California Coastal Commission. City of Oxnard General Plan Amendment PZ 16-620-01 (TN 214574) dated November 28, 2016. Submitted to CEC/Docket Unit on November 29, 2016.

Ventura County

ACLUP 2000a – Airport Comprehensive Land Use Plan for Ventura County Final Report, July 2000. http://www.goventura.org/sites/default/files/2000-airport-land-use-for-ventura-county.pdf. Accessed on September 16, 2016.

NOISE AND VIBRATION

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

If built and operated in conformance with the proposed **Noise and Vibration** conditions of certification, the Puente Power Project (Puente or the project) would comply with all applicable noise and vibration laws, ordinances, regulations, and standards (LORS) and would produce no significant direct or cumulative adverse noise impacts on people within the project area, including the environmental justice population.

Staff retains the responsibility to monitor the enforcement of the conditions of certification listed above. Staff would work under the authority of the Energy Commission's compliance project manager (CPM) to monitor and review the reporting of project performance during construction, demolition, and the full term of operation, including facility closure.

INTRODUCTION

The construction, demolition, and operational activities associated with any power plant create noise, or unwanted sound. The character and loudness of the noise, the times of day or night that it is produced, the duration and frequency of the occurrence of the noise, and the proximity of the facility to sensitive receptors all combine to determine whether the facility would meet applicable noise control laws and ordinances and whether it would cause significant adverse noise impacts. In some cases, vibration may be produced as a result of power plant construction practices such as pile driving. The ground-borne energy of vibration may have the potential to cause nuisance and structural damage.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the Puente power block to be located on the site of the existing Mandalay Generating Station (MGS) and from the demolition of the MGS' existing conventional steam turbine Units 1 and 2 located on the same site. Staff recommends procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable LORS and to lessen the impacts to less than significant.

For an explanation of technical terms used in this section please refer to **NOISE APPENDIX A** at the end of this section.

SETTING

The proposed project, a single combustion turbine generator unit with a nominal capacity of 262 megawatt (MW), would be located within the existing MGS site at 393 North Harbor Blvd, Oxnard, California. The site is bordered by sand dunes and the Pacific Ocean to the west; McGrath Lake State Park and land owned by SunCal to the north; industrial uses to the north, south, and east; and agricultural uses farther to the east.

As a part of this project, the existing 430-MW MGS Units 1 and 2, a pair of conventional steam turbine generators, would be demolished. The 130-MW MGS Unit 3, a simple cycle combustion turbine generator, will remain on-line and operational.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Noise Table 1 below identifies the noise and vibration LORS related to Puente.

Noise Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal:	
Occupational Safety & Health Act (OSHA), Title 29, Code of Federal Regulations, § 1910.95	Protects workers from the effects of occupational noise exposure.
U.S. Environmental Protection Agency Guidelines	Assists state and local government entities in development of state and local LORS for noise.
Federal Transit Administration	Establishes thresholds for ground-borne vibration associated with construction of rail projects; also applied to other types of projects.
State:	
California Government Code, § 65302(f)	Encourages each local governmental entity to perform noise studies and implement a noise element as part of its general plan.
State of California, Office of Noise Control, Model Community Noise Control Ordinance	Provides guidance for acceptable noise levels in the absence of local noise standards.
California Occupational Safety & Health Act (Cal-OSHA): Title 8, California Code of Regulations, §§ 5095-5099 (Article 105)	Protects workers from the effects of occupational noise exposure.
California Department of Transportation (Caltrans), Transportation and Construction Vibration Guidance Manual	Establishes guidelines for assessing the impacts of ground-borne vibration associated with pile driving.
Local:	
Oxnard City Code, Noise Ordinance, Article XI, Sound Regulation	Provides exterior noise limits. Exempts construction between 7 a.m. and 6 p.m. weekdays and Saturdays from the provisions of Article XI, including the above noise limits.
City of Oxnard General Plan Chapter X, Noise Element	References the city of Oxnard Noise Ordinance limits.
County of Ventura Construction Noise Threshold Criteria and Control Plan	Provides noise limit requirements for construction work.
Ventura County General Plan, Chapter 2.16, Noise	Provides noise limits for ongoing noise generators.

FEDERAL

Under the Occupational Safety and Health Act of 1970, the Department of Labor, Occupational Safety and Health Administration (OSHA) adopted regulations (Title 29, Code of Federal Regulations, § 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 during which the worker is exposed (see **NOISE APPENDIX A, Noise Table A4** at the end of this section). The regulations further specify a hearing protection 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.

Guidelines are available from the U.S. Environmental Protection Agency (USEPA) to assist state and local government entities in developing state and local LORS for noise. Because there are existing local LORS that apply to this project, the USEPA guidelines are not applicable.

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 architectural damage for conventional sensitive structures is a peak particle velocity of about 0.2 inches per second (in/sec).

STATE

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

The State of California, Office of Noise Control prepared the Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. This model also defines a simple tone, or "pure tone," as one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five A-weighted decibels (dBA). This is consistent with the definition in **NOISE APPENDIX A**, **Noise Table A1**, last row, in this analysis.

The California Occupational Safety and Health Administration (Cal-OSHA) has adopted occupational noise exposure regulations (California Code of Regulations, Title 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to federal OSHA standards (see **NOISE APPENDIX A**, **Noise Table A4**).

In September 2013, the California Department of Transportation (Caltrans) released the Transportation and Construction Vibration Guidance Manual, available at http://www.dot.ca.gov/hq/env/noise/pub/TCVGM_Sep13_FINAL.pdf. This manual includes the FTA method and findings. For pile driving impacts, the manual uses a method based on the force of the pile driver as well as soil considerations in the calculation of vibration levels. Because the analysis in the Caltrans manual is more robust than the FTA's analysis, staff uses Caltrans' vibration criteria for pile driving associated with power plants. The Caltrans manual states that for construction activities that generate vibration, e.g., pile driving, the threshold of human response begins at a peak particle velocity of 0.16 in/sec. This is characterized by Caltrans as a "distinctly perceptible" event with an incident range of transient to continuous (Caltrans. "Transportation and Instruction Vibration Guidance Manual", September 2013. Report No. CT-HWANP-RT-13069.25.3, Table 20).

LOCAL

City of Oxnard LORS

The project is located within the city limits of Oxnard, an incorporated city within Ventura County. The Oxnard City Code, Noise Ordinance, Article XI, Sound Regulation, applies to noise. The city of Oxnard has also established noise compatibility guidelines in the Noise Element for Oxnard (Chapter X) which references the city of Oxnard Noise Ordinance limits.

Sections 7-185 and 7-188 of Article XI apply to the project. According to § 7-185, the maximum exterior levels that are considered acceptable for residential uses are 55 dBA L_{50},[1] between 7 a.m. and 10 p.m., and 50 dBA L_{50} between 10 p.m. and 7 a.m. Section 7-188(D) exempts construction between 7 a.m. and 6 p.m. weekdays and Saturdays from the provisions of Article XI, including the above noise limits.

Ventura County LORS

Although the project is located within the Oxnard city limits, one of the project's noise-sensitive receptors, identified as LT-2, is located within the unincorporated Ventura county limits north of the project site. Thus, this analysis includes the county's noise limit requirements for this receptor. The noise LORS applicable to LT-2 are the County of Ventura Noise Threshold Criteria and Control Plan and the Ventura County General Plan.

County of Ventura Construction Noise Threshold Criteria and Control Plan (County of Ventura 2010) provide the following outdoor construction noise limits for noise-sensitive receptors, which staff uses to establish the project's LORS-related construction and demolition thresholds at LT-2.

- Between 7 a.m. and 7 p.m. (day), the greater of 55 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.

[1] For the definition of the L_{50} and other sound metrics, see **NOISE APPENDIX A**, **Noise Table A1**.

- Between 7 p.m. and 10 p.m. (evening), the greater of 50 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.
- Between 10 p.m. and 7 a.m. (night), the greater of 45 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.

Ventura County General Plan, Hazards Appendix, Chapter 2.16 Noise (County of Ventura 2013), specifies the following (long-term) exterior noise limits for noise-sensitive receptors, which staff uses to establish the project's LORS-related operational thresholds at LT-2.

- Between 6 a.m. and 7 p.m., the greater of 55 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.
- Between 7 p.m. and 10 p.m., the greater of 50 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.
- Between 10 p.m. and 6 a.m., the greater of 45 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified and either eliminated or mitigated to the extent feasible. Section XII of Appendix G of the CEQA Guidelines (California Code of Regulations, title 14, Appendix G) describes some characteristics that could signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

1. 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;

2. exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels;

3. substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

4. substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Staff, in applying Item 3 above to the analysis of this and other power plant projects, concludes that an increase in background noise levels up to and including 5 dBA is less than significant, and an increase of above 5 dBA could be either significant or less than significant depending upon the circumstances of a particular case. For example, a significant impact may exist where the noise of the project plus the background exceeds the nighttime background level by more than 5 dBA at residential communities. Factors staff considers in determining if the noise is significant or not, are:

1. the resulting noise level[2];

2. the character of the noise;

3. the time the noise is produced (day or night);

4. the duration and frequency of occurrence of the noise; and

5. the land use designation of the affected receptor site and the type of receptor (residential, commercial, etc.).

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

- the construction activity is temporary; and
- the use of heavy equipment and noisy[3] activities is limited to daytime hours.

For purposes of evaluating impacts on residential uses, the project noise is compared with measured nighttime ambient noise levels, when residents are asleep. Staff uses the above methods and thresholds to evaluate the project's noise impacts on the project area's populations, including its environmental justice population.

DIRECT IMPACTS AND MITIGATION

Noise impacts associated with the project can be created by construction and demolition activities and normal operation of the project.

Ambient Noise Monitoring

In order to establish a baseline for the comparison of predicted project noise with existing ambient noise, the applicant conducted a long-term ambient noise survey on December 15-18, 2014 and provided the results in the AFC (PPP 2015a, § 4.7, Appendix H). This survey was performed using appropriately calibrated sound-recording equipment and industry-accepted standards and techniques. The noise survey monitored existing noise levels at the locations identified in **Noise Table 2** below. This table also includes a summary of the measurement results.

[2] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments and with industrial noise regulations adopted by European jurisdictions. In this case, if the project creates an increase in ambient noise no greater than 10 dBA, the project noise level may not be significant if the resulting noise level does not exceed 40 dBA.

[3] Noise that draws project-related complaints. For definition of "project-related complaints", see the footnote in Condition of Certification **NOISE-2**.

Noise Table 2
Sensitive Receptor Summary[4]

Receptor	Description	Distance to Puente (feet)	L_{eq} dBA Daytime	L_{eq} dBA Nighttime	L_{50} dBA Daytime	L_{50} dBA Nighttime	L_{90} dBA Nighttime
LT-1 5540 West 5th Street, Oxnard	Existing Residential Community South of Project Site (Oxnard Shores Mobile Home Park)	3,940	55	46	51	45	45
LT-2 5718 West Gonzales Road in Ventura County	Existing Residence North of Project Site	4,100	61	49	55	42	43
LT-3 Beach Walk Subdivision, Oxnard, Formerly Called North Shore Subdivision	Future Residential Community Southeast of Project Site[5]	2,625	63	54	61	45	47

Construction and Demolition Impacts and Mitigation

Construction and demolition noise is usually a temporary phenomenon. Demolition of MSG Units 1 and 2, which is anticipated to take approximately 15 months, would follow the completion of construction of the Puente power block which would last approximately 21 months; no overlap between demolition and construction is anticipated.

Since construction and demolition noise typically varies with time, it is most appropriately measured by and compared with the equivalent sound level, or L_{eq} metric. Noise levels from construction and demolition activities would be expected to reach L_{eq} levels of no more than 47 dBA at LT-1, 47 dBA at LT-2, and 52 dBA at LT-3 (PPP 2015x, Table 4.7-1a; PPP 2015a, Table 4.7-7).

[4] Existing baselines are averaged from PPP 2015x, Tables 4.7-5a, 4.7-5b, 4.7-6a, 4.7-6b, 4.7-7a, 4.7-7b, 4.7-8a, 4.7-8b, 4.7-9a, 4.7-9b, 4.7-10a, and 4.7-10b. The existing MGS Units 1, 2, and 3 operated part of the time during the period of data collection.

[5] The North Shore at Mandalay Bay is an approved residential development scheduled to commence construction in 2016.

After the publication of the PSA, the applicant docketed a “second enhancement and refinement” document for Puente (PPP 2016z). In this document the applicant provided a more detailed description of the modification to the existing storm water system, removal of the existing outfall, and restoration of the beach north and south of the removed outfall structure. The requirements contained in the following conditions of certification in this **Noise and Vibration** analysis apply to the entire Puente project, including the outfall work, and would sufficiently reduce any noise and vibration impacts that may be created by this work at the project’s noise-sensitive receptors. For example, **NOISE-6** would limit demolition and construction work to the daytime hours and would require these activities to be performed in a manner to ensure the potential for noise complaints is reduced as much as practicable.

Farm workers are present within approximately 800 feet of project’s power block. Demolition and construction work would periodically increase the existing ambient noise levels in this area by several decibels. However, restrictions on construction and demolition activities described in Conditions of Certification **NOISE-6** and **NOISE-7** would reduce the impact. In addition, these workers would be protected through their employer’s OSHA requirements for hearing protection and Condition of Certification **NOISE-1** requires the project owner to notify the farm workers’ employer of the start of construction.

Compliance with LORS

Project construction and demolition would occur during the day. The city of Oxnard noise LORS do not limit the loudness of construction/demolition noise during the day, but the County of Ventura Construction Noise Threshold Criteria and Control Plan does. Thus, for LT-2, which is the only project receptor located within the county limits, staff compares the projected construction/demolition noise level with the county’s allowable noise limit for daytime; that is, the greater of 55 dBA hourly L_{eq} or the existing ambient hourly L_{eq} plus 3 dBA. The existing average daytime ambient at LT-2 is 61 dBA L_{eq} (see **Noise Table 2**). Since this is greater than 55 dBA L_{eq}, the allowable noise limit becomes 61 dBA L_{eq} plus 3 dBA, or 64 dBA L_{eq}. The expected construction/demolition noise level at this location would be 47 dBA, lower than this limit and thus in compliance with the county’s threshold.

The applicant commits to performing noisy construction and demolition work during the times specified in the city of Oxnard Noise Ordinance § 7-188(D) (PPP 2015a, § 4.7.5.3.2; PPP 2015x, § 2.5); that is, 7 a.m. to 6 p.m. Mondays through Saturdays, with no such activities allowed on Sundays and federal holidays. To ensure that this requirement is met, staff proposes Condition of Certification **NOISE-6**, which restricts these activities to those times.

Therefore, project construction and demolition would comply with the noise LORS.

CEQA Impacts

The construction/demolition level of 47 dBA at LT-1 combined with the exiting average daytime ambient of 55 dBA L_{eq} at this location (from **Noise Table 2**) results in 56 dBA L_{eq}, only 1 dBA over the ambient, which is insignificant. The construction/demolition level of 47 dBA at LT-2 combined with the exiting average daytime ambient of 61 dBA

L_{eq} at this location (from **Noise Table 2**) results in no increase over the ambient. Similarly, the construction/demolition level of 52 dBA at LT-3 combined with the average daytime ambient of 63 dBA L_{eq} at this location (from **Noise Table 2**) results in no increase over the ambient.

In addition to restricting construction and demolition hours, **NOISE-6** requires the demolition and construction work to be performed in a manner to ensure the potential for noise complaints is reduced as much as practicable. In demolishing MGS Units 1 and 2, the exhaust-air stack and each turbine would be draped with an outdoor construction blanket to limit noise impacts. Other feasible measures may include the use of blasting mats or similar structures to reduce the impacts of falling debris from demolition of the stack and turbines (PPP 2015a, §§ 4.2.2, 4.7.2.1).

Also, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a public notification and noise complaint process to resolve any complaints regarding construction and demolition noise.

Therefore, the noise impacts of project construction and demolition would be less than significant.

Linear Facilities

Other than a new 500-foot-long natural gas pipeline and a new electrical transmission line extension across Harbor Blvd., no new linear facilities are required for the project (PPP 2015a, §§ 2.1, 4.7). Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Furthermore, construction of linear facilities would be limited to daytime hours in accordance with **NOISE-6**.

Vibration

The only construction work likely to produce vibration that could be perceived off site would be pile driving. The applicant anticipates that pile driving may be required for construction of Puente (PPP 2015a, § 4.7.2.2.1). As explained above in the **INTRODUCTION** to this section, Caltrans' measure of the threshold of distinct perception for pile driving begins at a peak particle velocity of about 0.16 in/sec (inches per second). Thus, in order to ensure vibration from construction would not be distinctly perceptible, Condition of Certification **NOISE-7** limits vibration from pile driving to 0.16 in/sec at the project's noise-sensitive receptors.

Pile Driving

Pile driving using traditional techniques could be expected to reach 104 dBA at a distance of 50 feet. The range of pile driving noise at receptors LT-1, LT-2, and LT-3 would be approximately 66-70 dBA. These levels exceed the ambient levels at these receptors by up to 11 dBA (see **Noise Table 2**, 4^{th} column [daytime ambient L_{eq}]). Therefore, pile driving using traditional techniques can potentially cause a significant noise impact at the nearest noise-sensitive receptors. However, several methods are available for reducing noise and vibration generated by traditional pile driving. These methods are: (1) the use of pads or impact cushions of plywood; (2) dampened driving, which involves some form of blanket or enclosure around the hammer; and (3) the use

of vibratory drivers. These methods can be effective in reducing the noise by 8-15 dBA as compared to unsilenced impact drivers.

To ensure that pile driving noise would be controlled and this work would be performed in a manner to reduce the potential for any noise complaints, staff proposes Condition of Certification **NOISE-7** below. Also, **NOISE-6** would limit pile driving to daytime hours.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards and has recognized the applicable LORS that would protect construction and demolition workers (OSHA and Cal-OSHA LORS, see **Noise Table 1**) (PPP 2015a §§ 4.7.1.1.2, 4.7.2.2.1, 4.7.5). To ensure that construction and demolition workers are, in fact, adequately protected in accordance with these LORS, staff proposes Condition of Certification **NOISE-3**.

Operation Impacts and Mitigation

The primary operational noise sources of the Puente project would include the gas turbine air inlet, gas turbine generator, selective catalytic reduction (SCR) module, exhaust-air stack, gas compressor, electric transformer, and some pumps, piping, and valves. Examples of effective mitigation measures that may be considered by the applicant (PPP 2015a, Table 4.7-9; PPP 2015x, § 4.7.2.3) and that are typically implemented for simple-cycle power plants, such as Puente, include:

- turbine inlet-air silencing;
- turbine generator enclosure;
- transformer blast walls;
- exhaust-air stack silencing;
- acoustical shrouding of SCR transition duct;
- gas compressor enclosure;
- pump enclosures;
- low-noise valves; and
- lagging of piping.

Staff compares the projected project noise with the applicable LORS, the city of Oxnard LORS for LT-1 and LT-3 (located within the city limits) and Ventura County LORS for LT-2 (located within the unincorporated county limits). In addition, in order to identify any significant adverse impacts, staff evaluates any increase in noise levels at these noise-sensitive receptors due to the project.

Compliance with LORS

The applicant used the Cadna/A® Noise Prediction Model to model the project's operational noise levels based on sound propagation factors adopted under the international standards organization's standard 9613-2 "Acoustics-Sound Attenuation during Propagation Outdoors" (PPP 2015x, § 4.7.2.2.3). Cadna/A® is an acceptable

environmental noise prediction model and standard 9613-2 is an acceptable industry standard. The project's loudest operational noise levels at the project's noise-sensitive receptors, as calculated by the model, are tabulated in **Noise Table 3** below (PPP 2015x, Table 4.7-7b). This table shows that the project would comply with the applicable LORS' allowable noise limits.

Noise Table 3
Predicted Operational Noise Levels at Sensitive Receptors and LORS Limits

Receptor	Project Operational Noise Level (dBA)	LORS Limit (dBA) Daytime/ Evening		Project in Compliance with Daytime/ Evening LORS?	LORS Limit (dBA) Nighttime	Project in Compliance with Nighttime LORS?
LT-1	43	55 L_{50} (7 a.m. - 10 p.m.)		Yes	50 L_{50} (10 p.m. - 7 a.m.)	Yes
LT-2	40	64 L_{eq}[6] (7 a.m.-6 p.m.)	50 L_{eq}[7] (6 p.m.-10 pm)	Yes	52 L_{eq}[8] (10 p.m. - 6 a.m.)	Yes
LT-3	46	55 L_{50} (7 a.m. - 10 p.m.)		Yes	50 L_{50} (10 p.m. - 7 a.m.)	Yes

As shown in **Noise Table 3**, operational noise would comply with the noise LORS applicable to each receptor location; that is, the project would be in compliance with the city of Oxnard's allowable limits at LT-1 and LT-3 and with Ventura County's allowable limits at LT-2.

To ensure that the project would not exceed the noise LORS limits, staff proposes Condition of Certification **NOISE-4**. This condition of certification requires an operational noise survey to ensure project compliance. Staff also proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a public notification and noise complaint process requiring the project owner to resolve any complaints that may be caused by operational noise. With implementation of these conditions of certification, noise due to project operation would comply with the applicable LORS.

CEQA Impacts

Power plant operational noise is steady in nature, as opposed to the intermittent and variable nature of noise from construction. Thus, it tends to define the background noise level. For this reason, staff typically compares power plant operational noise to existing ambient background noise levels at affected sensitive receptors. If this comparison

[6] Exiting ambient of 61 dBA L_{eq} (from **Noise Table 2**) is greater than the county's daytime limit of 55 dBA L_{eq}, so the allowable limit becomes 61 dBA L_{eq} plus 3 dBA, or 64 dBA L_{eq}, consistent with the guidelines of the county's General Plan.

[7] Evening ambient L_{eq} is 48 dBA (PPP 2015x, Table 4.7-5a), so the county's allowable evening limit of 50 dBA L_{eq} applies.

[8] Existing ambient of 49 dBA L_{eq} (from **Noise Table 2**) exceeds the county's nighttime limit of 45 dBA L_{eq}, so the allowable limit becomes ambient plus 3 dBA, or 52 dBA L_{eq}, consistent with the guidelines of the county's General Plan.

identifies a significant adverse impact, then feasible mitigation must be applied to the project to either reduce or remove that impact.

In many cases, a power plant operates around the clock for much of the year. Puente is expected to operate as an intermediate load and peaking facility, but it may operate at night, which could affect nearby residences if the noise impacts are left unmitigated. For residential receptors, staff evaluates project noise emissions by comparing them with nighttime ambient background levels. This evaluation assumes that the potential for public nuisance from power plant noise is greatest at night when residents are asleep. Nighttime ambient noise levels are typically lower than daytime levels; differences in background noise levels of 5 to 10 dBA are common. Staff uses the average of the lowest nighttime hourly background noise levels in terms of the L_{90} metric (the noise level that's exceeded 90 percent of the time) to arrive at a reasonable baseline for comparison with the project's predicted noise level.

Noise Table 4, below, compares the project's operational noise levels with the ambient nighttime noise levels.

Staff regards an increase of up to and including 5 dBA as a less-than-significant impact (see **METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE** above). In the LT-1 row of **Noise Table 4**, combining the project noise level of 43 dBA with the nighttime background noise level of 45 dBA L_{90} yields a combined value of 47 dBA L_{90}, 2 dBA above the ambient, which is a less-than-significant impact.

For LT-2, combining the project level of 40 dBA with the nighttime background level of 43 dBA L_{90} results in 45 dBA L_{90}, 2 dBA above ambient; again, less than significant. For LT-3, combining the project level of 46 dBA with the nighttime background level of 47 dBA L_{90} yields 50 dBA L_{90}, 3 dBA above the ambient; not a significant impact.

Noise Table 4
Predicted Operational Noise Levels at Sensitive Receptors and CEQA Limits

Receptor	Operational Noise Level[9] (dBA)	Measured Lowest Nighttime Ambient L_{90} (dBA)[10]	Combined, Ambient Plus Project (dBA)	Change (dBA)	Less Than Significant Impact?
LT-1	43	45	47	+2	Yes
LT-2	40	43	45	+2	Yes
LT-3	46	47	50	+3	Yes

Staff proposes Condition of Certification **NOISE-4** to ensure that project operation would not cause a significant increase in the existing nighttime ambient noise levels at the

[9] From **Noise Table 3**

[10] From **Noise Table 2**

noise-sensitive receptors. As explained above, the noise limits given in **NOISE-4** also ensure that the project would not exceed the noise LORS limits

Tonal Noises

One possible source of nuisance could be strong tonal noises from power plant equipment. Tonal noises are individual sounds (such as pure tones) which, while not louder than permissible levels, stand out in sound quality, such as high-pitched sounds. The applicant plans to address overall noise in project design, and to take appropriate measures, as needed, to eliminate tonal noises as possible sources of public complaints (PPP 2015a, § 4.7.4). To ensure that tonal noises do not cause public nuisance, staff proposes Condition of Certification **NOISE-4**, which would require mitigation measures, if necessary, to ensure the project would not create tonal noises.

Linear Facilities

Water and natural gas pipelines are usually underground and therefore silent during power plant operation. Noise effects from electrical interconnection lines typically do not extend beyond the lines' right-of-way easements. Other than a new 500-foot-long natural gas pipeline and a new electrical transmission line extension, no new linear facilities are required for the project. The new gas pipeline would be underground and therefore silent during plant operation. Noise effects from electrical transmission lines typically do not extend beyond the lines' right-of-way easements and would be inaudible to receptors.

Vibration

Vibration from an operating power plant could be transmitted through two primary means: ground (ground-borne vibration) and air (airborne vibration).

The operating components of Puente would consist of a high-speed gas turbine and electric generator, a natural gas compressor, and various pumps. All of these pieces of equipment are carefully balanced in order to operate properly and permanent vibration sensors are attached to the turbine and generator. Modern power plants using today's gas turbine technologies, such as Puente, have not resulted in vibration impacts. Ground-borne vibration from the Puente project would be undetectable by any offsite receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can shake the walls of lightweight structures. Puente's chief source of airborne vibration would be gas turbine exhaust air. In a power plant such as Puente, however, the exhaust must pass through the SCR module and the stack silencer before it reaches the atmosphere. The SCR and stack silencer act as efficient mufflers and significantly reduce airborne vibration. Thus, Puente would not cause airborne vibration effects that would be perceived offsite.

Worker Effects

The applicant acknowledges the need to protect power plant operating and maintenance workers from noise hazards and commits to compliance with all applicable LORS (OSHA and Cal-OSHA LORS, see **Noise Table 1**) (PPP 2015a, §§ 4.7.1.1.2, 4.7.2.2.3, 4.7.4, 4.7.5). 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 and provided. To ensure that plant operating and maintenance workers are adequately protected in accordance with these LORS, staff proposes Condition of Certification **NOISE-5**.

CUMULATIVE IMPACTS AND MITIGATION

Section 15130 of the CEQA guidelines (California Code of Regulations, title 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts (from existing and/or reasonably foreseeable projects) that, when considered together, compound or increase other environmental impacts. CEQA guidelines require that this discussion reflect the severity of the impacts and the likelihood of their occurrence, but does not need to provide as much detail as the discussion of impacts solely attributable to the project.

Typically, projects within the one-mile radius of a power plant project may present the potential for cumulative noise impacts. Thus, staff's cumulative noise analysis covers the area within this radius. The only project that may have the potential to create a cumulative impact when combined with Puente is the Beach Walk Subdivision (formerly called the North Shore Subdivision) to be located nearly half a mile from Puente; this is the future noise-sensitive residential community represented in this analysis by LT-3.

Construction work associated with this project may periodically overlap with construction or demolition work associated with the Puente project. However, Puente would require the following conditions of certification to assure the effective control of construction and demolition noise:

NOISE-1 and **NOISE-2**: Public notification and noise complaint process.

NOISE-6: Restriction on construction/demolition hours and noise control of these activities.

NOISE-7: Noise control during pile driving activities.

The Environmental Impact Report (EIR) prepared by the city of Oxnard for the Beach Walk Subdivision project lists several appropriate mitigation measures to control its construction noise (North Shore at Mandalay Bay EIR, State Clearinghouse No. 97061004, § 4.8). These measures are similar to those proposed in **NOISE-6** for Puente, such as, restricting construction to the daytime hours, locating equipment staging areas away from residential areas, providing sound-reduction features for construction equipment, and installing temporary sound barriers.

Condition of Certification **NOISE-4** would ensure that operational noise levels resulting from Puente comply with applicable local noise requirements and create a less-than-significant impact at the surrounding communities, including this subdivision. According to the city's EIR, a six-foot-tall masonry wall will be constructed around the subdivision, which would reduce the noise impact of Puente on its occupants.

Therefore, the combination of the mitigation measures provided for both projects would ensure that Puente would not create a significant cumulative noise impact.

ENVIRONMENTAL JUSTICE

As discussed in the **Environmental Justice** section of this Final Staff Assessment, the minority population in the six-mile radius around the proposed project constitutes an environmental justice (EJ) population based on race and ethnicity (**Environmental Justice Figure 1**). **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitutes an EJ population based on poverty.

Staff reviewed **Environmental Justice Figure 1** and **Table 3** in the **Environmental Justice** section to examine whether the construction and operation of Puente would have significant, unmitigated impacts or disproportionate impacts on an EJ population. In this analysis, staff has used the benchmarks under **METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE** to evaluate the project's noise impacts on the project area's populations, including its EJ population. As a result, staff has prepared Conditions of Certification **NOISE-1** through **NOISE-7** to ensure noise impacts are reduced to less than significant for all the area's population, including the EJ population.

The nearest EJ population is located approximately four miles east of the proposed project site, but noise impacts may occur within only one mile from the project site. The nearest residential receptors (future Beach Walk Subdivision) would be approximately 0.5 mile from the project, but would not be an EJ population. Farm workers are present within approximately 800 feet of the project's power block but restrictions on construction and demolition activities described in Conditions of Certification **NOISE-6** and **NOISE-7** would reduce the noise impact. In addition, these workers would be protected through their employer's OSHA requirements for hearing protection and Condition of Certification **NOISE-1** requires the project owner to notify the farm workers' employer of the start of construction. Due to the distance between the project and where the nearest EJ population resides, noise impacts would not be disproportionate. Therefore, noise produced by project construction and operation would not cause significant, unmitigated impacts to noise-sensitive receptors and would not contribute to disproportionate impacts to the EJ population, individually or cumulatively.

FACILITY CLOSURE

All operational noise from the project would cease when the Puente project closes, and no further adverse noise impact from its operation would be possible. The remaining temporary noise source would be the dismantling of the project structures and equipment, as well as any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction and demolition, it would be similarly treated; that is, noisy work would be performed during daytime hours with similar noise reduction measures as in **NOISE-6** (such as, the use of machinery and equipment that are properly insulated and the use of noise barriers). Any noise LORS in existence at that time would apply. Unless modified, applicable noise-related conditions of certification included in the Energy Commission decision would also apply.

RESPONSE TO PSA COMMENTS

The following are the comments staff received on the PSA in the area of **Noise and Vibration** (PPP 2016y) and the staff's responses to those comments.

Noise and Vibration		
Source of Comment	***Comment***	***Staff's Response***
Applicant	1. The applicant comments that Condition of Certification **NOISE-4** should refer to "monitoring locations" instead of "affected residence."	1. The measurement of power plant noise for the purpose of demonstrating compliance is not modified or compromised by characterizing the points of measurement as "monitoring locations" instead of "affected residence." Staff accepts this this change and has revised **NOISE-4** accordingly.
	2. The applicant requests the following changes to Condition of Certification **NOISE-6**: "Demolition and construction work shall be performed in a manner to ~~ensure~~ **avoid** excessive noise ~~is prohibited~~ and **reduce** the potential for noise complaints ~~is reduced~~ as much as practicable."	2. These changes are editorial in nature and do not affect the requirements in **NOISE-6**. Staff accepts the changes and has revised **NOISE-6** accordingly.

CONCLUSIONS

If built and operated in conformance with the following conditions of certification, Puente would comply with all applicable noise and vibration LORS and would produce no significant direct or cumulative adverse noise impacts on people within the project area, including the environmental justice population represented in **Environmental Justice Figure 1** and **Table 3**. It would not contribute to disproportionate noise and vibration impacts to the EJ population.

Staff recommends conditions of certification addressing worker and employee noise protection (**NOISE-3** and **NOISE-5**), measurement and verification that noise performance criteria are met at the project's noise-sensitive residential receptors (**NOISE-4**), and restrictions on construction and demolition activities (**NOISE-6** and

NOISE-7). Also, **NOISE-1** and **NOISE-2** establish a public notification and noise complaint process to resolve any noise complaints regarding project construction, demolition, or operation.

Staff retains the responsibility to monitor the enforcement of these conditions of certification. Staff would work under the authority of the CPM to monitor and review the reporting of project performance during construction, demolition, and the full term of operation, including facility closure.

PROPOSED CONDITIONS OF CERTIFICATION

PUBLIC NOTIFICATION PROCESS

NOISE-1 Prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the project site and one-half mile of the linear facilities, and the employer of the farm workers in the agricultural field approximately 800 feet from the Puente's power block, by mail or by 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, demolition, and operation of the project. If the telephone is not staffed 24 hours a 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 where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year and all subsequent demolition activities associated with MGS Units 1 and 2 have been completed.

Verification: At least 15 days prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site, and shall provide that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction, demolition, and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints[11]. The project owner or its authorized agent shall:

- use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to the noise complaint;

[11] A project-related noise complaint is a complaint about noise that is caused by the Puente project, as opposed to another source, and may constitute a violation by the project of any noise condition of certification, which is documented by an individual or entity affected by such noise.

- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise in the complaint;
- if the noise is project related, take all feasible measures to reduce the source of the noise; and
- submit a report documenting the complaint and actions taken. The report shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant that states that the noise problem has been resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file with the CPM a Noise Complaint Resolution Form, shown below, that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within a three business-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

EMPLOYEE NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during construction and demolition in accordance with Title 8, California Code of Regulations, Sections 5095-5099, and Title 29, Code of Federal Regulations, Section 1910.95.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

OPERATIONAL NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the noise levels due to the project operation alone do not exceed an hourly average exterior noise level of 45 dBA L_{50} measured at or near monitoring location LT-1, an hourly average exterior noise level of 42 dBA L_{eq} measured at or near monitoring location LT-2, and an hourly average exterior noise level of 48 dBA L_{50} measured at or near monitoring location LT-3.

No new pure-tone components (as defined in **Noise Table A1**, last row) shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws project-related complaints.

When the project first achieves a sustained output of 85 percent or greater of its rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring locations LT-1, LT-2, and LT-3, or at a closer location acceptable to the CPM and include L_{50}, L_{eq}, and L_{90} readings. This survey

shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution to the monitoring locations. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

If the results from the noise survey indicate that the power plant noise exceeds the above values at the above receptors, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to reduce the pure tones to a level that complies with **Noise Table A1**, below.

Verification: The above noise survey shall take place within 30 days of the project first achieving a sustained output of 85 percent or greater of its rated capacity.

Within 15 days after completing the survey, the project owner shall submit a summary report to the CPM. Included in the survey report shall be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. When these measures are implemented and in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following the project's attainment of a sustained output of 85 percent or greater of its rated capacity, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas within the power plant.

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 to be employed in order to comply with the above regulations.

Verification: Within 30 days after completing each 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 from OSHA and Cal-OSHA.

CONSTRUCTION AND DEMOLITION NOISE RESTRICTIONS

NOISE-6 Heavy equipment operation and noisy[12] work associated with the construction and demolition work relating to any project features, including pile driving and linear facilities, shall be restricted to the times delineated below:

Mondays through Saturdays:	7:00 a.m. to 6:00 p.m.
Sundays and federal holidays:	Construction and demolition not allowed

Demolition and construction work shall be performed in a manner to avoid excessive noise[13] and reduce the potential for noise complaints as much as practicable. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers and other state-required noise attenuation devices. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use (jake braking) shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction and demolition work associated with this project.

Construction and demolition equipment generating excessive noise shall be updated or replaced. Temporary acoustic barriers shall be installed around stationary construction and demolition noise sources if beneficial in reducing the noise. The project owner shall reorient construction and demolition equipment, and relocate construction staging areas, when possible, to minimize the noise impact to nearest noise-sensitive receptors.

PILE DRIVING MANAGEMENT

NOISE-7 The project owner shall perform pile driving in a manner to reduce the potential for any project-related noise complaints. The project owner shall notify the residents in the vicinity of pile driving prior to start of pile driving activities. Vibrations from pile driving shall be limited to a peak particle velocity of 0.16 inches per second at receptors LT-1, LT-2, and LT-3.

Verification: At least 15 days prior to first pile driving, the project owner shall submit to the CPM a description of the pile driving technique to be employed, including calculations showing its projected noise impacts at monitoring locations LT-1, LT-2, and LT-3.

At least 10 days prior to first pile driving, the project owner shall notify the residents within one mile of the pile driving. In this notification, the project owner shall state that it

[12] Noise that draws a project-related complaint. For definition of a “project-related complaint”, see the footnote in Condition of Certification **NOISE-2**.

[13] Noise that draws a project-related complaint.

will perform this activity in a manner to reduce the potential for any project-related noise complaints as much as practicable. The project owner shall submit a copy of this notification to the CPM prior to the start of pile driving.

NOISE COMPLAINT RESOLUTION FORM

Puente Power Project (Puente)

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).

REFERENCES

City of Oxnard 2006 – City of Oxnard General Plan Draft Background Report available online at https://www.oxnard.org/wp-content/uploads/2016/08/OxnardDraftBackgroundReport2006_04.21.06.pdf

County of Ventura 2010 – Construction Noise Threshold Criteria and Control Plan. Available online at http://www.ventura.org/rma/planning/pdf/ceqa/Construction_Noise_Thresholds.pdf.

County of Ventura 2013 – General Plan, Hazards Appendix, Chapter 2.16 Noise.

Oxnard City Code – Noise Ordinance, Article XI, Sound Regulation.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015x – Latham & Watkins, LLP, Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2016y -- Applicant's Comments on the Preliminary Staff Assessment, Latham & Watkins, LLP, and (TN 213683) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

PPP 2016z -- Puente Power Project, Project Enhancement, Outfall Removal and Beach Restoration, Latham & Watkins LLP, (TN 213802) dated September 26, 2016. Submitted to CEC/Dockets Unit on September 26, 2016.

NOISE APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive areas, 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 (L_{eq}), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (L_{dn}). 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 L_{dn} 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. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31, 1971).

In order to help the reader understand the concept of noise in decibels (dBA), **Noise Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

Noise Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10 percent, 50 percent, and 90 percent 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 (often used for an existing or pre-project noise condition for comparison study).
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.

Noise Table A2
Typical Environmental and Industry Sound Levels

Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environnent	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press, Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center, Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980			

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 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. (Kryter, Karl D., The Effects of Noise on Man, Academic Press, New York, 1970).

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: Architectural Acoustics, M. David Egan, 1988

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 10 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: 29 C.F.R. § 1910.

PUBLIC HEALTH

Testimony of Huei-An (Ann) Chu, Ph.D.

SUMMARY OF CONCLUSION

California Energy Commission staff has analyzed the potential human health risks associated with construction, demolition, and operation of the proposed Puente Power Project (Puente or project). Staff's analysis of potential health impacts was based on a highly conservative health-protective methodology that accounts for impacts on the most sensitive individuals in a given population. As part of its analysis, staff considered the environmental justice population, local farm workers, and recreational users. Staff concludes that there would be no significant health impacts from the project's toxic air emissions.

INTRODUCTION

The purpose of this section of the Final Staff Assessment (FSA) is to determine if emissions of toxic air contaminants (TACs) from the proposed Puente Power Project would have the potential to cause significant adverse public health impacts or to violate standards for the protection of public health. If potentially significant health impacts are identified, staff would identify and recommend mitigation measures necessary to reduce such impacts to insignificant levels.

In addition to the analysis in this **Public Health** section that focuses on potential effects on the public from emissions of toxic air contaminants, Energy Commission staff addresses the potential impacts of regulated, or criteria, air pollutants in the **Air Quality** section of this FSA and assesses the health impacts on public and workers from accidental releases of hazardous materials in the **Hazardous Materials Management** and **Worker Safety & Fire Protection** sections. The health and nuisance effects from electric and magnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project's wastewater streams are discussed in the **Soil and Water Resources** section. Releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Public Health Table 1 lists the federal, state, and local laws, ordinances, regulations, and standards (LORS) applicable to the control of TAC emissions and mitigation of public health impacts for Puente. This FSA evaluates compliance with these LORS.

Public Health Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
Clean Air Act section 112 (Title 42, U.S. Code section 7412)	Section 112 of the Clean Air Act addresses emissions of hazardous air pollutants (HAPs). This act requires new sources that emit more than ten tons per year of any specified HAP or more than 25 tons

Applicable LORS	Description
	per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).
40 Code of Federal Regulations (CFR) Part 63 Subpart YYYY (National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines)	This regulation applies to gas turbines located at major sources of HAP emissions. A major source is defined as a facility with emissions of ten tons per year (tpy) or more of a single HAP or 25 tpy or more of a combination of HAPs based on the potential to emit.
40 Code of Federal Regulations (CFR) Part 68 (Risk Management Plan)	This regulation requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans.
State	
California Health and Safety Code section 25249.5 et seq. (Proposition 65)	These sections establish thresholds of exposure to carcinogenic substances above which Proposition 65 exposure warnings are required.
California Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	These sections require facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans.
California Health and Safety Code section 41700	This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Health and Safety Code sections 44300 et seq.	Air Toxics Hot Spots Program requires participation in the inventory and reporting program at the local air pollution control district level.
California Health and Safety Code sections 44360 to 44366 (Air Toxics “Hot Spots” Information and Assessment Act—AB 2588)	These sections require that, based on results of a health risk assessment (HRA) conducted per ARB (California Air Resources Board) / OEHHA (Office of Environmental Health Hazard Assessment) guidelines, toxic contaminants do not exceed acceptable levels.
California Public Resource Code section 25523(a); Title 20, California Code of Regulations, sections 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These sections require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs).
Local	
Ventura County APCD (VCAPCD) Rule 51 (Nuisance Risk Management Review)	This rule prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. VCAPCD requires that for an increase in emissions or a change in mode or time of operation associated with a proposed new source or modification, VCAPCD shall perform an analysis to determine the possible impact to the nearest resident or worksite. If a preliminary prioritization analysis demonstrates that: • A unit’s prioritization score is less than the VCAPCD’s significance threshold and; • The project’s prioritization score is less than the

Applicable LORS	Description
	VCAPCD's significance threshold and; • The facility's total prioritization score is less than the VCAPCD's significance threshold Then, generally no further analysis is required. The District's "no further action" thresholds are 1 in a million for excess cancer risk, 0.5 for the chronic hazard index, and 0.5 for the acute hazard index.
VCAPCD Rule 73 (National Emission Standards for Hazardous Air Pollutants)	This rule requires units to comply with federal National Emission Standards for Hazardous Air Pollutant (NESHAP) standards.

SETTING

Characteristics of the natural environment, such as meteorology and terrain, affect the project's potential for impacts on public health. An emission plume from a facility would affect elevated areas before lower terrain areas because of reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts compared to lower-level areas. Also, the land use around a project site can influence impacts due to population distribution and density, which, in turn, can affect public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed Puente site is located at 393 North Harbor Boulevard in the city of Oxnard. It is within the Ventura County Air Pollution Control District (VCAPCD). Oxnard is a seaside city in Ventura County in Southern California. The project site is located at the site of the existing Mandalay Generating Station (MGS), an operating power plant (PPP 2015a, Section 2.0 and 4.9).

Puente would replace two aging gas-fired steam boiler generating units (Units 1 and 2) at the existing MGS[1] with a new General Electric (GE) Frame 7HA.01 natural gas–fired simple-cycle combustion turbine generator (CTG) and associated auxiliaries. In addition, the existing diesel emergency generator engine would be replaced with a new emergency engine, and the existing diesel emergency fire pump engine would be shut down. With the exception of certain infrastructure that would be re-purposed for the project's use, the remainder of the facility would remain unchanged, including the continued operation of one natural-gas–fired peaker combustion turbine (MGS Unit 3), and associated ancillary facilities (PPP 2015a, Section 4.9.1).

MGS Unit 2 would be permanently shut down at the end of the commissioning period for the proposed Puente gas turbine engine. MGS Unit 1 would operate after the new CTG is operational, but would be permanently shut down prior to December 31, 2020. Even though MGS Unit 1 would eventually be shut down (no later than December 31, 2020),

[1] MGS consists of two conventional boiler/steam turbine units (Units 1 and 2) and one gas turbine peaking unit (Unit 3).

project owner and staff's health risk assessments (HRA) conservatively assume that MGS Unit 1 would remain operational beyond 2020 (VCAPCD 2016a).

Puente would be developed on approximately 3 acres of previously disturbed vacant land within the existing boundaries of MGS. The Puente site is bordered by sand dunes and the Pacific Ocean to the west; McGrath Lake State Park and land owned by SunCal to the north; industrial uses to the north, south, and east; and agricultural uses farther to the east (PPP 2015a, Section 4.9.1).

According to the Application for Certification (AFC), approximately 271,186 residents live within a six-mile radius of the proposed project, and sensitive receptors within a six-mile radius of the project site include (PPP 2015a, Section 4.9.1 and Appendix J):

- 628 daycare centers
- 6 nursing homes
- 90 schools
- 1 hospital
- 6 colleges
- 1 arena

Sensitive receptors, such as infants, the aged, and people with specific illnesses or diseases, are the subpopulations which are more sensitive to the effects of toxic substance exposure. The nearest sensitive receptor to the project site is the Leite Family Daycare on Reef Way, approximately 1 mile (5,500 feet) to the southeast. Agricultural workers in fields near the project are not considered sensitive receptors, but they are considered and analyzed as off-site workers. The closest existing residential neighborhood is the Oxnard Shores Mobile Home Park, approximately 0.75 mile (or approximately 3,900 feet) to the south. The North Shore at Mandalay Bay residential development (recently re-named Beach Walk on the Mandalay Coast) is scheduled to commence vertical construction in 2016. The closest distance from the proposed Puente stack to this development boundary is approximately 0.47 mile to the southeast (approximately 2,460 feet) (PPP 2015a, Section 4.9.1).

METEOROLOGY AND CLIMATE

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into the air and the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants along with associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposures may be increased.

Atmospheric stability is one characteristic related to turbulence, or the ability of the atmosphere to disperse pollutants from convective air movement. Mixing heights (the height marking the region within which the air is well mixed below the height) are lower during mornings because of temperature inversions. These heights increase during

warm afternoons. Staff's **Air Quality** section presents a more detailed description of meteorological data for the area.

The Mediterranean climate of Ventura County has a large-scale wind and temperature regime controlled by the proximity to the Pacific Ocean and seasonal migration of the Pacific high-pressure system. As a result, summers are relatively cool and winters are warm in comparison to other locations. Temperatures below freezing occur infrequently, as do temperatures over 100 degrees Fahrenheit (°F) (PPP 2015a, Section 4.1.1.2).

The annual and quarterly wind rose plots[2] (from 2009 to 2013) for the Oxnard Airport monitoring station, which is approximately 2 miles to the east of the project, show that the prevailing winds that blow to the proposed Puente site were mostly from the west during February through October, and from the northeast during November through January (PPP 2015a, Section 4.1.1.2and Appendix C-1). Please refer to the **Air Quality** section of this FSA for more details.

EXISTING PUBLIC HEALTH CONCERNS

As previously noted, the proposed Puente site is located in Ventura County, within the Ventura County Air Pollution Control District (VCAPCD). By examining average toxic concentration levels from representative air monitoring sites, together with cancer risk factors specific to each carcinogenic contaminant, a lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. This analysis is prepared to identify the current status of respiratory diseases (including asthma), cancer, and childhood mortality rates in the population located within the same county or air basin of the proposed project site. Such assessment of existing health concerns provides staff with a basis to evaluate the significance of any additional health impacts from the project and assess the need for further mitigation.

Cancer

When examining such risk estimates, staff considers it important to note that the overall lifetime risk of developing cancer for the average male in the United States is about 1 in 2, or 500,000 in 1 million and about 1 in 3, or 333,333 in 1 million for the average female (American Cancer Society 2014).

From 2008 to 2012, the cancer incidence rates in California were 48.56 in 1 million for males and 39.48 for females. Also, from 2008 to 2012, the cancer death rates for California are 18.34 in 1 million for males and 13.53 in 1 million for females (American Cancer Society, Cancer Facts & Figures 2016, Table 4 and Table 5). The trend is toward lower values compared to earlier results for the 2007 to 2011 period.

By examining the State Cancer Profiles presented by the National Cancer Institute, staff found that the trend of cancer death rates in Ventura County had been falling between 2008 and 2012. These rates (of 14.72 in 1 million, combined male/female) were

[2] A wind rose plot is a diagram that depicts the distribution of wind direction and speed at a location over a period of time.

somewhat lower than the statewide average of 15.51 in 1 million (National Cancer Institute 2016a).

According to the County Health Status Profiles 2015, the death rate due to all cancers, from 2011 to 2013, is 14.68 in 1 million for Ventura County, slightly lower than the cancer death rate (15.09 in 1 million) for California (CDPH 2015).

Lung Cancer

As for lung and bronchus cancers, from 2008 to 2012 the cancer incidence rates in California were 5.58 in 1 million for males and 4.21 in 1 million for females. Also, from 2008 to 2012 the cancer death rates for California were 4.37 in 1 million for males and 3.05 in 1 million for females (American Cancer Society, Cancer Facts & Figures 2016, Table 4 and Table 5). The trend is toward lower values compared to earlier results for the 2007 to 2011 period.

The statistics from State Cancer Profiles are similar: Lung and Bronchus Cancer incidence rates in Ventura county during 2007-2011 were 4.47 in 1 million, which is slightly lower than the incidence rate of the entire state (4.95 in 1 million) (National Cancer Institute 2016b).

According to the County Health Status Profiles 2015, the death rate due to lung cancers, from 2011 to 2013, is 2.85 in 1 million for Ventura County, slightly lower than the death rate (3.36 in 1 million) for California (CDPH 2015).

Asthma

The asthma diagnosis rates in Ventura County are lower than the average rates in California for both adults (age 18 and over) and children (ages 1-17). The percentage of adults diagnosed with asthma was reported as 6.5 percent in 2005-2007, compared to 7.7 percent for the general California population. Rates for children for the same 2005-2007 period were reported as 7.5 percent in Ventura County compared to 10.1 percent for the state in general (Wolstein et al., 2010).

The Ventura County Health Care Agency Public Health division also provides information on its website regarding community health and demographic information for community members (Ventura County 2015a). Asthma diagnosis rates in Ventura County for adults are below the state average, but slightly higher than average for children in Ventura County. The percentage of adults who have been diagnosed with asthma was 10.9 percent in 2011-2012, compared with 14 to 17.7 percent of the population statewide (Ventura County 2015b). The rate for children was 16.5 percent, compared with 15.4 percent statewide for the same time period (Ventura County 2015c).

Valley Fever

An additional respiratory illness for the area is Valley Fever (Coccidioidomycosis). Valley Fever is an infection that occurs when the spores of the fungus *Coccidioides immitis* enter a human's lung through inhalation. When people breathe in these *Coccidioides* spores, they are at risk of developing Valley Fever.

Valley Fever is currently found in six southwestern states, including California. In California, the highest Valley Fever rates have been recorded in Merced, Madera, Fresno, Tulare, Kern, Monterey, Kings, and San Luis Obispo counties (CDC 2014). According to the CDC, parts of Ventura County are suspected endemic areas for Coccidioidomycosis (CDC 2015). In Ventura County, Valley Fever tends to be more prevalent in the hotter and dryer Simi Valley area, with higher incidences occurring in 2004 that may be attributed to wildfires in the area and the ensuing landslides. In a recent study of 15 counties impacted by Valley Fever between 2007 and 2011, Ventura County had 300 total reported cases, with 65 of those occurring in Oxnard. Ventura County ranked ninth in the total number or cases reported and in the mean incidence rate for the five year study period. There was no observed tendency of the number of cases to increase over time (MacLean 2014).

Given this information and considering the complexity of the proposed project which has multiple sources of multiple pollutants, staff also conducted an in-depth analysis of existing health issues in the vicinity of Ventura County where the proposed site would be located. The existing health analysis includes asthma, Chronic Obstructive Pulmonary Disease (COPD), Valley Fever, and cancer. Generally speaking, the analysis shows that Ventura County is ranked above average among counties in California with better overall health outcomes. Please see **Appendix A** below for more details.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This section discusses toxic air contaminant (TAC) emissions to which the public could be exposed during project construction/demolition and routine operation. Following the release of TACs into the air, water or soil, people would come into contact with them through inhalation, dermal contact, or ingestion via contaminated food, water or soil.

Air pollutants for which no ambient air quality standards have been established are called non-criteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, non-criteria pollutants have no ambient (outdoor) air quality standards that specify health-based levels considered safe for everyone[3]. Since non-criteria pollutants do not have such standards, a health risk assessment (HRA) is used to determine if people might be exposed to those types of pollutants at unhealthy levels.

The standard approach currently used for a HRA involves four steps: 1) hazard identification, 2) exposure assessment, 3) dose-response assessment and 4) risk characterization (OEHHA, 2003). These four steps are briefly discussed below:

1. **Hazard identification** is conducted to determine the potential health effects that could be associated with project emissions. For air toxics sources, the main purpose is to identify whether or not a hazard exists. Once a hazard has been identified, staff

[3] Carbon dioxide (CO_2) is also a non-criteria pollutant, but it is also not considered a TAC at normal concentrations and is not evaluated in this analysis.

evaluates the exact toxic air contaminant(s) of concern and determines whether a TAC is a potential human carcinogen or is associated with other types of adverse health effects.

2. An **exposure assessment** is conducted to estimate the extent of public exposure to project emissions, including: (1) the worst-case concentrations of project emissions in the environment using dispersion modeling; and (2) the amount of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact. Therefore, this step involves emissions quantification, modeling of environmental transport and dispersion, evaluation of environmental fate, identification of exposure routes, identification of exposed populations and sensitive subpopulations, and estimation of short-term and long-term exposure levels.

3. A **dose-response assessment** is conducted to characterize the relationship between exposure to an agent and incidence of an adverse health effect in exposed populations. The assumptions and methodologies of dose-response assessment are different between cancer and noncancer health effects. In cancer risk assessment, the dose-response relationship is expressed in terms of a potency (or slope) factor that is used to calculate the probability of getting cancer associated with an estimated exposure. In cancer risk assessment, it is assumed that risk is directly proportional to dose. It is also assumed that there is no threshold for carcinogenesis. In non-cancer risk assessment, dose-response data developed from animal or human studies are used to develop acute and chronic non-cancer Reference Exposure Levels (RELs). The acute and chronic RELs are defined as the concentration at which no adverse non-cancer health effects are anticipated. Unlike cancer health effects, non-cancer acute and chronic health effects are generally assumed to have thresholds for adverse effects. In other words, acute or chronic injury from a TAC would not occur until exposure to the pollutant has reached or exceeded a certain concentration (i.e., threshold).

4. **Risk characterization** is conducted to integrate the health effects and public exposure information and to provide quantitative estimates of health risks resulting from project emissions. Staff characterizes potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Staff conducts its public health analysis by evaluating the information and data provided in the AFC by the applicant. Staff also relies upon the expertise and guidelines of the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) in order to: (1) identify contaminants that cause cancer or other noncancer health effects, and (2) identify the toxicity, cancer potency factors and non-cancer RELs of these contaminants. Staff relies upon the expertise of the California Air Resources Board (ARB) and local air districts to conduct ambient air monitoring of TACs and on the California Department of Public Health to evaluate pollutant impacts in specific communities. It is not within the purview or the expertise of the Energy Commission staff to duplicate the expertise and statutory responsibility of these agencies.

For each project, a screening-level risk assessment is initially performed using simplified assumptions that are intentionally biased toward protection of public health. That is, staff uses an analysis designed to overestimate public health impacts from exposure to project emissions. It is likely that the actual risks from the source in question would be much lower than the risks as estimated by the screening-level assessment. The risks for such screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those assumptions in the assessment. Such an approach usually involves the following:

- using the highest levels of pollutants that could be emitted from the plant;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer model which predicts the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
- assuming that an individual's exposure to carcinogenic (cancer-causing) agents would occur continuously for 70[4] years; and
- using health-based objectives aimed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

A screening-level risk assessment would, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities would also emit certain substances (e.g. semi-volatile organic chemicals and heavy metals) that could present a health hazard from non-inhalation pathways of exposure (OEHHA 2003, Tables 5.1, 6.3, 7.1). When these multi-pathway substances are present in facility emissions, the screening-level analysis would include the following additional exposure pathways: soil ingestion, dermal exposure, consumption of locally grown plant foods, mother's milk and water ingestion[5] (OEHHA 2003, p. 5-3).

The HRA process addresses three categories of health impacts: (1) acute (short-term) health effects, (2) chronic (long-term) noncancer effects, and (3) cancer risk (also long-term). They are discussed below.

---

[4] In 2015 Guidance, OEHHA recommends that an exposure duration (residency time) of 30 years be used to estimate individual cancer risk for the maximally exposed individual resident (MEIR). However, the applicant still used 70 years as the exposure duration, which tends to overestimate project impacts of MEIR. In addition, for the maximally exposed individual worker (MEIW), OEHHA now recommends using an exposure duration of 25 years to estimate individual cancer risk for off-site workers (OEHHA 2015, Table 8.5). The applicant used 40 years as the exposure duration, which tends to overestimate project impacts of MEIW.

[5] The HRA exposure pathways for Puente included inhalation, home grown produce, dermal absorption, soil ingestion, fish ingestion and mother's milk, not including water ingestion because water sources are not impacted by the project.

Acute Noncancer Health Effects

Acute health effects are those that result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Such effects are temporary in nature and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic Noncancer Health Effects

Chronic noncancer health effects are those that result from long-term exposure to lower concentrations of pollutants. Long-term exposure is defined as more than 12 percent of a lifetime, or about eight years (OEHHA 2003, p. 6-5). Chronic noncancer health effects include heart and respiratory system diseases that reduced breathing efficiency such as asthma.

Reference Exposure Levels (RELs)

The analysis for both acute and chronic noncancer health effects compares the maximum project contaminant levels to safe levels known as Reference Exposure Levels, or RELs. These are amounts of toxic substances to which even sensitive individuals could be exposed without suffering any adverse health effects (OEHHA 2003, p. 6-2). These exposure levels are specifically designed to protect the most sensitive individuals in the population, such as infants, the aged, and people with specific illnesses or diseases which make them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature and include specific margins of safety. The margins of safety account for uncertainties associated with inconclusive scientific and technical information available at the time of setting the RELs. They are therefore meant to provide a reasonable degree of protection against hazards that research has not yet identified.

Concurrent exposure to multiple toxic substances would result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformity with California Air Pollution Control Officers Association (CAPCOA) guidelines, the HRA assumes that the effects of each substance are additive for a given organ system (OEHHA 2003, pp. 1-5, 8-12). Other possible mechanisms due to multiple exposures include those cases where the actions would be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of exposures, the health risk assessment could underestimate or overestimate the risks.

Cancer Risks

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the carcinogen would occur over a 70-year lifetime[6]. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound estimate based on the worst-case assumptions.

[6] See footnote 4.

Cancer Potency Factors

Cancer risk is expressed in terms of chances per million of developing cancer. It is a function of the maximum expected pollutant concentration, the probability that a particular pollutant would cause cancer (called potency factors), and the length of the exposure period. Cancer risks for individual carcinogens are added together to yield a total cancer risk for each potential source. The conservative nature of the screening assumptions used means that the actual cancer risks from project emissions would be considerably lower than estimated.

As previously noted, the screening analysis is performed to assess the worst-case risks to public health associated with the proposed project. If the screening analysis were to predict a risk below significance levels, no further analysis would be necessary and the source would be considered acceptable with regard to carcinogenic effects. If, however, the risk were to be above the significance level, then further analysis using more realistic site-specific assumptions would be performed to obtain a more accurate estimate.

SIGNIFICANCE CRITERIA

Energy Commission staff assesses the maximum cancer impacts from specific carcinogenic exposures by first estimating the potential impacts on the maximally exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using the worst-case assumptions. Since the individual's exposure would produce the maximum impacts possible around the source, staff uses this risk estimate as a marker for acceptability of the project's carcinogenic impacts.

Acute and Chronic Noncancer Health Risks

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, and the noted cancer impacts from long-term exposures. The significance of project-related impacts is determined separately for each of the three health effects categories. Staff assesses the noncancer health effects by calculating a hazard index. A hazard index is a ratio obtained by comparing exposure from facility emissions to the safe exposure level (i.e. REL) for that pollutant. A ratio of less than 1.0 suggests that the worst-case exposure would be below the limit for safe levels and would thus be insignificant with regard to health effects.

The hazard indices for all toxic substances with the same type of health effect are added together to yield a Total Hazard Index for the source. The Total Hazard Index is calculated separately for acute effects and chronic effects. A Total Hazard Index of less than 1.0 would indicate that cumulative worst-case exposures would not lead to significant noncancer health effects. In such cases, asthma and other noncancer health impacts would be considered unlikely even for sensitive members of the population. Staff would therefore conclude that there would be no significant asthma and other noncancer project-related public health impacts. This assessment approach is consistent with risk management guidelines of both California OEHHA and U.S. EPA.

Cancer Risk

Staff relies upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, (Health & Safety Code, §§25249.5 et seq.) for guidance in establishing significance levels for carcinogenic exposures. Title 22, California Code of Regulations, section 12703(b) states that "the risk level which represents no significant risk shall be one which is calculated to result in one or less excess cancer cases within an exposed population of 100,000, assuming lifetime exposure." This risk level is equivalent to a cancer risk of 10 in 1 million, which is also written as 10×10^{-6}. In other words, under state regulations, an incremental cancer risk greater than 10 in 1 million from a project should be regarded as suggesting a potentially significant carcinogenic impact on public health. The 10 in 1 million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program as the public notification threshold for air toxic emissions from existing sources.

An important distinction between staff's and the Proposition 65 risk characterization approach is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all the cancer-causing pollutants to which the individual might be exposed in the given case. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than the manner applied by Proposition 65. The significant risk level of 10 in 1 million is also consistent with the level of significance adopted by many California air districts. In general, these air districts would not approve a project with a cancer risk estimate of more than 10 in 1 million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection could be ensured. Staff's analysis also addresses potential impacts on all segments of the population, including the young, the elderly, and individuals with existing medical conditions that would render them more sensitive to the adverse effects of toxic air contaminants and any minority or low-income populations that are likely to be disproportionately affected by impacts. To accomplish this goal, staff uses the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of air toxics being analyzed. When a screening analysis shows the cancer risks to be above the significance level, refined assumptions would be applied for likely a lower, more realistic, risk estimate. If, after refined assumptions, the project's risk is still found to exceed the significance level of 10 in 1 million, staff would recommend appropriate measures to reduce the risk to less than significant levels. If, after all feasible risk reduction measures have been considered and a refined analysis still identifies a cancer risk of greater than 10 in 1 million, staff would deem such a risk to be significant and would not recommend project approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

PROPOSED PROJECT'S CONSTRUCTION/DEMOLITION IMPACTS AND MITIGATION MEASURES

The construction for the project would take total approximately 21 months, including site mobilization, grading, construction, and start-up/commissioning. Onsite construction is expected to commence in October 2018. Construction and startup of the project would be completed by June 2020 (PPP 2015a, Section 2.9). Construction of the proposed project is scheduled to occur over a 21-month period, followed by 3 months of Units 1 and 2 decommissioning activities (PPP 2015a, Section 4.1.3.5).

In November 2015, the applicant proposed a project enhancement and refinement relative to the previously submitted AFC, to include the demolition of the two gas-fired steam boiler generating units (Units 1 and 2) at the existing Mandalay Generating Station (MGS). MGS consists of two conventional steam turbine units (Units 1 and 2) and one gas turbine peaking unit (Unit 3). The original AFC assumed that if the project is approved and developed, MGS Units 1 and 2 would be retired by the completion of commissioning of the project (in June 2020), and that the units would then be decommissioned and left in place. In the project enhancement and refinement document, the applicant proposed to demolish MGS Units 1 and 2 following their retirement and decommissioning. The specific sequencing events of commissioning, retirement, decommissioning, and demolition activities would be retirement of MGS Unit 2 prior to completion of commissioning of the project, retirement of MGS Unit 1 by the applicable once-through cooling (OTC) compliance deadline of December 31, 2020, and decommissioning and demolition of MGS Units 1 and 2 thereafter. Unit 3 will continue to operate and would not be affected by the project or the demolition of MGS Units 1 and 2 (PPP 2015y, Section 1.1).

Decommissioning of Units 1 and 2 would commence upon retirement of both units (no later than December 31, 2020), and is anticipated to take approximately 6 months. Asbestos abatement and above-grade demolition work for MGS Units 1 and 2 is anticipated to take approximately 15 months following completion of decommissioning. Milestones are as follows (PPP 2015y, Section 1.4):

- Puente commercial online date: June 2020;
- Shut down of MGS Unit 2: June 2020 or Puente commercial online date;
- Shut down of MGS Unit 1: no later than December 31, 2020;
- Complete decommissioning of MGS Units 1 and 2: June 2021;
- Complete asbestos abatement: late 2021;
- Complete demolition: late 2022.

The potential construction/demolition risks are normally associated with exposure to asbestos, fugitive dust, and combustion emissions (i.e. diesel exhaust).

Asbestos

The demolition of buildings containing asbestos could cause the emission of asbestos. Asbestos is a mineral fiber that occurs in rock and soil. Because of its fiber strength and heat resistance, it has been used in a variety of building construction materials for insulation and as a fire-retardant. Asbestos has been used in a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings (US EPA, 2012). Structures built before 1980 are more likely to have asbestos containing materials (ACM). Thermal system insulation (formed or spray-on) is the ACM of greatest concern for response and recovery worker exposure (Occupational Safety and Health Administration [OSHA]). Exposure to ACM increases workers' and residences' risk of developing lung diseases, including asbestosis, lung cancer, and mesothelioma.

ACM are prevalent throughout the MGS plant equipment and structures. The applicant would verify the past surveys and conduct a new survey, if necessary, to identify the presence of ACM. Asbestos removal would take place in compliance with all federal, state, and local requirements, including those for personnel protection (PPP 2015y Section 2.1). Prior to the demolition of the structures, the applicant would develop the implementation plans for the identification, testing, removal, monitoring, and disposal of any hazardous fluids and building materials, including asbestos and lead-based paint, as necessary. The applicant also has to get the asbestos/lead-based paint abatement permit and notification from Ventura County Air Pollution Control District (VCAPCD) (PPP 2015y, Section 2.2).

The mitigation measures needed to reduce the impacts of asbestos, ACM and other hazardous wastes from the construction or demolition phases of the project are covered in the **Waste Management** section. As for asbestos, Condition of Certification **WASTE-5** requires that the project owner submit the VCAPCD Demolition or Renovation Plan for review prior to removal and disposal of asbestos. This program ensures there would be no release of asbestos that could impact public health and safety. Please refer to staff's **Waste Management** section for detailed mitigation measures regarding the construction/demolition of asbestos and ACM, and information on the safe handling and disposal of these and all project-related wastes.

Fugitive Dust

Fugitive dust is defined as dust particles that are introduced into the air through certain activities such as soil cultivation, vehicles operating on open fields, or dirt roadways. Fugitive dust emissions during construction and demolition of the proposed project could occur from:

- dust entrained during site preparation and grading/excavation at the construction site;
- dust entrained during onsite movement of construction vehicles on unpaved surfaces;
- fugitive dust emitted from an onsite concrete batch plant; and

- wind erosion of areas disturbed during construction activities.

The effects of fugitive dust on public health are covered in the **Air Quality** section of this FSA which includes staff's recommended mitigation measures, including **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) to prevent fugitive dust plumes from leaving the project boundary. As long as the dust plumes are kept from leaving the project site, there would be no significant concern of fugitive dust adversely affecting public health.

Diesel Exhaust

Emissions of combustion byproducts during construction would result from:

- exhaust from diesel construction equipment used for site preparation, grading, excavation, trenching, and construction of onsite structures;
- exhaust from water trucks used to control construction dust emissions;
- exhaust from portable welding machines, small generators, and compressors;
- exhaust from diesel trucks used to transport workers and deliver concrete, fuel, and construction supplies to construction areas; and
- exhaust from vehicles used by construction workers to commute to and from the project areas.

Construction/Demolition Health Risk Assessment (HRA) for Diesel Exhaust

The primary air toxic pollutant of concern from construction/demolition activities is diesel particulate matter (diesel PM or DPM). Diesel exhaust is a complex mixture of thousands of gases and fine particles and contains over 40 substances listed by the U.S. Environmental Protection Agency (EPA) as hazardous air pollutants (HAPs) and by ARB as toxic air contaminants. The diesel particulate matter (DPM) is primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust deserves particular attention mainly because of its ability to induce serious noncancer effects and its status as a likely human carcinogen.

Diesel exhaust is also characterized by ARB as "particulate matter from diesel-fueled engines." The impacts from human exposure would include both short- and long-term health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Effects from long-term exposure can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer. Diesel exhaust is listed by the EPA as "likely to be carcinogenic to humans" (U.S. EPA 2003).

Based on a number of health effects studies, the Scientific Review Panel (SRP) on Toxic Air Contaminants in 1998 recommended a chronic REL for diesel exhaust particulate matter of five micrograms per cubic meter of air ($\mu g/m^3$) and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$. However, SRP did not recommend a specific value for an acute REL since available data in support of a value was deemed insufficient. Therefore, there is no acute relative exposure level (REL) for diesel particulate matter, and it was not possible

to conduct an assessment for its acute health effects. In 1998, ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved the panel's recommendations regarding health effects (OEHHA 2009, Appendix A). In 2000, ARB developed a "Risk Reduction Plan to Reduce Particulate Matter Emissions From Diesel-Fueled Engines and Vehicles" and has been developing regulations to reduce diesel particulate matter emissions since that time.

A screening HRA for diesel particulate matter was conducted to assess the potential impacts associated with diesel emissions during the construction and demolition activities at Puente. This HRA was based on the annual average emissions of diesel particulate matter (DPM), assumed to occur each year for 1.5 years of continuous exposure for construction and 1.3 years of continuous exposure for demolition[7]. The results are listed in the upper portion of **Public Health Table 2**.

Construction of Puente Power Project

The HRA results for the short-term construction activities show a maximum off-property residential cancer risk (MEIR) of 2.7 in 1 million. This impact is below the significance threshold of 10 in 1 million. This low risk level would also apply to any exposure of field workers on the adjacent farmlands, transit workers, and those using the area for recreation. Even though the calculated point of maximum impact or PMI (i.e. 15.3) is higher than the threshold, it is located within the property boundaries of the project where there are no residences, farm workers or members of the public. Staff also checked all other receptors within the computer model output domain with risk numbers higher than the threshold, and confirmed that all of these receptors are either inside the property boundary or located along the property fence line. The excess cancer risk at the MEIW is 0.26 in a million (PPP 2015z). All of these risk numbers (except PMI) are less than the Energy Commission staff's significant impact threshold of 10 in a million. Therefore, staff concludes that there is no significant cancer health risk from the toxic air emissions from construction activities.

The predicted chronic health index at the PMI, MEIR and MEIW are 0.0167, 0.00201, and 0.00167, respectively (PPP 2015z). The chronic hazard indices for diesel exhaust during construction activities are all lower than the significance level of 1.0. This means that there would be no chronic non-cancer impacts expected from construction activities.

The predicted acute health index at the PMI, MEIR and MEIW are 0.00883, 0.0081, and 0.00883, respectively (PPP 2015z). The acute hazard indices for diesel exhaust during construction activities are all lower than the significance level of 1.0. This means that there would be no chronic non-cancer impacts expected from construction activities.

Demolition of Mandalay Unit 1 and 2

The HRA results for demolition activities indicate that a maximum off-property residential cancer risk (MEIR) of 1.25 in 1 million. This impact is below the significance threshold of 10 in 1 million. Even though the PMI (i.e. 11.48) is higher than the threshold, it is located

[7] The construction period of Puente is expected to last 1.5 years (i.e.18 months) (PPP 2015a, Section 4.1.3.5). The exposure time for the demolition were assumed to be 1.3 years as the demolition activity was projected to last about 15 months (PPP 2015y, Section 1.4).

within the property boundary of the project. Staff also checked all other receptors within the computer model output domain with risk numbers higher than the threshold, and confirmed that all of these receptors are either inside the property boundary or located along the property fence line. The excess cancer risk at the MEIW is 0.17 in a million (PPP 2015jj and CEC 2015oo). All of these risk numbers (except PMI) are less than the Energy Commission staff's significant impact threshold of 10 in a million. Therefore, staff concludes that there would be is no significant public health impacts from the demolition toxic air emissions.

The predicted chronic health index at the PMI, MEIR and MEIW are 0.0101, 0.00108, and 0.0101, respectively (PPP 2015jj and CEC 2015oo). The chronic hazard indices for diesel exhaust during demolition activities are all lower than the significance level of 1.0. This means that there would be no chronic non-cancer impacts expected from demolition activities.

The predicted acute health index at the PMI, MEIR and MEIW are 0.0081, 0.0029, and 0.081, respectively (PPP 2015jj and CEC 2015oo). The acute hazard indices for diesel exhaust during demolition activities are all lower than the significance level of 1.0. This means that there would be no acute non-cancer impacts expected from demolition activities.

Public Health Table 2
Construction/Demolition Hazard/Risk from DPMs

		Activities [a]		Significance Level [b]	Significant? [b]
Derived Cancer Risk (per million)	PMI	Construction	**15.3**	10	No (onsite impact)
		Demolition	**11.48**	10	No (onsite impact)
	MEIR	Construction	2.7	10	No
		Demolition	1.25	10	No
	MEIW	Construction	0.26	10	No
		Demolition	0.17	10	No
Chronic HI (dimensionless)	PMI	Construction	0.0167	1	No
		Demolition	0.0101	1	No
	MEIR	Construction	0.00201	1	No
		Demolition	0.00108	1	No
	MEIW	Construction	0.0167	1	No
		Demolition	0.0101	1	No
Acute HI (dimensionless)	PMI	Construction	0.00883	1	No
		Demolition	0.0081	1	No
	MEIR	Construction	0.00255	1	No
		Demolition	0.0029	1	No
	MEIW	Construction	0.00883	1	No
		Demolition	0.0081	1	No

Sources: PPP 2015z (Section 4.9.2), PPP 2015jj and CEC 2015oo.
[a] The modeling year is 2014.
[b] The significance level is a level that does not necessarily mean that adverse impacts are expected, but rather that further analysis and refinement of t**he exposure assessment is warranted.**

Based on the results of HRA, and considering the following two additional factors: (1) the potential exposure of DPM would be sporadic and limited in length and (2) the predicted incremental increase in cancer risk at the MEIR and MEIW and chronic health index at

the PMI, MEIR, and MEIW are less than the significance thresholds of ten in one million and 1.0, respectively, staff concludes that impacts associated with the DPM from anticipated Puente Power Project construction and demolition activities would be less than significant.

Conditions of Certification **AQ-SC5** (Diesel-Fueled Engine Control) in the **Air Quality** section of this FSA would ensure that cancer-related impacts of diesel exhaust emissions for the public and off-site workers are mitigated during construction/demolition to a point where they are not considered significant. The potential levels of criteria pollutants from operation of construction/demolition-related equipment are discussed in staff's **Air Quality** section along with mitigation measures and related conditions of certification. The pollutants of most concern in this regard are particulate matter (PM), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2).

Valley Fever

Puente is proposed for an area where the disease of Valley Fever (*Coccidioidomycosis)* may sometimes be present. Construction could disturb a certain percentage of approximately 3 acres of top soil that could harbor the *Coccidioides* spores, possibly exposing humans to the risk of Valley Fever. On-site workers and visitors and nearby residents could be exposed from inhaling these fungal spores from wind-blown dust generated from soil excavation work.

To minimize the risk of getting Valley Fever, Center for Disease Control and Prevention (CDC) recommends the following measures (CDC 2014):

- Wear an N95 mask if a person must be in or near a dusty environment, such as a construction zone
- Avoid activities that involve close contact to dust including yard work, gardening, and digging
- Use air quality improvement measures indoors such as HEPA filters
- Take prophylactic anti-fungal medication if deemed necessary by a person's healthcare provider
- Clean skin injuries well with soap and water, especially if they have been exposed to soil or dust

The California Department of Public Health (CDPH) also recommends that "those exposed to dust during their jobs or outside activities in these areas should consider respiratory protection, such as a mask, during such activities."

Based on CDC and CDPH's recommendations, staff recommends that project workers in the vicinity of any project's dust generation areas wet the soil before any excavation activities. Such workers should also wear protective masks and stay indoors during dust storms and close all doors and windows to avoid dust inhalation. Staff also considers the applicant's dust suppression plans discussed in the **Air Quality** section and required under Conditions of Certification, AQ-SC3 and AQ-SC4 adequate to minimize the risk of

workers getting exposed to Valley Fever in areas where *Coccidioides* spores may be found.

The potential Valley Fever risk to individuals away from the project site stems from the potential of the spores of the Valley Fever fungus to be released into the air as a result of grading and excavating activities during construction. Because the spores disperse similarly to dust, mitigation measures used to control dust would be effective to control spore dispersal. The applicant provided specific dust mitigation measures in Appendix C-6 of AFC (PPP 2015a, Section 4.9.2.2). In the **Air Quality** Section of this FSA, staff recommends requirement of specific mitigation measures, including **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) for the purposes of preventing all fugitive dust plumes from leaving the project boundary. Keeping the dust plumes within the project boundary would limit potential for exposure to Valley Fever to adjacent residents, farm workers, and members of the public traveling or recreating in proximity to Puente.

PROPOSED PROJECT'S OPERATIONAL IMPACTS AND MITIGATION MEASURES

Emission Sources

As previously noted, the emission sources of the proposed project would be: one new natural gas-fired, simple-cycle, air-cooled, nominal 262-MW generating facility, one new diesel emergency generator, one existing natural gas-fired peaker combustion turbine (MGS Unit 3), and one existing natural gas–fired boiler (MSG Unit 1). Pollutants that could potentially be emitted during operation are listed in **Public Health Table 3,** including both criteria and non-criteria pollutants. These pollutants include certain volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Criteria pollutant emissions and impacts are examined in staff's **Air Quality** analysis. Since the facility would use dry cooling, there would be no emissions of toxic metals or VOCs from cooling tower mist or drift and no health risk from the potential presence of the Legionella bacterium responsible for Legionnaires' disease.

The health risk from exposure to each project-related pollutant is assessed using the "worst case" emission rates and impacts. Maximum hourly emissions are used to calculate acute (one-hour) noncancer health effects, while estimates of maximum emissions on an annual basis are used to calculate cancer and other chronic (long-term) health effects.

In Tables 4.9-1, Table 4.9-2 and Table 4.9-3 of the AFC (PPP 2015a) the applicant lists the specific non-criteria pollutants that would be emitted as combustion byproducts from the natural gas-fired turbines, boiler and diesel emergency engine. The detailed emission summaries and calculations are presented in Appendix C-8 of the AFC (PPP 2015a). The emission numbers in Table C-8.4 of Applicant's Responses to Energy Commission Data Request, Set 2 (PPP 2015z) are a combination of the numbers from AP-42 and ARB California Air Toxics Emission Factor (CATEF) database. The applicant used the emission numbers mostly from AP-42, except the one for Formaldehyde was from ARB CATEF.

The regulation applied to gas turbines located at major sources of HAP emissions is 40CFR Part 63 Subpart YYYY. A major source is defined as a facility with emissions of ten tons per year (tpy) or more of a single HAP or 25 tpy or more of a combination of HAPs based on the potential to emit. According to Table 4.1-24 (PPP 2015z), the single highest HAP emissions, formaldehyde, from the facility is 2.89 tpy, which is less than 10 tpy. The total combined HAPs from all sources is 4.72 tpy, which is also less than 25 tpy. Therefore, the project is not a major source of HAPs and is not subject to this subpart.

Public Health Table 3
The Main Pollutants Emitted from the Proposed Project

Criteria Pollutants	Non-criteria Pollutants
Carbon monoxide (CO)	Acetaldehyde
Oxides of nitrogen (NO_x)	Acrolein
Particulate matter (PM10 and PM2.5)	Ammonia
Oxides of sulfur (SO_2)	Benzene
Volatile Organic Compounds (VOCs)	1,3-Butadiene
	Ethyl Benzene
	Formaldehyde
	Hexane
	Naphthalene
	Polycyclic Aromatic Hydrocarbons (PAHs)
	Propylene
	Propylene oxide
	Toluene
	Xylene
	Diesel PM

Source: PPP 2015a, Table 4.9-1, Table 4.9-2 and Table 4.9-3.

Hazard Identification

Numerous health effects have been linked to exposure to TACs, including development of asthma, heart disease, Sudden Infant Death Syndrome (SIDS), respiratory infections in children, lung cancer, and breast cancer (OEHHA, 2003). According to the Puente AFC, the toxic air contaminants emitted from the natural gas-fired CTGs include acetaldehyde, acrolein, ammonia, benzene, 1,3-butadiene, ethyl benzene, formaldehyde, napthalene, polycyclic aromatics, propylene oxide, toluene and xylene. **Public Health Table 3** and **Public Health Table 4** list each such pollutant which staff finds to be typical of the proposed project and similar projects.

Exposure Assessment

Public Health Table 4 shows how TACs would contribute to the total risk obtained from the risk analysis. The applicable exposure pathways for the toxic emissions include inhalation, home-grown produce, dermal (through the skin) absorption, soil ingestion, fish ingestion, and mother's milk (PPP 2015a, Section 4.9.2.4). This method of assessing health effects is consistent with OEHHA's Air Toxics Hot Spots Program Risk

Assessment Guidelines (OEHHA 2003) referred to earlier.

The next step in the assessment process is to estimate the project's incremental concentrations using a screening air dispersion model and assuming conditions that would result in maximum impacts. The applicant used the EPA-recommended air dispersion model, AERMOD, along with five years (2009–2013) of compatible meteorological data from the Oxnard Airport monitoring station (PPP 2015a, Section 4.1.1.2 and Appendix C-1).

Public Health Table 4
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✔	✔	✔
Acrolein				✔	✔
Ammonia				✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Ethyl Benzene			✔	✔	
Formaldehyde			✔	✔	✔
Napthalene		✔	✔	✔	
Polycyclic Aromatic Hydrocarbons (PAHs)	✔		✔		
Propylene Oxide			✔	✔	✔
Toluene				✔	✔
Xylene				✔	✔

Source: OEHHA / ARB 2015 and PPP 2015a, Table 4.9-3

Dose-Response Assessment

Public Health Table 5 (modified from AFC Table 4.9-3, including neither oral cancer potency factor nor chronic oral REL[8]) lists the toxicity values used to quantify the cancer and noncancer health risks from the project's combustion-related pollutants. The listed toxicity values include RELs and the cancer potency factors are published in the OEHHA's Guidelines (OEHHA 2003) and OEHHA/ARB Consolidation Table of OEHHA/ARB Approved Risk Assessment Health Values (ARB 2015). RELs are used to calculate short-term and long-term noncancer health effects, while the cancer potency factors are used to calculate the lifetime risk of developing cancer.

Characterization of Risks from TACs

As described above, the last step in an HRA is to integrate the health effects and public exposure information, provide quantitative estimates of health risks resulting from project emissions, and then characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

The applicant's HRA was prepared using the ARB's HARP model, version 2 (ARB, 2015).

[8] Except for PAHs, there are neither oral cancer slope factors nor chronic oral reference exposure levels available for these toxic air contaminants. The oral cancer slope factor for PAHs is 12 $(mg/kg\text{-}d)^{-1}$.

Emissions of non-criteria pollutants from the project were analyzed using emission factors. As noted previously, these emission factors were obtained mainly from the U.S. EPA AP-42 emission factors and ARB CATEF. Air dispersion modeling combined the emissions with site-specific terrain and meteorological conditions to analyze the mean short-term and long-term concentrations in air for use in the HRA. Ambient concentrations were used in conjunction with cancer unit risk factors and RELs to estimate the cancer and noncancer risks from operations. In the following sub-sections, staff reviews and summarizes the work of the applicant, and evaluates the adequacy of the applicant's analysis by conducting an independent HRA.

Public Health Table 5
Toxicity Values Used to Characterize Health Risks

Toxic Air Contaminant	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Chronic Inhalation REL ($\mu g/m^3$)	Acute Inhalation REL ($\mu g/m^3$)
Acetaldehyde	0.010	140	470 (1-hr) 300 (8-hr)
Acrolein	—	0.35	2.5 (1-hr) 0.7 (8-hr)
Ammonia	—	200	3,200
Benzene	0.10	60	1,300
1,3-Butadiene	0.60	20	—
Ethyl Benzene	0.0087	2,000	—
Formaldehyde	0.021	9	55 (1-hr) 9 (8-hr)
Hexane	—	7000	—
Napthalene	0.12	9.0	—
Polycyclic Aromatic Hydrocarbons (PAHs)	3.9	—	—
Propylene Oxide	0.013	3	3100
Toluene	—	300	37,000
Xylene	—	700	22,000

Sources: ARB 2015 and PPP 2015a, Table 4.9-3

The HRA was conducted for the general population, nearby residences, off-site workers and sensitive receptors. Staff only evaluates the health impact on off-site workers because on-site workers are protected by Cal OSHA and are not required to be evaluated under the Hot Spots Program, unless the worker also lives on the facility site or property. The sensitive receptors, as previously noted, are subgroups that would be at greater risk from exposure to emitted air toxics, and include the very young, the elderly, and those with existing illnesses.

Effective August 2012, all air toxics HRAs should use the new OEHHA's Air Toxics Hot Spots Program Risk Assessment Guideline (OEHHA 2012) which recommends breaking down exposure/risk by age group using age-dependent adjustment factors (i.e. age sensitivity factors) to calculate the cancer risk. This new methodology is used to reflect the fact that exposure varies among different age groups and exposure occurring in early life has a higher weighting factor.

Health risks potentially associated with ambient concentrations of carcinogenic pollutants were calculated in terms of excess lifetime cancer risks. The total cancer risk at any specific location is found by summing the contributions from the individual carcinogens. Health risks from non-cancer health effects were calculated in terms of hazard index as a ratio of ambient concentration of TACs to RELs for that pollutant.

The following is a summary of the most important elements of HRA for Puente:

- the analysis was conducted using the latest version of ARB/OEHHA Hotspots Analysis and Reporting Program Version 2 (HARP2)[9], which incorporates methodology presented in OEHHA's 2015 Guidance;
- emissions are based upon concurrent operation of all on-site sources, including one simple-cycle natural-gas-fired turbine, one natural-gas-fired peaker combustion turbine (MGS Unit 3), one new diesel emergency generator and one boiler (MGS Unit 1);
- All operating scenarios of the new gas turbine, including startups, shutdowns, and commissioning were included;
- exposure pathways included inhalation, soil ingestion, fish ingestion, dermal absorption, home grown produce, and mother's milk;
- the local meteorological data, local topography, grid, residences and sensitive receptors, source elevations, and site-specific and building-specific input parameters used in the HARP2 model were obtained from the AFC and modeling files provided by the applicant;
- the emission factors and toxicity values used in HRA were obtained from the AFC. The toxicity values are listed in **Public Health Table 5**.

Cancer Risk at the Point of Maximum Impact (PMI)

The most significant result of HRA is the numerical cancer risk for the maximally exposed individual (MEI) which is the individual located at the point of maximum impact (PMI) and risks to the MEI at a residence (MEIR). As previously noted, human health risks associated with emissions from the proposed project are unlikely to be higher at any other location than at the PMI. Therefore, if there is no significant impact associated with concentrations at the PMI location, it can be reasonably assumed that there would not be significant impacts in any other location in the project area.

The cancer risk to the MEI at the PMI is referred to as the Maximum Incremental Cancer Risk (MICR). However, the PMI (and thus the MICR) is not necessarily associated with actual exposure because in many cases, the PMI is in an uninhabited area. Therefore, the MICR is generally higher than the maximum residential cancer risk. MICR is based on 24 hours per day, 365 days per year, 70-year lifetime exposure. The potential exposure level for off-site nonresidential workers and those involved in recreational activities would thus be less. As shown in **Public Health Table 6**, total worst-case individual cancer risk is 1.3 in one million at the PMI. The PMI for impacts from operation is on the east boundary of the project. As **Public Health Table 6** shows, the cancer risk

[9] HARP2 can be downloaded from ARB's HARP website. http://www.arb.ca.gov/toxics/harp/harp.htm

value at PMI is below the significance level, ten in one million, indicating that no significant adverse cancer risk is expected.

Chronic and Acute Hazard Index (HI)

The screening HRA for the project included emissions from all sources and resulted in a maximum chronic Hazard Index (HI) of 0.00022 and a maximum acute HI of 0.013 to 0.024 (PPP 2015c and staff analysis for non-adjusted u*). As **Public Health Table 6** shows, both acute and chronic hazard indices are less than 1.0, indicating that no short- or long-term adverse health effects such as asthma and other respiratory effects are expected.

Project-Related Impacts at Area Residences

Staff's specific interest in the risk to the maximally exposed individual in a residential setting (MEIR) is because this risk most closely represents the maximum project-related lifetime cancer risk. Residential risk is presently assumed by the regulatory agencies to result from exposure lasting 24 hours per day, 365 days per year, over a 70-year lifetime. Residential risks were presented in terms of MEIR and health hazard index (HI) at residential receptors in **Public Health Table 6**. Exposure to off-site nonresident workers or recreational users would be lower with correspondingly lower health risks. The cancer risk for the MEIR is 0.33, which is below the significance level. The maximum resident chronic HI and acute HI are 0.000098 and 0.0062, respectively. They are both less than 1.0, indicating that no short- or long-term adverse health effects are expected at these residences.

Staff also included the North Shore at Mandalay Bay residential development (recently re-named "Beach Walk on the Mandalay Coast") as future residential receptors. As previously noted, the closest distance from the proposed Puente stack to this development boundary is approximately 0.47 mile to the southeast (approximately 2,460 feet). Therefore, it would be the closest residential area to the proposed project. The cancer risk for the North Shore development is 0.347, which is still below the significance level. The maximum resident chronic HI and acute HI are 0.000074 and 0.00472, respectively. They are both less than 1.0, indicating that no short- or long-term adverse health effects are expected at these residences.

Risk to Workers

The cancer risk to potentially exposed both project and offsite nonresidential workers was presented in terms of risk to the maximally exposed individual worker (or MEIW at PMI) and is summarized in **Public Health Table 6**. The worker is assumed to be exposed at the work location 8 hours per day, instead of 24; 245 days per year, instead of 365; and for 40 years, instead of 70 (PPP 2015z, Table 4.9-4). As shown in **Public Health Table 6**, the cancer risk for workers at MEIW (i.e. 0.1 in 1 million) is below the significance level. The maximum worker chronic HI and acute HI are 0.00022 and 0.013, respectively. They are both less than 1.0, indicating that no short- or long-term adverse health effects are expected among exposed workers.

Risk to Sensitive Receptors

Two sensitive receptors are located close to Puente. Leite Family Daycare is located approximately 1 mile (5,500 feet) to the southeast of the project. The highest cancer risk at this sensitive receptor is 0.268 in one million, the chronic HI is 0.00001 and the acute HI is 0.0059. JN Care Home is located approximately 1.82 miles southeast of the project boundary. The highest cancer risk at this sensitive receptor is 0.287 in one million, the chronic HI is 0.000035 and the acute HI is 0.0057. All risks are below their significance levels meaning that there would be an insignificant risk of asthma and other noncancer health impacts. Exposure to off-site nonresident workers or recreational users, would be lower with correspondingly lower health risks

In **Public Health Table 6**, it is notable that all the cancer and noncancer risks from Puente operation would be below their respective significance levels. This means that no health impacts would occur within all segments of the surrounding population. Therefore, staff concludes there is no need for conditions of certification to protect public health during facility operation.

Public Health Table 6
Cancer Risk and Chronic Hazard from Puente Operations

Receptor Location	Cancer Risk (per million)	Chronic HI [d]	Acute HI [d]
PMI [a]	1.3	0.00022	0.013/0.024[f]
Residence MEIR [b]	0.33	0.000098	0.0062
Future Residence (The North Shore Development)	0.347	0.000074	0.00472
Worker MEIW [c]	0.1	0.00022	0.013
Sensitive Receptor (Leite Family Daycare)	0.268	0.00001	0.0059
Sensitive Receptor (JN Care Home)	0.287	0.000035	0.0057
New CTG Startup/Shutdown			
PMI	-	-	0.026/0.054[f]
New CTG Commissioning Period (includes impacts from existing MGS Units 1 through 3)			
PMI	-	-	0.013/0.032[f]
Significance level	10	1	1
Significant?	No	No	No

Sources: PPP 2015z, Table 4.9-4
[a] PMI = Point of Maximum Impact
[b] MEIR = MEI of residential receptors. Location of the residence of the highest risk with a 70-year residential scenario.
[c] MEIW = MEI for offsite workers. Occupational exposure patterns assuming standard work schedule, i.e. exposure of eight hours/day, five days/week, 49 weeks/year for 40 years.
[d] HI = Hazard Index
[f] First value represents adjusted u* results while the second value represents non-adjusted u* results. Staff only reported the different results for acute HI since there are only slight differences between the two for cancer risk and chronic HI, which are based upon

annual average results. For more detailed discussion of the difference between adjusted u* results and non-adjusted u* results, please refer to **Air Quality** section.

Cancer Burden

Cancer burden is defined as the estimated increase in the occurrence of cancer cases in a population resulting from exposure to carcinogenic air contaminants. In other words, it is a hypothetical upper-bound estimate of the additional number of cancer cases that could be associated with toxic air emissions from the project. Cancer burden is calculated as the maximum product of any potential carcinogenic risk greater than 1 in one million, and the number of individuals at that risk level. Therefore, if a predicted derived adjusted cancer risk is greater than 1 in 1 million, the cancer burden is calculated for each census block receptor. OEHHA requires a 70-year exposure duration to estimated cancer burden or provide an estimate of population-wide risk (OEHHA 2015, page 8-1). The assumed exposure duration for nonresidential off-site workers or recreational users would be much less.

According to applicant's calculation, the HRA shows that the area with a carcinogenic risk above 1-in-one-million extends only for approximately 50 meters east of the project fence line within the existing transmission yard. Because no residential receptors are located in this small area, the potential cancer burden is zero (PPP 2015z, Table 4.9-4). Staff conducted another calculation for cancer burden. The area with a carcinogenic risk above 1-in-one-million is located in Census Tract 29.05 with total population of 5,478[10]. Cancer burden is then calculated as the maximum product of the highest carcinogenic risk of this census block (i.e., 1.3 in one million) and the number of individuals in this census block (i.e. 5,478), and the result is 0.0071. Therefore, the cancer burden is estimated to be less than one cancer case resulting from exposure to TACs of Puente operation.

CUMULATIVE IMPACTS AND MITIGATION

A project would result in a significant adverse cumulative impact if its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130). As for cumulative impacts for cumulative hazards and health risks, if the implementation of the proposed project, as well as the past, present, and probable future projects, would not cumulatively contribute to regional hazards, then it could be considered a less than cumulatively considerable impact.

The maximum cancer risk and non-cancer hazard index (both acute and chronic) for operations emissions from the project estimated independently by the applicant, staff, and the VCAPCD (VCAPCD 2016a and VCAPCD 2016c) are all below levels of corresponding significance. While air quality cumulative impacts could occur with sources within a six-mile radius, cumulative public health impacts are usually not

[10] More information regarding Census Tract 29.05: http://www.usboundary.com/Areas/Census%20Tract/California/Ventura%20County/Census%20Tract%2029.05/439900

significant unless the emitting sources are extremely close to each other, within a few blocks, not miles.

Southern California Edison's (SCE's) McGrath Peaker is located approximately 0.25 miles southeast of Puente, but it only runs occasionally which staff regards as not contributing significantly to the risks of TACs. Staff conducted a cumulative HRA including one simple-cycle natural-gas-fired turbine, one natural-gas-fired peaker combustion turbine (MGS Unit 3), one new diesel emergency generator and one boiler (MGS Unit 1) and McGrath. According to the results, if these sources run concurrently, the cancer risk of PMI is 5.06 in one million, and the cancer risk for the North Shore development is 4.27 in one million. The cumulative risks are still all below the significance levels.

All other identified facilities are at least three miles away from Puente (For example, the nearest planned project is Kaiser Medical Center, which is 3.71 miles away). Staff, therefore, concludes that the proposed Puente Power Project, even when combined with these projects, would not contribute to cumulative impacts in the area of public health.

Land Uses in the Area Surrounding Puente including Farming

Concerns have been raised that farming activities including pesticide use and exposures would contribute to health risks to farm workers and local residents. Pesticide use is regulated by CA Department of Pesticide Regulation and monitored by ARB. The applicable regulations are intended to ensure the safe use of each pesticide whose use might produce background levels that could be measurable. The closest farmland to Puente is approximately 0.2 miles. Since staff's analysis has shown that Puente construction and operation would lead to toxic emissions below levels of potential health significance, staff does not regard Puente as potentially contributing significantly to any health effects from existing pesticide use in the area.

Modeled facility-related risks would be much lower for more distant locations. Given the previously noted conservatism in the calculation method used, the actual risks would likely be much smaller. Therefore, staff does not consider the incremental risk estimate from Puente's operation as suggesting a potentially significant contribution to the area's overall or cumulative cancer risk that includes the respective risks from the background pollutants from all existing area sources.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows the presence of an environmental justice (EJ) population based on race and ethnicity within a six-mile radius of the project site. **Environmental Justice Table 3** shows that the cities of Oxnard and Port Hueneme have below-poverty-level populations significant enough to be considered EJ populations. Also, as previously noted, approximately 271,186 residents live within a six-mile radius of Puente Power Project, and sensitive receptors within a six-mile radius of the project site include 628 daycare centers, 6 nursing homes, 90 schools, 1 hospital, 6 colleges, and 1 arena (PPP 2015a, Section 4.9.1 and Appendix J). Moreover, there are a number of farm workers within the vicinity of the proposed site at any given time.

Ventura County's agricultural commissioner estimates that 17,000 to 24,000 immigrant workers come to the county each year at peak growing seasons (COO 2011). Due to the presence of an EJ population among residents and farm workers, this analysis must identify whether the construction and operation of the proposed Puente facility and the demolition of MGS could have significant, unmitigated impacts or disproportionate impacts on an EJ population.

Staff identified the potential public health impacts (i.e. cancer and non-cancer health effects) which could affect the EJ populations represented in **Environmental Justice Figure 1** and **Table 3**. These potential public health risks were evaluated quantitatively by conducting a health risk assessment, and the results were presented by level of risks. The potential construction/demolition risks are normally associated with exposure to asbestos, fugitive dust, and combustion emissions (i.e. diesel exhaust). The potential operation risks are associated with exposure to the toxic air contaminants emitted from the natural gas-fired combustion turbine generator (CTGs) including acetaldehyde, acrolein, ammonia, benzene, 1,3-butadiene, ethyl benzene, formaldehyde, napthalene, polycyclic aromatics, propylene oxide, toluene, xylene and diesel particulate matter (diesel PM) emitted during readiness testing of diesel-fueled emergency equipment. Staff concluded that no one (including the public, off-site nonresidential workers, recreational users, and EJ populations) would experience any acute or chronic cancer or non-cancer effects of health significance during construction and operation of the proposed Puente facility and the demolition of MGS units 1 and 2, and continued operation of MSG unit 3. Therefore, construction, demolition and operation of the project would not cause significant adverse direct, indirect, or cumulative public health impacts from the project's toxic air emissions. Given such lack of impacts, there would be no case of disproportionate public health impacts for all populations, including the EJ populations represented in **Environmental Justice Figure 1 and Table 3**. Please refer to the **Environmental Justice** section of this document for a full explanation of how staff determines the presence of EJ populations.

DISADVANTAGED COMMUNITIES

CalEnviroScreen indicators are used to measure factors that affect the potential[11] for pollution impacts in communities (OEHHA 2014). Staff used CalEnviroScreen 2.0 to identify disadvantaged communities[12] in the vicinity of the proposed project that may have been missed when screening by race/ethnicity and poverty (see **Environmental Justice Figure 1**). The point of maximum impact (PMI) is located at the east boundary of

[11] It is important to note that CalEnviroScreen is not an expression of health risk and does not provide quantitative information on increases of impacts for specific sites or project. CalEnviroScreen uses the criteria of "proximity" to a hazardous waste site, a leaking underground tank, contaminated soil, an emission stack (industry, power plant, etc.) to determine that a population is "impacted". It does not address general principles of toxicology: dose/response and exposure pathways. For certain toxic chemicals to pose a risk to the public, offsite migration pathways must exist (through ingestion, inhalation, dermal contact, etc.) and contact to a certain amount – not just any amount – must exist.

[12] The California Environmental Protection Agency (CalEPA), for purposes of its Cap-and-Trade Program, has designated "disadvantaged communities" as census tracts having a CalEnviroScreen score at or above the 75th percentile (CALEPA 2014). As a comparative screening tool, it is not intended to be used as a health or ecological risk assessment for a specific area or site.

the Puente site and the nearest EJ community is approximately 4 miles further east. As discussed previously, since impacts at the PMI are less than significant from a public health perspective, it can be reasonably assumed that there would not be significant impacts at any other location, including the EJ communities. Also, as previously noted, staff's analysis of potential health impacts was based on a highly conservative health-protective methodology that accounts for impacts on the most sensitive individuals in a given population.

CalEnviroScereen Overall Scores

Census tracts are identified in CalEnviroScreen 2.0 as disadvantaged communities if they have CalEnviroScereen scores above the 75th percentile. Census tracts near the Puente site with scores at 75 percent or above are shown in **Public Health Table 7**. Values are shown as percentiles, which indicate the percent of all census tracts with a lower score. A higher percentile indicates a higher potential relative burden. However, according to **Environmental Justice Figure 1**, all of these census tracts are located more than 3 miles away from the project site. As discussed previously in **Cumulative Impact and Mitigation**, public health impacts are usually not significant unless the emitting sources are extremely close to each other, within a few blocks, not within a few miles. Therefore, staff concludes that Puente would not affect these disadvantaged communities. Bolded values indicate the highest value for each indicator in these five census tracts.

Public Health Table 7
CalEnviroScreen 2.0 Indicator Percentile Scores (%)

Census Tract[1]	Total Population	Overall Score Range[2] (%)	Diesel PM (%)	Pesticide Use (%)	Toxic Releases from Facilities (%)	Age: Children and Elderly (%)	Asthma ER Visits (%)	Low Birth Weight Infants (%)
6111004902	5091	**96-100**	**53.95**	**99.83**	61.30	**85.80**	**81.30**	74.09
6111009100	5279	91-95	43.86	98.54	69.08	57.47	**81.13**	75.39
6111004715	5020	91-95	28.91	99.67	**88.61**	49.23	58.19	**81.90**
6111003900	7533	81-85	40.74	96.88	77.24	54.93	60.16	44.55
6111004503	4387	76-80	49.82	97.84	**96.51**	33.04	58.18	78.53

(Source: CalEnviroScreen 2.0 Data, www1.oehha.ca.gov/calenviroscreen/maps-data/download-data)
Notes:
1. Census tract locations are shown in **Environmental Justice Figure 1**.
2. Overall Score Range incorporates all indicators shown in **Environmental Justice Table 1**.
3. When a geographic area has no indicator value (for example, the census tract has no reported groundwater threats nearby), it is excluded from the percentile calculation and assigned a score of zero for that indicator.

CalEnviroScreen Indicators related to Public Health

Because a CalEnviroScreen score evaluates multiple pollutants and factors collectively, staff further examined individual contributions of indicators that are relevant to Public Health (see **Environmental Justice Table 1**). These individual contributions of indicators and their scores are presented in **Public Health Table 7**. They fall into two different categories: Exposures in Pollution Burden (Diesel PM, Pesticide, and Toxic Releases from Facilities) and Sensitive Populations in Population Characteristics (Children and Elderly, Asthma ER Visits, and Low Birth Weight Infants).

- **Diesel PM:** This indicator represents how much diesel particulate matter (PM) is emitted into the air within and nearby the census tract. The data are from 2010 California Air Resources Board's (ARB's) emission data from on-road vehicles (trucks and buses) and off-road sources (ships and trains, for example). Census Tract 6111004902 is the one with the highest potential relative burden among the five census tracts in **Public Health Table 7**. Sources of diesel PM within and nearby this census tract emit 15.33 kilograms per day; while diesel emissions in all census tracts in California range between 0 - 164 kilograms per day. The diesel PM percentile for this census tract is 54, meaning it is higher than 54 percent of the census tracts in California. The diesel PM emitted from the project (either from the diesel-fueled equipment during construction/demolition or from emergency equipment undergoing weekly readiness testing during operation) won't have a cumulative impact on the disadvantaged community of Census Tract 6111004902 because: (1) Census Tract 6111004902 is more than 6 miles away from the Puente site, (2) PMIs are either within the project boundaries (construction/demolition) or on the project boundary (operation), and (3) the impacts decrease rapidly as the diesel PM is transported from the site. Likewise, all other census tracts are at least 3 miles away from the Puente site; therefore, the diesel PM emitted from the project won't have cumulative impact on these disadvantage communities.
- **Pesticide Use:** Because many farmlands and farming activities are located in this area, the scores of pesticides for all census tracts are relatively high. This indicator represents the reported use of 69 hazardous and volatile pesticides in 2009-2011 collected by the California Department of Pesticide Regulation. Only pesticides used on agricultural commodities are included in the indicator. Please note that this indicator does not measure exposure, only proximity to use (i.e. it uses pounds per acre as a surrogate). Therefore, it only presents potential exposure, not actual exposure to pesticides. Census Tract 6111004902 has an estimated 48,370.408 pounds of active ingredients used per square mile. The percentiles for both census tracts are 100, meaning they are higher than 100% of the census tracts in California. The selected pesticides in highest uses in these tracts are: a.) Chloropicrin, b.) Methyl Bromide, c.) 1 3 Dichloropropene, d.) Metam Sodium, and e.) Chlorpyrifos. Since these five census tracts are all at least 3 miles away from the Puente site, the toxic air emitted from the project won't have cumulative impact on these disadvantaged communities with existent potential burden on pesticides.
- **Toxic Releases from Facilities:** The indicator represents modeled air concentration of chemical releases from large facility emissions in and nearby the census tract. The U.S. Environmental Protection Agency (US EPA) provides public information on the amount of chemicals released into the environment from many facilities. This indicator uses the air concentration and toxicity of the chemical to determine the toxic release score. The data are from 2010. Census Tract 6111004503 is the one with the highest potential relative burden among the five census tracts in **Public Health Table 7**. The score for this census tract is 14,067.59; while the toxic release indicator scores range from 0 to 750,000. The toxic release percentile for this census tract is 97, meaning it is higher than 97 percent of the census tracts in California. The score for Census Tract 6111004715 is 6,189.99. The toxic release percentile for this census tract is 89, meaning it is higher than 89 percent of all the census tracts in California. Since these five census tracts are all at least 3 miles away from the

Puente site, the air toxic emissions from the project won't have cumulative impact on these disadvantage communities with existent potential burden on toxics releases from facilities.

- **Age (Children and Elderly):** The age indicator measures the percent of children under age 10 and elderly over age 65 in the census tract. The data are from 2010. Census Tract 6111004902 is the one with the highest potential relative burden among the five census tracts in **Public Health Table 7**. In its total of 5,091 people, 20 percent are under age 10, and 10 percent are over age 65. Therefore, a total 29 percent of the people in this census tract are children or elderly. The percentile for this census tract is 86, meaning the percent of children and elderly is higher than 86 percent of the census tracts in California. As previously noted, staff's human health assessment (HRA) was based on a highly conservative health-protective methodology that accounts for impacts on the most sensitive individuals in a given population, including children and elderly people. According to the results of HRA, the risks of the nearest sensitive receptors (i.e Leite Family Daycare and JN Care Home) are all below health-based thresholds. Therefore, the toxic air emitted from the project won't cause significant health effects for the children and elderly in these disadvantage communities.
- **Asthma ER Visits:** This indicator is a representation of an asthma rate. It measures the number of emergency room visits for asthma per 10,000 people over the years 2007 to 2009. The information was collected by the California Office of Statewide Health Planning and Development. In Census Tract 6111004902 (5,091 people), 61 people per 10,000 people in this census tract visited the emergency room for asthma. The asthma percentile for this census tract is 81, meaning the asthma ER visitation rate is higher than 81 percent of the census tracts in California. In Census Tract 6111009100 (5,279 people), 61 people per 10,000 people in this census tract visited the emergency room for asthma. The asthma percentile for this census tract is 81, meaning the asthma ER visitation rate is higher than 81 percent of the census tracts in California. Census Tract 6111009100 (5,279 people), 61 people per 10,000 people in this census tract visited the emergency room for asthma. For more detailed discussion regarding existing asthma concern, please refer to **Public Health Appendix A**.
- **Low Birth Weight Infants:** This indicator represents the percent of low birth weight babies in the census tract. It measures the percentage of babies born weighing less than 2500 grams (about 5.5 pounds) out of the total number of live births over the years 2006 to 2009. The information was collected by the California Department of Public Health. Census Tract 6111004715 is the one with the highest potential relative burden among the five census tracts in **Public Health Table 7**. In its total, 5,020 people (or 5.43 percent) of births in this census tract were low birth weight. The low birth weight percentile for this census tract is 82, meaning the percent low birth weight is higher than 82 percent of the census tracts in California. As previously noted, staff's human health assessment (HRA) was based on a highly conservative health-protective methodology that accounts for impacts on the most sensitive individuals in a given population. According to the results of the HRA, the risk of the nearest sensitive receptor (i.e Leite Family Daycare) is below health-based

thresholds. Therefore, the toxic air emitted from the project won't cause significant health effects for the low birth weight infants in these disadvantage communities.

CONCLUSION

Public Health impacts would not contribute to disproportionate impacts to the EJ population. Also, public health impacts from the project on the EJ population would be less than significant.

COMPLIANCE WITH LORS

Staff has conducted a HRA for the proposed Puente Power Project and found no potentially significant adverse impacts for any receptors, including sensitive receptors. In arriving at this conclusion, staff notes that its analysis complies with all directives and guidelines from the Cal/EPA Office of Environmental Health Hazard Assessment and the California Air Resources Board. Staff's assessment is biased towards protection of public health and takes into account the most sensitive individuals in the population. Using extremely conservative (health-protective) exposure and toxicity assumptions, staff's analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project, including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions, would not experience any acute or chronic significant health risk or any significant cancer risk as a result of that exposure.

Staff incorporated every conservative assumption called for by state and federal agencies responsible for establishing methods for analyzing public health impacts. The results of that analysis indicate that there would be no direct or cumulative significant public health impact on any population in the area. Therefore, staff concludes that construction and operation of the project would comply with all applicable LORS regarding long-term and short-term project impacts in the area of public health.

RESPONSE TO PRELIMINARY STAFF ASSESSMENT COMMENTS

Public Health		
Source of Comment	***Comment***	***Staff Response***
Applicant		
	Staff received no comments from the applicant in the area of Public Health.	
Intervenors		
City of Oxnard (TN #213681)	1. "[The PSA's Evaluation of Air Quality and Public Health Impacts Is Inadequate. C. The PSA Fails to Evaluate Impacts to the Sensitive Receptors that Will Live Closest to the Power Plant. The PSA acknowledges that in the near future, a new residential development—the	1. The HRA for residences was expanded to include the North Shore Development and results are now included in **Public Health Table 6**. The health risks of this receptor area are all below significance thresholds.

Public Health		
Source of Comment	***Comment***	***Staff Response***
	North Shore or Beach Walk development—will be built less than a mile from the Project site. This development is fully entitled and is closer to the Project site than the Oxnard Shores mobile home park or the Leite Family daycare (which the PSA's Public Health section uses to evaluate sensitive receptor impacts). This new development will contain 292 housing units with approximately 800 to 1,000 residents, including sensitive receptors (young children and elderly) by the time the Project is operational. Other sections of the PSA evaluate impacts to future residents of this development, but they are improperly excluded from the PSA's Public Health analysis. The Public Health analysis should be revised to evaluate impacts on the Oxnard residents that will live closest to the Project site. 2. The Public Health analysis should consider the impact of the Project's many proposed startups and shutdowns, as emissions of many hazardous air pollutants, such as formaldehyde and acrolein, are significantly elevated during these periods.	2. The HRA results of new CTG startup/shutdowns were also included in **Public Health Table 6**, and the risks are also below the significance threshold.
Robert Sarvey (TN#212634)	3. The HRA for the facility concludes that the cancer risk from the facility is less than one and no further action is required to reduce the facilities health risk. The health risk assessment treats the project as a new standalone facility and ignores the fact the facility also includes two steam generators and a peaking turbine.	3. Staff's HRA did include emissions from concurrent operation of all on-site sources, including one simple-cycle natural-gas-fired turbine, one natural-gas-fired peaker combustion turbine (MGS Unit 3), one new diesel emergency generator and one boiler (MGS Unit 1).SCE's McGrath Peaker only runs occasionally; therefore, staff regarded it as not contributing significantly to the risks of TACs. Also, Staff conducted a cumulative HRA including one simple-cycle natural-gas-fired turbine, one natural-gas-fired peaker combustion turbine (MGS Unit 3), one new diesel emergency generator and one boiler (MGS Unit 1) and McGrath. According

Public Health		
Source of Comment	***Comment***	***Staff Response***
		to the results, if these sources run concurrently, the cancer risk at PMI is 5.06 in one million, and the cancer risk for the North Shore is 4.27 in one million. The cumulative risks are still all below the significance levels.
	4. The cancer risk from the current facility was determined to be 1 in a million for the facility in the 2004 Hot spots report issued by the district. That risk was assessed without current more sensitive regulatory models and the most recent toxicity values. Mandalay Unit 1 and the peaking unit at the site will continue to operate after the commissioning of the Puente Project therefore the health risks are significantly understated.	4. Staff's HRA was conducted using the latest version of ARB/OEHHA Hotspots Analysis and Reporting Program Version 2 (HARP2), which incorporates methodology presented in the latest OEHHA's 2015 Guidance.
Public		
Daniel Chavez Jr. (PSA Workshop)	5. Opposed to project. How can this plant not be a significant cause of cancer? The PSA cannot say that with certainty, because of the potential harmful impacts from decay of the plant over time. There is not enough evidence that there will be no cancer-causing impacts. You do not use real numbers; you are using estimates. Use accurate numbers for operation of the plant.	5. Staff's analysis of potential health impacts used accepted data and methodologies and was based on a highly conservative health-protective analysis that accounts for impacts on the most sensitive individuals in a given population. According to the results of HRA, all risk numbers of construction/demolition and operation activities are below significance thresholds.
Denis O'Leary (PSA Workshop)	6. There are 17500 students in K-8th grade in Oxnard, largely Latino population. There is a high instance of asthma in the Hueneme school district. There are concerns with existing air quality, pesticide use, other power plants and a Superfund site in the area.	**6.** Staff's analysis does account for the impacts to the most sensitive individuals in the population, including daycare centers, schools, and colleges. According to the results of HRA, all risk numbers of these sensitive receptors are below significance thresholds. Therefore, staff concludes that no significant adverse health impacts from toxic air emissions (TACs) are expected at any location of sensitive receptor, including schools. For a discussion of other air pollutants, please see the **Air Quality** portion of this analysis. As for asthma, please see staff's **Appendix A: Existing Public Health Concerns** for more detailed analysis. As for pesticides, since staff's analysis has shown that Puente construction and operation would lead to toxic emissions below levels of

Public Health		
Source of Comment	***Comment***	***Staff Response***
		potential health significance, staff does not regard Puente as potentially contributing significantly to any health effects from existing pesticide use in the area. Also, in previous EJ discussion, staff concluded that since the disadvantaged communities are all at least 3 miles away from the proposed Puente site, the toxic air emitted from the project won't have cumulative impact on these disadvantage communities with existent potential burden on pesticides.
Grace Chang (TN#214026)	7. Comments on power plant threatening the people of Oxnard with even greater hazards to their health … They absorbed a disproportionate burden of the pollution from these toxic power plants. 8. Issues of "environmental justice communities."	7. According to the results of HRA, all risk numbers of these sensitive receptors are below significance thresholds. Therefore, staff concludes that no significant adverse health impacts from toxic air emissions (TACs) are expected at any location of a sensitive receptor. For a discussion of other pollutants, please see the **Air Quality** portion of this analysis. 8. As for issues of disproportionate burden and environmental justice, please see staff's EJ section for more detailed discussion.
Agencies		
	Staff received no comments from the agencies in the area of Public Health.	
Organizations		
	Staff received no comments from the organizations in the area of Public Health.	

CONCLUSIONS

Staff has analyzed the potential public health risks associated with construction/demolition and operation of the Puente Power Project using a highly conservative methodology that accounts for impacts on the most sensitive individuals in any given population. Staff concludes that there would be no significant health impacts from the project's air emissions. Exposure to off-site nonresident workers or recreational users would be lower with correspondingly lower health risks. According to the results of staff's HRA, both construction/demolition and operating emissions from the project would not contribute significantly or cumulatively to morbidity or mortality in any age or ethnic group residing in the project area.

Staff concludes that Puente's public health impacts would be less than significant and would not contribute to disproportionate impacts to the EJ population.

PROPOSED CONDITIONS OF CERTIFICATION

No public health conditions of certification are proposed by staff.

ACRONYMS

ACM	Asbestos Containing Materials
AFC	Application for Certification
ARB	California Air Resources Board
Btu	British thermal unit
CAA	Clean Air Act (Federal)
CAL/EPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CEC	California Energy Commission (or Energy Commission)
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CTGs	Combustion Turbine Generators
CO	Carbon Monoxide
CO2	Carbon Dioxide
DPMs	Diesel Particulate Matter
FSA	Final Staff Assessment (this document)
HAPs	Hazardous Air Pollutants
HARP	Hot Spots Reporting Program
HARP2	Hot Spots Reporting Program Version 2
HEPA	High Efficiency Particulate Air
HRA	Health Risk Assessment
HI	Hazard Index
lbs	Pounds
LORS	Laws, Ordinances, Regulations and Standards
MACT	Maximum Achievable Control Technology
MEIR	Maximally Exposed Individual Resident

MEIW	Maximally Exposed Individual Worker
MICR	Maximum Individual Cancer Risk
mg/m3	Milligrams per Cubic Meter
MMBtu	Million British thermal units
MW	Megawatts (1,000,000 Watts)
NO	Nitric Oxide
NO2	Nitrogen Dioxide
NO3	Nitrates
NOx	Oxides of Nitrogen or Nitrogen Oxides
O2	Oxygen
O3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PM	Particulate Matter
PM10	Particulate Matter less than 10 microns in diameter
PM2.5	Particulate Matter less than 2.5 microns in diameter
PMI	Point of Maximum Impact
ppm	Parts Per Million
ppmv	Parts Per Million by Volume
ppmvd	Parts Per Million by Volume, Dry
PSA	Preliminary Staff Assessment
Puente	Puente Power Project (proposed project)
RELs	Reference Exposure Levels
SIDS	Sudden Infant Death Syndrome
SO2	Sulfur Dioxide

SO3	Sulfate
SOx	Oxides of Sulfur
SRP	Scientific Review Panel
TACs	Toxic Air Contaminants
T-BACT	Best Available Control Technology for Toxics
TDS	Total Dissolved Solids
tpy	Tons per Year
VCAPCD	Ventura County Air Pollution Control District
VOCs	Volatile Organic Compounds

REFERENCES

American Cancer Society, 2014, Lifetime Risk of Developing or Dying From Cancer. < http://www.cancer.org/cancer/cancerbasics/lifetime-probability-of-developing-or-dying-from-cancer>

American Cancer Society, *Cancer Facts & Figures 2015*. Atlanta: American Cancer Society; 2015 < http://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-044552.pdf

California Air Resources Board (ARB). 2015, Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. Updated May 13th, 2015. http://arbis.arb.ca.gov/toxics/healthval/contable.pdf

Centers for Disease Control and Prevention (CDC), 2014. Valley Fever Fact Sheet. <http://www.cdph.ca.gov/HealthInfo/discond/Documents/VFGeneral.pdf>

Centers for Disease Control and Prevention (CDC), 2015. Fungal pneumonia: a silent epidemic Coccidioidomycosis (valley fever) Fact Sheet. <http://www.cdc.gov/fungal/pdf/cocci-fact-sheet-california-final-508c.pdf>

California Department of Public Health (CDPH). Valley Fever <https://www.cdph.ca.gov/HealthInfo/discond/Documents/ValleyFever.pdf>

California Department of Public Health (CDPH). 2015. County Health Status Profiles 2015. https://www.cdph.ca.gov/programs/ohir/Documents/OHIRProfiles2015.pdf

CEC 2015oo – Air Quality Modeling Files (AERMOD and HARP2) (TN 207074).Submitted on December 18, 2015. CEC/Docket Unit on December 18, 2015.

COO 2011 – City of Oxnard, Development Services Department, Planning Division. 2030 General Plan: Goals and Policies. Adopted October 2011. Amended June 2016.

MacLean, Michael. 2014, The Epidemiology of Coccidioidomycosis – 15 California Counties, 2007-2011, produced for the California Coccidioidomycosis Collaborative. January 22nd, 2014 <https://www.vfce.arizona.edu/resources/pdf/The_Epidemiology_of_Coccidioidomycosis_%20Collaborative_County_Report.pdf>

National Cancer Institute. 2016a, State Cancer Profiles, “Death Rate/Trend Comparison by Cancer, death years through 2012: California Counties vs. California, All Cancer Sites, All Races, Both Sexes.” < http://statecancerprofiles.cancer.gov/cgi-bin/ratetrendbycancer/data.pl?001&0&06&6&1&0&3>

National Cancer Institute. 2016b, State Cancer Profiles, “Incidence Rate Report for by County, Lung & Bronchus, 2008-2012, All Races (includes Hispanic), Both Sexes, All Ages.” <http://statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=06&cancer=047&race=00&sex=0&age=001&type=incd&sortVariableName=rate&sortOrder=default>.

OSHA (Occupational Safety and Health Administration), Asbestos. < http://www.osha.gov/SLTC/etools/hurricane/building-demolition.html#asbestos >

OEHHA (Office of Environmental Health Hazard Assessment). 2003, Air Toxics Hot Spots Program Risk Assessment Guidelines. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. August 2003.

OEHHA (Office of Environmental Health Hazard Assessment). 2009, Adoption of the Revised Air Toxics Hot Spots Program Technical Support Document for Cancer Potency Factors, 06/01/09. <http://oehha.ca.gov/air/hot_spots/tsd052909.html>.

OEHHA (Office of Environmental Health Hazard Assessment). 2012, Air Toxics Hot Spots Program Risk Assessment Guidelines. Technical Support Document for Exposure Assessment and Stochastic Analysis, August 2012.

OEHHA (Office of Environmental Health Hazard Assessment). 2014, California Communities Environmental Health Screening Tool Report (CalEnviroScreen 2.0), October 2014.

OEHHA (Office of Environmental Health Hazard Assessment). 2015, Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments, March 6th, 2015.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015

PPP 2015b – NRG Energy Center Oxnard LLC/George L. Piantka (TN 204859). Data Adequacy Supplemental Response, dated June 1, 2015. Submitted to Jon Hilliard/CEC/Docket Unit on June 2, 2015

PPP 2015c – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), Dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015

PPP 2015y – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015

PPP 2015z – Latham & Watkins LLP Applicant’s Responses to CEC Data Request, Set 2 (TN 206791). Submitted on November 30, 2015. CEC/Docket Unit on November 30, 2015.

PPP 2015jj – Revised Air Quality Emissions and Modeling Results for the Enhancement and Refinement Demolition of Mandalay Units 1 and 2 Latham & Watkins LLP (TN 207055). Submitted on December 16, 2015. CEC/Docket Unit on December 16, 2015.

SCE 2007 - Southern California Edison, Before the Public Utilities Commission of the State of California, Assigned Commissioner's Ruling Addressing Electric Reliability Needs in Southern California for Summer 2007, Appendix D: *Mandalay Peaker Project Air Quality Impact Analysis*, February 2007, available at < https://www.sce.com/NR/rdonlyres/E515C7D3-0662-430F-8232-312CD5E5D966/0/EnvironmentalDocumentsMND0702Appendix.pdf >.

US EPA (Environmental Protection Agency). 2012, An Introduction to Indoor Air Quality – Asbestos. < http://www.epa.gov/iaq/asbestos.html>.

US EPA (Environmental Protection Agency). 2003, <http://cfpub.epa.gov/ncea/iris/index.cfm?fuseaction=iris.showQuickView&substance_nmbr=0642>.

Ventura County (Ventura County Public Health Division), 2015a. Available online at: http://www.healthmattersinvc.org/index.php.

Ventura County (Ventura County Public Health Division), 2015b. Adults with Asthma. Available online at: http://www.healthmattersinvc.org/modules.php?op=modload&name=NS-Indicator&file=indicator&iid=7913031.

Ventura County (Ventura County Public Health Division), 2015c. Children and Teens with Asthma. Available online at: http://www.healthmattersinvc.org/modules.php?op=modload&name=NS-Indicator&file=indicator&iid=8228237.

VCAPCD 2016a – Notice of Preliminary Determination of Compliance, Ventura County Air Pollution Control District with CEC Staff (TN 211570). Submitted to CEC/Docket Unit on May 19, 2016.

VCAPCD 2016b – Ventura County Air Pollution Control District Comments on Preliminary Staff Assessment (TN 213699) dated September 16, 2016. Submitted to CEC/Docket Unit on September 16,, 2016.

VCAPCD 2016c –Ventura County Air Pollution Control District Final Determination of Compliance,(TN 214005-1-214005-15). Submitted to CEC/Dockets Unit on October 14, 2016.

Wolstein, Joelle, et al. 2010, "Income Disparities in Asthma Burden and Care in California", December 2010. <http://www.healthpolicy.ucla.edu/pubs/files/asthma-burden-report-1210.pdf >.

PUBLIC HEALTH APPENDIX A

PUBLIC HEALTH APPENDIX A

Existing Public Health Concerns

1.0 INTRODUCTION

The purpose of this assessment is to identify the current status of cancer, respiratory disease--using asthma as the primary metric--and also evaluate Chronic Obstructive Pulmonary Disease (COPD) and Valley Fever in the region near the proposed Puente Power Project and in Ventura County. This will enable staff to compare the prevalence and mortality of respiratory disease and cancer in the vicinity of the proposed facility to the same concerns in populations located in other regions of California.

2.0 DEMOGRAPHICS OF VENTURA COUNTY AND CALIFORNIA

The United States Census Bureau (2015[13]) reports population characteristics with regards to age and racial/ethnic makeup of Ventura County and of the State of California as follows:

	Ventura County	California
Population, 2015	850,536	39,144,818
Persons <5 years old, 2015	6.3%	6.4%
Persons <18 years old, 2015	23.8%	23.3%
Persons 65 and over, 2015	14.1%	13.3%
	Ventura County	**California**
White persons, 2015	84.6%	72.9%
Black persons, 2015	2.3%	6.5%
American Indian/Alaska native, 2015	1.9%	1.7%
Asian, 2015	7.6%	14.7%
Native Hawaiian/Pacific Islander, 2015	0.3%	0.5%
Hispanic or Latino, 2015	42.3%	38.8%

3.0 VENTURA COUNTY HEALTH RANKING & AIR POLLUTION

According to the County Health Rankings and Roadmaps website (www.countyhealthrankings.org), Ventura county is ranked 8th out of 57[14] counties in California for overall health outcomes which include premature death and morbidity due to poor or fair health, poor physical health days, poor mental health days and low birth weight). Note that the lower the ranking, the better the health outcome. Likewise, Ventura

[13] http://www.census.gov/quickfacts/table/PST045215/06111,06

[14] Alpine County is not ranked.

County is ranked 15th out of 57 counties for overall health factors which include smoking, obesity, physical inactivity, excessive drinking, motor vehicle crash death rate, sexually transmitted diseases (STDs) and teen birth rate. For its physical environment (air pollution, particulate matter and ozone days[15], access to recreational facilities, limited access to healthy foods and fast food restaurants), Ventura County ranks 27th out of 57 of California counties (County Health Rankings 2016).

The American Lung Association (ALA 2016) State of the Air 2016 website (ALA 2016) gave Ventura County an "F" grade for ozone, a "B" grade for 24-hour particle pollution and a "Pass" grade for annual particle pollution. In order to determine grades for counties, US EPA data in 2012, 2013, and 2014 at monitoring sites throughout the US was used. In the analysis, air quality is color-coded and reported as Orange (unhealthy for sensitive populations), Red (unhealthy) and Purple (very unhealthy). In the data from 2012-2014, Ventura County was coded Orange for 54 days/year for ozone, Red for 2 days/year and Purple for 0 days/year. With regards to 24-hour particulate levels, Ventura County was Orange for 1 day/year, Red for 0 days/year and Purple for 0 days/year.

Staff calculated the percentages of at-risk groups in both Ventura County and California. The percentages of at-risk groups between Ventura County and California are very similar, except for poverty estimates. As for ranking, out of all California 58 counties Ventura County is ranked 40th in pediatric asthma, 19th in adult asthma, and 25th in COPD[16]. Note that the lower the ranking, the fewer the number of people in each at-risk group.

[15] In the context of the County Health Rankings, an "ozone day" is a day in which air quality is unhealthy for sensitive populations. In the comparison with other CA counties, the annual number of unhealthy air quality days due to ozone was compared and that, along with the other aspects of physical environment (air pollution, particulate matter and ozone days, access to recreational facilities, limited access to health foods and fast food restaurants). This information was obtained from the website www.countyhealthrankings.org/health-factors/environmental-quality. This website says that several measures can be used to represent air quality, the most common being annual average values for fine particulate matter and ozone. In the County Health Rankings, they use two measures to represent environmental quality: annual number of days that air quality was unhealthy for sensitive populations due to (1) fine particulate matter and (2) ozone concentrations. Furthermore, researchers used an air quality model to estimate peak fine particulate matter and ozone concentrations for each day in the year and, by comparing to national ambient air quality standards (NAAQS), they estimated the number of days that the air quality was poor for sensitive populations due to these contaminants.

[16] The lower the ranking is, the less the numbers of people in each at-risk group are.

At-risk Groups in Ventura County and California

		Ventura County	California	Ventura County's California Ranking
Total Population		846,178 (100%)	38,629,264 (100%)	46th
Under 18		204,568 (24.18%)	9,113,908 (23.59%)	40th
65 & Over		115,000 (13.59 %)	4,968,418 (12.87%)	27th
Lung Diseases	Pediatric Asthma	18,120 (2.14%)	810,765 (2.09%)	40th
	Adult Asthma	50,182 (5.93%)	2,297,615 (5.92%)	19th
	COPD	32,154 (3.8%)	1,425,401 (3.67%)	25th
Cardiovascular Disease		47,741 (5.64%)	2,099,027 (5.41%)	27th
Diabetes		68,697 (8.12%)	3,031,004 (7.81%)	26th
Poverty Estimate		95,912 (11.33%)	6,253,422 (16.12%)	11th

4.0 CANCER

4.1 CANCER IN THE UNITED STATES

Cancer is the second leading cause of death in the United States (following death due to heart disease), and is the cause of 1 of every 4 deaths in the nation (ACS 2016a). It has been estimated that on January 1, 2014, there were nearly 14.5 million Americans (children and adults) alive who were either cancer survivors or current cancer patients (ACS 2014). In 2016, the American Cancer Society (ACS) estimates that about 188,800 of the estimated 595,690 cancer deaths in the US were caused by cigarette smoking and thus could be prevented (ACS 2016a).

4.1.1 Cancer Incidence Rates

The top three leading sites of new cancer cases for males are prostate, lung/bronchus and colon/rectum. For women the top three leading sites of new cancer cases are breast, lung/bronchus and colon/rectum. (ACS 2016a, Figure 3).

Incidence rates in the U.S. for all cancers in 2008-20012 were highest among Non-Hispanic black males (529.3 cases per 100,000 population compared to 528.9 per 100,000 for Non-Hispanic white males) and Non-Hispanic white females (436.2 cases per 100,000 population compared to 408.1 per 100,000 for Non-Hispanic black females. As for lung and bronchus cancer, incidence rates were highest for Non-Hispanic black males (93.4 per 100,000 population) and Non-Hispanic white females (58.7 per 100,000) (ACS 2016a, Table 9).

4.1.2 Cancer Death Rates

The top three leading sites of cancer-causing death for males are lung/bronchus, prostate, and colon/rectum. For women the top three leading sites of cancer-causing deaths are lung/bronchus, breast, and colon/rectum (ACS 2016a, Figure 3).

The American Cancer Society also reported cancer death rates in the U.S. for 2008-2012. Non-Hispanic black males and females had the highest cancer death rates for cancers of all sites (267.7 per 100,000 for Non-Hispanic black males compared to 210.6 per 100,000 for Non-Hispanic white males and 170.4 per 100,000 for Non-Hispanic black females compared to 149.2 for Non-Hispanic white females). As for lung and bronchus cancer,

death rates were highest for Non-Hispanic black males (74.9 per 100,000 population) and Non-Hispanic white females (41.4 per 100,000) (ACS 2016a, Table 9). Cancer death rates are declining for all four of the most common cancer types – lung, colorectal, breast, and prostate (ACS 2016a, Figure 1 and Figure 2).

4.2 CANCER IN CALIFORNIA

4.2.1 Cancer Incidence Rates

More than 1,459,000 Californians who are alive today have a history of cancer. In 2016, it is estimated that 173,200 Californians would be diagnosed with cancer. In 2008-2012, the overall cancer incidence rate (the number of new cases per 100,000 population) in the state was lower compared to the rest of the nation. California cancer incidence rates for Asians/Pacific Islanders, African Americans, and non-Hispanic whites were between 2 percent and 4 percent lower than the rest of the country. Hispanics in California had a nearly 11 percent lower incidence rate than other Hispanics in the nation. Cancer incidence rates in California declined by 14 percent between 1988 and 2013 (ACS 2016b). African American males in California have the highest cancer incidence rate, followed by non-Hispanic white males. Non-Hispanic white females have the highest cancer incidence rate among women, followed by African American females (ACS 2016b, Figure 8).

Lung Cancer

As for lung cancer, in 2013, 16,636 new cases of lung cancer were diagnosed, accounting for about 10 percent of all cancer diagnoses in California. The incidence rate has been declining since the mid-1980s in men, but only since the mid-2000s in women. From 1988 to 2013, lung cancer incidence rates in California decreased by 2.5 percent per year in men and by 1.1 percent per year in women. California has experienced a much larger decrease in lung cancer incidence rates than the rest of the US, in large part due to the success of the state's tobacco control initiative (ACS 2016b).

Between 2006 and 2010, the lung and bronchus incidence rate for males in California was 60.4 new cases per 100,000 males per year. For females, the rate was slightly lower, with an incidence rate of 44.4 new cases per 100,000 females. With respect to race/ethnicity, African-American males and females as well as non-Hispanic white females had the highest incidence rates (84.2, 53.7 and 53.8 new cases per 100,000 persons, respectively) in the state (CCR 2014).

4.2.2 Cancer Death Rates

Cancer accounts for nearly 1 of every 4 deaths in California. In 2016, it is estimated that 59,060 Californians would die of cancer. Cancer mortality rates declined by 27 percent between 1988 and 2013. Mortality rates declined for all four major racial/ethnic groups in the state (ACS 2016b).

African American males in California have the highest cancer mortality rate, followed by non-Hispanic white males. African American females also have the highest cancer mortality rate among women, followed by non-Hispanic white females (ACS 2016b, Figure 9)

Lung Cancer

Lung cancer is the leading cause of deaths from cancer for both men and women. Lung cancer caused a total of 12,408 deaths (6,482 for males and 5,926 for females), accounting for about 22 percent of all cancer deaths for males and 21 percent of all cancer death for females in California in 2013 (ACS 2016b, Table 2). From 1988 to 2013, rates decreased 2.7 percent per year for men and 1.4 percent per year for women. Gender differences in lung cancer mortality reflect historical differences in patterns of smoking uptake and cessation over the past 50 years (ACS 2016b).

Between 2006 and 2010, the lung and bronchus mortality rate for males was 47.1 deaths per 100,000 males per year. For females, the rate was slightly lower, with a mortality rate of 32.2 deaths per 100,000 females per year. With respect to race/ethnicity, African-American males and females as well as non-Hispanic white females had the highest mortality rates (69.5, 40.6 and 39.1 deaths per 100,000 persons, respectively) in the state (CCR 2014).

4.3 CANCER IN VENTURA COUNTY

Members of the public have raised concerns that farming activities including pesticide use and exposures would contribute to health risks to farm workers and local residents. Pesticides can cause many types of cancer in humans. Some of the most prevalent forms include leukemia, non-Hodgkins lymphoma, brain, bone, breast, ovarian, prostate, testicular and liver cancers[17].

4.3.1 Cancer Incidence Rates

In 2013, there were 3,659 observed new cancer cases in Ventura County, and 351 observed new lung cancer cases (ACS, CDPH and CCR 2016b, Table 4).

An organization titled Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php) provided lung and bronchus cancer, breast and prostate incidence rates. This indicator shows age-adjusted incidence rates for lung and bronchus cancers, breast cancers and prostate cancers in cases per 100,000 population. All these three cancer incidence rates in Ventura County show a general downward trend over time. Compared to all other counties in California, lung and bronchus cancer incidence rates in Ventura County fell into the “green” area, representing the “best” 50th percentile while both breast and prostate cancer incidence rates fell into the “yellow” area, representing the 50th to 25th quartile. The indicators are compared below:

Cancer Incidence Rates, 2009-2013 (age-adjusted per 100,000 residents)

Cancers	Ventura County	California	U.S.
Lung and Bronchus	41.5	46.5	62.4
Breast	131.8	121.4	123.3
Prostate	116.4	118.7	123.1

Data source: National Cancer Institute, 2009-2013

[17] http://www.toxicsaction.org/problems-and-solutions/pesticides

4.3.2 Cancer Death Rates

In 2013, there were 1,294 observed cancer deaths in Ventura County, and 241 observed lung cancer deaths (ACS, CDPH and CCR 2016b, Table 5).

Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php) also provided age-adjusted death rates due to lung cancer. The age-adjusted death rates due to lung and bronchus, breast and prostate cancers in Ventura County have a general downward trend over time. When compared to all other counties in California, all these three cancer death rates in Ventura County fell into the "green" area, representing the "best" 50th percentile. The indicators show the age-adjusted death rate per 100,000 population due to cancers and are compared below:

Death Rates due to Cancer, 2012-2014 (age-adjusted per 100,000 residents)

Cancers	Ventura County	California	U.S.
Lung and Bronchus	26.9	31.7	46*
Breast	19.8	20.3	20.7**
Prostate	17.8	19.3	19.2**

Data source: California Department of Public Health, 2012-2014
*in 2009-2013
**in 2013

Cancer statistics in Ventura County at the zip code level are not available on Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php).

4.4 CHILDHOOD CANCER (AGE 0-14 YEARS)

4.4.1 United States

Childhood cancer does not encompass one single disease but rather represents a wide group of different malignancies that vary by histology, origin site, race, sex and age. The causes of cancer in children are unknown. Consistent findings have not been reported that link environmental exposures or parental occupations to childhood cancer. Only a few known conditions or agents have been determined to explain a small percentage of specific cancers in children (Down syndrome, ionizing radiation from accidents or radiation therapy, certain chemotherapeutic agents, AIDS, specific genetic syndromes; National Cancer Institute, NCI 2012).

Major categories of pediatric cancer include leukemia (31% of all childhood cancers, including benign brain tumors), brain and other central nervous system tumors (25 percent), neuroblastoma (6 percent), Wilms tumor (5 percent), non-Hodgkin lymphoma (4 percent), Hodgkin lymphoma (4 percent), rhabdomyosarcoma (3 percent), osteosarcoma (3 percent), retinoblastoma (2 percent), and Ewing sarcoma (1 percent) (ACS, CDPH and CCR 2016b).

However, new data from the Centers for Disease Control and Prevention shows that during the 1999–2014 period, brain cancer replaced leukemia as the most common

cancer-causing death in children and adolescents aged 1–19 years. In 2014, brain cancers accounted for nearly 30 percent of the nation's nearly 2,000 cancer deaths for children and young adults. The key findings from the research include (Curtin *et al.* 2016):

- During 1999–2014, the cancer death rate for children and adolescents aged 1–19 years in the United States declined 20 percent, from 2.85 to 2.28 per 100,000 population.
- The cancer death rate for males aged 1–19 years in 2014 was 30 percent higher than for females.
- Declines in cancer death rates during 1999–2014 were experienced among both white and black persons aged 1–19 years and for all 5-year age groups.
- During 1999–2014, brain cancer replaced leukemia as the most common cancer causing death among children and adolescents aged 1–19 years, accounting for 3 out of 10 cancer deaths in 2014.

The American Cancer Society (ACS 2016) estimates that about 10,380 new cases of childhood cancer will occur in the United States among children ages 0-14 in 2016, with an estimated 1,250 deaths. Childhood cancer incidence rates have slowly increased by 0.6 percent per year since 1975. Childhood cancer death rates declined by a total of 66 percent from 1969 (6.5 per 100,000) to 2012 (2.2 per 100,000), largely due to improvements in treatment and high rates of participation in clinical trials. From 2003 to 2012, the death rate declined by 1.3 percent per year. Cancer is the second leading cause of death in children aged 1 to 14, after accidents (ACS 2016ac).

4.4.2 California

More than 1,700 children and young adults under the age of 20 are diagnosed with cancer in California each year. Of these, more than 1,000 are between 0-14 years. When compared to the rest of the nation, the cancer incidence rate among children 0-14 years in the state between the years 2008 and 2012 was the same among non-Hispanic whites, 4 percent higher among African Americans, 3 percent higher among Hispanics, and 13 percent higher among Asians/Pacific Islanders (ACS, CDPH and CCR 2016b).

Although accidents kill about three times more children than cancer, an estimated 1 of every 265 children will develop some form of cancer before they are 20 years old. Mortality rates for childhood cancer in California have declined by 64 percent over the past four decades, from 7.3 (per 100,000) in 1970 to 2.6 in 2013. The substantial progress in reducing childhood cancer mortality is largely attributable to improvements in treatment and high rates of participation in clinical trials (ACS, CDPH and CCR 2016b).

Cancer incidence among children ages 0-14 in California in 2013 are given for race/ethnicity, per 100,000 age-adjusted (ACS, CDPH and CCR 2016b, Table 12)

	Cancer Cases	Cancer incidence rate
Non-Hispanic White	429	19.7
Non-Hispanic Black	69	14.4
Hispanic	611	15.3
Asian/Pacific Islander	126	13.6

4.4.3 Ventura County

Kidsdata.org, a program of the Lucile Packard Foundation for Children's Health, promotes the health and well-being of children in California by providing an easy-to-use resource that offers high-quality, wide-ranging, local data to those who work on behalf of children. The trends of childhood cancer for both Ventura County and California have been slightly increasing from 2000 to 2012. The numbers of new cancer diagnoses per 100,000 children/youth ages 0-19 over a 5-year period for both Ventura County and California from 2008 to 2012 are compared below:

Childhood Cancer Diagnoses Data, 2008-2012

Locations	Number	Rate per 100,000
United States	N/A	N/A
California	9,118	17.5
Ventura County	242	20.6

Data Source: Surveillance, Epidemiology, and End Results (SEER) Program. (2015). Research data (1973-2012). National Cancer Institute; U.S. Cancer Statistics Working Group. (2014). United States cancer statistics: 1999-2011 incidence and mortality web-based report. Centers for Disease Control and Prevention and National Cancer Institute (Jul. 2015).

5.0 ASTHMA

5.1 ASTHMA PREVALENCE

5.1.1 Ventura County and California

Asthma in Ventura County is evaluated here using results of California and county health surveys and other data sources. Asthma is a chronic lung disease that makes it harder to move air in and out of the lungs, making breathing difficult.

California Breathing, a division of the Environmental Health Investigations Branch of the California Department of Public Health, reported asthma prevalence for 2014 in county asthma profiles posted online (www.californiabreathing.org/asthma-data/county-asthma-profiles, California Breathing 2016). Data on lifetime and active asthma prevalence in California residents were collected in the 2014 California Health Interview Survey (CHIS) (California Breathing 2016). Pertinent data collected on lifetime and active asthma prevalence are summarized below:

Lifetime Asthma Prevalence by Age (2014)

	Ventura County	California
Children (0-4 yrs)	n/a	9.7%
Children (ages 5-17)	20.5%	17.1%
Adults (ages 18-64)	11.1%	14%
Adults (> 65 yrs)	9.8%	12%
All Ages	12.3%	14.1%

Active Asthma Prevalence by Age (2014)

	Ventura County	California
Children (0-4 yrs)	n/a	6.3%
Children (ages 5-17)	n/a	11.6%
Adults (ages 18-64)	6.5%	7.6%
Adults (> 65 yrs)	n/a	7.7%
All Ages	6.0%	8.3%

California Department of Health Service (CDHS) reported lifetime asthma prevalence for counties in California based on California Health Interview Survey (CHIS) 2001-2003. For all counties in California, the asthma lifetime prevalence from 2001 to 2003 was 12.4 percent for all counties and 11.9 percent for Ventura County (Milet *et al.* 2007, page 21). In 2010, 13.1 percent of adults and 12.5 percent of children had been diagnosed with asthma at some point in their lives (lifetime asthma); 7.9 percent of adults and 7.4 percent of children had current asthma (Milet *et al.* 2013, page 4).

Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php), provided by Ventura County Public Health, is a web-based source of population data and community health information. The percentage of people who have ever been told by a health care provider that they have asthma or lifetime asthma (adults with Asthma, children and teens with Asthma) are summarized below:

Lifetime Asthma (2013-2014)

	Ventura County	California	U.S.
Adults	10.7%	13.9%	13.8%
Children and Teens	8.3%	15.2%	n/a

Data source: California Health Interview Survey, 2013-2014

The trends of lifetime asthma were also reported on Health Matters in Ventura County. For adults, the percentage with asthma has been falling from 2007-2012. After an increase during 2012-2013, the percentage continued to fall. As for children and teens, the percentage with asthma increased slightly from 2009 to 2011, and then fell afterwards.

Conclusion

The lifetime asthma prevalence rates reported by California Breathing, CDHS, and Health Matters in Ventura County are similar. Generally speaking, the lifetime asthma

prevalence rates of Ventura County are slightly lower than corresponding rates for California.

5.1.2 Ventura County Zip Codes

Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php) also provided lifetime asthma information of some zip codes. The zip code where the proposed Puente site is located is 93036. Using the map on the website, the zip codes for the areas adjacent to zip code 93036 were identified and listed below. The percentages of adults who have ever been told by a health care provider that they have asthma or lifetime asthma (adults with Asthma) in each zip code are also summarized below:

Lifetime Asthma (2013-2014)

	Percentage (%)	Comparison to Ventura County
California	13.9	Higher
Ventura County	10.7	--
93036	**9.8**	**Lower**
93001	11.8	Higher
93003	11.6	Higher
93004	11.3	Higher
93010	11	Higher
93030	9.5	Lower
93033	9.2	Lower
93035	10.7	Same
93041	10.4	Lower

Data source: California Health Interview Survey, 2013-2014

The percentage of adult lifetime asthma in zip code 93036 is generally lower compared to the rates reported for the State of California, county overall and the other zip codes in the project vicinity.

For children and teens with Asthma, there is no information for the zip code where Puente would be located (i.e. 93036). The closest zip codes of the areas adjacent to the proposed Puente project site were: 93030 and 93033. Both are east of the project site. The percentages of people who have ever been told by a health care provider that they have asthma or lifetime asthma (children and teens with Asthma) are summarized below:

Children and Teens with Asthma (2013-2014)

	Percentage (%)	Comparison to Ventura County
California	15.2	Higher
Ventura County	8.3	--
93036	**n/a**	**n/a**
93030	12.5	Higher
93033	11.7	Higher

Data source: California Health Interview Survey, 2013-2014

5.2 ASTHMA HOSPITALIZATION AND EMERGENCY DEPARTMENT VISIT DATA

5.2.1 Ventura County and California

Asthma hospitalization data provide information on patients with asthma so severe that they are admitted to the hospital for treatment. These data do not provide information on asthma incidence in the population or on how many people visit private doctors, emergency rooms or outpatient clinics for asthma, or on the mortality rate of asthma.

Data on lifetime asthma hospitalizations and emergency department visits (ED Visit) in Ventura County and California residents, based on data collected by the California Office of Statewide Health Planning and Development (OSHPD) are available on-line at: http://www.californiabreathing.org/asthma-data/county-asthma-profiles/ventura-county-asthma-profile (California Breathing 2016). Pertinent data are summarized below for hospitalization rates, emergency department visits and by race/ethnicity:

Asthma Hospitalization & Emergency Dept. Visit data for Ventura County and California in 2014 (age-adjusted per 10,000 residents)

	Ventura County	California
Asthma Hospitalization Rate		
0-17 years old	4.9	10.9
18+ years old	4.9	6.5
All ages	4.9	7.6
Emergency Dept. Visit Rate		
0-17 years old	61.6	80.7
18+ years old	25.3	38.6
All ages	34.7	49.5

Data Source: Office of Statewide Health Planning and Development (OSHPD), 2014

Asthma hospitalization & emergency department visit data can also be compared to the Healthy People 2020 target levels (HHS 2014).

Asthma Hospitalization & Emergency Department Visit data for Ventura County and California in 2014 compared to Healthy People 2020 (HP 2020) targets (age-adjusted rate per 10,000 residents)

	Ventura County	California	HP 2020
Asthma Hospitalization Rate			
0-4 years old	10.3	22.0	19.6
5-64 years old	2.9	6.0	5.4
65+ years old	14.2	21.9	15.2
Emergency Dept. Visit Rate			
0-4 years old	76.8	103.4	95.7
5-64 years old	32.1	47	49.6
65+ years old	27.7	36.1	13.7

Age-adjusted asthma hospitalizations and emergency department visits (ED Visits) by Race/Ethnicity (in 2014; per 10,000 Ventura County residents)

	Hospitalizations	ED Visits
White	5.5	34.3
African-American	14.5	131.9
Hispanic	4.2	35.8
Asian/Pacific Islander	2.7	12.9

The data shows that the hospitalization rate for African-Americans is 2.64 times greater than the rate for Whites and approximately 3.45 times greater than the rate for Hispanics. Similarly, the emergency department visit rate for African-Americans is 3.85 times greater than the rate for Whites and about 3.68 times greater than the rate for Hispanics.

The California Department of Public Health, Environmental Health Investigations Branch (EHIB 2012) provides an online health tracking program, the California Environmental Health Tracking Program (http://www.cehtp.org/page/asthma/query). This program was used by staff to enter an “Asthma Data Query” to evaluate the most recent data on asthma hospitalizations and emergency department visits for Ventura County and the State of California.

Asthma Hospitalizations, all ages, age-adjusted per 10,000 (2012)

	Ventura County	California
Asthma Hopitalization	**6.02**	**8.57**
Asthma ED Vistis	**34.22**	**49.69**

In summary, the age-adjusted hospitalization rate due to asthma in 2012 for all ages was 8.57 per 10,000 population in California compared to 6.02 per 10,000 in Ventura County. For emergency department visits due to asthma in 2012, the rate for California was 49.69 per 10,000 population and in Ventura County it was 34.22 per 10,000.

Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php) also provided the information of asthma hospitalization and ER visits and their trends, including:

- Age-Adjusted Hospitalization Rate due to Asthma: the indicator showing the average annual age-adjusted hospitalization rate due to asthma per 10,000 population.
- Age-Adjusted Hospitalization Rate due to Adult Asthma: the indicator showing the average annual age-adjusted hospitalization rate due to asthma per 10,000 population aged 18 years and older.
- Age-Adjusted ER Rate due to Asthma: the indicator showing the average annual age-adjusted emergency room visit rate due to asthma per 10,000 population.
- Age-Adjusted ER Rate due to Adult Asthma: the indicator showing the average annual age-adjusted emergency room visit rate due to asthma per 10,000 population aged 18 years and older.
- Age-Adjusted ER Rate due to Pediatric Asthma: the indicator showing the average annual age-adjusted emergency room visit rate due to asthma per 10,000 population aged under 18 years.

Indicators due to Asthma, age-adjusted per 10,000 (2012-2014)

Age-Adjusted Indicator (per 10,000)	Ventura County	California
Hospitalization Rate due to Asthma	5.4	8
Hospitalization Rate due to Adult Asthma (>18 years old)	5.3	7.2
ER Rate due to Asthma	30	44.2
ER Rate due to Adult Asthma (>18 years old)	22.1	34.5
ER Rate due to Pediatric Asthma (<18 years old)	52.8	72

Data source: California Office of Statewide Health Planning and Development, 2012-2014

Conclusion

The numbers of asthma hospitalization & emergency department visits reported by Health Matters in Ventura County are similar to the ones reported by the California Office of Statewide Health Planning and Development (OSHPD) and the California Department of Public Health, Environmental Health Investigations Branch. According to all these three sources, the numbers of asthma hospitalization & emergency department visits of Ventura County are lower than corresponding cases in California.

5.2.2 Ventura County Zip Codes

Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php) also provided asthma hospitalization and ER visits in some zip codes. As noted above, the zip code which Puente is located is 93036. Using the map on the website, the zip codes for the areas adjacent to the proposed Puente project site were identified and listed below. The numbers of asthma hospitalization & emergency department visit percentages are summarized below:

Age-adjusted Hospitalization Rate due to Asthma (2012-2014)

Zip Code	All Ages (per 10,000 population)	Adults (per 10,000 adults)
California	8.0	7.2
Ventura County	5.4	5.3
93036	**4.6**	**4.2**
93001	5.3	3.9
93003	4.1	2.6
93004	5	4.2
93010	6.4	6.6
93030	10	11
93033	6	6.1
93035	5.1	4.1
93041	4.1	3

Data source: California Office of Statewide Health Planning and Development, 2012-2014

The rates of hospitalization due to asthma and adult asthma in zip code 93036 are both lower than the ones of both Ventura County and California.

Age-adjusted Emergency Room Visit Rate due to Asthma (2012-2014)

Zip Code	All Ages (per 10,000 population)	Adults (per 10,000 adults)	Pediatric (per 10,000 children)
California	44.2	34.5	72
Ventura County	30	22.1	52.8
93036	**31**	**21.4**	**58.7**
93001	37.7	27.3	67.6
93003	28.1	19.9	51.9
93004	27.8	18.2	55.3
93010	28.3	20.7	50.2
93030	60.3	45.7	102.3
93033	31.4	21.7	59.2
93035	29.6	21.6	52.5
93041	34.6	27.7	54.6

Data source: California Office of Statewide Health Planning and Development, 2012-2014

The rate of emergency room visits due to asthma in zip code 93036 is higher than corresponding rates for Ventura County but lower than for California. The rate of emergency room visits due to adult asthma in zip code 93036 is lower than corresponding

values for both Ventura County and California. The rate of emergency room visits due to pediatric asthma in zip code 93036 is higher than Ventura County but lower than for California.

5.3 ASTHMA MORTALITY DATA

California Breathing also reported asthma mortality statistics for 2008-2010 in county asthma profiles posted online (www.californiabreathing.org/asthma-data/county-asthma-profiles; California Breathing 2016). Age-adjusted asthma mortality rates are shown below:

Age-adjusted asthma mortality rate (in deaths per million)

Age	Ventura County	State of California
0-17 years old	n/a	1.9
18+ years old	16.9	14.3
All ages	12.9	11.1

California Department of Health Service (CDHS) reported age-adjusted asthma deaths for counties in California based on 2000-2004 aggregate data from the Behavioral Risk Factor Surveillance System (BRFSS) and the California Health Interview Survey (CHIS). For all counties in California, the asthma death rate in 2000 to 2004 was 15.5 per million and 17.7 per million for Ventura County (Milet *et al.* 2007, page 114).

Asthma mortality data can also be compared to the Healthy People 2020 target levels published by the Centers for Disease Control and Prevention and the National Institutes of Health (https://www.healthypeople.gov/2020/topics-objectives/topic/respiratory-diseases/objectives). The Healthy People 2020 target for asthma deaths is 4.9 per million in ages 35-64 and 21.5 per million for ages 65 and older (HHS 2014).

5.4 CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Chronic Obstructive Pulmonary Disease or COPD is a group of lung diseases that includes emphysema and chronic bronchitis. COPDs are characterized by airflow obstruction in the lungs that interferes with normal breathing. Eighty-two percent of deaths due to COPD are caused by cigarette smoking. According to the American Lung Association (ALA), COPD is the third leading cause of death in the United States (with an age-adjusted death rate of 41.2 deaths per 100,000 population in 2009), behind cancer and heart disease. COPD is the only lung disease with a higher age-adjusted death rate in Whites than in African-Americans (ALA 2013). The Healthy People 2020 target rate for COPD hospitalizations is 50.1 per 10,000 and 56.8 per 10,000 for COPD emergency department visits (HHS 2014).

Health Matters in Ventura County (http://www.healthmattersinvc.org/index.php) provided information for COPD within the population served by Medicare (Medicare Population). This indicator shows the percentage of Medicare beneficiaries who were treated for chronic obstructive pulmonary disease (COPD) in 2014. In Ventura County, 7.8 percent of Medicare beneficiaries were treated for COPD; in California, 8.8 percent of Medicare beneficiaries were treated for COPD.

6.0 VALLEY FEVER (COCCIDIOIDOMYCOSIS)

Valley Fever is a fungal infection that is caused by *coccidioides immitis* organisms that are found in the soil of dry, low rainfall areas. According to the Center for Disease Control and Prevention (CDC), parts of Ventura County are suspected endemic areas for Coccidioidomycosis (CDC 2015). Spores of the fungus can become airborne due to soil disruptions like farming, construction and wind, and can be carried by the wind for miles. If the spores are breathed into the lungs, they can cause Valley Fever. It is estimated that up to half of the people living in areas where Valley Fever is endemic have been infected. Filipinos, Hispanics, African-Americans, Native Americans and Asians are more susceptible to serious infection than whites, as are women in their third trimester of pregnancy, new mothers, people with weakened immune systems and the elderly (Mayo Clinic 2012).

Mild cases of Coccidioidomycosis, with symptoms appearing 1-3 weeks after exposure, present with flu-like symptoms of fever, chest pain and coughing and usually resolve on their own. In cases where these symptoms are more severe, the course of the disease varies and it may take months to fully recover, with the severity of the disease usually depending on the overall health of the exposed person. The initial infection may progress to a chronic pneumonia with symptoms of low-grade fever, weight loss, cough, chest pain and nodules in the lungs. In its most severe form, the infection spreads beyond the lungs to the skin, bones, liver, brain, heart, and membranes that protect the brain and spinal cord (meninges). The most severe and deadly complication is meningitis, an infection of the meninges (Mayo Clinic 2012).

In Ventura County, Valley Fever tends to be more prevalent in the hotter and dryer Simi Valley area. There was a ccidioidomycosis outbreak in Ventura County following the January 1994 earthquake, centered in Northridge, CA, The factors that increased the risk for acquiring acute coccidioidomycosis infection was identified to be the arthrospores spread in dust clouds generated by the earthquake (Schneider *et al.* 1997). There was another incidence that occurred in 2004 that may be attributed to wildfires in the area and ensuing landslides. In a recent study of 15 counties impacted by Valley Fever between 2007 and 2011, Ventura County had 300 total reported cases, with 65 of those occurring in Oxnard. Ventura County ranked ninth in the total number or cases reported and in the mean incidence rate for the five year study period. There was no observed tendency of the number of cases to increase over time (MacLean 2014). For comparison, the 2010 rate reported for the State of California was 11.5 cases per 100,000 population (CDPH 2011).

7.0 DISCUSSION OF PUBLUC HEALTH IN VENTURA COUNTY

Ventura County is ranked 8th among California's 57 counties for overall health outcomes, with no health data available for Alpine County.

The incidence rates of cancer in Ventura County are lower for lung and bronchus cancer and prostate cancers, and higher for breast cancer compared to the rates in the State of California. Cancer mortality rates of all cancer sites are lower in Ventura County than in the State of California.

Cancer is the leading cause of death by disease in children in California and the United States, with the most common cancers being leukemia and brain and other central nervous system tumors. Within the past 30 years or so, the incidence of childhood cancer has been rising slightly while the mortality rate is declining. The trends of childhood cancer for both Ventura County and California have been slightly increasing from 2000 to 2012. The incidence rate of childhood cancer in Ventura County is higher than the rate of California.

The asthma prevalence in Ventura County is generally lower than the prevalence observed in the State of California. On the contrary, the asthma mortality rate in Ventura County is slightly higher than the rate reported for the State of California. Asthma hospitalization and emergency department visit rates in 2014 were reported to be lower in Ventura County than in California.

Within Ventura County, the Puente zip code (i.e. 93036) has a lower lifetime asthma prevalence compared to rates reported for California, the county overall and for the other zip codes in the project vicinity.

Within Ventura County, the Puente zip code (i.e. 93036) has a lower hospitalization rate compared to rates reported for California and the county overall. Its emergency room visit rate due to asthma is slightly higher than Ventura County but lower than California. Its emergency room visit rate due to adult asthma is lower than the ones for both Ventura County and California. Its emergency room visit rate due to pediatric asthma is higher than Ventura County but lower than California.

Review of asthma hospitalization rates in Ventura County by race/ethnicity shows that the hospitalization rate for African-Americans is 2.64 times greater than the rate for Whites and approximately 3.45 times greater than the rate for Hispanics. Similarly, the emergency department visit rate for African-Americans is 3.85 times greater than the rate for Whites and about 3.68 times greater than the rate for Hispanics.

Medicare Population of COPD in Ventura County in 2014 is lower than the rate reported for California.

Valley Fever or Coccidioidomycosis is a potentially serious infection caused by fungi endemic to Ventura County soil. There was no observed tendency of the number of cases to increase over time.

CONCLUSIONS

This assessment has reviewed available information on the current status of cancer and respiratory disease in Ventura County, California with particular attention to the region near the proposed Puente Power Project. Studies reviewed have shown that Ventura County is ranked above average among counties in California for overall health outcomes.

Other than childhood cancer and breast cancer, the incidence rates in Ventura County are lower for lung and bronchus cancer and prostate cancer compared to the rates in the

State of California. Cancer mortality rates of all cancer sites are lower in Ventura County than in the State of California.

The asthma mortality rate in Ventura County is higher than the rate reported for the State of California. On the contrary, the asthma prevalence, asthma hospitalization and emergency department visit rates in Ventura County are all generally lower than the rate for California.

Medicare Population of COPD in Ventura County in 2014 is lower than the rate reported for California.

Valley Fever rates appear to be stable in Ventura County.

REFERENCES

American Cancer Society (ACS), 2014. “Cancer Treatment and Survivorship Facts & Figures 2014-2015”. Atlanta: American Cancer Society; 2014

American Cancer Society (ACS), 2016a. "Cancer Facts and Figures 2016." Atlanta: American Cancer Society.

American Cancer Society (ACS), California Department of Public Health (CDPH), and California Cancer Registry (CCR) 2016b. “California Cancer Facts & Figures 2016”. Oakland, CA: American Cancer Society, Inc., California Division; 2016

American Lung Association (ALA), 2013. Trends in COPD (Chronic Bronchitis and Emphysema): Morbidity and Mortality. March, 2013. < http://www.lung.org/assets/documents/research/copd-trend-report.pdf>

American Lung Association (ALA), 2016. “State of the Air 2016.” < http://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2016-full.pdf >

California Breathing 2016, Ventura County Asthma Profile, http://www.californiabreathing.org/asthma-data/county-asthma-profiles/ventura-county-asthma-profile

California Cancer Registry (CCR), 2011. “Selected Cancer Facts-Ventura County.” October 2011. < http://ccrcal.org/pdf/factsheets/counties/Ventura_CountyFactsheets2011.pdf>

California Cancer Registry (CCR), 2014. “California Cancer Registry Factsheet Lung and Bronchus Cancer” < http://www.ccrcal.org/pdf/Factsheets/Lung_Bron_2014_9-15-14.pdf >

Centers for Disease Control and Prevention (CDC), 2015. Fungal pneumonia: a silent epidemic Coccidioidomycosis (valley fever) Fact Sheet. http://www.cdc.gov/fungal/pdf/cocci-fact-sheet-california-final-508c.pdf

California Department of Public Health (CDPH). 2011. “Coccidioidomycosis Yearly Summary Report 2011.”

County Health Rankings, 2016. “County Health Rankings and Roadmaps, A Healthier Nation, County by County, Ventura.” < http://www.countyhealthrankings.org/ >

Curtin SC, Miniño AM, Anderson RN, 2016. Declines in cancer death rates among children and adolescents in the United States, 1999–2014. NCHS data brief, no 257. Hyattsville, MD: National Center for Health Statistics. 2016.

Eheman C et al. 2012. “Annual Report to the Nation on the Status of Cancer, 1975-2008, Featuring Cancers Associated with Excess Weight and Lack of Sufficient Physical Activity.” Wiley Online Library. March 28, 2012.

U.S. Department of Health and Human Services (HHS), 2014, Healthy People 2020. Washington, DC: U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion <https://www.healthypeople.gov/2020/topics-objectives/topic/respiratory-diseases/objectives>

MacLean, Michael. 2014, The Epidemiology of Coccidioidomycosis – 15 California Counties, 2007-2011, produced for the California Coccidioidomycosis Collaborative. January 22nd, 2014 <https://www.vfce.arizona.edu/resources/pdf/The_Epidemiology_of_Coccidioidomycosis_%20Collaborative_County_Report.pdf>

Mayo Clinic. 2012. "Valley Fever." < http://www.mayoclinic.org/diseases-conditions/valley-fever/basics/definition/con-20027390>

Milet M, Tran S, Eatherton M, Flattery J, Kreutzer R. 2007, "The Burden of Asthma in California: A Surveillance Report." Richmond, CA: California Department of Health Services, Environmental Health Investigations Branch, June 2007. < http://www.californiabreathing.org/images/pdfs/asthmaburdenreport.pdf>

Milet M, Lutzker L, Flattery J. 2013, *Asthma in California: A Surveillance Report.* Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, May 2013.

National Cancer Institute (NCI). 2012. "A Snapshot of Pediatric Cancers." National Institutes of Health, U.S. Department of Health and Human Services. October.

Schneider E1, Hajjeh RA, Spiegel RA, Jibson RW, Harp EL, Marshall GA, Gunn RA, McNeil MM, Pinner RW, Baron RC, Burger RC, Hutwagner LC, Crump C, Kaufman L, Reef SE, Feldman GM, Pappagianis D, Werner SB. 1997. A coccidioidomycosis outbreak following the Northridge, Calif, earthquake. JAMA. 1997 Mar 19; 277(11):904-8.

Stockman JK, Shaikh N, Von Behren J, Bembom O, Kreutzer R. 2013, California County Asthma Hospitalization Chart Book: Data from 1998-2000. Oakland, CA: California Department of Health Services, Environmental Health Investigations Branch, September 2003.

SOCIOECONOMICS

Testimony of Lisa Worrall

SUMMARY OF CONCLUSIONS

Staff concludes that construction and operation of the Puente Power Project (Puente or project) would not cause significant adverse direct, indirect, or cumulative socioeconomic impacts on the project area's housing, law enforcement services, or parks. Staff also concludes the project would not induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services. Staff-proposed Condition of Certification **SOCIO-1** would ensure project compliance with applicable laws, ordinances, regulations, and standards (LORS). Economic benefits would accrue to the city of Oxnard and Ventura and Los Angeles counties due to construction and operation of Puente and demolition of Mandalay Generating Station (MGS) Units 1 and 2.

Staff concludes that the project's socioeconomic impacts on the environmental justice (EJ) population represented in **Environmental Justice Figure 1** and **Table 3** would be less than significant and would not be disproportionate.

INTRODUCTION

Staff's socioeconomics impact analysis evaluates the project's induced changes from construction and operation on the following:

- existing population (population influx)
- employment patterns (temporary/permanent job creation and labor supply)
- local communities (housing) and resources (parks)
- law enforcement services
- estimated beneficial economic effects

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Socioeconomics Table 1 contains socioeconomics LORS applicable to the proposed project.

Socioeconomics Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
STATE	
California Education Code, section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, sections 65995-65998	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

SETTING

The proposed project is located in the city of Oxnard, Ventura County, within the boundaries of the existing MGS industrial site (393 North Harbor Boulevard). The existing power plant has three operating generating units (MGS units 1-3). If Puente is licensed, units 1 and 2 would be demolished, and one new unit would be constructed (Puente), leaving MGS unit 3 and the new Puente unit operating. The project would upgrade and repurpose existing maintenance, warehouse, transmission interconnections, and ancillary systems on the MGS site to the extent feasible. Also, the existing outfall structure would be removed and reconfigured wastewater and storm water systems would be constructed.

PROJECT STUDY AREAS

The applicant identified the following study areas for socioeconomic-related project impacts (PPP 2015a, pg. 4.10-1):

- population and housing
- Ventura County, including the cities of Oxnard, Ventura, Camarillo, Simi Valley, and Thousand Oaks, as well as Los Angeles County
- public services, utilities, schools, and local finances
- Ventura County
- regional workforce, sales tax, and indirect and induced economic project effects (including IMPLAN modeling[1])
- Ventura and Los Angeles counties
- EJ impacts within a six-mile radius of the project site

Staff considers the study area for law enforcement and parks to be the city of Oxnard and considers the study area for population and housing to be the cities of Oxnard, Port Hueneme and San Buenaventura (Ventura).

[1] IMPLAN is and input/output model used to estimate the indirect and induced economic benefits of a project based on the direct expenditures.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The California Environmental Quality Act (CEQA) requires a list of criteria to determine the significance of identified impacts. A significant impact is defined by CEQA as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (CEQA Guidelines section 15382).

Thresholds serve as the benchmark for determining if a project would result in a significant adverse impact when evaluated against existing conditions (e.g., "baseline" conditions). State CEQA Guidelines, codified in California Code of Regulations section 15064(e), specify:

> "Economic and social changes resulting from the project shall not be treated as significant effects on the environment."
>
> "Where a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant."

Staff has used Appendix G of the CEQA Guidelines for this analysis, which specifies that a project could have a significant effect on population, housing, and law enforcement services, schools and parks if it would:

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere; or
- Adversely impact acceptable levels of service for law enforcement and parks and recreation.

Staff’s assessment of the significance of any impacts on population, housing, police protection, and parks and recreation are based on professional judgments, input from local and state agencies, and the industry-accepted two-hour commute range for construction workers and one-hour commute range for operational workers.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Induce Substantial Population Growth

Staff defines “induce substantial population growth” (for purposes of this analysis) as workers moving into the project area because of project construction and operation, thereby encouraging construction of new homes or extension of roads or other infrastructure. To determine whether the project would induce population growth, staff analyzes the availability of the local workforce and the population within the region.

Staff defines the local workforce as:

- Residing within a two-hour commute of project construction and a one-hour commute for project operation.
- Oxnard-Thousand Oaks-Ventura Metropolitan Statistical Area [2] (MSA) (Ventura County) and Los Angeles-Long Beach-Glendale Metropolitan Division (MD) (Los Angeles County)

Workers with a greater commute would likely be non-local and would tend to seek lodging closer to the project site (temporarily during construction or permanently during operations).

Socioeconomics Table 2 shows the historical and projected populations for the cities within proximity of the project site, plus Los Angeles and Ventura counties. Population projections between 2010 and 2035 show a growth of roughly 21 percent in the cities within and around the six-mile radius. The cities of Oxnard and Ventura have the highest projected growth with 24 and 21 percent, respectively.

[2] A Metropolitan Statistical Area (MSA) contains a core urban area population of 50,000 or more, consists of one or more counties, and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core.

Socioeconomics Table 2
Historical and Projected Populations

Area	2000[1]	2010[2]	2020[3]	2035[3]	Projected Population Change 2010-2035	
					Number	Percent (%)
Oxnard	170,358	197,899	216,700	244,500	46,601	23.55
Port Hueneme	21,845	21,723	22,100	22,500	777	3.58
San Buenaventura (Ventura)	100,916	106,433	116,900	128,800	22,367	21.02
Camarillo	57,077	65,201	72,200	76,700	11,499	17.64
Simi Valley	111,351	124,237	129,700	133,200	8,963	7.21
Thousand Oaks	117,005	126,683	129,700	130,900	4,217	3.33
Ventura County	753,197	823,318	889,000[3] 867,535[4]	954,000[3] 940,102[4]	130,682*	15.87
Los Angeles County	9,519,338	9,818,605	10,404,000[3] 10,441,441[4]	11,353,000[3] 11,120,284[4]	1,534,395*	15.63

Notes: * Calculated using the highest 2035 population projection. **Sources:** [1]US Census 2000, [2]US Census 2010a, [3]SCAG 2012, [4]CA DOF 2013a.

Socioeconomics Table 3 shows the project labor needs and the total labor supply in the study area, which would be more than adequate to provide the construction and demolition labor for the project. Decommissioning (not included in the table) would employ approximately nine construction workers (PPP 2015a pg. 2-29). Project operations would employ 17 workers from the current MGS operations staff.

Socioeconomics Table 3
Total Craft Labor by Skill in the Study Area MSA/MD versus Project Labor Needs

	Oxnard-Thousand Oaks-Ventura MSA (Ventura County) and Los Angeles-Long Beach-Glendale MD (Los Angeles County)				Project Labor Needs	
	Total Workforce (2012)	Total Projected Workforce (2022)	Growth from 2012		Peak Construction Period (May 2019, Month 8)	Peak Demolition Period (Jan - May 2022, Months 7 - 11)
			Number	Percent		
CRAFT STAFF						
Asbestos removal certified workers[1]	970	1,190	270	22.7		0 (12)
Asbestos removal helpers[1]	970	1,190	270	22.7		0 (6)
Boilermaker	-	-	-	-	0 (10)	8
Carpenter	19,540	24,170	4,630	23.7	12	4
Cement Finisher	2,770	3,770	1,000	36.1	6	0 (4)
Electrician	12,160	14,710	2,550	21.0	10	8
Ironworker	940	1,170	230	24.5	8	8
Laborer[2]	23,140	28,730	5,590	24.2	10	10
Millwright	-	-	-	-	8	4
Operator[3]	4,290	4,860	570	13.3	6	8
Painters and Insulators	9,590	12,810	3,220	33.6	2 (8)	10
Pipefitter	8,720	10,710	1,990	22.8	10	8
Teamster[4]	17,080	18,610	1,530	9.0	2	2
CONSTRUCTION STAFF						
Business Manager [A]	73,000	82,000	9,000	12.3	1	
Civil/Structural Engineer	7,990	9,340	1,350	16.9	1	
Civil/Structural Superintendent [B]	7,080	7,410	330	4.7	1	
Construction Manager	11,560	13,160	1,600	13.8	1	
Document Control	-	-	-	-	1	
Electrical Engineer	5,390	5,350	-40	-0.7	1	
Electrical Superintendent	-	-	-	-	1	
Field Engineering Manager	-	-	-	-	1	
Mechanical/Piping Engineer	6,580	6,570	-10	-0.2	1	
Mechanical/ Piping Superintendent	-	-	-	-	1	
Payroll Clerk	5,930	6,720	790	13.3	1	
Procurement Manager [C]	2,280	2,430	150	6.6	1	
Project Controls Manager	-	-	-	-	1	
Quality Control Manager	-	-	-	-	1	
Receiving Manager [D]	29,830	31,260	1,430	4.8	1	
Safety Manager [E]	580	580	0	0	1	
Total Craft and Construction Staff	249,420	285,550	36,130	14.5	90	74*

Notes: - No data available. ( ) The number in the parenthesis represents the peak workforce for the trade type and project phase. The number outside of the parenthesis represents the number of workers for that trade during the project's peak month for each project phase. [1] Hazardous materials removal workers, [2] Construction laborer; [3] Operating Engineer; [4] Industrial Truck and Tractor Operators. [A] General and operations managers; [B] Architectural and engineering managers; [C] Procurement clerk; [D] Shipping, receiving, and traffic clerks; [E] Health and safety engineers, except mining safety engineers and inspectors. * 4 of the 74 total craft and construction staff are identified by the applicant as construction staff and cannot be matched to a specific trade type.
Sources: PPP 2015a, Table 2.9-1, pg. 2-53 to 2-55; PPP 2015x Pg.2-8; and CA EDD 2014.

The existing MGS power plant currently has two operating steam generating units (Units 1 and 2) and one operating gas combustion turbine unit (Unit 3). MGS Units 1 and 2 would be retired by the completion of commissioning of the new facility. Demolition of MGS Units 1 and 2 to grade, removal of the existing outfall structure, and reconfiguration of the wastewater and storm water systems are proposed as part of the project (PPP 2015x, pg.4-44, PPP 2016z, pg. 1-3). The project would upgrade and repurpose existing maintenance, warehouse, transmission interconnections, and ancillary systems on the MGS site to the extent feasible. Unit 3 and the new Puente unit would be the only operational units following commissioning of Puente.

The majority of construction and demolition operations is expected to take place between 7:00 a.m. and 6:00 p.m. Project construction and decommissioning activities would require onsite laydown areas (approximately 4.76 acres) for the laydown and storage of materials and assembly and storage of equipment (PPP 2015a, Figure 2.9-3). Approximately 0.92 acres onsite would be used for workforce parking. Demolition activities would require approximately 1.5 acres for onsite material storage and 0.92-acre workforce parking (PPP 2015x, Figure 2-1). No additional workforce would be needed to remove the outfall and reconfigure the wastewater and storm water systems (PPP 2016z, pg. 2-4).

The applicant expects project construction to last 21 months, from October 2018 until June 2020, with commercial operation beginning in June 2020 (PPP 2015a, pg. 2-1). The wastewater and storm water systems would be reconfigured during project construction (PPP 2016z, pg. 1-3). Decommissioning of Units 1 and 2 would follow once both units are shut down, with completion anticipated in June 2021 and require approximately nine workers on an intermittent basis, with Puente operations staff providing oversight (PPP 2015a, pg. 2-29 and CEC 2016g). Demolition of MGS Units 1 and 2 would commence in July 2021 and be completed in September 2022 for a 15-month demolition period (PPP 2015x, pg. 4-41). Removal of the existing outfall would occur during demolition of MGS Units 1 and 2 (PPP 2016z, pg. 1-3). Demolition would extend to December 2022 to ensure that outfall removal does not occur within nesting season (CEC 2016ab).

The project's construction workforce would reach a peak with 90 workers in month 8 (May 2019) and have an average workforce over the 21-month construction period of 45 workers. The demolition workforce would peak during months 7 to 11 (Jan to May 2022) with 74 workers and have an average workforce over the 15-month period of 54 workers (PPP 2015x, pg. 2-8). The peak workforce needed for the project is presented in **Socioeconomics Table 3**.

The applicant assumes that approximately 90 percent of the construction workforce and 95 percent of the demolition workforce would be drawn from Ventura and Los Angeles counties and thus would be considered local workforce, commuting daily to the project site (PPP 2015, pg. 4.10-8 and PPP 2015x, pg. 4-41). The remaining ten percent of the construction workforce and five percent of the demolition workforce would be considered non-local and likely seek lodging closer to the project site, returning to their primary residences on weekends.

During peak construction there would be 90 workers, with approximately 81 local and 9 non-local workers. During peak demolition there would be 74 workers, with approximately 71 local and 4 non-local workers. During construction, there would be an average of 45 workers, with approximately 40 local and 5 non-local workers. During demolition, there would be an average of 54 workers, with approximately 51 local and 3 non-local workers.

Energy Commission staff contacted the local building and construction trades council for more information about the local construction workforce in Ventura County. Tony Skinner with the Tri-Counties Building and Construction Trades Council (Ventura, Santa Barbara, San Luis Obispo counties) (BCTC) explained that labor supply for Puente would not be a problem. Mr. Skinner explained that the latest economic forecast by the Economic Development Collaborative of Ventura County reported July 2015 as one of the worst months since the recession in the construction sector for Ventura County (CEC 2015t). According to BCTC staff consulted for other similar projects to Puente, there is a certain ratio of apprentices to journeyman members required for staffing a job site. With robust apprentice programs, most of which last five years, there are apprentices at all levels available for staffing for Puente.

The 17 operations staff needed for Puente would be drawn from the existing MGS staff (PPP 2015a, pg. 5.10-13). There would be no new workers hired, therefore no new residents would be added and Puente would not create a substantial population influx.

Staff concludes the project's construction, decommissioning, demolition, and operations workforce would not directly or indirectly induce a substantial population growth in the project area, and therefore, the project would create a less than significant impact under this criterion.

Housing Supply

Socioeconomics Table 4 presents housing supply data for the project area. As of April 1, 2010, there were 103,730 housing units within a six-mile radius of the project site with a vacancy of 6,415 units, representing a 6.2 percent vacancy rate. Changes to population and housing stock have been updated by the California Department of Finance for 2015. Year 2015 housing estimates indicated 106,216 housing units within the six-mile radius, with a vacancy of 6,460 for a vacancy rate of 6.1 percent (CA DOF 2015). The updated data show almost a 2.5 percent increase in housing stock and a one tenth decrease in vacancy rate. A five percent vacancy is a largely industry-accepted minimum benchmark for a sufficient amount of housing available for occupancy (Virginia Tech 2006). The housing counts in the project area indicate a sufficient supply of available housing units within a six-mile radius of the project site.

Socioeconomics Table 4
Housing Supply Estimates in the Project Area

Housing Supply Occupancy Status	Area					
	Cities in a Six-Mile Radius of Project Site*		Ventura County		Los Angeles County	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Total housing units	103,730	100	281,695	100	3,445,076	100
Occupied	97,315	93.8	266,920	94.8	3,241,204	94.1
Vacant	6,415	6.2	14,775	5.2	203,872	5.9
Status of Vacant Units						
For rent	2,125	33.1	4,664	31.6	104,960	51.5
For sale only	923	14.4	2,467	16.7	26,808	13.1
For seasonal, recreational, or occasional use	1,880	29.3	3,545	24	19,099	9.4
For migratory workers	2	0.0	12	0.1	109	0.1
Other**	1,485	23.1	4,087	27.7	53,005	26.0

Notes: *Cities include Oxnard, Port Hueneme, and San Buenaventura (Ventura). **Other includes rented, not occupied; sold, not occupied; and other vacant. **Source:** US Census 2010b.

The city of Oxnard had 549,590 motel/hotel rooms with a forecast occupancy rate of 66.3 percent for 2014 (PKF 2014). Ventura County had 1,650,530 rooms with a forecast occupancy rate of 69.2 for 2014. There are over 650 recreational vehicle (RV) and campground spaces spread throughout 11 RV/campground parks within the study area. (RV Parking 2014). The majority of the RV/campground parks have restrictions limiting stays to 14 consecutive days. There are a few RV/campground parks that allow extended stay.

During construction, there would be approximately nine non-local workers during peak construction and an average of five non-local workers. Decommissioning would require at most, one non-local worker on an intermittent basis. During demolition, there would be four non-local workers during peak demolition and an average of three non-local workers. Non-local workers are likely to seek lodging closer to the project site. With many lodging options to choose from, staff expects no new housing would be required as a result of the project.

There would be no new workers hired for project operation because the 17 operational staff needed would be drawn from the existing MGS staff. As a result, there would be no impacts to the housing supply.

Staff concludes the project's construction, decommissioning, demolition, and operations workforce would not have a significant adverse impact on the housing supply in the project area, Ventura or Los Angeles counties and therefore, the project would create a less than significant impact under this criterion.

Displace Substantial Numbers of Existing Housing and People

Puente is proposed on the site of the existing MGS property. The project would not directly displace existing housing or people. The project would not induce substantial

population growth or create the need for replacement housing to be constructed elsewhere, as previously discussed.

Staff concludes the project would have no impact on area housing as the project would not displace any people or necessitate the construction of replacement housing elsewhere.

Result in Substantial Physical Impacts to Government Facilities

As discussed under the subject headings below, Puente would not cause significant impacts to service ratios, response times, or other performance objectives relating to law enforcement or parks.

Law Enforcement

The California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads. Small segments of state highways 1, 34, and 232 are within the city of Oxnard and are served by both CHP and Oxnard Police Department (OPD). CHP services for state highways and roads include law enforcement, traffic control, accident investigation, and the management of hazardous material spill incidents. The nearest CHP office is located in Ventura (San Buenaventura) (CHP 2015). The **Hazardous Materials Management** section of this document discusses response times for hazardous material incidents.

The proposed project site is located within the jurisdiction of OPD. The department has a response goal for priority calls (emergency) of less than five minutes. The project site is within the Beat 21 patrol Division, in the District Two boundary. Beat 21 is in the northwest end of the city limits and is not patrolled on a regular basis. OPD's station serving the project area is located at 251 South "C" Street, a distance of 5.2 miles from the project site. OPD has 239 sworn police officers and 125 civilians with 13 sworn officers per shift with three shifts. OPD's actual service standard is 1.19 officers per 1,000 people and their desired service standard is 1.9 officers per 1,000 people. The estimated response time for priority calls (emergency) is less than 5 minutes and the estimated response time for non-priority calls (non-emergency) is 20 to 45 minutes (COO 2015i).

Staff contacted OPD to discuss the proposed project, ascertain their ability to provide law enforcement services to the project, and solicit comments or concerns they might have about the project. Staff included an example of two conditions of certification typically applied to projects like Puente to address construction and operations site security and traffic management.

When asked if the project could trigger the need for additional law enforcement services for on-site crimes against persons, theft or materials, and/or vandalism, OPD Commander Randy Latimer expressed concerns that during construction theft of construction materials may occur due to the heavy transient population in the area, as has been OPD's experience in the past with large construction projects. He recommended ensuring the existing fencing is intact and video surveillance of all access points and perimeter fencing, plus 24/7 guard services (COO 2015i).

When asked about the possibility of increased project-related traffic during construction or operations affecting circulation and access on roads near the Puente site to the extent that an impact to emergency-response times may occur, Commander Latimer explained that Harbor Boulevard is often congested during peak traffic hours so partial or complete blockage of this two-lane road could delay emergency response during construction. Commander Latimer anticipates emergency response delays to be unlikely during project operation. Traffic and Transportation staff has proposed Condition of Certification **TRANS-2**, which would require preparation and implementation of a traffic control plan to address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes. See the **Traffic and Transportation** section of this document for a full assessment of impacts related to traffic and transportation.

Chief Jeri Williams provided additional emergency response comments about the Puente project. In the event of an incident at the project site requiring OPD response and if flooding should occur above one foot, OPD would be able to respond by relying on transportation by the fire department's vehicles with higher clearance, or by requesting mutual aid assistance from Ventura County. OPD's vehicles cannot operate in floodwater above one foot in depth and Oxnard Fire Department largest vehicles cannot operate in floodwater above two feet in depth. In the event of a major emergency, such as an earthquake or tsunami, a request for OPD response would not be a priority compared to rescue and evacuation and other higher priorities (COO 2015i). Refer to the **Soil and Water Resources** section for discussion about coastal flooding, storm scenarios, and sea level rise. Refer to the **Geological and Paleontological Resources** section for discussion about earthquakes and tsunamis.

The applicant provided a few details about project site security. There is an existing perimeter fence surrounding the MGS facility. The applicant's construction site security plans include a guard stationed at designated gates to control access during construction, construction employee training, and work rules. Hazardous Materials Management staff is proposing Conditions of Certification **HAZ-7** and **HAZ-8**, which would require the preparation of a construction site security plan and operation security plan and include a protocol for contacting law enforcement and the Energy Commission compliance project manager (CPM) in the event of suspicious activity or emergency. See the **Hazardous Materials Management** section of this document for a full assessment of impacts related to site security.

Chief Williams requested the Energy Commission require Puente to submit security plans and fees for a security review by OPD and incorporate OPD's conditions of approval in the license, should the project be licensed. According to Hazardous Materials Management staff, the site security plans required by Conditions of Certification **HAZ-7** and **HAZ-8** are required to be designed in compliance with North American Electric Reliability Council (NERC) guidelines. NERC guidelines are sanctioned by all utilities and the federal government and are the guidelines the Energy Commission uses. For more discussion about NERC or site security, refer to the **Hazardous Materials Management** section. Based on the two staff-recommended Hazardous Materials Management conditions of certification and the required project design compliance with NERC guidelines, Socioeconomics staff concludes project site security would be consistent with current power plant security standards.

According to Commander Latimer, OPD has no additional needs to maintain or meet existing service standards with the addition of Puente. Staff concludes the project would not result in law enforcement response times being affected so that they exceed adopted response time goals. The project would not necessitate alterations to a police station or the construction of a new police station to maintain acceptable response times for law enforcement services; therefore, no associated physical impact would result. Staff concludes that for the above reasons, the project would create a less than significant impact on law enforcement.

Education

The California Government Code sets forth the exclusive methods of considering and mitigating impacts on school facilities. Section 65995 expressly provides that "[t]he payment or satisfaction of a fee, charge, or other requirement levied or imposed pursuant to Section 17620 of the Education Code in the amount specified in Section 65995 … are hereby deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving but not limited to, the planning, use, or development of real property, or any change in governmental organization… on the provision of adequate school facilities."

School Impact Fees

School fees are applied to the new construction or reconstruction of existing building for industrial use (Cal. Education Code § 17620 (a) (2), Cal. Gov. Code § 65995 (d)). The fees are assessed on the area of covered and enclosed space and are calculated prior to the issuance of building permits during plan review. The project is in the Oxnard School District and Oxnard Union High School District. The rate for the 2015-2016 fiscal year for new or commercial or industrial development for the Oxnard School District is $0.356 per square foot of covered and enclosed, non-residential space (CEC 2015j). The rate for the Oxnard Union High School District is $0.54 per square foot of covered and enclosed, non-residential space (OUHSD 2015). Based on the preliminary project design, approximately 600 square feet of the existing warehouse building would be reconfigured as a control center, and the existing 6,106 square foot administration building would be upgraded and thus both subject to assessment.

Approximately $2,387.34 in school fees would be assessed for the Oxnard School District (OSD) and $3,621.24 for the Oxnard Union High School District (OUHSD) for a combined total of $6,008.58. Staff is proposing Condition of Certification **SOCIO-1** to ensure the payment of fees to these school districts. The project would comply with Section 17620 of the Education Code through the one-time payment of statutory school impact fees to the Oxnard School District and Oxnard Union High School District.

Parks

Oxnard has 59 parks with approximately 532 acres and 14 recreational facilities (Oxnard 2011a). Park amenities include ball diamonds, basketball courts, jogging path, picnic areas, shelters and tables, playgrounds, soccer field, tennis courts, volleyball, dog parks, and horseshoes. The closest park to the project site is the Mandalay County Park. The closest park to the project site with amenities is the Oxnard Beach Park.

The city has a park standard of three acres per 1,000 residents (Oxnard 2011b). ACS five year data (2010-2014) show the estimated population in Oxnard as 201,744[3] (US Census 2015). Based on this current estimate, approximately 605 acres of parks would be needed to meet the park standard. The city has approximately 532 acres of parks, equating to approximately 2.64 acres per 1,000 residents, so the city does not meet its park standard.

Staff's analysis shows there would not be a large number of workers moving into the project area during project construction and no workers moving to the project area for project operations, and therefore, there would be little, if any, increase in the usage of or demand for parks or other recreational facilities.

Staff concludes the project would not result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives with respect to parks. The project would not increase the use of neighborhood or regional parks or recreational facilities to the extent that substantial physical deterioration of the facility would occur, or be accelerated. The project would not necessitate the construction of new parks in the area, nor does the project propose any park facilities. For the above reasons, staff concludes the project would have a less than significant impact of neighborhood or regional parks and recreational facilities.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in significant adverse cumulative impacts when its effects are cumulatively considerable; that is, the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects [Cal. Code Regs., tit. 14, § 15065(a)(3)].

In a socioeconomic analysis, cumulative impacts could occur when more than one project in the same area has an overlapping construction schedule, thus creating a demand for workers that cannot be met locally, or when the projects' demand for public services do not match a local jurisdiction's ability to provide such services. An influx of non-local workers and their dependents can strain housing, parks and recreation, and law enforcement services.

Staff reviewed the Puente Master Cumulative Project List for projects that would employ a similar workforce to Puente and have overlapping construction schedules. In assessing Puente's direct impacts, staff assumed about 10 percent of the Puente construction/demolition workforce would be non-local and seek temporary lodging closer to the project site. In assessing cumulative impacts, staff estimated the workforce for the cumulative projects would include about 10 percent non-local workers.

The applicant anticipates that if Puente is approved, the project's 21-month construction period would begin in October 2018, followed by a 3-month decommissioning and a 15-month demolition of MGS Units 1 and 2. Staff considers the following projects in **Socioeconomics Table 5** part of the cumulative setting for socioeconomic resources.

[3] The Five-Year ACS estimate for population in Oxnard is 201,744 with a margin of error of +/- 157, and a coefficient of variation of 0.05.

Socioeconomics Table 5
Cumulative Projects

ID #	PROJECT NAME	DESCRIPTION	LOCATION	STATUS
1	Beachwalk on the Mandalay Coast (formerly North Shore Subdivision)	183 single-family homes, 109 detached condos, and on-site amenities.	NE corner of W Fifth St and Harbor Blvd, Oxnard	Plan Check, dirt, gravel and rock movement. Submitted plans for off-site improvements for Harbor Boulevard - widening, etc. No active permits pulled for houses yet.
7	Holiday Inn Express Hotel (PROJ-7630)	40-room addition to existing Holiday Inn Express & Suites Hotel, consisting of 3 stories over 23,961 sq. ft.	1080 Navigator Dr, Ventura	Approved
8	Sondermann-Ring - Amendment (PROJ-6237)	300 Apartment Units and 20,292 sq. ft. commercial retail. Includes private indoor and outdoor recreational facilities and 2.44-acre park and waterfront promenade (3 stories).	Ventura Harbor adjacent to Anchors Way & Navigator Dr, Ventura	All planning approvals
9	Teal Club Specific Plan	990 residential units of varying density, single-family, townhomes, condominium, and apartment units; 21 ac. community park; 8 ac. school site; 60,000 sq. ft. mixed use and retail; 132,000 sq. ft. business research park; 1 ac. fire station site.	SE corner of Doris Ave and N Patterson Rd, Oxnard	Resubmitted; Draft EIR in preparation.
10	Ventura Harbor Marina and Yacht Yard Expansion	Increase number of boat slips from 40 to 80 (40 new boat slips). Expansion involves removing the existing dock structure, concrete ramps, a portion of the existing pier, and fuel docks; construction of expanded dock structure; relocation of fuel dock; onshore parking improvements; and other related facility improvements. Expanded dock would extend further into main channel of Ventura Harbor, but consistent with June 2014 Ventura Port District Commission channel limits. Parking improvements require removal of several mature palm trees and other landscape elements.	Anchors Way Dr/ Beachmont St, Oxnard	Mitigated Negative Declaration published Aug. 2015.
17	Olivas Park Drive Extension Project	(1) Extend Olivas Park Drive as 4-lane Secondary Arterial between Golf Course Dr and Auto Center Dr; (2) construct levee/floodwall approximately 5,400 linear ft. along north side of Santa Clara River that terminates 350 feet south of Southern Pacific Railroad; (3) General Plan	Between Golf Course Dr and Johnson Dr, Ventura	Local Agency Formation Commission hearing Sept. 16, 2015

ID #	PROJECT NAME	DESCRIPTION	LOCATION	STATUS
		amendments for land use changes for parcels within 139-acre project boundary, (4) Specific Plan amendment to revise boundaries of Auto Center Specific Plan; and (5) zone changes for amendment to revise boundaries of Auto Center Specific Plan; and (5) zone changes for parcels within project boundaries. Project also includes a pre-zone and annexation of one County parcel. Proposed zoning and land use amendments could accommodate maximum of 1,258,000 sq. ft. commercial and 75,000 sq. ft. industrial. Roadway extension transition to join existing improvements at Johnson Dr/U.S. 101 southbound ramps interchange. No improvements other than the transition proposed as part of this project at Johnson Dr/U.S. 101 interchange. Montalvo Community Services District (MCSD) to abandon and remove existing MCSD wastewater treatment plant components and wastewater treated at this facility diverted to city of Oxnard's wastewater facility.		
19	Marriott-Residence Inn (PROJ-5616)	New four-story hotel with 128 Rooms coving 87,000 sq. ft.	770 S Seaward Ave, Ventura	Plan Check
21	Santa Clara River Levee Improvements Downstream of Union Pacific Railroad (SCR-3) Project	Structural improvements to existing SCR-3 levee for FEMA certification. Between Bailard Landfill and N Ventura Rd (reaches 1-3) two options considered. Option 1A (Full Levee System) adds fill material and riprap to raise existing levee (8,875 feet) with one tie-in to Bailard Landfill. Option 1B (Minimum Levee System) adds fill material along portion of existing levee (3,575 feet), with tie-ins to Bailard, Coastal, and Santa Clara Landfills. Fill in existing River Ridge Golf Course swale. Between N Ventura Rd and UPRR bridge (Reach 4), construct 950-foot long floodwall on river side of road with visible height of 6 feet; install flood gate across N Ventura Rd; and construct 4- to 6-foot floodwall south side of N Ventura Rd for 860 ft.	N Ventura Rd, N of W Vineyard Ave, Oxnard	Unknown
26	Island View Apartments-Westwood	Four-story apartment complex with 154 units.	Alameda at 8th St behind Montalvo	Under construction

ID #	PROJECT NAME	DESCRIPTION	LOCATION	STATUS
	Communities (PROJ-2008)		Square, Ventura	
27	Ravello Holdings (PROJ-6811)	5-story mixed-use structure with 306 apartment units and 10,000 sq. ft. commercial.	Johnson Dr and Northbank Dr, Ventura	Proposed
36	Community Memorial Hospital Parking Structure	5 1/2-story parking structure with 571 parking spaces and 1,399 sq. ft. retail liner.	City Parking Lot, N of 29 N Brent St and S of new Community Memorial Hospital building, Ventura	Proposed
37	Wagon Wheel Development Project (PA18)	219 market rate apartments, recreation/meeting room, tot lot, and landscaped paseos. Construct commercial area (16,303 sq. ft.)	Wagon Wheel Rd and Winchester Dr, Oxnard	Proposed
38	Community Memorial Hospital	New hospital building adaptive reuse of existing hospital (121,000 sq. ft.). New street extensions, new public plaza.	S of Loma Vista Rd, W of Brent St, and N of Main St, Ventura	Under construction
40	Skyview Apartment Complex	240-unit affordable (100% affordable) housing apartment.	1250 S Oxnard Blvd, Oxnard	Proposed
41	Third Tower	15-story office tower in Esplanade Financial Square. Approx. 300,000 sq. ft.	E Esplanade Dr, Oxnard	Approved
55	RiverPark: Sonata Apartments	53 apartments (3 story buildings) with garages and recreation facilities.	2905 Danvers River St, Oxnard	Under Construction
56	RiverPark: Tempo Apartments	235 apartments (3 story buildings) with garages and recreation facilities.	443 Forest Park Blvd, Oxnard	Under Construction
57	Hemlock Apartments (PROJ-1126)	23 apartments.	264/274 S Hemlock St, Ventura	In Plan Check
59	Terraza de Las	Four 16-unit multifamily buildings with total of 64	Carmelita Ct,	Under Construction

ID #	PROJECT NAME	DESCRIPTION	LOCATION	STATUS
	Cortes	affordable apartments, and one 1,080 sq. ft. community building, parking and landscaping on a 3.56 acre site.	Oxnard	
63	Trailer Hotel (PROJ-7213)	New 34 unit airstream trailer park.	398 S Ash St, Ventura	All planning approvals
65	Santa Clara Apartments (PROJ-6263)	Eight apartments.	1254 & 1268 E Santa Clara St, Ventura	All planning approvals
67	J Street Drain Project	Increased flow capacity of existing J Street Drain to accommodate runoff from 100-year storm event, reducing potential flooding of residential and commercial areas in cities of Oxnard and Port Hueneme.	J St and Redwood Ave to S of Hueneme Rd, Oxnard and Port Hueneme	Approved
75	Hilton - Harbor and Figueroa (PROJ-8165)	160 room hotel: 5,242 sq. ft. retail space, a 5,337 sq. ft. restaurant, and a 1,555 sq. ft. upper roof lounge (covered area only). Total project 4-stories and 156,160 sq. ft.	SE corner Harbor & Figueroa, Ventura	Proposed
78	Ventura Downtown Housing (PROJ-5085)	5- story, 255 unit, apartment complex.	120 E Santa Clara St, Ventura	Proposed
101	Chapman, Mike (PROJ-04691)	7 apartments	95 E Ramona St, Ventura	Under Construction- Duplex constructed, 5 units pending construction
105	Westview Village (PROJ-7951)	Redevelopment of 180 public housing apartments and addition of 140 new apartments.	Between Barnett and Vince and riverside and Snow streets, Ventura	Proposed
114	Enclave at North Bank (PROJ-4184)	Vesting Tentative Map for subdivision of 12.61 acres into 84 residential lots with two open space lots. Design Review and Density Bonus Concessions for 91 residential units with 84 single-family units and 7 duplexes with adjacent park space (EIR- 5-12-10586)(EIR-2473)	SE corner Saticoy Ave and N Bank Dr, Ventura	In Plan Check
120	Westwood/ Parklands (PROJ-03829)	216 detached homes and 110 attached homes.	SW corner Wells and Telegraph Rd,	All planning approvals

ID #	PROJECT NAME	DESCRIPTION	LOCATION	STATUS
			Ventura	
122	Parklands Apartments (PROJ-4222)	173 apartment units with community building.	SW corner Telegraph Rd and Wells Rd, Ventura	In Plan Check
123	East Village Residential (PROJ-4154)	50 low income apartments.	Snapdragon and Los Angeles Ave, Ventura	Under construction
127 not shown on map	North Pleasant Valley (NPV) Treatment Facility	Construction/operation of a groundwater treatment facility, including drilling and production of two new wells, installation of pipelines for distribution of raw well water, product water and brine. Facility would provide treated water to Camarillo's existing service area, with average design capacity of 7,500 acre feet year of production water.	Las Posas Rd/Lewis Rd, Camarillo	Unknown
128 not shown on map	East Area 1 Specific Plan Amendment	501 acres site for up to: (1) 1,500 residential dwelling units, (2) 240,000 sq. ft. commercial and light industrial, (3) 9.2 acres of civic uses for school facilities, and 225.3 acres open space and park uses.	Telegraph Rd and Padre Lane, Santa Paula	Unknown
129 not shown on map	Santa Barbara County Reliability Project	(1)Reconstruct existing 66 kV subtransmission facilities within existing and new utility rights-of-way between the existing Santa Clara Substation in Ventura County and the existing Carpinteria Substation located in the City of Carpinteria in Santa Barbara County (Segments 4 and 3B); (2) Modify subtransmission, substation, and/or telecommunications equipment within the existing Carpinteria, Casitas, Getty, Goleta, Ortega, Santa Barbara, Santa Clara, and Ventura Substations; and (3) Install fiber optic telecommunications equipment for the protection, monitoring and control of subtransmission and substation equipment along Segments 1,2, and 4 and at Carpinteria, Casitas, Santa Clara, and Ventura Substations.	City of Ventura, Ventura County to City of Carpenteria, Santa Barbara County	Final CPUC Decision November 5, 2015. Coastal development permit necessary from Santa Barbara County. Estimated 2 year construction
130 not shown	Moorpark Newbury 66 kV Subtransmission	New 66 kV subtransmission line and related facilities within portion of SCE's existing Moorpark-Ormond Beach 220 kV Transmission Line right-of-way (ROW) and portion	E Los Angeles Ave, W Los Angeles Ave,	Draft CPUC Decision published May 20, 2016. Final hearing June 23, 2016. Permit to construct received

ID #	PROJECT NAME	DESCRIPTION	LOCATION	STATUS
on map	Line Project	of SCE's Moorpark-Newbury-Pharmacy 66 kV Subtransmission Line ROW. New subtransmission line between SCE's Moorpark Substation and Newbury Substation and construction of 1,200 ft. underground line, 5 miles new 66 kV line, 2 miles new 66 kV line within Moorpark-Newbury-Pharmacy 66 kV subtransmission line, and 1 mile new 66 kV subtransmission line into Newbury Substation.	and Gabbert Rd, Moorpark	Aug 18, 2016.. Estimated 10-month construction beginning mid November 2016.

The socioeconomic impacts of Puente are primarily driven by the construction workforce needs of the project. Puente would employ an average of 45 workers per month during construction and would peak during month 8 (May 2019) with 90 workers onsite. During demolition there would be an average of 54 workers employed with 74 workers during the peak months (7 to 11). The majority of the construction and demolition workforce are expected to be local workers commuting daily to the project site. Any potential project impacts from the ten percent of non-local workforce during construction (average 5, peak 9) and 5 percent of non-local workforce during demolition (average 3, peak 4) would be the result of these workers temporarily relocating closer to the project site. Temporary lodging would be sought by these non-local workers. Once operational, Puente would permanently employ 17 workers, drawn from the existing MGS staff. No additional operations staff would be required.

The cumulative projects are at different stages of approval and construction, so the labor needed to construct them and any associated housing needed for non-local workers would be spread out over time, instead of occurring all at one time. Also as discussed previously, staff estimates that as with Puente construction, only approximately 10 percent of the workforce needed for the cumulative projects would be non-local and seek lodging closer to the project sites. **Socioeconomics Table 6** presents the total labor force within Oxnard-Thousand Oaks-Ventura MSA and the Los Angeles-Long Beach-Glendale Metropolitan Division.

Socioeconomics Table 6
Table Labor Supply for Selected MSAs/MD

Total Labor for Selected MSA/MD (Construction Workforce)*	Total Workforce for 2012	Total Projected Workforce for 2022	Growth from 2012	Percent Growth from 2012 (%)
Oxnard-Thousand Oaks-Ventura MSA	21,310	25,330	4,020	18.9
Los Angeles-Long Beach-Glendale Metropolitan Division	228,110	260,220	32,110	14.1
TOTALS	249,420	285,550	36,130	14.5

Notes: Total workforce includes only the crafts specifically needed for Puente. *See **Socioeconomics Table 3** for list of crafts included in the total construction workforce figures. **Source:** CA EDD 2015.

Even if several of the cumulative projects were to have overlapping construction schedules with their peak construction activity occurring at the same time, this workforce is more than sufficient to accommodate the labor needs for the projects identified in **Socioeconomics Table 5**, including Puente.

As shown in **Socioeconomics Table 5**, there are approximately 450 apartments in the cities of Oxnard and Ventura currently under construction. With an additional 500 apartments and 202 hotel/temporary lodging rooms approved for construction in these cities, this added housing would supplement the many lodging options already available for non-local workers. Thus, the temporary construction workforces for Puente and the

other identified projects would not have a significant cumulative impact on the housing supply. There are a few cumulative projects that could add new residents if some of the new employees do not already live in the area. The large housing supply and new housing in construction would easily accommodate the new residents that may be employed by a few of the cumulative projects. Puente would not add new residents to the area as no additional operational workers would be hired; therefore, the project would not contribute to any cumulative impacts on housing supply due to a permanent influx of workers.

Non-local construction workers who seek lodging closer to the project do not bring their families with them and generally return to their residences over the weekend. Because they are not likely to spend time at neighborhood parks and recreational facilities, the project would not affect neighborhood or regional parks or other recreational facilities. Therefore, Puente would not contribute to any cumulative impacts on neighborhood or regional parks or other facilities.

The MGS is a currently operating power plant already served by OPD. As discussed previously, the project would not result in law enforcement response times being affected and would not increase the demand for law enforcement services. Thus, the project would not contribute to any cumulative impacts on law enforcement services. For the reasons discussed above, staff does not expect the construction or operation of Puente and the decommissioning and demolition of MGS Units 1 and 2 to make a cumulatively considerable contribution to any significant cumulative impacts on population, housing, parks and recreation, or law enforcement.

COMPLIANCE WITH LORS

Socioeconomics Table 7 summarizes Puente's compliance with applicable laws, ordinances, and regulations (LORS) pertaining to socioeconomics.

Socioeconomics Table 7
Project Compliance with Adopted Socioeconomics LORS

Applicable LORS	Description	Puente Consistency
State		
California Education Code, Section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.	**Consistent.** **SOCIO-1** requires the project owner to pay school impact fees to the Oxnard School District and Oxnard Union School District.
California Government Code, Sections 65995-65998	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.	**Consistent.** See the previous explanation.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows the presence of an environmental justice (EJ) population based on race and ethnicity within a six-mile radius of the project site. **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitutes an EJ population based on poverty. Because the study area used in this analysis for impacts on law enforcement, parks and recreation, population influx, and housing supply includes the cities of Oxnard and Port Hueneme, staff has considered Puente's socioeconomic impacts on the EJ population living in these geographic areas.

Staff concludes that construction and operation of Puente would not cause significant adverse direct, indirect, or cumulative socioeconomic impacts on the project area's housing, law enforcement services, or parks. Staff also concludes the project would not induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services.

The project's impacts are predominantly driven by the temporary influx of non-local construction workers seeking lodging closer to the project site. The few construction workers seeking lodging during project construction and demolition would have a negligible reduction of the housing supply. As no new operations workers would be added, no impacts would occur during operations.

None of the socioeconomic impacts from Puente would disproportionately affect the EJ population. The only type of disproportionate socioeconomic impact that a project could have on minority and low income populations is if the project were to displace residents from where they live, causing them to find housing elsewhere. If this occurs, an EJ population may have a more difficult time finding replacement housing due to racial

biases and possible financial constraints. As Puente would not displace any residents or remove any housing, there is no disproportionate impact to EJ populations from this project.

Staff concludes that the project's socioeconomic impacts would be less than significant on the EJ population represented in **Environmental Justice Figure 1** and **Table 3**. In addition, these effects would not disproportionately impact the EJ population living in the study area.

NOTEWORTHY PUBLIC BENEFITS

Staff defines noteworthy public benefits to include changes in local economic activity and local tax revenue that would result from project construction and operation. To assess the gross economic value of the proposed project, the applicant developed an input-output model using proprietary cost data and the IMPLAN Professional 3.0 software package. IMPLAN is an input-output model used by economists to measure the ripple effect on the local economy from the dollars spent on, or resulting from, a variety of activities including development, in this case, the construction and operation of Puente.

The assessment used Ventura and Los Angeles counties as the units of analysis.

Impact estimates reflect the following scenarios; the construction phase, the demolition phase, and the operations phase of the project. For these phases, the applicant estimated the total direct, indirect, and induced economic effects on employment and labor income. The proposed reconfiguration of the wastewater and storm water systems and removal of the existing outfall structure are not included in these estimated economic benefits.

Direct economic effects represent employment, labor income, and spending associated with decommissioning, construction, and operation of the project.

Indirect economic effects represent expenditures on intermediate goods made by suppliers who provide goods and services to the project. Induced economic effects represent changes in household spending that occur due to the wages, salaries, and proprietor's income generated through direct and indirect economic activity.

IMPLAN Model Components

- Estimates do not represent a precise forecast, but rather an approximate estimate of the overall economic effect.
- Is a static model, meaning that it relies on inter-industry relationships and household consumption patterns as they exist at the time of the analysis.
- Assumes that prices remain fixed, regardless of changes in demand, and that industry purchaser-supplier relationships operate in fixed proportions.

- Does not account for substitution effects, supply constraints, economies of scale, demographic change, or structural adjustments.

Socioeconomics Table 8 reports the applicant's estimates of the economic benefits that would accrue to the city of Oxnard, and Ventura and Los Angeles counties due to construction and operation of Puente and demolition of MGS Units 1 and 2.

Socioeconomics Table 8
Puente's Economic Benefits (2014 dollars)

TOTAL FISCAL BENEFITS Construction and Operation of Puente and Demolition of MGS Units 1 and 2	
Estimated annual property taxes	Increased by $2,841,236
State and local sales taxes:	
Construction	Based on $64.6 million in local expenditures
	$1,033,600 City of Oxnard
	$1,211,250 Ventura County
	$3,197,700 Los Angeles County
Operation	-[2]
	-
	-
	-
Demolition	-
School Impact Fees	Estimated total: $6,008.58
	$2,387.34 for OSD
	$3,621.24 for OUHSD
TOTAL NON-FISCAL BENEFITS	
Total capital costs	$235 to $270 million (2015 dollars)
Construction payroll (incl. benefits)	$15 to $17 million
Operations payroll (incl. benefits)	$2.3 million annually[2]
Demolition payroll (incl. benefits)	$9.1 million
Construction materials and supplies	$179 million
Operations and maintenance supplies	$8.6 million first year of operation[2]
Demolition materials and supplies	$3.8 million
TOTAL DIRECT, INDIRECT, AND INDUCED BENEFITS	
Estimated Direct Benefits	
Construction Jobs	48 (average), 90 (peak)
Operation Jobs	0 new jobs (17 from existing MGS workforce)
Demolition Jobs	54 (average), 74 (peak)
Estimated Indirect Benefits	
Construction Jobs	115
Construction Income	$7,196,314
Operation Jobs	-[2]
Operation Income	-[2]
Demolition Jobs	16
Demolition Income	$980,000
Estimated Induced Benefits	
Construction Jobs	84
Construction Income	$4,201,590
Operation Jobs	-[2]
Operation Income	-[2]
Demolition Jobs	56
Demolition Income	$2.8 million

Note: [1] Based on applicant's estimates. [2] No net change in benefits compared to the existing power plant operations. – Data not provided. **Sources:** CEC 2015b; PPP 2015a, pgs. 1-3, 4.10-7 to 4.10-11, and 4.10-29; and PPP 2015x, pgs. 4-41 and 4-42.

PROPERTY TAX

The Board of Equalization (BOE) has jurisdiction over the valuation of a power-generating facility for tax purposes if the power plant produces 50 megawatts (MWs) or greater. For a power-generating facility producing less than 50 MW, the county has jurisdiction of the valuation. Puente would have a net nominal rating of 262 MWs, therefore, the BOE is responsible for assessing property value. The property tax rate is set by the Ventura County Auditor-Controller's office. Property taxes are collected and distributed at the county level.

Construction of the power plant would add approximately $232.5 million in improvements. With a property tax rate consistent with the current rate for the existing MGS site (1.222037 percent), the project would generate $2,841,236 in property taxes during the first year of operation (CEC 2015K, PPP 2015a, pg. 4.10-9). The revenue collected from property taxes is distributed among school districts, special districts, redevelopment agencies, unincorporated areas, and incorporated areas (cities) by Ventura County. The remaining property tax generated above 1 percent (0.222037 percent) is distributed in whole to the city.

RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

The following table presents the comments received related to Socioeconomics and staff's response.

Socioeconomics		
Source of Comment	***Comment***	***Staff Response***
Applicant (TN 213683)	1. Comment 65. Property tax. The PSA has typos for the tax rate of 1.1222037 - should be 1.222037	1. Staff agrees with the comment and has changed the text.
Applicant (TN 213683)	2. Comment 66. Noteworthy public benefits. Characterization of the project's future operations as "Not a new benefit" would be better characterized as "no net change in benefits compared to the existing power plant operations"	2. Staff agrees with the comment and has changed the text.
Communities for a Better Environment (California Environmental Justice Alliance-CEJA) (TN 213682)	3. In footnote 2 on page 3 of the comment letter, it states that the PSA appears to have omitted an economic analysis of Puente and its alternatives.	3. Staff declined to make changes and does not agree with this comment. While the applicant provided economic impact information for Puente, analyzing the economic benefits is not a requirement under CEQA or Socioeconomics-related LORS.

CONCLUSIONS

Staff concludes Puente would not cause a significant adverse socioeconomic impact as a result of the construction or operation of the proposed project, or contribute to any significant cumulative socioeconomic impacts, for the following reasons:

1. The project's construction, decommissioning, operation, and demolition workforce would not directly or indirectly induce a substantial population growth in the project area.

2. The project's construction, decommissioning, operation, and demolition workforce would not have a significant impact on housing within the project area and would not displace any people or housing, or necessitate construction of replacement housing elsewhere.

3. The project would not result in significant physical impacts associated with the provision of new of physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives with respect to law enforcement services, or parks and recreation.

4. The project's socioeconomic impacts on the EJ population represented in **Environmental Justice Figure 1** and **Table 3** would be less than significant and would not be disproportionate.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the one-time statutory school facility development fee to the Oxnard School District and to the Oxnard Union High School District as required by Education Code Section 17620.

Verification: At least 30 days prior to the start of project construction, the project owner shall provide to the compliance project manager (CPM) proof of payment to the Oxnard School District and to the Oxnard Union High School District of the statutory development fees.

REFERENCES

CA DOF 2013a – California Department of Finance, *Report P-1 (County): State and County Total Population Projections, 2010-2020.* Sacramento, California, January 2013.

CA DOF 2015 – California Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011-2015*, Sacramento, California, May 1, 2015.

CA EDD 2014 – Employment Development Department, State of California, Labor Market Information, *Projections of Employment by Industry and Occupation, 2012-2022 Occupational Employment Projections for Oxnard-Thousand Oaks-Ventura Metropolitan Statistical Area (Ventura County) and Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles County), published February 2015 and December 2014,* respectively, <http://www.labormarketinfo.edd.ca.gov/data/employment-projections.html>.

CA Parks 2015 – California Department of Parks and Recreation, accessed August 24, 2015, <http://www.parks.ca.gov/ParkIndex/>.

CEC 2015b – California Energy Commission/Jon Hilliard (TN 204463). Report of Conversation Re: Total Capital Costs for Puente Power Project, dated April 30, 2015. Submitted to CEC/Docket unit on May 1, 2015.

CEC 2015j – California Energy Commission/Lisa Worrall (TN 205667) Report of Conversation – Oxnard School District- School Impact Fee, dated August 10, 2015. Submitted to CEC/Dockets Unit on August 10, 2015

CEC 2015k – California Energy Commission/Lisa Worrall (TN 205584) Report of Conversation – Property Tax Clarification. Impact Fee, dated July 31, 2015. Submitted to CEC/Dockets Unit on July 31, 2015.

CEC 2015t – California Energy Commission/Jon Hilliard (TN 206083). Letter from Tri-County Building and Construction Trade Council to CEC staff. Dated September 01, 2015. Submitted to CEC/Docket Unit on September 11, 2015.

CEC 2016g – Email from Applicant (NRG Puente) Clarifying the Schedule for Decommissioning and Demolition of Existing Mandalay Generating Station Units 1 and 2 Proposed as Proposed as Part of PUENTE Activities (TN 208186). Submitted to CEC/Docket Unit on January 20, 2016.

CEC 2016ab – California Energy Commission, Request to Clarify Project Schedule E-mail (TN 214570) dated November 25, 2016. Submitted to CEC/ Dockets Unit on November 28, 2016.

CHP 2015 – California Highway Patrol, < https://www.chp.ca.gov/Find-an-Office/Coastal-Division/Offices/(765)-Ventura >, 2015.

COO 2015j – Oxnard Fire and Police Response Capacity Letter. (TN 206245) RE: Oxnard Response to Law enforcement Needs Letter TN# 205741, Dated August 14, 2015 Filer Lisa Worrall. Submitted Shute, Mihaly & Weinberger LLP, Dated 10/01/2015. CEC /Docket Unit on October 1, 2015.

OUHSD 2015 – Oxnard Union High School District, Divisions / Administrative Services / Facilities / School Fees, 2015. <http://www.ouhsd.k12.ca.us/divisions/administrative-services/facilities/school-fees/>.

Oxnard 2011a – City of Oxnard 2030 General Plan, 4. Infrastructure and Community Services, October 2011, <https://www.oxnard.org/2030-general-plan/>.

Oxnard 2011b – Oxnard Parks and Facilities Division, Parks Information, <http://www.oxnardrec.org/17/3/960/>.

PKF 2014 – PKF Consulting, 2014 Southern California Lodging Forecast, <http://www.santabarbaraca.com/includes/media/docs/2014-Travel-Outlook-Southern-California-Lodging-Forecast.pdf>.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015

PPP 2015y – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2016z – Puente Power Project, Project Enhancement - Outfall Removal and Beach Restoration, Latham & Watkins LLP, (TN 213802) dated September 26, 2016. Submitted to CEC/Dockets Unit on September 26, 2016.

RV Parking 2014 – RV Parking.com, 2014, <http://www.rvparking.com/>.

SCAG 2012 – Southern California Association of Governments, Adopted 2012 RTP Growth Forecast, <http://www.scag.ca.gov/forecast/index.htm>, March 12, 2012.

US Census 2000 – United States Census Bureau, *P001: Total Population [1] – Universe: Total population, Census 2--- Summary File (SF 1) 100-percent Data*, <http:factfinder2.censuc.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2010a – United States Census Bureau, *QT-PL-Race, Hispanic or Latino, Age, and Housing Occupancy: 2010* – Census Redistricting Data (Public Law 94-171) Summary File, Tables P1, P2, P3, P4, H1, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2010b – United States Census Bureau, *QT-H1: General Housing Characteristics: 2010 – 2010 Census Summary File 1*, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

US Census 2015 – United States Census Bureau, *B01003: TOTAL POPULATION – Universe: Total population, 2010 – 2014 American Community Survey 5-Year Estimates*, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Virginia Tech 2006 – Virginia Tech, Virginia Tech Housing Needs and Market Analysis, Thomas Jefferson PDC, Center for Housing Research Virginia Tech, October 2006, <http://www.vchr.vt.edu/pdfreports/tjhousingreportfinalrev3.pdf>.

SOIL AND WATER RESOURCES

Testimony of Marylou Taylor, P.E.

SUMMARY OF CONCLUSIONS

The construction and operation of the proposed Puente Power Project (Puente or project), which includes decommissioning and demolition of the existing Mandalay Generating Station (MGS) Units 1 and 2 located adjacent to the Puente site, could potentially impact soil and water resources. Energy Commission staff (staff) compared Puente to the existing setting (baseline conditions) and evaluated the potential for the project to: cause accelerated wind or water erosion and sedimentation; exacerbate flood conditions in the vicinity of the project; adversely affect surface or groundwater supplies; degrade surface or groundwater quality; and comply with all applicable laws, ordinances, regulations, standards (LORS), and state policies. Staff also discusses the present and future flood risks in terms of the severity of consequences from flood hazards.

Using significance criteria based on California Environmental Quality Act (CEQA) Guidelines, staff concludes that the project would not result in significant adverse impacts that cannot be avoided or mitigated. The following table summarizes staff's conclusions related to each potential impact to soil and water resource issue analyzed.

Impact Analysis	Puente Construction	Puente Operation	MGS Decommissioning and Demolition
Soil Erosion and Storm Water Control	Less than significant (Page 4.11-23)	Less than significant (Page 4.11-28)	Less than significant (Page 4.11-55)
Groundwater Quality and Supply	Less than significant (Page 4.11-25)	Less than significant (Page 4.11-30)	Less than significant (Page 4.11-57)
Surface Water Quality	Same as Storm Water Control	Less than significant (Page 4.11-29)	Less than significant (Page 4.11-57)
Regional Water Supply	Less than significant (Page 4.11-26)	Less than significant (Page 4.11-30)	Less than significant (Page 4.11-61)
Wastewater Management	Less than significant (Page 4.11-27)	Less than significant (Page 4.11-30)	Less than significant (Page 4.11-56)
Flooding	Same as Storm Water Control	Onsite (Page 4.11-31): Less than significant Offsite (Page 4.11-31): Less than significant	Same as Storm Water Control

Staff also concludes that Puente would not result in the indirect impact of inducing population growth in the vicinity, and Puente's incremental effects on regional water supply or the quality of surface water and groundwater would not be cumulatively considerable.

Relative flood risk was determined by estimating the likelihood of a flood impacting Puente and evaluating the consequences resulting from those flood impacts. Based on flood hazard maps issued by the Federal Emergency Management Agency's (FEMA), staff determined that present-day flood risks are low. FEMA's comprehensive study of Pacific Coast flood hazards (preliminary findings were released September 30, 2016) is considered to be the best information available. Staff's sea level rise analysis follows the State of California Sea-Level Rise Guidance Document issued by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) and the Sea Level Rise Policy Guidance adopted by the California Coastal Commission (CCC). Staff's evaluation determined that future flood risks for Puente would be between low and medium, based on flood hazard maps developed by USGS using the Coastal Storm Modeling System (CoSMoS 3.0).

Hazard	Risk Assessment	Page
Riverine Flooding	Low	4.11-35
Coastal Flooding	Low	4.11-36
Levee Failure	Low	4.11-38
Dam Failure	Low	4.11-39
Sediment Deficiency to Beaches	Low	4.11-40
Climate Change – Riverine Flooding	Low to Medium	4.11-44
Climate Change – Coastal Flooding	Project Lifespan: Low Permanent Closure: Zero	4.11-46

Staff analyzed Puente's potential effects of water quality impacts and flooding risks on environmental justice (EJ) populations represented in **Environmental Justice Figure 1** and **Environmental Justice Table 3**. Staff concludes that Puente would not individually or cumulatively contribute to disproportionate flooding impacts and that mitigated water quality impacts would not disproportionately affect EJ populations. Soil and water resource impacts on the EJ population would be reduced to less than significant with adoption of conditions of certification.

Staff also concludes that, with implementation of conditions of certification recommended by staff, the project would comply with relevant federal, state, and local LORS with the exception of Policy SH-3.2 of the 2030 Oxnard General Plan. In addition, the project would not comply with the CCC's recommendation to relocate to an alternative site. However, if the Energy Commission determines that there is no feasible alternative site for relocation, the project would meet the provisions related to soil and water resources that were identified in the CCC report. Conclusions are listed on page 4.11-96 followed by proposed conditions of certification. The list of acronyms, references, and figures are at the end of this section.

This **Soil and Water Resources** analysis also includes information to provide readers with background and technical material.

- **Response to Comments** (page 4.11-77) received since PSA publication into the docket or at workshops are included to address specific topics.

- **FSA Updates and Additions** (page 4.11-104) summarizes changes to the analysis since publication of the PSA.
- **Appendix SW-1: Climate Change and Puente Coastal Flooding** discusses several issues of contention in detail and explains how staff determined whether information is relevant and appropriate. The issues are:
  - Sea Level Rise Guidance
  - Critical Infrastructure
  - Coastal Dependency
  - Planning Horizon
  - Hazard vs. Risk
  - Flood Prediction Models
  - Erosion Potential of Dunes
  - Hazard Zone Mapping
  - FEMA Hazard Map Update
- **Appendix SW-2: The California ISO, Puente, and Grid Reliability** discusses staff's position regarding the effect of Puente outages on grid reliability.
- **Appendix SW-3: Estimating Flush Times** is the technical material that describes how staff compares marine harbor flush rates with and without flows induced by once-through cooling of MGS Units 1 and 2. This information is part of the impact analysis of MGS decommissioning on water quality of the Edison Canal and Channel Islands Harbor.

INTRODUCTION

On May 15, 2015, NRG Oxnard Energy Center LLC (applicant) filed an application for certification (AFC) to construct and operate the 262-megawatt (MW) Puente Power Project (Puente). The applicant also proposes to decommission and demolish the existing Mandalay Generating Station (MGS) Units 1 and 2 located adjacent to the Puente site. On June 17, 2016, staff published its Preliminary Staff Assessment (PSA), an initial technical evaluation that analyzed potential impacts on soil and water resources through the construction and operation of Puente. Environmental effects of the decommissioning and demolition of MGS were considered with respect to the potential that these activities change the scope or nature of the environmental impacts of the Puente facility. Where the potential for Puente to result in a significant impact was identified, staff proposed mitigation to reduce the significance of the impact and, as appropriate, conditions of certification were recommended. This Final Staff Assessment (FSA) follows a 90-day public comment period and serves as staff's complete analyses and recommendations to the Committee.

This **Soil and Water Resources** section of the FSA includes several updates and additions to staff's PSA analysis. Most notably, the applicant proposed to remove the existing shoreline discharge outfall in response to recommendations submitted from the California Coastal Commission (CCC). Staff's updated analysis includes this modification. Also, staff supplemented the impacts analysis to environmental justice communities in response to several intervenors requesting a more robust analysis related to low-income and minority communities. A summary of other updates and additions in the **Soil and Water Resources** section are compiled for the reader's convenience (see "FSA Updates and Additions" on page 4.11-104).

METHODOLOGY FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

Significance criteria are based on those listed in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Soil and water resources impacts would be significant if the project would:

- violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - result in substantial erosion or siltation on- or off-site;
    - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
    - create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or
    - impede or redirect flood flows
- adversely impact open space used for production of resources by, among other things:
    - substantially impeding groundwater recharge;
    - causing substantial soil erosion or the loss of topsoil;
    - areas required for the protection of water quality and water supply
- require or result in the construction of new or expanded water, wastewater treatment, or storm water drainage facilities, the construction of which could cause significant environmental effects;
- have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;
- result in a determination by the wastewater treatment provider that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects); or
- have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly.

Although the CEQA Guidelines provide a checklist of suggested issues that should be addressed in an environmental document, neither the CEQA statute nor the CEQA guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. This is left to lead agency judgment and discretion, based on factual data and guidance from regulatory agencies and other sources where available and applicable. Staff assessed whether there would be a significant impact under the CEQA. Where a potentially significant impact was identified, staff proposed mitigation to ensure the impacts would be less than significant.

While CEQA does not require an environmental assessment to analyze the impact of existing environmental conditions on a proposed project's future users or residents,[1] Public Resources Code section 25001 indicates the importance of state government, through the Energy Commission, to ensure a reliable supply of electrical energy while maintaining environmental quality protection.[2] The **Power Plant Reliability** section of this FSA analyzes how the Puente facility is designed, sited, and operated in order to ensure its safe and reliable operation. This **Soil and Water Resources** section discusses relative flood risk in terms of the likelihood of a flood causing operational failure of the proposed Puente facility and the severity of consequences to safety of people onsite and electric grid reliability (local or system wide).

In additional to an environmental impact analysis, staff assessed whether the project would comply with the federal, state, and local environmental LORS described in **Soil & Water Resources Table 1**. These LORS intended to protect human health and the environment were established to ensure the best and appropriate use and management of both soil and water resources. A major component of staff's determination regarding significance is the project's compliance with these requirements applicable to the use and management of soil and water resources.

[1] Unless expressly required by certain CEQA provisions (e.g. airport, school, and housing projects).

[2] Staff notes that the evaluation of electric grid reliability is the joint responsibility of the Energy Commission, California Public Utilities Commission (CPUC), and California Independent Systems Operator (California ISO).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Soil & Water Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
Clean Water Act 33 USC, §1251 et seq.	The primary objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's surface waters. CWA Section 401: Requires certification that the proposed project is in compliance with established water quality standards. CWA Section 402: Direct and indirect discharges and storm water discharges into waters of the U.S. must be made pursuant to a National Pollutant Discharge Elimination System (NPDES) permit.
Resource Conservation and Recovery Act (40 CFR, part 260 et seq.)	Seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
State	
California Constitution, article X, section 2	Requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use is prohibited.
Porter-Cologne Water Quality Control Act California Water Code, section 13000 et seq.	The State Water Resources Control Board (SWRCB) has the ultimate authority over state water rights and water quality policy. Porter-Cologne also establishes nine Regional Water Quality Control Boards (RWQCB) to oversee water quality on a day-to-day basis at the local/regional level. Section 13260: Requires filing with the SWRCB or appropriate RWQCB a report of waste discharge for any discharge that could affect the water quality of the state. Section 13550: Requires the use of recycled water for non-potable uses subject to recycled water being available and upon other criteria such as the quality and quantity of the recycled water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use will not impact downstream users or biological resources.
California Water Code, sections 10910-10915	Requires public water systems to prepare water supply assessments (WSA) for certain defined development projects subject to the California Environmental Quality Act. Lead agencies determine, based on the WSA, whether protected water supplies will be sufficient to meet project demands along with the region's reasonably foreseeable cumulative demand under average-normal-year, single-dry-year, and multiple-dry-year conditions.

Applicable LORS	Description
California Coastal Act Public Resources Code, Division 20	The policies of the Coastal Act constitute the statutory standards applied to planning and regulatory decisions made by the Commission and by local governments. Policies address issues associated within the designated Coastal Zone, such as shoreline public access and recreation, terrestrial and marine habitat protection, landform alteration, industrial uses, and water quality.
Title 20, California Code of Regulations, sections 1301-1313	The regulations under Quarterly Fuel and Energy Reports (QFER) require power plant owners to periodically submit specific data to the California Energy Commission, including water supply and water discharge information.
Local	
City of Oxnard 2030 General Plan	The City of Oxnard General Plan Land Use Element, adopted October 2011 then amended June 2016, sets out a vision to guide future development in the city through 2030. Policies include: SC-2.3 Sea Level Rise Consideration in Decision-Making SC-2.4 Avoidance of Coastal Armoring or Hardening ER-3.4 Reduce Impact on Harbor, Bay, and Ocean Water Ecology ER-3.5 Reduce Construction Silt and Sediment ER-5.1 Wastewater Treatment ER-5.7 Minimizing Paved Surfaces SH-3.2 New Development Flood Mitigation SH-3.2 Development of Electricity Generating Facilities in Areas Subject to Coastal and Other Environmental Hazards
City of Oxnard Code of Ordinances	The Oxnard Zoning Ordinance establishes all of the regulatory, penal and administrative laws of general application within the city. Chapter 18: Floodplain Management – to minimize public and private losses due to flood conditions through provisions that restrict, regulate, and impose requirements in specific areas of special flood hazard. Chapter 22: Water – includes articles that promote water conservation, recycled water use, and storm water quality management.
City of Oxnard Water Neutral Policy	All new developments approved within the city of Oxnard must offset the water demand associated with the project with a supplemental water supply.
State Water Policies	
SWRCB Resolution 75-58	Power Plant Cooling Water Policy: The purpose of the policy is to provide consistent statewide water quality principles and guidance for adoption of discharge requirements, and implementation actions for power plants that depend on inland waters for cooling.
Warren-Alquist Act Public Resources Code, Division 15, section 25008	The California Energy Commission's enabling statutes echo the Constitutional concern for beneficial use and protection of the state's water supplies, by promoting "all feasible means" of water conservation and "all feasible uses" of alternative water supply sources.

Applicable LORS	Description
California Energy Commission 2003 Integrated Energy Policy Report Public Resources Code, Division 15, section 25300 et seq.	Water Use and Wastewater Discharge Policy: Consistent with SWRCB 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy in 2003 that: • Limits the use of fresh water for power plant cooling unless alternatives are environmentally undesirable or economically unsound • Requires zero liquid discharge (ZLD) for wastewater unless shown to be environmentally undesirable or economically unsound.

PROPOSED PROJECT

Construction of the project consists of four sequential phases:

- site preparation, construction, and commissioning of Puente;
- operation of Puente;
- shutdown and decommissioning[3] of MGS Units 1 and 2; and
- demolition of MGS Units 1 and 2.

If approved, site preparation and construction of Puente is estimated to take approximately 21 months, from October 2018 through June 2020. After the completed power plant is commissioned and operational, the shutdown and decommissioning of MGS Units 1 and 2 is anticipated to begin by January 2021 and take approximately six months. Complete demolition, including demolition of the ocean outfall, would be in late 2022. Therefore, decommissioning and demolition of MGS Units 1 and 2 would follow Puente's completed construction, but would be concurrent with Puente operations.

Refer to the **Project Description** section of this FSA for more information on major features of the proposed project. **Project Description Figures 1** through **4** show the location of Puente with respect to MGS. Information relevant to the soil and water resources analysis is summarized below. For a complete detailed description of the proposed project, refer to the AFC (PPP 2015a) and the applicant's related supplemental material.

SETTING AND EXISTING CONDITIONS

The project site is located in the city of Oxnard in Ventura County, along the shore of the Pacific Ocean and just south of McGrath Lake State Park. The area is primarily characterized by agricultural and open space uses among the western dunes on the Oxnard Plain. (**Soil & Water Resources Figure 1** shows the existing land uses in the

[3] MGS Units 1 and 2 are subject to the California State Water Resources Control Board's *Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling*, also referred to as the Once-Through Cooling Policy. Irrespective of the proposed development of Puente, pumping of ocean water for cooling MGS Units 1 and 2 must be reduced or eliminated as of the once-through cooling (OTC) Policy compliance date of December 31, 2020.

area surrounding the site.) The Puente site would be located on approximately three acres on the northwest portion of the existing 36-acre MGS property. Laydown and parking areas used during construction would be located within the MGS property (PPP2015a §2.4). A more complete description of existing MGS facilities and proposed Puente facilities, including the site layout, linear facilities, and regional maps, can be reviewed in the **Project Description** section of this FSA.

SURFACE WATER FEATURES

Pacific Coast

The Puente site is among the sand dunes along the coast of the Pacific Ocean, located between the mouth of the Santa Clara River (two miles north of the site) and the entrance to Channel Islands Harbor (four miles south of the site). The center of the city of Oxnard is approximately four miles to the east. The regional hydrologic setting is presented in **Soil & Water Resources Figure 2**.

The Los Angeles Regional Water Quality Control Board (LARWQCB), which regulates water quality protection for almost all of Ventura County and most of Los Angeles County, identifies the watershed containing the Puente site as coastal drainage area (see **Soil & Water Resources Figure 3**). Within this separate Watershed Management Area (WMA), beneficial uses are designated for Edison Canal Estuary, Channel Islands Harbor (and the adjacent Mandalay Bay marina), McGrath Lake, and the Pacific Ocean (see **Soil & Water Resources Table 2**). The beneficial uses, together with water quality objectives, form the water quality standards mandated by LARWQCB to protect these water resources, as set forth in Los Angeles Region Basin Plan (LARWQCB 2014).

Soil & Water Resources Table 2
Beneficial Uses of Nearby Water Bodies

Beneficial Uses	McGrath Lake	Edison Canal	Mandalay Bay (marina)	Channel Islands Harbor	Pacific Ocean (nearshore)
Industrial Service Supply (IND)		X	X	X	X
Navigation (NAV)			X	X	X
Commercial and Sport Fishing (COM)				X	X
Estuarine Habitat (EST)	X				
Marine Habitat (MAR)		X	X	X	X
Wildlife Habitat (WILD)	X	X	X	X	X
Rare, Threatened, or Endangered Species (RARE)	X	X			X
Wetland Habitat (WET)	X				
Water Contact Recreation (REC-1)	X[1]	X	X	X	X
Non-contact Water Recreation (REC-2)	X[1]	X	X	X	X
Preservation of Biological Habitats (BIOL)					X
Migration of Aquatic Organisms (MIGR)					X
Spawning / Reproduction /Early Development (SPWN)					X
Shellfish Harvesting (SHELL)					X

(Source: LARWQCB 2014) Note 1: Limited public access precludes full utilization.

Edison Canal

The Edison Canal is south of the Puente site with roughly 900 feet of the canal's length located within the MGS property. The existing MGS facility withdraws ocean water from this man-made, 2.5-mile canal for industrial cooling then discharges the cooling water to the Pacific Ocean through a concrete-and-rock revetted structure immediately west of the MGS facility. In addition to providing once-through cooling water to MGS Units 1 and 2, the Edison Canal also services MGS Unit 3, a 130 MW simple-cycle combustion turbine unit. Although Unit 3 does not create steam, water is pumped from the Edison Canal to supply bearing cooling water to the combustion turbine cooling water heat exchanger whenever Unit 3 is in operation. An emergency diesel powered firewater pump draws supply water from the Edison Canal as well (LARWQCB 2015).

Ocean water enters the Edison Canal from the Channel Islands Harbor located further south. The Harbor caters primarily to recreational uses, occupying 310 acres of land

and water and accommodating approximately 2,150 vessels with a specific number of slips reserved for commercial fishing vessels. Other harbor features include restaurants, a linear park, retail businesses, residential and hotel development, and commercial businesses providing services for boaters (COO 2002). Over the years, the residential development referred to as Mandalay Bay has expanded the marina north of the harbor. Occupying roughly 400 acres of land and water, this residential community features waterfront dock homes accessible to the coast through the Channel Islands Harbor.

Flows from various storm water and agricultural drains also enter the Edison Canal, Mandalay Bay, and Channel Islands Harbor. Roughly 1,300 acres of agricultural land located east of the Edison Canal is serviced by Oxnard Drainage District No. 1, which maintains a system of tile drains installed in 1918 to make the area suitable for agriculture (VLAFC 2005). These sub-surface drains lower the water table by allowing groundwater to seep into pipes and be carried away to a drainage ditch, such as the Doris Drain and the Fifth Street Drain, and into the Edison Canal. Storm water runoff from the agricultural land also collects in these ditches. Storm water runoff within the Oxnard city limits is collected by the city's storm drainage system consisting of underground pipes, open channels, and pump stations. The drainage facilities for the city either discharge directly into the ocean or they discharge into a drainage ditch and then into the ocean (CAR 2016). Eight major water outfalls discharge agricultural drainage and storm water runoff to the Edison Canal, Mandalay Bay residential marina, or Channel Islands Harbor (see **Soil & Water Resources Figure 4**). The tributary area of this watershed is approximately 7,410 acres (GEO 2014).

The Edison Canal terminates at the MGS intake structure with no direct connection to the Pacific Ocean. Near the MGS intake, the canal dimensions are approximately ten feet deep and 40 to 100 feet wide (PPP 2015c). When all circulating water pumps are in operation, the once-through cooling water system has a combined pumping capacity of approximately 255 million gallons per day. When Unit 3 is in operation, a single 3,200 gallon per minute low capacity saltwater pump provides bearing cooling water to the combustion turbine. After MGS makes use of the water pumped from the Edison Canal, the facility combines the spent once-through cooling water from Units 1 and 2, together with storm water runoff and process wastewaters from all three units, and discharges to a single ocean outfall. The concrete- and rock-vetted discharge structure on Mandalay Beach west of the facility site is a shallow water discharge to the Pacific Ocean (LARWQCB 2015).

McGrath Lake

Approximately 500 feet north of the Puente site is McGrath Lake, which is a 10-acre, brackish lake located at the southern end of McGrath State Beach Park within a stabilized sand dune complex. The lake and surrounding area was historically part of the wetland and floodplain complex of the Santa Clara River Delta. An extensive suite of dunes, marsh, salt flats, and lagoons stretched from south of the Santa Clara River to the present-day Naval Base Ventura County Point Mugu. Beginning around the 1920s, artificial drainage projects throughout the Oxnard Plain flushed out alkali salts to support crops. Tile drains were installed in much of the watershed upstream of the lake to drain groundwater from shallow soil zones which allowed for extensive agricultural operations (SCC 2011). Today, the "Central Ditch" conveys storm water and agricultural drainage

directly to McGrath Lake from approximately 730 acres of nearby land (LARWQCB 2009). **Soil & Water Resources Figure 5** shows the tributary area that drains to McGrath Lake.

Because the lake has no natural surface outlet, contaminants remain in the lake and ultimately settle to the bottom. In particular, PCBs and organochlorine (OC) pesticides detected in both water and sediment samples led LARWQCB to identify these constituents of concern as impairments of McGrath Lake. Although PCBs and OC pesticides were banned many years ago, they persist in the environment and continue to cause water quality impairments. They easily bind to sediments and particulate organic matter that are transported with runoff through the Central Ditch to McGrath Lake, where high sediment toxicity and extended residence time may result in some release of contaminants to the water (LARWQCB 2009). McGrath Lake is upgradient of the MGS site (WPK 2007).

Santa Clara River

Approximately two miles north of the Puente site is the Santa Clara River. It is approximately 85 miles in length, stretching between the northern slope of the San Gabriel Mountains in Los Angeles County and the Pacific Ocean on the coast of Ventura County. The watershed of the Santa Clara River is approximately 1,600 square miles and contains surface-water storage reservoirs and dams including the Santa Felicia Dam at Piru Reservoir, the Pyramid Lake Dam, and the Castaic Lake Dam. While dams and reservoirs help control downstream flows of tributaries feeding into the river, they only regulate 34 percent of the watershed. Flows in the Santa Clara River can vary dramatically, often exhibiting very low flow in dry periods that increase exponentially during winter storm events. In the rainy season (November through March), river flows rapidly peak then subside depending on the intensity of rainfall events (WCVC 2014).

The mouth of the Santa Clara River is a dynamic environment. Hydrologic conditions frequently change due to natural variations in watershed flow, discharge of treated effluent and irrigation return water, and ocean tides. Constant wave action in addition to sediment drift results in the gradual formation of a sandbar across the mouth of the river. When river flow is low, the sandbar completely blocks direct river outflow and forms an embayment between the river mouth and Harbor Boulevard. The sandbar is mechanically breached on occasion by State Park employees or farm maintenance people to prevent flooding of McGrath State Park or upriver agricultural lands. If river flow is high, which can occur during or immediately after storms, a natural breach occurs when the water level in the embayment rises faster than the sandbar can build up (CPR 1979).

The Puente site is located south of the Santa Clara River WMA, but the area has historically experienced flooding from the Santa Clara River. Prior to agricultural development within the region, the dune system at the time was much broader and prevented flows of Santa Clara River floodwaters from reaching the ocean. This created an extensive suite of marsh, salt flats, and lagoons stretched from south of the Santa Clara River to the present-day Naval Base Ventura County Point Mugu (SCC 2011).

Although urban development and agriculture operations have since eliminated these lagoons, these low-lying areas can potentially flood during extreme flood events.

No significant flooding has occurred at MGS since 1969, when a series of major storms produced devastating floods in Ventura County. During this event, floodwaters from the Santa Clara River entered the MGS site, which prompted the construction of the earthen dikes on the northern and eastern sides of the property to prevent any flooding in the future (PPP 2015a §4.15.1.5).

GROUNDWATER

The project site is in the western portion of the Oxnard Plain groundwater basin which extends several miles offshore beneath the marine shelf, where the outer edges are in direct contact with seawater (PPP 2015a §4.15.1.4). The Oxnard Plain hydrologic sub-area contains areas of unconfined and perched aquifers in the Santa Clara Hydrological Area of the Ventura Hydrologic Unit. Since the late 1800s, a steady increase in groundwater demand in Ventura County for farming and urban uses has resulted in groundwater overdraft conditions. Aquifers within the Oxnard Plain have experienced groundwater storage reductions and groundwater levels that have declined below sea level, resulting in water quality degradation from sea water intrusion and ground subsidence (CH2M 2004 §2.6). Additional information about groundwater conditions are discussed under “Hydrogeological Resources” in the **Geology and Paleontology** section of this FSA.

Depth to groundwater underlying the MGS property ranges from approximately 5 to 9 feet below ground surface (bgs). Groundwater is monitored as part of ongoing subsurface investigations regarding past operations by Southern California Edison (SCE), the previous owners of MGS (see “Soil Contamination” discussion below). Metals (arsenic, chromium, nickel, and vanadium) exceeding the groundwater regulatory maximum contaminant level values have been detected in groundwater samples from several wells. A plume of nickel and vanadium exists down gradient from the basins in a 15-foot thick saturated zone (PPP 2015a §4.15.1.4). As a result, a Land Use Covenant will reportedly be put in place, restricting the use of groundwater pumped from the MGS site (AEC 2015a). Additional information can be found under “Existing Site Contamination” in the **Waste Management** section of this FSA.

SOIL FEATURES

The coastal area between the Santa Clara River and Port Hueneme Harbor consists of the Oxnard Plain, a broad and low-lying alluvial plain. The shoreline is mostly a long and wide sandy coast, historically backed by dunes (BEA 2009). The Puente site is located on the western edge of the Oxnard Plain, bordered by sand dunes and a wide, sandy beach to the west (PPP 2015a §4.11.1). The MGS property occupies approximately 1,800 feet of ocean frontage. The Natural Resources Conservation Service maps the location of the Puente and MGS sites as Coastal Beaches. A preliminary geotechnical evaluation performed in November 2013 found that the Puente site is predominantly underlain by sand and silty sand sediments, with some interbedded sandy silt and clay (N&M 2013). Additional information regarding the subsurface characteristics of the Puente site can be found in the **Geology and Paleontology** section of this FSA.

SOIL CONTAMINATION

The three-acre Puente site was originally graded in the 1950s during construction of MGS and installation of the 30 inch-diameter line to supply natural gas. This brownfield land has remained vacant, other than occasional use to temporarily store dredged material from the Edison Canal. In 2011, this land was used for temporary storage of contaminated soil for SCE's retention basin remediation project. The existing retention basins on the MGS property were historically used to temporarily store boiler chemical cleaning wastewater for offsite treatment and disposal. This method of boiler cleaning stopped in 1986, but subsequent testing of soil and groundwater samples indicated subsurface contamination (PPP 2015a §4.11.2). Although SCE sold the MGS facility in 1998, SCE retains responsibility for environmental liability associated with past operation of the retention basins during its ownership. SCE developed plans to remove the contaminated soil and treat the groundwater to acceptable levels. Under the guidance and direction of California Department of Toxic Substances Control (DTSC), SCE continues to implement its approved remediation plan to "clean close" the retention basin area[4] (WPK 2007). Analysis of potential impacts from exposure to potentially contaminated soils during construction and operation of Puente is provided in the **Waste Management** section of this FSA.

LOCAL WATER SUPPLIES AND WASTEWATER SERVICE

The city of Oxnard owns and operates its own municipal water supply system, which relies on local groundwater and imported water supplies. Groundwater is obtained from city wells or purchased from the United Water Conservation District (UWCD). Imported water is purchased from the Calleguas Municipal Water District (CMWD), which obtains the water from the State Water Project. The city blends water from these three sources to achieve an appropriate balance between water quality, quantity, reliability, and cost. From 2006 to 2010, the blend ratio of imported surface water and groundwater (from either UWCD or city wells) has varied between 1:1 and 1:2 (MNS 2016).

The city provides wastewater collection and treatment services through the Public Works Wastewater Division. The Oxnard Wastewater Treatment Plant (OWWTP), located in southwest Oxnard, serves the cities of Oxnard and Port Hueneme, Naval Base Ventura County Pt. Mugu, and some adjacent unincorporated areas. The city owns, operates, and maintains roughly 380 miles of sewer pipeline and 15 wastewater lift stations (CAR 2016). The OWWTP has an average design capacity of 31.7 million gallons per day (mgd) with average daily flows of approximately 24 mgd, and the potential for expansion to 39.7 mgd (COO 2011 §1.7).

The city typically discharges effluent from its wastewater treatment plant (treated to secondary standards) directly to a permitted deep ocean outfall. Implementation of the city's Groundwater Recovery Enhancement and Treatment (GREAT) Program, now allows for higher beneficial uses of the wastewater by producing recycled water from the

[4] *Clean closure* refers to the level of site remediation that meets closure performance standards for "unrestricted land use". Note that SCE will not physically close the retention basins, which are necessary for continued operation of MGS. The basins will remain in operation and unaffected after the site is remediated and approved by DTSC.

city's Advanced Water Purification Facility (AWPF). Through the GREAT Program, recycled water can offset potable water used for irrigation or groundwater used for agricultural activities. Recycled water can also be used for groundwater injection into the Oxnard Plain Basin to mitigate ongoing overdraft and seawater intrusion.[5] (CH2M 2004 §2.4.4). The AWPF, which began operating on a small scale in April 2015, provides recycled water to the city's golf courses. The city is also pushing to convert irrigation systems from groundwater to recycled water at agricultural sites located along the city's Recycled Water Backbone System. In March 2016, recycled water became available to agricultural users primarily in the southern Oxnard Plain. The AWPF's initial capacity is 7,000 acre-feet per year (afy) with potential to increase supply to over 28,000 afy (Rincon 2015).

PROJECT DESCRIPTION

PUENTE FACILITY CONSTRUCTION

Construction of Puente is expected to occur over a 21-month period (from October 2018 through June 2020). The facility would occupy approximately three acres of land, consisting of a combustion gas turbine connected to an electric generator and equipped with an emissions control system and other auxiliary systems. Construction activities would include site preparation, grading, excavations for foundations, pile driving[6], and construction of the new facility. Approximately 5.6 acres within the MGS property would be used for construction laydown, offices, and parking. Approximately 0.9 acre of the 5.6 acres is currently paved. All construction parking and laydown areas are previously disturbed, and graded, compacted, or paved for existing industrial uses (PPP 2015a §4.11.3.2).

Puente would be located on the portion of the MGS property that was graded around the time MGS Units 1 and 2 were constructed. This portion of land was originally slated for development of future steam-generating units (MGS Units 3 and 4); however, these were never constructed at this location (although an alternative MGS Unit 3 was constructed on the southern portion of the MGS property). A 30-inch-diameter gas line traverses the site; this gas line was intended to be the gas supply for the future steam-generating units (PPP 2015a §2.4).

The Puente site is currently undeveloped, with no structures or equipment present. There would be minimal demolition (removal of abandoned fuel oil pipeline and various piping) during construction. New pipelines would be constructed using open-trench methods. The trenches are expected to be no greater than four feet deep. Soil would be removed from the trench and used as backfill. Excess soil and disposal from utilities trenching is expected to be minimal. All the areas designated for pipeline construction

[5] *Overdraft* is a non-sustainable condition of a groundwater basin that occurs when the amount of water withdrawn exceeds the amount of water that recharges the basin over a period of years. Seawater intrusion occurs when saltwater is drawn toward the freshwater zones of an aquifer.

[6] To minimize noise and vibration, the applicant plans to avoid pile driving and use alternative methods such as auger cast, hydraulic, or drilled piles. However, pile driving could be determined necessary during detailed design or during construction (NRG 2016).

are previously disturbed industrial areas of the MGS property (PPP 2015a §4.11.3.2). Proposed locations of pipeline systems (domestic water, demineralized water, service water, natural gas, and ammonia) are identified in **Project Description Figure 7**.

The Puente site is generally flat, but some grading would be required to provide a level area for the project. Surficial soils would be excavated and re-compacted or replaced with materials from the Puente site or larger adjacent MGS site. Preliminary grading plans show a need for 1,000 cubic yards (cu-yd) of fill and a cut of 12,400 cu-yd, resulting in a net excess of 11,400 cu-yd. The 11,400 cu-yd of soil is planned to be removed from site, and would be reused, recycled, or sent for disposal (PPP 2015a §4.11.3.2). Proposed site grading is presented in **Project Description Figure 10**.

Construction activity near the Edison Canal would be limited to placing the wastewater pipe on the bank of the canal. Riprap already exists on the canal banks, and additional riprap would only be installed if needed to prevent erosion (PPP 2016z §3.15.2).

Soil Erosion and Storm Water Control

During construction of the project, best management practices (BMPs)[7] would be implemented to reduce erosion and prevent silt from being discharged off site. Dust erosion control measures would be used to minimize the windblown erosion of soil from the project site. Clean water would be sprayed on the soil in construction areas to suppress dust. Sediment barriers, such as straw bales or silt fences, would be placed to slow runoff and trap sediment. Sediment barriers would be placed around sensitive areas (such as the Edison Canal) to prevent contamination by sediment-laden water. Barriers would be placed around the site boundary to prevent sediment from leaving the site. Because the project site is relatively level, the applicant expects standard surface erosion control techniques to be effective (PPP 2015a §4.11.5).

Water Use

The AFC identified the following construction activities that would use water: dust suppression, compaction, and hydrostatic testing[8]. The estimated total amount of potable water to be used for these activities during the 21-month construction period is approximately 3.3 acre-feet (ac-ft). The average use would be approximately 51,500 gallons per month (0.16 ac-ft), peaking for five months at 75,000 gallons (0.23 ac-ft) for hydrostatic testing and flushing (PPP 2015a Table 2.9-4)[9]. For the maximum 12-month

[7] Storm water and soil erosion BMPs are methods that have been determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources. BMPs can be classified as "structural" (i.e., devices installed or constructed on a site) or "non-structural" (procedures, such as modified landscaping practices). There are a variety of BMPs available, depending on pollutant removal capabilities.

[8] A *hydrostatic test* is a way in which leaks can be found in pressure vessels such as pipelines and plumbing. The test involves placing water, which is often dyed for visibility, in the pipe or vessel at the required pressure to ensure that it will not leak or be damaged.

[9] Staff found calculation errors in the AFC's table of construction water requirements (PPP 2015a Table 2.9-4). Assuming the values shown for each month is correct, the total amount of water used during construction is 1,085,000 gallons (3.3 ac-ft), the average monthly water use is approximately 51,500 gallons, and the average daily use is approximately 1,700 gallons.

period, the estimated amount of water to be used for construction would be approximately 2.2 ac-ft. The source of water would be potable water provided by the city of Oxnard, delivered via an existing water line and connection on the MGS property (PPP 2015a §4.15.2.4).

Wastewater Management

Wastewater generated during construction would include sanitary waste, storm water runoff, equipment wash down water, concrete washout wastewater, and wastewater from hydrostatic testing. If groundwater is encountered during excavations, water would be collected from dewatering[10] activities (PPP 2015c). Construction-related wastewater would be classified as hazardous or nonhazardous then managed according to appropriate LORS. Hazardous wastewater would be collected by a licensed hazardous waste hauler for disposal at a licensed hazardous waste facility (PPP 2015a §4.14.2.2). Sanitary wastewater would be handled by portable chemical toilets, and hydrostatic testing water would be discharged in accordance with the LARWQCB's requirements for discharges of low-threat hydrostatic test waters (PPP 2015a §4.15.2).

PUENTE FACILITY OPERATION

Soil Erosion and Storm Water Control

The proposed Puente site would consist of about one acre of impervious area (paved roads, paved parking areas, and built structures) with the remaining two acres covered with gravel. BMPs would be implemented to reduce erosion and prevent silt from being discharged offsite. Storm water that does not infiltrate the Puente site would be collected by a new storm water drainage system.

The system would include use of the existing North and South Basins, a new underground storm water vault to be installed north of the existing retention basins, a new oil/water separator, and new piping for discharge to the Edison Canal. Existing and proposed components of the storm water drainage system are identified in **Project Description Figure 9**. Storm water that can be reused feasibly and practically for industrial purposes (i.e., evaporative cooling for the Puente unit) and/or for onsite irrigation would be conveyed from the new storm water vault to the existing Service Water Tank via a 6-inch-diameter pipe. Otherwise, storm water would be stored for potential use later by pumping the runoff from the new vault to either the North or South Basin, both of which would hold storm water runoff from the Puente site exclusively and be segregated from process wastewater (PPP 2016z §2.1.1).

Storm water runoff from the existing MGS facility would continue to be collected in the existing MGS storm water system and directed to an existing underground vault located south of the existing basins. From there, three 1200-gallon-per-minute (gpm) transfer pumps convey the water to either the North or South Basin (PPP 2016z). Using this

[10] *Construction dewatering* is the action of removing groundwater or surface water from a construction site. For foundation excavations, dewatering is typically used to remove groundwater seepage from the bottom of an excavation, increase stability of excavation slopes, and/or improve soil conditions for supporting the structure.

scheme of storm water draining, the basins combined storage capacity can accommodate the one- and two-year storm for the existing MGS area combined with the Puente area (PPP 2015a Appendix A-7).

Storm water collected in the North and South Basins would then flow to a new underground discharge vault to be installed east of the existing retention basins, where it would be mixed with wastewater from the East Basin (process wastewater, described below) for ultimate discharge to the Edison Canal. From this new discharge vault, four 600-gpm transfer pumps would convey wastewater through an underground pipe to a small sump near the canal. At this point, the wastewater could be monitored or sampled, if required, before the water enters the canal. The banks of the Edison Canal currently have riprap in place, but additional riprap could be placed at the discharge point into the canal if needed to prevent erosion (PPP 2016z §3.15).Storm water that could potentially be exposed to pollutants, such as oils and greases, would be directed to a new oil-water separator and managed as process wastewater (described below).

Water Use and Supply

The estimated total average annual water use at Puente is estimated to be 19 AFY, with approximately 3 AFY for personnel use and approximately 16 AFY for industrial process use. The water for Puente would be potable water from the city of Oxnard through the existing MGS potable water supply. The personnel uses of potable water include personnel consumption, eyewash stations, showers, and sanitary needs. Average industrial water use would be approximately 16 afy for combustion turbine inlet air evaporative cooler makeup, service water, and water for combustion turbine washes (PPP 2015a §2.7).

Because Puente would be a dry-cooled facility and use dry low-NO_X burners, water would not be necessary for these purposes. The evaporative cooler, which is not necessary for operation, would only be used to increase performance when ambient temperature is above an appropriate level (PPP 2015a §2.7.5.1). The amount of storm water to be collected from the Puente site for reuse on an annual basis would depend on the timing and the amount of rainfall. The preliminary estimate, based on historical annual rainfall, suggests that up to 80,000 gallons could be collected for reuse annually (PPP 2016z §1.3).

The project includes backup water storage. Service water would be stored onsite in an existing 445,000-gallon service-water tank that has sufficient capacity for 102 hours of operation at full-load peak demand. In the event of an outage of the water treatment system, each of the two demineralized-water storage tanks provides sufficient capacity for approximately 96 hours of peak-load operation (PPP 2015a §4.15.5.3.7).

The two existing MGS firewater pumps and tank (lower portion of the service-water tank) would be retained and the firewater loop would be extended to service Puente. The primary fire pump would be connected to the new Puente switchgear and backed up by a new emergency diesel generator. The other would be the emergency backup fire pump, connected to MGS Unit 3 switchgear (PPP 2015a §2.5). For more information about the fire water system, see the **Worker Safety and Fire Protection** section of this FSA.

Wastewater Management

General Facility Drainage

MGS currently manages storm water discharges in compliance with the discharge prohibitions, effluent limitations, and receiving water limitations specified in the Waste Discharge Requirements (WDR) issued by LARWQCB (Order No. R4-2015-0201, NPDES No. CA0001180) and the MGS Storm Water Pollution Prevention Plan (SWPPP) by implementing appropriate BMPs.

A new storm water conveyance system, as described above, would direct storm water runoff from the Puente site to either the service water tank for reuse or the existing North and South Basins for disposal. Storm water runoff from the existing MGS facility would continue to be collected through its existing storm water system and conveyed to the existing North or South Basins. The combined maximum storage capacity of the basins, with no freeboard, is approximately 2.5 ac-ft. Storm water that could potentially be exposed to pollutants, such as oils and greases, would be directed to a new oil-water separator (OWS) system. Although oil leakage from equipment is expected to be minimal, all equipment that has potential for leakage of oil or hazardous chemicals would be situated in spill containment areas. The oil from the oil containment chambers of the OWS would be collected and shipped off site for recycling. After passing through the OWS, water from the clear effluent chambers would be discharged to the existing East Basin (PPP 2016z §3.15). Similarly, potentially polluted storm water from the MGS site would be conveyed to the existing OWS then the clear effluent would be discharged to the existing East Basin also (PPP 2016aa). The East Basin, a former boiler chemical cleaning waste basin, is currently out of service and no longer in use. The East Basin has no outlet and currently collects and evaporates rainwater (AEC 2015a).

Process Wastewater

Puente's process wastewater would consist of softener-regeneration waste, reverse-osmosis concentrate, evaporative-cooler blowdown[11], and condensation drains from the intercoolers (PPP 2015a §2.7). Process wastewater would pass through a new OWS and be pumped to the existing East Basin, which would be segregated from the storm water collected in the North or South Basin (PPP 2016z §1.3).

Process wastewater from the East Basin would flow into a new underground discharge vault to be installed east of the existing retention basins, where it would mix with surplus storm water from the North and South Basins for ultimate discharge to the Edison Canal. From this new discharge vault, four 600-gpm transfer pumps would convey wastewater through an underground pipe to a small sump near the canal. At this point, the wastewater could be monitored or sampled, if required, before discharge to the canal. The banks of the Edison Canal currently have riprap in place, but additional riprap could be placed at the discharge point into the canal if needed to prevent erosion (PPP 2016z §3.15).

[11] *Blowdown* is the portion of water drained from a process to remove mineral build-up from concentrated recirculating water. These minerals would cause scaling on equipment surfaces and can damage the system.

MGS currently combines process wastewater from storm water runoff together for discharge. The existing wastewater collection system, which consists of storm water collection pipes, sump pumps, and OWS, currently pumps this mixed wastewater to the North and South Basins then to the Pacific Ocean via the existing outfall structure. After retirement of MGS Units 1 and 2, storm water runoff from the MGS site would be managed as described above. MGS Unit 3 bearing cooling water is currently sourced from the Edison Canal and discharged to the Pacific Ocean through the ocean outfall structure. After retirement of MGS Units 1 and 2, this bearing cooling water would continue to come from the canal but discharges would go back to the Edison Canal (PPP 2016z).

Sanitary Wastewater

The Puente site is in the portion of the city of Oxnard that is not serviced by the city's wastewater system (PPP 2015a §4.15.1.7). Puente would use MGS's existing sanitary sewer collection system. The system collects discharge from sinks, toilets, and other sanitary facilities for treatment and disposal in septic tanks and leach field. The applicant states that no modifications to the existing septic system are anticipated, because the amount of domestic water used and sanitary wastewater generated is expected to be approximately the same as current operations (PPP 2015a §2.7.6.1). The septic system is operated in accordance with the WDRs issued by LARWQCB (Order No. R4-2008-0087, File No. CI-8561) (PPP 2015a §4.15.1.7).

MGS DECOMMISSIONING

MGS Units 1 and 2 are subject to the California State Water Resources Control Board (SWRCB) *Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling*, also referred to as the Once-Through Cooling Policy[12]. Irrespective of the proposed development of Puente, pumping of ocean water for cooling MGS Units 1 and 2 must be reduced or eliminated as of the once-through cooling (OTC) Policy compliance date of December 31, 2020.

If Puente is approved, the applicant would begin decommissioning activities following completion of Puente construction. The applicant proposes to use much of MGS's existing supporting facilities for Puente, including the administration building, warehouse building, retention basins, and septic system. For a complete list of existing MGS facilities to be repurposed for Puente, refer to the **Project Description** section of this FSA.

Decommissioning activities of MGS Units 1 and 2 are expected to take six months and anticipated to be complete by June 2021. All chemicals and hazardous materials associated with MGS Units 1 and 2 would be removed from the site and disposed of. Following decommissioning, some equipment and piping (such as lube oil tanks or fuel oil piping) that, although emptied of hazardous materials, may still be contaminated.

[12] The OTC Policy was adopted in 2010 by SWRCB that addresses the discharges of once-through cooling (OTC) water by California power plants. OTC systems present a considerable and chronic stressor to the state's coastal aquatic ecosystems. http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/policy100110.pdf.

This equipment would be removed and disposed of in compliance with all applicable federal, state, and local requirements. The applicant proposes to saw cut piping into manageable sections, then tilt the sections and apply heat to drain any remaining fuel oil. This method could be revised depending on conditions found during decommissioning and demolition. Proper materials handling and disposal practices would be followed for this procedure (PPP 2016aa).

Water Use

Minimal water use is expected during decommissioning. The decommissioning activities that would use water include dust suppression and domestic water use. There would be a minimal amount of equipment wash-down required. The total monthly water use would be approximately 33,000 gallons per month (3,000 gallons for domestic water use and 30,000 gallons for dismantling and dust suppression). Over the six-month decommissioning period, total water use would be approximately 198,000 gallons, or approximately 0.6 ac-ft. The source of water for decommissioning would be potable water provided by the city of Oxnard, delivered via an existing water line and connection on the MGS property (PPP 2015c, CEC 2016ab).

Wastewater Management

Wastewater generated during decommissioning would include sanitary waste, storm water runoff, and liquid wastes. These wastewaters would be classified as hazardous or nonhazardous. If hazardous, they would be collected by a licensed hazardous waste hauler for disposal at a licensed hazardous waste facility. Domestic wastewater generated during the six-month decommissioning period would be handled by portable toilet facilities and/or by existing bathroom facilities in the administration building. Wastewater from the administration building would be discharged to the existing MGS septic system that would continue to be used during Puente operations (PPP 2015c). Although MGS Units 1 and 2 would no longer discharge process wastewater to the retention basins after decommissioning, the basins would be reused to handle storm water and process wastewater from Puente and MGS Unit 3 as well as storm water from the area associated with MGS Units 1 and 2 (PPP 2015a §2.7, PPP 2016z).

MGS DEMOLITION

Following retirement and decommissioning of Units 1 and 2, the applicant proposes to demolish all above-grade structures associated with MGS Units 1 and 2 except for the supporting facilities to be repurposed for Puente. Asbestos abatement and above-grade demolition work for MGS Units 1 and 2 is anticipated to take approximately 15 months following completion of decommissioning, and would be completed by late 2022 (PPP 2015y §1.4).

The demolition area is approximately 3.9 acres, which consists of the existing MGS Unit 1 and 2 structures and adjacent paved area (about 3.4 acres) and the ocean outfall structure (0.4 acre). All construction laydown and parking areas would be within the existing MGS site, and are the same areas that are proposed for use during construction of Puente. Some structures and equipment would be removed first to provide working areas for remaining demolition equipment and activities. It is also expected that other areas of the property, including laydown areas used for Puente

construction, would be identified as temporary storage areas for scrap, recycle, and/or offsite disposal to various end users, and staging during demolition (PPP 2015y §2.2).

In addition, about one acre of beach would be disturbed by equipment movement to and from the outfall structure. Areas immediately adjacent to the structure would be disturbed during removal of the fencing and riprap, and areas within the outfall may be disturbed during abandonment of the underground portion of the outfall. Most of the affected area is bare sand with limited vegetation. All of the work area would be above mean higher high water, so there would be little to no contact between ocean water and debris from, or equipment used for, the demolition (PPP 2016z §3.11.2).

Demolition and removal of the existing ocean outfall structure would occur during demolition of MGS Units 1 and 2 (PPP 2016z §3.1.1). The outfall structure wing walls would be removed and the existing riprap pushed up to five feet into the tunnel using a backhoe. Then a concrete plug would be installed and concrete slurry pumped behind the plug. The remaining riprap on the beach would be moved by backhoe to protect the plugged outfall and excess riprap either recycled or removed from site. Sand that is currently adjacent to the riprap would be used to cover the plugged outfall. Dozers and backhoes would then spread and redistribute sand to fill in the outfall channel. The sand bars that have been created north and south of the outfall by the MGS discharge to the ocean would be re-contoured. Sand from the main dunes would not be moved (PPP 2016aa).

Underground conduits associated with the existing OTC system would be abandoned in place. To prevent flows from entering these conduits, the intake of the outfall would be plugged with concrete, the circulating water pipes filled with concrete slurry, and the mixing vault filled with riprap then filled with concrete slurry. In addition, slurry may also be pumped via holes drilled into the top of the outlet structure from Beach Road. For all demolition activities, sand from the main dunes would not be moved (PPP 2016aa).

Soil Erosion and Storm Water Control

Demolition of MGS Units 1 and 2 would include demolishing the structures to grade, meaning removal of aboveground equipment and structural elements. No excavation to remove foundations or underground piping would be required and below-grade spaces would be filled with crushed concrete. Similar to the construction of Puente, the applicant would develop a SWPPP and implement BMPs during demolition activities (PPP 2015y §4.11.2).

Demolition of the outfall would occur concurrently with demolition of MGS Units 1 and 2, and would use the same staging areas. Demolition of the outfall would include demolishing the wing walls and removing the riprap and fencing, which would have a total footprint of approximately 0.4 acre (PPP 2016z §3.1.1).

Water Use

Demolition activities would require water for dust control, equipment wash-down, and concrete preparation (to fill belowground spaces). The source of water would be potable water provided by the city of Oxnard, delivered via an existing water line and connection on the MGS property. The estimated total amount of potable water to be used during

the 15-month demolition period, including domestic use, is approximately 3.2 ac-ft. The average use would be approximately 69,600 gallons per month (0.21 ac-ft), peaking for three months at about 102,000 gallons (0.31 ac-ft) during removal of boiler plant equipment and structures (PPP 2015y §4.15.2 and Table 2-5).

Wastewater Management

Wastewater generated during demolition would include sanitary waste, storm water runoff, equipment wash-down water, and concrete washout wastewater. Sanitary wastewater would be handled by portable chemical toilets. Storm water runoff would be collected via existing storm water drains and conveyed to the North and South Basins (PPP 2015y §4.15.2 and Table 2-1). Storm water that could potentially be exposed to pollutants, such as oils and greases, would be directed to an OWS system (PPP 2015a §2.7). Demolition-related wastewater would be classified as hazardous or nonhazardous then managed according to appropriate LORS. Hazardous wastewater would be collected by a licensed hazardous waste hauler for disposal at a licensed hazardous waste facility (PPP 2015a §4.14.2.2).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This subsection provides an evaluation of the expected direct, indirect, and cumulative impacts on soil and water resources that could be caused by the construction and operation of Puente, including the decommissioning and demolition of MGS. Staff's analysis consists of a description of the potentially significant impacts, gathering data related to construction and operation of the project, then reaching a conclusion to determine whether the project presents potentially significant impacts. If staff determines there is a significant impact, then the applicant's proposed mitigation is evaluated for sufficiency. Staff may or may not recommend additional or entirely different mitigation measures that are potentially more effective than those proposed by the applicant. Mitigation is designed to reduce the effects of potentially significant impacts to a level that is less than significant.

Potential impacts include the project's effect on soil erosion, surface water quality, surface water hydrology, groundwater quality, water supplies, and flooding.

PUENTE CONSTRUCTION

Soil Erosion and Storm Water Control

Water quality can be affected by sedimentation caused by erosion, by runoff carrying contaminants, and by direct discharge of pollutants (point-source pollution). Soil erosion can occur during construction and grading activities when disturbed soil is exposed and most vulnerable to detachment by wind and water. Increased sedimentation, over and above the amount that enters the water system by natural erosion, can cause many adverse impacts on aquatic organisms, water supply, and wetlands. Contamination of a nearby water body can occur from wastewater that is directly discharged (point-source) or storm water runoff that has been in contact with toxic materials or surfaces (contact

runoff)[13]. Contaminants and toxic substances can also attach to sediments and travel in sediment-laden water flows.

The proposed project is subject to construction-related storm water permit requirements of the federal Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permit. In California, these NPDES requirements are typically met through California's *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit) administered by SWRCB. Prior to any ground-disturbing construction activity, the applicant must obtain a Construction General Permit, which includes preparation of a Storm Water Pollution Prevention Plan (SWPPP).

The applicant submitted a Draft SWPPP for Construction (PPP 2015a Appendix A-8) that was developed based on site-specific features and construction activities. It identifies potential pollutants and preliminarily identifies the BMPs that would be implemented to protect storm water quality and to prevent or minimize soil erosion during Puente construction. The Draft SWPPP also describes procedures for BMP inspection and maintenance, as well as details of the site's Construction Site Monitoring Program. Six categories of BMPs are anticipated for construction activities:

- Erosion Control - protects the soil surface and prevents soil particles from being detached by rainfall, flowing water, or wind (e.g. soil binders).
- Sediment Control - traps soil particles after they have been detached and moved by rain, flowing water, or wind (e.g. silt fences, fiber rolls).
- Tracking Control - minimizes the amount of dirt, mud, or dust that is generated, and can thus be tracked or blown off the site (e.g. stabilized construction entrance/exit).
- Wind Erosion Control - reduces dust generated from disturbed soil surfaces (e.g. water sprinkled for dust suppression, cover soil stockpiles).
- Non-storm Water Management – housekeeping and procedural practices to minimize or eliminate the discharge of potential pollutants (e.g. vehicle and equipment maintenance, pile driving operations, concrete curing).
- Waste Management - properly manages and disposes of construction site waste to reduce the risk of pollution from materials (e.g. spill prevention and control, hazardous waste management, solid waste management).

After review of the Draft SWPPP, staff agrees that the proposed BMPs during construction would minimize impacts on water quality. Compliance with the Construction General Permit requires implementation of specific BMPs as well as numeric action levels (NALs) to achieve minimum water quality standards[14]. Because Puente construction activities would be subject to storm water regulatory requirements and the

[13] *Contact runoff* in this analysis refers to storm water in contact with exposed polluted or toxic materials and/or surfaces that can potentially result in contaminated runoff (containing trace oil, chemicals, metal, toxic substances, or other pollutants).

[14] Technology-based NALs are numeric benchmark values for certain parameters (pH and turbidity) that, if exceeded in effluent sampling, trigger the discharger to take actions. The purpose of NALS is to assist dischargers in evaluating the effectiveness of their BMPs.

applicant would obtain a Construction General Permit, the impacts of Puente construction on surface water quality would be **less than significant**.

Because the Construction General Permit stems from federal regulations of the Clean Water Act, it is not within the purview of the Energy Commission's authority. Staff recommends Condition of Certification **SOIL&WATER-1** to inform the compliance project manager (CPM) of construction site BMP implementation and to notify the CPM of issues regarding compliance with the Construction General Permit.[15]

Groundwater

Construction activities can potentially impact both groundwater quantity and quality. Temporary pumping could lower the groundwater level at the pumping site (drawdown) which could potentially reduce the well yield of any nearby wells, reduce required supply for nearby groundwater-dependent habitat, and induce intrusion of subsurface contaminants or seawater. Additional water quality impacts could occur if construction activities allow contaminants to reach groundwater, either directly (when excavation reaches groundwater level) or through soil infiltration.

As described in the AFC, the applicant does not expect Puente construction activities to impact groundwater for the following reasons (PPP 2015a §4.15.2):

- Compliance with the Construction General Permit would minimize or eliminate pollutant spills that could potentially infiltrate to groundwater.
- Wastewater would be managed according to appropriate LORS, which minimizes or eliminates water quality impacts on groundwater.
- Groundwater would not be used to supply construction activities, which eliminates impacts caused by the installation or operation of a production well. Furthermore, no public water supply wells are within one mile of the MGS property, and the one private supply well in the area is over 1000 feet away.
- The likelihood of encountering groundwater during project construction is low (maximum depth of excavation would be approximately seven feet for the foundation of the power block). Dewatering, if required, would likely occur for a short duration. The collected water would be discharged to holding tanks, tested, and then reused or discharged to the existing MGS basins. In addition, no excavations are expected to encounter contaminated groundwater associated with SCE's remediation project.[16]

While staff generally agrees, concerns remain regarding potential groundwater impacts despite the low likelihood of dewatering. Forested/shrub wetlands are located at Mandalay State Beach, McGrath Lake, and the habitat restoration area adjacent to the northern side of the MGS property and dewatering activities could potentially cause

[15] More information about the roles and responsibilities of the CPM can be found in the **Compliance Conditions and Compliance Monitoring Plan** section of this FSA.

[16] SCE's remediation project is discussed in "Soil Contamination" above.

adverse effects on these wetland habitats.[17] The applicant was requested to provide additional information that describes proposed dewatering activities assuming a conservative groundwater depth of seven feet bgs, including: pumping effects (radius of influence and drawdown); potential impacts on any nearby groundwater-dependent habitat; and proposed measures to ensure contaminated groundwater would not be present in discharges (CEC 2015i).

The applicant's supplemental information (PPP 2015c) indicates that if dewatering is required to construct the power block foundation, the approach would be to install shoring around the construction area and install dewatering sumps within the shored area. Compared to a traditional well point dewatering system, the proposed shored dewatering sump approach reduces the radius of influence; reduces the initial volume of groundwater pumped to achieve the desired soil conditions; and reduces the overall volume of water pumped during the dewatering process. The radius of influence would be constrained by the shored area, which would not extend beyond the MGS property line (PPP 2015c).

Staff estimated the potential radius of influence based on the proposed construction dewatering plan presented by the applicant and staff assessment of the hydrogeologic regime beneath the site. Studies based on data from groundwater monitoring wells indicate to staff that construction dewatering at the Puente site would have no discernable impact on the groundwater flow beneath the wetland areas located near McGrath Lake. (Discussion of area hydrogeology staff's estimate of potential dewatering drawdown is in the **Geology and Paleontology** section of this FSA).

Staff agrees that the proposed shored dewatering sump design would not cause offsite groundwater impacts because the pumping rate would be relatively low and the drawdown would not extend beyond the MGS property line. However, to ensure dewatering would not negatively affect wetlands north of the site, staff recommends Condition of Certification **SOIL&WATER-3** requiring review and approval of the dewatering plan prior to excavation of the power block foundation. With implementation of this condition of certification, in addition to requirements to ensure any contaminated groundwater collected during dewatering would be properly disposed in accordance with **SOIL&WATER-2** (described further in "Puente Construction - Wastewater Management" below), the impacts of Puente construction on groundwater quality and quantity would be **less than significant**.

Water Supply

The source of water for Puente construction activities would be potable water provided by the city of Oxnard, delivered via an existing water line and connection on the MGS property. Over the 21-month construction period, the estimated total amount of water use would be 3.3 ac-ft, averaging approximately 0.16 ac-ft per month. For the maximum 12-month period, the estimated amount of water to be used for construction is approximately 2.2 ac-ft (PPP 2015a §4.15.2.4). When estimated domestic uses related

[17] These forested/shrub wetlands are mapped in the U.S. Fish and Wildlife Service's National Wetlands Inventory. For detailed discussion about Puente impacts on wetlands and critical habitats, see the **Biological Resources** section of this FSA.

to construction activities are included, the maximum 12-month use of potable water is approximately 2.8 ac-ft (PPP 2016y).

Although this amount of water use is individually minor, when added with concurrent water use during other phases of the proposed project, it could potentially impact potable water supplies. Staff's evaluation of these potential impacts analyzes water use from all phases of the proposed project in the "Cumulative Impacts" subsection below (see the "Water Supply" discussion on page 4.11-63).

Wastewater Management

Wastewater generated during construction would include sanitary waste, storm water runoff, equipment wash-down water, concrete-washout wastewater, and wastewater from hydrostatic testing. If groundwater is encountered during excavations, water would be collected from dewatering activities. Wastewater that is not properly disposed could potentially contaminate groundwater through soil infiltration, as well as a nearby water body through direct discharge or contact runoff.

The applicant states that all construction-related wastewater would be managed according to appropriate LORS. Hazardous wastewater would be collected by a licensed hazardous waste hauler for disposal at a licensed hazardous waste facility (PPP 2015a §4.14.2.2). Compliance with the Construction General Permit would implement BMPs to properly manage storm water runoff, equipment wash-down water, concrete-washout wastewater, and sanitary waste (PPP 2015a Appendix A-8). Compliance with other NPDES permits adopted by LARWQCB would specifically regulate discharges of hydrostatic test waters and construction dewatering:

- NPDES Permit No. CAG674001: *Discharges of Low Threat Hydrostatic Test Water to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties*.
- NPDES Permit No. CAG994004: *Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties.*

These permits specify discharge prohibitions, effluent limitations, and monitoring and reporting requirements to show that minimum water quality standards are achieved. Because Puente construction wastewater discharges would be subject to federal regulatory requirements and the applicant would obtain the appropriate NPDES permit, the impacts of Puente construction wastewater discharges on soil and water resources would be **less than significant**.

Staff recommends Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-2** to inform the CPM of NPDES permit implementation and to notify the CPM of issues regarding compliance with these permits. Additional Conditions of Certification in the **Waste Management** section of this FSA would require reports of hazardous wastewater disposal in accordance with all applicable federal, state, and local requirements.

PUENTE OPERATION

Soil Erosion and Dune Impacts

Onsite soil erosion can potentially impact surface water quality by increasing the amount of sediment that enters the water system by natural erosion. The Puente site would consist of paved roads, paved parking areas, and graveled areas to reduce erosion and prevent silt from being discharged off site. Post-construction BMPs would reduce soil erosion impacts during operations to **less than significant**.

Coastal sand dunes usually begin to form when windblown sand collects in areas landward of the beach that allows the sand to accumulate (e.g. around small objects such as driftwood). Once formed, the low hills of loose sand are colonized by salt-tolerant, pioneer plants that both increase the resistance of the surface layer of sand to wind erosion and reduce the wind speeds over the surface. The incipient dunes or foredunes will continue growing, unless they are destroyed by wave action at high tide levels. As an incipient foredune builds up and out, sand inundation and salt spray levels decrease, while nutrient levels and vegetation cover increase, resulting in more stable dunes (SLOSS 2012). Dunes can become quite large, some adjacent to the MGS property are over 20 feet tall, but they take years to form and are extremely fragile.

Dune formations are dynamic in nature, migrating and reforming, depending on wind strength and direction, wave patterns, and coastal topography. The natural processes that impact the beach/dune system are episodic, with periods of little or no change followed by times of intense activity, most obviously during storms when dunes could erode rapidly. The subsequent re-building of the dunes by wind action allows the system to recover, but natural restoration of heavily damaged dunes can take years[18]. Dunes protect low-lying coastal areas from flooding and act as a buffer against erosion. They form a reservoir of sand, replenished when beach levels are high and released to nourish the foreshore during storm erosion. They also provide critical habitat for a number of coastal plant and animal species.

In addition to natural processes, damage to dunes can result from human activities impacting dune vegetation such as excessive trampling, driving vehicles over dunes, the removal of sand for urban development, excessive extraction of ground water, and allowing excessive grazing by farm animals. When small areas of sand are no longer stabilized with vegetation, erosional notches and hollows can eventually grow to become large blowouts. At exposed sites, even a few people occasionally walking across a foredune may disturb the vegetation sufficiently to increase wind erosion and initiate blowouts (SLOSS 2012).

The dunes surrounding the project site are old and stable, as described in the **Geology and Paleontology** section of this FSA. Natural processes, such as wave action and weather, will continue to influence the dune system, but activities from Puente operation would not cause a direct or indirect adverse physical change to any sand dunes. The

[18] Assuming a sufficient supply of sediment is available to replace the sand lost during the storm. For further discussion on sediment supply, see “Hazard – Sediment Deficiency to Beaches” in the “Puente Operation” subsection on page 4.11-40.

Puente footprint, in addition to areas for construction laydown and parking, are located on previously disturbed, and graded, compacted, or paved areas for existing industrial uses. No traffic or other physical disturbance of dunes surrounding the site would be required for project construction and operation. For these reasons, the impacts of Puente on sand dunes located both onsite and offsite would be **less than significant**.

Surface Water Quality

Water quality can be affected by sedimentation caused by erosion, by runoff carrying contaminants, and by direct discharge of pollutants (point-source pollution). As land is developed, the new impervious surfaces can send an increased volume of runoff containing oils, heavy metals, and other contaminants (non-point source pollution) into adjacent water bodies.

A new oil/water separation system for Puente would collect the oily water from the equipment wash-downs, leakage, sample drains, and miscellaneous plant drains. All equipment that has the potential for oil leaks (including new transformers) or hazardous chemicals would be kept in the spill containment areas. Storm water from the areas that may accumulate small amounts of oil and chemicals would be collected in a system of floor drains, equipment drains, curbed area drains, and sumps. After passing through the oil/water separator, water from the clear effluent chambers would be discharged to the existing wastewater sump via the existing oily waste network. The oil from the oil containment chambers of the oil/water separator would be collected and shipped off the site for recycling (PPP 2015a Appendix A-2).

There would be no direct storm water runoff from the MGS property to McGrath Lake or to the ocean. Storm water discharge from the property to the Edison Canal would be controlled by site grading, drainage controls, underground vaults, and basins. Discharges to the Edison Canal must be in compliance with a project-specific NPDES permit that would include discharge prohibitions, effluent limitations, and monitoring and reporting requirements to show that minimum water quality standards are achieved. Staff recommends Condition of Certification **SOIL&WATER-4** to ensure compliance with applicable WDR permits and to inform the CPM of issues regarding this wastewater discharge.

Furthermore, Condition of Certification **WORKER SAFETY-2** would require a Hazardous Materials Management Program, and Condition of Certification **WASTE-8** would require an Operation Waste Management Plan. Both documents would be developed by the applicant to address handling, transportation, tracking, usage, storage, emergency response, spill control and prevention, training, record keeping, and reporting of hazardous wastes on the site. Other conditions of certification in the **Waste Management** section of this FSA address wastes, including cleanup of all spills of hazardous substances. With implementation of these conditions of certification and compliance with the NPDES permit, impacts from polluted runoff would be avoided or reduced to **less than significant** during operation of the proposed project.

Groundwater

Operation of Puente would not include any groundwater pumping, so the project would not cause groundwater drawdown nor induce intrusion of subsurface contaminants or seawater. However, groundwater quality impacts could occur if operation allows contaminants to reach groundwater through soil infiltration.

The same measures implemented to avoid or reduce impacts to polluted runoff (see "Surface Water Quality" above) would also protect groundwater quality. Wastewater generated during operation would be managed to reduce impacts to groundwater (see "Wastewater Management" below). Furthermore, all three retention basins onsite are lined to prevent infiltration. For these reasons, the impacts of Puente operation on groundwater quality would be **less than significant**.

Water Supply

The process water and domestic water supply for Puente, an estimated average annual water use of 19 afy, would be water from the city of Oxnard through the existing MGS potable water supply. Although this amount of water use is individually minor, when added with concurrent water use during other phases of the proposed project, it could potentially impact potable water supplies. Staff's evaluation of these potential impacts analyzes water use from all phases of the proposed project in the "Cumulative Impacts" subsection (see the "Water Supply" discussion on page 4.11-63).

Wastewater Management

Wastewater generated during operation would include sanitary waste, storm water runoff, and process wastewater. If wastewater is not properly disposed, then contamination could potentially occur to a nearby water body or groundwater could become contaminated through soil infiltration.

Puente wastewater would be managed by the systems previously described under "Wastewater Management" in the Puente Facility Operation subsection (see page 4.11-19). The existing MGS septic system, which currently operates under a project-specific Waste Discharge Requirements (WDRs) permit,[19] would be used for Puente operations. Storm water that cannot be reused would be combined with process wastewater, from both Puente and MGS Unit 3, and ultimately discharged to the Edison Canal. Similarly, discharges to the Edison Canal must be in compliance with a project-specific NPDES permit. These permits specify discharge prohibitions, effluent limitations, and monitoring and reporting requirements to show that minimum water quality standards are achieved. Because discharges of storm water runoff, process wastewater, and septic waste are regulated under WDR permits, the impacts of wastewater on soil and water resources would be **less than significant**. Staff recommends Condition of Certification **SOIL&WATER-4** to regulate wastewater discharges and to inform the CPM of issues regarding these wastewater discharges.

[19] LARWQCB Order No. R-4-2008-0087 for the onsite sewage treatment system

Flooding

Flooding is an overflow of water onto land that is normally dry. Staff analyzed potential flooding of the project site that might occur from:

- construction that substantially alters the existing drainage patterns of the site (due to site grading, increasing impervious surfaces, or placing the project in a location that would alter the course of a stream or river);
- riverine flooding caused by rapid accumulation of storm water runoff in a watershed;
- failure of regional floodplain management (such as failure of a dam or levee);
- coastal flooding due to tidal waters and/or offshore storms; and
- tsunamis and seiches caused by geological events (see the **Geology and Paleontology** section of this FSA).

Onsite Flooding Impacts

The existing topography of the proposed site is bare soil and relatively flat (see **Project Description Figure 3**). Due to perimeter berms and sand dunes, the MGS site does not experience run-on from offsite areas. After construction of Puente, approximately one acre would be covered by impervious surfaces (e.g., the new facility and pavement). The addition of impervious surfaces to an area previously undeveloped does not allow storm water to infiltrate into the ground. Storm water runoff quickly concentrates and could potentially cause flooding due to the volume and velocity of accumulated water. Large areas of pavement could result in onsite flooding causing damage to equipment and structures.

Preliminary drainage calculations indicate that the existing onsite basins have adequate capacity to accommodate the one- and two-year storm for the existing MGS combined with the Puente area (PPP 2015a Appendix A-7). Because the onsite storm water collection system would adequately manage the increase of impervious area, onsite flooding impacts due to construction or operation of Puente are **less than significant**.

Offsite Flooding Impacts

A project could potentially cause offsite flooding impacts by:

- allowing onsite storm water to flow offsite;
- changing the course or capacity of a stream or river;
- accidentally releasing contamination or toxic substances during a flood event; or
- exacerbating flood damage to offsite areas during a flood event.

As discussed above, the onsite storm water collection system would adequately manage the increase of impervious area and prevent storm water runoff from impacting adjacent properties. The location of the Puente site would not impact the course of a stream or river, making this impact not applicable to this project.

The accidental release of contamination or toxic substances during a flood event is prevented or minimized by implementing a Hazardous Materials Management Program

(discussed in the **Worker Safety and Fire Protection** section) and Operation Waste Management Plan (discussed in the **Waste Management** section). Handling of toxic and hazardous substances must follow strict management regulations, including secure storage with secondary containment. Hazardous waste must also be managed in accordance with regulations for onsite storage followed by proper offsite disposal based on the amounts collected and time of storage on site. Implementation of these and similar procedures would protect the environment and the safety of workers onsite during normal operating conditions. Should a flood event occur, these BMPs would reduce or limit the impact of a release to travel offsite and affect the public or surrounding biological resources.

The potential for the project to exacerbate flood damage during a large storm event is a concern expressed by intervenors (COO 2016f). Currently, MGS pumps water from the Edison Canal then discharges its wastewater (OTC, process wastewater, and storm water) across the beach to the Pacific Ocean. The proposed project would significantly reduce the amount of water pumped from the Edison Canal (for MGS Unit 3 use) and eliminate all discharges to the ocean, but Puente wastewater would be a new source of discharge to the Edison Canal.

The applicant explained in a Data Response (PPP 2016ab) that the additional discharge to the Edison Canal from the proposed project would be negligible compared to the entire drainage area that currently discharges to it. Based on the geometry of the canals and the information shown on FEMA's preliminary flood hazard map, the applicant concluded that the Edison Canal would be able to convey the 100-year storm without any flooding, while maintaining six to seven feet of freeboard. Because the project's estimated runoff during a 100-year storm event would be just 1.3 percent of the estimated total peak runoff of the entire drainage area to the Edison Canal (as calculated by the applicant), the available freeboard is more than adequate to manage Puente's discharges in addition to the current total flows. The applicant goes on to state that available freeboard could adequately accommodate all discharge sources and the cumulative impacts due to high tide, the 100-year storm event, and sea level rise of two feet (PPP 2016ab).

Staff reviewed the applicant's estimates and agrees with the findings. **Soil & Water Resources Figure 4** maps the areas of Oxnard and Ventura County that drain into the Edison Canal, Mandalay Bay marina, and Channel Islands Harbor. Even with conservative estimates of Puente discharges to the Edison Canal, the available freeboard is more than adequate to manage Puente's discharges in addition to the current total flows due to the 100-year storm event and sea level rise of two feet. Because Puente would not cause or exacerbate flooding to areas offsite and proper implementation of BMPs would reduce or limit the impact of a release to travel offsite, offsite flooding impacts due to construction or operation of Puente are **less than significant**.

Flood Hazard Areas and Relative Risk

Staff notes CEQA's explicit distinction between significant effects of a project on the environment and significant effects of the environment on a project.[20] While CEQA only requires an agency to consider the impacts of the proposed project on the environment, commission staff also considers general impacts to public health and safety and grid reliability, which may entail assessing site-specific vulnerabilities. Impacts to safety and reliability can potentially result from flooding due to river overtopping, coastal offshore storms, dam failure, and levee failure.[21] Applicability of preexisting hazards is based on Puente's proposed location in relation to a delineated hazard area in authoritative hazard maps. Staff does not propose mitigation regarding these hazards in this impact analysis, but instead assesses the flood risks.[22]

Relative flood risk was determined by estimating the likelihood of a flood impacting Puente and evaluating the consequences resulting from those flood impacts (see **Soil & Water Resources Table 3**). The likelihood of flood at the Puente site varies depending on the type of hazard: river overtopping, coastal offshore storms, dam failure, and levee failure. Flood hazards are evaluated based on authorized maps identified by the appropriate regulating agency. Consequences of site inundation, on the other hand, are very project specific and not dependent on the cause of the flood.

Soil & Water Resources Table 3
Risk Assessment

Risk = Consequence x Likelihood			
	Higher Likelihood Impacts	Medium Likelihood Impacts	Lower Likelihood Impacts
High Consequence	High Risk	High Risk	Medium Risk
Medium Consequence	High Risk	Medium Risk	Low Risk
Low Consequence	Medium Risk	Low Risk	Low Risk

Source: COCAT 2013

For purposes of this section, the likelihood of impacts is based on hazard maps, and the consequences are evaluated with respect to the severity of flood impacts to safety of people onsite and electric grid reliability (local or system wide).[23] Staff evaluated the consequences with respect to the severity of flood impacts on the following:

[20] *California Building Industry Association v. Bay Area Air Quality Management District*, Case No. S213478 (Cal. Supreme Court, December 17, 2015)

[21] Discussion of tsunamis, seiches, and other flooding caused by seismic events and submarine landslides can be found in the **Geology and Paleontology** section of this FSA.

[22] Staff explains determination of risk in the "Hazard vs. Risk" discussion of **Appendix SW-1**.

[23] The **Power Plant Reliability** section of this FSA analyzes how Puente is designed, sited, and operated in order to ensure its safe and reliable operation.

- Safety of people onsite and offsite
- Harm to biological resources from onsite toxins running offsite
- Effects of operational failure on electric grid reliability (local and system wide)

Staff determined that the consequences to onsite workers would be low because the impact of accidental release of toxic and hazardous substances are reduced or limited with implementation of LORS and conditions of certification discussed in this FSA (see the **Worker Safety and Fire Protection** and **Waste Management** sections). If a flood event triggered a local emergency with evacuations, onsite workers could have difficulty leaving the site if surrounding access roads are impassable. The site itself is somewhat elevated compared to the rest of the MGS property and adjacent properties, so workers could potentially remain onsite until flood levels subside enough to leave the site.

If a flood event results in operational failure of the facility, its inability to generate electricity is not expected to hinder local emergency response activities or threaten community safety. The electric grid (both local and system wide) is designed with redundancies to account for unexpected short- and long-term outages of a facility. Therefore, staff concludes that the overall consequences of flood damage are low, because Puente is not a critical facility[24] and its location would not exacerbate offsite flood impacts.

The release of contamination or toxic substances during a flood event is prevented or minimized by implementing a Hazardous Materials Management Program (discussed in the **Worker Safety and Fire Protection** section) and Operation Waste Management Plan (discussed in the **Waste Management** section). Handling of toxic and hazardous substances must follow strict management regulations, including secure storage with secondary containment. Hazardous waste must also be managed in accordance with regulations for onsite storage followed by proper offsite disposal based on the amounts collected and time of storage on site. Implementation of these and similar procedures would protect the environment and the safety of workers onsite during normal operating conditions. Should a flood event occur, these BMPs would reduce or limit the impact of a release to travel offsite and affect the public or surrounding biological resources.

To determine the likelihood of a hazard occurring, staff evaluated flood hazards based on Federal Emergency Management Agency (FEMA) maps. The magnitude of flood used nationwide as the standard for floodplain management is a flood having a probability of occurrence of 1 percent in any given year. This flood is also known as the 1-percent annual chance flood,[25] or base flood. The Federal Insurance Rate Map (FIRM) is the official map created and distributed by FEMA for the National Flood Insurance Program (NFIP) that shows areas subject to inundation by the base flood for

[24] Staff explains this determination in the “Critical Infrastructure” discussion of **Appendix SW-1**.

[25] Also commonly called a *100-year flood*, it refers to a flood that statistically has a 1 percent chance of occurring once at a particular location in any given year. Similarly, a *100- year storm* refers to a rainfall event that statistically has this same 1-percent chance of occurring. However, not every 100-year storm corresponds to a 100-year flood because several factors can independently influence the cause-and-effect relation between rainfall and streamflow. For instance, if a 100-year storm is preceded by smaller storms, the saturated ground could increase runoff and result in more flooding than expected.

participating communities. FIRMs contain flood risk information based on historic, meteorologic, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development.

As a condition of participation in NFIP, the city of Oxnard adopted a floodplain management ordinance that meets or exceeds the minimum NFIP criteria. The ordinance regulates new and existing development in mapped floodplains based on the effective FIRM for the area. FEMA, which manages flood risk on the national level, initiated a five-year plan to update flood hazard maps. Currently, Oxnard's effective FIRM is dated 2010 (see **Soil & Water Resources Figure 6**), but the coastal hazard zones that it presents are based on studies developed in 1983 (FEMA 2012). As part of FEMA's process to update and re-map the coastal flood risk and wave hazards for all California counties along the open coast, FEMA is performing detailed engineering analysis using two-dimensional wave models and new high-resolution digital elevation data (FEMA 2015b). On September 30, 2016, FEMA released the Preliminary FIRM of Ventura County to give community officials, residents, and other stakeholders an early look at the projected risk identified by coastal flood hazard study. Although Preliminary FIRMs are not final, they are presented as the best information available at the time. This preliminary data is released for review and guidance purposes, but a community can reasonably utilize the preliminary data for regulating development before the map becomes final and effective (FEMA 1998).[26]

The following flood hazard discussions are based on the Preliminary FIRM released on September 30, 2016. **Soil & Water Resources Figure 7** shows the updated hazard boundary near the Puente site and compares it to the 2010 Effective FIRM. Staff also discusses two potential hazards not included in FEMA maps: flooding due to dam failure and beach erosion due to sediment deficiency. These topics are mentioned in various public comments concerned about construction of Puente at the proposed site.

Hazard – Riverine Flooding

Prior to agricultural development within the region, large areas of the Oxnard Plain were historically a part of the extensive wetland and floodplain complex of the Santa Clara River Delta. Over the years, numerous levees were built to protect the agricultural lands and urban development along the river, but these areas are subject to inundation during severe flood events, typically as the result of longer intervals of rain or a series of winter storms.

FEMA prepares FIRMs that show the 1-percent annual chance floodplain boundaries based on a detailed study that includes a hydrologic analysis of the Santa Clara River watershed to determine the probability that a discharge of a certain size will occur and a hydraulic analysis to determine the characteristics and depth of the flood that results from that discharge. The FIRMs also show floodplain boundaries for the 500-year flood, which is the flood having a 0.2-percent chance of occurrence in any given year. The Santa Clara River's designated floodway is shown as its channel plus the portion of adjacent floodplain needed to convey the base or 1-percent annual chance flood event

[26] For more information, see the "FEMA Hazard Map Update" discussion of **Appendix SW-1**.

without increasing flood levels by more than one foot and without increasing velocities of flood water.

The Preliminary FIRM released in September 2016 (see **Soil & Water Resources Figure 7**) shows that the proposed Puente site is not located within the base flood boundary or within the designated floodway. The southwest corner of the site is located within the 500-year floodplain boundary, which does not require purchase of flood insurance. Because the likelihood of floodwaters from the Santa Clara River reaching the site is low and the consequences of flood damage are low (Puente is not a critical facility[27] and its location would not exacerbate offsite impacts), from **Soil & Water Resources Table 3** staff concludes this flood **risk is low**.

Hazard – Coastal Flooding

The water level along the shoreline is constantly moving. High and low tides are affected by astronomical position (the gravitational pull of the moon and sun acting on a rotating Earth), which result in daily, monthly, and annual variations of tide elevations. The surf zone is the area that alternates between the advance and retreat of the water level, where dominant processes include wave setup, runup, overtopping, and erosion. The backshore zone is the area that is outside the normal surf zone, which is normally dry and subject to development. Coastal flooding occurs when the backshore zone becomes inundated with ocean water.

Coastal flooding in California can have different causes (FEMA 2015b):

- Pacific Winter Storms – During the winter, storm systems from the Aleutian Islands, Hawaii (“Pineapple Express”), and other parts of the North Pacific impact the California coastline. These low-pressure systems generate large waves and meteorological effects can elevate tide levels along the coast.
- Remote Swell Events – Pacific Ocean swell is generated by remote storms from other regions, such as offshore Baja California, New Zealand, and other areas of the North Pacific. Storm types include offshore extra-tropical storms, tropical storms, hurricanes, and southern hemisphere swell. Remote swell events can be difficult to predict.
- Extreme High Tide Inundation – When Pacific Ocean storms coincide with high tides, storm surge due to meteorological effects can further elevate open coast water levels to produce extreme high tides. El Niño conditions along the California coast can also contribute to storm surge and produce extraordinarily high water levels. Extreme high tides can exceed eight feet above Mean Lower Low Water (MLLW) in Southern and Central California.
- El Niño Winter Storms – During El Niño winters, atmospheric and oceanographic conditions in the Pacific Ocean produce severe extra-tropical winter storms that impact the California coast. Storms follow a more southerly track and bring intense rainfall and storm conditions. Tides are elevated by approximately six to twelve inches above normal throughout the winter. Changes in alongshore sediment

[27] Staff explains this determination in the “Critical Infrastructure” discussion of **Appendix SW-1**.

transport patterns can greatly erode beaches and decrease beach width, exposing areas typically protected from ocean swell.

- Tsunamis – Tsunamis are long period waves generated primarily by earthquakes, but can be caused by volcanic eruptions or landslides.

The 1-percent annual chance flood is defined as the basis for hazard zone mapping by FEMA. Unlike the Atlantic and Gulf coasts (where the 100-year flood is typically associated with the 100-year storm event), waves on the Pacific Coast may be associated with both local and distant storms; water levels are influenced by El Niño, setup, and tides; and low frequency oscillations in the surf zone significantly influence runup. In other words, no single mechanism is responsible for the 1-percent annual chance flood. Additionally, numerous combinations of waves and water levels during any given storm event can affect the delineated flood hazard boundary due to differing responses in the form of runup, setup, erosion, or coastal structure interaction in the backshore zone. Therefore, for the Pacific Coast, FEMA determines the 1-percent annual chance flood characteristics from response statistics rather than event statistics.[28]

Coastal flood hazard zones shown in FIRMs for coastal areas are developed from a detailed analysis of waves, water levels, wave effects, and shoreline response. Flood hazard zones are generally divided into three categories:

1. VE Zones: coastal high hazard areas where wave action and/or high-velocity water can cause structural damage during the 1-percent annual chance flood[29];

2. AE Zones: areas of inundation by the 1-percent annual chance flood, where flood hazards are not as severe as in VE zones; and

3. X Zones: areas subject to flooding by floods more severe than the 1-percent annual chance flood.

The Preliminary FIRM released in September 2016 (see **Soil & Water Resources Figure 7**) shows that the proposed Puente site is not located within the 1-percent annual chance flood. As discussed above in "Flood Hazard Areas and Relative Risk", although Preliminary FIRMs are not final, they are considered by FEMA to be the best information available at the time.[30] Because the likelihood of coastal flooding reaching the site is low and the consequences of flood damage are low (Puente is not a critical facility[31] and its location would not exacerbate offsite impacts), from **Soil & Water Resources Table 3** staff concludes this flood **risk would be low**.

[28] For more information, see the "Hazard Zone Mapping" discussion of **Appendix SW-1**.

[29] Defined by FEMA as meeting one of more of the following criteria: wave runup elevation is at least three feet above the eroded ground profile; wave overtopping splash exceeds the crest of a barrier by three feet or more; landward high-velocity flow (based on flood depth and velocity) is 200 ft^3/s^2 or more; breaking wave height is three feet more; and/or fits the criteria of a primary frontal dune zone (NHC 2005).

[30] For more information, see the "FEMA Hazard Map Update" discussion of **Appendix SW-1**.

[31] Staff explains this determination in the "Critical Infrastructure" discussion of **Appendix SW-1**.

Hazard – Flooding via the Edison Canal

The Edison Canal could potentially provide a pathway for storm surge and floodwaters into the MGS property, because the Pacific Ocean is the dominant source of water in the canal. This is of particular concern of some intervenors because no flood protection exists (structural or natural) between the Edison Canal and the MGS property.

FEMA's Preliminary map does not indicate that storm-induced wave impacts or coastal flooding is expected to enter the site from this direction. Staff finds this reasonable due to the path that a storm wave must travel through Channel Islands Harbor, Mandalay Bay marina, and winding path of the Edison Canal before reaching the MGS facility. Each obstacle encountered (sea walls, boat docks, marine vessels) and every change in direction (bends and curves) would decrease the energy of a wave entering Channel Islands Harbor. The applicant submitted results from a simulation for tsunami waves entering the harbor with maximum amplitude of six feet that travel through the harbor and up the canal (PPP 2016a). It shows the maximum amplitude changes as the width of the waterway changes. These waves eventually dissipate along the Edison Canal, over a mile away from the MGS property. (For more discussion on tsunami flooding, see the **Geology and Paleontology** section of this FSA.) Likewise, a storm wave would decrease in energy with each obstacle encountered. Because the likelihood of floodwaters traveling through the Edison Canal and reaching the site is low and the consequences of flood damage are low (Puente is not a critical facility[32] and its location would not exacerbate offsite impacts), from **Soil & Water Resources Table 3** staff concludes this flood **risk is low**.

Hazard – Levee Failure

Levees are designed to provide a specific level of flood protection. The existing Santa Clara River Levee System (SCR-3) located along the river's southern bank downstream of Highway 101 protects over 3,800 structures and roadways located in the northern portion of the city of Oxnard. SCR-3 is approximately two miles long and composed of four reaches. All four reaches were built by different agencies over many years, with different sections completed for different purposes. Consequently, in its current configuration, the existing SCR-3 levee system does not meet the Federally-mandated levee certification regulations[33]. In addition, the section between the Union Pacific Rail Road (UPRR) crossing and the Highway 101 Bridge currently has no levee, creating a 750-foot-long "gap" in flood protection. Over 3,800 structures and roadways located in the northern portion of the city of Oxnard are currently subject to flooding due to these existing deficiencies (ASPEN 2015).

The current effective FIRM for the Santa Clara River in the vicinity of SCR-3 was issued January 2010, but revised the next day by Letter of Map Revision (LOMR) to revert to the previously effective map based on 1985 data and analyses. The lands adjacent to SCR-3 and the "gap" are currently designated as moderate risk areas with reduced flood risk due to the levee (see **Soil & Water Resources Figure 6**), and property owners are not required to purchase flood insurance at this time. However, without

[32] Staff explains this determination in the "Critical Infrastructure" discussion of **Appendix SW-1**.

[33] Found in the Code of Federal Regulations (44 CFR Section 65.10).

implementation of SCR-3 levee improvements and closure of the gap, it is expected that property owners with federally backed mortgages would need to purchase flood insurance upon the next FIRM revision currently in progress by FEMA. The Ventura County Watershed Protection District (VCWPD) will implement an improvement project to rehabilitate SCR-3 (plus the southern portion of the "gap") to comply with FEMA levee certification requirements. Flood protection between the UPRR and Highway 101 would be provided as part of The Village Specific Plan development, with the city of Oxnard acting as lead agency for that component (ASPEN 2015).

Based on the current effective FIRM, the risk of a potential levee failure of SCR-3 to impact the Puente site is low. As shown on **Soil & Water Resources Figure 6**, the area affected by the levee certification deficiencies (identified as area with reduced flood risk due to levee) is approximately two miles away from the proposed Puente site. When improvements are complete to comply with FEMA levee certification requirements the chance of levee failure drops considerably. Because the likelihood of levee failure is low and the consequences of flood damage are low (Puente is not a critical facility[34] and its location would not exacerbate offsite impacts), from **Soil & Water Resources Table 3** staff concludes flood risk due to levee failure **is low**.

Hazard – Dam Failure

Ventura County is vulnerable to inundation from dam failure, with the most susceptible areas located along the Santa Clara River such as the city of Oxnard. There are three major dams on the Santa Clara River located upstream from the city: the Santa Felicia Dam at Lake Piru, the Castaic Lake Dam, and the Pyramid Lake Dam. These water storage reservoirs are also designed as flood and debris control during storm events. To cause a catastrophic flood, dam failure would have to occur during extreme storm events that cause inflow to the basin above the emergency spillway freeboard capacity. All three dams are subject to state regulations through the California Division of Safety of Dams, which inspects them annually to ensure that they are in good operating condition and requires studies of potential flooding in the event of sudden or total dam failure. The agency that owns the dam prepares dam inundation maps that contain flood-wave arrival time estimates and flood inundation limits (URS 2005).

There is no record of failure of any dam located in Ventura County. However in 1928, failure of the St. Francis Dam located in the San Francisquitos Canyon in Los Angeles County resulted in catastrophic impacts in Ventura County. Constructed to store water from the Los Angeles-Owens River Aqueduct, the dam collapsed after it was completely filled for the first time. At the peak of the flood, the wall of water was reported to be 78 feet high. By the time it hit Santa Paula, 42 miles south of the dam, the water was estimated to be 25 feet deep. Nearly 500 people were killed, and damage estimates exceeded $20 million (AEC 2015b).

Today, the risk of any regional, state-regulated dam failing is considered extremely remote. Because dam inundation maps anticipate flooding throughout the entire city of Oxnard and other parts of Ventura County, a Dam Failure Response Plan was developed. Disaster coordination and planning is the responsibility of the Sheriff's

[34] Staff explains this determination in the "Critical Infrastructure" discussion of **Appendix SW-1**.

Department through its Office of Emergency Services, which maintains this plan and other hazard mitigation plans for the county (VCRMA 2013). Because the likelihood of dam failure is extremely low and the consequences of flood damage are low (Puente is not a critical facility and its location would not exacerbate offsite impacts), from **Soil & Water Resources Table 3** staff concludes this flood **risk is low**.

Hazard – Sediment Deficiency to Beaches

Littoral drift refers to the movement of sand in the direction of the longshore current, analogous to a river of sand moving parallel to the shore. Ventura County is located in the Santa Barbara Littoral Cell where a southward net littoral drift dominates moving sand southward or southeastward along the beaches. Sediments enter the littoral cell primarily from discharge of coastal rivers and streams as well as bluff erosion. Ultimately, the sand is lost from the system or cell through either a submarine canyon or a coastal dune field (CSMW 2006).

The shoreline within a littoral cell is dynamic. Beach widths change seasonally due to changes in weather, storm intensity, and wave climate. Seasonal beach erosion is typically a recoverable process. Strong winter waves are more erosive and cut away at the sand, and the smaller, less energetic summer waves move sand onshore to rebuild the beach. The long-term width of the beaches within a cell is governed by the long-term balance between the volumes of sand entering and leaving a littoral cell. Over years and decades, beaches can erode (narrow), accrete (widen), or remain in equilibrium, because of available sand within a littoral cell. When the construction of dams for inland reservoirs reduces the supply of sand from the river or large coastal engineering structures such as breakwaters or jetties alter the movement of sand along the shore, affected beaches can experience permanent erosion and narrowing or take years or decades to re-establish equilibrium (CSMW 2006).

The Puente site is located in the section of the Santa Barbara Littoral Cell known as the Oxnard Plain Reach, which extends from the mouth of the Ventura River to Port Hueneme Harbor. Sediment supply along this reach is dominated by contributions of sediment discharged from the Ventura River and the Santa Clara River. Sediment moves southward along this reach and, historically, was lost from the cell into the submarine Hueneme Canyon.

Construction of the Ventura and Channel Islands harbors modified the natural transport of sediment by trapping sand to keep their entrances open for navigation. Sand is stored in these sediment traps until it is dredged, ideally once or twice a year (CSMW 2007). The dredged material is deposited down the coast to beaches that depend on this once-steady supply of sand. In the past, the U.S. Army Corps of Engineers typically allocated federal funds to dredge these sediment traps, but multiple years of budget cuts and partial funding have only been adequate to dredge a fraction of the sand that is normally dredged for maintenance of these harbors.

Beach width can help protect shores by dispersing some wave energy, especially during storms. An insufficient supply of sediment, however, cannot maintain the beach width. Nearly all of the alongshore sand transport is trapped at Channel Islands Harbor, so sand is dredged to maintain the navigation channel and moved downcoast to Hueneme Beach, about five miles south of the proposed project site (BEA 2009). Hueneme Beach

has experienced dramatic erosion as a consequence of lapsed dredging of Channel Islands Harbor (see **Soil & Water Resources Figure 8**).

Intervenors have expressed concern that insufficient dredging of Ventura Harbor could cause the beach to narrow near the Puente site (COO 2015a, CEC 2015ee page 57). This stretch of the shoreline has experienced an overall increase of beach width over the last 50 years, which would not be possible without a sufficient supply of sediment to replace the sand lost to littoral drift. Intervenors expect that several years of lapsed dredging would cause erosion and coastal flooding similar to the substantive erosion of Hueneme Beach, which would make Puente extremely vulnerable to coastal flooding. Testimony submitted to the CPUC (COO 2015a) compares photos of the beach width in front of the MGS outfall taken in 1966 and 2012 that shows beach widening by at least 200 feet, suggesting that the main contributor was sand bypassing from Ventura Harbor. Its conclusions included the statement: “If the dredging [of Ventura Harbor] ceases, the beaches [adjacent to the MGS property] should be expected to narrow and dunes reduce in height similar to the immediate post construction of the Ventura Harbor [in 1963], which would magnify the possibility of coastal hazards impacting the expansion site.”

Staff agrees that sediment from Ventura Harbor dredging contributes to maintaining the beach width near Puente. However, staff concludes this contribution is small compared to the contribution of sediment supplied by the Santa Clara River. Although beach width could narrow if dredging of Ventura Harbor ceases, sediment loads would continue from the Santa Clara River, which comprises the majority of overall sediment supply to the littoral cell (see **Soil & Water Resources Figure 9**). The volume of littoral drift between Santa Barbara Harbor and the Ventura River is essentially constant, averaging about 315,000 cubic yards per year (cu-yd/yr). The volume roughly doubles to about 597,000 cu-yd/yr with sediment contributions from the Ventura River and beach erosion just to the south of it. This larger volume becomes trapped at Ventura Harbor until dredging allows the sediment to continue its southern movement. Further south, the Santa Clara River contributes the majority of sediment into the littoral cell, averaging about 1,193,000 cu-yd/yr. This is the equivalent to twice the average volume dredged from Ventura Harbor. South of the Santa Clara River, littoral drift stops at the sediment trap constructed at Channel Islands Harbor, where sand accumulates until it is dredged. An average of about 1,010,000 cu-yd/yr is dredged to supply sand to Silver Strand Beach and Hueneme Beach located downshore of the harbor (BEA 2009). The annual average volume of sand supplied by both rivers and dredged from each harbor is summarized in **Soil & Water Resources Table 4**, which shows the increasing sand supply and changes of sediment movement near the Puente site.

Soil & Water Resources Table 4
Average Annual Rate of Littoral Drift and Supply

Oxnard Plain Reach	Sand Movement (average cu-yd/yr)	Sand Supply (average cu-yd/yr)
Santa Barbara Harbor	315,000	
Ventura River		102,000
Beach Erosion		180,000
Ventura Harbor	597,000	
Santa Clara River		1,193,000
Puente site is located between Santa Clara River and Channel Islands Harbor		
Channel Islands Harbor	1,010,000	

(Source: BEA 2009, RUNYAN 2002)

Despite the fact that flows in the Santa Clara River can vary dramatically and oftentimes a sandbar gradually forms at the mouth of the river (see the "Santa Clara River" discussion on page 4.11-12), wet years provide significant amounts of sediment for littoral transport during large floods[35] and breaches of the sandbar allow small contributions during dry years[36] (see **Soil & Water Resources Figure 10**). Infrequent severe floods are thought to be responsible for delivering the majority of sediment to the coast and a single large storm can deliver more sand to the beaches than multiple years of low to moderate rainfall (USGS 2006). Significant amounts of sediment from the Santa Clara River are closely tied to major flood events that occurred 1969, 1978, 1993, and 2005 (SWS 2011) which dominate sediment processes on beaches to the south of the river (BEA 2009).

With an average annual drift of about 1,800,000 cu-yd/yr occurring past the Santa Clara River and only about 1,000,000 cu-yd/yr dredged from Channel Islands Harbor, there appears to be unaccounted sand on the order of 800,000 cu-yd/yr. The Oxnard Plain Reach is not well understood compared to the Goleta and Santa Barbara Reaches, but different studies suggest possible explanations. Because Channel Islands Harbor is not dredged to a consistent depth, sediment might be stored in the sand trap of the harbor until adequate funds are appropriated for dredging (RUNYAN 2002). Another possible explanation is that following the major flood events of the Santa Clara River, immense volumes of sand were discharged from the river and deposited to a nearshore delta, which builds onto the offshore delta (SWS 2011). In addition, a portion of the sand, about 10,000 cu-yd/yr, is estimated to be transported inland by wind, which helps build the dunes (BEA 2009). With multiple possibilities of sand storage, this region is

[35] In general, the coarser sediment (>0.0625 mm) as shown in **Soil & Water Resources Figure 10** eventually provides sediment for littoral transport and supplies sediment that builds the barrier beach and causes mouth closure during periods of low river discharge (SWS 2011).

[36] At the mouth of the river, the city of Ventura Water Reclamation Facility discharges an average of approximately 8.4 mgd of treated effluent into the river. This discharge can cause the water level to rise above the sandbar resulting in a breach during times of low rainfall (SWS 2011).

considered to be sediment abundant, as opposed to sediment limited where wave energy is capable of moving more sand than exists on the beach (BEA 2009).

Regional sediment management in this area focuses on preservation of the natural river sediment supply as well as harbor sand bypassing programs. Potential effects of harbor dredging on beach width at the proposed Puente site are expected to be much less significant than observed damage to Hueneme Beach because littoral drift delivers sediment from the Santa Clara River to Puente while Channel Islands Harbor restricts littoral transport to Hueneme Beach. A comparison of the width of the beach estimated from aerial photographs does not show a direct relationship between the dredging and the beach width. If Ventura Harbor dredging is insufficient but supply of sediment from the Santa Clara River watershed is assumed unchanged, then substantial erosion of the beach at Puente is unlikely. In other words, the lack of dredging at Ventura Harbor would not significantly reduce the volume of sand needed to maintain the beach width at the project site.

Other factors affecting local beach erosion in the Santa Barbara Littoral Cell are the prevailing wave climate and the local orientation of the coastline. Numerical modeling was used to identify and quantify the average annual sediment transport between Pt. Conception and Pt. Mugu. The sheltering effect of the Channel Islands causes the west/northwest swells to dominate, so net littoral drift moves sand southward or southeastward along the beaches. The less frequently occurring southeastern swell enters the littoral cell between the Channel Islands and Pt. Mugu and can affect south facing beaches, but most of the south facing coastline west of the Ventura River is sheltered from extreme wave events (see **Soil & Water Resources Figure 11**). No waves come from the north due to the sheltering effect of Pt. Conception (USGS 2009a).

McGrath State Beach (adjacent to the Puente site) and Hueneme Beach are both located outside the Channel Islands sheltering affect from southern swells. Although littoral drift is dominated by the western swell, the southern swell has a considerable effect on littoral movement in this area. Along western-facing shorelines in this area, the opposing swell directions can result in deceleration of littoral-drift rates. This slowdown of sediment corresponds with the decadal-scale accretion noted near the project site (USGS 2009a). Conversely, Hueneme Beach is mostly southern-facing and therefore more exposed to southern swells. Because Channel Islands Harbor restricts littoral transport to this area, significant erosion is highly likely unless harbor dredging or other activities can provide Hueneme Beach a sufficient supply of sediment.

Because the likelihood of sediment deficiency to the beach adjacent to the Puente site is low and the consequences of flood damage are low (Puente is not a critical facility[37] and its location would not exacerbate offsite impacts), from **Soil & Water Resources Table 3** staff concludes this flood **risk is low**.

[37] Staff explains this determination in the “Critical Infrastructure” discussion of **Appendix SW-1**.

Effects of Climate Change on Flood Hazards

The discussion in **Air Quality Appendix AIR-1** analyzes Puente's potential impacts of burning natural gas and producing greenhouse gas emissions that would contribute cumulatively to climate change. Conversely, staff recognizes that current and future effects of global climate change could affect Puente's facilities and operations. The following discussion considers the potential effects on both riverine and coastal flooding due to climate change during the project's 30-year operating life. Although CEQA does not require identification of significant effects of the environment (such as sea level rise) on a project, all state agencies including the Energy Commission are required to take climate change into account in planning decisions.[38] Staff's assessment of future flooding is similar to evaluation of present-day flooding, namely, evaluating the consequences with respect to the severity of flood impacts on the following:

- safety of people onsite
- local emergencies and evacuations
- electric grid reliability (local and system wide)

The discussion of potential flooding due to climate change is included here to serve the Committee with information that staff believes to be useful, relevant, and appropriate.[39]

The following discussions analyze how climate change may affect flooding potential at the proposed site. As with the analysis of present-day hazards (above), staff does not discuss mitigation but instead assesses the flood risks (see **Soil & Water Resources Table 3**). Specifically, staff determines the relative flood risk by determining the likelihood of a flood impacting Puente and evaluating the consequences resulting from those flood impacts.[40]

Climate Change – Riverine Flooding

Climate change is expected to increase the portion of precipitation falling as rain rather than snow in the mountain areas, which could have significant impact on the timing and magnitude of runoff patterns. Although the 11-year running average of annual precipitation in California shows no clear indication of either an increasing or decreasing trend in precipitation between 1895 and 2013, annual average has shown large year-to-year variability. For example, the South Coast Region has an average annual precipitation of 17.38 inches, and one of the wettest winters (over 36 inches during 2005-2006 water year) was followed by the driest winter (5.5 inches during the 2007-2008 water year). Historic data also show periods of consecutive dry years, particularly since the 1970s (OEHHA 2013). While future changes in long-term average precipitation rates are difficult to predict, it is generally expected that extreme

[38] Governor Schwarzenegger's Executive Order S-13-08 (November 2008) and Governor Brown's Executive Order B-30-15 (April 2015)

[39] **Appendix SW-1** and **Appendix SW-2** discuss several issues of contention in greater detail and explain how staff determined whether information is relevant and appropriate.

[40] Staff explains determination of risk in the "Hazard vs. Risk" discussion of **Appendix SW-1**.

precipitation episodes such as atmospheric river storms[41] may become more extreme as the climate changes (DETT 2011). In effect, climate change may result in storm events that could flood larger areas for longer periods of time.

In addition, warmer temperatures and longer droughts are expected to contribute to more frequent and intense wildfires. The causes of fires are not necessarily climate-related, but hot, dry conditions can exacerbate ignitions from lightning, arson, and equipment use. An increase in the frequency and severity of wildfires reduces the availability of vegetation that absorbs runoff, which can result in increased runoff, erosion, and sedimentation. Areas damaged by these wildfires would have a greater potential for flooding and could affect the magnitude and frequency of flood events (OEHHA 2013).

Larger, more powerful flood flows could potentially damage levees and cause significant flooding. As discussed above in "Hazard - Levee Failure", there is an improvement project in development to rehabilitate SCR-3 to comply with FEMA levee certification requirements. Construction of the proposed project is anticipated to occur over a 27-month period, beginning in 2016. A design flow in the Santa Clara River of 250,000 cubic feet per second (cfs) was used[42], which is the best available estimate of the 1-percent annual chance peak flow (consistent with estimates of future flows after further development of the watershed) plus an additional 10 percent factored in to address the inherent uncertainty of estimating (ASPEN 2015).

While climate change is expected to result in larger flood events, the magnitude of this increase is difficult to estimate. Designing the levee improvements for 10 percent over the 1-percent annual chance peak flow is conservative, but it may or may not sufficiently contain flows caused by atmospheric river storms or floods exacerbated by extensive wildfire damage to the watershed. Despite this uncertainty, a safety factor of 10 percent seems reasonable to staff considering this is in addition to minimum factors of safety incorporated into FEMA certification requirements.

The magnitude of future flood events is unknown, so the likelihood of floodwaters reaching the proposed Puente site could be medium or high. However, the site is approximately two miles away from the Santa Clara River and somewhat elevated compared to its surrounding area, which might help reduce its exposure. Even if floodwaters were to overtop a section of the levee, the consequences of flood damage are low (Puente is not a critical facility[43] and its location would not exacerbate offsite impacts). As shown on **Soil & Water Resources Table 3,** this flood **risk is low to medium**.

[41] *Atmospheric River storms* are basically narrow intense bands of moist air that deliver moisture to a particular area for varying lengths of time. For example, the "Pineapple Express" moves warm, moist air from the tropics near Hawaii into California and produces intense rains over large areas.

[42] For comparison, the largest flow on record, 175,000 cfs, occurred during the 1928 St. Francis Dam failure. The next largest flows resulted from major storms: 120,000 cfs (1938), 165,000 cfs (January 1969), 152,000 cfs (February 1969), and 136,000 cfs (2005). (SWS 2011, Table 4-1)

[43] Staff explains this determination in the "Critical Infrastructure" discussion of **Appendix SW-1**.

Climate Change – Coastal Flooding

So far during these proceedings, the potential effect of climate change on coastal flooding is a topic that is often mentioned by the public and intervenors. Staff again stresses that CEQA does not require identification of significant effects of the environment (such as sea level rise) on a project; therefore, this subsection does not discuss conditions of certification to mitigate potential impacts. Instead, staff presents information to the Committee that meets the requirement of Executive Order B-30-15 that all state agencies, including the Energy Commission, are required to take climate change into account in planning decisions. The following discussion is consistent with state guidance[44] for sea-level rise (SLR) to evaluate risks of coastal flooding, and roughly follows Appendix B of the California Coastal Commission SLR Policy Guidance.

Extensive documentation regarding the impacts of climate change on coastal flooding has been docketed by the applicant, intervenors, and the public. Issues of contention are discussed in greater detail in **Appendix SW-1** and **Appendix SW-2** that explain how staff determined that the information presented below is relevant and appropriate.

Sea Level Rise – Best Available Science

Increasing temperatures from climate change result in sea level rise as land-based glaciers, snowfields, and ice sheets melt and the ocean's surface layer warms and thermally expands. State SLR guidance stresses the use of "the most recent and best available science", which for California is currently the 2012 National Research Council's Report (NRC 2012). Key points from this report include the following:

- The study developed latitudinally specific estimates of sea-level rise based on factors specific to the west coast. (The estimates applicable to Ventura County are shown in **Soil & Water Resources Table 5**).[45]
- Most coastal damage is caused by the confluence of large waves, storm surges, and high astronomical tides during a strong El Niño. Some models predict a northward shift in North Pacific storm tracks, and some observational studies report that the largest waves are getting higher and winds are getting stronger. Observational records are not long enough to confirm whether these are long-term trends.
- There is some controversy around research conclusions about significant wave heights based on buoy data. The observed trend in increased significant wave heights may reflect natural variability, rather than long-term change associated with rising greenhouse gases (in which case it could be expected to continue).
- Even if storminess or the frequency of high waves does not increase in the future, sea-level rise will magnify the adverse impact of storm surges and high waves on the coast. Extreme events can increase sea levels much faster than the projections for sea level rise due to climate change. The number and duration of extreme high water events are expected to increase.

[44] For more information, see the "Sea Level Rise Guidance" discussion of **Appendix SW-1**.

[45] The NRC sea level rise projections use the year 2000 as the base year, but there has been little, if any, measureable rise in sea level since 2000 for most locations in California. There is no need to adjust the SLR projections for projects that begin development in the near future and exist for a limited lifetime. This conservative approach would address the possibility that latent SLR might occur quickly (CCC 2015).

- All methods of developing projections for rates of sea level rise have large uncertainties when projecting out to 2100. Confidence in the study is likely to be highest for projections to 2030 and perhaps 2050.
- Storms and sea-level rise are causing coastal cliffs, beaches, and dunes to retreat horizontally at rates from a few cm/yr to several m/yr. Cliffs could retreat horizontally by more than 30 m (about 100 feet) by 2100.
- The overall effect of sea level rise on natural shorelines will be influenced by several other important local factors, including shoreline composition, morphological setting, benthic biota, elevation, slope, sediment supply, vegetation, subsidence, tidal range, hydrology, and management.

Soil & Water Resources Table 5
California Sea Level Rise Projection using 2000 as the Baseline

Time Period	South of Cape Mendocino
2000 – 2030	0.13 to 0.98 foot
2000 – 2050	0.39 to 2.0 feet
2000 – 2100	1.38 to 5.48 feet

(Source: NRC 2012)

Sea Level Rise – Consider Timeframe and Risk Tolerance

If Puente is approved, the facility is expected to begin commercial operation in 2020 and operate for 30 years to 2050. The NRC report states that global climate models provide a reasonable representation of the future climate system at shorter timescales (2030 and perhaps 2050), because confidence in the global and regional projections of SLR is relatively high. However, SLR projections after 2050 become increasingly more uncertain, and by 2100 uncertainties are large (NRC 2012). The large uncertainties of future projections are due in part to modeling uncertainties, but primarily due to uncertainties about future global greenhouse gas emissions, and uncertainties associated with the modeling of land ice melting rates. Therefore, for projects with timeframes beyond 2050, state SLR guidance emphasizes the importance of risk tolerance (see **Soil & Water Resources Table 3**) when establishing the high and low range of projected SLR. Similar recommendations to consider risk tolerance is also in the SLR guidance adopted by the California Coastal Commission, advising that a longer timeframe of 100 years or more should be considered for critical infrastructure.

Staff does not believe a 100-year operational life is appropriate for Puente, in part because it is not considered a critical facility.[46] The AFC identifies the project's design lifespan to be 30 years, but the AFC also mentions the possibility of operating for longer depending on economics and other factors. A 20-year contract for gas-fired generation purchase agreement between the applicant and SCE was approved by the CPUC on May 25, 2016, but a contract would not preclude Puente from operating beyond a 20-year agreement. Staff understands that a lifespan of 30 years for a "typical" natural gas power plant is generally accepted within the power industry, and that actual useful life

[46] Staff explains this determination in the "Critical Infrastructure" discussion of **Appendix SW-1**.

depends on need, location, maintenance investments, partial load cycling operation, efficiency, functional obsolescence, the addition of renewable sources of generation to the system, and frequency of starts and stops. For these reasons, the proposed 30 years of commercial operation is a reasonable timeframe for analysis. Therefore, staff's primary focus is on the projected range of SLR by 2050 which is between 0.39 foot and 2.0 feet as shown in **Soil & Water Resources Table 5**.[47]

California has a mixed semidiurnal tide cycle, meaning two high and two low tides every lunar day. To determine "present-day" local water levels for the proposed Puente site (such as mean tide level and mean high/low water), staff referenced tidal datum values of the closest tide station at Rincon Island.[48] These values represent the average elevations caused by astronomical position (gravitational interaction of the sun, moon and Earth) and do not include other factors that can raise water levels (such as storms, swells, and El Niño cycles). The tidal datum Mean High Water (MHW) is the average of all the high tides, which occurs twice every lunar day, over the National Tidal Datum Epoch.[49] The Mean Higher High Water (MHHW) is the average of only the higher high tide levels, which occurs once every lunar day. Similarly, the Mean Low Water (MLW) is the average of all low tides over the epoch, and the Mean Lower Low Water (MLLW) is the average of only the lower low tide levels.

The MHHW is the best possible approximation of the threshold at which inundation can begin to occur, because coastal areas higher than MHHW are typically dry most of the time. The highest high tides within a calendar year are typically referred to as "king tides", which generally refers to the peak winter high tides and occurs two or three times a year. Present-day elevation of MHHW is 5.36 feet along this portion of the coast. Coastal areas close to but higher than this elevation are typically dry most of the time, but occasional flooding may occur during winter when tides are higher. Present day "king tides" are at an elevation of about 7.0 feet about two or three times a year. By 2050, SLR is expected to increase water levels by 0.39 foot at a minimum or possibly as much as 2.0 feet. Staff added these low and high projections to the present-day local tidal datum to calculate the projected range of future mean tide elevations, as shown in **Soil & Water Resources Table 6**. When the highest estimate of SLR is used, the projected MHHW in 2050 is higher than present-day king tides. Under this scenario, areas that currently flood twice a year during king tides could potentially flood every month for multiple days.

[47] For more information, see the "Planning Horizon" discussion of **Appendix SW-1**.

[48] NOAA Tide Predictions of Rincon Island, Station ID 9411270. NOAA determines values at this subordinate station based on data from the Los Angeles tide station.

[49] The "present-day" epoch used by NOAA is the period 1983 – 2001.

Soil & Water Resources Table 6
Current and Future Station Tidal Datums for Rincon Island

Description	Elevation (feet, NAVD88)		
	Present Day	2050 Low Estimate	2050 High Estimate
Mean Higher-High Water (MHHW)	5.36	5.75	7.36
Mean High Water (MHW)	4.60	4.99	6.60
Mean Tide Level (MTL)	2.75	3.14	4.75
Mean Low Water (MLW)	0.89	1.28	2.89
Mean Lower-Low Water (MLLW)	-0.10	0.29	1.90

(Source: NOAA 2003, see **Appendix SW-3 Figure 2**)

Note: Present Day tidal datums are based on the latest published epoch (1983-2001) published by NOAA. This tidal epoch can be considered equivalent to the year 2000 baseline for the NRC projections (CCC 2015).

A demonstration of potential increase of coastal flooding is depicted in **Soil & Water Resources Figure 12**. Staff collected data of daily tidal levels for 2015 and determined that the peak tide for that year occurred twice in November reaching 6.8 feet (shown in blue). To show how SLR could affect regular tide elevations, staff added 0.39 foot to the same daily tide data for 2015 and calculated the number of days that tide levels were 6.8 feet or above (shown in red) to represent the low SLR scenario. The process was repeated adding 2.0 feet (shown in green) to represent the high SLR scenario.

Staff's example shows that SLR would cause local tide levels to reach 7.0 feet or above during more days of the year. When the lowest SLR projection of 0.39 foot is assumed, the number of days that tides reach seven feet could increase from a few days each year (present-day) to a few days each month during the fall and winter by 2050. When the highest SLR projection of 2.0 feet is assumed, the number of days could increase to occurring every month of the year for two weeks or more. Even with the highest projection of king tides reaching nine feet, the elevation of the proposed site is at 14.0 feet and the dunes separate the ocean from the site. While these future tide elevations alone would not threaten the Puente site, they would contribute to potential wave damage and flooding when combined with other factors that raise water levels (described below).

Sea Level Rise – Consider Storms and Other Extreme Events

Currently, storm waves that impact the coast during low tide generally will not cause coastal flooding. Most of the damage and subsequent flooding along the California coast occurs when large storms (wind forcing and storm surges) coincide with high tides or other contributors to local sea level changes such as remote swells, and Pacific Ocean basin-wide phenomena (e.g. El Niño Southern Oscillation, Pacific Decadal Oscillation (PDO)). Although each factor may only contribute one foot or less individually, the additive effects can cause a substantial rise to the total water level (TWL). These various effects are not always consistent and can occur for different lengths of time (potentially lasting days or months) which becomes difficult to estimate when or how long two or more factors may coincide (see **Soil & Water Resources**

Figure 13). For example, local tides can raise levels five feet within a day and an extreme storm can cause water levels to increase about five feet over the course of hours. Slower, longer-term rates of change include El Niño type events that can raise sea levels by 1-2 feet over months.

Tides are periodic and very predictable, but the other potential components of sea-level fluctuations are less predictable. Storms are highly seasonal and episodic. During the winter months, intense extra-tropical storms follow a more southerly track and affect the central and southern portion of the state. Occasional "atmospheric rivers" originating in the tropics also approach from the southwest, bringing periods of heavy rains and warm temperatures. Deep-water swells travel primarily from the west and northwest, but southern swells can affect wave climate[50] during the summer months.

During El Niño winter months, storms tend to increase in frequency and intensity in Southern California with higher monthly mean significant wave heights and extreme wave heights. Also during El Niño, there is a greater occurrence of large waves from the west, southwest, and south which can affect shorelines that are typically sheltered from northwest swells (see **Soil & Water Figure 11**). Extreme coastal events are usually caused by large amounts of energy from large waves that coincide with high tides or a strong El Niño cycle. For example, one of the more damaging storm seasons on record occurred during the 1982/83 El Niño when waves from a distant storm combined with locally generated waves and the highest tides of the year, resulting in substantial damage along much of the California Coast.

The NRC report states that all climate models project California will continue to experience winter storm activity in future decades, with storm-generated bursts of high sea levels and waves expected to vary from year to year and decade to decade. Short-period fluctuations of sea level may sometimes exceed eight inches, and storm-driven wave heights of three feet or even higher amplitudes than are seen in the historical record could easily occur. These variations will have greatest impact when they occur on days with high tides (NRC 2012). Although the effects of climate change on future storms are inconclusive (i.e. whether typical storms or El Niño events would be more intense or occur more often), the impact of SLR alone is expected to increase the number and duration of extreme high water events.[51]

As discussed in "Hazard – Coastal Flooding" above, the Puente site is currently located outside the VE Zone (coastal high hazard area during the 1-percent annual chance flood) on FEMA's current effective map and it is expected to stay outside the VE Zone in FEMA's revised preliminary map. This is consistent with past MGS records spanning more than 60 years that indicate no impacts or damage to the dunes or MGS facilities due to waves or storm surges. In particular, the two strongest El Niño cycles on record which occurred 1982/83 and 1997/98 (see **Soil & Water Figure 14**) were accompanied by large waves and storm surges that caused damage to Oxnard Shores and other

[50] Wave climate is the long-term statistical characterization of the behavior of waves in the ocean (e.g. seasonal variations).

[51] Similar to the impact of SLR on tides (see **Soil & Water Resources Figure 12**), the likelihood of an extreme flood event occurring in the future increases with the actual rate of sea level rise.

locations in Ventura County, but no recorded damage at the MGS facility or impacts to MGS operations (PPP 2015k). However, FEMA coastal hazard maps do not incorporate any future affects due to climate change.

Many studies in recent years have used computer modeling to understand the extent of future coastal hazards due to climate change. Several government agencies and environmental institutes have translated the results of different studies into simplified, web-based tools available to local planners and other interested members of the public. Staff chose to use the Coastal Storm Modeling System (CoSMoS 3.0) because it projects Southern California coastal flooding and erosion due to both sea level rise and storms driven by climate change. To account for future impacts of climate change, models are driven by output from the latest Global Climate Models and include regional and local sea level rise factors. The projections were generated using the latest downscaled climate projections[52] and fluvial discharges for Southern California and calibrated hydrodynamic models. The resulting maps incorporate future sea level rise into the analysis, and acknowledge that storms may not persist long enough to cause maximum possible beach erosion.[53] As shown in **Soil & Water Resources Figure 15** and **Figure 16**, coastal storm modeling shows no inundation of the site during a 100-year storm with 3.3 feet of SLR.

Sea Level Rise – Consider Changing Shorelines

The Puente site is separated from the Pacific Ocean by sand dunes and a wide, sandy beach. As discussed in "Soil Erosion and Dune Impacts" above, the beach and dunes form a dynamic system that protect low-lying coastal areas from flooding. Beach widths change seasonally due to changes in weather, storm intensity, and wave climate and seasonal beach erosion is typically a recoverable process. The distance between the toe of the dunes (the base of the dune facing the ocean) and the existing water level at MHHW can be up to 500 feet.

The NRC report states that storms and SLR are causing beaches and dunes to retreat horizontally. More intense storms could increase erosion and more frequent storms could hinder recovery.[54] An assessment of impacts from SLR to shoreline projects must address local shoreline changes, such as accounting for changes in El Niño frequency, storm intensity, sediment supply, or changing transport conditions.

Based on staff's research, this section of shoreline does not appear to be at high risk of erosion. A comparison between two aerial photographs taken in 1947 and 2014, show an increase in beach width that is conservatively estimated to be 200 feet (PPP 2015k, §54). The site-specific characteristics of the beach (e.g. wide, dune backed, relatively low exposure to southern swells, and downcoast from a large sediment source, the Santa Clara River) support this long-term shoreline accretion. In addition, there was no recorded damage to the MGS facility during the two strongest El Niño cycles on record

[52] Because global climate models are spatially coarse and not adequate for evaluating local climate impacts, downscaled projections are translated to locally relevant resolution so that they can address monthly and daily climate questions.

[53] Further discussion about Hazard Zone Mapping is in **Appendix SW-1**.

[54] Further discussion about Storm-Induced Erosion is in **Appendix SW-1**.

(occurring 1982/83 and 1997/98). El Niño years are typically times of significant sediment introduction to the coast because of increased likelihood of extreme rainfall events (USGS 2006). Sediment supply is not expected to decrease during the project lifetime.[55]

The newly developed CoSMoS - Coastal One-line Assimilated Simulation Tool (COAST) includes a numerical model which simulates long-term shoreline evolution due to sediment mobilized by waves and SLR. Staff used this tool to evaluate potential changes in the shoreline at the site. The modeled processes include longshore and cross-shore sediment transport, the effects of SLR, and sediment supply from natural sources and human activities. A key assumption of the tool is that any shoreline profile with a positive rate of change (seaward) is a result of a generous sediment source ("nourishment"). Given the historical beach growth discussed above, CoSMoS-COAST applied this assumption to the stretch of the shoreline at the project site. The positive rates of change are assimilated into the future projections, along with other drivers of shoreline change, notably sea level rise and cross-shore and alongshore sediment transport processes due to waves. Because this assumption could result in the potential underestimation of future beach erosion, modeling was also performed assuming these areas would have no future sediment "nourishment" (by setting the historical rate to zero) (USGS 2016).

The results of CoSMoS-COAST (see **Soil & Water Resources Figure 17**) show the projected shoreline near the project site by 2050 when assuming almost two feet of SLR, a high estimate of SLR as listed in **Soil & Water Resources Table 5**. The green line shows the initial condition and represents the present-day location of the shoreline. The final shoreline position due to longshore and cross-shore sediment transport was modeled under two scenarios. The blue line assumes that nourishment at this location continues in the future, and the red line assumes that no future nourishment occurs. The shaded areas of blue and red show the range of uncertainty for each scenario, which includes the potential for additional erosion during winter.

As shown in **Soil & Water Resources Figure 17**, both the blue and red lines are seaward of the green line. This indicates that the projected change in shoreline under both nourishment scenarios is expected to result in a wider beach by 2050. This circumstance is not typical along the Ventura County coastline. According to the CoSMoS-COAST results, the beach is projected to widen under both scenarios at two locations: approximately 12,000 feet of shoreline at Mandalay Beach (between Gonzales Rd and Wooley Rd) and approximately 3,000 feet of shoreline at Point Mugu Naval Air Station. The rest of Ventura County is expected to experience beach erosion under one or both nourishment scenarios.

Also shown in **Soil & Water Resources Figure 17**, when potential winter erosion is incorporated, the final shoreline position at the project site could be located at roughly the same position as the initial shoreline (assuming continued nourishment) or between 50 to 90 feet inland of the initial shoreline position (assuming no future nourishment).

[55] For further discussion on sediment supply, see the "Hazard – Sediment Deficiency to Beaches" discussion on page 4.11-40.

These results indicate that the amount of longshore and cross-shore sediment transport over the next 30 years is projected to potentially compensate or at least offset future erosion caused by a high estimate of SLR (as listed in **Soil & Water Resources Table 5**).

Sea Level Rise – Discussion

As instructed by the state guidance for sea level rise, staff's evaluation of risks of coastal flooding used the "most recent and best available science" and considered the project timeframe, risk tolerance, extreme events, and changing shorelines. The NRC report, which is considered California's best available science, projects future sea level rise to be up to 2.0 feet by 2050, when the project is expected to end its commercial operation. Because the proposed project is not a critical facility, flood protection beyond the standard 1-percent annual chance event or for an extended timeframe (e.g. 100 years) is not warranted. The CoSMoS 3.0 modeling system, which projects coastal flooding and erosion due to both sea level rise and storms driven by climate change, shows that no inundation of the site is expected during a 100-year storm with 3.3 feet of SLR (as shown in **Soil & Water Resources Figure 15** and **Figure 16**). FEMA flood mapping shows similar results (see **Soil & Water Resources Figure 7**) of no inundation at the site during a 1-percent chance annual event.[56]

Long-term shoreline changes due to different SLR scenarios were projected using the CoSMoS-COAST modeling system. Assuming sea level rise of two feet occurs by 2050, the projection of shoreline change includes cumulative storm activity, seasonal trends, El Niño Southern Oscillation, and SLR. **Soil & Water Resources Figure 17** shows the projected shoreline position when potential winter erosion is included, but it does not map flooding from a large storm event. An effort has begun to map flood hazard areas of Southern California using CoSMoS 3.0 that incorporates long-term shoreline change for specific scenarios (e.g. 100-year storm event with two feet of SLR). To date, maps for the San Diego County coastline have been released, but maps for Ventura County and the rest of Southern California are still under development.[57]

As shown in **Soil & Water Resources Figure 17**, final shoreline position at the project site could be located at roughly the same position as the initial shoreline (assuming continued nourishment) or between 50 to 90 feet inland of the initial shoreline position (assuming no future nourishment). Because widening of Mandalay Beach is projected to continue to 2050, the incremental daily erosion due to SLR is projected to be limited. Therefore, the flood hazard areas presented in **Soil & Water Resources Figure 15** and **Figure 16** are reasonable projections of flood hazards that include long-term shoreline change. For these reasons, from **Soil & Water Resources Table 3** staff **expects** that

[56] Although similar, mapping results from FEMA and CoSMoS do not exactly agree. These discrepancies stem from the differing characteristics of each tool, as described in the "Hazard Zone Mapping" discussion of **Appendix SW-1**.

[57] The coastlines of San Diego County and Ventura County are very different, so a review of recently released maps of San Diego would not provide much insight about potential changes for Ventura County.

coastal flood risk would be low during the 30-year lifespan of the proposed project even with uncertainties of hazard modeling and rate of future SLR.[58]

As discussed above[59], the Edison Canal's distant connection to the Pacific Ocean could potentially provide a pathway for storm surge and floodwaters elevated by SLR to reach the MGS property. Large storm waves originating from the ocean are not expected to reach the project site because the long length, relatively narrow and shallow geometry, and complex shape of the waterway would dissipate the wave energy. Even if these large storm waves were to occur during king tide with the highest SLR projection, elevated water levels would begin to overtop the harbor and marina before traveling the length of the canal to flood the site. For example, Channel Islands Blvd, which marks the border between Channel Islands Harbor and Mandalay Bay marina, crosses over the waterway at two locations (see **Soil & Water Resources Figure 4**). The roadway elevation of Channel Islands Blvd in this area is approximately 12 feet (NAVD 88). Elevated water levels would first fill the low-lying areas east of the harbor along Channel Islands Blvd before reaching the Puente site which would be at an elevation of 14 feet. Because the likelihood of future flooding via the Edison Canal and the consequence of flood damage is low (Puente is not a critical facility), from **Soil & Water Resources Table 3** staff concludes that this **flood risk is low**.

Staff also considered the possibility of Puente becoming operational but then unexpectedly shutting down prior to the anticipated operating life of 30 years. A variety of factors could result in facility closure, including, but not limited to, economic conditions, irreparable damage, or functional obsolescence. Condition of Certification **COM-15** (see the **Compliance Conditions** section of this FSA) anticipates eventual facility closure by requiring a Provisional Closure Plan and Estimate of Permanent Closure Costs. This plan described the closure process (including demolition, site remediation, and contingencies) and is developed during the start of commercial operation with updates every five years. If a project owner initiates but then suspends closure activities, the Energy Commission may initiate correction action against the project owner to complete facility closure, and the owner remains liable for all associated costs. Because Condition of Certification **COM-15** ensures the demolition of the facility following permanent closure, from **Soil & Water Resources Table 3** staff concludes that **long-term, "legacy" coastal flood risk is zero**.

Conversely, Puente could potentially operate for longer than expected. Staff understands that a lifespan of 30 years for a "typical" natural gas power plant is generally accepted within the power industry, and that actual useful life depends on need, location, maintenance investments, partial load cycling operation and frequency of starts and stops. If Puente continues to be economically viable after 30 years, an unlikely scenario for a fossil-fueled unit, the facility would likely require some type of equipment update or system overhaul. These types of changes would trigger

[58] On May 25, 2016 the CPUC approved a 20-year contract between SCE and NRG for gas fired generation at P3. Staff's review of the proposed project is conducted independent of the CPUC's approval of this underlying contract. The CPUC found that "during the term of the contract and the expected life of the plant, the risk of coastal flooding has not been shown to compromise the reliability of the proposed project".

[59] See subheading "Hazard – Flooding via the Edison Canal" above.

submission of a Petition to Amend the Energy Commission Decision in accordance with Condition of Certification **COM-10**. If a proposed modification results in an added, changed, or deleted condition of certification, or makes changes causing noncompliance with any applicable LORS, the petition shall be processed as a formal amendment to the Decision, triggering public notification of the proposal, public review of the Energy Commission staff's analysis, and consideration of approval by the full Energy Commission.

Analysis of coastal flood risks for extended operations is beyond the scope of this staff assessment but is worth mentioning with regards to Executive Order B-30-15 considering climate change in planning decisions. While flooding to some extent is expected to occur gradually over the long-term, the number of years before the eventual occurrence of long-term or permanent inundation is difficult to predict. SLR projections after 2050 become increasingly more uncertain and by 2100 uncertainties are large. The most significant threats to California's shoreline over the next few decades will continue to be short-term episodic events, but the impacts of climate change on the Puente site after 2050 is unclear. Timing is imprecise and the extent of impacts could potentially range from occasional nuisance flooding, to increased days of unscheduled outages, to facility closure due to irreparable damage.

MGS DECOMMISSIONING/DEMOLITION

Soil Erosion and Storm Water Control

Decommissioning and demolition activities could potentially cause impacts similar to construction activities (see the "Puente Construction" subsection on page 4.11-23). The applicant states that neither MGS decommissioning nor MGS demolition would involve excavation of underground infrastructure or substantial soil disturbance activities. The demolition area is approximately 3.9 acres, which consists of the existing MGS Unit 1 and 2 structures and adjacent paved area (about 3.4 acres) and the ocean outfall structure (0.4 acre). The laydown and staging areas used during Puente construction would continue to be used during decommissioning and demolition as needed, implementing standard BMPs similar to those used for construction. BMPs, as needed and as appropriate, could include sediment control measures and tracking control measures (PPP 2015c, PPP 2015y §§1.4 and 4.11.2).

Staff agrees these measures are appropriate. Demolition activities, in particular, are subject to requirements of the Construction General Permit.[60] Although demolition does not propose excavation or substantial soil disturbance, the proposed demolition activities might be considered part of a larger common plan that includes Puente construction. Condition of Certification **SOIL&WATER-1** requires the construction SWPPP to include demolition activities of MGS Units 1 and 2 and the ocean outfall structure, unless documentation from the SWRCB or the LA RWQCB is provided that shows the NPDES Permit is not required for proposed demolition activities.

[60] The Construction General Permit (SWRCB Order No. 2009-0009-DWQ) covers any construction or demolition activity, including clearing, grading, excavation, or other land disturbance (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale).

Even if the SWRCB or the LARWQCB determines that MGS demolition activities are not required to comply with the NPDES Permit, the applicant proposes to develop and implement a Demolition Hazardous Building Materials Management Plan and a Demolition Waste Management Plan (PPP 2015y §4.14.2). Other conditions of certification in the **Waste Management** section of this FSA address wastes, including cleanup of all spills of hazardous substances.

Because no substantial soil disturbance activities would occur and implementation of BMPs would continue through MGS decommissioning and demolition, the impacts of soil erosion and storm water runoff would be **less than significant**.

Wastewater Management

Wastewater generated during decommissioning and demolition would include sanitary waste, storm water runoff, and liquid wastes. Wastewater that is not properly disposed could potentially contaminate groundwater through soil infiltration, as well as a nearby water body through direct discharge or contact runoff.

The applicant states that all wastewater related to decommissioning and demolition would be managed according to appropriate LORS. Hazardous wastewater would be collected by a licensed hazardous waste hauler for disposal at a licensed hazardous waste facility. Sanitary waste would be handled either by portable toilet facilities and/or the existing MGS septic system. Storm water runoff would be managed by the onsite storm water collection system, and standard BMPs similar to those used for construction would be implemented to manage various liquid wastes. BMPs relevant to decommissioning and demolition activities and handling of wastewater would include:

- Non-storm Water Management - water conservation practices; vehicle and equipment cleaning, fueling, and maintenance, and concrete curing.
- Waste Management - material delivery and storage, material use, stockpile management, spill prevention and control, solid waste management, hazardous waste management, concrete waste management, and septic/sanitary waste management.

Staff concludes that BMPs during decommissioning and demolition would minimize impacts on water quality through erosion control and wastewater management. Both the onsite storm water collection system and the existing MGS septic system must be covered under project-specific Water Board permits.[61] Portable toilet facilities would be serviced by a contracted and permitted sanitary service. These permits specify discharge prohibitions, effluent limitations, and monitoring and reporting requirements to show that minimum water quality standards are achieved. Because MGS decommissioning and demolition activities would be implement appropriate BMPs, and discharges of storm water runoff and septic waste are regulated under Water Board permits, the impacts of wastewater on soil and water resources would be **less than significant**.

[61] LARWQCB Order No. R-4-2008-0087 for the onsite sewage treatment system

Groundwater Quality

Groundwater quality impacts could occur if decommissioning or demolition activities allow contaminants to reach groundwater, either directly (when excavation reaches groundwater level) or through soil infiltration. The applicant states that neither decommissioning nor demolition activities intend to excavate and remove any buried conduits or pipes. Existing MGS buried conduits and piping would be abandoned in-place, blocked, and sealed with a cement grout at entrance, exit, and manhole access locations to preclude water entry and potential pathways to subsurface discharge. All chemicals and hazardous materials associated with MGS Units 1 and 2 would be removed from the site and disposed of. Following decommissioning, some equipment and piping (such as lube oil tanks or fuel oil piping) that, although emptied of hazardous materials, may still be contaminated. This equipment would be removed and disposed of in compliance with all applicable federal, state, and local requirements.

Because no substantial soil disturbance activities would occur and implementation of BMPs would minimize or eliminate pollutant spills that could potentially infiltrate to groundwater, the impacts of MGS decommissioning or demolition on groundwater quality would be **less than significant**.

Surface Water Quality

As discussed above, soil erosion, storm water runoff, and wastewater discharges during MGS decommissioning or demolition would not significantly impact the water quality of nearby water bodies. However when once-through cooling of Units 1 and 2 cease, reduced flows could potentially impact the water quality of the Edison Canal. Although elimination of once-through cooling for MGS will occur irrespective and independent of Puente approval, staff analyzed impacts of MGS decommissioning because it was included in the project description.

Edison Canal

As discussed above in the “Project Description”, decommissioning of MGS Units 1 and 2 would occur in order for the applicant to comply with the state’s OTC Policy. Replacing the steam generators of MGS with the combustion turbine generator of Puente would eliminate the need for steam-cycle condensation, which would cease the use of once-through cooling. Although the absence of a steam cycle eliminates OTC discharges, Puente would produce other wastewater discharges (estimated annual average of 6.5 afy) consisting of reverse osmosis reject, softener regeneration waste, evaporative cooler blowdown, and OWS discharge (PPP 2015a §2.7.6.1, Table 2.7-5). The WDR permit, as required in **SOIL&WATER-4**, would specify discharge prohibitions, effluent limitations, and monitoring and reporting requirements to show that minimum water quality standards are achieved. Therefore, the potential water quality impacts on the Edison canal from project discharges would be **less than significant**.

In addition, MGS decommissioning could theoretically degrade water quality of the Edison Canal and Channel Islands Harbor by reducing flushing and water circulation. Detrimental water quality in a marine harbor can be avoided by reducing the potential sources of pollutants and maintaining an optimal flush rate. If pollutant concentrations are allowed to increase above critical levels, then water quality can degrade. Adequate

flushing and water circulation within a marina improves water quality, reduces or eliminates water stagnation, and helps maintain biological productivity and aesthetics.

Flushing

The flush time of a harbor is basically the time needed to remove or reduce (to a target concentration) a dissolved or suspended contaminant. In other words, it is how fast water in the harbor is mixed with "new" water from the ocean. When a single number (e.g. 10 days) is given as the flushing time of a body of water (e.g. marina basin, harbor, or estuary), this number represents an average time for flushing and replacement for the entire body of water[62]. The water exchange rate is affected by many factors such as harbor configuration, local tidal range, wave climate, and weather conditions. Depending on the geographical location, one or more of these variables can dominate the water exchange properties of a harbor at any given time.

Recognizing the importance of marina flushing in efforts to minimize nonpoint source pollution in coastal waters, the U.S. Environmental Protection Agency (EPA) provides guidelines for marina flushing management measures. It identified BMPs as illustrative examples of flushing guidelines in different coastal regions and primarily applies to new or expanding marinas. Although there is no specific guideline for marina basins in Southern California, EPA guidelines for southeastern and northwestern United States suggests flushing reductions (the amount of conservative substance[63] that is flushed for the basin) ranging from 70 percent to 90 percent over a 24-hour period to maintain water quality (USEPA 1993).

Harbor Circulation Study

A circulation study of Channel Islands Harbor (EIC 2003) was conducted in 2003 to define circulatory conditions, gauge the ability of enhanced circulation to affect and reduce bacteria exceedances, and determine the means of enhancing circulation. The study was part of a larger effort, at the time, to address exceedance of water quality standards for bacteria at the two small, adjacent beaches located inside the Channel Islands Harbor. Bacteria sampling and testing, water current measurements, and a dye study was conducted in support of the circulation study. Staff focused on the study's analysis of dominant factors that affect the harbor's circulation: tidal currents, MGS pumping flows, and wind-induced currents.

To examine the roles that these three factors play, the study used the RMA-2 model, a two-dimensional numerical hydrodynamic model developed by the U.S. Army Corp of Engineers. Results of the circulation analysis indicated that tidal currents are dominant and MGS pumping[64] flows are secondary. During ebb currents (falling tide), MGS pumping reduces the velocity of harbor water through the harbor entrance toward the ocean. Conversely, the velocity of flow currents (rising tides) are increased into the

[62] Residence time of a contaminant in a marina basin can range from zero days at the ocean boundary to as much as several weeks within the marina basin at secluded locations or where in-water structures prevent water from circulating.

[63] These are substances that do not decay, so the concentration is a function of dilution.

[64] Modeling simulations assumed MGS operating with all pumps on producing a pumping rate of 253 million gallons per day.

harbor entrance by approximately 12 percent compared to tidal currents alone. The study states that even though the circulation is better relative to conditions with tides only, circulation at the two small beaches is still relatively poor compared to circulation at the harbor entrance channel area (EIC 2003). In other words, MGS pumping has a minor effect in water circulation.

Staff's Simplified Estimate

The scope of the Harbor Circulation Improvement Study did not include flush time[65], so staff attempted to estimate average flush time for the entire system (Channel Islands Harbor, Mandalay Bay marina, and Edison Canal) using a simple model. In **Appendix SW-3**, staff compared marine harbor flush rates with and without flows induced by once-through cooling of MGS Units 1 and 2. Staff notes that calculated values of flush times with MGS pumping assume that all four pumps operate continuously and at full capacity. This in turn would imply that MGS generates power continuously, which is not accurate as explained below. MGS only produces a small fraction of its total maximum capacity of power generation, so its actual contribution to marina flushing is limited based on the number of days it is in operation. Staff also acknowledges that the calculated flush times do not adequately represent conditions of the harbor system, because the model used by staff is far too simple to apply to such a complex system (consisting of an elongated harbor with one entrance, a marina with multiple segments, and a non-navigable canal over two miles long) with areas of restricted circulation. The use of simplified models in such cases can greatly underestimate flush times (NOAA 2004).

Despite this weakness, staff's intention is to estimate relative flush times (with and without MGS pumping) knowing that the calculated values are underestimations, possibly by a very large margin. Results were evaluated knowing that actual flush times would be longer than the calculated values. Even with these underestimations, as discussed in **Appendix SW-3**, staff made the following important conclusions:

1. Tidal currents alone do not provide adequate flushing. The EPA guideline recommends a flush time of one day to "refresh" from 70 perfect to 90 percent of the total volume of water. Staff calculations show that the one day flush time would, at best, refresh 15 percent of the water. Using the ideal mixing assumptions, flush times calculated to reach 70 percent and 90 percent are 8.2 days and 15.6 days, respectively. Actual flush times are expected to be longer than these calculated values.

2. MGS pumping improves circulation, but flush times are still well below EPA guidelines. Using ideal mixing assumptions, staff calculations show that MGS pumping might improve flush times by, at best, 40 percent. This is a relative comparison and actual flush times are expected to be longer than calculated values.

3. It is worth repeating that these calculations assume that MGS generates power continuously. In reality, MGS only produces a small fraction of its total maximum capacity of power generation, as discussed below.

[65] Instead, the study modeled contaminant dispersal at the two beaches.

MGS Capacity Factors

The capacity factor of a power plant is the ratio of its actual output over a period of time, to its potential output if it were possible for it to operate at full nameplate capacity continuously over the same period of time. This ratio, typically expressed as a percentage, indicates a facility's level of use. As shown in **Soil & Water Resources Figure 18**, California had a sharp decline in generation from aging power plants[66], such as MGS, which began a trend that continued as more modern fossil-fueled and renewable plants were brought online. Eventually the capacity factors of these aging plants became as low as peaking generators, on average operating at a 5 percent capacity factor in 2013, compared to a 42 percent capacity factor in 2001. Also shown in **Soil & Water Resources Figure 18**, the combined use of MGS Units 1 and 2 follows the same downward trend of aging power plants in the state.

The capacity factor data illustrate the overall utilization of the total MGS capacity, but to understand the operating profile of the MGS it is also important to note the variability in unit loads. The California Independent System Operator (CAISO) will often take advantage of the MGS' low minimum operating level and its ramping capabilities and operate the MGS at minimum loads to meet existing and anticipated electrical reliability needs. **Soil & Water Resources Figure 19** shows that average loads have generally been well below maximum loads, and for the majority of the year MGS does not generate power. There are four 44,000–gallon-per-minute (gpm) pumps serving MGS Units 1 and 2, two pumps for each unit (PPP 2015c). Facility operating procedures have been modified as of October 1, 2011, to specifically require that these water pumps are removed from service whenever the units are not directly engaged in power-generating activities, post-generation equipment cooling, or critical system maintenance, as defined in the OTC Policy. Generally, when the units are generating power, these pumps are on; otherwise, the pumps are off.[67] As a result, these four pumps do not operate for most of the year (see **Soil & Water Resources Figure 19**).

Annual capacity factors from 2010 to 2014 ranged between 2.1 percent and 5.7 percent, with a five-year average of 3.9 percent (see **Soil & Water Resources Table 7** below). This is a considerable drop from the previous year period, from 2006 to 2010, which had an average capacity factor of 9.4 percent.

[66] "Aging" power plants are those plants built prior to 1980 and are composed almost exclusively of steam turbines that use once-through cooling technology. Due to air quality and environmental concerns, aging power plants are being phased out or repowered with cleaner, more efficient combustion turbine technology. There were 27 of these aging plants in 2001, and by 2013 there were 19 still operational.

[67] MGS Unit 3 is served by a 3,200-gpm pump, which does not need to maintain a minimum flow to circulate service water when not producing power (PPP 2015c). However, this low capacity pump operates for three to four hours once or twice per day for "critical system maintenance" to provide a low-volume stream of bearing cooling water (LARWQCB 2015). Also, when the units have been shut down for an extended period of time, it is necessary to operate a 44,000 gpm pump for a short period of time to prevent sand buildup at the ocean outfall that would impair operations (LARWQCB 2015).

Soil & Water Resources Table 7
MGS Recent Water Use and Capacity Factors

	Potable Water Use (acre-feet)	Ocean Water Inflow (acre-feet)	Capacity Factor[1] (%)
2010	38.6	47,753	2.05
2011	48.4	64,031	2.36
2012	76.5	86,015	5.59
2013	87.8	122,354	5.74
2014	58.2	74,007	3.87
Five Year Average	61.9	78,832	3.92

(Source: PPP 2015a Table 4.15-3, PPP 2015c)
Note 1: Capacity factor based on net megawatt-hours of MGS Units 1 and 2 out of total maximum megawatt-hours possible.

Discussion

Staff concludes that the main cause of potential water stagnation is the complex configuration of the harbor and marina, which hinders the circulation of water. Although estimates from the Harbor Circulation Improvement Study show MGS pumping increases flows into the harbor during rising tides, it found that pumping at full capacity was only a minor improvement to water circulation within the harbor. Staff's simplified estimate of average flush time for the entire system (Channel Islands Harbor, Mandalay Bay marina, and Edison Canal) concluded that tidal currents alone do not provide adequate flushing and that actual flush times are still well below EPA guidelines even with all four MGS pumps operating continuously and at full capacity.

In reality, MGS only produces a small fraction of its total maximum capacity of power generation. Pumps do not operate when the units are not directly engaged in power-generating or post-generation equipment cooling activities or critical system maintenance, so its contribution to marina flushing is limited based on the number of days it is in operation. Its downward trend of energy production has decreased the amount of cooling water pumped over the past ten years or more. Staff considers the years since 2010, when the facility's capacity factor has remained less than 6 percent (as shown in **Soil & Water Resources Table 7**), to be the "baseline physical condition" by which staff determines whether the impact is significant. Because MGS pumping is only a minor contribution to flush time and the pumps do not operate for most of the year, any impacts from shutting down the pumps are **less than significant**.

Water Supply

The source of water for both MGS decommissioning and demolition activities would be potable water provided by the city of Oxnard, delivered via an existing MGS water line. Over the six month decommissioning period, total water use would be approximately 198,000 gallons, or approximately 0.6 ac-ft (PPP 2015c, CEC 2016ab). During the 15-month demolition period, approximately 3.2 ac-ft would be used, which includes domestic water use. The average use would be approximately 0.21 ac-ft per month, peaking for threemonths at about 0.31 ac-ft per month during removal of boiler plant equipment and structures (PPP 2015y Table 2-4).

Although this amount of water use is individually minor, when added with concurrent water use during other phases of the proposed project, it could potentially impact potable water supplies. Staff's evaluation of these potential impacts analyzes water use from all phases of the proposed project in the "Cumulative Impacts" subsection below (see the "Water Supply" discussion on page 4.11-63).

INDIRECT IMPACTS

Indirect impacts are effects caused by the project and occurring later in time or farther removed in distance, but still reasonably foreseeable. Indirect impacts usually result from a chain of events caused by the project, intended or not.

Growth Inducing

Each new municipal facility constructed, such as a power plant, has the potential to promote population growth in the vicinity. The resulting population increase could strain existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The **Socioeconomics** section of this FSA discusses growth-inducing impacts, and further concludes that the construction and operation workforces would not directly or indirectly induce substantial growth or a concentration of population and the Puente project would not encourage people to permanently move into the area. Based on this information, the approval of Puente would not indirectly result in a significant increase of water and wastewater utility customers.

CUMULATIVE IMPACTS

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code Regulations, Title 14, section 15130).

Surface Water and Groundwater Quality

As identified in the **Executive Summary** section of this FSA, 126 projects within ten miles of the proposed Puente project have been approved, are under review, or in construction (see **Executive Summary Table 1** and **Executive Summary Figure 1**). Approximately ten of these projects, along with the proposed project, have the potential to contribute to increased local soil erosion and storm water runoff. Without the use of storm water BMPs and erosion control BMPs, these changes could incrementally increase local soil erosion and storm water runoff leading to significant impacts to the quality of receiving water bodies. By complying with all applicable erosion and storm water management LORS, including the NPDES Construction General Permit, the proposed Puente project would avoid or substantially lessen the cumulative problem.[68]

[68] CEQA also allows the lead agency to determine that a project's contribution to a cumulative impact is not significant "if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the

The Puente project's contribution would not be "cumulatively considerable" and, therefore, not significant.

Water Supply

Estimated potable water use for all phases of the proposed project are shown below in **Soil & Water Resources Table 8**. Annual water use peaks during the 15-month period when MGS demolition overlaps with Puente initial operations, assuming that Puente is dispatched to operate the maximum allowable hours.

Soil & Water Resources Table 8
Estimated Potable Water Use for All Phases[1]

	Puente Construction	MGS Decommissioning	MGS Demolition	Puente Operations	Annual Total (acre-feet)
Begin End	Oct 2018 June 2020	Jan 2021 June 2021	July 2021 Dec 2022	June 2020 June 2050	
2018	0.7				0.7
2019	3.1				3.1
2020	1.0			9.5	10.5
2021		0.6	0.9	19	20.5
2022			2.3	19	21.3
2023				19	19
Phase Total	4.8	0.6	3.2		

(Sources: PPP 2015a Table 2.9-4 and §2.7, PPP 2015c, PPP 2015y Table 2-4, CEC 2016ab)
Note 1: All volumes are in acre-feet and include domestic water use associated with each phase.

CEQA requires an assessment of a proposed project's impacts on the local water supply system. Particularly, the California Water Code sections 10910-10915 require development of a Water Supply Assessment (WSA) containing specific elements related to current and projected supplies and demands of the system's service area. Proposed projects meeting certain size and water usage criteria must have a WSA prepared during the CEQA process, which is typically prepared by the water purveyor.

Based on definitions detailed in the Water Code, the proposed project does not meet the criteria to require a WSA. Specifically, the proposed project would occupy less than 40 acres, would have less than 65,000 square feet of floor area, and would use less water than a 500 dwelling unit project. To verify that a WSA is not required, staff contacted the water purveyor (the city of Oxnard) (CEC 2015n) who confirmed a WSA is not needed.

---

cumulative problem … within the geographic area in which the project is located." (California Code of Regulations, Title 14, section 15064(h)(3).)

In light of the project's use of potable water for construction, decommissioning, and demolition activities[69], staff analyzed whether this use would adversely impact the city's potable water supplies. Because water would be supplied through the existing water connection on the MGS property, staff considered Puente water use in relation to current potable water use at MGS. During the past 5 years, MGS' annual potable water consumption has averaged approximately 62 afy, with a range from approximately 38 afy to 88 afy. This variability in water use is largely due to the variability of the actual number of hours the facility generated power, as reflected in the capacity factor (see **Soil & Water Resources Table 7** above). These power units at MGS no longer operate as baseload power generation and currently operate as peaking generators dispatched by California Independent System Operator (CAISO) during periods of high load demand (GEN 2011).

Because the proposed project would essentially replace the existing MGS (where the annual potable water consumption averaged 62 afy over the past five years), the net result would be a decreased demand of potable water compared to current demand at the Mandalay property. As shown on **Soil & Water Resources Figure 20**, net use of potable water peaks when Puente construction coincides with existing MGS operation. However, potable water use at MGS has varied over the years, so actual net use during this period is difficult to predict.

Potable water use during construction would be temporary, and this amount is small compared to overall MGS potable water use. In addition, decommissioning of MGS Units 1 and 2 would significantly decrease the potable water demand to the MGS property for the long-term. For these reasons, the use of potable water for the proposed project would not adversely impact the city's potable water supplies. Staff recommends Condition of Certification **SOIL&WATER-5** to place annual limits on potable water use and to address possible exceedances prior to reaching the maximum limit.

ENVIRONMENTAL JUSTICE

As discussed in the **Environmental Justice** section of this FSA, the minority population in the six-mile radius around the proposed project constitutes an environmental justice (EJ) population based on race and ethnicity (see **Environmental Justice Figure 1**). **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitute an EJ population based on poverty.

Additionally, much of the land located east of the Puente site has agricultural uses (see **Soil & Water Resourced Figure 1**). There are a number of farm workers within the vicinity of the proposed site at any given time. Ventura County's agricultural commissioner estimates that 17,000 to 24,000 immigrant workers come to the county each year at peak growing seasons (COO 2011). Due to the presence of an EJ population among residents and farm workers, this analysis must identify whether the construction and operation of the proposed Puente facility and the demolition of MGS

[69] Although many activities related to construction, decommissioning, and demolition are suitable for non-potable water use, the infrastructure is not in place to provide recycled water to the Puente site. (See discussion on "California Constitution, Article X, Section 2" on page 4.11-68.)

could have significant, unmitigated impacts or disproportionate impacts on an EJ population.

The preceding subsections found that the proposed project would not cause impacts to groundwater quality or potable water supplies, and impacts on surface water quality would be mitigated to less than significant. With respect to flood risks, staff's evaluation concludes that present-day flood risks are low and future flood risks could be between low and moderate.[70] This subsection compares risks and impacts on the EJ populations with respect to the risks and impacts on the overall population within the project area.

DISADVANTAGED COMMUNITIES

The California Communities Environmental Health Screening Tool (CalEnviroScreen) identifies California disadvantaged communities[71] most burdened by pollution based on geographic, socioeconomic, public health, and environmental hazard criteria. The tool's output provides a summary score to show relative ranking for each of the state's 8,000 census tracts by examining 12 types of pollution and environmental factors in relation to vulnerability of the residents based on seven population characteristics. These 19 indicators, listed in **Environmental Justice Table 1**, are used to measure factors that affect the potential for pollution impacts in communities (OEHHA 2014).

It is important to note that CalEnviroScreen is not an expression of health risk and does not provide quantitative information on increases of impacts for specific sites or project. CalEnviroScreen uses the criteria of "proximity" to a hazardous waste site, a leaking underground tank, contaminated soil, an emission stack (industry, power plant, etc.) to determine that a population is "impacted". It does not address general principles of toxicology: dose/response and exposure pathways. For certain toxic chemicals to pose a risk to the public, offsite migration pathways must exist (through ingestion, inhalation, dermal contact, etc.) and contact to a certain amount – not just any amount – must exist.

Staff used CalEnviroScreen 2.0 to identify disadvantaged communities in the vicinity of the proposed project that may have been missed when screened by race and ethnicity only. Because a CalEnviroScreen score evaluates multiple pollutants and factors collectively (as shown in **Environmental Justice Table 4**), staff examined individual contributions of indicators that are relevant to soil and water resources: drinking water contaminants, groundwater threats, and impaired water bodies. The scores presented in **Soil & Water Resources Table 9** are shown as percentiles, which indicate the percent of all census tracts with a lower score. A higher percentile indicates a higher relative burden. For example, each census tract was assigned a "Drinking Water" score based on the relative concentrations of different contaminants and whether multiple contaminants are present. Contaminants could be introduced into drinking water

[70] The coast flood hazards mapped in FEMA's Preliminary FIRM, while not yet formally adopted, are considered to be the best information available.

[71] The California Environmental Protection Agency (CalEPA), for purposes of its Cap-and-Trade Program, has designated "disadvantaged communities" as census tracts having a CalEnviroScreen score at or above the 75th percentile (CALEPA 2014). As a comparative screening tool, it is not intended to be used as a health or ecological risk assessment for a specific area or site.

sources in many ways, such as by natural occurrence, accidents, industrial releases, and agricultural runoff. A census tract with a drinking water contaminant score in the 75 percentile indicates that its burden is higher than 75 percent of all California census tracks.

Soil & Water Resources Table 9
CalEnviroScreen 2.0 Indicator Percentile Scores

Census Tract[1]	Total Population	Overall Score Range[2]	Drinking Water	Groundwater Threats	Impaired Water Bodies
6111004902	5091	96-100%	38.41	85.12	97.27
6111009100	5279	91-95%	38.91	92.68	0
6111004715	5020	91-95%	54.48	88.36	80.63
6111004704	1469	81-85%	54.51	88.18	97.27
6111003900	7533	81-85%	38.91	85.01	0
6111004503	4387	76-80%	38.91	0	0

(Source: CalEnviroScreen 2.0 Data, www1.oehha.ca.gov/calenviroscreen/maps-data/download-data)Notes:

1. Census tract locations are shown in **Environmental Justice Figure 1**.
2. Overall Score Range incorporates all indicators shown in **Soil & Water Resources Table 9**.
3. When a geographic area has no indicator value (for example, the census tract has no reported groundwater threats nearby), it is excluded from the percentile calculation and assigned a score of zero for that indicator.

The indicator scores presented in **Soil & Water Resources Table 9** are somewhat similar between census tracts, with the following exceptions:

- Drinking Water Contaminants: CalEnviroScreen data indicate that two tracts have higher scores due to the presence of total coliform bacteria. These two tracts are located at least six miles from the project site.
- Groundwater Threats: The state collects data of storage tanks that are leaking pollutants on land or underground. This score is based on the number of groundwater cleanup sites, the weight of each site (with consideration of both the site type and status), and the distance to the census tract. The high score of 92.68 corresponds to the tract having 11 sites nearby.
- Impaired Water Bodies: This score is based on the number of pollutants in nearby water bodies listed as impaired (exceeds established standards) and the water bodies' distance to the census tract. Three tracts have high scores due to their distance to impaired waters such as Revolon Slough and Calleguas Creek.

IMPACTS ON WATER QUALITY

Water quality could potentially affect EJ communities due to:

- cumulative risks due to exposure from pollution sources in addition to the proposed project;
- unique exposure pathways and scenarios (e.g., subsistence fishers, farming communities); and

- sensitive populations or socioeconomic factors (e.g., individuals with poor diets, limited or no access to healthcare)

Water quality can be affected by sedimentation caused by erosion, by runoff carrying contaminants, and by wastewater discharge of pollutants (point-source pollution). As land is developed, the new impervious surfaces can send an increased volume of runoff containing oils, heavy metals, and other contaminants (non-point source pollution) into adjacent water bodies. To mitigate potential impacts to less than significant, compliance with project-specific LARWQCB permits would ensure minimum water quality standards are met. Puente wastewater (process wastewater, storm water runoff, and domestic wastewater) would be managed by wastewater systems regulated by LARWQCB. The existing MGS septic system would continue to treat sanitary wastewater (Order No.R-4-2008-0087). The new proposed system to collect process wastewater and storm water would require a new LARWQCB permit to discharge into the Edison Canal, implementing water quality restrictions, monitoring and reporting requirements, and pollution prevention measures. This would ensure there are no cumulative water quality impacts that would affect an EJ community disproportionately.

The City of Oxnard blends imported water with local groundwater to supply municipal potable water. Puente wastewater would discharge water in the Edison Canal, so this effluent would not impact water supply sources. Treated discharges from the septic system would eventually enter the groundwater, which could potentially affect EJ communities. However, no public water supply wells are within one mile of the MGS property (PPP 2015a §4.15.1.4). In addition, wells down gradient of the Puente site are located in an area where groundwater levels have dropped due to excessive pumping. To limit continued groundwater pumping of this coastal area, United Water Conservation District supplies potable water to wholesale customers on the Oxnard Plain (City of Oxnard, Port Hueneme Water Agency, the Naval Base, and a number of small mutual water companies) via the Oxnard-Hueneme pipeline (CH2M 2004). Rather than extracting groundwater, the city's GREAT Program injects recycled water into this area to fight ongoing overdraft and seawater intrusion (see "Local Water Supplies" description on page 4.11-14). Because potable water supplies are protected and Puente wastewater discharges would not affect potable water supplies, mitigated water quality impacts would not disproportionately affect EJ communities.

FLOODING RISKS

Community flooding, regardless of its cause, can result in structural damage, property loss, exposure to contamination or toxic substances, and impacts to public health and safety. Although CalEnviroScreen does not evaluate flood risks, disadvantaged communities could be disproportionately impacted. Low-income households are less likely to afford emergency preparedness materials, buy insurance policies, and obtain needed building improvements. Renters are also less likely to reinforce buildings and buy insurance because the decision to make major improvements and financial gains typically lies with the property owner. Emergency response crews may be unable to communicate with non-English speakers. The ability to remain safe or evacuate high-risk areas during a flood event is largely affected by factors such as quality of residential structures, access to transportation, availability of emergency supplies, effective service by emergency responders, and exposure to environmental hazards (CEC 2009).

Although multiple factors raise the vulnerability of EJ communities to a flood event and increase the likelihood of disproportionate impacts, the proposed Puente project would not cause these communities to flood nor exacerbate flood impacts during a flood event. As described in the "Offsite Flooding Impacts" above, if the vicinity were to become inundated from flood hazards, location of the Puente site would not cause the depth or velocity of these floods to increase or decrease. For this reason, the proposed project would not individually or cumulatively contribute to disproportionate flooding impacts to EJ communities.

COMPLIANCE WITH LORS AND STATE POLICIES

CLEAN WATER ACT

Staff has determined that the proposed project would satisfy the requirements of CWA Section 402 by complying with applicable NPDES permits from the SWRCB. A Construction General Permit would regulate storm water discharges during construction of Puente and demolition of MGS. Compliance with two additional NPDES permits would be required, if applicable, to specifically regulate wastewater discharge from hydrostatic testing and construction dewatering. Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-2** would inform the CPM of appropriate BMP implementation and any issues regarding these permits. Requirements of CWA Section 401 would be met during commercial operations by complying with Waste Discharge Requirements issued by LARWQCB to regulate storm water and process wastewater to the Edison Canal and domestic wastewater to a subsurface septic system. Condition of Certification **SOIL&WATER-4** would inform the CPM of any issues regarding these wastewater discharges.

THE RESOURCE CONSERVATION AND RECOVERY ACT

The proposed project would comply with RCRA by preventing surface and groundwater contamination through proper identification, handling, and disposing of hazardous wastes. Condition of Certification **WORKER SAFETY-2** would require a Hazardous Materials Management Program that addresses hazardous materials onsite including handling, transportation, tracking, usage, and storage. Several conditions of certification in the **Waste Management** section of this FSA ensure the project site is investigated and any contamination identified is remediated as necessary, with appropriate professional and regulatory agency oversight.

CALIFORNIA CONSTITUTION, ARTICLE X, SECTION 2

The California Constitution, Article X, Section 2 requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited. The use of potable water for activities suitable for non-potable water use (e.g. construction, decommissioning, and demolition) when a water source of lower quality is available is inconsistent with California Constitution, Article X, Section 2.

Although the city's AWPF began producing recycled water in April 2015, this early phase of the GREAT program currently provides recycled water to the city's golf courses and to agricultural users primarily in the southern Oxnard Plain. The applicant's

proposal to use potable water for construction, decommissioning, and demolition activities is reasonable because the infrastructure is not in place to provide recycled water to the site in a manner that is economically feasible. The closest point of connection to the city's Recycled Water Backbone System is approximately four miles from the site, near Fifth Street and Ventura Road.

The additional construction that would be required to install a recycled water pipeline to the project site would create a new and unnecessary potential for environmental impacts. The project's proposed use of water is not high enough to justify these additional impacts. Existing site water uses which include MGS, currently uses more water than the proposed Puente facility. The operational use of water by Puente would represent a reduction in use relative to the CEQA baseline (see **Soil & Water Resources Figure 20**). No new impacts were identified by staff that would justify the need for the construction of an extensive recycled water pipeline. In addition, the amount of potable water proposed is minimal and its use for these purposes would be temporary. The use of potable water for this project is reasonable.

CALIFORNIA WATER CODE

Section 13260

Through the establishment of waste discharge requirements by LARWQCB, water quality of the Edison Canal is maintained. The proposed project would use the existing MGS collection system (for process wastewater and storm water) and the existing MGS septic system, which are both currently operating under project-specific Waste Discharge Requirements issued by LARWQCB. Condition of Certification **SOIL&WATER-4** would inform the CPM of any issues regarding these wastewater discharges.

Section 13550

California Water Code (CWC) Section 13550 requires the use of recycled water for nonpotable uses if 1) the quality of recycled water is adequate and available for the intended use, 2) the recycled water can be furnished for the uses at a reasonable cost to the user, 3) the use of recycled water from the proposed source will not be detrimental to public health, and 4) the use of recycled water for these uses will not adversely affect downstream water rights, will not degrade water quality, and is determined not to be injurious to plant, fish, and wildlife. Although many activities related to construction, decommissioning, and demolition are suitable for non-potable water use, the infrastructure is not in place to provide recycled water to the Puente site.

Although the city began producing recycled water in April 2015, this early phase of the program currently provides recycled water to the city's golf courses and to agricultural users primarily in the southern Oxnard Plain. The closest point of connection to the city's Recycled Water Backbone System is approximately four miles from the Puente site, near Fifth Street and Ventura Road. The additional construction that would be required to install a recycled water pipeline to the project site would result in unreasonable costs for a new water supply and create a new and unnecessary potential for environmental impacts.

The project's proposed use of process water is not high enough to justify these additional costs and impacts. Use of recycled water for the proposed industrial processes such as inlet air cooling could result in increased concentrations of briny wastewater discharge compared to the use of potable water. Disposal of this wastewater could require pretreatment prior to discharge thus resulting in additional increased cost for limited use of recycled water. Also, existing site water uses at MGS are currently more than the estimated water use at Puente. The operational use of water by Puente would represent a reduction in use relative to the CEQA baseline (see **Soil & Water Resources Figure 20**). Because the infrastructure is not in place, the use of recycled water is not economically feasible for the limited quantities that would be used by Puente.

Sections 10910-10915

These sections of the CWC require an agency managing a public water system to prepare a water supply assessment (WSA) for certain defined development projects subject to CEQA. The proposed project does not meet the definition of "project" as defined in these sections of the Water Code, therefore a WSA is not required (see the "Water Supply" discussion on page 4.11-63).

CALIFORNIA COASTAL ACT

The CCC is the primary agency which issues Coastal Development Permits to develop within a Coastal Zone. If a local agency has a Local Coastal Program (LCP), which has been certified by CCC, then that agency takes over the responsibility for issuing Coastal Development Permits. Although the Puente site is located within the City of Oxnard's certified LCP, the Energy Commission has exclusive jurisdiction over siting proposed thermal power plants of 50 MW or greater, including those located in the coastal zone.

Both the Coastal Act and the Warren-Alquist Act provide that both Commissions participate in the review of proposed power plants in the coastal zone. Staff of the two Commissions have developed a Memorandum of Agreement that describes the manner in which to coordinate reviews and identifies the process for the Energy Commission to consider CCC's findings and recommendations for project consistency with relevant Coastal Act and LCP policies. On September 15, 2016, the CCC submitted a report recommending several specific provisions for the Energy Commission to adopt as part of any final approval of Puente (CCC 2016a). The report focused on the project's potential adverse effects in five key issue areas: (1) land use, (2) wetlands and environmentally sensitive habitat areas, (3) hazards associated with flood, tsunami, and sea level rise, (4) wastewater management, and (5) public access and recreation. A summary of CCC comments and staff's responses are found in this section's "Response to Comments" table below, beginning with comment #56.[72]
The CCC report concluded that the project should be built elsewhere because of concerns of flooding and wetlands impacts, among other concerns. Regarding flood hazards, the CCC believes that the PSA may have underestimated existing, site-

[72] CCC comments summarized in the table are those pertaining to soil and water resources. Responses to other CCC comments are found in the **Land Use**, **Biological Resources**, **Alternatives**, **Traffic and Transportation**, and **Geology and Paleontology** sections of this FSA.

specific flood hazards at the project site, stating that both 100-year and 500-year flood events are reasonably foreseeable during the project's four years of construction and its 30-year operating life. In addition, the CCC disagrees with the PSA determination that Puente would not represent a "critical facility" in the context of the electricity generation and distribution system. The CCC report states that the selection of an alternative inland site that is free of flooding hazards would best meet the requirements of Coastal Act Section 30253, which requires that risks to life and property be minimized, and the stability and structural integrity of new development be assured, without resorting to the construction of shoreline protective devices (CCC 2016a page 37). Similarly, the CCC recommends site relocation to avoid wetland impacts (further discussion on wetlands is found in the **Biological Resources** section of this FSA). If the Energy Commission determines that there is no feasible alternative site to relocate the project, the CCC report recommends several specific provisions for the Energy Commission to adopt as part of any final approval of Puente.

Staff does not agree that potential flooding impacts warrant relocation of the project. The dispute stems from the position of whether or not Puente is a critical facility requiring greater design standards for flood protection. Staff's conclusion that Puente is not a critical facility is explained in the "Critical Infrastructure" discussion of **Appendix SW-1**. Another disagreement relates to the potential severity of future flooding hazards. Neither CCC staff nor Energy Commission staff performed computer modeling to estimate future hazards, but instead turned to studies performed by The Nature Conservancy and the USGS, respectively. Each study uses very different assumptions, which result in considerable differences between the mapped areas of potential flooding. Staff's reasoning to base potential future flood hazards on the USGS study is explained in **Appendix SW-1** under the headings "Erosion Potential of Dunes" and "Hazard Zone Mapping".

When CCC released its report, the applicant indicated to staff their agreement to implement many of the CCC recommendations (NRG 2016), including removal of the existing shoreline discharge outfall. Although the CCC recommendations exceed the PSA's mitigation requirements, staff respects the CCC's position and the applicant's willingness to address their concerns. As shown in the "Response to Comments" table, staff modified **SOIL&WATER-3** to require groundwater monitoring as part of the dewatering plan, and staff added **SOIL&WATER-6** to prohibit shoreline protective devices and require beach and dune monitoring.

However, staff does not agree with the CCC recommendation to require flood damage prevention of the 500-year flood event, despite the applicant's acceptance of this recommendation. The CCC believes this level of flood prevention is needed to minimize risks to life and property per the Coastal Act, as reference above. While staff acknowledges the benefit of exceeding the PSA's mitigation requirements, this specific recommendation could potentially result in design changes substantial enough to warrant further environmental review. For example, if the earthen berm located at the north side of the MGS property must be modified to protect against water levels equivalent to the 500-year event plus 24 inches of sea level rise, changes to the berm

could potentially result in encroachment on the wetlands located near McGrath Lake.[73] If the applicant decides to pursue this additional site protection then additional information would be required from the applicant prior to completing this FSA. Staff would need time to review the new information and file data requests if needed to ensure there are no new environmental impacts from a redesign of the project.

In summary, if the Energy Commission determines that there is no feasible alternative site for relocation, the CCC report recommends several specific provisions related to soil and water resources by eliminating the existing shoreline discharge outfall and implementing Conditions of Certification **SOIL&WATER-3** and **-6**, but staff does not require CCC's recommendation for flood damage prevention of the 500-year flood event.

CALIFORNIA CODE OF REGULATIONS

Title 20, Sections 1301 – 1313

These data collection regulations known as Quarterly Fuel and Energy Reports (QFER) are to obtain necessary information in order for the California Energy Commission to develop policy reports and analyses related to energy. Power plant owners are required to periodically report specific operational data to the California Energy Commission, including water supply and water discharge information. Through compliance with Conditions of Certification **SOIL&WATER-4** and **SOIL&WATER-5**, in addition to the required QFER submittals, the proposed project would provide the required data.

CITY OF OXNARD 2030 GENERAL PLAN

California law requires each local government to adopt a local general plan that reflects the goals and policies that guide the physical development of land within its jurisdiction. The city of Oxnard's general plan includes specific policies to achieve established goals, which are organized by category topics. The analysis below lists policies within the categories of Sustainable Community (SC), Environmental Resources (ER), and Safety and Hazards (SH) that are relevant to soil and water resources.

Policy SC-2.3 Sea Level Rise Consideration in Decision-Making: Ensure that all planning, public works, and related decisions take rising sea level into consideration and take steps to reduce risk of damage or loss of life and property. Staff bases its sea level rise analysis on State of California Sea-Level Rise Guidance Document issued by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) and the Sea Level Rise Policy Guidance adopted by the California Coastal Commission (CCC). The sea level rise analysis contained in this FSA is consistent with Policy SC-2.3.

Policy SC-2.4 Avoidance of Coastal Armoring or Hardening: Wherever feasible, avoid coastal armoring or hardening in new development or in mitigating current and future

[73] These wetlands are designated Environmentally Sensitive Habitat Areas (ESHAs) and must have a minimum 100-foot buffer. See Condition of Certification **BIO-7** in the **Biological Resources** section of this FSA.

risk to existing development. Condition of Certification **SOIL&WATER-6** prohibits the construction of shoreline armoring for the life of the project. Staff concludes that the project would be consistent with Policy SC-2.4.

Policy ER-3.4 Reduce Impact on Harbor, Bay, and Ocean Water Ecology: Condition or comment on any applications received for dredging to control turbidity and prevent interruption with spawning or migratory cycles, condition and conduct harbor and bay development in a manner that will result in the lowest reasonable level of contamination, monitor vessel wastes and report them to the proper agency, and continue to comment on the potential effects on ocean water quality of new development and offshore operations (oil, gas extraction, and LNG terminals) operations within the Santa Barbara Channel. Puente would not involve dredging activities and would not allow discharges to the harbor or the canal. Activities related to the construction or operation of Puente or the decommissioning or demolition of MGS would not significantly impact contamination levels in the harbor or the canal. Through compliance with applicable NPDES permits, the project would not have significant impacts to ocean water ecology. Staff concludes that the project would be consistent with Policy ER-3.4.

Policy ER-3.5 Reduce Construction Silt and Sediment: Require that construction-related silt and sediment be minimized or prohibited to minimize temporary impacts on biological resources. Puente construction activities would be subject to NPDES Construction General Permit regulatory requirements which include specific BMPs to achieve minimum water quality standards. The applicant would obtain a Construction General Permit to manage construction-related silt and sediment. Staff concludes that the project would be consistent with Policy ER-3.5.

Policy ER-5.1 Wastewater Treatment: Treat all wastewater in compliance with approved discharge permits. All phases of the proposed project are subject to wastewater discharge requirements from applicable NPDES permits. The Construction General Permit regulates both Puente construction and MGS demolition activities. During Puente operations and MGS decommissioning, permits regulate process and storm water discharges to the Edison Canal and sanitary discharges to the onsite septic system. Conditions of Certification **SOIL&WATER-1** through **-4** would notify the CPM of issues regarding those wastewater discharges. Staff concludes that the project would be consistent with Policy ER-5.1.

Policy ER-5.7 Minimizing Paved Surfaces: Require minimization and/or permeability of paved surfaces in new developments and replacement paving, where feasible. Puente would consist of about one acre of impervious area (paved roads, paved parking areas, and built structures) with the remaining two acres covered with gravel. Storm water that does not infiltrate the Puente site would be collected by a new storm water drainage system and pumped either to the service water tank or to existing MGS storm drain system. Staff concludes that the project would be consistent with Policy ER-5.7.

Policy SH-3.2 New Development Flood Mitigation: As a condition of approval, continue to require new development to mitigate flooding problems identified by the National Flood Insurance Program and/or other expert information. The Preliminary FIRM released September 2016 shows that the proposed Puente site is not located within the

base flood boundary or within the designated floodway. Staff concludes that the project would be consistent with Policy SH-3.2.

Policy SH-3.5 Development of Electricity Generating Facilities of 50 Megawatts or More in Areas Subject to Coastal and Other Environmental Hazards: Prohibits the construction, modification, alteration, replacement, or improvement of equipment that result in electricity generation of 50 MW or more in a location documented by the city as threatened by seismic hazards, wildfire, flooding, or coastal hazards including tidal inundation, storm wave run-up, beach and dune erosion and retreat, and tsunami inundation. Puente would not be consistent with Policy SH-3.5 because it would generate more than 50 MW of electricity at a location documented as "Combined Hazard Zone" in the *City of Oxnard Sea Level Rise Atlas* published in April 2016.

Staff has concluded in this analysis and in the **Geology and Paleontological Resources** section that the potential environmental impacts from the conditions listed above are less than significant or can be mitigated to less than significant with the proposed conditions of certification. In addition, the risk due to flooding is low therefore the project could be allowed, notwithstanding this policy.

CITY OF OXNARD CODE OF ORDINANCES

Ordinance No. 2426 and No. 2640

Substantial improvements or proposed new development of a structure located in areas of special flood hazards, as identified by FEMA, must follow minimum standards regarding anchoring, construction materials and methods, and elevation and flood proofing. Puente is not located within a FEMA special flood hazard area and, therefore, is not subject to these requirements. Nonetheless, Puente incorporates some minimum standards, such as the use of anchored pilings and avoidance of sand dune disturbance. Staff concludes that the project is not subject to compliance.

Ordinance No. 2728

Recycled water shall be used for suitable, non-potable purposes whenever and wherever recycled water is available at a reasonable cost and of an adequate quality. The Recycled Water Master Plan identifies recycled water use areas where types of recycled water uses are mandatory. Puente is not located in a recycled water use area and the infrastructure is not in place. The use of recycled water is not economically feasible for the limited quantities used by Puente. Staff concludes that the project would be in compliance.

Ordinance No. 2459 and No. 2876

The discharge of pollutants into the storm drain system or receiving waters is prohibited. All discharges of material other than storm water into the storm drain system must be in compliance with the city's NPDES permit and any other NPDES permit applicable to the subject property. All phases of the proposed project are subject to wastewater discharge requirements from applicable NPDES permits. The Construction General Permit regulates both Puente construction and MGS demolition activities. During Puente operations and MGS decommissioning, permits regulate process and storm

water discharges to the Edison Canal and sanitary discharges to the onsite septic system. Conditions of Certification **SOIL&WATER-1** through **-4** would require compliance with these permits and notification of the CPM of issues regarding discharges. Staff concludes that the project would be in compliance.

CITY OF OXNARD WATER NEUTRALITY POLICY

The Oxnard City Council established a water demand "neutrality" policy in 2008 and later reaffirmed it in 2011. Under this policy, all new developments approved within the city must offset the water demand associated with the project with a supplemental water supply. "New development" includes all planned (meaning those anticipated in the current General Plan) and any unplanned future development occurring in the city (KJC 2012).

The policy has subsequently been interpreted and applied by the City Council[74] to mean that a project that is consistent with the 2030 General Plan land uses that were included in the 2010 Urban Water Management Plan (UWMP) demand projections is eligible for city-provided water service, unless the project's water demand is substantially greater than the 2010 UWMP's water demand factor for that land use. Because Puente would essentially replace the existing MGS resulting in a net decrease demand of potable water, the proposed project complies with the Water Neutrality Policy. In addition, Condition of Certification **SOIL&WATER-5** would place annual limits on potable water use and ensure compliance with the policy (see the "Water Supply" discussion on page 4.11-63).

STATE WATER POLICIES: SWRCB RESOLUTION 75-58, WARREN-ALQUIST ACT, 2003 IEPR WATER POLICY

The California Energy Commission stated in its 2003 Integrated Energy Policy Report its responsibility to apply state water policy to minimize the use of fresh water, promote alternative cooling technologies, and minimize or avoid degradation of the quality of the state's water resources. Consistent with SWRCB 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy that (1) limits the use of fresh water for power plant cooling unless alternatives are environmentally undesirable or economically unsound, and (2) requires zero liquid discharge (ZLD) for wastewater unless shown to be environmentally undesirable or economically unsound.

Fresh Water Alternatives

Although the city's AWPF began producing recycled water in April 2015, this early phase of the GREAT program currently provides recycled water to the city's golf courses and to agricultural users primarily in the southern Oxnard Plain. The infrastructure is not in place to provide recycled water to the site in a manner that is economically feasible. The closest point of connection to the city's Recycled Water Backbone System is approximately four miles from the site, near Fifth Street and Ventura Road. The additional construction that would be required to install a recycled water pipeline to the project site would create a new and unnecessary potential for

[74] May 19, 2015 Oxnard City Council Meeting. Agenda Item No. J-3.

environmental impacts. The project's proposed use of water is not high enough to justify these additional impacts. Existing site water uses which include MGS, currently uses more water than the proposed Puente facility. The operational use of water by Puente would represent a reduction in use relative to the CEQA baseline (see **Soil & Water Resources Figure 20**). No new impacts were identified by staff that would justify the need for the construction of an extensive recycled water pipeline. In addition, the amount of potable water proposed is minimal and its use for these purposes would be temporary. The use of potable water for construction, decommissioning, and demolition activities is reasonable.

ZLD Feasibility

The Energy Commission encourages power plant developers to incorporate ZLD facilities into their power plant designs as a way of reducing discharges and maintaining the quality of state waters. The use of a ZLD for Puente would be infeasible, however, because the project would not produce enough wastewater to make it economically feasible. Typically, ZLD is only feasible where a combined cycle power plant uses wet cooling for cooling of the steam cycle and large volumes of wastewater must be treated to produce a solid waste for disposal. ZLD is feasible in these cases because of the economy of scale, and it eliminates potentially significant environmental impacts that may result from other wastewater treatment methods such as evaporation ponds and deep well injection. Puente would be a simple cycle facility that does not have a steam cycle requiring cooling, but it would use water for inlet air cooling which produces a "blowdown" or wastewater stream similar to a wet cooled system that must be disposed of. The volume of wastewater is significantly less, however, and can be managed along with other water treatment wastewater. As discussed above, wastewater discharged in accordance with a LARWQCB permit would mitigate potential impacts.

Staff concludes that it would be too costly to add a ZLD system to process wastewater from this project given the rather small rate of discharge that is less than 10 afy. In addition, the project would also employ dry low NOx combustors which significantly reduce water use and potential waste water discharge compared to wet NOx combustors. It would be unreasonable to require the use of an expensive ZLD system. And lastly, wastewater generated by this project would be much smaller than those from MGS being the baseline condition which this project would be replacing, thereby resulting in a net saving of water, which would be a net benefit to the environment.

NOTEWORTHY PUBLIC BENEFITS

The proposed project would eliminate the discharge of wastewater to the Pacific Ocean and remove the existing ocean outfall structure. In addition, Puente would use less potable water compared to MGS because the construction of Puente and decommissioning of MGS would free potable water for other uses.

RESPONSES TO COMMENTS

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
Applicant *NRG Energy Center Oxnard* Latham & Watkins LLP TN#213683 9/15/2016	1. Modify **SOIL&WATER-1** verification "…project owner shall submit the construction SWPPP to the ~~CBO and~~ CPM…"	1. No objection. Staff revised **SOIL&WATER-1.**
	2. **SOIL&WATER-3** pertains to industrial discharges; it should be revised to pertain to dewatering or be deleted since dewatering is referenced in **SOIL&WATER-2**.	2. Agree. Staff revised **SOIL&WATER-3**.
	3. During construction, the total estimated amount of potable water to be used for construction needs and domestic needs is approximately 4.8 acre-feet. The maximum 12-month use is approximately 2.8 acre-feet. Modify **SOIL&WATER-5**. "Potable water use for construction shall not exceed ~~2.3~~ 2.8 acre-feet per calendar year."	3. No objection. Staff agrees that the 12-month maximum is approximately 2.8 ac-ft when estimated domestic uses related to construction activities are included. Staff revised **SOIL&WATER-5**.
	4. During decommission and demolition, potable water will be used for domestic needs as well. Modify **SOIL&WATER-5** "Total potable water use for these purposes shall not exceed ~~2.3~~ 2.9 acre-feet per calendar year."	4. No objection. Staff agrees that the 12-month maximum is approximately 2.85 ac-ft. Staff revised **SOIL&WATER-5**.
	5. Clarify **SOIL&WATER-5** to say calendar year, as follows: "Total potable water use for these purposes shall not exceed 19-acre-feet per calendar year.	5. No objection. Staff revised **SOIL&WATER-5.**
	6. Please note that estimated total amount of 3.3 ac-ft potable water use during construction (PSA page 4.10-	6. No objection. Staff updated values in **Soil & Water Resources Table 8** to include domestic uses associated with

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	15) does not include potable water for domestic purposes such as drinking water, showers, etc.	construction activities.
	7. AFC Table 2.9-4 contained a typographical error. The total construction water use (dust suppression plus other construction) shown as 492,524 average monthly gallons, should be 49,254 average monthly gallons over the 21 month construction period. Nevertheless, staff's estimate is comparable (PSA page 4.10-15).	7. No objection.
	8. PSA pages 4.10-16 and 4.10-17 state that the largest user of service water is the evaporative cooler. Note that the project has been designed to use a very small amount of water, less than 20 acre-feet per year. Evaporative coolers will be used occasionally (i.e., when ambient temperatures exceed 59 degrees Fahrenheit and the unit is operating at base load) for power augmentation.	8. No objection. Staff revised the sentence to no longer state that the evaporative cooler is the largest user of service water.
	9. Decommissioning of MGS Units 1 and 2 is anticipated to be completed by June 2021. PSA page 4.10-18 shows incorrect date.	9. Correction made.
	10. **SOIL&WATER-3** reference (PSA page 4.10-24) incorrectly states the condition addresses a dewatering plan.	10. Agree. Correction made.
	11. Footnote on PSA page 4.10-25 should reference page 4.10-39.	11. Agree. Correction made.
	12. PSA page 4.10-27 states that	12. Agree. Correction made.

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	the estimated maximum annual water use is 19 afy. As stated in AFC Table 2.7-5, the 19 afy is average annual use.	
	13. Add text to PSA page 4.10-52 as follows: "Even with the highest projection of king tides reaching nine feet, the elevation of the proposed site is at 14.0 feet <u>and the dunes separate the ocean from the site</u>."	13. No objection. Staff revised the sentence.
	14. Regarding PSA page 4.10-52 (2nd to last paragraph): Storm surge on the Southern California Coast is usually on the order 1 to 2 feet or less occasionally more. Five feet of storm surge is extreme for Southern California and 25 feet of storm surge occurs during hurricanes in the Gulf of Mexico and along the Atlantic Coast but not along the California Coast.	14. Agree. The 25-foot storm surge in the PSA was intended to describe offshore waves during a large storm. Staff revised the sentence to state that extreme storms can cause water levels to increase about five feet.
	15. Regarding PSA page 4.10-61: The elimination of once-through cooling is due to the OTC compliance, not the development of Puente.	15. Agree. Staff revised the sentence to acknowledge compliance with the OTC Policy.
	16. Regarding PSA page 4.10-83: **SOIL&WATER-3** addresses wastewater discharges, and not construction dewatering. Dewatering is referenced in **SOIL&WATER-2**.	16. Agree. Correction made.
	17. Regarding PSA page 4.10-114: Text should be revised to "It appears that the differences in SLR scenarios are relatively minor; <u>therefore, inundation of the Puente site would not be anticipated under the SLR scenarios due to the elevation</u>	17. No objection. Staff revised the sentence.

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	of the Puente site." 18. Regarding PSA page 4.10-128 (2nd paragraph): Great Diurnal Range and Mean Range of tide should not be averaged. Use difference between MHW and MLW (Mean Tidal Range) to get average tidal prism.	 18. Agree. Correction made.
Intervenor *City of Oxnard* Shute, Mihaly & Weinberger LLP TN#213681 9/15/2016	19. The PSA relies on a draft sea level rise methodology with known shortcomings to assert that the Project site is not exposed to future coastal hazards. In doing so, it goes out of its way to criticize a more robust and widely-accepted model that The Nature Conservancy prepared specifically to identify coastal hazards along the Ventura coast. 20. The PSA does not adequately consider continued operation of the Mandalay Generating Station beach outfall. 21. Given both the numerous permits required to continue operating the outfall, and the impacts associated with continuing its operation, the PSA should evaluate alternative discharge options for wastewater and storm water from the project site. 22. The project may require a permit from the Ventura County Watershed Protection District if reduced water intake from the Edison Canal will degrade water quality in the canal. The PSA should list these and any other required	19. Staff's reasoning to base potential future flood hazards on the USGS study is explained in **Appendix SW-1** under the headings "Erosion Potential of Dunes" and "Hazard Zone Mapping". 20. The applicant subsequently modified the wastewater discharge system and no longer proposes discharging through the ocean outfall structure. 21. See response to comment #20. 22. The Ventura County Flood Control District has jurisdiction of the Channel Islands Harbor and canals that discharge to that area (Oxnard West Drain, Fifth Street Drain, and Doris Drain), but it does not have jurisdiction of the Edison

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	regulatory permit in its project description.	Canal. The LARWCB would be responsible for issuing a WDR permit for the project discharges to the Edison Canal. See **SOIL&WATER-4**.
	23. The Coastal Commission's 30413(d) Report outlines the many inconsistencies between the project and the California Coastal Act and the City's Local Coastal Plan. Among other findings, "The Commission believes that the requirement of this policy [to address coastal hazards] can best be met through risk avoidance, that is, by the selection of an alternative inland site that is free from flooding hazards."	23. Staff does not agree that potential flooding impacts warrant relocation of the project. See the "California Coastal Act" discussion under the subheading "Compliance with LORS and State Policies".
	24. The PSA assumes that the facility is not critical infrastructure and therefore evaluates risks to the facility only through 2050. This limited time period is contrary to the CCC SLR Guidance, which instructs that sea level rise planning should use a 100-year or greater lifespan for "critical infrastructure" including "power plants and energy transmission infrastructure."	24. The project is not a critical facility. The CCC Sea Level Rise Policy Guidance states that some power plants (not all power plants) are critical infrastructure. It also states that determination of criticality should be based on the relative importance of its various assets for the delivery of vital services, the protection of special populations, and other important functions (CCC 2015 page 82). Further discussion regarding critical infrastructure is in **Appendix SW-1**.
	25. Although the PSA attempts to distinguish peaking power plants as "non-critical," the FEMA manual includes no such distinction and instead states that critical facilities include "utilities." This recognition that energy utilities, regardless of type, are	25. The project is not a critical facility. The FEMA manual lists "utilities" as examples along with "health and safety facilities, government facilities, and hazardous materials facilities". This does not imply all energy utilities regardless of type should be considered

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	critical infrastructure is consistent with the understanding of critical infrastructure recognized by the US Dept of Homeland Security, the CCC SLR Guidance, and in the Cal EMA and the California National Resources Agencies' climate adaptation guidance.	critical. The sentence in the FEMA manual preceding the statement cited by the commenter defines critical facility as "A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired." Further discussion regarding critical infrastructure is in **Appendix SW-1**.
	26. As the state moves towards a 50 percent renewable portfolio, there will be an increased reliance on gas-fired generation to provide baseload power when intermittent renewable generation is offline. If the Moorpark-Pardee transmission line were to fail, then the project would need to provide baseload generation for the subarea until the line was restored. The PSA should consider the project's full proposed function in serving future electrical demand.	26. Puente would be limited to 2,150 total permitted hours per year (consisting of 1,750 hours of normal operation per year, with 200 hours for startups and 200 hours of shutdown) per Air Quality Condition of Certification **AQ-48**. This does not warrant consideration as a baseload facility.
	27. The CPUC approved procurement of this new generation based on its asserted need to meet local capacity requirements that would "provide important grid support services." Because the facility would provide necessary backup generation in the Moorpark subarea, it must be considered a critical energy facility under the standards established by the	27. The project is not a critical facility. The testimony presented at the CPUC proceedings addressed the need for long-term procurement to meet local capacity requirements, and this does not directly translate to the need for heightened protection from flood damage. Further discussion regarding critical infrastructure is in

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	CCC.	**Appendix SW-1**.
	28. It is inappropriate to limit the evaluation of coastal hazards to a 30-year timeframe. If the PSA intends to truncate its evaluation of the project's hazard exposure, then it should recommend a condition of certification requiring that the project actually cease operation and be removed after this 30 year period.	28. A lifespan of 30 years for a "typical" natural gas power plant is generally accepted within the power industry. If Puente continues to be economically viable after 30 years, the facility would likely require some type of equipment update or system overhaul which would trigger Condition of Certification **COM-10**. (See subheading "Sea Level Rise – Discussion".)
	29. The PSA must evaluate the extent to which approval of the project will interfere with adaption efforts along the coastline. The project relies on existing infrastructure that also must be moved in the face of rising sea levels (e.g. roads and transmission lines).	29. The City of Oxnard's 2030 General Plan identifies a number of goals and policies identified for possible incorporation into an Oxnard Climate Action and Adaptation Plan, but the relocation of roads or utilities due to sea level rise is not mentioned. Although this may be a long-term goal of the City, it is not identified. In contrast, Policy ER-12.12 calls for rerouting roads and utilities around agricultural areas.
	30. The PSA relies solely on a preliminary methodology for assessing sea level rise – CoSMoS 3.0 – that cannot be adequately peer-reviewed because it lacks publicly available technical documentation, and has not been specifically adapted to the Ventura coast.	30. Staff's reasoning to base potential future flood hazards on the USGS study is explained in **Appendix SW-1** under the headings "Erosion Potential of Dunes" and "Hazard Zone Mapping".
	31. The PSA fails to adequately address coastal erosion and fails to include any historical events to verify its assumptions. The PSA must take into account the	31. The FSA refers to CoSMoS erosion modeling results recently released in October 2016. See response to comment #30.

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	combined effect of shoreline erosion, flooding, storm erosion, and sea level rise.	
	32. The PSA omits any analysis of impacts from dune migration that will occur with sea level rise. Sand removal necessary to respond to dune migrations would undermine the integrity of the dune structure and reduce its ability to project against future storms and sea level rise. The PSA must address the impacts of dune retreat and any measure needed to manage it.	32. See responses to comments #59 and #60.
	33. The PSA must be revised to address the issues raised by the Coastal Commission in its 30413(d) report.	33. This FSA addresses the issues raised by Coastal Commission.
	34. The Coastal Resilience model used by the City to assess coastal hazards assumed a moderate estimate of sea level rise. However, since that analysis was conducted, it has become clear that sea level rise is projected to be far greater. Citation added.	34. See response to comment #19.
	35. Taking a precautionary approach to resource siting is especially important because the City of Oxnard has been found to have a high-level of social vulnerability to climate change. Citation added.	35. Staff acknowledges Oxnard's social vulnerability, but notes that the report cited in the comment is based on maps that the Pacific Institute states should not be used to assess actual coastal hazards.
<u>Intervenor</u> *City of Oxnard* David Revell TN#213681 9/15/2016 Exhibit 9	36. The PSA incorrectly states that the Puente site is adjacent to sand dunes, when in fact the Puente site is situated in the middle of sand dunes and just inland of the primary frontal dune. The National Research Conservation Service has	36. Staff revised the sentence to indicate that the site is among sand dunes instead of adjacent to them.

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	mapped the soils at the proposed location as "Coastal Beaches", indicating that this site was formed by coastal processes.	
	37. The PSA relies on a course sand sediment fraction of 0.0625 mm, which is too small to be considered as sand remaining on the beach. This overstates the volume of sediment supply available to replenish the beach and dunes. Sediment grains under 0.125 mm in diameter are not likely to replenish the beach, and the PSA should be corrected to fix this error.	37. The commenter refers to a statement in Footnote 35 that describes **Soil & Water Resources Figure 10**. Staff's intention is to show the episodic nature of sediment yield from the Santa Clara River. The source of this information is the *Geomorphic Assessment of the Santa Clara River Watershed* (SWS 2011), a report prepared for VCWPD, Los Angeles County Department of Public Works, and U.S. Army Corps of Engineers to assist these agencies of the Santa Clara River Watershed Feasibility Study.
	38. More fundamentally, the PSA fails to address whether the ~1.2 MCY/year of sediment discharged from the Santa Clara to the beaches is a sustainable trend. The long term precipitation projections show a decline over the coming century. Especially when coupled with urbanization of the upper watershed, the sediment discharge trend is more likely to decrease.	38. Although annual precipitation in California has varied greatly, there is no clear trend of increasing or decreasing sediment discharge (see discussion under "Climate Change – Riverine Flooding"). Staff notes that, due to this uncertainty, the authors of Coastal Resilience Ventura (ESA 2013 page 28) and Vulnerabilities of the Proposed Mandalay Generating Station (COO 2015a page 6) performed modeling with the assumption that there was no substantive changes to annual watershed sediment yield from the Santa Clara River. In addition, it is not a given that urbanization would result in decreased sediment discharge at the river mouth. It would

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
		likely increase or at least stay the same over time.
	39. While the PSA focuses primarily on dredging of the Ventura Harbor, it doesn't consider the impact of NOT dredging Channel Islands Harbor which backs sand upcoast to the site, especially following large flow years on the Santa Clara River. Changes to either harbor dredging could impact the stability of the fronting beach and dunes at the Puente site and should be considered when assessing the longterm reliability of the dunes as protection for the Puente project.	39. Staff evaluated sediment transport by longshore currents. Halting dredging activities would result in increasing the sediment load for longshore transport. **Soil & Water Resources Figure 9** shows that longshore sediment net transport is from north to south along the shoreline in the vicinity of Puente. Because of Puente's distance from the entrance of Channel Islands Harbor, the buildup of sediment would have little if any impact on the dunes at Puente.
	40. Dune transgression or landward advance will cause more windblown sand onto the site and require additional sand management activities. If the managed sand is removed from the dune system, this sand management practice over time could further expose the dunes to erosion and the Puente site to coastal flooding. The PSA should consider anticipated frontal dune migration towards the Puente site that will accompany expected sea level rise.	40. See response to comment #61.
	41. The PSA relies on an inoperable tide station (Rincon Island) that has been out of service for over 25 years. As a result, the PSA ignores actual tide and buoy data.	41. The commenter misrepresents staff's use of the Rincon Island tide station. Staff did not rely on data from an inoperable tide station. Staff used the NOAA Rincon Island tide gauge tidal datum because it is the nearest to the project site, exactly as used by the authors of *Coastal Resilience*

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
		Ventura (ESA 2013 page 13) and *Vulnerabilities of the Proposed Mandalay Generating Station* (COO 2015a page 1). Staff obtained tidal information directly from NOAA, which determines values at this subordinate station based on data from the Los Angeles station.
	42. The use of only a 30-year planning horizon is inconsistent with the CCC sea level rise policy guidance which recommends 100-year horizon for energy infrastructure. The PSA's subjective interpretation of the definition of critical infrastructure avoids this designation.	42. See response to comment #24.
	43. The failure to evaluate the impacts of the Puente project over a longer time frame also has implications for climate adaptation efforts in surrounding communities. All the communities, infrastructure and utilities that rely on the existing power plant are forced to make long term community decisions based on these existing utility alignments rather than considering more progressive forms of adaptation. This interference with the ability of communities to implement climate adaptation policies is a significant long term cumulative impact throughout the region but particularly to the adjacent communities of Oxnard and Ventura County.	43. See response to comment #29.
	44. The PSA incorrectly dismisses the TNC modeling results in	44. See response to comment

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	favor of preliminary and undocumented modeling by other entities. This very likely downplays the significance of the impacts to the Puente site.	#19.
Intervenors *Environmental Coalition of Ventura Co, Sierra Club Los Padres Chapter, and Environmental Defense Center* Brian Segee TN#213635 9/13/2016	The PSA is compared to the CCC 30413(d) Report for the following topics: 45. The CCC Report states that the site may be subject to present and future adverse effects from flooding, sea level rise, and tsunamis because of its relatively low-lying elevation adjacent to the shoreline. This is counter to the PSA. 46. The project site is not currently located within the 2010 FIRM Map 100-year floodplain but is located in the 500-year flood zone. 47. The CCC Report concludes the dunes are more erosive than disclosed in the PSA. At a base flood elevation of 20 feet, floodwaters would be expected to spill over into the site via low points in the dune and berm system. These waves could erode the dunes and or berm, resulting in the potential for flooding. 48. The CCC asserts that the PSA failure to adequately consider dune structure resulted in significant underestimation of flood risk. The PSA does not identify any significant flood risk during a 100-year event even considering climate change, but does not appear to consider Revell's findings. 49. Neither the 2010 FIRM Map or	45. See response to comment #23. 46. The FSA refers to FEMA's Preliminary FIRM recently released in September 2016. 47. Although wave runup elevation of 20 feet could potentially overtop the dunes, flood damage may not necessarily occur. FEMA would extend the flood zone boundary past the dunes if wave overtopping splash is found to exceed a barrier by three feet or more. Further discussion regarding Hazard Zone Mapping is in **Appendix SW-1**. 48. See response to comment #23. 49. Staff included a discussion of

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	the 2016 Draft Map appear to account for the Edison Canal which provides a pathway for storm surges and floodwaters into the MGS site, although water elevations would be somewhat attenuated by the long distance between the ocean and the project site via the canal.	the potential for flooding of the site via the Edison Canal.
	50. The PSA does not account for TNC modelling of flood events, which suggests a 100-year flood event on the Santa Clara River under existing conditions the project site could be subject to inundation. The CCC Report states that the PSA underestimates existing, site-specific flood hazards at the project site, including flooding that could occur during a 100-year or greater event.	50. See responses to comments #19 and #23.
	51. With regards to sea level rise effects on flooding, the CCC report notes that the PSA's use of CoSMoS to project maximum wave runup elevation with over 3 feet of sea level rise results in a value lower than the present-day coastal base flood elevation (+20 feet NAVD88) shown on the 2016 draft FEMA flood map.	51. FEMA and CoSMoS do not map the same coastal hazards. The FEMA preliminary map shows where wave runup reaches three feet above the eroded ground. In contrast, CoSMoS maps the areas of sustained inundation, where water levels remain at least two minutes. CoSMoS maps indicate water that might splash over the dunes is expected to drain quickly. Further discussion regarding Hazard Zone Mapping is in **Appendix SW-1**
	52. The CCC report finds that if two feet of sea level rise are added to the 2016 coastal base flood elevation, the 100-year flood zone in 2050 could reach +22 feet, which would	52. See response to comment #47

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	almost certainly result in overtopping of the dunes and at least some flooding of the project site, even without accounting for erosion. This is counter to the PSA. 53. The PSA should be revised to address Revell's analysis, the TNC's model, and the CCC's evaluation, and find that beach erosion/flooding and tsunami impacts are significant and unavoidable, and focus on alternative locations outside of this hazardous zone. And the following which is not related to the CCC Report: 54. The PSA does not adequately disclose or investigate the potential of utilizing non-potable or recycled water. The feasibility of accessing the City of Oxnard's recycled water system is not discussed at any length, despite the requirements of Porter-Cologne Act § 13550 requirements.	53. See response to comment #19. 54. Staff provides analysis specific to Porter-Cologne Act § 13550 under the heading "Compliance with LORS and State Policies" regarding the potential of utilizing recycled water.
Intervenor *Robert Sarvey* TN#213668 9/15/2016	55. Include a condition of certification which requires use of a zero liquid discharge system to eliminate all process wastewater issues. Zero liquid discharge is a feasible alternative used by many combustion turbine facilities including ones permitted by the Energy Commission.	55. Staff analysis of project compliance with the Energy Commission water policy including use of ZLD is provided under "Compliance with LORS and State Policies".
Agency *California Coastal Commission* *30413(d) Report*	56. Although it appears unlikely that the wetlands and riparian habitats adjacent to the project would be affected by the proposed dewatering activities, insufficient information exists to support a definitive conclusion (for instance, the	56. A numerical estimate of dewatering radius of influence and analysis is included in the **Geology and Paleontology** section of this FSA under the heading "Hydrogeological Resources and Construction

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
Joseph Street TN#213667 9/15/2016 and TN#213675 9/15/2016 and TN#213677 9/15/2016	PSA has not provided a numerical estimate of the dewatering radius of influence). 57. Modify **SOIL&WATER-3** to require groundwater monitoring at a minimum of two locations along the northern edge of the MGS parcel (between the Puente site and adjacent habitat areas). Require that dewatering activities immediately cease if groundwater monitoring demonstrates a decrease in groundwater levels outside of the previously-projected radius of influence, until such time as NRG has revised the dewatering and/or foundation installation plan to reduce the area of groundwater drawdown such that reduced groundwater levels do not extend beyond the monitoring wells and parcel boundary. 58. Develop a new condition of certification requiring a Wastewater Reuse and Recycling Plan to maximize reuse of the process wastewater and storm water generated and collected at the MGS following the construction of the Puente and decommissioning of Units 1 and 2 and eliminate the discharge of wastewater to the beach. If reuse/recycling is infeasible, require a Wastewater Plan to include measures preventing back-beach ponding, avoid impacts to avian nesting areas, and eliminate the need for	Dewatering". 57. No objection to adding a requirement for groundwater monitoring. Staff revised **SOIL&WATER-3**. 58. The applicant subsequently modified the wastewater discharge system and no longer proposes discharging through the ocean outfall structure.

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	repeated excavation of a discharge channel on the beach.	
	59. If relocation is not feasible, develop a new condition of certification requiring facility design measures to reduce flooding risks due to a 500-year flood event at the project site that includes an additional 24 inches of sea level rise. After CPM approval, the measures must be incorporated into the final project design.	59. Although the applicant accepts this recommendation (NRG 2016), staff has determined flood damage prevention from the 500-year event is not necessary. Changes to project design may be required to accommodate a 500 year flood event. Staff would need more information on the proposed design change so additional analysis can be conducted prior to finalizing this FSA. (See the discussion under "California Coastal Act" in the subsection "Compliance with LORS and State Policies".)
	60. Develop a new condition of certification that prohibits construction of future shoreline armoring or protective structures, including but not limited to seawalls, revetments, groins, and deep piers/caissons.	60. Applicant accepts this recommendation (NRG 2016). Staff added **SOIL&WATER-6** that prohibits shoreline protective devices.
	61. Develop a new condition of certification to require beach and dune monitoring.	61. Applicant accepts this recommendation (NRG 2016). Staff added **SOIL&WATER-6** to require beach and dune monitoring.
Agency *Caltrans* Dianna Watson TN#212615 8/4/2016	62. Storm water run-off is a sensitive issue for Los Angeles and Ventura Counties and staff should be mindful of requirements for run-off water discharges.	62. This FSA analyzes storm water runoff and wastewater discharges related to all phases of the proposed project (construction, operations, decommissioning, and demolition). See "Summary of Conclusion" on page 4.11-1.
Agency *Los Angeles Regional Water Quality Control*	63. The following topics should have been included in the PSA: the volume and quality of Puente wastewater	63. The applicant subsequently modified the wastewater discharge system and no longer proposes discharging

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
Board Samuel Unger TN#212794 8/15/2016	discharges, impacts to beach access, and the water quality at the beach.	through the ocean outfall structure.
<u>Agency</u> *County of Ventura Planning Division* Kari Finley TN#213654 9/15/2016	64. Due to its proximity to County jurisdictional boundaries, the County's General Plan policies (GPP) should be considered and evaluated in the PSA's LORS analysis. 65. On-going impacts to coastal environment, including the sand dunes and adjacent estuary, should be evaluated and mitigated for consistency with GPP 1.10.2-1 "Coastal beaches and sand dunes." 66. The new facility could be re-located to another, less environmentally sensitive location in order to help restore the invaluable and irreplaceable coastline to its natural condition.	64. Because certification by the Energy Commission is in lieu of permits required by state, local, or regional agencies, staff analyzes LORS which would be applicable but for the Commission's authority. 65. See response to comment #61. 66. See response to comment #23.
<u>Agency</u> *California Department of Fish and Wildlife* Edmund Pert TN#214009 10/14/2016	67. MGS is located in a historic dune system which supports a variety of types of wetlands. Cumulatively, the existing facility and new project interferes with natural sand movement processes and dune stabilization. This reduces or eliminates native dune species. 68. Additional analyses are	67. Staff acknowledges that remnant dune areas have dramatically decreased over the past 50 years and continue as more dune areas are proposed for development. The proposed site, however, would not result in any dune loss because the facility footprint was graded around the time MGS Units 1 and 2 were constructed. In addition, staff concludes that impacts of Puente on sand dunes located both onsite and offsite would be less than significant (see discussion under "Soil Erosion and Dune Impacts"). 68. Staff concludes that coastal

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	needed of rising sea levels and the potential environmental consequences should the proposed project require armoring or become damaged, and/or inoperable.	flood risks would be low during the 30-year lifespan of Puente, assuming 24 inches of sea level rise (see discussion under "Climate Change – Coastal Flooding"). Staff also requires **SOIL&WATER-6** to prohibit shoreline protective devices and require beach and dune monitoring, as recommended by the California Coastal Commission.
	69. Pumping large quantities of OTC water has likely kept the canal water circulating and cooler in temperature. When MGS pumping ceases, stagnant waters create a nuisance for nearby residents and are detrimental to aquatic organisms that can be found in this canal.	69. Staff concludes that any impacts from shutting down the OTC pumps are less than significant, because MGS pumping is only a minor contribution to flush time and the pumps do not operate for most of the year (see impact discussion under "Surface Water Quality – Edison Canal).
<u>*Public*</u> *The Nature Conservancy* Lily Verdone TN#213641 9/14/2016	70. The CCC Sea Level Rise Policy Guidance call for consideration of greater design standards (e.g., 200-year event, 500-year event) for critical infrastructure – including power plants – along the coast. It also recommends applying high sea level rise projections and "worst case scenarios" for the siting and design of critical facilities. This is counter to the PSA.	70. See response to comment #24.
	71. The PSA's use of the preliminary release of CoSMoS 3.0 does not note that the preliminary results do not show erosion or cliff retreat included in those flood projections nor do they model the combined risks of these hazards.	71. See responses to comments #30 and #31.

Soil and Water Resources		
Source of Comment	***Summary of Comment***	***Staff Response***
	72. Final results from the Coastal Resilience Ventura climate hazard model are complete, comprehensive, and model combined risks of multiple hazards. These results clearly indicate existing risk at the propose site that increase over time. They show significant risk of coastal erosion and flood hazards under various future climate scenarios at the site.	72. See response to comment #19.
<u>Public</u> *Friends of Channel Islands Harbor* Steven Kinney TN#213661 9/15/2016 and TN#213684 9/15/2016	73. There is an inherent beneficial effect on water quality in the harbor from the flushing action supplied by the pumping at the Mandalay Plant. Staff's conclusion is based largely on modeling with is uncertain in its reliability.	73. Staff's intention is to estimate relative flush times (with and without MGS pumping) knowing that the calculated values are underestimations, possibly by a very large margin. Staff concludes that the main cause of potential water stagnation is the complex configuration of the harbor and marina, which hinders the circulation of water (see impact discussion under "Surface Water Quality – Edison Canal).
	74. Shutting the pumps off for good could lead to a significant deterioration of water quality in the harbor. This issue should be considered as yet unresolved, subject to further analysis and discussions.	74. See response to comment #69.

CONCLUSIONS

Staff's conclusions based on analysis of the information are as follows:

1. The proposed project would eliminate the discharge of wastewater to the Pacific Ocean and remove the existing ocean outfall structure.

2. The proposed project would use less potable water compared to MGS. This would free potable water for other uses.

3. Staff regards demolition activities the same as construction activities, as described in the **Compliance Conditions** section of this FSA. Condition of Certification **SOIL&WATER-1** would reduce or avoid impacts of soil erosion and storm water runoff to surface water and groundwater quality during construction of Puente and demolition of MGS Units 1 and 2. Condition of Certification **SOIL&WATER-2** would protect water quality from the specific discharges of hydrostatic test water and construction dewatering. Condition of Certification **SOIL&WATER-3** would minimize groundwater impacts should construction dewatering occur.

4. Post-construction BMPs would reduce soil erosion impacts during operations to less than significant, and impacts on sand dunes located both onsite and offsite would be less than significant under normal operational activities.

5. Puente wastewater (process, storm water, and sanitary wastewater streams) would be managed by onsite wastewater systems. Potential impacts of project wastewater during operations on groundwater and surface water quality would be reduced to less than significant with compliance with Waste Discharge Requirements established and enforced by the LARWCQB. Condition of Certification **SOIL&WATER-4** would notify the CPM of issues regarding these wastewater discharges.

6. The city of Oxnard has sufficient potable water supplies to meet the proposed project's needs for the life of the project. Condition of Certification **SOIL&WATER-5** places an annual limit on potable water use and requires that possible exceedances are addressed prior to reaching the maximum limit.

7. The proposed project does not require a Water Supply Assessment (WSA) because it is not a "Project" as defined by California Water Code Section 10912.

8. Puente would not cause or exacerbate flooding to areas offsite and proper implementation of BMPs would reduce or limit the impact of a release to travel offsite. Therefore, offsite flooding impacts due to construction or operation of Puente are less than significant.

9. The overall consequences of flood damage are low, because Puente is not a critical facility and its location would not exacerbate offsite flood impacts. Therefore, the flood risk is low for scenarios where the probability of flooding is low (specifically riverine flooding, levee failure, dam failure, and sediment deficiency to beaches).

10. Based on preliminary results of coastal storm modeling that incorporates the effects of climate change on flood hazards, staff concludes that coastal flood risk would be

low during the 30-year lifespan of the proposed project, even with uncertainties of hazard modeling and rate of future sea level rise.

11. Staff does not agree with the CCC recommendation to require flood damage prevention of the 500-year flood event, despite the applicant's acceptance of this recommendation. If the applicant decides to pursue this additional site protection, then additional information would be required from the applicant prior to completing this FSA. Staff would need time to ensure there are no new environmental impacts from a redesign of the project.

12. Puente would not result in the indirect impact of inducing population growth in the vicinity. Puente's incremental effects on regional water supply or the quality of surface water and ground water would not be cumulatively considerable.

13. Staff concludes that with the adoption of conditions of certification, the soil or water resources impacts from Puente would be less than significant on the environmental justice population, with no disproportionate impacts.

14. Puente would comply with federal and state LORS with implementation of conditions of certification recommended by staff. Puente is also consistent with local LORS with the exception of Policy SH-3.2 of the 2030 Oxnard General Plan.

PROPOSED CONDITIONS OF CERTIFICATION

CONSTRUCTION - NPDES GENERAL PERMIT

SOIL&WATER-1: The project owner shall fulfill the requirements contained in the State Water Resources Control Board's *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002)* and all subsequent revisions and amendments. The project owner shall develop and implement a construction Storm Water Pollution Prevention Plan (SWPPP) for the construction of the project. The SWPPP shall also include demolition activities of MGS Units 1 and 2, unless documentation from the State Water Resources Control Board or the Regional Water Quality Control Board is provided that shows the NPDES Permit is not required for proposed demolition activities.

Verification: At least thirty days prior to site mobilization, the project owner shall submit the construction SWPPP to the compliance project manager (CPM) and a copy of the approved SWPPP shall be kept accessible onsite at all times. The project owner shall submit to the CPM a copy of any correspondence between the project owner and the State Water Resources Control Board or the Regional Water Quality Control Board, within ten days of its mailing or receipt, about the general NPDES permit for discharge of storm water associated with this activity. This information shall include the notice of intent, the notice of termination, and any updates to the construction SWPPP.

CONSTRUCTION - NPDES WASTEWATER DISCHARGES

SOIL&WATER-2: The project owner shall fulfill the requirements contained in the following NPDES permits adopted by Los Angeles Regional Water Quality Control Board (LARWQCB), and all subsequent revisions and amendments, which specifically regulate discharges of hydrostatic test waters and construction dewatering, as applicable: NPDES Permit No. CAG674001: *Discharges of Low Threat Hydrostatic Test Water to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties* and NPDES Permit No. CAG994004*: Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties*.

Verification: The project owner shall submit to the CPM copies of all relevant correspondence between the project owner and the SWRCB or LARWQCB regarding the above NPDES permits within ten days of its receipt or submittal. This information shall include copies of the Notice of Intent and Notice of Termination for the project. A letter from the SWRCB or LARWQCB indicating that there is no requirement for the wastewater discharge of hydrostatic testing or construction dewatering would satisfy the corresponding portion of this condition.

CONSTRUCTION – DEWATERING PLAN

SOIL&WATER-3: Prior to any groundwater dewatering, the project owner shall submit a dewatering plan to the CPM for review and approval. The dewatering plan shall provide details of the dewatering methods, the locations and dimensions of anticipated dewatering areas, and the expected dates of dewatering. The plan shall also include maximum daily and average daily pumping rates, total volume expected to be pumped during dewatering, estimates of drawdown that may occur at the wetlands north of the project site, and procedures for groundwater elevation monitoring. The plan shall identify potential mitigation, as needed, and describe under what circumstances such mitigation would be implemented.

Construction dewatering shall not occur until the dewatering plan is approved by the CPM and the project owner obtains the NPDES permit for dewatering, per **SOIL&WATER-2**. After project construction is complete, the project owner shall submit a report to the CPM summarizing construction dewatering activities, comparing actual pump rates and drawdown to the estimates calculated for the plan, and detailing the implementation and effectiveness of mitigation that occurred.

Verification: At least thirty days prior to any construction groundwater dewatering, the project owner shall submit a dewatering plan to the CPM for review and approval. At least seven days prior to construction groundwater dewatering, the project owner shall provide documentation of a NPDES permit for dewatering per **SOIL&WATER-2**. No later than thirty days after project construction is complete, the project owner shall submit a report to the CPM summarizing construction dewatering activities. The project owner shall include all calculations and assumptions made in development of the plan and interpretations, calculations, and assumptions used in development of any reports.

OPERATION – WASTE WATER DISPOSAL AND REPORTING

SOIL&WATER-4: Prior to operations, the project owner shall obtain the applicable Los Angeles Regional Water Quality Control Board (LARWQCB) Waste Discharge Requirements (WDR) permits for municipal domestic wastewater discharge through the existing subsurface septic system and for storm water and process wastewater discharges to the Edison Canal. It is the Commission's intent that these requirements be enforceable by both the Commission and LARWQCB. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to LARWQCB. Accordingly, the Commission and LARWQCB shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the LARWQCB. In addition, LARWQCB may "prescribe" these requirements as waste discharge requirements pursuant to Water Code Section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code Section 25531, subdivision (c).

The project owner shall ensure compliance with WDR permits, and all subsequent revisions and amendments, for the life of the project. The project owner shall notify the CPM of any violations of discharge limits or amounts. A monthly summary of industrial wastewater discharge shall be submitted to the CPM in the annual compliance report.

Verification: At least sixty days prior to any wastewater discharge to the Edison Canal, the project owner shall provide documentation to the CPM demonstrating compliance with the WDRs established by LARWQCB. At least thirty days prior to operations, the project owner shall provide documentation to the CPM demonstrating compliance with updated WDR established by LARWQCB for discharges to the onsite septic system. The project owner shall submit to the CPM any updates or amendments of the above WDRs within ten days of adoption by the LARWQCB. The project owner shall notify the CPM of any violations, exceedances, enforcement actions, or corrective actions within ten days of receipt from the LARWQCB and fully explain the situation and corrective action taken in the annual compliance report. The annual compliance report shall include a monthly summary of daily industrial wastewater discharge and an estimate of reclaimed storm water used to offset potable water use.

WATER USE AND REPORTING

SOIL&WATER-5: The project owner shall record daily water use for project construction and operation, and the decommissioning and demolition of MGS. The project owner shall comply with the water use limits and reporting requirements described below. If water use is forecasted to exceed the maximum annual use, the project owner shall notify the CPM and develop a plan to address exceedances.

Water supply for construction needs shall be potable water supplied from the city of Oxnard. Potable water use for construction activities, including related domestic uses, shall not exceed 2.8 acre-feet per calendar year. A monthly summary of project construction daily water use shall be submitted to the CPM in the monthly compliance report.

Water supply for MGS decommissioning and demolition needs shall be potable water supplied from the city of Oxnard. Total potable water use for these purposes shall not exceed 2.9 acre-feet per calendar year. A monthly summary of MGS decommissioning and demolition daily water use shall be submitted to the CPM in the monthly compliance report.

Water supply for operation and domestic needs shall be potable water supplied from the city of Oxnard. Total potable water use for these purposes shall not exceed 19 acre-feet per calendar year. A monthly summary of daily water use, differentiating between operational and domestic use, shall be submitted to the CPM in the annual compliance report for the life of project operation.

Verification: The monthly compliance report shall include a monthly summary of daily water use for project construction, MGS decommissioning, and MGS demolition (as applicable). The annual compliance report shall include a monthly summary of daily water use, differentiating between operational and domestic use.

The project owner shall notify the CPM within fourteen days upon forecast to exceed the maximum annual water use as described above. Prior to exceeding the maximum use, the owner shall provide a plan to address exceedances.

OPERATION - BEACH AND DUNE MONITORING PLAN

SOIL&WATER-6: Prior to project construction, the project owner shall submit a Beach and Dune Monitoring Plan to California Coastal Commission for review and comment and CPM for approval. The plan shall identify representative monitoring locations that can be dedicated and accessed over the life of the project. The plan shall discuss how the monitoring locations will be measured and the frequency of monitoring necessary to demonstrate if any significant changes in beach and dune morphology are occurring. The plan shall also include triggers for further action based on the degree of beach narrowing and/or dune loss, and identify measures that could halt or slow the observed erosion without construction of shoreline protective devices. An annual summary shall be submitted to the CPM in the annual compliance report.

In the event that the project, including any future improvements, is threatened with damage or destruction from coastal hazards, or is damaged or destroyed by coastal hazards, protective structures (including but not limited to seawalls, revetments, groins, deep piers/caissons, etc.) shall be prohibited. The project owner waives any right to construct such protective structures, including any that may exist under Public Resources Code Section 30235.

Verification: At least sixty days prior to project construction, the project owner shall submit a Beach and Dune Monitoring Plan to the CPM for review and approval.

ACRONYMS

ac-ft	acre-feet
AFC	application for certification
afy	acre-feet per year
AWPF	Advanced Water Purification Facility
bgs	below ground surface
BMPs	best management practices
CAISO	California Independent Systems Operator
CCC	California Coastal Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMWD	Calleguas Municipal Water District
CO-CAT	The Coastal and Ocean Resources Working Group for the Climate Action Team
CoSMoS	Coastal Storm Modeling System
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
cu-yd	cubic yards
cu-yd/yr	cubic yards per year
CWA	Clean Water Act
DTSC	California Department of Toxic Substances Control
EJ	environmental justice
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
FSA	Final Staff Assessment
gpm	gallons per minute
GREAT	Groundwater Recovery Enhancement and Treatment
LARWQCB	Los Angeles Regional Water Quality Control Board
LCP	Local Coastal Program
LOMR	Letter of Map Revision
LORS	laws, ordinances, regulations, standards
mgd	million gallons per day
MGS	Mandalay Generating Station
MHHW	Mean High Higher Water
MHW	Mean High Water
MLLW	Mean Lower Low Water
MLW	Mean Low Water
MTL	Mean Tide Level
MW	megawatt
NALs	numeric action levels
NAVD88	North American Vertical Datum of 1988
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination Sytem
NRC	National Research Council

OC	organochlorine pesticides
OEHHA	Office of Environmental Health Hazard Assessment
OTC	once-through cooling
OWS	oil-water separator
OWWTP	Oxnard Wastewater Treatment Plant
PDO	Pacific Decadal Oscillation
PSA	Preliminary Staff Assessment
QFER	Quarterly Fuel and Energy Reports
RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison
SCR-3	Santa Clara River Levee downstream of Highway 101
SLC	California State Lands Commission
SLR	sea level rise
SWPPP	Storm Watr Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
TWL	total water level
UPRR	Union Pacific Rail Road
USC	United States Code
UWCD	United Water Conservation District
UWMP	Urban Water Management Plan
VCWPD	Ventura County Watershed Protection District
WDR	Waste Discharge Requirements
WMA	Watershed Management Area
WSA	water supply assessment
ZLD	zero liquid discharge

FSA UPDATES AND ADDITIONS

The table below summarizes information in this FSA that are updates or additions to staff's PSA analysis. This information is provided for the reader's convenience and does not include every change to the document since the PSA was published.

Update / Addition	**Subsection**
Project modification to discharge wastewater to the Edison Canal instead of the Pacific Ocean	Project Description Assessment of Impacts
Updated FEMA maps	Flooding Appendix SW-1
Flooding Hazard via Edison Canal	Flooding
Additional CoSMoS 3.0 modeling	Flooding Appendix SW-1
Updated water use estimate for MGS decommissioning from 3 months to 6 months	Cumulative Impacts Figure 20
CalEnviroScreen included	Environmental Justice
Recycled water analysis	LORS Compliance
Coastal Commission report	LORS Compliance
City of Oxnard's amendment to the 2030 General Plan	LORS Compliance
ZLD analysis	LORS Compliance
Responses to comments received since publication of the PSA	Responses to Comments
Modified S&W-3 to add groundwater level monitoring to dewatering plan	Proposed Conditions of Certification
Added S&W-6 prohibits shoreline protective devices and requires beach monitoring	Proposed Conditions of Certification
Further discussion regarding critical facility	Appendix SW-1

REFERENCES

AEC 2015a – AECOM. Phase I Environmental Site Assessment for the Mandalay Generating Station Site. March 31, 2015.

AEC 2015b – AECOM, prepared for Ventura County Sheriff's Office of Emergency Services. 2015 Ventura County Multi-Hazard Mitigation Plan. Adopted by the Ventura County Board of Supervisors on September 22, 2015.

ASPEN 2015 – Aspen Environmental Group, prepared for Ventura County Watershed Protection District. Initial Study, Santa Clara River Levee Improvements Downstream of Union Pacific Railroad (SCR-3) Project. February 2015.

BAKER 2015 – BakerAECOM LLC, prepared for U.S. Federal Emergency Management Agency Region IX, Open Pacific Coast Study. Intermediate Data Submittal #1, Scoping and Data Review, Ventura County, California. January 28, 2015.

BEA 2009 – Beach Erosion Authority for Clean Oceans and Nourishment. Coastal Regional Sediment Management Plan: Central Coast from Pt. Conception to Pt. Mugu. January 2009.

CAR 2016 – Carollo Engineers, Inc, prepared for City of Oxnard. Public Works Integrated Master Plan, Final Draft. May 2016.

CCC 2015 – California Coastal Commission. Sea Level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits. Adopted August 12, 2015.

CCC 2016a – California Coastal Commission. 30413(d) Report – Final Approved Report (TN 213667) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

CEC 2009 – California Energy Commission. The Impacts of Sea-Level Rise on the California Coast. CEC-500-2009-024-F. May 2009.

CEC 2015i – California Energy Commission/Jon Hilliard (TN 205389). Data Request Set 1 (Nos. 1-47), dated July 17, 2015. Submitted to John Chillemi, NRG Oxnard Energy Center, LLC/CEC/Docket Unit on July 17, 2015.

CEC 2015n – California Energy Commission/Marylou Taylor (TN 205669). Letter to the City of Oxnard Re: Water Supply Assessment (WSA) for Puente Power Project, dated August 12, 2015. Submitted to the City of Oxnard Water Resources Division/CEC/Docket Unit on August 12, 2015.

CEC 2015ee – California Energy Commission (TN 206522). Transcript of 8/17/15 Public Site Visit, Environmental Scoping Meeting and Informational Hearing. Submitted to CEC/Docket Unit on November 6, 2015

CEC 2016ab – California Energy Commission (TN 214570). Request to Clarify Project Schedule E-mail dated November 25, 2016. Submitted to CEC/ Dockets Unit on November 28, 2016.

CALEPA 2014 – California Environmental Protection Agency. Designation of Disadvantaged Communities Pursuant to Senate Bill 535 (De Leon). October 2014.

CH2M 2004 – CH2MHill, prepared for City of Oxnard. Groundwater Recovery Enhancement and Treatment (GREAT) Program: Water Resources Technical Report. February 2004.

COCAT 2013 – Coastal and Ocean Working Group of the California Climate Action Team. State of California Sea-Level Rise Guidance Document. March 2013 update.

COO 2002 – City of Oxnard, Planning & Environmental Services. Coastal Land Use Plan. Revised May 2002.

COO 2011 – City of Oxnard, Development Services Department, Planning Division. 2030 General Plan: Goals and Policies. Adopted October 2011. Amended June 2016.

COO 2015a – City of Oxnard/Ellison Folk, Edward T. Schexnayder, Shute, Mihaly & Weinberger LLP (TN 204942). Testimony of Dr. David Revell on Behalf of the City of Oxnard dated April 8, 2015. Submitted to CEC/Docket Unit on June 8, 2015.

COO 2016f – City of Oxnard, (TN 211004). City of Oxnard's Data Requests, Set 6 (Nos. 104-111). Submitted to CEC/ Dockets Unit on October 14, 2016.

CPR 1979 – California Department of Parks and Recreation. General Plan McGrath State Beach. May 1979.

CSMW 2006 – California Coastal Sediment Management Workgroup. Littoral Cells, Sand Budgets, and Beaches: Understanding California's Shoreline. By K. Patsch and G. Griggs. October 2006.

CSMW 2007 – California Coastal Sediment Management Workgroup. Development of Sand Budgets for California's Major Littoral Cells. By K. Patsch and G. Griggs. January 2007.

DETT 2011 – Michael Dettinger. Climate Change, Atmospheric Rivers, and Floods in California – A Multimodel Analysis of Storm Frequency and Magnitude Changes. Journal of the American Water Resources Association (JAWRA), Vol 47, Issue 3. 2011.

EIC 2003 – Everest International Consultants, prepared for Ventura County Harbor Department. Channel Islands Harbor Circulation Improvement Study. July 2003.

ESA 2013 – ESA PWA, prepared for The Nature Conservancy. Coastal Resilience Ventura, Final Technical Report for Coastal Hazard Mapping. D211452.00. July 25, 2013.

FEMA 1998 – Federal Emergency Management Agency. IS-9 Managing Floodplain Development through the National Flood Insurance Program. March 1998.

FEMA 2012 – Federal Emergency Management Agency, Region 9. Open Pacific Coast Study, Frequently Asked Questions (FAQ). August 2012.

FEMA 2015b – Federal Emergency Management Agency. Open Pacific Coast Study, California Coastal Analysis and Mapping Project. October 2015.

GEN 2011 – GenOn West. Mandalay Generating Station Implementation Plan for the Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling. April 1, 2011.

GEO 2014 – Geosyntec Consultants, prepared for County of Ventura Public Works Agency and Ventura County Watershed Protection District. Bacteria Total Maximum Daily Load Draft Compliance Report, Harbor Beaches of Ventura County (Kiddie Beach and Hobie Beach). December 18, 2014.

GRIGGS 2005 – Gary Griggs, Kiki Patsch, and Lauret Savoy. Living with the Changing California Coast. University of California Press, 2005.

LARWQCB 2009 – Los Angeles Regional Water Quality Control Board. McGrath Lake PCBs, Organochlorine Pesticides, and Sediment Toxicity TMDL. Revised September 2009.

LARWQCB 2014 – Los Angeles Regional Water Quality Control Board. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties. Revised September 2014.

LARWQCB 2015 – Los Angeles Regional Water Quality Control Board. Waste Discharge Requirements for the NRG California South LP Mandalay Generating Station. Order No.

R4-2015-0201, NPDES No. CA0001180. Adopted on October 8, 2015. Effective on January 1, 2016.

MNS 2016 – MNS Engineers, Inc, prepared for City of Oxnard. 2015 Urban Water Management Plan. July 1, 2016.

MOORE 2000 – David W. Moore, Ph.D., prepared for San Diego Unified Port District. An Evaluation of Tidal Flushing for Shelter Island Yacht Basin Using a Simple Tidal Prism Model. August 30, 2000

N&M 2013 – Ninyo & Moore Consultants, prepared for NRG Energy Inc. Preliminary Geotechnical Evaluation: Mandalay Generating Station Repowering Project. November 27, 2013.

NHC 2005 – Northwest Hydraulic Consultants, prepared for U.S. Federal Emergency Management Agency. Final Draft Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States. January 2005.

NOAA 2004 – National Oceanic and Atmospheric Administration Office of Coast Survey. Report on the National Ocean Service Workshop on Residence/Flushing Times in Bays and Estuaries. Workshop held in Silver Spring, MD on June 8-9, 2004.

NRC 2012 - National Research Council. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past Present, and Future. June 2012.

NRG 2016 – NRG Energy Center Oxnard LLC (TN 213624). Response to Recommended Specific Provisions in August 26, 2016 Proposed Report. Dated September 6, 2016. Submitted to CEC/Docket Unit on September 12, 2016.

OEHHA 2013 – Office of Environmental Health Hazard Assessment. Indicators of Climate Change in California. August 2013.

OEHHA 2014 – Office of Environmental Health Hazard Assessment. California Communities Environmental Health Screening Tool, Version 2.0 (CalEnviroScreen 2.0). October 2014.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015c – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015.

PPP 2015k – Latham & Watkins LLP (TN206310). Applicant's Response to city of Oxnard Data Request, Set 2 (47-67). Submitted to CEC/Docket Unit on October 8, 2015.

PPP 2015y – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2016a – Latham & Watkins LLP (TN 207179). Applicant's Responses to City of Oxnard Data Requests, Set 4. Submitted to CEC/Docket Unit on January 4, 2016.

PPP 2016y – Latham & Watkins LLP (TN 213683). Applicant's Comments on the Preliminary Staff Assessment, dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

PPP 2016z – Latham & Watkins LLP (TN 213802). Project Enhancement - Outfall Removal and Beach Restoration, dated September 26, 2016. Submitted to CEC/Dockets Unit on September 26, 2016.

PPP 2016aa-- Latham & Watkins LLP, (TN 214336). Applicant's Responses to CEC Data Requests, Set 4 (77-107), dated November 26, 2016. Submitted to CEC/Dockets Unit on November 1, 2016.

PPP 2016ab – Latham & Watkins LLP, (TN 214330). Applicant's Responses to City of Oxnard Data Requests, Set 6, dated November 1, 2016. Submitted to CEC/Dockets Unit on November 1, 2016.

RINCON 2015 – Rincon Consultants, prepared for City of Oxnard. Coastal Apartment Homes Project and Coastal Senior/Assisted Living Project: Draft Initial Study/ Mitigated Negative Declaration. June 2015.

RUNYAN 2002 – Kiki Runyan and Gary Griggs. Implications of Harbor Dredging for the Santa Barbara Littoral Cell. Conference Paper: California and the World Ocean 2002.

SCC 2011 – State Coastal Conservancy. Historical ecology of the lower Santa Clara River, Ventura River, and Oxnard Plain: an analysis of terrestrial, riverine, and coastal habitats. August 2011.

SLOSS 2012 – Craig Sloss, Michael Shepherd, and Patrick Hesp. Coastal Dunes: Geomorphology. Natural Education Knowledge, Vol 3, Issue 10. 2012.

SWRCB 2010a – California State Water Resources Control Board. Water Quality Control Policy on the Use of Coastal Estuarine Waters for Power Plant Cooling: Final Substitute Environmental Document. May 4, 2010.

SWRCB 2010b – California State Water Resources Control Board. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) – Statewide. www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml accessed October 27, 2015.

SWS 2011 – Stillwater Sciences, prepared for Ventura County Watershed Protecetion District. Geomorphic Assessment of the Santa Clara River Watershed, Synthesis of the Lower and Upper Watershed Studies, Ventura and Los Angeles Counties, California. April 2011.

URS 2005 – URS Corporation, prepared for Ventura County Watershed Protection District. Flood Mitigation Plan for Ventura County, California. March 2005.

USEPA 1993 – U.S. Environmental Protection Agency. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. Chapter 5: Management Measures for Marinas and Recreational Boating. EPA 840-B-92-002.

USEPA 2000 – U.S. Environmental Protection Agency. EPA Statutory and Regulatory Authorities Under Which Environmental Justice Issues May Be Addressed in Permitting. Memorandum from Gary Guzy, General Counsel, to EPA Assistant Administrators. December 1, 2000.

USEPA 2001 – U.S. Environmental Protection Agency. National Management Measures Guidance to Control Nonpoint Source Pollution from Marinas and Recreational Boating. EPA 841-B-01-005. November 2001.

USGS 2006 – U.S. Geological Survey. National Assessment of Shoreline Change Part 3: Historical Shoreline Change and Associated Coastal Land Loss along Sandy Shorelines of the California Coast. By C.J. Hapke et al. Geological Survey Open-File Report 2006-1219. 2006.

USGS 2009a – U.S. Geological Survey. Coastal Processes Study of Santa Barbara and Ventura Counties, California. By P.L. Barnard et al. Geological Survey Open-File Report 2009-1029. March 2009.

USGS 2016 – U.S. Geological Survey. Santa Barbara and Ventura County CoSMoS Initial Results. Webinar produced by USC Sea Grant on February 9, 2016. https://uscseagrant.webex.com/uscseagrant/lsr.php?RCID=656eb6fbeb97c93c7e6b3866d52e9a40 accessed March 11, 2016.

VCRMA 2013 – Ventura County Resource Management Agency. Ventura County General Plan, Hazards Appendix. Amended October 22, 2013.

VLAFC 2005 – Ventura Local Agency Formation Commission. Municipal Service Review, Drainage Services Special Districts, Oxnard Drainage District No. 1, Oxnard Drainage District No. 2. February 16, 2005.

WCVC 2014 – Watersheds Coalition of Ventura County. 2014 Integrated Regional Water Management Plan. Adopted June 19, 2014.

WPK 2007 – Worley Parsons Komex, prepared for Southern California Edison. Draft Closure Plan: Mandalay Generating Station Retention Basin Site. November 2007.

APPENDIX SW-1
SOIL AND WATER RESOURCES

Testimony of Marylou Taylor, P.E.

EFFECTS OF CLIMATE CHANGE AND COASTAL FLOODING ON PUENTE

The applicant, intervenors, and the public have filed extensive, but often conflicting, documentation regarding the impacts of climate change on coastal flooding to the Puente docket. This appendix discusses the following issues of contention in detail and explains how staff determined the relevance to the project:

- Sea Level Rise Guidance
- Critical Infrastructure
- Coastal Dependency
- Planning Horizon
- Hazard vs. Risk
- Flood Prediction Models
- Erosion Potential of Dunes
- Hazard Zone Mapping
- Federal Emergency Management Agency (FEMA) Hazard Map Update

SEA LEVEL RISE GUIDANCE

Coastal Commission and State Agency Working Group Guidance Documents

The California Coastal Commission (CCC) and the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) each published a sea level rise (SLR) guidance document in response to Governor Schwarzenegger's Executive Order S-13-08 issued in November 2008, which directed state agencies to plan for sea-level rise and coastal impacts. Although each guidance document was written for a different target audience, they are not in conflict with each other.

CO-CAT is a working group comprised of senior level staff from California state agencies responsible for ocean and coastal resource management that was formed to share information and coordinate actions for adapting to climate change impacts. CO-CAT developed the State of California Sea-Level Rise Guidance Document (COCAT 2013) to provide information and recommendations to enhance consistency across agencies in their development of approaches to sea-level rise. The CCC is one of the participating agencies of CO-CAT. CCC plans and regulates the use of land and water in the coastal zone, in partnership with coastal cities and counties. Development activities of land or public access to coastal waters generally require a coastal permit from either the CCC or an approved Local Coastal Program administered by the local government. In August 2015, the CCC adopted the Sea Level Rise Policy Guidance document (CCC 2015) as interpretive guidelines for Local Coastal Programs and Coastal Development Permit applicants. The Guidance is intended to assist in the preparation for sea level rise within the context of the California Coastal Act.

Appendix SW-1 Table 1 summarizes both SLR guidance documents. Both documents identify the 2012 National Research Council report as the "best available science" on the projected range of sea level rise by the years 2030, 2050, and 2100.

Appendix SW-1 Table 1
Summary of Sea Level Rise Guidance from CCC and CO-CAT

California Coastal Commission (CCC)	**Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT)**
Process for addressing SLR in Coastal Development Permits	*Policy recommendations for incorporating SLR projections into planning and decision making for projects in California*
1. Establish the projected sea level range for the proposed project. • Determine time period of concern using expected project life. • Use range of SLR scenarios based on best available science (e.g. 2012 NRC report). • Modify projections to incorporate vertical land motion and planning horizon if needed. 2. Determine how sea level rise impacts may constrain the project site. • Consider current and future hazard impacts of: geologic stability and erosion, flooding and inundation, wave impacts, other impacts 3. Determine how the project may impact coastal resources over time, considering sea level rise. • Resources: Public access, coastal habitats, agriculture, water quality, scenic resources, archaeological and paleontological 4. Identify project alternatives to both avoid resource impacts and minimize risks to the project. 5. Finalize project design and submit permit application.	1. Use the ranges of SLR presented in the June 2012 National Research Council report as a starting place and select SLR values based on agency and context-specific considerations of risk tolerance and adaptive capacity. 2. Consider timeframes, adaptive capacity, and risk tolerance when selecting estimates of SLR. 3. Consider storms and other extreme events. 4. Coordinate with other state agencies when selecting values of SLR and, where appropriate and feasible, use the same projections of sea-level rise. 5. Future SLR projections should not be based on linear extrapolation of historic sea level observations. 6. Consider changing shorelines. 7. Consider predictions in tectonic activity. 8. Consider trends in relative local mean sea level.

Both documents also recommend similar important considerations when analyzing sea level rise such as timeframe, risk tolerance, changing shorelines, and extreme events.

The main differences between the two documents are functionality and target audience. The CCC document focuses on how to apply the Coastal Act to the challenges presented by sea level rise through Local Coastal Program certifications and updates and Coastal Development Permit decisions. A sizeable document almost 300 pages in length, the CCC guidance contains current science, technical, and other information and practices. It is intended to serve as a multi-purpose resource for a variety of audiences and includes a high level of detail on many subjects. In contrast, the CO-CAT guidance is a 13-page document developed specifically to assist state agencies with information and recommendations to enhance consistency across agencies. It recognizes that the document will be used in a flexible manner to fit the different mandates and decision-making processes of state agencies. It functions as a starting point for all state agencies to establish a general framework and approach.

Staff uses both documents for analysis of Puente. Staff bases its sea level rise analysis on the CO-CAT guidance, as directed under Executive Orders S-13-08 and B-30-15. The CCC guidance is a valuable resource that staff uses to analyze impacts of SLR on the proposed project. Staff's analysis of climate change effects on coastal flooding roughly follows Appendix B of the CCC guidance, which provides information for determining local hazards.

Intervenors and members of the public insist that staff incorporate the CCC guidance into the analysis for Puente, including sections on scenario-based analysis to approach sea level rise planning; storms, extreme events, and abrupt change; and sea level rise adaptation planning. Furthermore, they urge the Energy Commission to treat the project as critical infrastructure, and to apply the heightened considerations established by the CCC guidance (ECVC/SC/ED 2015b).

Conclusion:

Staff bases its sea level rise analysis on the CO-CAT guidance, and uses the CCC guidance as a resource to analyze impacts of SLR. "Critical Infrastructure" is a separate issue (discussed below). If staff considered a project to be a critical facility, additional considerations would be applied to the analysis as recommended by both CCC and CO-CAT guidance documents.

THE DIFFERENCE BETWEEN CRITICAL INFRASTRUCTURE AND CRITICAL FACIILTY

While it is important to reduce or eliminate risks from various hazards throughout a community, several types of structures and infrastructure are most important to protect. Damage to these critical facilities can impact the delivery of vital services, can cause greater damages to other sectors of the community, or can put special populations at

risk. FEMA recommends that critical facilities exceed the minimum NFIP standards for flood protection to ensure functional continuity of the critical services.[75]

Intervenors and members of the public have asserted that the project is critical infrastructure, and therefore a flood analysis must apply the heightened considerations as stated by the CCC guidance. Staff acknowledges that the electric grid is critical infrastructure, but Puente itself is not a critical facility. The discussion below describes intervenors' comments and explains the basis of staff's disagreement.

Federal Emergency Management Agency (FEMA) and California Independent System Operator (California ISO) Serve Different Functions.

Intervenors state that Puente is a critical facility, citing the testimony presented at the CPUC proceedings where Southern California Edison and NRG used terms such as "critical contingency", "critical services", "critical generating location", and "essential electrical services" (COO 2015b1). Staff does not agree. The testimony presented at the CPUC proceedings addressed the need for long-term procurement to meet local capacity requirements, and this does not directly translate to the need for heightened protection from flood damage. To understand staff's position on critical facilities, a clear distinction is needed between what FEMA and California ISO consider "critical". Staff's position is that using FEMA's determination of critical facility is appropriate for flood analysis of the proposed Puente site.

California ISO - LCR

The California ISO is responsible for ensuring grid reliability, both system reliability and local reliability, throughout its balancing authority area. Local reliability requires that a California ISO-designated local reliability area[76] have sufficient local power generation to meet long-term local capacity requirements (LCRs). In 2013, based on California ISO's study showing the need for in-area generation of the Moorpark sub-area of the Big Creek/Ventura local reliability area, the CPUC authorized Southern California Edison to procure a specific amount of additional electric capacity to meet long-term LCRs by 2021.[77]

California ISO's Local Capacity Technical Analysis uses power flow modeling to assess whether a local reliability area would meet established reliability criteria, such as the ability to supply a one-in-ten-year load forecast with two major contingency outages occurring almost simultaneously. The study determined that for the Moorpark sub-area, the most critical contingency is the loss of a transmission line followed by the loss of

[75] Executive Order 11988 established a Federal Flood Risk Management Standard for construction or substantial improvement of federally funded buildings, roads and other infrastructure to better withstand the impacts of flooding. (The new standard does not affect the standards or rates of the National Flood Insurance Program.)

[76] A *local reliability area* is a geographic area that is transmission-constrained, meaning it does not have sufficient transmission import capability to serve the local customer demand.

[77] Decision 13-02-015 of the California Public Utilities Commission. February 13, 2013.

another pair of transmission lines. The proposed Puente would provide electric capacity to help meet these local requirements, and therefore must be located within the Moorpark sub-area.

In addition to providing contingency support in the Moorpark sub-area, Puente would also provide "flexible capacity" for the electric grid system as a whole. As explained in the **Project Description** section of this FSA, the proposed Puente project would be a modern, rapid-response, combustion turbine generator plant that would be available, as needed, during periods of high energy demand and during integration of renewable (solar and wind) energy's variable-output generation. As such, Puente would run only occasionally. California ISO plans the grid system to include redundancies, so an outage of the 271-MW Puente, whether for a short time or several months, would not threaten system reliability. For further discussion, see **APPENDIX SW-2** "The California ISO, the Puente Power Project, and Grid Reliability".

FEMA – CRS Program

FEMA does not require NFIP policyholders to exceed minimum standards to protect critical facilities. Instead, FEMA developed the Community Rating System (CRS), a voluntary incentive program that recognizes and encourages floodplain management activities that exceed the minimum NFIP requirements. Under CRS, flood insurance premium rates are discounted to reward community actions. The CRS has specific credited activities that are assigned credit points based on the extent of the activity. A community that engages in more mitigation activities becomes eligible for increasing NFIP policy premium discounts. One of the identified activities is "Protection of Critical Facilities (PCF)" from higher flood levels.

The CRS Coordinator's Manual (FEMA 2013) is the guidebook for the CRS and sets the criteria for CRS classification. It defines Critical Facility as:

> **A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired.** Critical facilities include health and safety facilities, utilities, government facilities, and hazardous materials facilities. For the purposes of a local regulation, a community may also use the International Codes' definition for Category III and IV buildings. [emphasis added.]

For further guidance on evaluating a PCF activity, the CRS Manual explains that there are usually two kinds of critical facilities that a community should address:

- **Facilities that are vital to flood response activities or critical to the health and safety of the public before, during, and after a flood**, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, vehicle and equipment storage facility, or shelter. (emphasis added)

- **Facilities that, if flooded, would make the flood problem and its impacts much worse**, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant. [emphasis added]

Staff focuses on the intent (which staff has bolded in the text above). Although utilities and power generation facilities are mentioned as general examples of "critical" facilities, staff posits this emphasis stems from the fact that coal-fired power plants have historically produced the vast majority of the U.S. net electricity generation[78] as baseload generators.[79] It appears that these types of facilities, which contribute a large share of the electricity needed to meet the minimum continuous energy demand, would be considered a critical facility because an unexpected interruption in production could result in serious consequences. On the other hand, modern, rapid-response, combustion turbine generator plants such as the proposed Puente project would run only occasionally, during periods of renewable integration, local contingency operations, or high energy demand. As a dispatchable natural gas-fired facility, the proposed Puente does not fit the description of Critical Facility.

FEMA – HMA Programs

FEMA's Hazard Mitigation Assistance (HMA) programs reduce community vulnerability to disasters and their effects, promote individual and community safety and resilience, and promote community vitality after natural disaster. Critical facilities are defined[80] as:

> Structures and institutions necessary, in the community's opinion, for response to and recovery from emergencies. Critical facilities must continue to operate during and following a disaster to reduce the severity of impacts and accelerate recovery. These would include, but not be limited to:
>
> - Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or chemically-reactive materials
> - Hospitals, nursing homes, and housing likely to have occupants who may not be sufficiently mobile to avoid injury or death during an emergency
> - Police stations, fire stations, vehicle and equipment storage facilities, and EOCs[81] that are needed for emergency response activities before, during, and after the event
> - Public and private utility facilities that are vital to maintaining or restoring normal services to affected areas before, during, and after the event

[78] From 1949 to 2011, coal-fired plants production has ranged between 54 and 80 percent of total net kilowatt-hours generated from fossil fuels and between 43 to 57 percent generated from all sources including nuclear, and renewable (EIA 2012 Table 8.2b).

[79] The coal fleet maintained an average annual capacity factor above 70 percent from 2002 through 2008 (EIA 2013 p. 42).

[80] This definition is for HMA program use and clarification and is not meant to provide a definition for use under other programs or supersede any FEMA regulation (FEMA 2015a).

[81] Emergency Operation Centers.

- Other structures or facilities the community identifies as meeting the general criteria above.

Although HMA programs are not applicable to the siting process of Puente, they provide insight into FEMA's considerations whether a facility should meet higher flood protection standards. Similar to the CRS Program, the focus is on the potential consequences to the community if the facility could not operate during or after a disaster. When referring to utilities, critical facilities are described as "vital to maintaining or restoring normal services to affected areas before, during, and after the event." Modern, rapid-response, combustion turbine generator plants such as the proposed Puente project would run only occasionally, during periods of renewable integration, local contingency operations, or high energy demand. As a dispatchable natural gas-fired facility, the proposed Puente does not fit the description of Critical Facility.

Executive Order 11988 – FFRMS

Executive Order 11988 established a Federal Flood Risk Management Standard for a higher level of resilience for federal critical actions that includes any activity for which even a slight chance of flooding is too great. Under these standards, federal agencies determine whether an action is critical. To assist agencies in determining whether a proposed action is a "critical action," the U.S. Water Resources Council issued Guidelines for Implementing Executive Order 11988 in October 2015 that presented the following example questions to consider. If any of the answers are "yes," then the proposed action is a critical action.

- If flooded, would the proposed action create an added dimension or consequence to the hazard?
    - Is the action a structure or facility producing and/or storing highly volatile, toxic, radioactive, or water-reactive materials?
- If the action involves structures such as hospitals, nursing homes, prisons, and schools, would occupants of these structures be sufficiently mobile and have available transport capability to avoid loss of life and injury given the flood warning lead times available?
    - Would emergency services functions be delayed or unavailable as a result of the location of the action?
    - Are there routes to and from the structure that would be inaccessible during a flood and hinder evacuation?
    - Would the location of the structure result in unacceptable hazards to human safety, health, and welfare of the occupants?
- Would essential or irreplaceable resources, utilities, or other functions be damaged beyond repair, destroyed, or otherwise made unavailable?
    - Would utilities, critical equipment, systems, networks, or functions be damaged beyond repair or destroyed?
    - Would physical or electronic records without backups or copies be destroyed or made unavailable as a result of where these items are located in a structure?

- Would national laboratories' research activities or items of significant value to research communities be damaged or destroyed as a result?
- Would items or structures of substantial cultural significance be damaged, destroyed, or otherwise harmed?

- Would the damage or disruption from a local flooding event lead to regional or national catastrophic impacts (e.g., a port being closed for a period following a storm event, which has an impact on transportation of goods nationally)?
- Would damage or disruption to a given facility or infrastructure component have potential for cascading damage or disruption to other facilities and infrastructure classes, some of which may already be stressed by flood conditions (e.g., electricity outage due to substation damage resulting in wastewater treatment facility shutdown or gasoline pump outage)?

As with the FEMA programs, Executive Order 11988 focuses on the potential consequences to the community if the facility could not operate during or after a disaster. Modern, rapid-response, combustion turbine generator plants such as the proposed Puente project would run only occasionally, during periods of renewable integration, local contingency operations, or high energy demand. As a dispatchable natural gas-fired facility, the proposed Puente does not fit the description of Critical Facility.

Electrical Utilities: "Some" vs. "All"

Intervenors state that energy utilities, regardless of type, are critical infrastructure as recognized by the U.S. Dept. of Homeland Security, the CCC SLR Guidance, and in the Cal EMA and the California National Resources Agencies' climate adaptation guidance. They add, "None of these documents supports, or even suggests, the PSA's attempt to carve out peaking power plants from the definition of critical infrastructure." Staff notes that these documents aim to help communities identify critical systems and offer guidance for prioritizing assets when developing community hazard plans. Energy utilities are part of the energy sector which are critical infrastructure, but the final determination of an asset's criticality involves case-specific evaluation and risk analysis.

U.S. Dept. of Homeland Security (U.S. DHS)

In the Critical Infrastructures Protection Act of 2001, the term "critical infrastructure" means systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.[82] The National Infrastructure Protection Plan (NIPP), revised in 2013, identifies U.S. energy infrastructure as one of 16 critical infrastructure sectors considered so vital to the United States that their incapacitation or destruction would have a debilitating effect.[83] The NIPP builds upon a risk management framework

[82] Section 1016(e) of the USA PATRIOT Act of 2001 (42 U.S.C. 5195c(e)).

[83] NIPP 2013 was issued response to Presidential Policy Directive-21 on Critical Infrastructure Security and Resilience

that requires an understanding of the criticality of assets, systems, and networks, as well as the associated dependencies and interdependencies of critical infrastructure.

Identifying and prioritizing which assets of an infrastructure are most essential to its function, or pose the most significant danger to life and property if threatened or damaged, is necessary for developing an effective protection strategy. President Bush's National Strategy for Homeland Security[84] explicitly adopts critical asset differentiation. The Strategy states, "The assets, functions, and systems within each critical infrastructure sector are not equally important. The transportation sector is vital, but not every bridge is critical to the Nation as a whole." (CRS 2004)

The National Critical Infrastructure Prioritization Program (NCIPP) within DHS is the primary program helping entities prioritize critical infrastructure at the national level. This program identifies nationally significant assets, systems, and networks which, if destroyed or disrupted, could cause some combination of significant casualties, major economic losses, and/or widespread and long-term impacts to national well-being and governance. The NCIPP list of the nation's highest-priority infrastructure was developed based on consequence thresholds (e.g. number of fatalities, mass evacuation length). Federal departments and agencies work with sector partners, both private and public, to identify, prioritize, assess, and remediate the security of their respective critical infrastructure. The U.S. Department of Energy was designated the Sector-Specific Agency for the Energy Sector, which includes the production, refining, storage, and distribution of oil, gas, and electric power, except for commercial nuclear power facilities.

In 2009, DHS expanded the NCIPP list to include clusters and systems of critical infrastructure. According to the NCIPP guidance, clusters or systems of critical infrastructure are made up of two or more associated or interconnected assets or nodes that can be disrupted through a single event, resulting in regional or national consequences that meet the NCIPP criteria thresholds. An asset is a single facility with a fixed location that functions as a single entity (although it can contain multiple buildings or structures) and meets the NCIPP criteria by itself. A node is a single facility, similar to an asset, that does not meet the NCIPP criteria individually but does meet the criteria when grouped with other nodes or assets in a cluster or system (GAO 2013). **Appendix SW-1 Figure 1** provides an illustration of an asset, a node, a cluster, and a system.

Staff notes that, although NCIPP is not applicable to the siting process of Puente, this DHS program demonstrates the complexity of associated dependencies and interdependencies of critical infrastructure. As shown in **Appendix SW-1 Figure 1**, the example of a node presents a case where critical infrastructure (i.e. the electrical grid) can contain a facility that does not meet the consequence-based threshold criteria to become critical by itself. In this context, this term generally refers to identifying potential venues for sabotage or terrorist attack, but this approach can also help with categorizing assets for all-hazard planning purposes.

[84] U.S. Office of Homeland Security. *The National Strategy for Homeland Security*. July 16,2002. p 31.

California Coastal Commission (CCC)

Intervenors' comments state that the CCC SLR Guidance instructs that sea level rise planning should use a 100-year or greater lifespan for "critical infrastructure" including "power plants and energy transmission infrastructure." Staff notes that the CCC Sea Level Rise Policy Guidance states that some power plants (not all power plants) are critical infrastructure. It also states that a community's determination of a facility's criticality should be based on the relative importance of its various assets for the delivery of vital services, the protection of special populations, and other important functions (CCC 2015 page 82). This is similar to the approach of considering the potential consequences to the community if the facility could not operate during or after a disaster. The CCC SLR Guidance does not definitively define all power plants to be "critical".

Some intervenors have emphasized and supported CCC's report of finding and recommendations (CCC 2016a) that conclude the project should be built elsewhere. The CCC report presents several concerns including the potential for flooding impacts. The CCC report states that Puente would remain "an important component of the regional system," and that "electrical generating stations are typically classified as critical facilities for purposes of natural hazards and emergency planning."

Staff argues that Puente does not automatically fall into the "critical" category. As discussed above, although utilities and power generation facilities are mentioned as general examples of "critical" facilities, staff posits this emphasis stems from the fact that coal-fired power plants have historically produced the vast majority of the U.S. net electricity generation[85] as baseload generators.[86] It appears that these types of facilities, which contribute a large share of the electricity needed to meet the minimum continuous energy demand, would be considered a critical facility because an unexpected interruption in production could result in serious consequences.

Until the recent emergence of renewable energy in California, natural gas fueled baseload plants provided a majority of the state's electricity similar to the rest of the nation's dependency on coal. Now that the electricity supply system has changed, often only 'firming' power is needed to fill in when renewables cannot meet demand. The current electricity system in California requires redundancy in availability of power from natural gas peaker plants such as Puente and therefore there can be many situations where power from a modern, rapid-response, combustion turbine generator plant such as the proposed Puente project would run only occasionally, during periods of renewable integration, local contingency operations, or high energy demand. As a dispatchable natural gas-fired facility, the proposed Puente would not be critical.

[85] From 1949 to 2011, coal-fired plants production has ranged between 54 and 80 percent of total net kilowatt-hours generated from fossil fuels and between 43 to 57 percent generated from all sources including nuclear, and renewable (EIA 2012 Table 8.2b).

[86] The coal fleet maintained an average annual capacity factor above 70 percent from 2002 through 2008 (EIA 2013 p. 42).

California Emergency Management Agency (Cal EMA)[87]

Cal EMA hazard mitigation planning staff coordinates with local jurisdictions and reviews all Local Hazard Mitigation Plans (LHMPs) in accordance with the Federal Disaster Mitigation Act of 2000 to ensure compliance with the Local Mitigation Plan Review Guide published by FEMA. Cal EMA assists local governments in the development of LHMPs and provides technical assistance, training, and outreach. Once Cal EMA planning staff finds the LHMP to be "approvable," the plan is forwarded to FEMA Region IX mitigation planning staff for final review and approval.

As part of the required element of hazard identification and risk assessment, the LHMPs are to include the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas. With respect to identifying critical facilities, Cal EMA staff acknowledges that every jurisdiction is unique. The list of assets that are most important to protect, as well as the criticality of any given facility, can vary widely from community to community. In the context of LHMPs, Cal EMA states that "there is no universal definition of a critical facility, nor is one associated with the Disaster Mitigation Act of 2000 planning requirements as promulgated in the Interim Final Rule [as described in FEMA's Local Mitigation Plan Review Guide]. For planning purposes, a jurisdiction should determine criticality based on the relative importance of its various assets for the delivery of vital services, the protection of special populations, and other important functions." Therefore, Cal EMA does not consider all energy utilities, regardless of type, as critical facilities, instead it requires jurisdiction specific analysis of what a community should consider critical.

California Natural Resources Agency

The California Natural Resources Agency published the Safeguarding California Plan, which provides policy guidance for state decision makers as part of continuing efforts to reduce impacts and prepare for climate risks. At the community level, the Natural Resources Agency and Cal EMA developed the California Adaption Planning Guide to provide guidance to support regional and local communities in proactively addressing the unavoidable consequences of climate change.

The Adaptation Planning Guide presents the basis for climate change adaptation and introduces a systematic process for local and regional climate vulnerability assessment and adaptation strategy development. Similar to other guidance documents described above, it includes vulnerability assessment and strategy development with prioritized goals. Seven "impact sectors" are the organizing framework for the climate vulnerability assessment. The Infrastructure sector includes the resources and services critical to community function (roads, rail, water, waste, electricity, gas, and communications systems).

Because infrastructure is critical to community function, even small failures can result in large consequences. Many of the threats to infrastructure are already accounted for in the planning and design of these systems, so assessments need to evaluate the

[87] This agency is also known as the California Office of Emergency Services (Cal OES).

systems' ability to withstand projected future conditions due to climate change. The guide emphasizes the importance of considering how one failure can cascade into another, turning a small failure into a catastrophic system failure. Potential impacts should be viewed both internally (locally) and externally (regionally). A minor interruption can cause drastic impacts if it occurs in tandem with other impacts or if it sets off a cascade of consequences.

As with the other guidance documents described above, staff notes that this is similar to the approach of considering the potential consequences to the community if the facility could not operate during or after a disaster. Utilities are part of the critical infrastructure, but the final determination of an asset's criticality involves evaluation and risk analysis.

Conclusion:

Staff acknowledges that the electric grid is critical infrastructure, but Puente itself is not a critical facility. This relationship is similar to the analogy: The transportation sector is vital, but not every bridge is critical to the nation as a whole. The proposed Puente project would be a modern, rapid-response, combustion turbine generator plant that would run only occasionally, to provide "flexible capacity" to the grid system during periods of renewable integration or high energy demand. For local contingency operations, California ISO's established reliability criteria calls for the ability of the local reliability area to supply a one-in-ten-year load forecast with two major contingency outages occurring almost simultaneously. The scenario of a catastrophic coastal storm (0.2-percent annual chance or worse) occurring simultaneously with the sub-area's most critical contingency (identified by California ISO) during the hottest day of the decade (one-in-ten year load forecast) is extremely remote.

The proposed Puente is not a critical facility requiring additional flood protection because failure to operate during or after a major flood would not increase the severity of flood impacts nor impede the community's recovery, i.e., its operation during or after a major flood would not be necessary to maintain electrical service in the flooded area. To assert otherwise would require assuming that the infrastructure necessary to deliver energy from Puente – wherever it were to be built - to end-users in the flooded area would remain intact after a flood, but that the infrastructure needed to deliver energy from any and all other power plants (both in and outside the Moorpark sub-area) was disabled. The potential failure of Puente would not threaten local reliability or system reliability.

COASTAL DEPENDENCY

Consistency with the California Coastal Act

The California Coastal Act (PRC §30101) defines "Coastal-dependent development or use" as "any development or use which requires a site on, or adjacent to, the sea to be able to function at all." Intervenors and members of the public assert that the Puente project is not coastal-dependent and therefore construction at the proposed site is not consistent with the California Coastal Act. A discussion of Puente's consistency with land use LORS is contained in the **Land Use** section of this PSA. All applicable local

and state land use LORS are analyzed, including the California Coastal Act, the Warren-Alquist Act, and the City of Oxnard Coastal Land Use Plan.

Conclusion:

Whether or not Puente is consistent with the Coastal Act is a **Land Use** issue and beyond the scope of the **Soil and Water Resources** technical section. (See the **Land Use** section of this FSA).

PLANNING HORIZON

Proposed Puente Lifespan vs. MGS Lifespan

Sea level rise guidance (COCAT 2013) emphasizes the importance of the timeline identified for a project. For the near future (out to 2030), confidence in the global and regional projections is relatively high, but uncertainty grows larger as the time horizon of the projection is extended forward (see **Appendix SW-1 Table 2**). These uncertainties arise from an incomplete understanding of the global climate system, the inherent unpredictability of natural climate variation, the inability of global climate models to represent every important global and regional component accurately, and the need to make assumptions about important climate drivers over future decades (e.g., greenhouse gas emissions, aerosols, and land use). The actual sea-level rise value for 2100 is likely to fall within the wide uncertainty bounds provided in the 2012 NRC West Coast Sea Level Rise Report, but a precise value cannot be specified with any reasonable level of confidence.

Appendix SW-1 Table 2
California Sea Level Rise Projection using 2000 as the Baseline

Time Period	South of Cape Mendocino
2000 - 2030	0.13 to 0.98 ft
2000 - 2050	0.39 to 2.0 ft
2000 - 2100	1.38 to 5.48 ft

(Source: COCAT 2013 and CCC 2015)

If the proposed Puente project is approved, the facility is scheduled to begin commercial operation in 2020 and operate for 30 years to 2050. A few public comments have raised concern that, if approved, the facility could remain operational for much longer, similar to the 60-year operational life of MGS. These comments suggest that a longer period appropriate for industrial facilities should be applied. The CCC guidance (CCC 2015) advises, “A longer time frame of 100 years or more should be considered for critical infrastructure like bridges or industrial facilities.”

The AFC identifies the project’s design lifespan to be 30 years, but the AFC also mentions the possibility of operating for longer depending on economics and other factors. A 20-year contract for gas-fired generation purchase agreement between the applicant and SCE was approved by the CPUC in late May 2016, but the contract would not preclude Puente from operating for less than or beyond a 20-year agreement. Staff understands that a lifespan of 30 years for a “typical” natural gas power plant is

generally accepted within the power industry, and that the actual useful life also depends on partial load cycling operation and frequency of starts and stops. For these reasons, the proposed 30 years of commercial operation is a reasonable timeframe, so staff's primary focus is on the projected range of SLR by 2050 (between 0.39 foot and 2.0 feet).

Conclusion:

An assumed 100-year operational life is inappropriate mainly because Puente is not critical infrastructure (see "Critical Infrastructure" discussed above). The proposed 30 years of commercial operation is a reasonable timeframe, so staff's primary focus is on projected sea level rise by 2050 shown in **Appendix SW-1 Table 2**.

HAZARD VS. RISK

The terms "hazard" and "risk" are often used interchangeably. However, in terms of risk assessment, these are two very distinct terms. A hazard is any biological, chemical, mechanical, or physical agent that is reasonably likely to cause harm or damage to humans or the environment with sufficient exposure. Risk is the probability that exposure to a hazard will lead to a negative consequence. With regard to flooding, an evaluation of flood risk provides information that is more useful for the Committee than only a discussion of flood hazard.

Flooding hazard is a measure of the potential for a flood to occur at a given site. It is also a measure of the potential magnitude of site-specific effects, including extent of inundation, height of runup, flow depth, and velocity of flow. Location of a project within a flood hazard zone indicates that flooding is reasonably likely to cause harm or damage to the project.

Flood risk is a measure of the consequences given the occurrence of a flood, which can be characterized in terms of damage, loss of function, injury and loss of life. Risk depends on many factors including exposure (magnitude of hazard), potential negative impacts (possible harm or damage), vulnerability (possible weaknesses in protection), adaptive capacity (ability to respond, moderate, or cope), and consequences (severity of impacts from exposure).

As stated in the **Soil and Water Resources** section (see "Flooding" in the "Puente Operation" subsection), staff determines the relative flood risk by estimating the likelihood of a flood impacting the proposed Puente and evaluating the consequences resulting from those flood impacts (shown in **Soil & Water Resources Table 3**). This approach of:

Risk = Likelihood x Consequence

was taken from the State of California Sea-Level Rise Guidance Document (see discussion above on Sea Level Rise Guidance), but staff also applied this evaluation to present-day flooding risk. The likelihood of impacts is mainly based on hazard maps, and the consequences are evaluated with respect to the severity of impacts on the following:

- Safety of people onsite and offsite
- Harm to biological resources from onsite toxins running offsite
- Effects of operational failure on electric grid reliability (local or system wide)

Conclusion:

An evaluation of flood risk is more useful information than a discussion of flood hazard alone, because the consequences of impacts are included in the evaluation.

FLOOD PREDICTION MODELS

Bathtub vs. Hydrodynamic Analysis

Maps and computer simulations that show the extent of potential sea-level rise are a common method of communicating the risk to coastal areas. These maps are included in assessment reports from various nongovernmental organizations, state and local agencies, and other private groups. In the last several years, vast amounts of high quality elevation data derived from light detection and ranging (LIDAR) have become available, and they are highly suitable for detailed study of physical responses related to sea-level rise. Although various mapping tools use the same LIDAR data, their flood maps may show different areas of inundation for the same sea level rise scenario. Very large discrepancies are usually due to the differences between the type of model used, a static ("bathtub") model or a hydrodynamic model.

A "bathtub" model simply compares the projected higher water level to the land elevation and assumes that land below the water level is flooded instantly. It does not take into consideration whether the new flood areas connect to the ocean, nor does it consider how the changes to the water level will change wave propagation or overtopping of flood barriers. This model presents a significant oversimplification of the processes involved in flooding, but it provides value in allowing individuals to gain a broad view of the general areas that could experience "every day" impacts of sea level rise on the regular tide cycle. Conversely, hydrodynamic modeling takes into account the details of local development patterns and the characteristics of waves and storms, and can therefore provide a clearer understanding of local sea level rise impacts compared to static models. In particular, hydrodynamic models take into account factors that alter flooding and inundation patterns and impacts.

Hydrodynamic flood mapping is recommended over equilibrium (i.e. "bathtub") mapping because the static model is strongly biased towards over-prediction (GALLIEN 2011). **Appendix SW-1 Figure 2** compares the modeling method of six different mapping tools available online. No individual tool is completely accurate, but each has strengths that make it unique from the others and different limitations that users should keep in mind. Staff reviewed three interactive web-based flood map tools that were developed using dynamic modeling: Coastal Resilience (by The Nature Conservancy), Federal Insurance Rate Maps (FIRM, by FEMA), and the Coastal Storm Modeling System (CoSMoS 3.0, by USGS). Staff chose to use CoSMoS information because it projects coastal flooding and erosion due to both sea level rise and storms driven by climate change (discussed further below).

Conclusion:

Flood hazard information based on hydrodynamic analysis and site-specific data is required for siting purposes. Staff chose to use CoSMoS information because it projects coastal flooding and erosion due to both sea level rise and storms driven by climate change (discussed further below).

EROSION POTENTIAL OF DUNES

Storm-Induced Erosion

Pacific Coast beaches experience typical seasonal changes in profile and location from summer to winter conditions (see **Appendix SW-1 Figure 3**). During winter months, increased total water levels along with high-energy, steep waves tend to move sand offshore. This increased wave energy changes the beach profile by pulling sand from the upper portions of the beach, typically resulting in a flatter beach. The sandbars that form just offshore help protect the beach by causing waves to break farther offshore and reduce the energy of the waves that come onshore. By the end of the summer or early fall after months of calm seas, the beach slowly recovers. The berms and back beach dunes typically recover, as long as sediment is supplied by the offshore bar or sediment sources upcoast (NHC 2005).

One large storm or a series of storms can cause significant beach and dune erosion. Storm erosion follows a similar but more rapid pattern than seasonal erosion. Damaging storms usually occur in the fall, winter, or early spring months when the “seasonal” winter beach profile is already relatively lean in shape. Storm damage can cause extensive dune erosion, scarping, or complete loss of the frontal dune. Recovery from a large storm follows a similar process of the seasonal beach, with offshore sandbars providing protection as smaller waves gradually buildup the beach. This can occur in the course of one season, but may take a year or more. Dune recovery is a much slower process that involves dune vegetation re-establishing, wind transport of sand, and other processes. It can take several seasons to several years or more for a dune to recover naturally from an extreme storm event.

Conservative vs. Worst-Case

The complexity of coastal processes combined with the uncertainty of future waves, storms and sediment supply makes the task of predicting future beach and dune erosion difficult. While different methods have been developed to estimate and model coastal erosion, there is no single specific accepted method. When choosing between a conservative approach and a worst-case approach, staff considered the timeframe and risk tolerance of the proposed project.

Potential erosion at a particular location is influenced by site-specific factors including beach slope, width, orientation, sediment grain size, manmade structures, and human actions. The most dramatic changes in beach profile occur from episodic erosion. The amount of shoreline erosion during a storm depends primarily upon the magnitude of wave energy impacting the shore and the duration of the storm. The shoreline’s ability to recover from storm damage depends on the time between storms and the availability of sufficient sediment needed to rebuild. Chronic erosion, on the other hand, occurs

from slow, long-term processes such as gradual shoreline adjustment associated with sea level rise, land subsidence, declining sediment supply, and possible long-term shifts in wave conditions, rainfall, and runoff due to climate change (NHC 2005).

Intervenors and members of the public have stated that present-day coastal hazards can flood the project site and directly affect safe operations of the proposed project. Several comments refer to hazard maps included in testimony submitted to the CPUC (COO 2015a) that show the area of potential coastal flooding reaches the proposed site's boundaries, almost completely surrounding the site. Staff learned that these maps were developed primarily for updating the City of Oxnard's Local Coastal Plan and therefore (understandably) reflect very conservative assumptions and scenarios. However, applying these maps to analyze site-specific flood risks of the proposed project is overly conservative. Staff offers the following assessment of why the hazard maps were not used for project analysis.

- *The representative wave conditions for the flood event is based on the highest observed water level at the Rincon Island tide gage on January 27, 1983* (ESA 2013, Table 14). Staff's position is the design event for the proposed project should be based on the one percent annual chance event consistent with engineering standards for flood design. The use of the highest observed water level is appropriate for purposes of a Local Coastal Plan, especially when historic records are limited. However, using this wave climate for purposes of analyzing Puente is too conservative, because assuming a worst-case scenario is unnecessarily extreme especially when combined with the other assumptions below.
- *Potential erosion projection assumes that the coast would erode or retreat based on a maximum storm wave event with unlimited duration* (ESA 2013, page 20). Staff understands the uncertainty of the duration or clustering of future storms, but assuming a storm of unlimited duration is extremely conservative. This type of assumption represents a worst-case scenario that is not appropriate for the objective analysis of the proposed project.
- *Areas that are eroded are assumed to be flooded during a large storm* (ESA 2013, page 33). While this is a reasonable assumption in general, when combined with the assumption of a storm event with unlimited duration, it becomes unreasonably excessive. Overestimating the area of erosion would therefore result in overestimating the area of flooding.
- *Flooded areas with connectivity to the ocean were mapped. To conservatively account for seepage and potential errors in the digital elevation data, any pools (greater than 32 square feet) within ten feet of areas connected to the ocean were assumed flooded. Similarly, donut holes that are smaller than one acre were also assumed flooded* (ESA 2013, page 33). Including adjacent isolated pools and small donut holes to mapped flooded areas is reasonable, but it becomes overly conservative when combined with the other assumptions discussed above. If the mapped area of flooding is overestimated, then the addition of adjacent isolated pools and donut holes could represent a worst-case scenario that is not appropriate for the proposed project.

A conservative approach is appropriate for the proposed project rather than a worst-case approach. Episodic erosion will occur, but estimating coastal erosion based on the most damaging wave conditions on record for an unlimited amount of time essentially represents a series of multiple historic extreme storms occurring within the same season. This scenario is possible, but very remote. Although the likelihood increases with climate change, the probability of this scenario occurring during the proposed project's lifetime is very uncertain. The use of a worst-case approach could be appropriate for a critical facility requiring heightened flood protection, however the proposed Puente is not considered a critical facility (see "Critical Infrastructure" discussion above). In addition, this section of the shoreline is not at high risk of erosion, as suggested by the site-specific characteristics of the beach (e.g. wide, dune backed, relatively low exposure to southern swells, and downcoast of a large sediment source, the Santa Clara River) and no recorded damage to the MGS facility during the two strongest El Niño cycles on record (occurring 1982/83 and 1997/98). Therefore, the assumptions discussed above are not warranted for estimating coastal erosion and resulting floods.

Conclusion:

The use of worst-case assumptions and scenarios are unwarranted for estimating coastal erosion and resulting floods at the Puente site. The proposed project is not considered a critical facility and this section of the shoreline is not at high risk of erosion. Analysis of site-specific flood risks should be based on the one percent annual chance event consistent with engineering standards for flood design, which is an appropriately conservative approach rather than a worst-case approach.

HAZARD ZONE MAPPING

The Differences between Coastal Resilience, FEMA FIRM, and CoSMoS 3.0

Due to increasing risk of flooding in coastal communities, several government agencies and environmental institutes have used mathematical modeling to develop interactive maps to visualize specific areas at risk to coastal hazards. Communities can use these maps to increase public education and awareness about coastal hazards, incorporate impacts of coastal hazards into planning and decision-making about coastal infrastructure, and improve emergency disaster management. Staff reviewed three coastal hazard maps that were developed using dynamic modeling[88]: Coastal Resilience (by The Nature Conservancy (TNC)), Federal Insurance Rate Maps (FIRM, by FEMA), and the Coastal Storm Modeling System (CoSMoS 3.0, by USGS).

Each tool was developed with its own modeling framework, but all three are conceptually similar. Each uses a combination of specialized computer models to transform offshore waves to nearshore coastal waters. The results from these modeling efforts provide boundary conditions for detailed onshore coastal flood hazard analyses

[88] ESA 2013, COO 2015a, BAKER 2015, USGS 2009b, USGS 2014, USGS 2016

that take into account key coastal processes, such as shoreline/dune erosion, wave setup, wave runup, and overland wave propagation. The most-recent LIDAR topography and digital bathymetry (the underwater equivalent to topography) are integrated into the models for improved results of beach/dune response to wave conditions and flooding extent of areas hydraulically connected to the ocean.

All three modeling systems mapped projected flooding at the proposed Puente site. (It should be noted that at the time of this writing, final maps of the project area from FEMA and USGS have not yet been officially released, as further described below. Staff obtained preliminary information available online by the respective developers of each tool for analysis in this FSA.) Staff attempted to compare the results of each tool for the same specific event: a 100-year coastal water level event assuming two feet of sea level rise. Because each tool has limited choices of mapping options, staff was not able to make a direct comparison. The maps from all three tools, showing projected flooding during an extreme event with different values of SLR (see **Appendix SW-1 Figure 4**), appears to present conflicting results. The FEMA map does not incorporate any amount of sea level rise, but the area of flooding is larger than USGS map that includes almost 40 inches of sea level rise. The map by TNC shows almost complete flooding of the MGS property with only slightly over two inches of sea level rise. These discrepancies stem from the differing characteristics of each tool, as described below.

Extreme Events

FEMA maps the one percent annual chance (100-year) flood event using a response-based approach. Based on water level and wave time series (1960 – 2009), a 50-year hourly time series of total water levels (TWL) was computed for each point of interest at the shoreline.[89] Using this TWL time series, statistical analysis was conducted to determine the one percent annual chance TWL and resulting one percent annual chance runup event for hazard area mapping. Because nearshore wave transformation was performed by a modeling system, there was no direct analysis of individual observed wave records to determine storm wave characteristics (BAKER 2015). FEMA does not incorporate any amount of sea level rise when mapping hazard zones; therefore, maps represent present-day hazards only.

USGS projected future coastal hazards for the 100-year storm event in combination with sea-level rise. Storms are first identified from time-series of total water level proxies (TWLpx) developed from a simulated 30-year offshore wave time series (1980 – 2010) and a projected 90-year time series (2010 – 2100). TWLpx are computed for each point of interest at the shoreline based on the combination of storm surges, wave setup and runup, and sea level anomalies (seasonal tides and SLR). To account for future impacts of climate change, models are driven by output from the latest Global Climate Models and results include regional and local sea level rise factors. Then values of TWLpx are evaluated for extreme events. Several 100-year events are determined from varying combinations of wave-wind conditions and used for multiple model runs to better

[89] For more information on total water level (TWL), see “SLR – Consider Storms and Other Extreme Events” in the “Operation” subsection of the **Soil and Water Resources** section of this FSA and **Soil & Water Resources Figure 13**.

account for regional and directional flooding affects. Model results are combined and compiled into scenario-specific composites of flood projection (e.g. 100-year storm with 3-feet of SLR).

TNC focuses on the evaluation of the extreme events during maximum storm-induced TWLs when hazards are most severe. A 20-year offshore wave time series (1992 – 2012) was used to develop nearshore wave height and period. These nearshore time series were then used to calculate a time series of TWLs for each point of interest at the shoreline. The high tide coastal storm flood modeling was integrated with the coastal erosion hazard zones (see "Shoreline Change" below). Future sea level rise was added to the total water level incrementally at each ten-year time step (ESA 2013). The largest storm on record was used for the coastal storm flooding, a storm event that occurred during the strong El Niño winter of 1982/1983 during which wave heights reached 25 feet at 22 seconds. Erosion projections were made every ten years and the coastal storm flood model considered these eroded areas susceptible to flooding during a large storm event (COO 2015).

Shoreline Change

FEMA does not directly incorporate the rates of shoreline change into the coastal flood analysis, because maps represent present-day hazards only. Instead, the erosion of shore and dune profiles are estimated during single large storm events. Because the potential flooding hazard event will likely occur during the winter, before determining beach profile changes for a particular storm event the initial beach profile conditions are first estimated. This initial beach profile represents the likely winter profile conditions for a particular coastal setting, defined as the Most Likely Winter Profile (MLWP). The storm-induced erosion alters the shoreline profile, which can affect the area and depth of resulting floods. Long-term littoral transport is not included in the analysis.

USGS determines storm-induced erosion based on the TWLpx of an extreme event (e.g. one percent annual chance) in addition to sea level rise and storms driven by climate change. The Coastal One-line Assimilated Simulation Tool (COAST) is a complementary module within CoSMoS that simulates long-term shoreline evolution due to sediment mobilized by waves and SLR. The modeled processes include longshore and cross-shore sediment transport, the effects of SLR, and sediment supply by natural sources and human activities. The result are integrated into flood mapping for more precise projections of future extents of flooding based on an evolving coastline. To date, integrated maps for the San Diego County coastline have been released, but maps for Ventura County and the rest of Southern California are still under development.[90] Long-term shoreline changes due to different SLR scenarios were mapped for Ventura County using the CoSMoS-COAST modeling system, but it does not incorporate flooding from a large storm event.

TNC modeled coastal erosion by incorporating erosion due to SLR and erosion due to an extreme storm wave event. Because of wide uncertainties of future changes of

[90] The coastlines of San Diego County and Ventura County are very different, so a review of recently released maps of San Diego would not provide much insight about potential changes for Ventura County.

sediment from the watersheds, sediment supplies are assumed to have no substantive changes. To account for SLR, erosion projections were made every ten years and the maximum possible erosion was estimated by assuming a maximum storm with "unlimited duration". This conservative approach is intended to address the uncertainty of future storms. The potential erosion mapped during an extraordinarily long storm accounts for the possible occurrence of a cluster of large storms that does not allow time for full recovery. Because sea levels are expected to rise for centuries, this worst-case erosion could occur at some point in the future.

Hazard Zone Mapping

FEMA's Special Flood Hazard Area (SFHA) Mapping defines NFIP regulatory requirements concerning coastal construction. VE Zones are high hazard areas where wave action and/or high-velocity water can cause structural damage during the one percent annual chance flood and, therefore, construction requirements are more stringent compared to other zones. The actual VE Zone boundary shown on the Flood Insurance Rate Map (FIRM) is defined as the furthest inland extent of five criteria.[91] As shown in **Appendix SW-1 Figure 4(B)**, the project site is outside the VE Zone, which appears to extend to the dunes. The location of the boundary implies that waves do not overtop the dunes, flooding does not continue landward, and the dunes do not fit the criteria of a primary frontal dune zone. Therefore, the boundary represents the area where wave runup reaches three feet above the eroded ground. The project site is inside an X Zone, which is an area subject to flooding by floods more severe than the one percent annual chance flood.

USGS uses data that is based on maximum "sustained" inundation (rather than maximum wave runup height) to map the flood boundary location. The maximum water elevation attained at the MHHW gauge that is sustained a duration of at least two minutes is then extrapolated to intersect with the beach profile. This water elevation, which effectively represents standing water, is used to determine the eroded profile (at the time of "sustained" water level, not necessarily the final profile). The landward extent of flooding is the location of the water elevation at the eroded profile and the estimate of the wave setup is used as the ''flood elevation''. As shown in **Appendix SW-1 Figure 4(C)**, the project site is outside the projected flood area during a 100-year event with about 40 inches of SLR. The location of the boundary implies that inundation does not occur past the dunes. Because the map does not represent splashing, but it shows that water that may splash over the dunes is expected to drain quickly. USGS states that the wave setup approach for estimating coastal flooding is a better indicator of coastal regions that are subject to persistent, potentially damaging flooding during a given storm. In contrast, the more conservative wave runup approach represents less frequent, shallower flooding.

[91] VE Zone must meet one of more of the following criteria: wave runup elevation is at least three feet above the eroded ground profile; wave overtopping splash exceeds the crest of a barrier by three feet or more; landward high-velocity flow (based on flood depth and velocity) is 200 ft^3/s^2 or more; breaking wave height is three feet more; and/or fits the criteria of a primary frontal dune zone (FEMA 2015c).

TNC's mapping uses a process called "spatial aggregation" to show the combined hazard zones of a given location. This type of exposure analysis determines the likelihood of damages based on the number of hazard zones that encroach on a particular asset. A user can indicate different planning horizons and different SLR scenarios when choosing hazard zones: erosion hazard zones (integrated with coastal flooding); coastal wave hazard zone (wave impacts); coastal flooding during extreme coastal events; coastal inundation during monthly extreme tides; and river flooding. **Appendix SW-1 Figure 4(A)** shows the combination of three separate hazards (erosion, coastal flooding, and wave impacts) under three different SLR scenarios (2.3 inches, 5.2 inches, and 8.0 inches). The location of the boundary shows that multiple hazards occur in all directions around the Puente site, implying that the entire dune system is eroded to expose most of the MGS property to wave impacts and flooding. It appears that the differences in SLR scenarios are relatively minor; therefore, inundation of the Puente site would not be anticipated under the SLR scenarios due to the elevation of the Puente site.

Discussion

These three tools use very different assumptions (see **Appendix SW-1 Table 3**), which result in considerable differences between the mapped results.

Appendix SW-1 Table 3
Summary Comparison of Coastal Flood Hazard Maps

	Preliminary FIRM (FEMA)	**CoSMoS 3.0 (USGS)**	**Coastal Resilience (TNC)**
Extreme Events	Statistical 100-year flood event, with climate change not analyzed	Global climate model incorporated to produce statistical 100-year storm event	Largest storm on record, applied with unlimited duration
Shoreline Change	Winter beach profile, but no long-term change	Global climate model incorporated to produce long-term beach erosion	Largest storm on record every ten years with maximum possible erosion
Hazard Zone Mapping	The furthest inland extent of: wave runup, wave overtopping, or landward high-velocity flow	Area of flooding sustained for at least two minutes	Layers several maps (erosion, flooding, wave impact, etc.) and shows areas of overlap

TNC's mapping, by far the most conservative of the three tools, was developed as part of the Coastal Resiliency Study for long-term coastal planning. It assesses the vulnerabilities of human and natural resources through technical analysis of coastal hazards and climate change. Because sea levels are expected to rise for centuries, a conservative approach accounts for hazards that could occur at some point in the future. Although the combined hazard zones provide information on the possible hazards that could occur at a site, this type of analysis does not take into account the probability of simultaneously occurring events. This is useful for planning purposes over

a very long-term timeframe, but not appropriate for a project-level analysis in a 30-year timeframe.

FEMA maps serve two purposes: rating structures for flood insurance policies and community floodplain management. The development of these maps is closely regulated by the National Flood Insurance Program and revisions occur roughly every five years, if needed. Future sea level rise is not analyzed. Although flood protection standards are nationwide, FEMA guidance for map development considers conditions applicable to specific regions. For the Pacific Coast, the somewhat conservative wave runup approach represents less frequent, shallower flooding. Although official FEMA maps with updated coastal hazards are not yet available for Ventura County, the Preliminary maps released in September 2016 are considered the best information available and are appropriate to use for flood hazard analysis (see “FEMA Hazard Map Update” below).

USGS tool focuses on the assessment phase. These maps incorporate future sea level rise into the analysis, but acknowledge that storms may not persist long enough to cause maximum possible beach erosion. The less conservative wave setup approach represents more persistent flooding that could potentially cause more damage. Staff’s position is the CoSMoS 3.0 tool is a reasonable method of analyzing future hazards that also includes potential effects of climate change. Although maps of future shoreline changes are available for Ventura County, USGS has not yet released maps that incorporate both shoreline changes and a large storm event. However, CoSMoS-COAST projects the 2050 shoreline position at the project site would be located at roughly the same position as present-day (see **Soil & Water Resources Figure 17** and the discussion under “Climate Change – Coastal Flooding” in the **Soil & Water Resources** section of this FSA). Therefore, the flood hazard areas presented in **Soil & Water Resources Figure 15** and **Figure 16** are reasonable projections of flood hazards that include long-term shoreline change.

Conclusion:

The CoSMoS 3.0 tool by USGS is a reasonable method of analyzing future hazards by 2050 that also includes potential effects of climate change. Awareness of its assumptions helps understanding of its limitations and appropriate use. Staff also considers the other two tools (by FEMA and TNC) in the context of their intended functions.

FEMA HAZARD MAP UPDATE

Effective Map vs. Preliminary Map

Floodplain maps show areas subject to inundation by the base flood (one percent annual chance flood). The main uses of floodplain maps are:

- Flood insurance – determining which buildings must have flood coverage and how much it costs
- Local building regulation – grading, building and remodeling in the mapped floodplain must comply with special rules and regulations.

The Federal Insurance Rate Map (FIRM) is the official map created and distributed by FEMA for the National Flood Insurance Program (NFIP). Each FIRM includes an "Effective Date" indicating the map is final and must be used for flood insurance purposes. Additionally, the City of Oxnard adopted a floodplain management ordinance based on the effective FIRM for the area. (Communities participating in NFIP are required to regulate new and existing development in mapped floodplains through ordinance that meets or exceeds the minimum NFIP criteria.)

Flood risks can change over time and water flow and drainage patterns can change dramatically because of surface erosion, land use, and natural forces. When updating a FIRM, FEMA requires the revision follows set standards and methods in the following sequence of steps: Planning, Development, Draft, Preliminary, and Effective. During the Draft stage, FEMA reviews and modifies, as appropriate, the draft information to ensure it complies with established NFIP criteria, then dates are set that the maps enter the Preliminary and Effective stages. The time between the Preliminary and Effective dates is typically 18 to 24 months.

The Preliminary FIRM is released to the public to give community officials, residents, and other stakeholders an early look at the projected risk identified by an in-progress flood hazard study. After a 90-day Appeal Period followed by a post-preliminary process, FEMA issues a notice of final flood elevation determination [Letter of Final Determination (LFD)]. The FIRM becomes effective starting six months after the LFD is issued, and the community must adopt a compliant floodplain management ordinance by the FIRM effective date to remain a participant in good standing in the NFIP.

Preliminary data are for review and guidance purposes. Although Preliminary FIRMs are not final, they are presented as the best information available at the time. Preliminary data cannot be used to rate flood insurance policies or enforce the federal mandatory purchase requirement, but a community can reasonably utilize the preliminary data for regulating floodplain development before the map becomes final and effective (FEMA 1998).

Ventura County's effective FIRM is dated 2010, but updates at the time were limited to inland hazards (e.g. riverine flooding). The boundaries shown of coastal hazards were developed in 1983, when the last comprehensive study of coastal flood risk was completed for California's Pacific coastline. FEMA is in the process of performing a detailed engineering study of the Pacific coast to reanalyze coastal flood hazards and

update FIRMs. This Open Pacific Coast study uses new technologies and coastal data to apply current FEMA standards of flood hazard analyses specific to the Pacific Coast of the United States (FEMA 2012). Preliminary FIRMs were released in September 2016. Depending on the time needed to resolve any appeals and finalize maps during the post-preliminary process, the Preliminary FIRM is projected to become Effective in 2018.

Because the Preliminary maps incorporate recent coastal data and apply current FEMA standards for the Pacific Coast, flood hazard boundaries are expected to change from the boundaries currently delineated on the Effective maps (see **Soil & Water Resources Figure 6**). Although not yet "official", using Preliminary maps is appropriate for analysis of anticipated flood hazard areas.

Conclusion:

Using Preliminary maps, considered the best information available, is appropriate for analysis of flood hazard areas.

REFERENCES

BAKER 2015 – BakerAECOM LLC, prepared for U.S. Federal Emergency Management Agency Region IX, Open Pacific Coast Study. Intermediate Data Submittal #1, Scoping and Data Review, Ventura County, California. January 28, 2015.

CCC 2015 – California Coastal Commission. Sea Level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits. Adopted August 12, 2015.

CCC 2016a – California Coastal Commission. 30413(d) Report – Final Approved Report (TN 213667) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

COCAT 2013 – Coastal and Ocean Working Group of the California Climate Action Team. State of California Sea-Level Rise Guidance Document. March 2013 update.

COO 2015a – City of Oxnard/Ellison Folk, Edward T. Schexnayder, Shute, Mihaly & Weinberger LLP (TN 204942). Testimony of Dr. David Revell on Behalf of the City of Oxnard dated April 8, 2015. Submitted to CEC/Docket Unit on June 8, 2015.

COO 2015b1 – City of Oxnard/ Shute, Mihaly & Weinberger LLP (TN 205930). City of Oxnard Comments Responding to CEC Issues Identification of August 10, 2015. Submitted to CEC/Docket Unit on August 31, 2015.

CRS 2004 – Congressional Research Service. Critical Infrastructure and Key Assets: Definition and Identification. CRS Report for Congress, Order Code RL32631. October 1, 2004.

ECVC/SC/ED 2015b – Environmental Defense Center/Presiding and Associate Commissioners (206231). Additional scoping comments on Staff ID Report. Submitted on behalf of inventors Environmental Coalition, Environmental Defense Center, and Sierra Club, Los Padres Chapter. Dated 09/29/2015. Docket Unit on September 29, 2015.

EIA 2012 – U.S. Energy Information Administration. Annual Energy Review 2011. DOE/EIA-0384. September 2012.

EIA 2013 – U.S. Energy Information Administration. Annual Energy Outlook 2013 with Projections to 2040. DOE/EIA-0383. April 2013.

ESA 2013 – ESA PWA, prepared for The Nature Conservancy. Coastal Resilience Ventura, Final Technical Report for Coastal Hazard Mapping. D211452.00. July 25, 2013.

FEMA 1998 – Federal Emergency Management Agency. IS-9 Managing Floodplain Development through the National Flood Insurance Program. March 1998.

FEMA 2012 – Federal Emergency Management Agency, Region 9. Open Pacific Coast Study, Frequently Asked Questions (FAQ). August 2012.

FEMA 2013 – Federal Emergency Management Agency. National Flood Insurance Program Community Rating System Coordinator's Manual. FIA-15/2013. OMB No. 1660-0022. Edition 2013.

FEMA 2015a – Federal Emergency Management Agency. Hazard Mitigation Assistance Guidance: Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program. February 27, 2015.

FEMA 2015b – Federal Emergency Management Agency. Open Pacific Coast Study, California Coastal Analysis and Mapping Project. October 2015.

FEMA 2015c – Federal Emergency Management Agency. Guidance for Flood Risk Analysis and Mapping, Coastal Floodplain Mapping. Guidance Document 39. November 2015.

GALLIEN 2011 – T.W. Gallien, J.E. Schubert, B.F. Sanders. Predicting Tidal Flooding of Urbanized Embayments: A Modeling Framework and Data Requirements. Coastal Engineering, Vol 58. January 2011.

GAO 2013 – U.S. Government accountability Office. Critical Infrastructure Protection, DHS List of Priority Assets Needs to Be Validated and Reported to Congress. GAO-13-296, Report to Congressional Requesters. March 2013.

NHC 2005 – Northwest Hydraulic Consultants, prepared for U.S. Federal Emergency Management Agency. Final Draft Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States. January 2005.

USGS 2009b – U.S. Geological Survey. The Framework of a Coastal Hazards Model – A Tool for Predicting the Impact of Severe Storms. Coastal Hazards Task of the USGS Multi-Hazards Demonstration Project in Southern California. By P.L. Barnard et al. Open-File Report 2009-1073. May 2009.

USGS 2014 – U.S. Geological Survey. Development of the Coastal Storm Modeling System (CoSMoS) for Predicting the Impact of Storms on High-Energy, Active-Margin Coasts. By P.L. Barnard et al. Natural Hazards, Vol 74, Issue 2. November 2014.

USGS 2016 – U.S. Geological Survey. Santa Barbara and Ventura County CoSMoS Initial Results. Webinar produced by USC Sea Grant on February 9, 2016. https://uscseagrant.webex.com/uscseagrant/lsr.php?RCID=656eb6fbeb97c93c7e6b3866d52e9a40 accessed March 11, 2016.

APPENDIX SW-2
SOIL AND WATER RESOURCES

Testimony of David Vidaver

THE CALIFORNIA ISO, PUENTE, AND GRID RELIABILITY

SUMMARY

System and local reliability planning, which are probabilistic in nature, are conducted to ensure that electricity demand can be met except under very stressed conditions that are expected to occur one day or less every ten years. System reliability assessments assume that several thousand mega-watts (MW) of generation capacity will be unavailable to the California Independent System Operator (California ISO) due to maintenance needs at any and every moment in time; accordingly, an outage of the 271 MW Puente Power Project (Puente or project), whether for a short time or several months, would not threaten system reliability. Local reliability requires that sufficient generation be located in transmission-constrained areas so as to withstand the sequential failure of two major system components under one-day-in-ten-year demand conditions. Thus the potential failure of a single component - Puente - does not threaten local reliability. The joint failure of three components (e.g. Puente, McGrath and Mandalay Unit 3 generation units due to a natural disaster) is sufficiently remote that the California ISO does not consider it a contingency for which it must plan as part of its responsibility for ensuring local reliability.

INTRODUCTION

The California ISO is responsible for ensuring grid reliability throughout its balancing authority area; it is required to meet reliability standards imposed by the North American Electric Reliability Corporation (NERC) and the regional Western Electricity Coordinating Council (WECC). These standards require that the California ISO portion of the transmission grid be expanded, maintained, and operated so as to ensure reliable electricity service even during periods of stress (i.e., under extreme electricity demand conditions and after the failure of major system components: large generators and transmission lines). It also requires that the California ISO procure control of sufficient generation capacity to ensure reliable service given the transmission system that is in place. In other words, reliable service requires joint consideration of the transmission system and the portfolio of power plants that generate electricity.

“Reliable service” is broadly defined as the ability to meet customer demand for electricity every day but one over a ten-year period. In California, the demand for electricity is most likely to be highest on the hottest weekday of the year, when air conditioning use is highest. The one-day-in-ten-year standard has historically required procurement of generation capacity equal to 115 percent - 117 percent of *forecasted* peak (maximum) electricity demand. The excess, (the “planning reserve margin”) allows for generators being out for maintenance, hotter than *expected* weather on the hottest

day of the year, and the need for at least a three percent "operating reserve margin" under all operating conditions.[92]

SYSTEM RELIABILITY AND LOCAL RELIABILITY

Electric reliability has two spatial dimensions: system reliability and local reliability. System reliability requires that the California ISO procure control over sufficient generation capacity – both internal to the California ISO area and imported from elsewhere – to meet customer demand in the California ISO area in aggregate: the above-mentioned 115 percent - 117 percent of forecasted peak load. If constructed, Puente would contribute up 271 MW to system capacity requirements.

Local reliability requires that sufficient capacity be available under stressed conditions within any California ISO-designated area that is "transmission constrained." Such areas, designated load reliability areas (LRA)[93], are characterized by a need for "local" generation capacity within the area, as there is insufficient transmission capacity to import all the electricity that may be needed under stressed conditions. The amount of capacity needed in an area or sub-area is designated the "local capacity requirement" (LCR). An area's LCR is the amount of capacity that must be dispatchable in order to ensure that the area can be reliably served under 1-day-in-10 -year demand conditions even if two major system components fail within 90 minutes of each other[94]. LCRs are determined annually (one year ahead) by the California ISO in a series of studies collectively referred to as the Local Capacity Technical Analysis.

The availability of a sufficient amount of capacity in an LRA and its sub-areas is ensured by imposing "local resource adequacy requirements" on load-serving entities (utilities, energy service providers and community choice aggregators) who, in turn, and when and where necessary, enter into "resource adequacy contracts" with merchant generators. This contract requires the generator to make itself available to the California ISO for dispatch upon request.

MOORPARK SUB-AREA

There are ten LRAs in the California ISO balancing authority area; some of these have sub-areas in which threshold amounts of local capacity must be available to the California ISO. The area with the largest LCR is the Los Angeles Basin LRA: 8,900 MW

[92] *Operating reserve margin* is the amount of capacity available in real time over and above that which is generating electricity. At operating reserve margins of less than three percent, the system is at risk of uncontrolled, cascading outages given sudden component failure; as, a result, service is curtailed when the operating reserve margin falls to less than three percent.

[93] They are also referred to as "local capacity areas" (LCA).

[94] Those generation resources in an LRA that are owned by municipal utilities are assumed to be operated at full output; those with must-take contracts with investor-owned utilities are assumed to be operated at their historical average output levels for summer afternoons. Load-serving entities (utilities, energy service providers and community choice aggregators) must demonstrate control of sufficient remaining capacity through ownership or contract to meet their (peak load-proportionate) share of the LCR.

of the area's 11,000 MW were needed for local reliability in 2015. If constructed, Puente would reside in the Moorpark sub-area of the Big Creek – Ventura LRA and contribute up to 271 MW towards the area and sub-area LCRs. In 2017, the LCR for the LRA is 2,398 MW, for the Moorpark subarea it is 462 MW.[95] The projected LCRs for 2020 are 2,598 MW and 547 MW, respectively.[96] Changes in the LCR over time are largely a function of demand growth and upgrades to the transmission system. These raise and lower the LCR, respectively.

In its 2012 Long-term Procurement Planning (LTPP) proceeding (R.12-03-014), the California Public Utilities Commission (CPUC) authorized Southern California Edison to procure at least 215 MW and up to 290 MW of conventional natural gas-fired generation capacity in the Moorpark sub-area in order to meet anticipated long-run LCRs in the Moorpark sub-area.[97] This authorization considered two significant future developments. One was the deployment of "preferred resources" in the Moorpark LCR: energy efficiency, demand response, and renewable generation capacity. These reduce the LCR requirement or contribute toward meeting it using resources that are preferred to the development of natural gas-fired generation. The second was the expected retirement of Units 1 and 2 at the Ormond Beach Generating Station and Units 1 and 2 at the Mandalay Generating Station no later than December 2020, pursuant to the State Water Resource Control Board's policy on the use of once-through cooling technologies in power plants. These local resources contribute more than 1,940 MW to meeting the Moorpark and Big Creek – Ventura LCRs; it is their retirement that effectively creates the need for the development of new capacity.

GRID RELIABILITY AND PUENTE OUTAGES

In assessing the potential impact of an outage of Puente on system and local reliability, it is important to remember that reliability planning is probabilistic in nature. The electricity system is planned (and operating standards are imposed) so as to reduce the likelihood of involuntary load shedding[98] to acceptable levels, but very-low probability events can still result in curtailed service. For example, extremely high temperatures across the California ISO area (say, observed only once every 25 years), combined with a higher-than-average level of power plant outages, will almost certainly result in load shedding, as it should.[99]

[95] 2016 Local Capacity Technical Analysis: Final Report and Study Results, California ISO, April 15, 2015. The 2017 version of this analysis, published on April 29, 2016, found a LCR for the Moorpark sub-area of 511 MW, an increase of 49 MW over the 2016 value.

[96] 2020 Local Capacity Technical Analysis: Final Report and Study Results, California ISO, April 30, 2015, p. 88.

[97] Decision Authorizing Long-term Procurement for Local Capacity Requirements (D.13-02-015), California Public Utilities Commission, February 13, 2013.

[98] *Involuntary load shedding* is an industry term for a controlled "turning off of the lights" in order to prevent a potentially uncontrolled collapse of the system.

[99] "Acceptable" levels of reliability are determined, in part, by the cost of providing higher levels of reliability. Building a large (500-MW) power plant for $700 million dollars might reduce the probability of

System reliability planning assumes that a share of generation capacity will be out for maintenance at any point in time, including during periods of peak demand. Puente being unavailable, whether for a few days or a few months, is all but a non-event from a system reliability standpoint; Puente's 271 MW of capacity is a small share of the several thousand MWs of capacity that are assumed to be unavailable on a given day. Recall that California's electricity system survived the shutdown of the San Onofre Nuclear Generating Station (2,240 MW) from January 13, 2012 to June 7, 2013 without experiencing load curtailments.

The impact of a Puente outage on *local* reliability is of greater significance, but does not raise the probability of load shedding to an unacceptable level. The California ISO's 2020 Local Capacity Technical Analysis (LCTA)[100] allows one to reasonably assume the following for 2021, the year immediately following the retirement of Units 1 and 2 at Ormond Beach an Units 1 and 2 at Mandalay:

- A 2021 LCR requirement of 547 MW, unchanged from 2020, due to the need to maintain local service with the sequential outage of the three Moorpark – Pardee 230kV transmission lines *when electricity demand in the Moorpark sub-area is at 1-in-10-year peak levels.*
- Total generation capacity in the Moorpark sub-area of 695 MW, including the generation assumed to be in operation in 2020, plus Puente (not assumed to be operating in 2020 in the California ISO study), less the Ormond Beach facility (1,516 MW) and Units 1 and 2 at Mandalay (430 MW), both assumed to be retired at the end of 2020 pursuant to the SWRCB's once-through-cooling policy.

The 2020 LCTA determined that the event which has the greatest impact on LCR needs is the sequential loss of a transmission line and another pair of transmission lines, not the loss of two power plants, even the 1,516 MW of units at Ormond Beach. It follows that the sequential loss of Puente and another major component does not create reliability issues: reliable service can be maintained in the Moorpark sub-area at the decadal peak even if Puente (and another component of the system) is not available. While the loss of Puente reduces sub-area capacity to 424 MW (less than the 547 MW LCR), this presents reliability concerns *only when the Moorpark - Pardee 230kV transmission lines are unavailable*. This "N-3 contingency," (one transmission line going down, the remaining lines going down, *and* Puente being unavailable) is not one that the California ISO is required to plan for; it is considered too improbable. It is all the

---

an involuntary curtailment of service during a summer from, for example, 3 percent to 1 percent and be deemed a good investment. Building a second plant (for the same $700 million cost) reduces the probability by less (say from 1 percent to 0.6 percent), a third by even less (from 0.6 percent to 0.4 percent) and so on. At some point the "reliability bang for the buck" is not sufficient to justify the additional investment/cost.

[100] 2020 Local Capacity Technical Analysis: Final Report and Study Results, California ISO, April 30, 2015.

more improbable when one considers that this series of events must occur on the hottest day of the decade.[101]

The simultaneous output of Puente, Mandalay 3 and McGrath, a total of 448 MW (leaving 247 MW of generation available in the Moorpark sub-area), due, for example to severe flooding, has the potential to create reliability concerns. The remaining generation is 300 MW less than the estimated 2021 LCR. But here again, even if the simultaneous outage of Puente, Mandalay, and McGrath is considered a single contingency (it is not), this would be an N-3 contingency that the California ISO is not required to plan for. And, again, this would have to happen on the hottest day of the decade.[102] The chances of the failure of the Moorpark – Pardee 230kV transmission lines on the hottest day of the decade, after a 500-year flood has disabled the coastal peakers in the Moorpark sub-area are remote enough that the California ISO and the state energy agencies are not required to build or operate the electricity system to guard against the event.

[101] It should be noted that electricity demand in the Moorpark sub-area on the "typical hottest day of the year" is roughly 300 MW less than the demand on the "typical hottest day of the decade," or roughly the amount of energy that would be provided by the Puente. While it would be necessary to perform a power flow study to verify that such is the case, it would appear that the sequential loss of the Moorpark – Pardee 230kV transmission lines and the simultaneous outage of the Puente would not result in curtailments on the typical hottest day of the year.

[102] Again, this 300 MW shortage would be offset by 300 MW of lower sub-area demand if it merely happened on the typical hottest day of the year.

APPENDIX SW-3
SOIL AND WATER RESOURCES

Testimony of Marylou Taylor, P.E.

ESTIMATING FLUSH TIMES

INTRODUCTION

When once-through cooling of MGS Units 1 and 2 ceases, reduced flows could potentially degrade water quality of the Edison Canal and Channel Islands Harbor by reducing flushing and water circulation. To determine whether MGS decommissioning would significantly impact water quality, staff compared marine harbor flush rates with and without flows induced by once-through cooling of MGS Units 1 and 2.[103]

The flush time of a harbor is basically the time needed to remove or reduce (to a permissible concentration) a dissolved or suspended contaminant. Long flush times indicate sluggish circulation, and short flush times usually indicate a rapid exchange of water between the harbor and the open ocean. Short flush times are often associated with better water quality. The water exchange rate is affected by many factors such as harbor geometry, local tidal range, wave climate[104], and weather conditions. Depending on the geographical location, one or more of these variables can dominate the water exchange properties of a harbor at any given time.

For simplicity, staff assumed that the ebb and flood flows of the tidal cycle to be the dominant factor, with other factors (wind effects, stratification, turbulent mixing, etc.) assumed negligible. This appeared a reasonable assumption considering the absence of a year-round freshwater source, such as a river that contributes to flushing of an estuary. Channel Islands Harbor does not have the benefit of turbulent mixing and dilution from an additional source. Wave activity within the harbor is relatively quiet due to the entrance channel jetties, detached breakwater, and two small wave-absorbing beaches inside the harbor immediately opposite the entrance (USACE 1967). Furthermore, a harbor circulation study in 2003 found tidal currents to be the dominant environmental forcing factor (EIC 2003).

APPROACH

Staff used a simple model to estimate tidal flushing that was used by the Unified Port of San Diego in consultation with the San Diego Regional Water Quality Control Board

[103] The Edison Canal also services MGS Unit 3, a 130 MW simple-cycle combustion turbine unit. Because Unit 3 does not create steam, it does not utilize once-through cooling water. However, whenever Unit 3 is in operation, a single 3,200 gallon per minute low capacity saltwater pump provides bearing cooling water from the Edison Canal to the combustion turbine cooling water heat exchanger (LARWQCB 2015). Unit 3 is seldom in operation, having a capacity factor of less than one percent.

[104] *Wave climate* is the long-term statistical characterization of the behavior of ocean waves at a particular location.

(RWQCB) when developing total maximum daily load of dissolved copper for a harbor located in San Diego Bay (MOORE 2000). This simple model (box model) assumes a one-dimensional volume exchange between the harbor and the ocean: a volume of seawater enters the harbor with the rising tide, mixes with harbor water, and then a volume of the mixed water leaves the harbor during the falling tide. This volume of water is known as the tidal prism (see **Appendix SW-3 Figure 1**).

The box model divides the total amount of water in the harbor into two separate volumes. The volume of water when the tide is at mean lower low water represents the minimum amount that is present in the harbor (the bottom portion of the box figure). The volume of ocean water that enters the harbor (the top portion of the box figure) fluctuates throughout the year, so this simple box model estimates the long-term average volume to represent the tidal prism. If the tidal prism comprises a large proportion of water in the harbor, then the rising and falling tides would remove this volume of water out of the harbor along with pollutants or suspended sediments. Conversely, a small tide prism relative to total harbor volume implies a slower exchange of harbor water and incoming ocean water.

The number of tidal cycles required to achieve a specified dilution is calculated using the following equation:

$$N = \frac{\ln (C_o/C_n)}{\ln (1+ ((V_P/V_L) \times \alpha))} \qquad \text{Equation 1}$$

where N = number of tidal cycles
C_o = initial concentration (dimensionless)
C_n = final concentration (dimensionless)
V_P = volume (ft^3) of the tidal prism
V_L = volume (ft^3) of the harbor at Mean Lower Low Water (MLLW)
α = fractional rate of exchange

The equation can also be used to estimate the exchange of a relative amount of water (for instance, replace 50 percent of harbor water with ocean water). The fractional rate of exchange in the equation accounts for partial mixing of incoming water and water in the harbor, otherwise the equation would assume that the two volumes of water completely mix with every tide cycle.

ASSUMPTIONS AND DATA SOURCES

Volume of Tidal Prism (V_P)

California has a mixed semidiurnal tide cycle, meaning two high and two low tides every lunar day.[105] These high and low water levels are also affected by the moon's rotation around the earth and the earth's rotation around the sun, all resulting in daily, monthly,

[105] Unlike a 24-hour solar day, a lunar day lasts 24 hours and 50 minutes.

and annual variations of tide elevations. For most NOAA tide stations, tidal datums are computed using 19 years of tide data, the definition of a tidal epoch. The Mean Higher High Water (MHHW) and Mean Lower Low Water (MLLW) levels represent the mean of the daily highest and lowest water levels. The difference in height between the two is the Great Diurnal Range (GT). The Mean High Water (MHW) and Mean Low Water (MLW) levels represent the mean of all the high and low tides of an epoch, respectively. The difference in height between these two is the Mean Range of Tide (MN). Datum elevations of the tidal station at Rincon Island are shown in **Appendix SW-3 Figure 2** (the nearest station located roughly 15 miles up coast of Puente).

Staff estimated V_P by multiplying the tidal range of 3.72 feet (see **Appendix SW-3 Figure 1**) by the area of open water. The area of open water (see **Appendix SW-3 Figure 3**) was estimated from several sources, as listed in **Appendix SW-3 Table 1**. Assuming that the area of open water did not change over the tidal ranges, estimated volume V_P is 68,845,021 cubic feet (or 1465.7 acre-feet).

Appendix SW-3 Table 1
Estimated Area of Open Water

Sub-Area	Acres	Estimated from	Source
Channel Islands Harbor	200	Ventura County Harbor Department	VEN 2014
Mandalay Bay	124	Main Channel: 1.4 miles long 300 feet wide Other channels: 2 miles long 100 feet wide	City of Oxnard Zone Map Book Map ID 15
Mandalay Bay Phase IV	55	Specific Plan	City of Oxnard Development Services
Edison Canal	15	2.5 miles ~ 50 feet wide	PPP 2015c
TOTAL	394 acres		

Note: Sub-areas are shown in **Appendix SW-3 Figure 3**.

Volume at MLLW (V_L)

V_L can be estimated by multiplying the area of open water by the depth at MLLW (see **Appendix SW-3 Figure 1**). Nautical charts show that Channel Islands Harbor depths at MLLW vary from 18 feet at the entrance, ten feet in the main channels, and about nine feet at the end that is adjacent to the Mandalay Bay marina (NOAA 2015). Staff assumed that a depth of nine feet continues into the waterways within the entire Mandalay Bay and the Edison Canal (see **Appendix SW-3 Table 2**). Using these assumptions, the estimated volume V_L is 164,264,760 cubic feet (or 3,771 acre-feet).

Appendix SW-3 Table 2
Estimated Depth of Open Water

Sub-Area[1]	Area (acres)	Estimated Depth at MLLW	Volume (cubic feet)	Source
Channel Islands Harbor	200 (13%) (36%) (51%)	18 feet 10 feet 9 feet	20,386,080 31,363,200 39,988,080	NOAA 2015
Mandalay Bay	124	9 feet	48,612,960	Note 2
Mandalay Bay Phase IV	55	9 feet	21,562,200	Note 2
Edison Canal[3]	6	9 feet	2,352,240	LARWQCB 2004
TOTAL	385		164,264,760	

Notes:
1. Sub-areas are shown in **Appendix SW-3 Figure 3**.
2. Staff assumed 9 feet depth continues into the waterways within the entire Mandalay Bay.
3. The Edison Canal was last dredged to a depth of ten feet below MLLW, and limited to a width of 20 feet in the central channel of the canal (rather than the entire width of the canal bottom). Staff assumed subsequent sedimentation reduced present day depth to nine feet.

Mixing (α)

The tidal prism method is a classical approach to estimating flushing time in tidal systems when only basin geometry (mean volume, surface area) and tidal range information are available. Two important assumptions with the basic tidal prism method are that the system is well mixed between incoming and outgoing tides, and that the source of new seawater does not contain return flow from the previous ebb tide. Because neither unmixed seawater nor returning harbor water contribute to flushing, deviations between an ideal system and reality can result in an underestimate of the flushing time, perhaps severely (UOG 2006). To account for partial mixing in the system, Equation 1 includes the fractional rate of exchange (α) to better estimate turnover time of the system (MOORE 2000).

This fractional rate of exchange, however, is very difficult to estimate especially for complex systems that contain areas of inefficient mixing. To further complicate estimates, the variable α is a significant factor in the equation where a small variance in its value can result in large change in the value of N. Because staff has no basis to develop an estimate for α of the Channel Islands Harbor system, staff assumed an exchange rate of 0.33 which is equivalent to South Beach Marina in Oregon, a simple marina with good hydraulic characteristics and good exchange due to strong currents (USEPA 1981). Since small, simple water bodies flush quickly and complex water bodies flush slowly (VIMS 2007), using the known exchange rate of a well flushed marina produces the absolute lower limit (least number of days) when estimating the flush time for the Channel Islands Harbor system.

Initial Concentration (C_o) and Final Concentration (C_n)

Recognizing the importance of marina flushing in efforts to minimize nonpoint source pollution in coastal waters, the U.S. Environmental Protection Agency (EPA) provides guidelines for marina flushing management measures. It identified BMPs as illustrative examples of flushing guidelines in different coastal regions and primarily applies to new or expanding marinas. Although there is no specific guideline for marina basins in Southern California, EPA guidelines for southeastern and northwestern United states suggests adequate tidal flushing to maintain water quality flushing reductions (the amount of conservative substance that is flushed for the basin) ranging from 70 percent to 90 percent over a 24-hour period (USEPA 1993).

To estimate the number of tidal cycles required to flush 70 percent of the harbor system using Equation 1, staff set C_o to 100 and C_n to 30. Similarly, C_n was set to ten for estimating the 90 percent flush time. These two scenarios mark the range of adequate tidal flushing suggested by EPA guidelines.

Pumps Off vs. Pumps On

The value of V_P in Equation 1 represents the volume change of the system over one tidal cycle (UOG 2006). When the MGS pumps remove water from the Edison Canal, the same volume of water is replaced by ocean water drawn in through Channel Islands Harbor entrance. This flow of water contributes to flushing without affecting the level of the tide. Staff accounted for this additional mixing by adding the volume of pumped water to the tidal prism (see **Appendix SW-3 Figure 4**).

The pumped volume assumes that pumps operate continuously and at full capacity. There are four 44,000–gallon-per-minute (gpm) pumps serving MGS Units 1 and 2, two pumps for each unit. Staff calculated the number of days to flush 70 percent of the water system when all four pumps are operating, when two pumps are operating, and under tide currents alone (no pumping). The same calculations were made for flushing 90 percent of the water system. The variables used for each scenario are summarized in **Appendix SW-3 Table 3**.

Appendix SW-3 Table 3
Values Used for Equation 1

Percent flushed	**70%**	**90%**	
C_o	100	100	initial concentration
C_n	30	10	final concentration
α	0.33	0.33	fractional rate of exchange
Pumps operating	**None**	**2 pumps**	**4 pumps**
Pumped volume (ft^3)	0	16,940,000	33,880,000
V_P	63,845,021	80,785,021	97,725,021
V_L	164,264,760	147,324,760	130,384,760
Total volume (ft^3)	228,109,781	228,109,781	228,109,781

RESULTS

Calculated flush times are graphed in **Appendix SW-3 Figure 4** and show that:

4. Tidal currents alone do not provide adequate flushing. The EPA guideline recommends a flush time of one day to "refresh" from 70 perfect to 90 percent of the total volume of water. Staff calculations show that the one day flush time would, at best, refresh 15 percent of the water. Using the same ideal mixing assumptions, flush times calculated to reach 70 percent and 90 percent are 10 days and 19 days, respectively. Actual flush times are expected to be longer than these calculated values.
5. MGS pumping improves circulation, but flush times are still well below EPA guidelines. Using ideal mixing assumptions, staff calculations show that MGS pumping might improve flush times by, at best, about 40 percent. This is a relative comparison and actual flush times are expected to be longer than calculated values.

DISCUSSION

Equation 1 is an example of a simple one dimensional model also known as a low-order box model. As mentioned above, an important assumption with the basic tidal prism method is that the system is well mixed between incoming and outgoing tides. The more complex a system is with multiple areas of inefficient mixing, the more error is introduced when applying a simple box model.

Knowing that the calculated values are underestimations, staff's intention is to estimate a flush time what would represent the absolute lower limit (least number of days) by assuming the known exchange rate of a well flushed marina. South Beach Marina in Oregon is a simple marina with good hydraulic characteristics and good exchange due to strong currents. **Appendix SW-3 Figure 5** shows the fraction rate of exchange at different locations of the marina, with the most mixing occurring near the marina entrance and least occurring in the south corners.

In comparison, the configuration of Channel Islands Harbor system is very complex, consisting of an elongated harbor with one entrance, a residential marina with multiple segments constructed using about eight miles total of reinforced concrete seawall, and a non-navigable canal over two miles long (see **Appendix SW-3 Figure 3**). The EPA guidelines for marina flushing management measures recommends that new marina or expanding marinas include as few enclosed water sections or separated basins as possible to promote circulation within the entire basin. If possible, establish two openings at opposite ends of the marina to promote flow-through currents (USEPA 2001). Generally, a rectangular basin is accepted as the best geometric shape for maximizing both the number of boat slips and basin circulation. To maximize flushing and minimize waves, the basin should have as few vertical walls as possible, interior corners gently rounded with constantly changing radii, and a bottom sloped toward the exit and main waterway. The flushing potential of several conceptual marina basin configurations is illustrated in **Appendix SW-3 Figure 6**.

As expected, staff's calculations show that MGS pumping improves circulation using Equation 1. However, the estimate of a 40 percent improvement is highly questionable because of the system's complex configuration. While researching information to collect data for this study, staff learned that development of Channel Islands Harbor and the Mandalay Bay marina have significantly affected water circulation over the years. When MGS Units 1 and 2 began operating in 1959, the Edison Canal was originally connected to Port Hueneme, located approximately 4.5 miles southeast of the MGS. At that time the canal was a relatively straight path and the only open water area was Port Hueneme. Construction of Channel Islands Harbor in 1965 relocated the connection of the Edison Canal to ocean water (GENON 2011). MGS cooling water no longer passed through Port Hueneme, but instead flowed through Channel Islands Harbor (see **Appendix SW-3 Figure 7**). The following 40 years saw expansions to the harbor and residential developments that increased the area of open water more than 300 acres. When the final phase of construction to Mandalay Bay was complete in 2008, the entire configuration was able to accommodate over 3,000 boat slips for residential, commercial, and recreational uses (see **Appendix SW-3 Figure 8**).

CONCLUSION

Staff used a simple one-dimensional model to estimate the 70 percent and 90 percent flush times for the Channel Islands Harbor system (includes Mandalay Bay marina and Edison Canal). Results show that flush times, under tidal flows only, are significantly below EPA guideline recommendation to reach between 70 and 90 percent flushing by one day. Even with ideal mixing assumptions, calculated flush times to reach 70 percent and 90 percent are 10 days and 19 days, respectively. Actual flush times are expected to be longer than these calculated values because the system's geometric complexity hinders tidal mixing.

MGS pumping improves circulation, but flush times are still well below EPA guidelines. Over the years, the entire system (harbor, marina, and canal) has increased in size and geometric complexity. With each expansion project, overall circulation has likely worsened. Staff's calculations show an improvement of 40 percent in flush times when all four MGS pumps operate continuously and at full capacity, but this estimate is highly questionable because of the system's complex configuration. Actual mixing rate and hours of pumping are much lower than staff's assumptions, so actual flush times are expected to be longer than calculated values. This suggests that the contribution of MGS pumping to flush time is considerably less than staff's calculated estimates. When considering the fact that MGS only produces a small fraction of its total maximum capacity of power generation, its contribution to flush time becomes significantly less.

Staff concludes that any impacts from shutting down the MGS pumps are insignificant. Measures that are much more aggressive are needed to improve water circulation that meets the EPA guideline.

REFERENCES

EIC 2003 – Everest International Consultants, prepared for Ventura County Harbor Department. Channel Islands Harbor Circulation Improvement Study. July 2003.

GENON 2011 – GenOn West, L.P. Mandalay Generating Station Implementation Plan for the Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling. April 1, 2011.

LARWQCB 2004 – Los Angeles Regional Water Quality Control Board. Order No. R4-2004-0096. Revised Waste Discharge Requirements for Reliant Energy Mandalay, Inc. (Edison Canal Maintenance Dredging). June 10, 2004.

MOORE 2000 – David W. Moore, Ph.D., prepared for San Diego Unified Port District. An Evaluation of Tidal Flushing for Shelter Island Yacht Basin Using a Simple Tidal Prism Model. August 30, 2000.

NOAA 2003 – National Oceanic and Atmospheric Administration Center for Operational Oceanographic Products and Services. Tidal Datum 9411270, Rincon Island, Pacific Ocean, CA. April 17, 2003.

NOAA 2015 – National Oceanic and Atmospheric Administration Office of Coast Survey. Harbor Chart 18725, Channel Islands Harbor and Port Hueneme, Edition 30. Prinit date June 1, 2013. Last correction July 16, 2015.

PPP 2015c – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015

UOG 2006 – University of Georgia, Department of Marine Sciences, J.E. Sheldon and M. Alber. The Calculation of Estuarine Turnover Times Using Freshwater Fraction and Tidal Prism Models: A Critical Evaluation. *Estuaries and Coasts*, Vol. 29, No. 1, pp. 133-146. February 2006.

USACE 1967 – U.S. Army Corps of Engineers, W. Herron and R. Harris. Littoral Bypassing and Beach Restoration in the Vicinity of Port Hueneme, California. Proceedings of 10th Conference on Coastal Engineering, Tokyo, Japan, 1966.

USEPA 1981 – U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory by Richard Callaway. Flushing Study of South Beach Marina, Oregon. Journal of the Waterway, Port, Coastal and Ocean Division. EPA-600/J-81-397. May 1981. http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/26343/FlushingStudySouthBeach.pdf;sequence=1

USEPA 1985 – United States Environmental Protection Agency. Coastal Marina Assessment Handbook. EPA 904/6-85-132. April 1985.

USEPA 1993 – U.S. Environmental Protection Agency. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. Chapter 5: Management Measures for Marinas and Recreational Boating. EPA 840-B-92-002.

https://owpubauthor.epa.gov/polwaste/nps/czara/upload/czara_chapter5_marinas.pdf

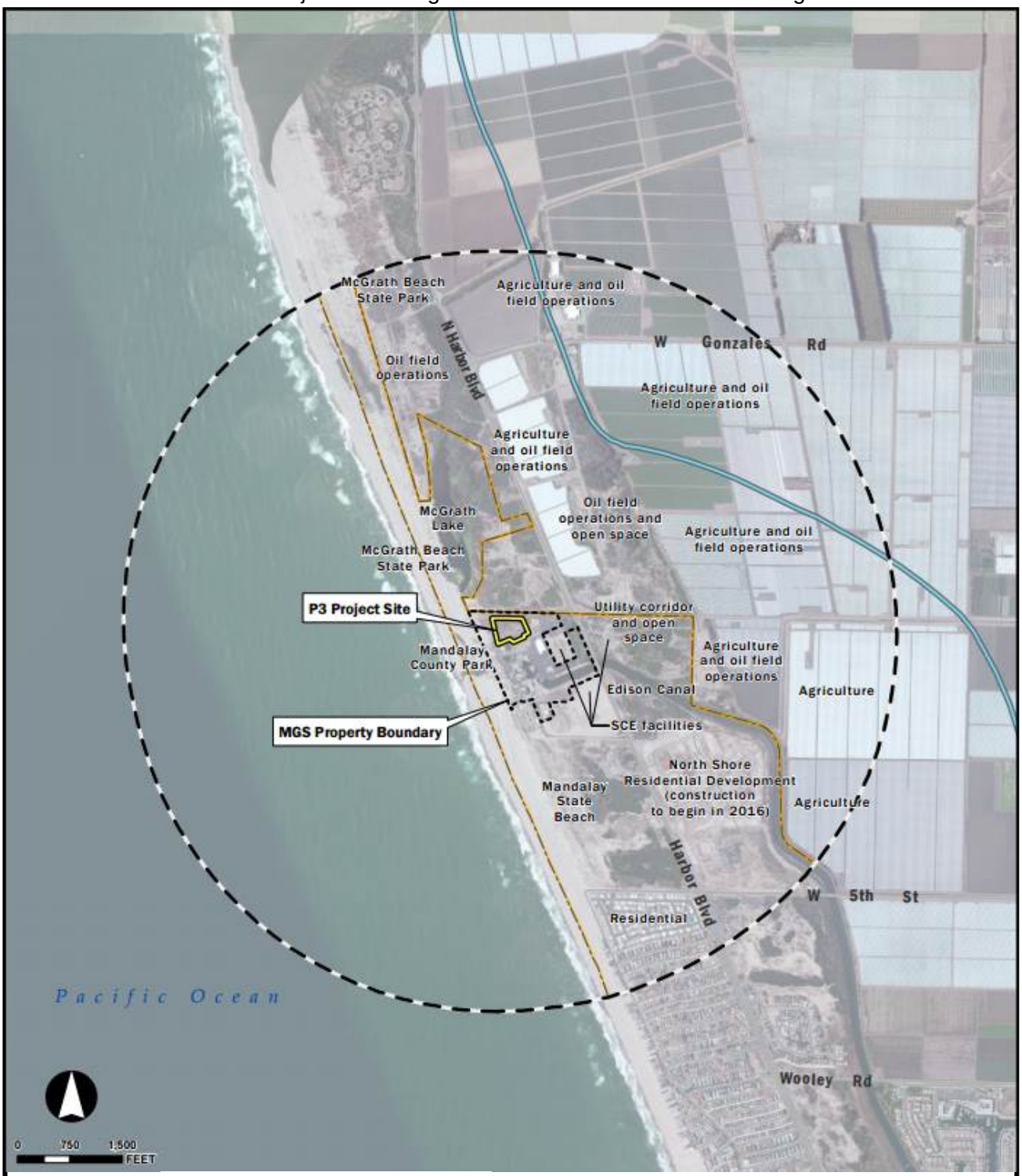
USEPA 2001 – U.S. Environmental Protection Agency. National Management Measures Guidance to Control Nonpoint Source Pollution from Marinas and Recreational Boating. EPA 841-B-01-005. November 2001. http://www.epa.gov/polluted-runoff-nonpoint-source-pollution/marinas-and-boating-national-management-measures

VEN 2014 – County of Ventura Harbor Department. Channel Islands Harbor Public Works Plan, Fifth Amendment Draft. Adopted by County of Ventura Board of Supervisors June 17, 2014. http://vcportal.ventura.org/HARBOR/docs/Draft_PWP_Fifth_Amendment_June_2014.pdf

VIMS 2007 – Virginia Institute of Marine Science Center for Coastal Resources Management, prepared for Virginia Department of Environmental Quality. Tidal Flushing Characteristics in Virginia's Tidal Embayments. November 2007.

SOIL & WATER RESOURCES - FIGURE 1

Puente Power Project – Existing Land Uses in the Area Surrounding the Site



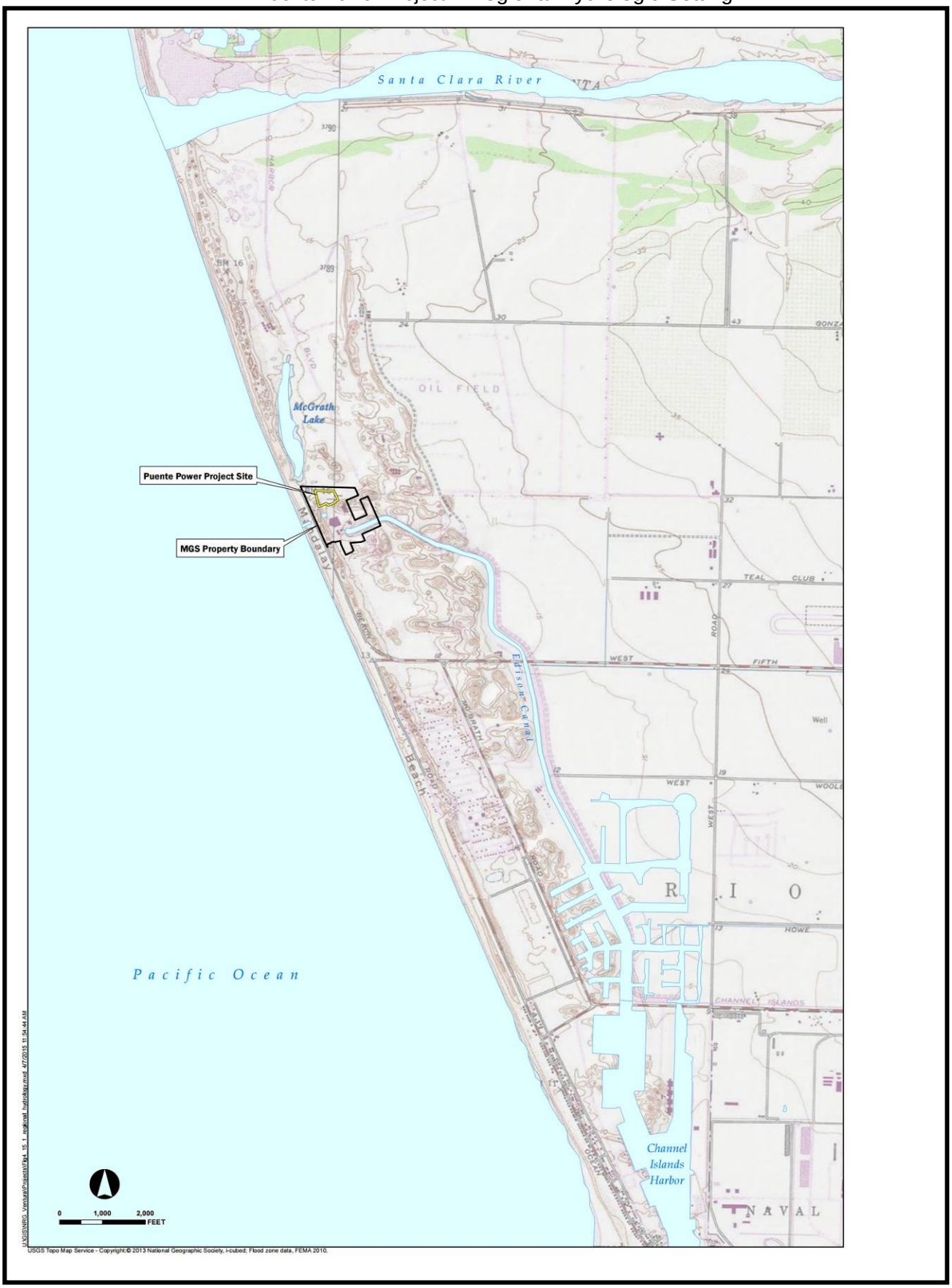
Note: All agriculture is conventional irrigated row crop (primarily strawberries)

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: PPP 2015a Figure 4.6-2, 2015

SOIL & WATER RESOURCES - FIGURE 2

Puente Power Project – Regional Hydrologic Setting

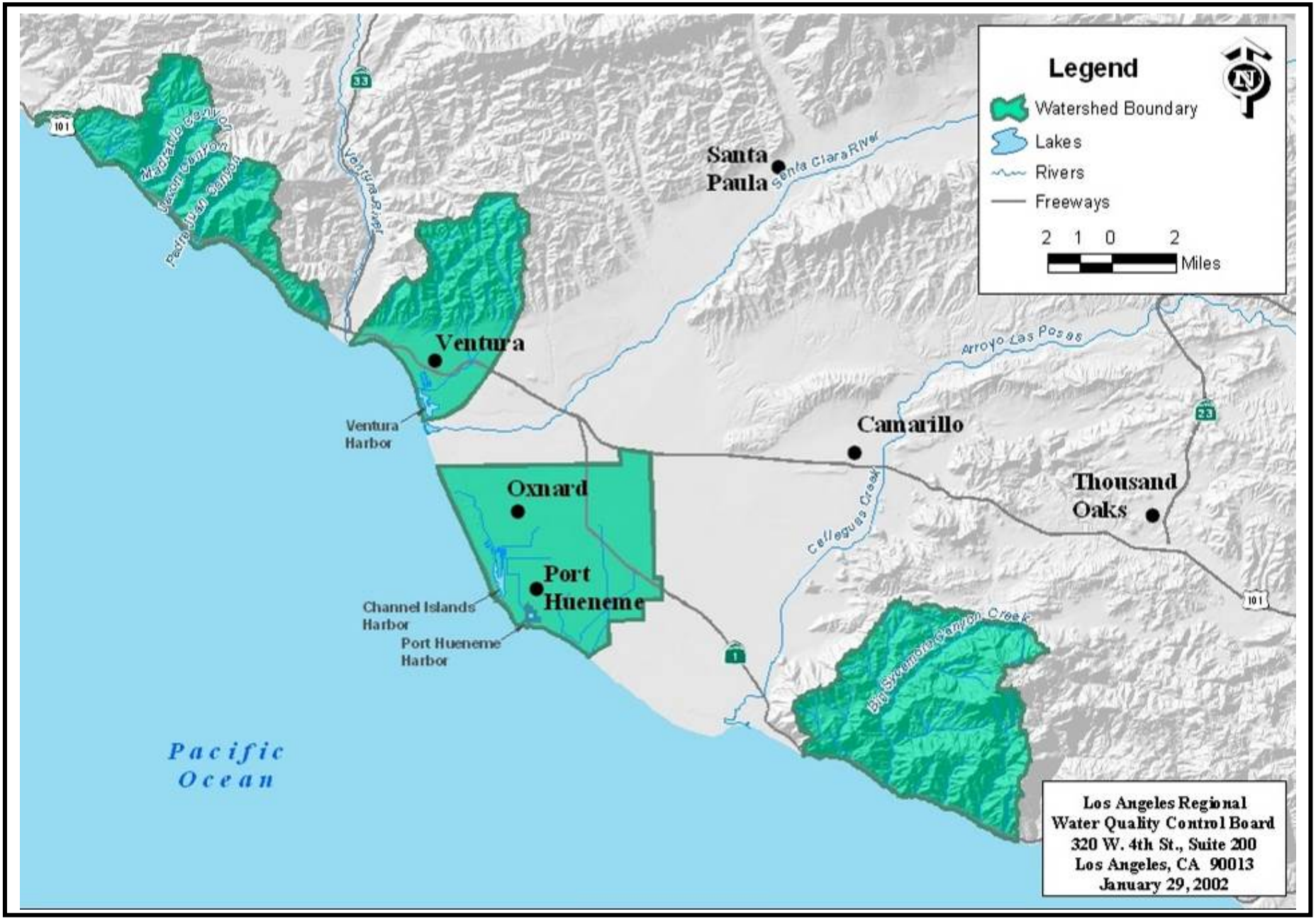


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: PPP 2015a §4.15

SOIL & WATER RESOURCES - FIGURE 3

Puente Power Project – Miscellaneous Ventura Coastal Watershed Management Area



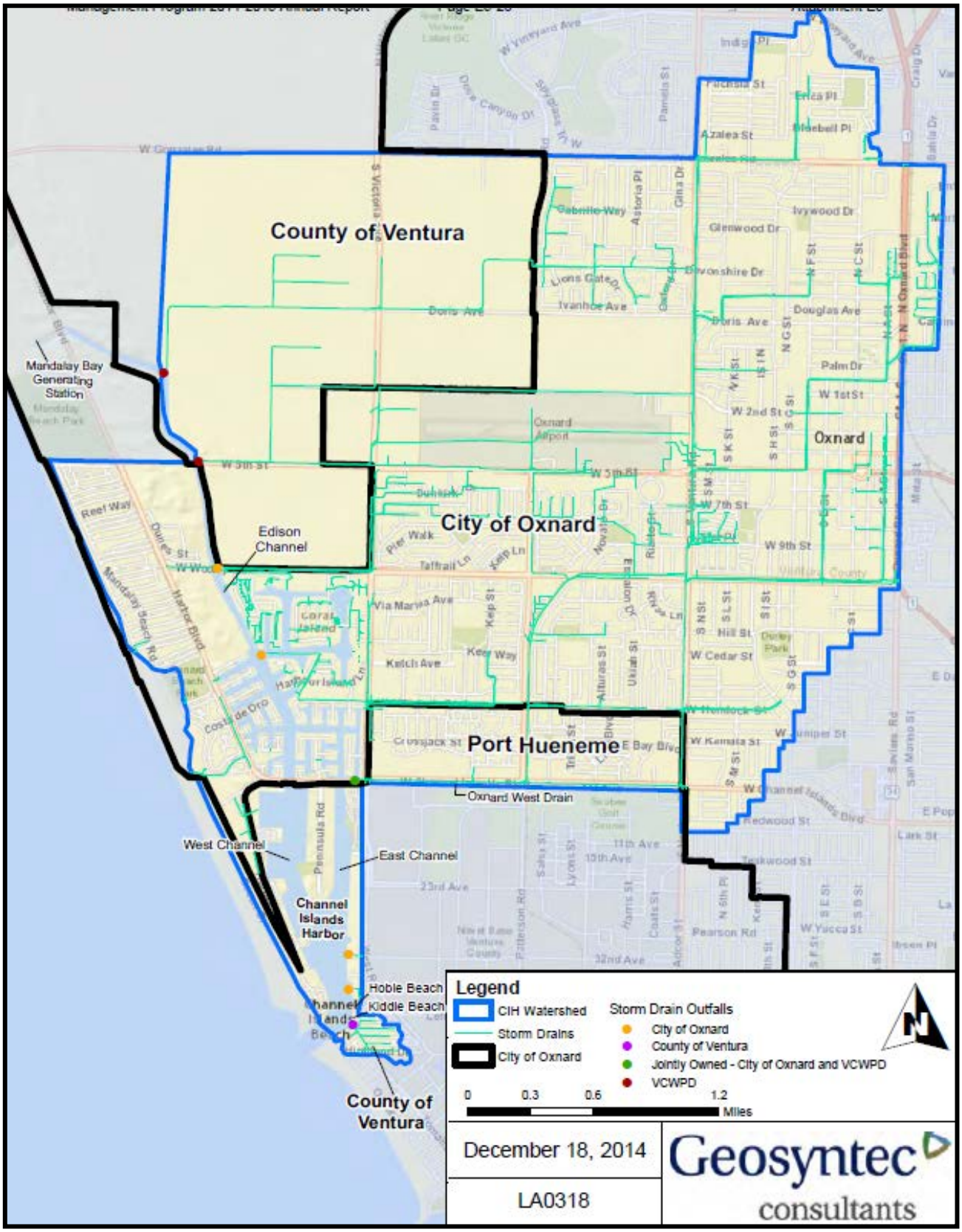
SOIL AND WATER RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Los Angeles Regional Water Quality Control Board, 2002

SOIL & WATER RESOURCES - FIGURE 4

Puente Power Project – Channel Islands Harbor Watershed

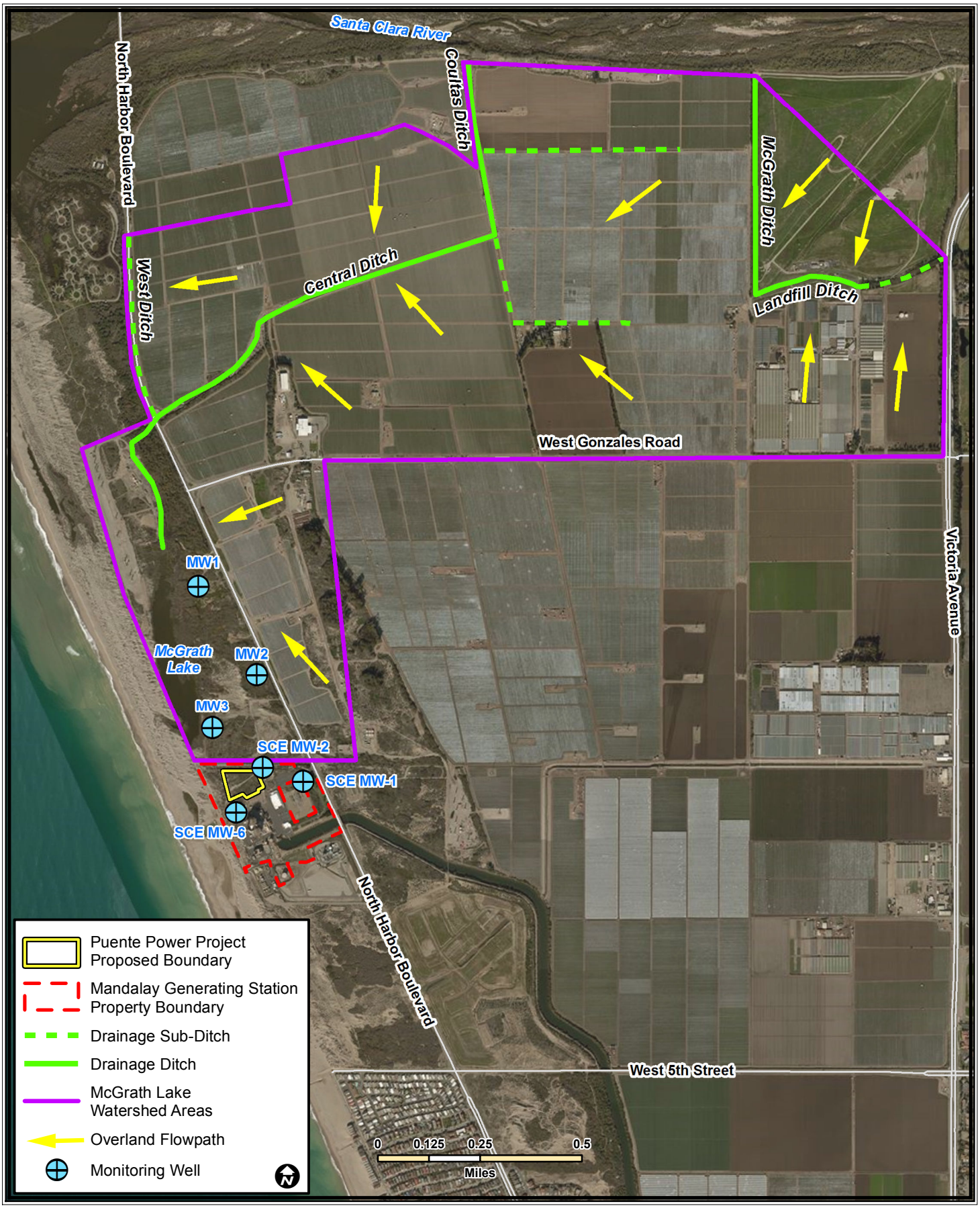


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: GEO 2014

SOIL & WATER - FIGURE 5

Puente Power Project - McGrath Lake Watershed and Groundwater Monitoring Locations



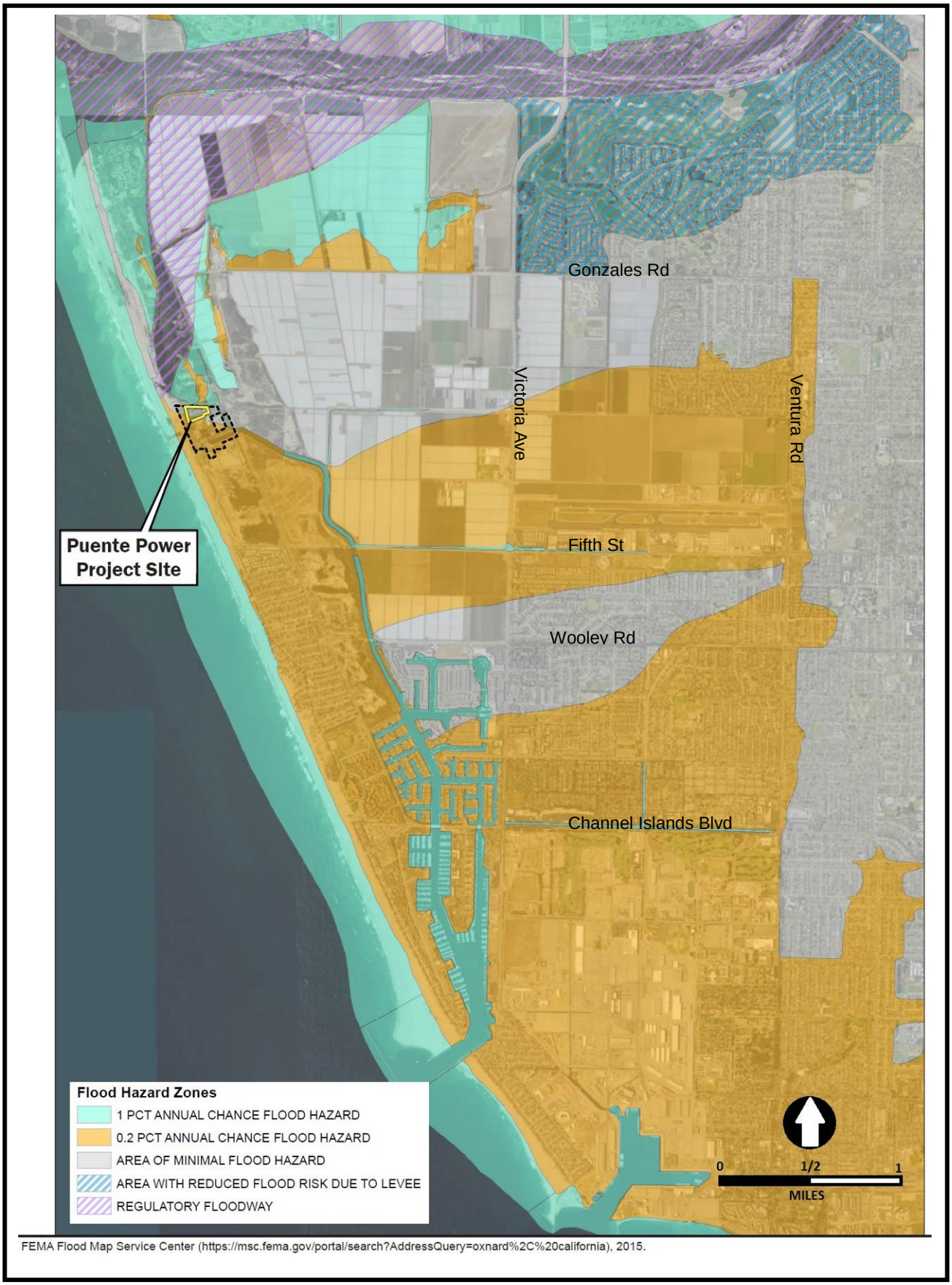
CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI and 2005 McGrath Lake Watershed Managment Study

SOIL AND WATER RESOURCES

SOIL & WATER RESOURCES - FIGURE 6

Puente Power Project – 2010 FEMA Flood Hazard Map



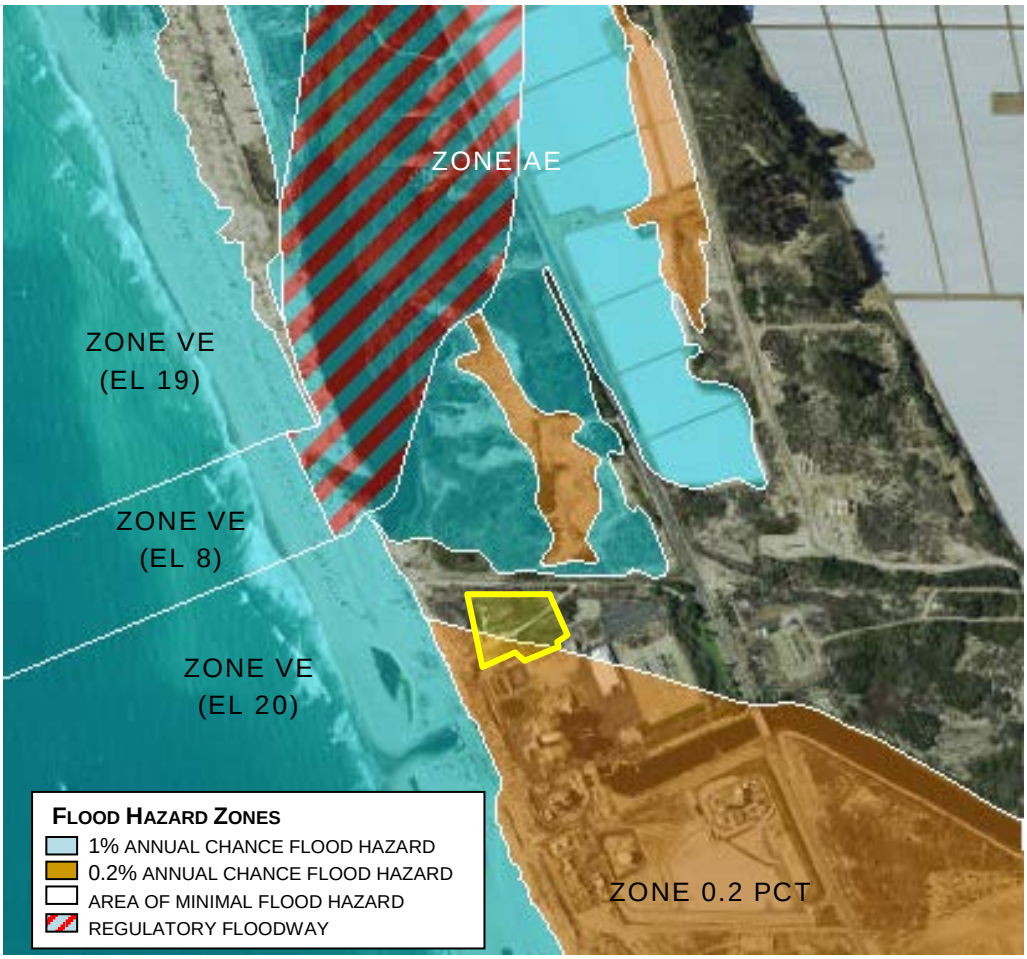
FEMA Flood Map Service Center (https://msc.fema.gov/portal/search?AddressQuery=oxnard%2C%20california), 2015.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: COO 2015m

SOIL & WATER RESOURCES - FIGURE 7

Puente Power Project – Preliminary Maps of FEMA Flood Coastal Hazards



The updated hazard boundary near the P3 site, above, is approximately 230 feet closer inland compared to the 2010 Effective FIRM. The increase of hazard area is shaded in pink below.

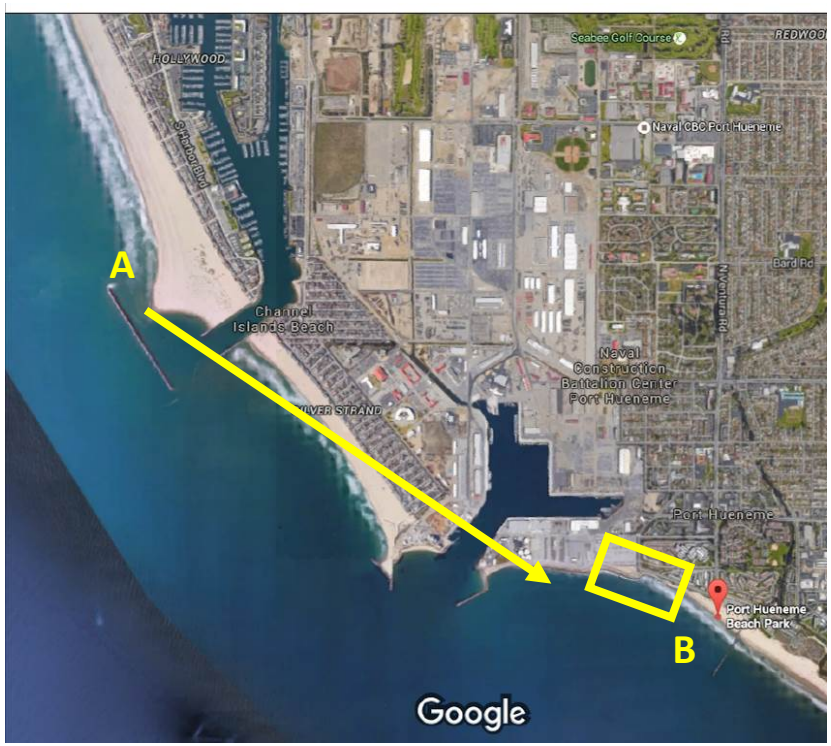
Esri, HERE, DeLorme, iPC | USDA FSA,

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: FEMA's Geoplatform (http://arcg.is/2dxDjzG) accessed October 10, 2016

SOIL & WATER RESOURCES - FIGURE 8

Puente Power Project – Erosion at Hueneme Beach



Imagery ©2015 Google, Data CSUMB SFML, CA OPC, Map data ©2015 Google

N34 08.28 W119 12.28 Image 201001309 Thu Sep 23 12:57:02 2010

N34 08.43 W119 12.21 Image 201308977 Sun Sep 29 12:05:07 2013

Above:
Sediment trap at Channel Islands Harbor (A) stops the littoral transport of sand to Hueneme Beach (B). Box is the location of beach photos.

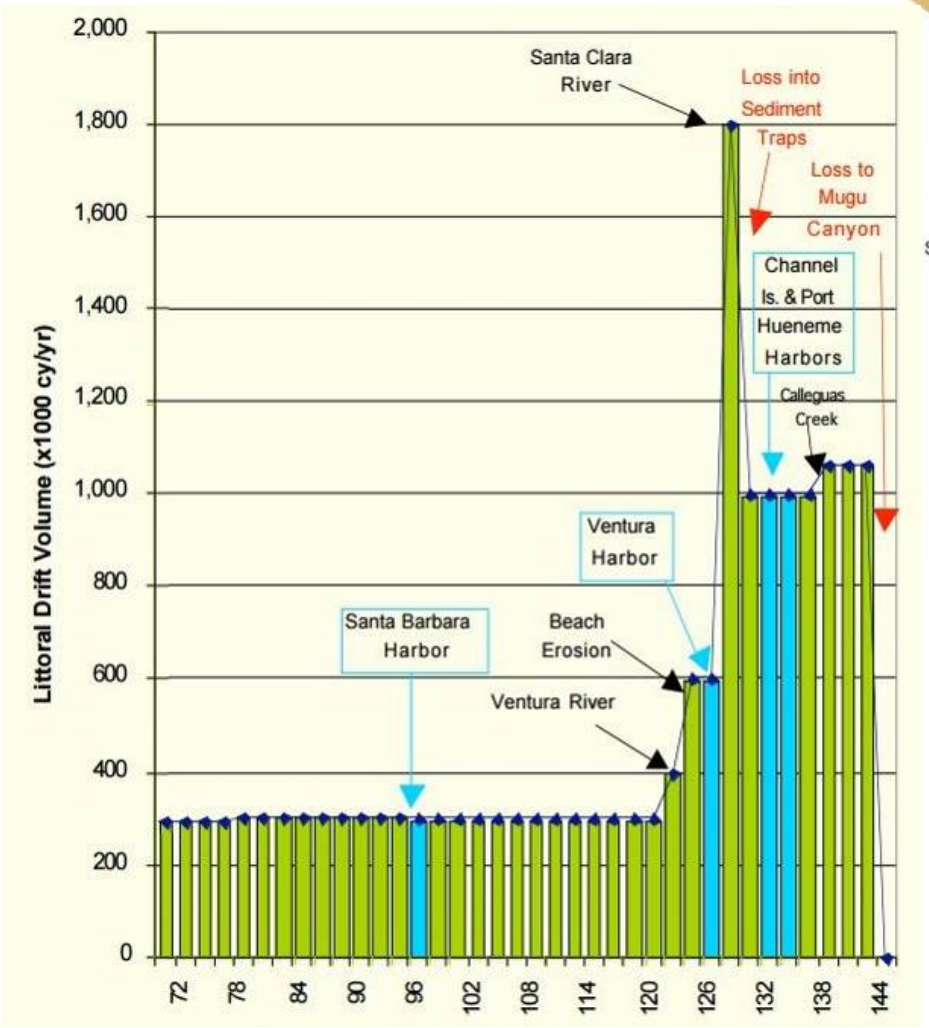
Right:
Substantial beach erosion between 2010 (top) and 2013 (bottom) due to lapsed dredging of Channel Islands Harbor.

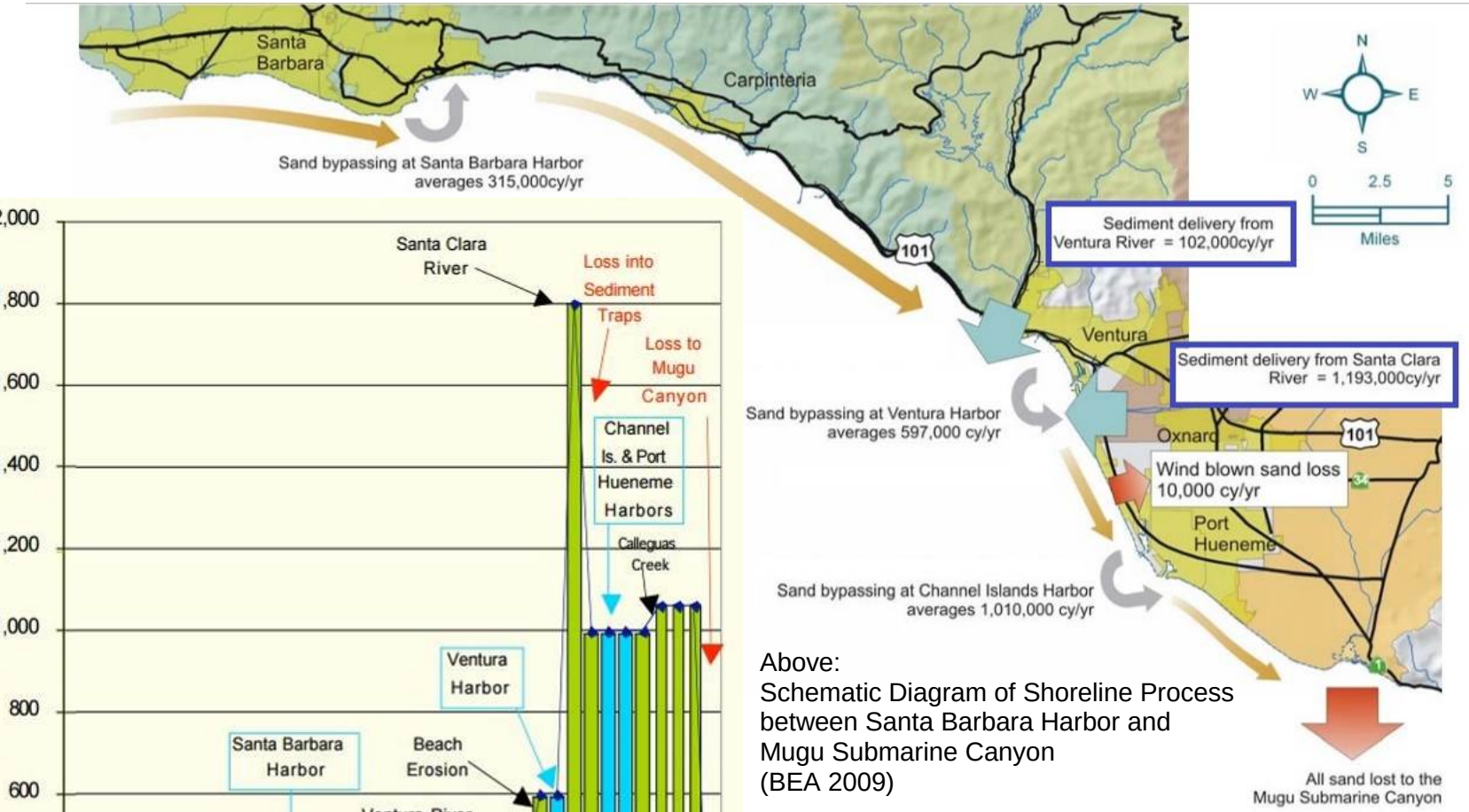
SOIL AND WATER RESOURCES

SOURCE: www.Californiacoastline.org, 2015

SOIL & WATER RESOURCES - FIGURE 9

Puente Power Project – Average Annual Littoral Longshore Transport



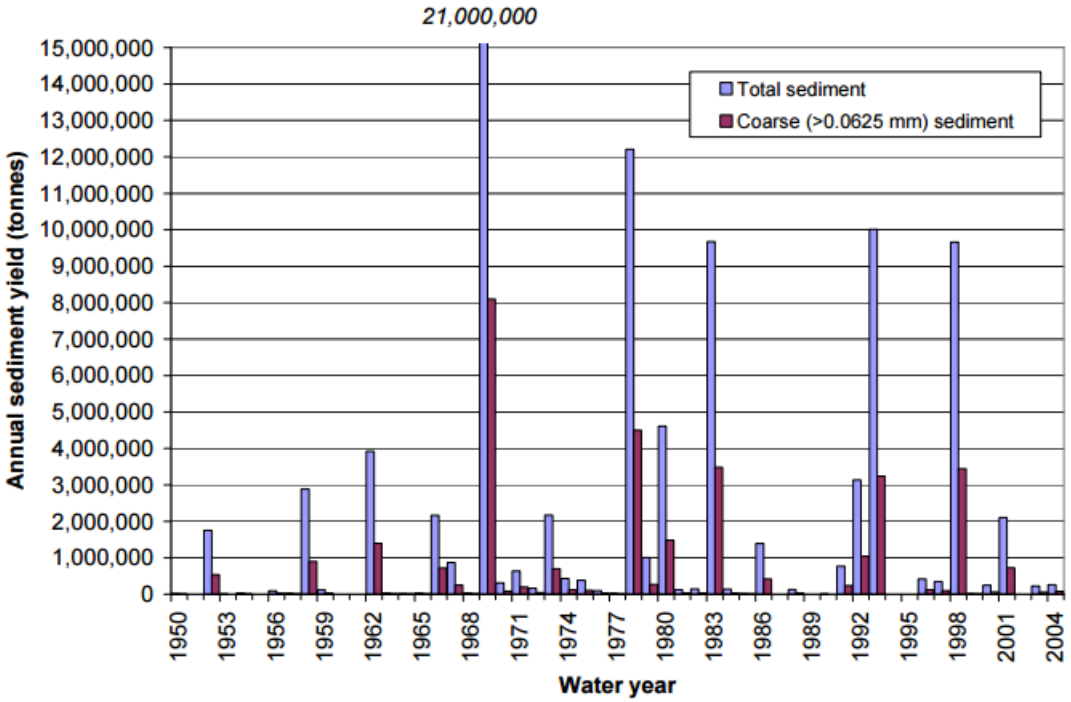


Above:
Schematic Diagram of Shoreline Process between Santa Barbara Harbor and Mugu Submarine Canyon
(BEA 2009)

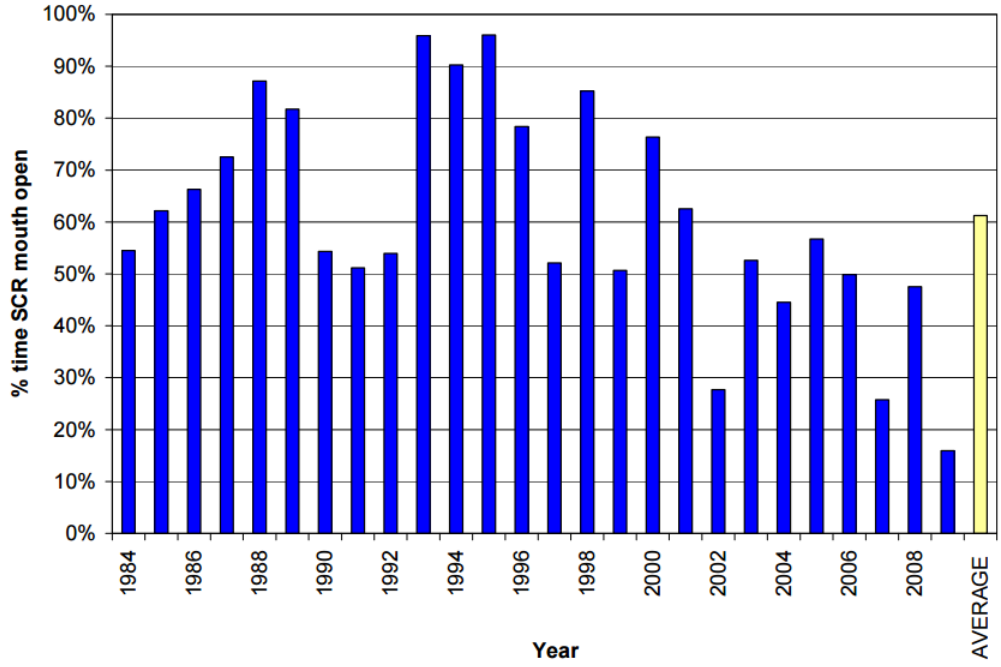
Left:
Littoral Longshore Transport Volumes between Santa Barbara Harbor and Mugu Submarine Canyon
(RUNYAN 2002)

Note: Values presented by these sources differ slightly, but degrees of magnitude are the same.

SOURCE: BEA 2009 and RUNYAN 2002



Calculated total sediment yield (suspended load + bedload) and coarse (>0.0625 mm) sediment yield for the Lower Santa Clara River at former Montalvo stream gauge (USGS 11114000).

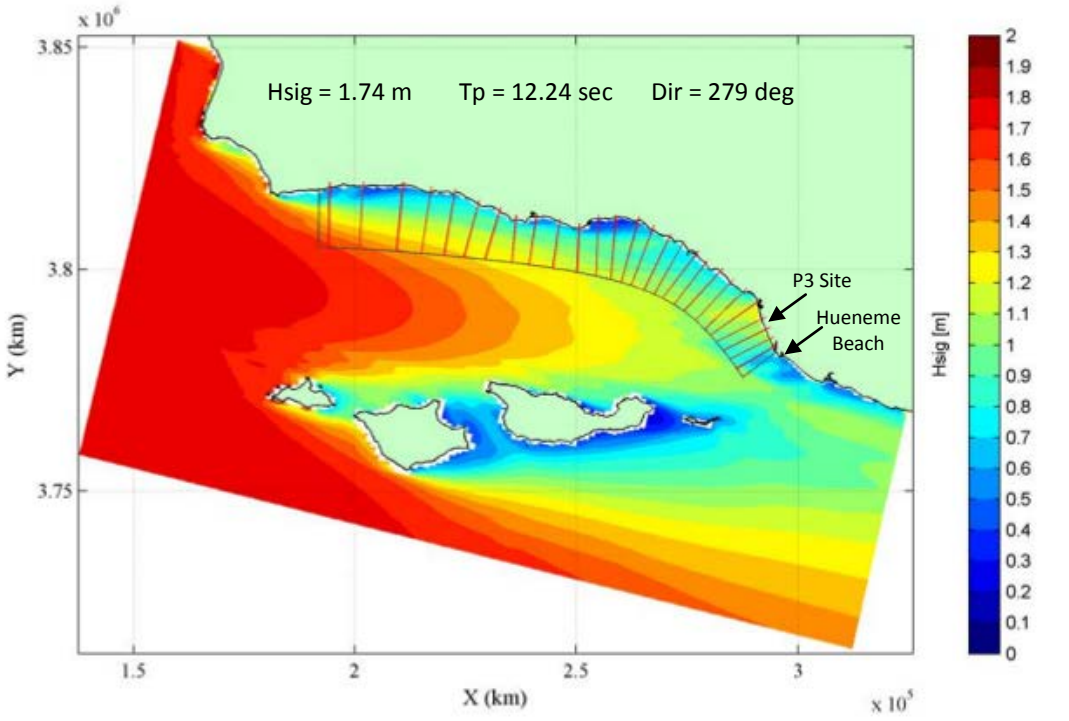


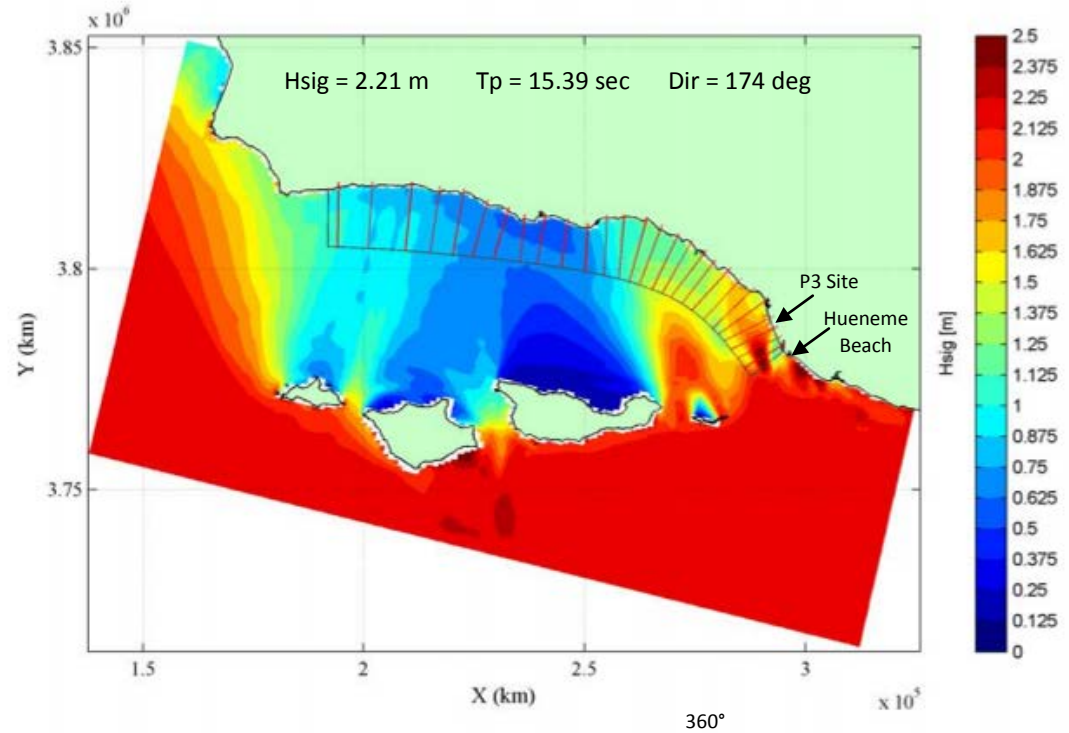
Percentage of time that the Santa Clara River mouth was open on an annual basis. (City of Ventura)

SOURCE: Geomorphic Assessment of the Santa Clara River Watershed (SWS 2011)

SOIL & WATER RESOURCES - FIGURE 11

Puente Power Project – Sheltering Effect of the Channel Islands

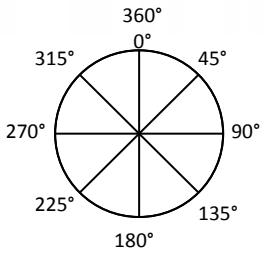




Hsig = Significant wave height (meters)

Tp = Peak period (seconds)

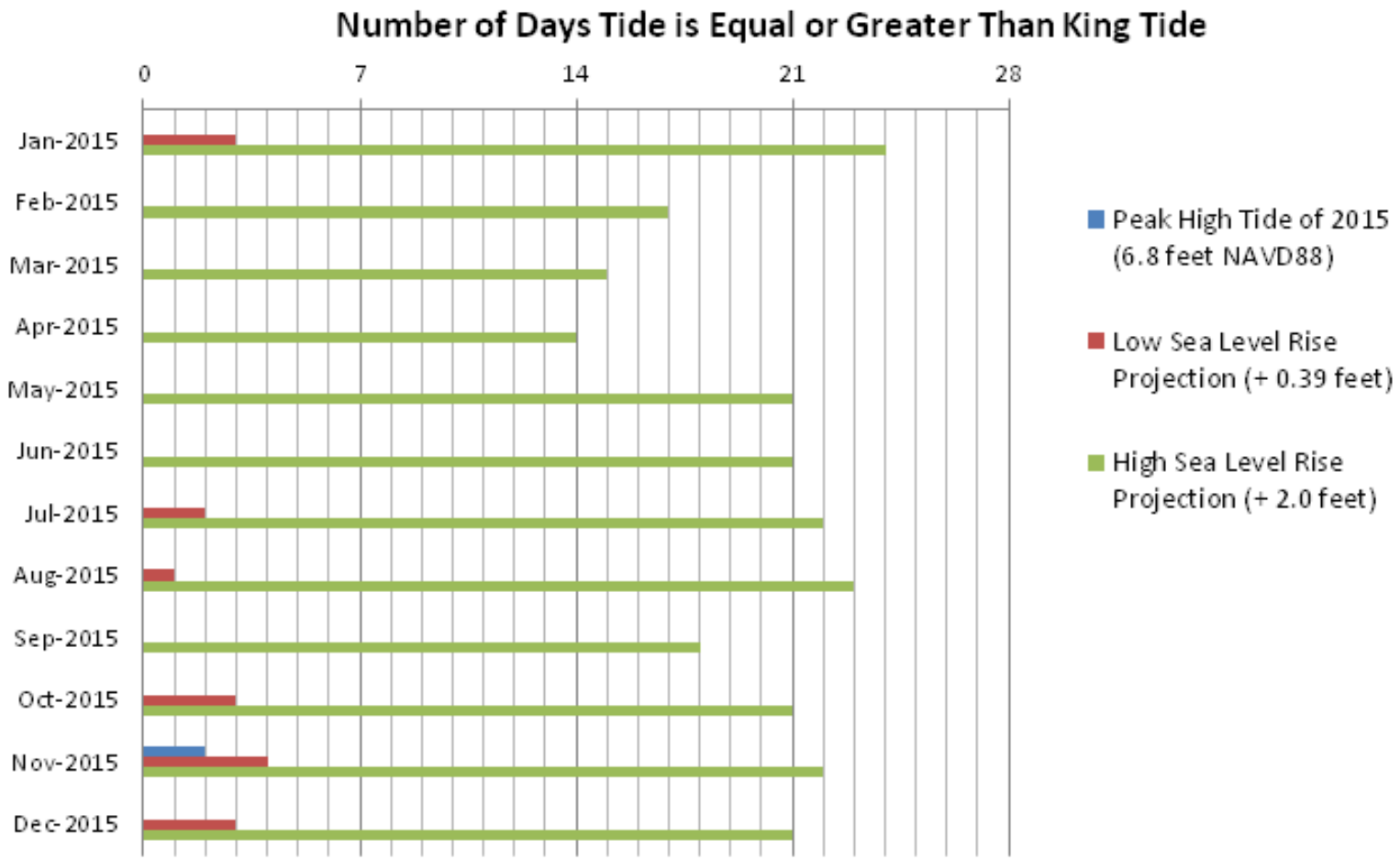
Dir = Direction (degrees)



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: USGS 2009, Appendix E

Puente Power Project – Potential Increase of Extreme Tides with Sea Level Rise

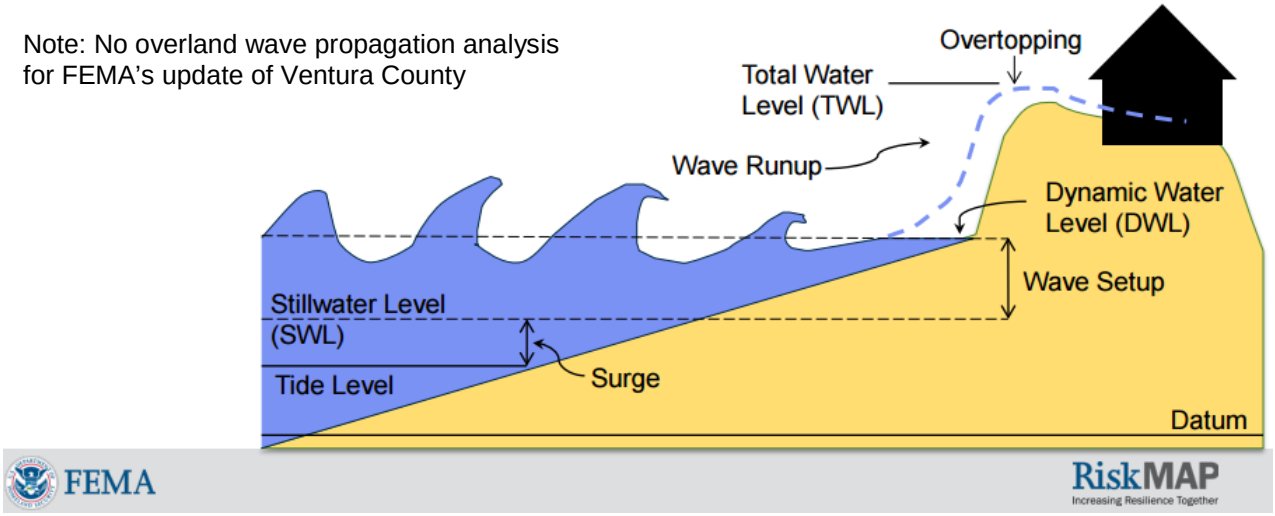


Source: 2015 daily tidal levels obtained from NOAA (Tide Predictions of Rincon Island Station ID: 9411270) were used by staff to develop this figure.

Components of the total water level (TWL)

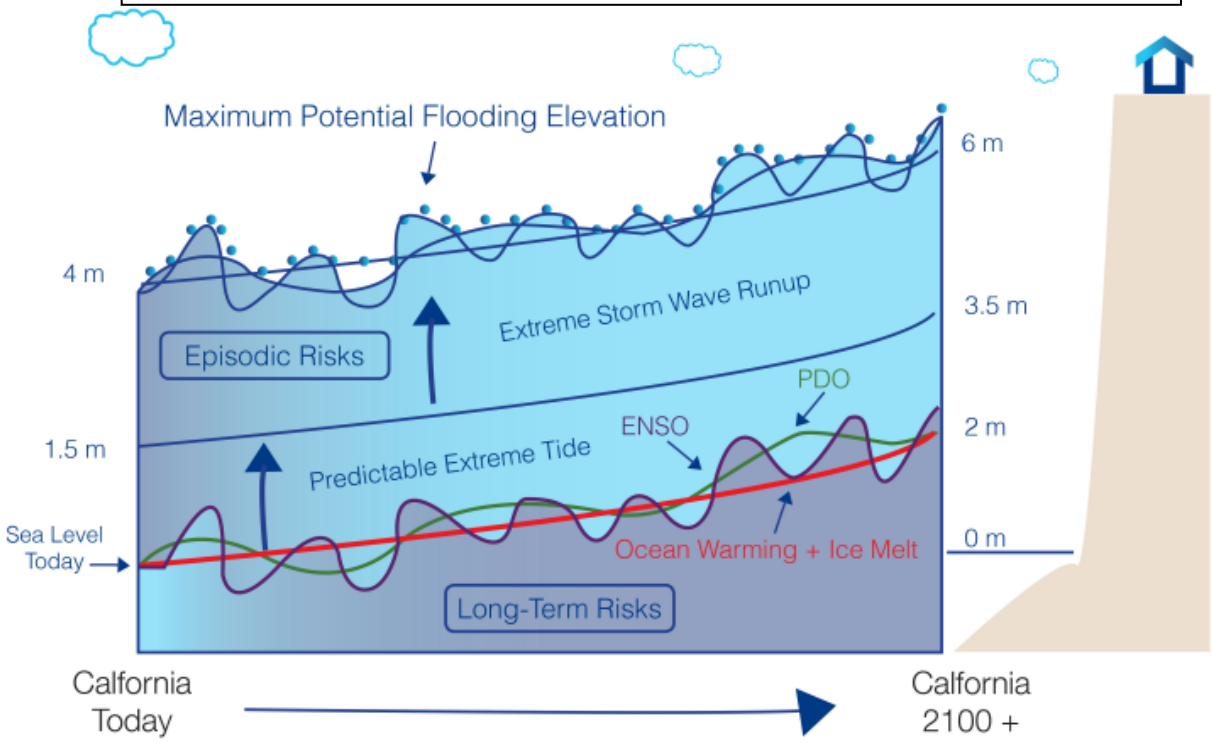
- Astronomical tide (predicted tide): 5 – 7 feet
- Surge components: atmospheric pressure, wind setup, El Niño, Pacific Decadal Oscillation: 1 – 3 feet
- Wave effects: wave setup + runup: 10 – 20 feet

Note: No overland wave propagation analysis for FEMA's update of Ventura County



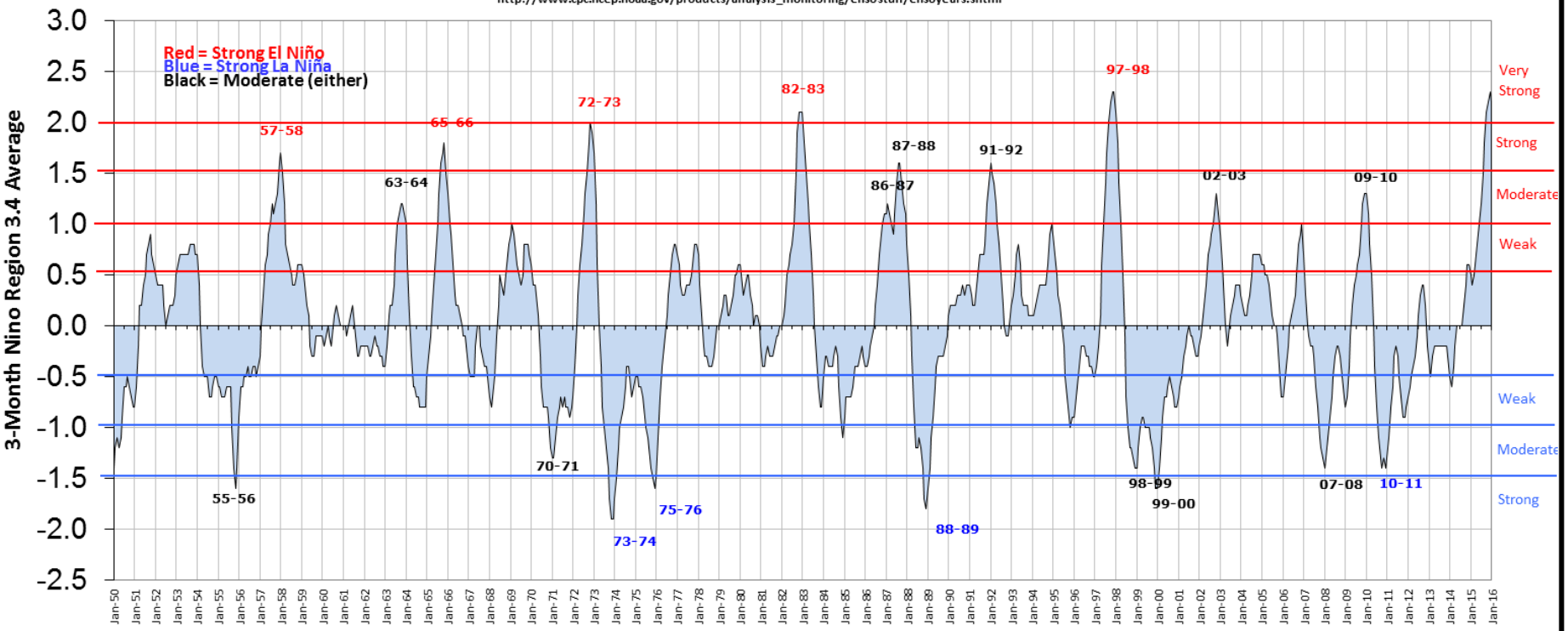
SWL = Tide + Surge (no wave effects) + sea level rise

TWL = SWL + wave setup + wave runup



SOIL & WATER RESOURCES - FIGURE 14

Puente Power Project – Relative Strength of ENSO since 1950

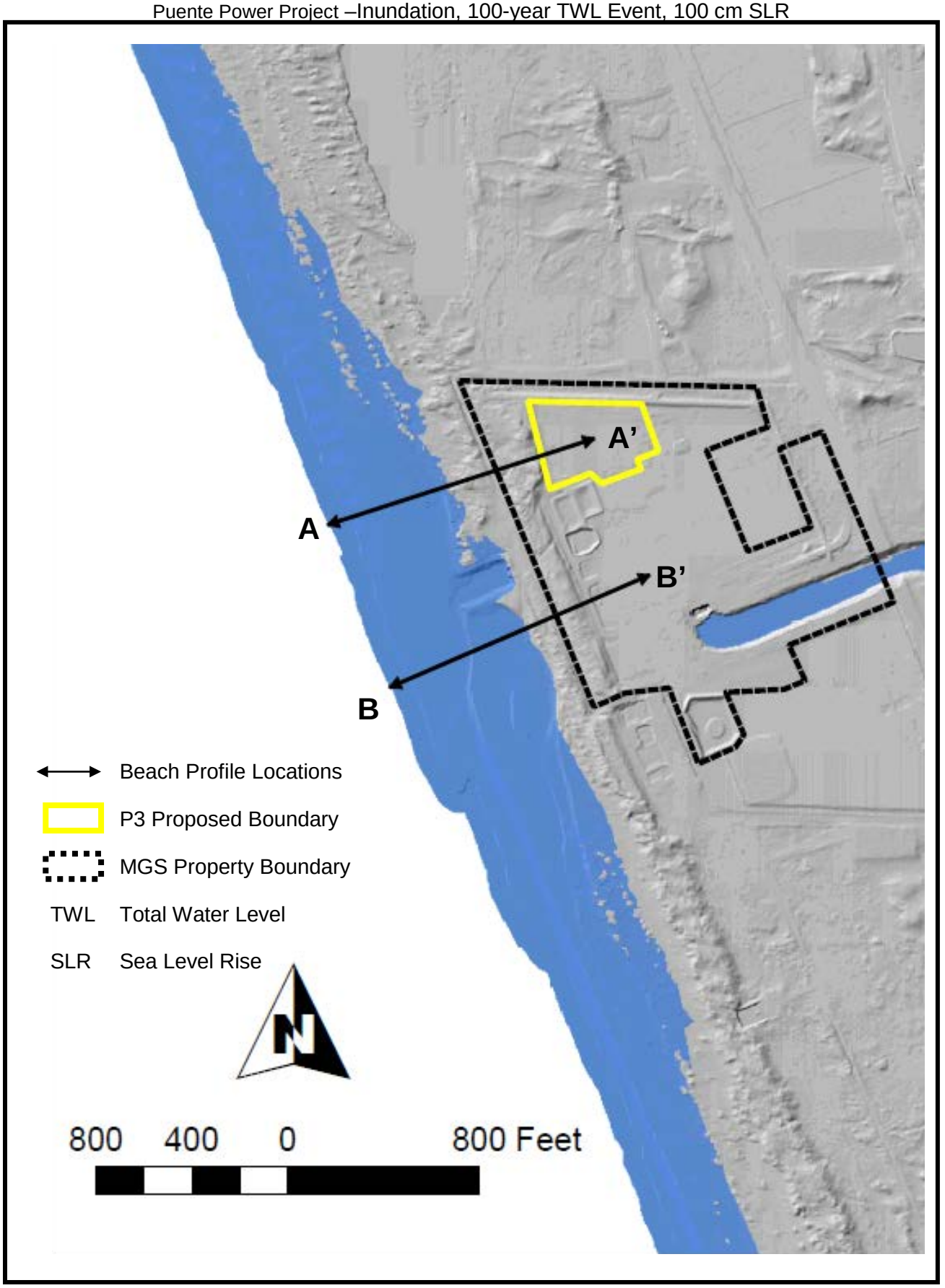


El Niño–Southern Oscillation (ENSO) is one of the most important climate phenomena on Earth due to its ability to change the global atmospheric circulation, which in turn, influences temperature and precipitation across the globe. Because ENSO is such a large, complex, and dynamic system, several different indexes are used to measure the different aspects of the ocean and the atmosphere over the tropical Pacific. ENSO can often be predicted many seasons in advance of its strongest impacts on weather and climate. At NOAA, the official ENSO indicator is the Oceanic Niño Index (ONI), which is based on sea surface temperature (SST) in the east-central tropical Pacific Ocean. (NOAA Climate.gov)

SOURCE: http://ggweather.com/enso/oni.htm accessed on March 8, 2016

SOIL & WATER RESOURCES - FIGURE 15

Puente Power Project –Inundation, 100-year TWL Event, 100 cm SLR

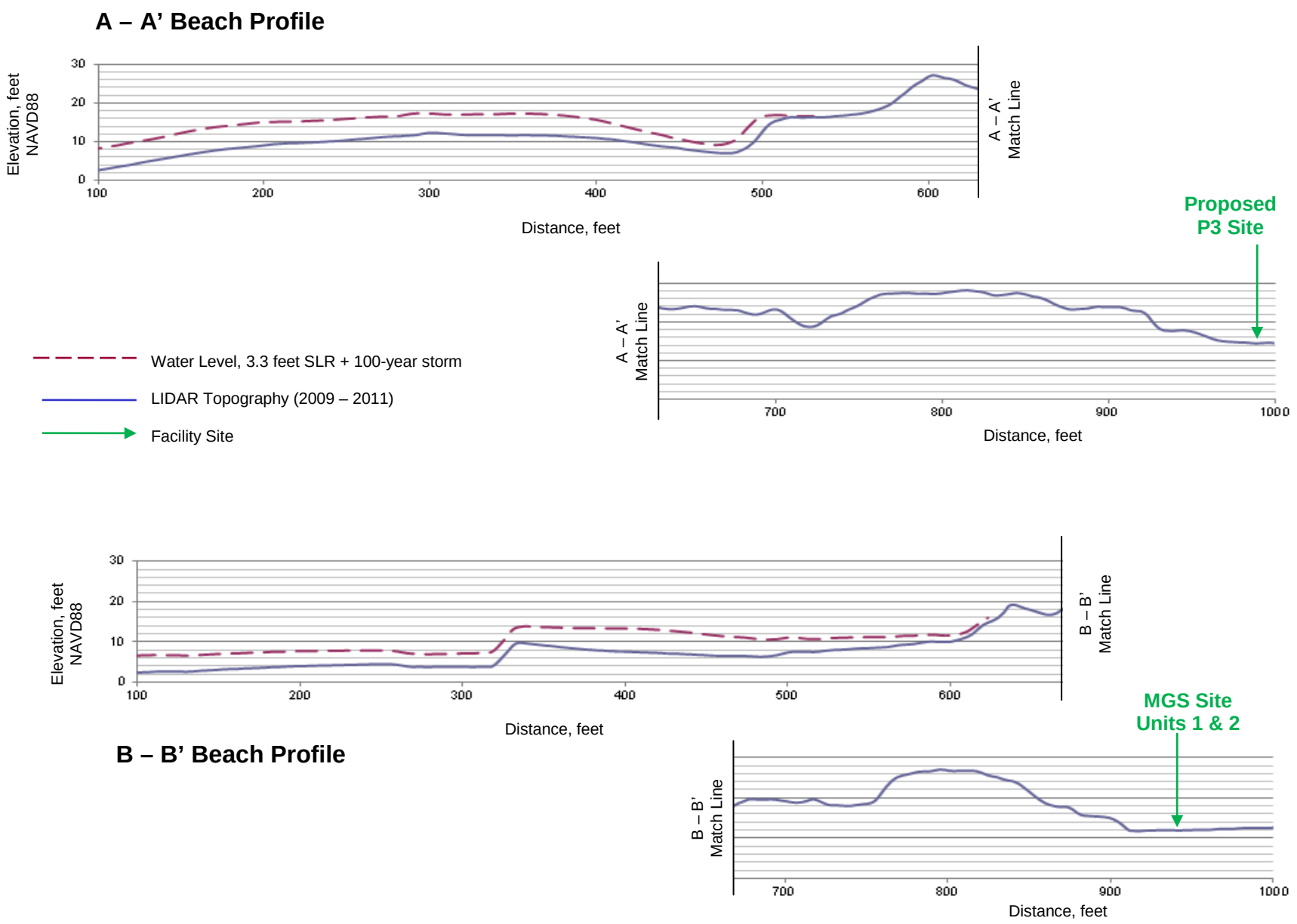


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: USGS CoSMoS 3.0 (http://walrus.wr.usgs.gov/coastal_processes/cosmos/socal3.0/index.html) accessed March 21, 2016

SOIL & WATER RESOURCES - FIGURE 16

Puente Power Project – Beach Profiles from CoSMoS 3.0



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: USGS CoSMoS 3.0 (http://walrus.wr.usgs.gov/coastal_processes/cosmos/socal3.0/index.html) accessed March 21, 2016

SOIL & WATER RESOURCES - FIGURE 17

Puente Power Project – CoSMoS v3.0 Projections of Shoreline Change

Puente Power Project Site

Initial Shoreline Position

Projections of Shoreline Changes – Sea Level Rise of 58 cm (1.9 ft) at January 2050

Final Shoreline Position (with continued nourishment)

Uncertainty in final shoreline position + potential winter erosion

Final Shoreline Position (with no nourishment)

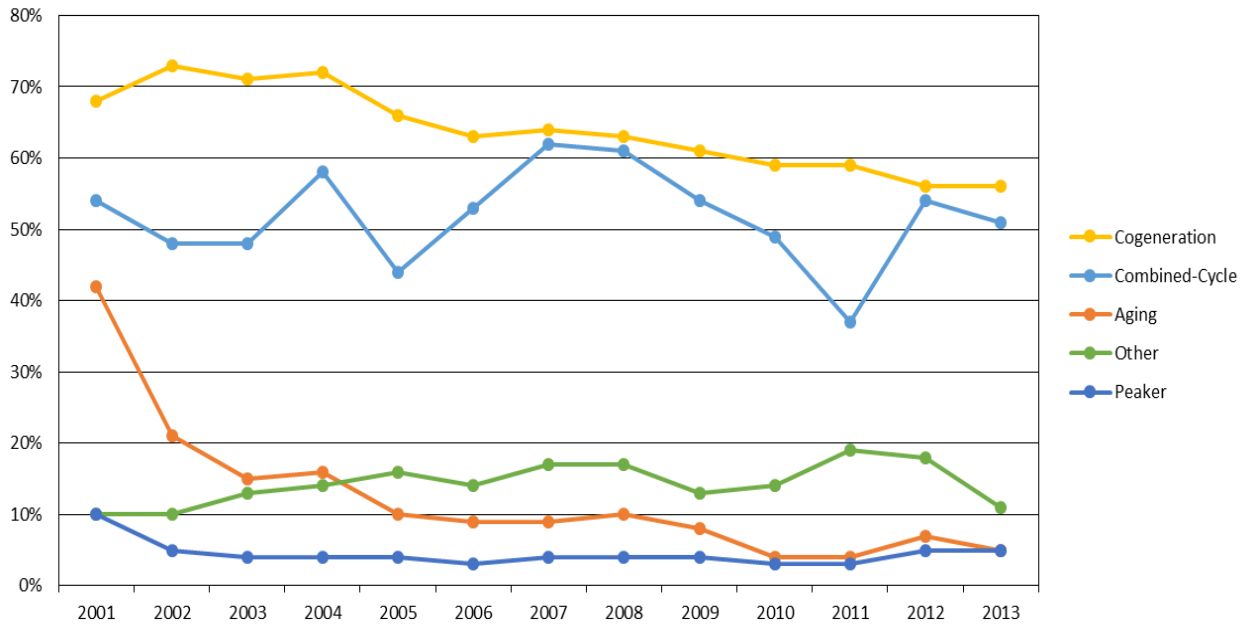
Uncertainty in final shoreline position + potential winter erosion

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

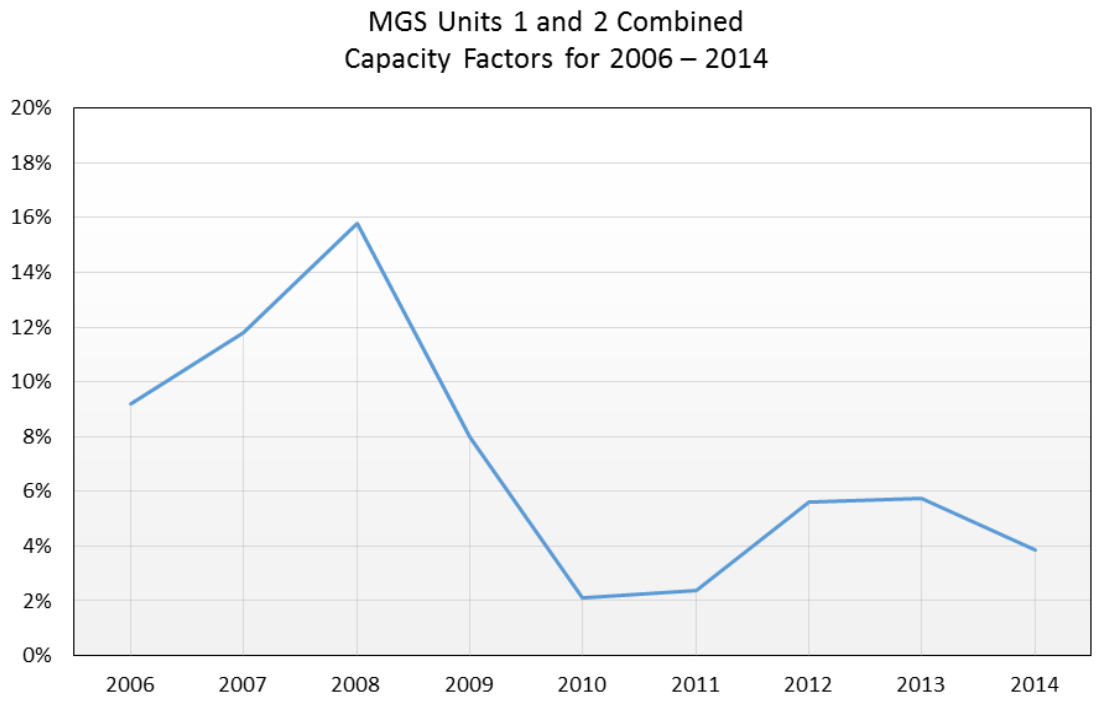
SOURCE: CoSMoS Southern California v3.0 Phase 2 (https://www.sciencebase.gov/catalog/folder/5633fea2e4b048076347f1cf) accessed November 7, 2016

SOIL & WATER RESOURCES - FIGURE 18

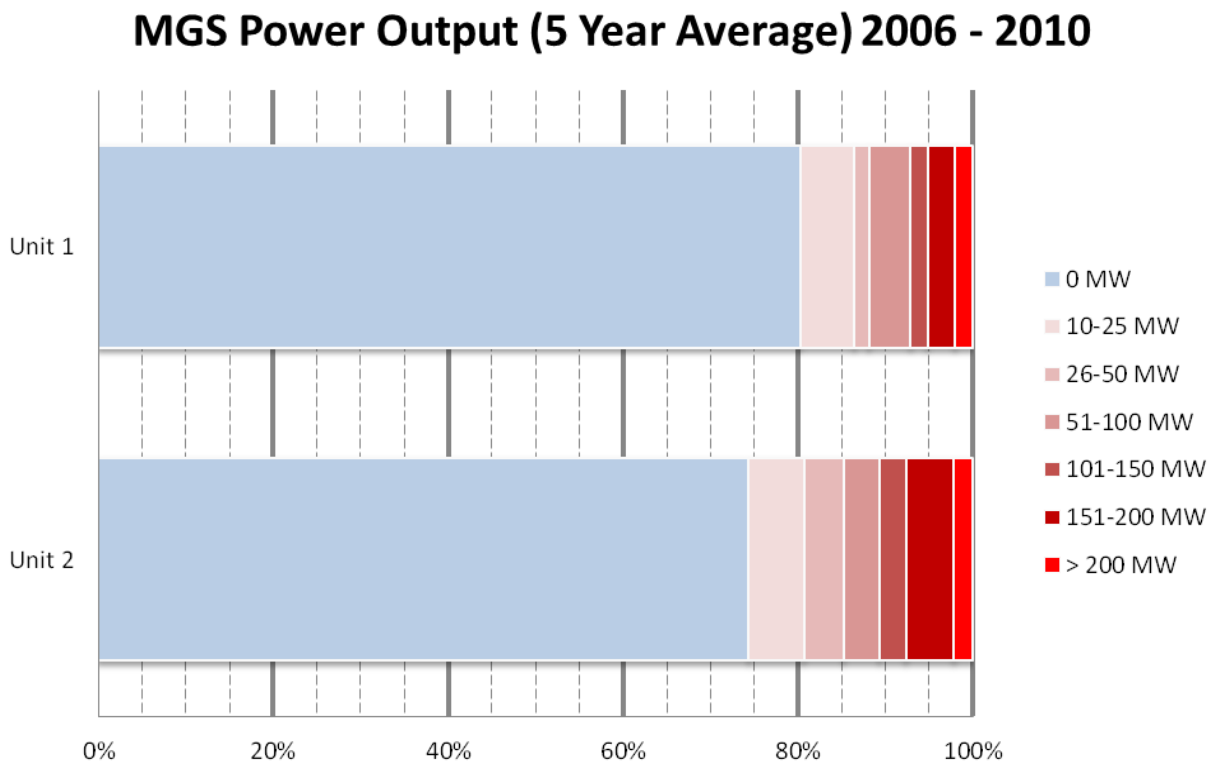
Puente Power Project – Comparison of Capacity Factors



(Source: Nyberg, Michael. 2014. Thermal Efficiency of Gas-Fired Generation in California: 2014 Update. California Energy Commission. CEC 200-2014-005.)

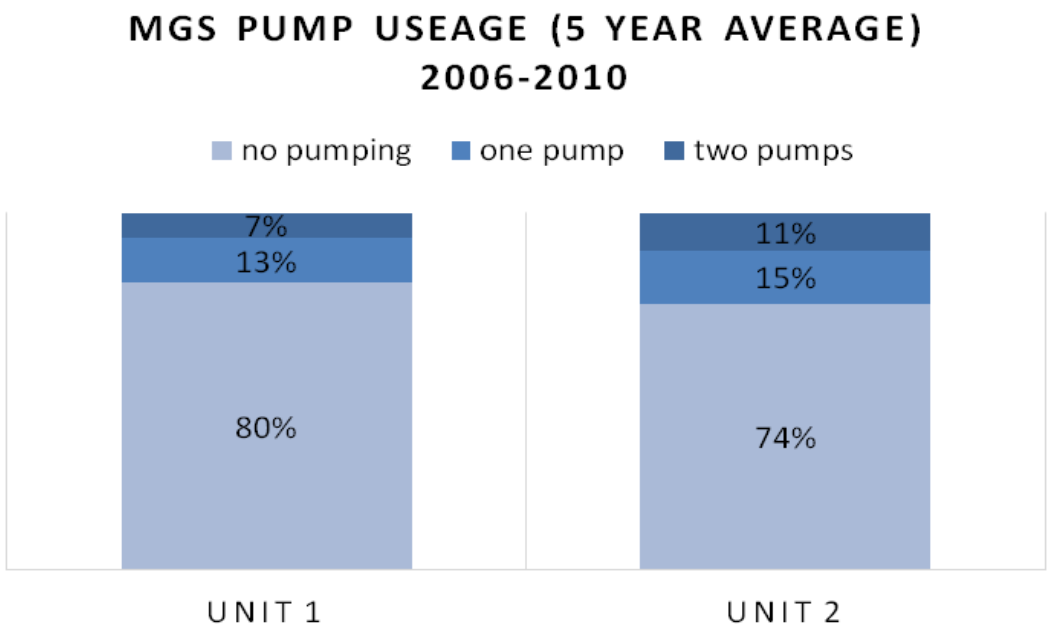


(Sources: GEN 2011, PPP 2015c)



(Source: GEN 2011)

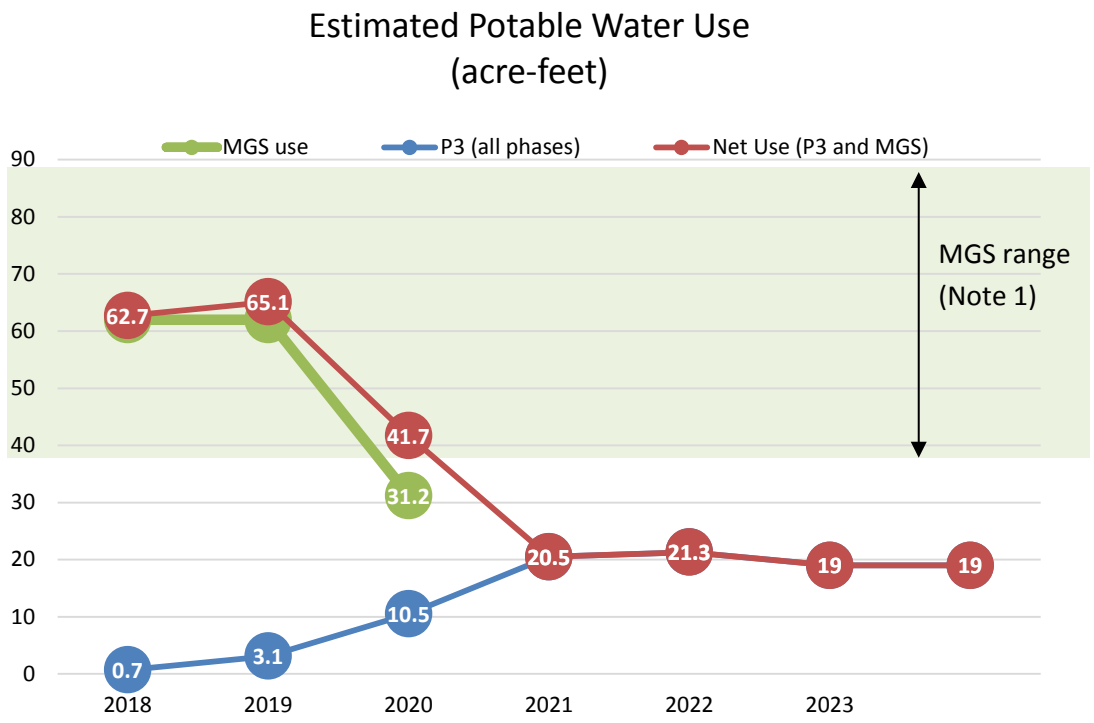
Notes: Units are rated at 215 MW each.
Five year average capacity factor of 9.4%.



Two pumps service each unit. Pumps do not operate when the units are not directly engaged in power-generating activities or critical system maintenance. Average operating profile of pumps is based on the average operating profile, assuming each unit operates one pump to generate less than 100 MW and two pumps operate to generate 100 MW or more.

SOIL & WATER RESOURCES - FIGURE 20

Puente Power Project – Estimated Potable Water Use



	Construction	Decommission	Demolition	Operations[2]	P3 Total	MGS	Net[3]
2018	0.7				0.7	62	62.7
2019	3.1				3.1	62	65.1
2020	1.0			9.5	10.5	31.2	41.7
2021		0.6	0.9	19	20.5		20.5
2022			2.3	19	21.3		21.3
2023				19	19		19
2024				19	19		19

(Sources: PPP 2015a Table 2.9-4 and §2.7, PPP 2015c, PPP 2015x Table 2-4, CEC 2016ab)

Notes:

1. MGS annual water use over the past five years ranged between 39 ac-ft in 2010 and 88 ac-ft in 2013 (PPP 2015a Table 4.15-3). Table above uses the five year average of 62 ac-ft to estimate future use.
2. Average annual use takes downtime into account. It is therefore based on the average daily use attenuated by an average annual capacity factor of 30 percent.
3. This represents potential maximum water use. Actual water use would depend on the ambient temperature, capacity factor, and operating profile.
4. All volumes are in acre-feet and include domestic water use associated with each phase.

APPENDIX SW-1 - FIGURE 1

Puente Power Project – Description and Illustration of an Asset, a Node, a Cluster, and a System

Asset

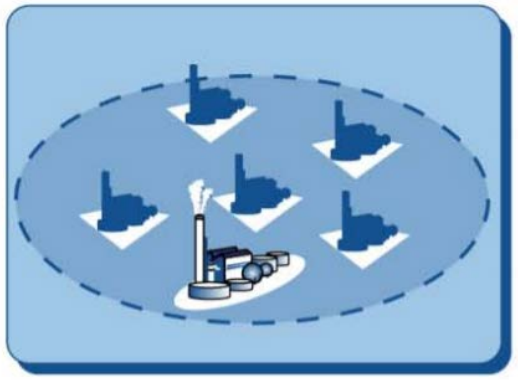
An asset is a single facility with a fixed location that functions as a single entity.

Assets can meet the NCIPP list criteria by themselves.

Node

A node is a single facility, similar to an asset, but does not meet the NCIPP list criteria by itself.

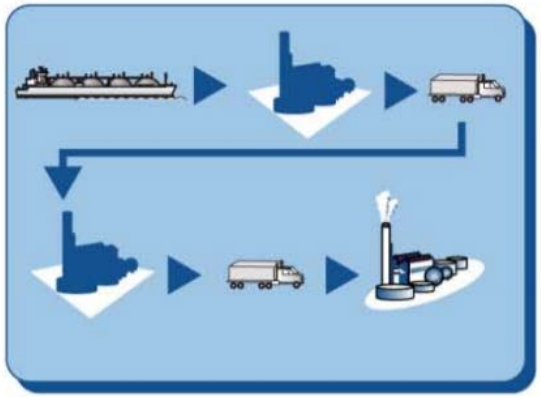
Cluster



A cluster is a group of two or more associated infrastructure facilities (assets or nodes) that can be disrupted through a single natural or man-made event, resulting in regional or national consequences.

Clusters can be included on the NCIPP list.

System



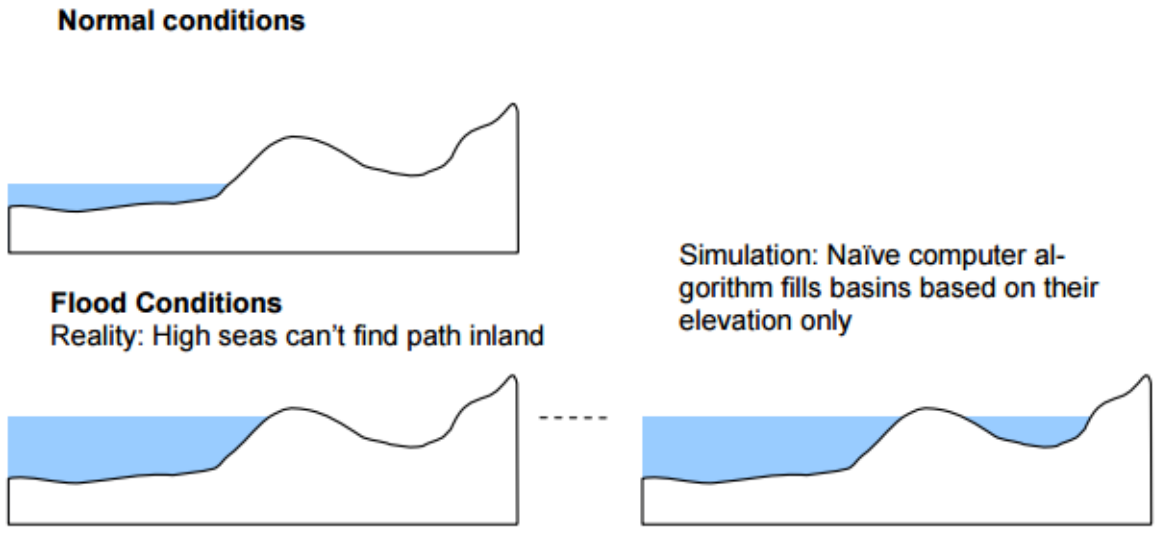
A system is a group of two or more interconnected infrastructure facilities (assets or nodes) that can be disrupted through a single natural or man-made event, resulting in regional or national consequences.

Systems can be included on the NCIPP list.

NCIPP - National Critical Infrastructure Prioritization Program
(a program of the Department of Homeland Security's Office of Infrastructure Protection)

SOURCE: GAO 2013

Mapping Tool	Modeling Method	Organization/Sponsor
Surging Seas Risk Finder	Modified bathtub approach, modeling hydrologic connectivity and locally adjusted MHHW levels.	Climate Central
Sea Level Rise and Coastal Flooding Impacts Viewer	Modified bathtub approach, modeling hydrologic connectivity and locally adjusted MHHW levels.	NOAA Coastal Services Center
Coastal Resilience	HEC-GeoRAS tool in ArcGIS outputs for river flooding , FEMA overtopping model used results projected against topographic surface composite	The Nature Conservancy
Pacific Institute – The Impacts of Sea Level Rise on California's Coast	Bathtub approach	Ca Energy Comm, Ca EPA, Metropolitan Trans Comm, Caltrans, and the Ca Ocean Protection Council
Cal-Adapt - Exploring California's Climate	Bathtub approach and USGS Coastal Storm Modeling System (CoSMoS)	Ca Energy Comm; UC Berkeley Geospatial Innovation Facility
Our Coast, Our Future	USGS Coastal Storm Modeling System (CoSMoS)	Point Blue Conservation Science; USGS; Gulf of the Farallones National Marine Sanctuary; Coravai LCC

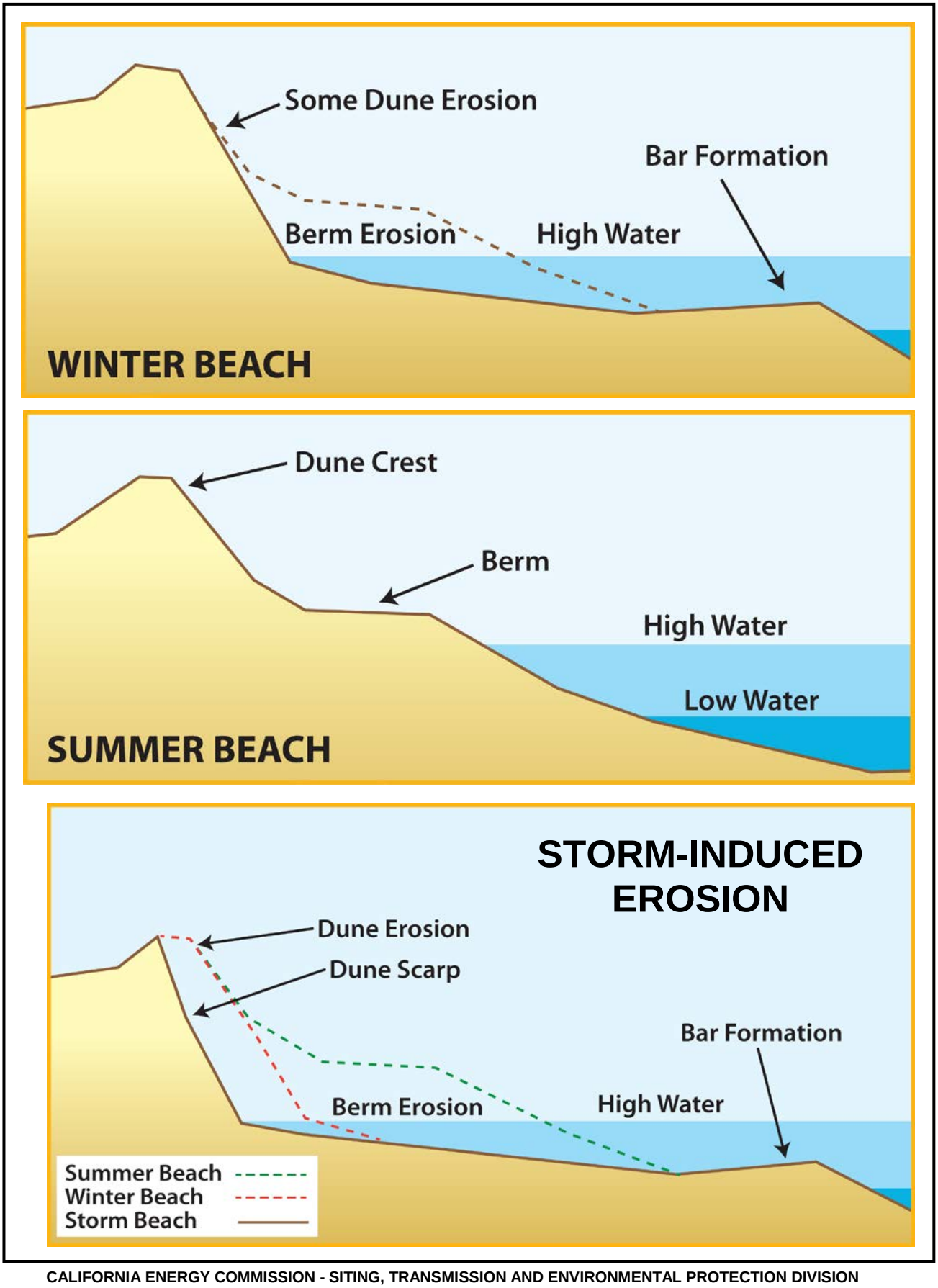


A static ("bathtub") model does not accurately map coastal flooding in areas protected by seawalls or levees or natural barriers.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: The Sea Level Rise and Coastal Flood Web Tools Comparison Matrix. The Nature Conservancy, NOAA's Office for Coastal Management, Climate Central. URL http://sealevel.climatecentral.org/matrix/, Date Access: March 7, 2016

APPENDIX SW-1 - FIGURE 3

Puente Power Project – Erosion of Beaches and Dunes



Puente Power Project – Comparison of Flood Web Tools at Proposed P3 Site

(A)
Coastal Resilience Ventura
The Nature Conservancy

Combined Coastal Erosion, Flooding and Wave Impact Hazards in 2030

- with 2.3 inches of SLR
- with 5.2 inches of SLR
- with 8.0 inches of SLR

Source: COO 2015a, Figure 10

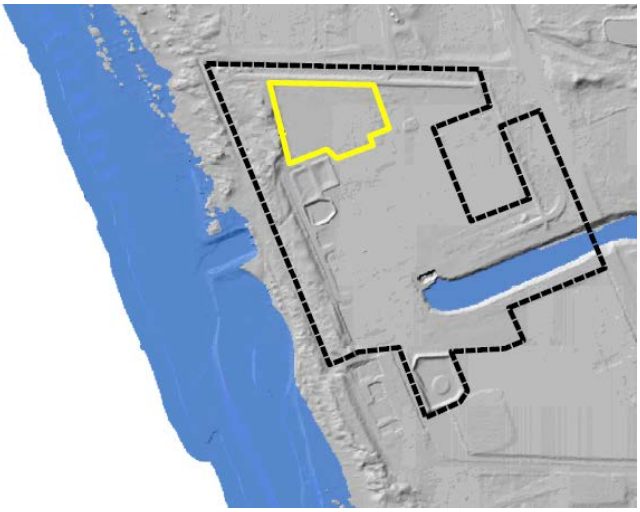
(B)
Preliminary FIRM
FEMA

Coastal High Hazard Area (VE Zone)
during one percent annual chance flood

No sea level rise

FLOOD HAZARD ZONES
- 1% ANNUAL CHANCE FLOOD HAZARD
- 0.2% ANNUAL CHANCE FLOOD HAZARD
- AREA OF MINIMAL FLOOD HAZARD
- REGULATORY FLOODWAY

Source: FEMA's Geoplatform (http://arcg.is/2dxDjzG) accessed October 10, 2016

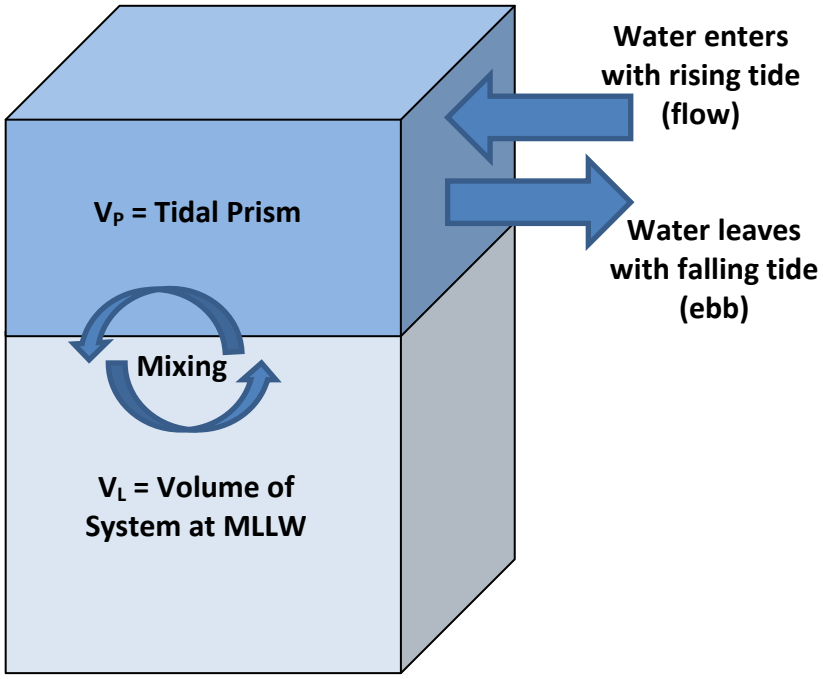


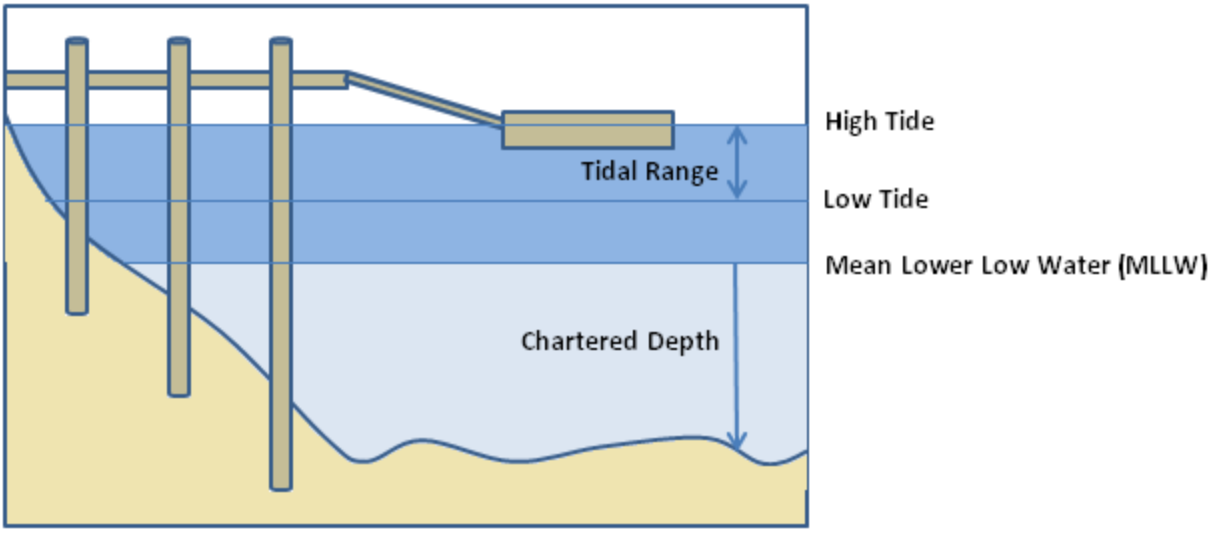
(C)
CoSMoS 3.0 – Initial Results
USGS

Inundation of 100-year Event with 39.4 inches of SLR

Source: USGS CoSMoS 3.0 (http://walrus.wr.usgs.gov/coastal_processes/cosmos/socal3.0/index.html) accessed March 21, 2016

Puente Power Project – Tidal Prism Simple Model





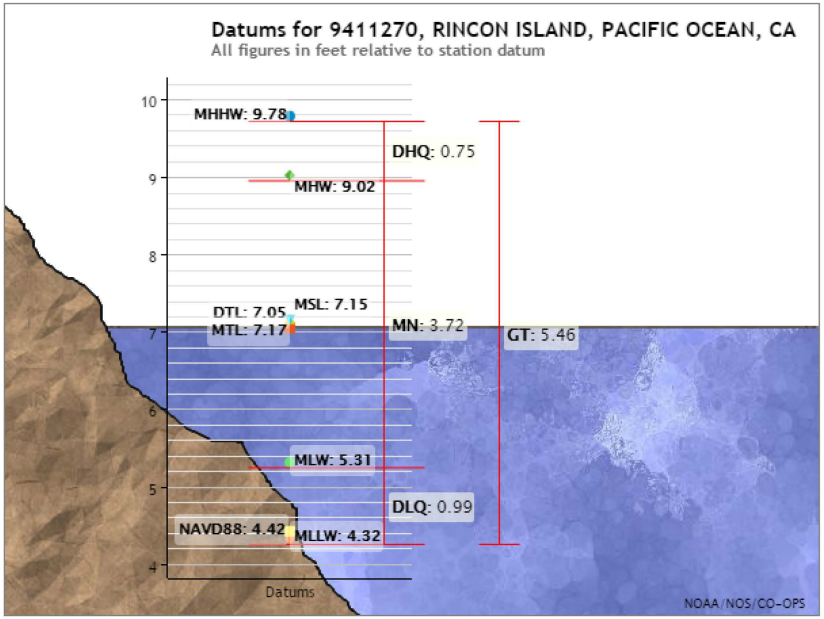
APPENDIX SW-3 - FIGURE 2

Puente Power Project - Datum elevations of Rincon Island

Elevations on Station Datum

Station: 9411270, RINCON ISLAND, PACIFIC OCEAN, CA
T.M.: 120
Epoch: 1983-2001
Status: Accepted (Apr 17 2003)
Datum: STND
Units: Feet

Datum	Value	Description
MHHW	9.78	Mean Higher-High Water
MHW	9.02	Mean High Water
MTL	7.17	Mean Tide Level
MSL	7.15	Mean Sea Level
DTL	7.05	Mean Diurnal Tide Level
MLW	5.31	Mean Low Water
MLLW	4.32	Mean Lower-Low Water
NAVD88	4.42	North American Vertical Datum of 1988
STND	0.00	Station Datum
GT	5.46	Great Diurnal Range
MN	3.72	Mean Range of Tide
DHQ	0.75	Mean Diurnal High Water Inequality
DLQ	0.99	Mean Diurnal Low Water Inequality
HWI	5.47	Greenwich High Water Interval (in hours)
LWI	11.52	Greenwich Low Water Interval (in hours)
Maximum	12.13	Highest Observed Water Level
Max Date & Time	01/27/1983 07:30	Highest Observed Water Level Date and Time
Minimum	2.00	Lowest Observed Water Level
Min Date & Time	01/16/1965 00:00	Lowest Observed Water Level Date and Time
HAT		Highest Astronomical Tide
HAT Date & Time		HAT Date and Time
LAT		Lowest Astronomical Tide
LAT Date &		LAT Date and Time



Showing datums for

9411270 RINCON ISLAND, ...

Data Units ◉ Feet ○ Meters

Epoch ◉ Present (1983-2001) ○ Superseded (1960-1978)

Submit

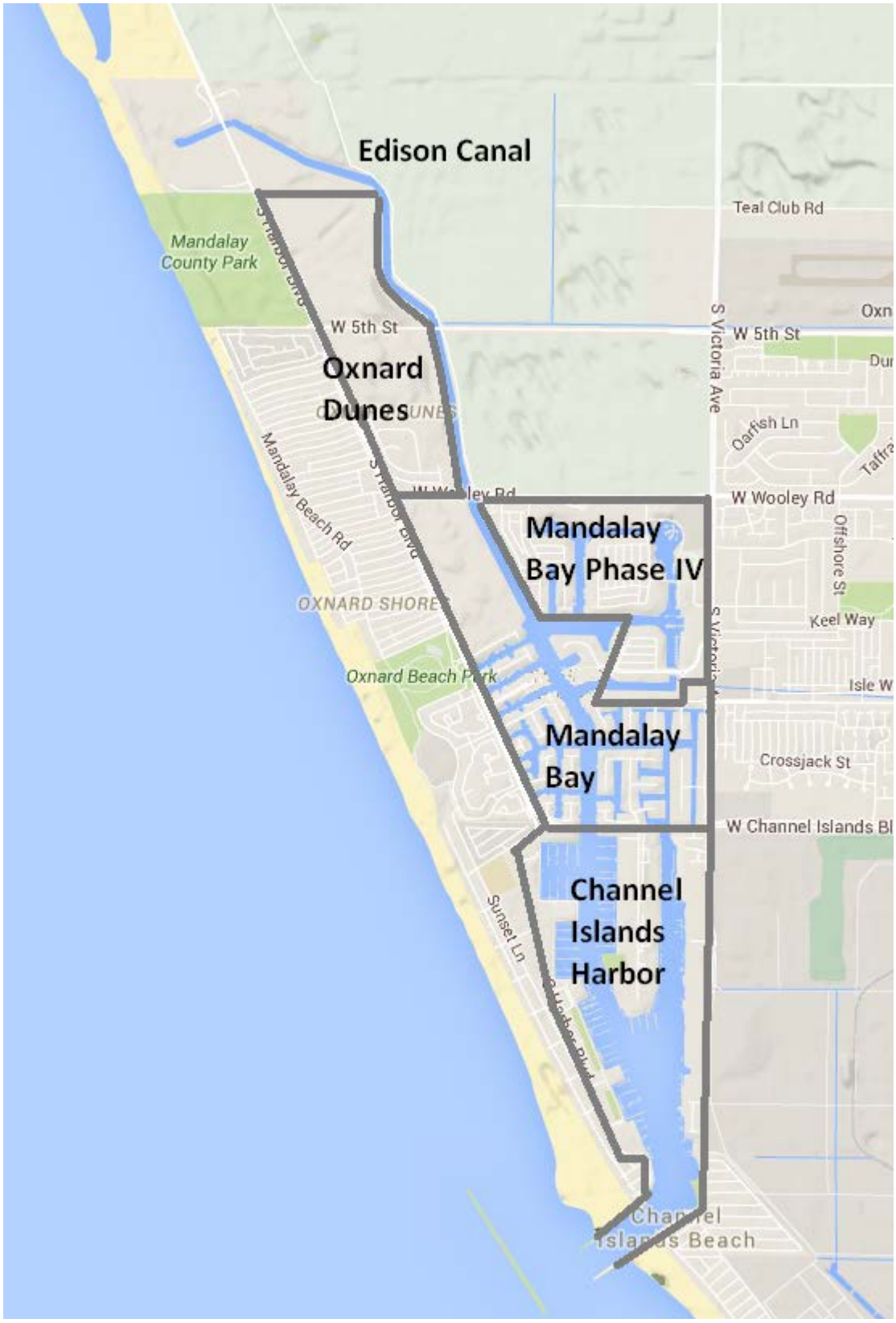
APPENDIX SW-3

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: NOAA 2003

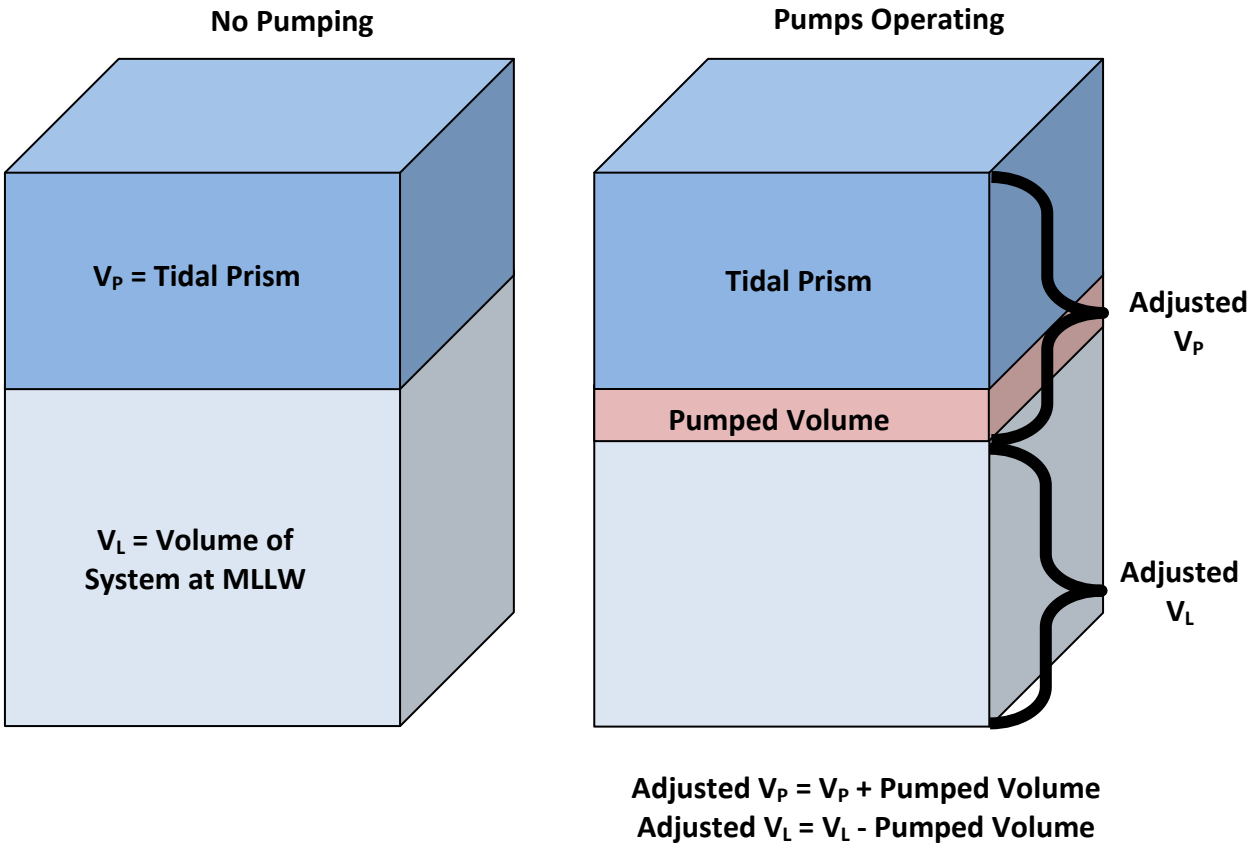
APPENDIX SW-3 - FIGURE 3

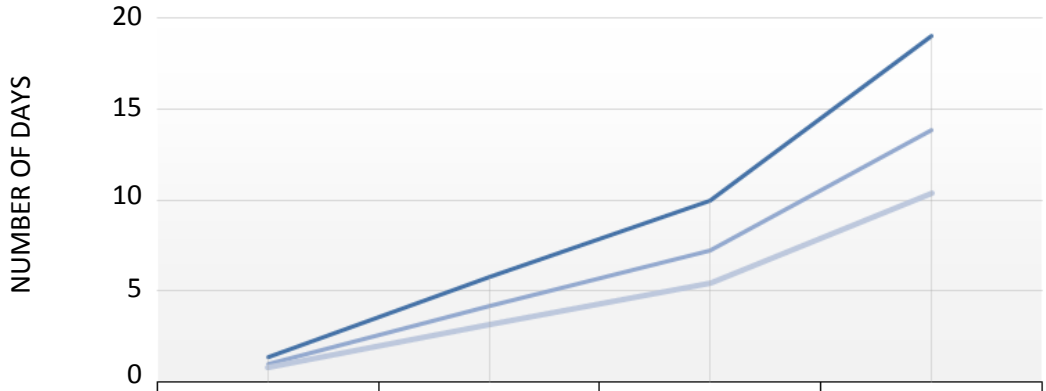
Puente Power Project – Sub-Areas to Find Area of Open Water



APPENDIX SW-3 - FIGURE 4

Puente Power Project – Pumps Off vs. Pumps On

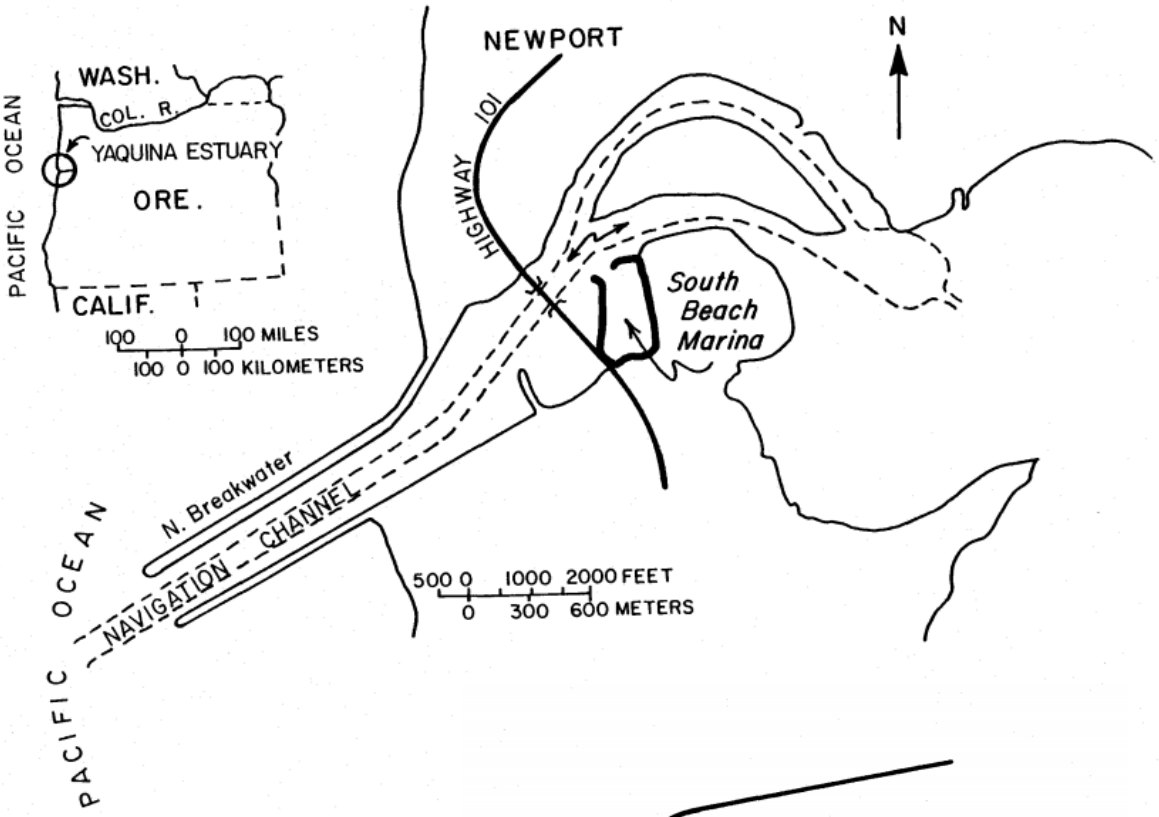


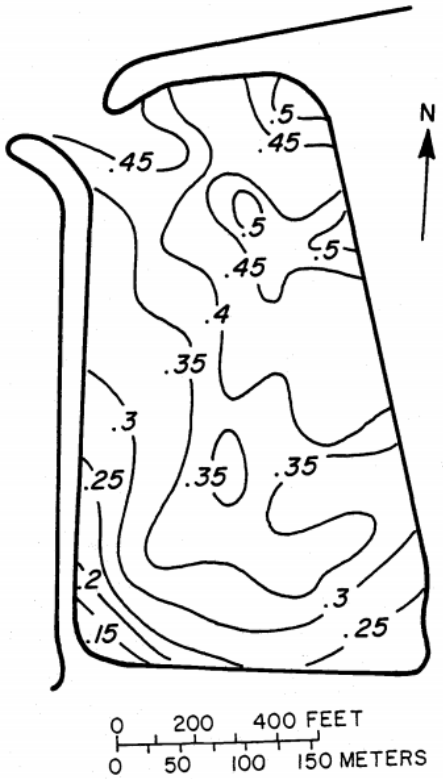


Percent Flushed	15%	50%	70%	90%
No Pumping	1.3	5.7	10.0	19.1
Two Pumps	1.0	4.2	7.2	13.8
Four Pumps	0.7	3.1	5.4	10.4

APPENDIX SW-3 - FIGURE 5

Puente Power Project – South Beach Marina





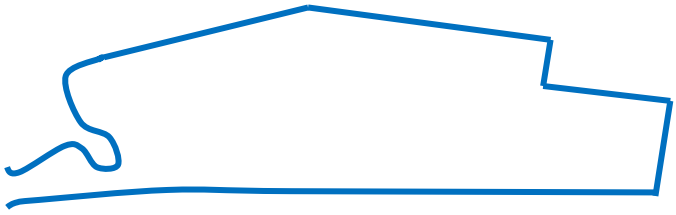
Above: Location map of South Beach Marina and Yaquina Estuary

Right: Isopleths of Fractional Exchange Rate (from hydraulic modeling)

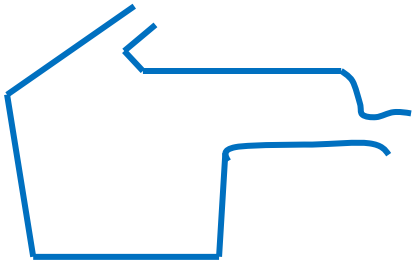
CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: USEPA 1981

APPENDIX SW-3 - FIGURE 6

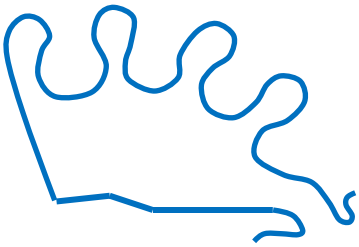
Puente Power Project – Conceptual Marina Configurations



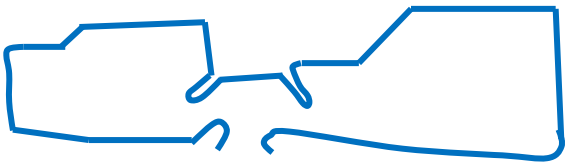
Rectangular Basin
Asymmetrical Single Entrance
Moderate Flushing Potential



Rectangular Basin
Two-Channel Entrance
Good Flushing Potential



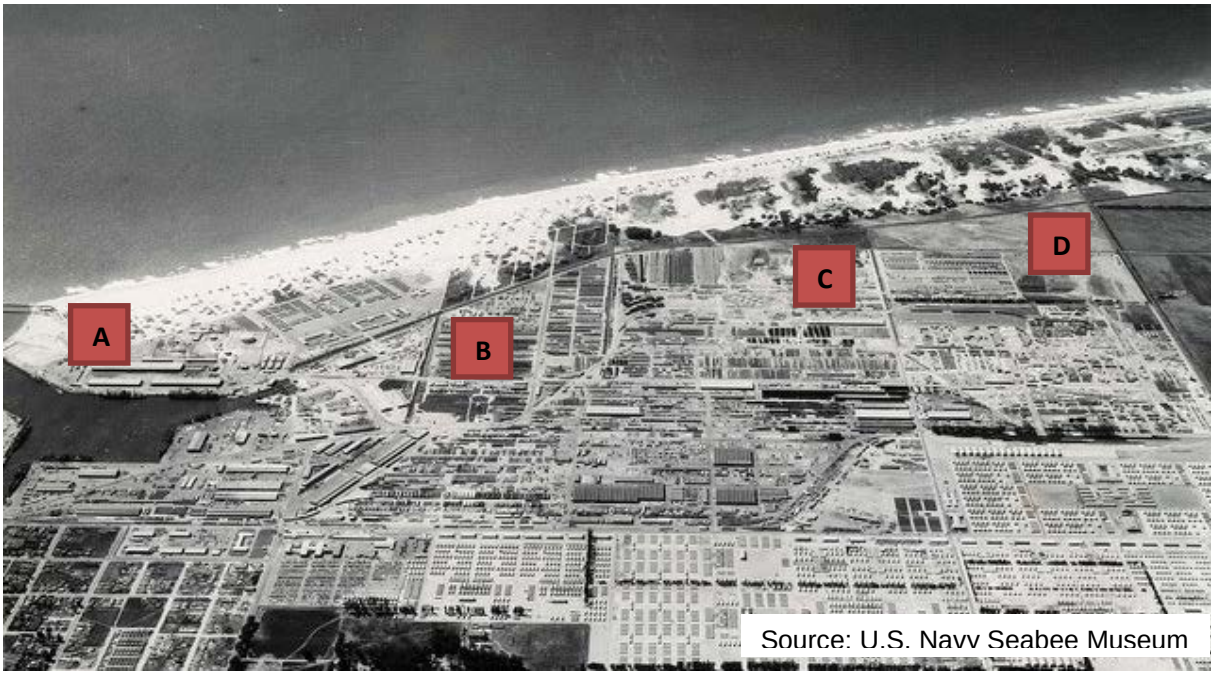
Pod Type Development Marina
Asymmetrical Entrance
Poor Flushing Potential



Rectangular Basin
Single Symmetrical Entrance
Good Flushing Potential

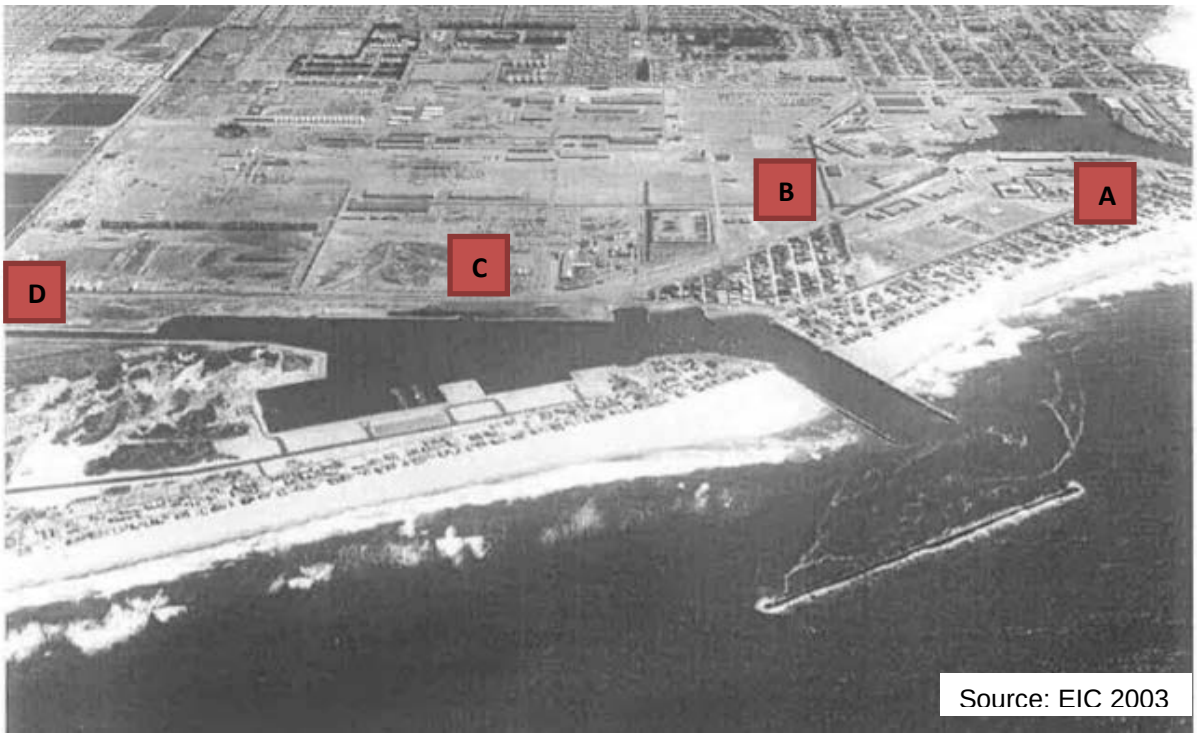
Finger Canal
Poor Flushing Potential

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: USEPA 1985

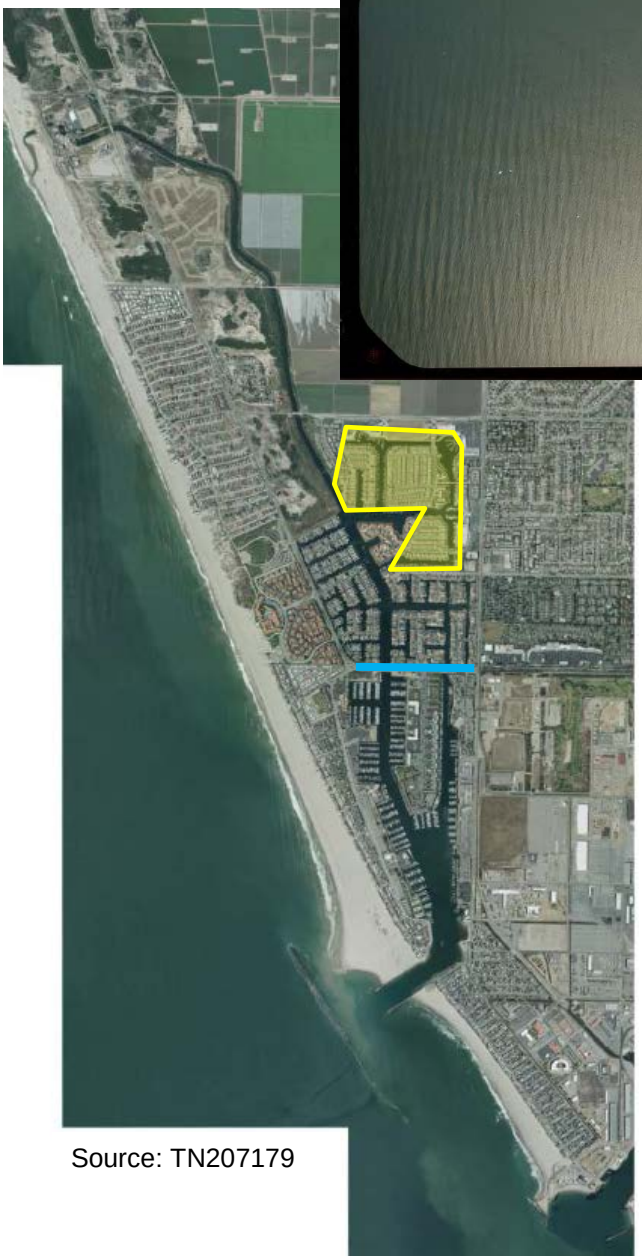


Above: View of the shoreline facing west taken in 1944. Port Hueneme [A] connects to a drainage canal located along the east edge of the sand dunes toward McGrath Lake. This canal was later directed to supply cooling water to MGS.

Below: View of the shoreline facing east taken in 1965. Construction of Channel Islands Harbor [C] cuts canal flow [B] from Port Hueneme [A]. The canal continues north [D] to the MGS site.



Source: COO 2015m



Source: TN207179

Above: 1999
Highlighted area shows growth since the official opening of Channel Islands Harbor in 1965. The blue line shows the boundary between Mandalay Bay and Channel Islands Harbor.

Left: 2013
Highlighted area shows the final phase of development that completed in 2008.

TRAFFIC AND TRANSPORTATION

Testimony of Jonathan Fong and Andrea Koch

SUMMARY OF CONCLUSIONS

The construction and operation of the Puente Power Project (Puente or project) could result in significant impacts to the nearby traffic and transportation system. Staff has determined that with implementation of staff's proposed conditions of certification, Puente's impacts to the surrounding traffic and transportation system would be less than significant. Condition of Certification **TRANS-2** would require implementation of a Traffic Control Plan that would reduce the potential for accidents caused by construction traffic exiting the project site to travel northbound on Harbor Boulevard. Conditions of Certification **TRANS-6** and **TRANS-7** would mitigate potentially significant impacts to aviation from the thermal plumes that Puente's combustion turbine generator (CTG) stack would generate. Condition of Certification **TRANS-6** would require obstruction marking and lighting of the CTG stack to alert pilots of the location of the plume. Condition of Certification **TRANS-7** would require the project owner to work with the Federal Aviation Administration, the Oxnard Airport Manager, and the Ventura County Department of Airports to notify all pilots using the Oxnard Airport and airspace above the Puente site of potential plume hazards.

With implementation of the proposed conditions of certification (**TRANS-1** through **TRANS-7**), the project would comply with all applicable laws, ordinances, regulations, and standards (LORS) related to traffic and transportation and would result in less than significant impacts to the traffic and transportation system.

INTRODUCTION

In compliance with the California Environmental Quality Act (CEQA) and Energy Commission requirements, this analysis identifies the project's potential impacts to the surrounding traffic and transportation system and proposes mitigation measures (conditions of certification) that would avoid or reduce these impacts to a less than significant level. This analysis also addresses the project's consistency with applicable federal, state, and local transportation-related LORS.

SETTING

The project site is located in the city of Oxnard in Ventura County. Puente would be constructed on approximately 3 acres of the northwest portion of the existing 36-acre Mandalay Generating System (MGS) property at 393 North Harbor Boulevard. The project would replace two gas-fired steam-generating units (Units 1 and 2) at the existing MGS with a new CTG and associated ancillary facilities.

Regional access to the project site would be from Highway 101. Local access would be from Harbor Boulevard, the direct access to the project site, and also from Gonzales Road, West Fifth Street, and Victoria Avenue. The nearest airport is Oxnard Airport, approximately 1.9 miles southeast of the project, and there are also railways nearby. For maps of the project site in relation to the local and regional traffic and transportation

systems, see **Traffic and Transportation Figure 1 – Local Traffic and Transportation Setting** and **Figure 2 – Regional Traffic and Transportation Setting.**

The following freeways and roads provide access to the project and may be impacted by construction and operation traffic.

U.S. Highway 101

U.S. Highway 101 (also known as Ventura Freeway in the project area) is a major 1,540-mile long north-south freeway that extends from Washington State to California. In the general area of the project, Highway 101 runs northwest-southeast, provides three lanes in each direction, and has junctions with State Route (SR) 1, SR 232 and SR 34. Commuters traveling between Ventura, Los Angeles, and Santa Barbara heavily use this route, as do people traveling seasonally for vacations along the coast. Access to the project from Highway 101 is from Victoria Avenue.

Harbor Boulevard

Harbor Boulevard is a north-south, four-lane secondary arterial located east of MGS that provides primary access to the proposed project site via an unsignalized T-intersection (VCTC 2009). South of its intersection with West 5th Street, Harbor Boulevard transitions from a two-lane arterial to a four-lane arterial. The posted speed limit for Harbor Boulevard is 50 mph. Harbor Boulevard crosses Edison Canal via Bridge 550 just south of the project site.

Gonzales Road

Gonzales Road is an east-west arterial located north of the project. From Harbor Boulevard to Victoria Avenue, Gonzales Road is classified as a two-lane local arterial (VCTC 2009). It has a posted speed limit of 55 mph and is a designated truck route (VCTC 2009).

Victoria Avenue

Victoria Avenue is a north-south primary arterial located east of the project site that provides regional access from Highway 101 (VCTC 2009). It is a divided four-lane facility and has a posted speed limit of 55 mph. It is a designated truck route (VCTC 2009).

West 5th Street

West 5th Street is an east-west arterial located south of the project site. Its roadway classification varies. From Harbor Boulevard to Victoria Avenue, it is classified as a local arterial. From Victoria Avenue to Rice Avenue, it is classified as a secondary arterial, with the exception of a segment between Ventura Road and Oxnard Boulevard which is classified as a local arterial (VCTC 2009). Approximately one mile southeast of the project site, West 5th Street crosses the Edison Canal. West 5th Street is a truck route (VCTC 2009).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 1 provides a general description of adopted federal, state, and local LORS that apply to this project and pertain to traffic and transportation. Staff's analysis of Puente's compliance with these LORS is presented in **Traffic and Transportation Table 7**.

Traffic and Transportation Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
Code of Federal Regulations Title 49, Subtitle B: Sections 171-177 and 350-399	Requires proper handling and storage of hazardous materials during transportation.
Code of Federal Regulations Title 14 Aeronautics and Space, Part 77 - Objects Affecting Navigable Airspace	Establishes standards for determining physical obstructions to navigable airspace and provides for aeronautical studies to determine the effect of physical obstructions on the safe and efficient use of airspace.
State	
California Vehicle Code: Div. 2, Chap. 2.5; Div. 6, Chap. 7; Div. 13, Chap. 5; Div. 14; Div. 14.1; Div. 14.3; Div. 14.7; Div. 14.8; & Div. 15	Includes regulations pertaining to: licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
California Streets and Highway Code: Div.1, Chap. 1, Article 3, Section 117; Div. 1, Chap. 3; Div. 2, Chap. 5.5 and 6	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits. Requires permits for the location in the right-of-way of any structures or fixtures necessary to telegraph, telephone, or electric power lines or of any ditches, pipes, drains, sewers, or underground structures.
California Health and Safety Code, Section 25160 et seq.	Pertains to operators of vehicles transporting hazardous materials; promotes safe transportation of hazardous materials.
State of California Department of Transportation (Caltrans), Caltrans Guide for the Preparation of Traffic Impact Studies	Caltrans' target level of service (LOS) for state highway facilities is at the transition between LOS C and LOS D. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the target LOS. If an existing state highway is operating at less than the appropriate target LOS, the existing measure of effectiveness should be maintained.
Local	
County of Ventura General Plan, Transportation/Circulation Policies, Section 4.2.2	Policy 4.2.2-3: The minimum acceptable LOS for road segments and intersections within the Regional Road Network and Local Road Network shall be as follows: a) LOS D for all county thoroughfares and federal and state highways in the unincorporated area of the county c) LOS C for all county-maintained local roads d) At any intersection between two roads, each of which has a prescribed minimum acceptable LOS, the lower LOS of the two shall be the minimum acceptable LOS for that intersection.

Applicable LORS	Description
2009 Ventura County Transportation Commission, Congestion Management Program, Chapter 2	2. Sets a minimum LOS of "E" for the CMP road network. The minimum standard of LOS E only applies to the CMP; local agency LOS minimum standards may be higher than the CMP minimum.
City of Oxnard 2030 General Plan, Infrastructure and Community Services Element	Policy ICS-2.6: Reduction of Construction Impacts Minimize and monitor traffic and parking issues associated with construction activities, require additional traffic lanes and/or other traffic improvements for ingress and egress for new developments for traffic and safety reasons, where appropriate.
	Goal ICS-3: Maintain LOS C at designated intersections, unless otherwise reduced by city council direction. Policy ICS-3.1: CEQA Level of Service Threshold Requires level of service C as the threshold of significance for intersections during environmental review.
	Policy ICS-4.4: Truck Route Compliance Work with agencies and commercial businesses involved with goods movement to ensure that truck routes are adhered to by commercial vehicle drivers.
	Policy ICS-9.2: Development has Adequate Parking Review development proposals to encourage shared parking use and ensure adverse parking impacts are minimized or avoided.
City of Oxnard 2030 General Plan, Safety and Hazards Element	Policy SH-7.2: Handling of Hazardous Materials Requires that hazardous materials are transported within the city in a safe manner and in compliance with local, state and federal standards.
City of Oxnard Codified Ordinances, Chapter 8, Sec. 8-3, 8-4	Requires commercial vehicles over five tons, including load, to use designated truck routes. Any street not identified as a truck route is classified as a light traffic street.
City of Oxnard Municipal Code, Sec. 19-206	Requires an encroachment permit to conduct construction activities within city rights-of-way.
City of Oxnard Municipal Code, Sec. 19-241	Requires a special permit to operate or move an overweight vehicle on city streets or highways.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Significance criteria used in this document for evaluating environmental impacts are based on the CEQA Guidelines, the CEQA Environmental Checklist (Appendix G) for Transportation/Traffic, and applicable LORS used by other governmental agencies. Specifically, staff analyzed whether the proposed project would:

1. cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);

2. conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel, and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

3. conflict with an applicable congestion management program, including, but not limited to, level of service standards (LOS) and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

4. substantially increase hazards due to a design feature (e.g., sharp curves, dangerous intersections, or glint or glare) or incompatible uses (e.g., farm equipment);

5. conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities;

6. result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

7. produce a thermal plume in an area where flight paths are expected to occur and cannot be avoided; or

8. have individual environmental effects that, when considered with other impacts from the same project or in conjunction with impacts from other closely related past, present, and reasonably foreseeable future projects, are considerable or compound or increase other environmental impacts.

Level of Service and Study Locations

Level of service is a generally accepted measure used by traffic engineers and planners to describe and quantify the traffic congestion level on a particular roadway or intersection in terms of speed, travel time, and delay. The *Highway Capacity Manual 2010*[1] includes six levels of service for roadways and intersections. These levels of service range from LOS A, the best and smoothest operating conditions, to LOS F, the worst, most congested operating conditions.

The city of Ventura considers LOS E acceptable at freeway interchange intersections, and LOS D acceptable at the principal intersections within the city. Principal intersections are intersections that are regularly monitored by the city as a gauge of the operation of the city's circulation system. The city does not have an LOS standard for non-principal intersections, except for those that are located on the Congestion

[1]The *Highway Capacity Manual* (HCM) is the most widely used resource for traffic analysis. The Highway Capacity Manual is prepared by the Transportation Research Board Committee on Highway Capacity and Quality of Service. The current edition was published in 2010.

Management Program (CMP) network, at which the CMP level of service standard of LOS E is applicable (CEC 2016a).

Staff reviewed the following locations on the surrounding roadway network for potential project impacts to LOS. See **Traffic and Transportation Figure 3** for a map showing these study freeways, roadways, and intersections.

Freeways and Roadways:

- Highway 101- west of Victoria Avenue
- Highway 101- east of Victoria Avenue
- Harbor Boulevard- north of Gonzales Road
- Harbor Boulevard- between Gonzales Road and MGS Entrance
- Harbor Boulevard- between MGS Entrance and West 5th Street
- Harbor Boulevard- south of West 5th Street
- Gonzales Road- between Harbor Boulevard and Victoria Avenue
- Victoria Avenue- north of Gonzales Road
- Victoria Avenue- between Gonzales Road and West 5th Street
- West 5th Street- west of Victoria Avenue

Intersections:

- Victoria Avenue and Gonzales Road
- Victoria Avenue and Doris Avenue
- Victoria Avenue and West 5th Street
- Harbor Boulevard and Gonzales Road
- Harbor Boulevard and MGS Entrance
- Harbor Boulevard and West 5th Street

Staff used the LOS standards of the California Department of Transportation (Caltrans), Ventura County, the Ventura County Transportation Commission, and the cities of Oxnard and Ventura, as significance thresholds to determine whether Puente-generated traffic impacts would be significant.

DIRECT/INDIRECT TRAFFIC AND TRANSPORTATION IMPACTS AND MITIGATION

The direct and indirect traffic and transportation impacts of the proposed project are discussed in this subsection.

Construction Traffic

If approved, project construction would begin in October 2018 and would be completed by June 2020, a total construction period of 21 months. Peak construction would be

during the 8th month of construction in May 2019. Construction would generally occur between 7 AM and 6 PM. During the start-up and testing phase of the project, some construction activities (e.g., concrete pours, testing of new equipment) may occur 24 hours a day, 7 days a week (PPP 2015a, p. 4.12-7). Workers would remain onsite during these 24-hour construction activities.

For access to the project site during construction, most construction vehicles (including both worker and truck traffic) would travel northbound or southbound on Highway 101, exiting to travel south on Victoria Avenue, west on Gonzales Road, and south on Harbor Boulevard to the MGS driveway (PPP 2015a, Figure 4.12-8).

Worker Traffic

The applicant and Socioeconomics staff assume that at least 90 percent of the project construction workforce would commute from locations nearby in Ventura and Los Angeles counties due to the high availability of workers (PPP 2015a, p. 4.10-8). (See the **Socioeconomics** section of this document for more information.) Each construction worker would generally work 10-hour shifts comprising a 50-hour workweek. The average size of the workforce over the entire construction period would be approximately 45 workers.

Analysis of project construction impacts focuses on the periods of peak construction and MGS demolition, which would employ the highest number of workers compared to other phases of construction, generate the most vehicle trips, and result in the worst-case scenario for traffic impacts. MGS demolition traffic is similar to peak construction traffic, so this analysis more specifically analyzes peak construction traffic.

The peak construction period in May 2019 would involve 90 construction workers. Assuming the worst-case scenario, in which each construction worker commutes individually, workers would make approximately 180 daily one-way trips during the peak construction month (90 one-way trips in and 90 one-way trips out). Ninety percent of worker trips would occur prior to morning peak hours, while 10 percent would arrive during morning peak hours (7-9 AM). Sixty percent of construction workers would depart during evening peak hours (4-6 PM), while the remaining 40 percent would depart early in the evening before the evening peak. This would result in 9 one-way workforce vehicle arrival trips during the morning peak hours and 54 one-way workforce vehicle departure trips during the evening peak hours.

Truck Traffic

Prior to the peak construction month of May 2019, approximately 11,400 cubic yards of excess fill would be removed from the project site for site preparation over a five-month period from November 2018 to March 2019. Approximately 950 truck trips would be needed, with a maximum of 24 truck roundtrips per day. The majority of these trips would not take place during the peak hour.

Peak construction would generate approximately five daily truck roundtrips, with up to two one-way truck trips occurring during the morning peak hours and none during the evening peak hours. For this traffic analysis, truck trips were converted to passenger car equivalent (PCE) trips at a ratio of three passenger cars for each truck, resulting in 15

daily PCE truck roundtrips (30 daily one-way PCE truck trips) and six one-way PCE peak hour truck trips.

Trucks would likely travel the same route to the project as the majority of the construction worker traffic, which is from Highway 101 to Victoria Avenue, Gonzales Road, and Harbor Boulevard. Both Victoria Avenue and Gonzales Road are designated truck routes (VCTC 2009). Three heavy haul trucks would access the site via an undetermined route after transporting heavy equipment from the Union Pacific Railroad switchyard in Oxnard (PPP 2015a, pages 2-25 and 4.12-7). (See the discussion later in this section under "Rail Service".)

Total Construction Traffic

The total number of workforce and truck trips generated during peak construction would be 210 daily one-way trips (180 one-way worker trips added to 30 one-way PCE truck trips). Approximately 69 of these one-way trips would occur during peak hours: 15 one-way trips during the morning peak and 54 one-way trips during the evening peak. See **Traffic and Transportation Table 2**, below, for details. This table summarizes all peak construction traffic generated by the project, including construction worker trips and delivery/haul truck trips. Staff used the total construction traffic shown in this table to analyzes potential construction traffic impacts.

Traffic and Transportation Table 2
Total Daily Trips during Peak Construction

Vehicle Type	Daily Roundtrips	One-Way Daily Trips	One-Way AM Peak Hour Trips	One-Way PM Peak Hour Trips
Construction Worker Vehicles	90	180	9	54
Trucks (Delivery/Haul Vehicles) (PCE)[1]	15	30	6	0
Total	105	210	15	54

[1] PCE, or passenger car equivalent, is a conversion unit for comparing the traffic impacts of a large truck with the traffic impacts of a smaller car. Here, one truck trip is equivalent to three PCE.
Source: PPP 2015a, p. 4.12-22

Staff compared traffic LOS on nearby roads, freeways, and intersections during baseline 2015 conditions and during peak construction. See **Traffic and Transportation Figure 3** for the locations of these study segments and intersections. **Traffic and Transportation Table 3**, below, shows this comparison for study freeway and roadway segments. As reflected in the table, all study roadway segments would operate at or above the applicable LOS standard during peak construction. However, the two freeway segments, Highway 101 west of Victoria Avenue and Highway 101 east of Victoria Avenue, do not currently meet Caltrans' LOS standard of "C" and would also not meet this standard during peak construction. (See the yellow and red freeway segments shown on **Traffic and Transportation Figure 3** for their locations.) Highway 101 west of Victoria Avenue currently operates at LOS D, and with 84 daily one-way trips added during peak construction, would continue to operate at LOS D. Highway 101 east of Victoria Avenue currently operates at LOS F, and with 94 daily one-way trips

added during peak construction, would continue to operate at LOS F. Although Caltrans provides an LOS standard of "C" for highways under its jurisdiction, Caltrans' policy is that if an existing state highway is operating at less than the appropriate target LOS, the existing measure of effectiveness (in this case, the existing LOS) should be maintained (CT 2002). Although the LOS for Highway 101 would not change with the addition of project construction traffic, there is no designation below LOS F. The 94 daily one-way trips added to Highway 101 during peak construction would be less than a 0.1 percent increase to the existing traffic volume. In accordance with Caltrans' policy, the freeway segments would maintain their existing LOS during peak construction, and the project's direct impacts to these freeway segments would comply and not be significant. However, the project would contribute to cumulative traffic impacts on Highway 101 east of Victoria Avenue, which is already heavily impacted by "past" projects that have generated large amounts of traffic as reflected in the baseline LOS F conditions of this segment. See the discussion on cumulative impacts later in this section.

Traffic and Transportation Table 3
Roadway Average Daily Traffic (ADT) and LOS: A Comparison between Baseline and Peak Construction Conditions

No.	Freeway/Road Segment	2015 ADT and LOS	2015 Plus Peak Construction ADT and LOS	Agency or Agencies with Jurisdiction	Most Restrictive LOS Standard[1]
1	Harbor Boulevard, North of Gonzales Road	18,030 LOS A	18,040 LOS A	County of Ventura, Ventura County Transportation Commission, City of Ventura	LOS D[2]
2	Harbor Boulevard, North of MGS Driveway	17,090 LOS A	17,258 LOS A	County of Ventura, Ventura County Transportation Commission	LOS D[2]
3	Harbor Boulevard, South of MGS Driveway	17,070 LOS A	17,113 LOS A	City of Oxnard, Ventura County Transportation Commission	LOS E[3]
4	Harbor Boulevard, South of West 5th Street	15,850 LOS A	15,860 LOS A	City of Oxnard, Ventura County Transportation Commission	LOS E[3]
5	Gonzales Road, East of Harbor Boulevard	3,550 LOS A	3,707 LOS A	County of Ventura, Ventura County Transportation Commission	LOS D[2]

No.	Freeway/Road Segment	2015 ADT and LOS	2015 Plus Peak Construction ADT and LOS	Agency or Agencies with Jurisdiction	Most Restrictive LOS Standard[1]
6	Victoria Avenue, North of Gonzales Road	43,810 LOS D	43,988 LOS D	City of Ventura, County of Ventura, Ventura County Transportation Commission	LOS D[2]
7	Highway 101, West of Victoria Avenue	119,000 LOS D	119,084 LOS D	City of Ventura, Ventura County Transportation Commission, Caltrans	LOS C. If operating at less than this, the existing LOS should be maintained.[4]
8	Highway 101, East of Victoria Avenue	139,000 LOS F	139,094 LOS F	City of Ventura, County of Ventura, Ventura County Transportation Commission, Caltrans	LOS C. If operating at less than this, the existing LOS should be maintained.[4]
9	Victoria Avenue between Gonzales Road and West 5th Street	42,413 LOS C	42,440 LOS C	County of Ventura, City of Oxnard, Ventura County Transportation Commission	LOS D[2]
10	West 5th Street between Harbor Boulevard and Victoria Avenue	5,102 LOS A	5,126 LOS A	City of Oxnard	N/A- Staff selected LOS C[5]

[1] In several instances, there is more than one LOS standard which applies. In this column, staff has provided the most restrictive LOS standard.

[2] The most restrictive applicable LOS standard is Ventura County's standard of LOS D or above for all county thoroughfares and federal highways and state highways in the unincorporated area of the county.

[3] The most restrictive applicable LOS standard is the Ventura County Transportation Commission's standard of LOS E or above on CMP highways and roadways.

[4] The most restrictive applicable LOS standard is Caltrans' target LOS for state highway facilities, which is at the transition between LOS C and LOS D. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the target LOS. If an existing state highway is operating at less than the appropriate target LOS, the existing measure of effectiveness should be maintained.

[5] The city of Oxnard only provides LOS standards for intersections. Therefore, there is no applicable LOS standard for this road segment. Staff assigned a conservative threshold of LOS C.

Source: PPP 2015a, p.4-12-23; PPP 2015j, pp. 45-1 − 45-2; PPP 2015u, pp. 73-1 − 73-2

Traffic and Transportation Table 4, below, shows peak construction impacts to study intersections. For the morning and evening peak traffic hours, it compares baseline 2015 intersection delay and LOS to peak construction intersection delay and LOS. Prior to project construction, all intersections operate at an acceptable LOS during both the morning and evening peak hours, with the exception of the intersection of Harbor Boulevard and the MGS entrance. This intersection currently operates at LOS D during

the morning peak hour and LOS E during the evening peak hour, exceeding the applicable LOS standard of "C". Peak construction would worsen operation conditions at this intersection. The morning peak hour LOS would degrade from LOS D to LOS E during peak construction. The evening peak hour LOS would remain at LOS E, but delay would increase by almost 10 seconds. This intersection is controlled by a stop sign at the MGS exit driveway, with Harbor Boulevard uncontrolled and free flowing, so delays would only affect traffic exiting the project site, not the public. For this reason, staff does not consider impacts to LOS at this intersection as significant.

Traffic and Transportation Table 4
Peak Hour Intersection LOS: A Comparison Between Baseline and Peak Construction Conditions

#	Study Intersection	Year 2015 AM/PM Peak Hour Volume-to-Capacity and LOS		Year 2015 Plus Peak Construction AM/PM Peak Hour Volume-to-Capacity and LOS		LOS Standard
		AM	PM	AM	PM	
1	Victoria Avenue/Gonzales Road	0.760 LOS C	0.776 LOS C	0.760 LOS C	0.790 LOS C	LOS D[2]
2	Harbor Boulevard/Gonzales Road	0.704 LOS C	0.694 LOS B	0.712 LOS C	0.694 LOS B	LOS D[2]
3	Harbor Boulevard/MGS Entrance	35.0 seconds[3] LOS D	35.6 seconds[3] LOS E	35.100 seconds[3] LOS E	45.200 seconds[3] LOS E	LOS C[1]
4	Harbor Boulevard/West 5th Street	0.739 LOS C	0.468 LOS A	0.739 LOS C	0.483 LOS A	LOS C[1]
5	Victoria Avenue/West 5th Street	0.558 LOS A	0.577 LOS A	0.558 LOS A	0.591 LOS A	LOS C[1]
6	Victoria Avenue/Doris Avenue	0.737 LOS C	0.658 LOS B	0.737 LOS C	0.658 LOS B	LOS D[2]

[1] City of Oxnard jurisdiction - LOS standard is "C" for intersections
[2] County of Ventura jurisdiction - LOS standard is "D" for county thoroughfares and intersections
[3] The measure of effectiveness (MOE) for unsignalized intersections is delay in seconds per vehicle.Source: PPP 2015a, p.4.12-22; PPP 2015j, pp. 45-1 − 45-2; PPP 2015u, pp. 73-1 − 73-2

While peak construction of Puente would cause less than significant impacts to traffic LOS, staff is concerned that construction traffic, especially heavy haul vehicles, exiting the project site to turn left onto northbound Harbor Boulevard could potentially cause vehicular accidents. Construction vehicles would need to cross fast-moving southbound traffic (with a speed limit of 50 miles per hour) to make this turn, and as discussed earlier, the MGS driveway/Harbor Boulevard intersection is only controlled by a stop sign at the MGS driveway exit. To mitigate this potential hazard, staff is proposing Condition of Certification **TRANS-2**, which would require implementation of a Traffic Control Plan requiring that vehicles exit the site by turning right onto southbound Harbor

Boulevard, unless a flagger is available to assist with a left turn onto northbound Harbor Boulevard. **TRANS-2** would also require signage along Harbor Boulevard warning drivers of construction traffic exiting the project site. In the AFC, the applicant also proposed implementation of a Traffic Control Plan, although staff is proposing that additional details be included, such as the above requirements for heavy haul vehicles exiting the site.

Heavy haul vehicles could pose hazards to motorists by damaging local roadway pavement surfaces. To mitigate this potential impact, staff has recommended Condition of Certification **TRANS-3**, which would require the project owner to restore all public roads, easements, and rights-of-way damaged by project-related traffic. With implementation of this condition, road damage would not cause significant impacts to motorist safety.

With implementation of **TRANS-1** through **TRANS-3**, construction traffic impacts would be less than significant.

Outfall Removal and Beach Restoration

Since publication of the Preliminary Staff Assessment (PSA), the applicant proposes removing the existing outfall structure and restoring the beach area. Construction activities associated with reconfiguring the wastewater and storm water systems and the demolition and removal of the outfall would not generate additional construction-related or demolition-related traffic. The additional activities and needed construction equipment to remove the outfall and restore the beach area are incorporated as part of the activities and equipment needed for demolition of MGS Units 1 and 2. All parking and staging areas would be located within the existing project site boundaries.

Construction of the wastewater modifications would be completed during the 21-month project construction period. Demolition of the outfall would be completed during the 15-month demolition period for MGS Units 1 and 2. Overall, the proposed project enhancements would not change any traffic and transportation impacts already analyzed in the PSA. Staff is proposing a revision to Condition of Certification **TRANS-2 (Traffic Control Plan, Heavy Haul Plan, and Parking/Staging Plan)** to include the areas needed for outfall removal and beach restoration as part of the Parking and Staging Plan.

Operation Traffic

If approved, the applicant anticipates that Puente would be operational by June 2020. Plant operation would require approximately 17 full-time employees, taken from existing MGS staff. The facility would be staffed 7 days a week, 24 hours a day. Normal operation of the plant would require some occasional deliveries and maintenance-related trips and would not increase operation traffic from existing MGS operation. It is expected the new project would increase aqueous ammonia deliveries by approximately 15 truck trips annually, but this increase is small and would not affect LOS. Operation traffic would be negligible and would not significantly impact daily LOS on nearby freeways, roadways and intersections.

MGS Decommissioning Traffic

MGS Units 1 and 2 would continue to operate until 2020, when they would be decommissioned. Decommissioning activities for MGS Units 1 and 2 would start no later than December 31, 2020 and would take approximately six months, ending in June 2021 (PPP 2015x, CEC 2016g). The decommissioning of MGS Units 1 and 2 would not generate additional traffic, as nine members of the existing MGS workforce would perform the work intermittently for three months while overseen by Puente staff, and no heavy construction equipment would be required. MGS decommissioning would not generate traffic impacts.

MGS Demolition Traffic

If Puente is approved, demolition of MGS Units 1 and 2 would occur over approximately 15 months, from July 2021 through September 2022. There would be a peak demolition workforce of 74 workers during a five-month period between January and May 2022. Assuming each worker commuted alone, these workers would generate 148 one-way trips per day (PPP 2015x, CEC 2016g). It is assumed that at least 95 percent of the demolition workforce would commute from locations near the project site locally in Ventura and Los Angeles counties due to the high availability of workers. (See the **Socioeconomics** section of this document for more information.)

Demolition truck trips would peak during month 9 of demolition, in March 2022, with an average of 11 trucks daily during a five-day workweek from Monday through Friday. This equates to approximately 33 daily PCE truck roundtrips, or 66 PCE daily one-way truck trips. Most truck trips would not occur during the peak hour, which would reduce their traffic impacts. The demolition traffic route would be the same as that used for project construction (PPP 2015x).

Demolition traffic trips are summarized in **Traffic and Transportation Table 5**, below.

Traffic and Transportation Table 5
Total Daily Trips during Peak Demolition

Vehicle Type	Daily Roundtrips	One-Way Daily Trips
Construction Worker Vehicles	74	148
Trucks (Delivery/Haul Vehicles) (PCE)[1]	33	66
Total	107	214

[1] PCE, or passenger car equivalent, is a conversion unit for comparing the traffic impacts of a large truck with the traffic impacts of a smaller car. Here, one truck trip is equivalent to three PCE.
Source: PPP 2015x, p. 4-47

The total number of one-way daily demolition trips, 214, is slightly higher than the number of one-way daily peak construction trips, which is 210. Because the number of daily trips is similar, and because the traffic route would be the same, staff's traffic LOS analysis for peak construction also applies to peak demolition. Like peak construction, peak demolition would cause less than significant impacts to the traffic and

transportation system with implementation of Conditions of Certification **TRANS-1** through **TRANS-3**.

Parking

The AFC states that adequate onsite parking would be provided, and parking outside of the MGS property would not be required. A total of 0.92 acre of existing paved on-site parking would be available for construction and demolition parking. An additional 4.76 acres would be available for construction materials storage and laydown and for temporary offices.

Staff confirmed that the construction storage, laydown, and parking areas would adequately accommodate construction and demolition parking. On average, a parking lot must have 350 square feet of space for every parked vehicle, which includes both the actual parking space and room for circulation. During peak construction, which would employ more workers than peak MGS demolition, the proposed project would require parking for approximately 90 construction worker vehicles. Using the standard of 350 square feet needed for each parking space, approximately 0.72 acre would be needed for construction vehicle parking, less than the 0.92-acre of parking provided. The remaining 4.76 acres of storage and laydown area could accommodate overflow parking if needed. Because the MGS property supplies sufficient space for on-site parking, the project would not result in any parking spillover to sensitive areas and would not create any adverse impacts.

During project operation, 17 full-time employees drawn from the existing MGS workforce would work at Puente. Not all employees would be on-site at the same time. The project would use existing MGS parking consisting of 140 spaces, which is more than sufficient to accommodate all employee and visitor vehicles. There would be no parking impacts from operation of Puente.

Hazardous Materials and Waste Transportation

Both the construction and operation of the project would involve transportation of hazardous materials and waste to and from the site. The transport vehicles would be required to follow federal and state regulations governing proper containment vessels and vehicles, including appropriate identification of the nature of the contents. The applicant has stated in the AFC the project owner's intent to comply with these regulations. Condition of Certification **TRANS-4** would verify the project owner's compliance with applicable regulations by ensuring the owner contracts with licensed hazardous materials delivery and waste hauler companies. Compliance with applicable hazardous materials and waste transportation regulations would ensure that there would be no significant impacts to roadways and the traveling public. See the **Hazardous Materials Management** and **Waste Management** sections of this Final Staff Assessment (FSA) for more information.

Rail Service

The Coast Main Line, running between eastern Ventura County in the city of Simi Valley and western Ventura County in the city of Ventura, is the major railway in the project area (VCTC 2009). It is located approximately five miles east of the project in the city of Oxnard and runs north/south through the northern portion of the city limits. The Coast

Main Line provides commuter rail service, including Metrolink, the Amtrak Pacific Surfliner, and the Amtrak Coast Starlight, as well as freight service via Union Pacific (VCTC 2009).

The applicant has proposed use of the Coast Main Line for transportation of most of the heavy equipment needed for construction, including the combustion turbine, generator step-up transformer, and associated components. Deliveries would be to the Union Pacific Railroad (UPRR) switchyard in Oxnard located approximately 5 miles southeast of the project site at the block formed by Highway 1 to the west, 3rd Street to the north, Rose Avenue to the east, and 5th Street to the south. Heavy haul trucks would make approximately three total deliveries during construction to transport the equipment from the switchyard to the project site (PPP 2015a, pages 2-25 and 4.12-7). In the AFC, the applicant stated that the most direct route from the UPRR switchyard is via 5th Street to Harbor Boulevard, then to the project site, a distance of approximately 5 miles. A portion of 5th Street along this route is not a designated truck route (VCTC 2009, page 69, Exhibit 15). However, Section 8-3(B) of the city of Oxnard municipal code would allow for an exception to use 5th street as it is the most direct route to the project site. The applicant stated in the AFC the project owner's intention to comply with local jurisdictions' truck routes. Condition of Certification **TRANS-1** would ensure the project owner complies with local jurisdictions' limitations on truck routes.

The Ventura County Railway is another railway near the project site, transporting freight between the cities of Oxnard and Port Hueneme and U.S. Naval Base Ventura County. It is a short-line railroad operated by Rail America Corporation. At its point closest to the project site, where it interchanges with the Union Pacific Railroad at Oxnard (GW 2015, VCTC 2009), it is located approximately 4.5 miles southeast of the project. The applicant does not propose use of this railroad for transporting construction equipment.

The project is not in the immediate vicinity of any of these railways, and the project would not obstruct railways or interfere with rail service. There would be no impacts to rail service.

Bus Service

Gold Coast Transit (GCT) provides bus service in western Ventura County, including the city of Oxnard. Near the proposed Puente site, two bus lines operate on Victoria Avenue. (GCT 2014). National bus service is provided by Greyhound Lines, which has a station in Oxnard (GH 2015). There are also various intercity bus routes serving Oxnard, such as the Coastal Express, Highway 101 and Conejo Connection, and CSUCI-Oxnard (VCTC 2015). There are no bus lines directly serving the proposed project site.

The project would add traffic to Victoria Avenue, where bus lines operate, but these vehicles would not cause traffic level of service to fall below acceptable standards. The project would not significantly delay bus service or obstruct bus infrastructure. Impacts to bus service would be less than significant.

Bicycle Facilities

The designated bicycle routes closest to the project site are:

- Harbor Boulevard, a Class II bike lane (Class II bike lanes provide a striped lane for one-way bicycle travel)
- Gonzales Road, a Class II bike lane east of Victoria Avenue to Rice Avenue
- Victoria Avenue, a Class II bike lane between the Santa Clara River and Gonzales Road, and between Teal Club Road and the Port Hueneme city limit
- 5th Street, a Class II bike lane from Victoria Avenue to H Street (CO 2011b, VCTC 2015a)

Construction, demolition, and operation traffic would not result in significant LOS impacts and would not obstruct bike lanes; therefore, the project's impacts to bicycle facilities would be less than significant.

Pedestrian Facilities

Because the proposed project site is located in a rural area, there are minimal pedestrian activities and facilities nearby. There are no sidewalks or crosswalks within the immediate vicinity of the project site; the nearest sidewalks and crosswalks are located approximately one mile south of the project on West 5th Street and Harbor Boulevard. Therefore, construction and operation of Puente and MGS demolition would not impact pedestrian activities or facilities.

Airports/Aviation Activities

Airports in the vicinity of the proposed project site are Oxnard Airport, Naval Base Ventura County (NBVC) Point Mugu, and Camarillo Airport. The following aviation analysis focuses on these airports. The Oxnard Airport is the closest airport to the project site, and therefore its operations are most likely to be affected by the proposed project's tall structures and thermal plumes. See **Traffic and Transportation Figure 2 – Regional Traffic and Transportation Setting** for the locations of these airports.

Oxnard Airport

The Oxnard Airport is a public non-hub airport owned by the County of Ventura, located approximately 1.9 miles southeast of the project. The Oxnard Airport is home to approximately 157 aircraft: 116 single-engine, 26 multi-engine, and 15 helicopter aircraft. Aircraft operations average 163 flights per day. The Oxnard Airport has an operating control tower. Operations are approximately 50 percent local general aviation, 40 percent transient general aviation, 9 percent air taxi, and 1 percent military aviation (AIRNAV 2015a).

The Oxnard Airport has one runway, 7/25, which runs east-west and has a left-hand traffic pattern. It is 5,953 feet long and 100 feet wide. Runway 25 provides an instrument approach. The pattern altitude of the Oxnard Airport for single-engine aircraft is 1,000 feet above ground level (AGL). For multi-engine aircraft and jets, the pattern altitude is 1,400 feet AGL (AIRNAV 2015a).

From flight tracking data obtained from the Federal Aviation Administration (FAA), staff determined that aircraft associated with the Oxnard Airport occasionally pass over the proposed project site, sometimes at low altitudes. However, the flight tracking data shown in **Traffic and Transportation Figure 4** identifies aircraft altitudes in increments

of 1,000 feet in the area of the project site from October 1 through November 1, 2015. The data indicates a substantial amount of nearby westbound air traffic passes south of the project site, presumably to join the V25 Visual Flight Rules (VFR) corridor west of the project site that runs northwest/southeast approximately along the coast of California at an altitude of 6,000 feet mean sea level (MSL) (SV 2016). There is also another nearby VFR corridor, V27-485, to the east of Oxnard Airport that runs northwest/southeast between Oxnard Airport and Camarillo Airport at an altitude of 5,000 feet MSL (SV 2016). Neither of these VFR corridors passes over the project site, and aircraft would not need to pass over the project site to join either corridor, or to enter or exit the traffic pattern at the Oxnard Airport. Most of the aircraft leaving Oxnard Airport turn left and depart the traffic pattern to the east. **Traffic and Transportation Figure 5** identifies VFR corridors in the project area and **Traffic and Transportation Figure 6** is the Oxnard Airport Pilot Guide which shows typical departure and arrival routes at Oxnard Airport.

The proposed project site is located within the Oxnard Airport Study Area as defined by the Airport Comprehensive Land Use Plan (ACLUP) for Ventura County, where land use compatibility with the airport is more of a concern than compatibility of land uses further away from the airport (VCALUC 2000). It is also within the Oxnard Airport Sphere of Influence. The 2030 General Plan states that “The Oxnard Airport Sphere of Influence is a designated area for the coordination and review of land use proposals which may affect or be affected by the operations of the Oxnard Airport” (CO 2011a). Staff has reviewed the Ventura County ACLUP and found no policies directly applicable to the project, and therefore has found no inconsistencies between the project and the ACLUP.

Naval Base Ventura County Point Mugu

Naval Base Ventura County (NBVC) Point Mugu is owned by the United States Navy and located approximately ten miles southeast of the project site. It is designated as a private use air station where naval aircraft are based and operate daily (AIRNAV 2015b). The airport has two runways, Runway 3-21 (running northeast-southwest), which is 11,102 feet long and 200 feet wide, and Runway 9-27 (running east and west), which is 5,502 feet long and 200 feet wide. Both runways have left-hand traffic patterns.

NBVC Point Mugu includes a 36,000 square-mile “Sea Range”, an area over the Pacific Ocean off the coast of California stretching approximately from the United States/Mexico border at its southern end to the Cambria and San Simeon area at its northern end. A military training route called IR200 links the Sea Range with the military area located at China Lake (NAWCWD 2015). This military training route does not pass over the proposed project site.

The flight tracks that staff obtained from the FAA do not include military flights, so staff could not determine whether any flights associated with NBVC Point Mugu pass over the project site. However, in the Ventura County Comprehensive Airport Land Use Plan, the general flight tracks associated with NBVC Point Mugu do not appear to go in directions that would pass over the project site (VCALUC 2000; see Exhibits 5E, 5F, 5G, and 5J). Given its length and orientation, Runway 3-21 appears to be the main runway that provides access to the Sea Range and aircraft would not fly over the project site. Staff has reviewed representative flight track figures in the NBVC Joint Land Use

Study and the NBVC Point Mugu Air Installations Compatible Use Zones Study and no aircraft flight approaches or departures are depicted over the project site (NBVC 2015a, b).

Camarillo Airport

Camarillo Airport is a public airport owned by the County of Ventura, located approximately eight miles east of the project site. The airport is home to approximately 520 aircraft: 381 single-engine, 53 multi-engine, 36 jets, and 30 ultralight aircraft, in addition to 20 helicopters. The Camarillo Airport has an operating control tower. Aircraft operations average 374 flights per day. Operations comprise approximately 49 percent transient general aviation, 49 percent local general aviation, 2 percent air taxi, and less than 1 percent military aviation (AIRNAV 2015c).

Camarillo Airport has one runway, 8-26, which runs east-west and is 6,013 feet long and 150 feet wide. The Runway 8 side has a right-hand traffic pattern, while the Runway 26 side has a left-hand traffic pattern. The pattern altitude of the Camarillo Airport for single-engine aircraft is 800 feet AGL. For multi-engine and jet aircraft, the pattern altitude is 1,000 feet AGL (AIRNAV 2015c).

As with the Oxnard Airport operations, flights do not need to pass over the project site to join any VFR corridors or to enter or exit the traffic pattern at Camarillo Airport. (For more information on flight paths in the area, see **Traffic and Transportation Figure 4** for tracked flight altitudes in the area of the project site from October 1st through November 1st 2015, and **Traffic and Transportation Figure 5** for VFR corridors in the area.)

Aviation Impacts

To assess the Puente Power Project's aviation impacts, staff examined whether the project's combustion turbine generator (CTG) stack, electric transmission structures, construction equipment (e.g., cranes), and thermal plumes could obstruct or impair airspace, posing hazards to aircraft pilots and passengers.

CTG Stack and Transmission Towers/Obstruction of Airspace

For construction or alterations within 20,000 feet of an airport with a runway more than 3,200 feet in length, the FAA shall be notified if their height exceeds an imaginary surface extending outward and upward at a slope of 100 to 1 from the nearest point of the nearest runway of the airport (14 C.F.R., § 77.9(b)(1)). The Oxnard Airport is located within 20,000 feet of the project site and has a runway exceeding 3,200 feet in length. Therefore, this regulation applies.

Tall structures at the project site include the 80- to 90-foot tall transmission structures (a steel pole and take-off structure) and the 188-foot-tall CTG stack. The 220-kV take-off structure would be located approximately 10,063 feet from the end of the Oxnard Airport's runway, meaning that the threshold for FAA notification is approximately 100.63 feet for this structure. At 80 to 90 feet tall, the take-off structure would not penetrate this threshold. Because the height threshold for FAA notification would be slightly higher for the steel pole located further from the airport runway, the 80- to 90-foot-high steel pole also would not require FAA notification.

The CTG stack would be located approximately 10,845 feet from the nearest runway of Oxnard Airport, meaning that any structure higher than 108.45 feet would require notification. Even when taking into account the fact that the CTG stack location is lower in elevation than the airport runway, the 188-foot-tall CTG stack exceeds this notification threshold. In compliance with FAA regulations, the applicant submitted Form 7460-1 "Notice of Proposed Construction or Alteration" to the FAA for the CTG stack. On October 7, 2015, the FAA issued a "Determination of No Hazard to Air Navigation" for the stack, concluding that it would not be a hazard to air navigation. The determination required that the applicant file an FAA Form 7460-2, Notice of Actual Construction or Alteration, within 5 days after the stack reaches its greatest height (FAA 2015). Staff has proposed Condition of Certification **TRANS-5** to verify that the applicant files this notice in compliance with FAA regulations. **TRANS-5** would also verify that the applicant files an FAA Form 7460-1, Notice of Proposed Construction or Alteration, with the FAA if any cranes or other construction equipment are used that would exceed a height of 188 feet, as required by the FAA's Determination of No Hazard for the CTG stack. With implementation of **TRANS-5**, Puente's compliance with FAA regulations would be verified, and its physical structures would not constitute a hazard to air navigation.

The FAA's Determination of No Hazard stated that marking and lighting of the CTG stack are not necessary for aviation safety (FAA 2015). However, the FAA does not currently evaluate plume hazards as part of their hazards determination process. Because the CTG stack would emit thermal plumes that could be hazardous to aircraft, staff is proposing Condition of Certification **TRANS-6**, which would require that the project owner mark and light the CTG stack to alert pilots of the location of the source of the thermal plumes. (See more information below in the "Thermal Plumes" subsection.)

In conclusion, impacts to aviation from the project's CTG stack and construction cranes would be less than significant with the implementation of **TRANS-5** and **TRANS-6**.

Thermal Plumes

Puente's CTG stack would produce a thermal plume during operation. Thermal plume velocities would be greatest at the discharge point, with plume velocities decreasing with increasing altitude. Plume velocities would also be highest during certain weather conditions, such as cool temperatures and calm winds. Thermal plumes can potentially result in significant impacts to aircraft operations. See the discussion below for staff's evaluation of the project's potential to cause significant impacts to aviation.

Determination of Screening Threshold

In the Puente PSA, staff used an average plume vertical velocity of 4.3 meters per second (m/s) as the threshold for potential impacts to aviation. Staff determined the approximate altitude at which a plume would have an average velocity of 4.3 m/s and concluded that aircraft flying through the plume at this altitude or below, where velocities would be even higher, could experience turbulence threatening aircraft control.

Staff determined from a literature search that a peak vertical plume velocity of 10.6 m/s (5.3 m/s average plume velocity) is more appropriate as a screening threshold for potential impacts to aircraft. For more details about staff's determination of the new threshold, please see **Traffic and Transportation Appendix TT-1.**

Impact Determination

Energy Commission Air Quality staff modeled plume velocity for the project's CTG stack to determine whether the thermal plumes would exceed 10.6 m/s peak velocity at altitudes where aircraft could fly. Air Quality staff found that thermal plume peak vertical velocity would exceed 10.6 m/s up to an altitude of approximately 2,375 feet AGL under the worst-case scenario of cool temperature/calm wind conditions. (Calm winds occur approximately only 2.7% of the time at the project site.) In addition, wind and fog (which is a common occurrence during summer in the project area) quickly dissipates plume velocity. Staff has been advised by NBVC Pt. Mugu staff that fog occurs in the local area on a daily basis during the months of May and June. (NBVC 2016b). At altitudes higher than approximately 2,375 feet AGL, thermal plume velocity was below the 10.6 m/s screening threshold for endangering aircraft. See **Traffic and Transportation Appendix TT-2** of this section for more information.

As discussed earlier, the FAA issued a Determination of No Hazard for the project's CTG stack. However, the FAA's review only considers hazards posed by physical structures, not plumes. To ensure that plumes associated with project operation would not impact aviation activities, staff proposes Condition of Certification **TRANS-7**. **TRANS-7** would require the project owner to work with the FAA, the Oxnard Airport Manager, and the Director of the Ventura County Department of Airports to notify all pilots using the Oxnard Airport and airspace above the project site of potential plume hazards. These activities would include, but not be limited to, the project owner:

- working with the FAA to issue a Notice to Airmen (NOTAM) of the identified plume hazard;
- working with the Oxnard Airport Manager to add a remark about the plume hazard to the Automatic Terminal Information Service (ATIS) and the Airport Facility Directory;
- working with the Director of the Ventura County Department of Airports to update the Oxnard Airport Pilot Guide to advise pilots about the plume; and
- updating the Los Angeles Sectional Chart and other applicable airspace publications used by pilots to indicate that pilots should avoid direct overflight of Puente.

TRANS-7 is consistent with guidance from the FAA Aeronautical Information Manual, which recommends that pilots should fly upwind of thermal plumes out of caution, and that pilots should refer to the Airport/Facility Directory, where notes may caution pilots and identify the locations of structures emitting plumes (FAA 2015a).

Proposed Condition of Certification **TRANS-6**, discussed earlier, would further ensure that plumes associated with project operation would not impact aviation activities. **TRANS-6** would require marking and lighting of the CTG stack to help pilots identify the location of the plume. Lighting would be activated in the evening and would consist of top-mounted flashing red L-864 lights.

There are no VFR corridors directly above the project site, and aircraft do not need to fly over the project site to access the nearby VFR corridors. Aircraft also do not need to fly over the project site to enter or exit the Oxnard Airport traffic pattern. Finally, aircraft should already be avoiding overflight in the vicinity of the project site, as Puente 's stack would be located approximately 879 feet from the existing four 54-foot-high stacks at

MGS Unit 3, which generate plumes with peak velocities of 10.6 m/s or more at altitudes up to approximately 2,020 feet AGL. Staff notes that there have been no known aircraft safety incidents resulting from overflight of the plumes at MGS Unit 3, even though there are currently no advisories to avoid overflight on the Los Angeles Sectional Chart, Oxnard Airport Facility Directory, or the Oxnard Airport Pilot Guide.

While the FAA tracking data discussed earlier shows that some overflight of the power plant site currently occurs, staff concludes it is feasible for pilots to avoid overflight of Puente, and that **TRANS-6** and **TRANS-7** are adequate to reduce any potential aviation impacts to a less than significant level.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact when its effects are cumulatively considerable. *Cumulatively considerable* means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, current projects, and reasonably foreseeable future projects (Cal. Code Regs., tit. 14, § 15130).

Traffic Impacts

To evaluate cumulative impacts to traffic LOS, staff reviewed known past, current, and reasonably foreseeable future projects that could generate traffic on the Puente study roadways. Staff found that the main projects that could potentially cause cumulative impacts to traffic LOS, due to their location and size, when combined with Puente are: Anacapa Townhomes, Avalon Homes Subdivision, Beachwalk on the Mandalay Coast, Victoria Corporate Center, Rancho Victoria Plaza Shopping Center, and the Teal Club Specific Plan. **Traffic and Transportation Figure 7 – Cumulative Projects** presents the location of these projects with respect to Puente. **Traffic and Transportation Table 6** (below) provides information regarding these known projects.

Traffic and Transportation Table 6
Development Considered in the Cumulative Condition

Project	Location	Distance from Project Site	Potential Puente Study Roadways Affected	Status of Project
Anacapa Townhomes	5001 W. Wooley Road, Oxnard	1.45 miles to the south	Highway 101, Harbor Boulevard, Victoria Avenue, and West 5th Street	**Approved but on hold**. Coastal Development Permit (CDP) issued. No building or grading permits issued. Project owner is exploring selling the project (AT 2015, CEC 2015bb).
Avalon Homes Subdivision	On the bend of Catamaran Street, Oxnard	1.35 miles to the south	Highway 101, Harbor Boulevard, Victoria Avenue, and West 5th Street.	**Proposed.** Draft Environmental Impact Report (EIR) is being prepared. CDP to follow (CEC 2015ff).
Beachwalk on the Mandalay Coast (formerly North Shore Subdivision)	Northeast corner of West Fifth Street and Harbor Boulevard, Oxnard	0.85 miles to the south	Highway 101, Harbor Boulevard., Victoria Avenue, and West 5th Street	**Approved but will be resubmitted with design changes.** Project owner is revising plans to resubmit and is interested in selling the land to another developer (CEC 2015gg).
Victoria Corporate Center	Northeast corner of Victoria Avenue and Olivas Park Drive, Ventura	3.40 miles to the northeast	Highway 101 and Victoria Avenue	**Approved and for sale.** Seven one-story industrial office buildings to be constructed one building at a time (CV 2015, CEC 2015hh). The development is currently for sale (LF 2016).
Rancho Victoria Plaza Shopping Center	3600 and 3700 West Fifth Street, Oxnard	2 miles to the southeast	Highway 101 and Victoria Avenue	**Approved but proposed modifications to project under review.** Project owner has yet to submit Final Map and building permit application (CEC 2015gg).
Teal Club Specific Plan	Southeast corner of Doris Avenue and North Patterson Road, Oxnard	2.85 miles to the east	Highway 101, Victoria Avenue and West Gonzales Road	**Proposed.** The city is preparing the Final EIR for initial Planning Commission review in 2016 (CO 2016).

Each of these nearby projects has the potential to create cumulative traffic impacts when combined with Puente. Staff conducted further analysis, as summarized below. The analysis only examines cumulative impacts during project peak construction and demolition of MGS Units 1 and 2, as this is when Puente's greatest traffic impacts would occur. Operation of Puente and decommissioning of MGS Units 1 and 2 would not generate trips above baseline conditions because these activities would use existing MGS staff. Therefore, Puente would not contribute to cumulative traffic impacts during operation and decommissioning activities.

Anacapa Townhomes

A Coastal Development Permit (CDP) has been approved for the Anacapa Townhome Development (ATD), located approximately 1.45 miles to the south of the Puente site, at the northeast corner of the South Harbor Boulevard and Wooley Road intersection in the city of Oxnard. The project consists of the development of five buildings with 70 condominiums on a 3.5-acre site. Currently, the development is on hold, and no building or grading permits have been issued. The project owner is exploring options with other developers and is hoping to sell the project (CEC 2015bb). An offering memorandum was released in April 2015 stating the objectives, risks, and terms of investment involved with the project (AT 2015). Construction of this project could potentially overlap with Puente peak construction or MGS demolition.

Avalon Homes Subdivision

The proposed Avalon Homes Subdivision (AHS) would be located in the city of Oxnard approximately 1.35 miles to the south of the Puente site. The AHS project would consist of 64 single-family homes on an eight-acre property bordered by West 5th Street to the north, West Wooley Road to the south, and South Harbor Boulevard to the west. The project's Draft EIR is currently being prepared and will be released for public comment and review. The Oxnard City Council would then review the Final EIR and CDP application. The construction start date is unknown (CEC 2015ff) but construction could potentially overlap with Puente peak construction or MGS demolition.

Beachwalk on the Mandalay Coast

The proposed Beachwalk on the Mandalay Coast (BMC) Development is located northeast of the intersection of West 5th Street and South Harbor Boulevard, approximately 0.85 mile to the south of the Puente site. In 1999, the city of Oxnard approved an EIR for the BMC project and the subsequent planning permits. The project proposes 292 new homes, public parks, preserved open space and trails, a pedestrian bridge over South Harbor Boulevard, and a boardwalk through Mandalay State Beach to the ocean.

The BMC development was issued updated planning permits in 2007, but the project owner has decided to modify the plans to resubmit. No building permits have been issued to date. The project owner might be interested in selling the project to another developer (CEC 2015gg). The start date is unknown but construction could potentially overlap with Puente peak construction or MGS demolition.

Rancho Victoria Plaza Shopping Center

The Rancho Victoria Plaza Shopping Center (RVPSC) is located in the city of Oxnard at 600 Victoria Avenue, southeast of the intersection of South Victoria Avenue and West 5th Street. It is located approximately two miles southeast of the proposed Puente site. RVPSC is an approved, but not yet built, multi-tenant shopping center that has undergone multiple plan modifications over the last 23 years since it was approved in 1993. In April 2014, the project owner submitted an addendum to the Mitigated Negative Declaration to request approval of a revision to the Tentative Tract Map and a Special Use Permit to construct an office/retail center on a vacant 6-acre property located on the RVPSC site. The tentative tract map revision is for a reduction of 15 parcels to 11 parcels. The Special Use permit proposes to reduce 14 structures to 11 structures; increase total floor space from 53,016 to 53,950 square feet; and revise onsite circulation and parking, the architectural design, the landscape plan, and the sign program (CO 2014). The proposed project modifications are still under review. The project owner to this date has not submitted the final map or building permit applications to the city of Oxnard. The start date is unknown (CEC 2015gg) but construction could potentially overlap with project peak construction or MGS demolition.

Teal Club Specific Plan

The Teal Club Specific Plan project (TCSP) is located approximately 2.85 miles east of the proposed Puente site, just south of Doris Avenue and east of Victoria Avenue. The project, a pedestrian-oriented village on 175 acres, would consist of a range of residential densities, an elementary school, public park, fire station, and 60,000 square feet of retail, office and mixed-use space. The city is preparing the Final EIR for initial Planning Commission review in 2016 (CO 2016).

Construction of the TCSP is planned in two phases: Phase 1, with completion by 2020, and Phase 2, with construction beginning in 2020 and ending in 2025. Phase 1 includes the construction of 770 residential units, a twelve-acre community park, a four-acre pocket park, four acres of mixed-use and retail commercial, and a fire station and YMCA facility. Phase 2 is the remainder of the project, which consists of 220 single- and multi-family residential units, eight acres of community parks, and a ten-acre business research park.

The TCSP's Draft EIR requires mitigation measures for improvements to the following three intersections: Victoria Avenue and Gonzales Road; Victoria Avenue and Doris Avenue; and Victoria Avenue and Teal Club Road. These improvements include modifying a southbound right-turn lane to a third southbound "through" lane; the addition of a third northbound and third southbound lane; and the signalization of an intersection. All improvements are required to occur prior to any portion of Phase 1 development. During operation (occupancy), Phase 1 would generate approximately 722 AM peak hour trips and 954 PM peak hour trips, and an average daily traffic (ADT) volume of 9,973 trips. Phase II would generate approximately 372 AM peak hour trips and 404 PM peak hour trips, and an ADT volume of 3,820 trips (CO 2015).

No planning permits have been issued, so the construction start date is unknown. If Phase I is completed by 2020 as planned, Phase I construction and potentially the proposed traffic improvements, would overlap with Puente's peak construction. If Phase

II is constructed between 2020 and 2025, Phase II construction would overlap with MGS demolition. MGS demolition would also overlap with occupancy of Phase I.

Victoria Corporate Center

The Victoria Corporate Center (VCC) is located 3.4 miles to the northeast of the Puente site, immediately to the south of Highway 101 at the northeast corner of Victoria Avenue and Olivas Park Drive in the city of Ventura. The project has approvals for the construction of seven industrial office buildings (CV 2015, CEC 2015hh). The development is currently for sale (LF 2016). The start date is unknown but construction could potentially overlap with Puente construction or MGS demolition.

Most of these projects have unknown construction start dates. All projects could involve construction that would overlap with Puente construction or MGS demolition activities, especially the TCSP, which has the most definitive construction start dates, and would generate sizable operation (occupancy) traffic that would likely coincide with MGS demolition activities. Significant cumulative traffic impacts to LOS could result and Puente's incremental impacts would be cumulatively considerable, given the fact that Highway 101 east of Victoria Avenue currently operates at LOS F. To mitigate Puente's contribution to potentially significant cumulative impacts, staff proposes that **TRANS-2** include a requirement to stagger worker and truck traffic during peak hours for both Puente peak construction and MGS demolition, meaning that worker arrival trips and worker departure trips would not occur simultaneously. Implementation of **TRANS-2** would reduce the project's contribution to significant cumulative traffic impacts to less than cumulatively considerable, given the fact that construction and demolition traffic would be temporary. Also, as agency approval of other projects is gained, staggering of project construction timing may occur to further reduce any potential cumulative traffic impacts.

Aviation Impacts

Puente would include a 188-foot-tall CTG stack, a height which required the applicant to notify the FAA under Section 77.9 of the Code of Federal Regulations. The FAA issued a Determination of No Hazard for the CTG stack. The only other tall structure in the area that could combine with Puente to create a cumulative obstruction hazard impact for aircraft is the existing 200-foot-tall stack shared by MGS Units 1 and 2. However, the applicant would demolish this stack following construction of Puente. Puente's stack would be located approximately 1,440 feet (439 meters) from the 80-foot-high stack at the McGrath power plant, and approximately 879 feet (268 meters) from the four 54-foot-high stacks at MGS Unit 3. However, these stacks are relatively low and do not trigger FAA review of obstruction hazards. Therefore, Puente's stack would not combine with other tall structures to create cumulative obstruction hazard impacts to aircraft.

Puente's plumes could possibly combine with other project plumes to create potentially significant cumulative impacts to aircraft. Puente would create high-velocity thermal plumes that would exceed a peak velocity of 10.6 m/s, and could impact aviation safety, at altitudes up to 2,375 feet AGL, as discussed earlier in this section. MGS Unit 3, which will remain in operation, creates thermal plumes estimated to exceed this threshold at altitudes up to 2,020 feet AGL. SCE McGrath creates thermal plumes estimated to

exceed this threshold at altitudes up to 500 feet AGL. (See **Appendix TT-2** of this section for more information.) Staff's proposed Condition of Certification **TRANS-7** would involve notification to pilots of Puente's plume with an advisory to avoid overflight, and **TRANS-6** would require marking and lighting of the Puente's CTG stack to alert pilots of the location of the plume's source. These conditions of certification would mitigate Puente's incremental impacts, and would likely discourage pilots from flying over the entire area, including MGS Unit 3 and SCE McGrath. Pilots can avoid overflight of Puente, as flying over it is not required for entering or exiting the traffic pattern at the Oxnard Airport, or for entering or exiting any nearby VFR corridors. There are no VFR corridors over the alternative sites. With mitigation, staff concludes that Puente's contribution to potentially significant cumulative impacts would be less than cumulatively considerable.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows the presence of an environmental justice (EJ) population based on race and ethnicity within a six-mile radius of the project site. **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitute an EJ population based on poverty. Please refer to the **Environmental Justice** section of this document for a full explanation of how staff determines the presence of EJ populations. Staff's proposed mitigation would reduce traffic and transportation impacts to less than significant for the population in general, including the EJ population represented in **Environmental Justice Figure 1 and Table 3**.

Staff identified two potential traffic impacts, which, if unmitigated, could affect EJ populations represented in **Environmental Justice Figure 1** and **Table 3**. During construction of the project, heavy haul trucks could increase hazards to motorists by damaging local roadway pavement surfaces and construction traffic exiting the site to travel northbound on Harbor Boulevard could increase accident risk. Individuals from the EJ populations represented in **Environmental Justice Figure 1** and **Table 3** could potentially use Harbor Boulevard and other local roadways while traveling in their vehicles, making them subject to increased hazards and accident risks. With staff's proposed conditions of certification requiring the project owner to implement a Traffic Control Plan (**TRANS-2**) and repair all project-related damage to public roads, easements, and rights-of-way (**TRANS-3**), the impact would be less than significant.

DISADVANTAGED COMMUNITIES

Staff reviewed **Environmental Justice Figure 1** and found that the census tracts in the figure that are identified as disadvantaged communities by the California Environmental Protection Agency are not in the areas expected to experience project-generated traffic. Project-generated traffic, which would have less-than-significant impacts with implemented conditions of certification, is expected to occur closer to the project site and extending north on Harbor Boulevard and Victoria Avenue to Highway 101, where there are no disadvantaged communities. Most project traffic would likely access a freeway before entering census tracts identified as disadvantaged shown in **Environmental Justice Figure 1** that are located to the east of the project site.

Staff concluded that the project's traffic and transportation impacts would not disproportionately affect the EJ population, as these types of impacts would affect the EJ population just as they would affect the population living in the area potentially affected by project related traffic. The traffic and transportation impacts from the project on the EJ population would be less than significant with staff's proposed conditions of certification.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

With the proposed conditions of certification, Puente would comply with all traffic-related LORS. **Traffic and Transportation Table 7** provides a general description of the applicable LORS and a summary of project compliance.

Traffic and Transportation Table 7
Project Compliance with Adopted Traffic and Transportation LORS

Applicable Law	Description	Consistency
Federal		
Code of Federal Regulations Title 49, Subtitle B: Sections 171-177 and 350-399	Requires proper handling and storage of hazardous materials during transportation.	Consistent. The applicant has stated that the project would conform to this law by requiring shippers of hazardous materials to use the required markings on their transportation vehicles and to use properly licensed contractors and employees for hazardous materials transportation (PPP 2015a, p. 4.12-14). **TRANS-4** would verify the project owner's compliance with these regulations. **HAZ-3, -5, and -6** in the **Hazardous Materials Management** section would require a Safety Management Plan for the delivery of hazardous materials, hazardous materials delivery trucks to meet safety specifications, and to use a specified route to the project site**.**
Code of Federal Regulations Title 14 Aeronautics and Space, Part 77 - Objects Affecting Navigable Airspace	Establishes standards for determining physical obstructions to navigable airspace and provides for aeronautical studies to determine the effect of physical obstructions on the safe and efficient use of airspace.	Consistent. On October 7, 2015, the FAA issued a "Determination of No Hazard to Air Navigation" for the stack, concluding that it would not be a hazard to air navigation. The Determination required that the applicant file an FAA Form 7460-2, Notice of Actual Construction or Alteration, within 5 days after the stack reaches its greatest height (FAA 2015). Staff has proposed Condition of Certification **TRANS-5** to verify that the applicant files this notice in compliance with FAA regulations. **TRANS-5** would also

Applicable Law	Description	Consistency
		verify that the applicant files an FAA Form 7460-1, Notice of Proposed Construction or Alteration, with the FAA if any cranes or other construction equipment are used that would exceed a height of 188 feet, as required by the FAA's Determination of No Hazard issued for the project's stack.
State		
California Vehicle Code: Div. 2, Chap. 2.5; Div. 6, Chap. 7; Div. 13, Chap. 5; Div. 14; Div. 14.1; Div. 14.3; Div. 14.7; Div. 14.8; & Div. 15	Includes regulations pertaining to: licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.	Consistent. The applicant has stated that the project would conform to the applicable provisions of the California Vehicle Code (PPP 2015a, pp. 4.2-14 – 4.2-16). Compliance would be verified by implementation of **TRANS-1** and **TRANS-4**. **TRANS-1** requires the project owner to demonstrate compliance with the applicable agencies' limits on vehicle sizes and weights, driver licensing, and truck routes, including evidence that the necessary permits for roadway use have been obtained. **TRANS-4** requires the project owner to demonstrate that only licensed hazardous materials delivery and waste hauler companies will be used.
California Streets and Highway Code (S&HC): Div.1, Chap. 1, Article 3, Section 117; Div. 1, Chap. 3; Div. 2, Chap. 5.5 and 6	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits. Requires permits for the location in the right-of-way (ROW) of any structures or fixtures necessary to telegraph, telephone, or electric power lines or of any ditches, pipes, drains, sewers, or underground structures.	Consistent. The project would not require any offsite construction within roadways or rights-of-way. The existing transmission line from the SCE's Mandalay Switchyard to an existing transmission structure across and east of Harbor Boulevard would be rerouted/reconfigured from a new take-off structure to the transmission system and, thereby, bypass the Mandalay Switchyard. New structures would be located outside of any ROWs. (PPP 2016z) In addition, staff is recommending Condition of Certification **TRANS-3** (Restoration of All Public Roads, Easements, and Rights-of-Way) which would require the project owner to restore all rights-of-way damaged due to project-related construction and demolition activities and traffic.
California Health and Safety Code: Section 25160 et seq.	Pertains to operators of vehicles transporting hazardous materials; promotes safe transportation of hazardous materials.	Consistent**.** The applicant has stated in the AFC the project owner's intent to comply with these regulations. Condition of Certification **TRANS-4**

Applicable Law	Description	Consistency
		would verify the project owner's compliance with applicable regulations by ensuring the owner contracts with licensed hazardous materials delivery and waste hauler companies. See the **Hazardous Materials Management** section of this document for more information on hazardous materials.
State of California Department of Transportation (Caltrans), Caltrans Guide for the Preparation of Traffic Impact Studies	Caltrans' target LOS for state highway facilities is at the transition between LOS "C" and LOS "D". However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the target LOS. If an existing state highway is operating at less than the appropriate target LOS, the existing measure of effectiveness should be maintained.	Consistent. Highway 101 west of Victoria Avenue currently operates at LOS D and would continue to operate at LOS D during peak construction and peak demolition. Highway 101 east of Victoria Avenue currently operates at LOS F and would continue to operate at LOS F during peak construction and MGS demolition. The affected freeway segments would maintain their existing LOS during peak construction, therefore the project would be consistent with this policy.
Local		
County of Ventura General Plan, Transportation/Circulation Policies, Section 4.2.2	Policy 4.2.2-3: The minimum acceptable LOS for road segments and intersections within the Regional Road Network and Local Road Network shall be as follows: a) LOS D for all county thoroughfares and federal highways and state highways in the unincorporated area of the county… c) LOS C for all county-maintained local roads d) At any intersection between two roads, each of which has a prescribed minimum acceptable LOS, the lower LOS of the two shall be the minimum acceptable LOS for that intersection.	Consistent. Project-generated traffic would not cause degradation of LOS below these standards.
2009 Ventura County Transportation Commission, Congestion Management Program, Chapter 2	Sets a minimum LOS of E for the CMP road network. The minimum standard of LOS E only applies to the CMP; local agency LOS minimum standards may be higher than the CMP minimum.	Consistent. Project-generated traffic would not cause degradation of LOS below these standards.

Applicable Law	Description	Consistency
City of Oxnard 2030 General Plan, Infrastructure and Community Services Element	Policy ICS-2.6: Reduction of Construction Impacts Minimize and monitor traffic and parking issues associated with construction activities, require additional traffic lanes and/or other traffic improvements for ingress and egress for new developments for traffic and safety reasons, where appropriate.	Consistent. The applicant stated in the AFC that the project owner would implement a Traffic Control Plan (TCP), which would address these issues. **TRANS-2** ensures implementation. The project, with implementation of **TRANS-2**, would not create the need for additional traffic lanes and/or other traffic improvements for traffic and safety reasons.
	Goal ICS-3: Maintain level of service "C" at designated intersections, unless otherwise reduced by city council direction. Policy ICS-3.1: CEQA Level of Service Threshold Requires level of service "C" as the threshold of significance for intersections during environmental review.	Consistent. Project-generated traffic would not degrade intersection LOS below these standards. Although the intersection of the MGS driveway and Harbor Boulevard currently operates below this standard, and would operate below this standard during project construction, operation, and MGS demolition, delays would only affect traffic exiting the project site, not the general public. For this reason, staff does not consider the project as out of compliance with city of Oxnard LOS standards.
	Policy ICS-4.4: Truck Route Compliance Work with agencies and commercial businesses involved with goods movement to ensure that truck routes are adhered to by commercial vehicle drivers.	Consistent. The applicant stated in the AFC the project owner's intention to comply with local jurisdictions' truck routes. Condition of Certification **TRANS-1** would verify the project owner's compliance with local jurisdictions' limitations on truck routes.
	Policy ICS-9.2: Development has Adequate Parking Review development proposals to encourage shared parking use and ensure adverse parking impacts are minimized or avoided.	Consistent. All construction, operation, and MGS decommissioning and demolition parking would occur on-site. **TRANS-2** ensures compliance by requiring the project owner to prepare a Parking/Staging Plan (PSP) for these phases as part of the TCP. The PSP must comply with the city of Oxnard's parking regulations.
City of Oxnard 2030 General Plan, Safety and Hazards Element	Policy SH-7.2: Handling of Hazardous Materials Requires that hazardous materials are transported within the city in a safe manner and in compliance with local, state and federal standards.	Consistent. The applicant has stated in the AFC the project owner's intent to comply with these regulations. Condition of Certification **TRANS-4** would verify the project owner's compliance with applicable regulations by ensuring the owner contracts with licensed hazardous materials delivery and waste hauler companies. See the **Hazardous**

Applicable Law	Description	Consistency
		Materials Management section of this document for more information on hazardous materials.
City of Oxnard Codified Ordinances, Chapter 8, Sec. 8-3, 8-4	Requires commercial vehicles over five tons, including load, to use designated truck routes. Any street not identified as a truck route is classified as a light traffic street.	Consistent. The applicant stated in the AFC the project owner's intention to comply with local jurisdictions' limitations on truck routes. Condition of Certification **TRANS-1** would verify the project owner's compliance with these regulations. See the **Hazardous Materials Management** section of this document for more information on hazardous materials.
City of Oxnard Municipal Code, Sec. 19-206	Requires an encroachment permit to conduct construction activities within city rights-of-way.	Consistent. There is no offsite construction within roadways or rights-of-way. The existing transmission line from the SCE's Mandalay Switchyard to an existing transmission structure across and east of Harbor Boulevard would be rerouted/reconfigured from a new take-off structure to the transmission system and, thereby, bypass the Mandalay Switchyard. The take-off pole would be located on the project site and no new offsite construction would be required to interconnect to the existing transmission system. (PPP 2016z) In addition, staff is recommending Condition of Certification **TRANS-3** (Restoration of All Public Roads, Easements, and Rights-of-Way) which would require the project owner to restore all rights-of-way damaged due to project-related construction and demolition activities and traffic.
City of Oxnard Municipal Code, Sec. 19-241	Requires a special permit to operate or move an overweight vehicle on city streets or highways.	Consistent. The applicant has stated that the project would comply. Compliance would be verified by implementation of **TRANS-1**, which requires the project owner to demonstrate compliance with the applicable agencies' limits on vehicle sizes and weights, driver licensing, and truck routes, including evidence that the necessary permits for roadway use have been obtained.

NOTEWORTHY PUBLIC BENEFITS

The project would not yield any noteworthy public benefits related to traffic and transportation.

RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

Traffic and Transportation Table 8 presents staff's responses to comments received on the Traffic and Transportation section of the PSA.

Traffic and Transportation Table 8
Response to Comments on the PSA

Source of Comment	Comment	Staff Response
Applicant (Represented by Latham & Watkins LLP) (TN 213683, PPP 2016y)	1. The applicant requested minor changes to verification language for proposed Condition of Certification **TRANS-6** (Obstruction Marking and Lighting). The applicant requested that the timeline be changed from "At least 60 days prior to the start of construction" to "At least 60 days prior to the start of construction of the stack".	1. Staff agrees with the comment and has changed the text.
City of Oxnard, Intervenor (Represented by Shute, Mihaly & Weinberger LLP) (TN 213681, COO 2016d)	1. The applicant would use heavy-haul trucks to transport the majority of the heavy equipment needed for construction from the Union Pacific Switchyard, but the PSA does not disclose the route that would be used to travel to the project site. It is not clear that heavy-haul trucks can transport materials to the project site by using only designated truck routes (for instance, Harbor Boulevard is not a designated truck route). Moreover, if the applicant is limited to using designated traffic routes, as condition **TRANS-1** (Roadway Use Permits and Regulations) would require, this truck traffic may still require removal of traffic signals or trees to accommodate the power plant's heavy equipment. The PSA should provide the exact traffic routes from the rail switchyard to the project site and disclose the precise amount and size of heavy equipment that will be transported. Without this information, the city cannot fully evaluate these potential impacts.	1. As stated in the FSA analysis, heavy haul trucks would make approximately three total deliveries during construction to transport equipment from the railroad switchyard to the project site (PPP 2015a, pages 2-25 and 4.12-7). It is true that if Harbor Boulevard is not a designated truck route, the trucks cannot make the entire journey on designated truck routes. However, section 8-3(B) of the city's municipal code (Light Traffic Streets Designated; Heavy Trucks Prohibited) states, "No operator of a commercial vehicle with a gross weight, including load, over five tons ("truck"), shall use a light traffic street, except when necessary to reach a location, for loading and unloading cargo, and such location cannot be reached by a truck route." Therefore, if a heavy truck cannot travel to the Puente site completely on a

Source of Comment	Comment	Staff Response
		designated truck route then the code allows the heavy truck to use light traffic street(s) as necessary. In addition, the proposed conditions of certification in the FSA would ensure that the project's heavy haul truck trips would not impact the city of Oxnard. **TRANS-1** ensures the project owner's compliance with the city of Oxnard's limitations on vehicle sizes and weights, driver licensing, and truck routes, and involves the project owner's coordination with the city of Oxnard. Condition of Certification **TRANS-2** requires the project owner to implement a Traffic Control Plan (TCP), including a detailed heavy haul plan, prepared in consultation with the city of Oxnard. Finally, Condition of Certification **TRANS-3** requires the project owner to restore all public roads, easements, rights-of-way, and any other transportation infrastructure damaged due to project-related activities. Therefore, if heavy haul trips caused damage, it would be repaired.
	2. The PSA fails to evaluate whether heavy-haul trips through the center of Oxnard will worsen traffic conditions or create traffic safety hazards within the city. Using designated trucking routes alone is not sufficient to mitigate these potential impacts. Again, without a proposed trucking route, it is impossible for the city or members of the public to understand the transportation impacts associated with this proposal. The PSA must fully disclose and evaluate these traffic impacts.	2. As stated in the FSA analysis, there are only three planned heavy haul truck trips. This small number of heavy haul truck trips would not significantly worsen traffic conditions or create traffic safety hazards, especially with implementation of proposed Conditions of Certification **TRANS-1**, **TRANS-2**, and **TRANS-3**, discussed in the response to city of Oxnard Comment #1 above.

Source of Comment	Comment	Staff Response
	3. Additionally, the PSA should require full development of the proposed Traffic Control Plan now instead of relying on it as deferred mitigation. Aspects of the final Traffic Control Plan could create secondary traffic impacts that have not been evaluated in the PSA. For instance, the current Traffic Control Plan proposal states that it will require all trucks exiting the project site to turn right (south) onto Harbor Boulevard, but the PSA's traffic analysis suggests that truck traffic would not travel south of the project site (PSA 4.11-10) and does not appear to evaluate the impacts of such southbound truck traffic. CEQA requires that agencies consider secondary impacts associated with proposed mitigation. Consequently, the PSA should fully describe the necessary elements of the Traffic Control Plan and assess any secondary impacts associated with implementing this plan.	3. Implementation of the TCP discussed in Condition of Certification **TRANS-2** would require all vehicles exiting the project site to turn right (south) onto Harbor Boulevard unless there is a flagger available to assist them in turning left. As shown in **Traffic and Transportation Table 4,** the projected levels of service during construction activities would operate at an acceptable LOS at all affected intersections, including Harbor Blvd/ 5th Street and Victoria Ave./ 5th Street. Implementation of the TCP is not expected to result in any affected intersection operating below an acceptable LOS.
California Coastal Commission (TN 213337, CCC 2016a)	1. The PSA indicates that certain phases of project construction could include work seven days a week. The PSA does not, however, describe the levels of project-related traffic that would be generated during these periods, nor whether construction traffic outside of the normal work week could adversely affect recreational traffic, and thus public access, along the Harbor Boulevard corridor. To ensure consistency with Coastal Act and Local Coastal Program policies protecting public access to the coast, the Commission recommends that Condition **TRANS-3** be modified to require the applicant to include in its Traffic Control Plan any measures necessary to minimize construction traffic on weekends and holidays, and to avoid delays and degraded LOS during these key recreational periods.	1. According to page 4.12-7 of the Puente AFC, some activities (e.g., concrete pours, new equipment testing) may continue 24 hours a day, 7 days a week during the start-up and testing phase of the project. Workers would remain onsite during these 24-hour construction activities. This phase of the project is expected to be of relatively short duration and employ a minimal number of workers. Also, only some activities, such as concrete pours, would continue for 24 hours a day, 7 days a week during this period. Therefore, there would be no LOS impacts expected from any work on weekends or holidays.

Source of Comment	Comment	Staff Response
California Department of Transportation (Caltrans) (TN 212615, DOT 2016a)	1. Caltrans acknowledges that a Traffic Control Plan would be prepared under **TRANS-2** in the PSA. Please forward a copy of the TCP once it is completed and include an analysis of the US-101 Victoria Avenue off-ramp, as it is the planned access route during project construction.	1. Condition of Certification **TRANS-2** requires the project owner to consult with the Caltrans District 7 office in the preparation of the TCP and submit any comments from Caltrans to the compliance project manager (CPM) at the Energy Commission. To ensure that Caltrans receives a copy of the completed TCP, staff added the following language to the "Verification" portion of **TRANS-2**: "After CPM review and approval, the project owner shall provide completed copies of the TCP to the Department of Transportation (Caltrans) District 7 office, the County of Ventura, the city of Oxnard, and the city of Ventura, sending copies of the correspondence to the CPM." Related to Caltrans' request to analyze the US-101 Victoria Avenue off-ramp, the purpose of this request is unclear. Staff concluded that traffic added to Highway 101, including its off-ramps, during peak construction would be indistinguishable from the existing traffic volumes. Staff believes an analysis is unnecessary because it would not be able to identify the individual traffic contribution made by the Puente project to traffic volumes on Highway 101. In addition, the TCP (as part of **TRANS-2**) has requirements to stagger traffic which staff believes is sufficient to mitigate project impacts to the US-101 Victoria Avenue off-ramp.
	2. As a reminder and as noted in the PSA under**TRANS-1**, any transportation of heavy construction equipment and/or materials that requires the use of oversized transport vehicles on state highways will require a Caltrans transportation permit. Caltrans recommends that large-size truck trips be limited to off-peak commute periods.	2. Staff added the following language to **TRANS-2**: "Heavy haul trips should be planned for off-peak commute periods."

Source of Comment	Comment	Staff Response
Naval Base Ventura County (TN 213650, NBVC 2016a)	1. On page 4.11-19, the PSA refers to Point Mugu Naval Air Station. The correct name of the installation is Naval Base Ventura County (NBVC) Point Mugu.	1. Staff has made the changes to the name of the installation.
	2. The proposed location of the project is just outside of the Imaginary Surfaces for the NBVC Point Mugu airfield. Aircraft departing from or arriving at NBVC Point Mugu may transit in the vicinity of the proposed project location. As noted in the PSA, further information on flight paths and altitudes is appropriate for the FSA. Depending on the results of the analysis, it may be appropriate to include coordination with NBVC in the recommendations contained in **TRANS-7** (Pilot Notification and Awareness).	2. Because the flight tracks that staff obtained from the FAA do not include military flights, staff could not determine whether any flights associated with NBVC Point Mugu pass over the project site. However, in the Ventura County Comprehensive Airport Land Use Plan, the general flight tracks associated with NBVC Point Mugu do not appear to go in directions that would pass over the project site (VCALUC 2000; see Exhibits 5E, 5F, 5G, and 5J). As noted earlier, staff has reviewed representative flight track figures in the NBVC Joint Land Use Study and the Air Installations Compatible Use Zones Study and determined there are no tracks over the project site (NBVC 2015a,b). Given its length and orientation, Runway 3-21 appears to be the main runway that provides access to the Sea Range and aircraft would not fly over the project site.
Ventura County Department of Airports (TN 213674, VC 2016c)	1. The proposed location of the project creates a hazard to aviation that does not currently exist due to the projected high velocity thermal plume, and is not compatible with Oxnard Airport operations. The proposed mitigation **TRANS-7** does not adequately mitigate the hazard and restricts access to and from the Oxnard Airport.	1. Staff respectfully disagrees. As noted earlier, the existing four 54-foot-high stacks at MGS Unit 3 generate plumes with peak velocities of 10.6 m/s or more at altitudes up to approximately 2,020 feet AGL. Please see the analysis in this section under “Thermal Plumes” and “Cumulative Impacts and Mitigation”. Staff discussed the project extensively with Mr. McNamee, Director of the Ventura County Department of Airports, via e-mail (VCDOA 2016, CEC 2016v) and a phone conference. Mr. McNamee stated that the project owner agreed to light the CTG stack in past discussions with the Department of Airports, and that he supported staff’s proposed **TRANS-6** condition requiring marking and lighting. Mr. McNamee also requested that the

Source of Comment	Comment	Staff Response
		project include a condition granting an avigation easement to the county for the unobstructed use and passage of all types of aircraft in the airspace over the project (CEC 2016v). Staff does not believe an avigation easement is necessary because **TRANS-7** only results in advising pilots to avoid overflight and has no authority to prevent overflight. In addition, the granting of an avigation easement is contrary to staff's recommendation to avoid overflight of the power plant. However, staff has included in **TRANS-7** Mr. McNamee's recommendation to update the Oxnard Airport Pilot Guide to alert pilots about possible plume hazards (VCDOA 2016). **TRANS-7** would require the project owner to work with the Director of the Ventura County Department of Airports to fund a revision to the Oxnard Airport Pilot Guide showing the location of the power plant and a note advising pilots to avoid overflight. Mr. McNamee provided a quote of approximately $1,934 for the project owner to fund the labor, printing, and shipping and handling for the Oxnard Airport Pilot Guide update.
	2. The Department of Airports (DOA) interprets the PSA's conclusions to mean that a plume velocity of 4.3 m/s at 4,260 feet AGL and below could compromise pilot control and aircraft stability and endanger aircraft. If this is true, the Energy Commission is essentially allowing a 4,260 foot-tall invisible tower to be located 1.8 miles from the departure end of Runway 25 at Oxnard Airport. This is of concern because aircraft departing and arriving to Oxnard Airport are likely to be between 1,000 feet and 3,000 feet AGL as they ascend or descend to airport pattern altitude of approximately 1,000 feet AGL. Traffic and Transportation Figure 4 in the PSA depicts aircraft overflight of the project site currently. In the two-month period used, 85 aircraft overflew the site. Extrapolating this would result in approximately 510 aircraft overflights per year. Of these overflights depicted in Figure 4 for the two-month period,	2. Staff notes that as discussed in this FSA, and as discussed with the DOA via e-mail and phone conference, staff has changed the screening threshold vertical velocity to a peak vertical velocity of 10.6 m/s. At altitudes of approximately 2,375 feet AGL and below, aircraft could potentially experience peak vertical velocities of 10.6 m/s or more, potentially endangering aircraft. Please see staff's analysis in this section under "Thermal Plumes" and "Cumulative Impacts and Mitigation". Staff concluded that impacts to aviation are less than significant with mitigation. Also, staff notes for clarity that **Traffic and Transportation Figure 4** in the PSA has been revised for the FSA to only show overflights over a period of a month to reduce visual clutter and make the figure more readable.

Source of Comment	Comment	Staff Response
	14 were between 2,001-3,000 feet AGL, 60 were between 1,001-2,000 feet AGL, and 11 were below 1,000 feet AGL. If only one aircraft overflies the site and encounters loss of control at these low altitudes which results in injury or death, is that one too many?	
	3. The DOA questions adjusting the threshold velocity used to determine a hazard to aviation from the project at this time, as it does not appear to have been used for any proposed power plant previously. With that in mind, Energy Commission staff stated that using the new velocity threshold, there would be plume hazards up to an altitude of approximately 2,375 feet. This would still create a potential hazard to the aircraft that overfly the site.	3. It is true that staff has not used the new screening threshold of 10.6 m/s peak vertical velocity for previous projects, but it is based on best available research, which categorized the old threshold of 4.3 m/s average vertical velocity as light turbulence, not severe turbulence. Staff also concludes that with mitigation, impacts to aircraft would be less than significant. See the "Thermal Plumes" discussion in this section and **Appendices TT-1 through TT-3** for further details.
	4. As discussed in the PSA, the FAA has identified a new model, the MITRE Corporation's Exhaust Plume Analyzer, as a potentially effective tool to assess the impact that exhaust plumes may impose on flight operations in the vicinity of airports. Energy Commission staff conducted a preliminary evaluation using the MITRE model for the Puente plume, but does not believe the MITRE model can be used for Puente because the FAA's guidance is not fully developed, and there are limitations to the vertical axis calculations. The result is that staff did not include in the PSA the data derived from the MITRE model. The MITRE model results provided by Energy Commission staff to the DOA via email on September 14th show that severe turbulence will likely be encountered by light general aviation aircraft at altitudes exceeding 3,000 feet, but with higher probability at lower altitudes. The DOA requests that staff conduct a more thorough analysis	4. Staff has provided MITRE model results in **Appendix TT-3** of this document to address this comment. However, due to the current limitations of the MITRE model, staff does not believe the MITRE model should be used for final work products. Please see **Appendix TT-3** for a discussion of the limitations of the MITRE model. In addition, the output provided by the MITRE model is similar to the output provided by the Spillane approach. As such, the conclusions made related to Puente's thermal plumes would not change and staff is recommending Conditions of Certification **TRANS-5**, **TRANS-6**, and **TRANS-7**, which would reduce potential impacts to aviation operations to a less than significant level.

Source of Comment	Comment	Staff Response
	of the plume, incorporating the MITRE model, prior to approval of the project.	
	5. The issue of Puente's operating times was also raised. The PSA states on page 4.11-54, "[the project] is designed as a simple-cycle, peaking turbine facility. It is proposed to be limited to operate no more than 2,453 hours per year. Actual operation is likely to be considerably less, perhaps no more than 500 to 1,000 hours per year depending on electrical system load needs." If the project operates to the upward limitation of 2,453 hours per year, that is more than a fulltime equivalent position working 5 days a week from 8:00 am to 5:00 pm and should not be considered inconsequential when determining the probability of aircraft overflight while the project is operating and generating thermal plumes.	5. Staff acknowledges this point. However, it is likely that the plant would operate for fewer hours, and the fact that calm wind conditions, which produce the worst-case, highest velocity plumes, occur only approximately 2.7% of the time at the site, reduces the amount of time that the plant would be generating a worst-case plume. Wind and fog quickly dissipates plume velocity and cohesion.
	6. **TRANS-7**, while possible to implement, will not likely result in all overflight being avoided. The DOA currently provides recommended patterns to avoid overflight of the existing power plant in a published Pilot Guide, yet Traffic and Transportation Figure 4 in the PSA clearly depicts overflight of the site currently occurring. Further, if **TRANS-7** did result in overflight being avoided, it results in restricting access to the Oxnard Airport in a manner that does not currently exist. This is of concern for the existing aircraft utilizing Oxnard Airport, and could negatively impact the DOA's efforts to restore commercial airline service to Oxnard Airport.	6. While the DOA provides recommended flight patterns in the Oxnard Airport Pilot Guide, it does not specifically identify the location of the existing power plant or include an advisory to avoid it. There are currently no advisories to avoid overflight on the Los Angeles Sectional Chart, Oxnard Airport Facility Directory, or the Oxnard Airport Pilot Guide. Implementation of **TRANS-7** would be expected to reduce the number of overflights of the area by alerting pilots to the presence of the project's plume and recommending avoidance of overflight on numerous documents that pilots should be consulting prior to flying. Furthermore, pilots can feasibly avoid overflight of the project site on the way to and from the Oxnard Airport. See the "Thermal Plumes" and "Cumulative Impacts and Mitigation" discussions in this section for more

Source of Comment	Comment	Staff Response
		information.
Ventura County Transportation Commission (TN 213676, VC 2016d)	1. While the physical structure of the proposed project is outside of any airport safety zone and the height of the exhaust stack is below the conical surface established by FAA Regulation Part 77, the exhaust plume extends well above that surface creating uncertain conditions for flight operations. The discussion of the project's exhaust plume in the PSA does not capture the operational concerns voiced by Ventura County Department of Airports at a June 8, 2016 meeting including Energy Commission staff, DOA staff, Airport Land Use Commission staff and others, or in subsequent discussions. DOA's local knowledge of existing conditions and aircraft movements in this area is critical in any assessment of potential hazards.	1. Staff respects the knowledge of the DOA and has included additional details in the FSA to further address their concerns. Please see the "Thermal Plumes" and "Cumulative Impacts and Mitigation" discussions in this section for more information, as well as the comment responses in this table.
	2. The FAA's September 24, 2015 Memorandum (Technical Guidance and Assessment Tool for Evaluation of Thermal Exhaust Plume Impact on Airport Operations) identifies the MITRE "Exhaust-Plume- Analyzer" as a free tool to better assess the impact of plumes on flight operations. The Memorandum further discusses that FAA Advisory Circular (AC) 5190-4, A Model Zoning Ordinance to Limit the Height of Objects Around Airports, is currently being updated to include evaluation of exhaust plumes. Although that update has not been published yet, it demonstrates the FAA's ongoing effort to ensure exhaust plumes are thoroughly considered. The Airport Land Use Commission	2. Staff has included additional analysis of the thermal plume in the FSA. Please see the "Thermal Plumes" and "Cumulative Impacts and Mitigation" discussions in this section for more information, as well as the comment responses in this table. Staff has also provided MITRE model results in **Appendix TT-3** of this document to address this comment and Ventura County DOA Comment #4, above.

Source of Comment	Comment	Staff Response
	suggests that a much more thorough analysis of the project exhaust plume needs to be conducted, including the MITRE analysis and consideration of local aircraft traffic patterns, so that the public can be confident in the conclusions that the PSA puts forward.	
	3. The MITRE results should also be put in the context of land use consistency within the Airport Comprehensive Land Use Plan (ACLUP) Study Area for Oxnard Airport. Should the project's exhaust plume be found to be disruptive to flight operations, it could inhibit further commercial development of Oxnard Airport and could be counter to policies contained in the Ventura County ACLUP.	3. Staff has reviewed the Ventura County ACLUP and has not identified any policies with which the project is inconsistent. Also, staff has concluded that the project's plume would have less than significant impacts to aviation with mitigation. Please see the "Thermal Plumes" and "Cumulative Impacts and Mitigation" discussions in this section for more information, as well as the comment responses in this table.
Ventura County Transportation Department (TN 213655, VC 2016b)	1. An Encroachment Permit is required for any work or traffic impacts in county road right-of-way (ROW). Of particular concern would be (1) Harbor Boulevard, a county-maintained roadway approximately 725 feet north of the Edison Canal Bridge and (2) the intersection of Harbor Boulevard at Gonzales Road, a county-maintained intersection approximately 0.87 mile north of the canal.	1. The existing transmission line from the SCE Mandalay Switchyard to an existing transmission structure across and east of Harbor Boulevard would be rerouted/reconfigured from a new take-off structure to the transmission system and, thereby, bypass the Mandalay Switchyard. The new take-off pole would be located on the Puente Site. In addition, temporary and short-duration access to the base of the SCE transmission tower would occur via the existing paved and gravel access road on the eastern side of Harbor Boulevard. Therefore, an encroachment permit would not be required. (PPP 2016z) In addition, staff is recommending Condition of Certification **TRANS-3** (Restoration of All Public Roads, Easements, and Rights-of-Way) which would require the project owner to restore all rights-of-way damaged due to project-related construction and demolition activities and traffic.

Source of Comment	Comment	Staff Response
	2. The cumulative impacts of the development of this project, when considered with the cumulative impact of all other approved (or anticipated) development projects in the county, will be potentially significant. To address the cumulative adverse impacts of traffic on the County Regional Road Network, the appropriate Traffic Impact Mitigation Fee (TIMF) should be paid to the county when construction occurs. Based on the information provided in the PSA, the fee due to the county would be $5,626.72. This estimated fee may be subject to adjustment at the time of deposit, due to provisions in the TIMF Ordinance allowing the fee to be adjusted for inflation based on the Engineering News Record Construction Cost Index. The above is an estimate only, based on information provided in the PSA.	2. Staff disagrees that the proposed project would result in significant cumulative traffic impacts. Staff is recommending Condition of Certification **TRANS-3** (Restoration of All Public Roads, Easements, and Rights-of-Way) which would require the project owner to repair any roadways damaged during project construction and demolition.
	3. Please provide the Public Works Agency (PWA) Transportation Department with the FSA when it becomes available for our review and comment.	3. Staff has added the PWA Transportation Department to the agency contact list for this project, so the Department will be notified of publication of the FSA.

CONCLUSIONS AND RECOMMENDATIONS

Staff has analyzed the proposed Puente Power Project's impacts to the nearby traffic and transportation system. Construction and operation of the project could result in significant impacts to the nearby traffic and transportation system. Construction traffic exiting left to travel northbound on Harbor Boulevard could potentially create accident hazards. Staff proposes Condition of Certification **TRANS-2** for implementation of a Traffic Control Plan that requires signage along Harbor Boulevard warning drivers of construction traffic exiting the project site. The Traffic Control Plan would also be required to instruct construction vehicles to exit the site by turning right onto southbound Harbor Boulevard, unless a flagger is present to provide advance notice to approaching traffic of cross-traffic conflicts.

Another possible project impact would be from thermal plumes, which could pose hazards to aircraft. Under certain conditions, Puente would generate a high-velocity

thermal plume exceeding a peak vertical velocity of 10.6 meters per second, the threshold velocity of concern for severe turbulence, at altitudes up to 2,375 feet above ground level. Staff proposes Conditions of Certification **TRANS-6** and **TRANS-7** to mitigate potentially significant impacts to aviation. Condition of Certification **TRANS-6** would require obstruction marking and lighting of the CTG stack to alert pilots of the location of the plume. Condition **TRANS-7** would require the project owner to work with the FAA, the Oxnard Airport Manager, and the Ventura County Department of Airports to notify all pilots using the Oxnard Airport and airspace above the project site of potential plume hazards.

With implementation of the proposed conditions of certification listed below (**TRANS-1** through **TRANS-7**), the Puente Power Project would comply with all applicable LORS related to traffic and transportation and would result in less than significant impacts to the traffic and transportation system.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 Roadway Use Permits and Regulations

The project owner shall comply with limitations imposed by the California Department of Transportation (Caltrans) and other relevant jurisdictions, including the city of Oxnard, the County of Ventura, and the city of Ventura, on vehicle sizes and weights, driver licensing, and truck routes.

Verification: In the Monthly Compliance Reports (MCRs), the project owner shall identify the permits received during that reporting period (copies of actual permits are not required in the MCR) to demonstrate project compliance with limitations of relevant jurisdictions for vehicle sizes, weights, driver licensing, and truck routes. The project owner shall retain copies of permits and supporting documentation on-site for compliance project manager (CPM) inspection if requested.

TRANS-2 Traffic Control Plan, Heavy Haul Plan, and Parking/Staging Plan

Prior to the start of construction, the project owner shall prepare a Traffic Control Plan (TCP) for the project's construction and operation traffic and for Mandalay Generating Station (MGS) decommissioning and demolition traffic. The TCP shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes.

The project owner shall consult with Caltrans District 7 office, the County of Ventura, the city of Oxnard, and the city of Ventura in the preparation and implementation of the TCP. The project owner shall submit the proposed TCP to these agencies in sufficient time for review and comment, and to the CPM for review and approval prior to the proposed start of construction and implementation of the plan.

The TCP shall include:

- Routes used for construction- and demolition-related trips for workers, deliveries, and heavy-haul trucks. The plan shall require that vehicles exit the site by turning right onto southbound Harbor Boulevard, unless a flagger is present to direct traffic on Harbor Boulevard while the vehicles turn left onto northbound Harbor Boulevard
- Location and type of signage on Harbor Boulevard warning traffic to use caution and to be aware of construction and demolition vehicles exiting the power plant site
- Timing of construction and demolition-related trips for workers, deliveries, and heavy-haul trucks, with trips scheduled for off-peak hours to the maximum extent possible, and staggered if occurring during the peak hours.
- Parking/Staging Plan (PSP) for project construction, MGS demolition, outfall removal/ beach restoration and project operation. The PSP must comply with the city of Oxnard's parking regulations by providing sufficient on-site parking for all workers and construction vehicles
- Placement of necessary signage, lighting, and traffic control devices at the project construction site and laydown areas
- A heavy haul plan addressing the transport and delivery of heavy and oversized loads requiring permits from Caltrans, other state or federal agencies, and/or the affected local jurisdictions. Heavy haul trips should be planned for off-peak commute periods

  Means of access for emergency vehicles to the project site

Verification: At least 60 calendar days prior to the start of construction, the project owner shall submit the TCP to Caltrans District 7 office, the County of Ventura, the city of Oxnard, and the city of Ventura for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to the agencies requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from the agencies, along with any changes to the TCP for CPM review and approval.

TRANS-3 Restoration of All Public Roads, Easements, and Rights-of-Way

The project owner shall restore all public roads, easements, rights-of-way, and any other transportation infrastructure damaged due to project-related construction and demolition activities and traffic. Restoration to the infrastructure's original condition shall be completed in a timely manner.. Restoration of significant damage which could cause hazards (such as potholes, deterioration of pavement edges, or damaged signage) shall take place immediately after the damage has occurred.

Prior to the start of site mobilization, the project owner shall notify the relevant agencies, including the city of Oxnard, County of Ventura, city of Ventura, and Caltrans District 7, of the proposed schedule for project construction and MGS demolition. The purpose of this notification is to request that these

agencies consider postponement of any planned public right-of-way repairs or improvement activities in areas affected by project construction until construction is completed, and to coordinate any concurrent activities that cannot be postponed.

Verification: Prior to the start of site mobilization, the project owner shall video all public roads, easements, right-of-way segment(s), and intersections along the route construction and demolition vehicles would take in the vicinity of the project site. The project owner shall provide the videos or other recorded visual media to the CPM.

If damage to any public road, easement, or right-of-way occurs during construction or demolition, the project owner shall notify the CPM and the affected agency/agencies to identify the sections to be repaired. At that time, the project owner and CPM shall establish a schedule for completion and approval of the repairs with which the project owner must comply, unless approval for a schedule change is provided by the CPM. Following completion of any repairs, the project owner shall provide the CPM with letters signed by the affected agency/agencies stating their satisfaction with the repairs.

TRANS-4 Transportation of Hazardous Materials

The project owner shall contract with licensed hazardous materials delivery and waste hauler companies for the transportation of hazardous materials and wastes.

Verification: In the Monthly Compliance Reports (MCRs) during construction and demolition and the Annual Reports during operation, the owner shall provide the names of the contracted hazardous materials delivery and waste hauler companies used, as well as licensing verification. Licensing verification only needs to be included in the MCRs when a new company is used. If a company's licensing verification has already been submitted in an MCR, it is not necessary to submit it again. Licensing verification must be included in all Annual Reports, even if the company has already been used.

TRANS-5 Federal Aviation Administration Notification

The project owner shall submit the following filings to the Federal Aviation Administration (FAA):

- Form 7460-1, Notice of Proposed Construction or Alteration, regarding the use of any construction cranes exceeding 188 feet in height;
- Form 7460-2, Notice of Actual Construction or Alteration, for the combustion turbine generator (CTG) stack within 5 days after it reaches its greatest height.

The project owner shall comply with any conditions imposed by the FAA on the use of construction cranes exceeding 188 feet in height.

Verification: At least 60 days prior to ground disturbance, the project owner shall submit a copy of the FAA Determination of No Hazard to Navigable Airspace regarding the construction cranes to the CPM.

Within 10 days following the date the CTG stack reaches its greatest height, the project owner shall submit to the CPM a copy of the Form 7460-2 submitted to the FAA.

TRANS-6 Obstruction Marking and Lighting

The project owner shall install obstruction marking and lighting on the CTG stack. Lighting on the CTG stack shall consist of top-mounted flashing red L-864 lights consistent with the standards set in FAA Advisory Circular 70/7460-1L, Obstruction Marking and Lighting, particularly Section 5.5 “Chimneys, Flare Stacks, and Similar Solid Structures". Lighting shall be as close to the top of the CTG stack as possible for pilot visibility. Lighting need not be installed on lower levels. Obstruction marking shall also be near the top of the CTG stack and need not be installed on lower levels.

Lighting and marking shall be operational for the life of project operation.

Verification: At least 60 days prior to the start of construction of the CTG stack, the project owner shall submit to the CPM for approval final design plans for the CTG stack that depict the required obstruction marking and lighting. Prior to the start of plant operation, the project owner shall install and activate permanent obstruction marking and lighting consistent with the approved design plans and shall inform the CPM in writing within 10 days of installation and activation.

Any future upgrades to the required lighting configurations, types, location, or duration or to obstruction marking shall not be implemented before approval by the CPM.

TRANS-7 Pilot Notification and Awareness. The project owner shall initiate the following actions to ensure pilots are aware of the project location and potential hazards to aviation:

1. Submit a letter to the FAA requesting a Notice to Airmen (NOTAM) be issued advising pilots of the location of the power plant and recommending avoidance of overflight. The letter should also request that the NOTAM be maintained in active status until all navigational charts and Airport Facility Directories (AFDs) have been updated.

2. Submit a letter to the FAA requesting a power plant depiction symbol be placed at the power plant site location on the Los Angeles Sectional Chart with a notice to avoid direct overflight.

3. Submit a request to the Oxnard Airport Manager to add new remarks to the Automatic Terminal Information Service (ATIS) and to the AFD. The remarks shall identify the location of the power plant and advise pilots to avoid direct overflight as they approach or depart the airport.

4. Submit aerodrome remarks describing the location of the power plant and advising against direct overflight to the:

    a. FAA Chart Supplement for California Jeppesen (Airway Manual Services - Western U.S. Airport Directory)

    b. Pilots Guide to California Airports- PDF Edition

5. Work with the Director of the Ventura County Department of Airports to fund a revision to the Oxnard Airport Pilot Guide showing the location of the power plant and a note advising pilots to avoid direct overflight.

Verification: Within 60 days following the start of construction, the project owner shall submit to the CPM for review and approval draft language for the letters of request to the FAA, the Oxnard Airport Manager, the Director of the Ventura County Department of Airports, and the listed publications. The letters should request a response within 30 days that includes a timeline for implementing the required actions.

Within 60 days after CPM approval of the draft language, the project owner shall submit the required letters of request to the FAA, the Oxnard Airport Manager, the Director of the Ventura County Department of Airports, and the identified publications. The project owner shall submit copies of these requests to the CPM. A copy of any resulting correspondence shall be submitted to the CPM within 10 days of receipt. If the FAA, Oxnard Airport Manager, the Director of the Ventura County Department of Airports, or the listed publications do not respond within 30 days, the project owner shall contact the CPM.

REFERENCES

AGBM 2007 – Australian Government Bureau of Meteorology. Manual of Aviation Meteorology, Second Edition, dated 2007. Published by Airservices Australia.

AIRNAV 2015a – AirNav, Oxnard Airport, http://www.airnav.com/airport/KOXR , accessed October 2015.

AIRNAV 2015b – AirNav, Point Mugu Naval Air Station, https://www.airnav.com/airport/KNTD , accessed October 2015.

AIRNAV 2015c – AirNav, Camarillo Airport, http://www.airnav.com/airport/kcma , accessed October 2015.

AT 2015 – Anacapa Townhomes Offering Memorandum, April 2015, http://www.landadvisors.com/pdf/CAVentura174979.pdf, accessed October 2015.

CASA 2012 – Australian Government Civil Aviation Safety Authority, Advisory Circular AC 139-5(1), Plume Rise Assessments, November 2012, https://www.casa.gov.au/files/139c05pdf , accessed May 2016.

CCC 2016a – California Coastal Commission 30413(d) Report -- Final Approved Report (TN213667) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

CEC 2015aa – Report of Conversation (ROC)-CEC Staff and Ventura County. ROC between CEC Transportation-Planning staff and Ventura County Transportation staff. October 27, 2015. (TN- 206440). CEC/Docket Unit October 27, 2015.

CEC 2015bb – Report of Conversation (ROC)-CEC and staff and city of Oxnard staff. ROC between CEC Planning staff and city of Oxnard Staff. October 27, 2015. (TN 206441). CEC/Docket Unit October 27, 2015.

CEC 2015ff – Report of Conversation with CEC Staff and Kathleen Mallory from city of Oxnard Planning Department. (TN 206648). Submitted on November 16, 2015. CEC/Docket Unit on November 17, 2015.

CEC 2015gg – Report of Conversation with CEC Staff and Juan Martinez from city of Oxnard Planning Department (TN 206649). Submitted on November 16, 2015. CEC/Docket Unit on November 17, 2015.

CEC 2015hh – Report of Conversation with CEC Staff and Jared Rosengren, Associate Planner with city of Ventura Community Development Department. (TN 206650). Submitted on November 16, 2015 CEC/Docket Unit on November 17, 2015.

CEC 2016a – E-mail between CEC staff and city of Ventura staff confirming the City's traffic level service standards (LOS) (TN 207173). Submitted to CEC/Docket Unit on January 4, 2016.

CEC 2016g – Email from Applicant (NRG Puente) Clarifying the Schedule for Decommissioning and Demolition of Existing Mandalay Generating Station Units 1 and 2 Proposed as Proposed as Part of PUENTE Activities (TN 208186). Submitted to CEC/Docket Unit on January 20, 2016.

CEC 2016v – CEC Staff's and Todd McNamee, Director of the Ventura County Department of Airports, Comments on the Puente Power Project (TN 211755). Submitted to CEC Docket Unit on June 8, 2016.

CEC 2016w – CEC Staff's and Steve DeGeorge, Director of Planning, Ventura County Transportation Commission Comments on the Puente Power Project. (TN 21154). Submitted to CEC/Docket Unit on June 8, 2016.

CO 2011a – City of Oxnard 2030 General Plan Goals and Policies, adopted October 2011, http://developmentservices.cityofoxnard.org/7/76/961/ , accessed October 2015.

CO 2011b – City of Oxnard Bicycle & Pedestrian Facilities Master Plan, adopted February 2011, http://developmentservices.cityofoxnard.org/Uploads/Planning/Oxnard%20BPMP%20Feb12.pdf , accessed October 2015.

CO 2014 – City of Oxnard, Rancho Victoria Shopping Center Mitigated Negative Declaration 2005, No.05-09 http://oxnard.granicus.com/MetaViewer.php?view_id=46&clip_id=2752&meta_id=140315, accessed October 2015.

CO 2015 – City of Oxnard, Teal Club Specific Plan EIR, August 2015, http://developmentservices.cityofoxnard.org/Uploads/Planning/Teal%20Club%20Specific%20Plan%20DEIR%20w_Appendices%20A%20-%20K.pdf, accessed November 2015.

CO 2016 – City of Oxnard, Planning Division Quarterly Project List, January 2016, http://developmentservices.cityofoxnard.org/Uploads/Planning/,January%202016%20Project%20List%20v3.pdf , accessed February 2016.

COO 2016d – City of Oxnard PSA Comments (TN 213681) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

CT 2002 – State of California Department of Transportation (Caltrans), Guide for the Preparation of Traffic Impact Studies, December 2002, http://dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf , accessed November 2015.

CV 2015 – City of Ventura, Victoria Corporate Center Amendment, Administrative Permit Staff Analysis, accessed October 2015.

DOT 2016a – Department of Transportation Comments: On Puente Power Project - Preliminary Staff Assessment, Dianna Watson, (TN 212615) Dated August 3, 2016. Submitted to CEC/Docket Unit on August 4, 2016.

GCT 2014 – Gold Coast Transit, http://www.goldcoasttransit.org/schedules/service-area , accessed September 2015.

GH 2015 – Greyhound http://locations.greyhound.com/bus-stations/search?state=CA&city=Oxnard&zip =, accessed September 2015.

GW 2015 – Genesee & Wyoming Inc, Ventura County Railroad (VCRR), http://www.gwrr.com/operations/railroads/north_america/ventura_county_railroad , accessed October 2015.

FAA 2006 – Federal Aviation Administration, Flight Procedures Standards Branch. Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes, dated January 2006. http://www.ctcombustion.com/oxc/sources/20-safetyriskanalysis.pdf , accessed September 2016.

FAA 2015 – Federal Aviation Administration, Determination of No Hazard to Air Navigation, TN # 206297.

FAA 2015a – Federal Aviation Administration. Aeronautical Information Manual, December 10, 2015. https://www.faa.gov/air_traffic/publications/media/aim.pdf , accessed September 2016.

LF 2016 – Land and Farm, Victoria Corporate Center, http://www.landandfarm.com/property/Victoria_Corporate_Center-2381885/, accessed February 2016.

NAWCWD 2015 – Naval Air Warfare Center Weapons Division, Point Mugu Sea Range and Facilities, http://www.navair.navy.mil/nawcwd/Command/downloads/CL_facilities/Fact%20Sheets%204%20PAO/03_Point%20Mugu%20QuickFacts.pdf , accessed October 2015.

NBVC 2015a – Naval Base Ventura County Joint Land Use Study, September 2015.

NBVC 2015b – Naval Base Ventura County Air Installations Compatible Use Zones Study, December 2015.

NBVC 2016a – Naval Base Ventura County Comments re PSA (TN 213650) dated September 14, 2016. Submitted to CEC/Docket Unit on September 14, 2016.

NBVC 2016b – Phone conversation between Amanda Fagan, Community Planning Liaison Officer, and James Adams, California Energy Commission, on October 7, 2016.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015c – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), Dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015.

PPP 2015e – Latham & Watkins LLP (TN 205912). Applicant's Presentation: PUENTE A Bridge to California's Energy Future – Informational Hearing & Site Visit August 27, 2015. Submitted to CEC/Docket Unit on August 28, 2015.

PPP 2015j – Latham & Watkins LLP (TN 206215). Applicant's Response to CEC Data Request, Set 1, 45 day Extension. Submitted on September 2015. CEC/Docket Unit on September 25, 2015.

PPP 2015u – Applicant's responses to CEC Data Requests, Set 2 (48-74) (TN 206614). Latham & Wilkins LLP Submitted on November 13, 2015. CEC/Docket on November 13, 2015.

PPP 2015x – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2016y – Applicant's Comments on the Preliminary Staff Assessment, Latham & Watkins LLP, and (TN 213683) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

PPP 2016z – Applicant's Responses to CEC Data Requests Set 4 (77-107) (TN 214336) dated November 1, 2016. Submitted to CEC/Docket Unit on November 1, 2016.

SV 2016 – SkyVector Aeronautical Charts, Oxnard Airport Area, https://skyvector.com/?ll=34.200805556,-119.207222222&chart=404&zoom=3, accessed September 2016.

TCS 2008 – Traffic Circulation Study City of Oxnard 2020 General Plan Update/EIR, http://oxnard.granicus.com/MetaViewer.php?view_id=32&clip_id=946&meta_id=65758, accessed September 2015.

TRB 2014 – Transportation Research Board of the National Academies, Airport Cooperative Research Program. ACRP Report 108, Guidebook for Energy Facilities Compatibility with Airports and Airspace, dated 2014. Sponsored by the Federal Aviation Administration. http://www.trb.org/Publications/Blurbs/170609.aspx, accessed September 2016.

VC 2015 – Ventura County, Ventura County General Plan, Goals, Policies and Programs, last amended on October 20, 2015, http://www.ventura.org/rma/planning/pdf/plans/Goals-Policies-and-Programs.pdf, accessed November 2015.

VC 2016b – County of Ventura, Transportation Dept. Comments on Preliminary Staff Assessment (TN 213655) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15. 2016.

VC 2016c – County of Ventura, Department of Airports Comments: PUENTE Incompatible with Oxnard Airport (TN 213674) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

VC 2016d – Ventura County Transportation Commission Comments on Preliminary Staff Assessment (TN 213676) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

VCALUC 2000 – Ventura County Airport Land Use Commission, Airport Comprehensive Land Use Plan for Ventura County, adopted July 7, 2000, http://www.goventura.org/sites/default/files/2000-airport-land-use-for-ventura-county.pdf , accessed October 2015. VCDOA 2016 – E-mails between Todd McNamee, Director of the Ventura County Department of Airports, and CEC Staff (TN 213834). Submitted to CEC Docket Unit on September 29, 2016.

VCTC 2009 – Ventura County Transportation Commission, Congestion Management Program, http://www.goventura.org/?q=congestion-management-program-cmp , accessed October 2015.

VCTC 2015 – Ventura County Transportation Commission, VCTC Intercity Transit Routes and Schedules, http://www.goventura.org/travel-ventura , accessed October 2015.

VCTC 2015a – Ventura County Transportation Commission, Ventura County Bike Maps, http://www.goventura.org/travel-ventura/bike/bike-maps , accessed October 2015.

APPENDIX TT-1
PLUME THRESHOLD DETERMINATION

Testimony of Jonathan Fong and Andrea Koch

INTRODUCTION

Staff has historically used an average thermal plume vertical velocity of 4.3 meters per second (m/s) as the threshold for potential impacts to aviation. Staff would prepare a plume velocity analysis and calculate the altitude at which a plume would have an average velocity of 4.3 m/s and conclude that aircraft flying through the plume at this altitude or below, could experience turbulence threatening aircraft control.

Staff found that based on recent publications, an average vertical velocity of 4.3 m/s is not an appropriate threshold. The purpose of this appendix is to provide documentation of staff's determination that a 10.6 m/s peak vertical velocity should be considered as the appropriate threshold.

BACKGROUND

The FAA identifies thermal plumes as a potential source of impacts to aviation, but currently does not have an adopted threshold of significance for vertical plume velocities. Staff has relied on a 4.3 m/s threshold which originated from the Australian Government Civil Aviation Safety Authority (CASA) Advisory Circular, AC 139-05 (0), "Guidelines for Conducting Plume Rise Assessments", dated June 2004. The Advisory Circular stated that "Aviation authorities have established that an exhaust plume with a vertical gust in excess of 4.3 m/s may cause damage to an aircraft airframe, or upset an aircraft when flying at low levels" (FAA 2006). However, recent publications state that 4.3 m/s represents light turbulence, which would only result in "rhythmic bumpiness and momentary changes in altitude and attitude" if an aircraft flew through the plume (AGBM 2007, Table 10.1). This would not be a significant impact to aircraft. Furthermore, the origin of CASA's 4.3 m/s threshold is unknown, and CASA was unable to verify the source of the threshold (TRB 2014, page 55).

REVISED PLUME THRESHOLD

Plume Threshold Determination Table 1 is a modified version of Table10.1 in the Australian Government Bureau of Meteorology's "Manual of Aviation Meteorology", Second Edition, dated 2007. A 10.6 m/s vertical gust corresponds to the initial threshold of severe turbulence, which would result in "large abrupt changes in altitude and attitude, and momentary loss of control" (AGBM 2007).

Plume Threshold Determination Table 1

Intensity	Airspeed fluctuations (knots)	Vertical gusts (feet per second)	Vertical gusts (meters per second)	Aircraft reaction
Light	5 - 14.9	5 - 20	1.5 - 6.1	Rythmic bumpiness. Momentary changes in altitude and attitude.
Moderate	15 - 24.9	20 - 35	6.1 - 10.6	Rapid bumps or jolts. Appreciable changes in altitude and attitude.
Severe	=> 25	35 - 50	10.6 - 15.2	Large abrupt changes in altitude and attitude. Momentary loss of control.
Extreme		> 50	> 15.2	Practically impossible to control aircraft. May cause structural damage.

Source: *Manual of Aviation Meteorology*, Table 10.1, Second Edition, 2007, Australian Government Bureau of Meteorology,

The FAA-sponsored "Guidebook for Energy Facilities Compatibility with Airports and Airspace" also includes information supporting the use of 10.6 m/s as a screening threshold (TRB 2014). The 10.6 m/s screening threshold is also referenced in CASA's November 2012 Advisory Circular as a screening threshold for severe turbulence to aircraft (CASA 2012). The 2012 circular is an update to the AC 139-05 (0) CASA Advisory Circular which staff has historically referenced as the origin of the 4.3 m/s threshold.

When considering the potential effects of thermal plumes in terms of G-load, 1G is considered as the start of severe turbulence and corresponds with the severe turbulence threshold of 10.67 m/s (AGBM 2007). The FAA-sponsored "Guidebook for Energy Facilities Compatibility with Airports and Airspace" (TRB 2014) supports the 1G threshold (and thus, the corresponding threshold of 10.67 m/s) as the start of severe turbulence. The Guidebook also states on page 52 that NOAA defines severe turbulence as starting at 1G. Finally, page 56 of the Guidebook references a MITRE study's conclusion that an appropriate safety threshold is the potential for a plume to create more than a 1G vertical acceleration on an aircraft.

In light of the literature cited above, staff determines the threshold of a peak vertical velocity of 10.6 m/s to be appropriate.

PEAK VERTICAL VELOCITY

It should be noted that while staff previously used a threshold representing a plume's *average* vertical velocity (4.3 m/s), staff's new threshold of 10.6 m/s represents a plume's *peak* vertical velocity. The problem with using an average vertical velocity as a threshold is that it is an average across the entire plume and does not represent the worst-case velocity that could be encountered within the plume. The peak vertical velocity for a plume, which generally occurs toward the middle of the plume, can be up to twice the average vertical velocity at a particular altitude. Using staff's past analysis method as an example, at the altitude where the average vertical velocity was 4.3 m/s

across the entire plume, the peak velocity at that altitude could be twice that, at approximately 8.6 m/s toward the middle of the plume. Examining staff's new threshold as another example, at the altitude where the plume's peak vertical velocity would be 10.6 m/s, the average vertical velocity would be 5.3 m/s, slightly higher than the previously used threshold of 4.3 m/s average vertical velocity.

CONCLUSION

Based on review of the recent publications discussed above, staff will use 10.6 m/s peak vertical plume velocity as the new threshold. The altitude at which a plume would have a peak vertical velocity of 10.6 m/s would be the same altitude at which a plume would have an average vertical velocity of half that, 5.3 m/s.

REFERENCES

AGBM 2007 – Australian Government Bureau of Meteorology. Manual of Aviation Meteorology, Second Edition, dated 2007. Published by Airservices Australia.

CASA 2012 – Australian Government Civil Aviation Safety Authority, Advisory Circular AC 139-5(1), Plume Rise Assessments, November 2012, https://www.casa.gov.au/files/139c05pdf , accessed May 2016.

FAA 2006 – Federal Aviation Administration, Flight Procedures Standards Branch. Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes, dated January 2006. http://www.ctcombustion.com/oxc/sources/20-safetyriskanalysis.pdf , accessed September 2016.

TRB 2014 – Transportation Research Board of the National Academies, Airport Cooperative Research Program. ACRP Report 108, Guidebook for Energy Facilities Compatibility with Airports and Airspace, dated 2014. Sponsored by the Federal Aviation Administration. http://www.trb.org/Publications/Blurbs/170609.aspx , accessed September 2016.

APPENDIX TT-2
PLUME VELOCITY ANALYSIS

Testimony of Jacquelyn Record

INTRODUCTION

The following provides an assessment of the vertical thermal plume velocities for the Puente Power Project's (Puente) General Electric (GE) 7HA.01 combustion turbine generator (CTG) exhaust stack. Staff also evaluated the thermal plume velocities from the existing Mandalay Generating Station (MGS) Unit 3 simple-cycle CTG, and the nearby Southern California Edison McGrath simple-cycle CTG exhaust stacks. Staff completed calculations to determine the worst-case vertical plume velocities at different heights above the ground based on the applicant's proposed facility design and expected operations for Puente and applicant-recommended facility design and operating conditions for MGS Unit 3 and McGrath. The purpose of this appendix is to provide documentation of the Spillane approach method that staff has historically used to estimate worst-case vertical plume velocities to assist evaluation of the project's impacts on aviation safety in the vicinity of the proposed facility. **Traffic and Transportation Appendix TT-3** discusses the recent MITRE model developed for the Federal Aviation Administration and partially evaluates the Puente CTG using the newer model.

PROJECT DESCRIPTION

Puente is a proposed natural gas-fired, simple-cycle, air-cooled electrical generating facility that would have a single turbine with a nominal generating capacity of 262 megawatts (MW) and gross generating capacity of approximately 271 MW. The project would consist of one (1) natural gas-fired GE 7HA.01 CTG and related ancillary equipment proposed to be located on the existing MGS site. There are small ancillary air-coolers for this simple-cycle project which service lube oil cooling, gas compressor cooling, and generator cooling. This air-cooling system has a very small heat rejection load in comparison to the existing and proposed gas turbines, and would not have thermal plumes of a magnitude to affect aircraft safety.

The applicant would continue to operate MSG Unit 3, comprising eight simple-cycle units generating approximately 130 MW, with exhaust from four rectangular co-located stacks. Due to the proximity to the Puente project site, the neighboring McGrath 49-MW simple-cycle turbine is also included in this analysis.

PLUME VELOCITY CALCULATION METHOD

SPILLANE APPROACH

Staff uses a calculation approach from a technical paper (Best 2003) to estimate the worst-case plume vertical velocities for the three facility stacks (Puente, MGS Unit 3 and McGrath). The calculation approach, which is also known as the Spillane approach method, is limited to calm wind conditions, which are the worst-case wind conditions

which produce worst-case plume rise and velocities. The Spillane approach uses the following equations to determine vertical velocity for single stacks during these calm wind conditions (i.e. wind speed = 0):

(1) $(V*a)^3 = (V*a)_o^3 + 0.12*F_o*[(z-z_v)^2-(6.25D-z_v)^2]$
(2) $(V*a)_o = V_{exit}*D/2*(T_a/T_s)^{0.5}$
(3) $F_o = g*V_{exit}*D^2*(1-T_a/T_s)/4$
(4) $Z_v = 6.25D*[1-(T_a/T_s)^{0.5}]$

Where: V = vertical velocity (m/s), plume-average velocity
a = plume top-hat radius (m, increases at a linear rate of $a = 0.16*(z- z_v)$
F_o= initial stack buoyancy flux m^4/s^3
z = height above stack (m)
z_v= virtual source height (m)
V_{exit}= initial stack velocity (m/s)
D = stack diameter (m)
T_a= ambient temperature (K)
T_s= stack temperature (K)
g = acceleration of gravity (9.8 m/s^2)

Equation (1) is solved for V at any given height above the stack (and then added to stack height to obtain height above ground) that is above the momentum rise stage for single stacks (the height where z > 6.25D) and at the end of the plume merged stage for multiple plumes. The physical distances between the three different gas turbine exhaust stacks under consideration are great enough that the plumes are not expected to fully merge. However, partial merging may occur under some metrological conditions. Additionally, it is assumed that the four separate MGS Unit 3 exhaust plumes would be fully merged due to their proximity. These equations provide the plume diameter and plume-average velocity for the plume at various heights above ground; the peak plume velocity would be two times higher than the plume-average velocity predicted by these equations. The stack buoyancy flux (F_o) is a prominent part of Equation (1). The calm wind condition basis represents the worst-case conditions, and the vertical velocities will decrease substantially as wind speeds increase from calm conditions.

For multiple stack plumes, where the stacks are roughly equivalent, the multiple stack plume velocity during calm winds can be calculated in a simplified fashion. The approach is presented in the Best paper as follows:

(5) $V_m = V_{sp}*N^{0.25}$

Where: V_m = multiple stack combined plume vertical velocity (m/s)
V_{sp} = single plume vertical velocity (m/s), calculated using Equation (1)
N = number of stacks

This simplified multiple stack plume velocity calculation method predicts somewhat lower velocity values than the full Spillane approach methodology as given in data results presented in the Best paper (Best 2003).

SUMMARY

This appendix uses the Spillane approach method to be consistent with staff assessments done for other projects. The Spillane approach method is described in Federal Aviation Administration (FAA) materials as providing similar risk assessments for light aircraft compared to the MITRE model. Staff has also discussed the MITRE model developed for the FAA and evaluated the project's CTG using the MITRE model; see **Traffic and Transportation Appendix TT-3**.

EQUIPMENT DESIGN AND OPERATING PARAMETERS

GE 7HA.01 SIMPLE-CYCLE CTG DESIGN AND OPERATING PARAMETERS

The design and operating parameter data for the Puente CTG stack exhaust are provided in **Plume Velocity Analysis Table 1**. Staff chose three scenarios from the applicant-provided modeling inputs from Application for Certification (AFC) Appendix C-5, Table C-5.2. Operating parameters chosen were for ambient temperatures of 38.9, 59, and 82.0 degree Fahrenheit (ºF) at maximum turbine loads to compute worst-case vertical plume velocities. The exhaust operating parameters shown correspond to full load operation for the corresponding ambient conditions.

Plume Velocity Analysis Table 1
Puente GE 7HA.01 CTG Exhaust Parameters

Parameter				
Number of Stacks	1			
Stack Height	188 ft. (57.3 meters)			
Stack Diameter	22 ft. (6.71 meters)			
CTG Load (%)	100			
Ambient Temperature (°F)	38.9	59.0	82.0	
With Evaporative Cooling	No	No	Yes	No
Exhaust Temperature (°F)	900	900	900	900
Actual Cubic Feet per Minute (ACFM)	3,551,197	3,631,025	3,626,463	3,450,842
Exhaust Velocity (meter/second)	155.7 ft/s (47.46 m/s)	159.2 ft/s (48.52 m/s)	159.00 ft/s (48.46 m/s)	151.30 ft/s (46.12 m/s)
Exhaust Flow Rate (1000 lbs/hr)	6,181	6,322	6,314	6,008

Source: AFC Appendix C-5, Table C-5.2 (PPP 2015b)

MGS UNIT 3 SIMPLE-CYCLE DESIGN AND OPERATING PARAMETERS

The design and operating parameter data for MGS Unit 3 is provided in **Plume Velocity Analysis Table 2** and was provided by the applicant, with the exception of the exhaust flow rate. Staff noticed some of the operating parameters for MSG Unit 3 are internally inconsistent between the exhaust flow rate, the heat rejection, and the exhaust velocity which was submitted in DR Set 1 Table A-2-1 (PPP 2015c). Staff recalculated the

exhaust flow rate to be consistent with the applicant-provided exhaust velocity and temperature, with the staff-calculated value now shown in the table with an asterisk symbol (*) in the operating parameters as shown in **Plume Velocity Analysis Tables 2** and **3**.

Alternatively, if the heat rejection is accurate then the exhaust velocity should be around 30 percent less. Because the staff-computed exhaust velocity is higher, staff decided to use this larger value to be conservative and used an exhaust flow rate of 2,598,000 lbs per hour to correlate with an exhaust velocity of 49.98 m/s and temperature of 712 degrees Fahrenheit.

Plume Velocity Analysis Table 2
MGS Unit 3 Operating and Exhaust Parameters

Parameter	
Number of Stacks	4
Stack Height	54 ft. (16.46 meters)
Stack Equivalent Diameter	12.9 ft. (3.93 meters)
Ambient Temperature (°F)	59
Ambient Relative Humidity (%)	60
Number of Stacks in Operation	4
Heat Rejection (MW/hr)	102
Exhaust Temperature (°F)	712
Exhaust Velocity Per Stack	164 ft/s (49.98 m/s)
Exhaust Flow Rate (1000 lbs/hr)	2,598*

Source: DR Set 1 Table A-2-1 (PPP 2015c) and staff calculations.
*Value provided is staffs own calculation, and is different from what was provided in Applicants Data Responses to Set 1 (TN 205765) (PPP 2015c).

MCGRATH SIMPLE-CYCLE DESIGN AND OPERATING PARAMETERS

The design and operating parameter data for McGrath facility is provided in **Plume Velocity Analysis Table 3**. Because of the lack of available data specific to the McGrath simple-cycle gas turbine exhaust stack, the applicant recommends using operating parameters based on exhaust characteristics from a similar GE LM6000 gas turbine at the Almond 2 Power Plant Project.[2] Consistent with the staff computation for MSG Unit 3, staff computed the exhaust flow rate to be consistent with the exhaust velocity and temperature.

[2] Almond 2 Power Plant Project, AFC, Tables 5.1A-3 and 5.1B-2b, May 2009.

Plume Velocity Analysis Table 3
McGrath Operating and Exhaust Parameters

Parameter	
Number of Stacks	1
Stack Height	80 ft (24.4 meters)
Stack Diameter	12 ft (3.66 meters)
Ambient Temperature (°F)	59
Ambient Relative Humidity (%)	60
Heat Rejection (MW/hr)	63
Exhaust Temperature (°F)	850
Exhaust Velocity	99.0 ft/s (30.17 m/s)
Exhaust Flow Rate (1000 lbs/hr)	1,213*

Source: DR Set 1 Table A-2-2 (PPP 2015c) and staff calculations.
* Value provided is staffs own calculation, and is different from what was provided in Applicants Data Responses to Set 1 (TN 205765) (PPP 2015c).

PLUME VELOCITY CALCULATION RESULTS

Using the Spillane approach method, the plume average and peak vertical velocities at different heights above ground were determined by staff for calm conditions for Puente, MSG Unit 3 and McGrath. Staff evaluated the potential for plume merging using the following stack-to-stack distances: (1) the distance between Puente and MSG Unit 3 would be 268 meters, (2) the distance between Puente and McGrath would be 439 meters and (3) the distance between MSG Unit 3 and McGrath is 174 meters. Plumes begin merging when the radius of each of the two plumes added together equals the distance between the stacks. As a rule of thumb they are considered fully merged when the sum of the plume radii adds to equal twice the distance between stacks.

As shown in **Plume Velocity Analysis Tables 1**, **2** and **3**, the three stacks and associated plumes under consideration in this analysis differ greatly from one another. Staff concludes that they are sufficiently different that the simplified merging process used for Equation 5 cannot be used. The vertical velocity associated with Puente is expected to be greater than MSG Unit 3 and much greater than McGrath due to its higher heat release rate, and is expected to represent worst-case plume velocity conditions.

Staff first evaluated the vertical plumes for each of the three facilities assuming they are located far enough apart that the plumes would not merge (although the four stacks of Unit 3 are assumed to merge with one another). The results are shown in **Plume Velocity Analysis Tables 4**, **5** and **6**. Then staff examined the likelihood of the plumes merging, even though they result in much different vertical plumes.

Staff calculated plume average and peak vertical velocities for all four operating cases shown in **Plume Velocity Analysis Table 1** for the Puente stack and determined the worst-case predicted plume velocities occurred at 100 percent load without duct firing

for the 38.9 ºF ambient temperature condition. Staff's calculated plume peak velocity values are provided in **Plume Velocity Analysis Table 4**.

Plume Velocity Analysis Table 4
Puente Worst-Case Predicted Plume Average/Peak Velocities (m/s)[a,c]

Height Above Ground (ft.)[b]	Plume Diameter (m)	Average Velocity (m/s)	Peak Velocity (m/s)
300	5.63	32.42	64.84
400	15.39	15.07	30.14
500	25.14	11.59	23.18
600	34.90	10.04	20.07
700	44.65	9.10	18.20
800	54.40	8.45	16.90
900	64.16	7.96	15.91
1000	73.91	7.57	15.13
1100	83.66	7.24	14.49
1200	93.42	6.97	13.94
1300	103.17	6.74	13.47
1400	112.92	6.53	13.06
1500	122.68	6.35	12.70
1600	132.43	6.19	12.37
1700	142.19	6.04	12.08
1800	151.94	5.91	11.81
1900	161.69	5.78	11.57
2000	171.45	5.67	11.34
2100	171.45	5.57	11.13
2200	181.20	5.47	10.94
2300	190.95	5.38	10.75
2400	200.71	5.29	10.58
2500	210.46	5.21	10.42
2600	220.22	5.14	10.27
2700	229.97	5.07	10.13
2800	239.72	5.00	10.00
2900	249.48	4.93	9.87
3000	259.23	4.87	9.75

Source: Staff calculations.
Notes:
a. The Traffic and Transportation section of this document describes a plume average vertical velocity of 5.3 m/s, which is equivalent to a peak vertical velocity of 10.6 m/s, to be the critical velocity of concern to light aircraft. 1 m/s is equal to 3.28 ft/s, therefore 10.6 m/s is equal to 34.8 ft/s.
b. FAA regulations state that an aircraft may not be operated below an altitude of 1,000 feet above the highest obstacle when flying over congested areas. 1 foot is equal to 0.3048 meters, therefore, 1,000 feet is equal to 304.8 meters.
c. 100 Percent Load at 38.9°F Ambient Temperature

Staff calculated plume peak vertical velocities for the operating cases shown in **Plume Velocity Analysis Table 2** for the four MSG Unit 3 stacks and determined the worst-case predicted plume velocities occurred at a 59 ºF ambient temperature condition. Staff assumed all four stacks of MGS Unit 3 combined to determine the value for Plume Equivalent Diameter and Velocity shown in the table. Staff's calculated plume peak velocity values are provided in **Plume Velocity Analysis Table 5**.

Plume Velocity Analysis Table 5
MGS Unit 3 Worst-Case Predicted Plume Average/Peak Velocities (m/s)[a, c]

Height Above Ground (ft.)[b]	Plume Diameter (m)	Average Velocity (m/s)	Peak Velocity (m/s)
300	21.36	12.35	24.69
400	31.12	10.27	20.55
500	40.87	9.15	18.31
600	50.62	8.42	16.83
700	60.38	7.88	15.76
800	70.13	7.46	14.92
900	79.88	7.12	14.25
1,000	89.64	6.84	13.68
1,100	99.39	6.60	13.20
1,200	109.15	6.39	12.78
1,300	118.90	6.20	12.41
1,400	128.65	6.04	12.08
1,500	138.41	5.89	11.78
1,600	148.16	5.76	11.51
1,700	157.91	5.63	11.27
1,800	167.67	5.52	11.04
1,900	177.42	5.42	10.83
2000	187.18	5.32	10.64
2010	188.15	5.31	10.62
2020	189.13	5.30	10.60
2030	190.10	5.29	10.58
2040	191.08	5.28	10.56
2050	192.05	5.27	10.55
2060	193.03	5.26	10.53
2070	194.00	5.26	10.51
2080	194.98	5.25	10.49
2090	195.95	5.24	10.48
2100	196.93	5.23	10.46

Source: Staff calculations.
Notes:
a. The Traffic and Transportation section of this document describes a plume average vertical velocity of 5.3 m/s, which is equivalent to a peak vertical velocity of 10.6 m/s, to be the critical velocity of concern to light aircraft. 1 m/s is equal to 3.28 ft/s, therefore 10.6 m/s is equal to 34.8 ft/s.
b. FAA regulations state that an aircraft may not be operated below an altitude of 1,000 feet above the highest obstacle when flying over congested areas. 1 foot is equal to 0.3048 meters, therefore, 1,000 feet is equal to 304.8meters.
c. 100 Percent Load at 59°F Ambient Temperature

Staff calculated plume average and peak vertical velocities for the operating cases shown in **Plume Velocity Analysis Table 3** for the McGrath stack and determined the

worst-case predicted plume velocities occurred at a 59 ºF ambient temperature condition. Staff's calculated plume average and peak velocity values are provided in **Plume Velocity Analysis Table 6**.

Plume Velocity Analysis Table 6
McGrath Worst-Case Predicted Plume Average/Peak Velocities (m/s)[a, c]

Height Above Ground (ft)[b]	Plume Diameter (m)	Average Velocity (m/s)	Peak Velocity (m/s)
300	18.75	6.92	13.85
400	28.50	5.91	11.81
500	38.25	5.32	10.64
600	48.01	4.91	9.83
700	57.76	4.61	9.23
800	67.52	4.37	8.75
900	77.27	4.18	8.36
1000	87.02	4.02	8.03
1100	96.78	3.87	7.75
1200	106.53	3.75	7.50
1300	116.28	3.64	7.29
1400	126.04	3.55	7.09
1500	135.79	3.46	6.92
1600	145.54	3.38	6.76
1700	155.30	3.31	6.61
1800	165.05	3.24	6.48
1900	174.81	3.18	6.36
2000	184.56	3.12	6.24

Source: Staff calculations.
Notes:

a. The Traffic and Transportation section of this document describes a plume average vertical velocity of 5.3 m/s, which is equivalent to a peak vertical velocity of 10.6 m/s, to be the critical velocity of concern to light aircraft. 1 m/s is equal to 3.28 ft/s, therefore 10.6 m/s is equal to 34.8 ft/s.
b. FAA regulations state that an aircraft may not be operated below an altitude of 1,000 feet above the highest obstacle when flying over congested areas. 1 foot is equal to 0.3048 meters, therefore, 1,000 feet is equal to 304.8 meters.
c. 100 Percent Load at 59 °F Ambient Temperature

The velocity values listed above in **Plume Velocity Analysis Table 4**, **5** and **6** are plume average velocities along with peak vertical velocities across the area of the plume. The maximum plume velocity, based on a normal Gaussian distribution, is two times the plume average velocities.

As explained in the **Traffic and Transportation** section of this document, a plume average vertical velocity of 5.3 m/s (peak velocity of 10.6 m/s) has been determined by staff to be the threshold for potentially significant impacts to aviation. FAA regulations state that an aircraft may not be operated below an altitude of 500 feet when flying over non-congested areas, or below 1,000 feet above the highest obstacle when flying over congested areas (14 C.F.R., § 91.119). As shown in **Plume Velocity Analysis Tables 4**, **5** and **6**, the Puente, MSG Unit 3, and McGrath average vertical velocities at 500 feet above ground are estimated to be 11.59, 9.15, and 5.32 m/s, respectively; and at 1,000 feet above ground are estimated to be 7.57, 6.84 and 4.02 m/s, respectively.

The Puente exhaust plume's average vertical velocity is calculated to drop below 5.3 m/s (peak velocity of 10.6 m/s) at a height of approximately 2,375 feet. The MSG Unit 3 exhaust plume's average vertical velocity is calculated to drop below average velocity of 5.3 m/s (peak velocity of 10.6 m/s) at a height of approximately 2,020 feet. The McGrath exhaust plume's average vertical velocity is calculated to drop below 5.3 m/s (peak velocity of 10.6 m/s) at a height of approximately 500 feet. As can be seen, the heights where the thermal plumes are considered no longer a hazard to light aircraft varies considerably from plume-to-plume. However, these results were obtained by assuming the plumes would not begin to merge before reaching these heights. Plume merging potential is discussed below.

MERGING OF SEPARATE PLUMES WITH DIFFERENT CHARACTERISTICS

When the sum of the radius of one plume and an adjacent plume equals the distance between the two stacks, the plumes would begin to merge and there would be less plume surface area to entrain ambient air into the plume. As a result, the vertical velocity would be expected to decrease more slowly than fully unmerged plumes and the height at which the vertical velocity would decrease below the critical plume-average or peak vertical velocity would occur at a higher height than if the plumes did not merge.

In order to determine if a partially merging or fully merging plume would occur between the separate stack plumes evaluated in **Plume Velocity Analysis Tables 4**, **5** and **6**, staff needed to first determine how far apart the other two stacks are compared to Puente's stack. The separation between the Puente stack and the four MSG Unit 3 stacks would be approximately 268 meters and the separation between the Puente stack and the McGrath stack would be approximately 439 meters. The plumes would begin to merge when the sum of the plume radii equals the distance between the stacks. The plumes would be assumed to be fully merged when the sum of the plume radii equals twice the distance between stacks. Although worst-case ambient temperature conditions for Puente differ from MSG Unit 3 and McGrath, for purposes of evaluating plume merging potential they are assumed to occur concurrently.

The Puente plume would begin to merge with the MSG Unit 3 plume at around 2,800 feet above ground level and would not be fully merged until about 5,625 feet above ground level. Likewise, the Puente plume would begin to merge with McGrath at around 4,625 feet above ground level and would not be fully merged until about 9,250 feet above ground level. The likelihood of having calm wind conditions at these heights at a California coastal location, combined with operation of a simple-cycle peaking turbine, is very low. Also, for the most part the merging would occur at heights where the vertical plume velocity is below the average velocity of 5.3 m/s and an equivalent peak velocity of 10.6 m/s significance threshold. However, partial plume merging could somewhat increase the heights above ground where the vertical velocity reduces to below 5.3 m/s.

WIND SPEED STATISTICS

Since the Spillane approach method used by staff is limited to calm wind conditions, the frequency of occurrence of calm wind conditions needs to be evaluated for the project site area. However, calm wind statistics data is not needed as input for the plume modeling itself. The meteorological monitoring station closest to the proposed site is the Oxnard Airport monitoring station, which is approximately 2 miles east of the proposed Puente site. There are no substantial complex terrain features between the monitoring station and the proposed project site; therefore, meteorological data collected at the Oxnard Airport monitoring station are considered to be representative of the project site.

Wind speed data collected at a height of approximately 45 feet above ground are used to represent the region affected by the stack's plume from the ground level. For this project, the plume's height extends at least 2,375 feet above ground level, which is over 52 times higher than the ground-based calm wind measurement.

Plume Velocity Analysis Table 7 provides the hourly average wind speed statistics for Puente from meteorological data collected from Oxnard Airport monitoring station. Wind roses and wind frequency distribution data was collected for 2009 through 2013. Calm winds for the purposes of the reported monitoring station statistics are those hours with average wind speeds below 0.5 m/s. The data shows that calm winds occurred 2.7 percent of the time and the average wind speed was 3.24 m/s. Wind speeds greater than or equal to 2.1 m/s occurred 32.7 percent of the time (PPP 2015a). Calm/low wind speeds conditions averaging an hour or longer appear to be infrequent in the site area. The Spillane approach method assumes calm winds, which would allow buoyant thermal plumes to have a worst-case average plume velocity as shown in **Plume Velocity Analysis Table 4** through **Plume Velocity Analysis Table 6**. The calm wind condition basis represents the worst-case conditions, and is considered to be conservative; the vertical velocities will decrease substantially as wind speeds increase from calm conditions.

Plume Velocity Analysis Table 7
Wind Speed Statistics for Oxnard Airport

Wind Speed Statistics	
Wind Speed	Percent
Calm	2.72%
≤ 2.1 m/s	32.7%
≤ 3.6 m/s	28.7%
≤ 5.7 m/s	23.4%
≤ 8.8 m/s	9.5%
≥ 8.8 m/s	2.5%

Source: Staff data reduction of Oxnard Airport monitoring site meteorological data from 2009-2013.

CONCLUSIONS

The calculated worst case calm wind condition vertical plume average velocities from Puente and MSG Unit 3 are predicted to exceed an average velocity of 5.3 m/s (peak velocity of 10.6 m/s) at heights at or above 1,000 feet above ground level, while for McGrath they are estimated to be below 1,000 feet above ground level. Specifically, for Puente's plume, this critical threshold is expected to be exceeded up to 2,375 feet above ground level and MSG Unit 3's plume is expected to exceed the critical threshold up to 2,020 feet above ground level. Lastly, McGrath's plume is expected to exceed the critical threshold up to 500 feet above ground level.

The vertical velocities from the stack exhausts at given heights above ground decrease as wind speeds increase. The plume average and peak vertical velocities for the Puente and MSG Unit 3 would remain relatively high during calm or very low wind speed conditions. These low wind speed conditions lasting an hour or more occur 2.72 percent of the time. Additionally, shorter periods of dead calm winds, lasting long enough to increase the vertical plume velocities to heights up to peak heights, can also occur during hours with low average wind speeds.

The likelihood of having completely calm wind conditions at these heights at a coastal California location, combined with the time when a simple-cycle turbine might be required to operate, is very low. Thus, the plume vertical velocities shown in **Plume Velocity Analysis Tables 4**, **5** and **6** are considered to represent a conservative analysis of potential aircraft safety risk. However, partially merged plumes could increase these heights somewhat. Unfortunately, the Spillane approach method used by staff cannot be used to evaluate merging of the three plumes that would be located at this site because the plumes are too diverse.

Puente is designed as a simple-cycle, peaking turbine facility. It is proposed to be limited to operate no more than 2,453 hours per year. Actual operation is likely to be considerably less, perhaps no more than 500 to 1,000 hours per year depending on electricity system demand. The ambient conditions used in this analysis represents the average ambient temperature cases at peak turbine load, which is considered a reasonably conservative worst case for this peaking project that is expected to primarily operate during the summer. The reader should refer to the **Traffic and Transportation** section of this document for a discussion of impacts to aviation safety related to the vertical velocity results presented in this analysis.

REFERENCES

Best, P. et al. 2003. Aviation Safety and Buoyant Plumes. Presented at the Clean Air Conference, Newcastle, New South Wales, Australia. By Peter Best, Lena Jackson, Mark Kanowski of Katestone Environmental, Toowong, Queensland, Australia and Kevin Spillane of Bendigo, Victoria, Australia.

CASA 2012 – Australian Civil Aviation Safety Authority (CASA) advisory circular AC 139-5(1) dated November 2012, (https://www.casa.gov.au/files/139c05pdf)

FAA 2015 – Federal Aviation Administration Memorandum – Technical Guidance and Assessment Tool for Evaluation of Thermal Plume Impact on Airport Operations (September 24, 2015).

MITRE 2012 – Expanded Model for Determining the Effects of Vertical Plumes on Aviation Safety, Gouldley, Hopper and Schwalbe, MITRE Product MP 120461, September 2012.

MITRE 2015 – Exhaust Plume Analyzer. Model build date January 28, 2015.

MITRE 2015a – Center for Advanced Aviation System Development [http://www.mitre.org/centers/center-for-advanced-aviation-system-development/who-we-are], website accessed 11-17-15.

MITRE 2015b – Email from Ryan Huleatt (MITRE Corporation) to Jacquelyn Record (Energy Commission staff), October 28, 2015.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015b – Latham & Watkins LLP/Paul Kihm (TN 205765). Responses to CEC Data Requests Set 1 (1-47), Dated August 2015. Submitted to CEC/Docket Unit on August 17, 2015.

APPENDIX TT-3
PLUME VELOCITY ANALYSIS – MITRE MODEL

Testimony of Jacquelyn Record

INTRODUCTION

Comments received from the County of Ventura, Department of Airports (VC 2016c) on the Preliminary Staff Assessment (PSA) requested staff to run the Exhaust Plume Analyzer model developed by MITRE Corporation ("MITRE model") to evaluate the thermal plume that would be emitted from the Puente Power Project (Puente or project). This appendix in the Final Staff Assessment (FSA) discusses the strengths and weaknesses of the MITRE model and applies it to evaluate Puente's main plume. Results include graphical representations of the MITRE model output. This appendix will show results only for Puente's combustion turbine generator (CTG) stack.

PROJECT DESCRIPTION

Puente is a proposed natural gas-fired, modern, rapid-response, simple-cycle combustion turbine, air-cooled electrical generating facility that would have a single turbine with a nominal generating capacity of 262 megawatts (MW) and gross generating capacity of approximately 271 MW. The project would consist of one (1) natural gas-fired GE 7HA.01 CTG, and related ancillary equipment proposed to be located on the existing MGS site. There are small ancillary inlet air-coolers for this project which service lube-oil cooling, gas-compressor cooling, and generator cooling. This inlet air-cooling system has a very small heat rejection load in comparison to the existing and proposed gas turbines, and would not have thermal plumes of a magnitude to affect aircraft safety.

MITRE EXHAUST PLUME ANALYZER

On September 24, 2015, the Federal Aviation Administration (FAA) released a guidance memorandum (FAA 2015) recommending that thermal plumes be evaluated for air traffic safety. FAA determined that the overall risk associated with thermal plumes in causing a disruption of flight is low. However, it determined that such plumes in the vicinity of airports may pose a unique hazard to aircraft in critical phases of flight (such as take-off and landing). In this memorandum a new computer model, different than the analysis technique used by staff and identified in **Appendix TT-1** as the Spillane approach, is used to evaluate vertical plumes for hazards to light aircraft. It was prepared under FAA funding and available for use in evaluating exhaust plume impacts.

This new model, the MITRE Corporation's Exhaust Plume Analyzer (MITRE 2012), was identified by the FAA as a potentially effective tool to assess the impact that exhaust plumes may impose on flight operations in the vicinity of airports (FAA 2015). The MITRE model was developed to evaluate aviation risks from large thermal stacks, such as turbine exhaust stacks. The model provides output in the form of graphical risk probability isopleths ranging from 10^{-2} to 10^{-7} risk probabilities for both severe turbulence and upset for four different aircraft sizes. However, at this time the MITRE

model cannot be used to provide reasonable risk predictions on other types of thermal plume sources such as variable exhaust temperature thermal plume sources, including cooling towers and air-cooled condensers. Furthermore, the MITRE model can only be used on a single set of inputs of stack parameters, such as the stack height, diameter, exit velocity, and exit temperature. Therefore, the model does not allow a cumulative analysis of other stacks that are close by. The Puente CTG, McGrath, and MGS Unit 3 stacks would each need to be run separately. Staff used the worst case results obtained from the Spillane approach to screen for the worst case, and the Puente CTG stack resulted in the highest values of significant height. Due to the current limitations of the MITRE model, the purpose of the analysis in this appendix is to compare significant height results obtained from the MITRE model to the results obtained from the Spillane approach. Therefore, staff only ran the MITRE model for the Puente CTG. These results can be seen below. Staff will consider using the MITRE model to analyze future projects once the model is expanded to increase its applicability.

The FAA has not provided guidance on how to evaluate the risk probability isopleth output of the MITRE model, but states in their memorandum that they intend to update their guidance on near-airport land use, including evaluation of thermal exhaust plumes, in fiscal year 2016. However, MITRE Corporation is suggesting that a probability of severe turbulence at an occurrence level of greater than 1×10^{-7} (they call this a Target Safety Level) should be considered potentially significant. This is equivalent to one occurrence of severe aircraft turbulence in 10 million flights. For the past 50 years, the MITRE Corporation has provided air-traffic safety guidance to FAA, and the recommended Target Safety Level is based on this experience (MITRE 2015a).

The MITRE model provides output to predict the probability of aircraft upset from plumes up to a maximum height of 3,500 feet above ground. However, the meteorological data used by the model is limited to a maximum height of 3,000 feet and the portion of the output above 3,000 feet reuses the 3,000 foot meteorological data. While it is possible to extend the vertical axis for the output plot, the MITRE Corporation has stated, “they cannot recommend doing so for this particular analysis [Puente]” (MITRE 2015b).

The applicant’s proposed use of a large frame CTG as a simple-cycle turbine is an unusual case, with high exit velocities and high exit temperatures; the MITRE model was not designed with this uncommon use of a large frame CTG in a simple-cycle configuration. The model was developed with the assumption that a plume would not rise higher than 3,000-3,500 feet above ground level, so the modeling output was terminated at that height[3]. The effort to expand the data set and model to work properly at altitudes above 3,000 feet above ground level is such that the MITRE Corporation would need additional funding.

The MITRE model uses site specific computer-generated, three-dimensional meteorological data (atmospheric temperature and wind speed, varying with height

[3] This recommendation seems to be based on MITRE’s worst case exhaust assumptions that are similar to the exhaust conditions of a GE LM6000 gas turbine (like McGrath’s gas turbine) operating in simple-cycle mode.

above ground at the specific site location) combined with a series of aircraft airframe types to determine levels of turbulence and the resulting risk of upset effects on the various aircraft types. The data sources used to create the site-specific meteorological data are from the National Oceanic and Atmospheric Administration's National Weather Service (NWS). These computer-generated data are averaged over 13-kilometer horizontal grid cells using a model covering the continental United States. The specific NWS measuring stations that provide this data were not identified in the model documentation. The model uses three years of the computer-generated site-specific hourly meteorological data to perform these calculations (MITRE, 2012).

Staff conducted a preliminary evaluation of Puente's gas turbine stack using the MITRE model. Results for four types of aircraft airframes are reported below for severe turbulence and the probability of an aircraft being affected by that turbulence. The MITRE Corporation recommends: " …. *using a probability of occurrence of* 10^{-7} *as a Target Level of Safety (TLS) where, during these weather conditions, it is recommended that procedures are adjusted or the landing runway is changed if necessary to avoid this hazardous airspace."* They also state that *"… with some further study the TLS of* 1×10^{-7} *could be reassessed."*

The results for the most vulnerable types of aircraft (light sport aircraft and light general aviation) were well above 3,000 feet above ground, outside the recommended output range of the model and above the 3,500 foot level provided as the highest extent in the model's graphical output files. At this time, staff does not believe the MITRE model should be used for final work products until the vertical axis is extended, the significance threshold is verified by the FAA or local aviation representatives, and the model capabilities are enhanced to include other thermal plume sources such as cooling towers and air-cooled condensers.

EQUIPMENT DESIGN AND OPERATING PARAMETERS

GE 7HA.01 CTG DESIGN AND OPERATING PARAMETERS

The stack input data for the CTG stack exhaust are provided in **Appendix TT-3, Table 1**. Staff used data from the applicant-provided modeling inputs from Application for Certification (AFC) Appendix C-5, Table C-5.2.

Appendix TT-3, Table 1
MITRE Model Stack Inputs

	Input Value	Units
Stack Height	188	ft
Stack Diameter	22	ft
Initial Release Velocity	159.2	ft/s
Initial Release Temperature	900	°F
Number of Stacks	1	stack

The weather/metrological data which was used as part of the MITRE model runs was from a monitoring station at latitude 34.208 longitude -119.252 for January 1, 2011 thru December 30, 2013.

The MITRE model incorporates several factors at a site; these factors taken into account are described below:

- Stack size, number, and height; type of exhaust or effluent;
- Proximity of stacks to the airport flight paths;
- Temperature and vertical speed of the effluent;
- Size and speed of aircraft encountering exhaust plumes; and
- Local winds, ambient temperatures, stratification of the atmosphere at the plume site.

MITRE MODEL RESULTS

As explained above, the MITRE model provides output in the form of graphical risk probability isopleths ranging from 10^{-2} to 10^{-7} risk probabilities for both “severe turbulence” and “upset” for four different aircraft four types: (1) Light-Sport aircraft, (2) Light General Aviation (GA) aircraft, (3) Business Jets, and (4) Narrow-Body Jets. This appendix includes results for the Severe Turbulence scenario for each aircraft type. MITRE does not provide output in terms of vertical velocity, which is the metric produced by the Spillane Approach that staff normally uses; it provides frequency of severe turbulence or upset above and downwind from the stack as a function of meteorological conditions at the site. The MITRE model impacts are based on each individual airframe sizes and how the vertical gusts impact each airframe based on their area/size and weight, where the model evaluates the frequency for vertical gusts from

the plume to cause each impact or frequency level. Results are visually depicted in the figures below.

Staff notes that the meteorological data used by the MITRE model is limited to a maximum height of 3,000 feet above ground level (AGL) and metrological data and associated risk probabilities above that level are extrapolated from data for the 3,000 AGL throughout this appendix.

LIGHT-SPORT AIRCRAFT[4]

For light-sport aircraft, the MITRE model provides output data to predict plumes up to the threshold of significance of 10^{-4}, as shown in **Appendix TT-3, Figure 1** and **Appendix TT-3, Table 2**. However, staff was unable to determine the heights for 10^{-5}, 10^{-6}, and 10^{-7} risk probabilities due to the maximum height of the Exhaust-Plume analyzer's graphical results which has a height limit 3,500 feet AGL.

For a risk probability of 10^{-2} a light-sport aircraft could experience severe turbulence at a height of 1,750 feet AGL. For a risk probability of 10^{-3}, a light-sport aircraft could experience severe turbulence at a height of around 2,500 feet AGL. Lastly, for a risk probability of 10^{-4}, a light-sport aircraft could experience severe turbulence at a height of around 3,400 feet AGL.

LIGHT GENERAL AVIATION (GA) AIRCRAFT[5]

For light general aviation (GA) aircraft, the MITRE model provides output data to predict plumes up to the threshold of significance of 10^{-5}, as shown in **Appendix TT-3, Figure 2** and **Appendix TT-3, Table 3**. However, similar to the results for light-sport aircraft, staff was unable to determine the heights for 10^{-6}, and 10^{-7} risk probabilities due to the maximum height of the Exhaust-Plume analyzer's graphical depiction of frequency of severe turbulence results which has a maximum of 3,500 feet AGL.

For a risk probability of 10^{-2} a light-GA aircraft could experience severe turbulence at around 1,300 feet AGL. For a risk probability of 10^{-3}, a light-GA aircraft could experience severe turbulence at a height of around 1,750 feet AGL. For a risk probability of 10^{-4}, a light-GA aircraft could experience severe turbulence at a height of around 2,350 feet AGL. Lastly, for a risk probability of 10^{-5}, a light-GA aircraft could experience severe turbulence at around 3,100 feet AGL.

[4] Light-Sport – This uses parameters provided in the Pilot's Operating Handbook for the Cessna 162 (as cited in S. Gudmundsson, 2013), with lift curve slope estimated using methods in Gudmundsson's book (as cited in Cessna, October 2011). Note that the probability of reaching aircraft upset cannot be calculated for the Light-Sport aircraft since the Rolling Moment of Inertia could not be found in literature or derived (MITRE 2014).

[5] Light GA – This uses parameters provided for the North American Navion GA aircraft found in Schmidt (as cited in L.V. Schmidt, 1998) (MITRE 2014)

BUSINESS JETS[6]

For Business Jets, the MITRE model provides output data to predict plumes up to the threshold of significance of 10^{-7}, as shown in **Appendix TT-3, Figure 3** and **Appendix TT-3, Table 4**.

For a risk probability of 10^{-2} a business jet aircraft could experience severe turbulence at around 1,000 feet AGL. For a risk probability of 10^{-3}, a business jet aircraft could experience severe turbulence at around 1,350 feet AGL. For a risk probability of 10^{-4}, a business jet aircraft could experience severe turbulence around 1,700 feet AGL. For a risk probability of 10^{-5}, a business jet aircraft could experience severe turbulence at a height of around 2,150 feet AGL. For a risk probability of 10^{-6}, a business jet aircraft could experience severe turbulence at a height of around 2,600 feet AGL. Lastly, for a risk probability of 10^{-7}, a business jet aircraft could experience severe turbulence around 3,200 feet AGL.

NARROW-BODY JETS[7]

For narrow-body jets, the MITRE model provides output data to predict plumes up to the threshold of significance of 10^{-7}, as shown in **Appendix TT-3, Figure 4** and **Appendix TT-3, Table 5**.

For a risk probability of 10^{-2} a narrow-body jet could experience severe turbulence at around 550 feet AGL. For a risk probability of 10^{-3}, a narrow-body jet could experience severe turbulence at a height of around 775 feet AGL. For a risk probability of 10^{-4}, a narrow-body jet could experience severe turbulence around 925 feet AGL. For a risk probability of 10^{-5}, a narrow-body jet could experience severe turbulence at a height AGL of around 1,075 feet. For a risk probability of 10^{-6}, a narrow-body jet could experience severe turbulence at a height AGL of around 1,300 feet. Lastly, for a risk probability of 10^{-7}, a narrow-body jet could experience severe turbulence around 1,500 feet AGL.

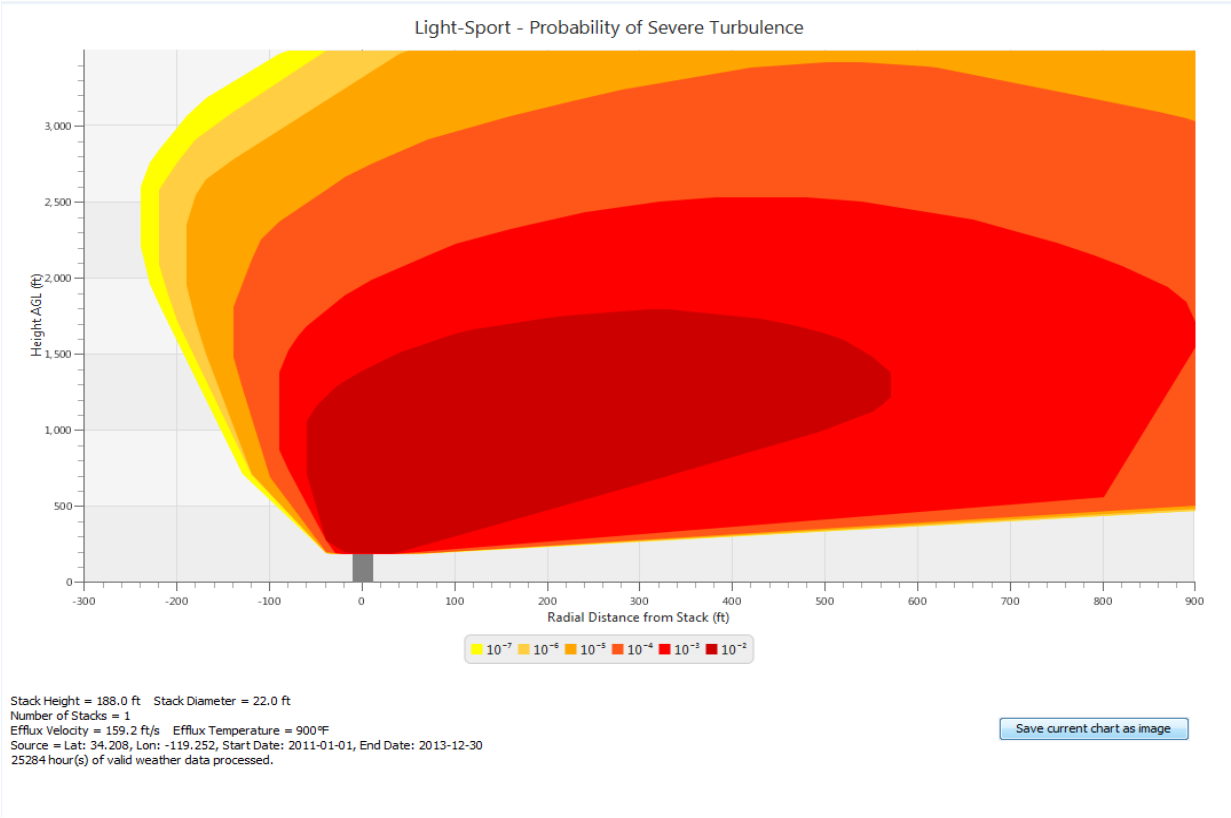
MITRE MODEL RESULT SUMMARY

Appendix TT-3, Table 6 compares risk probabilities for each aircraft type evaluated. It shows that Light Sport aircraft are the most susceptible for upset conditions, followed by light General Aviation aircraft. Business Jets and Narrow-Body Jets are less likely to be affected by Puente's thermal plume. For a risk probability of 10^{-7}, only the Business and Narrow Body Jets could be determined using the MITRE model approach to give an associated height of 3,200 ft, and 1,500 ft, respectively. For further discussion on the interpretation of the results, please see the **Traffic and Transportation** section of this FSA.

[6] Business Jet – This uses parameters provided for the Lockheed Jetstar aircraft found in Schmidt (as cited in L.V. Schmidt, 1998) (MITRE 2014).

[7] Narrow-Body Jet – This uses parameters provided for the Convair CV-880M aircraft found in Schmidt (as cited in L.V. Schmidt, 1998) (MITRE 2014).

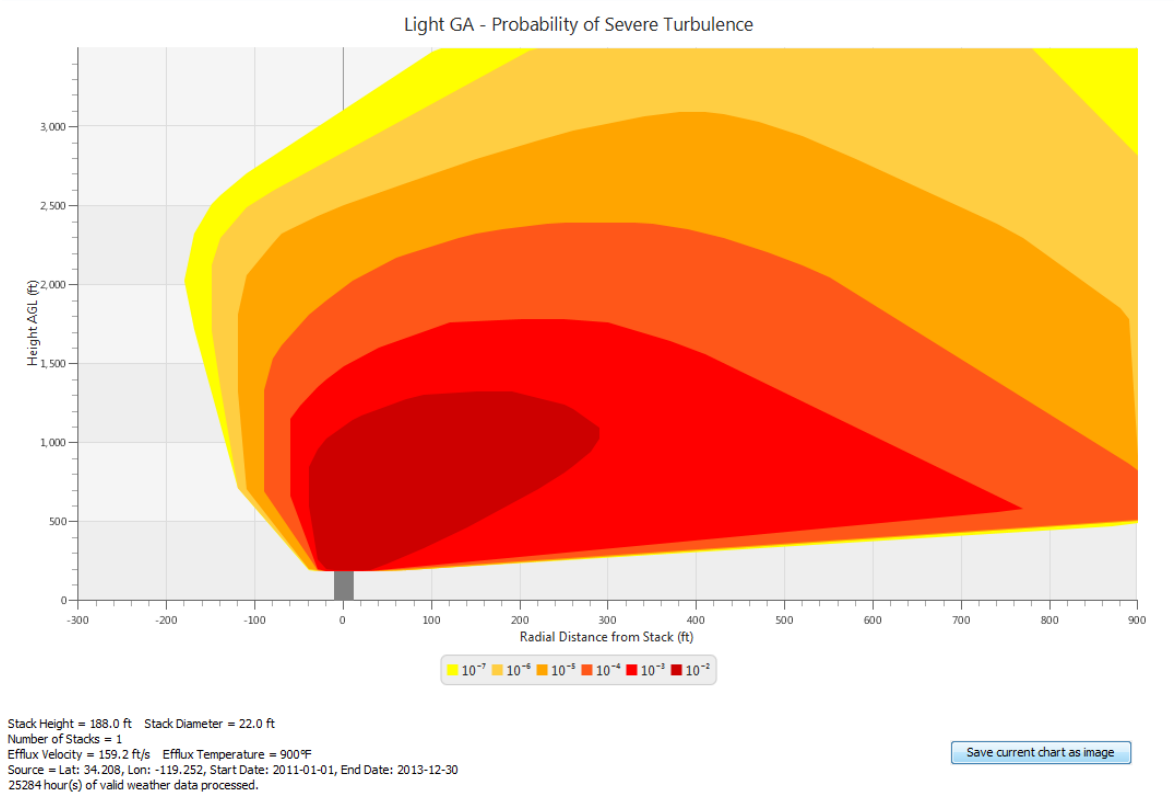
Appendix TT-3, Figure 1
MITRE Model Results
Risk Probability of Severe Turbulence for Light-Sport Aircraft



Appendix TT-3, Table 2
MITRE Model Results
Height of Risk Probability Estimated for Light-Sport Aircraft

Risk Probabilities	Estimate Height AGL (ft)
10^{-7}	Unable to Determine
10^{-6}	Unable to Determine
10^{-5}	Unable to Determine
10^{-4}	3,400
10^{-3}	2,500
10^{-2}	1,750

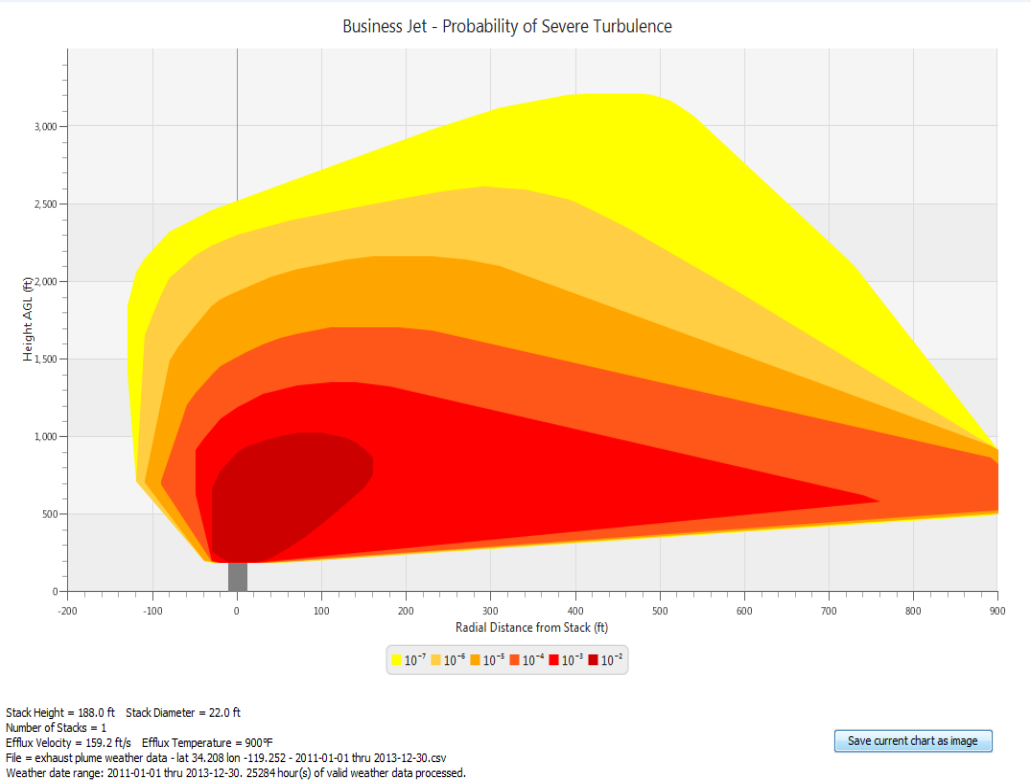
Appendix TT-3, Figure 2
MITRE Model Results
Risk Probability of Severe Turbulence for Light GA Aircraft



Appendix TT-3, Table 3
MITRE Model Results
Risk Height Estimate for Light-GA

Risk Probabilities	Estimate Height AGL (ft)
10^{-7}	Unable to Determine
10^{-6}	Unable to Determine
10^{-5}	3,100
10^{-4}	2,350
10^{-3}	1,750
10^{-2}	1,300

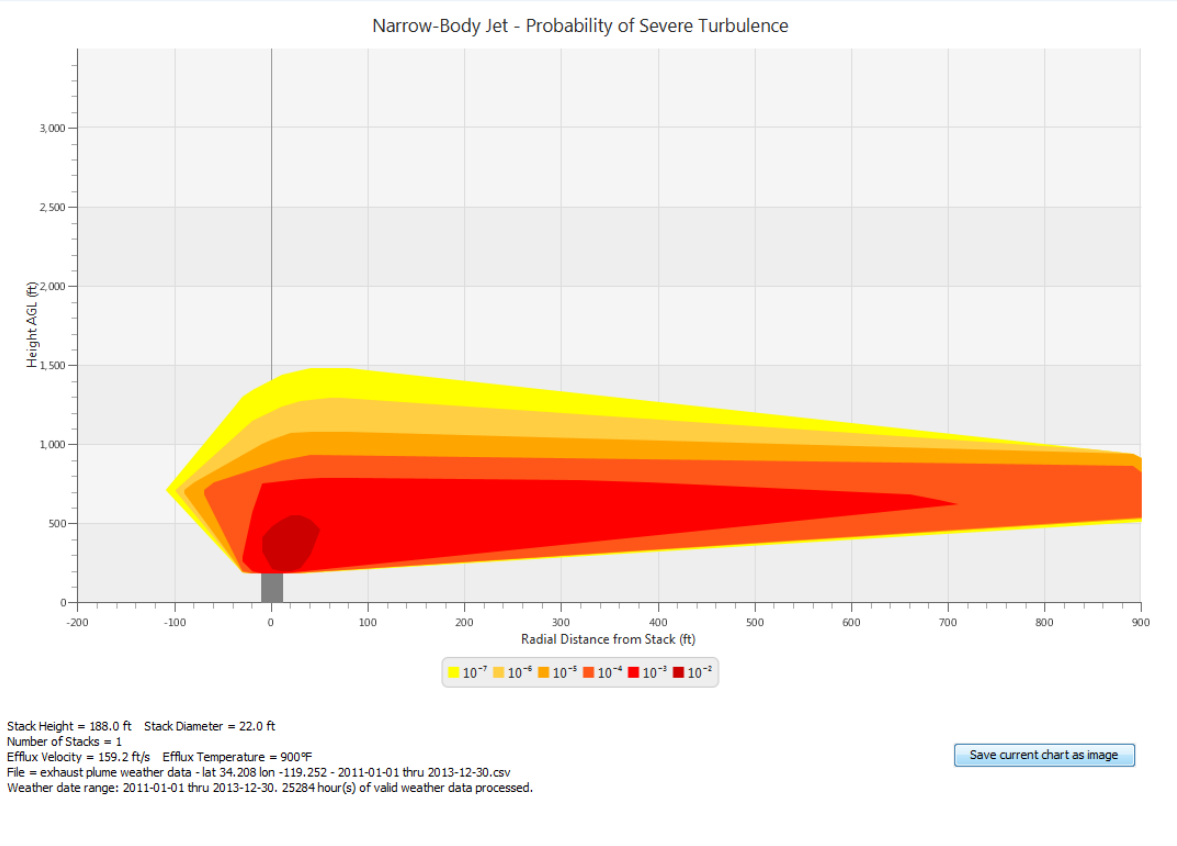
Appendix TT-3, Figure 3
MITRE Model Results
Risk Probability of Severe Turbulence for Business Jets



Appendix TT-3, Table 4
MITRE Model Results
Risk Height Estimate for Business Jets

Risk Probabilities	Estimate Height AGL (ft)
10^{-7}	3,200
10^{-6}	2,600
10^{-5}	2,150
10^{-4}	1,700
10^{-3}	1,350
10^{-2}	1,000

Appendix TT-3, Figure 4
MITRE Model Results
Risk Probability of Severe Turbulence for Narrow-Body Jets



Appendix TT-3, Table 5
MITRE Model Results
Risk Height Estimate for Narrow-Body Jets

Risk Probabilities	Estimate Height AGL (ft)
10^{-7}	1,500
10^{-6}	1,300
10^{-5}	1,075
10^{-4}	925
10^{-3}	775
10^{-2}	550

Appendix TT-3, Table 6
MITRE Model Results
Risk Height Estimates for Each Aircraft Type

Risk Probability	Light Sport Aircraft	Light GA Aircraft	Business Jets	Narrow-Body Jets
10^{-7}	Unable to Determine	Unable to Determine	3,200	1,500
10^{-6}	Unable to Determine	Unable to Determine	2,600	1,300
10^{-5}	Unable to Determine	3,100	2,150	1,075
10^{-4}	3,400	2,350	1,700	925
10^{-3}	2,500	1,750	1,350	775
10^{-2}	1,750	1,300	1,000	550

REFERENCES

Cessna, October 2011, “Pilot’s Operating Handbook and Flight Training Supplement Cessna Model 162 – Revision 4.” https://support.cessna.com/docs/custsupt/cessnasupport/documents/162PHUS.pdf

L.V. Schmidt, 1998. Introduction to Aircraft Flight Dynamics, AIAA Education Series, 397.

MITRE 2012 – Expanded Model for Determining the Effects of Vertical Plumes on Aviation Safety, Gouldley, Hopper and Schwalbe, MITRE Product MP 120461, September 2012.

MITRE 2014 – Exhaust Plume Analyzer - User Guide.ppt, The MITRE Corporation, Contract Number DTFAWA-10-C-00080, October 2014.

MITRE 2015 – Exhaust Plume Analyzer. Model build date January 28, 2015.

MITRE 2015a – Center for Advanced Aviation System Development [http://www.mitre.org/centers/center-for-advanced-aviation-system-development/who-we-are], website accessed 11-17-15.

MITRE 2015b – Email from Ryan Huleatt (MITRE Corporation) to Jacquelyn Record (Energy Commission staff), October 28, 2015.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

S. Gudmundsson, 2013. General Aviation Aircraft Design. Butterworth-Heinemann, Waltham, MA.

VC 2016c-- County of Ventura, Department of Airports Comments: PUENTE Incompatible with Oxnard Airport (TN 213674) dated September 15, 2016. Submitted to CEC/Docket Unit on September 15, 2016.

TRAFFIC AND TRANSPORTATION - FIGURE 1

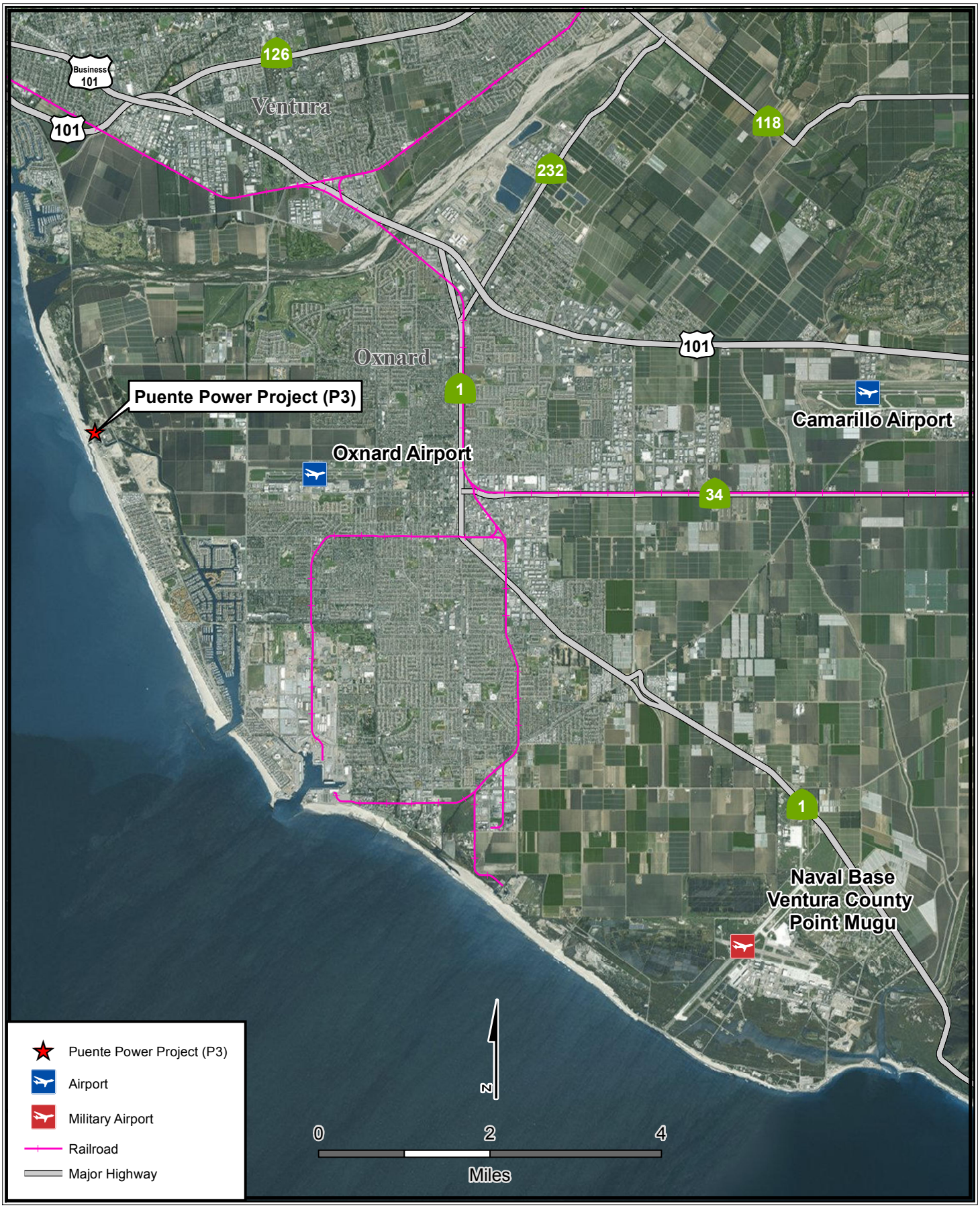
Puente Power Project - Local Traffic and Transportation Setting

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI Imagery, California Department of Transportation Data

TRAFFIC AND TRANSPORTATION - FIGURE 2

Puente Power Project - Regional Traffic and Transportation Setting

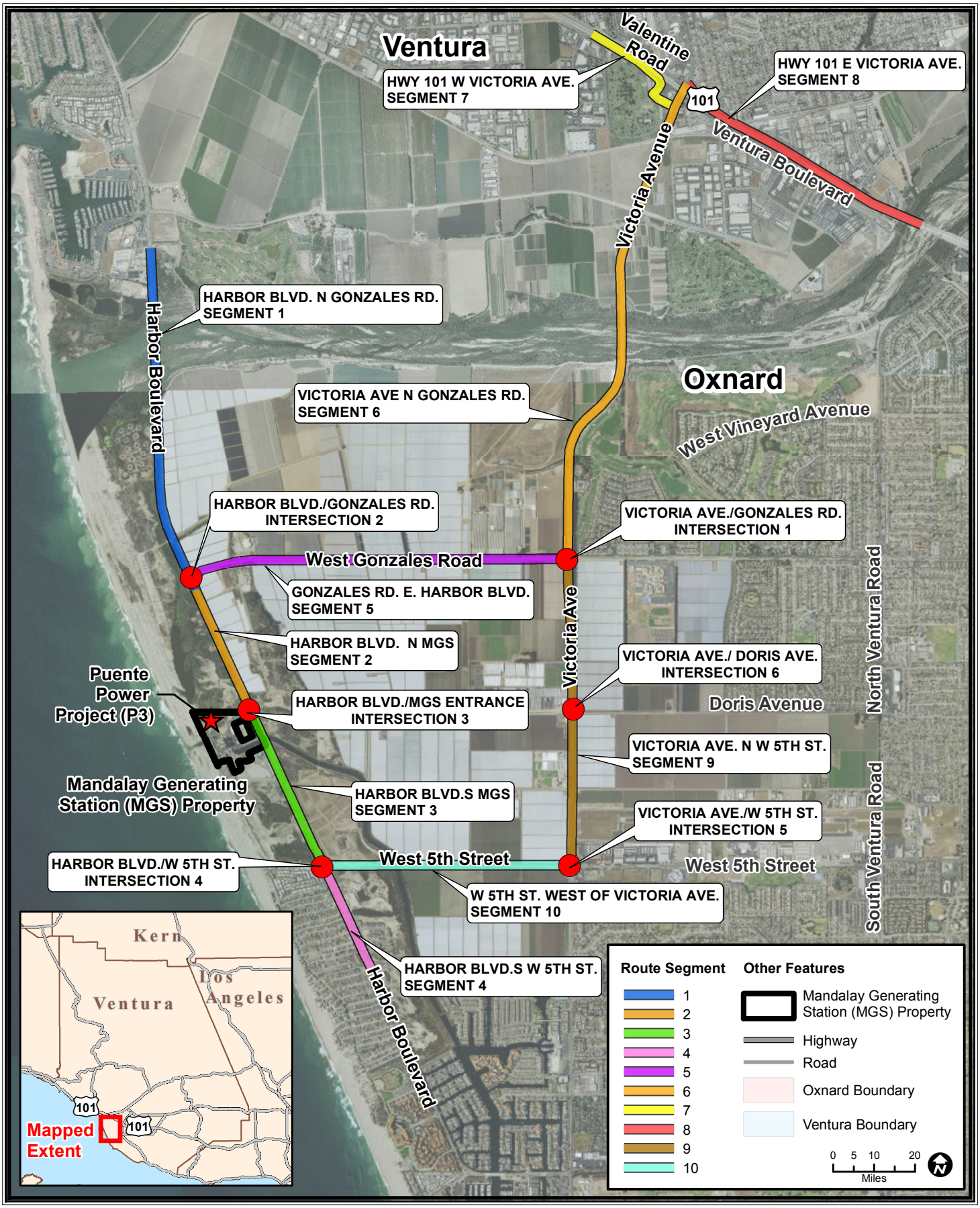


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI Imagery, California Department of Transportation Data

TRAFFIC AND TRANSPORTATION - FIGURE 3

Puente Power Project - Study Freeway/ Segments and Intersections

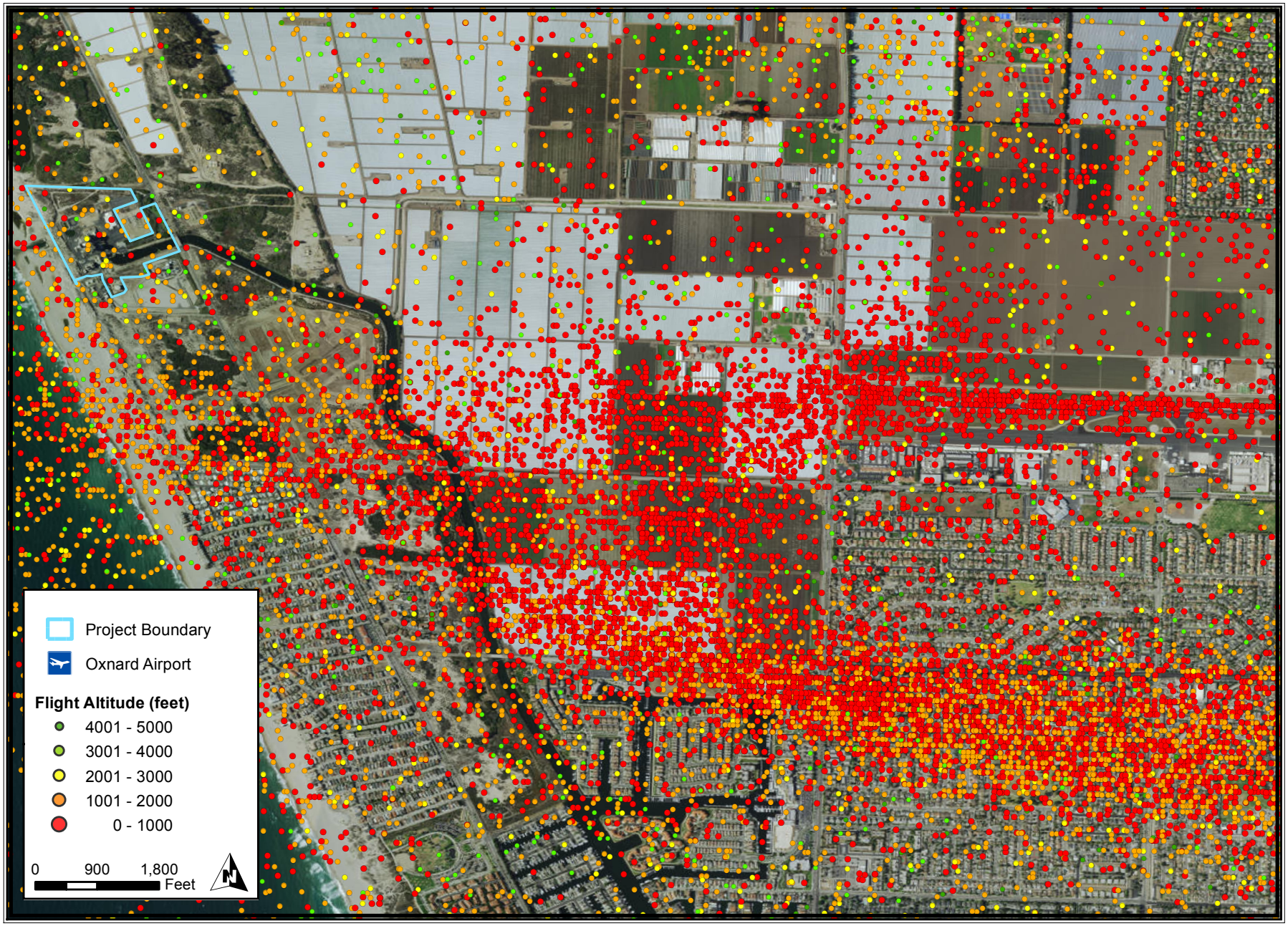


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI Imagery, California Department of Transportation Data

TRAFFIC AND TRANSPORTATION - FIGURE 4

Puente Power Project - Tracked Flight Altitudes (October 1 - November 1, 2015)

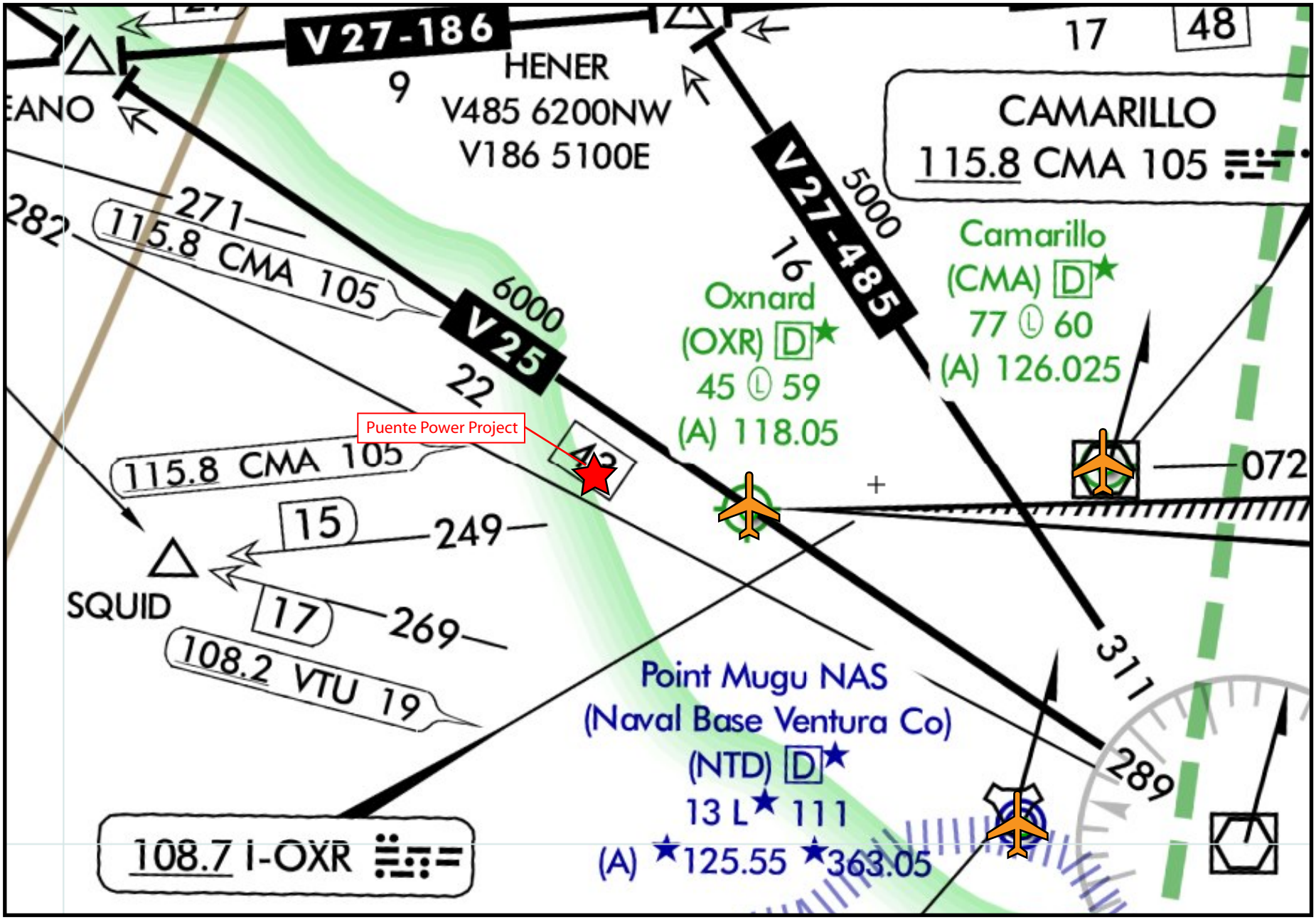


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI Imagery, Federal Aviation Administration Data

TRAFFIC AND TRANSPORTATION - FIGURE 5

Puente Power Project - SkyVector Map of Visual Flight Rules Corridors



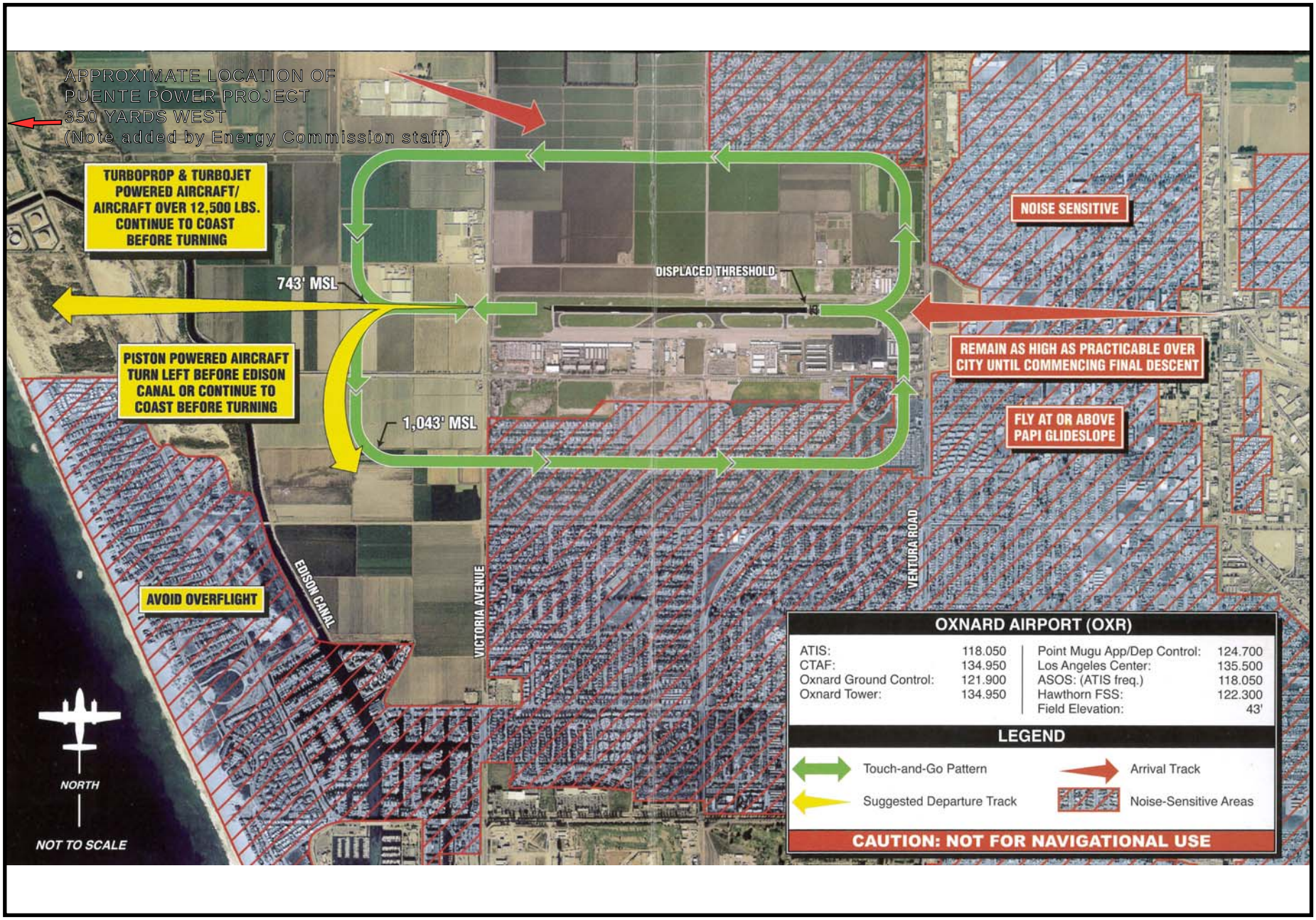
TRAFFIC AND TRANSPORTATION

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SkyVector 2016 (https://skyvector.com/?ll=34.200805556,-119.207222222&chart=404&zoom=3)

TRAFFIC AND TRANSPORTATION - FIGURE 6

Puente Power Project - Oxnard Airport Pilot Guide



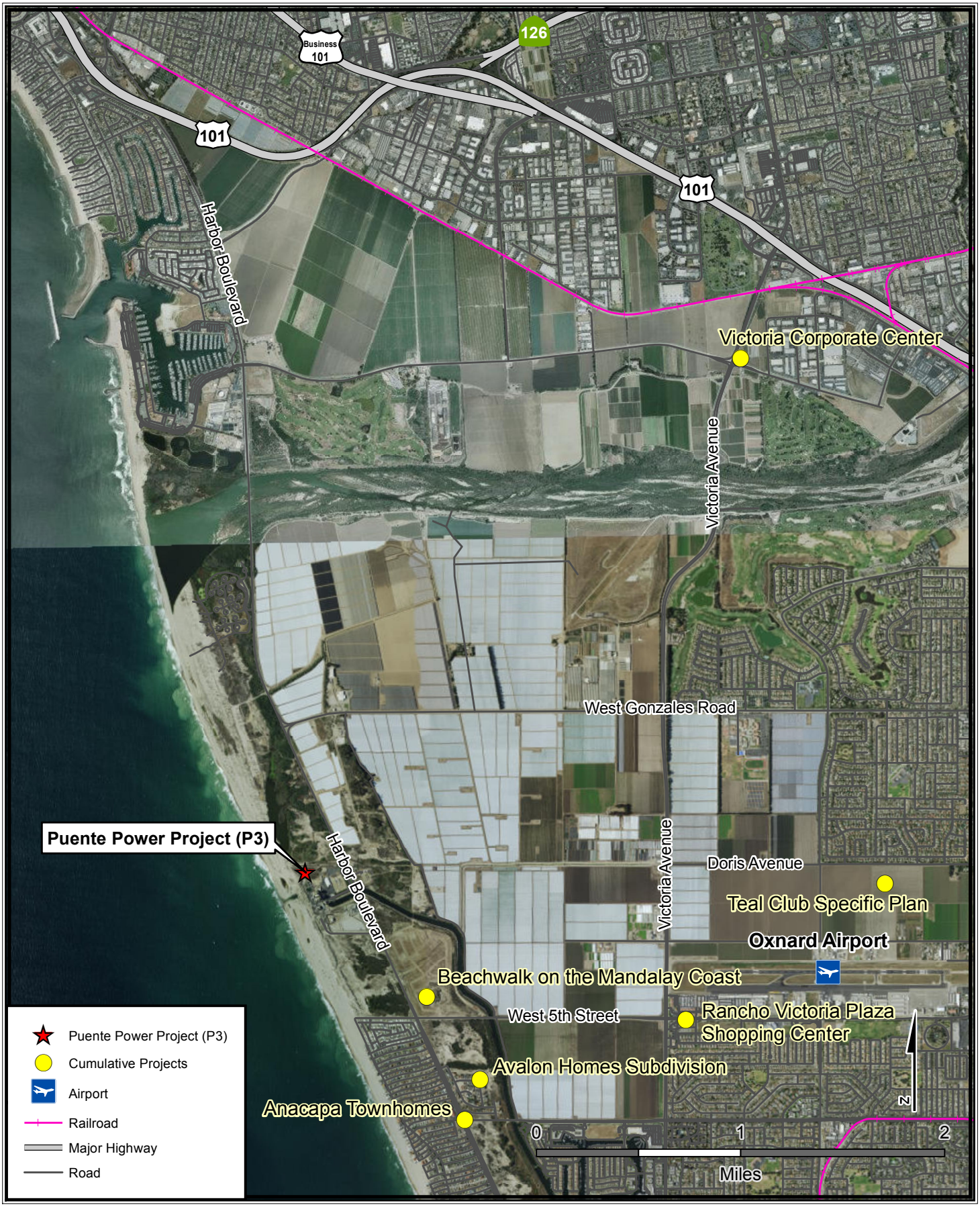
TRAFFIC AND TRANSPORTATION

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Ventura County Department of Airports

TRAFFIC AND TRANSPORTATION - FIGURE 7

Puente Power Project - Cumulative Projects



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI Imagery, California Department of Transportation Data

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Huei-An (Ann) Chu, Ph.D.

SUMMARY OF CONCLUSIONS

As a result of project refinements, the applicant proposes to build a 220-kilovolt (kV) transmission line to connect the proposed Puente Power Project (Puente or project) to the existing Southern California Edison's (SCE's) transmission system, bypassing the existing Mandalay Switchyard. The portion of transmission line between the gas turbine and a take-off structure to be located at the Mandalay property would be owned, operated and maintained by the applicant while the portion between the take-off structure and the SCE transmission system lattice tower would be owned, operated and maintained by SCE.

The proposed lines would lie mainly within the boundaries of the Puente and MGS site, but a short section of offsite line would be necessary. Since the proposed 220-kV lines would be operated within the SCE service area, they would be designed, constructed, operated, routed, and maintained according to SCE's guidelines for line safety and field management. The lines would conform to all applicable laws, ordinances, regulations and standards. Since the proposed transmission lines would be short in length with no nearby residences, there would be no potential for residential electric and magnetic field exposures, which have been of some health concern. With the four proposed conditions of certification, any safety and nuisance impacts from construction and operation of the proposed lines would be less than significant.

INTRODUCTION

The purpose of this Final Staff Assessment (FSA) is to assess the transmission line design and operational plan for the proposed Puente to determine whether its related field and non-field impacts would constitute a significant environmental hazard in the area around the proposed route. All related health and safety laws, ordinances, regulations, and standards (LORS) are currently aimed at minimizing such hazards.

Staff's analysis focuses on the following issues, taking into account both the physical presence of the line and the physical interactions of its electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

The federal, state, and local laws and policies in the next section apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements.

METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

The LORS and practices listed in **TLSN Table 1** have been established to maintain impacts below levels of potential environmental significance. Thus, if staff determines that the project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following table summarizes the LORS applicable to this facility. These LORS are fully evaluated in the remainder of this section.

Transmission Line Safety and Nuisance (TLSN) Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1L (2015), "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7460) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/7460-1L, "Obstruction Marking and Lighting"	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	
Federal	
Title 47, CFR, section 15.205, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Hazardous and Nuisance Shocks	
State	
California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.

Title 8, California Code of Regulations (CCR) section 2700 et seq. “High Voltage Safety Orders”	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
National Electrical Safety Code (NESC)	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	

Applicable LORS	Description
Institute of Electrical and Electronics Engineers (IEEE) 1119, “IEEE Guide for Fence Safety Clearances in Electric-Supply Stations”	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC ”Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California”	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision D.93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
CPUC Decision D.06-01-042	Re-affirms CPUC EMF Policy in D.93-11-013.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
Title14, Cal.Code Regs., sections 1250-1258, “Fire Prevention Standards for Electric Utilities”	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

SETTING AND EXISTING CONDITIONS

The proposed project would be located at 393 North Harbor Boulevard in Oxnard, Ventura County, California. The proposed 262-megawatt (MW) (nominal net) Puente project would replace a portion of the existing 430-MW Mandalay Generating Station (MGS). MGS Units 1 and 2 would be retired and MSG Unit 3 would continue to operate (PPP 2015a, Section 3.5).

PROJECT DESCRIPTION

One single-circuit 220-kilovolt (kV) transmission line and one double-circuit 220-kilovolt (kV) transmission line would be required to connect Puente to SCE’s transmission system to enable delivery of the project's electrical output to the transmission grid (PPP 2016w). Both lines would be designed and constructed in accordance with California Public Utilities Commission (CPUC) General Order (GO) 95, “Rules for Overhead Line Construction” and other applicable state and local codes (PPP 2015a, Section 3.0).

The applicant provided a map showing the entire generator tie-line route from the Puente project site to the existing 220-kV transmission structure across and east of

Harbor Boulevard. The 220-kV transmission interconnection for the proposed Puente facility would consist of a single gen-tie connection, which would require one mono-pole structure and one 220-kV take-off structure. This segment would be owned, operated and maintained by the applicant. The remainder of the transmission interconnection would be owned by SCE. It would consist of a double gen-tie connection connecting the proposed take-off structure to the existing SCE lattice tower located east of Harbor Boulevard, bypassing the existing Mandalay Switchyard (PPP 2016w and PPP 2016aa, Figure 102-1).

The combustion turbine generator (CTG) would connect to the transmission system tie line via a generator step-up (GSU) transformer. The 220-kV single-circuit transmission line interconnection would be approximately 250 feet in total length, from the GSU to the 220-kV tie-in-point at the take-off structure (PPP 2016w). The 220-kV double-circuit transmission line interconnection would be approximately 565 feet, from the take-off structure to the SCE transmission structure across Harbor Blvd (CEC 2016aa).

The interconnection would mostly lie within the Puente site, but would cross a small portion of the Mandalay Generating Station site. The existing double-circuit transmission line from the SCE's Mandalay Switchyard to an existing transmission structure across and east of Harbor Boulevard would be rerouted/reconfigured from the new take-off structure to the transmission system, thereby bypassing the Mandalay Switchyard. In addition, there would be an electrical enclosure installed in the southern portion of the existing Mandalay Switchyard to house the protection, control, and telecommunications equipment (PPP 2016w).

The new 220-kV circuit line from the project switchyard to the new take-off structure would use one steel pole structure. The steel pole and the take-off structure would be constructed of weathered or galvanized steel. The steel pole structure would be bolted or slip-fit design. The pole would be a single-circuit structure, and the take-off structure would be a double-circuit structure. Both the single-circuit and double-circuit structures would be approximately 80- to 90-feet tall, with phase conductors that may be arranged horizontally, vertically, or in a delta configuration, depending on the requirements for particular structures. The vertical configuration would be the predominant configuration type (PPP 2016w).

Staff has concluded that the first point of grid interconnection would be the transmission structure lattice tower located east of Harbor Boulevard (not the take-off structure as proposed by the applicant) and therefore staff must analyze the impacts accordingly (CEC 2016z, page 9). For more detailed discussion regarding the first point of grid interconnection, please see staff's **Transmission System Engineering** Section.

With the current land uses in the vicinity of the proposed lines, residential exposure to the generated fields would be limited. Site access is restricted and would be limited to station workers, incidental construction and maintenance personnel, other company personnel, regulatory inspectors, and approved guests. Because access would not be

available to the general public, general public exposure to EMF is not expected to occur from Puente or the transmission facilities to be constructed as part of the project (PPP 2015, Section 3.6.1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

DIRECT IMPACTS AND MITIGATION

Aviation Safety

For Puente, any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace. The requirements in the LORS listed in **TLSN Table 1** establish the standards for assessing the potential for obstruction hazards within the navigable airspace. The requirements also establish the criteria for determining when to notify the FAA about such hazards. For example, FAA notification is required in cases of structures over 200 feet above ground level, or if the structure were to be less than 200 feet in height but located within the restricted airspace in the approaches to public or military airports and heliports. Moreover, for airports with runways longer than 3,200 feet, the restricted space is defined by the FAA as an area space that extends 20,000 feet (3.3 nautical miles) from the runway. For airports with runways of 3,200 feet or less, the restricted airspace is defined as a space that extends 10,000 feet from the runway. For heliports, the restricted space is area space that extends 5,000 feet (0.8 nautical miles) from the landing site.

The proposed 220-kilovolt (kV) transmission lines connecting the proposed Puente to SCE's transmission system would be 80 to 90 feet in height (PPP 2016w, Figure 3-2), which is less than the 200-feet height of concern to FAA. Therefore, the project would not have any structures tall enough to trigger the filing of Form 7460 (Notice of Proposed Construction or Alteration) with the FAA.

The closest airfield is the Oxnard Airport (OXR), which is approximately 1.8 miles (less than the 3.3 miles identified above) southeast of the project site (PPP2015a, Section 2.12.1.5). The length of its runway is 5,950 feet (more than the 3,200 feet also identified above) oriented in an east-west alignment. Therefore, the Puente site is in the restricted airspace of Oxnard Airport (PPP2015a, Section 4.12.2.2.9). The airport is operated by Ventura County and is classified as a non-hub commercial service airport.

In addition, two other airports operate in neighboring areas. Camarillo Airport is approximately 8 miles east of the Puente site, and Point Mugu Airport is approximately 10 miles southeast of the Puente site (PPP 2015a, Section 4.12.4.4). The closest airfield with regularly scheduled commercial flights is Santa Barbara Airport, approximately 44 miles away from Puente (PPP 2015a, Section 2.12.1.5). Based on the distance of the Camarillo Airport and Point Mugu Airport from the Puente site, the project would have no impact on these airports (PPP2015a, Section 4.12.2.2.9).

The closet private heliport is Rotor-Aids Maintenance Hangar Heliport (CL73)[1], which

[1] http://www.airnav.com/airport/CL73

is approximately 2.7 miles (more than 0.8 miles) southeast of the project site.

Staff has assessed the potential for an aviation hazard with regard to: (a) the height of the proposed project transmission lines, and (b) distances and orientation from identified runways. Because SCE's transmission system would be 80 to 90 feet in height (PPP 2016w, Figure 3-2), which is less than the 200-feet height of concern to FAA, staff concludes that the transmission lines would not pose a significant collision hazard to area aviation or aircraft. Thus, an FAA "Notice of Proposed Construction or Alteration" (Form 7460) for an obstruction hazard would not be necessary.

Interference with Radio-Frequency Communication

Transmission line-related radio-frequency interference is one of the indirect effects of line operation. It is produced by the physical interactions of line electric fields. More specifically, such interference is due to 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. Corona from a transmission line may result in radio and television reception interference, audible noise, light, and production of ozone. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication.

Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts therefore would be minimized by reducing the line electric fields and by locating the line away from inhabited areas.

The Puente transmission lines would be built and maintained according to standard practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345 kV and above, and not for 220-kV lines such as the proposed line of Puente. The proposed Puente's generation tie-line is rated at less than 345 kV and would be located within an existing power plant and project's boundary with no nearby residents (PPP 2015a, Section 3.6.1). It is unlikely that the project transmission line would have any effect on radio or television reception due to the approximately 2,200-foot distance from the transmission interconnection line to the nearest residence (i.e. the North Shore at Mandalay Bay residential development, which is proposed to begin development in 2016) (PPP 2015a, Section 3.6.2). Therefore, staff does not expect any corona-related radio-frequency interference or complaints. Thus, staff does not recommend any related condition of certification.

Audible Noise

Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line's electric field, the potential for perception would be assessed from estimating the field strengths during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. Audible noise is, therefore, not generally expected at significant levels from lines of less than 345 kV as proposed for Puente. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing that the fair-weather audible noise from modern transmission lines is generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the proposed line right-of-way would fall mainly within the boundaries of the existing Mandalay power plant boundary (PPP 2015a, Section 3.6.1), and SCE service area (PPP 2016w and CEC 2016z, page 9), staff does not expect the proposed line operation to add significantly to current background noise levels in the project area.

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. Instead, such audible noise is limited through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. Since these designs are also aimed at minimizing field strengths, staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed project and related facilities, please refer to staff's analysis in the **Noise and Vibration** section.

Fire Hazards

The fire hazards addressed in **TLSN Table 1** are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between a line and nearby trees and other combustible objects.

The requirements of the existing SCE fire prevention and suppression program would be implemented for the proposed project line. The applicant would comply with Title 14, California Code of Regulations, Section 1250, Article 4, which establishes fire prevention standards for electric power generation facilities (PPP 2015a, Section 3.6.4). Also, GO-95 establishes rules and guidelines for transmission line construction (PPP 2015a, Section 3.8.2), including clearances from other manmade and natural structures, and tree-trimming requirements to mitigate fire hazards. Therefore, the applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Although the new line would be located within the MGS or Puente property, Condition of Certification **TLSN-1 and TLSN-2** are recommended to ensure compliance with these program requirements.

Hazardous Shocks

Hazardous shocks are those that could result from direct or indirect contact between

an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death. Hazard shocks remain a driving force in the design and operation of transmission and other high-voltage lines.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

Potentially hazardous shocks could result from electrical faults from the new Puente equipment or the SCE high-voltage transmission system. The existing SCE 230-kV transmission system is located within a secured area under SCE's access control. The SCE transmission system, located east of Harbor Boulevard, is fenced to keep individuals from entering the area where they could be exposed to associated hazardous shocks. The new Puente 220-kV generation tie lines would be designed in accordance with applicable LORS. Implementing the GO-95-related measures against direct contact with the energized line would serve to minimize the risk of hazardous shocks. Because the lines would be constructed in conformance with the requirements of CPUC GO-95 and Title 8 California Code of Regulations (CCR) 2700, hazardous shocks are highly unlikely to occur as a result of the project's construction and operation (PPP 2015a, Section 3.6.3). Staff's recommended Conditions of Certification **TLSN-1** and **TLSN-3** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). The potential for nuisance shocks around the proposed line would be minimized through standard industry grounding practices.

For the proposed project line, the project owner would be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff recommends Condition of Certification **TLSN-3** to ensure such grounding for Puente.

Electric and Magnetic Field (EMF) Exposure

Both electric and magnetic fields are created whenever electricity flows, and exposure to them together is generally referred to as electric and magnetic field (EMF) exposure. There is general public concern regarding the possibility of health effects

from EMF exposure.

The electrical transmission interconnection and other electrical devices that would be constructed as part of the project emit EMF when in operation. These fields are typically measured near ground level, where they are encountered by people. EMF fields, to the extent they occur, could impact receptors on the properties adjacent to the project site (PPP 2015a, Section 3.6.1).

As previously stated, the Puente electrical transmission interconnection and other electrical devices would be located mainly within the Puente and MGS properties and SCE's transmission system. There are no receptors adjacent to the Puente site. Site access is restricted and would be limited to station workers, incidental construction and maintenance personnel, other company personnel, regulatory inspectors, and approved guests. Because access would not be available to the general public, general public exposure to EMF is not expected to occur from Puente or the transmission facilities to be constructed as part of the project (PPP 2015a, Section 3.6.1).

Electric Fields

Electric fields around transmission lines are produced by differences in voltage (i.e., electrical charges on the energized conductor). The electric field strength is measured in volts per meter (V/m). Electric Fields are easily shielded/weakened by conducting objects such as trees and buildings. Increased voltage produces a stronger electric field, but increased distance from the sources decreases its strength.

Magnetic Fields

Magnetic fields around transmission lines are produced when electric current (measured in amperes) flows. Magnetic fields are measured in gauss (G) or tesla (T). Unlike electric fields, magnetic fields are not easily shielded/weakened by most materials. Magnetic field strength is directly proportional to the current; that is, increased amperes produce a stronger magnetic field. Like electric fields, increased distance from the sources decreases its strength.

The strengths of both the electric field and magnetic field are inversely proportional to the distance from the conductors. Thus, the EMF strength declines as the distance from the conductor increases.

Human Health Risk Assessment Findings

Human health risk assessments for EMF are conducted to determine if there are biological and other hazards from EMF exposure and what the potential health impacts might be.

Although there are several studies on the health effects of EMF, there are no consistent conclusions from human studies (epidemiological and clinical) and animal studies. In 1996, the World Health Organization (WHO) launched a large, multidisciplinary research effort (i.e. the International EMF Project) to bring together

current knowledge and available resources including 25,000 articles which had been published over the past 30 years. Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields[2]. The conclusions from WHO and other sources are summarized as follows:

- **Effects on general health:** Scientific evidence does not support a link between the reported symptoms (including headaches, anxiety, suicide and depression, nausea, fatigue and loss of libido) and exposure to electromagnetic fields.

- **Effects on pregnancy outcome:** The overall weight of evidence shows that exposure to fields at typical environmental levels does not increase the risk of any adverse outcome such as spontaneous abortions, malformations, low birth weight, and congenital diseases. There have been occasional reports of associations between health problems and presumed exposure to electromagnetic fields, such as reports of prematurity and low birth weight in children of workers in the electronics industry, but these have not been regarded by the scientific community as being necessarily caused by the field exposures.

- **Cataracts:** General eye irritation and cataracts have sometimes been reported in workers exposed to high levels of radiofrequency and microwave radiation, but animal studies do not support the idea that such forms of eye damage could be produced at levels that are not thermally hazardous[3]. There is no evidence that these effects occur at levels experienced by the general public.

- **Cancers:** Despite many studies, the evidence for any effect remains highly controversial. However, it is clear that if electromagnetic fields do have an effect on cancer, then any increase in risk will be extremely small. The results to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults. The U. S. National Institute of Environmental Health Sciences (NIEHS) also concluded that “a link has not been established between residential EMF exposure and adult cancers, including leukemia, brain cancer, and breast cancer.” There have been no proven instances of cancer clusters[4] linked with EMF exposure, either (NIEHS 2002).

- **Childhood leukemia and cancers:** There have been studies showing a weak association between measured fields and childhood leukemia, but it is not clear

[2] EMF can be broadly divided into *static* and *low-frequency* electric and magnetic fields, where the common sources include power lines, household electrical appliances and computers, and *high-frequency* or radio frequency fields, for which the main sources are radar, radio and television broadcast facilities, mobile telephones and their base stations, induction heaters and anti-theft devices (WHO 2002).

[3] The definition of “thermally hazardous" is “any system above 130°F which exposes persons to potential thermal burns” (Source: http://apps.leg.wa.gov/wac/default.aspx?cite=296-59-080). Therefore, EMF is not at the level that is thermally hazardous.

[4] An unusually large number of cancers, miscarriages, or other adverse health effects that occur in one area or over one period of time is called a “cluster.”

whether this represents a cause-and-effect relationship. A number of epidemiological studies suggest small increases in risk of childhood leukemia with exposure to low frequency magnetic fields in the home. However, scientists have not generally concluded that these results indicate a cause-and-effect relationship between exposure to the fields and disease. Moreover, animal and laboratory studies have failed to demonstrate any reproducible effects that are consistent with the hypothesis that fields cause or promote cancer. After reviewing all the data, NIEHS also concluded in 1999 that the evidence was weak, but that it was still sufficient to warrant limited concern. Other than leukemia, the present available series of studies indicates no association between EMF exposure and childhood cancers (NIEHS 2002).

- **Electromagnetic hypersensitivity and depression:** Some individuals report hypersensitivity (examples: aches and pains, headaches, depression, lethargy, sleeping disorders, and even convulsions and epileptic seizures) to electric or magnetic fields. There is little scientific evidence to support the association between electromagnetic hypersensitivity and electromagnetic field exposure. Recent Scandinavian studies found that individuals do not show consistent reactions under properly controlled conditions of electromagnetic field exposure. Nor is there any accepted biological mechanism to explain hypersensitivity.

Based on the available evidence as evaluated by WHO and NIEHS, staff has determined that there is not sufficient evidence that such fields pose a significant health hazard to exposed humans.

EMF Exposure Guidelines and Policies

There are no health-based federal regulations or industry codes specifying environmental limits or maximum acceptable levels of EMF from power lines. Most regulatory agencies believe, as staff does, 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.

Staff considers it important, as does the California Public Utilities Commission (CPUC), to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff therefore considers it appropriate, in light of present uncertainty, to recommend feasible reduction of such fields without affecting safety, efficiency, reliability, and maintainability.

While there is considerable uncertainty about EMF health effects, 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 would likely be small;

- The most biologically significant types of exposures have not been established;

- Most health concerns are about the magnetic field; and

- There are measures that could be employed for field reduction, but they are not recommended because they would affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

State's Approach to Regulating EMF Exposures

In the absence of conclusive or evocative evidence, some states, including California, have chosen not to specify maximum acceptable levels of EMF exposure. Instead, these states, including California, mandate a program of prudent avoidance whereby EMF exposure to the public would be minimized by encouraging electric utilities that are regulated by the CPUC to use cost-effective techniques to reduce the levels of EMF. The municipal and other publicly owned utilities that are not under the direct jurisdiction of the CPUC voluntarily comply with this CPUC policy.

In 1993, the CPUC[5] issued Decision D. 93-11-013, establishing EMF policy for California's investor-owned electric utilities. The decision acknowledged that scientific research had not demonstrated that exposures to EMF cause health hazards and that it was inappropriate to set numeric standards that would limit exposure. In recognizing the scientific uncertainty, the CPUC addressed public concern over EMF by establishing a no-cost and low-cost EMF reduction policy that utilities would follow for proposed electrical facilities.

In 2006, the CPUC revisited the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The findings specified in Decision D.06-01-042 did not point to a need for significant changes to existing field management policies. Instead, D.06-01-042 re-affirmed D.93-11-013 in that health hazards from exposures to EMF have not been established and that state and federal public health regulatory agencies have determined that setting numeric exposure limits is not appropriate at this time. The CPUC also re-affirmed its past conclusions and required the existing no-cost and low-cost precaution-based EMF policy to be continued. The CPUC requirement is that such field reductions are to be made only in connection with new or modified lines in any of the utilities' service areas. Each utility complies by establishing its own EMF-reducing measures and incorporating such measures into the designs for all new or upgraded power lines and related facilities. The CPUC further established specific limits on the resources to be used in each case for field reduction.

Since there are no residences in the immediate vicinity of the proposed project's transmission lines, there would not be the long-term residential EMF exposures mostly responsible for the health concerns noted above. The only project-related EMF exposures of potential significance would be the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the

[5] CPUC regulates the installation and operation of many high-voltage lines owned and operated by investor-owned utilities.

vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern.

In keeping with this CPUC policy, staff requires a showing that each proposed overhead line would be designed according to the safety and EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures would impact line operation if applied without appropriate regard for environmental and other local factors bearing on safety, reliability, efficiency, and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied in ways that prevent significant impacts on transmission line operation and safety. The extent of such applications would be reflected by ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values could be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths could be estimated for any given design using established procedures.

Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support structures, degree of cancellation from nearby conductors, distance between conductors, and, in the case of magnetic fields, amount of current in the line.

Since the CPUC currently requires that most new lines in California be designed according to safety and EMF-reducing guidelines of the electric utility in the service area involved, their fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed project line according to existing SCE field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

Industry's and Applicant's Approach to Reducing EMF Exposures

The present focus of EMF exposure concern is on the magnetic field. This is because unlike electric fields, magnetic fields would penetrate the soil, buildings, and other materials to produce the types of human exposures at the root of health concerns. The industry seeks to reduce exposure, not by setting specific exposure limits, but through design guidelines that minimize exposure in each given case.

In comparison to the strong magnetic fields from the more visible high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields from high-voltage lines while using some common household appliances (National Institute of Environmental Health Sciences 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short term duration, while the exposures from power lines are lower level, but long term duration. Scientists have not established which of these exposure types would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures

regularly occur in areas other than around high-voltage power lines.

As with similar SCE lines, specific field strength-reducing measures would be incorporated into the proposed line design to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures that could be applied include the following:

1. increasing the distance between the conductors and the ground to an optimal level;

2. reducing the spacing between the conductors to an optimal level;

3. minimizing the current in the line; and

4. arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Since, as previously noted, the route of the proposed project's transmission line would have no nearby residences, long-term residential field exposures would not be a significant concern. The field strengths of most significance would be encountered within the boundaries of the existing MGS site, the proposed Puente project site, and an SCE-controlled area. These field intensities would depend on the effectiveness of the applied field-reducing measures. The requirements in Condition of Certification **TLSN-4** for field strength measurements are intended to assess the applicant's assumed field reduction efficiency.

CUMULATIVE IMPACTS

Operating any given project may lead to significant adverse cumulative impacts when its effects are considered cumulatively considerable. "Cumulatively considerable" means in this context that the incremental field and non-field effects of an individual project would be significant when considered together with the effects of past, existing, and future projects (California Code Regulation, Title 14, section 15130). When field intensities are measured or calculated for a specific location, they reflect the interactive, and therefore, cumulative effects of fields from all contributing conductors. This interaction could be additive or subtractive depending on prevailing conditions. For the proposed project's transmission lines, this interaction would occur between the Puente-related fields and the fields from nearby SCE lines. Since the proposed project's transmission lines would be designed, built, and operated according to applicable field-reducing SCE guidelines (as currently required by the CPUC for effective field management), any contribution to cumulative area exposures should be at levels expected for SCE lines of similar voltage and current-carrying capacity and not considered environmentally significant in the present health risk-based regulatory scheme. The actual field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-4**.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows the presence of an environmental justice (EJ) population based on race and ethnicity within a six-mile radius of the project site. **Environmental Justice Table 3** shows that the cities of Oxnard and Port Hueneme have below-poverty-level populations significant enough to be considered EJ populations.

Staff concludes that the proposed 220-kV lines would conform to all applicable laws, ordinances, regulations and standards. Also, since the proposed transmission lines would be short in length with no nearby residences, there would be no potential for residential electric and magnetic field exposures which have been of some health concern for previous projects. Short-term exposures have negligible health concerns. In addition, with the four proposed conditions of certification, any safety and nuisance impacts from construction and operation of the proposed lines would be less than significant.

Given such lack of impacts, there would be no case of disproportionate Transmission Line Safety and Nuisance (TLSN) impacts for all populations, including the EJ populations represented in **Environmental Justice Figure 1** and **Table 3 in the Environmental Justice** section of this FSA. The nearest EJ community is located approximately 4 miles east of the proposed transmission line while TLSN impacts are usually within a relatively short distance, no greater than a few hundred feet from the proposed line. Therefore, staff does not expect there would be any TLSN impacts on any population, including the EJ population in these disadvantage communities.

Any off-site workers, such as farm workers, would usually be in the vicinity of potential TLSN impacts only for a short period of time. As discussed earlier, short-term exposures have negligible health concerns. With the four proposed conditions of certification, staff does not expect there would be any short-term or long-term TLSN impacts on off-site workers. Please refer to the **Environmental Justice** section of this document for a full explanation of how staff determines the presence of EJ populations.

COMPLIANCE WITH LORS

As previously noted, current health-risk-driven CPUC policy on EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in the case of Puente is SCE. Since the proposed project's 220-kV lines would be designed according to the respective requirements of the LORS listed in **TLSN Table 1**, and operated and maintained according to current SCE guidelines on line safety and field strength management, staff considers the proposed design and operational plan to be in compliance with the health and safety requirements of concern in this analysis.

The actual contribution to the area's field exposure levels would be documented for

the proposed route from results of the field strength measurements required in Condition of Certification **TLSN-4**.

RESPONSE TO COMMENTS ON THE PSA

To date, staff has received no public or agency comments on the transmission line nuisance and safety aspects of the proposed Puente and would reply to any such comments received in the Final Staff Assessment (FSA) document for the project.

NOTEWORTHY PUBLIC BENEFITS

Since the proposed tie-in lines would pose specific, although insignificant risks of the field and non-field effects of concern in this analysis, their building and operation would not yield any public benefits regarding the effort to minimize any human risks from these impacts.

FACILITY CLOSURE

If the proposed Puente project were to be closed and decommissioned, and all related structures are removed as described in the **Project Description** section, the minimal electric shocks and fire hazards from the physical presence of this tie-in line would be eliminated. Decommissioning and removal would also eliminate the transmission lines' field and non-field impacts assessed in this analysis in terms of nuisance shocks, radio-frequency impacts, audible noise, and electric and magnetic field exposure, and aviation safety. Since the lines would be designed and operated according to existing SCE guidelines, these impacts would be as expected for SCE lines of the same voltage and current-carrying capacity and therefore, at levels reflecting compliance with existing health and safety LORS.

CONCLUSIONS

Puente construction and operation, including the new single-circuit 220-kilovolt (kV) transmission line and the new double-circuit 220-kilovolt (kV) transmission line to connect the proposed Puente to SCE's transmission system, is not expected to result in significant changes in EMF levels, corona, audible noise, or radio and television interference.

The proposed 220-kV transmission lines would not pose a potential line-related collision hazard to area aviation or aircraft. Therefore, the applicant would not need to file the "Notice of Proposed Construction or Alteration" (Form 7460) for an obstruction hazard. Puente would be located within the existing MGS property boundary and would tie into the existing SCE's transmission system. Therefore, staff concludes it is not feasible to recommend specific location changes on the basis of a potential hazard to area aviation.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current SCE

guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise.

The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's GO-95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route.

Since electric or magnetic field health effects have neither been established nor ruled out for the proposed Puente and similar transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential, magnetic exposure would be insignificant for the proposed lines given the absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for SCE lines of similar design and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

Since the proposed project's lines would be operated to minimize the health, safety, and nuisance impacts of concern to staff and would be routed within an area with no nearby residences, staff considers the proposed design, maintenance, and construction plan as complying with the applicable LORS. With implementation of the four recommended conditions of certification, any such impacts would be less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed 220-kV transmission lines according to the requirements of California Public Utility Commission's GO- 95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and Southern California Edison's EMF reduction guidelines.

Verification: At least 30 days prior to start of construction of the transmission lines or related structures and facilities, the project owner shall submit to the compliance project manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ensure that the route of the proposed transmission lines is kept free of combustible material, as required under the provisions of GO-95 and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the proposed route and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

TLSN-3 The project owner shall ensure that all permanent metallic objects within the proposed route are grounded according to industry standards.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

TLSN-4 The project owner shall measure the maximum strengths of the line electric and magnetic fields at the edge of the right-of-way to validate the estimates the applicant has provided for these fields. These measurements shall be made (a) according to the standard procedures of the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) and (b) before and after energizing. The measurements shall be completed no later than six months after the start of operations.

Verification: The project owner shall file copies of the pre-and post-energizing measurements with the CPM within 60 days after completion of the measurements.

REFERENCES

EPRI — Electric Power Research Institute 1982. Transmission Line Reference Book: 345 kV and Above.

CEC 2016z—California Energy Commission Puente Power Project 15-AFC-01 Data Requests Nos. 77-107 (TN 213968) dated October 11, 2016. Submitted to CEC/ Dockets Unit on October 11, 2016.

CEC 2016aa—California Energy Commission, Puente Refinement to Transmission Line Interconnection E-mail (TN 214435) dater November 7, 2016. Submitted to CEC/ Dockets Unit on November 8, 2016.

National Institute of Environmental Health Sciences (NIEHS) 1998. *An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields, Working Group Report*. < http://www.niehs.nih.gov/health/assets/docs_a_e/emf1.pdf >

National Institute of Environmental Health Sciences (NIEHS) 2002, *Electric and Magnetic Fields Associated with the Use of Electric Power*. <http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf#search=Electric%20and%20Magnetic%20Fields%20Associated%20with%20the%20Use% 20of%20Electric%20Power >

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220- 14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015

PPP 2016w -- Refinement to Transmission Interconnection Latham & Watkins LLP, (TN 21300) dated August 26, 2016. Submitted to CEC/Docket Unit on August 26, 2016.

PPP 2016aa-- Applicant's Responses to CEC Data Requests, Set 4 (77-107),Latham & Watkins LLP, (TN 214336) dated November 1, 2016. Submitted to CEC/Dockets Unit on November 1, 2016.

World Health Organization (WHO) 2002, *Establishing a Dialogue on Risks from Electromagnetic Fields*. < http://www.who.int/peh-emf/publications/EMF_Risk_ALL.pdf >

World Health Organization (WHO), *Electromagnetic fields (EMF)*, <http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html>

VISUAL RESOURCES

Testimony of Eric Knight

SUMMARY OF CONCLUSIONS

The proposed Puente Power Project (Puente or project) would not have a substantial adverse effect on visual resources, and would be in conformance with applicable laws, ordinances, regulations, and standards (LORS) pertaining to visual resources, with the effective implementation of the applicant's proposed mitigation measures and staff's proposed conditions of certification.

INTRODUCTION

The California Environmental Quality Act (CEQA) requires the California Energy Commission to determine the potential for significant impacts to visual resources resulting from the proposed project. Visual resources are the natural and cultural features of the environment that can be viewed. Visual resources also include "sensitive viewing areas," which are areas consisting of uses such as residential, recreational, travel routes, and tourist destinations, and the people within those use areas, or "sensitive viewers." This analysis focuses on whether the project would cause significant, adverse visual impacts and whether it would conform to applicable LORS.

Visual Resources Appendix-1 (VR Appendix-1), Visual Resources Terms, Definitions, and Analysis Method, describes Energy Commission staff's methodology used in this analysis, and the "Method and Thresholds for Determining Significance" subsection below describes the thresholds for determining environmental impacts. In accordance with staff's procedure, conditions of certification are proposed as needed to reduce potentially significant impacts to less than significant levels or to the extent feasible, and to ensure LORS conformance, if possible.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Visual Resources Table 1 lists the state and local LORS applicable to the project. Further details on these LORS and the project's conformance with specific policies and requirements are discussed in **Visual Resources Table 3** in the "Conformance with Laws, Ordinances, Regulations, and Standards" subsection, below. No federal LORS pertaining to visual resources are applicable to Puente.

Visual Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
State	
California Coastal Act (Public Resources Code, §30000 et seq.)	The California Coastal Act is the foundation of the California Coastal Management Program. The Coastal Act defines the state's coastal management goals and policies, establishes the boundaries of the state's coastal zone, and creates governmental mechanisms for carrying out the management program. The Coastal Act sets forth general policies that govern the California Coastal Commission's review of permit applications and local plans.
Local	
Oxnard Coastal Land Use Plan	The Coastal Land Use Plan includes policies for resource management within the city of Oxnard's Coastal Zone Boundary.
Oxnard 2030 General Plan, Goals and Policies	The Oxnard General Plan contains goals and policies that are intended to guide a wide range of public and private development decisions through 2030. The Goals and Policies document includes the seven state-required elements (land use, circulation, housing, open-space, conservation, safety, and noise), optional elements (sustainable community and military compatibility).
Oxnard Coastal Zoning Ordinance	The purpose of this article is to implement the policies of the California Coastal Act as identified in the Coastal Land Use Plan.
Oxnard Zoning Code	This chapter establishes the minimum requirements for the promotion of the public health, safety, comfort, convenience, and general welfare for the city.

SETTING

REGIONAL DESCRIPTION

The proposed project site is on the coast of southern California, on the Oxnard Plain, a large coastal plain in southwestern Ventura County, California surrounded by the mountains of the Transverse ranges. The site is in the city of Oxnard, which is just south of the city of Ventura, west of the city of Camarillo, and north of Port Hueneme. Terrain along the Oxnard Plain is gently rolling to flat, varying in elevation from sea level to about 115 feet above sea level. The Pacific Ocean and the Los Padres and San Gabriel Mountains are visible from within the city of Oxnard. (PPP 2015a)

PROJECT, SITE, AND VICINITY DESCRIPTION

Puente would occupy approximately 3 acres within the northern portion of the 36-acre Mandalay Generating Station (MGS) property located at 393 North Harbor Boulevard. The MGS property is bordered immediately to the west by Mandalay State Beach. On

the north and south, the property is bordered by McGrath State Beach and Mandalay County Park, respectively. Immediately north of the project site is undeveloped open space that surrounds McGrath Lake. The Puente site is bordered to the east by the Southern California Edison (SCE) Mandalay Switchyard. To the east of North Harbor Boulevard are open space, agricultural lands, and oil production facilities. An SCE substation is east of North Harbor Boulevard, directly opposite the Mandalay Switchyard. Immediately south of the MGS property is the SCE-owned McGrath Peaker Plant and DCOR LLC's Mandalay On-shore Facility, an oil and gas production facility. An undeveloped residential subdivision of 292 planned residences called "North Shore at Mandalay Bay" is just southeast of the MGS property. The nearest existing residential area is Oxnard Shores subdivision, located south of West Fifth Street about ¾ mile from the project site. **Visual Resources Figure 1** shows the existing view of the MGS from Mandalay State Beach, immediately west of the Oxnard Shores subdivision. **Visual Resources Figure 2** shows the view of MGS Units 1 and 2 from a point on Mandalay State Beach immediately to the west.

Puente would consist of a single combustion turbine with one, 188-foot tall exhaust stack and associated facilities. If approved and following operation of Puente, existing MGS Units 1 and 2 and the 200-foot tall exhaust stack would be removed to grade, and the ocean outfall structure would be removed and the beach in this area restored. Unit 3, located immediately south of units 1 and 2, would remain. Puente would interconnect with the existing SCE transmission system via a new approximately 250-foot long overhead transmission line that would be supported by one, 80- to 90-foot tall steel pole structure and one 80- to 90-foot tall take-off structure. The new line would be located mostly within the Puente site but would cross a small portion of the MGS site. The existing transmission line from the SCE Mandalay Switchyard to an existing lattice tower on the east side of Harbor Boulevard would be rerouted to the new take-off structure to interconnect Puente to the existing Mandalay-Santa Clara Transmission Line, bypassing the switchyard.

Puente would use a dry cooling system which uses air instead of water to cool superheated steam in the condenser. Therefore, there would be no visible water vapor plumes emitted from the cooling system that could affect visual quality. Visible plumes also would not be emitted from the combustion turbine exhaust stack since the exhaust temperature would be 900 degrees Fahrenheit and have low moisture content.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Staff uses the environmental checklist in Appendix G of the State CEQA Guidelines and professional practices for visual resource assessments to evaluate the potential effects of a project on visual resources. From the CEQA Guidelines, an impact on visual resources is considered significant if the project would:

- have a substantial adverse effect on a scenic vista;
- substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

- substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

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 land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance"(Cal. Code Regs., tit.14, § 15382).

Staff's visual resources impact methodology is primarily adapted from guidelines used by the U.S. Forest Service, U.S. Bureau of Land Management, and U.S. Department of Transportation. These guidelines are useful and meaningful for assessing the potential impacts of projects in various environmental settings, including the setting for Puente.

The process to evaluate potential impacts on visual resources from construction and operation of Puente involved these general steps:

- Define the visual environment, or visual sphere of influence (VSOI), within which visual impacts could occur.
- Identify and select key observation points (KOPs), or critical viewpoints within the VSOI for the project.
- Evaluate the potential effects of the project on visual resources based on the estimated visual sensitivity of the viewing public and the degree of visual change that would occur with project construction and operation.

VR Appendix-1 provides further detail on the approach and process used in this visual resources analysis.

Key Observation Points

The visual resources analysis involved identifying KOPs, or critical viewpoints, that would most clearly show the visual effects of the proposed project. A KOP may also represent primary viewer groups (e.g., recreationists) that could potentially be affected by the project. Results of the VSOI analysis, field visits, and a photographic survey for Puente resulted in selection of five KOPs to represent views from areas with relatively high levels of visual sensitivity. In consultation with Energy Commission staff, the applicant selected the following KOPs to represent viewing conditions for nearby residential, tourist, and recreational areas:

- KOP 1 – Mandalay State Beach, west of West 5th Street
- KOP 2 – Mandalay State Beach, west of Mandalay Beach County Park
- KOP 3 – McGrath State Beach, southwest of McGrath Lake
- KOP 4 – Rancho Victoria Plaza on Victoria Avenue
- KOP 5 – "North Shore at Mandalay Bay" on Harbor Boulevard

As required by the Energy Commission's Siting Regulations, the applicant took photographs of the project site to show the existing visual conditions as viewed from the KOP locations. The applicant then used the existing condition (baseline) photographs from the selected KOPs to prepare representative visual simulations of the proposed project. The simulations portray the relative scale and extent of the project as it would be seen from the KOP locations. The existing view photographs and the visual simulations were compared by staff for each KOP to determine the potential effects of the project on visual resources.

Staff's evaluation of the visual sensitivity for each representative KOP includes consideration of five factors: *visual quality, viewer concern, visibility, number of viewers,* and *duration of view* (see Diagram 1 in **VR Appendix-1**). Overall viewer exposure for each KOP is generally based on an average of the values for *site visibility, number of viewers,* and *duration of view*. *Overall visual sensitivity* is generally based on an average of the values for *visual quality, viewer concern,* and *overall viewer exposure*. **VR Appendix-1** includes definitions for the key terms used in this analysis.

Staff's assessment of visual impacts is based on the change that would occur from the introduction of new built elements in the VSOI. The *overall visual change* is typically based on an average of the values for *contrast, dominance,* and *view blockage* for each KOP.

The rating scale to assess *visual sensitivity* and *visual change* ranges from low to high for each factor. The ratings for *overall visual sensitivity* and *overall visual change* are combined to determine the visual impact significance for each KOP using **VR Appendix-1**, Table 5 – KOP Visual Impact Significance Determination.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Scenic Vistas

A significant effect on the environment would occur if a project would have a substantial adverse effect on a *scenic vista.* The term "scenic vista" is not defined in CEQA statute or guidelines. "Vista" is sometimes defined as a distant view through or along an avenue or opening. For this visual resources analysis, scenic vista is further defined as a view that includes remarkable or memorable scenery or a view of a natural or cultural feature that is indigenous to the area. Staff has not identified any scenic vistas that would be impacted by the proposed project. Puente would have ***no impact*** under this criterion.

Scenic Resources

A significant effect on the environment would occur if a project would substantially damage *scenic resources*, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. The city of Oxnard's beaches and coastline are recognized as the city's primary natural scenic resources, with two state beaches located within the city's planning area: McGrath State Beach and Mandalay Beach State Park.

Within McGrath State Beach is the 133-acre Santa Clara Estuary Natural Preserve, located approximately two miles north of the project site. The Natural Preserve is

primarily within the Santa Clara River bed between the Pacific Ocean and North Harbor Boulevard Bridge. Recreational use is limited to passive activities (e.g., nature observation, hiking). The McGrath State Beach campground is closed to the public due to extensive flooding by the Santa Clara River and the resulting damage. A photograph of the view of the MGS from McGrath State Beach Campground is provided in **Visual Resources Figure 3**.

McGrath Lake is near the southern end of McGrath State Beach. It is an approximate 12-acre shallow coastal freshwater back dune lake. A variety of birds inhabit the area around the lake, which is located approximately 500 feet northwest of the project site.

Next to the MGS site is Mandalay State Beach, a sandy low-lying beach for public recreation day use, and Mandalay Beach County Park, a 94-acre undeveloped open space. This segment of beach and the park have no public facilities. Areas within the county park are fenced off to protect nesting areas for the California least tern and the western snowy plover, and to help the County of Ventura's active attempt to restore sensitive, fragile, and unique dunes and wetlands (**Visual Resources Figure 4** - View of Mandalay Beach County Park from Mandalay State Beach).

The city of Oxnard's Coastal Land Use Plan states: "The ocean is generally not visible from Harbor Boulevard, limiting the visual resources north of Fifth Street…Other visual resources in the coastal zone include the tall sand dunes south of Fifth Street and south of Wooley Road, the lower dunes in the Mandalay Beach County Park north of Fifth Street and the wetlands in the Ormond Beach area (Oxnard 1982, p. III-23)." Harbor Boulevard is to the east of the MGS site. Fifth Street is a little more than ½-mile to the south.

There are no scenic resources on the project site. In addition, Puente would not damage scenic resources in the areas surrounding the project site. Removal of the outfall structure would restore a portion of beach damaged by operation of the MGS. Puente would have ***no impact*** under this criterion. Puente's visual impact on the visual character or quality of Oxnard beaches surrounding the site is discussed below (see KOPs 1 through 3 and the "Viewpoint of Outfall from Beach" subsection).

Visual Character or Quality

A significant effect on the environment would occur if a project would substantially degrade the existing visual character or quality of the site and its surroundings. The project's effect on visual character or quality is assessed from the five KOPs identified above. **Visual Resources Table 2**, Key Observation Point Evaluation Matrix and Visual Impact Determination Conclusions, summarizes the evaluations for each KOP's existing and proposed condition and the visual impact determination conclusion of the proposed project at each KOP.

Visual Resources Table 2 – Key Observation Point Evaluation Matrix and Visual Impact Determination Conclusions												
KOP	**Visual Sensitivity (Existing Condition)**							**Visual Change (Proposed Condition)**				**Visual Impact Determination**
	Visual Quality	**Viewer Concern**	**Viewer Exposure**				**Overall Visual Sensitivity[2]**	**Contrast**	**Dominance**	**View Blockage**	**Overall Visual Change[3]**	**Overall Visual Sensitivity + Overall Visual Change[4]**
			Visibility	**Number of Viewers**	**Duration of View**	**Overall Viewer Exposure[1]**						
1	Moderately Low	High	Moderate to High	Moderate	High	Moderate to High	Moderate to High	Moderate	Low to Moderate	Low	Low to Moderate	Less Than Significant
2	Moderately Low	High	High	Moderate	High	Moderate to High	Moderate to High	Moderate	Moderate	Low to Moderate	Low to Moderate	Less Than Significant
3	Moderately Low	High	High	Moderate	High	Moderate to High	Moderate to High	Moderate	Moderate to High	Moderate	Moderate	**Less Than Significant with Mitigation**
4	Moderately Low	High	Low to Moderate	High	Moderate	Moderate	Moderate	Low	Low	Low	Low	Less Than Significant
5	Moderately Low	Moderate	Moderate to High	High	Low	Moderate	Moderate	Low	Moderate	Low to Moderate	Low to Moderate	Less Than Significant

Notes: High = 5 Moderate to High = 4 Moderate = 3 Low to Moderate = 2 Low = 1

[1] Visibility + Number of Viewers + Duration of View ÷ 3 = Overall Viewer Exposure

[2] Visual Quality + Viewer Concern + Overall Viewer Exposure ÷ 3 = Overall Visual Sensitivity

[3] Contrast + Dominance + View Blockage ÷ 3 = Overall Visual Change

[4] Overall Visual Sensitivity + Overall Visual Change = Visual Impact Determination (see Table 5 in Appendix VR-1)

KOP 1 – Mandalay State Beach, West of West 5th Street

KOP 1 is located on Mandalay State Beach, west of the intersection of West 5th Street and Mandalay Beach Road, approximately ¾ mile south of the Puente site. KOP 1 represents a public view from a segment of low-lying beach looking north toward the site (see **Visual Resources Figure 6**). Features within the view include the beach, coastal foredunes, low shrubs and grasses, ice plant, an oil/gas production rig, the MGS, and the exhaust stack for the McGrath Peaker.

Existing visual quality is considered low to moderate, primarily as a result of the bulky MGS Units 1 and 2 and the 200-foot tall stack, which contrasts strongly with its coastal setting. Given that this KOP is located on a public beach, and near the northern boundary of the Oxnard Shores subdivision, viewer concern is rated high. Overall viewer exposure is rated moderate to high, which when combined with the ratings for visual quality and viewer concern, results in an overall visual sensitivity rating of *moderate to high* in the area of KOP 1.

Visual Resources Figure 7 shows the existing view with a photo simulation of the project. From the area of KOP 1, Puente's stack would be clearly visible. While difficult to detect, the project's two transmission structures would also be visible in the view. Although Puente's tall, cylindrical stack would contrast with the broad, horizontal landscape features, it would appear similar to the existing vertical elements at the site and in the vicinity. As seen from the area of KOP 1, Puente would occupy a small portion of the view and would be subordinate to the existing power plant. From this vantage point, Puente would appear to increase the mass of the MGS somewhat. From KOP 1, Puente would not block views of scenic resources (beach, dunes). Overall visual change is rated *low to moderate*, which in the context of moderate to high visual sensitivity in the area of KOP 1, would be a ***less than significant effect*** on the environment.

Visual Resources Figure 8 shows a simulation of the project after demolition of MGS Units 1 and 2 in 2022. Without the massive boiler structures and stack (with its red and white painted top), visual quality is improved over baseline conditions.

KOP 2 – Mandalay State Beach, West of Mandalay Beach County Park

KOP 2 is located on Mandalay State Beach, west of Mandalay Beach County Park, approximately ½ mile south of the project site. KOP 2 represents a public view from a segment of low-lying beach looking north toward the site (see **Visual Resources Figure 9**). Features within the view include the beach, coastal foredunes, low shrubs and grasses, ice plant, the MGS, transmission poles and lines, and palm trees.

Visual quality is considered low to moderate primarily as a result of the MGS, which contrasts strongly with its coastal setting. At this distance, the chaotic, complex nature of the existing facility is evident. Similar to KOP 1, viewer concern is rated high and viewer exposure is moderate to high. Overall visual sensitivity is *moderate to high* in the area of KOP 2.

Visual Resources Figure 10 shows the existing view with a photo simulation of the project. Although Puente's simple, geometric shapes would contrast with the horizontal expanse of the beach, it would be similar in form to MGS Units 1 and 2. Puente would occupy a small portion of the field of view at KOP 2, and would be subordinate to the substantially more massive MGS. The project's transmission structures would be visible; however they would be seen in the context of existing poles and vertical elements and would not draw attention. From KOP 2, Puente would not block views of scenic resources (beach, dunes). Overall visual change is rated *low to moderate*, which in the context of moderate to high visual sensitivity in the area of KOP 2, would be a ***less than significant effect*** on the environment.

Visual Resources Figure 11 shows a simulation of the project after demolition of MGS Units 1 and 2 in 2022. Without the massive boiler structures and stack, visual quality is improved over baseline conditions. Puente's structures would be simpler and have a more cohesive design than MGS Units 1 and 2. Existing levels of contrast and dominance would be substantially reduced.

KOP 3 – McGrath State Beach, Southwest of McGrath Lake

KOP 3 is located on McGrath State Beach southwest of McGrath Lake, less than ¼ mile north of the project site. KOP 3 represents a public view from a segment of beach looking south toward the project site (see **Visual Resources Figure 12**). Features in the view include coastal foredunes along with the more stable interior back dunes and dune swale, low shrubs and grasses, ice plant, MGS, transmission poles and lines, and the top of the McGrath Peaker exhaust stack. Like the other recreational viewpoints, visual quality is considered low to moderate and viewer concern is rated high. Overall visual sensitivity is *moderate to high* in the area of KOP 3.

Visual Resources Figure 13 shows the existing view with a photo simulation of the project. At this close distance, Puente would loom over this portion of McGrath State Beach, and would appear co-dominant with MGS Units 1 and 2. Puente's vertical forms, although similar to those of MGS, would contrast with the broad, horizontal form of the beach and dunes. View blockage of the sky backdrop is considered moderate; but Puente would not block views of scenic resources (beach, dunes) as seen from KOP 3. The new transmission pole and take-off structure are plainly visible at the left side of the simulation. However, the project's transmission structures would be seen in the context of numerous existing transmission structures at the Mandalay Switchyard and would not contribute substantially to the project's visual effect from this viewing area. Overall visual change due to the project would be *moderate*. In the context of moderate to high visual sensitivity in the area of KOP 3, the moderate level of visual change would be a ***significant effect*** on the environment. To reduce Puente's visual contrast, the applicant proposes use of "non-reflective elements where practical" and to use paint colors that would blend in with the existing visual conditions, stating in the AFC that "[t]he colors will provide subtle variations and contrast. The selected color will help the project to blend more naturally with the natural setting" (PPP 2015a, page 4.13-14). The new transmission structures would be constructed of weathered or galvanized steel. Staff has incorporated the applicant's proposed mitigation measures into staff's proposed Condition of Certification **VIS-1**.

Visual Resources Figure 14 shows a photo simulation of the project after demolition of MGS Units 1 and 2 in 2022. Although power plant structures would be located closer to McGrath State Beach than they are presently, the overall quality of the view is improved by the removal of the massive, chaotic form of MGS Units 1 and 2. Puente's structures would be simpler and have a more cohesive design than MGS Units 1 and 2 and would be painted or treated to minimize color contrast with the setting. With the removal of units 1 and 2, existing levels of contrast and dominance would be substantially reduced, baseline conditions would be improved, and the project's visual impacts to the KOP 3 area would be ***less than significant***.

KOP 4 – Rancho Victoria Plaza on Victoria Avenue

KOP 4 is located on Victoria Avenue south of West 5th Street near Rancho Victoria Plaza, a retail strip commercial center, and Sea View Estates, a residential subdivision. The KOP is approximately 2 miles southeast of the project site. KOP 4 represents a public view from a segment of Victoria Avenue, an arterial road, looking northwest toward the project site (see **Visual Resources Figure 15**). Features within the view include a wind barrier (a length of fence with fabric attached), tilled farmland, and transmission poles and lines; in the distance are dunes, trees, and the silhouette of MGS Units 1 and 2 and the 200-foot tall exhaust stack.

Existing visual quality is rated low to moderate. Victoria Avenue is a designated "scenic route" according to the Oxnard Local Coastal Plan interactive map; therefore viewer concern is rated high. According to the Traffic and Transportation section of the AFC, there are 43,810 average daily trips on Victoria Avenue. The posted speed limit is 55 MPH. Overall visual exposure is rated *moderate* as is overall visual sensitivity.

Visual Resources Figure 16 shows the existing view with a photo simulation of the project. The project would occupy a very small portion of the field of view from this distance, would be subordinate to the existing MGS, and would be similar in form to the MGS and other vertical elements in the view. Overall visual change is considered *low*. In the context of moderate visual sensitivity in the area of KOP 4, the low degree of visual change would have a ***less than significant effect*** on the environment.

Visual Resources Figure 17 shows a photo simulation of the project after demolition of MGS Units 1 and 2 in 2022. Without the MGS, baseline conditions would improve.

KOP 5 – "North Shore at Mandalay Bay" on Harbor Boulevard

KOP 5 is located on Harbor Boulevard at the main entrance to the "North Shore at Mandalay Bay" residential subdivision project. Located approximately ¾ mile southeast of the project site, KOP 5 represents a public view from a segment of Harbor Boulevard, an arterial road, looking northwest toward the project site (see **Visual Resources Figure 18**). Features within the view include low shrubs and grasses, dune vegetation (area within Mandalay Beach County Park), MGS, McGrath Peaker, and transmission poles and lines.

Existing visual quality is rated low to moderate. Harbor Boulevard is a designated "scenic route" according to the Oxnard Local Coastal Plan interactive map; therefore viewer concern is rated high. According to the AFC, there are 17,090 average daily trips

on Harbor Boulevard. Overall visual exposure is rated *moderate* as is overall visual sensitivity.

Visual Resources Figure 19 shows the existing view with a photo simulation of the project. The project would occupy a small portion of the field of view and would be similar in form to the MGS, McGrath Peaker, and other vertical elements in the view. Dominance is rated moderate. The project's transmission structures would be visible from this KOP; however, they would be seen in the context of existing electrical infrastructure and would not draw attention. As seen from KOP 5, Puente would block the view of some electrical infrastructure and a small amount of sky and mountains; view blockage is rated low to moderate. Overall visual change is considered *low to moderate*. In the context of moderate visual sensitivity in the area of KOP 5, the low to moderate degree of visual change would have a ***less than significant effect*** on the environment.

Visual Resources Figure 20 shows a simulation of the project after demolition of MGS Units 1 and 2 in 2022. Puente's structures would be simpler and have a more cohesive design than MGS Units 1 and 2, appearing similar to the McGrath Peaker design. Existing levels of contrast and dominance would be substantially reduced and baseline conditions would be improved.

Viewpoint of Outfall from Beach

Since publication of the Preliminary Staff Assessment (PSA), the applicant proposes removing the existing ocean outfall structure, including wing walls, riprap, and the fencing around the outfall (PPP 2016). Demolition activities would be conducted in stages, and in a manner that minimizes visible dust. A new key observation point was identified which is located approximately 400 feet west of the outfall structure. This viewpoint represents a public view from the beach fronting the MGS site and looking away from the ocean and toward the MGS site. Features within the view primarily include direct, uninterrupted views of the outfall along with coastal foredunes, interior back dunes and dune swale, low shrubs and grasses, ice plant, MGS, transmission poles and lines, and the top of the McGrath Peaker exhaust stack.
Like the other recreational viewpoints, visual quality is considered low to moderate and viewer concern is rated high. Overall visual sensitivity is *moderate to high*.

A photo simulation prepared by the applicant shows that demolition of the outfall would result in significant and immediate improvements to existing visual character with elimination of the manmade outfall structure along with beach erosion and ponding that occurs as a result of discharges. See **Visual Resources Figures 21** through **23** for before and after images. Removal of the outfall structure would lead to increased sand area and eventually to buildup of the natural dunes that form behind the high tide line of the beach that would add to the natural appearance and character of the beach in the long term (5 to 10 years). Demolition of the outfall would result in positive impacts to the visual character and quality of the area immediately adjoining the Puente site.

Light and Glare

A significant effect on the environment would occur if a project would create a new source of substantial light or glare that would adversely affect night or daytime views in the area. If approved, construction of the project is estimated to take approximately 21 months and demolition of MGS (including the outfall) about 15 months to complete. Construction and demolition activities generally would occur between 7:00 a.m. and 6:00 p.m., Monday through Friday. All construction/demolition laydown and parking areas would be within the existing MGS site. Construction/demolition activities, materials, equipment, trucks, temporary structures, and vehicles would be visible from offsite areas, in particular from McGrath State Beach. The associated visual changes are considered adverse, but not significant. On AFC page 4.13-11, the applicant states that any nighttime lighting that is required during construction and demolition would be positioned to face downward and away from beach, residential, and agricultural uses, as is practicable for safety. Page 4.13-14 of the AFC states that operational lighting would be directed downward to avoid backscatter, and shielded from public view to the extent practicable. In addition, lighting not required continuously during nighttime hours would be controlled with sensors or switches and operated so that lighting would be on only when needed. With the applicant's proposed mitigation measures, the project would not be a source of substantial light that would adversely affect nighttime views. Staff has incorporated these measures into proposed Conditions of Certification **VIS-2** and **VIS-3**, which address the design and use of lighting for construction/demolition and power plant operations, respectively.

In regard to daytime glare, page 4.13-14 of the AFC states that project structures and transmission pole structures would be treated to reduce sun reflectivity and potential glint/glare; the applicant proposes use of "non-reflective elements where practical." To minimize visual contrast, the applicant also proposes to use paint colors that would blend in with the existing visual conditions, stating that "[t]he colors will provide subtle variations and contrast. The selected color will help the project to blend more naturally with the natural setting." Staff has incorporated the applicant's proposed mitigation measures into staff's proposed Condition of Certification **VIS-1** to ensure project structures would not be a source of substantial glare nor contrast with their coastal setting, which could adversely affect daytime views.

With mitigation, the proposed project would have a ***less than significant effect*** on the environment under this criterion.

CUMULATIVE IMPACTS AND MITIGATION

Under the CEQA Guidelines, cumulative impacts of the project must be discussed when the proposed project's incremental effect is "cumulatively considerable" (Cal. Code Regs., tit. 14, § 15130(a)). "'Cumulatively considerable' means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (Cal. Code Regs., tit.14, § 15065(a)(3)).

Staff prepared a Visual Sphere of Influence (VSOI) using Geographic Information System software to delineate the terrain surface where Puente's tallest structure (the 188-foot tall exhaust stack) could potentially be visible within a five-mile radius **Visual Resources Figure 24** shows the VSOI prepared for the cumulative impact analysis and the locations of existing and reasonably foreseeable future projects identified for the visual resources cumulative impact analysis within the five-mile radius.

Staff concludes that Puente's stack would not be visible from the seven identified projects. Therefore, the incremental visual effect of the proposed project, combined with the visual effects of the identified projects, is not cumulatively considerable and therefore would not be significant. Puente's contribution to any significant cumulative lighting impacts would be less than cumulatively considerable with staff's proposed Conditions of Certification **VIS-2** and **VIS-3**.

ENVIRONMENTAL JUSTICE

Environmental Justice Figure 1 shows the presence of an environmental justice (EJ) population based on race and ethnicity within a six-mile radius of the project site. **Environmental Justice Table 3** shows that the below-poverty-level population in the cities of Oxnard and Port Hueneme constitute an EJ population based on poverty. Please refer to the **Environmental Justice** section of this document for a full explanation of how staff determines the presence of EJ populations.

The project would occupy a very small portion of the field of view from the EJ populations shown in **Environmental Justice Figure 1**, the nearest of which are located about 2 miles from the project site. The project would be subordinate to the existing MGS and would be similar in form to the MGS and other vertical elements as viewed from EJ populations (see the discussion for KOP 4 above, for example). Staff's proposed conditions of certification would reduce visual resource impacts to less than significant for the population in general, including the EJ population. Changes to the visual resource environment would not disproportionally affect individuals in EJ populations because of the low degree of visual change.

CONFORMANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Visual Resources Table 3 provides staff's assessment of Puente's conformance with applicable LORS pertaining to protection of visual resources.

Visual Resources Table 3
Project Conformance with Applicable Visual Resources LORS

LORS	LORS Description	Conformance	Basis for Conformance with LORS
STATE			
California Coastal Act	**Section 30251**. The 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.	Yes	The MGS began operation in 1959. Puente would be sited on a three-acre disturbed area of the 36-acre MGS site (see **Visual Resources Figure 25** – Aerial View of Simulation of Puente Power Plant). Puente would have a simple, sleek design compared to the complex, chaotic character of MGS Units 1 and 2. AFC page 4.14-14 suggests a color treatment for the project to help it to blend with its coastal setting. Staff has proposed Condition of Certification **VIS-1**, which would require application of surface treatment on exteriors of buildings, structures, and equipment to reduce contrast and minimize glare. Complete removal of all above-grade components of units 1 and 2 would be completed by late 2022. The removal of the units would improve visual quality in this visually degraded area of the coastal zone. Removal of the outfall structure would restore a degraded portion of beach. See **Visual Resources Figure 26**.
LOCAL			
Oxnard Coastal Land Use Plan	**Policy 37**. All new development in the coastal zone shall be designed to minimize impacts on the visual resources of the area. Particular care should be taken in areas of special quality, such as those identified in the LCP [Local Coastal Program].	Yes	See discussion above for Section 30251 of the Coastal Act.
	Policy 38. Height restrictions as defined by City Zoning Ordinance shall be used to avoid blocking views.	Yes	The Coastal Land Use Plan states, “The ocean is generally not visible from Harbor Boulevard, limiting the visual resources north of Fifth Street...Other visual resources in the coastal zone include the tall sand dunes south of Fifth Street and south of Wooley Road, the lower dunes in the Mandalay Beach County Park north of Fifth

LORS	LORS Description	Conformance	Basis for Conformance with LORS
			Street and the wetlands in the Ormond Beach area." Harbor Boulevard fronts the MGS property to the east. Fifth Street is a little more than ½-mile to the south. The ocean and beach are not visible from Harbor Boulevard near the MGS. Puente would not block views of Oxnard's scenic resources.
Oxnard 2030 General Plan, Goals and Policies			
	Policy ER - 6.1 Incorporate Views In New Development. Preserve important public views and viewsheds by ensuring that the scale, bulk and setback of new development does not significantly impede or disrupt them and ensure that important vistas and view corridors are enhanced. Require development to provide physical breaks to allow views into these vistas and view corridors.	Yes	This policy is a directive of the city to itself and would not obligate a project applicant to take action. In any case, staff concludes that the project would be consistent with this policy. Removal of MGS Units 1 and 2 and the outfall structure would improve visual quality in this degraded area of the coastal zone. Puente would not significantly impede or disrupt views along the beach.
	Policy ER - 6.2 Protect and Enhance Major Scenic Resources. Protect and enhance the scenic resources of the beaches, Channel Island harbor, windrows, farmland, the Channel Islands, and surrounding mountains.	Yes	This policy is a directive of the city to itself and would not obligate a project applicant to take action. In any case, staff concludes that the project would be consistent with this policy. Demolition of units 1 and 2 and removal of the outfall and restoration of the beach would enhance a scenic resource.
	Policy ER - 6.4 Siting of Transmission Lines. Work with utility companies to avoid transmission lines interfering with scenic views.	Yes	This policy is a directive to the city and would not require any action by the applicant. Nonetheless, staff concludes that the project would be consistent with this policy. Puente's transmission line would be located mostly within the Puente site, but would cross a small portion of the MGS site. The line would be approximately 250 feet long, and supported by two structures, 80 to 90 feet tall. The line would not interfere with scenic views.
	Policy ER - 6.5 Control of Lighting and Glare. Require that all outdoor light fixtures including street lighting, externally illuminated signs, advertising displays, and billboards use low-energy, shielded light fixtures	Yes	AFC page 4.13-14 states that lighting would be directed downward to avoid backscatter, and shielded from public view to the extent practicable. Lighting not required continuously during nighttime hours would be

LORS	LORS Description	Conformance	Basis for Conformance with LORS
	which direct light downward and, where public safety would not be compromised, encourage the use of low-pressure sodium lighting for all outdoor light fixtures.		controlled with sensors or switches operated so that lighting would be on only when needed. Staff has proposed Condition of Certification **VIS-3** pertaining to permanent exterior lighting.
	Coastal Resources Goal ER-8. Protect coastal resources as a significant landscape feature to be experienced by residents and visitors.	Yes	This policy is a directive to the city itself. Nonetheless, visual quality of this portion of the coastline would be improved.
	Policy ER- 8.1 Protect Shoreline. Protect the shoreline and views to and along the Pacific Ocean, recognizing their value as natural and recreational resources.	Yes	This policy is a directive to the city itself. However, removal of MGS Units 1 and 2 and the outfall structure would improve views along this portion of the shoreline.
	Section 16-320. On-Site Lighting Lighting within physical limits of the area required to be lighted shall not exceed seven footcandles, nor be less than one footcandle at any point. A light source shall not shine upon, or illuminate directly any surface other than the area required to be lighted. No lighting shall be of a type or in a location that constitutes a hazard to vehicular traffic, either on private property or on abutting streets. The height of light standards shall not exceed 26 feet. To prevent damage from automobiles, standards shall be mounted on reinforced concrete pedestals or otherwise protected.	Yes	See proposed Condition of Certification **VIS-3**.
Oxnard Coastal Zoning Ordinance	**Article III. Specific Coastal Development and Resources Standards**		
	Section 17-33. Visual Resources The purpose of this section is to provide standards to ensure that the scenic and visual qualities of Oxnard's Coastal Zone are considered and protected as a resource of public importance, in a manner consistent with the standards contained in this section and other general and specific coastal development and resource standards contained in this chapter, as well as all applicable provisions and policies and the	Yes	See basis for conformance with the Oxnard Coastal Land Use Plan, above.

LORS	LORS Description	Conformance	Basis for Conformance with LORS
	Oxnard coastal land use plan. All new development in Oxnard's Coastal Zone shall be designed to protect views to and along the ocean and scenic coastal areas. Specific standards are contained in Policy Nos. 37 and 38 of the Coastal Land Use Plan.		
	Article IV. General Coastal Development and Resources Standards		
	Section 17-47. Landscaping Standards The purpose of this section is to provide standards designed to enhance the appearance of development within the city by requiring the placement and maintenance of landscaping for aesthetic and screening purposes, and to provide for areas of improved open space consistent with the Coastal Land Use Plan, with special concern for the coastal zone. The landscaping standards shall apply where landscaping is required by this chapter as part of a project or permit condition of approval and to all areas where landscaping is proposed by the applicant.	Yes	The applicant is not proposing to install new landscaping on the Puente site. The effectiveness of landscaping the project site in order to screen or partially screen the project from the southern portion of McGrath State Beach would be negligible.
	Section 17-51. General Standards The purpose of this section is to provide general standards relating to fencing, building heights, zone walls, on-site lighting, architectural features and similar provisions which generally apply to all development within the coastal zone. Except as otherwise provided in this chapter, the general standards of chapter 16 shall apply to development in the coastal zone.	Yes	Regarding building height, see the **Land Use** section of the staff assessment. Regarding on-site lighting, see Section 16-320 On-Site Lighting above. The project's Operation Security Plan includes a requirement for a permanent full perimeter fence or wall, at least eight (8) feet tall. If a wall is selected, Visual Resources staff recommends that it be designed in an aesthetically pleasing way – see Condition of Certification **VIS-1**. Refer to the **Hazardous Materials Management** section of the staff assessment for discussion.

NOTEWORTHY PUBLIC BENEFITS

The proposed project would result in beneficial visual impacts from the removal of MGS Units 1 and 2 and the outfall structure in 2022. Baseline viewing conditions from public beaches and other vantage points would be improved.

RESPONSE TO COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

Visual Resources Table 4 presents staff's responses to comments received on the **Visual Resources** section of the PSA.

Visual Resources Table 4
Response to Comments on the PSA

Source of Comment	Comment	Staff Response
City of Oxnard, Intervenor (Represented by Shute, Mihaly & Weinberger LLP) (TN# 213681, COO 2016d)	1. The PSA's evaluation of the project's visual impacts concludes that the project will have a net beneficial impact on visual resources because Mandalay Units 1 and 2 will be demolished. Because these retiring once through-cooling facilities would require removal [because they will be a nuisance under the city's code], the project would create 30 years of additional visual blight on Oxnard's waterfront, directly adjacent to McGrath State Beach. The PSA must acknowledge and evaluate this significant visual impact.	1. Staff appropriately considered baseline viewing conditions, which includes the degradation caused by the MGS, in its assessment of Puente's impacts on visual quality. Regarding decommissioned units 1 and 2, it is unknown at what point future circumstances would cause the city to take action on a nuisance determination, and how and when that would result in these units being removed according to a schedule. If Puente is approved by the Energy Commission, the applicant's proposal to demolish units 1 and 2 and the 200-foot tall stack is certain to occur. Staff does not agree that Puente would result in "30 years of additional visual blight". Visual quality would be improved over baseline viewing conditions. Condition of Certification **VIS-1** would ensure the quality of surface treatments (e.g., paint) on project structures would be maintained for the life of the project.
	2. The PSA does not account for significant short-term cumulative impacts of Puente combined with the existing MGS Units 1 and 2. In the years between the commencement of project construction and ultimate demolition of these old once-through-cooling units, all of these structures would be visible on Oxnard's coast. CEQA requires evaluation of such short-term environmental impacts.	2. The staff assessment fully analyzes the potential visual impacts of constructing and operating Puente including those impacts in combination with the existing MGS at all key observation points (KOPs 1 through 5).
	3. The PSA fails to adequately apply the identified thresholds of significance for determining a visual impact. Specifically, the PSA determines no significant impact would occur to a scenic vista or resource even though the proposed project would visibly mar views of the coastline from McGrath State Beach and Mandalay County Park. The entire viewshed from 10 miles across Oxnard Plain is a scenic vista of the coastline and Channel Islands National Park. The PSA	3. The staff assessment fully and adequately analyzes the project's potential visual impacts to scenic resources including McGrath State Beach and Mandalay Beach State Park (refer to the "Scenic Resources" and "Visual Character and Quality" subsections of the FSA). The staff assessment identifies and concludes there are no scenic resources on the project site that could be damaged by the project. With removal of the outfall structure, Puente would restore a portion of beach damaged by operation of the

Source of Comment	Comment	Staff Response
	should be revised to consider the project's impacts to these resources.	MGS. The staff assessment further analyzes Puente's potential visual impacts on the visual character or quality of Oxnard beaches surrounding the site, and concludes that visual quality would be improved over baseline viewing conditions (see discussions for KOP 1 through KOP 3).
	4. The project is inconsistent with city regulations for visual resources in a coastal zone. The project exceeds the General Plan's six-story height limit for this property. The proposed project is inconsistent with LCP Policy 37, which require all new development in the coastal zone to minimize impacts to visual resources, and General Plan Policy ER-6.2 to protect and enhance the scenic resources of the beaches. The PSA attempts to avoid these policies by quoting a section of the LCP that states that the ocean is not visible from a section of Harbor Boulevard. This fact, however, provides no analysis of the project's impact on views of the ocean, the beach, and the surrounding coastal dunes from other nearby vantage points. Any such analysis would find the project inconsistent with the city's General Plan and LCP.	4. The staff assessment fully and adequately analyzes the project's consistency with all applicable city LORS (see **Visual Resources Table 3**), including policies 37 and ER-6.2. Consistent with these policies, the applicant's proposal to completely remove all above-grade components of units 1 and 2 would improve visual quality in this visually degraded area of the coastal zone. The proposal to remove the outfall structure would restore the visual character/quality of a degraded portion of beach. Staff believes the approach taken to analyze the project's potential impacts on scenic resources is accurate. The staff assessment discusses the project's potential to affect scenic resources (beaches, dunes) from nearby vantage points such as KOPs 1, 2, and 3, which are all located on the beach (see **Visual Resources Figure 5**). Puente would not block views of these scenic resources. Puente's structures would be simpler and have a more cohesive design than MGS Units 1 and 2 and would be painted or treated to minimize color contrast with the setting. With the removal of units 1 and 2, existing levels of contrast and dominance would be substantially reduced, baseline conditions would be improved, and the project's visual impacts to beach views would be less than significant Please see the **Land Use** section of the FSA for a discussion of the project's conformance with height restrictions.

Source of Comment	Comment	Staff Response
	5. The PSA should consider feasible mitigation measures to reduce the project's long-term and short-term visual impacts, as well as inconsistencies with applicable LORS. Such mitigation should include redesigning the project to reduce the size of the proposed stack to minimize its visual profile along the beach.	5. Staff is recommending conditions of certification to reduce the project's short- and long-term impacts on visual resources. With the recommended conditions of certification and the applicant's proposal to demolish units 1 and 2 and remove the outfall, the project would comply with applicable LORS and impacts would be less than significant. Please see the **Alternatives** section of the FSA for a discussion on the feasibility of reducing the height of the exhaust stack.
Steve Nash (TN# 213820)	6. Residents will have to live with the visual blight if the project is approved.	6. The comment does not relate to the adequacy of the analysis of environmental impacts conducted in the staff assessment. Staff concludes that the proposed project would not result in any significant impacts related to visual resources as proposed by the applicant and conditioned by staff. Staff's analysis does not support the commenter's conclusion that the proposed project would result in visual blight. Visual quality of the site and its surroundings would be improved over baseline viewing conditions.
County of Ventura (TN# 213654)	7. The county requests an evaluation of the project's consistency with certain county general plan policies because the site is located adjacent to the county's jurisdictional boundary and within the sensitive resource area of the coastal zone. *Visual resources: GPP 1 .7.2.1 ... development which would significantly degrade visual resources or significantly alter or obscure public views or visual resources shall be prohibited unless no feasible mitigation measures are available and the decision-making body determines there are overriding considerations.* Puente would not only prolong on-going impacts of the MGS on visual and recreational resources but would further clutter the viewshed from both the land and beachside. Puente would degrade public views and have	7. As presently proposed by the applicant and conditioned by staff, Puente would not significantly degrade visual resources, or significantly alter or obscure public views or visual resources. As reported in the staff assessment, the city of Oxnard's Coastal Land Use Plan states that "[t]he ocean is generally not visible from Harbor Boulevard, limiting the visual resources north of Fifth Street." With the proposal to demolish to grade units 1 and 2, and remove the ocean outfall structure and restore the beach, Puente would improve baseline viewing conditions from both the land and beach sides. Puente would not obscure views of scenic resources (beaches, dunes).

Source of Comment	Comment	Staff Response
	significant impact on visual resources.	
	8. *Visual impacts of utility lines: GPP 4.5.2.1 New gas, electric, cable television and telephone utility transmission lines shall use or parallel existing utility rights-of-way where feasible and avoid scenic areas when not in conflict with the rules and regulations of the California Public Utilities Commission. When such areas cannot be avoided, transmission lines should be designed and located in a manner to minimize their visual impact.* Puente would prolong the on-going visual impacts by extending the life of the power station at this location. Alternative designs or alternative locations should be utilized to mitigate these impacts.	8. The applicant recently changed the project's proposed electrical interconnection from a 750-foot long overhead line with four 100-foot tall poles, to an approximately 250-foot long line supported by two 80- to 90-foot tall structures (one monopole and one take-off structure). The new line and structures would be seen in the context of numerous transmission structures at the SCE Mandalay Switchyard and would have a negligible impact on visual resources.
	9. *Underground service lines: GPP 4.5.2.3 Discretionary development shall be conditioned to place utility service lines underground wherever feasible.* Undergrounding of the service lines would reduce visual impacts.	9. The short overhead line would be seen in the context of numerous transmission structures at the SCE Mandalay Switchyard and would have a less than significant impact on visual resources. The support structures would be constructed of weathered or galvanized steel to minimize contrast. Undergrounding the line is not viewed as necessary.

CONCLUSIONS

Staff evaluated if the Puente Power Project would have a significant effect on the environment according to Appendix G of the State CEQA Guidelines and if the project would be in conformance with applicable laws, ordinances, regulations, and standards. Staff concludes the following:

- The proposed project would not have a substantial adverse effect on a scenic vista.
- The proposed project would not substantially damage a scenic resource.
- The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings at Key Observation Points (KOPs) 1, 2, 4,

and 5. At KOP 3, visual character or quality of the existing site and surroundings would be degraded – a potentially significant effect on the environment. The applicant has proposed mitigation measures, incorporated into staff's proposed Condition of Certification **VIS-1**, to treat project structures in colors that would help to blend the project into its coastal setting and to use non-reflective materials to the extent feasible. In addition, in November 2015, the applicant revised the project description to include above-grade removal of MGS Units 1 and 2 in 2022. With the removal of units 1 and 2, existing levels of contrast and dominance would be substantially reduced, baseline conditions would be improved, and impacts at KOP 3 would be less than significant. The applicant's recent proposal to remove the ocean outfall would further improve the visual conditions of the beach.

- The proposed project would not create a new source of substantial glare or light that would adversely affect daytime or nighttime views in the area. Conditions of Certification **VIS-2** and **VIS-3** would ensure no significant impacts occur from lighting during the construction, demolition, and operation phases of the project.
- The proposed project's incremental visual effect is not cumulatively considerable.
- Proposed mitigation measures and conditions of certification would reduce visual impacts to less than significant for all populations, including environmental justice populations. Impacts to environmental justice populations would not be disproportionate.
- The project as currently proposed would be in conformance with applicable, state and local LORS pertaining to visual resources, with the effective implementation of the applicant's proposed mitigation measures and staff's proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

Surface Treatment of Project Structures and Buildings

VIS-1 The project owner shall prepare and implement a Surface Treatment Plan addressing treatment of the surfaces of all project structures, buildings, fences, and walls visible to the public such that proposed colors and finishes: (1) minimize visual intrusion and reduce contrast by blending with the existing visual environment, (2) avoid creating new sources of substantial glint and glare, and (3) are consistent with all applicable laws, ordinances, regulations, and standards.

A. The Surface Treatment Plan shall be submitted to the compliance project manager (CPM) and the Planning Director of the city of Oxnard, for simultaneous review and comment. Any comments on the plan from the city shall be provided to the CPM. Modifications to the Surface Treatment Plan are prohibited without the CPM's approval. The Surface Treatment Plan shall provide the following:

1. A discussion of all considered surface treatments and the rationale for choosing the proposed surface treatment colors and finishes;
2. An assessment of each considered surface treatment's effectiveness in avoiding or minimizing impacts to visual resources, ensuring compatibility between the energy facility site and its surroundings, and enhancing design and visual quality of the site and its surroundings;
3. Three printed sets (11" x 17"), and a digital copy in PDF format of elevation drawings depicting at life-size scale the major project structures and buildings, and specifying for each structure and building: (1) the proposed color and finish; and (2) the height, length, and width or diameter;
4. Two sets of color brochures, color chips, and or physical samples showing each proposed color and finish. Digital files showing proposed colors may not be submitted in place of original samples. Colors must be identified by vendor, name, and number, or according to a universal designation system;
5. Three printed sets (11'' x 17") and a digital copy in PDF format of color visual simulations at life-size scale showing the surface treatment proposed for the project structures. The visual simulations for key observation point (KOP) 2 and KOP 3 shall be used to prepare images showing the proposed surface treatment plan;
6. A detailed schedule for completing the surface treatments;
7. A procedure to ensure proper surface treatment maintenance for the life of the project.

B. The transmission structures shall be constructed using self-weathering steel to blend with the environment to the greatest extent feasible, and the finish shall appear as a matte patina. No galvanizing process shall be used that produces a reflective or shiny metallic finish. Unpainted exposed lagging and surfaces of steel structures that are visible to the public shall be embossed or otherwise treated to reduce glare.

Verification: At least 90 calendar days before submitting instructions for colors and other surface treatments to manufacturers or vendors of project structures, and/or ordering prefabricated project structures, the project owner shall submit the Surface Treatment Plan to the CPM and the Planning Director of the city of Oxnard for simultaneous review and comment. The project owner shall provide the CPM with a copy of the transmittal letters submitted to the city requesting their review of the Surface Treatment Plan. The CPM shall deem the Surface Treatment Plan acceptable to the city if comments are not provided to the CPM within 45 calendar days of receipt of said plan.

If the CPM determines that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by the CPM. A copy of the revised plan shall be provided to the city's Planning Director. No work to implement the Surface Treatment Plan shall begin until final plan approval is received from the CPM.

Prior to the start of commercial operation of the project, the project owner shall notify the CPM that surface treatments of all publicly visible structures and buildings identified in the Surface Treatment Plan have been completed and that the facilities are ready for inspection. The project owner shall obtain written confirmation from the CPM that the project complies with the Surface Treatment Plan.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report for the project. At a minimum, the report shall specify:

1. The condition of the surfaces and finishes of all structures at the power plant site,

2. All major maintenance activities that occurred during the reporting year, and

3. A schedule for major maintenance activities for the next year.

Site Lighting – Project Demolition, Construction, and Commissioning

VIS-2 Consistent with applicable worker safety regulations, the project owner shall ensure that lighting of demolition and construction areas and construction worker parking lots minimizes potential night lighting impacts by implementing the following measures:

A. All fixed-position lighting shall be hooded and shielded to direct light downward and toward the construction area to be illuminated to prevent illumination of the night sky and minimize light trespass (i.e., direct light extending beyond the boundaries of the parking lots and construction sites, including any security-related boundaries).

B. Lighting of any tall construction equipment (e.g., scaffolding, derrick cranes, etc.) shall be directed toward areas requiring illumination and shielded to the maximum extent practicable.

C. Task-specific lighting shall be used to the maximum extent practicable.

D. Wherever and whenever feasible, lighting shall be kept off when not in use and motion sensors shall be installed and used to the maximum extent practicable.

E. The CPM shall be notified of any demolition- and construction-related lighting complaints. Complaints shall be documented using a form in the format shown in Attachment 1, and completed forms shall record resolution of each complaint. A copy of each completed complaint form shall be provided to the CPM. Records of lighting complaints shall also be kept in the compliance file at the project site.

Verification: Within seven calendar days after the first use of construction and demolition lighting, the project owner shall notify the CPM that the lighting is ready for inspection. If the CPM determines that modifications to the lighting are needed for any construction milestone, within 14 calendar days of receiving that notification, the project owner shall correct the lighting and notify the CPM that modifications have been completed.

Within 48 hours of receiving a lighting complaint for any construction activity, the project owner shall provide to the CPM a copy of the complaint report and resolution form, including a schedule for implementing corrective measures to resolve the complaint.

The project owner shall report any lighting complaints and document their resolution in the Monthly Compliance Report for the project, accompanied by copies of completed complaint report and resolution forms for that month.

Lighting Management Plan – Project Operation

VIS-3 The project owner shall prepare and implement a comprehensive Lighting Management Plan. The comprehensive Lighting Management Plan shall be submitted to the CPM, and the Planning Director of the city of Oxnard for simultaneous review and comment. Any comments on the plan from the city shall be provided to the CPM. The project owner shall not purchase or order any lighting fixtures or apparatus until written approval of the final plan is received from the CPM. Modifications to the Lighting Management Plan are prohibited without the CPM's approval.

Consistent with applicable worker safety regulations, the project owner shall design, install, and maintain all permanent exterior lighting such that light sources are not directly visible from areas beyond the project site, glare is avoided, and night lighting impacts are minimized or avoided to the maximum extent feasible. All lighting fixtures shall be selected to achieve high energy efficiency for the facility. The project owner shall meet these requirements for permanent project lighting:

1. The Lighting Management Plan shall include three printed sets of full-size plans (24” x 36”, minimum), three sets of 11” x 17” reductions, a digital copy in PDF format, and contain the following information.

2. The Lighting Management Plan shall be prepared with the direct involvement of a certified lighting professional trained to integrate efficient technologies and designs into lighting systems.

3. Exterior lights shall be hooded and shielded and directed downward or toward the area to be illuminated to prevent obtrusive spill light (i.e., light trespass) beyond the project site.

4. Exterior lighting shall be designed to minimize backscatter to the night sky to the maximum extent feasible.

5. Energy efficient lighting products and systems shall be used for all permanent new lighting installations. Smart bi-level exterior lighting using high efficiency directional LED fixtures shall be used as appropriate for exterior installations. The lighting system shall work in conjunction with occupancy sensors, photo sensors, wireless controls, and/or other scheduling or controls technologies to provide adequate light for security and maximize energy savings.

6. Lighting fixtures shall be kept in good working order and continuously maintained according to the original design standards.

7. The Lighting Management Plan shall be consistent with all applicable laws, ordinances, regulations, and standards.

The CPM shall be notified of any complaints about permanent lighting at the project site. Complaints shall be documented using a form in the format shown in Attachment 1, and completed forms shall record resolution of each complaint. A copy of each completed complaint form shall be provided to the CPM. Records of lighting complaints shall also be kept in the compliance file at the project site.

Verification: At least 90 calendar days before ordering any permanent lighting equipment for the project, the project owner shall submit the comprehensive Lighting Management Plan to the CPM and the Planning Director of the city of Oxnard for simultaneous review and comment. The project owner shall provide the CPM with a copy of the transmittal letters submitted to the city requesting their review of the Lighting Management Plan. The CPM shall deem the Lighting Management Plan acceptable to the city of Oxnard if comments are not provided to the CPM within 45 calendar days of receipt of said plan.

If the CPM determines that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by the CPM. A copy of the revised plan shall be provided to the Planning Director of the city of Oxnard. No work to implement the plan (e.g., purchasing of fixtures) shall begin until final plan approval is received from the CPM.

Prior to the start of commercial operation of the project, the project owner shall notify the CPM that installation of permanent lighting for the project has been completed and that the lighting is ready for inspection. If the CPM notifies the project owner that modifications to the lighting system are required, within 30 days of receiving that notification, the project owner shall implement all specified changes and notify the CPM that the modified lighting system(s) is ready for inspection.

Within 48 hours of receiving a complaint about permanent project lighting, the project owner shall provide to the CPM a copy of the complaint report and resolution form, including a schedule for implementing corrective measures to resolve the complaint.

The project owner shall report any complaints about permanent lighting and document their resolution in the Annual Compliance Report for the project, accompanied by copies of completed complaint report and resolution forms for that year.

REFERENCES

California Department of Parks and Recreation, “McGrath State Beach,” n.d., http://www.parks.ca.gov/?page_id=607.

City of Oxnard Coastal Land Use Plan, February 1982 as amended. Last revised May 2002. https://www.oxnard.org/wp-content/uploads/2016/03/CoastalLandUsePlan.pdf.

City of Oxnard Local Coastal Plan interactive map <maps.ci.oxnard.ca.us/planning/localcoastalplan.html>.

City of Oxnard Coastal Zoning Ordinance, Chapter 17 of the City Code. http://library.amlegal.com/nxt/gateway.dll/California/oxnard/oxnardcaliforniacodifiedordinances?f=templates$fn=default.htm$3.0$vid=amlegal:oxnard_ca.

City of Oxnard 2030 General Plan Goals and Policies. October 2011. https://www.oxnard.org/wp-content/uploads/2016/08/2030GeneralPlanGoalsPoliciesOctober2011W.pdf.

PPP 2015a – NRG Energy Center Oxnard LLC/John Chillemi (TN 204219-1 – 204220-14). Application for Certification, dated April 13, 2015. Submitted to Robert Oglesby/CEC/Docket Unit on April 16, 2015.

PPP 2015x – Latham & Watkins LLP Project Enhancement and Refinement, Demolition of Mandalay Generating Station Units 1 and 2 (TN 206698). Submitted on November 19, 2015. CEC/Docket Unit on November 19, 2015.

PPP 2016 – NRG Project Enhancement – Outfall Removal and Beach Restoration (TN 213802). Submitted on September 26, 2016. CEC/Docket Unit on September 26, 2016.

VISUAL RESOURCES APPENDIX-1

VISUAL RESOURCES TERMS, DEFINITIONS, AND ANALYSIS METHOD

This appendix is divided into two main sections. The first section defines key terms and describes the method used by Energy Commission staff (staff) to evaluate effects of a project on visual resources. The second section describes the process to evaluate effects of publicly visible water vapor plumes on visual resources.

Staff conducted a preliminary analysis of the proposed project's exhaust gas characteristics and ambient air conditions and determined that conditions would be unlikely to cause formation of visible plumes above the project's exhaust stack. Therefore, the section of this appendix pertaining to visible plumes is not applicable to the proposed project.

KEY TERMS AND ANALYSIS METHOD

VISUAL SPHERE OF INFLUENCE AND DISTANCE ZONES

The *visual sphere of influence* (VSOI) depicts the area within which the proposed project could cause significant impacts on visual resources. The extent of the VSOI will vary depending on the project setting, topography, and the presence or absence of natural or built screening, and it must be determined on a case-by-case basis. For projects in urban settings, visibility of a project site may be limited to specific vantage points in the VSOI. For projects in relatively open areas, a project site may be visible throughout most of the VSOI.

A VSOI boundary may be refined to account for local viewing conditions and topographic screening based on computer *viewshed* analysis and mapping, which is a useful way to determine project visibility and to communicate that information to others. A viewshed is the surface area visible from a given viewpoint or series of viewpoints. It is also the area from which that viewpoint or series of viewpoints may be seen. At a basic level, a viewshed is a plan view or map of areas with an unobstructed sightline to a single observer viewpoint (Federal Highway Administration 1990).

The VSOI may be mapped up to a distance of approximately five miles from a project site. At the limits of the VSOI, distant background features may blend together such that they would not be especially discernible to the viewer.

Visual resource management guidelines and methods established by federal agencies are often adapted and used by staff to evaluate the impacts of a project on visual resources. The visual management system of the U.S. Forest Service uses distance zones to describe parts of a characteristic landscape that is subject to inventory and evaluation (Bacon 1979). The Federal Highway Administration (FHWA) uses similar descriptions for distance zones (FHWA 1990). Staff includes a discussion of distance zones to describe views of the project site from parts of the VSOI, which are described as follows:

- **Foreground**. This zone will usually be limited to areas within one-quarter to one-half mile of the observer, but must be determined on a case-by-case basis as should any distance zoning. The limit of this zone is based on distances at which details can be perceived. For example, the viewer may see the texture and form of individual plants or tree boughs. Intensity of color and its value will be at a maximum level.
- **Middleground**. This zone may extend from the foreground zone to three to five miles from the observer. Texture is generally characterized by masses of trees in stands of uniform tree cover. Parts of the landscape may be seen to join together; hills become a range or trees appear as a forest. Individual tree forms are usually only discernible in very open or sparse stands.
- **Background**. This zone may extend from the middleground zone to infinity. The surfaces of land forms lose detail distinctions, and the emphasis is on the outline or edge of the land forms. The texture in stands of uniform tree cover is generally very weak or nonexistent. In open or sparse timber stands, texture is seen as groups or patterns of trees. Atmospheric haze may diminish colors, soften features, and reduce contrast in background views.

Visual elements closer to the viewer will be in the foreground or middleground. Visual elements at the limits of the project VSOI will generally be those that appear in the background.

VISUAL ABSORPTION CAPABILITY

Visual absorption capability (VAC) provides an additional perspective on the landscape and its capacity to visually withstand or absorb changes from a project. VAC is an estimate or measure of the capacity of a landscape to absorb visual alterations without significantly affecting visual character (Bacon 1979). High VAC may be associated with varied, undulating landforms and varied vegetation canopy. Low VAC may be associated with a uniform landscape, an even tree canopy, and steep slopes. (As the upward slope increases, a greater area of land becomes directly visible and any intervening vegetation loses the potential to screen the activity.)

SELECTION OF KEY OBSERVATION POINTS

Sensitive viewing areas are identified and inventoried in the VSOI for a project where project structures and facilities could be visible to the public. A list of sensitive viewing areas could include several types of uses:

- residential;
- recreational, including wildlife areas, parks, visitor centers, hiking trails, and other recreation areas;
- travel routes, including major roads or highways and designated scenic roads; and
- tourist destinations, including historic landmarks and other protected natural and built features in the landscape.

Refinement of the visual analysis for a project involves identifying critical viewpoints, or key observation points (KOPs). KOPs are selected to represent the most critical viewpoints from off-site locations where a project would be visible to the public.

Because it is infeasible to analyze all viewpoints, KOPs are selected that would most clearly display the visual effects of the proposed project. A KOP may also represent a primary viewer group(s) (e.g., motorists on a highway in the project area) that could potentially be affected by a project.

Following selection of the KOPs, photographs are taken of the project site to show existing conditions from the KOPs. The existing condition (baseline) photographs taken from the selected KOPs are used to prepare representative visual simulations of the proposed project or specific project feature. The simulations portray the relative scale and extent of the project. The photograph of the existing condition and the visual simulation (proposed condition) are reviewed for each KOP to determine the potential effects of a project on visual resources.

PROCESS TO EVALUATE KEY OBSERVATION POINTS

VISUAL SENSITIVITY (EXISTING CONDITION)

Steps to evaluate the overall visual sensitivity for each KOP involve consideration of several key factors: *visual quality, viewer concern, visibility, number of viewers,* and *duration of view*. In a project analysis, the rating scale ranges from low to high for each factor. These factors are also used to convey the overall scenic value of the view from each representative KOP. The five factors are described below. (Diagram 1 [below] illustrates the process to evaluate the KOPs and determine impact significance.)

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. The visual quality of an area is composed of visual or scenic resources, which are those physical features that make up the visible landscape, including land, water, vegetation, and the built environment (e.g., buildings, roadways, irrigation canals, and other structures). Scenic resources that compose scenic views and sites are generally valued for their aesthetic appearance. Using staff's visual resources analysis method, visual quality is generally rated from low to high.

Memorable or visually powerful landscapes are generally rated high when the landscape components combine in striking or distinctive visual patterns. Landscapes with high visual quality are visually coherent and harmonious when each element is considered as part of the whole. The landscapes are free from encroaching elements and thus retain their visual integrity. Landscapes rated low are often dominated by visually discordant built elements. **VR Table 1** describes a set of ratings associated with an assessment of visual quality.

VR Table 1
Landscape Scenic Quality Scale

Rating	Description
Outstanding Visual Quality	This rating describes landscapes with exceptionally high visual quality. These landscapes are often significant regionally and/or nationally, and they usually contain exceptional natural or cultural features that contribute to this rating. They might be described as "picture-postcard" landscapes. People are attracted to these landscapes to view them. These landscapes are often managed in a manner to ensure preservation of the inherent qualities of the landscape.
High Visual Quality	Landscapes with high visual quality may contain cultural or natural features in the landscape that attest to their value. These landscapes often contain visually interesting spaces and elements that are arranged in ways that make them particularly pleasant places to be. Areas with high visual quality often provide recreational opportunities where the visual experience is important. These landscapes are often managed to emphasize preservation of the inherent qualities of the landscape.
Moderately High Visual Quality	These landscapes have above average scenic value but do not possess all of the qualities associated with places that are rated high. The scenic value of these landscapes may be lower due to the less interesting arrangement of landscape elements. These landscapes may have recreational potential, and visual quality is an important management concern.
Moderate Visual Quality	These landscapes have average scenic value and are not especially memorable. They usually lack noteworthy cultural or natural features. These landscapes may have considerable recreational potential and visual quality is a management consideration.
Moderately Low Visual Quality	These landscapes have below average scenic value. They may contain visually discordant built elements, but the landscape is not dominated by these features. They often provide little visual interest and lack spaces that people will perceive as inviting. Recreational activities may occur in areas with below average scenic value, but the visual experience for recreationists is less important in these areas. Management concerns for visual quality may be limited to minimizing the adverse visual impacts of resource management activities or projects.
Low Visual Quality	Landscapes with low scenic value may be dominated by visually discordant built elements. They do not include places that people will find inviting, and lack attributes that make areas with higher quality views memorable and visually interesting. These landscapes often have little recreational potential. Management concerns for visual quality may either address rehabilitation of visually discordant built elements or are limited to minimizing the adverse visual impacts of resource management activities or projects.
Source: Adapted from Buhyoff et al., 1994	

Viewer Concern

Viewer concern represents the estimated reaction of a viewer or viewer group to visible changes in the view. Viewer concern will vary depending on the characteristics and preferences of the viewer group. An assessment of viewer concern can be made based on the extent of the public's concern for a particular landscape or for scenic quality in general. Existing discordant elements in the landscape may temper viewer concern.

Viewer concern for homeowners or other local residents is expected to be high for views near their homes. Viewers engaging in recreational activities and enjoying scenic surroundings are generally expected to be highly concerned about potential degradation of the existing visual quality and character of their views.

Viewer activity is an identifying characteristic of viewer groups (FHWA 1990). Commuting in heavy traffic can distract an observer from many aspects of the visual environment; therefore, viewer concern tends to be lower for views seen by people driving to and from work or as part of their work. Employees, managers, and patrons of businesses may have extended and repeated views of their surroundings on a daily basis. This viewer group may have lower expectations for visual elements in the VSOI than residents and recreationists.

The viewer concern of motorists generally depends on when and where travel occurs, the angle of view, the view distance, and the frequency of travel of the motorist in a particular area. As the observer's speed increases, the sharpness of lateral vision declines, and the observer tends to focus along the line of travel. It is assumed that motorists on freeway systems during periods of free flow travel have a low to moderate viewer concern. Daily commuters using inner city freeways in heavy traffic are primarily focused on traffic and roadway conditions along the travel corridor. Commuters traveling at normal freeway speeds are generally more aware of views from the freeway. Motorists driving for pleasure are expected to have a higher concern for view. Motorists who are local residents and/or business owners may have a higher viewer concern due to their personal investment in the area and greater familiarity with the local environment.

In urban and semi-rural settings, individual viewers are likely to include employees and managers working in offices and commercial and industrial businesses. In rural and semi-rural areas, individual viewers may include people employed in agricultural, industrial, and commercial businesses. For viewers whose focus is on their work and daily pursuits, viewer concern is generally expected to be low to moderate. However, this rating will vary depending on the existing visual quality of the landscape and built environment.

Scenic roadways, cultural features, or other areas identified in adopted land use planning documents are subject to protection. The scenic qualities of protected resources are recognized for their value to the public, and the expectation of viewers is that views of protected resources will be preserved.

Visibility

An assessment of visibility addresses how well the project site or feature can be seen from a particular location. The degree of visibility generally depends on the angle or direction of view; extent of visual screening provided by built and/or natural elements; topography; and the distance between the object (i.e., the project site) and existing homes, streets, or parks. In this sense, visibility is determined by considering any and all obstructions that may be in the sightline, including trees and other vegetation, buildings, hills, and transmission poles or towers.

Number of Viewers

This is an estimate of the number of viewers who may see the project site or feature. The estimate is based on the number of residences, the average traffic volume on local roads and highways, and the number of recreational users per day (e.g., the number of people participating in any recreational activity during a 24-hour period). Traffic volume is based on data such as average daily vehicle trips (ADT) or annual average daily vehicle trips (AADT).

For recreational users, the number of viewers is closely tied to visual quality and viewer concern. For recreationists engaged in activities where visual quality is on the higher end of the scale, the number of viewers is carefully considered in the visual assessment. For example, a recreational area in an area with a high visual quality rating may receive a higher rating overall regardless of the number of viewers. For example, a visual change at a national park is generally more important than a visual change near a large sports stadium.

VR Table 2 shows ratings based on estimated numbers of viewers. Variations in viewer preferences and existing visual quality will influence these ratings.

VR Table 2
Approximate Number of Viewers By Viewer Category and Corresponding Rating

Residential (number of residences	Recreationists (number of people per day)	Motorists (number of motor vehicles per day)	Rating
Over 100	Over 200	Over 10,000	High
50–100	100–200	5,000–10,000	Moderate to High
20–50	50–100	2,500–5,000	Moderate
5–20	25–50	500–2,500	Low to Moderate
2–5	10–25	125–500	Low
Source: Energy Commission staff			

Duration of View

Duration of view is the estimated length of time a project site is viewed by a person or group of people. The importance of view duration varies depending on the activities of the viewers. Duration of view is generally less of a concern when the viewer only briefly glimpses the visible feature or site. However, if the site is subject to viewing for a longer period, as from a scenic overlook, then duration of view is a factor of greater importance. Residential viewers typically have the longest duration of view. A resident with a direct view of a project site might have views lasting for extended periods depending on the orientation of the residence and the extent of visual screening.

For motorists, the duration of view depends on the speed of travel, view distance, and angle of observation. For a motorist traveling at 60 miles per hour on a highway with a direct view of a project site, and where the initial point of visibility is approximately one mile away, the viewer might see the site for a continuous 60-second period.

The duration of view for recreationists will vary depending on whether the recreational activity is *active* or *passive*. Active recreation involves direct participation in a sport or play activity, which typically requires the use of an organized space (e.g., off-road bike trails or a team sports field). A view of a proposed project by people observing or engaging in active recreation is estimated to be of short duration. People engaging in recreational activities under these conditions are likely to be focused on the sport rather than the aesthetics of the environment.

Passive recreation often involves low impact activities or observation and does not require use of an organized play or sports area. Viewers are more closely associated with the surrounding physical environment where the activity takes place. Typical activities include climbing, hiking, wildlife observation, fishing, and picnicking. A view of a proposed project by an individual engaged in passive recreation is estimated to be of longer duration than for someone participating in active recreation.

VR Table 3 provides a baseline to determine the ratings associated with view duration. As with number of viewers, variations in viewer preferences and existing visual quality will influence the relative importance of the ratings for duration of view.

VR Table 3
Approximate Duration of View and Corresponding Rating

Approximate Duration of View	Rating
Longer than 2 minutes	High (extended period of time)
1–2 minutes	Moderate to High
20–60 seconds	Moderate (mid-length period of time)
10–20 seconds	Low to Moderate
Less than 10 seconds	Low (brief period of time)
Source: Energy Commission staff	

Overall Viewer Exposure

Overall viewer exposure is based on *visibility*, *number of viewers*, and *duration of view*. These three factors are generally given equal weight in determining overall viewer exposure. However, additional weight is given to any factor with an extreme value. For example, if a project's visibility is very limited because it would be almost entirely screened from public view, staff gives a lower value to overall viewer exposure.

Overall Visual Sensitivity

Overall visual sensitivity is based on *visual quality*, *viewer concern*, and *overall viewer exposure*. These three factors are generally given equal weight in determining the level of overall visual sensitivity.

VISUAL CHANGE (PROPOSED CONDITION)

The visual change for each KOP is described using the terms *contrast*, *dominance*, and *view blockage*. The scale for rating the visual change ranges from low to high for each factor. The three factors used to evaluate visual change are described below.

Contrast

The degree to which a project could affect the visual quality of a landscape generally depends on the visual contrast created between a project and the existing landscape (U.S. Bureau of Land Management 1986 and 2012). The basic design elements of form, line, color, and texture are used for this comparison and to describe the visual contrast created by a project:

- **Form**. Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those that exist in the landscape.
- **Line**. Contrasts in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their subelements (e.g., boldness, complexity, and orientation) from existing lines.
- **Color**. Changes in value, or a gradation or variety of a color (hue) tend to create the greatest contrast. Other factors such as saturation of a color, reflectivity, color temperature, may also increase the contrast.
- **Texture**. Noticeable contrast in texture usually stems from differences in the grain, density, and internal contrast. Other factors such as irregularity and directional patterns of texture may affect the rating.

Projects designed to repeat forms, lines, colors, and textures as those present in the existing landscape will generally be less noticeable. (See also the discussion above under “Visual Absorption Capability.”) **VR Table 4** provides a baseline for the degree of contrast rating.

VR Table 4
Degree of Contrast and Corresponding Rating

Criteria	Rating
The element contrast demands attention, will not be overlooked, and is dominant in the landscape.	High (strong)
	Moderate to High
The element contrast begins to attract attention and begins to dominate the characteristic landscape.	Moderate
The element contrast can be seen but does not attract attention.	Low to Moderate (weak)
	Low
The element contrast is not visible or perceived.	None
Source: Adapted from U.S. Bureau of Land Management 1986	

Dominance

Dominance is a measure of (a) the proportion of the total field of view that the proposed feature occupies, (b) a proposed feature's apparent size relative to other visible landscape features, and (c) the conspicuousness of the proposed feature due to its location in the view. Also, forms that are bold, regular, solid, or vertical will tend to dominate the landscape.

A proposed feature's level of dominance may be lower in a panoramic setting than in an enclosed setting with a focus on the feature itself. A feature's level of dominance is higher if it is (a) near the center of the view, (b) elevated relative to the viewer, or (c) has the sky as a backdrop. As the distance between a viewer and a feature increases, the feature's apparent size decreases and its dominance decreases as a consequence. The level of dominance is rated from low (subordinate) to high (dominant).

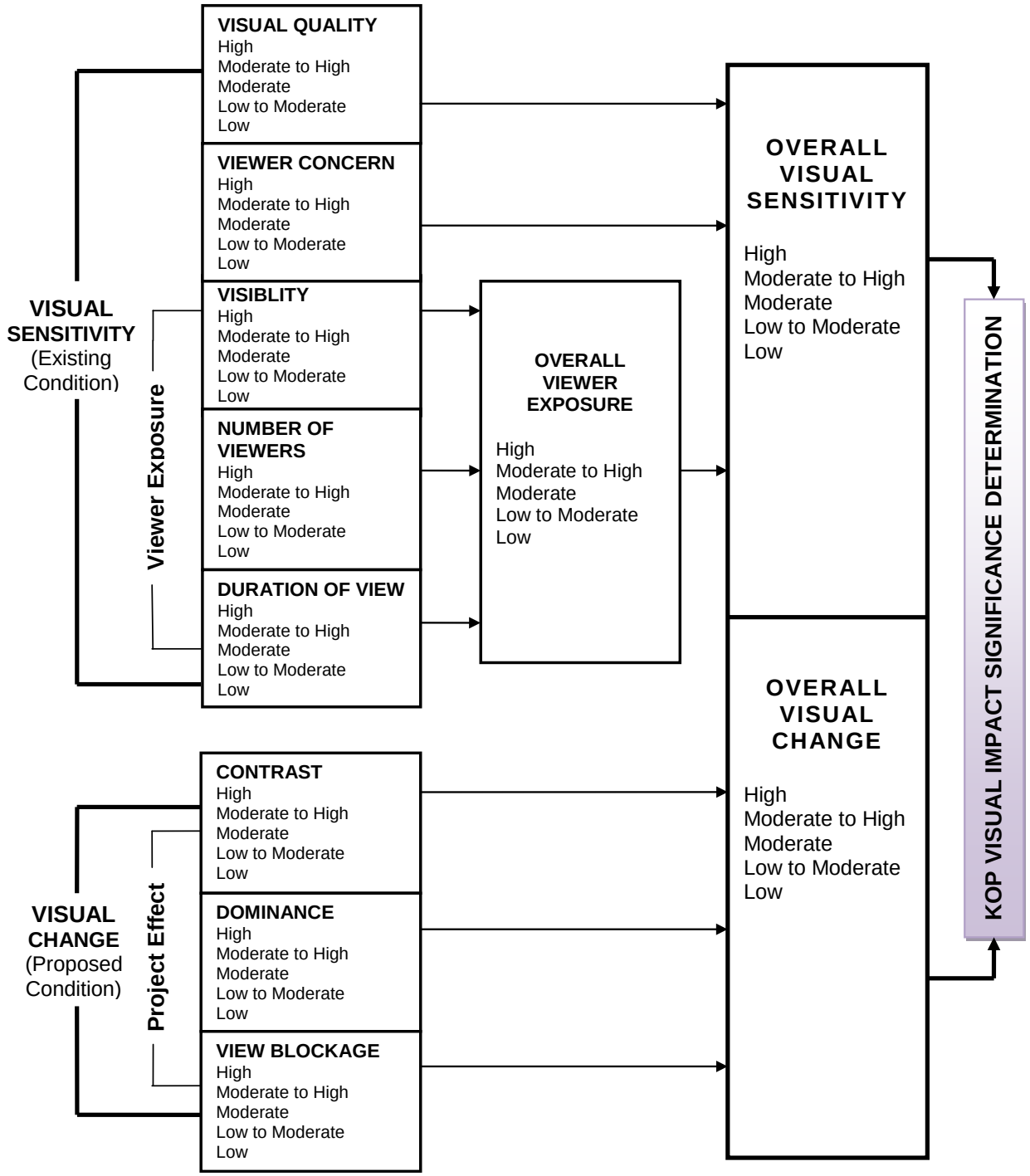
View Blockage

View blockage is the extent to which an existing publicly visible landscape feature (built or natural elements) would be blocked from view by the proposed project. The view is also disrupted when the continuity of the view is interrupted. Higher quality landscape features can be disrupted by the introduction of lower quality features into the view. The degree of view blockage is rated from low to high.

Overall Visual Change

Overall visual change is based on *contrast*, *dominance*, and *view blockage*. These factors are given equal weight in an assessment of overall visual change. Overall visual change is rated from low to high.

VISUAL RESOURCES Diagram 1- Key Observation Point Evaluation



VISUAL IMPACT SIGNIFICANCE DETERMINATION

Visual impact significance is based on the ratings for *overall visual sensitivity* and *overall visual change*. The ratings for overall visual sensitivity and overall visual change are combined to determine significance of the visual impact for each KOP (**VR Table 5**).

VR Table 5
KOP Visual Impact Significance Determination

Overall Visual Sensitivity	Overall Visual Change				
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**
High	Significant	Significant	Significant	Less Than Significant	Less Than Significant
Moderate to High	Significant	Significant	Potentially Significant	Less Than Significant	Less Than Significant
Moderate	Significant	Potentially Significant	Less Than Significant	Less Than Significant	Less Than Significant
Low to Moderate	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant	No Impact
Low	Less Than Significant	Less Than Significant	Less Than Significant	No Impact	No Impact

Notes:

"Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (Cal. Code Regs., tit. 14, § 15382). Implementation of mitigation measures may or may not avoid the impact or reduce it to a less-than-significant level.

CEQA does not require mitigation for less-than-significant impacts.

PUBLICLY VISIBLE WATER VAPOR PLUMES

When a thermal power generation facility with a cooling tower[1] is operated at times when the ambient temperature is low and relative humidity is high, the warm moisture (water vapor) that is discharged from the cooling tower condenses as it mixes with cooler ambient air, resulting in creation of a visible plume. The publicly visible plume could substantially degrade the existing visual character or quality of the project site and its surroundings, potentially causing a significant impact to visual resources.

Computer modeling is used to estimate the frequency and size of the vapor plume(s) for a power plant project. If the plume modeling analysis results in a conclusion that plume frequency is greater than 20 percent, staff prepares an analysis of the vapor plume's potential effects on visual resources in the VSOI for the project.

[1] Other types of thermal power generation facilities are also sources of visible water vapor plumes, including combined cycle gas turbine exhausts and geothermal steam exhausts. These facilities are evaluated in the same manner as cooling tower plumes.

Staff established a 20th percentile plume frequency during *seasonal* (November through April) *daylight clear* hours (i.e., no rain/fog high visual contrast hours) as a reasonable worst-case scenario. It is during high visual contrast viewing hours ("clear sky") conditions that water vapor plumes show the greatest contrast with the sky. Water vapor plumes emitted during rain and fog conditions and under some cloud conditions (e.g., marine layer) or at nighttime would not introduce substantial visual contrast into the environment. Staff has included in the *clear* category:

a) all hours with sky cover equal to or less than 10 percent, and

b) half of the hours with total sky cover of 20–90 percent.

The rationale for including these two components in this category is as follows:

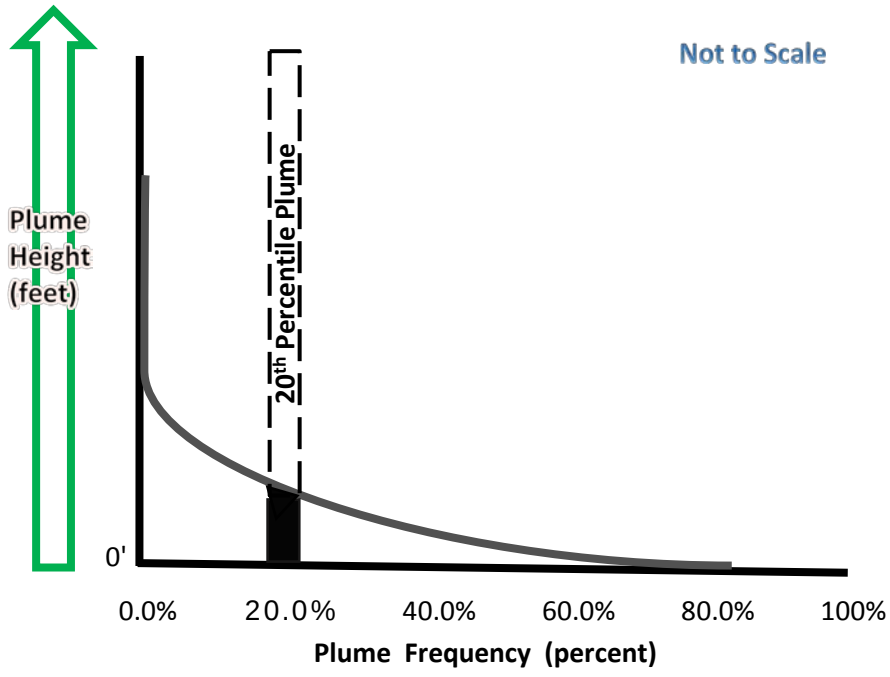
a) Visible plumes typically contrast most with sky under clear conditions, and when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear.

b) For a substantial portion of the time when total sky cover is 20–90 percent, the opacity of sky cover is relatively low (equal to or less than 50 percent), so this sky cover does not always substantially reduce contrast with visible plumes; staff has estimated that approximately half of the hours meeting the latter sky cover criteria can be considered high visual contrast hours and are included in the "clear sky" definition.

Plume frequency is calculated on the six-month portion of the year when the ambient conditions are such that visible water vapor plumes are most likely to occur. This maximum six-month "seasonal" period for plume formation generally occurs between November and April when temperatures are cool or cold, and relative humidity is high.

Staff uses the Combustion Stack Visible Plume (CSVP) model to estimate plume frequency and plume size. If the CSVP modeling conducted for the proposed project's cooling tower predicts a *seasonal daylight clear* hour plume frequency of 20 percent or greater, staff evaluates the *20th percentile plume* in the visual resources analysis. (Discussions of visible water vapor plumes are presented in the Visual Resources section of staff assessments.) Staff considers the 20th percentile plume to be the reasonable worst-case plume dimension for the purpose of analysis. Publicly visible plumes that occur more than 20 percent of the time would be more frequent but smaller in size than those that occur less than 20 percent of the time. This approach recognizes that the largest plumes would occur very rarely, while the most frequent plumes and even the average plumes would be much smaller in size. For example, using a scale of 0 to 100, a one percentile plume would be extremely large, very noticeable to a wide area, but would occur very infrequently. A 100th percentile plume would be nonexistent (see Diagram 2 below). If the modeled publicly visible plume is predicted to occur less than 20 percent of seasonal daylight clear hours, the impact to the existing visual character or quality of the project site and its surroundings is generally considered less than significant, and it is not considered further in the visual resources analysis.

Visual Resources Diagram 2 – Visible Plume Height/Frequency Curve



A plume frequency of 20% represents staff's threshold for conducting a detailed plume analysis.

In the evaluation of the visual effects of the modeled 20th percentile plume, staff addresses the *overall visual sensitivity* for the existing condition and the potential *overall visual change* created by the plume's degree of contrast, level of dominance, and view blockage from the selected KOPs (see Visual Resources Diagram 1).

PUBLICLY VISIBLE WATER VAPOR PLUME ABATEMENT METHODS

Staff has identified four methods to lower a plume's frequency or eliminate the plume completely.

Increase Cooling Tower Air Flow

Increasing the cooling tower air flow will lower the exhaust temperature and reduce plume frequency but would not eliminate the potential for visible water vapor plumes under all conditions. This method focuses on the design of the cooling tower fan flow capacity versus the amount of heat rejected in the cooling tower. Any specific cooling tower design needs to be fully modeled to determine the effective final plume frequency reductions.

Wet/Dry Cooling Tower

This type of cooling tower reduces plume formation by adding heat or heated ambient air to the saturated wet cooling section exhaust to reduce its saturation level. The saturated exhaust can be heated using a separate dry module above the wet cooling

tower. Alternatively, outside air can be pulled into separate areas where a dry section heats the air to reduce humidity and a wet section creates warm, humid exhaust. The heated ambient air and humid exhaust are mixed to reduce the humidity of the combined exhaust steam to avoid creating a plume when meeting ambient air.

The amount of plume reduction that can be accomplished by this type of system can vary from a relatively moderate reduction to a significant reduction in visible plume frequency. The specific wet/dry design would be based on the desired degree of plume reduction.

Wet Surface Air Cooler

The basic operating principle of a wet surface air cooler (WSAC) is rejection of heat by evaporation. The WSAC technology is similar to a wet/dry cooling tower. Where this system is different is that it could eliminate the need for a heat exchanger. The cooling fluid(s) used for the intercooler and any auxiliary cooling systems could be piped directly into the WSAC, which can operate as a non-contact heat rejection system with the use of water sprayed over the cooling pipes to increase the heat rejection when necessary. The expected hot temperature of the cooling fluid would increase the efficiency of this type of system. There may still be the potential for plumes to form under high cooling load periods during certain ambient conditions, but the WSAC could be designed, such as for wet/dry operation depending on cooling load, to maintain a minimal plume frequency well below 20 percent during “clear hours.”

Air Cooled Condenser (Dry Cooling)

The use of an air cooled condenser (ACC) would eliminate the formation of a publicly visible water vapor plume. Air cooled condensers condense exhaust steam from the steam turbine and return condensate to the boiler to perform this function. Steam enters the air cooled condenser above the heat exchangers, flows downward through the heat exchanger tubes, where it condenses and is captured in pipes at the base of the heat exchangers. The condensate is then returned to the boiler water system. Mechanical fans force air over the heat exchangers.

REFERENCES

Bacon, W. R. 1979—The Visual Management System of the Forest Service, USDA. In: Elsner, G. H., and R. C. Smardon, technical coordinators. 1979. Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource [Incline Village, Nev., April 23–25, 1979]. Gen. Tech. Rep. PSW-GTR-35. Berkeley, CA. Pacific Southwest Forest and Range Exp. Stn., U.S. Forest Service, U.S. Department of Agriculture, pages 660–665.

Buhyoff, G.J., P.A. Miller, J.W. Roach, D. Zhou, and L.G. Fuller. 1994 — An AI Methodology for Landscape Visual Assessments. *AI Applications.* 8(1):1–13.

U.S. Bureau of Land Management 1986 — Visual Resource Contrast Rating, BLM Manual Handbook 8431, Available: <http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS/2.html>. January 17, 1986. Accessed April 11, 2013.

U.S. Bureau of Land Management 2012 — Visual Resource Management System. Available: <http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS/2.html>. Accessed April 11, 2013; last modified June 28, 2012.

Federal Highway Administration 1990 — *Visual Impact Assessment for Highway Projects (FHWA-HI-88-054)*. Available: <http://contextsensitivesolutions.org/content/reading/visual-impact-2/>. Accessed April 11, 2013. Pages 26, 27, 63, 64, 116, and 123. Published September 1990, first printing 1979. Washington, D.C.

VISUAL RESOURCES ATTACHMENT-1
LIGHTING COMPLAINT RESOLUTION FORM

Facility Name: Puente Power Project Complaint Log No:
Complainant's name and address: Phone No:
Date and time complaint received: Complaint filed: ☐ By Telephone ☐ In Writing (attach letter) ☐ In Person Date of first occurrence:
Description of the complaint (lighting, duration, etc.):
Findings of investigation by NRG personnel: Indicate if complaint relates to a violation of an Energy Commission condition: ☐ Yes ☐ No Date complainant contacted to discuss findings:
Description of corrective measures taken or other complaint resolution: Indicate if complainant agrees with proposed resolution: In not, explain: Additional relevant information:
If corrective action necessary, date completed: Date of first response to complainant: (attach copy) Date of final response to complainant: (attach copy)
This information is certified to be correct: Plant or project manager's signature: Date: