DOCKETED

Docket Number:	07-AFC-06C
Project Title:	Carlsbad Energy Center - Compliance
TN #:	202287-2
Document Title:	CECP Petition to Anend
Description:	N/A
Filer:	Raquel Rodriguez
Organization:	Locke Lord, LLP
Submitter Role:	Applicant Consultant
Submission Date:	5/2/2014 3:58:16 PM
Docketed Date:	5/2/2014

Petition to Amend Carlsbad Energy Center Project

07-AFC-06C

April 2014

Applicant

Carlsbad Energy Center LLC

Prepared by

CH2MHILL®

CB&I

IS021314194212SAC

Petition to Amend Carlsbad Energy Center Project

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Due to size this document has been separated into two parts. This is Part 1 which begins with:

Acronyms and Abbreviations:

Through

6.0 Potential Effects on the Public

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Acronyms and Abbreviations

µg/m^3	microgram(s) per cubic meter
°F	degrees Fahrenheit
3-D	three-dimensional
AB	Assembly Bill
AC	alternating current
ACM	asbestos-containing material
ADT	average daily trips
AFC	Application for Certification
afy	acre-feet per year
APCD	air pollution control district
APN	Assessor Parcel Number
AQIA	air quality impact analysis
AQMD	air quality management district
ARM	Ambient Ratio Method
ARMR	Archaeological Resource Management Report
AST	aboveground storage tank
AT&SF	Atchison, Topeka and Santa Fe
ATC	Authority to Construct
ATCM	airborne toxic control measure
BACT	Best Available Control Technology
BMP	best management practice
BOE	California Board of Equalization
BOP	balance of plant
BPIP-PRIME	Building Profile Input Program – Plume Rise Model Enhancements
Btu	British thermal unit
CAA	Clean Air Act
CAAQS	California ambient air quality standards
CAISO	California Independent System Operator
CalARP	California Accidental Release Program
Caltrans	California Department of Transportation
CAM	compliance assurance monitoring
CARB	California Air Resources Board

CAS	Chemical Abstract Service
CBC	California Building Code
CBO	Chief Building Official
CBSC	2010 California Building Standards Code
CCR	California Code of Regulations
CDE	California Department of Education
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEDD	California Employment Development Department
CEMS	continuous emissions monitoring system
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
City	City of Carlsbad
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
COC	Condition of Certification
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRM	cultural resource monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
CRT	Coastal Rail Trail
CSS	Construction Safety Supervisor
CTG	combustion turbine generator
DAS	data acquisition system
DC	direct current
DEH HMD	San Diego County Department of Environmental Health, Hazardous Materials Division
DEM	Digitized Elevation Map
DOC	Determination of Compliance
DOF	California Department of Finance

DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EMF	electric and magnetic field
EPA	U.S. Environmental Protection Agency
EPS	Encina Power Station
FAA	Federal Aviation Administration
FDOC	Final Determination of Compliance
FY	fiscal year
GEP	Good Engineering Practice
GHG	greenhouse gas
GO	General Order
gpm	gallon(s) per minute
gr/dscf	grains per dry standard cubic foot
GSU	generator step-up
H&SC	Health and Safety Code
HARP	CARB's Hotspots Analysis and Reporting Program
HBM	Hazardous Building Material
HNO_3	nitric acid
Hz	hertz
I/O	input / output
I-5	Interstate 5
IEPR	2007 Integrated Energy Policy Report
ISIS	Interconnection System Impact Studies
km	kilometer(s)
KOP	Key Observation Point
kV	kilovolt(s)
LAER	Lowest Achievable Emission Rates
LBP	lead-based paint
LGIA	large generator interconnection agreement
LHV	lower heat value
LORS	laws, ordinances, regulations, and standards
LOS	level of service
LOSSAN	Los Angeles to San Diego Double-Tracking Project
LOTO	lockout/tagout
MCR	Monthly Compliance Report

MEI	Maximally Exposed Individual
MEIR	Maximally Exposed Individual Resident
MEIW	Maximally Exposed Individual Worker
mgd	million gallons per day
mm	millimeter
MMBtu	million Btu
MMBtu/hr	million British thermal units per hour
MSA	Metropolitan Statistical Area
MSAT	mobile source air toxic
NAAQS	national ambient air quality standards
NaOH	sodium hydroxide
NCTD	North County Transit District
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
ng/m^3	nanogram(s) per cubic meter
NH_3	ammonia
NO	nitric oxide
NO_2	nitrogen dioxide
NOTAM	Notice To Airmen
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historical Places
NSPS	National Standards of Performance for New Stationary Sources
NSR	New Source Review
O&M	operations and maintenance
O_2	oxygen
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OLM	Ozone Limiting Method
PAHs	polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PCE	passenger car equivalent
PDOC	Preliminary Determination of Compliance
PEAR	Project Enhancement and Refinement

PM_{10}	particulate matter with aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with aerodynamic diameter less than or equal to 2.5 microns
PMI	Point of Maximum Impact
ppb	parts per billion
ppm	parts per million
ppmv	parts per million by volume
PRC	Public Resources Code
PRM	Paleontological Resource Monitor
PRMMP	Paleontological Resources Monitoring and Mitigation Plan
PRS	Paleontological Resources Specialist
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTA	Petition to Amend
PTO	Permit to Operate
PUC	Public Utilities Commission
RCRA	Resource Conservation and Recovery Act
REL	Reference Exposure Level
RMP	Risk Management Plan
RPS	Renewable Portfolio Standard
RQ	reportable quantities
RUSLE2	Revised Universal Soil Loss Equation
RV	recreational vehicle
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SCR	selective catalytic reduction
SDAPCD	San Diego Air Pollution Control District
SDCDEH	San Diego County Department of Environmental Health
SDG&E	San Diego Gas and Electric Company
SDNR	San Diego Northern Railway
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SHRA	screening health risk assessment
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPPE	Small Power Plant Exemption

SVP	Society of the Vertebrate Paleontologists
SWPPP	Stormwater Pollution Prevention Plan
TAC	toxic air contaminant
T-BACT	Toxics Best Available Control Technology
TIBL	thermal inversion boundary layer
tpy	ton(s) per year
TQ	threshold quantities
TSDF	treatment, storage, and disposal facility
TSP	total suspended particulate
UPS	uninterruptible power supply
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator Projection
VOC	volatile organic compound
WDR	Waste Discharge Requirement
WEAP	Worker Environmental Awareness Program

SECTION 1.0

Executive Summary

Carlsbad Energy Center LLC (the Project Owner), an indirect wholly owned subsidiary of NRG Energy, Inc., is the project owner of the Carlsbad Energy Center Project (CECP), 07-AFC-06C. The CECP was approved by the California Energy Commission (CEC) in June 2012. The approved CECP is referred to throughout this Petition to Amend (PTA) as the "Licensed CECP." This PTA proposes changes to the Licensed CECP that will result in an improved version of the CECP that is referred to as the "Amended CECP" in this PTA.

The Amended CECP fits the interests and policies of the City of Carlsbad (City) and further addresses comments and concerns posed by members of the community during CECP licensing process. In particular, the Amended CECP facilitates the retirement and removal of the EPS and supports future redevelopment opportunities for the portion of the EPS site west of the North Coast Transit District railroad right-of-way.

The Amended CECP better meets the needs and interests of the region's electricity consumers, and the policies and directions of the State of California. The changes proposed in this PTA are necessary and important because they will facilitate the development of much needed peaking generation in a region that is responding to the loss of generation capacity at San Onofre Nuclear Generating Station, the imminent retirement of once-through cooling generation, and the integration of intermittent and cyclical renewable electricity sources.

1.1 Project Overview

This PTA proposes necessary improvements and changes to the Licensed CECP that include contributing to electricity reserves that assist San Diego Gas and Electric Company (SDG&E) in ensuring a reliable energy supply, and providing local and electrical transmission grid support in San Diego County and the southern California region. The proposed changes also address and mitigate many of the expressed reasons for community opposition to the project that were voiced when the project was licensed.

The key changes, improvements, and characteristics of the Amended CECP include:

- The addition of the shutdown and decommissioning of EPS's once-through cooled Units 1 through 5 and small combustion turbine, and the subsequent above-grade removal of those units, the building that houses them, and other existing buildings and support facilities at EPS.
- Redesign of the CECP into a simple-cycle combustion gas turbine power plant that will be able to serve the region's electrical need of flexible, fast-start to integrate renewable energy and ensure a reliable and stable electrical grid.
- Reduced visibility of the new generating units, which have considerably lower height and profile than the Licensed CECP.
- Improved site access and mobility that satisfies the City Fire Department.
- Support from the City that makes the use of reclaimed water much more feasible and likely.
- Reduced air emissions as compared to the Licensed CECP.
- Improved conformity to local land use ordinances.
- Continued project placement on the land between I-5 and the railroad tracks, which is significantly farther back from the coastline than EPS.
- Elimination of once through cooling at the generating station site.

- Coordination of the project within a larger agreement with the City of Carlsbad and SDG&E that benefits coastal zone land use and access.

The Amended CECP will be a simple-cycle generating facility using six natural-gas-fired, GE LMS100 combustion turbines with a 632 megawatt (MW) net nominal output. The combustion turbines will boast the highest simple-cycle thermal efficiency, in excess of 44 percent, of any comparable technology. They will be supported by common, balance of plant equipment including a bulk water storage and treatment plant, fuel gas compressor enclosure, compressed air system, fire protection enclosure, and an aqueous ammonia storage area.

Table 1.1-1 lists the technical areas addressed in this PTA and those areas where the Project Owner is requesting changes to the 07-AFC-06C Final Decision, including subsequent amendments, and the Conditions of Certification (COCs) that are currently in effect. The details of the proposed changes to the COCs can be found in the appropriate technical areas in this PTA.

The environmental analysis in Section 5.0 concludes that the proposed changes to the CECP will reduce environmental impacts and improve compliance with applicable laws, ordinances, regulations, and standards (LORS) as compared to the Licensed CECP.

TABLE 1.1-1
Technical Sections with New or Modified Conditions of Certification

Technical Area	New or Revised COCs	Technical Area	New or Revised COCs
Air Quality	Yes	Transmission Line Safety and Nuisance	No
Biological Resources	No	Traffic and Transportation	No
Cultural Resources	No	Visual Resources	Yes
Geologic Resources	No	Waste Management	No
Hazardous Materials Management	Yes	Worker Safety/Fire Protection	Yes
Land Use	Yes	Facility Design	No
Noise and Vibration	Yes	Paleontological Resources	No
Public Health	Yes	Power Plant Efficiency	No
Soil and Water Resources	No	Power Plant Reliability	No
Socioeconomic Resources	No	Transmission System Engineering	No

1.2 Overview of Proposed Changes

The Project Owner proposes these necessary changes to the Licensed CECP in order to make the resulting Amended CECP substantially more consistent with local ordinances and to accommodate the electrical needs of the Southern California region.

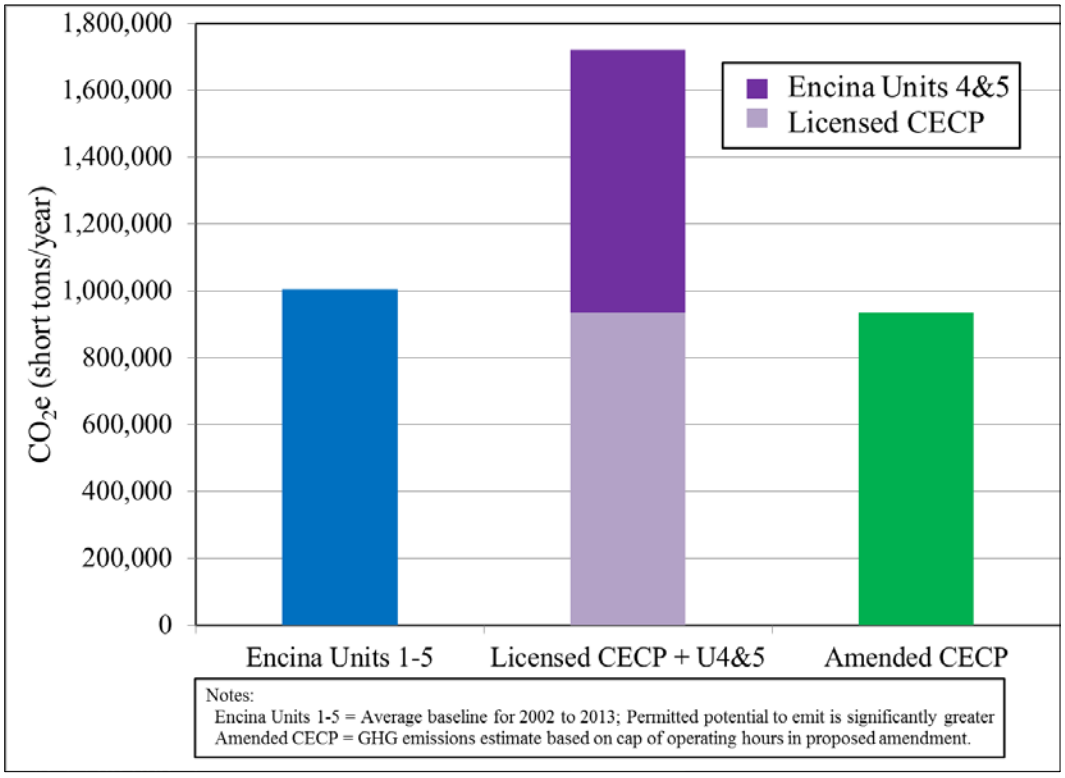
The proposed changes will expand the footprint of the generating plant, as compared to the Licensed CECP, to the south but still keep the new generating station entirely within the portion of the Licensed CECP site, east of the railroad tracks and west of I-5. The Amended CECP units will be in the footprints of four large, out-of-service fuel oil storage tanks, which will be demolished prior to commencement of construction of the Amended CECP.

The Amended CECP units will consist of six GE LMS100 combustion turbines operated in simple-cycle mode with a net nominal output of 632 MW. These units will be considerably lower in profile than the Licensed CECP. For example, the stack height of each LMS100 combustion turbine will be approximately 90 feet as

compared to the stack height of approximately 140 feet for the Licensed CECP units. The generating equipment will continue to be in the existing tank farm basin with its lower elevation (i.e., 30 feet below surrounding grade), which contributes to the lower profile of the Amended CECP. Transmission towers that will support the Amended CECP will be approximately 120 feet and will be located east of the tank farm basin, away from the western portion of the EPS and the coast. The orientation of the Amended CECP generating units and transmission lines were developed with consultation from the City of Carlsbad Fire Department to improve access to the site, including within the tank farm basin, and address prior safety concerns. As with Licensed CECP, landscaping along the east perimeter of the site will be implemented to help screen the Amended CECP. And Amended CECP will continue to be compatible with the City's lift station and sewer line improvements and the future widening of I-5.

As part of the Amended CECP, EPS Units 1 through 5 will be shut down when the new units begin commercial operation—not just Units 1 through 3. The overall air emissions from the amended CECP, as compared to the Licensed CECP will be considerably less as shown in Figure 1.2-1. In addition, unlike the Licensed CECP, the EPS units and their associated above-grade building and support structures and systems will be removed to grade. The site west of the railroad tracks, excepting easements necessary to support site access, transmission, and linear services, will be available for redevelopment planning consistent with the City's vision in its General Plan.

FIGURE 1.2-1
Comparison of Amended CECP to Licensed CECP Estimated Emissions



Commercial operation of the Amended CECP is anticipated in November 2017. Following commercial operation of the LMS100 units, EPS Units 1 through 5 and the small combustion turbine will be shut down as planned in the Amended CECP and consistent with State Water Resources Control Board's Once-Through Cooling Policy. Removal of EPS's above-grade structures will commence 1 year following shutdown of the EPS units.

These changes are subject to the CEC Siting Regulations Section 1769 requirements, which this PTA is meant to satisfy.

1.3 Project Location

The Amended CECP will continue to occupy the same portion of land in the City of Carlsbad, situated east of the railroad tracks and west of I-5, which constitutes a portion of the larger property that contains EPS, supporting equipment, and several fuel oil storage tanks. This portion of land is recessed approximately 30 feet below the surrounding grade, which helps reduce its visibility and other potential environmental impacts, such as noise. The approximately 30-acre Amended CECP site is located in the City of Carlsbad, in San Diego County, in an area zoned Public Utility, which specifically allows electrical generation and transmission facilities (see Figure 1.3-1, Regional Location Map). Figure 2.0-1 shows the location of the Amended CECP generating facility, its electric transmission lines, natural gas supply pipeline, reclaimed water supply pipeline, and potable water supply line. The total land acreage of the existing EPS is approximately 95 acres, not including the Agua Hedionda Lagoon acreage also owned by Cabrillo Power I LLC.

1.4 Project History and Overview of PTA Request

In 2007, the Project Owner filed an Application for Certification (AFC) seeking approval from the CEC to build the Licensed CECP and then shut down EPS Units 1, 2, and 3. In June 2012, the CEC approved the Licensed CECP by issuing its Final Decision on the Carlsbad Energy Center Project, 07-AFC-06C. This PTA seeks amendments to the Final Decision to lower the project's environmental impacts, conform to the electrical need in the region, and provide an improved fit with community interests.

1.5 Consistency with License

Section 1769(a)(1)(D) of the CEC Siting Regulations requires a discussion of the Amendment's consistency with the requisite LORS and whether the additions are based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the CEC Final Decision for 07-AFC-06C. If the project is no longer consistent with the license, an explanation of why the Amended CECP should be permitted must be provided. The following sections address the required explanation, rationale, and LORS compliance analysis for the proposed Amended CECP. Proposed changes to the existing COCs are discussed as part of the impacts analyses in Section 5.0. In completing the environmental analysis required to comply with Section 1769, the Project Owner requests that relevant information from the 07-AFC-06C proceedings be incorporated by reference [CCR 1704 (a) (2)].

1.6 Necessity of Proposed Change

Sections 1769(a)(1)(B) and 1769(a)(1)(C) of the CEC Siting Regulations require a discussion of the necessity for the proposed changes to the project and whether this modification is based on information known by the petitioner during the certification proceeding. The purpose of the proposed changes in this PTA is to make the CECP conform to current electrical energy needs for fast-response peaking generation and to better respond to the unanticipated and unprecedented retirement of the San Onofre Nuclear Generating Station. Further, and something that could not be anticipated, changing circumstances created an opportunity for cooperation with the City of Carlsbad. The result of that cooperation was an agreement between the City of Carlsbad and the Project Owner (see Appendix 2A) that allows for a much improved design that also includes full shut down of EPS Units 1 through 5.

1.7 Cumulative Impacts

Each issue area discussion in Section 5.0 addresses the cumulative environmental effects from the Amended CECP. This discussion concludes that implementation of the Amended CECP will not result in significant, unmitigated cumulative impacts.

1.8 Compliance with Laws, Regulations, Ordinances and Standards

The CEC Final Decision for the CECP overrode potential conflict with several LORS. The Amended CECP addresses some of these LORS and concurrent action by the City of Carlsbad is expected to eliminate any potential LORS compliance issues. As a result, the Amended CECP is expected to be compliant with LORS and the Licensed CECP Final Decision.

1.9 Document Organization

Pursuant to Section 1769 of the CEC Siting Regulations, the environmental analysis conducted for this PTA relies upon relevant information from the 07-AFC-06C proceedings to describe unchanged baseline conditions. This PTA includes the following sections:

Section 1.0 Introduction

Section 2.0 Project Description

Section 3.0 Transmission System Engineering

Section 4.0 Natural Gas Supply

Section 5.0 Environmental Analysis: updates to baseline conditions, evaluation of potential environmental impacts as compared to the CEC Final Decision (07-AFC-06C), current LORS, revisions to COCs, and references to updated technical data to support the environmental analyses

Section 6.0 Potential Effects on the Public

Section 7.0 List of Property Owners

Section 6.0 Potential Effects on Property Owners

1.10 Schedule

The anticipated schedule for this PTA and the Amended CECP is as follows:

- April 2014: Project Owner files application for an Authority to Construct with the San Diego Air Pollution Control District (SDAPCD)
- April 2014: Project Owner files this PTA with CEC
- May to October 2014: CEC Staff reviews PTA and issues data requests and holds public workshops, if needed
- November 2014: Project Owner receives Preliminary Determination of Compliance (PDOC) from SDAPCD
- December 2014: Project Owner receives CEC Preliminary Staff Assessment
- February 2015: Project Owner receives Final Determination of Compliance (FDOC) from SDAPCD (FDOC becomes Authority to Construct upon CEC issuance of decision on PTA)
- May 2015: CEC Issues Final Staff Assessment
- May 2015: CEC Evidentiary Hearings
- July 2015: CEC Siting Committing issues recommended decision on PTA
- August 2015: CEC Approves PTA
- October 2015: Commence construction

- November 2017: Amended CECP commercial operation
- November 2018: Estimated start of EPS demolition
- November 2020: Estimated completion of EPS demolition and availability of western portion of site for re-entitlement to match General Plan amendments and community interest

1.11 Necessity for the Proposed Modifications

The modifications proposed in this 2014 PTA are necessary to:

1. Modify the CECP to include retirement of all five EPS units allowing faster and more complete response to both the pending once-through-cooling reductions and better grid support from the shutdown of San Onofre Nuclear Generating Station.
2. Better redevelop brownfield sites in proximity to existing infrastructure.
3. Meet the demand for fast response, highly efficient peaking capacity to provide grid stability to accommodate increased renewable energy generation by adding dispatch capabilities to accommodate planned and unplanned grid outages in response to excessive demands and natural disasters.
4. Eliminate overrides of LORS that are no longer necessary or appropriate.
5. Modify design aspects of the project to reduce potential environmental impacts and to integrate community-desired development conditions on and adjacent to the site.

1.12 Project Ownership

The Project Owner for the CECP is Carlsbad Energy Center LLC.

1.13 Recommendations and Conclusions

Based on the analysis included in this PTA, all direct, indirect, and cumulative impacts of the CECP on health, safety, and the environment will remain less than significant with the Amended CECP. Impacts are actually reduced in many disciplines, and compliance with LORS is improved. For these reasons, Project Owner is confident that this PTA should be approved by the CEC.

Legend

☆ Carlsbad Energy Center

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FIGURE 1.3-1
Regional Location Map
Carlsbad Energy Center Project

CH2MHILL

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SECTION 2 .0

Project Description

The California Energy Commission (CEC), in its Final Decision dated June 2012,[1] approved the Carlsbad Energy Center Project (07-AFC-06C; CECP) in the city of Carlsbad, San Diego County. The project owner, Carlsbad Energy Center LLC, an indirect, wholly owned subsidiary of NRG Energy, Inc. (Project Owner), proposes to modify the project as licensed by the CEC (the "Licensed CECP") to improve the project's ability to meet regional electrical resource needs, as determined by San Diego Gas and Electric Company (SDG&E). These improvements include contributing to electricity reserves that generally will ensure a reliable energy supply, and providing local and electrical transmission grid support in San Diego County and the southern California region. The proposed changes also address and mitigate many of the expressed reasons for community opposition to the project voiced when the project was licensed. Consequently, the City of Carlsbad supports the amended project, as indicated in its letter of support dated April 23, 2014, which is attached as Appendix 2B (the "City Letter").

This section describes the design, construction, and operation of the proposed amended CECP (the "Amended CECP"), including associated linear features and facilities, and provides a discussion of the proposed demolition of the Cabrillo Power I LLC[2] Encina Power Station (EPS) facilities after the Amended CECP construction is complete.

This Petition to Amend (PTA) includes the above-grade decommissioning and removal of EPS Units 1 through 5 and other existing buildings and support facilities at EPS, after the Amended CECP is online. The shutdown of existing EPS Units 1 through 5 will provide emission offsets and will comply with the State of California's Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Once-Through Cooling Policy). The PTA also proposes the above-grade demolition of the existing EPS buildings and related equipment west of the railroad tracks that divide the Amended CECP site from the EPS generation facilities and switchyard. The parcel of land on which the EPS is situated and the CECP will be situated is referred to herein as the "Cabrillo Parcel." The Amended CECP is proposed to come online by fourth quarter 2017, and demolition of the above-grade EPS generating units, buildings, and related equipment would commence as soon as practicable after the Amended CECP is online.

This PTA evolved from an agreement entered into by the project owner, the City of Carlsbad, and SDG&E in January 2014 that resolves many of the points of community opposition with the Licensed CECP and addresses the type of generation that is better suited to meet SDG&E's generation needs in northern San Diego County (see the City Agreement in Appendix 2A). The Licensed CECP consisted of two 1-on-1 combined-cycle units, while the Amended CECP will consist of six simple-cycle combustion turbine units. By using six smaller, fast-start, peaking units instead of two larger combined-cycle trains, the Amended CECP will have greater operational flexibility, whereby any combination of the six units could be used to generate electricity as needed to supply grid demand. The six smaller peaking units will also be much better suited to allow the continued integration of cyclical and intermittent renewable generation, as all of the net output from the Amended CECP will be fast start and readily dispatchable. Additionally, the Amended CECP will retire the older EPS generating system and will eliminate the use of once-through sea water cooling. For the Amended CECP's raw water needs, the project will preferentially use California Code of Regulations (CCR) Title 22 reclaimed water, thereby minimizing the use of potable water onsite. Additionally, following demolition of the aboveground EPS structures, the western portions of the Cabrillo Parcel would be available for non-power-production redevelopment, an important issue for the neighboring community.

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[1] California Energy Commission. 2012. *Carlsbad Energy Center Project Commission Decision.* June. Available online at: http://www.energy.ca.gov/2011publications/CEC-800-2011-004/CEC-800-2011-004-CMF.pdf

[2] Cabrillo Power I LLC is also an indirect, wholly owned subsidiary of NRG Energy, Inc.

The Amended CECP will be a simple-cycle generating facility configured using six, nominally 100-megawatt (MW), natural-gas-fired combustion turbines with a capacity of 632 MW net output.[3] Similar to the Licensed CECP, the Amended CECP's units will interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective, neighboring SDG&E switchyards.

In conjunction with the demolition of EPS, the power plant operation and maintenance will be relocated on the east side of the railroad tracks with a new administrative and control room building and a smaller warehouse.

Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP.

A new 138-kV transmission line and a new 230-kV transmission line have been developed for this project and are identified in Figure 2.0-1. The 2,200-foot-long, 138-kV transmission line and 4,000-foot-long, 230-kV transmission line will be located along the eastern and southern boundary of the CECP site before crossing the railroad tracks and tying into the SDG&E Encina switchyard. Additional details regarding this transmission line are provided in Section 3.0, Transmission Systems Engineering.

To support the evaporative air-cooling system make-up and other industrial uses, the Amended CECP will use no more than 336 acre-feet per year (afy) of CCR Title 22 reclaimed water provided by the City of Carlsbad (City). This is a decrease in reclaimed water use from the Licensed CECP. The evaporative cooling blow-downs will be recycled to the onsite raw water storage tank for reuse. Reverse osmosis reject stream and other plant wastewater will be discharged to the City of Carlsbad (Encina Wastewater Authority) system via an existing sanitary/industrial sewer line that traverses the Amended CECP site. Reclaimed water will be provisioned to the Amended CECP through a reclaimed water pipeline of the same size, location, and configuration as that proposed for the Licensed CECP. The reclaimed water pipeline will be constructed within City easements on the Amended CECP site, and only approximately 1,000 feet of the line will occupy publicly dedicated streets or property.

The purified ocean water system, authorized in the Licensed CECP, will remain as an option should reclaimed water not be available to support the Amended CECP operations.

Potable water for drinking, eye protection, safety showers, restrooms, and emergency fire protection will be served from the City's existing potable water system, as planned for the Licensed CECP. Also as planned for the Licensed CECP, potable water will remain available as a back-up water source in the event neither purified ocean water nor reclaimed water is available.

Sanitary and industrial wastewater disposal will be discharged to an existing 42-inch City of Carlsbad (Encina Wastewater Authority) sanitary sewer system that runs along the western edge of the Amended CECP site. Connection to the City's existing sewer line will require approximately 1,100 feet of new, onsite piping for points of connection from the proposed six peaking units, administration/control building, and operations/maintenance building.

The Amended CECP's six generating units (designated Units 6, 7, 8, 9, 10 and 11) will be located on a portion of the Licensed CECP site, east of the railroad tracks and west of Interstate 5 (I-5), and in the footprints of four existing fuel oil storage tanks, which will be demolished prior to commencement of construction of the Amended CECP (see Figure 2.0-1). The demolition of the fuel oil storage tanks 5, 6 and 7 are included in the

[3] Rated at average annual ambient condition of 60.3°F with evaporative cooling and 79 percent relative humidity

existing CEC 2012 Final Decision for CECP. The demolition of fuel oil storage tanks 1 and 2 (west of the railroad tracks) and fuel oil storage tank 4 east of the railroad tracks is addressed in a separate PTA.

The Amended CECP will be sited within a recessed location along the eastern boundary of the EPS site. This location significantly reduces or eliminates many issues commonly associated with large power plants, some of which posed challenges for the Licensed CECP. For instance, by being constructed at a lower elevation than the existing topography, the generating units will be minimally visible from many offsite locations and the site's bowl-shaped topography will provide sound energy attenuation. Additionally, the Amended CECP will be located east of the railroad tracks that bisect the EPS site and will be farther from the beach than the existing EPS facilities, ensuring the Amended CECP's consistency with the City of Carlsbad's land use goal of enabling future non-power-production redevelopment of portions of the former EPS footprint.

Once site preparation is complete, construction, commissioning, and operation of the six proposed simple-cycle units will proceed. Once the Amended CECP units are online, EPS Units 1 through 5 and the "black start" generator of EPS will be decommissioned and the above-grade portions of the EPS generating units, buildings and related facilities will be demolished.

To support construction, approximately 19.3 acres of the EPS site situated to the west of the railroad tracks will be used for a combination of equipment laydown and construction worker parking (Figure 2.0-2). Some preparation will be required to ensure the areas are usable for the purpose intended, including site grading and removal of existing, abandoned fuel oil piping that parallels the eastern fence of the SDG&E Encina switchyard to allow construction of a section of the underground portion of the 230-kV transmission line to support the Amended CECP. Similar to the Licensed CECP, no offsite construction worker parking or construction equipment or material laydown areas are anticipated to be necessary for the construction of the Amended CECP.

The approximately 30-acre Amended CECP site is located in the city of Carlsbad, in San Diego County, in an area zoned Public Utility, which specifically allows electrical generation and transmission facilities. Figure 2.0-1 shows the location of the Amended CECP generating facility, its electric transmission lines, natural gas supply pipeline, reclaimed water supply pipeline, and potable water supply line. The total land acreage of the existing EPS is approximately 95 acres, not including the Agua Hedionda Lagoon acreage also owned by Cabrillo Power I LLC. The EPS consists of two parcels: (1) approximately 65-acres containing the existing EPS generating equipment (Assessor Parcel Number [APN] 210-01-43), and (2) an approximately 30-acre plot east of the railroad tracks that currently contains the fuel oil storage tanks that are being removed, where the CEC approved the construction of the Licensed CECP, and upon which the Amended CECP is also proposed to be constructed (APN 210-01-41).

As part of the Amended CECP, existing EPS Units 1 through 5 will be decommissioned and demolished. The removal of the EPS units will create substantial environmental benefits, including permanent air emission reductions from the boiler units; elimination of the 857 million gallons per day of cooling water (seawater) intake capacity of the existing units, and the resulting decrease in impingement and entrainment of marine organisms attributed to those units' cooling water flow in compliance with EPA 316 (B) regulations; cessation of discharge of wastewaters to the Pacific Ocean from Units 1 through 5; and the opportunity to redevelop the portion of the parcel west of the railroad tracks for non-power-production uses.

2.1 Generating Facility Description, Design, and Operation

This section describes the Amended CECP's facility design and operation.

2.1.1 Site Arrangement and Layout

The Amended CECP site plan is shown in Figure 2.1-1. These figures illustrate the location and size of the Amended CECP.

The Amended CECP site is north of the intersection of Avenida Encinas and Cannon Road. The main operations site access and railroad access will also remain unchanged from the Licensed CECP. The primary operations access will be from Carlsbad Boulevard, through the existing EPS site and the Poseidon Desalination Plant, and will use the existing railroad crossing between APN 210-01-43 and APN 210-01-41. The main operations access will also serve as a secondary construction access point. The primary construction access will be from the Cannon Road Service Center gate, west of the railroad tracks. Additional construction access will be from Carlsbad Boulevard, at an entrance just south of the EPS. Heavy haul truck access will be from Cannon Road through the Avenida Encinas entrance to the SDG&E switchyard property, east of the railroad tracks. An existing North County Transit District railroad spur that terminates on APN 210-01-43 will be used for select heavy and oversize equipment deliveries during construction.

Portions of the Amended CECP site will be paved to provide internal access to project facilities and site buildings. The area surrounding equipment, where not paved, will have gravel surfacing. Similar to the Licensed CECP, the 138-kV and 230-kV high-voltage transmission lines will run from the Amended CECP power block area to the existing SDG&E 138-kV and 230-kV switchyards on the EPS property. The onsite route for the high-voltage lines is shown in Figures 2.0-1 and 2.1-1. The single-line representation of the interconnection scheme is depicted in Figure 2.1-2. Based on the previously approved large generator interconnection agreements (LGIA), SDG&E will expand the existing Encina switchyard to accommodate the new interconnection from the Amended CECP power block. Additional detail is provided in Section 3.0, Transmission System Engineering. Interconnection system impact re-studies for the 138-kV and 230-kV systems will be submitted to the California Independent System Operator (CAISO) for review. These system impact re-studies are expected to demonstrate that no offsite transmission upgrades are required for the Amended CECP.

2.1.2 Process Description

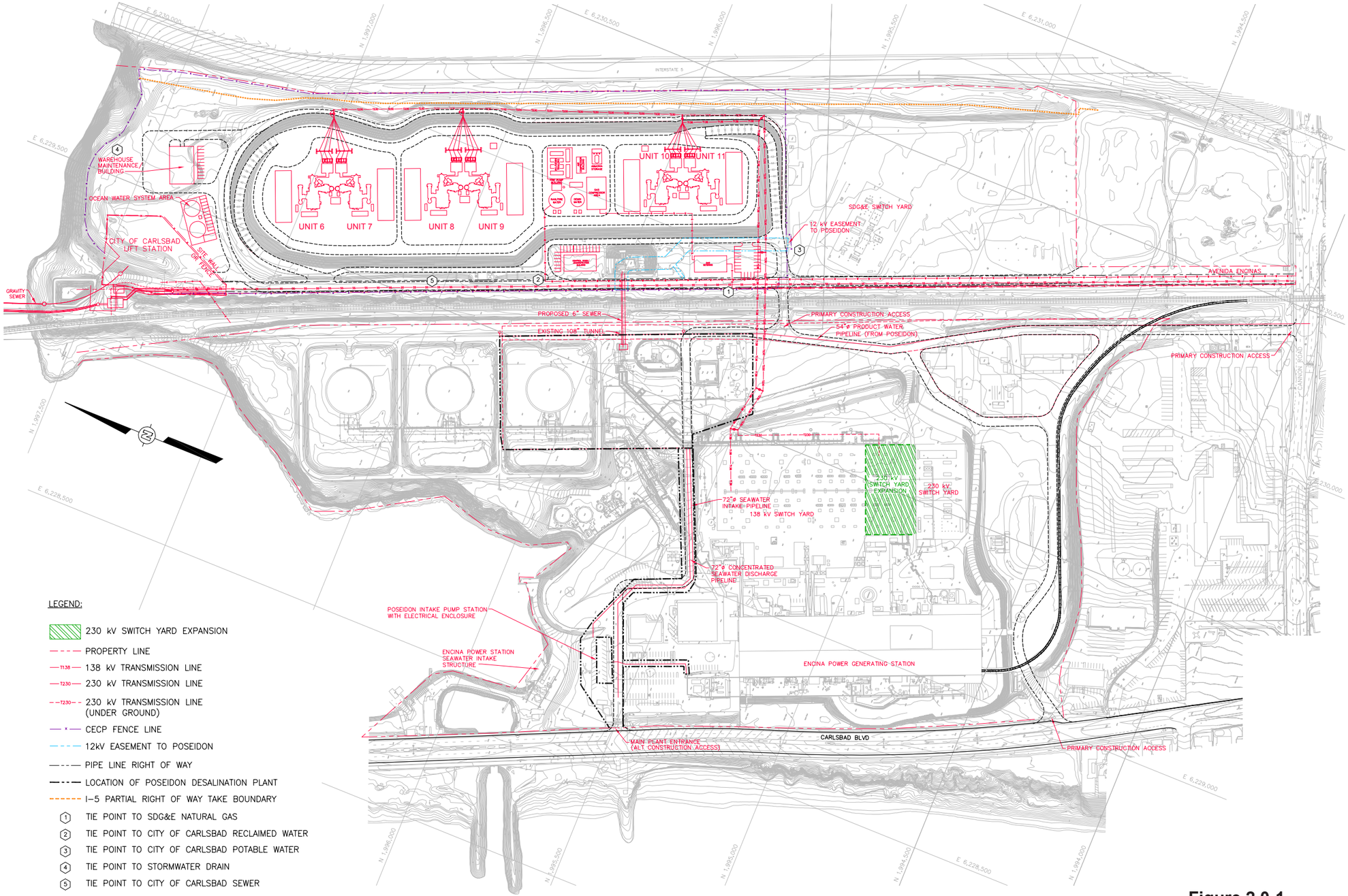
The Amended CECP will consist of six independent combustion turbine generators (CTG) designed for demineralized water injection to reduce nitrogen oxide production; an air-cooled fin-fan cooler; a shell and tube heat exchanger for cooling of system cooling water as well as the intercooler between the low-pressure and high-pressure compressor stages; and associated support equipment providing 632 MW net output. The combustion turbines will be GE LMS100 units, which boast the highest simple-cycle thermal efficiency, in excess of 44 percent, of any comparable technology. The CTGs will be supported by common, balance of plant (BOP) equipment including a bulk water storage and treatment plant, fuel gas compressor enclosure, compressed air system, fire protection enclosure, and an aqueous ammonia storage area.

Each GE LMS100 turbine is capable of reaching 100 percent load in 10 minutes or less with ramp rates up to 50 MW per minute, providing rapid response to changes in grid demand.

Associated equipment for the Amended CECP will include emission control systems necessary to meet the proposed local, state, and federal emission limits.

2.1.3 Generating Facility Cycle

Within each CTG, combustion air will flow through the inlet air filter, through the evaporative cooler and associated air inlet ductwork, be compressed in the gas turbine compressor section, and then flow to the CTG combustor. The LMS100 design incorporates an intercooler between the low pressure compressor and high pressure compressor, which assists in providing high thermal efficiency. Natural gas fuel will be injected into the compressed air in the combustor and ignited. The hot combustion gases will expand through the power turbine section of the CTG, causing the shaft to rotate and drive the electric generator and CTG compressor.



LEGEND:

- 230 kV SWITCH YARD EXPANSION
- PROPERTY LINE
- 138 kV TRANSMISSION LINE
- 230 kV TRANSMISSION LINE
- 230 kV TRANSMISSION LINE (UNDER GROUND)
- CECP FENCE LINE
- 12kV EASEMENT TO POSEIDON
- PIPE LINE RIGHT OF WAY
- LOCATION OF POSEIDON DESALINATION PLANT
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY
- (1) TIE POINT TO SDG&E NATURAL GAS
- (2) TIE POINT TO CITY OF CARLSBAD RECLAIMED WATER
- (3) TIE POINT TO CITY OF CARLSBAD POTABLE WATER
- (4) TIE POINT TO STORMWATER DRAIN
- (5) TIE POINT TO CITY OF CARLSBAD SEWER

NOTE:

OCEAN WATER SYSTEM PIPING NOT SHOWN FOR CLARITY.

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

APPROXIMATE SCALE
0 150 300 450 FEET

Figure 2.0-1
Plot Plan
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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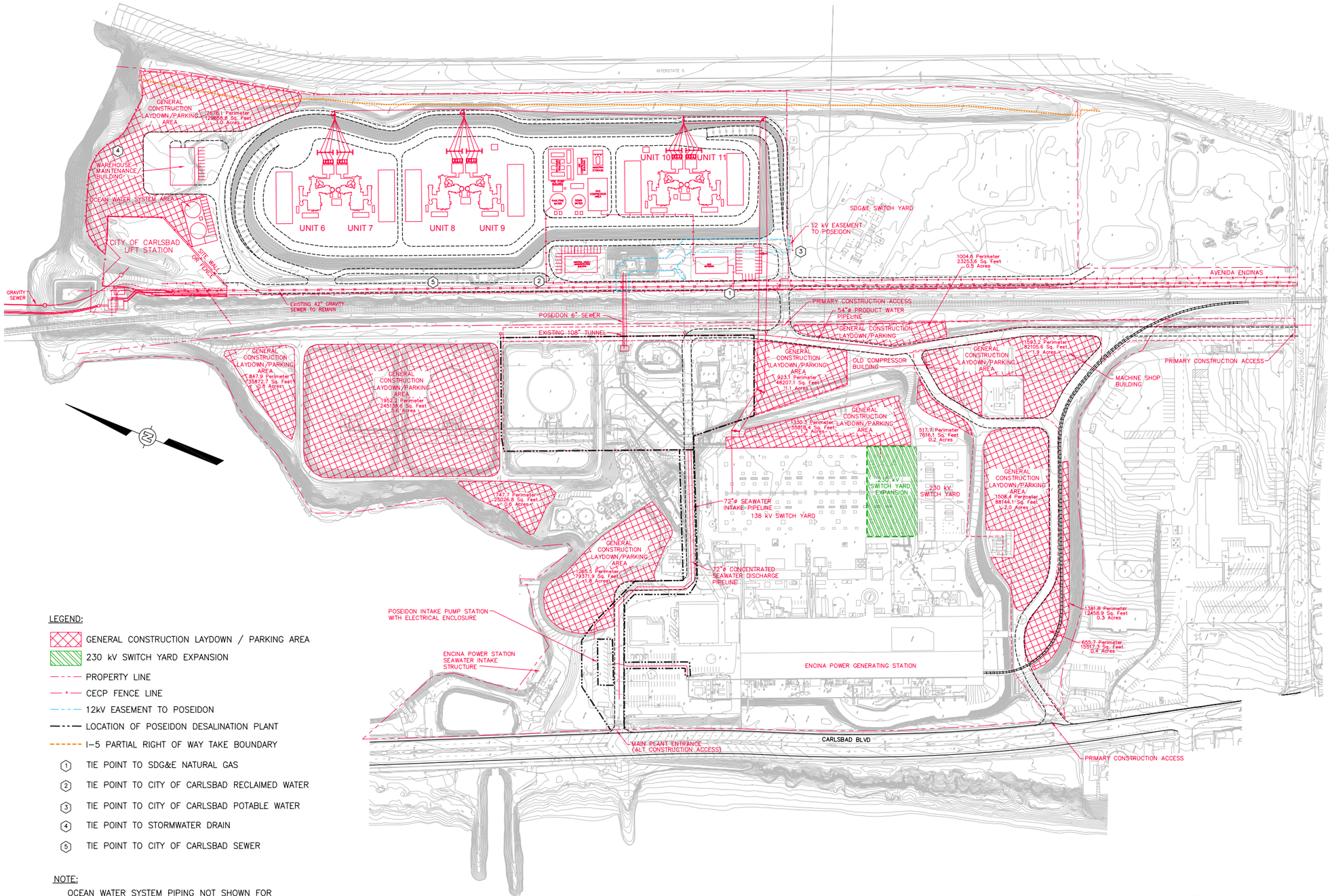

LEGEND:

- GENERAL CONSTRUCTION LAYDOWN / PARKING AREA
- 230 kV SWITCH YARD EXPANSION
- PROPERTY LINE
- CECP FENCE LINE
- 12kV EASEMENT TO POSEIDON
- LOCATION OF POSEIDON DESALINATION PLANT
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY
- (1) TIE POINT TO SDG&E NATURAL GAS
- (2) TIE POINT TO CITY OF CARLSBAD RECLAIMED WATER
- (3) TIE POINT TO CITY OF CARLSBAD POTABLE WATER
- (4) TIE POINT TO STORMWATER DRAIN
- (5) TIE POINT TO CITY OF CARLSBAD SEWER

NOTE:

OCEAN WATER SYSTEM PIPING NOT SHOWN FOR CLARITY.

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

Figure 2.0-2
Construction Laydown and Parking
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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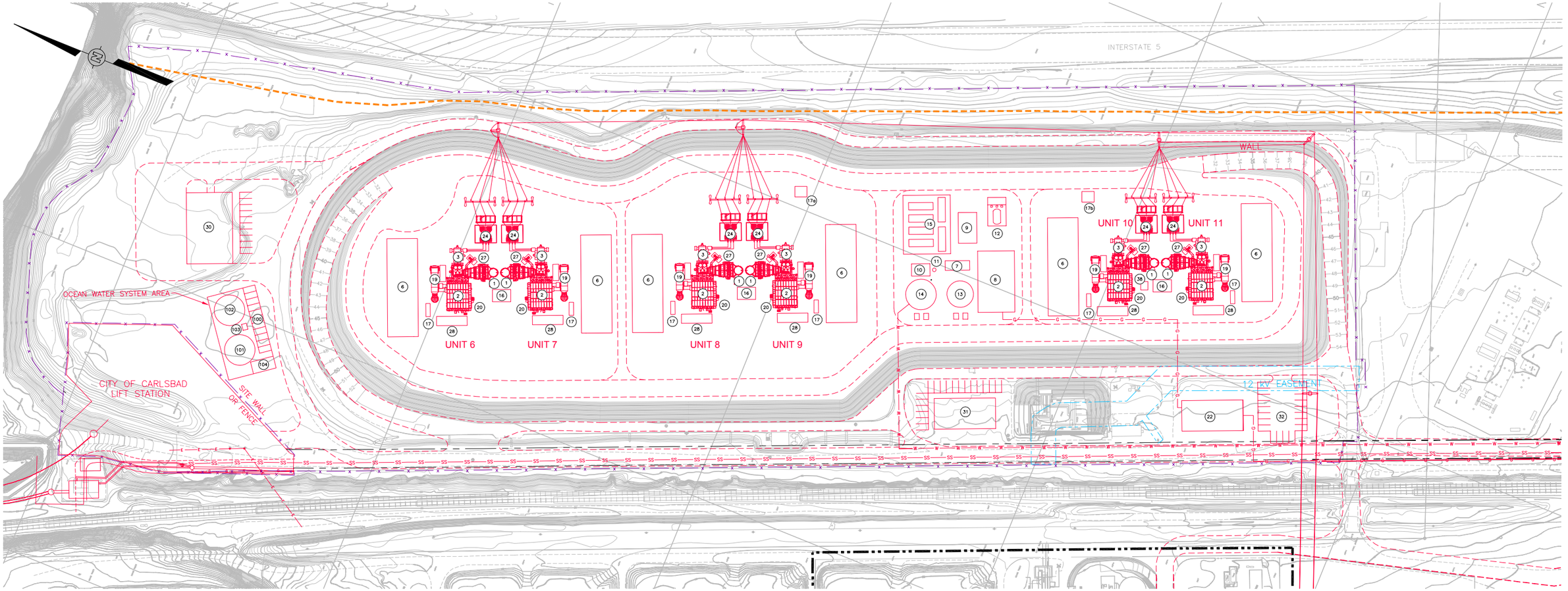


LEGEND:

- LOCATION OF POSEIDON DESAL PLANT
- PIPE LINE RIGHT OF WAY
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY
- G — GAS LINE (APPROVED ROUTING PER PEAR)
- W — RECLAIMED WATER LINE (APPROVED ROUTING PER AFC)
- SS — SANITARY SEWER LINE
- x — FENCE LINE / PROJECT BOUNDARY
- 12kV EASEMENT TO POSEIDON

EQUIPMENT LIST

1	EXHAUST STACK
2	COMBUSTION TURBINE ENCLOSURE
3	GENERATOR ENCLOSURE
6	FIN FAN COOLERS
7	BOP PDC
8	GAS COMPRESSOR BUILDING
9	AIR COMPRESSOR BUILDING
10	FIRE PUMP BUILDING
11	DIESEL STORAGE TANK (IF NEEDED)
12	AMMONIA STORAGE AREA
13	DEMINERALIZED WATER TANK
14	RAW/FIRE WATER TANK
15	WATER TREATMENT TRAILERS
16	CEMS ENCLOSURE
17	UNIT AUXILIARY TRANSFORMER
18	AMMONIA PREP SKID
19	SHELL AND TUBE HEAT EXCHANGER
20	AUXILIARY SKID
22	GAS METERING
24	GSU TRANSFORMER
27	ATTEMPORATION BLOWER SKID
28	CTG AND INTERCOOLER MCC
30	WAREHOUSE AND MAINTENANCE BUILDING
31	CONTROL ROOM AND ADMINISTRATION BUILDING
32	PARKING LOT
38	EMERGENCY DIESEL GENERATOR
100	OCEAN WATER TRAILERS
101	OCEAN WATER STORAGE TANK
102	ULTRA FILTRATION STORAGE TANK (OWS)
103	ULTRA FILTRATION PUMPS
104	SOLIDS UNLOADING SPACE

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

NOTE:

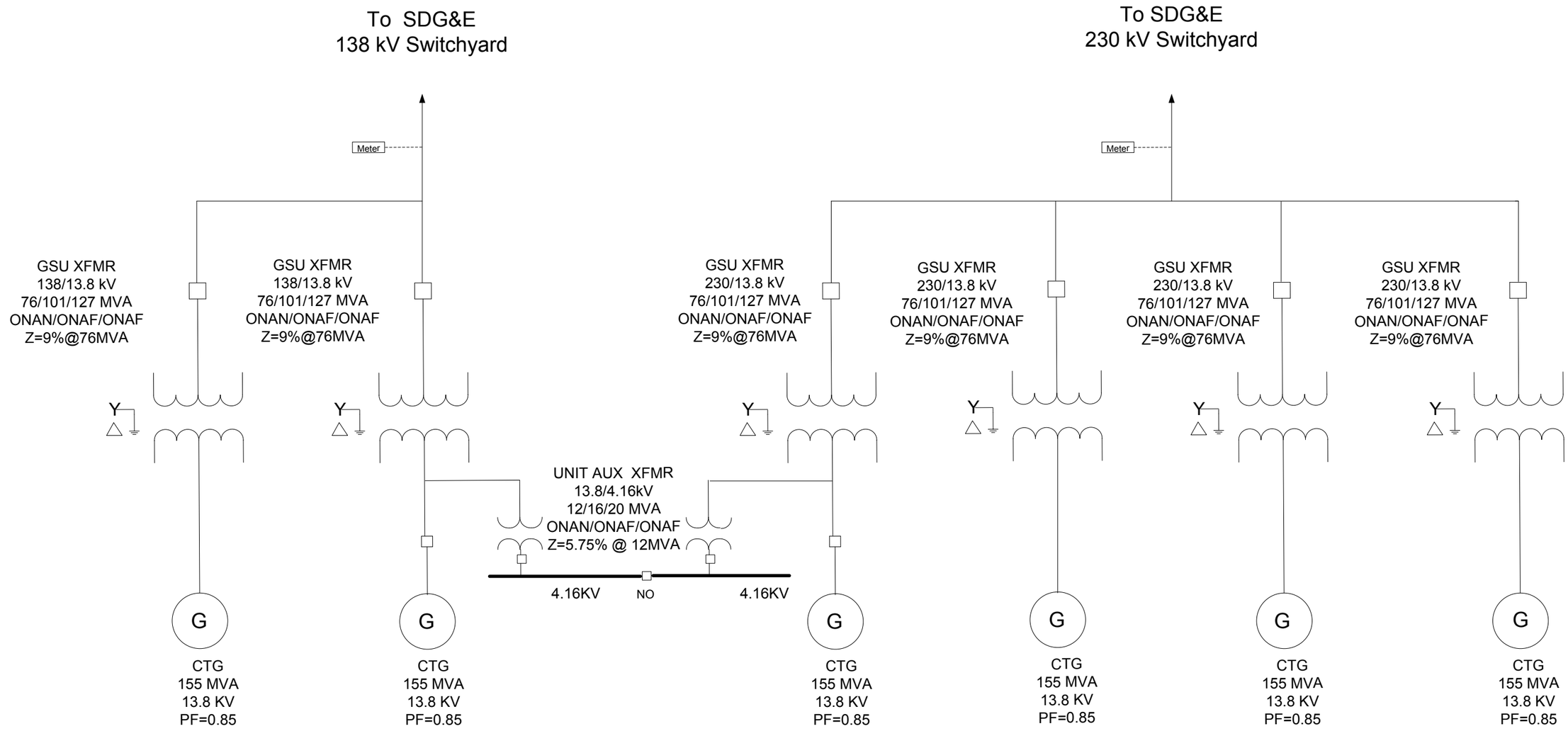
SOME EQUIPMENT NOT SHOWN FOR CLARITY.

APPROXIMATE SCALE

0 80 160 240 FEET

Figure 2.1-1
Site Plan
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

CH2MHILL®



Note:

1. The 138kV transmission line and the 230kV transmission line will each be equipped with a set of metering equipment.
2. Ratings and equipment configuration shown are preliminary and will be finalized during detail design.

Figure 2.1-2
CECP Conceptual One-Line Diagram
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

2.1.4 Combustion Turbine Generators

Electricity would be produced by any one of the proposed six CTGs. In a typical GE LMS100 CTG, thermal energy is produced through the combustion of natural gas, which is converted into mechanical energy required to drive the combustion turbine compressors and electric generators. Each CTG system consists of a stationary combustion turbine generator, supporting systems, and associated auxiliary equipment. The CTGs will be equipped with the following required accessories to provide safe and reliable operation:

- Inlet air filters
- Inlet air evaporative coolers
- Demineralized water injection skid
- Compressor intercooler
- Fin/fan cooler and shell and tube heat exchanger as well as a cooling water circulating pump
- Metal acoustical enclosure
- Redundant lube oil coolers
- Compressor wash system
- Fire detection and protection system

The metal acoustical enclosures will be provided for the CTGs and respective accessory equipment, all of which will be located outdoors.

Each CTG exhaust will be equipped with a carbon monoxide oxidation (CO) catalyst and a selective catalytic reduction (SCR) emission control system that uses 19% aqueous ammonia in the presence of a catalyst to reduce oxides of nitrogen (NO_x) levels in the exhaust gases. Ammonia from the aqueous ammonia storage tank will be vaporized and then injected into the CTG exhaust gas stream via a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction will reduce NO_x to nitrogen and water. Exhaust from each CTG will be discharged from individual, 90-foot-tall, 14.25-foot-diameter exhaust stacks.

2.1.5 Major Electrical Equipment and Systems

For the Amended CECP, like the Licensed CECP, the bulk of the electric power produced by the facility will be interconnected to the CAISO grid via the existing SDG&E 138-kV and 230-kV switchyards located on the EPS site. A small amount (approximately 20.6 MW) of parasitic electric power will be used to power the Amended CECP's onsite auxiliaries such as pumps, fans and compressors, control systems, and general facility loads including lighting, heating, and air conditioning. Some power will also be converted from alternating current (AC) to direct current (DC), which will be used as backup power for control systems and other critical uses. Transmission and auxiliary uses are discussed in the following subsections.

2.1.5.1 AC Power—Transmission

Power will be generated by the six CTGs at 13.8 kV and then stepped up by independent transformers for each CTG. Two CTGs will have voltage increased to 138 kV, and the remaining four CTGs will be stepped up to 230 kV for high voltage feed to the respective existing SDG&E switchyards. An overall single-line diagram of the amended facility's electrical system is shown in Figure 2.1-2. The CTGs will be connected by iso-phase bus duct to oil-filled step-up transformers that increase the voltage to 138-kV/230-kV respectively, as indicated on the single-line diagram. Surge arresters will be provided at the high-voltage bushings to protect the transformers from surges on the high-voltage systems caused by lightning strikes or other system disturbances. The transformers will be set on concrete foundations within containments designed to contain the transformer oil in the unlikely event of a leak or spill. The high-voltage side of the step-up transformers will be interconnected to the existing switchyards. As previously mentioned, from the existing switchyards, power will be transmitted via 138-kV and 230-kV transmission lines to the CAISO-controlled electric grid.

A more detailed discussion of the transmission system is provided in Section 3.0.

2.1.5.2 AC Power—Distribution to Auxiliaries

Auxiliary power to the combustion turbine power block will be supplied at 4,160 volts AC by a double-ended 4,160-volt switchgear lineup. Two oil-filled, 13.8-to-4.16-kV unit auxiliary stepdown transformers will supply power to the switchgear. The high-voltage side (13.8 kV) of the unit auxiliary transformers will be connected to the outputs of two CTGs, one associated with the 138-kV transmission line and one associated with the 230 kV transmission line. This connection will allow the switchgear to be powered from any of the six generators or by back-feeding power from the existing switchyards through either of the unit auxiliary transformers. Low-voltage side (13.8 kV) generator circuit breakers will be provided for the CTGs. These circuit breakers are used to isolate and synchronize these two generators, and will be located between the generators and the connections to the transformers. The remaining four CTGs will be synchronized via a high-voltage circuit breaker located on the high-voltage side of the step-up transformers. The 4,160-volt switchgear lineup supplies power to the various 4,160-volt motors, to the combustion turbine starting system, and to the load center transformers (used for 4,160- to 480-volt reductions and for 480-volt power distribution). The 4,160-volt switchgear will use vacuum interrupter circuit breakers to isolate the main incoming feeds and respective power distribution.

The load center transformers will be oil-filled with each supplying 480-volt, 3-phase power to the double-ended load centers.

The load centers will provide power through feeder breakers to the various 480-volt motor control centers (MCC). The MCCs will distribute power to ancillary equipment including 480-volt motors, 480-volt power distribution panels, and lower-voltage lighting and distribution panel transformers. Power for the AC power supply (120-volt/208-volt) system will be provided by the 480-volt MCCs and 480-volt power panels. 480-120/208-volt dry-type transformers will provide transformation of 480-volt power to 120/208-volt power.

2.1.5.3 125-Volt DC Power Supply System

The Amended CECP will deploy one common 125-volt DC power supply system consisting of one 100-percent-capacity battery bank, two 100-percent-capacity static battery chargers, a switchboard, and two or more distribution panels that will be supplied for BOP equipment. Each CTG will be provided with its own dedicated battery systems and charger.

Under normal operating conditions, the battery chargers will supply DC power to the DC loads. The battery chargers receive 480-volt, three-phase AC power from the AC power supply (480-volt) system and continuously charge the battery banks while simultaneously supplying power to the DC loads.

Under abnormal or emergency conditions, should the power from the AC power supply (480-volt) system be disrupted, the batteries will supply DC power to the DC system loads. Similar to the Licensed CECP, the batteries for the system at the Amended CECP will be sized to provide up to 3 hours of continuous supply to the site vital DC loads. Recharging of discharged batteries occurs upon restoration of 480-volt power from the AC power supply (480-volt) system. The battery re-charge rate is dependent on the characteristics of the battery, battery charger, and the connected DC load during charging. The anticipated maximum recharge time will be 12 hours.

The 125-volt DC system will also be used to provide control power to the 138 kV/230 kV generator breakers, 4,160-volt switchgear, 480-volt load centers, critical control circuits, and emergency DC motors.

2.1.5.4 Uninterruptible Power Supply System

The combustion turbines will also have an essential service 120-volt AC, single-phase, 60-hertz (Hz) uninterruptible power supply (UPS) to supply AC power to critical equipment loads as well as provide power for unit protection and safety systems that require uninterruptible AC power.

A UPS inverter will supply 120-volt, AC single-phase power to the UPS panel distribution boards that supply critical AC loads. The UPS inverter will be fed from the station 125-volt DC power supply system. Each UPS

system will consist of one full-capacity inverter, a static transfer switch, a manual bypass switch, an alternate source transformer, and two or more panel boards.

The normal source of power to the system will be from the 125-volt DC power supply system through the inverter to the panel board. A solid-state static transfer switch will continuously monitor both the inverter output and the alternate AC source. The transfer switch will automatically transfer essential AC loads without interruption from the inverter output to the alternate source upon loss of the inverter output.

A manual bypass switch will also be included to enable isolation of the inverter for testing and maintenance without interruption to the essential service AC loads.

The distributed control system (DCS) operator stations will be supplied from the UPS. Additionally, the continuous emission monitoring (CEM) equipment, DCS controllers, and input/output (I/O) modules will be fed from either the UPS system or from 125-volt DC power directly.

2.1.6 Fuel System

The proposed CTGs are designed to burn natural gas only. The natural gas requirement during full load operation at extreme high ambient temperature of 96.0°F is approximately 798.6 million British thermal units per hour (MMBtu/hr).[4] The maximum natural gas requirement, expected during low ambient temperature operation conditions, is approximately 865.6 MMBtu/hr (LHV basis).

Similar to the Licensed CECP, natural gas will be delivered to the Amended CECP via a 20-inch-diameter pipeline from an existing SDG&E high-pressure, natural gas pipeline located within an existing right-of-way on the EPS site. This pipeline will extend to the facility from the existing SDG&E natural gas pipeline (Line TL 2009, "Rainbow line") located adjacent to the Amended CECP site, on the west side of and parallel to the railroad tracks on the EPS site. At the Amended CECP site, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and gas compressors prior to entering the combustion turbines.

Historical data indicate that the pressure on the SDG&E Line TL 2009 generally is approximately 250 pounds per square inch gauge (psig) minimum. Three 50-percent-capacity electric-driven fuel gas compressors will be provided to boost the pressure to the 850 psig required by the combustion turbines. The gas compressors will be located in an enclosure in the BOP area of the Amended CECP.

Additional detailed information on the natural gas supply and plant usage at the Amended CECP is provided in Section 4.0.

2.1.7 Water Supply and Use

The Application for Certification (AFC), Section 3.0, for the Licensed CECP[5] identified the primary project water supply as City of Carlsbad CCR Title 22 reclaimed water supplied to the site from the utility easement on the east side of the railroad tracks, as shown in Figure 2.0-1. The Project Enhancement and Refinement (PEAR), Section 2.3.2,[6] added an alternative to the City of Carlsbad reclaimed water source. This alternative is an ocean water source to be withdrawn via the Agua Hedionda Lagoon and the existing EPS once-through cooling water discharge channel. This alternate design requires an added water pre-treatment system to remove filterable solids and to treat the saltwater to a level that can be accepted by the reverse osmosis and

[4] Lower heat value [LHV] basis, for each CTG unit

[5] Carlsbad Energy Center LLC. 2007. *Carlsbad Energy Center Project Application for Certification.* November. Available online at: http://www.energy.ca.gov/sitingcases/carlsbad/documents/applicant/afc/

[6] CH2M HILL and Shaw, Stone & Webster. 2008. *Carlsbad Energy Center Project (07-AFC-6) Project Enhancement and Refinement Document. Submitted by Carlsbad Energy Center LLC.* July. Available online at: http://www.energy.ca.gov/sitingcases/carlsbad/documents/applicant/2008-08-27_PROJECT_ENHANCEMENT_AND_REFINEMENT.PDF

polishing water treatment system. To accommodate the necessary equipment, the water treatment system will be located on the north rim of the Amended CECP power block area, as shown in Figure 2.1-1.

The Amended CECP will preferentially use Title 22 reclaimed water as the primary water source, provided it is available. The ocean water alternative approved in the Licensed CECP will be implemented as a backup water supply in the event reclaimed water is unavailable. Figures 2.1-3a and 2.1-3b show daily average consumption with six CTGs operating at up to a 31 percent capacity factor with CTG evaporative cooling, for reclaimed water and ocean water, respectively. While high-purity demineralized water will no longer be required for the steam cycle, it will be required for emission control via direct injection into the combustion turbines and turbine wash water.

The Amended CECP fire protection system will be modified from the Licensed CECP to have a common but larger raw water tank for fire protection and process use, as well as expanded fire loops for the expanded Amended CECP site. Both the power block area and rim area hydrants will be charged by this source, eliminating the tie to the existing EPS. Potable water from the existing City of Carlsbad supply will be used for the new administration/control building, warehouse, and emergency eyewash and safety showers, and will also serve as an emergency connection for the fire water tank should reclaimed or ocean water become interrupted.

Up to approximately 30 gallons per minute (gpm) of reclaimed water will be used to irrigate site landscaping, which is included in the water balance diagrams.

A more detailed description of the water supply system, treatment, and permits is provided in Section 5.11, Soil and Water Resources.

2.1.7.1 Primary Source—Reclaimed Water

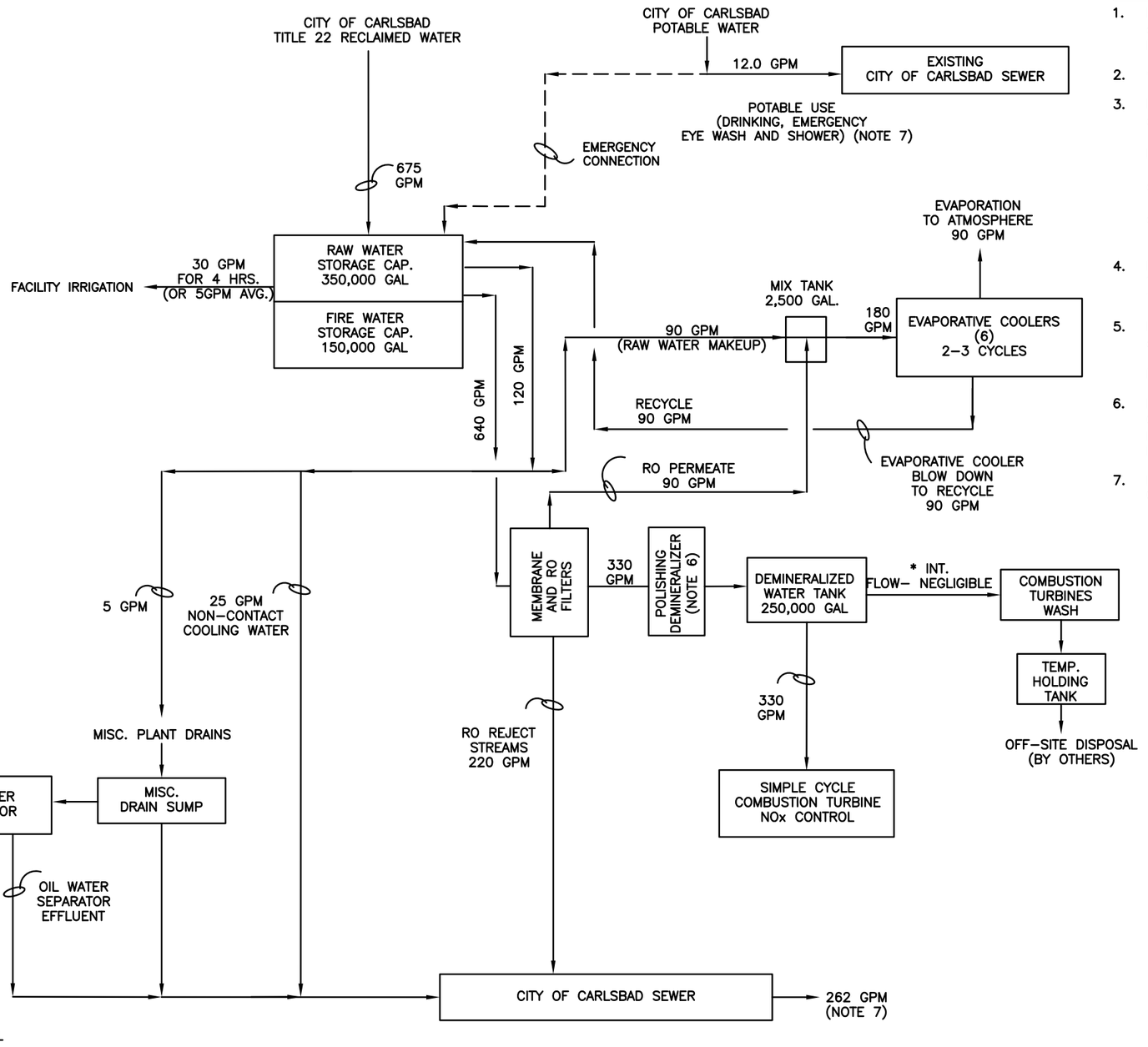
Reclaimed water will be obtained via a new reclaimed water line that will tie into the new 500,000-gallon aboveground raw water tank. This tank will have a dedicated capacity of 150,000 gallons for the fire water and 350,000 gallons for process water. The process water will be pretreated with a combination of cartridge and membrane filters and subsequent reverse osmosis and a final demineralization process. The demineralized water will be stored in a dedicated 250,000-gallon demineralized water storage tank and used for NOx emission control of the combustion turbines. A portion of the reverse osmosis permeate will be mixed with untreated process water in a 2,500-gallon mix tank and used for evaporative cooling of the inlet air for the combustion turbines, as needed. The demineralized water, mixed with minimal, non-toxic cleaning chemicals, will also be used for infrequent cleaning of the internal components of the combustion turbines during scheduled outages.

The reclaimed water balance diagram (Figure 2.1-3a) shows the equipment required as well as water uses and waste streams for both a daily maximum and yearly average use.

2.1.7.2 Alternate Source—Ocean Water

In the unlikely event that reclaimed water is unavailable, an ocean water system will be implemented. To obtain ocean water, the existing EPS intake and discharge structure will be used, as well as piping from the withdraw point on the discharge side of the structure – the current ocean water withdrawal point for the Poseidon Desalination Plant and terminating at the Amended CECP site. The current intake structure for the cooling water system removes water from the Agua Hedionda Lagoon, which was designed for 857 million gallons per day (mgd) of cooling water. The Poseidon Desalination Plant will withdraw approximately 100 mgd of the Encina discharge water prior to re-admittance to the ocean discharge system.

Processed ocean water will be stored in the 500,000-gallon raw water tank to be located near the processing trailers on the north end of the rim of the power block. An approximately 40,000-gallon service water tank will be required to store the processed water to be used for evaporative coolers and as the source for the second stage reverse osmosis equipment.

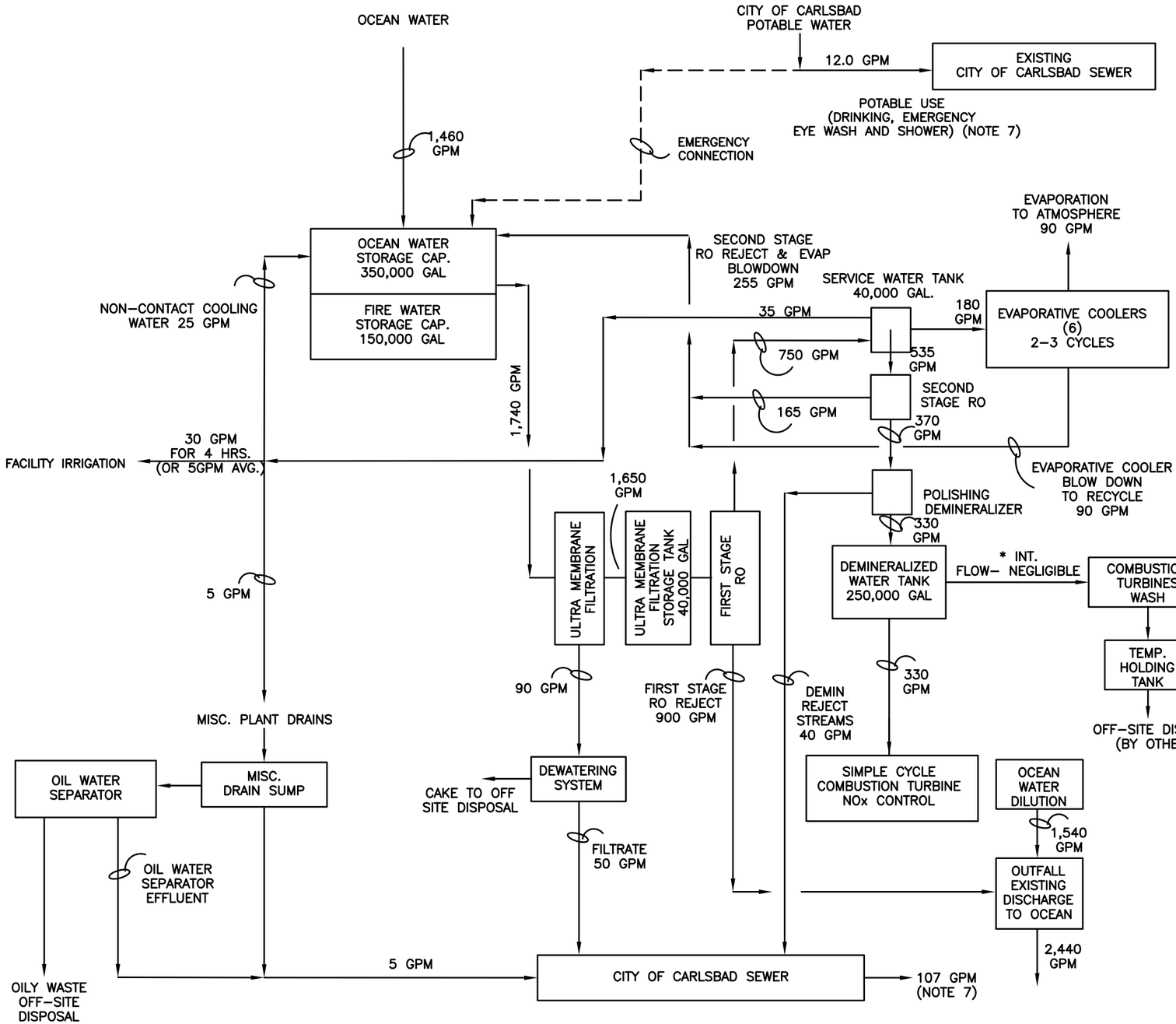


NOTES:

1. DESIGN BASIS:
   a) NOx USE – 55 GPM PER TURBINE
   b) EVAP COOLING USE – 15 GPM PER TURBINE
2. * INT. = INTERMITTENT FLOWS
3. MAXIMUM DAILY CONSUMPTION
   a) TITLE 22 RECLAIMED WATER 729,000 GALS./DAY
   b) POTABLE WATER – 17,200 GALS./DAY (NON-FIRE USE)
   c) POTABLE WATER – EMERGENCY ONLY (FIRE USE)
   d) FIRE WATER STORAGE REFILL – 500GPM MINIMUM (150,000 GALS./FILL)
4. FLOW RATE (GPM) IS DAILY AVERAGE, BASED ON 18 HR. OPERATION PER DAY. EVAP COOLER ON 18-HRS/DAY.
5. MAXIMUM ANNUAL CONSUMPTION:
   a) TITLE 22 RECLAIMED WATER – 109,350,000 GALS.
   b) POTABLE WATER – 2,592,000 GALS.
6. DEMINERALIZER SYSTEM TO CONSIST OF A COMBINATION OF MEMBRANE FILTRATION (MF), REVERSE OSMOSIS (RO) AND A POLISHING DEMINERALIZER.
7. FLOWS INCLUDED IN TOTAL PLANT DISCHARGE TO CITY OF CARLSBAD SEWER

SOURCE: CB&I ENVIRONMENTAL & INFRASTRUCTURE, INC

Figure 2.1-3a
Reclaimed Water Balance
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend



NOTES:

1. DESIGN BASIS:
   a) NOx USE – 55 GPM PER TURBINE
   b) EVAP COOLING USE – 15 GPM PER TURBINE
2. * INT. = INTERMITTENT FLOWS
3. MAXIMUM DAILY CONSUMPTION
   a) OCEAN WATER – 1,576,800 GALS./DAY
   b) POTABLE WATER – 17,200 GALS./DAY (NON-FIRE USE)
   c) POTABLE WATER – EMERGENCY ONLY (FIRE USE)
   d) FIRE WATER STORAGE REFILL – 500GPM MINIMUM (150,000 GALS./FILL)
4. FLOW RATE (GPM) IS DAILY AVERAGE, BASED ON 18 HR. OPERATION PER DAY. EVAP COOLER ON 18-HRS/DAY.
5. MAXIMUM ANNUAL CONSUMPTION:
   a) OCEAN WATER – 236,520,000 GALS.
   b) POTABLE WATER – 2,592,000 GALS.
6. DEMINERALIZER SYSTEM TO CONSIST OF A COMBINATION OF MEMBRANE FILTRATION (MF), 2-STAGE REVERSE OSMOSIS (RO) AND A POLISHING DEMINERALIZER.
7. POTABLE WATER FLOWS INCLUDED IN TOTAL DISCHARGE TO CITY OF CARLSBAD SEWER

SOURCE: CB&I ENVIRONMENTAL & INFRASTRUCTURE, INC

Figure 2.1-3b
Ocean Water Balance
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

The first stage reverse osmosis reject will be diluted and returned to the intake structure by the ocean-water-system return line, and the second stage reverse osmosis reject will be recycled into the bulk ocean water/fire water storage tank for re-use.

Because of the much higher salinity of the ocean water relative to the reclaimed water, a two-stage reverse osmosis system will be used for demineralizing the ocean water, followed by polishing. Seawater reverse osmosis systems operate at elevated pressures (800 to 1,000 psi), use a higher amount of ocean water, and produce more reject streams for the same amount of treated water produced. The ocean water entering the reverse osmosis stages will be pre-treated with cartridge and membrane filters, which will remove filterable solids. A solids dewatering system will be provided to remove any moisture from the filter cake, which will be disposed of offsite. The demineralization process will also require additional treatment such as chlorination, dechlorination, and degasification processes prior to and after the reverse osmosis stages.

The ocean water balance diagram (Figure 2.1-3b) shows the equipment required as well as daily average water use.

2.1.7.3 Fire Water

Raw water will be allocated for firefighting and will be stored in an approximately 500,000-gallon aboveground storage tank. This tank will hold a minimum of 150,000 gallons for dedicated fire protection. The remaining 350,000-gallon capacity will be allocated for storing process water.

2.1.7.4 Potable Water

The Amended CECP will require potable water for the administration/control building and the warehouse buildings, as well as for emergency eye wash stations and showers in the power block area. Similar to the Licensed CECP, the Amended CECP will use potable water as the backup water source for all CECP needs should the reclaimed water or ocean water systems become unavailable or interrupted. Potable water will be supplied from the City system and will be protected against cross-contamination with the use of a reduced-pressure backflow prevention device or air gap.

2.1.7.5 Sanitary Sewers

Sanitary and industrial wastewater disposal will be served by the City of Carlsbad (Encina Wastewater Authority) sewer system.

A more detailed description of the water supply system, treatment, and permits is provided in Section 5.11, Soil and Water Resources.

2.1.7.6 Construction Practices

The Amended CECP's connection to the existing potable water line and connection to the existing City of Carlsbad sewer line will be constructed from the tie points shown in Figure 2.1-1. The construction will be open trench work with approximately 36 inches of ground cover for the installed pipes. During non-work hours, trench plates will cover exposed trench excavations.

The new reclaimed water line is more extensive in scope, extending approximately 3,700 feet to the Amended CECP site from the south at Cannon Road/Avenida Encinas. The reclaimed water line will be installed under Cannon Road using partial traffic lane closures to accommodate open trench construction. The installation crossing of Cannon Road is expected to occur over a period of approximately 3 weeks.

The alternate ocean water source will require installation of a new pipeline from the existing EPS discharge channel crossing east through the Poseidon Desalination Plant and entering the Amended CECP site boundary, where the pipeline will turn north toward the ocean water treatment system facilities.

All trenches will be backfilled using excavated soil and compacted for pipe stability and minimum subsequent subsidence. Backfill will be to original grade or level. The Cannon Road crossing for the reclaimed water line will be repaved to achieve original traffic surface conditions.

2.1.7.7 Water Requirements

The estimated average daily, maximum daily, and maximum annual quantity of reclaimed water required for operation of the Amended CECP is presented in Table 2.1-1. The alternate source ocean water requirements are presented in Table 2.1-2. The daily water requirements shown are estimated quantities based on the simple-cycle plant operating at a 31 percent capacity factor, with evaporative cooling.[7]

TABLE 2.1-1
Daily and Annual Water Use for Amended CECP Operations—Reclaimed Water Supply

Water Use	Average Daily Use (gpm)	Maximum Daily Use (gpd)	Maximum Annual Use (afy)
Reclaimed Water	210*	675	336*
Potable Water	12	12	19

*Based on an annual operation of 2,700 hours/year at full plant output

TABLE 2.1-2
Daily and Annual Water Use for Amended CECP Operations—Ocean Water Supply

Water Use	Average Daily Use (gpm)	Maximum Daily Use (gpd)	Maximum Annual Use (afy)
Ocean Water	450*	1,460	726*
Potable Water	12	12	19

*Based on an annual operation of 2,700 hours/year at full plant output

2.1.8 Plant Cooling Systems

The Amended CECP's cycle heat rejection system will consist of air-cooled fin-fan coolers, shell and tube heat exchangers with closed loop circulating water pumps, and evaporative coolers. The heat rejection system will cool the CTG lube oil to within limits specified by the CTG manufacturer as well as reject the heat created by the high-temperature inter-cooler.

Mixed reclaimed and reverse osmosis permeate will be used for evaporative cooling. Mixing of reclaimed and reverse osmosis permeate will be necessary to avoid formation of scales on the evaporative cooler media.

It is estimated that 50 percent of the evaporative cooling water will be lost to atmosphere via CTG exhaust and the remaining 50 percent will be recycled to the raw water storage tank. The evaporative cooling water will not be treated with any chemicals.

2.1.9 Waste Management

Similar to the Licensed CECP, all wastes produced at the Amended CECP will be properly collected, treated if necessary, and properly disposed of. Wastes will include process and sanitary wastewater, and nonhazardous waste and hazardous waste, both liquid and solid. Waste management is discussed in more detail in Section 5.14.

[7] Peak water requirements shown in Tables 2.1-1 and 2.1-2 are based on the plant operating at full load, with evaporative cooling, and an ambient temperature of 96.0°F and 36.0 percent relative humidity.

2.1.9.1 Wastewater Collection, Treatment, and Disposal

The reject stream from the reverse osmosis units will be sent to the City of Carlsbad sewer system. Evaporative cooler blowdown will be internally recycled for reuse. Miscellaneous plant drains (sample cooling, pump leaks, equipment washwater) will be collected, oil and suspended solids contamination will be removed by an oil/water separator, and the balance will be discharged to the City of Carlsbad sewer system (also referred to as the Encina Wastewater Authority's sanitary sewer system).The water balance diagrams, Figures 2.1-3a and 2.1-3b, show the anticipated wastewater streams and flow rates for the Amended CECP. A second wastewater collection system will collect sanitary wastewater from sinks, toilets, showers, eye wash stations, and other sanitary facilities, and subsequently discharge to Encina Wastewater Authority's sanitary sewer system.

Accidental leaks and discharges inside the power generating areas will be contained and disposed offsite, in accordance with approved spill prevention, control and countermeasures plans.

2.1.9.1.1 Reverse Osmosis Reject / Demineralizer Disposal

Processing of the City reclaimed water through the reverse osmosis system will produce a reject stream that will contain higher concentrations of reclaimed water constituents and traces of water-treatment chemicals added to the reclaimed water to prevent bio-fouling and scaling of reverse osmosis membranes. The concentrations of water constituents in the reject stream will be below the maximum permissible discharge limits before they enter the City of Carlsbad (Encina Wastewater Authority) sewer system.

The characteristics of the Amended CECP's combined discharge to the sewer system are provided in Table 2.1-3. Average discharge will be 81 gpm; peak flow to the sewer will be approximately 262 gpm.

The mixed bed polishing units will be regenerated offsite and will produce no liquid or solid wastes inside the Amended CECP boundary.

TABLE 2.1-3
Summary of Average Water Quality Characteristics for Amended CECP Wastewater Compared to Encina Wastewater Authority Discharge Limits

Constituent	Unit	Wastewater (reverse osmosis reject water)	Allowable Discharge Limits
Cadmium	ppm	0.02	0.43
Chromium (T)	ppm	0.02	3.50
Copper	ppm	0.03	4.40
Lead	ppm	0.02	1.8
Nickel	ppm	0.03	1.8
Silver	ppm	0.03	4.2
Zinc	ppm	0.07	6.2
pH	Units	6 to 9	5.5-11

2.1.9.1.2 Plant Drains and Oil/Water Separator

Blowdown from the inlet air evaporative cooling system will be recycled to the raw water tank for re-use. Normal plant drains will collect any containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas will be collected in a system of floor drains, hub drains, and sumps. Oil and grease and suspended solids will be filtered from the water and the balance discharged to the sewer system. Drains that can potentially contain accidental spills of oil or grease will be routed through an oil/water separator first. Plant wastewater that might carry high amounts of oil and grease or chemicals

will be collected and removed for offsite disposal. Wastewater from combustion turbine water washes will be collected in sumps and will be trucked offsite for disposal at an approved wastewater disposal facility.

2.1.9.1.3 Storm Drains

The storm drain system will be installed to manage stormwater collection around each power block and the BOP area, and gravity drains to an oil/water separator. A secondary containment system will provide additional verification that no hydrocarbons are present prior to pumping the water to a bio-swale on the north side of the Amended CECP site. From the swale, the remaining water that has not evaporated or absorbed will be drained through the existing permitted discharge into the lagoon. An emergency generator will supply backup power for the storm drain system. The existing National Pollutant Discharge Elimination System (NPDES) permit for the EPS will be modified to support the Amended CECP (see Section 5.11, Soil and Water Resources).

2.1.9.1.4 Solid Wastes

The Amended CECP will produce wastes typical of power generation operations and routine maintenance. Generation plant wastes include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Solid wastes will be trucked offsite for recycling and/or disposal (see Section 5.14).

2.1.9.1.5 Hazardous Wastes

Several methods will be used to properly manage and dispose of hazardous wastes generated by the Amended CECP. Waste lubricating oil will be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of in a Class I landfill. Spent SCR and oxidation catalysts will be recycled by the supplier or disposed of in accordance with regulatory requirements. Workers will be trained to handle hazardous wastes generated at the site.

2.1.10 Management of Hazardous Materials

The Amended CECP will make us of the same hazardous material management detailed in the Licensed CECP.

A list of the chemicals anticipated to be used at the Amended CECP and their storage locations is provided in Section 5.5, Hazardous Materials Handling. This list identifies each chemical by type, intended use, and estimated quantity to be stored onsite. Section 5.5 includes additional information on hazardous materials handling.

2.1.11 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the CTGs will be controlled using state of-the-art systems pursuant to federal, state, and local regulations. To ensure that the systems perform correctly, continuous emissions monitoring for NO_x and CO will be performed. Section 5.1, Air Quality, includes additional information on emission control and monitoring.

2.1.11.1 NO_x Emission Control

The CTGs selected for the Amended CECP require high-purity demineralized water for injection into the combustors to control emissions of NO_X. In addition, the exhaust duct work incorporates SCR systems to further control NO_x concentrations in the exhaust stacks to no more than 2.5 ppmvd, corrected to 15% oxygen (O_2). The SCR process will use 19% aqueous ammonia. Ammonia slip, or the concentration of unreacted ammonia in the stack exhaust, will be limited to 5.0 ppmvd, corrected to 15% O_2. The SCR equipment will include a reactor chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors.

2.1.11.2 Carbon Monoxide and Volatile Organic Compound Emission Control

The combustion turbine combustors incorporate staged combustion of a pre-mixed fuel/air charge, resulting in high thermal efficiencies with reduced CO and volatile organic compounds (VOC) emissions. CO and VOC emissions will be further controlled by means of a CO oxidation catalyst. CO emission rate in stack exhaust will be limited to 4.0 ppmvd, corrected to 15% O_2. VOC emission rate will be limited to 2.0 ppmvd, corrected to 15% O_2.

2.1.11.3 Particulate Emission Control

Emissions will be controlled by the use of best combustion practices, high-efficiency air inlet filtration, and the use of natural gas. Similar to the Licensed CECP, natural gas will be the only fuel used, which, relative to other burnable materials, is low in sulfur and is very low in particulate emissions.

2.1.11.4 Continuous Emission Monitoring

Similar to the Licensed CECP, each CTG will have a continuous emission monitoring system (CEMS) that will sample, analyze, and record fuel gas flow rate, NO_x and CO concentration levels, and percentage of O_2 in the exhaust gas from the CTG exhaust stacks. The CEMS system will transmit data to a data acquisition system (DAS) that will store the data and generate emission reports in accordance with federal, state, and regional permit requirements. The DAS will also include alarm features that will propagate alarm signals to the plant DCS when the emissions approach or exceed pre-selected limits.

2.1.12 Fire Protection

The fire protection system design detailed in the Licensed CECP has been modified to reflect the Amended CECP site layout. The existing potable water fire suppression system will be removed and replaced by a deluge system by interconnection to the City of Carlsbad reclaimed water supply. This system will have onsite storage in a dual-purpose, combination raw water/fire water storage tank. City of Carlsbad potable water will be the emergency backup water source should there be an unlikely interruption in the reclaimed water supply. Two separate distribution loops will be installed at the Amended CECP site: one located around the perimeter of the reconfigured power block in the recessed area, and a secondary loop surrounding the perimeter of the area above the recessed power block. Access roads on the site will be expanded to a width of 28 feet to ensure adequate space for firefighting trucks to access the site, as shown in Figure 2.1-4.

Additionally, GE will provide self-contained systems to provide independent protection of the individual CTGs. The new deluge system layout is shown in Figure 2.1-5. The GE system will deploy National Fire Protection Association (NFPA) required protection for the new equipment.

The GE Fire and Explosion Protection System includes the following fire protection measures:

- Mitigates fires from starting, through fire prevention,
- Detects fires in early stages with fire detection systems,
- Contains fires using confinement designs, and
- Employs active fire suppression systems.

The Amended CECP's additional fire protection measures will include:

- Establishing fire zones with physical separation between buildings,
- Separating buildings and structures for mitigating smoke spread,
- Constructing containment walls where oil is used,
- Minimizing the use of combustible materials,
- Providing sloped surfaces for draining combustible material to containment sumps,
- Adding separate escape routes in enclosures to the outside, and
- Implementing egress escape plans for large structures.

The Amended CECP fire protection system consists of wet pipe sprinkler systems and carbon dioxide (CO_2) systems. Fire detection devices or methods for detection include fuel gas, thermal rate compensated, and smoke- or manual-activated sensing. Potential hazards being monitored include ammonia, natural gas, lubricating oil, hydraulic oil, insulating oil, electrical gear, wood, PVC, and other flammable material like the gas turbine inlet filter. System isolation and area classifications will be in accordance with NFPA recommendations.

The primary source of the fire protection systems is the raw water storage tank supplied with reclaimed water, with backup sources from the City potable water system. Tank sizing is governed by NFPA 850A: a 100-percent-capacity electric and a 100-percent-capacity diesel-driven fire pump will maintain system pressure during filling and fire events. A low-capacity jockey fire pump will maintain system pressure during non-fire suppression system activity.

A fire water loop will surround the power block with hydrants installed per criteria specified in NFPA codes and standards. This loop will also supply the deluge system in the air compressor enclosure, gas compressor enclosure, and the fire pump enclosure in the BOP area, as well as provide fire suppression for the warehouse/maintenance and administration/control buildings. Electrically sensitive areas in the administration/control building will be protected by automated dry agent fire protection suitable for occupied spaces. Each CTG will be equipped with a CO_2 fire-suppression system that is integrated into the turbine control system. The automatically actuated CO_2 system provides fire suppression in the turbine compartments.

Power distribution centers and auxiliary enclosures in the power block will also be equipped with fire extinguishers per NFPA guidelines.

The main transformers will be designed in accordance with NFPA 78 and will not be provided with specific fire suppression systems.

Local fire protection and suppression panels will be provided for each area being protected with automated functions and alarming. Local alarm annunciation will also be replicated to the main control system.

Section 5.5, Hazardous Materials Handling, includes additional information for fire and explosion risk, and Section 5.10, Socioeconomics, provides information on local fire protection capability.

2.1.13 Plant Auxiliaries

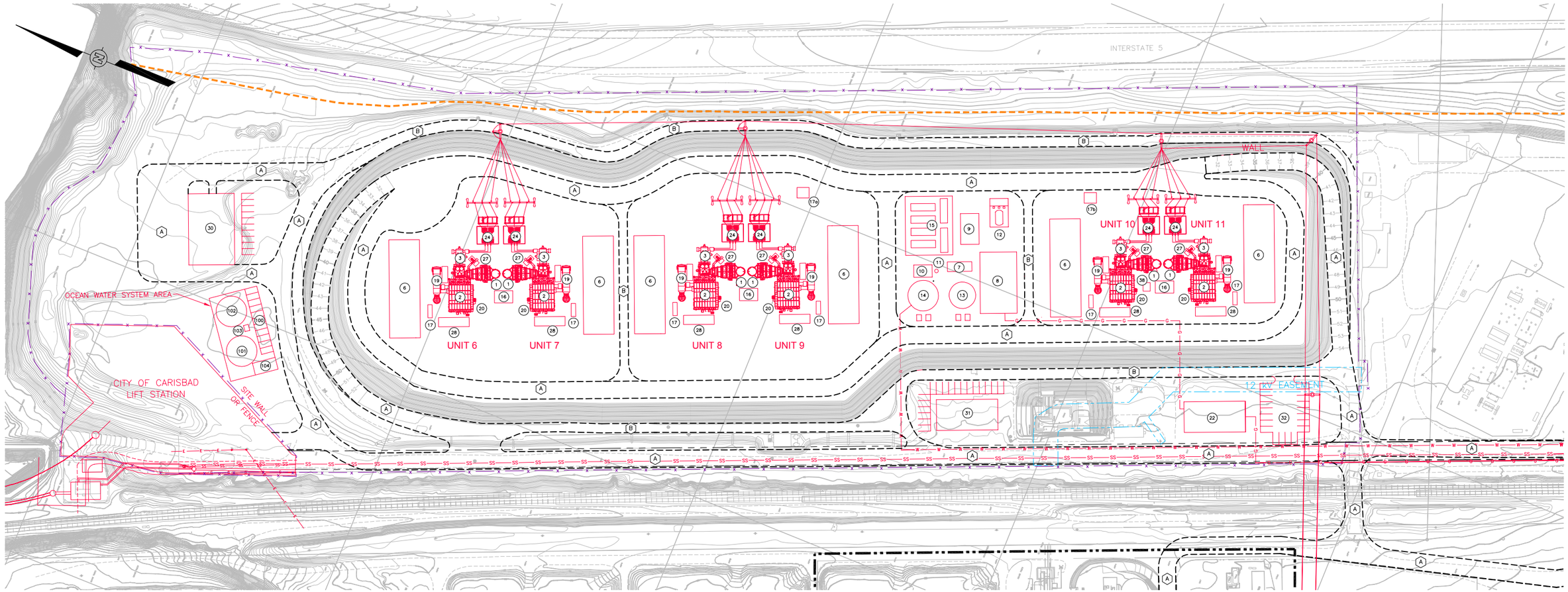
The following systems will support, protect, and control the generating facility.

2.1.13.1 Lighting

The Amended CECP will employ the same standards and design intent of the lighting system as the Licensed CECP.

2.1.13.2 Grounding

The same engineering standards will be incorporated into the grounding system of the Amended CECP as with the Licensed CECP.



LEGEND:

- LOCATION OF POSEIDON DESAL PLANT
- PIPE LINE RIGHT OF WAY
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY
- G — GAS LINE (APPROVED ROUTING PER PEAR)
- W — RECLAIMED WATER LINE (APPROVED ROUTING PER AFC)
- SS — SANITARY SEWER LINE
- x — FENCE LINE / PROJECT BOUNDARY
- 12kV EASEMENT TO POSEIDON
- (A) FIRE & HEAVY HAUL ROAD
- (B) SERVICE & MAINTENANCE ROAD

EQUIPMENT LIST

1 EXHAUST STACK
2 COMBUSTION TURBINE ENCLOSURE
3 GENERATOR ENCLOSURE
6 FIN FAN COOLERS
7 BOP PDC
8 GAS COMPRESSOR BUILDING
9 AIR COMPRESSOR BUILDING
10 FIRE PUMP BUILDING
11 DIESEL STORAGE TANK (IF NEEDED)
12 AMMONIA STORAGE AREA
13 DEMINERALIZED WATER TANK
14 RAW/FIRE WATER TANK
15 WATER TREATMENT TRAILERS
16 CEMS ENCLOSURE
17 UNIT AUXILIARY TRANSFORMER
18 AMMONIA PREP SKID
19 SHELL AND TUBE HEAT EXCHANGER
20 AUXILIARY SKID
22 GAS METERING
24 GSU TRANSFORMER
27 ATTEMPORATION BLOWER SKID
28 CTG AND INTERCOOLER MCC
30 WAREHOUSE AND MAINTENANCE BUILDING
31 CONTROL ROOM AND ADMINISTRATION BUILDING
32 PARKING LOT
38 EMERGENCY DIESEL GENERATOR
100 OCEAN WATER TRAILERS
101 OCEAN WATER STORAGE TANK
102 ULTRA FILTRATION STORAGE TANK (OWS)
103 ULTRA FILTRATION PUMPS
104 SOLIDS UNLOADING SPACE

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

APPROXIMATE SCALE
0 80 160 240 FEET

Figure 2.1-4
Site Road Plan
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

CH2MHILL®

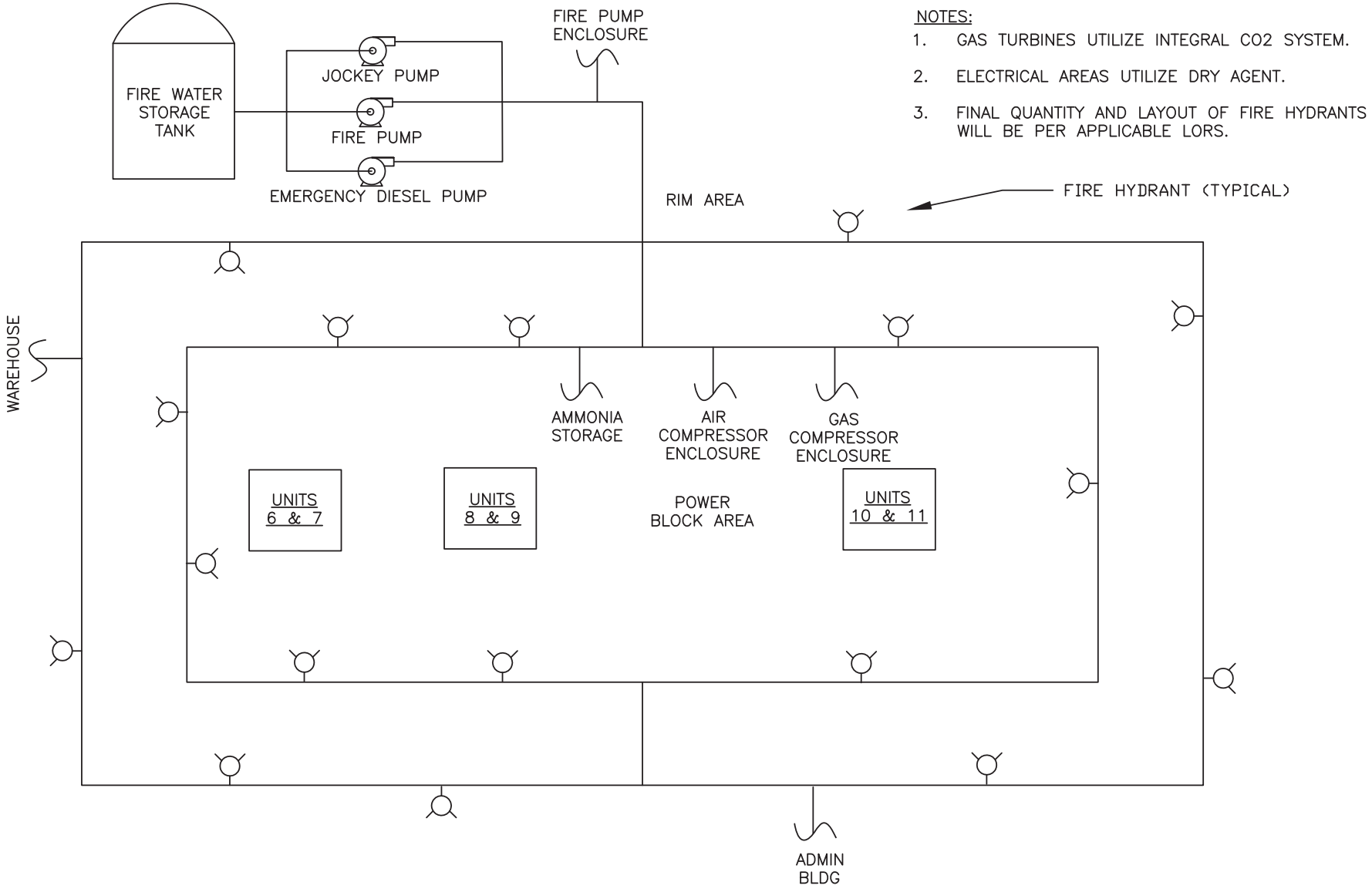


Figure 2.1-5
CECP Fire Protection
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

SOURCE: CB&I ENVIRONMENTAL & INFRASTRUCTURE, INC

2.1.13.3 Distributed Control System

The DCS provides modulating control, digital control, monitoring, and indicating functions for the plant power block systems. The following functions will be provided:

- Controlling the CTGs and other generation systems in a safe, coordinated manner;
- Controlling of BOP systems in response to plant demands;
- Monitoring controlled plant equipment and process parameters and delivery of this information to plant operators;
- Providing graphical user interface control displays (printed logs, video monitors) for signals generated within the system or received from input / output (I/O);
- Providing consolidated plant process status information through displays presented in a timely and meaningful manner;
- Providing alarms of out-of-limit parameters or parameter trends, displaying on alarm video monitors(s), and recording on an alarm historian; and
- Providing means for data storage and historical data retrieval.

The DCS will be a redundant microprocessor-based system and will consist of the following major components:

- PC-based operator console(s) with video monitors
- Engineer work station(s)
- Distributed processing units
- I/O cabinets
- Historian system
- Printer(s)
- Data telemetry to the combustion turbine control systems

The DCS will have a functionally distributed architecture comprising a group of similar redundant processing units linked to a group of operator consoles and the engineer workstation(s) by virtue of redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and retain historical information. Redundancy offers a fail-safe mode of operation wherein no single processor failure can cause or prevent a unit trip.

The DCS will interface with the control systems furnished by the CTG supplier to provide remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information.

The system will be designed with sufficient redundancy to preclude a single device failure from significantly affecting overall plant control and operation. This also will allow critical control and safety systems to have redundancy of controls, as well as an uninterruptible power source.

As part of the quality control program, daily operator logs will be available for review to determine the status of the operating equipment.

2.1.13.4 Cathodic Protection

The cathodic protection system will be designed to control the electrochemical corrosion of designated metal piping buried in the soil. Depending on the corrosion potential and the site soils, either passive or impressed current cathodic protection will be provided.

2.1.13.5 Service Air

The service air system will supply compressed air to hose connections for general plant use. Service air headers will be routed to hose connections located at various points throughout the facility.

2.1.13.6 Instrument Air

The instrument air system will provide dry air to pneumatic operators and devices. An instrument air header will be routed to locations within the facility equipment areas and within the water treatment facility where pneumatic operators and devices will be located.

2.1.14 Administrative Building and Warehouse

2.1.14.1 Administrative Building

The Administrative Building will replace the functionality of the existing Encina plant operations by creating a workspace for site administration and control room operation. In addition to the required parking areas, an additional parking area will be provided for visitors or meeting attendees. Utilities for this building will also be provided.

The workspace will provide a control room, DCS room including uninterruptable power supply equipment, electrical room, plant and maintenance operations supervision offices, mail room, reception entry, general service offices, and conference rooms along with associated restroom and locker facilities.

2.1.14.2 Warehouse

The warehouse will replace the functionality of the existing Encina facility by creating an enclosed Maintenance workspace. Utilities will also be provided to this structure.

The workspace will support maintenance activities including warehousing spare parts, service air compressors, welding area, maintenance shop area, electrical/instrument and control shop area, tool cribs, offices, high-value storage area along with the associated restrooms, and changing areas. A loading dock area will be included for deliveries.

2.1.15 Interconnect to Electrical Grid

The six CTGs will be interconnected to the regional electrical grid through new 138-kV/230-kV transmission connection lines that will exit the Amended CECP power block site to the southwest and be routed to the respective existing SDG&E switchyards (see Section 3.0, Transmission System Engineering). Similar to the Licensed CECP, no offsite additional electrical transmission lines are required.

2.1.16 Project Construction

The construction schedule addressed in the AFC has changed to accommodate the modifications proposed in the PTA, and the following construction workforce tables have changed accordingly. The construction and Commercial Operating Date schedule selected for the amended project will be based on the terms of a negotiated Power Purchase Agreement.

Table 2.1-4 provides the Amended CECP construction workforce by labor craft by month during the 24-month construction schedule. See Section 5.10, Socioeconomics, for the average and peak construction workforce for the Amended CECP.

The hours at which construction takes place for the Amended CECP are not changed from the Licensed CECP. Table 2.1-5A provides the anticipated construction deliveries by truck, and Table 2.1-5b shows the anticipated truck and rail deliveries for heavy or oversize deliveries. See Section 5.12, Traffic and Transportation, for average and peak construction traffic (construction workers and deliveries) for both of the Amended CECP construction schedule options.

TABLE 2.1-4
Amended CECP Construction Workforce by Labor Craft by Month

	Months After Notice to Proceed																							
	Construction Phase																				Commissioning Phase			
Craft	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Total**
Plant																									
Insulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	9	11	11	11	18	14	0	0	0	81
Boiler Makers	0	0	3	3	5	10	12	12	19	19	17	19	19	22	19	14	6	6	6	6	6	11	0	0	234
Masons	0	0	0	2	4	4	4	4	3	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	32
Carpenters	3	3	15	25	18	26	26	26	26	26	26	15	15	21	20	11	10	9	7	5	5	2	1	0	341
Electricians	3	3	5	7	8	10	14	20	24	24	24	25	25	35	35	35	18	15	11	7	7	5	5	5	370
Ironworkers	0	0	4	9	6	7	13	16	16	22	20	20	20	27	29	31	14	11	10	9	9	3	0	0	296
Laborers	22	34	34	38	38	38	38	38	38	38	36	28	25	34	25	25	14	13	13	15	15	3	2	2	606
Millwrights	0	0	0	0	0	0	6	6	7	7	7	11	11	14	13	10	9	8	8	8	8	1	1	1	136
Operating Engineers	24	30	0	3	6	9	7	9	10	10	12	12	12	13	15	16	9	8	7	7	7	1	1	0	228
Plasterers	0	0	0	0	0	0	0	0	1	2	2	2	3	4	4	2	2	1	0	0	0	0	0	0	23
Painters	0	0	0	0	0	0	0	1	1	2	2	4	3	4	4	4	4	4	3	3	2	2	0	0	43
Pipefitters	3	5	10	10	12	20	30	30	34	34	34	32	34	36	36	36	25	20	20	16	14	4	4	4	503
Sheetmetal Workers	0	0	0	0	0	2	4	7	7	8	8	9	10	11	11	8	6	5	3	3	3	1	0	0	106
Sprinkler Fitters	0	0	0	0	0	0	1	1	1	1	3	4	7	7	7	5	5	4	4	3	3	0	0	0	56
Teamsters	24	27	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	85
Surveyors	3	5	5	5	4	5	4	4	3	3	3	3	3	3	3	2	2	2	2	1	1	2	0	0	68
Manual Staff Subtotal	**82**	**107**	**78**	**104**	**103**	**133**	**161**	**176**	**192**	**199**	**197**	**187**	**190**	**234**	**231**	**210**	**137**	**119**	**107**	**103**	**95**	**36**	**15**	**12**	**3208**
Other Plant Staff	14	20	34	46	46	46	34	34	38	38	45	44	46	40	38	34	30	21	21	21	21	18	17	17	763
Plant Total	**96**	**127**	**112**	**150**	**149**	**179**	**195**	**210**	**230**	**237**	**242**	**231**	**236**	**274**	**269**	**244**	**167**	**140**	**128**	**124**	**116**	**54**	**32**	**29**	**3971**
Linear Construction																									**0**
Laborers												18	21												39
Operating Engineers												9	7												16
Pipefitters												7	7												14
Teamsters												5	4												9
Manual Staff Subtotal												**39**	**39**												**78**
Linear Construction Staff												4	4												8
Linear Construction Total												**43**	**43**												**86**
Total Construction Staff	**96**	**127**	**112**	**150**	**149**	**179**	**195**	**210**	**230**	**237**	**242**	**274**	**279**	**274**	**269**	**244**	**167**	**140**	**128**	**124**	**116**	**54**	**32**	**29**	**4057**

TABLE 2.1-5A

Anticipated Construction Schedule for Truck Deliveries of Equipment (Excluding Heavy Equipment Deliveries and Demolition)

Month After Construction Mobilization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Equipment and Materials																								
Generating Facility																								
Combustion Turbine/Generator							5	13	25	32	34	29	19	10	10									
Mechanical Equipment			5	5	16	16	32	32	54	54	53	53	32	26	13	5	3							
Electrical Equipment and Materials		3	3	8	8	11	16	16	32	32	32	43	37	27	16	16	5	5						
Piping, Supports & Valves		3	4	8	14	27	43	43	53	54	64	53	32	26	16	5	5							
Concrete and Rebar		50	197	245	484	484	105	87	43	17	9													
Miscellaneous Steel/Architectural				5	5	16	27	32	32	26	10	5												
Consumables/Supplies	14	16	35	38	43	43	43	43	43	46	46	46	46	37	37	27	27	10	10	3				
Contractor Mobilization & Demobilization	11	11	16	10	5										3	10	16	10	10	3				
Construction Equipment	5	5	11	8	8	5	5	5	4	4	2	2	1	1	3	3	5	3	3					
Miscellaneous																					3	3	3	3
Subtotal	**30**	**88**	**271**	**327**	**583**	**602**	**276**	**271**	**286**	**265**	**250**	**231**	**167**	**127**	**98**	**66**	**61**	**28**	**23**	**6**	**3**	**3**	**3**	**3**
Average Daily	**1.4**	**4.2**	**12.9**	**15.6**	**27.8**	**28.7**	**13.1**	**12.9**	**13.6**	**12.6**	**11.9**	**11.0**	**8.0**	**6.0**	**4.7**	**3.1**	**2.9**	**1.3**	**1.1**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**
Project Linears																								
Electrical Equipment and Materials												6	6											
Piping, Supports & Valves												18	18											
Concrete and Rebar												20	23											
Miscellaneous Steel/Architectural												2	4											
Consumables/Supplies												18	18											
Construction Equipment												13	13											
Subtotal												**77**	**82**											
Average Daily												**3.5**	**3.9**											
Total	**30**	**88**	**271**	**327**	**583**	**602**	**276**	**271**	**286**	**265**	**250**	**308**	**249**	**127**	**98**	**66**	**61**	**28**	**23**	**6**	**3**	**3**	**3**	**3**
Total Average Daily	**1.4**	**4.2**	**12.9**	**15.6**	**27.8**	**28.7**	**13.1**	**12.9**	**13.6**	**12.6**	**11.9**	**14.0**	**11.9**	**5.8**	**4.5**	**3.0**	**3.0**	**1.3**	**1.1**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**

TABLE 2.1-5B

Anticipated Construction Deliveries, Both Truck Deliveries and Rail Deliveries (Heavy and Oversize Loads)

Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Rail Delivery w/ Heavy Haul[a]													2	2	2	2	2	2		8	6				28
Rail Delivery[b]													1	2	2	2	2	1		8					16
Total Rail Deliveries	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4	4	4	3	0	16	6	0	0	0	44
Truck Deliveries[c]																									
GE Power Plant					154	202	222	326	369	349	316	286	307	264	239	205	194	186	192	120	64	30	19	11	4,055
Site Prep / Access Roads	180	270	100																						550
Berms - Gunite & Wire Mesh			8	2																					10
Project Linears												10	8	2											20
Transmission													9	16	6	2			2						35
Total Truck Deliveries	180	280	116	4	154	202	222	326	369	349	316	286	324	282	245	207	194	186	194	120	64	30	19	11	4,670

[a]All rail deliveries relate to GE power plant activities. Heavy haul transporter to move equipment from rail spur to construction location at power block (assume 500 hp range) (distance: approx. 4,300 ft.)

[b]Typical flatbed train car is 27 tons unloaded, 110 tons fully loaded

[c]Assume semi tractor/trailer or dump truck approx. 450 to 470 hp range

Construction laydown and construction worker parking areas for the Amended CECP will occupy about 19.3 acres at selected locations within the existing EPS site (see Figure 2.0-2). Construction truck delivery access will be from Cannon Road and Carlsbad Boulevard, as shown in Figure 2.0-2. Materials and equipment will be delivered by truck and rail. An existing railroad track is located immediately on the west side of the Amended CECP site and will be available for delivery of large or heavy equipment (see Figure 2.0-2, Construction Laydown and Parking).

2.1.17 Generating Facility Operation

Operations at the Amended CECP will be staffed with an estimated 18-person workforce including operators on rotating shifts and maintenance technicians during the standard 8-hour work day. This estimated 18-person workforce will be sourced from the existing 50-person workforce that presently operates the existing EPS. The facility will be staffed 7 days a week, 24 hours per day, but will have a limit of 2,700 operating hours per CTG annually.

It is expected that the Amended CECP will be operated primarily as a peaking facility on daily cycles, especially during summer months. The exact operational profile of the Amended CECP, however, cannot be defined in detail because operation of the facility depends on the variable demand in the service area and various grid conditions.

The Amended CECP may be operated in one or all of the following conditions:

- **Load Following**. During non-peak seasons (primarily spring and fall), the facility will most likely be operated at loads that may vary between maximum continuous output (all six units operating at base load) and minimum load (one CTG operating as low as 25 percent load) to meet electrical demand at all times between 0600 and 2400 hours.[8] In this mode, the plant is dispatched in real-time fashion.
- **Daily Cycling**. The facility will most likely be operated in daily cycling condition, wherein the plant is operated at pre-determined fixed load points during the day and totally shut down at night or on weekends. This condition may occur either with daily nighttime shutdowns or with weekend shutdowns depending on electrical demand, and other issues.
- **Full Shutdown**. This would occur if forced by lack of load demand/dispatch, equipment malfunction, fuel supply interruption, transmission line disconnect, or scheduled maintenance.

In the unlikely event of a situation that causes a longer-term cessation of normal operations, security of the facilities will continue to be maintained on a 24-hour basis, and the CEC will be notified. Depending on the length of shutdown, a contingency plan for the temporary cessation of operations may be implemented. Such contingency plan will be in conformance with all applicable laws, ordinances, regulations, and standards (LORS) and protection of public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, could include the draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS. (See Section 2.4, Facility Closure, for a full discussion of temporary cessation of operations and full closure of the Amended CECP.)

2.2 Encina Power Station Demolition

This PTA incorporates the shutdown and demolition of the EPS as part of the Amended CECP. Following shutdown of EPS Units 1 through 5, the project owner will demolish the EPS aboveground structures west of the railroad tracks. This will include the removal of the emergency/black start combustion turbine generator. This change will also allow and facilitate future redevelopment of western portions of the EPS

[8] Between mutual agreement with City of Carlsbad, the CECP will normally operate between 0600 and 2400 hours. Only in emergency situations will the plant operate between 2400 and 0600 hours.

site for non-power-production uses. Though not part of the Amended CECP, the project owner entered into an agreement with the City of Carlsbad and SDG&E that may move the current SDG&E Cannon Street maintenance yard to a new, inland location. The demolition of EPS is another step toward facilitating a remodeled coastal area and reflects a significant and important community development flowing from the Amended CECP.

2.2.1 EPS Background

The EPS Units 1, 2 and 3 were constructed in the 1950s, and feature 100-, 104- and 110-MW GE steam turbines and generators, respectively. Units 4 and 5 were built in the 1970s, and utilize approximately 300-MW and 330-MW Westinghouse steam turbines and generators, respectively. Additionally, a 17-MW GE Frame 5 simple-cycle gas turbine and generator is used for black-start back feed capability. All five units contain steam boilers, and all units are connected to the ocean water intake and discharge systems. The 400-foot-tall exhaust stack is shared by the five units. Other miscellaneous equipment and structures west of the railroad tracks include administrative, operations, and maintenance buildings and wastewater storage tanks and associated pumps that manage EPS's wastewater.

The Amended CECP will replace this aging infrastructure with more efficient, effective generating units, located inland, east of the railroad tracks. This replacement will then allow demolition of the EPS and redevelopment of the western portions of the EPS property, subject to necessary easements to support the operation and security of the Amended CECP. The demolition must also accommodate the infrastructure required to maintain the Poseidon Desalination Plant (Poseidon) operations and the continued function of the SDG&E switchyard. Access roadwork, utility connections, and security for the Amended CECP operations will be retained or modified in the western portion of the site.

2.2.2 Demolition Phase

The EPS demolition phase is anticipated to take 22 months and will begin after shutdown of EPS Units 1 through 5. Demolition mobilization will occur after achieving commercial operation of the Amended CECP and retirement of the EPS generating units. The subject demolition areas are shown in Figure 2.2-1, Encina Power Station Demolition, and Figure 2.2-2 depicts the site after EPS demolition is complete. The EPS demolition will generally occur within an area bounded by the property fence line west of the railroad tracks, south of the lagoon, east of Carlsbad Boulevard or the Pacific Coast Highway, and north of the SDG&E maintenance property. Two EPS water storage tanks located on the SDG&E maintenance property will be included in the demolition. No activity is planned west of Carlsbad Boulevard. The SDG&E Encina switchyards and supporting control house are excluded from demolition. Additionally, areas of the EPS property in the previously described boundary will remain, such as the leased areas required by the Poseidon Desalination Plant. There are no plans to use areas of the property east of the railroad tracks for demolition activities, but site access could occur through the southwest corner of the Amended CECP site.

Generally, demolition will proceed as a set of segmented tasks associated with each of the following major components or component areas on site:

- Power plant building and contents
- Combustion turbine and structures, east power plant building
- Ocean water intake/discharge piping, structures and equipment
- Northwest structures, tanks, and piping
- Fuel oil piping and supports
- Southeast corner structures
- Two domestic water tanks on SDG&E property

The actual sequencing of the overall EPS demolition will be such that it provides a programmatic approach to removal of the power plant while supporting continued operation and maintenance activities of the property co-inhabitants, Poseidon and SDG&E, and also provides support of the Amended CECP. Sequencing

is described further below. The following is a more complete description of the seven primary demolition targets:

Power plant building and contents: The main powerhouse structures and systems will be demolished to an "at grade" condition. This includes the transformers up to an interface with the SDG&E switchyard. Crushed concrete will be used to fill basements and other subgrade infrastructure that represent a safety risk by not being filled.

Combustion turbine and structures, east power plant building: Removal of the emergency/black-start gas turbine generator to include ISO phase bus and dedicated water storage tank, and structures that will no longer be necessary for SDG&E switchyard operations and maintenance.

Ocean water intake/discharge piping, structures, and equipment: The ocean water intake system will be isolated from the lagoon. Poseidon will continue to intake ocean water for the Carlsbad Desalination Project from the current EPS discharge tunnel, as permitted. The intake will have stop logs installed to allow a concrete plug to be poured to isolate the intake piping from the lagoon, and the circulating water piping at the inlet and exit of each condenser will be cut and a welded cap installed. Aboveground piping, valves, screens, filters, and other structures will be demolished and removed. The intake canals and underground circulating piping will be isolated and remain intact. Crushed concrete and other onsite fill will be used to restore subgrade areas to grade where they represent a safety risk by not being filled. Detailed plans for the isolation of the intake structure and discharge piping that Poseidon will continue to use will be documented in an EPS Demolition Plan that will be submitted to the CEC Compliance Project Manager for review and approval.

Northwest structures, tanks and piping: The industrial wastewater facility north of the switchyard will be demolished. Some of the tanks and equipment that will be removed are Low Volume Waste Tanks #1 and #2 (that discharge via the NPDES permit), Extended Waste Tanks #3 and #4 and Treated Water Tanks #5 and #6 (that discharge to Encina Water Authority), as well as supporting pumps, filters, piping, instrumentation and controls. The tanks, piping, valves, pumps, and other structures will be demolished and removed and crushed concrete and other onsite fill will be used to fill subgrade areas that represent a safety risk by not being filled.

Fuel oil piping and supports: Any final above-grade fuel oil piping and supports not previously removed as part of the Amended CECP development and/or during construction of the Poseidon facility will be removed.

Southeast corner structures: The machine shop and compressor building, each on either side of the existing fuel gas regulating station, will be demolished to grade.

Two domestic water tanks on SDG&E property: Two welded steel tanks, located on the SDG&E maintenance yard to the south of EPS, serve as storage for the EPS fire water system. The aboveground tanks and associated piping, pumps, and structures will be demolished to grade.

2.2.3 Demolition Sequencing and Process

Demolition of EPS, and of each of the above seven components and component areas, will follow a general systematic approach that allows for cleanup and removal of hazardous building materials, recycling of valuable materials, physical demolition and removal of equipment and structures, and final site grading and clean up. Conventional demolition with continual separation of salvageable materials will be the most cost-effective method of disposal. The project is expected to follow the typical sequence, however, some tasks may be completed in parallel and may be subject to change based on permit requirements including work plan development, approval of designated disposal/recycling targets, hazardous building materials (HBM) abatement plans, permitting, grading, site-specific health and safety plan, etc.

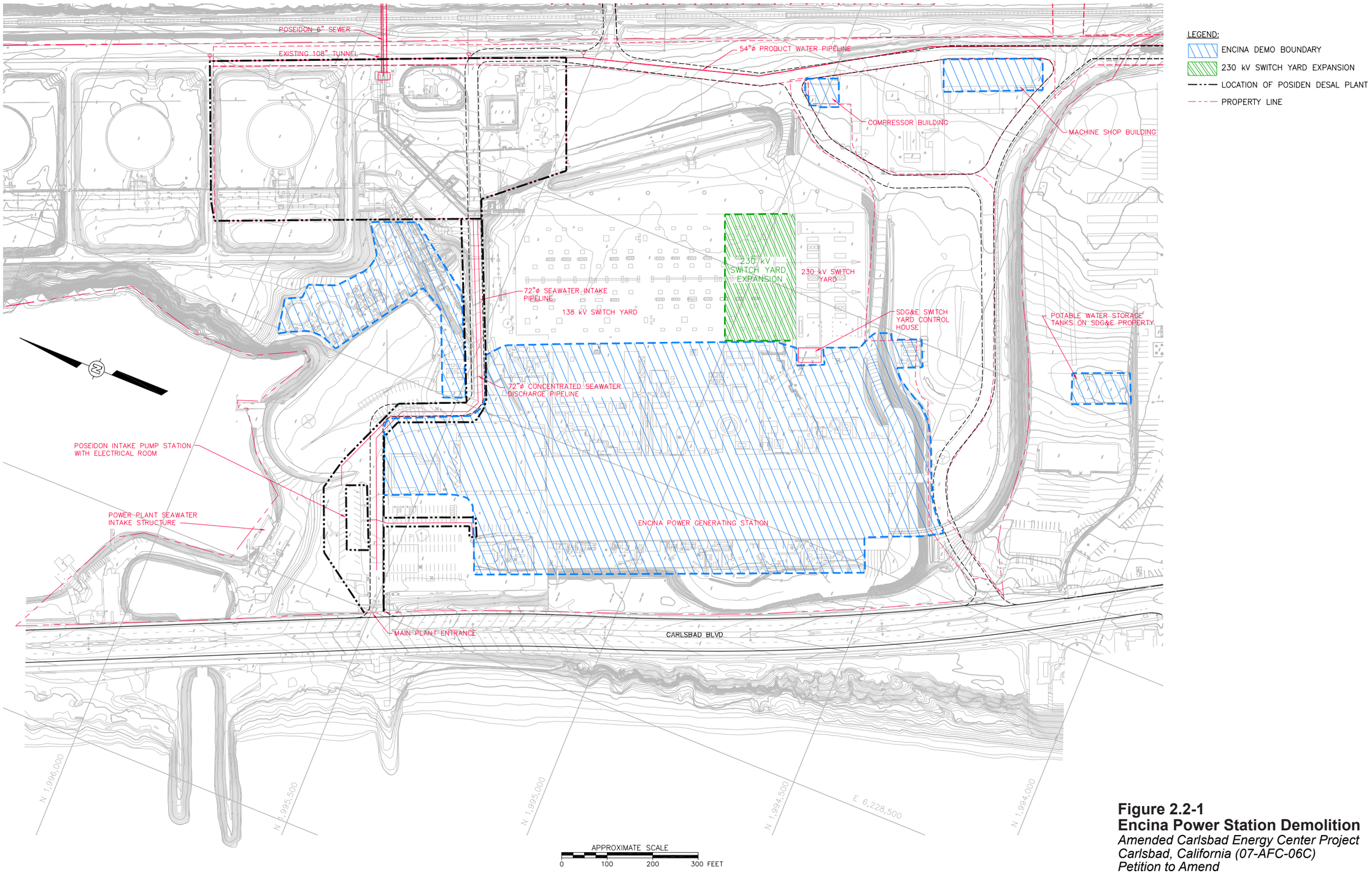
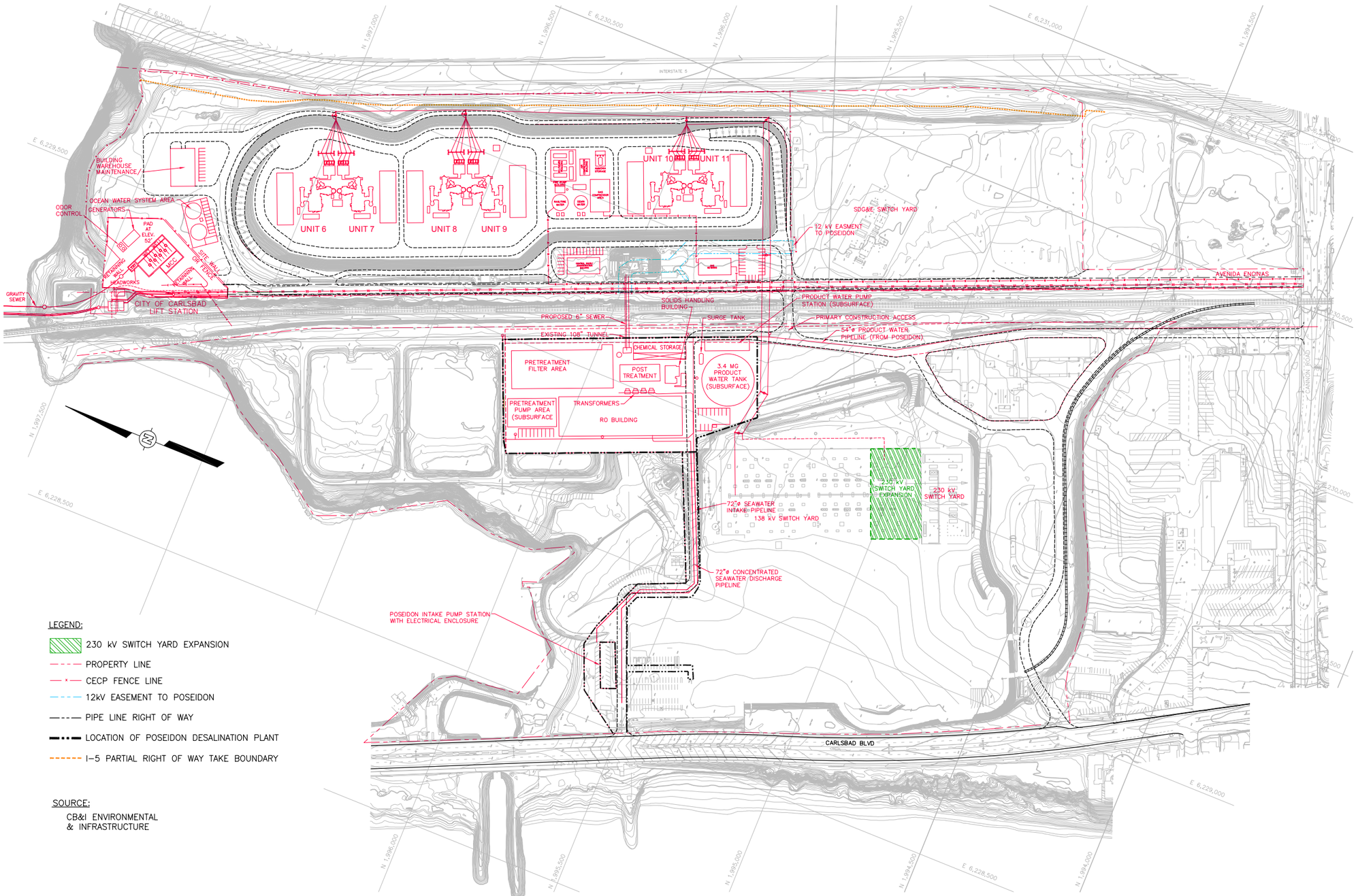


Figure 2.2-1
Encina Power Station Demolition
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

CH2MHILL®



LEGEND:

- 230 kV SWITCH YARD EXPANSION
- PROPERTY LINE
- CECP FENCE LINE
- 12kV EASEMENT TO POSEIDON
- PIPE LINE RIGHT OF WAY
- LOCATION OF POSEIDON DESALINATION PLANT
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

APPROXIMATE SCALE

0 150 300 450 FEET

Figure 2.2-2
Depiction of Site after EPS Demolition
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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Generally, the demolition process will proceed as follows:

- **Planning and assessment:** Surveys and evaluations will be conducted to identify and assess the presence of HBMs as well as recyclable metals, materials, and equipment. Generally this phase will proceed as follows:
  - Develop the implementation plans for the identification, testing, agency permitting, removal, monitoring, and disposal of any hazardous building materials prior to the demolition of the structures.
  - Determine the final configuration and construction requirements for isolating the ocean water intake and discharge in a manner that supports final plans for Poseidon's use of ocean water and also supports any final plans to use ocean water to produce purified ocean water for plant makeup purposes.
  - Develop demolition plans.
  - Contract for services related to the plans.

  At the completion of this phase, the demolition of EPS will be ready to commence. The exact timing of the initiation of demolition will be driven by actual dates that Units 1 through 5 are shut down and released from service, the Amended CECP is commercially operating, and the Amended CECP construction contractor has demobilized to the extent such demobilization is needed to allow demolition of EPS.
- **Demolition mobilization**: Any permits required beyond the CEC license will be drawn. To the maximum extent possible, existing construction infrastructure for CECP will remain onsite and be used to support demolition of EPS.
- **Preliminary HBM abatement and material recycling:** Any preliminary recycling activities will commence as will any HBM abatement identified in plans as being completed prior to major structure or demolition activities.
- **Demolition of selected structures to facilitate construction, demolition, and laydown:** Some structures and equipment will be removed first to provide working areas for remaining demolition equipment and activities. This will be primarily in the area east and north of the main power building. It is also expected that other areas of the property west of the railroad tracks will be identified as temporary storage areas for scrap, recycle, and/or offsite disposal to various end users and staging.
- **Seal intake structure:** Remove HBMs and materials not pertinent to onsite storage and scrap value materials from the structure and sequentially demolish and fill the structure or associated void to the extent required for safety and environmental best management practices.
- **Outlying structures and piping systems:** Removing HBMs and materials not pertinent to onsite storage and scrap value materials from the structures and sequentially demolish and remove the structures.
- **Main power building:** Remediate all HBMs and materials not pertinent to onsite storage and scrap value materials from the structure and sequentially deconstruct the structure.
- **Stack removal:** The stack is the largest visual structure. The concrete in the stack will be used to begin a material spoils system for filling below-grade spaces, and the steel liner will be demolished and prepared for recycling.
- **Remaining systems and structures required during demolition:** This includes but is not limited to lighting, fire protection, electrical relays for switchyard interconnections, repurposed administration and maintenance facilities, or other systems identified during the engineering phase as necessary to support demolition.

- **Demobilize demolition**: Remove trailers, equipment, and any remaining materials left over from demolition.
- **Final "as left" acceptance:** Gain CEC approval that EPS demolition is completed and the western portion is available for redevelopment under other jurisdictional bodies.

2.2.4 Safety and Hazardous Materials Removal

Key health and safety aspects such as physical hazards, asbestos, lead, and other HBMs require careful management during demolition to minimize risks to site workers and the public while complying with LORS. HBMs, including asbestos, mercury, and lead-based paints have been identified by a limited survey performed in 2006 by Shaw Environmental & Infrastructure, Inc., and additional identification will be required at the outset and throughout the demolition process. Asbestos is one of the most prevalent HBMs present in EPS structures. Asbestos removal will be monitored to ensure no asbestos is released into ambient air. See the Hazardous Materials, the Waste Management, and the Worker Safety sections of this PTA for a complete explanation of how these hazards and risks will be managed.

2.2.5 Demolition Practices

For each element of the demolition, activity includes:

- Mobilize and set up demolition support needs, like power.
- Make site and structures safe and secure for worker access and demolition.
- Implement erosion control plan.
- Confirm energy sources, utilities, and pipelines, etc.
- Develop and implement utility capping plan and lockout/tagout (LOTO) plan, as required.
- Remove universal wastes.
- Remove asbestos and lead or other HBMs.
- Identify equipment and scrap recovery.
- Remove structure through mechanical means.
- Segregate process steel and masonry/concrete from other streams.
- Backfill subsurface with appropriate fill to final grade and restore surface cover per plan.
- Demobilize all demolition equipment.

Table 2.2-1 provides quantity estimates for major equipment required, Table 2.2-2 provides quantity estimates for craft and support staff, and Table 2.2-3 provides an estimate for truck deliveries to the site to support the EPS demolition.

2.2.6 Remediation

Subsurface remediation of the EPS site is not included as part of the demolition activities to occur under this amendment, but may be conducted at a later date for future redevelopment of the site. During demolition, if obvious areas of contamination are found (stained soil or soil with a strong odor), samples will be taken to determine the type and potential extent of contamination. If these samples exceed county or state standards, they will be cleaned to industrial clean up levels in coordination with the appropriate agencies.

TABLE 2.2-1
Major Equipment Quantities for EPS Demolition

Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Crawler Excavator w/Breaker						2	3	3	4								2						14
Crawler Excavator w/Grapple or Bucket	1	1	1	1	1	1	2	2	2	1	1	1	1	3	3	3	3						31
Crawler Excavator w/Shear						1	2	2	2	1	1	1	1	3	3	3	3						23
Crawler Excavator w/Pulverizer								2	2														4
Skid Steer Loader	2	2	6	8	8	10	10	10	12	6	6	6	6	6	6	6	6			2	2	2	122
Track Loader	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2	1	1	1	25
Rubber Tire Loader											1	1	1	1	1	1	1	1	1				10
Water Truck	1	1	1	1	1	2	2	3	3	2	2	2	2							1	1	1	26
Hydro-Crane			1	1			2	2	1	1	1	1	2										12
Portable Crusher										1	1	1	1	1	1	1	1	1	1				10
Ten Wheeler with Dump Bins				2	2	2	2	2	2	2	2	2	2										20
Semi-End Dumps						2	3	4	6	2	2	2	2	8	4	14	14	3	3				79
Tractor/Trailer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	25

Estimates of work force demographics required for the demolition of EPS are shown in Table 2.2-2.

TABLE 2.2-2
Labor Work Force Demographics for EPS Demolition

Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Craft																							
Laborers	10	10	45	105	155	165	146	91	72	56	50	28	25	25	15	15	15	12	10	10	10	10	1080
Operating Engineers	2	2	2	2	2	4	8	10	12	4	4	4	2	8	8	8	8	4	2	2	2	2	102
Contractor Staff																							
Construction Manager	3	3	7	13	17	20	20	16	13	10	9	7	6	9	6	6	6	5	0	0	0	0	176
Administrators	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	44
Engineering Supervisor	3	3	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	28
Health and Safety Engineer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	44
Monthly Totals	22	22	59	125	179	194	179	122	102	75	68	44	38	49	34	31	34	26	17	17	17	17	1474

Estimates of truck deliveries required for the demolition of EPS are shown in Table 2.2-3.

TABLE 2.2-3
Truck Deliveries Required for EPS Demolition

Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Totals
Equipment Services	1	1	4	4	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	1	1	1	139
Oxygen and Propane	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4				70
Diesel Fuel	4	4	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	2	2	2	218
Drinking Water	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
First Aid Supplies	1						1						1						1				4
Small Tools and Supplies	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	82

2.3 Engineering

In accordance with CEC siting regulations, this subsection, together with the engineering appendices and other pertinent sections, including Section 3.0, Transmission System Engineering; Section 4.0, Natural Gas Supply; and Section 5.11, Soil and Water Resources; presents information concerning the design and engineering of the Amended CECP. It describes the design of the facility and discusses the reliability and estimated thermal efficiency of the facility. The LORS applicable to the engineering of the Amended CECP are provided along with a list of agencies that have jurisdiction, the contact persons within those agencies, and a list of the permits that will be required.

The Amended CECP will require the following three major engineering changes from the Licensed CECP:

- Re-design of the power block to simple-cycle configuration, eliminating the steam cycle requirements
- Addition of an administration/control room building and an operations/maintenance warehouse.
- Expanding the decommissioning and demolition to include the existing EPS Units 1 through 5, retaining the functionality to support the existing SDG&E switchyard and existing EPS ocean water intake structure to service the Poseidon desalinization plant.

2.3.1 Facility Design

A detailed description of the Amended CECP is provided in Section 2.1, Generating Facility Description, Design, and Operation. Design for safety is provided in Section 2.3.2, Facility Safety Design.

Geotechnical aspects for the Amended CECP site, based on available information, are discussed in Section 5.4, Geologic Hazards and Resources.

Descriptions of the following design criteria are included in Appendix 2C:

- Civil Engineering Design Criteria
- Structural Engineering Design Criteria
- Mechanical Engineering Design Criteria
- Electrical Engineering Design Criteria
- Control Engineering Design Criteria
- Chemical Engineering Design Criteria
- Geologic and Foundation Design Criteria

Design and engineering information and data for the following systems are provided in the following subsections of this PTA:

- **Power Generation**—See Section 2.1.4, Combustion Turbine Generators; Appendix 2C; and Sections 2.1.5 through 2.1.13, which describe the various plant auxiliaries.
- **Heat Dissipation**—See Section 2.1.8, Plant Cooling Systems; and Appendix 2C.
- **Cooling Water Supply System**—See Section 2.1.7, Water Supply and Use; and Appendix 2C.
- **Air Emission Control System**—See Section 2.1.11, Emission Control and Monitoring, and Section 5.1, Air Quality.
- **Waste Disposal System**—See Section 2.1.9 and Section 5.14, Waste Management.
- **Noise Abatement System**—See Section 5.7, Noise.
- **Switchyards/Transformer Systems**—See Section 2.1.5, Major Electrical Equipment and Systems; Section 2.1.13.2, Grounding; Section 2.1.5.1, AC Power—Transmission; Section 2.1.15, Interconnect to Electrical Grid; Section 3.0, Transmission System Engineering; and Appendix 2C.

2.3.2 Facility Safety Design

The Amended CECP will be designed to maximize safe operation. Potential hazards that could affect the facility include earthquake, flood, and fire. Facility operators will be trained in safe operation, maintenance, and emergency response procedures to minimize the risk of personal injury and damage to the plant.

2.3.2.1 Natural Hazards

The principal natural hazard associated with the Amended CECP site is earthquakes. The site is located in Seismic Risk Zone 4. Structures for the Amended CECP, as for the Licensed CECP, will be designed to meet the seismic requirements of CCR Title 24 and the latest California Building Code (CBC). Section 5.4, Geologic Hazards and Resources includes a review of potential geologic hazards, seismic ground motion, and potential for soil liquefaction due to ground-shaking. Potential seismic hazards will be mitigated by implementing the CBC construction guidelines. Appendix 2C includes the structural seismic design criteria for the buildings and equipment.

Flooding is not a hazard of concern for the Amended CECP. According to the Federal Emergency Management Agency, the site is not within either the 100- or 500-year flood plain. Section 5.11, Soil and Water Resources, includes additional information on the potential for flooding.

2.3.2.2 Emergency Systems and Safety Precautions

This subsection discusses the fire protection systems, emergency medical services, and safety precautions to be used by project personnel. Section 5.10, Socioeconomics, includes additional information on area medical services, and Section 5.15, Worker Health and Safety, includes additional information on safety for workers. Appendix 2C presents the design practices and codes applicable to safety design for the Amended CECP. Compliance with these requirements will minimize impacts of the Amended CECP on public and employee safety.

2.3.2.2.1 Emergency Ingress and Transmission Line Design

The transmission lines will be owned and operated by the CECP. The CECP will have up to date information with respect to the status of the transmission line. In the event that the CECP requests assistance from the Fire Department, the CECP will inform the Fire Department of whether the transmission line is currently energized or de-energized. An existing pole has been relocated to reduce the span of the overhead transmission line across the entrance to the Amended CECP, in accordance with discussions with the Fire Department.

The transmission line will be designed to withstand wind loading based on 85 mph basic wind speed and the seismic acceleration suitable for the location. In addition this transmission line will be equipped with HV circuit breakers on both ends, and redundant current differential protective relays will be installed to protect each transmission line. The redundant current differential protective relays will be purchased from two different manufacturers to eliminate the likelihood of common mode failures.

The current differential protective relays continuously monitor the current in each conductor in the transmission line. It automatically trips (opens) the circuit breakers on both end of the transmission line if the current flowing into one end of the conductor does not equal the current flowing out of the other end of the conductor. This situation could occur if there is a break in the conductor, or there is a line-to-ground fault. The total clearing time, from sensing the fault (or breaking of the conductor) to opening the circuit breakers is less than five cycles, or 0.083 seconds. In addition, the circuit breakers are equipped with other relays to provide short circuit protections.

2.3.2.2.2 Fire Protection Systems

The Amended CECP will rely on both onsite fire protection systems and local public fire protection services.

The fire protection systems are designed to protect personnel and limit property loss and plant downtime from fire or explosion. The Amended CECP will have the following fire protection systems.

CO_2 Protection Systems

These systems protect the combustion turbines and certain accessory equipment compartments from fire. The system will have fire detection sensors in all protected compartments. Actuating one sensor will provide a high-temperature alarm on the combustion turbine control panel. Actuating a second sensor will trip the combustion turbine, turn off ventilation, close ventilation openings, and automatically release the gas and chemical agents. The gas and chemical agents will be discharged at a design concentration adequate to extinguish the fire.

Fire Hydrants/Hose Stations

This system will replace the existing EPS's fixed fire-suppression systems. Water will be supplied from the Amended CECP water treatment system with an emergency fill from the potable water system. Hydrants will be located to support firefighting with the existing Carlsbad Fire Services hose system.

Fire Extinguishers

The plant administrative/control/warehouse/maintenance buildings and other structures will be equipped with fixed fire suppression systems and portable fire extinguishers as prescribed by the local fire department.

Local Fire Protection Services

In the event of a major fire, the plant personnel will be able to call upon Carlsbad Fire Services for assistance. The Hazardous Materials Risk Management Plan (see Section 5.5, Hazardous Materials Handling) for the plant will include all information necessary to allow fire-fighting and other emergency response agencies to plan and implement safe responses to fires, spills, and other emergencies.

Fire Roads

Fire road access to the project boundary and within the project site is shown on the Site Road Plan, Figure 2.1-4.

2.3.2.2.3 Personnel Safety Program

The Amended CECP will operate in compliance with federal and state occupational safety and health program requirements. Compliance with these programs will minimize project effects on employee safety. These programs are described in Section 5.15, Worker Health and Safety.

2.3.3 Facility Reliability

This subsection discusses the Amended CECPs expected availability, equipment redundancy, fuel availability, water availability, and project quality control measures.

2.3.3.1 Facility Availability

Because of regional system electrical needs, it is anticipated that the Amended CECP will normally be called upon to operate at peaking average annual capacity factors. The facility will be designed to operate between 25 and 100 percent load for any one of the six units to support dispatch service in response to customer demands for electricity.

The Amended CECP will be designed for an operating life of a minimum of 30 years. Reliability and availability projections are based on this operating life. Operation and maintenance procedures will be consistent with industry standard practices to maintain the useful life status of plant components.

The percent of time that the Amended CECP is projected to be operated is defined as the "service factor." The service factor considers the amount of time that a unit is operating and generating power, whether at full or partial load. Because the Amended CECP is intended for peaking use, it is difficult to predict the service factor. Each unit of the Amended CECP will be limited to approximately 2,700 operating hours per year.

The six separate CTG power generation units will operate in parallel. Each CTG will provide approximately 17 percent of the total simple-cycle power output.

The combustion turbine subsystems include the combustion turbine, inlet air filtration and evaporative coolers, generator and excitation systems, turbine lube oil system, hydraulic system, and turbine control and instrumentation. The combustion turbine will produce thermal energy through the combustion of natural gas and the conversion of the thermal energy into mechanical energy through rotation of the combustion turbine that drives the compressor and generator. The generator will be an open air-cooled type.

The generator excitation system will be a solid-state static system. Combustion turbine control and instrumentation (interfaced with the DCS) will coordinate the turbine governing system, and the protective system.

The simple-cycle power block is served by the following BOP systems.

2.3.3.1.1 Distributed Control System

The DCS will be a redundant microprocessor-based system that will provide the following functions:

- Control the CTGs and other systems in response to unit load demands (coordinated control)
- Provide control room operator graphical user interface
- Monitor plant equipment and process parameters and provide this information to the plant operators in a meaningful graphical format
- Provide visual and audible alarms for abnormal events based on field signals or software-generated signals from plant systems, processes, or equipment

The DCS will have functionally distributed architecture comprising a group of similar redundant processing units linked to a group of operator consoles and an engineer workstation by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes.

Plant operation will be controlled from the operator panel located in the control room. The operator panel will consist of two individual video/keyboard consoles and one engineering workstation. Each video/keyboard console will be an independent electronic package such that failure of a single package does not disable more than one video/keyboard. The engineering workstation will allow the control system operator interface to be monitored and revised by authorized personnel.

2.3.3.1.2 Demineralized Water System

The demineralized water system will consist of four 33-percent capacity demineralizer trains from an onsite water treatment system consisting of reverse osmosis units and mixed ion-exchange beds. The unit(s) will be leased portable/mobile trailer-mounted units. Demineralized water will be stored in a 250,000-gallon demineralized water storage tank. The reverse osmosis reject will be discharged to the City of Carlsbad (Encina Wastewater Authority) sewer system. The mixed beds will be regenerated offsite and will produce no liquid or solid wastes onsite.

2.3.3.1.3 Power Cycle Makeup and Storage

The power cycle makeup and storage subsystem provides demineralized water storage and pumping capabilities to supply high-purity water for injection into the CTGs for NOx control and chemical cleaning operations. Major components of the system are the demineralized water storage tank, providing for more than a 12-hour supply capacity of demineralized water at peak load, and two 100-percent-capacity, horizontal, centrifugal, cycle makeup water pumps.

2.3.3.1.4 Compressed Air

The compressed air system provides instrument air and service air to points of use throughout the facility. The compressed air system will include two 100-percent-capacity motor-driven air compressors, two 100-percent-capacity air dryers with pre-filters and after filters, two air receivers, instrument air header, and service air header. Only instrument air will be dried. A self-contained service air system is planned for the warehouse building.

2.3.3.2 Fuel Availability

Natural gas will be delivered via a new, 1,100-foot-long pipeline that will connect into SDG&E's TL 2009 gas line adjacent to the plant site.

2.3.3.3 Water Availability

The Amended CECP will use no more than 336 afy of CCR Title 22 reclaimed water provided by the City of Carlsbad for evaporative cooling make-up, as feed water to the demineralizers that will provide high-purity water for the CTGs and miscellaneous plant uses. Reclaimed water will also be used to irrigate site landscaping. Potable water will be used as alternate emergency supply to the fire protection system should the availability of reclaimed water be interrupted for more than 10 hours. Water for drinking, eye wash stations, safety showers, and service water will be provided from the City's potable water system.

The availability of water to meet the needs of the Amended CECP is discussed in more detail in Section 5.11, Soil and Water Resources.

2.3.4 Quality Assurance Program

The Quality Assurance Program that will be applied to the Amended CECP is summarized in this subsection. The objective of the Quality Assurance Program is to ensure that all systems and components have the appropriate quality measures applied; whether it is during design, procurement, fabrication, construction, or operation. The goal of the Quality Assurance Program is to achieve the desired levels of safety, reliability, availability, operability, survivability, constructability, and maintainability for the generation of electricity.

The required quality assurance for a system is obtained by applying controls to various activities, according to the activity being performed. For example, the appropriate controls for design work are checking and review, and the appropriate controls for manufacturing and construction are inspection and testing. Appropriate controls will be applied to each of the various activities for the project.

2.3.4.1 Project Stages

For quality assurance planning purposes, the project activities have been divided into the following ten stages that apply to specific periods of time during the amended project:

- **Conceptual Design Criteria.** Activities such as definition of requirements and engineering analyses.
- **Detail Design.** Activities such as the preparation of calculations, drawings, and lists needed to describe, illustrate, or define systems, structures, or components.
- **Procurement Specification Preparation.** Activities necessary to compile and document the contractual, technical and quality provisions for procurement specifications for plant systems, components, or services.
- **Manufacturer's Control and Surveillance.** Activities necessary to ensure that the manufacturers conform to the provisions of the procurement specifications.
- **Manufacturer Data Review.** Activities required to review manufacturers' drawings, data, instructions, procedures, plans, and other documents to ensure coordination of plant systems and components, and conformance to procurement specifications.

- **Receipt Inspection.** Inspection and review of product at the time of delivery to the construction site.
- **Construction/Installation.** Inspection and review of storage, installation, cleaning, and initial testing of systems or components at the facility.
- **System/Component Testing.** Actual operation of generating facility components in a system in a controlled manner to ensure that the performance of systems and components conform to specified requirements.
- **Plant Operation.** As the Amended CECP progresses, the design, procurement, fabrication, erection, and checkout of each generating facility system will progress through the stages defined above.
- **EPS Demolition.** Prior to the commencement of the EPS demolition, an engineering analysis and design will be performed to identify systems to be retained for the SDG&E switchyard and ocean water intake structure functionality for Poseidon.

2.3.4.2 Quality Assurance Records

The quality assurance record practice in the Licensed CECP will be used for the Amended CECP.

A plant operation and maintenance program, typical of a project this size, will be implemented to control operation and maintenance quality. A specific program for the Amended CECP will be defined and implemented during initial plant startup.

2.3.5 Thermal Efficiency

The maximum thermal efficiency that can be expected from a natural-gas-fired simple-cycle plant using GE LMS100 combustion turbine units is approximately 44 percent on a lower heating value basis. Other types of operations, particularly those at less-than-full gas turbine output, will result in lower efficiencies. The basis of the Amended CECP operations will be system dispatch within California's power generation and transmission system. It is expected that the Amended CECP will be primarily operated as a peaking unit, on daily cycles especially during summer months, of higher system demands, with operations limited to approximately 2,700 hours per CTG per year. There will be off-peak periods when the Amended CECP will be shut down for lack of economic dispatch. The number of startup and shutdown cycles is expected to range between zero and 400 per year per CTG.

The GE LMS100 units are capable of ramp rates of 50 MW per minute, and can reach full power in 10 minutes. Plant fuel consumption will depend on the operating profile of the amended power plant. It is estimated that the range of fuel consumed by the Amended CECP will be from a minimum of near zero British thermal units (Btu) per hour to a maximum of approximately 887.2 MMBtu per hour per unit (LHV basis) at full load and average ambient conditions. Using a projected heat rate of 7,953 Btu/kWh; this results in a total yearly consumption of 2.3 Million MMBtu of gas consumption per unit.

2.4 Facility Closure

This section provides the following information regarding the temporary or permanent closure of the Amended CECP:

- A schedule for the development of a preliminary closure plan for the Amended CECP facility when it ceases operations at the end of its useful physical or economic life.
- A discussion of how facility closure will be accomplished in the event of premature or unexpected cessation of operations prior to the end of the facility's useful life.

The project owner will approach a closure of the Amended CECP in the same manner as would have been implemented for the Licensed CECP. Section 2.4.1 discusses temporary facility closure and Sections 2.4.2 and 2.4.3 discuss permanent facility closure.

2.4.1 Unexpected Temporary Cessation of Operations

In the event of a short-term, unexpected temporary cessation of operations that does not involve facility damage, the project owner will maintain the Amended CECP in working condition so that the facility is able to restart operations when the unexpected cessation of operations event is resolved or ceases to restrict operations. If there is a possibility of hazardous substances release, the project owner will notify the CEC's compliance unit and appropriate local agencies in accordance with: (1) the applicable LORS in effect at the time; (2) the procedures set forth in the Amended CECP contingency plan described below; and (3) the CECP's facility Risk Management Plan.

In the event the temporary closure includes damage to the facility, and there is a release or threatened release of hazardous materials into the environment, the procedures set forth in the Amended CECP's Risk Management Plan will be implemented. Although tailored to the Amended CECP, these procedures will be generally identical to those procedures that would be employed for the Licensed CECP.

Depending on the expected duration of the temporary cessation of operations, chemicals may be drained from storage tanks and other equipment and removed from the site. The integrity of the equipment and facilities will be maintained. The project owner will handle and dispose of waste materials (hazardous and nonhazardous) in accordance with the applicable LORS in effect at the time of unexpected temporary cessation of operations. The project owner will maintain facility security procedures during temporary cessation of operations so the Amended CECP is secure from trespass.

Prior to initiation of operations of the Amended CECP, the project owner will prepare an onsite contingency plan and submit this plan to the CEC's compliance unit. The contingency plan will specifically address actions that will be implemented by the project owner during temporary and unplanned or unexpected cessation of operations of the CECP. The plan will ensure that necessary steps to protect public health and safety, and mitigate potential environmental impacts, are taken in a timely manner in accordance with the applicable LORS in effect at the time. The Amended CECP contingency plan will include the same elements as the Licensed CECP's contingency plan.

And as with the plan for the Licensed CECP, the project owner will periodically review the Amended CECP onsite contingency plan and will update the plan as necessary.

2.4.2 Planned Permanent or Premature Cessation of Operations

The anticipated life of the simple-cycle units that will be installed as part of the Amended CECP is a minimum of 30 years. Continued operation of the Amended CECP beyond 30 years is likely to be a viable option, especially with good maintenance practices and selective replacement of various plant equipment and components. Prior to planned permanent or premature cessation of operations of the new units at the Amended CECP, the project owner will prepare a closure plan in the manner and containing the elements described in the AFC for the Licensed CECP. The project owner's approach to permanently closing the Amended CECP will mirror the procedure approved by the CEC for the Licensed CECP, except to the extent any deviations are necessary due to the reconfigured power block for the Amended CECP.

2.4.3 Unexpected Permanent Cessation of Operations

In the event of an unexpected permanent cessation of operations of CECP, the project owner will follow the procedures outlined in the Amended CECP contingency plan to assure that appropriate steps to mitigate public health and safety and environmental concerns are taken in a timely manner. As discussed above, prior to initiation of operations of CECP, the project owner will prepare a contingency plan for the new generating units at the Amended CECP and submit this plan to the CEC's compliance unit. The contingency plan will specifically address actions that will be implemented by the project owner during unexpected permanent cessation of operations of the Amended CECP. The plan will ensure that necessary steps to protect public health and safety, and mitigate potential environmental impacts, are taken in a timely

manner in accordance with the applicable LORS in effect at the time. This contingency plan will include the same elements as the contingency plan for the Licensed CECP.

The project owner will periodically review the Amended CECP's onsite contingency plan and will update the plan as necessary.

In the event of an unexpected permanent cessation of operations of the Amended CECP, the project owner will notify the CEC and other responsible agencies. These agencies will be informed of the status of the unexpected permanent closure activities. Concurrently, the project owner will prepare a permanent closure/decommissioning plan which will address the same issues as described above for the planned permanent closure/decommissioning plan. This plan will be developed in coordination with the CEC and other responsible agencies.

2.5 Laws, Ordinances, Regulations, and Standards

2.5.1 General LORS

The following LORS are generally applicable to the project:

- Uniform Fire Code, Article 80
- Occupational Safety and Health Act—29 CFR 1910 and 29 CFR 1926
- Environmental Protection Agency—40 CFR 60, 40 CFR 75, 40 CFR 112, 40 CFR 302, 40 CFR 423, 40 CFR 50, 40 CFR 100, 40 CFR 260, 40 CFR 300, and 40 CFR 400
- California Code of Regulations—Title 8, Sections 450 and 750 and Title 24, 2013, Titles 14, 17, 19, 20, 22, 23, 26, and 27
- California Department of Transportation—Standard Specifications
- California Occupational Safety and Health Administration—Regulations and Standards
- California Business and Professions Code—Sections 6704, 6730, and 6736
- California Vehicle Code—Section 35780
- California Labor Code—Section 6500
- Federal Aviation Agency—Obstruction Marking and Lighting AC No. 70/7460-1H
- City of Carlsbad—Regulations and Ordinances

Codes and standards pertinent to the Amended CECP generating facility are presented in Appendix 2C. The applicable local LORS and local agency contacts involved in administration and enforcement are described below.

2.5.2 Local LORS

The Amended CECP site is located in the city of Carlsbad, in an area zoned for Public Utility use, which allows for the presence of electrical generation and transmission facilities. Therefore, development of a generating facility on the Amended CECP site is a permitted use. The Amended CECP will be subject to all applicable regulations of the City of Carlsbad (see Section 5.6, Land Use).

2.6 Local Agency Contacts

Table 2.6-1 lists local agency contacts.

TABLE 2.6-1
Local Agency Contacts

Agency	Contact	Title	Telephone
City of Carlsbad Fire Services	Gregory Ryan	Deputy Fire Marshall	(760) 602-4663
City of Carlsbad Building Dept.	Mike Peterson	Senior Building Official	(760) 602-2721
City of Carlsbad Planning Dept.	Scott Donell	Senior Planner	(760) 602-4618
City of Carlsbad Engineering Dept.	Not yet assigned		

2.7 Local Permits Required and Permit Schedule

After the receipt of the approval of the amended project design, several permits will be required and will be issued by the CEC Assigned Chief Building Official (CBO). These are summarized in Table 2.7-1.

TABLE 2.7-1
Permits and Agency Contacts

Permit or Approval	Schedule	Agency Contact	Applicability
Approval of Grading Plan; issuance of construction, grading, and building permits	Minimum of 30 days prior to construction	CBO	Site grading, and excavation at site or along linear project features within public right-of-way
Certificate of Occupancy	Completion of construction	CBO	Occupancy of facilities once construction is completed.
RMP	Completion of construction	San Diego County DEHS	Modification of existing RMP (i.e., management of change)

SECTION 3.0

Transmission System Engineering

This section provides the Project Owner's evaluation of how the Amended CECP could impact transmission system engineering and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to transmission system engineering. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to transmission system engineering that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Change in 230-kV electrical connection from San Diego Gas and Electric Company (SDG&E) switchyard on the east side of the railroad tracks to the SDG&E switchyard (Encina) on the west side of the railroad tracks.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 as well as black-start generator EGT-1 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective SDG&E switchyards situated on and adjacent to the Cabrillo Parcel.

Following completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

3.1 Changes to the Transmission System Engineering

After the CEC issued the Final Decision, SDG&E expanded its 230-kV switchyard on the Cabrillo Parcel. Because of this switchyard expansion and the changes to the CECP power block that are proposed in this PTA, the Project Owner has refined the transmission system engineering for the Amended CECP.

The Project Owner will develop the CECP on the existing EPS site. The Amended CECP will have six generating units, designated as Units 6, 7, 8, 9, 10, and 11. Each unit consists of one natural-gas-fired combustion turbine generator (CTG). Each generator will have a generator step-up (GSU) transformer with the high-voltage primary winding connected to a high-voltage circuit breaker.

For Amended CECP Units 6, 7, 8, and 9, the GSU transformers connected to their respective CTGs will increase the generation voltage from 13.8 kV to 230 kV. The 230-kV SF_6 circuit breakers will be connected to the high side of the GSU transformers, which will be connected to a new 230-kV transmission line. This approximately 4,000-foot-long transmission line, will travel overhead from Units 6, 7, 8, and 9 until the northeast corner of the newly expanded 230-kV SDG&E Encina Switchyard. From there, it will travel underground to its point of connection within this switchyard. SDG&E has made modifications to the south end of the existing 138-kV switchyard by expanding the 230-kV bus to accept this new 230-kV interconnection.

For Amended CECP Units 10 and 11, the GSU transformers connected to their respective CTGs will increase the generation voltage from 13.8 kV to 138 kV. The 138-kV SF_6 circuit breakers will be connected to the high side of the GSU transformers, which will be connected to a new 138-kV transmission line. This approximately 2,200-foot-long transmission line will interconnect Units 10 and 11 to the SDG&E 138-kV Encina Switchyard.

The transmission line interconnection to the California Independent System Operator (CAISO) grid will be via new 138-kV and 230-kV transmission lines from the Amended CECP to the 138-kV Encina Switchyard, and the newly expanded 230-kV Encina Switchyard. Figure 3.1-1 shows the transmission line routes, and Figure 3.1-2 shows the current layout of the SDG&E switchyards. Figure 3.1-3 depicts the ultimate arrangement of these switchyards with the Amended CECP interconnections. The transmission line route—east of the respective GSU transformers to transmission poles planned along the eastern edge of the tank farm basin and then traversing to the 138-kV and 230-kV switchyards along the southern portion of the CECP site—was selected because of constraints on the west side of the tank farm bowl. These constraints include utility right-of-ways that include existing and future City sewer pipelines, natural gas pipeline, underground electrical cable to support Poseidon's desalination plant, and communications fiber optics. Placement of 138-kV and 230-kV transmission lines on the west side of the tank farm bowl may affect operations of the planned location of the Amended CECP administration building and control room. Transmission lines on the east side of the tank farm bowl as depicted minimize potential impacts to fire department access to the Amended CECP from the north if there is maintenance in process on a transmission line or, in more extreme scenario, a downed line or pole. Finally, placement of the transmission lines on the east side of the bowl reduces potential visual impacts because the poles will be more visible to Carlsbad Boulevard and the beach areas and to future redevelopment of the west side of Encina Power Station site.

This section describes the addition of the interconnecting transmission lines and notes where SDG&E has examined the impact on the existing electrical transmission grid. Additional discussions include potential electrical line nuisances (electrical, magnetic, audible noise, corona effects, and safety of the interconnection).

The CECP site was selected, in part, because the existing EPS site is already connected to the SDG&E transmission system via the existing 138-kV and 230-kV SDG&E Encina Switchyards. As part of the CECP, existing EPS Generation Units 1-5 will be retired after the Amended CECP Units 6, 7, 8, 9, 10, and 11 are commercially online as described in Section 2.2, Encina Power Station Demolition. Figures 3.1-4a and 3.1-4b show the pre-project one-line and three-line diagrams, respectively, for existing Encina Generating Units 1, 2, and 3. The vacated Bay 1 bus position in the existing SDG&E 138-kV Encina Switchyard will be used to

connect the new 138-kV transmission lines from CECP Units 10 and 11. The 230-kV transmission line from CECP Units 6, 7, 8, and 9 will use overhead line and underground cables that will terminate directly at Bay 4 in the newly expanded SDG&E 230-kV Encina Switchyard. Figure 3.1-3 depicts the ultimate arrangement of the Encina Switchyards with the Amended CECP interconnections.

Figure 3.1-1 shows the Amended CECP site layout, including the 138-kV and 230-kV transmission line routing within the Cabrillo Parcel. Figures 3.1-4c through 3.1-4e contain one-line diagrams of the existing Encina Generating Units 4, 5, and EGT-1, which will be removed during demolition of the EPS.

3.2 Transmission Line Description, Design, and Operation

This section discusses the existing transmission facilities in the vicinity of the CECP, the interconnection to SDG&E system, and the Amended CECP six generator Interconnection System Impact Studies (ISIS) by SDG&E and CAISO. There are two separate ISIS processes: one for interconnection on the 230-kV system and one on the 138-kV system.

3.2.1 Existing Transmission Facilities

The 138-kV and 230-kV SDG&E Encina Switchyards remain connected to the same EPS units and transmission lines they were connected to when the PEAR was submitted to the CEC in 2008 (CH2M HILL and Shaw, Stone & Webster, 2008).

3.2.2 Proposed Transmission Interconnection

Like the Licensed CECP, the Amended CECP will interconnect to the SDG&E transmission system via the existing 138-kV and newly expanded 230-kV SDG&E Encina Switchyards.

3.2.3 Proposed Transmission Interconnection at 230 kV

In October 2013, SDG&E issued a revision to the final Interconnection Facilities Study. The revision, called the Interconnection Reassessment Study Report (Reassessment Report), is provided in Appendix 3A. In the Reassessment Report, the point of interconnection is a proposed new, expanded bus in the existing 230-kV SDG&E Encina Switchyard instead of the Cannon Road substation, as described in the PEAR.

The Amended CECP 230-kV interconnecting transmission system is shown in Figure 3.1-1. The transmission line will start from four 230-kV SF_6 circuit breakers adjacent to CECP Units 6, 7, 8, and 9, and will terminate within one of the bays in the expanded SDG&E 230-kV Encina Switchyard, as shown in Figures 3.1-5 and 3.1-6. As previously described, the total length of this transmission line is approximately 4,000 feet, the majority of which will be overhead conductors until it reaches the northeast corner of the existing 138-kV Encina Switchyard, where the transmission line will transition into underground circuit to maintain the required electrical clearance.

The interconnection facilities required to interconnect the Amended CECP to the SDG&E system at 230 kV are:

- The interconnection facilities for SDG&E consist of a trench, conduit system, and 230-kV underground cables from SDG&E's existing switchyard fence line to a new termination stand at one of the bays in the newly expanded 230-kV Encina Switchyard.
- From the SDG&E 230-kV switchyard fence, the underground 230-kV cable will continue through a trench or underground conduits to a cable termination stand situated northeast of the 138-kV SDG&E Encina Switchyard. From there, an overhead transmission line will continue around the south and east sides of the new power plant, where each set of lines will branch off and connect to an H-frame on the east side of Units 6, 7, 8, and 9.

As part of the reliability network upgrades to accommodate the new units, SDG&E will:

- Extend the SDG&E Encina 230-kV low bus, install one termination stand, install two 230-kV circuit breakers, and install four 230-kV disconnects.

3.2.4 Proposed Transmission Interconnection at 138 kV

From the Amended CECP, as shown in Figure 3.1-1, will run approximately 2,200 feet of overhead transmission line from the two 138-kV SF_6 circuit breakers of CECP Units 10 and 11 to Bay 1 dead-end structure in the 138-kV SDG&E Encina Switchyard, typical pole configurations as shown in Figures 3.1-5 through 3.1-7.

To interconnect the Amended CECP to the SDG&E system at 138 kV, the following actions are necessary:

- In the 138-kV SDG&E Encina Switchyard, SDG&E will disconnect the existing, incoming 138-kV lines from the EPS Generating Unit 1 GSU transformer and will perform the bus rearrangements necessary to accommodate the Amended CECP 138-kV transmission line.
- From the last Amended CECP 138-kV transmission line dead-end pole, SDG&E will connect the Amended CECP 138-kV transmission line to the vacated position in Bay 1 at the north end of the 138-kV Encina Switchyard.

3.2.5 Transmission Interconnection System Impact Studies

SDG&E/CAISO issued the final Interconnection Facilities Study for the Encina repower 138-kV system, dated July 7, 2008. This study was modified with the Reassessment Report, dated October 22, 2013, which was issued partially to account for changes to the Amended CECP facility and is provided as Appendix 3A. Additionally, individual reports Q137 and Q189, provided in Appendix 3B, detail the modifications to the 230-kV and 138-kV switchyards, respectively. The point of interconnection for the 138 kV line is at the SDG&E 138-kV Encina Switchyard, and the point of interconnection for the 230-kV line is at the expanded 230-kV SDG&E Encina Switchyard. The Amended CECP will have net output of 211 MW from CECP Units 10 and 11 for interconnection to the SDG&E 138-kV Encina Switchyard, and a net output of 421 MW from CECP Units 6, 7, 8, and 9 for interconnection to the SDG&E 230-kV Encina Switchyard. As for the Licensed CECP, for the Amended CECP, no delivery network upgrades were directly identified for the interconnection of the project.

The following reliability upgrades to the existing facilities beyond the point of interconnection are needed to interconnect the Amended CECP to the Encina 138-kV bus, as detailed in Q189:

- Install 200 feet of overhead conductors to the property line along the east side of the substation to Bay 1 dead-end structure.
- Install associated control and protection panels for the new line position and add remote terminal unit points for the control, monitoring, and alarming.
- Remove Encina 1 Main Transformer overhead conductors from Bay 2.
- Relocate TL13801 from Bay 1 to Bay 2.
- Install associate control and protection panels and communications to relocate TL13801 (Encina-Cannon) from Bay 1 to Bay 2.
- Upgrade two line disconnects and associated insulators in Bay 2 for TL1380.
- Implement an SPS to trip generation at Encina following the N-2 outage of Encina-San Luis Rey-Palomar 230-kV lines.

The following reliability upgrades to the existing facilities beyond the point of interconnection are needed to interconnect the Amended CECP to the expanded Encina 230-kV bus, as detailed in Q137:

- Install one termination stand

- Install 255 feet of 3500 KCMIL copper
- Install 500 feet of 4/0 bare strand copper
- Install 200 feet of 6- to 8-inch conduit
- Extend the 230-kV Encina low bus
- Install two 230-kV circuit breakers
- Install four 230-kV disconnects
- Install control and protection panels
- Update remote terminal unit

The Project Owner will retire all of the EPS Generating Units once all units of the Amended CECP achieve commercial operation, as described in Section 2.2, Encina Power Station Demolition.

3.3 Transmission System Safety and Nuisances

This section addresses safety and nuisance issues associated with the Amended CECP's electrical interconnection to the existing electrical grid. The Project Owner analyzed for the Amended CECP all subject matter areas considered by the CEC in reaching its Final Decision. Despite the difference in generation technology and design between the Licensed CECP and the Amended CECP, the transmission system safety and nuisance issues and LORS applicable to the Amended CECP remain nearly the same as those for the Licensed CECP. Hence, the Project Owner will continue to employ the same compliance measures that the CEC approved for the Licensed CECP, except as noted to the contrary herein. And, therefore, only those issues, LORS, or compliance or safety measures that differ from those for the Licensed Project are discussed herein. The modifications to the project that are proposed in this PTA will not impair the facility's ability to comply with applicable LORS.

3.3.1 Electrical Clearances

The final design of the Amended CECP will comply with California Public Utilities Commission (CPUC) General Order (GO) 95, as well as CPUC decision 93-11-013 for the electric and magnetic field (EMF) reduction.

3.3.2 Electrical Effects

Corona and field effects of high-voltage transmission lines are discussed in this section of the PTA. These effects at the Amended CECP are generally the same as those for the Licensed CECP.

3.3.3 EMF Assumptions

The assumptions used to calculate these values and factors that impact the EMF in the vicinity of the power lines discussed below. In their calculations, CECP and SDG&E will use a worst-case voltage of 242 kV (230 kV + 5 percent) for the 230-kV lines and a worst-case voltage of 145 kV (138 kV + 5 percent) for the 138-kV lines.

The magnetic field is proportional to line loading (amperes), which varies as power plant generation is changed by the system operators to meet increases or decreases in electrical demand. Line loading values used for the EMF calculations are based on the nominal output rating of the connected generators.

The Amended CECP will produce 421 MW net output from CECP Units 6, 7, 8, and 9 for interconnection to the expanded SDG&E 230-kV Encina Switchyard. The transmission line connecting Units 6, 7, 8, and 9 generation to the expanded SDG&E 230-kV switchyard, similar to the Licensed CECP transmission line, will be routed partly overhead and partly underground using 230-kV cables and the line will be entirely inside the property lines of the Cabrillo Parcel and adjoining SDG&E property. The Cabrillo Parcel and SDG&E properties are not accessible to the public; therefore, the public will not be exposed to any EMF levels.

The Amended CECP will produce 211 MW net output from CECP Units 10 and 11 for interconnection to SDG&E 138-kV Encina Switchyard. The transmission line connecting Units 10 and 11 generation to the SDG&E 138-kV Encina Switchyard will also be routed entirely inside the Cabrillo Parcel's property line.

Therefore, as with the 230-kV line, the public will not be exposed to any EMF levels. From the 138-kV switchyard, the line extends approximately 1,300 feet from the nearest residence. This 211-MW addition will replace the 330-MW generation capacity of retiring EPS Units 1, 2, and 3, for a net generation reduction of 130 MW. This reduction will not impact the capacities of the outgoing 138-kV transmission lines from the SDG&E Encina 138-kV switchyard; therefore, the EMF levels for these lines will not change.

The following figures illustrate the plan view of the interconnection between CECP Units 6, 7, 8, 9, 10, and 11 and the SDG&E 230-kV and 138-kV switchyards. Other figures show the cross sections of the transmission line poles at different locations, take-off structures, and cable riser poles.

- Figure 3.1-1 illustrates the plan view of the interconnection alignments.
- Figure 3.1-5 shows the 230-kV line cross-section dead-end pole.
- Figure 3.1-6 shows the 138-kV and 230-kV line pole cross-section, double-circuit configuration.
- Figure 3.1-7 shows the 138-kV and 230-kV line pole cross section, double-circuit dead-end configuration.

3.3.4 Conclusion on EMF and Audible Noise

After evaluation of the electrical effects of the high-voltage transmission lines, it is the Project Owner's conclusion that:

- Similar to the Licensed CECP, electrical effects calculations do not have to be submitted to the CEC with this PTA for the 230-kV and 138-kV Amended CECP interconnect transmission lines because these transmission lines will be constructed on the property wholly owned by Cabrillo Power I LLC and the adjoining SDG&E site, with no public receptors. No noticeable noise is expected from the proposed SDG&E 230-kV lines and switchyard south of the Canon substation, as noise levels are only perceptible above 345 kV.
- Furthermore, electrical effects calculations do not need to be submitted with this PTA for the transmission line outlets for the existing 230-kV and 138-kV switchyards because the Amended CECP will not alter the existing lines' electric field, audible noise, voltage, and line configuration. In the transmission system, power flows in all directions and depends on imports, internal generation, transmission lines that may be out of service, and system load demand. The Amended CECP is not expected to require a change of conductor size for the existing transmission lines. The existing line EMF is based on the capacity rating of the transmission lines; therefore, the EMF levels for these lines will remain unchanged for the Amended CECP. SDG&E may assess any effects of its proposed 230-kV Encina Switchyard and the new, incoming transmission lines.

3.3.5 Fire Safety

Similar to the Licensed CECP, the proposed 230-kV/138-kV interconnecting transmission lines within the existing EPS site to SDG&E 138-kV and 230-kV switchyards will be designed, constructed, and maintained in accordance with CPUC GO-95. CPUC GO-95 establishes clearances from other man-made and natural structures as well as tree-trimming requirements to mitigate fire hazards. The trees along the existing railroad corridor that crosses the CECP site can present a fire hazard. These trees will be trimmed as necessary, and a distance will be maintained from these trees to the CECP transmission line interconnection. However, it is unlikely that any vegetation management will be required because the entire proposed route is over areas that have existing transmission and distribution lines. The Project Owner or its designee will maintain the interconnection corridor in accordance with accepted industry practices. This will include identification and abatement of any fire hazards to ensure safe operation of the line.

The transmission lines will be owned and operated by the CECP. The CECP will have up-to-date information with respect to the status of the transmission line. In the event that the CECP requests assistance from the fire department, CECP will inform the fire department of whether the transmission line is currently energized or de-energized. An existing pole will be relocated to reduce the span of the overhead transmission line across the entrance to the Amended CECP, in accordance with discussions with the

Carlsbad Fire Department. Due to these discussions and this pole relocation, among other design improvements included in this Petition to Amend, the City of Carlsbad's Fire Department has agreed to provide primary emergency response service to the Amended CECP (see the City Letter in Appendix 2B).

This transmission line is equipped with high-voltage circuit breakers on both ends, and redundant current differential protective relays will be installed to protect each transmission line. The redundant current differential protective relays will be purchased from two different manufacturers to eliminate the likelihood of common mode failures.

The current differential protective relays continuously monitor the current in each conductor in the transmission line. It automatically trips (opens) the circuit breakers on both end of the transmission line if the current flowing into one end of the conductor does not equal the current flowing out of the other end of the conductor. This situation could occur if there is a break in the conductor or there is a line-to-ground fault. The total clearing time, from sensing the fault (or breaking of the conductor) to opening the circuit breakers is less than five cycles, or 0.083 second. In addition, the circuit breakers are equipped with other relays to provide short circuit protections.

3.4 Applicable Laws, Ordinances, Regulations, and Standards

The Final Decision found the CECP to be in compliance with applicable transmission engineering LORS. As described in this PTA, the Amended CECP will also be consistent with applicable transmission-related LORS, the Amended CECP will not alter the assumptions or conclusions in the Final Decision, and no additional or revised LORS compliance requirements have been identified.

3.4.1 Jurisdiction

Table 3.5-1 identifies federal, state, and local agencies with jurisdiction to issue permits or approvals, conduct inspections, and/or enforce the above referenced LORS. Table 3.5-1 also identifies the associated responsibilities of these agencies as they relate to the construction and operation of the Amended CECP.

TABLE 3.5-1
Agencies with Jurisdiction for Transmission System Engineering

Agency or Jurisdiction	Responsibility
CEC	Jurisdiction over new transmission lines associated with thermal power plants that are 50 MW or more (PRC, 25500).
CEC	Jurisdiction of lines out of a thermal power plant to the interconnection point to the utility grid (PRC, 25107).
CEC	Jurisdiction over modifications of existing facilities that increase peak operating voltage or peak kilowatt capacity 25 percent (PRC, 25123).
CPUC	Regulates construction and operation of overhead transmission lines. (General Order No. 95 and 131-D) (those not regulated by the CEC)
CPUC	Regulates construction and operation of power and communications lines for the prevention of inductive interference (GO-52).
Federal Aviation Administration	Establishes regulations for marking and lighting of obstructions in navigable airspace (Advisory Circular No. 70/7460-1G).
CAISO	Provides final interconnection approval.
City of Carlsbad	Establishes and enforces zoning regulations for specific land uses. Issues variances in accordance with zoning ordinances.
City of Carlsbad	Jurisdiction over safety inspection of electrical installations that connect to the supply of electricity (National Fire Protection Association 70).
City of Carlsbad	Issues and enforces certain ordinances and regulations concerning fire prevention and electrical inspection.

PRC = Public Resources Code

3.5 References

CH2M HILL and Shaw, Stone & Webster. 2008. *Carlsbad Energy Center Project (07-AFC-6) Project Enhancement and Refinement Document. Submitted by Carlsbad Energy Center LLC.* July. Available online at: http://www.energy.ca.gov/sitingcases/carlsbad/documents/applicant/2008-08-27_PROJECT_ENHANCEMENT_AND_REFINEMENT.PDF

Electric Power Research Institute. 1975. *Transmission Line Reference Book, 345-kV and Above*. Palo Alto, California.

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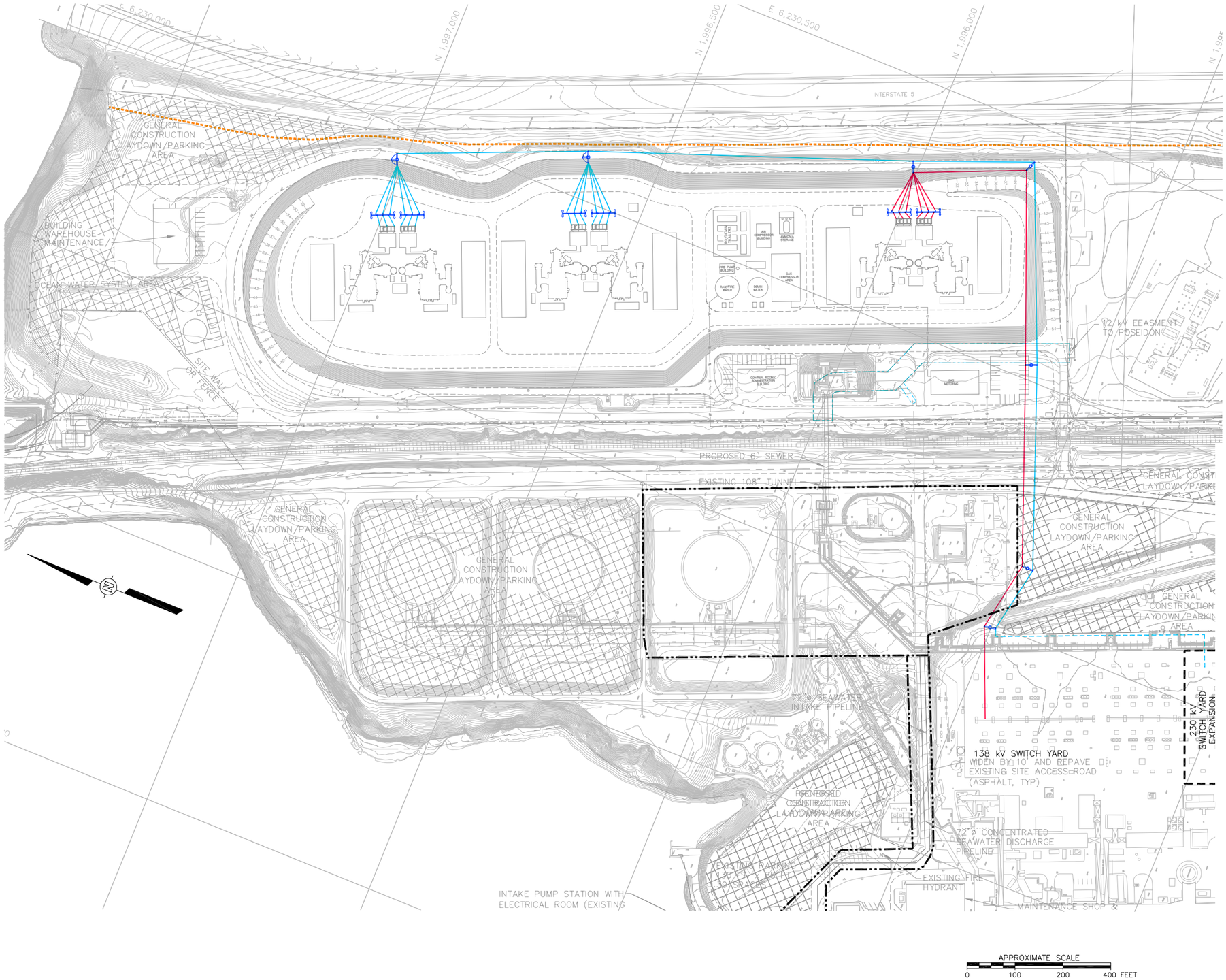
EMF Research and Education. 2004. *EMF Design Guidelines for Electrical Facilities, Southern California Edison Company*. Irwindale, California. September.

Institute of Electrical and Electronics Engineers Power Engineering Society. 1985. *Corona and Field Effects of AC Overhead Transmission Lines, Information for Decision Makers*. July.

Southwire Company. 2007. *Overhead Conductor Manual, 2nd Edition*.



LEGEND:

- TRANSMISSION TOWER
- 230 kV TRANSMISSION LINE
- 138 kV TRANSMISSION LINE
- 12kV EASEMENT TO POSEIDON
- LOCATION OF POSEIDON DESAL PLANT
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

Figure 3.1-1
Encina Power Station Transmission Line Routes
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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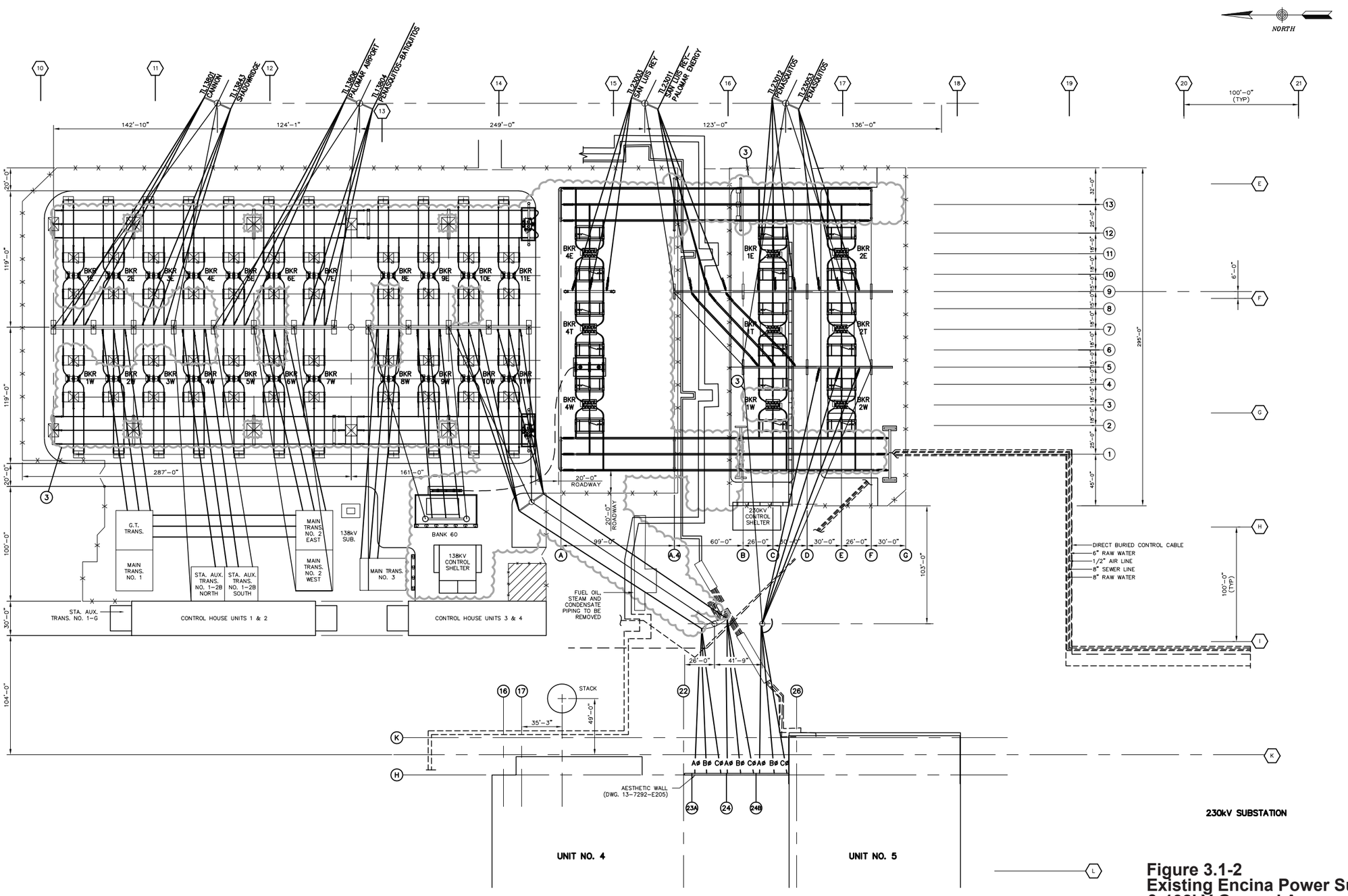


Figure 3.1-2
Existing Encina Power Substation 230kV & 138kV General Arrangement
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

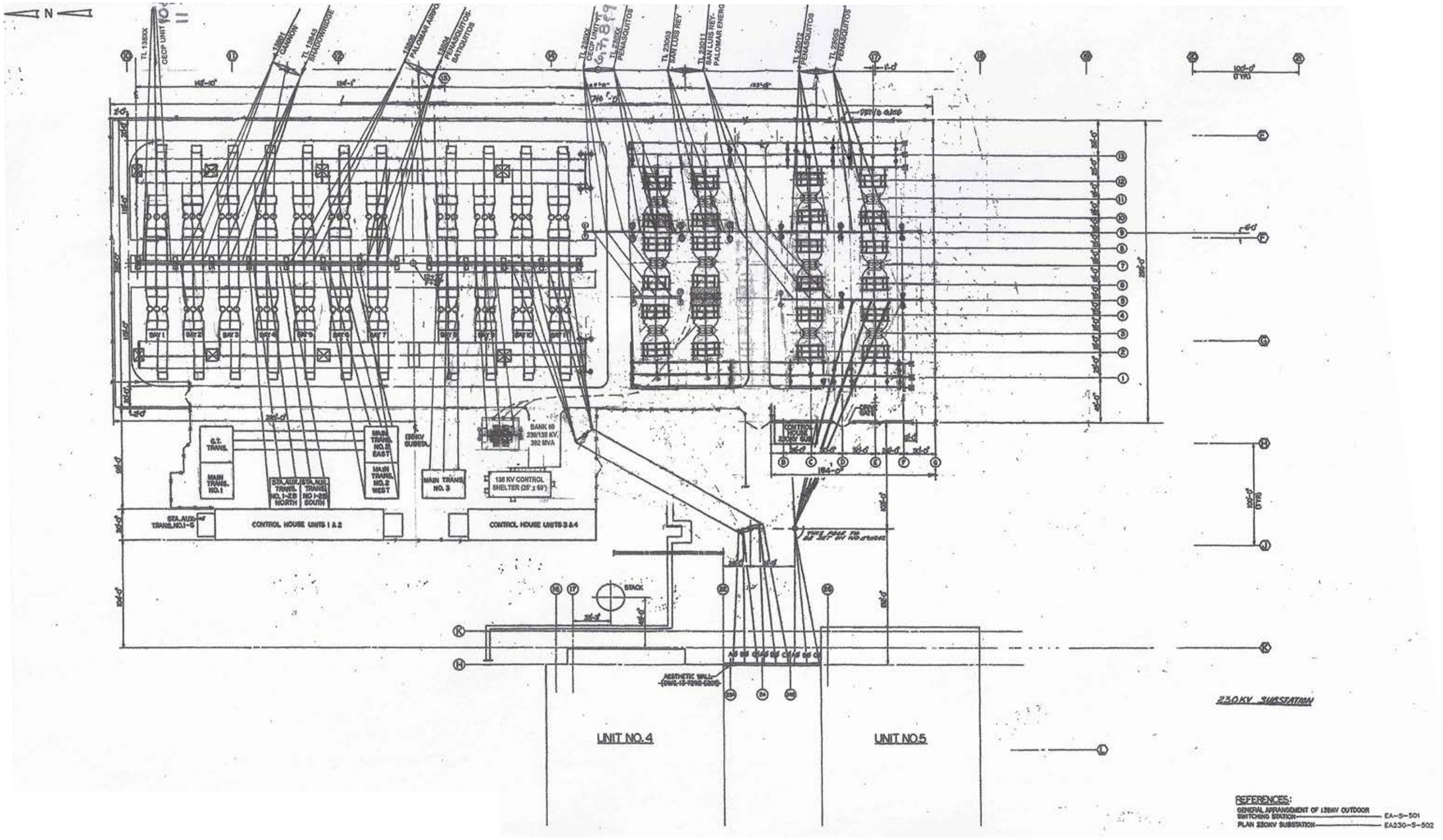
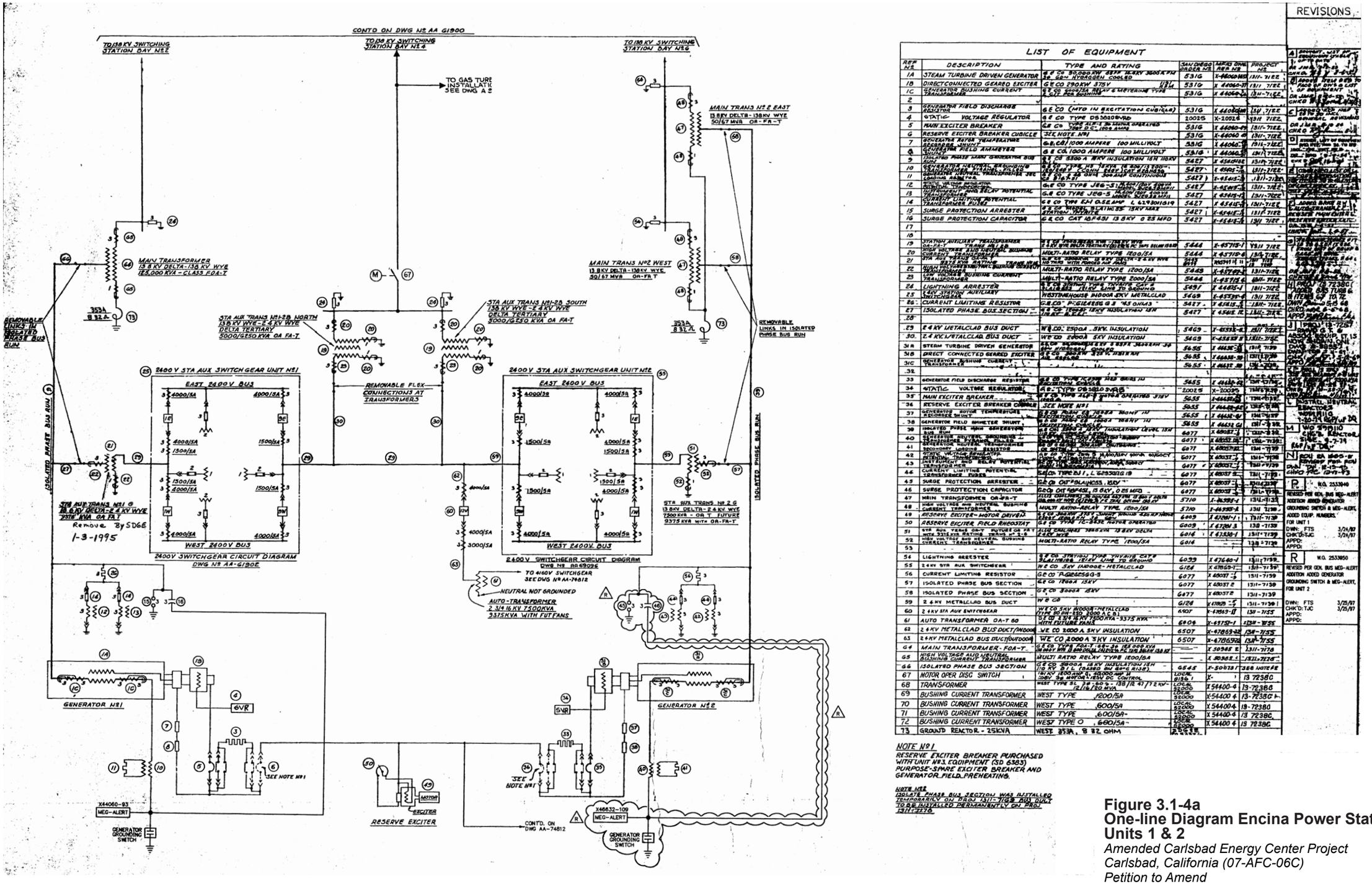


Figure 3.1-3
Amended Encina Power Substation
230kV & 138kV General Arrangement
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend



REVISIONS

LIST OF EQUIPMENT

REF NO.	DESCRIPTION	TYPE AND RATING	SAN DIEGO ORDER NO.	MFRS DWG REF NO.	PROJECT NO.
1A	STEAM TURBINE DRIVEN GENERATOR	G.E. CO 50,000 KW 85% P.F. 18 KV 3605 R.P.M. 1/2 GEN HYDROGEN COOLED	5316	X-44060-103	1311-7122
1B	DIRECT CONNECTED GEARED EXCITER	G.E. CO 280 KW 375 V	5316	X 44060-37	1311-7122
1C	GENERATOR BUSHING CURRENT TRANSFORMER	4 C.T. CO. CENTRAL RELAY & METERING TYPE 1 C.T. PER BUSHING	5316	X 44060-24	1311-7122
2					
3	GENERATOR FIELD DISCHARGE RESISTOR	G.E. CO (MTD IN EXCITATION CUBICLE)	5316	X 44060-40	1311-7122
4	STATIC VOLTAGE REGULATOR	G.E. CO TYPE DS 2020 B/BD	10015	X-10015	1311-7122
5	MAIN EXCITER BREAKER	G.E. Co TYPE AM-4.16-250 MOTOR OPERATED 3 POLE D.C., 1000 AMP.	5316	X 44060-49	1311-7122
6	RESERVE EXCITER BREAKER CUBICLE	SEE NOTE NO 1	5316	X 44060-41	1311-7122
7	GENERATOR ROTOR TEMPERATURE RECORDER SHUNT	G.E. CO. 1000 AMPERE 100 MILLIVOLT	5316	X 44060-39	1311-7122
8	GENERATOR FIELD AMMETER SHUNT	G.E. CO. 1000 AMPERE 100 MILLIVOLT	5316	X 44060-38	1311-7122
9	ISOLATED PHASE MAIN GENERATOR BUS RUN	G.E. CO. 5300 A. 18 KV INSULATION 15 KV 110 KV BIL	5427	X 45405-1	1311-7122
10	GENERATOR NEUTRAL GROUNDING TRANSFORMER 3 PHASE, 4 POLE	G.E. CO. TYPE HS 12 KVA 18,400/13,800 - 240/120 V. 2 CODE SIZE SAFE AMBIENT	5427	X 45405-2	1311-7122
11	GENERATOR NEUTRAL RESISTOR 15Ω LOADING RESISTOR	G.E. CO. 25 OHM 300 AMP CONTINUOUS 25 Ω 51.63 KV	5427	X-45405-3	1311-7122
12	STATIC VOLTAGE REGULATOR POTENTIAL TRANSFORMER	G.E. CO TYPE JVG-3	5427	X-45405-4	1311-7122
13	FIELD GROUND RELAY POTENTIAL TRANSFORMER	G.E. CO TYPE JVG-5	5427	X 45405-5	1311-7122
14	CURRENT LIMITING POTENTIAL TRANSFORMER 7500 KVA	G.E. CO TYPE EH 0.5E AMP L 62930116 19	5427	X 45405-6	1311-7122
15	SURGE PROTECTION ARRESTER	G.E. CO. WHEEL, 3 LATHE 3S 15 KV MAX STATION MOUNTS	5427	X-45405-7	1311-7122
16	SURGE PROTECTION CAPACITOR	G.E. CO CAT 16F431 13.8 KV 0.25 MFD	5427	X-45405-8	1311-7122
17					
18					
19	STATION AUXILIARY TRANSFORMER OA-FA-T	G.E. CO. 3 PHASE 60 CYCLE 65°C RISE 13,800 DELTA - 2,400 WYE DELTA TERTIARY 1,200 KVA	5444	X-45715-1	1311-7122
20	STA. ELECTRICAL AUTOMATIC EQUIPMENT	MULTI-RATIO RELAY TYPE 1200/5A	5444	X-45716-6	1311-7122
21	STA AUX TRANS NO 1-2B NORTH 8.32 KVA RATING	G.E. CO. 3 PHASE 60 CYCLE 65°C RISE 138 KV WYE - 2.4 KV WYE DELTA TERTIARY 5000/6250 KVA OA FA-T	5443	X45716-11	1311-7122
22	NEUTRAL CURRENT TRANSFORMER	MULTI-RATIO RELAY TYPE 1200/5A	5443	X-45716-5	1311-7122
23	138 KV BUSHING CURRENT TRANSFORMER	MULTI-RATIO RELAY TYPE 2000/5A	5444	X-45716-6	1311-7122
24	LIGHTNING ARRESTER	G.E. CO. TYPE 9E 120 KV 60 CYCLE	5491	X 44015-1	1311-7122
25	5 KV STATION AUXILIARY	WESTINGHOUSE INDOOR 5KV METALCLAD	5469	X-45739-6	1311-7122
26	CURRENT LIMITING RESISTOR	G.E. CO. PCGIE4E8G G 3 "45 OHMS	5427	X 45415-6	1311-7122
27	ISOLATED PHASE BUS SECTION	G.E. CO. TYPE 3 PHASE 60 CYCLE 65°C RISE 18 KV 110 KV BIL	5427	X 45412-12	1311-7122
28					
29	2.4 KV METALCLAD BUS DUCT	WESTCO 2500A 5KV INSULATION	5469	X-45393-6	1311-7122
30	2.4 KV METALCLAD BUS DUCT	WESTCO 2000A 5KV INSULATION	5469	X-45388-8	1311-7122
31A	STEAM TURBINE DRIVEN GENERATOR	G.E. CO. 50,000 KW 85% P.F. 18 KV 3605 R.P.M. 1/2 GEN HYDROGEN COOLED	5455	X 44060-103	1311-7139
31B	DIRECT CONNECTED GEARED EXCITER	G.E. CO. 280 KW 375 V. 1131 R.P.M.	5455	X 44060-49	1311-7139
31C	GENERATOR BUSHING CURRENT TRANSFORMER	4 C.T. - 6 RELAY	5455	X 44060-39	1311-7139
31E					
33	GENERATOR FIELD DISCHARGE RESISTOR	G.E. CO. TYPE CR 4938 B 1183 OHMS 110 RESISTING ELEMENTS	5455	X 44060-40	1311-7139
34	STATIC VOLTAGE REGULATOR	G.E. TYPE DS 2020 B/BD	10015	X-10015	1311-7139
35	MAIN EXCITER BREAKER	G.E. CO TYPE AM-4.16-250-3 MOTOR OPERATED 3 POLE D.C., 1000 AMP.	5455	X-44060-49	1311-7139
36	RESERVE EXCITER BREAKER CUBICLE	SEE NOTE NO 1	5455	X 44060-41	1311-7139
37	GENERATOR ROTOR TEMPERATURE RECORDER SHUNT	G.E. CO. 1000 AMP. 50 MILLIVOLT	5455	X 44060-39	1311-7139
38	GENERATOR FIELD AMMETER SHUNT	G.E. CO. 1000 AMP. 50 MILLIVOLT	5455	X 44060-38	1311-7139
39	ISOLATED PHASE MAIN GENERATOR BUS RUN	G.E. CO. 5300 A. 18 KV INSULATION 15 KV 110 KV BIL	5427	X 45405-1	1311-7122
40	GENERATOR NEUTRAL GROUNDING TRANSFORMER	G.E. CO. TYPE HS 12 KVA 18,400/13,800 - 240/120 V. 2 CODE SIZE SAFE AMBIENT	6077	X 45405-2	1311-7139
41	GENERATOR NEUTRAL RESISTOR	G.E. CO. 25 OHM 300 AMP CONTINUOUS 25 Ω 51.63 KV	6077	X 45405-3	1311-7139
42	STATIC VOLTAGE REGULATOR POTENTIAL TRANSFORMER	G.E. CO. TYPE JVG-3	6077	X 45405-4	1311-7139
43	FIELD GROUND RELAY POTENTIAL TRANSFORMER	G.E. CO. TYPE JVG-5	6077	X 45405-5	1311-7139
44	CURRENT LIMITING POTENTIAL TRANSFORMER 7500 KVA	G.E. CO. TYPE EH 0.5E AMP L 62930116 19	6077	X 45405-6	1311-7139
45	SURGE PROTECTION ARRESTER	G.E. CO. WHEEL, 3 LATHE 3S 15 KV MAX STATION MOUNTS	6077	X 45405-7	1311-7139
46	SURGE PROTECTION CAPACITOR	G.E. CO. CAT 16F431, 13.8 KV, 0.25 MFD.	6077	X 45405-8	1311-7139
47	MAIN TRANSFORMER OA-FA-T	G.E. CO. 3 PHASE 60 CYCLE 65°C RISE 13.8 KV DELTA - 138 KV WYE 50/67 MVA OA-FA-T	5710	X-45395-1	1314-7139
48	HIGH VOLTAGE AND NEUTRAL BUSHING CURRENT TRANSFORMER	MULTI RATIO-RELAY TYPE 1200/5A	5710	X-45395-8	1314-7139
49	RESERVE EXCITER-MOTOR DRIVEN	G.E. CO. 280 KW 375 V. SHUNT WOUND 1131 R.P.M. 1/2 GEN HYDROGEN COOLED	6009	X 45781-1	1311-7139
50	RESERVE EXCITER FIELD RHEOSTAT	G.E. CO. TYPE IC-8432 MOTOR OPERATED	6009	X 45781-3	1311-7139
51	STA AUX TRANS ONLY FUTURE OR FAT 5315 KVA RATING	G.E. CO. 3 PHASE 60 CYCLE 65°C RISE 138 KV WYE - 2.4 KV WYE DELTA TERTIARY 1,200 KVA	6016	X 45381-1	1311-7139
52	HIGH VOLTAGE AND NEUTRAL BUSHING CURRENT TRANSFORMER	MULTI-RATIO RELAY TYPE 1200/5A	6016	—	1311-7139
53					
54	LIGHTNING ARRESTER	G.E. CO. STATION TYPE 9VM 9E 120 KV 60 CYCLE 10 KA DISCHARGE 72 KV CONT. TO GROUND	6039	X 47640-1	1311-7139
55	2.4 KV STA AUX SWITCHGEAR	WE CO. 5 KV INDOOR-METALCLAD	6128	X 47869-1	1311-7139
56	CURRENT LIMITING RESISTOR	GE CO. PCGIE2568-5	6077	X 45037-2	1311-7139
57	ISOLATED PHASE BUS SECTION	G.E. CO. 1800A 13KV	6077	X 45037-2	1311-7139
58	ISOLATED PHASE BUS SECTION	G.E. CO. 3000A 13KV	6077	X 45037-2	1311-7139
59	2.4 KV METALCLAD BUS DUCT	WE CO.	6128	X 47869-2	1311-7139
60	2.4 KV STA AUX SWITCHGEAR	WE CO. 5 KV INDOOR-METALCLAD TYPE 50 DW-150 3000 A. 5 KV	6907	X-47869-11	1311-7155
61	AUTO TRANSFORMER OA-T 60	G.E. CO. 2 3/4 16 KV 7500 KVA - 9375 KVA WITH FUTURE FANS	6804	X-45752-1	1314-7155
62	2.4 KV METAL CLAD BUS DUCT (INDOOR)	WE CO. 3000 A. 5 KV INSULATION	6507	X-47869-22	1314-7155
63	2.4 KV METALCLAD BUS DUCT (OUTDOOR)	WE CO. 2000 A. 5 KV INSULATION	6507	X-47869-22	1314-7155
64	MAIN TRANSFORMER - FOA-T	G.E. CO. TYPE FOA-T, 65°C RISE 125,000 KVA 13,800 WYE - 2.4 KV DELTA TERTIARY 138 KV	—	X 30965-1	1311-7139
65	HIGH VOLTAGE AND NEUTRAL BUSHING CURRENT TRANSFORMER	MULTI RATIO RELAY TYPE 1200/5A	—	X 30965-1	1311-7139
66	ISOLATED PHASE BUS SECTION	G.E. CO. 3000 A. 18 KV INSULATION 150 KV BIL 65°C RISE	6645	X-50838-1	SEE NOTE #2
67	MOTOR OPER DISC SWITCH	18 KV 1200 AMP. W. 40000 AMP. 1/2 SEC. SYM. 250 V. D.C. CONTROL	LOCAL 8136-1	X-	13 72380
68	TRANSFORMER	WEST TYPE 21 138 KV 138/12.47/7.2 KV 12/16/20 MVA	LOCAL 38000	X 54400-4	13-72386
69	BUSHING CURRENT TRANSFORMER	WEST TYPE 1200/5A	LOCAL 38000	X-54400-4	13-7238C-1
70	BUSHING CURRENT TRANSFORMER	WEST TYPE 600/5A	LOCAL 38000	X 54400-4	13-72380
71	BUSHING CURRENT TRANSFORMER	WEST TYPE 600/5A	LOCAL 38000	X 54400-4	13 72386
72	BUSHING CURRENT TRANSFORMER	WEST TYPE O 600/5A	LOCAL 38000	X 54400-4	13 72386
73	GROUND REACTOR - 25KVA	WEST 353A, 8.32 OHM	20615		

NOTE NO 1
RESERVE EXCITER BREAKER PURCHASED WITH UNIT NO 3 EQUIPMENT (SD 6383) PURPOSE - SPARE EXCITER BREAKER AND GENERATOR FIELD PREHEATING.

NOTE NO 2
ISOLATE PHASE BUS SECTION WAS INSTALLED TEMPORARILY ON PROJ 1311-7139 BUS DUCT TO BE INSTALLED PERMANENTLY ON PROJ 1311-7270.

A — BREAKER NO 37 AND GENERATOR NEUTRAL GROUNDING EQUIPMENT ADDED ON THIS DWG. ADDED NOTE 2 AND REF NO 66 TO LIST OF EQUIPMENT. DR J.M.B. 6-8-67 CHK'D. 6-8-67

B — ADDED NOTE 2 TO LIST OF EQUIPMENT. DR J.M.B. 6-8-67 CHK'D. 6-8-67

C — REVISED PER GENERAL REQUIREMENTS. DR J.M.B. 6-8-67 CHK'D. 6-8-67

D — ADDED BARE BUS TO ISOLATED PHASE BUS RUN. REVISED PHASE BUS TO ISOLATED PHASE BUS RUN. DR. J.M.B. 6-8-67 CHK'D. 6-8-67

E — ADDED NOTE 3 AND REF NO 67 TO LIST OF EQUIPMENT. DR. J.M.B. 6-8-67 CHK'D. 6-8-67

F — ADDED NOTE 3 AND REF NO 67 TO LIST OF EQUIPMENT. DR. J.M.B. 6-8-67 CHK'D. 6-8-67

G — ADDED NOTE 3 AND REF NO 67 TO LIST OF EQUIPMENT. DR. J.M.B. 6-8-67 CHK'D. 6-8-67

H — ITEMS OF TO 72. DWN 5-15-68 CHK'D. 5-15-68 APP'D. 5-15-68

J — INSTALL 13 BUSTRAK ELECTORS WO 2533110 DWG. 1-30-73 REV. 2-7-74 R&R NF DR

K — REV. PER MEG-ALERT SYSTEM PER ECN DWG. NO. 6-15-73 CHK'D. 6-15-73

L — INSTALL 13 BUSTRAK ELECTORS WO 2533110 DWG. 1-30-73 REV. 2-7-74 R&R NF DR

M — WO 2533110 DWG. ELECTOR STA. 2-7-74 R&R NF DR

N — ECN 69-1665-E REVISED PER ECN DWG. NO. 6-15-73 CHK'D. 6-15-73

R — W.O. 2533940 REVISED PER GEN. BUS MEG-ALERT ADDITION ADDED GENERATOR GROUNDING SWITCH & MEG-ALERT, ADDED EQUIP. NUMBERS. FOR UNIT 1 DWN: FTS 3/24/97 CHK'D:TJC 3/24/97 APP'D: APP'D:

R — W.O. 2533950 REVISED PER GEN. BUS MEG-ALERT ADDITION ADDED GENERATOR GROUNDING SWITCH & MEG-ALERT, FOR UNIT 2 DWN: FTS 3/25/97 CHK'D:TJC 3/25/97 APP'D: APP'D:

Figure 3.1-4a
One-line Diagram Encina Power Station Units 1 & 2
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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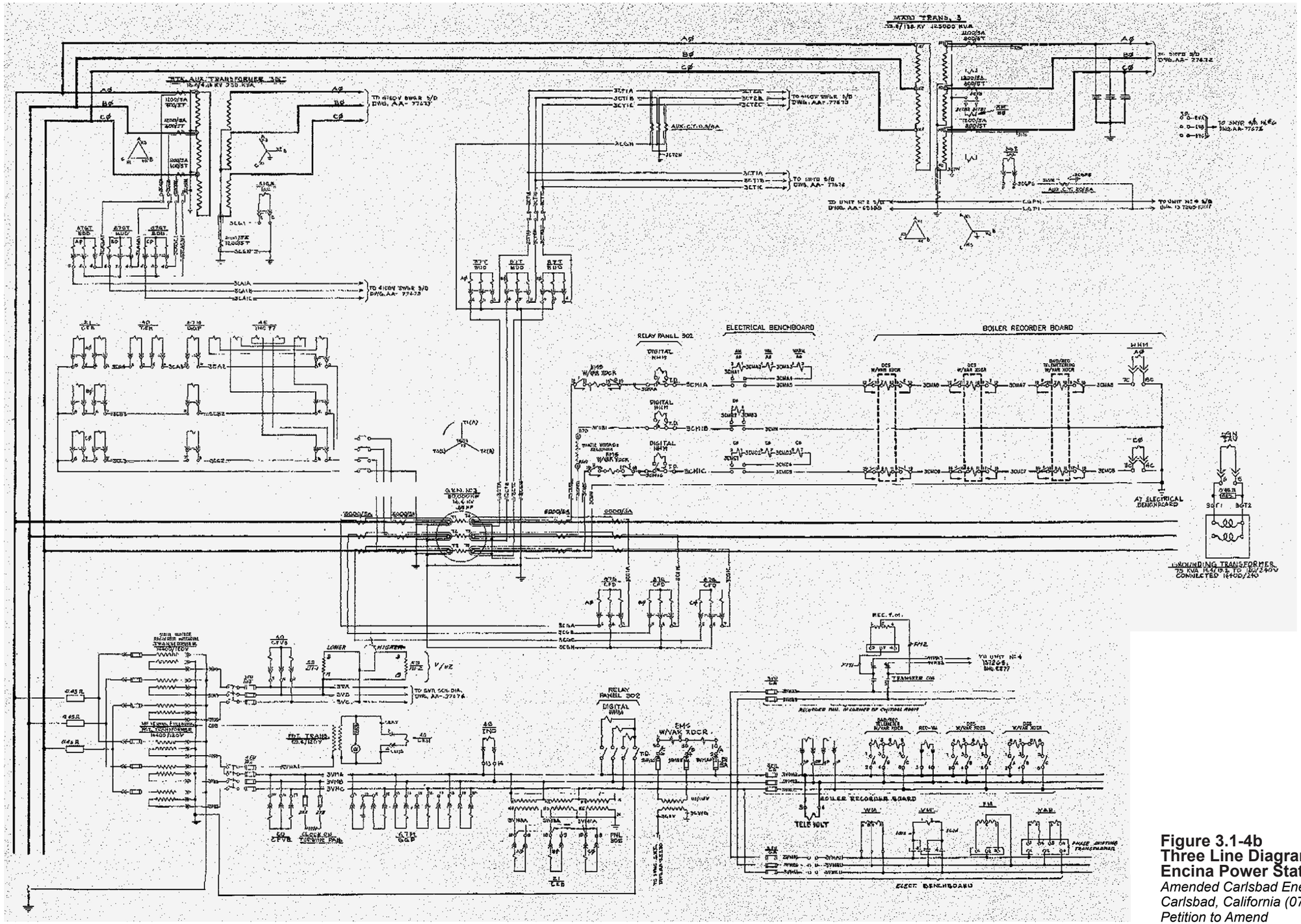
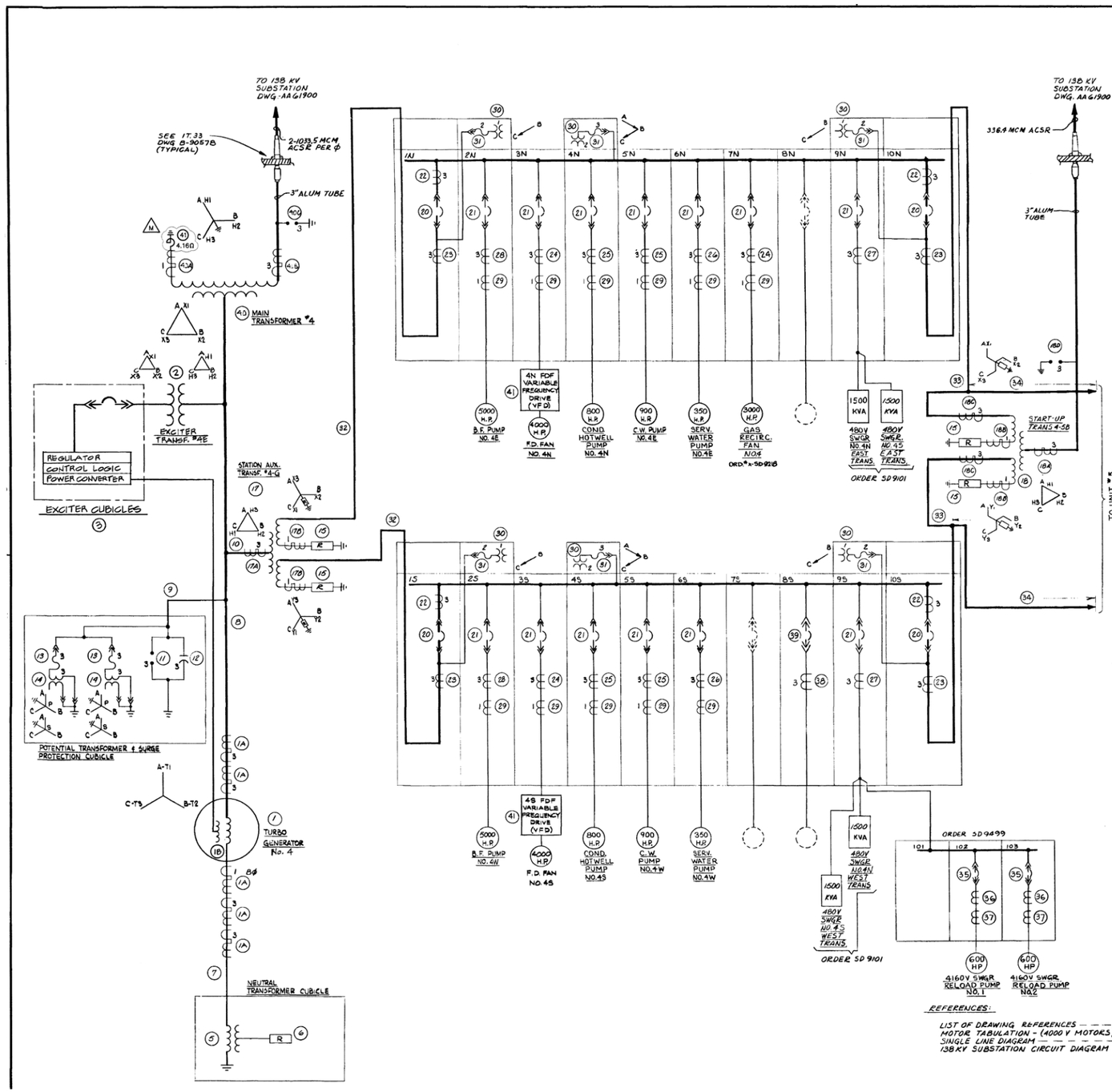


Figure 3.1-4b
Three Line Diagram
Encina Power Station Unit 3
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend



LIST OF EQUIPMENT

REF. NO.	DESCRIPTION	TYPE & RATING	MFG. DWG. NO. XSD (ORDER NO.)
1	STEAM TURBINE DRIVEN GENERATOR	WEST., 3600 RPM, 60 Hz, 3 Ø, 340000 KVA @ .9 PF, 306,000 KW, 23 KV, (1890 PSIG @ 950°F & 60 PSIG @ ½	XSD 8703-23 XSD 8703-1
1A	GENERATOR BUSHING C.T.	WEST., TYPE 10,000/5A METERING & RELAYING	XSD 8703-28,101
1B	GENERATOR FIELD	WEST. 0.102 OHMS @ 75°, 3352 AMPS, 400V	
	(NOT USED)		
2	EXCITER TRANSFORMER	VIRGINIA TRANSFORMER CORP., 3245 KVA, 22,000Δ/570YG, SILICON-FILLED, 0.5% IMP.	
3	STATIC EXCITER	A-C SYSTEMS, 355 AADC ABOVE NOMINAL A-C BREAKER-600VAC, 5200A, SIEMANS TYPE 8.3200	
4	(NOT USED)		
5	GENERATOR NEUTRAL GROUNDING TRANS.	G.E. 75 KVA 22,000 - 120/240 V, 1 Ø	XSD 8804-12
6	GENERATOR NEUTRAL TRANSFORMER SECONDARY LOADING RESISTOR	G.E., CAST GRID, 700A, .192Ω (1 MIN. RATING)	XSD 8804-13
7	NEUTRAL BUS CONNECTION	G.E., 6½ DIA. 6 FT. LENGTH	XSD 8804-12
8	GENERATOR MAIN ISOLATED PHASE BUS DUCT	G.E., MINIFLUX, 22 KV, 9000 A (63°C/40°C RISE) 120,000 A MOM. 50 KV HIPOT. 110 KV BIL	XSD 8804-11 & -12
9	ISOLATED PHASE BUS DUCT TAP TO P.T. & SURGE PROTECTION HOUSING	G.E., MINIFLUX, 22 KV, 1200 A (65°C/40°C RISE) 120,000 A MOM, 50 KV HIPOT, 110 KV BIL	XSD 8804-12
10	ISOLATED PHASE DUCT TAP TO STATION AUX. TRANS. 4-G	G.E., MINIFLUX, 22 KV, 1200 A (65°C/40°C RISE) 120,000 A MOM, 50 KV, HIPOT. 110 KV BIL	XSD 8804-11
11	SURGE PROTECTION ARRESTOR	G.E., 24 KV, STATION TYPE, MOD. 9L11LA0824	XSD 8804-12
12	SURGE PROTECTION CAPACITOR	G.E. 24 KV, SINGLE POLE, (0.125 MF) MOD. 9L11BAC110	XSD 8804-12
13	CURRENT LIMITING POTENTIAL TRANSFORMER FUSES	G.E., TYPE EJ-1	XSD 8804-12
14	POTENTIAL TRANSFORMER	G.E., TYPE JVS-150, 22 KV/120V, 400VA, 60 Hz	XSD 8804-12
15	NEUTRAL GROUNDING RESISTOR	WEST., 1.6Ω, 1500 A @ 10 SEC., 2400 V	XSD 9198-1
16	(NOT USED)		
16A	(NOT USED)		
16B	(NOT USED)		
16C	(NOT USED)		
17	STATION AUX. TRANSFORMER 4-G	FEDERAL PACIFIC, 25/33.3/FOT 41.6 HVA, OA/FA/FOFA, 80.9 KV A HV, 4160/2400 Y LV & TERTIARY	XSD 8818-1
17A	HIGH VOLTAGE BUSHING C.T.	FEDERAL PACIFIC, 1200/5A, MULTI-RATIO	XSD 8818-2
17B	NEUTRAL BUSHING C.T.	FEDERAL PACIFIC, 1200/5A, MULTI-RATIO	XSD 8818-2
18	START-UP TRANSFORMER 4-5B	FEDERAL PACIFIC, 25/33.3/FOT 41.6 HVA, OA/FA/FOFA, 138 KV A HV, 4160 Y/2400 Y LV & TERT.	XSD 8818-1,3
18A	HIGH VOLTAGE BUSHING C.T.	FEDERAL PACIFIC 1200/5A MULTI-RATIO	XSD 8817-2
18B	NEUTRAL BUSHING C.T.	FEDERAL PACIFIC 1200/5A MULTI-RATIO	XSD 8817-2
18C	LOW VOLTAGE BUSHING C.T.	FEDERAL PACIFIC 3000/5A MULTI-RATIO	XSD 8817-2
18D	HIGH VOLTAGE LIGHTNING ARRESTOR	O.B. CO., STATION CLASS, 120 KV TYPE HPE 180, CAT.- 211332	XSD 8817-1,3
20	AIR CIRCUIT BREAKER 3P5T	G.E., TYPE PCB AM 4.16-350, 3000 A, 4160V	XSD 9004-4 XSD 9004-5
21	AIR CIRCUIT BREAKER 3P5T	G.E., TYPE PCB AM 4.16-250, 1200 A, 4160V	XSD 9004-4 XSD 9004-5
22	CURRENT TRANSFORMER	G.E., TYPE 3-JCB0 5000/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
23	CURRENT TRANSFORMER	G.E., TYPE 3 JCS0 3000/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
24	CURRENT TRANSFORMER	G.E., TYPE 3-JCS0 800/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
25	CURRENT TRANSFORMER	G.E., TYPE 3-JK53 150/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
26	CURRENT TRANSFORMER	G.E., TYPE 3-JK53 75/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
27	CURRENT TRANSFORMER	G.E., TYPE 3-JCS0 600/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
28	CURRENT TRANSFORMER	G.E., TYPE 3-JCS0 900/5A, SINGLE SEC.	XSD 9004-4 XSD 9004-5
29	CURRENT TRANSFORMER	G.E., RING TYPE, 6S, 50/5A	XSD 9004-4 XSD 9004-5
30	POTENTIAL TRANSFORMER	G.E., JVM3, 4200/120V, 60 Hz	XSD 9004-4 XSD 9004-5
31	CURRENT LIMITING FUSES	G.E., TYPE OC2	XSD 9004-4 XSD 9004-5
32	5KV BUS DUCT, TRANS 4-G TO UNIT 4 4160V SWGR.	G.E., 5KV, 3000A, 3 Ø NON SEGREGATED BUS	XSD 9004-3 (11)(2)(3) XSD 9004-2
33	5KV BUS DUCT, TRANS 4-5B TO UNIT 4 4160 V SWGR.	G.E., 5KV, 3000A, 3 Ø NON SEGREGATED BUS	XSD 9004-3 (11)(2)(3) XSD 9004-2
34	5KV BUS DUCT TRANS 4-5B TO UNITS 4160V SWGR	G.E. 5KV, 3000 A, 3Ø NON SEGREGATED BUS	XSD 9591- XSD 9591-
35	AIR CIRCUIT BREAKER 3P5T	G.E. TYPE PCB AM 4.16-250, 1200A, 4160V	XSD 9499-4 XSD 9499-5
36	CURRENT TRANSFORMER	G.E. TYPE 3-JK53 100/5A, SINGLE SEC.	XSD 9499-4 XSD 9499-5
37	CURRENT TRANSFORMER	G.E. RING TYPE, 6S/5A	XSD 9499-4 XSD 9499-5
38	CURRENT TRANSFORMER	G.E. TYPE 3-JC80 500/5, SINGLE SEC.	XSD 0042
39	AIR CIRCUIT BREAKER 3P5T	G.E. TYPE PCB AM 4.16-250, 1250, 1200 A, 4160 V	XSD 0042
40	POWER TRANSFORMER #4	G.E. 310000 KVA, 65°C RISE, FOA, 138000 GR Y/79674-20900 VOLT Δ	SDG&E MD 3502-28057 GO. S/N LT-380671
40A	TRANSF #4 NEUTRAL CURR. TRANSF	G.E. 1200/5 AMP M.R.B.C.T. CAT # 176B250B	" "
40B	TRANSF #4 H.V. CURR TRANSF	G.E. 2000/5 AMP M.R.B.C.T. CAT # 11B4238B	" "
40C	TRANSF #4 H.V. LIGHTING ARRESTOR	G.E. 138KV TYPE 9L11THA108	" "
41	NEUTRAL GROUNDING REACTOR	WEST, 25KV, 353 AMP, 4.16 OHMS	SDG&E H9-53326

REFERENCES:

LIST OF DRAWING REFERENCES — — — — — — E200
MOTOR TABULATION - (4000 V MOTORS) — — — E203
SINGLE LINE DIAGRAM — — — — — — — — E276
138 KV SUBSTATION CIRCUIT DIAGRAM — — — AA G1900

REVISIONS

L W.O. 2388880
REMOVED EXISTING BRUSHLESS EXCITER & REPLACED WITH STATIC EXCITER.
DWN: CG 8-2-92
CHK'D: D. [illegible]
APP'D: [illegible]

M RDU EA-1982-E
REVISED AS PER MARK-UP PRINT: ADDED REF. 41 AND INFORMATION ADDED EQUIPMENT NO.'s
DWN: FTS 8/18/97
CHK'D: TJC 8/18/97
APP'D:
APP'D:

D TRANSFERRED RELOAD PUMPS FROM CUB. 9S TO 8S ADDED DILUTION FEED & TANK FARM #5NE 480V SWGR TO CUB. 8S.
DWN. TB 4-14-75
CHK'D. [illegible] 4-23-75
APP'D. [illegible]
FILMED 7-8-75

E PROJ. 13-7548-101
REPLACED 4000 HP GAS RECIRC. FAN MOTOR WITH 5000 HP MOTOR AS ORDERED FOR UNIT #5 PER ORD. NO SD 9218
DWN: [illegible] 31-JULY-75
CHK'D: N.A. 8-19-75
APP'D: [illegible]
FILMED: 9-29-75

F PROJ 137292
CORRECTED FEED TO RELOAD PUMPS WAS CUB 8S & REMOVED DILUTION SWGR FEED
DWN 11-22-76
CHK'D HH 11-24-76
APP'D: [illegible] 12-7-76
FILMED 11-29-76

G REVISED TO PRESENT FIELD CONDITION 12-10-75
DWN: M B.
CHK'D HH 3-10-77
APP'D: [illegible] 4-27-77
FILMED: 5-5-77

H PROJ 13702
RELOCATED TANK FARM T7 FEED FROM UNIT 4 BUS TO UNIT 5 BUS
DWN GH 4-21-77
CHK'D HH 4-26-77
APP'D [illegible] 4-27-77
FILMED: 5-5-77

J REMOVE MAIN TRANSFORMER ITEM "16 WITH 115A FUSE" W.O. 211550-3
[illegible] 8-26-80 [illegible]

K W.O. 8400660
ADDED VARIABLE FREQUENCY DRIVES ON FD FANS 4N & 4S
DWN: B. GARNER 5-24-91
CHK'D: G. LOSET 7-31-91
APP'D: [illegible] 8/1/91

DESIGN SECTION APPROVALS

SECTION	INITIALS	DATE
ELECTRICAL		
ELEC. CONTROL		
LIGHTING		
MECHANICAL		
INSTRUMENT		
NTG. PLG. & VTG.		
STR. MISC., & SUP.		
NUCLEAR		
HYDRAULIC		
STRUCTURAL		
SUPERVISOR		

REGISTERED PROFESSIONAL ENGINEER RICHARD A. PETERSON No. 5801 ELECTRICAL STATE OF CALIFORNIA
SEAL

Figure 3.1-4c
One-line Diagram
Encina Power Station Unit 4
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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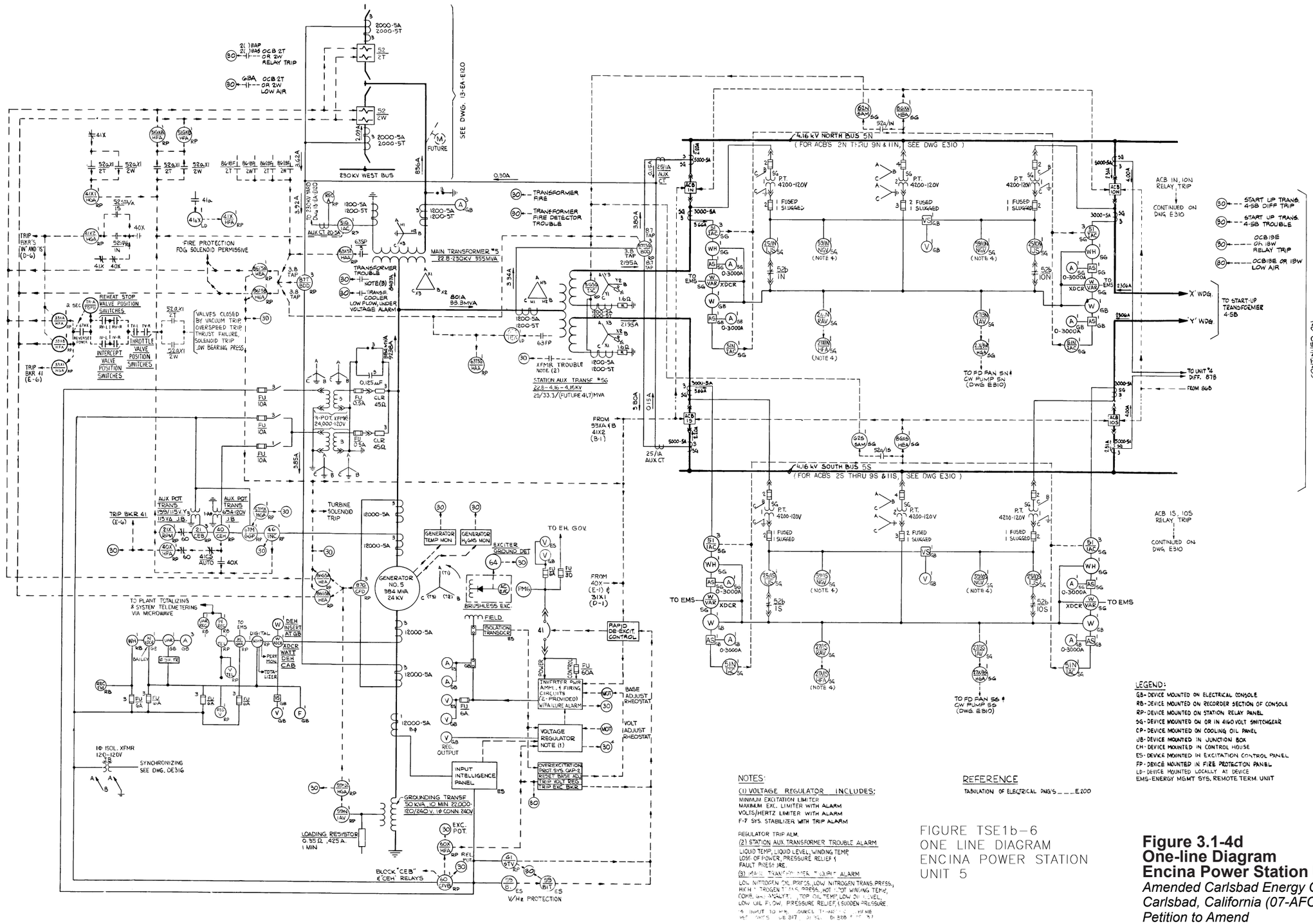

FIGURE TSE1b-6
ONE LINE DIAGRAM
ENCINA POWER STATION
UNIT 5

Figure 3.1-4d
One-line Diagram
Encina Power Station Unit 5
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

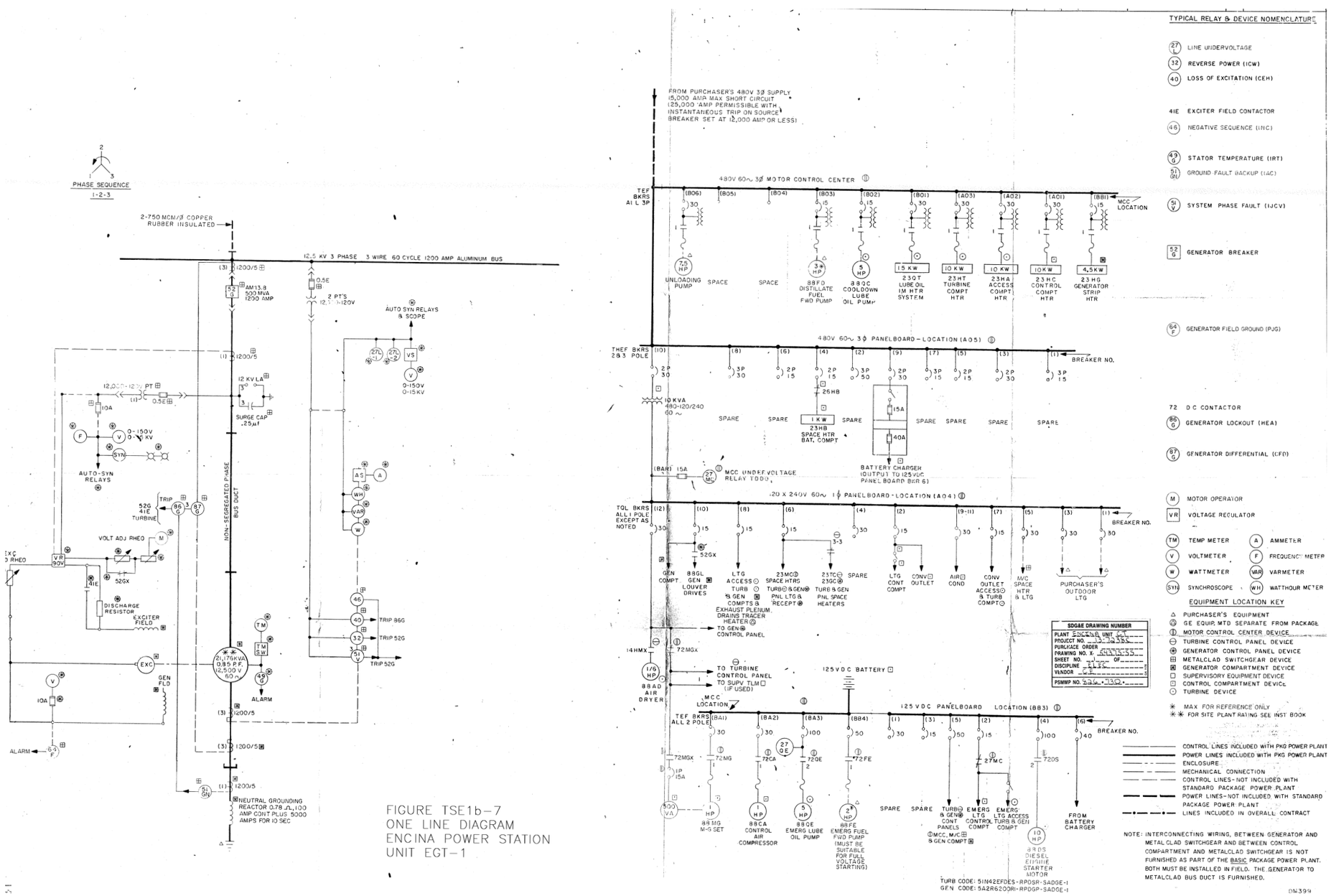

FIGURE TSE1b–7
ONE LINE DIAGRAM
ENCINA POWER STATION
UNIT EGT–1

Figure 3.1-4e
One-line Diagram
Encina Power Station Unit EGT-1
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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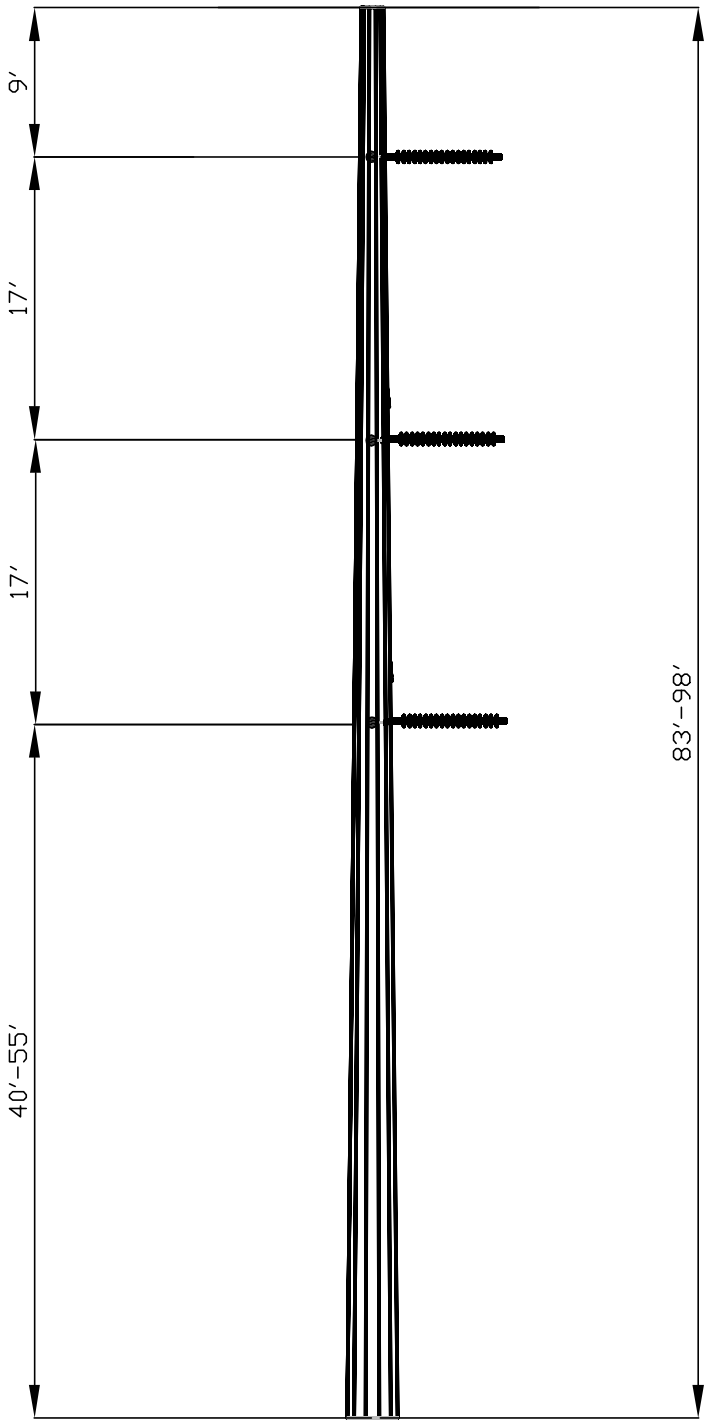


Figure 3.1-5
230kV Line Cross-section Deadend Pole
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

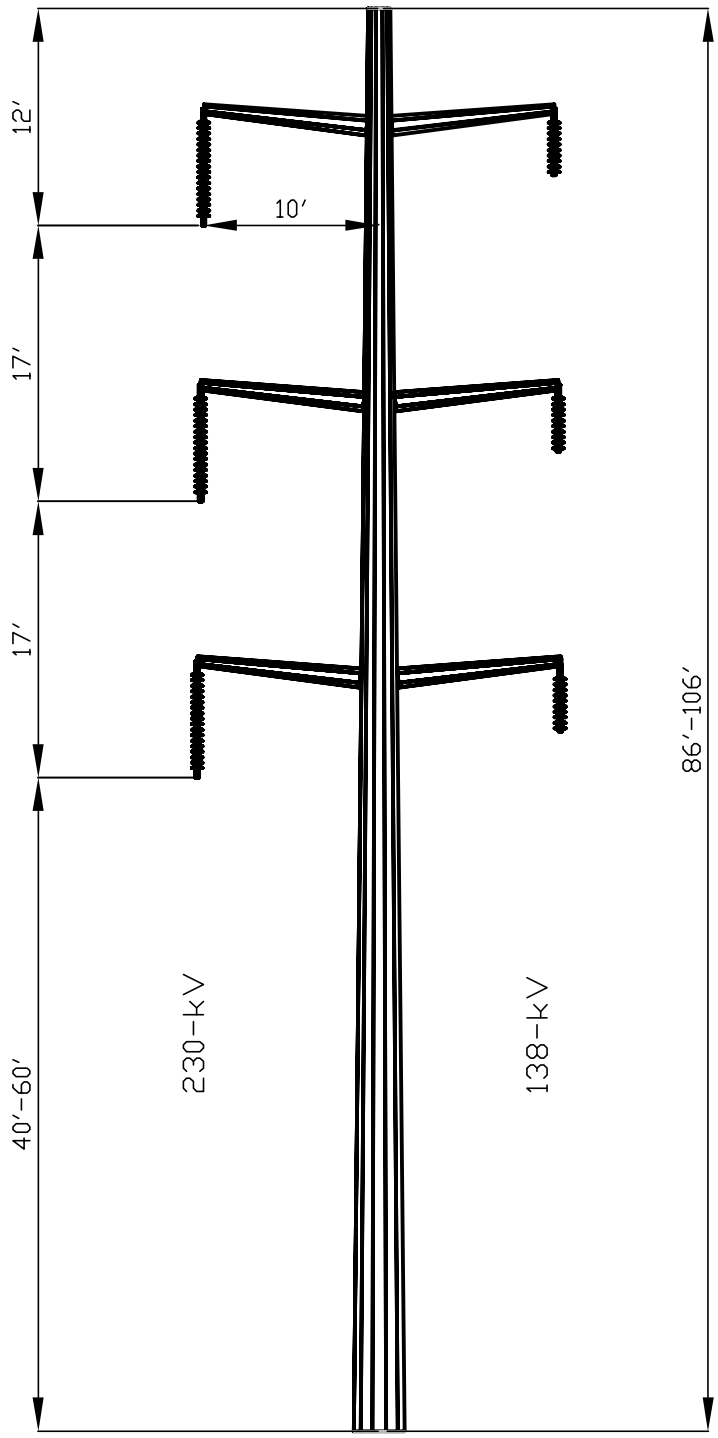


Figure 3.1-6
138/230kV Line Cross-section
Double Circuit Configuration
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

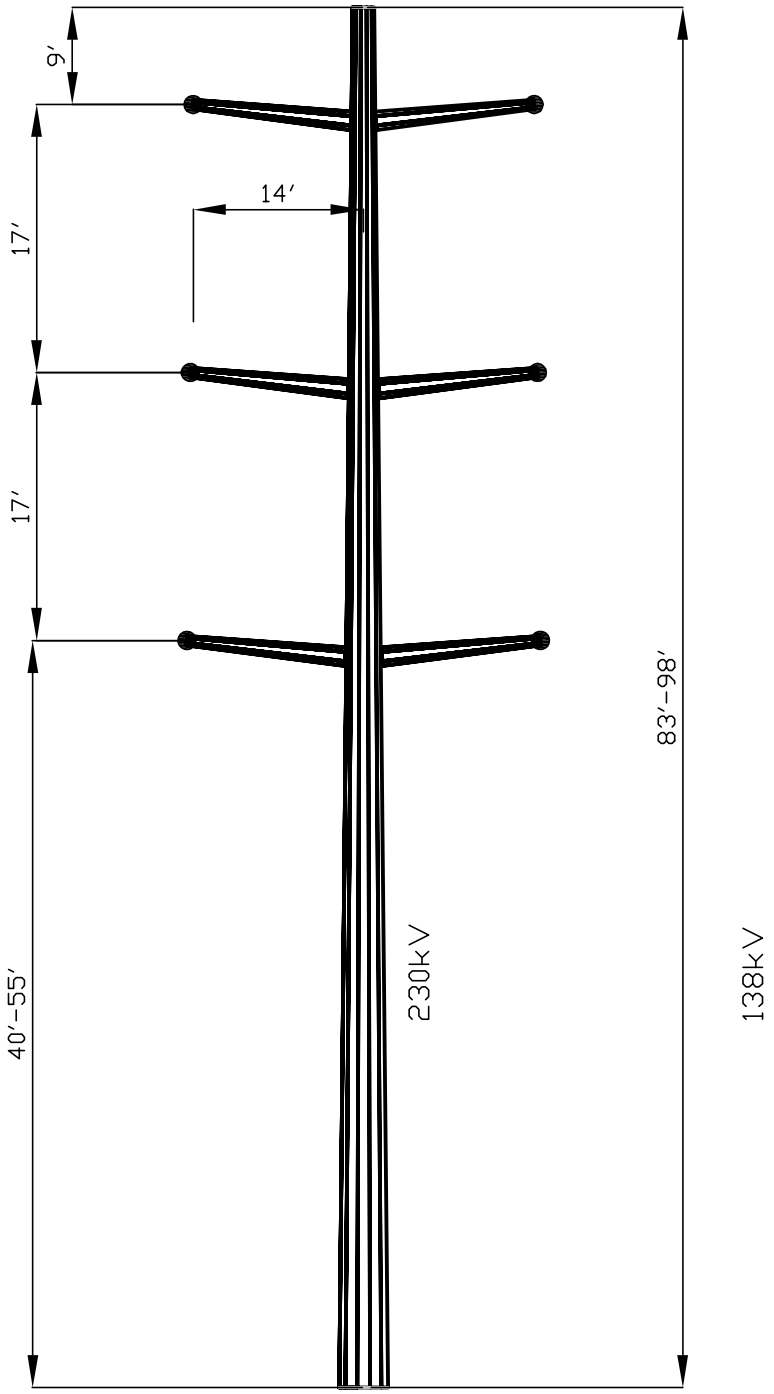


Figure 3.1-7
138/230kV Line Cross-section
Double Deadend Configuration
Line Divergence Point
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

SECTION 4.0

Natural Gas Supply

The existing Encina Power Station (EPS) is serviced by a 20-inch main gas transmission pipeline (Line TL 2009), which is owned and operated by San Diego Gas and Electric Company (SDG&E) as certified and licensed through the California Public Utilities Commission. The Amended CECP connection, like that for the Licensed CECP, is located south of the CECP site near the intersection of Cannon Road and Avenidas Encinas, and extends north from this intersection to the project site. SDG&E has performed engineering studies to ensure that there is sufficient system capacity to support the Amended CECP (see Appendix 4A).

4.1 Onsite Connection

For the Amended CECP, a new 20-inch natural gas pipeline, as opposed to the 18-inch line proposed for the Licensed CECP, will extend north from the existing 20-inch natural gas transmission line along Cannon Road to the fuel gas metering station on the Cabrillo Parcel. The total pipeline distance onsite remains unchanged from that in the Licensed CECP and is approximately 1,100 feet. The 20-inch line has been sized to accommodate the full complement of six simple-cycle generation units. Similar to the Licensed CECP, the Amended CECP engineering, procurement, and construction contractor will perform onsite natural gas service line routing and sizing from the metering station through the compressors, and to the combustion turbine generators. Figure 4.1-1 shows the natural gas route.

4.2 Construction Activities

4.2.1 Gas Pipeline

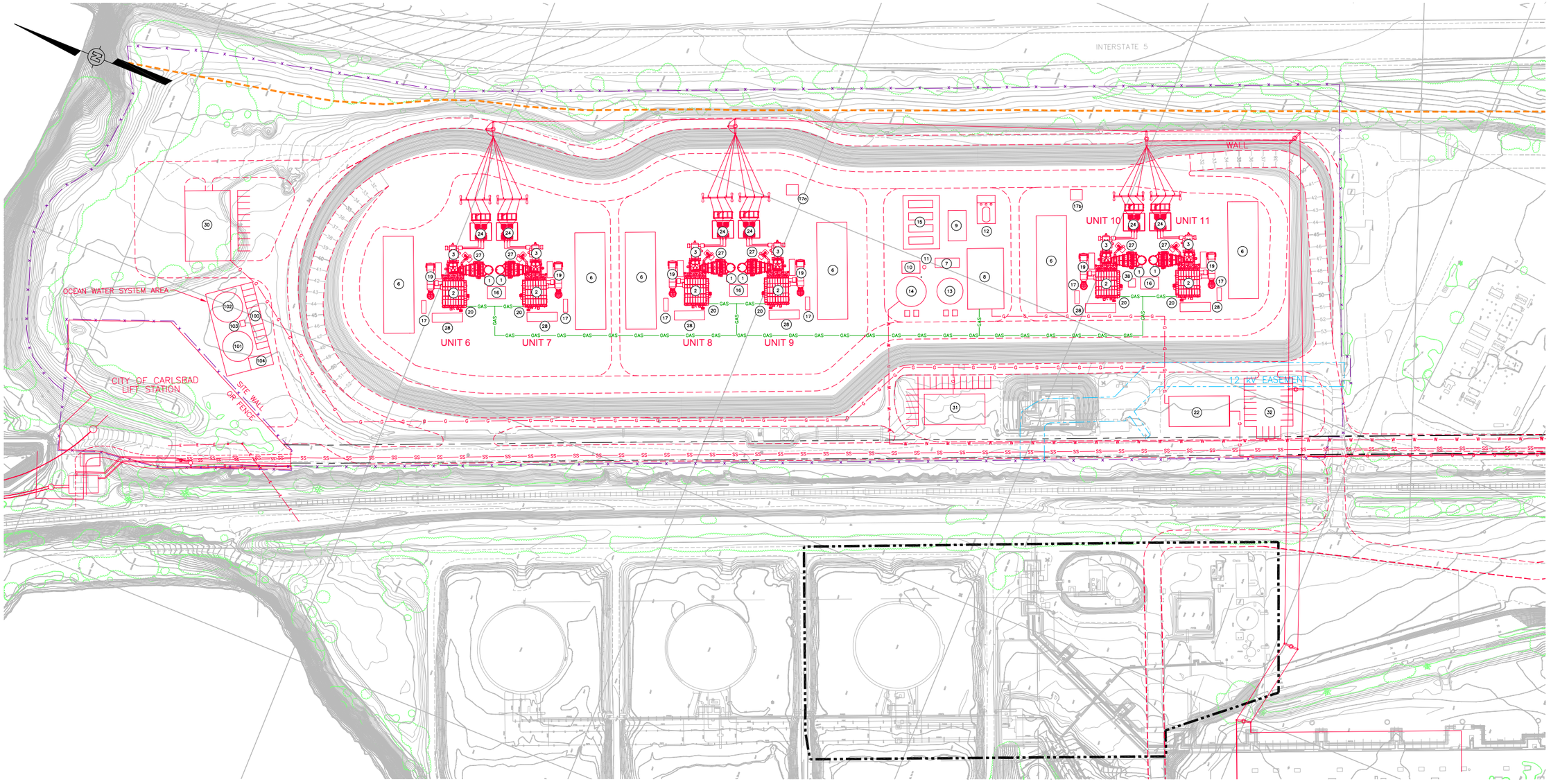
Although the Amended CECP requires installation of a 20-inch gas line instead of an 18-inch gas line, construction practices for the Amended CECP will remain generally the same as for the Licensed CECP. Only one step of the process, the pipeline integrity testing method, will differ from that for the Licensed CECP (exception follows).

During pressure integrity testing activities, both ends of the new pipeline will be capped and the pipeline will be filled with an inert gas, such as nitrogen, increasing the pressure as specified by the code requirements, and holding the pressure for a predetermined period of time. Inert gas would be brought in from offsite for the pressure testing and for pipe cleaning, ensuring that no potential contaminants could be trapped in the new pipeline.

Safety for the Amended CECP will be ensured by using both the Project Owner's and SDG&E's standard safety plan for the Amended CECP, or if constructed by others, the contractor will prepare and abide by safety plans. These plans will address specific safety issues, traffic control, working along traveled county streets, and other areas, as required by permits. Pressure testing and cleaning of equipment for the Amended CECP will not use natural gas or a combustible compressible media. All vents and relief valve discharges will be designed to ensure safe discharge to the atmosphere in the unlikely event the equipment requires a release of natural gas to the atmosphere.

4.2.2 Metering Station

Because of the project modifications and revised general arrangement, the metering station for the Amended CECP has been relocated to the southwest corner of the facility, as shown in Figure 2.0-1. Construction activities related to the metering station will remain unchanged from those for the Licensed CECP, and will include grading a pad and installing above- and belowground gas piping, metering equipment, gas conditioning, pressure regulation, and potential provisions for pigging facilities.



LEGEND:

- LOCATION OF POSEIDON DESAL PLANT
- PIPE LINE RIGHT OF WAY
- I-5 PARTIAL RIGHT OF WAY TAKE BOUNDARY
- G — GAS LINE (APPROVED ROUTING PER PEAR)
- W — RECLAIMED WATER LINE (APPROVED ROUTING PER AFC)
- SS — SANITARY SEWER LINE
- x — FENCE LINE / PROJECT BOUNDARY
- GAS — GAS DISTRIBUTION LINE

EQUIPMENT LIST

1 EXHAUST STACK
2 COMBUSTION TURBINE ENCLOSURE
3 GENERATOR ENCLOSURE
6 FIN FAN COOLERS
7 BOP PDC
8 GAS COMPRESSOR BUILDING
9 AIR COMPRESSOR BUILDING
10 FIRE PUMP BUILDING
11 DIESEL STORAGE TANK (IF NEEDED)
12 AMMONIA STORAGE AREA
13 DEMINERALIZED WATER TANK
14 RAW/FIRE WATER TANK
15 WATER TREATMENT TRAILERS
16 CEMS ENCLOSURE
17 UNIT AUXILIARY TRANSFORMER
18 AMMONIA PREP SKID
19 SHELL AND TUBE HEAT EXCHANGER
20 AUXILIARY SKID
22 GAS METERING
24 GSU TRANSFORMER
27 ATTEMPORATION BLOWER SKID
28 CTG AND INTERCOOLER MCC
30 WAREHOUSE AND MAINTENANCE BUILDING
31 CONTROL ROOM AND ADMINISTRATION BUILDING
32 PARKING LOT
38 EMERGENCY DIESEL GENERATOR
100 OCEAN WATER TRAILERS
101 OCEAN WATER STORAGE TANK
102 ULTRA FILTRATION STORAGE TANK (OWS)
103 ULTRA FILTRATION PUMPS
104 SOLIDS UNLOADING SPACE

SOURCE:

CB&I ENVIRONMENTAL & INFRASTRUCTURE

APPROXIMATE SCALE
0 80 160 240 FEET

Figure 4.1-1
Natural Gas Route
Amended Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

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SECTION 5.0

Environmental Information

This section presents the environmental, public health and safety, and local impact assessment disciplines for which the California Energy Commission (CEC) Energy Facilities Siting Regulations (Title 20, California Code of Regulations, Section 1704, Appendix B) require information in a Petition to Amend. The sections have a standardized format under the following headings:

- Amendment Overview
- Affected Environment
- Environmental Analysis
- Cumulative Impacts
- Laws, Ordinances, Regulations, and Standards (LORS)
- Conditions of Certification

The Amendment Overview briefly describes the proposed changes to the Licensed CECP. Affected Environment includes relevant background information about the project's environmental, social, and regulatory settings. Environmental Analysis analyzes the potential environmental consequences of the construction and operation of the Amended CECP as well as demolition and removal of the Encina Power Station. Cumulative Impacts discusses potential effects of the project that are not significant adverse impacts, but that could reach significance cumulatively in combination with other projects. Laws, Ordinances, Regulations, and Standards discusses and lists the LORS that pertain to the project for a given discipline and includes a demonstration that the project, as designed, would comply with all applicable LORS. Conditions of Certification discusses the Conditions of Certification approved for the Licensed CECP, and addresses any changes needed for the Amended CECP.

5.1 Air Quality

This section provides the Project Owner's evaluation of how the Amended CECP could impact air quality and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to air quality. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

This section presents the methodology and results of the air quality analyses performed to assess potential impacts associated with air emissions from construction and operation of the Amended CECP. Potential public health risks posed by emissions of non-criteria pollutants are also addressed in Section 5.9, Public Health.

5.1.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling.

Upon completion of demolition of EPS portions of the western areas of the Cabrillo Parcel will be removed from California Energy Commission (CEC) jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to CECP, such for transportation access, electrical interconnection, and water or gas supply.

5.1.2 Affected Environment

5.1.2.1 Air Quality Setting

The geography of the project site, elevations of the surrounding landscape, long-term climatic characteristics, and short-term weather variations all have important effects on the resulting ground-level pollutant concentrations that would result from air emissions related to the Amended CECP. The effects of the land and atmospheric variables are discussed separately.

5.1.2.2 Geography and Topography

The CECP will be located at the existing EPS site. The six new units (designated Units 6 through 11) will be located in the northeast area of the existing site, between the existing rail line and I-5, and at the location of previously existing fuel oil tanks.

5.1.2.3 Climate and Meteorology

The climate of San Diego County is subtropical with large-scale wind and temperature regimes controlled by the proximity of 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°F.

The amount of solar radiation is one factor influencing thermal turbulence; the more thermal turbulence, the more dispersion of pollutants. The project area receives significant sunshine throughout the year, even during winter. Annual average sunshine is the percentage of maximum possible time the sun can shine, and is approximately 68 percent in the San Diego area.

Wind speed and direction are key factors influencing the dispersion and transport of pollutants. Wind flows on an annual basis are predominately westerly. At Camp Pendleton, which is located approximately 10 kilometers (km) north of the Amended CECP site and is the source of the meteorological data used in air dispersion modeling (approved by the San Diego Air Pollution Control District [SDAPCD]), the most frequent wind direction is from the west-northwest during February through October, and from the northeast during November through January. Wind speeds average approximately 7 miles per hour, and the maximum wind speed is approximately 29 miles per hour (National Climatic Data Center, 1993). Appendix 5.1A provides the quarterly and annual wind roses and wind speed frequency tables for the 5 years, 2008 through 2012, used in the air dispersion modeling.

Temperatures in the project area range from an average of 57°F in December and January to 72°F in August, and relative humidity averages 58% during the daytime and 74% during the nighttime. Precipitation in the vicinity of the project site averages approximately 10.6 inches per year, with most of the precipitation occurring during winter (WorldClimate, 2014).

Air quality is determined primarily by the type and amount of pollutants emitted into the atmosphere, the topography of the air basin, and local meteorological conditions. The stable atmospheric conditions and light winds in the project area are conducive for accumulation of pollutants in the air basin.

5.1.2.4 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic

diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. Areas with ambient levels above these standards are designated by EPA as "nonattainment areas" subject to planning and pollution control requirements that are more stringent than standard requirements.

The California Air Resources Board (CARB) has established California ambient air quality standards (CAAQS) for ozone, CO, NO_2, SO_2, sulfates, PM_{10}, $PM_{2.5}$, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (one hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants there is more than one air quality standard, reflecting both short-term and long-term effects. Table 5.1-1 presents the NAAQS and CAAQS for selected pollutants. The California standards are generally set at concentrations lower than the federal standards and, in some cases, have shorter averaging periods.

EPA's current NAAQS for ozone went into effect on May 27, 2008. For ozone, the previous 1-hour ozone standard of 0.12 parts per million (ppm) was revoked in 1997 in all areas and the previous federal 8-hour standard of 0.08 ppm was revised to a level of 0.075 ppm.[2] Compliance with this ozone standard is based on the 3-year average of the annual fourth-highest daily maximum 8-hour average concentration measured at each monitor within an area. The NAAQS for particulates were revised in several respects. On December 14, 2012, the national annual $PM_{2.5}$ standard was lowered from 15 micrograms per cubic meter ($\mu g/m^3$) to 12.0 $\mu g/m^3$, based on the three-year average of annual arithmetic means. The existing national 24-hour $PM_{2.5}$ standard was retained at 35 $\mu g/m^3$, based on the 3-year average of the 98th percentile of 24-hour average concentrations at each monitor within an area. The existing 24-hour PM_{10} standard of 150 $\mu g/m^3$ was also retained, and this 24-hour PM_{10} standard is not to be exceeded more than once per year on average over a 3-year period. The national lead standard is 0.15 $\mu g/m^3$ based on a rolling 3-month average.[3] Effective on April 12, 2010, a new 1-hour standard of 0.100 ppm (100 parts per billion [ppb]) for NO_2 was added; this 1-hour NO_2 standard is based on the 3-year average of the 98th percentile of the annual 1-hour daily maximum concentrations.[4] The state has an annual PM_{10} standard of 20 $\mu g/m^3$, and a $PM_{2.5}$ standard of 12 $\mu g/m^3$ on an annual average basis; both standards became effective on July 5, 2003. On April 28, 2005, CARB approved an 8-hour ozone standard of 0.070 ppm; this new standard became effective on May 17, 2006. Finally, on February 22, 2007, CARB approved a 1-hour NO_2 standard of 0.18 ppm; this new standard became effective on March 20, 2008.

[2] 73 FR 16436, Mar 27, 2008

[3] 73 FR 66964, Nov 12, 2008

[4] 75 FR 6474, Feb 9, 2010

TABLE 5.1-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentrations	National Standards Primary	National Standards Secondary
Ozone	1 hour	0.09 ppm	—	Same as Primary Standard
	8 hours	0.070 ppm	0.075 ppm[a]	
Fine Particulate Matter (2.5 Microns)	24 hours	—	35 µg/m^3[c]	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	15 µg/m^3
Carbon Monoxide	1 hour	20 ppm	35 ppm	—
	8 hours	9.0 ppm	9 ppm	—
Nitrogen Dioxide	1 hour	0.18 ppm	100 ppb (196 µg/m^3)[c]	—
	Annual Arithmetic Mean	0.030 ppm	53 ppb (100 µg/m^3)	Same as Primary Standard
Sulfur Dioxide	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)[d]	—
	3 hours	—	—	0.5 ppm (1300 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	—	—
Lead	30 days Average	1.5 µg/m^3	—	—
	Calendar Quarter	—	1.5 µg/m^3[e]	Same as Primary Standard
	Rolling 3-month Average		0.15 µg/m^3	
Visibility Reducing Particles	8 hours	[f]		
Sulfates	24 hours	25 µg/m^3	No National Standards	
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 hours	0.01 ppm (26 µg/m^3)		

[a]3-year average of annual fourth-highest daily maximum 8-hour concentration.

[b]EPA revoked the annual PM_{10} NAAQS in 2006

[c]3-year average of 98th percentile

[d]3-year average of 99th percentile of 1-hour daily maximum

[e]NAAQS for lead was revised to a rolling 3-month average. The previous 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[f]In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Source: CARB, 2014a

5.1.2.5 Existing Air Quality

Data from several ambient air monitoring stations were used to characterize air quality for the CECP site. The Camp Pendleton monitoring station is the nearest ambient air quality monitoring station to the project site; it is located approximately 19 km to the northeast. However, because the Camp Pendleton station measures only ambient ozone and NO_2 levels, data collected at the Escondido monitoring station were used for CO, PM_{10}, and $PM_{2.5}$. The Escondido monitoring station is located approximately 24 km east of the project site. For ambient SO_2 levels, the nearest monitoring station is located in San Diego approximately 55 km south of the project site. The nearest sulfate monitor is located in Riverside, Riverside County (approximately 90 km northeast of the project site). Sulfate measurements at most monitoring stations in California were discontinued years ago because sulfur dioxide emissions are low enough to prevent sulfate levels from being anywhere near the CAAQS of 25 µg/m^3 on a 24-hour average basis. All ambient air quality

data presented in this section were taken from CARB publications and data sources or EPA air quality data tables.

5.1.2.6 Ozone

Ozone is generated by a complex series of chemical reactions between volatile organic compounds (VOC) and oxides of nitrogen (NOx) in the presence of ultraviolet radiation. Ambient ozone concentrations follow a seasonal pattern: higher in the summertime and lower in the wintertime. At certain times, the general area can provide ideal conditions for the formation of ozone due to the persistent temperature inversions, clear skies, mountain ranges that trap the air mass, and exhaust emissions from millions of vehicles and stationary sources. Based upon ambient air measurements at stations throughout the area, San Diego County is classified as a serious nonattainment area[5,6] for the state ozone standard and a nonattainment area for the 2008 federal 8-hour ozone standard.[7]

Maximum ozone concentrations at the Camp Pendleton station usually are recorded during the spring and fall months. Table 5.1-2 shows the annual maximum hourly ozone levels recorded at this station during the period 2003 - 2012, as well as the number of days during which the state and federal standards were exceeded. The 8-hour ozone NAAQS requires that the 3-year average of the fourth-highest values for individual years be maintained at or below 0.075 ppm. Therefore, the number of days in each year that the maximum 8-hour concentrations were above the standard, as shown in Table 5.1-1, does not equate to the number of violations. Trends of the maximum and the 3-year average of the fourth-highest daily concentrations of 8-hour average ozone readings and exceedances of the federal standard are shown in Figure 5.1-1. There have been no violations of the federal 8-hour ozone standards at this station since 2006. The long-term trends of maximum 1-hour ozone readings and violations of the state and federal standard are shown in Figure 5.1-2 for this monitoring station.

[5] Serious nonattainment is of “mid-range” magnitude in a nonattainment classification system based on the amount by which monitored levels of ozone have exceeded ambient air quality standard during the last 3 years. The classification, in order of increasing magnitude, includes marginal, moderate, serious, severe, and extreme.

[6] State Area Designations were approved by the Executive Officer on December 28, 2012 and became effective on April 1, 2013. An ozone 1-hour area classification map is available online at: http://www.arb.ca.gov/desig/adm/adm.htm

[7] Source: EPA, 2013.

TABLE 5.1-2
Ozone Levels in San Diego County, Camp Pendleton Monitoring Station, 2003–2012 (ppm)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highest 1-Hour Average	0.099	0.110	0.090	0.086	0.083	0.104	0.090	0.092	0.085	0.092
Highest 8-Hour Average	0.085	0.095	0.075	0.073	0.074	0.077	0.077	0.079	0.071	0.081
Fourth-highest values, 3-year average	0.075	0.077	0.076	0.073	0.070	0.071	0.070	0.068	0.067	0.064
Number of Days Exceeding:										
State Standard (0.090 ppm, 1-hour)	4	4	0	0	0	1	0	0	0	0
State Standard (0.070 ppm, 8-hour)	10	12	2	5	4	3	5	1	2	1
Federal Standard* (0.075 ppm, 8-hour)	5	6	0	0	0	2	1	1	0	1

*To attain this standard, the 3-year average of the fourth-highest maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (Effective May 27, 2008).
Note: Highest 1-hour and 8-hour State maximum were reported in this table

Source: CARB, 2014b

FIGURE 5.1-1
Maximum 8-Hour Average Ozone Levels, Camp Pendleton, 2003–2012

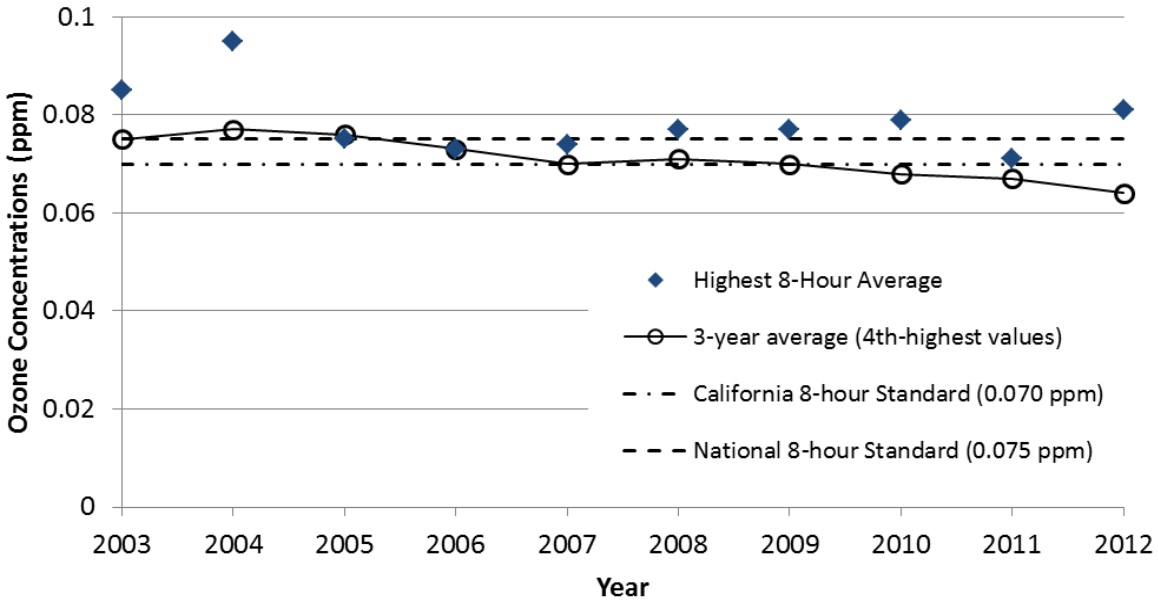
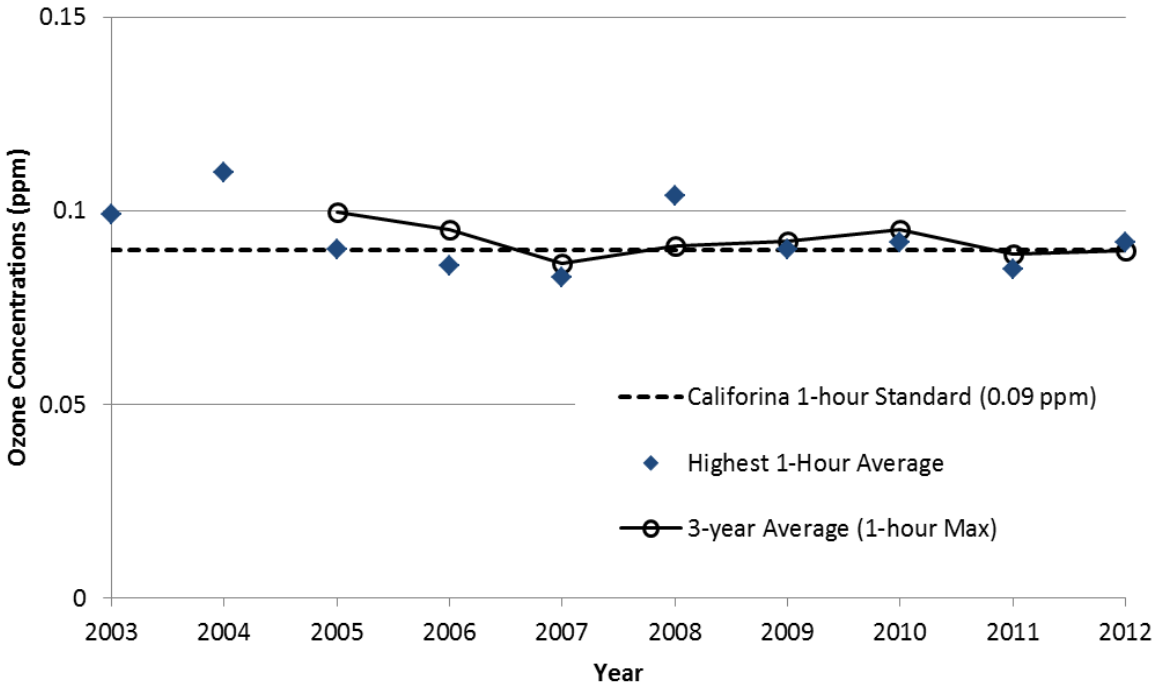


FIGURE 5.1-2
Maximum 1-Hour Average Ozone Levels, Camp Pendleton, 2003–2012



5.1.2.6.1 Nitrogen Dioxide

Atmospheric NO_2 is formed primarily from reactions between nitric oxide (NO) and oxygen or ozone. NO is formed during high-temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is less harmful than NO_2, it can be converted to NO_2 in the atmosphere within minutes to hours, depending on the composition and temperature of the atmosphere. For purposes of state and federal air quality planning, San Diego County is in attainment for NO_2.

Table 5.1-3 shows the long-term trend of maximum 1-hour NO_2 levels recorded at the Camp Pendleton monitoring station during the period from 2003 to 2012, as well as the annual average level for each of those years. During the period from 2003 to 2012, there were no violations of the CAAQS 1-hour standard (0.18 ppm) at the monitoring station. The highest 1-hour concentration recorded at the Camp Pendleton monitoring station during the years 2003 to 2012 was 0.099 ppm in 2004. A new federal 1-hour NO_2 standard of 0.100 ppm became effective on April 12, 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor must not exceed 0.100 ppm. Table 5.1-3 also shows that there were no violations of the annual NAAQS (0.053 ppm) or annual CAAQS (0.030 ppm) at the Camp Pendleton station during this period. Figure 5.1-3 shows the historical trend of maximum 1-hour NO_2 levels at this monitoring station. Annual average concentrations and trends are shown in Figure 5.1-4.

TABLE 5.1-3
Nitrogen Dioxide Levels in San Diego County, Camp Pendleton Monitoring Station, 2003–2012 (ppm)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highest 1-Hour Average	0.095	0.099	0.077	0.081	0.068	0.089	0.068	0.081	0.066	0.061
98th Percentile, 1-Hour, 3-year average	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.056	0.051	0.048
Annual Average	0.012	0.012	0.012	0.011	0.011	0.010	[a]	0.009	[a]	0.008
Number of Days Exceeding:										
State Standard (0.180 ppm, 1-hour)	0	0	0	0	0	0	0	0	0	0
Federal Standard[b] (0.100 ppm, 1 hour)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0

[a]There were insufficient data available to determine the value.

[b]The new federal 1-hour average NO_2 standard of 0.100 ppm was announced by EPA on February 9, 2010, and became effective April 12, 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average values at each monitor must not exceed 100 ppb.

Source: CARB, 2014b

FIGURE 5.1-3
Maximum 1-Hour Average Nitrogen Dioxide Levels, Camp Pendleton, 2003–2012

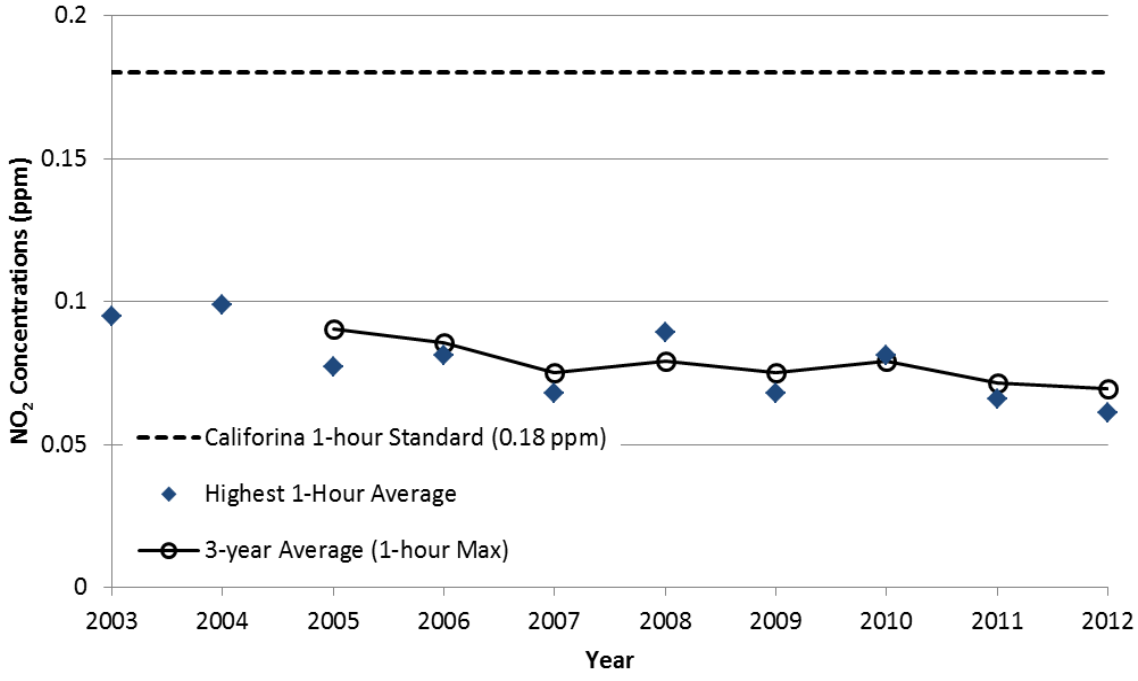
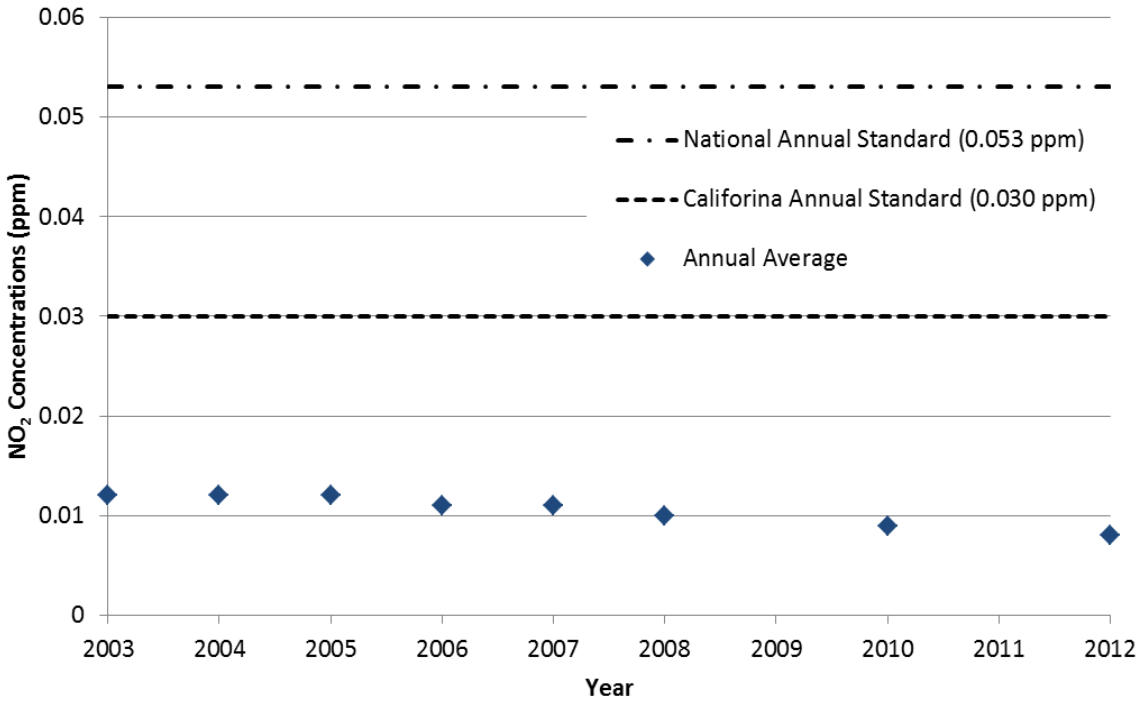


FIGURE 5.1-4
Annual Average Nitrogen Dioxide Levels, Camp Pendleton, 2003–2012



5.1.2.6.2 Carbon Monoxide

CO is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. In many areas of California, CO emissions from wood-burning stoves and fireplaces can also be measurable contributors to ambient CO levels. Industrial sources typically contribute less than 10% of ambient CO levels. Peak CO levels usually occur during winter due to a combination of higher emission rates and calm weather conditions with strong, ground-based inversions. San Diego County is classified as an attainment area for CO with respect to both state and national standards.

Table 5.1-4 shows the NAAQS and CAAQS for CO, and the maximum 1-hour and 8-hour average levels recorded at the Escondido monitoring station during the period 2003 to 2012. As indicated by this table, the maximum measured 1-hour average CO levels comply with the NAAQS and CAAQS (35.0 ppm and 20.0 ppm, respectively) and the maximum 8-hour values comply with the NAAQS and CAAQS of 9.0 ppm. The highest individual 1-hour and 8-hour CO concentrations at this station during the period from 2003 to 2012 were 10.64 ppm and 12.7 ppm, respectively, both recorded in 2003.

Trends of maximum 1-hour and 8-hour average CO concentrations are shown in Figure 5.1-5 and Figure 5.1-6, which show that, with the exception of 2003, maximum ambient CO levels monitored at the Escondido station have been well below the state standards for the last 10 years.

TABLE 5.1-4
Carbon Monoxide Levels in San Diego County, Escondido Monitoring Station, 2003 – 2012 (ppm)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highest 1-hour average	12.7	6.3	5.9	5.7	5.2	5.6	4.4	3.9	3.5	4.4
Highest 8-hour average	10.64	3.81	3.10	3.61	3.19	2.81	3.54	2.46	2.30	3.70
Number of days exceeding:										
State Standard (20.0 ppm, 1-hr)	0	0	0	0	0	0	0	0	0	0
State Standard (9.0 ppm, 8-hr)	1	0	0	0	0	0	0	0	0	0
Federal Standard (9.0 ppm, 8-hr)	1	0	0	0	0	0	0	0	0	0

Source: CARB, 2014b and EPA, 2014.

FIGURE 5.1-5
Maximum 1-Hour Average Carbon Monoxide Levels, Escondido, 2003–2012

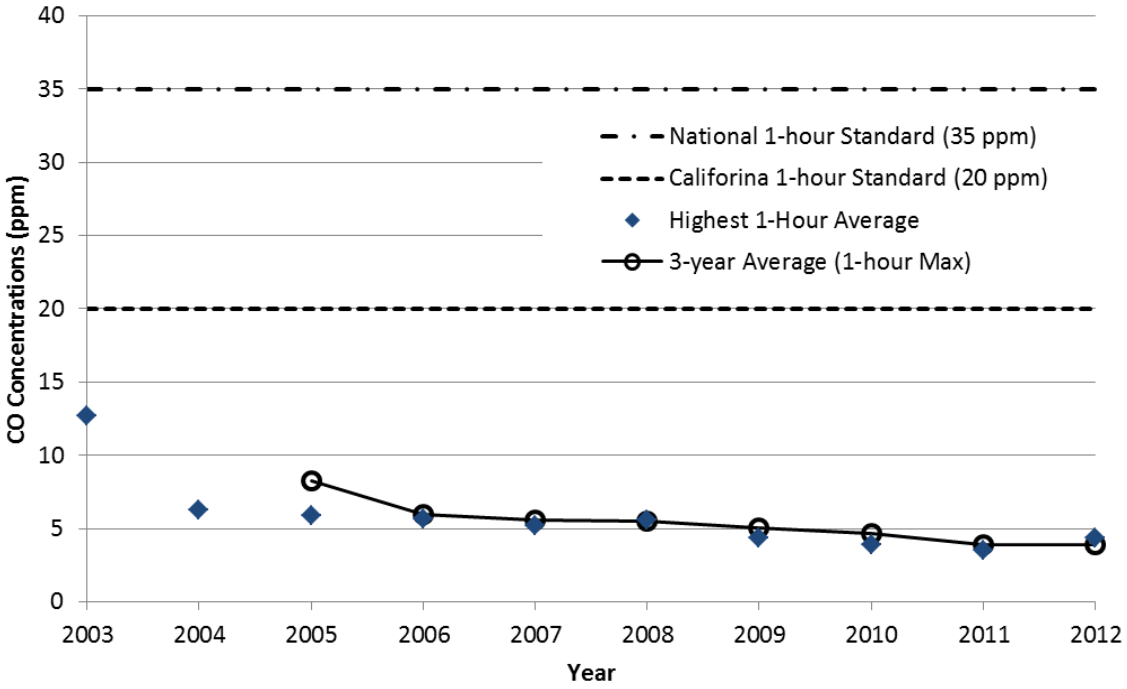
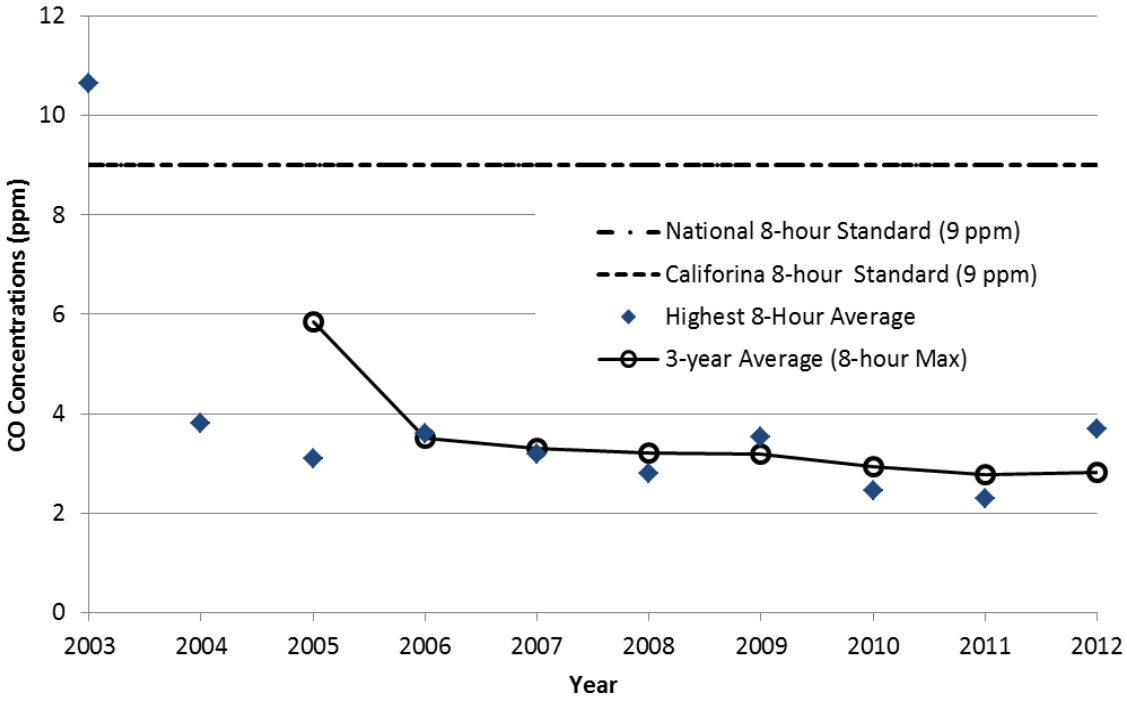


FIGURE 5.1-6
Maximum 8-Hour Average Carbon Monoxide Levels, Escondido, 2003–2012



5.1.2.6.3 Sulfur Dioxide

SO_2 is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat, or refine, sulfur or sulfur-containing chemicals. Natural gas contains nearly negligible sulfur, whereas fuel oils may contain much larger amounts. Peak, but low, concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. San Diego County is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Table 5.1-5 shows the available data on maximum 1-hour, 24-hour, and annual average SO_2 levels recorded at the San Diego monitoring stations during the period from 2003 to 2012. As indicated by this table, the maximum measured 1-hour average SO_2 levels comply with the new NAAQS (75 ppb) and CAAQS (0.25 ppm), and the maximum 24-hour values comply with the NAAQS and CAAQS of 0.14 ppm and 0.04 ppm, respectively. The table also demonstrates compliance with the annual SO_2 NAAQS of 0.03 ppm. Figure 5.1-7 shows that for the past years the maximum 24-hour SO_2 levels typically have been well below the state standard.

TABLE 5.1-5
Sulfur Dioxide Levels in San Diego County, San Diego Monitoring Station, 2003–2012 (ppm)

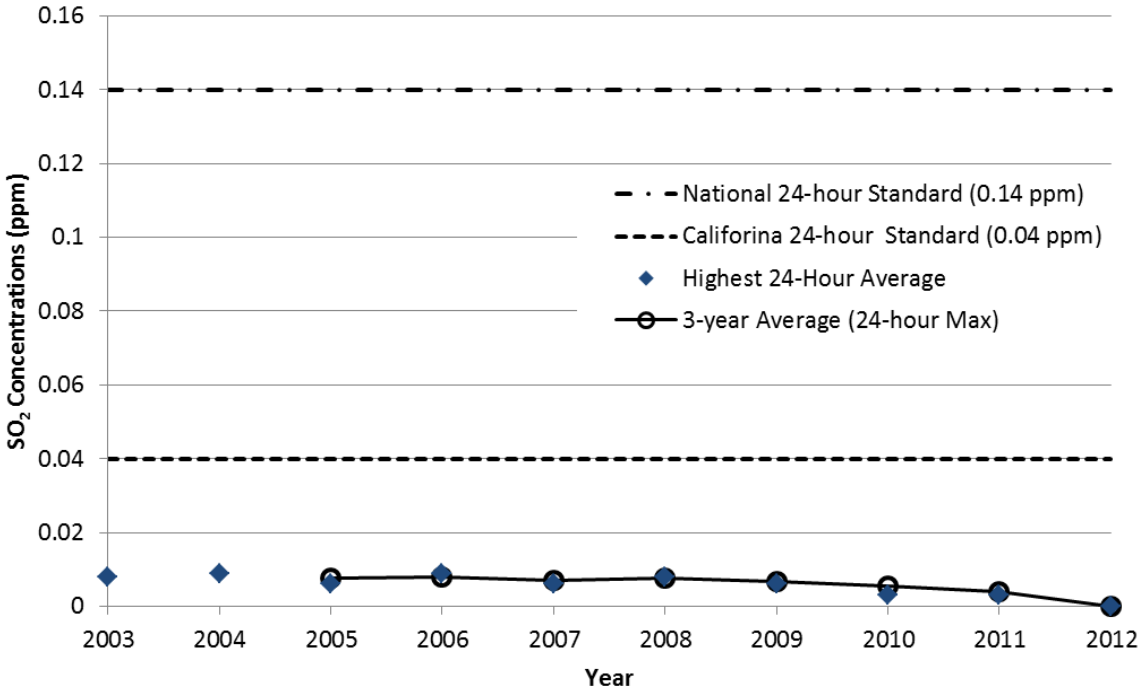
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highest 1-Hour Average	0.036	0.042	0.036	0.034	0.018	0.037	0.021	0.008	0.013	[a]
Highest 24-Hour Average	0.008	0.009	0.006	0.009	0.006	0.008	0.006	0.003	0.003	[a]
99th percentile 1-Hour, 3-year average	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.014	0.010	[a]
Annual Average	0.005	0.004	0.003	0.004	0.002	0.003	0.001	0.000	[a]	[a]
Number of days exceeding:										
State Standard (0.25 ppm, 1-hr)	0	0	0	0	0	0	0	0	0	0
Federal Standard[b] (0.075 ppm, 1-hr)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0
State Standard (0.040 ppm, 24-hr)	0	0	0	0	0	0	0	0	0	0
Federal Standard (0.140 ppm, 24-hr)	0	0	0	0	0	0	0	0	0	0

[a]There were insufficient data available to determine the value.

[b]Final rule signed June 22, 2010, effective August 23, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Source: CARB, 2014b and EPA, 2014

FIGURE 5.1-7
Maximum 24-Hour Average Sulfur Dioxide Levels, San Diego, 2003–2012



5.1.2.6.4 Respirable Particulate Matter (PM_{10})

Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources and manufacturing processes; sea salts; and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides, respectively. In 1984, CARB adopted standards for PM_{10} and phased out the total suspended particulate (TSP) standards that had been in effect previously. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of particulates that can be inhaled into the lungs (respired), and therefore is a better measure to use in assessing potential health effects. In 1987, EPA also replaced national TSP standards with PM_{10} standards. San Diego County is unclassified for the federal PM_{10} standard and is a nonattainment area for the state standard.

Table 5.1-6 shows the federal and state air quality standards for PM_{10}, maximum levels recorded at the Escondido monitoring station during 2003 to 2012, and arithmetic annual averages for the same period. At the Escondido station, the maximum 24-hour PM_{10} levels exceed the CAAQS state standard of 50 µg/m^3 a number of times per year up to 2009. The maximum daily concentration recorded during the analysis period was 179 µg/m^3 (both state and federal samplers) in 2003. The maximum annual arithmetic mean concentration recorded was 32.7 µg/m^3, also in 2003, which is above the state standard of 20 µg/m^3. The federal annual PM_{10} standard was revoked by the EPA in 2006.

TABLE 5.1-6
PM_{10} Levels in San Diego County, Escondido Monitoring Station, 2003–2012 (µg/m^3)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highest 24-Hour Average (Federal testing samplers)	179	57	42	51	68	82	73	42	40	33
Highest 24-Hour Average (State testing samplers)	179	58	42	52	68	84	74	43	40	33
Annual Arithmetic Mean	32.7	27.3	23.9	24.2	26.8	*	24.6	21.0	18.8	18.1
Number of Days Exceeding:										
State Standard (50 µg/m^3, 24-hour)	31	6	0	6	12	*	6	0	0	0
Federal Standard (150 µg/m^3, 24-hour)	3	0	0	0	0	0	0	0	0	0

*There were insufficient (or no) data available to determine the value.

Source: CARB, 2014b

The trend of maximum 24-hour average PM_{10} levels is plotted in Figure 5.1-8. The trend of maximum annual average PM_{10} readings and the California standard is shown in Figure 5.1-9. Annual average PM_{10} concentrations are above the state standard of 20 µg/m^3.

FIGURE 5.1-8
Maximum 24-Hour Average PM_{10} Levels, Escondido, 2003–2012

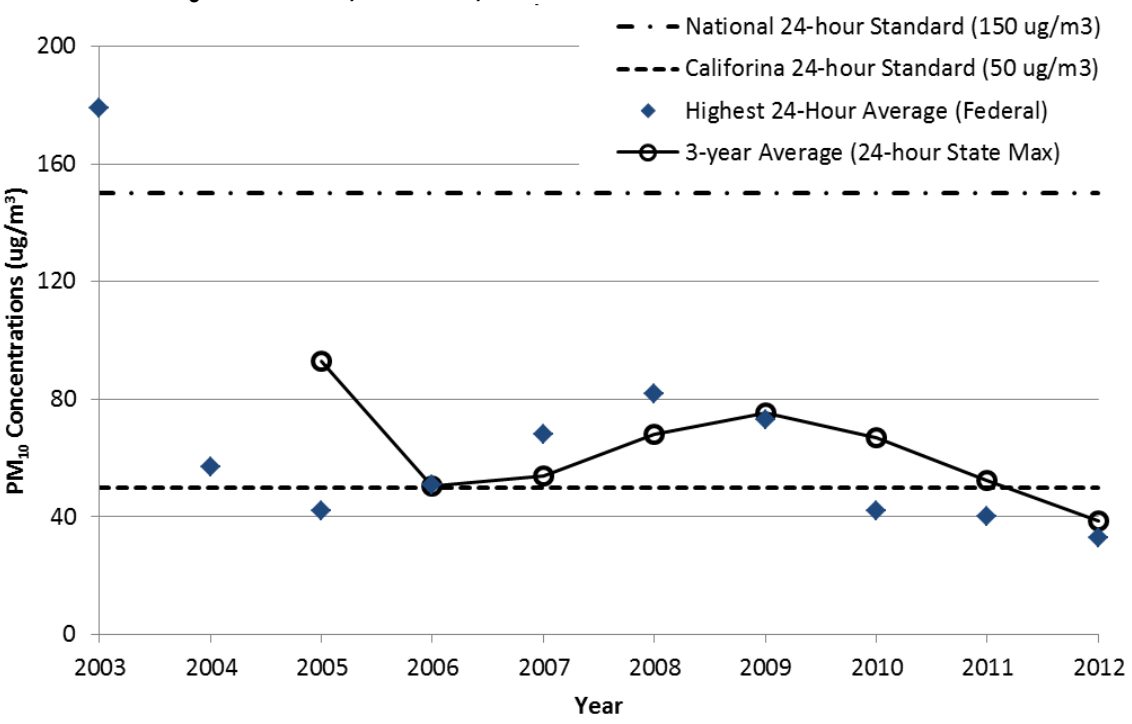
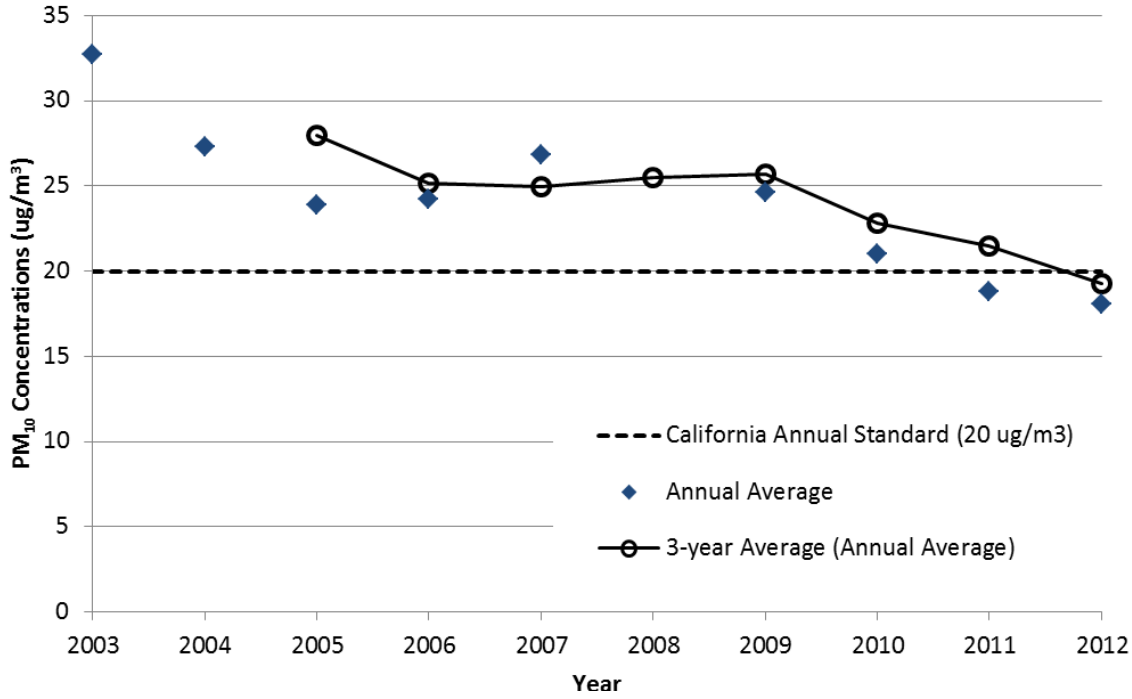


FIGURE 5.1-9
Annual Average PM_{10} Levels, Escondido, 2003–2012



5.1.2.6.5 Fine Particulate Matter ($PM_{2.5}$)

As discussed previously, the national annual $PM_{2.5}$ standard was lowered from 15 μg/m^3 to 12.0 μg/m^3 on December 14, 2012, based on the 3-year average of annual arithmetic means. The existing national 24-hour $PM_{2.5}$ standard was retained at 35 μg/m^3, based on the 3-year average of the 98th percentile of 24-hour average concentrations. $PM_{2.5}$ data have been collected at the Escondido monitoring station since 1999, and are presented below.

Table 5.1-7 shows the state and federal air quality standards for $PM_{2.5}$, maximum levels recorded at the Escondido monitoring station 2003-2012, and 3-year averages for the same period. During the past 10 years, the 24-hour average concentrations have not exceeded the federal standard of 35 μg/m^3 established in December 2006. During the past 5 years, annual average $PM_{2.5}$ levels have generally been above the federal and state standard of 12.0 μg/m^3. San Diego County is considered a nonattainment area for the state $PM_{2.5}$ standard, but is unclassified for the federal standard.

The trends of 24-hour and annual average $PM_{2.5}$ levels are plotted in Figure 5.1-10 and Figure 5.1-11, respectively.

TABLE 5.1-7
$PM_{2.5}$ Levels in San Diego County, Escondido Monitoring Station, 2003–2012 (μg/m^3)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highest 24-Hour Average (Federal)[b]	69.2	67.3	43.1	40.6	126.2	44.0	64.9	48.4	69.8	70.7
Number of Days Exceeding:										
Federal Standard (35 μg/m^3, 24-hour)	3	9	[a]	1	11	[a]	2	2	3	1
98th Percentile 24-hour	33.9	37.4	[a]	28.3	37.7	[a]	25.2	26.6	27.4	21.4
98th Percentile 24-hour, 3 year average	38	37	[a]	[a]	[a]	[a]	[a]	[a]	26	25
Annual Arithmetic Mean	14.2	14.1	[a]	11.5	13.3	12.4	13.5	12.7	13.2	10.8

[a]There were insufficient data available to determine the value.

[b]EPA lowered the 24-hour standard to 35 μg/m3 on December 17, 2006. Compliance with this standard is based on the 3-year average of the 98th percentile daily concentrations.

Source: CARB, 2014b and EPA, 2014

FIGURE 5.1-10
Maximum 24-Hour Average $PM_{2.5}$ Levels, Escondido, 2003–2012

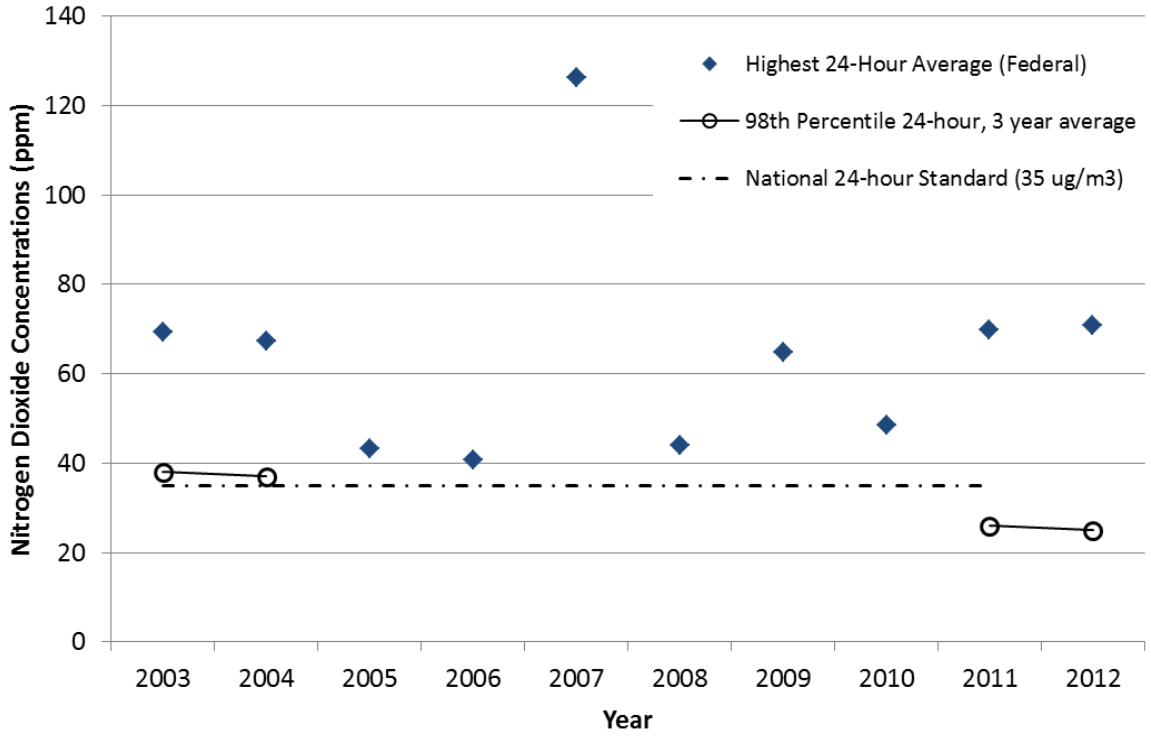
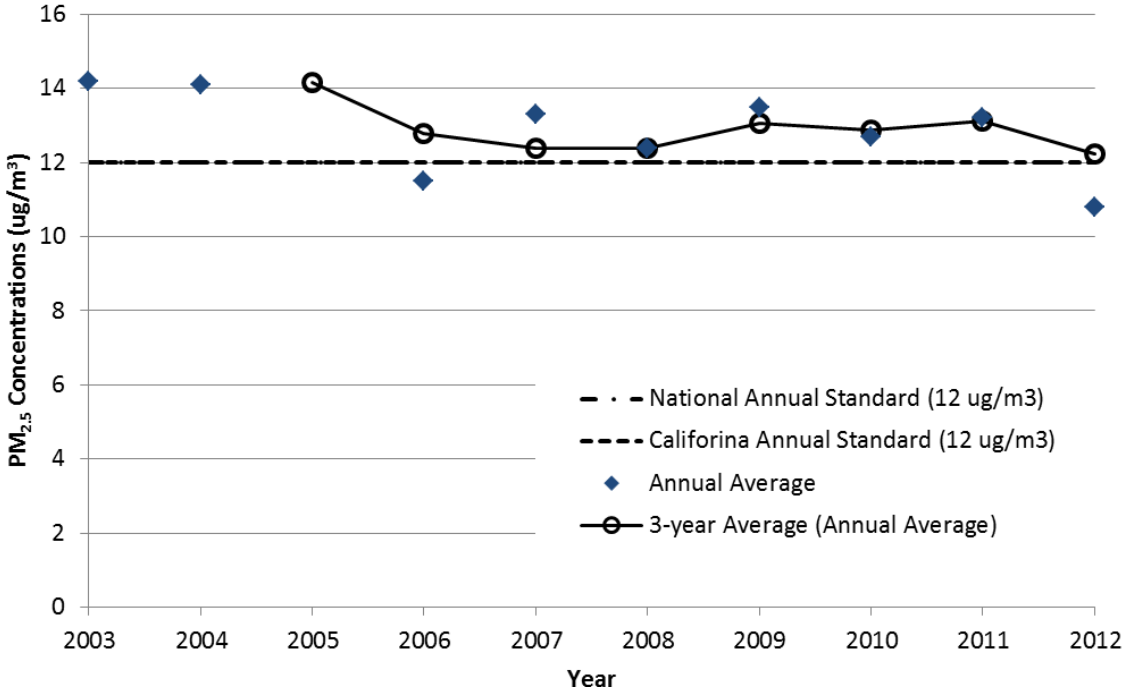


FIGURE 5.1-11
Annual Average $PM_{2.5}$ Levels, Escondido, 2003–2012



5.1.2.6.6 Airborne Lead

The majority of lead in the air results from the combustion of fuels that contain lead. Forty years ago, motor gasoline contained relatively large amounts of lead compounds used as octane-rating improvers, and ambient lead levels were relatively high. Beginning with the 1975 model year, new automobiles began to be equipped with exhaust catalysts, which were poisoned by the exhaust products of leaded gasoline. Thus, unleaded gasoline became the required fuel for an increasing fraction of new vehicles, and the phase-out of leaded gasoline began. As a result, ambient lead levels decreased dramatically. San Diego County has been in attainment of state and federal airborne lead levels for air quality planning purposes for a number of years.

On October 15, 2008, EPA revised the federal ambient air quality standard for lead, lowering it from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$ for both the primary and the secondary standard. EPA subsequently published the final rule in the Federal Register on November 12, 2008. This is the first time that the federal lead standard has been revised since it was first issued in 1978. In addition to revising the level of the standard, EPA changed the averaging time from a quarterly average to a rolling 3-month average. The level of the standard is "not to be exceeded" and is evaluated over a 3-year period. Many of stations stopped monitoring lead concentrations since the ambient lead concentrations have been well below the federal standard. For the San Diego monitoring stations, ambient lead levels were monitored through the end of 2004. Due to the scarcity of ambient lead data, Table 5.1-8 lists the federal air quality standard for airborne lead and the levels recorded in San Diego between 2003 and 2012 from the El Cajon monitoring station. Annual average levels are well below the federal standard.[8]

TABLE 5.1-8
Airborne Lead Levels in San Diego County, El Cajon-Redwood Avenue Monitoring Station, 2003–2012 (ng/m^3)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Annual Mean[b]	[a]	[a]	[a]	[a]	[a]	[a]	6.75	[a]	[a]	4.45
Annual Maximum	7.0	[a]	[a]	[a]	37	[a]	30	590	9.2	10
Number of Observations	5	0	0	0	17	0	31	18	22	29

[a]There were insufficient or no data available to determine the value.

[b]Means shown in CARB's toxics pages are actually means of monthly means. Using the mean of monthly means compensates for the uneven distribution of samples over the 12 months of the year.

Source: CARB, 2014c

ng/m^3 = nanograms per cubic meter

5.1.3 Air Quality Agencies

EPA has responsibility for enforcing, on a national basis, the requirements of many of the country's environmental and hazardous waste laws. California is under the jurisdiction of EPA Region 9, which has its offices in San Francisco. Region 9 is responsible for the local administration of EPA programs for California, Arizona, Nevada, Hawaii, and certain Pacific trust territories. EPA's activities relative to the California air pollution control program focus principally on reviewing California's submittals for the State Implementation Plan (SIP). The SIP is required by the federal Clean Air Act to demonstrate how all areas of the state will meet the national ambient air quality standards by the federally specified deadlines (42 USC §7409, 7411).

CARB was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program;

[8] CARB no longer reports summary lead statistics on its website. The 3-month average statistic is not available on the EPA AirData website (EPA, 2014).

to adopt and update, as necessary, the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards (California Health and Safety Code [H&SC] §39500 et seq.).

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCD) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMD), with more comprehensive authority over non-vehicular sources, as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California.

Air pollution control districts and air quality management districts in California have principal responsibility for:

- Developing plans for meeting the state and federal ambient air quality standard;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution; and
- Enforcing air pollution statutes and regulations governing non-vehicular sources and for developing employer-based trip reduction programs.

Each level of government (state, federal, and county/local air district) has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to this Amended CECP. The air agencies having permitting authority for the Amended CECP are shown in Table 5.1-9. The applicable federal LORS and compliance with these requirements are discussed in more detail in the following sections. The SDAPCD staff will treat the Petition to Amend (PTA) as an application for a Determination of Compliance.

TABLE 5.1-9
Air Quality Agencies

Agency	Authority	Contact
EPA Region 9	Permit issuance and oversight, enforcement	Gerardo Rios, Chief Permits Office EPA Region 9 75 Hawthorne Street San Francisco, CA 94105 (415) 744-1259
California Air Resources Board	Regulatory oversight	Cynthia Marvin, Chief Stationary Source Division California Air Resources Board 1001 I Street Sacramento, CA 95814 (916) 322-7236
San Diego Air Pollution Control District	Permit issuance, enforcement	Tom Weeks Chief, Engineering Division 10124 Old Grove Road San Diego, CA 92131 (858) 586-2600

5.1.3.1 Laws, Ordinances, Regulations, and Standards

Requirements of federal, state, and local jurisdictions are discussed in the following sections. Compliance with each of these requirements is addressed in Section 5.1.5.

5.1.3.1.1 Federal

EPA implements and enforces the requirements of many of the federal environmental laws. EPA Region 9, which has its offices in San Francisco, administers federal air programs in California. The federal Clean Air Act, as most recently amended in 1990, provides EPA with the legal authority to regulate air pollution from stationary sources such as the CECP. EPA has promulgated the following stationary source regulatory programs to implement the requirements of the federal Clean Air Act:

- Prevention of Significant Deterioration (PSD)
- New Source Review (NSR)
- Title IV: Acid Rain Program
- Title V: Operating Permits
- National Standards of Performance for New Stationary Sources (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)

Prevention of Significant Deterioration Program

Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

Requirements: Requires preconstruction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding NAAQS (i.e., attainment pollutants). For the SDAPCD, the PSD pollutants are SOx, NOx, CO, PM_{10}, $PM_{2.5}$, lead, and greenhouse gasses (GHG). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

The PSD requirements apply to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 tons per year (tpy), or any other facility that emits at least 250 tpy.

Effective July 1, 2011, a stationary source that emits more than 100,000 tpy of GHGs is also considered to be a major stationary source.

A major modification is any project at a major stationary source that results in a significant increase in emissions of any PSD pollutant.

A significant increase for a PSD pollutant is an increase above the significant emission rate for that pollutant (Table 5.1-10). It is important to note that once PSD is triggered by any pollutant, PSD requirements apply to any PSD pollutant with an emission increase above the significance level, regardless of whether the facility is major for that pollutant.

TABLE 5.1-10
PSD Significant Emission Thresholds

Pollutant	PSD Significant Emission Threshold (tpy)*
SO_2	40
PM_{10}	15
$PM_{2.5}$	10
NO_x	40
CO	100
Lead	0.6
GHGs	75,000

*40 CFR 52.21 (b)(1)(23).

The principal requirements for the PSD program include the following:

- Emissions of pollutants that are subject to PSD review must be controlled using Best Available Control Technology (BACT)
- Air quality impacts, in combination with other increment-consuming sources, must not exceed maximum allowable incremental increases
- Air quality impacts of all sources in the area plus ambient pollutant background levels cannot exceed NAAQS
- Pre- and/or post-construction air quality monitoring may be required
- The air quality impacts on soils, vegetation, and nearby PSD Class I areas (specific national parks and wilderness areas) must be evaluated

Air Quality Monitoring. At its discretion, the PSD permit issuer may require preconstruction and/or post-construction ambient air quality monitoring for PSD sources if representative monitoring data are not already available. Preconstruction monitoring data must be gathered over a 1-year period to characterize local ambient air quality. Post-construction air quality monitoring data must be collected as deemed necessary by the PSD permit issuer to characterize the impacts of project-related emissions on ambient air quality.

Best Available Control Technology. BACT must be applied to any new or modified major source to minimize the emissions increase of those pollutants exceeding the PSD emission thresholds. EPA defines BACT as an emissions limitation based on the maximum degree of reduction for each subject pollutant, considering energy, environmental, and economic impacts, that is achievable through the application of available methods, systems, and techniques. BACT must be as stringent as any emission limit required by an applicable NSPS or NESHAP.

Air Quality Impact Analysis. An air quality dispersion analysis must be conducted to evaluate impacts of significant emission increases from new or modified facilities on ambient air quality. PSD source emissions must not cause or contribute to an exceedance of any ambient air quality standard, and the increase in ambient air concentrations must not exceed the allowable increments shown in Table 5.1-11. Once PSD review is triggered for the project, all pollutants with emission increases above the PSD significance thresholds are subject to this requirement.

TABLE 5.1-11
PSD Increments and Significant Impact Levels

Pollutant	Averaging Time	SILs (µg/m³)[a]	Maximum Allowable Class II Increments[b]
SO_2	Annual	1.0	20
	24-hr	5	91
	3-hr	25	512
	1-hr	7.8[c]	No 1-hr increment
PM_{10}	Annual	1.0	17
	24-hr	5	30
$PM_{2.5}$	Annual	0.3	4
	24-hr	1.2	9
NO_2	Annual	1.0	25
	1-hr	7.5[c]	No 1-hr increment
CO	8-hr	500	No CO increments
	1-hr	2,000	

[a]40 CFR 51.165 (b)(2).
[b]40 CFR 52.21 (c)
[c]EPA has not yet defined significance impact levels (SILs) for 1-hour NO_2 or SO_2 impacts. However, EPA has suggested that, until SILs have been promulgated, values of 4 ppb (7.5 µg/m³) for NO_2 and 3 ppb (7.8 µg/m³) for SO_2 may be used. These values will be used in this analysis wherever a SIL would be used for NO_2 or SO_2.

Protection of Class I Areas. The potential increase in ambient air quality concentrations for attainment pollutants (i.e., NO_2, PM_{10}, or SO_2) within Class I areas closer than approximately 100 km may need to be quantified if the new or modified PSD source were to have a sufficiently large emission increase as evaluated by the Class I area Federal Land Managers. In such a case, a Class I visibility impact analysis would also be performed.

Growth, Visibility, Soils, and Vegetation Impacts. Impairment to visibility, soils, and vegetation resulting from PSD source emissions as well as associated commercial, residential, industrial, and other growth must be analyzed. This analysis includes cumulative impacts to local ambient air quality.

While the PSD program historically has been implemented in San Diego by EPA Region 9, EPA is expected to delegate this program to the SDAPCD in the near future with SIP approval of the new SDAPCD Rule 20.3.1.

As discussed in more detail below, the Amended CECP includes the installation of six new simple-cycle gas turbine units (also referred to as combustion turbine generating [CTG] units) and the shutdown of the five existing boilers and an existing peaker gas turbine at the EPS. With the shutdown of the existing boilers/peaker gas turbine, the facility-wide net emission change is expected to be below PSD significance thresholds for all pollutants with the exception of GHG emissions. Hence, the Amended CECP will be subject to the PSD program for GHG emissions.

Administering Agency: EPA Region 9.

Nonattainment New Source Review

Authority: Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52

Requirement: Requires preconstruction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of NAAQS. Nonattainment new source review jurisdiction has been delegated to the SDAPCD for all nonattainment pollutants and is discussed further under local LORS and conformance below.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

Acid Rain Program

Authority: Clean Air Act §401 (Title IV), 42 USC §7651

Requirement: Requires the monitoring and reporting of emissions of acidic compounds and their precursors. The principal source of these compounds is the combustion of fossil fuels. Therefore, Title IV established national standards to monitor, record, and in some cases limit SO_2 and NOx emissions from electrical power generating facilities. These standards are implemented at the local level with federal oversight.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

Title V Operating Permits Program

Authority: Clean Air Act §501 (Title V), 42 USC §7661

Requirements: Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. SDAPCD has received delegation authority for this program.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

National Standards of Performance for New Stationary Sources

Authority: Clean Air Act §111, 42 USC §7411; 40 CFR Part 60

Requirements: Establishes standards of performance to limit the emission of criteria pollutants (air pollutants for which EPA has established NAAQS) from new or modified facilities in specific source categories. These standards are implemented at the local level with federal oversight. The applicability of these regulations depends on the equipment size, process rate, and/or the date of construction, modification, or reconstruction of the affected facility.

The NSPS for Stationary Gas Turbines and for Stationary Compression Ignition Internal Combustion Engines will be applicable to the Amended CECP. Regarding the NSPS for Gas Turbines, NSPS Subpart KKKK, Standards of Performance for Stationary Gas Turbines sets limits on NOx and SO_2 emissions from gas turbines. Subpart KKKK limits NOx and SO_2 emissions from new gas turbines based on power output. The limits for gas turbines greater than 850 MMBtu/hr are 15 ppmv at 15% O_2/0.43 lb per MWh for NOx, and 0.90 lb per MWh SO_2 for SOx. For the size of engines proposed for the emergency fire pump and generator engines, NSPS Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines requires facilities to purchase engines meeting the EPA engine non-road certification level of Tier II or better depending on the year the engine is manufactured/purchased. This regulation also requires the engines to use ultra-low sulfur content diesel fuel.

On Sept. 20, 2013, the EPA issued a revised proposed NSPS to control GHG emissions from new power plants. The EPA proposed separate standards for natural gas-fired turbines and coal-fired units. The comment period for these revised standards ends on May 9, 2014. The GHG emission limits (a revision to NSPS Subpart KKKK) for new natural gas-fired combustion turbines subject to the regulation are 1,000 lb CO_2/MWh (new combustion turbines with a heat input rating greater than 850 MMBtu/hr) and 1,100 lb CO_2/MWh (new combustion turbines with a heat input rating equal to or less than 850 MMBtu/hr). New combustion turbines that supply less than one-third of their potential electric output (on a 3-year rolling average basis) to a utility distribution system are exempt from this regulation. Because the new gas turbines associated with the Amended CECP will supply less than one-third of their potential electric output to the local utility, the units will be exempt from this regulation. Consequently, there will be no further discussion of this GHG NSPS in this document.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

National Emission Standards for Hazardous Air Pollutants

Authority: Clean Air Act §112, 42 USC §7412

Requirements: Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution, but for which NAAQS have not been established) from major sources of HAPs in specific source categories.[9] These standards are implemented at the local level with federal oversight. Only the NESHAPs for gas turbines, which limit formaldehyde emissions from gas turbines, are potentially applicable to a new power plant project. However, as discussed further below, the gas turbine NESHAP is not expected to be applicable to the Amended CECP because the facility would not be a major source of HAPs (i.e., 10 tpy of one HAP or 25 tpy of all HAPs). Thus, NESHAPs requirements will not be addressed further.

Administering Agency: SDAPCD, with EPA Region 9 oversight.

Compliance Assurance Monitoring

Authority: 40 CFR 64 Compliance Assurance Monitoring (CAM)

Requirements: Requires compliance monitoring at emission units at major stationary sources that are required to obtain a Title V permit, and that 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

[9] A major source of HAPs is one that emits more than 10 tpy of any individual HAP, or more than 25 tpy of all HAPs combined.

maintain compliance with the emission limits. CAM is usually implemented through the Title V permit. The only equipment associated with the Amended CECP that may be affected by CAM are the oxidation catalysts that will be installed on the new gas turbines (if VOC control is claimed for use of oxidation catalysts).

Administering Agency: SDAPCD, with EPA Region 9 oversight.

5.1.3.1.2 State

CARB was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the CAAQS; to review the operations of the local APCDs; and to review and coordinate preparation of the SIP for achievement of the NAAQS. CARB has implemented the following state or federal stationary source regulatory programs in accordance with the requirements of the federal Clean Air Act and California H&SC:

- State Implementation Plan
- California Clean Air Act
- Toxic Air Contaminant Program
- Airborne Toxic Control Measure for Stationary Compression-Ignition Engines
- Nuisance Regulation
- Air Toxics "Hot Spots" Act
- CEC and CARB Memorandum of Understanding

State Implementation Plan

Authority: H&SC §39500 et seq.

Requirements: The SIP demonstrates the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines, as required by the federal Clean Air Act. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules or revise existing rules to demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in attainment of the NAAQS. The relevant SDAPCD Rules and Regulations that have been incorporated into the SIP are discussed with the local LORS below.

Administering Agency: SDAPCD, with CARB and EPA Region 9 oversight.

California Clean Air Act

Authority: H&SC §40910–40930

Requirements: Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained. The relevant components of the SDAPCD Air Quality Plan are discussed with the local LORS.

Administering Agency: SDAPCD, with CARB oversight.

Toxic Air Contaminant Program

Authority: H&SC §39650–39675

Requirements: Adopted in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants (TAC) and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. CARB assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk

assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to include the 187[10] federally identified hazardous air pollutants as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions.

Administering Agency: CARB

Airborne Toxic Control Measure for Stationary Compression-Ignition Engines

Authority: Title 17, California Code of Regulations, §93115

Requirements: The purpose of the airborne toxic control measure (ATCM) is to reduce diesel particulate matter and criteria pollutant emissions from stationary diesel-fueled compression ignition engines. The ATCM applies to stationary compression-ignition engines with a rating greater than 50 brake horsepower. The ATCM requires the use of CARB-certified diesel fuel or equivalent, and limits emissions from, and operations of, compression ignition engines.

Administering Agency: SDAPCD and CARB

Nuisance Regulation

Authority: H&SC §41700

Requirements: Provides 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."

Administering Agency: SDAPCD and CARB

Air Toxic "Hot Spots" Act

Authority: H&SC §44300–44384; 17 CCR §93300–93347

Requirements: Adopted in 1987, the Air Toxics "Hot Spots" Information and Assessment Act supplements the toxic air contaminant program, by requiring the development of a statewide inventory of air toxics emissions from stationary sources. The program requires affected facilities to prepare (1) an emissions inventory plan that identifies relevant air toxics and sources of air toxics emissions; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement risk management plans to reduce the associated health risks. This program is implemented at the local level with state oversight.

Administering Agency: SDAPCD and CARB

CEC and CARB Memorandum of Understanding

Authority: California Public Resources Code §25523(a); 20 CCR §1752, 1752.5, 2300-2309 and Div. 2, Chap. 5, Art. 1, Appendix B, Part (k)

[10] Methyl ethyl ketone was removed from the list on December 19, 2005 (http://www.epa.gov/ttn/atw/pollutants/atwsmod.html, accessed April 9, 2006).

Requirements: Provides for the inclusion of requirements in the CEC's decision on an AFC to assure protection of environmental quality; the application is required to include information concerning air quality protection.

Administering Agency: CEC

California Climate Change Regulatory Program

Authority: Stats. 2006, Ch. 488 and H&SC §38500–38599

Requirements: The State of California adopted the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) on September 27, 2006, which requires sources within the state to reduce carbon emissions to 1990 levels by the year 2020. Pursuant to this statutory authority, CARB has adopted regulations to limit GHG emissions from electric power plants and other specific source categories through a cap-and-trade program. In addition, CARB has adopted regulations requiring the calculation and reporting of GHG emissions from subject facilities.

The annual GHG emission reports to CARB for subject facilities must include the project's emission rates of greenhouse gases (CO_2, CH_4, N_2O, and SF_6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources.

On January 25, 2007, the Public Utilities Commission (PUC) and CEC jointly adopted a Greenhouse Gas Emissions Performance Standard in an effort to help mitigate climate change. The Emissions Performance Standard is a facility-based emissions standard requiring that all new long-term commitments for baseload generation to serve California consumers be with power plants that have emissions no greater than a combined-cycle gas turbine plant. That level is established at 1,100 pounds of CO_2 per megawatt-hour (or 0.50 MT CO_2 per megawatt-hour). As discussed under CCR Title 20, Chapter 11, Sections 2900, 2901(b), 2902(a), and 2905(a), this GHG Emissions Performance Standard applies only to baseload generating plants (a power plant that is designed and intended to provide electricity at an annualized plant capacity factor of at least 60 percent net generation available for sale). Because the Amended CECP's annual capacity factor will be below 60 percent, this Emissions Performance Standard is not applicable to the project. Consequently, there will be no further discussion of this GHG Emissions Performance Standard in this document.

Administering Agencies: CARB and CEC.

5.1.3.1.3 Local

When the state's air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. There are three different types of districts: county (including the SDAPCD), regional, and unified. In addition, special AQMDs, with more comprehensive authority over non-vehicular sources, as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California. Local districts have principal responsibility for the following:

- Developing plans for meeting the NAAQS and CAAQS;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution;
- Enforcing air pollution statutes and regulations governing non-vehicular sources; and
- Developing programs to reduce emissions from indirect sources.

San Diego Air Quality Plans

Authority: H&SC §40914

Requirements: Air quality plans define the proposed strategies, including stationary source and transportation control measures and new source review rules that will be implemented to attain and maintain the state ambient air quality standards. The relevant stationary source control measures and new source review requirements are discussed with SDAPCD Rules and Regulations.

Administering Agency: SDAPCD with EPA Region 9 and CARB oversight.

San Diego Air Pollution Control District Rules and Regulations

Authority: H&SC §4000 et seq., H&SC §40200 et seq., indicated SDAPCD Rules

Requirements: Establishes procedures and standards for issuing permits; establishes standards and limitations on a source-specific basis.

Administering Agency: SDAPCD with EPA Region 9 and CARB oversight.

Authority to Construct. Rule 10 (Permits Required) specifies that any facility installing nonexempt equipment that causes or controls the emission of air pollutants must first obtain an Authority to Construct from the SDAPCD. Under Rule 20.5 (h) (Power Plants), the District's Final Determination of Compliance acts as an authority to construct for a power plant upon approval of the Amended CECP by the CEC.

Review of New or Modified Sources. Rule 20.3 (New Source Review – Major Stationary Sources and PSD Sources) implements the federal NSR and PSD programs, as well as the new source review requirements of the California Clean Air Act. The rule contains the following elements:

- BACT and Lowest Achievable Emission Rates (LAER);
- Emission offsets; and
- Air quality impact analysis (AQIA).

Best Available Control Technology. BACT must be applied to any new or modified source resulting in an emissions increase exceeding any SDAPCD BACT threshold shown in Table 5.1-12.

TABLE 5.1-12
SDAPCD BACT and LAER Emission Thresholds

Pollutant	BACT Threshold (lb/day)	LAER Major Source Threshold (tpy)	LAER Major Modification Threshold (tpy)
CO	N/A[a]	N/A[b]	N/A[b]
NOx	10	50	25
PM_{10}	10	100	15
SO_2	10	100	40
VOC	10	50	25

[a] SDAPCD regulates BACT for CO under the PSD component of Rule 20.3.

[b] CO is an attainment pollutant and therefore not subject to LAER requirements.

The SDAPCD defines BACT as the most stringent emission limitation or control technique that:

- Has been proven in field application and that is cost-effective unless not achievable; or
- Has been demonstrated, but not necessarily proven, in field applications, and that is cost-effective; or
- Is any control equipment, process modification, change in raw material including alternate fuels, and substitution of equipment or processes with any equipment or processes (or any combination of these) determined to be technologically feasible and cost-effective; or

- Is contained in any SIP approved by EPA for such emission unit category, unless demonstrated to not be proven in field application, not be technologically feasible, or not be cost-effective.

LAER must be applied to any federal nonattainment pollutants (or their precursors) at new major sources or major modifications exceeding any emission threshold shown in Table 5.1-12. LAER is more stringent than BACT because it does not contain restrictions for cost-effectiveness. Only NOx and VOCs are federal nonattainment precursors in SDAPCD and therefore potentially subject to LAER. The SDAPCD defines LAER as:

- The most stringent emission limitation that is achieved in practice by such class or category of emission unit; or
- The most stringent emission limitation, or most effective emission control device or technique, contained in any SIP approved by the EPA for such emission unit class or category unless demonstrated to not be achievable; or
- BACT.

Emission Offsets. A new or modified source resulting in emission increases above the major source or major modification emission thresholds, as shown in Table 5.1-13, must offset emission increases of federal nonattainment pollutants (and their precursors) at a ratio of 1.2 to 1. If existing equipment is shut down at a source as part of a facility modification, the reductions in emissions from those shutdowns are subtracted from the increases associated with the new equipment to determine the net emissions increase subject to offset requirements. San Diego County is classified as a federal nonattainment area for the 8-hour ozone standard. Therefore, emissions of NOx and VOCs, as precursors to ozone, are subject to the emission offset requirements. VOC emission reductions may be used to offset NOx emission increases at an offset ratio of 2 to 1.

TABLE 5.1-13
SDAPCD Offset Emission Thresholds

Pollutant	Major Source Threshold [a] (tpy)	Major Modification Threshold [b] (tpy)
NOx	50	25
SOx	N/A[c]	N/A[c]
CO	N/A[c]	N/A[c]
VOC	50	25
PM_{10}	N/A[c]	N/A[c]

[a]SDAPCD Regulation II, Rule 20.1, Table 20.1-6

[b]SDAPCD Regulation II, Rule 20.1, Table 20.1-5

[c]Not applicable because CO, SOx, and PM_{10} are federal attainment pollutants and therefore are not subject to offset requirements.

Air Quality Impact Analysis (AQIA). An AQIA must be conducted to evaluate impacts on ambient air quality of emission increases from new or modified projects exceeding any AQIA threshold shown in Table 5.1-14. Project emissions must not cause a new exceedance or contribute significantly to an existing exceedance of any ambient air quality standard.

TABLE 5.1-14
SDAPCD AQIA EMISSION Thresholds*

Pollutant	Emission Thresholds		
	lb/hr	lb/day	tpy
CO	100	550	100
NOx	25	250	40
PM_{10}	N/A	100	15
SOx	25	250	40

*SDAPCD Regulation II, Rule 20.3, Table 20.3-1.

Toxic Risk Management. Rule 1200 (Toxic Air Contaminants – New Source Review) provides a mechanism for evaluating the potential impact of TAC (also called non-criteria pollutant) air emissions from new, modified, and relocated sources in the SDAPCD. The rule requires a demonstration that the source will not exceed the risk thresholds summarized in Table 5.1-15. As shown in this table, there are different acceptable risk levels depending upon whether a project uses Toxics-Best Available Control Technology (T-BACT). The Amended CECP will use T-BACT with the use of natural gas and installation of an oxidation catalyst system.

TABLE 5.1-15
SDAPCD Health Risk Thresholds

Risk Criterion	Risk Threshold
Cancer Risk with T-BACT	1×10^{-5}
Cancer Risk without T-BACT	1×10^{-6}
Acute Noncarcinogenic Health Hazard Index	1
Chronic Noncarcinogenic Health Hazard Index	1

CEC Review. Rule 20.5 establishes a procedure for coordinating SDAPCD review of power plant projects with the CEC's AFC, and Small Power Plant Exemption (SPPE) processes. Under this rule, the SDAPCD reviews the AFC/SPPE and issues a Determination of Compliance for a proposed project. Upon approval of the proposed project by the CEC, this Determination of Compliance is equivalent to an Authority to Construct. A Permit to Operate is issued following demonstration of compliance with all permit conditions.

Prevention of Significant Deterioration. Rule 20.3 (New Source Review – Major Stationary Sources and PSD Sources) implements the federal nonattainment NSR and PSD programs. Currently the PSD program in the SDAPCD is implemented by EPA Region 9 based on the federal version of the PSD regulations (40 CFR 52.21). On April 4, 2012, the SDAPCD approved a new PSD Regulation (Rule 20.3.1) that adopts the federal PSD regulations by reference. The SDAPCD expects that the EPA will approve Rule 20.3.1 in the near future. While the PSD program in the SDAPCD is implemented based on the federal PSD regulations (either by EPA Region 9 or by SDAPCD in the future under Rule 20.3.1), the SDAPCD will continue to require facilities to comply with the various requirements of Rule 20.3 (including those identified as PSD requirements).

Acid Rain Permit. Rule 1412 (Federal Acid Rain Program Requirements) adopts, by reference, the federal requirements of 40 CFR Part 72, which requires that certain subject facilities comply with maximum operating emissions levels for SO_2 and NOx, and monitor SO_2, NOx, and carbon dioxide emissions and exhaust gas flow rates. A Phase II acid rain facility, such as a new power plant project, must obtain an acid rain permit. A permit application must be submitted to the SDAPCD at least 24 months before operation of the new unit commences. The application must present all relevant Phase II sources at the facility, a compliance plan for each unit, applicable standards, and an estimated commencement date of operations. The Amended CECP will be a modification to an existing Phase II facility. Consequently, an application for a modification to the existing acid rain permit will be submitted according to the timeframe discussed above.

Federal Operating Permit. Rule 1414 (Applications) requires new or modified major facilities, NSPS sources, NESHAP sources, and/or Phase II acid rain facilities to obtain an operating permit containing the federally enforceable requirements mandated by Title V of the 1990 Clean Air Act Amendments. A permit application for a new or modified source must be submitted to the SDAPCD within 12 months of commencing operation. The application must present a process description identifying all new stationary sources at the facility, applicable regulations, estimated emissions, associated operating conditions, alternative operating scenarios, a facility compliance plan, and a compliance certification. The Amended CECP will be a modification to an existing Title V facility. Consequently, an application for a modification to the existing Title V permit will be submitted according to the timeframe discussed above.

New Source Performance Standards. Regulation X (Standards of Performance for New Stationary Sources) adopts, by reference, the federal standards of performance for new or modified stationary sources. The applicability of the New Source Performance Standards is discussed above under the federal regulations.

SDAPCD Prohibitory Rules

The general prohibitory rules of the SDAPCD applicable to the Amended CECP include the following:

Rule 50 – Visible Emissions. Prohibits visible emissions as dark as, or darker than, Ringelmann No. 1 for periods greater than three minutes in any hour.

Rule 51 – Nuisance. Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property.

Rule 52 – Particulate Matter Emission Standards. Prohibits PM emissions in excess of 0.10 grains per dry standard cubic foot (gr/dscf). This rule does not apply to stationary internal combustion engines.

Rule 53 – Combustion Contaminants. Prohibits sulfur emissions, calculated as SO_2, in excess of 0.05% by volume on a dry basis (500 parts per million by volume [ppmv]), and combustion particulate emissions in excess of 0.10 gr/dscf at 12% CO_2.

Rule 55 – Fugitive Dust Control. Requires control of dust emissions during construction activities. It prohibits visible dust emissions beyond the property line for periods aggregating more than 3 minutes in any 60-minute period, and minimization and daily removal of roadway dust.

Rule 62 – Sulfur Content of Fuels. Prohibits the burning of gaseous fuel with a sulfur content of more than 10 gr/100 scf and liquid fuel with a sulfur content of more than 0.05% sulfur by weight.

Rule 69.3 – Stationary Gas Turbines. Limits NOx emissions from a gas turbine to 42 ppmv at 15% O_2. The limit does not apply during a startup or shutdown period not to exceed 120 minutes.

Rule 69.3.1 – Stationary Gas Turbines. Limits NOx emissions from stationary gas turbines rated greater than or equal to 10 MW with post-combustion controls to 9 x E/25 ppm at 15%O_2, where E is the unit's thermal efficiency.

Rule 69.4.1 – Stationary Reciprocating Internal Combustion Engines. Limits CO, NOx, and VOC emissions from stationary reciprocating internal combustion engines rated greater than or equal to 50 bhp. However, emergency equipment operating less than or equal to 52 hours per year for testing or maintenance purposes and less than or equal to 200 hours per year for any purpose are exempt from the emission limits of Rule 69.4.1.

All applicable LORS are summarized in Table 5.1-16 along with identification of the section that discusses compliance with each requirement.

TABLE 5.1-16
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
Federal					
Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42 USC §7470-7491), Title 40 Code of Federal Regulations (CFR) Parts 51 & 52 (Prevention of Significant Deterioration Program)	Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to pollutants for which ambient concentrations are lower than NAAQS.	SDAPCD (expected delegation) with EPA oversight	PSD Permit for a New Major Source or major modification.	Proposed project will only trigger for GHG emissions.	5.1.3.1.1
CAA §171-193, 42 USC §7501 et seq. (New Source Review)	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than NAAQS.	SDAPCD with EPA oversight	Determination of Compliance (DOC) with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.1
CAA §401 (Title IV), 42 USC §7651 (Acid Rain Program)	Requires reductions in NOx and SO_2 emissions.	SDAPCD with EPA oversight	Acid Rain program requirements included in Determination of Compliance, Permit to Operate, and Title V permit.	Meet compliance deadlines listed in regulations.	5.1.3.1.1
CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	SDAPCD with EPA oversight	Modified Title V permit after review of application.	Permit application to modify existing Title V permit will be submitted within 12 months after commencement of operation.	5.1.3.1.1
CAA §111, 42 USC §7411, 40 CFR Part 60 (New Source Performance Standards – NSPS)	Establishes national standards of performance for new stationary sources.	SDAPCD with EPA oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.1

TABLE 5.1-16
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
State					
H&SC §44300-44384; California Code of Regulations (CCR) §93300-93347 (Toxic "Hot Spots" Act)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Screening HRA submitted as part of PTA.	5.1.3.1.2
California Public Resources Code §25523(a); 20 CCR §§1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that CEC's decision on PTA include requirements to assure protection of environmental quality; PTA required to address air quality protection.	CEC	Final Certification with conditions limiting emissions.	SDAPCD issuance of DOC precedes CEC approval of PTA.	5.1.3.1.2
17 CCR § 93115 (ATCM for Stationary Compression Ignition Engines)	Establishes emission and operational limits for diesel-fueled stationary compression ignition engines.	SDAPCD and CARB	DOC with conditions limiting emissions and operation.	Agency approval to be obtained before start of construction.	5.1.3.1.2
Local					
SDAPCD Rule 20.3 (New Source Review – Major Stationary Sources and PSD Sources)	NSR: Requires that preconstruction review be conducted for all proposed new or modified sources of air pollution, including BACT, emissions offsets, and air quality impact analysis.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 1200 (Toxics – New Source Review)	Requires that preconstruction review be conducted for all proposed new or modified sources of toxic air contaminants, including T-BACT, and a health risk assessment.	SDAPCD with EPA oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 1414 (Title V Applications)	Implements operating permits requirements of CAA Title V.	SDAPCD with EPA oversight	Issues modified Title V permit after review of application.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 1412 (Federal Acid Rain Program Requirements)	Implements acid rain regulations of CAA Title IV.	SDAPCD with EPA oversight	Title IV requirements included in DOC, Permit to Operate, and Title V permit.	Application to be made within 12 months of start of facility operation.	5.1.3.1.3

TABLE 5.1-16
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
SDAPCD Rule 50 (Visible Emissions)	Limits visible emissions to no darker than Ringelmann No. 1 for periods greater than 3 minutes in any hour.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained prior to commencement of operation.	5.1.3.1.3
SDAPCD Rule 51 (Nuisance)	Prohibits emissions in quantities that adversely affect public health, other businesses, or property.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 52 (Particulate Matter)	Limits PM emissions from stationary sources (does not apply to I/C engines including gas turbines).	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Proposed new equipment exempt from this regulation.	5.1.3.1.3
SDAPCD Rule 53 (Combustion Contaminants)	Limits SO_2 emissions from stationary sources.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 55 (Fugitive Dust)	Limits visible dust emissions from construction activities.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 62 (Sulfur Content of Fuels)	Limits the sulfur content of fuels combusted in stationary sources.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 69.3 (Stationary Gas Turbines)	Limits NOx emissions from stationary gas turbines.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 69.3.1 (Stationary Gas Turbines)	Limits NOx emissions from stationary gas turbines.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Rule 69.4.1 (Stationary Reciprocating Internal Combustion Engines)	Limits CO, NOx, and VOC emissions from stationary reciprocating internal combustion engines (does not apply to limited use emergency engines).	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Proposed new engine is exempt from this regulation due to operating limits.	5.1.3.1.3

TABLE 5.1-16
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
SDAPCD Regulation X (New Source Performance Standards: Subpart KKKK, Stationary Gas Turbines)	Requires monitoring of fuel, other operating parameters; limits NOx and SO_2 and PM emissions, requires source testing, emissions monitoring, and recordkeeping.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3
SDAPCD Regulation X (New Source Performance Standards: Subpart IIII, Stationary Compression Ignition Internal Combustion Engines)	Limits VOC, NOx, CO, and PM emissions and requires recordkeeping.	SDAPCD with CARB oversight	DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.3.1.3

Attainment Status. Table 5.1-17 summarizes the attainment status of the San Diego Air Basin based on the measured existing air quality described in Section 5.1.2.5, the ambient air quality standards presented in Table 5.1-1, and the responsibilities of EPA and CARB discussed in Sections 5.1.3.1.1 and 5.1.3.1.2, respectively.

TABLE 5.1-17
Ambient Air Quality Standard Attainment Status in San Diego Air Basin

Pollutant	Averaging Time	California	National
Ozone	1 hour	Nonattainment	No NAAQS
	8 hours	Nonattainment	Nonattainment
Carbon Monoxide	8 hours	Attainment	Unclassified/Attainment
	1 hour	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Annual Average	Attainment	Unclassified/Attainment
	1 hour	Attainment	Unclassified/Attainment
Sulfur Dioxide	Annual Average	No CAAQS	No NAAQS
	24 hours	Attainment	No NAAQS
	3 hours	No CAAQS	No NAAQS
	1 hour	Attainment	Attainment
Respirable Particulate Matter (10 Microns)	Annual Arithmetic Mean	Nonattainment	Unclassified/Attainment
	24 hours	Nonattainment	Unclassified/Attainment
Fine Particulate Matter (2.5 Microns)	Annual Arithmetic Mean	Nonattainment	Unclassified/Attainment
	24 hours	No CAAQS	Unclassified/Attainment
Sulfates	24 hours	Attainment	No NAAQS
Lead	30 days	Attainment	No NAAQS
	Calendar Quarter	No CAAQS	Unclassified/Attainment
	Rolling 3-Month Average	No CAAQS	Unclassified/Attainment
Hydrogen Sulfide	1-hour	Unclassified/Attainment	No NAAQS
Visibility Reducing Particles	8-hour	Unclassified/Attainment	No NAAQS

Sources: CARB, 2014d and EPA, 2013

5.1.4 Environmental Analysis

Ambient air quality impact analyses for the Amended CECP have been conducted to satisfy the SDAPCD, EPA, and CEC requirements for analysis of impacts from criteria pollutants (NO_2, CO, PM_{10}, $PM_{2.5}$, and SO_2) and noncriteria pollutants during project construction and operation. The analyses cover each phase of the Amended CECP. Section 5.1.4.1 gives an overview of the analytical approach. Section 5.1.4.2 presents the emissions for operation of the CECP, and Section 5.1.4.3 gives the ambient air quality impacts of operation. Section 5.1.4.4 discusses the Screening Health Risk Assessment. Section 5.1.4.5 provides the demolition/construction impacts analysis. As shown in Tables 5.1-25, 5.1-40, and 5.1-41, there are significant net reductions criteria pollutant, GHGs, and total nitrogen emissions when comparing the Amended CECP to the Licensed CECP.

5.1.4.1 Overview of the Analytical Approach to Estimating Facility Impacts

The following sections describe the emission sources that have been evaluated, the results of the ambient impact analyses, and the evaluation of the Amended CECP compliance with the applicable air quality regulations, including the District's NSR requirements. These analyses are designed to confirm that the Amended CECP's design features lead to less-than-significant impacts even with the following conservative analysis assumptions and procedures: maximum allowable emission rates, project operating schedules that lead to maximum emissions, worst-case meteorological conditions, and the worst-observed existing air quality added to the highest potential ground-level impact from modeling—even when all of these situations could not physically occur at the same time.

5.1.4.1.1 Emitting Units

The new gas turbines proposed for the Amended CECP will be GE LMS 100 simple-cycle gas turbines equipped with evaporative cooling. Each unit will include an air-cooled fin-fan cooler and associated support equipment. The six units will provide a total nominal generating capacity of 632 MW net output.[11] Each gas turbine will be equipped with water injection and a selective catalytic reduction (SCR) system for NOx control. An oxidation catalyst will be used to reduce CO emissions. Particulate, SOx, and VOC emissions will be minimized through the use of natural gas as the fuel. Emission control systems will operate at all times except during startups and shutdowns. Specifications for the new gas turbines are summarized in Table 5.1-18.

As discussed above, the use of natural gas as the sole fuel will minimize emissions of VOCs, SOx, and PM. Table 5.1-19 summarizes a typical analysis for the natural gas fuel to be used by the gas turbines.

The Amended CECP will also include the installation of a new diesel emergency fire pump engine rated at 244 horsepower (maximum fuel consumption rate of 14.8 gallons per hour) and a new diesel emergency generator engine rated at 500 kw (maximum fuel consumption rate of 35.9 gallons per hour). The auxiliary equipment associated with the Amended CECP will also include the installation of one 20,000-gallon aqueous ammonia (19%) storage tank.

Facility Operations

Gas turbine performance specifications were developed for three ambient temperature scenarios: extreme hot temperature (96°F), annual average temperature (60°F), and extreme low temperature (44°F). The annual average temperature scenario was used to characterize maximum hourly emissions during normal operation because it has the highest hourly heat input and emission rates. The plant may be operated under a wide variety of conditions over its life. The worst-case hourly emissions assume all six gas turbines will undergo startups simultaneously with no operation of the emergency generator engines. Maximum daily operations are based on each gas turbine undergoing four startups/shutdowns with the units operating at full-load for the remaining hours of the day and each emergency engine operating for 30 minutes for testing purposes. Maximum annual emissions are based on each gas turbine operating approximately 2,700 hours per year (including up to 400 startups/shutdowns per year) at annual average full-load operation. Annual emissions include the emergency engines each operating a total of 200 hours per year.

[11] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling.

TABLE 5.1-18
New Simple-Cycle Gas Turbine Design Specifications

Manufacturer	GE
Model	LMS 100PA
Fuel	Natural gas
Design Ambient Temperature*	60°F
Maximum Gas Turbine Heat Input Rate*	984 MMBtu/hr at HHV (each turbine)
Stack Exhaust Temperature*	781.7°F
Exhaust Flow Rate*	1,022,475 acfm
Exhaust O_2 Concentration, dry volume*	13.18%
Exhaust CO_2 Concentration, dry volume*	4.44%
Exhaust Moisture Content, wet volume*	6.94%
Emission Controls	Water injection and SCR; oxidation catalyst

*This ambient temperature at 100% load results in maximum heat input/power output; exhaust characteristics shown reflect this ambient temperature and load.

TABLE 5.1-19
Nominal Fuel Properties – Natural Gas

Component Analysis		Chemical Analysis	
Component	**Average Concentration, Volume**	**Constituent**	**Percent by Weight**
Methane (CH_4)	95.870 %	Carbon (C)	72.98 %
Ethane (C_2H_6)	1.808 %	Hydrogen (H)	23.86 %
Propane (C_3H_8)	0.336 %	Nitrogen (N)	1.05 %
Butane C_4H_{10})	0.122 %	Oxygen (O)	2.11 %
Pentane (C_5H_{12})	0.043 %	Sulfur (S)	0.75 gr/100 scf (short-term average) 0.25 gr/100 scf (long-term average)
Hexane (C_6H_{14})	0.026 %		
Nitrogen (N_2)	0.682 %	Higher Heating Value	1,020 Btu/scf 22,856 Btu/lb
Carbon Dioxide (CO_2)	1.113 %		
Sulfur (S)	<0.00 %		

Heat input levels for the gas turbines, as summarized in Table 5.1-20, correspond to the calculated unit and project emission levels.

TABLE 5.1-20
Maximum Proposed Project Fuel Use – CTGs (MMBtu)

Period	Gas Turbines (each)	Total Fuel Use (six units)
Per Hour	984	5,902
Per Day	23,606	141,638
Per Year	2,655,720	15,934,320

MMBtu = million Btu

Emissions and operating parameters for the gas turbines under various loads and ambient conditions are shown in Appendix 5.1B. Emissions and operating parameters for the emergency engines are also shown in Appendix 5.1B.

5.1.4.2 Emissions Calculations

This section presents calculations of emissions increases from the proposed Amended CECP generating and auxiliary equipment and of the emissions reductions from the shutdown of the existing boilers at the EPS for the purpose of demonstrating rule compliance. Tables containing the detailed calculations are included in Appendix 5.1B.

5.1.4.2.1 Criteria Pollutant Emissions: Amended CECP

The gas turbine and emergency engine emission rates have been calculated from vendor data, project design criteria, and established emission calculation procedures. The emission rates for the gas turbines and emergency engines are shown in the following tables. The detailed emission calculations for these units are shown in Appendix 5.1B.

Gas Turbine Emissions during Commissioning

The commissioning period begins when the gas turbines are prepared for first fire and ends upon successful completion of performance/compliance testing. The commissioning process entails several relatively short periods of operation prior to and following installation of the emission control systems. During these periods, NOx emissions will be higher than normal operating levels because the NOx emission control system would not be fully operational and because the gas turbine would not be tuned for optimum performance. CO emissions would also be higher than normal because turbine performance would not be optimized and the CO emissions control system would not be fully operational.

Gas turbine commissioning activities can be broken down into several separate test phases, as shown on the commissioning summary table included in Appendix 5.1B. The emission estimates shown in the detailed commissioning summary table in Appendix 5.1B are based on vendor-supplied emission rates. At the conclusion of the commissioning period, emissions rates will be at the normal operating levels discussed in the following paragraphs. While the required continuous emissions monitoring system (CEMS) for NOx and CO will be calibrated and operating during the commissioning test phases, the CEMS will be not certified until the end of the commissioning period.

The commissioning of the six new CTGs is expected to occur over approximately a four-month period. During this commissioning period, it will be necessary to continue to operate the existing EPS Units 1 through 5/peaker gas turbine. Consequently, as discussed in Section 5.1.4.3, the commissioning air quality modeling analysis performed for the Amended CECP includes the simultaneous operation of the new CTGs (commissioning tests) and the existing EPS units. Once the commissioning tests are complete and the new CTGs are available for commercial operation, the existing units will no longer be operated and will be removed from service.

Gas Turbine Emissions during Normal Operations

Emissions of NOx, CO, and VOC were calculated from emission limits (in ppmv at 15% O_2) and the exhaust flow rates. The NOx emission limit reflects the application of water injection and SCR. The VOC and CO emission limits reflect the use of good combustion practices and, for CO, an oxidation catalyst. SOx, PM_{10}, and $PM_{2.5}$ emission rates are based on the use of natural gas as the fuel and good combustion practices. Emissions are based on the heat input rates shown in Table 5.1-20.

SOx emissions were calculated from the heat input (in MMBtu) and a SOx emission factor (in lb/MMBtu). The short-term SOx emission factor of 0.0021 lb/MMBtu was derived from the maximum allowable (i.e., tariff limit) fuel sulfur content of 0.75 grains per 100 standard cubic feet (gr/100 scf). The annual average SOx emissions were based on the expected annual average sulfur grain loading of 0.25 gr/100 scf.

Maximum hourly PM_{10} emissions are based on vendor-supplied emission levels. $PM_{2.5}$ emissions were determined based on the assumption that all gas turbine exhaust particulate is less than 2.5 microns in diameter.

Emission rates for the CTGs are summarized in Table 5.1-21. The BACT analysis upon which the emission factors are based is presented in Appendix 5.1C and summarized in Section 5.1.2.6.3.

Gas Turbine Emissions During Startup and Shutdown

Maximum emission rates expected to occur during a gas turbine startup or shutdown are shown in Table 5.1-22. PM and SO_2 emissions are not included in this table because emissions of these pollutants will not be higher during startup and shutdown than during normal gas turbine operation. During a CTG startup, there are approximately 25 minutes with elevated emissions (emissions higher than during normal operation). Consequently, the hourly emission rates during CTG startups are based on 25 minutes of elevated emissions followed by 35 minutes of normal operating emission levels. During a CTG shutdown, there are approximately 13 minutes with elevated emissions (emissions higher than during normal operation). Consequently, the hourly emission rates during CTG shutdowns are based on 47 minutes of normal operating emission levels followed by 13 minutes of elevated emission levels.

TABLE 5.1-21
Maximum Hourly Emission Rates: CTGs

Pollutant	ppmvd at 15% O_2	lb/MMBtu	lb/hr
Each Gas Turbine[a]			
NOx	2.5	0.0091	9.00
SO_x (short term)	n/a	0.0021	2.07
SO_x (long term)	n/a	0.0007	0.69
CO	4.0	0.0088	8.80
VOC	2.0	0.0025	2.50
$PM_{10}/PM_{2.5}$[b]	n/a	0.0036	3.50

[a]Emission rates shown reflect the highest value at any operating load during normal operation (excluding startups/shutdowns).
[b]100 percent of PM_{10} emissions assumed to be emitted as $PM_{2.5}$.

TABLE 5.1-22
CTG Startup and Shutdown Emission Rates*

	NOx	CO	VOC
CTG Startup, lbs/hr, per gas turbine	20.0	12.5	3.5
CTG Shutdown, lbs/hr, per gas turbine	7.7	10.3	4.4
CTG Startup/Shutdown/Restart, lbs/hr, per gas turbine	28.2	17.3	6.2

*Startup and shutdown emission rates reflect the maximum hourly emissions during an hour in which a startup, shutdown, or both occur.

The Project Owner also expects that periodically there could be an hour when a startup, shutdown, and restart all occur. For this hour, there would be 25 minutes of elevated emissions due to the startup, 13 minutes of elevated emissions due a shutdown, followed by 22 minutes of elevated emissions due to the restart. While this situation is expected to occur very infrequently, from an hourly emission standpoint this would represent worst-case hourly emissions, and as such it is included in the ambient air impact analysis for the Amended CECP. The detailed CTG startup hourly emission calculations are shown in the startup/shutdown summary tables in Appendix 5.1B. Included in this appendix are the startup/shutdown emission levels supplied by the vendor for the gas turbines.

Criteria Pollutant Emissions Summary

The calculation of maximum project-related emissions shown in Table 5.1-23 is based on the CTG emission rates and heat input levels shown in the above tables and the following assumptions:

- Worst-case hour: All six gas turbines will undergo a startup/shutdown/restart sequence simultaneously in one hour. The emergency engines will not be operated during this hour.
- Worst-case day: Each gas turbine will undergo 4 startup hours (hours including a startup), 4 shutdown hours, and 16 hours of normal operation. The emergency engines will each be operated for 30 minutes for testing/maintenance purposes.
- Worst-case year: Each gas turbine will undergo 400 startups, 400 shutdowns, with a total of 2,700 hours of operation per year (including startup/shutdown periods). The emergency engines will each be operated a total of 200 hours.

The assumptions used in calculating maximum hourly, daily, and annual emissions from the new facility are shown in Appendix 5.1B.

The cooling towers proposed for the project will be a dry design. Therefore, there will be no emissions associated with this equipment. The only other source of criteria pollutant emissions for project operations will be fugitive leaks from the compressors used to increase the natural gas pressure required by the gas turbines. These leaks will result in a small amount of VOC emissions to the atmosphere. The gas compressor fugitive emission calculations are included in Appendix 5.1B.

The maximum hourly, daily, and annual emissions in Table 5.1-23 are used in the air dispersion modeling to calculate the maximum potential ground-level concentrations contributed by the Amended CECP to the ambient air.

5.1.4.2.2 Emissions for Existing Boilers at the Encina Power Station

The EPS consists of five natural-gas-fired steam boilers (Units 1 through 5), and one simple-cycle peaking gas turbine, rated at the following nominal levels: 113 MW, 109 MW, 115 MW, 293 MW, 315 MW, and 18 MW, respectively. As part of the Amended CECP, the existing boiler Units 1 through 5 and the peaker gas turbine at the EPS will be shut down and retired prior to commercial operation of the new equipment.

To determine the actual emissions associated with the operation of the existing EPS units, it is necessary to determine the baseline period. The three regulatory programs that discuss baseline periods for air quality purposes are CEQA, the SDAPCD NSR regulations, and the federal PSD regulations. These three baseline periods are summarized below:

- **CEQA** – Under the CEQA regulations there is no specific baseline period defined or required. The CEQA baseline period needs to reflect the actual conditions that exist at the start of the environmental review process for a project.

TABLE 5.1-23
Maximum Emissions From New Equipment

	Pollutant				
Emissions/Equipment	**NOx**	**CO**	**VOC**	**$PM_{10}/PM_{2.5}$**	**SOx**
Maximum Hourly Emissions[a]					
Gas Turbines[a]	169.4	103.9	37.0	21.0	12.4
Diesel Emergency Engines[b]	n/a	n/a	n/a	n/a	n/a
Gas Compressors	n/a	n/a	0.0	n/a	n/a
Total, pounds per hour =	**169.4**	**103.9**	**37.0**	**21.0**	**12.4**

TABLE 5.1-23
Maximum Emissions From New Equipment

	Pollutant				
Emissions/Equipment	**NOx**	**CO**	**VOC**	**$PM_{10}/PM_{2.5}$**	**SOx**
Maximum Daily Emissions[a]					
Gas Turbines	1,526.4	1,392.6	427.6	504.0	298.2
Diesel Emergency Engines	1.6	0.3	0.0	0.0	0.0
Gas Compressors	n/a	n/a	0.3	n/a	n/a
Total, pounds per day =	**1528.0**	**1392.9**	**427.9**	**504.0**	**298.2**
Maximum Annual Emissions[a]					
Gas Turbines	84.4	77.6	23.6	28.4	5.6
Diesel Emergency Engines	0.3	0.1	0.0	0.0	0.0
Gas Compressors	n/a	n/a	0.1	n/a	n/a
Total, tons per year =	**84.7**	**77.6**	**23.7**	**28.4**	**5.6**

[a]Maximum hourly, daily and annual gas turbine emission rates include emissions during startups/shutdowns.

[b]The diesel emergency engines will not be operated during a gas turbine startup and/or shutdown. Consequently, n/a is shown for all pollutants.

- **SDAPCD NSR** – Under SDAPCD NSR rules (Rule 20.1.d.2), the baseline period to establish the actual emissions for existing units is the most representative two-year period during the five years preceding the filing of a permit application with the SDAPCD.
- **Federal PSD** – Under the federal PSD regulations (40 CFR 52.21.b.48.1), the baseline period to establish the actual emissions for existing units is any consecutive 24-month period within the 5-year period preceding when actual construction of a new project begins. The EPA does allow the use of a different lookback period to calculate actual emissions if it is more representative of normal operation.

For CEQA purposes this analysis examines actual historical emissions for the existing EPS units averaged over the past 5 years, 10 years, and 12 years. The 12-year lookback period begins in 2002 which is consistent with the start of the baseline period used during the original permitting of the Licensed CECP. For both NSR and PSD purposes, the baseline emissions for the existing EPS units and the associated emissions reductions from the shutdown of these units are based on actual emissions during the most representative consecutive 2-year period during the 5 years preceding the filing of the PTA/SDAPCD permit application for the proposed project (2009 to 2013). The emission reductions associated with the shutdown of the existing units are shown in Table 5.1-24. The detailed calculation of the historical baseline emissions for the existing units at the EPS is included in Appendix 5.1B.

TABLE 5.1-24
Emissions for Existing Units (Maximum 2-Year Average for Period From 1/1/09 to 12/31/13)

	Pollutant (tpy)				
Emissions/Equipment	**NOx**	**CO**	**VOC**	**$PM_{10}/PM_{2.5}$**	**SOx**
Annual Emissions Encina Power Station					
Unit 1	5.5	33.7	3.3	4.6	0.4
Unit 2	6.5	39.7	3.5	4.9	0.4
Unit 3	6.5	18.7	4.0	5.5	0.4
Unit 4	15.6	10.8	8.3	11.5	0.9
Unit 5	23.9	75.8	12.0	16.5	1.3
Gas Turbine	0.3	0.4	0.0	0.1	0.0
Total	**58.3**	**179.1**	**31.1**	**43.0**	**3.4**

Net Changes in Criteria Pollutant Emissions for the Amended CECPt

Net emissions changes as a result of the proposed project are calculated on an annual basis for federal PSD, SDAPCD NSR, and CEQA purposes. These net emission changes are shown in Table 5.1-25. As shown on this table, there is significant net reduction in criteria pollutant emissions when comparing the Amended CECP to the Licensed CECP.

TABLE 5.1-25
Net Emissions Change for Amended CECP

	Pollutant (tpy)				
Emissions/Equipment	**NOx**	**CO**	**VOC**	**$PM_{10}/PM_{2.5}$**	**SOx**
Amended CECP vs. Shutdown of Existing Units					
Potential to Emit for New Equipment (Amended CECP)	84.7	77.6	23.7	28.4	5.6
Reductions from Shutdown of Existing Units	-58.3	-179.1	-31.1	-43.0	-3.4
Net Emission Change	**26.4**	**-101.5**	**-7.4**	**-14.6**	**2.2**
Amended CECP vs. Licensed CECP					
Potential to Emit for New Equipment (Amended CECP)	84.7	77.6	23.7	28.4	5.6
Potential to Emit for Licensed CECP*	163.1	641.5	52.8	96.0	10.0
Net Emission Change	**-78.4**	**-563.9**	**-29.1**	**-67.6**	**-4.4**

*This includes the emissions for the new equipment associated with the Licensed CECP (CEC June 2012 Approval of CECP, Air Quality Table-7) and the emissions for existing Units 4 and 5 (12-year lookback).

5.1.4.2.3 Non-Criteria Pollutant Emissions

Noncriteria pollutant emissions were estimated for the proposed gas turbines and emergency engines. These emissions are summarized in Table 5.1-26. The detailed noncriteria pollutant emissions calculations and the associated screening-level health risk assessment are included in Section 5.9, Public Health. Also shown below in Table 5.1-27 is a summary of the maximum potential to emit for noncriteria pollutants for the existing units at the facility. This information is provided for regulatory applicability purposes.

TABLE 5.1-26
Non-Criteria Pollutant Emissions for the New Equipment

Compound	**Emissions (tpy)**
Gas Turbines (six units)	
Ammonia (not a HAP)	54.73
Propylene (not a HAP)	4.33
Acetaldehyde	0.23
Acrolein	0.04
Benzene	0.07
1,3-Butadiene	0.00
Ethylbenzene	0.18
Formaldehyde	5.15
Hexane	1.45
Naphthalene	0.01
PAHs (other)	0.00
Propylene Oxide	0.17

TABLE 5.1-26
Non-Criteria Pollutant Emissions for the New Equipment

Compound	Emissions (tpy)
Toluene	0.75
Xylene	0.37
Subtotal HAPs	8.42
Subtotal All	67.48
Emergency Engines (two units)	
Diesel PM (not a HAP)	0.01
Acrolein	0.00
Subtotal HAPs	0.00
Subtotal All	0.01
Total HAPs (Proposed Project)	**8.42**
Total All Proposed Project)	**67.49**

TABLE 5.1-27
Non-Criteria Pollutant Emissions for the Existing Boiler Units 1, 2, 3, 4, 5, and Gas Turbine (Maximum 2-Year Avg. Over Past 5-Years)

Compound	Emissions (tpy)
Ammonia (not a HAP)	25.86
Benzene	0.01
Formaldehyde	0.44
Hexane	0.01
Naphthalene	0.00
Dichlorobenzene	0.01
Toluene	0.02
1,3-Butadiene	0.00
Acetaldehyde	0.00
Acrolein	0.00
Ethyl Benzene	0.00
PAHs (other)	0.00
Xylene	0.00
Total HAPs (Existing Facility)	**0.49**
Total All (Existing Facility)	**26.35**

5.1.4.2.4 Greenhouse Gas Emissions

Potential maximum annual GHG emissions for the operation of the Amended CECP were calculated using the calculation methods and emission factors from the EPA GHG Reporting Regulation.[12] Table 5.1-28 presents the estimated GHG emissions due to project operations in carbon dioxide equivalent [$CO2_e$]. Emissions of methane, nitrous oxide, and sulfur hexafluoride have been converted to carbon dioxide equivalents using GHG warming potentials of 25, 298, and 22,800 respectively. The estimated emissions include the combustion emissions for the six turbines and two emergency engines. They also include sulfur

[12] 40 CFR 98 (as revised on 11/29/13).

hexafluoride leakage emissions from eight new circuit breakers. The detailed GHG emission calculations are included in Appendix 5.1B.

TABLE 5.1-28
Project Greenhouse Gas Emissions

Unit	CO_2, metric tpy	CH_4, metric tpy	N_2O, metric tpy	SF_6, metric tpy	CO_2eq, metric tpy*	CO_2, metric tons/MWh
Gas Turbines	845,475	16	2	n/a		
Emergency Engines	102	0	0	n/a		
Circuit Breakers	n/a	n/a	n/a	$5.41x10^{-3}$		
Total =	845,577	16	2	0	846,574	0.48

*Includes CH_4, N_2O, and SF_6.

5.1.4.3 Air Quality Impact Analysis

The SDAPCD new source review regulations require the Applicant to prepare ambient air quality modeling analyses and other impact assessments. An ambient air quality impact assessment is also required by the CEC for CEQA review. These analyses are presented in this section.

5.1.4.3.1 Air Quality Modeling Methodology

An assessment of impacts from the Amended CECP on ambient air quality has been conducted using EPA-approved air quality dispersion models. These models use a mathematical description of atmospheric turbulent entrainment and dispersion to simulate the actual processes by which emissions are transported to ground-level areas.

Using conservative assumptions, the modeling was used to determine the maximum ground-level impacts of the Amended CECP. The results were compared with state and federal ambient air quality standards and PSD significance levels. If the standards are not exceeded in the analysis, then the modified facility will cause no exceedances under any operating or ambient conditions, at any location, under any meteorological conditions. In accordance with the air quality impact analysis guidelines developed by EPA[13] and CARB,[14] the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain;
- Aerodynamic effects (downwash) due to nearby building(s) and structures; and
- Impacts from inversion breakup (fumigation).

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. A stack plume can be impacted by downwash when wind speeds are high and a sufficiently tall building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee (downwind) side of the building or structure.

Fumigation conditions occur when the plume is emitted into a layer of stable air (inversion) that then becomes unstable from below, resulting in a rapid mixing of pollutants out of the stable layer and towards

[13] EPA. Guideline on Air Quality Models, 40 CFR Part 51, Appendix W.

[14] CARB. Reference Document for California Statewide Modeling Guideline, April 1989.

the ground in the unstable layer underneath. The low mixing height that results from this condition allows little diffusion of the stack plume before it is carried downwind to the ground. Although fumigation conditions are short-term, rarely lasting as long as an hour, relatively high ground-level concentrations may be reached during that period. Fumigation tends to occur under clear skies and light winds, and is more prevalent in summer.

Two types of fumigation are analyzed: inversion breakup and shoreline. Inversion breakup fumigation occurs under low-wind conditions when a rising morning mixing height caps a stack and "fumigates" the air below.

Shoreline fumigation occurs when a roughness boundary (generally a beach) causes turbulent dispersion to be much more enhanced near the ground, once again fumigating the air below. For shoreline fumigation, the lens-shape of the wedge of turbulent air rising from the beach is governed by several factors. SCREEN3 modeling was performed to evaluate shoreline fumigation associated with the Amended CECP following the methodology provided by EPA.[15]

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian (statistical) distribution around the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2(y/\sigma_y)^2}\right) * \left[\left\{e^{-1/2(z-H/\sigma_z)^2}\right\} + \left\{e^{-1/2(z+H/\sigma_z)^2}\right\}\right] \quad \text{(Eq. 1)}$$

where

- C = pollutant concentration in the air
- Q = pollutant emission rate
- $\sigma_y\sigma_z$ = horizontal and vertical dispersion coefficients, respectively, at downwind distance x
- u = wind speed at the height of the plume center
- x,y,z = variables that define the downwind, crosswind, and vertical distances from the center of the base of the stack in the model's three-dimensional Cartesian coordinate system
- H = the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and thermal buoyancy of the plume)

Gaussian dispersion models are approved by EPA for regulatory use and are based on conservative assumptions (i.e., the models tend to overpredict actual impacts by assuming steady-state conditions, no pollutant loss [through conservation of mass], no chemical reactions). The EPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. The following sections describe:

- Gas turbine screening modeling;
- Refined air quality impact analysis;
- Specialized modeling analyses;
- Results of the ambient air quality modeling analyses; and
- PSD significance levels.

[15] EPA, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised", 1992b.

Modeling for the Amended CECP was performed in accordance with the modeling protocol submitted to the SDAPCD and CEC. The SDACPD reviewed this protocol and made the following recommendations, which were incorporated into the modeling analysis performed for the CECP:

- Rather than a NO_2/NOx ratio of 10%, use NO_2/NOx ratios of 18% and 14% for the emergency fire pump engine and the emergency generator engine, respectfully (based on District test data);
- Rather than a 30-meter resolution, use U.S. Geological Survey National Elevation Dataset data at a horizontal resolution of 1/3 arc-second (approximately 10 meters); and
- Within 100 meters of points of potential maximum impacts, include an additional receptor grid with a resolution of 10 meters.

The modeling procedures used for each type of modeling analysis are described in more detail in the following sections.

Two different EPA guideline models were used for different meteorological conditions in the ambient air quality impact analysis: AERMOD[16] and SCREEN3.

The EPA-approved AERMOD model was used to evaluate impacts in simple, intermediate, and complex terrain. AERMOD is a Gaussian dispersion model capable of assessing impacts from a variety of source types in areas of simple, intermediate, and complex terrain. The model can account for settling and dry deposition of particulates; area, line, and volume source types; downwash effects; and gradual plume rise as a function of downwind distance. The model is capable of estimating concentrations for a wide range of averaging times (from 1 hour to 1 year), and was applied with 5 years of actual meteorological data recorded at the Camp Pendleton monitoring station.

The SCREEN3 model was used to evaluate gas turbine impacts under inversion breakup and shoreline fumigation conditions because these are special cases of meteorological conditions. The SCREEN3 model uses a range of meteorological conditions that could occur under inversion breakup and shoreline fumigation. Since the emissions from the emergency engines are so small compared to the gas turbine emissions, they are excluded from this single-source model used for the fumigation analysis. The fumigation analysis is discussed in more detail below.

Gas Turbine Screening Modeling

The screening and refined air quality impact analyses were performed using the AERMOD model. The screening modeling is performed to determine the combination of ambient temperature and gas turbine operating conditions that generates the highest ambient air quality levels for each pollutant and averaging period. The refined modeling uses the stack parameters that the screening-level modeling shows produced the highest ambient impacts (for each pollutant and averaging period).

Inputs required by AERMOD include the following:

- Model options
- Meteorological data
- Source data
- Receptor data

Standard AERMOD control parameters were used, including stack tip downwash, non-screening mode, non-flat terrain, and sequential meteorological data check. Stack-tip downwash, which adjusts the effective stack height downward following the methods of Briggs (1972) for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top, were selected per EPA guidance. As approved by the District during its review of the modeling plan (see Appendix 5.1D), the rural default option was used by not invoking the

[16] The acronym AERMOD was derived from American Meteorological Society/Environmental Protection Agency Regulatory Model.

URBANOPT option.[17] The use of the rural default in modeling for the Amended CECP is consistent with District policy and guidance (SDAPCD, 1996) for past modeling using at this site.

The required emission source data inputs to both models used in this analysis include source locations, source elevations, stack heights, stack diameters, stack exit temperatures and velocities, and emission rates. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used is the Universal Transverse Mercator Projection (UTM). The stack height that can be used in the model is limited by federal Good Engineering Practice (GEP) stack height restrictions, discussed in more detail below. In addition, Building Profile Input Program – Plume Rise Model Enhancements (BPIP-PRIME, current version 04274) requires nearby building dimension data to calculate the impacts of building downwash.

For the purposes of modeling, a stack height beyond what is required by GEP is not allowed. However, this requirement does not place a limit on the actual constructed height of a stack. GEP as used in modeling is the height necessary to assure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP modeling restriction assures that any required regulatory control measure is not compromised by the effect of that portion of the stack that exceeds the GEP. EPA guidance (EPA, 1985) for determining GEP stack height indicates that GEP is the greater of 65 meters or H_g, where H_g is calculated as follows:

$$H_g = H + 1.5L$$

where:

H_g = Good Engineering Practice stack height, measured from the ground-level elevation at the base of the stack

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack

L = lesser dimension, height or maximum projected width, of nearby structure(s)

In using this equation, the guidance document indicates that both the height and width of the structure are determined from the frontal area of the structure, projected onto a plane perpendicular to the direction of the wind.

For the new gas turbine stacks, the nearby (influencing) structures are the inlet air filter housings for the new units, which are 47.5 feet (14.5 m) high, 44.7 feet (13.6 m) long and 40.5 feet (12.3 m) wide. Thus H = L = 47.5 feet, and H_g = 2.5 * 47.5 = 119 feet (36.2 m). Since H_g is less than 65 m, the GEP stack height is 65 m. The proposed stack height of 90 feet (27.4 m) does not exceed GEP stack height of 65 m, and consequently satisfies the EPA requirement.

For regulatory applications, a building is considered sufficiently close to a stack to cause wake effects when the downwind distance between the stack and the nearest part of the building is less than or equal to five times the lesser of the height or the projected width of the building. Building dimensions for the buildings analyzed as downwash structures were obtained from plot plans. The building dimensions were analyzed using the BPIP-PRIME to calculate 36 wind-direction-specific building heights and projected building widths for use in building wake calculations. The building dimensions used in the GEP analysis are shown in Appendix 5.1E.

Screening Procedures and Unit Impact Modeling

Screening modeling was performed to select the worst-case gas turbine operating mode for each pollutant and averaging period. The modeling used emissions data based on an annual average temperature (60°F),

[17] The rural vs. urban option in AERMOD is primarily designed to set the fraction of incident heat flux that is transferred into the atmosphere. This fraction becomes important in urban areas having an appreciable "urban heat island" effect due to a large presence of land covered by concrete, asphalt, and buildings. This situation does not exist for the Amended CECP site.

maximum temperature (96°F), and minimum temperature (44°F), and at nominal minimum and maximum gas turbine operating load points of 25% and 100%. The determination of the worst-case gas turbine operating condition depends on how changes in emissions rates and stack characteristics (plume rise characteristics) interact with terrain features. For example, lower mass emissions resulting from lower load operations may cause higher concentrations than other operating conditions because lower final plume height may have a greater significant interaction with terrain features.

Initial AERMOD modeling runs were performed using normalized emission rates to assess the zone of impact and relative magnitude of the impacts. For the AERMOD gas turbine screening modeling, each gas turbine was modeled with a unit emission rate of 1 gram per second to obtain maximum 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentration to emission rate (χ/Q in units of $\mu g/m^3$ per g/s) values. These χ/Q values were multiplied by the actual emission rate in grams per second from the gas turbine to calculate ambient impacts for NO_2, CO, SO_2, and $PM_{10}/PM_{2.5}$ in units of $\mu g/m^3$. Stack characteristics used in the screening modeling analysis are shown in Appendix 5.1E.

The results of the screening analysis are shown in Appendix 5.1E. The stack parameters and emission rates corresponding to the operating case that produced the maximum impacts in the gas turbine screening analysis for each pollutant and averaging period were used in the refined modeling analysis to evaluate the impacts of the new units. For the unit impacts analysis, the CEC staff's recommendation regarding receptor grid spacing has been followed.[18]

Refined Air Quality Impact Analysis

In simple, intermediate, and complex terrain, AERMOD was used to estimate project-related impacts. The AERMOD model was used to calculate 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations.

Refined modeling was performed in two phases: coarse grid modeling and fine grid modeling. Preliminary modeling was performed with the coarse grid to locate the areas of maximum concentration. Fine grids were used to refine the location of the maximum concentrations.

The stack parameters and emission rates used to model combined impacts from all new equipment at the facility are shown in Appendix 5.1E. The model receptor grids were derived from U.S. Geological Survey 10-meter Digitized Elevation Map (DEM) data. CEC guidance was used to locate receptors.

A 250-meter resolution coarse receptor grid was developed and extended outwards at least 10 km. In addition, a nested grid was developed to fully represent the maximum impact area(s). The receptor grid was constructed as follows:

1. One row of receptors spaced 25 meters apart along the facility's fence line;
2. Four tiers of receptors spaced 25 meters apart, extending 100 meters from the fence line;
3. Additional tiers of receptors spaced 100 meters apart, extending from 100 meters to 1,000 meters from the fenceline; and
4. Additional tiers of receptors spaced 250 meters apart, out to at least 10 km from the most distant source modeled, not to exceed 50 km from the project site.
5. Additional refined receptor grids with 25-meter resolution were placed around the maximum first-high or maximum second-high coarse grid impacts and extended out 1,000 meters in all directions. In addition, refined receptor grids with 10-meter resolution were placed around the maximum first-high coarse grid impacts extending out 100 meters in all directions. Concentrations within the facility fenceline were not calculated.

[18] 25-meter resolution along the facility fenceline to 100 meters from the fenceline; 100 meter resolution from 100 meters to 1,000 meters from the fenceline; and 250-meter spacing out to at least 10 km from the site.

Terrain features were taken from the U.S. Geological Survey National Elevation Dataset (NED). The regions imported into the NED database are bounded by the following coordinates:

- South West corner: UTM Zone 11 (NAD 83) 465,500.0 m, 3,654,200.0 m; and
- North East corner: UTM Zone 11 (NAD 83) 483,000.0 m, 3,678,200.0 m.

These terrain data are included in the modeling DVD submitted to the SDAPCD and CEC as part of the PTA for the Amended CECP.

5.1.4.3.2 Specialized Modeling Analyses

Fumigation Modeling

Fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may cause high ground-level pollutant concentrations because the plume is unable to rise upwards normally due to the stable layer capping it from above, and be drawn to the ground by turbulence within the unstable layer. Although fumigation conditions rarely last as long as one hour, relatively high ground-level concentrations may be reached during that time. For this analysis, fumigation was assumed to occur for up to 90 minutes as required by EPA guidance.

The SCREEN3 model was used to evaluate maximum ground-level concentrations for short-term averaging periods (24 hours or less). Guidance from the EPA (EPA, 1992) was followed in evaluating fumigation impacts. This analysis is shown in more detail in Appendix 5.1E.

Shoreline Fumigation Modeling

Because land surfaces tend to both heat and cool more rapidly than water, shoreline fumigation tends to occur on sunny days when the denser cooler air over water displaces the warmer, lighter air over land. During an inland sea breeze, the unstable air over land gradually increases in depth with inland distance. The boundary between stable air over the water and unstable air over the land and the wind speed determine whether the plume will loop down before much dispersion of the pollutants has occurred.

SCREEN3 can examine sources within 3,000 meters of a large body of water, and was used to calculate the maximum shoreline fumigation impact. The model uses a stable onshore flow and a wind speed of 2.5 meters per second; the maximum ground-level shoreline fumigation concentration is assumed by the model to occur where the top of the stable plume intersects the top of the well-mixed thermal inversion boundary layer (TIBL). The model TIBL height was varied between 2 and 6 to determine the highest shoreline fumigation impact. The worst-case (highest) impact was used in determining facility impacts due to shoreline fumigation. Shoreline breakup fumigation was assumed to persist for up to 3 hours. The shoreline fumigation analysis is shown in more detail in Appendix 5.1E.

Gas Turbine Startup

Facility impacts were also evaluated during simultaneous startup of the six new gas turbines to evaluate short-term impacts under worst-case startup emissions. Gas turbine exhaust parameters used to characterize gas turbine exhaust during startup and the CO and NO_x emission rates are shown in Appendix 5.1E.

Ozone Limiting

1-hour NO_2 impacts during project operation were modeled using the Ozone Limiting Method (OLM) (Cole and Summerhays, 1979), implemented through the “OLMGROUP ALL” option in AERMOD (EPA, 2011a). AERMOD OLM was used to calculate the NO_2 concentration based on the OLM method and hourly ozone data. Hourly ozone data collected at the Camp Pendleton monitoring station during the years 2008-2012 were used in conjunction with OLM to calculate hourly NO_2 concentrations from hourly NOx concentrations.

Part of the NOx in the exhaust is converted to NO_2 during and immediately after combustion. The remaining percentage of the NOx emissions is assumed to be NO. For the new gas turbines, and as required by the SDAPCD, the analysis was performed using the following NO_2/NOx ratios:

- 13% during normal operating hours;
- 24% during hours in which a startup/shutdown occurs; and
- 24% during commissioning tests when the SCR system is not fully operational.

As approved by the SDAPCD, NO_2/NOx ratios of 18% and 14% were used for the diesel emergency fire pump and generator engines, respectfully.

As the exhaust leaves the stack and mixes with the ambient air, the NO reacts with ambient ozone (O_3) to form NO_2 and molecular oxygen (O_2). The OLM assumes that at any given receptor location, the amount of NO that is converted to NO_2 by this oxidation reaction is proportional to the ambient O_3 concentration. If the O_3 concentration is less than the NO concentration, the amount of NO_2 formed by this reaction is limited. However, if the O_3 concentration is greater than or equal to the NO concentration, all of the NO is assumed to be converted to NO_2.

Annual NO_2 concentrations were calculated using the Ambient Ratio Method (ARM), originally adopted in Supplement C to the Guideline on Air Quality Models (EPA, 1995) with a revision issued by EPA in March 2011. The Guideline allows a nationwide default of 80% for the conversion of nitric oxide (NO) to NO_2 on an annual basis and the calculation of NO_2/NOx ratios. This nationwide default conversion factor was used to model annual NO_2 impacts for the CECP.

Gas Turbine Commissioning

Gas turbine commissioning is the process of initial startup, tuning, and adjustment of the new CTGs and auxiliary equipment and of the emission control systems. The commissioning process for Amended CECP will consist of sequential test operation of each of the six gas turbines up through increasing load levels, and with successive application of the air pollution control systems. The total set of commissioning tests will require approximately 213 operating hours for each gas turbine with a total of approximately four calendar months required to complete the commissioning tests of the six new units. The detailed gas turbine commissioning schedule is included in Appendix 5.1B. While the total commissioning period for each gas turbine is expected to occur over a period of approximately 213 hours, because the gas turbine vendor requires 300 hours of equipment operation prior to the initial VOC/PM_{10} compliance test, in the permit application submitted to the SDAPCD the Applicant will be requesting that the District allow 300 hours of gas turbine operation prior to the initial VOC/PM_{10} compliance tests.

While it may not be possible to perform the commissioning tests on all six new units simultaneously due to several factors, including electrical interconnections and availability of commissioning crews, for the commissioning air quality modeling analysis it is assumed that all six new CTGs undergo commissioning simultaneously. During the commissioning phase of the Amended CECP, the existing boilers Units 1–5 and the peaking turbine at the EPS will remain available for operation and the commissioning modeling analysis accounts for the combined impacts for the new units (undergoing commissioning) and operation of the existing units. Once the commissioning tests are complete and the new CTGs are available for commercial operation, the existing EPS units will no longer be operated and will be removed from service.

Impacts during Normal Operation. Table 5.1-29 summarizes the maximum impacts during the normal operation of Amended CECP, calculated from the refined, startup/shutdown and fumigation modeling analyses described above.

Impacts During Gas Turbine Commissioning. During the gas turbine commissioning phase, NO_2 and CO impacts may be higher than under the operating conditions evaluated above. The commissioning period is comprised of various equipment tests. These tests and the associated emissions are summarized in Appendix 5.1B.

It is assumed that the maximum modeled impacts during commissioning will occur under the gas turbine operating conditions that are least favorable for dispersion. These conditions are expected to occur under low-load conditions.

As discussed above, during the commissioning of the new units it may be necessary to operate existing Units 1–5 and the existing peaking gas turbine. Therefore, the commissioning modeling analysis analyzed the combined impacts for the simultaneous commissioning of the six new units and the continued operation of the existing units. Emission rates and stack parameters for the new and existing units during the commissioning period are shown in Appendix 5.1E. Modeled short-term impacts (1-hour, 8-hour, and 24-hour average) during the commissioning period are summarized further below in Table 5.1-32. While SOx and $PM_{10}/PM_{2.5}$ emissions during the commissioning of the new gas turbines are not expected to be higher than during normal operation of these units, SO_2 and $PM_{10}/PM_{2.5}$ impacts are included in Table 5.1-32 to show the combined short-term impacts for the new/existing units.

Ambient Air Quality Impacts from the Proposed Project

To determine a project's air quality impacts, the modeled concentrations are added to the maximum background ambient air concentrations and then compared to the applicable ambient air quality standards. As discussed previously, the background $PM_{10}/PM_{2.5}$/and CO data were collected at the Escondido monitoring site (approximately 24 km from project site). The background NO_2 data was collected at the Camp Pendleton monitoring site (approximately 10 km from project site), and the background SO_2 data was collected at the San Diego-Beardsley Street monitoring site (approximately 50 km from project site). Because these are the nearest ambient monitoring stations to the project site, the data collected at these stations are considered representative of ambient concentrations in the vicinity of the Amended CECP.

TABLE 5.1-29
Normal Operation Air Quality Modeling Results for New Equipment

		Modeled Maximum Concentrations (µg/m³)			
Pollutant	**Averaging Time**	**Normal Operations AERMOD**	**Startup/Shutdown AERMOD**	**Fumigation SCREEN3**	**Shoreline Fumigation SCREEN3**
Combined Impacts Six Gas Turbines					
NO_2	1-hour	18.5	88.6	4.8	33.9
	98th percentile	12.3	63.5	–	—
	Annual	0.1	[a]	[c]	[c]
SO_2	1-hour	4.7	[b]	1.1	7.8
	3-hour	3.0	[b]	0.9	3.8
	24-hour	0.6	[b]	0.3	0.5
	Annual	0.0	[b]	[c]	[c]
CO	1-hour	20.0	60.3	4.6	32.7
	8-hour	7.2	20.7	2.6	6.2
$PM_{2.5}/PM_{10}$	24-hour	1.5	[b]	0.9	1.4
	Annual	0.04	[b]	[c]	[c]
Emergency Fire Pump Engine					
NO_2	1-hour	64.8	[d]	[e]	[e]
	98th percentile	63.4	[d]	[e]	[e]
	Annual	0.0	[d]	[e]	[e]
SO_2	1-hour	0.1	[d]	[e]	[e]
	3-hour	0.1	[d]	[e]	[e]
	24-hour	0.0	[d]	[e]	[e]
	Annual	0.0	[d]	[e]	[e]

TABLE 5.1-29
Normal Operation Air Quality Modeling Results for New Equipment

Pollutant	Averaging Time	Modeled Maximum Concentrations (µg/m³)			
		Normal Operations AERMOD	Startup/Shutdown AERMOD	Fumigation SCREEN3	Shoreline Fumigation SCREEN3
CO	1-hour	19.4	[d]	[e]	[e]
	8-hour	2.1	[d]	[e]	[e]
$PM_{2.5}/PM_{10}$	24-hour	0.1	[d]	[e]	[e]
	Annual	0.01	[d]	[e]	[e]
Emergency Generator Engine					
NO_2	1-hour	25.8	[d]	[e]	[e]
	98th percentile	19.6	[d]	[e]	[e]
	Annual	0.0	[d]	[e]	[e]
SO_2	1-hour	0.1	[d]	[e]	[e]
	3-hour	0.0	[d]	[e]	[e]
	24-hour	0.0	[d]	[e]	[e]
	Annual	0.0	[d]	[e]	[e]
CO	1-hour	4.2	[d]	[e]	[e]
	8-hour	0.3	[d]	[e]	[e]
$PM_{2.5}/PM_{10}$	24-hour	0.0	[d]	[e]	[e]
	Annual	0.00	[d]	[e]	[e]
Combined Impacts New Equipment					
NO_2	1-hour	64.8	[f]	[f]	[f]
	98th percentile	63.4	[f]	[f]	[f]
	Annual	0.2	[f]	[f]	[f]
SO_2	1-hour	4.7	[f]	[f]	[f]
	3-hour	3.0	[f]	[f]	[f]
	24-hour	0.6	[f]	[f]	[f]
	Annual	0.0	[f]	[f]	[f]
CO	1-hour	20.0	[f]	[f]	[f]
	8-hour	7.2	[f]	[f]	[f]
$PM_{2.5}/PM_{10}$	24-hour	1.5	[f]	[f]	[f]
	Annual	0.04	[f]	[f]	[f]

[a]Not applicable, because startup/shutdown emissions are included in the modeling for annual average.

[b]Not applicable, because emissions are not elevated above normal operation levels during startups/shutdowns.

[c]Not applicable, because inversion breakup is a short-term phenomenon and as such is evaluated only for short-term averaging periods.

[d]Not applicable, because engine will not operate during gas turbine startups/shutdowns.

[e]Not applicable, this type of modeling is not performed for small combustion sources with relatively short stacks.

[f]Impacts are the same as shown for gas turbines.

Table 5.1-30 presents the maximum concentrations of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ recorded between 2010 and 2012 from representative nearby monitoring stations, as required by Appendix B(g)(8)(G) of the CEC guidelines.

TABLE 5.1-30
Maximum Background Concentrations[a], Project Area, 2010–2012 (µg/m³)

Pollutant	Averaging Time	2010	2011	2012
NO_2 (Camp Pendleton)	1-hour	**152.4**	124.2	114.8
	Fed. 1-hour[c]	**105.3**	95.3	89.6
	Annual	**16.9**	*	15.1
SO_2 (San Diego)	1-hour	21.0	**34.1**	*
	Fed. 1-hour[d]	**35.8**	25.3	*
	24-hour	**7.9**	7.9	*
	Annual[b]	**7.9 (2009)**	2.6 (2010)	0.0 (2011)
CO (Escondido)	1-hour	4,468	4,009	**5,040**
	8-hour	2,818	2,635	**4,238**
PM_{10} (Escondido)	24-hour	**43**	40	33
	Annual	**22.8**	21.5	19.3
$PM_{2.5}$ (Escondido)	24-hour[e]	*	**26**	25
	Annual	12.7	**13.2**	10.8

Note: Reported values have been rounded to the nearest tenth of a µg/m³ except for PM_{10} which were already rounded to the nearest integer.

*There were insufficient data to determine the values.

[a]With the exception of federal 1-hr NO_2, federal 1-hr SO_2, and 24-hr $PM_{2.5}$, bolded values are the highest during the three years and are used to represent background concentrations.

[b]There were insufficient data to determine annual SO_2 for 2011 and 2012. Maximum 24-hour SO_2 values from 2009 to 2010 are presented in this table to represent "maximum" background concentrations.

[c]Federal 1-hour NO_2 is shown as the 3-year average 98th percentile, as that is the basis of the federal standard.

[d]Federal 1-hour SO_2 is shown as the 3-year average 99th percentile, as that is the basis of the federal standard.

[e]24-hour average $PM_{2.5}$ concentrations shown are 3-year average 98th percentile values, rather than highest values, because compliance with the ambient air quality standards is based on 98th percentile readings. Since the ambient standard is based on a 3-year average of the 98th percentile readings.

Source: CARB, 2014b and EPA, 2014.

The maximum modeled concentrations during normal operation shown in Table 5.1-29 are combined with the maximum background ambient concentrations in Table 5.1-30 and compared with the state and federal ambient air quality standards in Table 5.1-31. In Table 5.1-32, the maximum modeled concentrations during the commissioning period are compared with state and federal ambient air quality standards. Using the conservative assumptions described earlier, during normal operation the results indicate that the Amended CECP will not cause or contribute to violations of state or federal air quality standards, with the exception of the annual state PM_{10}/$PM_{2.5}$ standards and annual federal $PM_{2.5}$ standard. For these pollutants and averaging periods, existing background concentrations already exceed state/federal standards.

During commissioning activities the results indicate that once again the Amended CECP will not cause or contribute to violations of state or federal air quality standards, with the exception of the annual state PM_{10}/$PM_{2.5}$ standards and annual federal $PM_{2.5}$ standard (existing background concentrations already exceed state/federal standards).

TABLE 5.1-31
Modeled Maximum Proposed Project Impacts (Normal Operation)

Pollutant	Averaging Time	Maximum Project Impact (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	State Standard (µg/m³)	Federal Standard (µg/m³)
NO_2	1-hour	88.6	152.4	241	339	—
	98th percentile	63.5	105.3[a]	151	—	188
	Annual	0.2	16.9	17	57	100
SO_2	1-hour	7.8	34.1	42	655	—
	99th percentile	7.8	35.8[c]	44	—	196
	24-hour	0.6	7.9	9	105	—
CO	1-hour	60.3	5,040	5,100	23,000	40,000
	8-hour	20.7	4,238	4,259	10,000	10,000
PM_{10}	24-hour	1.5	43	45	50	150
	Annual	0.04	22.8	23	20	—
$PM_{2.5}$	24-hour	1.5	26[b]	28	—	35
	Annual	0.04	13.2	13	12	12

[a]1-hour NO_2 background concentration is shown as the 3-year average of the 98th percentile as that is the basis of the federal standard.

[b]24-hr $PM_{2.5}$ background concentration reflects 3-year average of the 98th percentile values based on form of standard.

[c]1-hr SO_2 background concentration reflects 3-year average of the 99th percentile values based on form of standard.

TABLE 5.1-32
Modeled Maximum Proposed Project Impacts (Commissioning Period)

Pollutant	Averaging Time	Maximum Project Impact[d] (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	State Standard (µg/m³)	Federal Standard (µg/m³)
NO_2	1-hour	176.9	152.4	329	339	—
	98th percentile	137.6	105.3[a]	152	—	188
SO_2	1-hour	7.6	34.1	42	655	—
	99th percentile	7.6	35.8[c]	43	—	196
	24-hour	1.0	7.9	9	105	—
CO	1-hour	868.9	5,040	5,909	23,000	40,000
	8-hour	297.6	4,238	4,536	10,000	10,000
PM_{10}	24-hour	2.0	43	45	50	150
$PM_{2.5}$	24-hour	2.0	26[b]	28	—	35

[a]1-hour NO_2 background concentration is shown as the 98th percentile as that is the basis of the federal standard.
[b]24-hr $PM_{2.5}$ background concentration reflects 3-year average of the 98th percentile values based on form of standard.
[c]1-hr SO_2 background concentration reflects 3-year average of the 99th percentile values based on form of standard.
dIncludes impacts from existing EPS units.

PSD Significance Levels

The PSD program was established to allow emission increases that do not result in significant deterioration of ambient air quality in areas where criteria pollutants have not exceeded the NAAQS. The net emission

increase shown later in Table 5.1-35 shows that although the Amended CECP will be a major source, the net increases resulting from the Amended CECP will trigger PSD review only for GHG emissions due to the shutdown of existing Units 1–5 and the peaking gas turbine. While the Amended CECP will not trigger a PSD review for NO_2, CO, SO_2, PM_{10}, or $PM_{2.5}$, an analysis was conducted to determine whether the ambient impacts of the Amended CECP exceed the PSD significance thresholds, as these thresholds are generally used as one measure of whether the project's ambient impacts will be significant. Modeled project impacts during normal operation are compared with the PSD significance thresholds in Table 5.1-33 below. As shown in this table, the maximum impacts for the Amended CECP during normal operation are below the PSD significance thresholds with the exception of 1-hour NO_2 and 24-hour $PM_{2.5}$ impacts.

TABLE 5.1-33
Comparison of Maximum Modeled Impacts and PSD Significant Impact Levels

Pollutant	Averaging Time	Significant Impact Level, µg/m³	Maximum Modeled Impact for CECP, µg/m³	Exceed Significant Impact Level?
NO_2	1-Hour	7.5*	88.6	Yes
	Annual	1	0.2	
SO_2	1-Hour	7.8	7.8	No
	3-Hour	25	3.8	
	24-Hour	5	0.6	
	Annual	1	0.0	
CO	1-Hour	2000	60.3	No
	8-Hour	500	20.7	
PM_{10}	24-Hour	5	1.5	No
	Annual	1	0.04	
$PM_{2.5}$	24-Hour	1.2	1.5	Yes
	Annual	0.3	0.04	

*EPA has not yet defined significance levels (SILs) for 1-hour NO_2 and SO_2 impacts. However, EPA has suggested that, until SILs have been promulgated, interim values of 4 ppb (7.5 µg/m³) for NO_2 and 3 ppb (7.8 µg/m³) for SO_2 may be used (EPA, 2010c and EPA, 2010d). These values will be used in this analysis as interim SILs.

5.1.4.4 Screening Health Risk Assessment

A screening health risk assessment (SHRA) was conducted to determine expected impacts on public health of the noncriteria pollutant emissions from the operation of the six gas turbines and emergency engines. The potential health risks and a detailed discussion of the approach used for the screening level risk assessment, including the detailed non-criteria-pollutant calculations, are provided in the Section 5.9, Public Health.

5.1.4.5 Demolition/Construction Impacts Analysis

The demolition/construction of the Amended CECP is scheduled to occur in the following two phases:

- Construction of the new equipment (24-month period); and
- Demolition of the existing EPS (22-month period).

There is no overlap between these two phases. The emissions were calculated for each phase. The demolition/construction emission estimates include emissions from vehicle and equipment exhaust and fugitive dust generated from material handling and paved/unpaved road travel. A dispersion modeling analysis and a screening health risk assessment were conducted based on these emissions. The detailed analysis of the demolition/construction emissions and ambient impacts is included in Appendix 5.1F.

5.1.5 Consistency with Laws, Ordinances, Regulations, and Standards

This section considers consistency separately for federal, state, and local requirements.

5.1.5.1 Consistency with Federal Requirements

The SDAPCD has been delegated authority by the EPA to implement and enforce most federal requirements that may be applicable to the Amended CECP, including new source performance standards and new source review for nonattainment pollutants. The Amended CECP will also be required to comply with the Federal Acid Rain requirements (Title IV). Because the SDAPCD is delegated authority to implement Title IV through its Title V permit program, the modified Title V Federal Operating Permit that will be issued as a result of the Amended CECP will include the necessary requirements for compliance with the Title IV Acid Rain provisions. In addition, the SDAPCD is in the processing of obtaining delegation from the EPA to implement the PSD program. Depending on the timing on the final PSD delegation to the SDAPCD, it may be necessary to submit a PSD permit application to EPA Region 9.

5.1.5.1.1 PSD Program

EPA has promulgated PSD regulations for areas that are in compliance with national ambient air quality standards (40 CFR 52.21). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., specific national parks and wilderness areas). There are five principal areas of the PSD program: (1) Applicability; (2) Best Available Control Technology; (3) Preconstruction Monitoring; (4) Increments Analysis; and (5) Air Quality Impact Analysis. Although issuance of the PSD permit will be the responsibility of either the SDAPCD or EPA Region 9 (depending on the timing for PSD delegation to the SDAPCD), the protection of Class I areas is still the responsibility of the Federal Land Managers.

The federal PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing stationary source. (These terms are defined in federal regulations.) (40 CFR 52.21) Since the EPS is an existing major source, the determination of applicability is based on evaluating the emissions changes associated with the Amended CECP in addition to all other emissions changes at the facility over a 5-year lookback period. In Table 5.1-34, the net emission changes at the EPS, based on the emissions from the new Amended CECP equipment and the shutdown of the existing EPS units, are compared to the regulatory significance thresholds. As shown in this table, the net emission changes associated with the Amended CECP are below these significance thresholds for all pollutants with the exception of GHG, and thus the Amended CECP is subject to PSD review only for GHG emissions. While the PSD regulations include several requirements, including controlling PSD pollutants with BACT, ambient air quality modeling, visibility impact analyses, and ambient monitoring requirements, the only PSD requirement applicable to GHG emissions is the requirement to use BACT for GHG emissions. As discussed in the detailed BACT analysis included in Appendix 5.1C, the Amended CECP will meet GHG BACT requirements with the use of high efficient simple-cycle gas turbines.

TABLE 5.1-34
Net Emission Change and PSD Applicability

Pollutant	Facility Net Increase (tpy)	PSD Significance Levels (tpy)	Are Increases Significant?
NOx	26.4	40	No
SO_2	2.2	40	No
VOC	-7.4	N/A*	N/A*
CO	-101.5	100	No
PM_{10}	-14.6	15	No
$PM_{2.5}$	-14.6	10	No
GHG	257,844	75,000	Yes

*Because the project area is classified as a federal nonattainment for ozone, this pollutant is not subject to the PSD regulations.

5.1.5.2 Consistency with State Requirements

As discussed in Section 5.1.3.1.2, state law set up local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. The CECP is under the local jurisdiction of the SDAPCD; therefore, compliance with District regulations will assure compliance with state air quality requirements.

5.1.5.3 Consistency with Local Requirements: SDAPCD

The SDAPCD has been delegated responsibility for implementing local, state, and federal air quality regulations in the San Diego Air Basin. The Amended CECP is subject to District regulations that apply to new stationary sources, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from non-criteria pollutants. The following sections evaluate facility compliance with applicable District requirements.

5.1.5.3.1 New Source Review Requirements

Under the regulations that govern new sources of emissions, the Amended CECP is required to secure a preconstruction Determination of Compliance from the SDAPCD, as well as demonstrate continued compliance with regulatory limits when the new equipment becomes operational. The preconstruction review includes demonstrating that subject new equipment will use BACT, will provide any necessary emission offsets, and will perform an ambient air quality impact analysis. The requirements of each of these elements of the SDAPCD's new source review program are discussed below.

Best Available Control Technology

BACT must be applied to a new or modified emissions unit resulting in an emissions increase exceeding SDAPCD BACT threshold levels. In Table 5.1-35, the maximum daily emissions from each gas turbine and each emergency engine are compared with the BACT thresholds. As shown in this table, the CTGs are subject to BACT for NOx, VOC, SOx, and PM_{10}. However, emissions for the emergency engines are below the BACT trigger levels, so the engines are not required to use BACT.

TABLE 5.1-35
SDAPCD BACT Emission Thresholds

Pollutant	BACT Threshold (lbs/day)	Each CTG (lbs/day)	Fire Pump Engine (lbs/day)	Generator Engine (lbs/day)
PM_{10}	10	84.0	0.0	0.0
NO_x	10	254.4	0.5	1.2
SO_x	10	49.7	0.0	0.0
VOC	10	71.3	0.0	0.0

*SDAPCD Rule 20.3 does not include a BACT requirement for CO.

BACT for the applicable pollutants was determined by reviewing a number of BACT guideline documents, including the SDAPCD BACT Guidance, the South Coast Air Quality Management District BACT Guideline Manual, and the EPA's RACT/BACT/LAER Clearinghouse. The detailed BACT analysis is included in Appendix 5.1C. As discussed in this analysis, the Amended CECP gas turbines will comply with BACT using the following measures.

- BACT for NOx emissions from the gas turbine will be the use of low-NOx emitting equipment and add-on controls. The Amended CECP will use water injection and SCR to reduce NOx emissions to 2.5 ppmvd NOx, corrected to 15 percent O_2 (ppmc).
- BACT for CO emissions will be achieved by using good combustion practices and an oxidation catalyst to achieve CO emissions of 4.0 ppmc.

- BACT for VOC emissions will be achieved by use of good combustion practices in the gas turbines to achieve VOC emissions of 2.0 ppmc.
- BACT for PM_{10} and SOx is best combustion practices and the use of natural gas. The proposed CTGs will burn exclusively PUC-regulated natural gas with a maximum short-term sulfur content of 0.75 grains per 100 scf (gr/100 scf), and an annual average level of 0.25 gr/100 scf.

Emission Offsets

Because the EPS is an existing major facility, emission offsets are required for net emission increases that occur at the facility above SDAPCD offset threshold levels. Emission offsets are required only for federal nonattainment pollutants. Since the District is classified as a federal nonattainment area for ozone, the pollutants regulated under the emission offset section of the District new source review program are the ozone precursors NOx and VOC. As shown in Table 5.1-36, the net increase in VOC emissions associated with the installation of the new equipment and shutdown of existing units is below the emission offset trigger level. Therefore, the Amended CECP does not trigger the SDAPCD emission offset requirement for this pollutant. However, the net increase in NOx emissions is above the offset trigger level and as for the Licensed Project, NOx emission offsets must be provided for this pollutant. The detailed NOx emission offset calculations are included in Appendix 5.1B. As shown by these calculations, 31.7 tpy of NOx emission offset credits must be provided for the Proposed Project. As shown in the list included in Appendix 5.1G, the Applicant has obtained the necessary amount emission offsets (in the form of emission offset credits). These emission offsets credits will be surrendered to the SDAPCD prior to the initial operation of the new units.

TABLE 5.1-36
SDAPCD Nonattainment Pollutant Emission Offset Thresholds (tpy)

Pollutant	Emission Offset Trigger Level*	Facility Net Emission Change	Emission Offsets Required?
NOx	25	26.4	Yes
VOC	25	-7.4	No

*SDAPCD Rule 20.1, Table 20.1-5.

Air Quality Impact Analysis

Under the SDAPCD new source review regulations, an air quality impact analysis must be performed if new or modified emission units result in emission increases above specific trigger levels. This analysis must confirm that the above emission increases will not interfere with the attainment or maintenance of an applicable ambient air quality standard or cause additional violations of a standard anywhere the standard is already exceeded. As shown in Table 5.1-37, the emissions for the new equipment are above the air quality impact analysis trigger levels for NOx, CO, PM_{10}, and SOx. Consequently, an air quality impact analysis must be performed for these pollutants. The modeling analyses presented in Section 5.1.4.3 show that the Amended CECP will not interfere with the attainment or maintenance of the applicable air quality standards or cause additional violations of any standards.

TABLE 5.1-37
Air Quality Impact Analysis Trigger Levels

Pollutant	Emissions for New Equipment[a]	Trigger Level[b]	AQIA Required?
Hourly Emissions			
NOx	169 lbs/hr	25 lbs/hr	Yes
CO	104 lbs/hr	100 lbs/hr	Yes
PM_{10}	N/A	N/A	N/A
SOx	12 lbs/hr	25 lbs/hr	No
Daily Emissions			
NOx	1,528 lbs/day	250 lbs/day	Yes
CO	1,393 lbs/day	550 lbs/day	Yes
PM_{10}	504 lbs/day	100 lbs/day	Yes
SOx	298 lbs/day	250 lbs/day	Yes
Annual Emissions			
NOx	85 tpy	40 tpy	Yes
CO	78 tpy	100 tpy	No
PM_{10}	28 tpy	15 tpy	Yes
SOx	6 tpy	40 tpy	No

[a]Normal operating year.
[b]SDAPCD Rule 20.3, Table 20.3-1.

SDAPCD Prohibitory Rules

The general prohibitory rules of the SDAPCD applicable to the Amended CECP are summarized below.

Rule 50 – Visible Emissions. Prohibits visible emissions as dark as, or darker than, Ringelmann No. 1 for periods greater than three minutes in any hour. With the use of natural gas, the Amended CECP is expected to comply with this regulation.

Rule 51 – Nuisance. Prohibits a facility from discharging air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property. The Amended CECP would not emit odorous pollutants, and the screening health risk assessment demonstrated that the potential health risks from the emissions are less than significant.

Rule 52 – Particulate Matter Emission Standards. Prohibits PM emissions in excess of 0.10 grains per dry standard cubic foot (gr/dscf). This rule does not apply to stationary internal combustion engines (including CTGs).

Rule 53 – Combustion Contaminants. Prohibits sulfur emissions, calculated as SO_2, in excess of 0.05% by volume (500 parts per million by volume [ppmv]), and combustion particulate emissions in excess of 0.10 gr/dscf at 12% CO_2. SO_x emissions from the Amended CECP will be below 0.5 ppmv, based on the fuel sulfur content levels of 0.75 gr/100 scf (short-term average) and 0.25 gr/100 scf (long-term average). The maximum particulate emissions for each CTG will be 3.5 lbs/hr. At low loads, the gas turbine exhaust flow rate will be approximately 189,845 dscfm at 3.43% CO_2 (see Appendix 5.1B), resulting in a particulate grain loading of 0.0022 gr/dscf. Corrected to 12% CO_2, this grain loading is 0.0077 gr/dscf at 12% CO_2 and complies with this regulation.

Rule 55 – Fugitive Dust Control. This rule requires control of dust emissions during construction activities and prohibits visible dust emissions beyond the property line for periods aggregating more than 3 minutes in any 60-minute period (also requires minimization of track-out onto public roadways). The proposed mitigation measures during construction of the Amended CECP are discussed in Appendix 5.1F. These mitigation measures will assure compliance with this regulation.

Rule 62 – Sulfur Content of Fuels. Prohibits the burning of gaseous fuel with a sulfur content of more than 10 gr/100 scf and liquid fuel with a sulfur content of more than 0.05% sulfur by weight. The natural gas that would be used in the Amended CECP will have a sulfur content that will be less than 0.75 gr S/100 scf (short-term average) and 0.25 gr S/100 scf (long-term average). The diesel fuel used in the emergency engines will comply with the current CARB fuel sulfur limit of 15 ppm, or 0.0015%, well below the limit of this rule.

Rule 69.3 – Stationary Gas Turbines. This rule limits NOx emissions from stationary gas turbines to 42 ppmv at 15% O_2. The rule does not apply during a startup or shutdown period (not to exceed 120 minutes). The NOx emissions for the Amended CECP gas turbines will be limited to 2.5 ppmc.

Rule 69.3.1 – Stationary Gas Turbines. Limits NOx emissions from stationary gas turbines rated greater than or equal to 10 MW with post-combustion controls to 9 ppmv (at 15% O_2, corrected for efficiency). The NOx emissions from the Amended CECP gas turbines will be limited to 2.5 ppmc.

Rule 69.4.1 – Stationary Reciprocating Internal Combustion Engines. Limits CO, NOx, and VOC emissions from stationary reciprocating internal combustion engines rated greater than or equal to 50 bhp. However, emergency equipment operating less than or equal to 52 hours per year for testing or maintenance purposes and less than or equal to 200 hours per year for any purpose are exempt from the emission limits of Rule 69.4.1. Therefore, with an annual operating limit of 200 hours per year for any purpose, the new emergency engines are exempt from these emission limits.

Rule 1200 – Toxic Air Contaminants. Requires preparation of a health risk assessment and demonstration that the project will not result in unacceptable health risks (cancer risk greater than 10 in a million, chronic health index greater than 1, acute health index greater than 1). As discussed in Section 5.9, Public Health, the Amended CECP will comply with these requirements.

Regulation XIV – Title V Operating Permits. This regulation implements the Title V federal operating permit program discussed above under Federal LORS. An application for a Title V permit modification will be submitted within 12 months of the start of operation of the new equipment.

40 CFR Part 60, Subpart KKKK (Standards of Performance for Stationary Combustion Turbines). This new source performance standard applies to gas turbines with a heat input in excess of 1 MMBtu/hr that commence construction after February 18, 2005, and therefore is applicable to the Amended CECP CTGs. Subpart KKKK limits NOx and SO_2 emissions from new gas turbines with a heat input greater than 850 MMBtu/hr to limits of 15 ppmv at 15% O_2 (ppmc) for NOx and 0.90 lbs/MWh for SOx. As shown in Table 5.1-38, the proposed CTGs at the Amended CECP will comply with these limits.

TABLE 5.1-38
Compliance with 40 CFR 60 Subpart KKKK

	Project Emission Levels			
Pollutant	**ppmc**	**lb/hr**	**lb/MWh**	**Subpart KKKK Limits**
NOx	2.5	—	—	15 ppmc
SOx	—	2.07	0.02	0.90 lb/MWh

Compliance with the NSPS limits must be demonstrated through an initial performance test. Because the Amended CECP gas turbines will be equipped with a NOx continuous emissions monitoring system (CEMS) that will comply with NSPS requirements, the initial performance test will be met as part of the initial NOx CEMS certification testing process and ongoing annual performance testing will not be required under the NSPS.

40 CFR Part 60, Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines). The new emergency diesel engines will be subject to this NSPS. For engines in this size

range, the NSPS requires manufacturers to provide engines that are certified to meet the NSPS emission standards (depending on the year an engine is manufactured). The Amended CECP will comply with the emission limitations of the NSPS by purchasing engines certified to meet the required standards.

The NSPS also requires engines in this size range to use fuel with a sulfur content not to exceed 15 ppm. The new emergency engines will comply with this requirement by using only CARB diesel fuel.

5.1.6 Cumulative Impacts

An analysis of potential cumulative air quality impacts that may result from the Amended CECP and other reasonably foreseeable projects is required by the SDAPCD and the CEC.

5.1.6.1 Criteria Pollutant Cumulative Impacts Analysis

Cumulative air quality impacts from the Amended CECP and other reasonably foreseeable projects will be both regional and localized in nature. Regional air quality impacts are possible for pollutants such as ozone, which is formed through a photochemical process that can take hours to occur, and $PM_{2.5}$, which is a mixture of locally generated pollutants and aerosols formed in the atmosphere. Carbon monoxide, NOx, and SOx impacts are generally localized in the area in which they are emitted. PM_{10} can create a local air quality problem in the vicinity of its emission source, but can also be a regional issue when it is formed in the atmosphere from VOC, SOx, and NOx.

The cumulative impacts analysis considers the potential for both regional and localized impacts due to emissions from proposed operation of Amended CECP. Regional impacts are evaluated by comparing maximum daily and annual emissions from Amended CECP with emissions of ozone and PM precursors in San Diego County. Localized impacts are evaluated by looking at other local sources of pollutants that are not included in the background air quality data to determine whether these sources in combination with Amended CECP would be expected to cause significant cumulative air quality impacts.

5.1.6.1.1 Regional Impacts

Regional impacts are evaluated by assessing the Amended CECP's contribution to regional emissions. Although the relative importance of VOC and NOx emissions in ozone formation differs from region to region and from day to day, reductions in emissions of both precursors are typically necessary to reduce overall ozone levels. The change in the sum of emissions of these pollutants, equally weighted, provides a rough estimate of the impact of the Amended CECP on regional ozone levels. Similarly, a comparison of the emissions of PM_{10} and $PM_{2.5}$ precursor emissions from the Amended CECP with regional $PM_{10}/PM_{2.5}$ precursor emissions provides an estimate of the impact of this project on regional $PM_{10}/PM_{2.5}$ levels.

Table 5.1-39 summarizes these comparisons; detailed calculations for the Amended CECP and the emission reductions for the shutdown of the existing units are shown in Appendix 5.1B. Amended CECP emissions are compared with regional emissions in 2015 (the Amended CECP is expected to begin operation in 2017). San Diego County emissions projections for 2015 were taken from CARB's web-based emission inventory projection software, available at *www.arb.ca.gov/app/emsinv/emssumcat.php.*

The emission reductions for the shutdown of the existing units at the EPS examine a 5-year, 10-year, and 12-year lookback period (12-year lookback starts in 2002, which matches the beginning of the baseline period used for the Licensed CECP permitting process). These comparisons show that the total ozone and $PM_{10}/PM_{2.5}$ precursor emissions reductions from the shutdown of the existing units at the EPS will be larger (with the exception of the 5-year lookback for ozone precursors) than the maximum potential emissions for the Amended CECP. Therefore, the Amended CECP will have an overall positive impact on regional ozone and $PM_{10}/PM_{2.5}$ formation.

TABLE 5.1-39
Comparison of Amended CECP Emissions to Regional Precursor Emissions in 2015: Annual Basis[a]

Ozone Precursors – Annual Basis	
Total San Diego County Ozone Precursors, tpy	98,842
Total CECP Ozone Precursor Emissions, tpy	108
CECP Ozone Precursor Emissions as Percent of Regional Total	0.11%
Reductions from Shutdown of Existing Units (5-Year Lookback), tpy[b]	-66
Reductions from Shutdown of Existing Units (10-Year Lookback), tpy[c]	-123
Reductions from Shutdown of Existing Units (12-Year Lookback), tpy[d]	-152
CECP Net Ozone Precursor Emissions with Shutdown of Existing Units (5-Year Lookback), tpy	42
CECP Net Ozone Precursor Emissions with Shutdown of Existing Units (10-Year Lookback), tpy	-15
CECP Net Ozone Precursor Emissions with Shutdown of Existing Units (12-Year Lookback), tpy	-44
CECP Net Ozone Precursor Emissions as Percent of Regional Total, with Shutdown of Existing Units	Net Benefit
$PM_{10}/PM_{2.5}$ Precursors – Annual Basis	
Total San Diego County PM_{10} Precursors, tpy	145,489
Total San Diego County $PM_{2.5}$ Precursors, tpy	112,822
Total CECP $PM_{10}/PM_{2.5}$ Precursor Emissions, tpy	142
CECP PM_{10} Precursor Emissions as Percent of Regional Total	0.10%
CECP $PM_{2.5}$ Precursor Emissions as Percent of Regional Total	0.13%
Reductions from Shutdown of Existing Units (5-Year Lookback), tpy[b]	-100
Reductions from Shutdown of Existing Units (10-Year Lookback), tpy[c]	-190
Reductions from Shutdown of Existing Units (12-Year Lookback), tpy[d]	-235
CECP Net $PM_{10}/PM_{2.5}$ Precursor Emissions with Boiler Shutdowns (5-Year Lookback), tpy	42
CECP Net $PM_{10}/PM_{2.5}$ Precursor Emissions with Boiler Shutdowns (10-Year Lookback), tpy	-47
CECP Net $PM_{10}/PM_{2.5}$ Precursor Emissions with Boiler Shutdowns (12-Year Lookback), tpy	-92
CECP Net $PM_{10}/PM_{2.5}$ Precursor Emissions as Percent of Regional Total, with Shutdown of Existing Units	Net Benefit

[a]County-wide emissions calculated as 365 times daily emissions.
[b]Based on average emissions during past 5 years (2009 to 2013).
[c]Base on average emissions during past 10 years (2004 to 2013).
[d]Base on average emissions during past 12 years (2002 to 2013).

5.1.6.1.2 Localized Impacts

To evaluate potential cumulative impacts of Amended CECP in combination with other projects in the area, projects within a radius of 6 km of the Amended CECP were examined for the cumulative localized impacts analysis.

Within this search area, three categories of projects with combustion sources were used as criteria for identification:

- Existing projects that have been in operation since at least 2012;
- Projects for which air pollution permits to construct have been issued and/or that began operation after the beginning of 2012; and
- Projects for which air pollution permits to construct have not been issued, but that are reasonably foreseeable.

Existing projects that have been in operation since at least 2012 are reflected in the ambient air quality data that have been used to represent background concentrations for the Amended CECP; consequently, no further analysis of the emissions from this category of facilities was performed.

Projects for which air pollution permits to construct have been issued but that were not operational in 2012 were identified through a request of permit records from the SDAPCD. The SDAPCD performed a search of its permit computer tracking system for permits issued after January 1, 2012, for projects located within six miles of the CECP. This search also included permit application packages the SDAPCD is currently processing for projects located within six miles of the CECP. Enclosed as Appendix 5.1H is a copy of the list of projects provided by the SDAPCD. As shown on this list, other than the EPS there is only one project with CO, NOx, SOx, PM_{10}, or $PM_{2.5}$ emissions above the CEC-established *de minimis* level of 5 tpy: a 212 bhp digester gas fired engine at the CHP Clean Energy LLC facility located in Oceanside, CA (roughly 3.5 miles from the project site). For this facility, the only pollutant with emissions above 5 tpy is CO (maximum emissions of approximately 10 tpy).

As shown previously in Table 5.1-33, the maximum impacts for the Amended CECP remain below the federal significant impact levels (SIL) for CO. The primary purpose of federal SILs is to identify a level of ambient impact that is sufficiently low relative to an ambient air quality standard or increment such that the impact can be considered de minimis. Hence, EPA considers a source whose individual impact falls below a SIL to have a de minimis impact on air quality concentrations that already exist. If a project's impacts are below a federal SIL, these impacts are not considered to cause or contribute to a violation of an ambient air quality standard and/or increment.[19]

Consequently, since Amended CECP's CO impacts are below federal SILs, the Project Owner concludes that the impacts of the Amended CECP will be de minimis and that there is no need to perform a further CEQA cumulative analysis for this pollutant.

The following project are not included in the list of new/future projects provided by the SDAPCD:

- Carlsbad Seawater Desalination Plant
- Vista/Carlsbad Interceptor Agua Hedionda Lift Station
- Interstate 5 North Coast Corridor Project
- Los Angeles to San Diego (LOSSAN) Double-Tracking Project

The proposed Carlsbad Seawater Desalination Plant will be located adjacent to the CECP. According to the Final Environmental Impact Report (EIR) for this project,[20] the equipment associated with operation of the desalination plant includes the desalination plant intake water pump station, pretreatment facilities, reverse osmosis system, product water pump station, membrane cleaning system, chemical feed equipment, solids handling equipment, service facilities (i.e., HVAC, lighting), and the Oceanside pump station. All of this equipment will utilize electric power, will not utilize any combustion or other fuel sources, and will not generate any air emissions during their operation.

The proposed Vista/Carlsbad Interceptor Agua Hedionda Lift Station will also be located adjacent to the CECP. As with the Carlsbad Seawater Desalination Plant, the equipment associated with the Lift Station is expected to be electric powered and will not generate air emissions.

The proposed I-5 North Coast Corridor Project includes proposed improvements to maintain or improve the existing and future traffic operations on the I-5 freeway from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton that is scheduled to occur over approximately a 20-year period. This project was considered during the original permitting of the Licensed CECP and, as summarized below, the CEC concluded that there would not be significant cumulative impacts.[21]

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[19] 75 FR 64891: "Accordingly, a source that demonstrates that the projected ambient impact of its proposed emissions increase does not exceed the SIL for that pollutant at a location where a NAAQS or increment violation occurs is not considered to cause or contribute to that violation."

[20] Final EIR for the Poseidon Carlsbad Desalination Project, 12/2005, Section 4.2, page 4.2-17 (http://carlsbaddesal.com/Websites/carlsbaddesal/images/eir/EIR_4_2.pdf).

[21] Commission Decision, Carlsbad Energy Center Project, 07-AFC-06, June 2012, pages 6.2-22 to 6.2-23.

Regarding cumulative operational impacts, the DEIR/DEIS states that the proposed project would reduce particulate emissions compared to the current baseline, and that toxic emissions from freeway traffic would also likely be reduced by the widening project. (DEIR/DEIS, pp. 3.14-6, 3.14-9.) These would be reductions from the current baseline conditions currently included in the Staff's air quality analysis. Moreover, the CECP operation and the I-5 freeway widening impacts will be in different locations due to the different types of emission sources and the relative buoyancy of CECP turbine emissions, which will be dispersed much further downwind. Therefore, significant cumulative impacts from the CECP operation and the I-5 widening project should not occur.

A review of the October 2013 FEIR/EIS for the I-5 North Coast Corridor Project indicates that the project may result in a slight increase in overall PM_{10} emissions (mainly associated with paved road travel fugitive dust emissions) compared to existing baseline levels due to increased traffic volumes. However, there will be an expected decrease in overall $PM_{2.5}$ emissions due to a reduction in Diesel truck exhaust emissions.[22] There will also be an expected decrease in CO ambient impacts[23] and mobile source air toxic (MSAT) pollutants compared to existing baseline conditions.[24] Therefore, with the continued conclusion in the FEIR/EIS that there will generally be a decrease in emissions associated with the I-5 North Coast Corridor Project, there are no expected significant cumulative impacts from the Amended CECP and the I-5 project.

The LOSSAN Double-Tracking Project includes the proposed double-tracking of the main line/bridges, curve realignment, and the addition of crossovers to increase capacity and enhance reliability of the railroad corridor from Los Angeles to San Diego scheduled to occur over approximately a 20-year period. While the Final Program EIR/EIS for the LOSSAN Double-Tracking Project[25] concludes that the project will increase regional rail emissions in San Diego County due to rail traffic increases once the double track is installed (FEIR/EIS, Table 3.3-6), the FEIR/EIS admits that the analysis did not account for the benefits associated with decreases in locomotive idling and/or decreases in automotive idling at crossings due to debottlenecking with the double-track design (FEIR/EIS, page 3.3-19). In addition, the FEIR/EIS admits that the analysis did not account for the benefits associated with the phase-in of the EPA Tier III locomotive engines and did not account for the benefits associated with the SCAQMD Locomotive Fleet Agreement (FEIR/EIS, page 3.3-16). The FEIR/EIS concludes that these benefits would need to be determined as part of project-specific analyses prepared for the LOSSAN project. The double-tracking of the main line that passes by the CECP is referred to as the South Carlsbad Double Track Project. This project includes the double-tracking of a 1.9-mile section of main line from Carlsbad Village southward past Cannon Road and was completed in February 2012.[26] According to a Federal Railroad Administration Categorical Exclusion Worksheet prepared by AMTRAK, the South Carlsbad Double Track Project is not expected to result in any changes that would impact operational air emissions.[27] This determination is based on an air quality impact analysis performed for this project[28] that concludes that the project will result in lower operational NOx, VOC, CO, and PM_{10} emissions due to a reduction in locomotive idling time. Therefore, there are no expected significant cumulative impacts from the Amended CECP and the LOSSAN Double-Tracking Project.

[22] Interstate 5 North Coast Corridor Project, FEIR/EIS, Section 3.14, page 3.14-18. (http://www.dot.ca.gov/dist11/Env_docs/I-5NCC/Final/i-5_part3_chp3.pdf)

[23] Interstate 5 North Coast Corridor Project, FEIR/EIS, Section 3.14, Table 3.14.6.

[24] Interstate 5 North Coast Corridor Project, FEIR/EIS, Section 3.14, page 3.14-23.

[25] Final Program EIR/EIS for the LOSSAN – Los Angeles to San Diego Proposed Rail Corridor Improvements in the State of California, 09/2007.

[26] http://www.keepsandiegomoving.com/Lossan/lossan-carlsbad-double-track.aspx.

[27] Federal Railroad Administration Categorical Exclusion Worksheet, 12/7/2009, FRA Project ID 20103221, AMTRAK, Section III.G.

[28] Air Quality Impact Analysis for Carlsbad Double Track Project, 11/2/2009, Tom Dodson and Associates, Operational Impacts, pages 23 to 26.

5.1.6.2 Greenhouse Gas Cumulative Impacts Analysis

In the absence of established thresholds of significance or methodologies for assessing impacts, this analysis of GHG emission impacts consists of quantifying project-related GHG emissions, determining their significance in comparison to the goals of AB 32, and discussing the potential impacts of climate change within the state as well as strategies for minimizing those impacts.

As the CEC's 2009 Integrated Energy Policy Report (CEC, December 2009) noted:

> *The Energy Commission's 'Framework for Evaluating Greenhouse Gas Implications of natural Gas-Fired Power Plants in California' found that as California's integrated electricity system evolves to meet GHG emissions reduction targets, the operational characteristics associated with increasing renewable generation will increase the need for flexible generation to maintain grid reliability. The report asserts that natural gas-fired power plants are generally well-suited for this role and that California cannot simply replace all natural gas fired power plants with renewable energy without endangering the safety and reliability of the electric system. The report acknowledges that California will need to modernize its natural gas generating fleet to reduce environmental impacts, however. Overall, the report found that the future of natural gas plants will likely fill five auxiliary roles: 1) intermittent generation support, 2) local capacity requirements, 3) grid operations support, 4) extreme load and system emergencies support, and 5) general energy support. The question remains as to the quantity, type, and location of natural gas-fired generation to fill remaining electricity needs once preferred resource targets are achieved. (p. 110)*

Most renewable energy facilities such as wind and solar are "intermittent resources," meaning these resources are not available to generate in all hours and thus have limited operating capacity. For example, intermittent resources can be limited by meteorological conditions on an hourly, daily, and seasonal basis. Further, most renewable resources have no ability to provide regulation—the ability to ramp up and down quickly at the system operator's direction to ensure electric system reliability. In addition, the availability of intermittent resources is often unrelated to the load profile they serve. For example, some photovoltaic resources reach peak production around 12:00 noon, while the electrical demand sometimes peaks between 5:00 p.m. and 7:00 p.m. "Firming" involves the use of fast-starting, flexible generation that is always available under all operating conditions to ramp up or ramp down, as necessary, to balance load and generation. Firming power is the cornerstone of system reliability. Thus, in the context of the California Environmental Quality Act, the CEC's Integrated Energy Policy Report, and other state GHG policy documents, the project would not be expected to cause a significant cumulative impact with respect to GHGs. Instead, the project supports the State's strategy to reduce fuel use and GHG emissions.

The project can be operated without the limitations affecting intermittent renewable resources. The project will provide fast-starting, flexible generating resources that will supplement and support intermittent renewable resources without affecting electric system reliability. Accordingly, as a fast-starting, flexible generating resource, Amended CECP will enhance the reliability of existing and future intermittent renewable resources and thus further California's Renewable Portfolio Standard (RPS) and GHG goals. As directed by SB 97, the Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions (GHG CEQA Guidance) on December 30, 2009. On March 18, 2010, those amendments became effective.

The GHG CEQA Guidance included the following elements:

- Quantification of GHG emissions;
- Determination of whether the project may increase or decrease GHG emissions as compared to existing environmental setting;
- Determination of whether the project emissions exceed a threshold of significance determined by the lead agency;

- The extent to which the project complies with state, regional, or local plans for reduction or mitigation of GHGs; and
- Mitigation measures.

Certain GHG reduction strategies will require increases in natural gas consumption; for example, some fraction of electric generation from coal-fired power plants will need to be replaced by natural gas fired generation. As the 2007 Integrated Energy Policy Report (IEPR) and a 2009 CEC Siting Committee Report (CEC, March 2009) acknowledged, "new gas-fired power plants are more efficient than older power plants, and they displace these older facilities in the dispatch order." The CEC's 2009 Framework report (CEC, May 2009) further discussed the role of new gas-fired power plants in displacing GHG emissions, and furthering the State's efforts to reduce GHG emissions. The 2009 Framework report concludes that as California expands renewable energy generation to achieve its GHG emissions reduction goals, it cannot simply retire natural-gas fired power plants: rather, new natural-gas fired power plants may be needed. Net GHG emissions for the integrated electric system will decline when new gas-fired power plants are added that (1) serve load growth or capacity needs more efficiently than the existing fleet; (2) improve the overall efficiency of the electric system; and/or (3) permit increased penetration of renewable generation (CEC, May 2009). Because of its location and operational characteristics, Amended CECP will contribute to the reduction of GHG emissions because it will achieve all of these goals.

In the Presiding Member's Proposed Decision for the Avenal Energy Project (CEC-800-2009 006-PMPD), the Committee has established a three-part test to ensure that new natural gas fired power plants approved by the CEC will support the goals and policies of AB 32 and the related parts of California's GHG framework. The elements of this test are listed below.

1. The project must not increase the overall system heat rate for natural gas plants.
2. The project must not interfere with generation from existing renewable facilities nor with the integration of new renewable generation.
3. Taking into account the factors listed in (1) and (2), the project must reduce system-wide GHG emissions and support the goals and policies of AB 32.

As a fast-starting, highly efficient facility, Amended CECP will meet all three of these criteria. The proposed high efficiency simple-cycle units would have a gross heat rate of approximately 7,947 Btu/kWh (LHV), which leads to an estimated GHG emission rate of 0.48 MT CO_2/MWh. The project's capability for fast response will provide firming capability that will support the integration of new renewable generation. By displacing older, less efficient units, the project will reduce system-wide GHG emissions.

In addition, GHG emissions for the Amended CECP will be offset in part by the shutdown of EPS Units 1–5 and the peaker gas turbine. The net GHG emission change is shown below in Table 5.1-40 looking at a 5-year, 10-year, and 12-year[29] lookback period for the existing EPS units. The detailed GHG emission calculations for the proposed new units and the existing EPS units are included in Appendixes 5.1B and 5.1C, respectively.

Table 5.1-40 demonstrates that all three baseline periods for the existing EPS units result in a significant reduction in GHG emissions, with the 12-year lookback period resulting in an overall net reduction in GHG emissions with the shutdown of the existing Units 1–5/peaker gas turbine. Table 5.1-40 also shows that there is a significant net reduction in GHG emissions when comparing the Amended CECP to the Licensed CECP.

[29] The 12-year lookback begins in 2002, which matches the beginning of the baseline period used for the original CECP permitting process.

TABLE 5.1-40
Net GHG Emissions Change for Amended CECP

Equipment	Total MT CO_2e [a]
Amended CECP vs. Shutdown of Existing Units	
Reductions from Shutdown of Existing Units	
Units 1–5 and Peaker Gas Turbine (5-Year Lookback)[b]	-450,922
Units 1–5 and Peaker Gas Turbine (10-Year Lookback)[c]	-805,745
Units 1–5 and Peaker Gas Turbine (12-Year Lookback)[d]	-912,085
New Equipment (Amended CECP)	
Gas Turbines and Emergency Engines[e]	846,574
Net Emission Change (5-Year Lookback) =	395,652
Net Emission Change (10-Year Lookback) =	40,829
Net Emission Change (12-Year Lookback) =	-65,511
Amended CECP vs. Licensed CECP	
Licensed CECP	
New Equipment and Existing Units 4 and 5[f]	-1,561,264
New Equipment (Amended CECP)	
Gas Turbines and Emergency Engines[e]	846,574
Net Emission Change =	-714,690

[a]Metric tons of carbon dioxide equivalent.

[b]Based on average emissions during past 5 years (2009 to 2013).

[c]Base on average emissions during past 10 years (2004 to 2013).

[d]Base on average emissions during past 12 years (2002 to 2013).

[e]Includes SF_6 from circuit breakers.

[f]This includes the emissions for the new equipment associated with the Licensed CECP (CEC June 2012 Approval of CECP, Greenhouse Gas Table-1) and the emissions for existing Units 4 and 5 for 12-year lookback.

5.1.6.2.1 Nitrogen Emission Analysis

Nitrogen deposition is the input of NOx and ammonia (NH_3) derived pollutants, primarily nitric acid (HNO_3), from the atmosphere to the biosphere. Nitrogen deposition can lead to adverse impacts on sensitive species including direct toxicity, changes in species composition among native plants, and enhancement of invasive species.

The total nitrogen emission levels (based on NOx and NH_3 emissions) for the Amended CECP will be offset in part by the shutdown of EPS Units 1–5 and the peaker gas turbine. The net nitrogen emission change is shown below in Table 5.1-41 looking at 5-year, 10-year, and 12-year lookback periods for the existing EPS units. The detailed nitrogen emission calculations for the proposed new units and the existing EPS units are included in Appendix 5.1B.

Table 5.1-41 demonstrates that all three baseline periods for the existing EPS units result in a significant reduction in total nitrogen emissions, with the 12-year lookback period resulting in an overall net reduction in nitrogen emissions with the shutdown of the existing Units 1–5/peaker gas turbine. Table 5.1-41 also shows that there is a significant net reduction in nitrogen emissions when comparing the Amended CECP to the Licensed CECP.

TABLE 5.1-41
Net Nitrogen Emissions Change for Proposed Project

Equipment	Total Nitrogen Emissions (tpy)[a]
Amended CECP vs. Shutdown of Existing Units	
Reductions from Shutdown of Existing Units	
Units 1–5 and Peaker Gas Turbine (5-Year Lookback)[b]	-29
Units 1–5 and Peaker Gas Turbine (10 -Year Lookback)[c]	-50
Units 1–5 and Peaker Gas Turbine (12 -Year Lookback)[d]	-65
New Equipment (Amended CECP)	
Gas Turbines and Emergency Engines	62
Net Emission Change (5-Year Lookback) =	34
Net Emission Change (10-Year Lookback) =	12
Net Emission Change (12-Year Lookback) =	-3
Amended CECP vs. Licensed CECP	
Licensed CECP	
New Equipment and Existing Units 4 and 5[e]	-119
New Equipment (Amended CECP)	
Gas Turbines and Emergency Engines	62
Net Emission Change =	-56

[a]Includes nitrogen associated with NOx and NH_3 emissions.

[b]Based on average emissions during past 5 years (2009 to 2013).

[c]Base on average emissions during past 10 years (2004 to 2013).

[d]Base on average emissions during past 12 years (2002 to 2013).

[e]This includes the emissions for the new equipment associated with the Licensed CECP (CEC June 2012 Approval of CECP, Air Quality Table-7) and the emissions for existing Units 4 and 5 for 12-year lookback.

5.1.7 Laws, Ordinances, Regulations, and Standards

A discussion of the air quality LORS applicable to the Amended CECP is included in Sections 5.1.3.1 and 5.1.5.

5.1.8 Conditions of Certification

In the June 2012 approval of the CECP, the CEC imposed a number of air quality COCs on the project based on the SDAPCD's FDOC that was issued on August 4, 2009. The Amended CECP will require the submittal of a new permit application to the SDAPCD requesting a new FDOC for the CECP. When issued, the new FDOC will likely include a number of new and/or revised equipment descriptions, emission limits, and operating restrictions. Since the new FDOC is not yet issued, it is currently impossible to provide an accurate markup of the existing air quality COCs showing the necessary changes to match the new FDOC.

5.1.9 Mitigation

Mitigation will be provided for all emissions increases from the Amended CECP in the form of emission reductions from the shutdown of existing units at the EPS, NOx emission reduction credits, and the installation of BACT for the new equipment, as required under District regulations. The demonstration of compliance with the BACT requirement is provided in Appendix 5.1C.

As discussed in Section 5.1.5.3.1, the emissions increases from the Amended CECP will be offset through the reductions achieved by shutting down the existing boiler Units 1–5 and the peaker gas turbine at the EPS and by providing NOx emission reduction credits. Table 5.1-34 demonstrated that the Amended CECP will result in a net reduction in emissions of CO, PM_{10}, and VOC; an increase in SOx emissions (no SDAPCD offset

requirement for this pollutant); and an increase in NOx emissions (as shown in Table 5.1-36, this increase triggers SDAPCD offset requirements). The NOx emission offsets required by the SDAPCD have been purchased and will be surrendered to the SDAPCD prior to the initial operation of the new units. Table 5.1-41 demonstrated that when a 10- or 12-year lookback is used to develop the baseline emissions for the existing EPS units, the Amended CECP will result in a net reduction in emissions of ozone and PM_{10}/$PM_{2.5}$ precursors with the shutdown of the existing Units 1–5/peaker gas turbine. Therefore, no further mitigation will be needed for the Amended CECP.

5.1.10 Permits Required and Permit Schedule

Under Rule 20.5, the SDAPCD regulates the construction and operation of new and modified power plants. As part of the application review process, the District will conduct a Determination of Compliance (DOC) review upon receipt of the PTA for the Amended CECP. The SDAPCD considers the PTA to be equivalent to an application for an Authority to Construct (ATC). The DOC review will consist of a review identical to that which would be performed if an application for an ATC had been received for a power plant and will confirm that the project will meet all applicable District rules and regulations.

A preliminary DOC (PDOC) is expected to be issued within approximately 180 days after the District determines that the PTA is complete. The PDOC will be circulated for public comment, and a final DOC (FDOC) will be issued by the SDAPCD after comment has been considered and addressed. Upon approval of the Amended CECP by the CEC, the FDOC confers the same rights and privileges as an ATC. The ATC allows for the construction of the new air pollution sources and services as a temporary Permit to Operate (PTO). Once the project has completed construction, begun operating, and performed the initial set of emission compliance tests, the SDAPCD will verify that the Amended CECP conforms to the FDOC/ATC and, following such verification, will issue a PTO.

The SDAPCD has received delegation from EPA to administer the federal Title IV and Title V programs for sources within its jurisdiction. The project will be subject to Acid Rain program requirements (federal Title IV). With regards to Title V, within 12 months of the initial operation of the new equipment a Title V permit application will be submitted to the District to modify the existing Title V permit for the EPS to include the operation of the new equipment. As discussed above, the SDAPCD expects that in the near future the EPA will delegate authority to the SDAPCD to issue PSD permits. If this is the case, the ATC will serve as the PSD permit as well. If this PSD delegation to the SDAPCD does not occur in a timely manner, a separate PSD permit application will be submitted to EPA Region 9 for a PSD review/permit for GHG emissions.

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5.2 Biological Resources

This section provides the Project Owner's evaluation of how the Amended CECP could impact biological resources and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to biological resources. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to biological resources that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.2.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.2.2 Affected Environment

The Amended CECP's biological study area, like that for the Licensed CECP, encompasses the Cabrillo Parcel and is bounded by the SDG&E service center property and Cannon Road to the south, I-5 to the east, Carlsbad Boulevard, the Pacific Ocean and Carlsbad State Beach to the west, and the Agua Hedionda Lagoon to the north. The north/south AT&SF/North County Transit District Rail Corridor bisects the area. Land uses surrounding the project site continue to include planned industrial, open space, travel/recreation, commercial and residential land uses. As for the Licensed CECP, the Amended CECP is similar to the existing land use within the Cabrillo Parcel boundary and will not encroach onto lands outside of this boundary.

The change in generation technology and the above-grade demolition of the EPS power building and miscellaneous support building at the EPS will not result in new impacts to biological resources beyond those identified in the Final Decision.

5.2.3 Environmental Analysis

The Amended CECP will not result in new impacts to biological resources beyond those identified for the Licensed CECP. Subsurface activities required for the Amended CECP will occur in areas of Cabrillo Parcel that have been previously disturbed as part of historical power plant operations; therefore, impacts beyond those described in the Final Decision are not anticipated.

CH2M HILL staff (Bridget Canty, Wildlife Biologist) conducted a site visit on February 10, 2014. During this visit, CH2M HILL staff, accompanied by an NRG representative, walked areas of the project site not currently impacted by construction activities. She noted that only minimal vegetation presently exists within the Cabrillo Parcel since most of the parcel is either paved, graveled, or under construction (i.e., ongoing construction of the Poseidon desalination facility located on a leased portion of the Cabrillo Parcel that is independent of CECP and the EPS). The Cabrillo Parcel does not provide significant plant or wildlife habitat. However, the Agua Hedionda coastal lagoon, located due north and west of the parcel boundary, provides suitable estuarine open water and riparian habitats, which offer abundant foraging, nesting opportunities, and cover for wildlife.

The resource protection measures included in existing COCs BIO-1 through BIO-9 of the Final Decision are adequate to address potential impacts to biological resources from implementation of the Amended CECP.

To determine the impacts of the Amended CECP on aquatic and terrestrial resources at the CECP site, updated species lists generated from queries of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and U.S. Fish and Wildlife Service (USFWS) were reviewed. Table 5.2-1 (due to size, this table has been provided at the end of this section) presents an updated comparison of special-status species that potentially occur at the site compared to those with potential to occur at the site at the time that the 2007 AFC was prepared (CDFW 2014, USFWS 2014, CNPS 2014). One additional species, Del Mar manzanita (*Arctostaphylos glandulosa* var. *crassifolia*), was identified as potentially occurring in the Amended Project area during the information review. In addition, one plant species, Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*) was removed from the list due to a change in the species' status. In addition, the statuses of fifteen other species were also revised at either the state or federal level; however, these changes in status result in no new or revised impacts to the Amended CECP.

Figure 5.2-1 shows the results of the queries related to the Amended CECP, as well as the likelihood of each species' occurrence in the Amended Project area based on presence (or lack) of suitable habitat. A review of sensitive natural communities and critical habitat was also conducted (Figure 5.2-2) for the Amended CECP. In addition, CH2M HILL staff conducted a site reconnaissance and nesting bird survey on March 10, 2014. No nesting birds, evidence of roosting bats, new habitats, wetlands, or special-status species were observed during the survey.

VICINITY MAP

LEGEND

- Site Boundary
- 1-Mile Buffer
- Plant
- Animal
- Terrestrial Community

CNDDB - March 2014

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (non-specific)
- Multiple (non-specific)
- Multiple (circular)

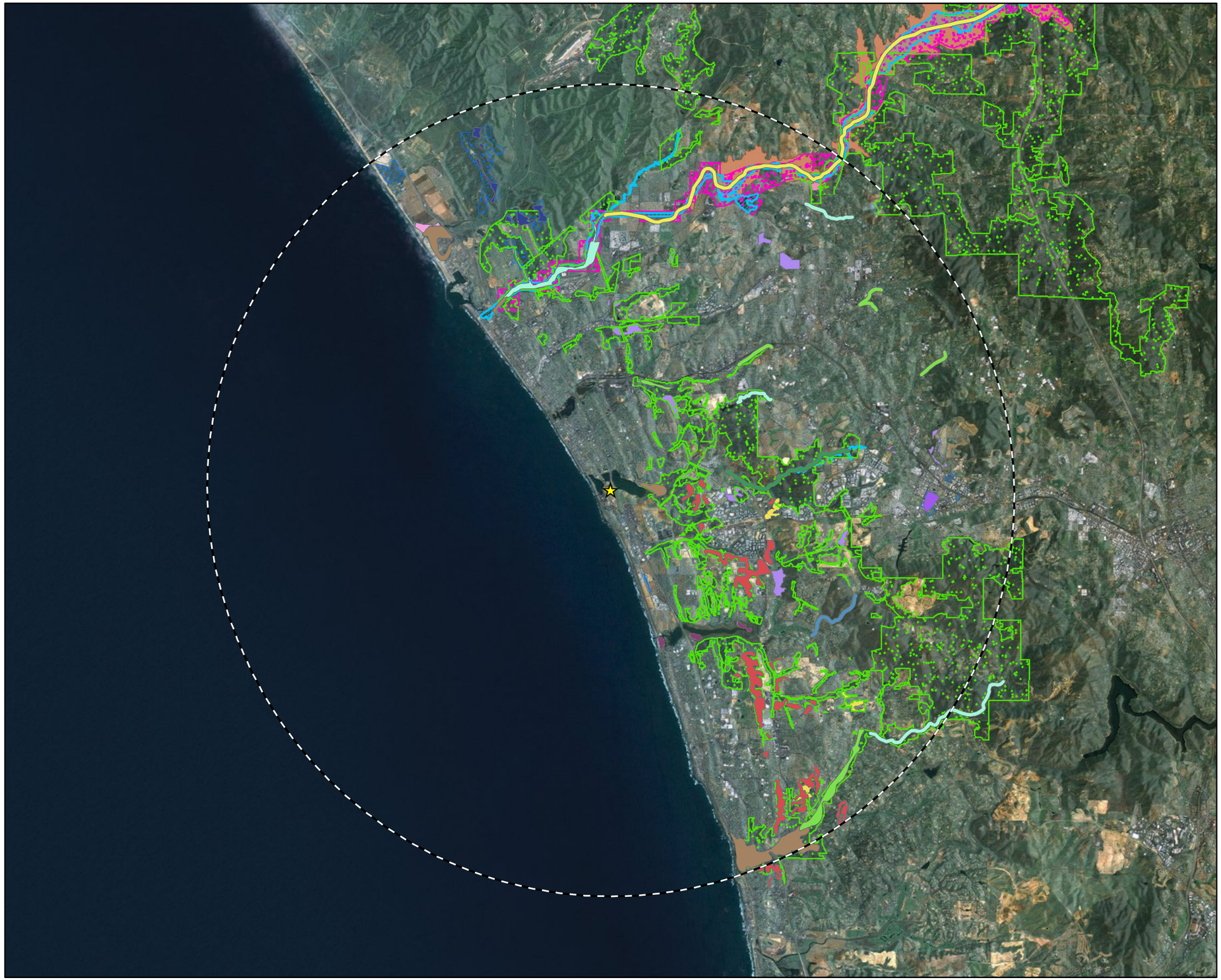
Source: CNDDB, March 2014

N

0 1,000 2,000 4,000

Feet

FIGURE 5.2-1
CNDDB Special-status Species Records Within 1 Mile
Carlsbad Energy Center Power (CECP) Project
Carlsbad, CA



LEGEND

- Project Site
- 10-Mile Project Buffer

Sensitive Habitats

- Coastal Brackish Marsh
- San Diego Mesa Claypan Vernal Pool
- San Diego Mesa Hardpan Vernal Pool
- Southern Coastal Salt Marsh
- Southern Cottonwood Willow Riparian Forest
- Southern Maritime Chaparral
- Southern Riparian Forest
- Southern Riparian Scrub
- Southern Sycamore Alder Riparian Woodland
- Southern Willow Scrub

Critical Habitat

- Arroyo (=arroyo southwestern) toad
- Coastal California gnatcatcher
- Least Bell's vireo
- Riverside fairy shrimp
- San Diego ambrosia
- San Diego fairy shrimp
- San Diego thornmint
- Southwestern willow flycatcher
- Spreading navarretia
- Thread-leaved brodiaea
- Western snowy plover

Source: California Department of Fish and Game, Habitat Conservation Division, Wildlife and Habitat Data Analysis Branch, December 2013.
U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office February 13, 2008.

N

0 1.25 2.5
Miles

FIGURE 5.2-2
Sensitive Natural Communities and Critical Habitat
Carlsbad Energy Center Power (CECP) Project
Carlsbad, CA

During the site visit conducted on March 10, 2014, CH2M HILL staff noted that only minimal vegetation presently exists within the Cabrillo Parcel since most of the facility is either paved, graveled, or disturbed due to ongoing construction. Although there is some vegetation growing on the slope along the northern EPS boundary and along the eastern fence line (bordering I-5), this vegetation consists of non-native species (ice plant, ornamental shrubs, and non-native trees) and is not considered species or habitat requiring protection. There is no designated or proposed critical habitat for federally listed species located within 1 mile of the CECP. Furthermore, the Amended CECP will result in a significant reduction in total nitrogen emissions (based on NOx and NH_3 emissions) from those approved for the Licensed CECP (see Section 5.1, Air Quality, for further details). No impacts, beyond those described in the Final Decision would occur to the Agua Hedionda Lagoon. The Amended CECP will not result in the permanent alteration of any existing sensitive or critical habitats and no impacts to special-status species are expected to occur, including to the one additional species identified during the updated information review.

The resource protection measures included in the Final Decision for the Licensed CECP, COCs BIO-1 through BIO-9, are adequate to address potential impacts to biological resources during construction and operation of Amended CECP, including the above-grade demolition of EPS. Construction and demolition activities will be conducted in compliance with these COCs and applicable LORS. Table 5.2-2 identifies the additional acreage that would be affected due to the slightly expanded footprint of the Amended CECP and the above-grade demolition of EPS.

TABLE 5.2-2
Summary of Changes to Potential CECP Impacts on Biological Resources during Construction and Demolition of the Amended CECP

Location	Project Work	Construction Zone Size	Habitat Type	Sensitive Biological Resources	Direct Impacts to Biological Resources*	
					Temporary	Permanent
CECP site	Construction of Amended CECP	30 acres	Developed and Disturbed	None	None	None
Encina Power Station	Demolition of Existing EPS building and other structures	Approximately 11.3 acres	Developed and Disturbed	None	None	None
Construction laydown/parking areas	Paved or gravel	Approximately 19.3 acres	Developed and Disturbed	None	None	None
230 kV transmission line	Connection to existing switchyard	4,000-ft onsite connection to existing SDG&E Encina Switchyard	Developed and Disturbed	None	None	None
138 kV transmission line	Connection to existing switchyard	2,200-ft onsite connection to existing SDG&E Encina Switchyard	Developed and Disturbed	None	None	None

*Impacts above and beyond those described in the Final Decision

NOTE: Underlined text indicates items that are new or changed from the Licensed CECP.

5.2.4 Cumulative Impacts

Construction activities for the Amended CECP will involve similar activities as those described for the Licensed CECP in the Final Decision. In addition, the impact on biological resources due to the operation of

six natural-gas-fired combustion GE LMS 100 turbines is similar to the operation of the two combined-cycle units previously licensed. Amended CECP demolition and construction activities are expected to occur in areas of the Cabrillo Parcel that have been previously disturbed as part of historical power plant operations. Therefore, the proposed project changes will not result in any significant cumulative impacts to biological resources beyond those addressed in the Final Decision.

5.2.5 Laws, Ordinances, Regulations, and Standards

The Final Decision found the Licensed CECP to be in compliance with applicable biology LORS. Likewise, the Amended CECP will be consistent with applicable biology-related LORS, the Amended Project will not alter the assumptions or conclusions in the CEC Final Decision, and no additional or revised LORS compliance requirements have been identified. As discussed above, the biological resource protection measures included in existing COCs BIO-1 through BIO-9 are adequate to address potential impacts to biological resources during construction and operation of Amended CECP, including the above-grade demolition of EPS. Construction and demolition activities for the Amended CECP will be conducted in compliance with these COCs and applicable LORS.

5.2.6 Conditions of Certification

Existing COCs do not need to be amended, as the Amended CECP will not result in new or more severe direct impacts. Potential indirect impacts to wildlife that may occur in Agua Hedionda Lagoon would be avoided and minimized through implementation of the existing COCs and applicable LORS.

BIO-1: The project owner shall assign a Designated Biologist to the project. The project owner shall submit the résumé of the proposed Designated Biologist, with at least three references and contact information, to the compliance project manager (CPM) for approval.

The Designated Biologist must meet at least 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 from a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society
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 résumé shall demonstrate to the satisfaction of the CPM that the proposed or alternate Designated Biologist has the appropriate training and background to implement effectively the mitigation measures and Conditions of Certification.

Verification: The project owner shall submit the specified information at least 90 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities shall commence until an approved Designated Biologist is available to be on-site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM in order to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

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, and closure activities. The Designated Biologist may be assisted by approved biological monitor(s), but remains the contact for the project owner and CPM. The Designated Biologist shall:

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 resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and 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. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., 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 report and the annual report
9. Train the biological monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits

Verification: The Designated Biologist shall submit in the monthly compliance report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the annual compliance report unless his/her duties are ceased as approved by the CPM.

BIO-3: The project owner's CPM-approved Designated Biologist shall submit the résumé, at least three references, and contact information of the proposed biological monitor(s) to the CPM for approval. The résumé shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological monitor(s) training by the Designated Biologist shall include familiarity with the Conditions of Certification, BRMIMP, WEAP, and all permits.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any site (or related facilities) mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that the individual biological monitor(s) has 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 10 days prior to their first day of monitoring activities.

BIO-4: The project owner's construction and 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 biological monitor(s), the project owner's construction' and 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 unauthorized adverse impact to biological resources if the activities continued

2. Inform the project owner and the construction and operation manager when to resume activities
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 instituted, as a result of the work stoppage

If the Designated Biologist is unavailable for direct consultation, the lead 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 following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIO-5: The project owner shall develop and implement a CPM-approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation, and closure, is informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media are made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures;
5. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
6. Include a training acknowledgment form to be signed by each worker indicating that he/she received training and shall abide by the guidelines.

The specific program may be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any project-related ground disturbing activities, the project owner shall provide to the CPM two copies of the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a résumé of the person(s) administering the program.

The project owner shall provide in the monthly compliance report 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. At least 10 days prior to site (and related facilities) mobilization, the project owner shall submit two copies of the CPM-approved materials.

The signed training acknowledgement forms from construction shall be kept on file by the project owner for a period of at least 6 months after the start of commercial operation.

During project operation, signed statements for active project operational personnel shall be kept on file for six months following the termination of an individual's employment.

BIO-6: The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment), and shall implement the measures identified in the approved BRMIMP.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify:

1. All biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner
2. All Applicant-proposed mitigation measures presented in the Application for Certification
3. All Biological Resources Conditions of Certification identified as necessary to avoid or mitigate impacts
4. All biological resource mitigation, monitoring, and compliance measures required in other state agency terms and conditions, such as those provided in the Regional Water Quality Control Board permits
5. All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements
6. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure
7. All required mitigation measures for each sensitive biological resource
8. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities
9. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction
10. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities — one set prior to any site (and related facilities) mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen
11. Duration for each type of monitoring and a description of monitoring methodologies and frequency
12. Performance standards to be used to help decide if/when proposed mitigation is or is not successful
13. All performance standards and remedial measures to be implemented if performance standards are not met
14. A preliminary discussion of biological resources related facility closure measures
15. Restoration and revegetation plan
16. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval

Verification: The project owner shall provide the specified document at least 60 days prior to start of any project-related ground disturbing activities.

The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM, the CDFG, and USFWS within five days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to site (and related facilities) mobilization, the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFG, the USFWS, and appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the monthly compliance reports by the Designated Biologist (i.e., 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; a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding.

BIO-7: Any time the project owner modifies or finalizes the project design, all feasible measures shall be incorporated that avoid or minimize impacts to the local biological resources. The project owner shall:

1. Design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources
2. Design, install, and maintain transmission lines and all electrical components in accordance with the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 to reduce the likelihood of electrocutions of large birds
3. Install bird flight diverters on the overhead ground wires of proposed transmission lines (230- and 138-kV) to reduce the likelihood of bird collision with power lines; if overhead ground wires are not installed, bird flight diverters shall be placed on the conductors
4. Eliminate from landscaping plans any List A California exotic pest plants of concern as defined by the California Exotic Pest Plant Council
5. Prescribe a road sealant that is non-toxic to wildlife and plants
6. Design, install, and maintain facility lighting to prevent side casting of light toward wildlife habitat (i.e., Agua Hedionda Lagoon); obstruction lighting shall be white flashing lights unless specifically prohibited by the FAA

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. 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.

BIO-8: The project owner shall implement the following measures to manage its construction site (and related facilities) in a manner to avoid or minimize impacts to local biological resources:

1. Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches if outside an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar material that is approved by USFWS and CDFG
2. Ensure that all food-related trash is disposed of in closed containers and removed at least once a week
3. Prohibit feeding of wildlife by staff and subcontractors
4. Prohibit non-security related firearms or weapons on-site
5. Prohibit pets on-site

6. Avoid work between March 1 and August 15 to avoid impacts to birds protected under the Migratory Bird Treaty Act
   A. If this is not feasible, a survey shall be conducted for nesting birds within the project area
   B. Should an active nest be discovered, the Designated Biologist or biological monitor shall establish an appropriate buffer zone (in which construction activities are not allowed) to avoid disturbance in the vicinity of the nest
      i. Construction activities shall not commence until the Designated Biologist or biological monitor has determined that the nestlings have fledged or that construction activities will not affect adults or newly fledged young OR
      ii. The Designated Biologist or biological monitor shall develop a monitoring plan that permits the activity to continue in the vicinity of the nest while monitoring nesting activities to ensure that nesting birds are not disturbed.
7. Report all inadvertent deaths of sensitive species to the biological monitor, who will notify CDFG or USFWS, as appropriate
8. Minimize use of rodenticides and herbicides in the project area

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. 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 biological resource measures have been completed.

BIO-9: In the event that EPS Units 4 and 5 (and their pumps that supply discharge water for desalination purposes by the CECP) cease to operate–and the CECP will require intake of ocean water–the project owner shall inform the appropriate resource agencies (i.e., NMFS, USFWS, and CDFG) and coordinate regarding the compliance with Clean Water Act Section 316(b), and/or the Endangered Species Act requirements, as necessary.

Verification: Annual reports of the operational status of Units 4 and 5 shall be submitted to the CPM, and planned closure of these units shall be reported to the CPM as soon as possible. No later than 30 days prior to decommissioning of Units 4 and 5, the project owner shall provide copies of pertinent records of conversation, permit applications, associated technical reports, and permits (as applicable) to the CPM to verify that federal and state agency coordination has occurred regarding compliance with Clean Water Act Section 316(b) and/or Endangered Species Act requirements, as necessary.

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Plants					
Abronia villosa var. *aurita*	chaparral sand-verbena	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Low
Acanthomintha ilicifolia	San Diego thorn-mint	FT, CE, CNPS 1B.1, HMP: Yes, NE	FT, CE, CNPS 1B.1, HMP: Yes, NE		Low
Adolphia californica	California adolphia	CNPS 2B.1, HMP: No	CNPS 2B.1, HMP: No		Low. Nearest occurrence within 1-mile radius (CDFW 2014).

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Ambrosia pumila	San Diego ambrosia	FE, CNPS 1B.1, HMP: Yes, NE	FE, CNPS 1B.1, HMP: Yes, NE		Low
Arctostaphylos glandulosa var. *crassifolia*	Del Mar manzanita	N/A	FE, CNPS 1B.1, HMP: Yes, NE	New species added from 2014 USFWS list (USFWS, 2014).	Low
Astragalus tener var. *titi*	coastal dunes milk-vetch	FE, CE, CNPS 1B.1, HMP: No	FE, CE, CNPS 1B.1, HMP: No		Low-Moderate
Atriplex pacifica	South Coast saltscale	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate. Nearest occurrence within 1-mile radius (CDFW 2014).
Atriplex serenana var. *davidsonii*	Davidson's saltscale	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate
Baccharis vanessae	Encinitas baccharis	FT, CE, CNPS 1B.1, HMP: Yes, NE	FT, CE, CNPS 1B.1, HMP: Yes, NE		Low
Brodiaea filifolia	thread-leaved brodiaea	FT, CE, CNPS 1B.1, HMP: Yes, NE	FT, CE, CNPS 1B.1, HMP: Yes, NE		Low
Brodiaea orcuttii	Orcutt's brodiaea	CNPS 1B.1, HMP: Yes, NE	CNPS 1B.1, HMP: Yes, NE		Low
Ceanothus verrucosus	wart-stemmed ceanothus	CNPS 2B.2, HMP: Yes	CNPS 2B.2, HMP: Yes		Low. Nearest occurrence within 1-mile radius (CDFW 2014).
Centromadia parryi ssp. *australis*	southern tarplant	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Moderate
Centromadia pungens ssp. *laevis*	smooth tarplant	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Moderate
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Low-Moderate. Historic occurrence (1941) within approximately 1.4 miles, but exact location is unknown (CDFW, 2014). Due to changes in habitat conditions, likely extirpated from immediate area.
Chorizanthe orcuttiana	Orcutt's spineflower	FE, CE, CNPS 1B.1, HMP: Yes, NE	FE, CE, CNPS 1B.1, HMP: Yes, NE		Low-Moderate
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Comarostaphylis diversifolia ssp. *diversifolia*	summer holly	CNPS 1B.2, HMP: Yes	CNPS 1B.2, HMP: Yes		Low
~~*Coreopsis*~~ *Leptosyne maritima*	sea dahlia	CNPS 2B.2, HMP: No	CNPS 2B.2, HMP: No	New genus	Low-Moderate
Corethrogyne filaginifolia var. *incana*	San Diego sand aster	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Low-Moderate
Corethrogyne filaginifolia var. *linifolia*	Del Mar mesa sand aster	CNPS 1B.1, HMP: Yes, NE	CNPS 1B.1, HMP: Yes, NE		Low-Moderate
Dudleya blochmaniae ssp. *blochmaniae*	Blochman's dudleya	CNPS 1B.1, HMP: Yes, NE	CNPS 1B.1, HMP: Yes, NE		Low-Moderate
Dudleya multicaulis	many-stemmed dudleya	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate
Dudleya variegata	variegated dudleya	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate
Dudleya viscida	sticky dudleya	CNPS 1B.2, HMP: Yes	CNPS 1B.2, HMP: Yes		Low-Moderate
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE, CE, CNPS 1B.1, HMP: Yes, NE	FE, CE, CNPS 1B.1, HMP: Yes, NE		Low
Eryngium pendletonensis	Pendleton button-celery	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Low
Euphorbia misera	cliff spurge	CNPS 2B.2, HMP: Yes	CNPS 2B.2, HMP: Yes		Low. Nearest occurrence within 1-mile radius (CDFW 2014).
Ferocactus viridescens	San Diego barrel cactus	CNPS 2B.1, HMP: Yes	CNPS 2B.1, HMP: Yes		Low-Moderate
Geothallus tuberosus	Campbell's liverwort	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Low
Hazardia orcuttii	Orcutt's hazardia	FC, CT, CNPS 1B.1, HMP: Yes, NE	FC, CT, CNPS 1B.1, HMP: Yes, NE		Low-Moderate
Isocoma menziesii var. *decumbens*	decumbent goldenbush	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate
Iva hayesiana	San Diego marsh-elder	CNPS 2B.2, HMP: Yes	CNPS 2B.2, HMP: Yes		Moderate

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No		Low-Moderate
~~*Lepidium virginicum* var. *robinsonii*~~	~~Robinson's pepper-grass~~	~~CNPS 1B.2, HMP: No~~	~~CNPS 1B.2, HMP: No~~	Removed from list due to change in CPNS rank to 4.3.	~~Low-Moderate~~
~~*Lotus*~~ *Acmispon nuttallianus*	Nuttall's ~~lotus~~ acmispon	CNPS 1B.1, HMP: No	CNPS 1B.1, HMP: No	New genus and common names	Low-Moderate
Bloomeria ~~*Muilla*~~ *clevelandii*	San Diego goldenstar	CNPS 1B.1, HMP: Yes, NE	CNPS 1B.1, HMP: Yes, NE	New genus	Low-Moderate
Nama stenocarpum	mud nama	CNPS 2B.2, HMP: No	CNPS 2B.2, HMP: No		Moderate
Navarretia fossalis	spreading navarretia	FT, CNPS 1B.1, HMP: Yes, NE	FT, CNPS 1B.1, HMP: Yes, NE		Low
Nemacaulis denudata var. *denudata*	coast woolly-heads	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Not likely. Nearest occurrence within 1-mile radius (CDFW 2014).
Nemacaulis denudata var. *gracilis*	slender woolly-heads	CNPS 2.2, HMP: No	CNPS 2.2, HMP: No		Low
Nolina cismontana	chaparral nolina	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Moderate
Orcuttia californica	California Orcutt grass	FE, CE, CNPS 1B.1, HMP: Yes, NE	FE, CE, CNPS 1B.1, HMP: Yes, NE		Low
Phacelia stellaris	Brand's phacelia	FC, CNPS 1B.1, HMP: No	FC, CNPS 1B.1, HMP: No		Low-Moderate
Quercus dumosa	Nuttall's scrub oak	CNPS 1B.1, HMP: Yes	CNPS 1B.1, HMP: Yes		Low
Suaeda esteroa	estuary seablite	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Moderate
Tetracoccus dioicus	Parry's tetracoccus	CNPS 1B.2, HMP: No	CNPS 1B.2, HMP: No		Low-Moderate
Invertebrates					
Branchinecta sandiegonensis	San Diego fairy shrimp	FE, HMP: Yes, NE	FE, HMP: Yes, NE		Not likely. Nearest occurrence from a vernal pool within the 1-mile survey area (CDFW 2014).
Euphydryas editha quino	quino checkerspot butterfly	FE, HMP: No	FE, HMP: No		Not Likely
Streptocephalus woottoni	Riverside fairy shrimp	FE, HMP: Yes, NE	FE, HMP: Yes, NE		Low-Moderate

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Fish					
Eucyclogobius newberryi	tidewater goby	FE, CSC, HMP: No	FE, CSC, HMP: No		Not likely. Nearest occurrence within Agua Hedionda in the 1-mile radius (CDFW 2014).
Gila orcuttii	arroyo chub	CSC, HMP: No	CSC, HMP: No		Moderate
Amphibians					
Bufo californicus	arroyo toad	FE, CSC, HMP: Yes	FE, CSC, HMP: Yes		Low-Moderate
Spea hammondii	western spadefoot	CSC, HMP: No	CSC, HMP: No		Low
Reptiles					
Aspidoscelis hyperythra	orange-throat whiptail	CSC, HMP: Yes	CSC, HMP: Yes		Moderate-High
Crotalus ruber	~~Northern~~ red-diamond rattlesnake	CSC, HMP: No	CSC, HMP: No	State no longer recognizes the northern subspecies	Moderate-High
Emys marmorata ~~pallida~~	~~southwestern~~ western pond turtle	CSC, HMP: No	CSC, HMP: No	State no longer recognizes the southwestern subspecies	Moderate-High
Eumeces skiltonianus interparietalis	Coronado Island skink	CSC, HMP: No	CSC, HMP: No		Low
Phrynosoma coronatum (blainvillii population)	coast (San Diego) horned lizard	CSC, HMP: Yes	CSC, HMP: Yes		Low
Salvadora hexalepis virgultea	coast patch-nosed snake	CSC, HMP: No	CSC, HMP: No		Low
Thamnophis hammondii	two-striped garter snake	CSC, HMP: No	CSC, HMP: No		Low-Moderate
Birds					
Accipiter cooperii	Cooper's hawk	CSC, HMP: Yes	~~CSC,~~ WL, HMP: Yes	Status changed to state watch list.	High
Agelaius tricolor	tricolored blackbird	CSC, HMP: Yes	CSC, HMP: Yes		Moderate
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	CSC, HMP: Yes	~~CSC,~~ WL, HMP: Yes	Status changed to state watch list.	Moderate-High

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Athene cunicularia	burrowing owl	CSC, HMP: Yes	CSC, HMP: Yes		Low
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	CSC, HMP: Yes	CSC, HMP: Yes		Low-Moderate
Charadrius alexandrinus nivosus	western snowy plover	FT, CSC, HMP: Yes	FT, CSC, FP; HMP: Yes		Not likely. Nearest occurrence in vicinity of Agua Hedionda in the 1-mile radius (CDFW 2014).
Circus cyaneus	northern harrier	CSC, HMP: Yes	CSC, HMP: Yes		High
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FC, CE, HMP: No	~~FC,~~ PT~~,~~ CE, HMP: No	Federal status change to proposed threatened.	Not Likely
Dendroica petechia brewsteri	yellow warbler	CSC, HMP: No	CSC, HMP: No		Low
Elanus leucurus	white-tailed kite	CSC, HMP: No	~~CSC,~~ FP, HMP: No	State status changed to fully protected.	Moderate
Empidonax traillii extimus	southwestern willow flycatcher	FE, HMP: Yes	FE, CE, HMP: Yes	Now listed as state endangered.	Not Likely
Eremophila alpestris actia	California horned lark	CSC, HMP: No	~~CSC,~~ WL, HMP: No	State status changed to watch list.	Low-Moderate
Falco peregrinus anatum	American peregrine falcon	CE, HMP: Yes	~~CE,~~ FP; HMP: Yes	Removed from state list, now fully protect.	Moderate-High
Icteria virens	yellow-breasted chat	CSC, HMP: Yes	CSC, HMP: Yes		Low
Ixobrychus exilis	least bittern	CSC, HMP: No	CSC, HMP: No		Not likely.
Laterallus jamaicensis coturniculus	California black rail	CT, CSC, HMP: No	CT, ~~CSC,~~ FP, HMP: No	State status changed to fully protected	Not likely
Pandion haliaetus	osprey	CSC, HMP: Yes	~~CSC,~~ WL, HMP: Yes	State status changed to watch list.	Not likely
Passerculus sandwichensis beldingi	Belding's savannah sparrow	CE, HMP: Yes	CE, HMP: Yes		Low. Present in vicinity of Agua Hedionda in the 1-mile radius (CDFW 2014).
Passerculus sandwichensis rostratus	large-billed savannah sparrow	CSC, HMP: Yes	CSC, HMP: Yes		Low-Moderate

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Pelecanus occidentalis californicus	California brown pelican	FE, CE, CSC, HMP: Yes	FE, ~~CE,~~ CSC, FP, HMP: Yes	State and federal de-listed. State status changed to fully protected.	Not likely. Nearest occurrence from Agua Hedionda during the 2007 and 2014 surveys.
Phalacrocorax auritus	double-crested cormorant	CSC, HMP: No	CSC, HMP: No	State status changed to watch list.	Not likely. Nearest occurrence from Agua Hedionda during the 2014 survey.
Plegadis chihi	white-faced ibis	CSC, HMP: Yes	~~CSC,~~ WL, HMP: Yes	State status changed to watch list.	Moderate
Polioptila californica	coastal California gnatcatcher	FT, CSC, HMP: Yes	FT, CSC, HMP: Yes		Low. Present within 1-mile radius (CDFW 2014).
Rallus longirostris levipes	light-footed clapper rail	FE, CE, CSC, HMP: Yes	FE, CE, ~~CSC*,~~ FP; HMP: Yes	State status changed to fully protected.	Not likely. Nearest occurrence from Agua Hedionda in the 1-mile radius (CDFW 2007).
Riparia riparia	bank swallow	CT, HMP: No	CT, HMP: No		Not Likely
Sternula antillarum browni	California least tern	FE, CE, CSC, HMP: Yes	FE, CE, ~~CSC,~~ FP; HMP: Yes	New genus. State status changed to fully protected.	Not likely. Nearest occurrence from vicinity of Agua Hedionda in the 1-mile radius (CDFW 2014).
Sterna elegans	elegant tern	CSC, HMP: Yes	CSC, WL; HMP: Yes	State status changed to watch list.	Not likely. Nearest occurrence from Agua Hedionda during the 2007 survey.
Vireo bellii pusillus	least Bell's vireo	FE, CE, HMP: Yes	FE, CE, HMP: Yes		Low
Mammals					
Chaetodipus californicus femoralis	Dulzura pocket mouse	CSC, HMP: No	CSC, HMP: No		Low
Chaetodipus fallax	northwestern San Diego pocket mouse	CSC, HMP: No	CSC, HMP: No		Low-Moderate
Choeronycteris mexicana	Mexican long-tongued bat	CSC, HMP: No	CSC, HMP: No		Low-Moderate
Dipodomys stephensi	Stephens' kangaroo rat	FE, CT, HMP: No	FE, CT, HMP: No		Low
Euderma maculatum	spotted bat	CSC, HMP: No	CSC, HMP: No		Low
Eumops perotis californicus	western mastiff bat	CSC, HMP: No	CSC, HMP: No		Low-Moderate
Lasiurus xanthinus	western yellow bat	HMP: No	HMP: No		Moderate. Nearest occurrence within the 1-mile radius (CDFW 2014).

TABLE 5.2-1
Summary of Changes/Additions of Potentially Occurring Special-Status Species in the Project Area (USGS San Luis Rey quad)

Scientific Name	Common Name	2007 Fed/State Status[a]	2014 Fed/State Status	Explanation of change	Potential Occurrence in Project Area
Lepus californicus bennettii	San Diego black-tailed jackrabbit	CSC, HMP: No	CSC, HMP: No		Low- Moderate
Neotoma lepida intermedia	San Diego desert woodrat	CSC, HMP: No	CSC, HMP: No		Moderate-High
Nyctinomops femorosaccus	pocketed free-tailed bat	CSC, HMP: No	CSC, HMP: No		Moderate. Nearest occurrence within the 1-mile radius (CDFW 2014).
Perognathus longimembris pacificus	Pacific pocket mouse	FE, CSC, HMP: No	FE, CSC, HMP: No		Low-Moderate
Taxidea taxus	American badger	CSC, HMP: Yes	CSC, HMP: Yes		Not Likely.

Status Codes:

CSC – California State Species of Concern

FC – Federal Candidate

FE – Federal Endangered

FT- Federal Threatened

SE – California State Candidate as Endangered

SE – California State Endangered

ST – California State Threatened

CNPS – California Native Plant Society ranking: (1A) Presumed extinct in California; (1B) Rare, threatened, or endangered in California and elsewhere; (2) Rare, threatened, or endangered in California, but more common elsewhere; (3) More information is needed; (4) Limited distribution; (.1) Seriously endangered in California; (.2) Fairly endangered in California; (.3) Not very endangered in California.

HMP – City of Carlsbad Habitat Management Plan

5.2.7 References

California Department of Fish and Wildlife (CDFW). 2014. California Natural Diversity Database (CNDDB) Rarefind 5. Electronic dataset available by subscription. Sacramento, CA. http://www.dfg.ca.gov/biogeodata/cnddb/subscribe.asp

California Native Plant Society (CNPS). 2014. Database search of special-status plants for the San Luis Rey quad and the surrounding 9 quads. http://www.rareplants.cnps.org/advanced.html

U.S. Fish and Wildlife Service (USFWS). 2014. Information, Planning, and Conservation System (iPaC). Endangered Species Act Species List for the Carlsbad Energy Center Project. http://ecos.fws.gov/ipac/

5.3 Cultural Resources

This section provides the Project Owner's evaluation of how the Amended CECP could affect cultural resources and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to cultural resources. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to cultural resources that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.3.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of potential impacts to Cultural Resources including the potential for changes or additions to COCs for the project are included in this section. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above grade elements of the main EPS power building and all support buildings, will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.3.2 Affected Environment

The Amended CECP will expand the footprint of the Licensed CECP. This slightly expanded ground disturbance footprint will result in no new impacts to cultural resources beyond those identified in the Final Decision.

On February 5, 2014, Natalie Lawson, M.A., RPA performed a pedestrian inventory of the proposed disturbance areas and laydown areas for the Amended CECP to identify prehistoric or historic cultural resources there, as well as those portions of the Cabrillo Parcel that would be affected by the above-grade demolition of the EPS. JRP Historical staff historian/architectural historian Steven J. Melvin also completed an intensive survey of the entire Cabrillo Parcel on February 5, 2014. This architectural survey included viewing all buildings and structures, and photographing and recording buildings and structures on the parcel that were 50 years old or older.

Previously recorded site CA-SDI-16885 is located within one of the construction laydown areas for the Amended CECP. This site was revisited in 2005, and researchers concluded the site does not retain its integrity due to mechanical scattering of artifacts from the original construction of the EPS. This site was not located during the recent survey. Because this site lacks integrity, it was not and continues not to be recommended as eligible for nomination to either the National Register of Historical Places (NRHP) or the California Register of Historical Resources (CRHR).

Previous geotechnical testing has resulted in the investigation of subsurface soil for substantially the entire EPS facility and identified artificial fill throughout the EPS at approximately 3 to 9 feet (Carlsbad Energy Center LLC 2007, p. 5.3-14, and CH2M HILL 2007, p. 15). No excavations will occur below the artificial fill in this construction laydown area and no impacts to this site are anticipated as a result of project implementation.

Previously recorded shell scatter CA-SDI-6751 is located east of the Amended CECP site, and over the course of multiple recordings has been documented as being contained entirely within the right-of-way fence of the ATSF railroad. The area between the railroad right-of-way fence and the existing storage tanks was examined and no evidence was observed of site CA-SDI-6751 in this area. Based on the review of the site records, this site does not meet any eligibility criteria for nomination to either the NRHP or the CRHR and is not located within the Amended CECP site. No impact to site CA-SDI-6751 will occur.

The current survey and evaluation of the EPS finds that it does not meet the criteria for listing in the NRHP or the CRHR, and is not an historical resource for the purposes of the California Environmental Quality Act (CEQA). All buildings or structures in the study area that are 50 years old and older received evaluation under NRHP and CRHR criteria. Also, all of the buildings and structures on the facility less than 50 years old received evaluation under NRHP Criteria Consideration G, which allows for properties less than fifty years old to be found eligible for listing in the NRHP or the CRHR if they are determined to have "exceptional importance." EPS Generating Units Nos. 1, 2, and 3 and their associated buildings and structures were built in 1954, 1956, and 1958, respectively. EPS Generating Units Nos. 4 and 5 and their associated buildings and structures were added in the 1970s. In addition to lacking historical significance and not meeting the criteria necessary for eligibility for listing in either the NRHP or CRHR, this facility also has diminished integrity, primarily due to maintenance of historic buildings into the modern era and the construction of additional facilities on the EPS site in the modern era. Therefore, none of the buildings and structures in the Amended CECP area are significant historic properties under Section 106 of the National Historic Preservation Act (NHPA), nor are they historical resources for the purposes of CEQA; no impacts to a historical resource are anticipated from implementation of the Amended CECP.

It is anticipated that demolition of the EPS will require grading and excavation activities similar to the demolition of the existing tanks 5, 6, and 7. Construction equipment/material laydown and parking areas for the Amended CECP will be located immediately north of the CECP site, as well as in the location of former tanks 1 and 2 west of the railroad tracks. Ground disturbance in the laydown areas is not anticipated to extend below artificial fill into native soil.

The resource protection measures included in existing COCs CUL-1 through CUL-8 included in the Final Decision are adequate to address potential impacts to cultural resources during construction of Amended CECP and during the above-grade demolition of EPS. The existing COCs for cultural resources are:

- CUL-1: Designated Cultural Resources Specialist
- CUL-2: Project Maps Showing Ground Disturbance
- CUL-3: Cultural Resources Monitoring and Mitigation Plan
- CUL-4: Cultural Resources Report
- CUL-5: Worker Environmental Awareness Program
- CUL-6: Cultural Resources Monitoring
- CUL-7: Designated Cultural Resource Specialist Authority
- CUL-8: Soil Borrow Areas

The Amended CECP will comply with the requirements set forth in these COCs.

5.3.3 Environmental Analysis

As discussed in Section 2.0, Project Description, the construction of six new units (designated Units 6, 7, 8, 9, 10 and 11) and the demolition of the EPS will result in similar activities as described in the Final Decision. Furthermore, because subsurface activities required for the Amended CECP are expected to occur in areas of the CECP site that have been previously disturbed as part of historical power plant operations, no impacts beyond those described in the Final Decision are anticipated. Therefore, the resource protection measures included in existing COCs CUL-1 through CUL-8 are adequate to address potential impacts to cultural resources due to the Amended CECP. The demolition and construction activities will be conducted in accordance with these COCs and all applicable LORS.

5.3.4 Demolition of Encina Power Station

The historic survey and evaluation of the EPS finds that it does not meet the criteria for listing in the NRHP or the CRHR, and is not an historical resource for the purposes of CEQA. It is anticipated that the above-grade demolition of the EPS will have limited effect on the existing ground surface of the EPS site.

As discussed above, the EPS and its supporting buildings or structures in the study area that are 50 years old and older received evaluation under NRHP and CRHR criteria. Also, the buildings and structures on the EPS less than 50 years old received evaluation under NRHP Criteria Consideration G, which allows for properties less than 50 years old to be found eligible for listing in the NRHP or the CRHR if they are determined to have "exceptional importance." EPS Generating Units Nos. 1, 2, and 3 and their associated buildings and structures were built in 1954, 1956, and 1958, respectively. EPS Generating Units Nos. 4 and 5 and their associated buildings and structures were added in the 1970s. In addition to lacking historical significance and not meeting the criteria for listing them in either the NRHP or CRHR, this facility also has diminished integrity. Therefore, none of the buildings and structures in the project area are significant historic properties under Section 106 of the NHPA, nor are they historical resources for the purposes of CEQA and no impacts to a historical resource is anticipated from project implementation.

5.3.5 Cumulative Impacts

The proposed Amended CECP will result in similar activities as described in the Final Decision. Furthermore, because subsurface activities required for the Amended CECP are expected to occur only in areas of the CECP site that have been previously disturbed as part of historical power plant operations, no impacts

beyond those described in the AFC and the Final Decision are anticipated. Therefore, the resource protection measures included in existing COCs CUL-1 through CUL-8 are adequate to address potential impacts to cultural resources, and the demolition and construction activities will be conducted in accordance with these COCs and all applicable LORS. Therefore, the Amended CECP will not result in any significant cumulative impacts beyond those addressed in the CEC's Final Decision.

5.3.6 Laws, Ordinances, Regulations, and Standards

The Final Decision found the CECP to be in compliance with applicable cultural resources LORS. The Amended CECP will also be consistent with applicable cultural resources-related LORS, the Amended CECP will not alter the assumptions or conclusions in the Final Decision, and no additional or revised LORS compliance requirements have been identified.

5.3.7 Conditions of Certification

Existing COCs CUL-1 through CUL-8 are adequate to address the Amended CECP without modification. These COCs are provided below.

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

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

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

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

CRMs shall meet the following qualifications:

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

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

Verification: The project owner shall submit the subject qualifications at least 45 days prior to the start of ground disturbance. At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed replacement CRS. At least 20 days prior to ground disturbance, the CRS shall submit written notification identifying anticipated CRMs for the project stating they meet the minimum qualifications required by this condition. If additional CRMs are needed later, the CRS shall submit written notice one week prior to any new CRMs beginning work.

CUL-2 Project Maps Showing Ground Disturbance: Prior to the start of ground disturbance, including tank removal and soil remediation, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the Application for Certification (AFC), data responses, and confidential cultural resources reports for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprint of the power plant, all linear facilities, access roads and laydown areas. Maps shall include the appropriate U.S. Geological Survey quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1 inch = 200 feet') 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 submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM for approval. Maps shall identify all areas of the project where ground disturbance is anticipated.

No ground disturbance, including tank removal and soil remediation, shall occur prior to CPM approval of maps and drawings, unless specifically approved by the CPM.

If construction of the project will proceed in phases, maps and drawings, not previously submitted, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

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

If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.

If project construction is phased, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

On a weekly basis during ground disturbance, including tank removal and soil remediation, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, email, or fax.

The project owner shall provide written notice of any changes to scheduling of construction phases within 5 days of identifying the changes. A copy of the current schedule of anticipated project activities shall be submitted in each MCR.

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

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

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

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

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

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

CUL-5 Worker Environmental Awareness Program: Prior to and for the duration of ground disturbance, including tank removal and soil remediation, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment. The 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 shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance, including tank removal and soil remediation, is completed or suspended, but shall be resumed when ground disturbance, such as landscaping, resumes.

The training may be presented in the form of a video. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. Information that the CRS, alternate CRS, and CRMs have the authority to halt construction to the degree necessary, as determined by the CRS, in the event of a discovery or unanticipated impact to a cultural resource;
4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources find, and shall contact their supervisor and the CRS or CRM; redirection of work will be determined by the construction supervisor and the CRS;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. An acknowledgement form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: At least 30 days prior to the beginning of ground disturbance, including tank removal and soil remediation, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval, and the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

On a monthly basis, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

No ground disturbance, including tank removal and soil remediation, shall occur prior to implementation of the WEAP program, unless specifically approved by the CPM.

CUL-6 Cultural Resources Monitoring: The project owner shall ensure that the CRS, alternate CRS, or CRMs shall monitor ground disturbance, including tank removal and soil remediation, full time at the project site and linear facilities, and ground disturbance full time at laydown areas or other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner (discovery). Specifically, the CRS, alternate CRS, or CRMs shall monitor the ground disturbance, including tank removal and soil remediation that reaches to within 3 feet of native soil below

the fill and all ground disturbance, including tank removal and soil remediation, in native soil. Whether or not archaeological monitoring is being conducted at project locations, twice daily, in the morning and afternoon, an archaeological monitor shall examine locations where machinery is disturbing fill soil to determine whether native soils might be disturbed. If disturbance is within 3 feet of native soil, full-time monitoring shall commence.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of all earth-moving activities on the project site and laydown areas, including tank removal and soil remediation, for as long as the activities are ongoing. Full-time archaeological monitoring shall require at least one monitor per excavation area where machines may disturb native soils. If an excavation area is too large for one monitor to effectively observe the soil removal, one or more additional monitors shall be retained to observe the area.

If future geotechnical core borings are conducted for the project, they shall be monitored and the boring cores examined by a geoarchaeologist or qualified archaeologist for the presence of cultural material. If cultural material is identified, that information shall be reported to the CPM within 24 hours. Whether or not cultural material is identified, the results of the core examinations shall be provided in a report to the CPM.

In the event that the CRS determines 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 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. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the Monthly Compliance Report (MCR). If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

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 by telephone or e-mail within 24 hours. 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.

A Native American monitor shall be obtained to monitor ground disturbance, including tank removal and soil remediation, in areas where excavations may extend into native soil. Informational lists of concerned Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance, including tank removal and soil remediation to proceed without a Native American monitor.

Verification: At least 30 days prior to the start of ground disturbance, including tank removal and soil remediation, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log. While monitoring is ongoing, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS.

Daily, the CRS shall provide a statement that "no cultural resources more than 50 years of age were discovered" to the CPM as an e-mail, or in some other form acceptable to the CPM. The statement shall also include information based on the twice daily observations of soils by the archaeological monitor and indicate the likelihood of disturbing native soils. If the CRS concludes that daily reporting is no longer necessary, a letter or e-mail providing a detailed justification for the decision to reduce or end daily reporting shall be provided to the CPM for review and approval at least 24 hours prior to reducing or ending daily reporting. At least 24 hours prior to implementing a proposed change in monitoring level, documentation justifying the change shall be submitted to the CPM for review and approval.

At least 24 hours prior to implementing a proposed change in monitoring level, documentation justifying the change shall be submitted to the CPM for review and approval.

If geotechnical core borings are conducted and cultural material is identified by a geoarchaeologist or archaeologist, the CPM shall be notified within 24 hours. Within 30 days after the examination of the core borings is completed, the CRS shall provide a copy of the results of the core examinations in a report to the CPM.

CUL-7 Designated Cultural Resource Specialist Authority: The project owner shall grant authority to halt construction to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance, including tank removal and soil remediation, shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources more than 50 years of age or considered exceptionally significant are found, or impacts to such resources can be anticipated, construction shall be halted or redirected in the immediate vicinity of the Discovery sufficient to ensure that the resource is protected from further impacts. The halting or redirection of construction 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 find description and the work stoppage;
2. The CRS has completed field notes, measurements, and photography for a DPR 523 primary form. The "Description" entry of the 523 form shall include a recommendation on the significance of the find. The project owner shall submit completed forms to the CPM.
3. 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.

Verification: At least 30 days prior to the start of ground disturbance, including tank removal and soil remediation, 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 construction activities 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 a.m. on Friday and 8:00 a.m. on Sunday morning.

Completed DPR form 523s 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 is more appropriate for the subject cultural resource, as determined by the CRS.

CUL-8 Soil Borrow Areas: 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 documented to and approved by the CPM, the CRS shall survey the borrow and/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, all these conditions of certification shall apply. The CRS shall report on the methods and results of these surveys in the CRR.

Verification: 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.

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.

5.3.8 References

Carlsbad Energy Center LLC. 2007. *Carlsbad Energy Center Project Application for Certification.* November. Available online at: http://www.energy.ca.gov/sitingcases/carlsbad/documents/applicant/afc/

CH2M HILL. 2007. Phase II Attachment DR73-1 for Environmental Site Assessment. Carlsbad Energy Center Project Application for Certification. November 2007.

5.4 Geologic Hazards and Resources

This section provides the Project Owner's evaluation of how the Amended CECP could affect geologic hazards and resources and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to geologic hazards and resources. Consistent with this PTA, this section focuses on changes to the impact or compliance of the Project as it was previously evaluated and approved in the original Application for Certification process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to geologic hazards and resources that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.4.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operation, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such for transportation access, electrical interconnection, and water or gas supply.

5.4.2 Affected Environment

This PTA proposes to modify the generation technology and add the demolition of the EPS to the Licensed CECP. Demolition of the EPS will increase the amount of demolition and excavation involved in the construction of CECP; however, the existing Geologic Hazards and Resources COCs in the Final Decision adequately address the environmental and other impacts of these activities.

These modifications will not result in any new or potential geologic hazards or impacts to geologic resources beyond those previously identified in the Final Decision. The Amended CECP is consistent with the Licensed CECP, adheres to the integrity of the approved COCs, and complies with all applicable LORS.

5.4.3 Environmental Analysis

The Amended CECP will be constructed in accordance with the 2010 California Building Standards Code (CBSC) and a final geotechnical report will be prepared prior to completing the final engineering design. Construction equipment/material laydown and construction worker parking areas for the Amended CECP will be located immediately north of the CECP facility, as well as on various areas west of the existing railroad tracks, including but not limited to the location of fuel oil tank numbers 1 and 2. Similar to the Licensed CECP, no offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The existing Geologic Hazards and Resources COCs ensure that construction and demolition-related activities at the project site will comply with appropriate geologic hazard and resource protection plans (the 2010 CBSC, applicable LORS, etc.). Therefore, the Amended CECP will not result in potential geologic hazards or impacts to geologic resources greater than those analyzed in the Final Decision, and no additional LORS or revisions to existing LORS are required. The resource protection measures included in existing COCs GEN-1, GEN-4, GEN-5, and CIVIL-1 are adequate to address geologic hazards and potential impacts to geologic resources and demolition and construction activities of the Amended CECP will be conducted in accordance with these COCs and all applicable LORS.

5.4.3.1 Excavations during Demolition Activities

The change in generation technology proposed in this PTA will expand the project footprint slightly, and consequently, will require additional excavation to that addressed in the Final Decision. The existing COCs ensure that demolition earthwork will comply with appropriate geologic hazard and resource protection plans (the 2010 CBSC, applicable LORS, etc.). Additionally, a final geotechnical report will be prepared prior to final engineering design. Therefore, the Amended CECP will not result in potential geologic hazards or impacts to geologic resources greater than those analyzed in the Final Decision, and no additional LORS or COCs, or revisions to existing LORS or COCs are required. The resource protection measures included in existing COCs GEN-1, GEN-4, GEN-5, and CIVIL-1 are adequate to address geologic hazards and potential impacts to geologic resources associated with excavations related to the Amended CECP demolition activities.

5.4.4 Demolition of Encina Power Station

Adding the demolition of the EPS in the Amended CECP will also increase the demolition and excavation for the project; however the COCs for the Licensed CECP ensure that demolition activities, including related earthwork, will comply with appropriate geologic hazard and resource protection plans (the 2010 CSBC, applicable geologic LORS, etc.). Similar to the Licensed CECP, a final geotechnical report will be prepared prior to final engineering design. Therefore, demolition of the EPS will not result in potential geologic

hazards or impacts to geologic resources greater than those analyzed in the Final Decision, and no additional COCs or revisions to existing COCs are required. The resource protection measures included in COCs GEN-1, GEN-4, GEN-5, and CIVIL-1 for the Licensed CECP are adequate to address geologic hazards and potential impacts to geologic resources associated with demolition of the EPS.

5.4.5 Cumulative Impacts

The Amended CECP will not result in any significant cumulative impacts to geologic resources or hazards beyond those addressed in the Final Decision.

5.4.6 Laws, Ordinances, Regulations and Standards

The Final Decision found the Licensed CECP to be in compliance with applicable geology LORS. Likewise, the Amended CECP is consistent with applicable geology LORS, will not alter the assumptions or conclusions in the Final Decision, and no additional or revised LORS compliance requirements have been identified for the Amended CECP.

5.4.7 Conditions of Certification

As previously discussed, the Amended CECP is subject to COCs GEN-1, GEN-4, GEN-5, and CIVIL-1 in the Final Decision, and the impact analysis of Amended CECP provided in this PTA concludes that no new COCs or modifications to existing COCs are necessary to address geologic hazards or potential impacts to geologic resources resulting from the Amended CECP. The existing COCs are provided below.

GEN-1: The project owner shall design, construct, and inspect the project in accordance with the 2010 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering laws, ordinances, regulations and standards (LORS) in effect at the time initial design plans are submitted to the chief building official (CBO) for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility (2010 CBC, Appendix Chapter 1, § 101.2, Scope). All transmission facilities (lines, switchyards, switching stations and substations) are covered in the conditions of certification in the Transmission System Engineering section of this Decision.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2010 CBSC is in effect, the 2010 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern. The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the compliance project manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO (2010 CBC, Appendix Chapter 1, § 110, Certificate of Occupancy). Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed

facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-4: Prior to the start of rough grading, the project owner shall assign a California- registered architect, structural engineer, or civil engineer, as the resident engineer in charge of the project (2010 California Administrative Code, § 4-209, Designation of Responsibilities). All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the Transmission System Engineering section of this document. The resident engineer may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The resident engineer shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications. The resident engineer shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements. If the resident engineer or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the resident engineer and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the resident engineer and other delegated engineer(s) within five days of the approval. If the resident engineer or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5: Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code § 6704 et seq., and §§ 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in

California.) All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the conditions of certification in the Transmission System Engineering section of this document.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project (2010 CBC, Appendix Chapter 1, § 104, Duties and Powers of Building Official).

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

   1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

   2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading; site preparation; excavation; compaction; and construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

   3. Provide consultation to the resident engineer during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

   1. Review all the engineering geology reports;

   2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load (2010 CBC, Appendix J, § J104.3, Soils Report; Chapter 18, § 1802.2, Foundation and Soils Investigations)

   3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2010 CBC, Appendix J, § J105, Inspections, and the 2010 California Administrative Code, § 4-211, Observation and Inspection of Construction (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and

   4. Recommend field changes to the civil engineer and resident engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations (2010 CBC, Appendix Chapter 1, § 114, Stop Orders).

C. The engineering geologist shall:

   1. Review all the engineering geology reports and prepare a final soils grading report; and

2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2010 California Administrative Code, § 4-211, Observation and Inspection of Construction (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the resident engineer during design and construction of the project;
3. Monitor construction progress to ensure compliance with engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's decision.

F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project. At least 30 days (or within a project owner and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval. If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

CIVIL-1: The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2010 CBC, Appendix J, § J104.3, Soils Report; and Chapter 18, § 1802.2, Foundation and Soils Investigation.

Verification: At least 15 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

5.5 Hazardous Materials

This section provides the Project Owner's evaluation of how the Amended CECP could impact hazardous materials and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the California Energy Commission's 2012 Final Decision. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to hazardous materials that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.5.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.5.2 Affected Environment

The following subsections describe the changes to the project as a result of the changed technology and demolition of the EPS. The PTA modifications, including technology change and water source change, will result in a revised chemical list for the project.

5.5.2.1 Hazardous Materials Used during Operations

The chemical list provided in the AFC/PEAR has been revised because of the change in technology for the Amended CECP. Use and storage locations for the hazardous materials that will be used for the Amended CECP are described in Table 5.5-1. Table 5.5-2 presents information about these materials, including trade names, chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities onsite, reportable quantities (RQ), California Accidental Release Program (CalARP) threshold quantities (TQ), and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Health hazards and flammability data are summarized for these materials in Table 5.5-3, which also contains information on incompatible chemicals (e.g., sodium hypochlorite and aqueous ammonia). New chemicals and revised quantities are provided in underlined text for ease of review (Tables 5.5-1 through 5.5-3 follow this page).

5.5.2.2 Aqueous Ammonia Tank and Secondary Containment

As a result of the changed technology and revised general arrangement, the previously licensed two ammonia 10,000 gallon tanks has been changed to one 20,0000-gallon tank. The tank would be filled to a maximum of 85 percent of volume or 17,000 gallons to allow for expansion. As a result of the change in tank size, a new offsite consequence analysis has been prepared. The changes to the tank size also will result in minimal changes to the frequency of aqueous ammonia deliveries to two deliveries per month during the summer (approximately 4 months), and one delivery every other month for the rest of the year (approximately 8 months), for a total of 12 deliveries per year.

Potential spill containment for the aqueous ammonia tank will be provided by a secondary containment basin surrounding the tank draining into an underground sump. The diked secondary containment area will be 30 feet wide by 34 feet long. The underground sump will be large enough to accommodate the full contents of the aqueous ammonia tank plus rainwater. The truck unloading area adjacent to the ammonia tank will be sloped such that any spill during unloading will flow into the tank containment area.

5.5.2.3 Offsite Consequence Analysis

The general arrangement of CECP has been revised because of the change in technology and resulted in the change from two ammonia tanks to one ammonia tank (see Figure 2.0-1). A new offsite consequence analysis was performed to assess the risk from a potential spill or rupture of the aqueous ammonia storage tank at the Amended CECP. Dispersion modeling was conducted using the SLAB numerical dispersion model (Lawrence Livermore National Laboratory, 1990).

TABLE 5.5-1
Use and Location of Hazardous Materials during Operations

Chemical	Use	Quantity (gallons/lbs)	Storage Location	State	Type of Storage
Aqueous Ammonia (19% NH_3 by weight)	Control oxides of nitrogen (NO_x) emissions through selective catalytic reduction	17,000 gallons	One onsite storage tank (1), 20,000 gallons. It will be filled to a maximum of 85% of volume or 17,000 gallons to allow for any expansion.	Liquid	Continuously Onsite
~~Acetyline~~	~~Welding~~	~~27 5cubic feet~~	~~Maintenance/Warehouse bldg~~	~~Gas~~	~~Continuously Onsite~~
~~Antifreeze~~	~~Closed loop cooling system~~	~~55 gal~~	~~Maintenance Shop~~	~~Liquid~~	~~Continuously Onsite~~
Citric Acid	Cleaning reverse osmosis units	Varies as needed (approx 100 lbs)	Pallet supported chemical storage bags in protected temporary storage location onsite.	Solid Powder	Initial Startup and Periodically Onsite
Cleaning chemicals/detergents	Periodic cleaning of combustion turbine	Varies as needed (approx 100 gal)	Chemical storage tote or drums at a protected temporary storage location onsite.	Liquid	Continuously Onsite
~~Coagulant Polymer~~	~~Coagulate particles in multimedia filter feedwater~~	~~400 gal~~	~~Water treatment building~~	~~Liquid~~	~~Continuously Onsite~~
Diesel No. 2	Fuel for fire pump engine/vehicles/ emergency generator	~~200~~ 3,000 gal	Permanent onsite storage in above-ground storage tanks with secondary containment.	Liquid	Continuously Onsite
General Dispersant – Cyanamer P-70	Anti-scaling Dispersant	~~200~~ 55 gal	Water treatment	Liquid	During Startup
Hydraulic Oil	High-pressure combustion turbine starting system, turbine control valve actuators	500 gal	Onsite 55-gallon drums	Liquid	Continuously Onsite
Hydrochloric Acid	Reverse Osmosis cleaning	Varies as needed (approx 100 gal)	Water treatment	Liquid	During Startup

TABLE 5.5-1
Use and Location of Hazardous Materials during Operations

Chemical	Use	Quantity (gallons/lbs)	Storage Location	State	Type of Storage
Ion Exchange Resin (Proprietary Mixture)	Demineralization of process water ~~boiler feedwater~~	Two trailer units ~~operating weight of 55,000 lbs each~~	Portable/removable trailer to be located at the northeast corner of Amended CECP site	Solid ~~Two units in 10 to 70% solution~~	~~Continuously Onsite~~ During Startup
Laboratory reagents	Water/wastewater laboratory analysis	~~20~~10 gal liquids 100 lbs solids	Laboratory chemical storage cabinets (stored in original chemical storage containers/bags)	Liquid and Granular Solid	~~Continuously Onsite~~ During Startup
Lubrication Oil	Lubricate rotating equipment (e.g., gas turbine bearings)	~~31,000~~ 18,000 gal	Contained within equipment	Liquid	Continuously Onsite
Mineral Insulating Oil	Transformers/switchyard	~~70,000~~ 76,000 gal	Contained within equipment	Liquid	Continuously Onsite
~~Nitrogen~~	~~Transformers~~	~~275 cubic feet~~	~~Hazardous materials storage yard~~		~~Continuously Onsite~~
~~Non-oxidizing Biocide~~	~~Cooling tower biological control, used periodically~~	~~200 gal~~	~~Cooling tower chemical feed area~~	~~Liquid~~	~~Continuously Onsite~~
Oxygen	Welding Gas	880 cubic feet	Maintenance/Warehouse bldg	Gas	Continuously Onsite
Scale/Corrosion Inhibitor Permatreat PC-191	Scale inhibitor for reverse osmosis	400 gal	Water treatment	Liquid	During Startup
Sodium Hydroxide (NaOH) (50% solution)	Convert CO_2 to alkalinity for removal by reverse osmosis~~; cooling tower biocide~~	~~900~~ 500 gal	Water treatment ~~building~~	Liquid	~~Continuously Onsite~~ During Startup
~~Sodium Hypochlorite (NaOCL)~~	~~Biocide for condenser cooling water system water treatment~~	~~2,700 gal~~	~~Water treatment building, aboveground tank~~	~~Liquid~~	~~Continuously Onsite~~
~~Sodium Nitrate~~	~~Cleaning of HRSG~~	~~Varies as needed (approx 500 lbs)~~	~~Outside near each HRSG~~	~~Solid~~	~~Initial startup and periodically onsite~~

TABLE 5.5-1

Use and Location of Hazardous Materials during Operations

Chemical	Use	Quantity (gallons/lbs)	Storage Location	State	Type of Storage
~~Sulfuric Acid~~	~~Circulating water pH control~~	~~2,700 gal~~	~~Aboveground tank~~	~~Liquid~~	~~Continuously Onsite~~
~~Sulfuric Acid for Station Batteries~~	~~Combustion turbine, misc.~~	~~100 gal~~	~~Electrical building; Battery~~	~~Solid~~	~~Continuously Onsite~~
Sulfur hexafluoride (SF_6)	Switchyard/ switchgear devices	~~200~~ 960 lbs	Contained within equipment	Gas	Continuously Onsite
~~Trisodium Phosphate (Na_3PO_4) (e.g., NALCO 7208)~~	~~Boiler water alkalinity control~~	~~400 gal~~	~~Cycle chemical feed building~~	~~Liquid~~	~~Continuously Onsite~~

TABLE 5.5-2
CECP Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[d]	Prop 65
Aqueous ammonia	Aqueous ammonia (19%)	7664-41-7 (NH3)	~~17,000 gal~~ One onsite storage tank (1), 20,000 gallons. It will be filled to a maximum of 85% of volume or 17,000 gallons to allow for any expansion.	100 lb	100 lb	500 lb	500 lb (state)	No
Citric acid	Citric acid	77-92-9	100 lb	[e]	[e]	[e]	[e]	No
Cleaning chemicals/detergents	Various	None	100 gal	[e]	[e]	[e]	[e]	No
Diesel No. 2	Oil	None	~~200~~ 3,000 gal	42 gal[f]	42 gal[f]	[e]	[e]	Yes
General Dispersant – Cyanamer P-70	Proprietary	Proprietary	~~200~~ 55 gal	[e]	[e]	[e]	[e]	No
Hydraulic oil	Oil	None	500 gal	42 gal[f]	42 gal[f]	[e]	[e]	No
Hydrochloric acid (reverse osmosis cleaning)	Hydrochloric acid (30%)	7647-01-0	Varies as needed, approx. 100 gal	5,000 lb	16,667 lb	[e]	[e]	No
Ion Exchange Resin (Proprietary Mixture)	Demineralization of boiler feedwater	None	Two trailer units ~~operating weight of 55,000 lbs each~~	[e]	[e]	[e]	[e]	No
Laboratory reagents (liquid)	Various	None	~~20~~ 10 gal	[e]	[e]	[e]	[e]	No
Laboratory reagents (solid)	Various	None	100 lb	[e]	[e]	[e]	[e]	No
Lubrication oil	Oil	None	~~31,000~~ 18,000 gal	42 gal[f]	42 gal[f]	[e]	[e]	No
Mineral insulating oil	Oil	8012-95-1	~~70,000~~ 76,000 gal	42 gal[f]	42 gal[f]	[e]	[e]	Yes
Oxygen	Oxygen	7782-44-7	880 cubic feet	[e]	[e]	[e]	[e]	No

TABLE 5.5-2
CECP Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	EHS TPQ[c]	Regulated Substance TQ[d]	Prop 65
Scale/Corrosive Inhibitor Permatreat PC-191	Proprietary mixture	Proprietary	400 gal	[e]	[e]	[e]	[e]	No
Sodium hydroxide (50% solution)	Sodium hydroxide 50%	1310-73-2	~~900~~ 500 gal	1,000 lb	2,000 lb	[e]	[e]	No
Sulfur hexafluoride (SF_6)	Sulfur hexafluoride	2551-62-4	~~200~~ 960 lb	[e]	[e]	[e]	[e]	No

[a] Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10% of a reportable chemical and the RQ is 100 lb., the reportable quantity for that material would be (100 lb.)/(10%) = 1,000 lb.

[c] Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] TQ is Threshold Quantity from 19 CCR 2770.5 (state) or 40 CFR 68.130 (federal)

[e] No reporting requirement. Chemical has no listed threshold under this requirement

[f] State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)]

TABLE 5.5-3
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Aqueous ammonia	Colorless liquid with pungent odor	*Corrosive:* Irritation to permanent damage from inhalation, ingestion, and skin contact.	Acids, halogens (e.g., chlorine), strong oxidizers, salts of silver and zinc.	Liquid is incombustible; Vapor is combustible, but difficult to burn
Citric acid	Translucent crystals	None.	None.	Non-flammable
Cleaning chemicals/detergents	Liquid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Diesel No. 2	Oily, light liquid	May be carcinogenic.	Sodium hypochlorite. Oxidizers.	Flammable
General dispersant (Cyanamer P-70)	Straw-colored liquid with ammonia odor	May irritate eyes and skin.	Strong acids and oxidizing agents.	Non-flammable
Hydraulic oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite. Oxidizers.	Combustible
Hydrochloric acid	Colorless, pungent, fuming liquid	*Strongly Corrosive and Toxic*: Toxic by ingestion. Strong irritant to eyes and skin.	Metals, hydroxides, amines, alkalis.	Non-flammable
Ion Exchange Resin (Proprietary Mixture)	Solid	None	None	Refer to individual chemical MSDS
Laboratory reagents	Liquid and solid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Lubrication oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite. Oxidizers.	Flammable
Mineral insulating oil	Oily, clear liquid	Minor health hazard.	Sodium hypochlorite. Oxidizers.	Can be combustible, depending on manufacturer
Oxygen	Colorless, odorless, tasteless gas	Therapeutic overdoses can cause convulsions. Liquid oxygen is an irritant to skin.	Hydrocarbons, organic materials.	Oxidizing agent; actively supports combustion
Scale/Corrosive Inhibitor Permatreat PC-191	Mix of phosphonates	May cause irritation with prolonged contact	Strong oxidizing agents, strong acids	Not Flammable

TABLE 5.5-3
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Sodium hydroxide (50%)	Clear yellow liquid	*Corrosive*: Irritant to tissue in presence of moisture; strong irritant to tissue by ingestion.	Water, acids, organic halogens, some metals.	Non-flammable
Sulfur hexafluoride (SF_6)	Colorless gas with no odor.	Hazardous if inhaled.	Disilane.	Non-flammable

Data were obtained from Material Safety Data Sheets and Lewis, 1991.

*Per DOT regulations, under 49 CFR 173: 'Flammable' liquids have a flash point less than or equal to 141°F; 'Combustible' liquids have a flash point greater than 141° F.

The worst-case accidental release scenario assumes that the aqueous ammonia storage tank is punctured and the entire contents of the tank are released into the secondary containment and sump located beneath the tank. An initial ammonia emission rate for an evaporating pool of 19-percent aqueous ammonia solution was calculated pursuant to the guidance given in *RMP Offsite Consequence Analysis Guidance, EPA, April 1999* and using the emission calculation tool for evaporating solutions provided in the Area Locations of Hazardous Atmospheres (ALOHA) model provided by the EPA (EPA, 2014). During the worst-case scenario, an initial ammonia evaporation rate was calculated for the tank containment area and was assumed to occur for 1 hour after the initial release. This is a conservative estimate because the released liquid would quickly drain into the sump, which has a much lower exposed surface area. For concentrated solutions, the initial evaporation rate is substantially higher than the rate averaged over time periods of a few minutes or more because the concentration of the solution immediately begins to decrease as evaporation begins. However, using the initial evaporation rate for the entire release results in a worst-case ammonia emission rate and provides for a conservative analysis. Release rates for ammonia vapor from an evaporating 19-percent solution of aqueous ammonia were calculated assuming that the mass transfer of ammonia across the liquid surface occurs according to principles of heat transfer by natural convection. The ammonia release rate was calculated using ALOHA, meteorological data listed below, and the dimensions of the secondary containment area. The offsite consequence analysis is provided as Appendix 5.5A.

Parameters used to calculate the ammonia emission rates include an atmospheric stability classification of "F," a wind speed of 1.5 meters/second and a temperature of 88 degrees Fahrenheit (°F), which represents the highest temperature recorded over the last 3 years at the project site.

Using these parameters, the ammonia plume was predicted to extend approximately 6.7 meters (22 feet) from the ammonia storage tank at a concentration of 150 parts per million (ppm), at height of 1.6 meters. At a concentration of 75 ppm, the distance was 6.9 meters (23 feet) from the tank (see Table 5.5-4 and Figure 5.5A-1 in Appendix 5.5A). The assumptions used in the ammonia analysis include the following:

- Ammonia emissions are assumed to occur over 1 hour, representing an evaporating pool of 17,000 gallons of a 19-percent ammonia solution
- An ammonia storage temperature of 88°F (highest temperature recorded at Oceanside Marina over the past 3 years)
- A diked secondary containment area of 1,020 square feet (30 feet wide by 34 feet long)

TABLE 5.5-4
Gaseous Ammonia Concentrations in the Event of a Release

	Distance in meters from Ammonia Tank to Plume Edge (feet)	
Concentration (ppm)	**0-Meter Receptor Height**	**1.6-Meter Receptor Height**
2000 ppm (risk of lethality)	5.48 (18.0)	6.30 (20.7)
300 ppm (OSHA's IDLH)	5.70 (18.7)	6.60 (21.7)
150 ppm (EPA/CalARP toxic endpoint)	5.76 (18.9)	6.74 (22.1)
75 ppm (CEC Significance Criterion)	5.79 (19.0)	6.87 (22.5)

Notes:
The complete Offsite Consequence Analysis may be found in Appendix 5.5A.
Distances calculated at ground level and based on the height of the average human (1.6 m).

IDLH = Immediately Dangerous to Life or Health

Based on this conservative modeling analysis, the worst-case accident is not expected to result in an offsite concentration greater than 75 ppm at the property boundary, located 96 feet from the center of the ammonia tank storage area, at the nearest point. Because the general public will not be exposed to

ammonia concentrations above 75 ppm during a worst-case release scenario, the storage of aqueous ammonia onsite will not pose a significant risk to the public.

5.5.3 Environmental Analysis

No new significant impacts to hazardous materials would result from the changes proposed as part of this Amendment. Additional hazardous materials will be brought on site; however, the materials will be handled and stored in a safe manner, reducing any potential public health or safety hazards. As a result of the changed chemicals however, COC HAZ-1 will require minor revisions to the approved chemical list to reflect the changes. Ammonia secondary containment will be designed to reduce spills outside of the secondary containment area and, in the event of a spill, the ammonia plume would not exceed the CEC significance value at the CECP fence line.

Although the change in energy generation technology has resulted in modifications to the chemical requirements and ammonia storage, the existing COCs would adequately protect workers and maintain sufficient hazardous materials management. Potential hazardous risks associated with these changes would be conducted in accordance with all applicable LORS and implementation of the CECP PTA modifications will not result in any increases in potential impacts to hazardous materials management.

5.5.4 Demolition of Encina Power Station

The above-grade demolition of the EPS will require additional demolition to that approved in the Final Decision; however, the existing COCs would maintain the hazardous materials management for these activities. Minor hazardous materials would be used by demolition equipment (oils, antifreeze, fuel); however, these would not be in quantities greater than those described in the Final Decision. All chemicals would be stored in accordance with applicable laws, ordinances, and regulations as described in the Final Decision. Therefore, the EPS above-grade demolition activities will not result in any increases in potential impacts to hazardous materials management.

5.5.5 Cumulative Impacts

The Amended CECP will not result in any significant cumulative impacts to hazardous materials management beyond those addressed in the CEC's Final Decision.

The primary potential cumulative impact from the use and storage of hazardous materials would be from a simultaneous release from two or more sites of a chemical or chemicals that would migrate offsite. Hazardous materials that do not migrate, such as sulfuric acid, will not present a potential cumulative impact. The only hazardous material that has the potential to migrate offsite from the Amended CECP is ammonia vapor released from spilled aqueous ammonia. To determine the potential for cumulative impacts, other sites in the vicinity that store and use ammonia must be identified and analyzed.

Numerous other facilities in the City of Carlsbad handle and store ammonia. Table 5.5-5 identifies those facilities closest to CECP that may have the potential to have ammonia onsite.

Based on the results of the offsite consequence analysis, offsite ammonia vapor concentrations from the amended CECP would only occur at levels below the CEC significance value at the project fenceline. In the unlikely event that an aqueous ammonia spill occurred at CECP, because the nearest facility is approximately 0.47 mile from the project location, offsite ammonia levels from the CECP would not be sufficient to cause cumulative impacts.

TABLE 5.5-5
Cumulative Projects List

Project Name	Location	Description	Status
Carlsbad Seawater Desalination Plant	Encina Power Station	50-million-gallon-per-day seawater desalination plant, pipelines, pumps, and other appurtenant and ancillary water facilities to produce and distribute potable water.	Currently under construction, more than 25% complete; operation expected in 2016.
CIP – Vista/Carlsbad Interceptor Agua Hedionda Lift Station (VC 12)	South shore of Agua Hedionda Lagoon adjacent to the east side of the railroad tracks.	Upgrade the existing pump station to increase capacity for buildout conditions. The project would also include replacement of existing pumps with larger capacity pumps and associated appurtenances.	Expected to be constructed in 2014

5.5.6 Laws, Ordinances, Regulations, and Standards

The CEC's Final Decision found the project to be in compliance with all applicable LORS. An updated research analysis has been conducted to determine if the LORS referenced in the AFC/PEAR are still current, and one additional new LORS is included in the Table 5.5-6 below. As described in this PTA, the Amended CECP is consistent with applicable worker safety-related LORS, and the Amendment will not alter the assumptions or conclusions made in the CEC's Final Decision.

TABLE 5.5-6
Laws, Ordinances, Regulations, and Standards Applicable to Hazardous Materials Handling

Law, Ordinance, Regulation, or Standard	Applicability
San Diego County Department of Environmental Health, Hazardous Material Division (HMD) various programs	HMD is the CUPA for San Diego County that regulates and conducts inspections of businesses that handle hazardous materials, hazardous wastes, and/or have underground storage tanks. HMD programs include assistance with oversight on property re-development (i.e., brownfields); and voluntary or private oversight cleanup assistance. The Amended CECP will comply with HMD requirements concerning storage and handling of hazardous materials and wastes and will also cooperate with HMD on resolution of environmental issues at the site.

CUPA = Certified Unified Program Agency

5.5.7 Conditions of Certification

Existing COCs HAZ-2 through HAZ-10 are adequate to address the Amended CECP without being modified. The existing COC HAZ-1 has been revised below (in strikethrough and underline text), as described above. These COCs are provided below.

HAZ-1: The project owner shall not use any hazardous materials not listed in Tables 5.5-1, 5.5-2, 5.5-3~~ATTACHMENT A~~, or in greater quantities or strengths than those identified by chemical name in ~~ATTACHMENT A~~ those tables, unless approved in advance by the Compliance Project Manager (CPM).

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

HAZ-2: The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) prepared pursuant to the California Accidental Release Program (CalARP) to the San Diego County Department of Environmental Health, Hazardous Materials Division (DEH HMD) and the CPM for review. After receiving comments from the San Diego County DEH HMD and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final Business Plan and RMP shall then be

provided to the San Diego County DEH HMD and the Carlsbad Fire Department 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 Business Plan 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 and the Carlsbad 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 either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tanks shall be protected by a secondary containment basin capable of holding 125 percent of the storage volume or the storage volume plus the volume associated with 24 hours of rain, assuming the 25-year storm. The final design drawings and specifications for the ammonia storage tanks and secondary containment basins shall be submitted to the CPM.

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

HAZ-5: The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-307.

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: The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (I-5 to Cannon Road to Avenida Encinas to the project site). The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least 60 days prior to receipt of any hazardous materials onsite, the project owner shall submit copies of the required transportation route limitation direction 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 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 will 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 2002). 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 B), 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 C), 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 D), 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, and which 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, 7 days per week; or
    B. Power plant personnel on site 24 hours per day, 7 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 Council 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 a statement 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 statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-9: If the project owner dedicates an easement for the Coastal Rail Trail, it shall be located within the boundaries of the overall Encina Power Station Precise Development Plan area in a location mutually agreed upon with the City of Carlsbad and located west of the north/south AT&SF/North County Transit District Rail Corridor. In no event shall the project owner grant or dedicate an easement for the Coastal Rail Trail east of the Rail Corridor on the CECP site.

Verification: Not later than 10 days after drafting an agreement, the project owner shall submit to the CPM for review and approval the instrument of easement dedication showing that the location mutually agreed upon with the City of Carlsbad is west of the north/south AT&SF/North County Transit District Rail Corridor.

HAZ-10: The project owner shall not conduct or allow any fuel gas pipe cleaning activities on the site involving fuel gas pipe of four-inches or greater external diameter, 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. high pressure air, nitrogen, steam) or mechanical “pigging” shall be used. The project owner shall prepare a Fuel Gas Pipe Cleaning Work Plan which shall indicate the method of cleaning to be used, what gas will be used, the source of pressurization, and whether a mechanical Pipeline Inspection Gizmo (PIG) will be used, and submit this Plan to the CBO for information, to the Carlsbad Fire Department for review and comment, and to the CPM for review and approval. Exceptions to any of these provisions will be made only if no other satisfactory method is available, and then only with the approval of the CPM after review and comment from the CBO and the Carlsbad Fire Department.

Verification: At least 30 days before any fuel gas pipe cleaning activities involving pipe of four-inches or greater external diameter, the project owner shall submit a copy of the Fuel Gas Pipe Cleaning Work Plan to the CBO for information, to the Carlsbad Fire Department for review and comment, and to the CPM for review and approval.

5.5.8 References

Lawrence Livermore National Laboratory. 1990. SLAB Numerical Dispersion Model.

Lewis, M. A. 1991. Chronic and Sublethal Toxicities of Surfactants to Aquatic Animals: A Review and Risk Assessment. Battelle, Environmental Biology and Assessment, Columbus, Ohio. *Wat. Res.* Vol. 25, No. 1, pp. 101-113.

U.S. Environmental Protection Agency (EPA). 2014. ALOHA Atmospheric Dispersion Model. Available online at: http://www2.epa.gov/cameo/cameo-downloading-installing-and-running-aloha

5.6 Land Use

This section provides the Project Owner's evaluation of how the Amended CECP could impact land use and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to land use. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process.

The Amended CECP eliminates several contentious land use issues allowing several Conditions of Certification (COCs) to be deleted, and enabling the City to support the project (see the City Letter in Appendix 2B). Further, when the City of Carlsbad (City) completes its changes to land use ordinances, as approved by the City Council on April 22, 2014, and contemplated in the City Letter in Appendix 2B, the Amended CECP will be nearly consistent with, if not entirely consistent with, local land use LORS.

5.6.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings, will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.6.2 Affected Environment

The Amended CECP land use study area encompasses the Cabrillo Parcel and is bounded by SDG&E service center property and Cannon Road to the south, Interstate 5 (I-5) to the east, Carlsbad Boulevard, the Pacific Ocean and Carlsbad State Beach to the west, and the Agua Hedionda Lagoon to the north. The north/south AT&SF/North County Transit District Rail Corridor bisects the area. Land uses surrounding the Cabrillo Parcel include planned industrial, open space, travel/recreation, commercial, and residential land uses.

The Amended CECP, like the Licensed CECP, would be located in the Coastal Zone on land designated as Public Utility in the Carlsbad General Plan and Zoning Ordinance (U and PU, respectively), which specifically allows electrical generation and transmission facilities. Therefore, similarly to the Licensed CECP, the Amended CECP is consistent with existing land uses and local zoning designations at and around the facility. Although the Amended CECP's generation capabilities will have changed from those of the Licensed CECP, from a land use perspective the project changes proposed in this PTA will greatly improve the CECP. Specifically, the Amended CECP will effectively remove the EPS from the Cabrillo Parcel, a project improvement required by the City Agreement (see Appendix 2A). The same land use COCs that were applicable to the Licensed CECP should be applied to the Amended CECP.

The Final Decision identified the LORS that are applicable to the Licensed CECP. It thoroughly analyzed the Licensed CECP's consistency with applicable LORS and discussed the CEC's reasons for overriding them. This same approach by the CEC may not be necessary for the Amended CECP, or at least not as extensively. During the conceptual phase of the Amended CECP, the Project Owner discussed the changes proposed in this PTA with the City. As discussed in the City Letter, the City is in the process of determining that the Amended CECP would serve an extraordinary public purpose because it (a) provides a firm commitment to demolish the EPS, which would lessen the current industrial use of the Cabrillo Parcel; (b) provides for public use and future redevelopment of the western portion of that land; and (c) has reduced environmental and fire safety impacts. Because City leadership and staff appreciate the need for and benefits of the Amended CECP, the City has begun the process of modifying certain of its LORS to enable the Amended CECP to comply with them, including incorporating compatible land use provisions into its General Plan (see Appendix 2B).

Between the time when the CEC issued its Final Decision through April 22, 2014, the City had not adopted any changes to the City's LORS that would affect the project. On April 22, 2014, the City adopted all of the proposed City Resolutions discussed in the City Letter (see Appendix 2B). The City's adoption of those revisions to its LORS demonstrated its support of the Amended CECP. Implementation of these revisions are likely to occur after the Project Owner's submission of this PTA to the CEC. The Project Owner plans to submit additional information to the CEC as City policy, zoning, and ordinances change. The Project Owner is confident that the changes will be timely implemented so as to facilitate a timely review of this PTA by CEC Staff. Generally, the changes will significantly reduce, if not eliminate, the need for overrides of local LORS.

5.6.3 Environmental Analysis

As previously discussed, in its Final Decision, the CEC determined that the Licensed CECP was not consistent with then-new City of Carlsbad land use LORS. However, the Licensed CECP is considered to be a significant improvement over the EPS facility, will replace an existing power plant with a more efficient generation facility, is consistent with other industrial land uses in the vicinity, and is required for public convenience and necessity. Therefore, pursuant to the Warren-Alquist Act, the CEC determined that it was appropriate to

override the incompatible City LORS and approve the Licensed CECP. The Amended CECP increases the land use benefits of the CECP and is not anticipated to have any land use impacts beyond those described and approved for the Licensed CECP in the Final Decision.

Furthermore, like the Licensed CECP, the Amended CECP will be situated east of the railroad tracks that bisect the Cabrillo Parcel, and will completely eliminate the EPS to the west of the railroad tracks. Situating the facility solely in this eastern location will ensure the Amended CECP's consistency with the City's land use goal of limiting future uses of the western portion of the Cabrillo Parcel to those in keeping with beach enjoyment and visitation.

Through the construction and demolition phases of the Amended CECP, the Project Owner would retain and the CEC would maintain jurisdiction over the real property containing the new power plant, including identified areas west of the new plant. However, after completion of the Amended CECP, then as contemplated herein and in the Final Decision, jurisdiction over the area west of the railroad tracks would revert to the California Coastal Commission and the City of Carlsbad. Pursuant to the recent City Agreement between the City and Cabrillo Power I LLC, Cabrillo Power I LLC would transfer ownership or control of certain western portions of the Cabrillo Parcel to the City (see Appendix 2A). These transfers would promote local land use goals by (a) expanding the available public space along this section of the coast, and (b) beautifying the coastline by replacing the prominent EPS with a recessed, modern, lower-profile power plant that is removed from coastal traffic.

In assessing the cumulative land use impacts of the Amended CECP, the Project Owner considered the remote possibility that the SDG&E service center on land adjacent to the Cabrillo Parcel would be relocated nearby. Although this SDG&E project is independent from CECP, it is addressed in the City Agreement, and SDG&E and the City are discussing the potential relocation of the SDG&E service center to better accommodate the CECP (see Appendix 2A).

Therefore, the resource protection measures included in existing COC LAND-1 are adequate to address potential land use impacts of the Amended CECP. The Amended CECP demolition and construction activities will be conducted in accordance with these COCs and all overridden LORS and/or any new LORS adopted by the City during the PTA approval process.

5.6.4 Demolition of Encina Power Station

Demolition of the EPS would not encroach onto land situated outside of the Cabrillo Parcel. Therefore, the findings and conclusions included in the Final Decision regarding land use impacts are also applicable to the demolition of the EPS. Application of the existing COCs would ensure that demolition activities would comply with applicable LORS. Therefore, demolition of the EPS will not implicate additional LORS or result in land use impacts greater than those analyzed in the Final Decision.

5.6.5 Cumulative Impacts

The Amended CECP will not result in any significant cumulative impacts to land use beyond those addressed in the Final Decision. As part of preparation of this PTA, the City of Carlsbad was contacted to provide a list of current projects and reasonably foreseeable future projects for use in the cumulative analysis for this PTA. Table 5.6-1 is an update to Table 5.6-7, Cumulative Projects List, included in the CECP AFC.

The City and SDG&E are conceptually discussing the potential relocation of SDG&E's service center located adjacent to the EPS. However, no formal plan or concept has been submitted by SDG&E, and this proposed facility relocation is so attenuated that the Project Owner has not considered it as a cumulative project in this PTA. Any such relocation of the SDG&E service center would be an independent project from the Amended CECP, initiated and implemented solely by SDG&E.

There are no planned regional actions by third parties that when combined with the Amended CECP would result in any significant cumulative impacts to land use beyond those addressed in the Final Decision.

TABLE 5.6-1
Cumulative Projects List

Project Name	Location	Description	Status
Carlsbad Seawater Desalination Plant	Encina Power Station	50-million-gallon-per-day seawater desalination plant, pipelines, pumps, and other appurtenant and ancillary water facilities to produce and distribute potable water.	Currently under construction, more than 25% complete; operation expected in 2016.
Interstate 5 North Coast Corridor	Northern San Diego County. La Jolla Village Drive (I-5) and Mira Mesa Boulevard (I-805) to Vandgrift Boulevard.	27-mile project adding highway lanes and operational improvements to provide mobility choices for motorists on I-5 in northern the San Diego region.	The overall corridor project is a 20-year expansion that has just begun along certain segments. The Amended CECP has been designed to accommodate this project.
CIP – Vista/Carlsbad Interceptor Agua Hedionda Lift Station (VC 12)	South shore of Agua Hedionda Lagoon adjacent to the east side of the railroad tracks.	Upgrade the existing pump station to increase capacity for buildout conditions. The project would also include replacement of existing pumps with larger-capacity pumps and associated appurtenances.	Expected to be constructed in 2014
Los Angeles to San Diego (LOSSAN) Double-Tracking Project	AT&SF Railroad LOSSAN corridor	Double-tracking of main line and bridges, curve realignment, and the addition of crossovers to increase capacity and enhance reliability of the railroad corridor for freight rail service	Projects are in various stages of development from preliminary engineering and environmental review to pre-final design.
Coastal Rail Trail (CRT)	44 miles within the railroad right-of-way from Oceanside to downtown San Diego	Multi-modal transportation route that is separated from the roadway.	The CRT route location has not been finalized in the area of the EPS; but as indicated by the City Letter, the Project Owner is cooperating with the City and CRT representatives to discuss possible locations on the Cabrillo Parcel.

5.6.6 Laws, Ordinances, Regulations, and Standards

The CEC Final Decision found the Licensed Project to be inconsistent with City of Carlsbad land use LORS; however, pursuant to the Warren-Alquist Act, the CEC overrode the City LORS and approved the CECP with inclusion of the mitigation incorporated into the adopted COCs discussed below. The modifications to the Licensed CECP that are proposed in this PTA will not alter the assumptions or conclusions made in the Final Decision, and no additional or revised LORS with which the Amended CECP would need to comply have been identified.

However, as previously mentioned herein, the City is in the process of amending several of its LORS to support the CECP as it would be modified by this PTA. The applicable resolutions include:

1. A resolution that the City Council Resolution No. 98-145 requirement to comprehensively update Specific Plan 144 is no longer necessary;

2. A resolution to repeal existing City Council Ordinance CS-050 adopted in 2009, which replaced the City's former, non-conforming building and use standards (Carlsbad Municipal Code Chapter 21.48) and specifically repealed the public utility exemptions therein;
3. A resolution to accept the transfer of all land use plans and functions of the former Carlsbad Redevelopment Agency, assume responsibility and authority for enforcing those land use plans and functions, and find that the Amended CECP complies with the land use policies of the South Carlsbad Coastal Redevelopment Area Plan because the General Plan and Zoning Ordinance permit such use, and the Amended Project will serve an extraordinary public purpose based on the City Council's findings; and
4. A resolution to repeal City Council Urgency Ordinance CS-170, which amended Zoning Ordinance Chapter 21.36, and specifically, Section 21.36.020, Permitted Uses, to require a conditional use permit for the generation and transmission of electrical energy, and a City Council determination that the use serves an extraordinary public purpose. (See Appendix 2B.)

As these City LORS will not be amended, although adopted, prior to the date on which the Project Owner submits this PTA to the CEC, final resolution on the land use compatibility of the project and any needed overrides will be made as the PTA is processed.

5.6.7 Conditions of Certification

Land use impacts are subject to approved COCs LAND-1 through LAND-3. Because the Amended CECP resolves ambiguity over the future of the existing EPS, LAND-2 and LAND-3 are no longer required and should be deleted. This analysis further concludes that no new COCs are required for the Amended CECP.

Below the full text of all three Land Use COCs are provided with the accompanying notation that LAND-2 and LAND-3 should be deleted.

LAND-1: The project owner shall dedicate an easement for the Coastal Rail Trail within the boundaries of the overall Encina Power Station Precise Development Plan area in a location mutually agreed upon with the City of Carlsbad located west of the north/south AT&SF/North County Transit District Rail Corridor within 180 days from the start of construction.

If the project owner and the City of Carlsbad cannot reach agreement on the location of the easement (for example due to public safety and security reasons) the project owner shall provide funds to the City of Carlsbad for use in the development of the Coastal Rail Trail within the City of Carlsbad. The project owner shall provide funding to the City of Carlsbad for development of the Coastal Rail Trail as approved by the Compliance Project Manager (CPM) within 180 days of the start of construction. The amount and payment of funds will be determined by an independent appraisal of property within the boundaries of the Encina Power Station that would have been provided for a Coastal Rail Trail easement. The project owner shall select an appraiser for approval by the CPM and pay all costs associated with the appraisal.

Verification: The project owner shall provide proof of easement dedication or appraisal and payment to the City of Carlsbad within 180 days of the start of construction.

~~**LAND-2**: On or before January 1, 2016, the project owner shall prepare and submit a Demolition, Removal, and Remediation Plan (DRRP) to the CPM, and the City of Carlsbad, and the Carlsbad Redevelopment Agency. The DRRP shall propose the process, schedule, and legal requirements for the demolition, removal, and remediation for above ground structures of the Encina Power Station (Units 1 through 5), associated structures, the black start unit and the exhaust stack. As part of completion of the DRRP, project owner shall consult with the California Energy Commission, the California Coastal Commission, the City of Carlsbad, the Carlsbad Redevelopment Agency, the San Diego Regional Water Quality Control Board, the San Diego Air Pollution Control Board, and the California Independent System Operator to ensure the DRRP best reflects the procedural and substantive requirements that will apply to the site.~~

~~On or before January 1, 2017, project owner shall prepare and submit to the CPM, and the City of Carlsbad, and the Carlsbad Redevelopment Agency, a study of the estimated costs associated with implementing the DRRP. Project owner shall demonstrate, to the CPM's satisfaction, fiscal capability to implement the DRRP prior to commencement of demolition activities. Such demonstration could be accomplished by submittal of a financial plan, deposit of funds into a dedicated account, or any combination thereof.~~

~~Verification~~: ~~Verification: On or before January 1, 2016, project owner shall provide the DRRP to the CPM for review and approval and to the City of Carlsbad, the Carlsbad Redevelopment Agency, and the California Coastal Commission for review and comment. The City of Carlsbad and the Carlsbad Redevelopment Agency shall provide comments on the DRRP to the CPM and project owner within 60 days or a date mutually agreeable to project owner and the City of Carlsbad and the Carlsbad Redevelopment Agency.~~

~~On or before January 1, 2016, project owner shall submit to the CPM evidence that the redevelopment process with the Carlsbad Redevelopment Agency City of Carlsbad for redeveloping the Encina Power Station site has begun or shall submit to the CPM evidence of a later mutually agreed upon date by project owner and the Carlsbad Redevelopment Agency City of Carlsbad to begin the redevelopment process.~~

~~On or before January 1, 2017, project owner shall submit the results of the study on estimated costs of implementing the DRRP to CPM for review and approval and to the City of Carlsbad and the Carlsbad Redevelopment Agency for review and comment. The City of Carlsbad and the Carlsbad Redevelopment Agency shall provide comments on cost estimate to the CPM and project owner within 60 days or a date mutually agreeable to the project owner and the City of Carlsbad and the Carlsbad Redevelopment Agency.~~

~~The project owner shall report to the CPM on June 30, 2012 and every June 30 thereafter until notified by the CPM that reports are no longer required, as to the progress made toward satisfaction of this Condition and Condition LAND-3. The reports shall include all relevant information, including an assessment of the factors which continue to require that any or all of Units 1 through 5 and the black start unit remain operational.~~

~~LAND-3:~~ ~~On or before January 1, 2017, project owner shall submit applications for required permits and approvals for demolition, removal, and remediation of the Encina Power Station Units 1 through 5, associated structures, the black start unit and the exhaust stack.~~

~~Upon the commencement of commissioning activities of the project, project owner shall request permission from the California Public Utilities Commission (CPUC) and California Independent System Operator to permanently shutdown Units 1 through 5 and the black start unit. The request shall be resubmitted annually thereafter until permission is granted. Project owner shall seek partners to complete redevelopment of the Encina Power Station according to the Demolition, Removal, and Remediation Plan (DRRP) approved by the CPM pursuant to LAND-2. Upon the permanent retirement of Units 1 through 5 at Encina Power Station, Project Owner shall actively pursue fiscally viable redevelopment of the Encina Power Station. Such pursuit could include selling or transferring the land and facilities to a developing entity or entering into a joint venture with one or more developers. The project owner is not expected to commence demolition and remediation without a viable City approved redevelopment plan. Redevelopment of the site to the west of the rail corridor shall be for a purpose other than the generation of electricity.~~

~~Verification~~: ~~Project Owner shall report submit to CPM copies of any required demolition, removal and remediation permits on annual basis the status of the redevelopment efforts at the Encina Power Station. Within 60 days of receipt receiving the report, the CPM shall schedule and hold a public workshop to present the report and solicit public comments and questions.~~

5.7 Noise and Vibration

This section provides the Project Owner's evaluation of how the Amended CECP could impact noise and vibration and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to noise and vibration. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to noise and vibration that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.7.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.

Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 8-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.7.2 Affected Environment

The land use surrounding the Amended CECP is substantially the same as previously analyzed in the CECP AFC/PEAR. The Cabrillo Parcel is bounded by SDG&E service center property and Cannon Road to the south, I-5 to the east, Carlsbad Boulevard, the Pacific Ocean and Carlsbad State Beach to the west, and the Agua Hedionda Lagoon to the north. The north/south AT&SF/North County Transit District (NCTD) Rail Corridor bisects the parcel. Land uses surrounding the project site include planned industrial, open space, travel/recreation commercial, and residential land uses. The Amended CECP, like the Licensed CECP is similar to the existing land uses within the Cabrillo Parcel boundary.

The closest residential area to the Licensed and Amended CECP is located north of the Agua Hedionda Lagoon, approximately 1,750 feet from the facility site. I-5 is the dominant noise source at the closest receptors. I-5 carries 198,000 average daily trips (ADT) in the vicinity of the project (Caltrans, 2012). Truck traffic accounts for approximately 4.8 percent of all trips on I-5 near Cannon Road (Caltrans, 2012). Local traffic, the COASTER commuter rail service (which is being expanded), Amtrak rail services, and heavy rail traffic are also prominent existing noise sources.

5.7.3 Environmental Analysis

The land use surrounding the Amended CECP is the same as that previously analyzed for the Licensed CECP, as described in Section 5.7.2. The construction of the Amended CECP, and decommissioning and demolition of the above-grade structures and equipment at the EPS will utilize similar construction equipment and consist of similar activities to those identified for the Licensed CECP. However, the duration of such construction-related activities will be extended from 24 months for construction of the Licensed CECP to 45 months for construction of the Amended CECP, as the Amended CECP includes approximately 24 months for decommissioning and demolition of the EPS.

Typically, heavier construction activities will be scheduled to occur between 7 a.m. and 6 p.m. Infrequently, additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities (e.g., pouring concrete at night during hot weather, working around time-critical shutdowns, and constraints). During some construction periods and during the startup phase for each of the generation units, some activities will necessarily continue 24 hours per day, 7 days per week; however, as agreed in the City Agreement, the Project Owner will minimize these periods to the extent possible (see Appendix 2A).

Because the Amended CECP will be a simple-cycle system, the facility will not have a steam turbine. Therefore, steam blows are no longer necessary, a discussion of steam blows is no longer relevant, and COC NOISE-7 can be deleted.

5.7.4 Demolition of Encina Power Station

As described in Section 2.2, decommissioning, demolishing, and removing the EPS will utilize similar construction equipment and consist of activities similar to those demolition and removal activities approved for the Licensed CECP. Active demolition activities are anticipated to occur after construction of the Amended CECP is complete. Heavy equipment or other louder activities generally will be scheduled to occur between 7 a.m. and 6 p.m.

5.7.5 Cumulative Impacts

The Amended CECP will not result in any significant cumulative noise impacts beyond those addressed and approved for the Licensed CECP. As part of preparation of this PTA, the relevant planning agencies were contacted and identified many of the same projects which were previously assessed for the Licensed CECP (refer to Section 5.6, Land Use). The adjacent Carlsbad Seawater Desalination Plant is currently under

construction and expected to start operations in 2016. The environmental impact report for the future widening of I-5 (North Coast Corridor) identified and evaluated the feasibility and reasonableness of noise abatement (i.e., noise walls) between Cannon Road to Tamarack Avenue. Preliminary recommendations for noise abatement were made in the Final Decision, but final decisions on which measures will be include in the Licensed Project, would not be made until the horizontal and vertical alignment and other factors are finalized. The same approach would apply to the Amended CECP. The route for the Coastal Rail Trail, a multi-use trail for pedestrians and bicyclists, has not been finalized in the vicinity of EPS. The Los Angeles to San Diego (LOSSAN) Double-Tracking project will add an additional rail line and associated infrastructure, including new double track bridges. Construction of LOSSAN is not yet funded and the project is currently undergoing environmental review. The anticipated completion year for LOSSAN is currently 2030. Consistent with the Final Decision, these transportation projects have not progressed sufficiently to enable a meaningful or quantitative evaluation of cumulative noise impacts. The Licensed CECP has been publically announced and known about for many years and has been or will be considered in the various transportation projects (North Coast Corridor, Coast Rail Trail, and LOSSAN) evaluation of cumulative impacts. The Amended CECP is committing to the same sound levels as approved for the Licensed CECP, and consistent with the Final Decision, no cumulative impacts are anticipated.

5.7.6 Laws, Ordinances, Regulations, and Standards

The Final Decision found the Licensed CECP to be in compliance with applicable LORS. In 2013, the City of Carlsbad modified the allowable hours for construction activities in Chapter 8.48, Noise, of its municipal code as follows:

Weekdays 7:00 a.m. to 6:00 p.m.
Saturday 8:00 a.m. to 6:00 p.m.

The Amended CECP will comply with the COCs established by the Final Decision, with minor proposed modifications identified in Section 5.7.7, to account for the revision to the City's municipal code.

5.7.7 Conditions of Certification

The Amended CECP will comply with the existing COCs established by the Final Decision with the proposed modifications in underline/strikeout below. A minor change to NOISE-6 is necessary to reflect the City of Carlsbad's updated construction hours, and NOISE-7 is deleted, as steam blows are no longer a required construction activity.

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

Verification: 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, describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

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

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

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

NOISE-3: The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented throughout construction of the project. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM the noise control program and the project owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE-4: The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due solely to plant operation to exceed an average of 53 dBA L_{eq} measured at monitoring locations M2 or M7. No new pure-tone components shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

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 at the affected residence. The character of the plant noise shall be evaluated at the affected residential locations to determine the presence of pure tones or other dominant sources of plant noise.

1. When the project first achieves a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct community noise surveys at monitoring locations M2 and M7 or at closer locations acceptable to the CPM. These surveys shall be performed during power plant operation and shall also include measurement of one-third octave band sound pressure levels to determine whether new pure-tone noise components have been caused by the project.
2. If the results from the noise surveys indicate that the power plant average noise level (L_{eq}) at M2 or M7 exceeds the above value, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.
3. If the results from the noise surveys indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The surveys shall take place within 30 days of the project's first achieving a sustained output of 80 percent or greater of rated capacity. Within 15 days after completing the surveys, the project owner shall submit a summary report of the surveys to the CPM. Included in the report shall be a description of any additional mitigation measures necessary to achieve compliance with the above-listed noise limit and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey(s).

Within 15 days of completion of the new survey(s), the project owner shall submit to the CPM a summary report of the new noise survey(s), performed as described above and showing compliance with this condition.

NOISE-5: Following the project's first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095–5099 and Title 29, Code of Federal Regulations section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

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

NOISE-6: Noisy construction work relating to any project features shall be restricted to the times of day delineated below:

Weekdays	7:00 a.m. to 6:00 p.m. ~~sunset~~
Saturdays	8:00 a.m. to 6:00 p.m. ~~sunset~~

Haul trucks and other engine-powered equipment shall be equipped with mufflers that meet all applicable regulations. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

For purposes of this condition, "noisy construction work" is defined as steam blows and any other project-related work that draws a legitimate noise complaint. A legitimate noise complaint refers to a noise caused by the construction of the CECP project, as opposed to another source, as verified by the CPM. A legitimate complaint constitutes either: a violation by the project of any noise Condition of Certification which is documented by another individual or entity affected by such noise; or a minimum of three complaints over a 24-hour period that are confirmed by the CPM, the project owner, or any local or state agency that would, but for the exclusive jurisdiction of the Energy Commission, otherwise have the responsibility for investigating noise complaints or enforcing noise mitigation.

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 of the project.

~~**STEAM BLOW RESTRICTIONS**~~

~~**NOISE-7:** The project owner shall equip high pressure steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at a distance of 50 feet.~~

~~**Verification:** At least 15 days prior to the first steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected.~~

5.7.8 References

California Department of Transportation (Caltrans). 2012. Traffic Management Branch. 2012 Traffic Counts.

5.8 Paleontological Resources

This section provides the Project Owner's evaluation of how the Amended CECP could affect paleontological resources and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to paleontological resources. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to paleontological resources that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.8.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230 kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operation, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.8.2 Affected Environment

Demolition of the EPS and the change in generation technology from R2C2 to six natural-gas-fired combustion GE LMS100 turbines will not result in new impacts to paleontological resources beyond those identified in the Final Decision, as no new geologic units will be affected by construction or excavation activities. Excavations with the potential to affect paleontologically sensitive sediment under the Amended CECP include digging associated with excavations for the foundations of the new turbine generators, as well as ducting and piping, where those excavations extend beyond disturbed sediment. The resource protection measures included in existing COCs PAL-1 through PAL-7 are adequate to address potential impacts to paleontological resources resulting from the Amended CECP.

5.8.3 Environmental Analysis

As discussed in Section 2.0, Project Description, the change in generation technology from R2C2 to six natural-gas-fired combustion GE LMS100 turbines will result in similar grading, excavation, foundation, and underground infrastructure activities to those described in the Final Decision. All construction activities are limited to areas previously addressed in the Final Decision and previously submitted amendments. Therefore, the Amended CECP will not have a greater impact on paleontological resources than the Licensed CECP, and no additional LORS or revisions to existing LORS are required for the Amended CECP. The resource protection measures included in existing COCs PAL-1 through PAL-7 are adequate to address potential impacts to paleontological resources during construction-related excavations.

All construction equipment/material laydown and construction worker parking areas for the project will be located on the Cabrillo Parcel immediately north of the CECP facility, as well as on various areas west of the existing railroad tracks, including but not limited to the former locations of fuel oil tanks 1 and 2. Only surface grading will occur in these new laydown areas, if any site improvements are necessary, and the surface of these areas has been previously disturbed by current operations of the EPS. Therefore, the construction of these laydown and worker parking areas has no potential to affect paleontological resources, and no additional LORS or revisions to existing LORS are required.

5.8.4 Demolition of Encina Power Station

EPS demolition activities are limited to aboveground and at-grade structures and equipment. Although unexpected, should any activities occur below grade, they would occur in disturbed sediment that has no paleontological sensitivity. Any fossils in the disturbed sediment would have been mechanically broken and removed from their stratigraphic context during previous excavation and backfill operations for the EPS and, therefore, are of no scientific significance. Consequently, the aboveground and at-grade demolition of the EPS has no potential to disturb paleontological resources.

5.8.5 Cumulative Impacts

The activities for the Amended CECP that are analyzed in this PTA are expected to occur in areas that have been previously disturbed during historical power plant operations. Hence, impacts beyond those described in the Final Decision and other amendments are not anticipated. Therefore, the resource protection measures included in existing COCs PAL-1 through PAL-7 will ensure that the Amended CECP does not result in any significant cumulative impacts beyond those addressed in the Final Decision.

5.8.6 Laws, Ordinances, Regulations and Standards

The Final Decision found the CECP to be in compliance with applicable paleontology LORS. The Amended CECP is consistent with applicable paleontology LORS, will not alter the assumptions or conclusions in the Final Decision, and no additional or revised LORS compliance requirements have been identified.

5.8.7 Conditions of Certification

The CECP is subject to approved COCs PAL-1 through PAL-7. Pursuant to the Project Owner's analysis of the environmental impacts of the Amended CECP, the Project Owner has determined that no new COCs or modifications to the Paleontological Resources COCs for the Licensed CECP are necessary for the Amended CECP. The existing COCs are provided below.

PAL-1 Paleontological Resources Specialist: At least 90 days prior to ground-breaking, the Applicant shall provide the CPM with a resume detailing the qualifications of its PRS and Paleontological Resource Monitors (PRMs) for review and approval. If the approved PRS or one of the PRMs is replaced prior to completion of project mitigation and report, the Applicant shall obtain CPM approval of the replacement.

The resume shall demonstrate to the satisfaction of the CPM the appropriate paleontological education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a paleontologist. The experience of the PRS shall include the following:

1. Institutional affiliations or appropriate credentials and college degrees;
2. Ability to recognize and recover fossils in the field;
3. Geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils;
5. Publications in scientific journals; and
6. At least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

Under direction of the PRS the project owner shall obtain qualified PRMs to monitor as necessary on the project. PRMs shall have the equivalent of the following qualifications:

1. BS or BA degree in geology or paleontology, or biology and one year experience monitoring in California; or
2. AS or AA in geology, paleontology, or biology and four years experience monitoring in California; or
3. Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California; or
4. Enrollment in a graduate program pursuing a degree in paleobiology or paleontology, and a BS or BA degree in geology or paleontology.

Verification:

1. At least 60 days prior to the start of ground disturbance, the CPM shall provide confirmation that the PRS's resume is adequate (or not), and the Applicant will respond within one week with a statement of availability of its designated PRS for onsite work.
2. At least 20 days prior to ground disturbance, the PRS or Applicant shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for

approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning onsite duties.

3. Prior to the termination or release of a PRS, the Applicant shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 Maps and Drawings: The Applicant shall provide to the PRS and the CPM maps and drawings showing the footprints of the power plant and all linear facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the Applicant shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the Applicant shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps, and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the PRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the Applicant shall provide the maps and drawings.
2. If there are changes to the footprint of the project, revised maps and drawings shall be provided at least 15 days prior to the start of ground disturbance.
3. If there are changes to the scheduling of the construction phases, the Applicant shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 Paleontological Resources Monitoring and Mitigation Plan: At least 60 days prior to ground-breaking, the PRS shall prepare, and the Applicant shall submit to the CPM for review and approval, a PRMMP to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval and subsequent implementation of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities and may be modified by the PRS with CPM approval.

This document shall be used as a basis for discussion in the event that onsite decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's onsite manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontologists (SVP, 1995) and shall include, but not be limited to, the following:

1. Stipulations that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation shall be performed according to the PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and all conditions for certification;

3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained beds;
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring;
6. A discussion of the procedures to be followed in the event of a significant fossil discovery, including notifications;
7. A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
9. Identification of the institution(s) that will be approached to receive any data and fossil materials that may be recovered, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution(s); and,
10. A copy of the paleontological conditions of certification.

Verification: At least thirty (30) days prior to ground disturbance, the Applicant shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the project applicant evidenced by a signature.

PAL-4 Employee Awareness Training Program: Prior to ground disturbance and for the duration of construction, the Applicant and the PRS shall prepare and conduct CPM-approved training for all project managers, construction supervisors and workers who operate ground disturbing equipment or tools. Workers to be involved in ground disturbing activities in sensitive units shall not operate equipment prior to receiving worker training. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Paleontological Resources Module of the Worker Environmental Awareness Program (WEAP) shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. Training shall be provided for each new employee involved with ground disturbing activities. The in-person training shall before a new-hire begins work. Video-taped training modules are acceptable as long as they are reviewed and approved by the PRS. Provisions will be made to provide the WEAP training to workers not fluent in English.

The Paleontological Resources training shall include:

1. A discussion of applicable laws and penalties under the law designed to protect fossil resources;
2. The PRS shall provide good quality photographs or physical examples of fossils that may be expected in the area, and general descriptions of the stratigraphic units which may contain fossils;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of, and in proximity to a discovery, or unanticipated impact to a paleontological resource;
4. Instruction that, should they encounter known or suspected fossils, employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;

5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification:

1. At least 30 days prior to ground disturbance, the Applicant shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.
2. At least 30 days prior to ground disturbance, the Applicant shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.
3. If an alternate paleontological trainer is requested by the Applicant, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval. Alternate trainers shall not conduct training prior to CPM authorization.
4. The Applicant shall provide in the Monthly Compliance Report the WEAP copies of the Certification of Completion forms with the names of those trained and the trainer for each training offered that month. The Monthly Compliance Report shall also include a running total of all persons who have completed the training to date.

PAL-5 Monitoring and Discoveries: The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction related grading, excavation, trenching, and auguring in areas where potentially fossil bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.
2. PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

Verification: The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the PRS shall include a justification in summary as to why monitoring was not conducted.

PAL-6 Treatment of Discovered Resources: The Applicant, through the designated PRS, shall ensure the recovery, preparation for analysis, initial analysis, identification and inventory, preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The Applicant shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report (PRR). The Applicant shall be responsible to pay curation fees for fossils collected and curated as a result of paleontological monitoring and mitigation.

PAL-7 Final Report: The Applicant shall ensure preparation of a PRR by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the recovered fossil materials and related information and submitted to the CPM for review and approval. The report shall include, but not be limited to, a description and inventory of recovered fossil materials; diagrams and photos showing the stratigraphic context and the location of paleontological resources encountered; results of initial analysis; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

Verification: Within ninety (90) days after completion of ground disturbing activities that, in the opinion of the PRS, have the potential to affect paleontologically sensitive sediments, the Applicant shall submit the Paleontological Resources Report under confidential cover.

5.9 Public Health

This section provides the Project Owner's evaluation of how the Amended CECP could impact public health and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to public health. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification process. Any proposed changes to Conditions of Certification (COCs) are provided.

This section presents the methodology and results of a human health risk assessment performed to assess potential impacts and public exposure associated with airborne emissions from the construction and operation of the Amended CECP.

Generally, the Amended CECP is not likely to create any new significant impacts to public health that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.9.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above grade elements of the main EPS power building and also of all support buildings, will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

Air will be the dominant pathway for potential public exposure to non-criteria pollutants released by the Amended CECP. Emissions to the air will consist primarily of combustion by-products produced by the simple-cycle gas turbine units and Diesel emergency engines. Potential health risks from combustion emissions will occur almost entirely by direct inhalation. To be conservative and as required by the San Diego Air Pollution Control District (SDAPCD), additional pathways for dermal absorption, soil ingestion, mother's milk ingestion, home-grown produce ingestion, and fish ingestion were included in the health risk modeling. The health risk assessment for the Amended CECP was conducted in accordance with guidance established by the California Office of Environmental Health Hazard Assessment (OEHHA, 2003), the California Air Resources Board (CARB, 2014), and the SDAPCD (2006).

The Amended CECP will use new, efficient simple-cycle technology to minimize emissions of pollutants per unit of electric energy generated, thus reducing potential effects on public health. It is beyond the scope of this analysis to describe the public health benefits that derive from the generated electric power that is provided to homes, businesses, hospitals, and other societal institutions.

Combustion byproducts with established national and California ambient air quality standards (referred to as "criteria pollutants") are addressed in Section 5.1, Air Quality. Discussion of the potential health risks associated with these criteria pollutants is presented in this section. Human health risks potentially associated with accidental releases of stored hazardous materials at the Amended CECP (aqueous ammonia) are discussed in Section 5.5, Hazardous Materials.

5.9.2 Affected Environment

The California Energy Commission (CEC) defines sensitive receptors as infants and children, the elderly, the chronically ill, and any other members of the general population who are more susceptible to the effects of exposure to environmental contaminants than the population at large. For the purpose of this analysis, sensitive receptors are defined as the locations occupied by groups of individuals who may be more susceptible to health risks from a chemical exposure: schools (public and private), day-care facilities, convalescent/nursing homes, retirement homes, health clinics, and hospitals. Because sensitive individuals may be located at any residential site, risk-based standards apply to existing residences and places where residences may be built without a change in zoning as well as sensitive receptors. If project impacts are protective of sensitive individuals at the point of maximum impact, they are protective at all locations. Identification of sensitive receptors is typically done to ensure that notice of possible impacts is provided to the community.

In accordance with guidance from the CEC, a search was conducted for sensitive receptors within 3 miles of the CECP site. Daycare, hospital, park, preschool, and school receptors found within 3 miles are listed in Appendix 5.9A. The nearest sensitive receptor to the CECP site is located approximately 1.5 km to the northeast.

The nearest residence to the CECP site is approximately 0.7 km southwest of the project site.

Air quality and health risk data presented by CARB in the 2009 Almanac of Emissions (the most recent CARB Almanac of Emissions available containing toxic air contaminants [TACs) and Air Quality for the San Diego Air Basin show that over the period 1990 through 2007, the average concentrations for the top ten TACs have been substantially reduced, and the associated health risks for the San Diego Air Basin are showing a steady downward trend as well. CARB-estimated emissions inventory values for the top ten TACs for 2008 and ambient levels and associated potential risks for 2007 are presented in Table 5.9-1 for the air basin.

TABLE 5.9-1
Top Ten TACs Emitted by All Sources in the San Diego Air Basin

TAC	2008 Emissions (tons/year)	2007 Levels and Risks	
		Concentration (ppbv)	Potential Carcinogenic Risk (in 1 million)
Acetaldehyde	524	0.88	4
Benzene	770	0.37	35
1,3-Butadiene	233	0.07	27
Carbon tetrachloride	0.09	0.09 (2003)	25 (2003)
Chromium, hexavalent	0.06	0.03 ng/m^3	5
Para-Dichlorobenzene	122	0.15 (2006)	10 (2006)
Formaldehyde	1,282	2.2	16
Methylene chloride	359	0.14	<1
Perchloroethylene	422	0.03	1
Diesel PM	1,607	1.4 μg/m^3 (2000)	420 (2000)

Source: CARB, 2009
μg/m^3 = micrograms per cubic meter
ng/m^3 = nanograms per cubic meter
ppbv = parts per billion by volume

Concerning the current incidence of cancer and respiratory illnesses and diseases in the vicinity of the proposed project, the County of San Diego Health and Human Services Agency offers the following information. The number of annual asthma hospitalizations in the north coastal portion of San Diego County, which includes the project area, has remained within the narrow range of 210 to 253 during the period of 2007 through 2011, the most recent period for which data are available (County of San Diego Health and Human Services Agency, 2013). This area accounts for approximately 10 percent of the total county asthma hospitalizations. Lung cancer deaths during this same period have also remained within a narrow range, from 154 to 165 per 100,000 population (County of San Diego Health and Human Services Agency, 2011), which is a slightly lower incidence rate than in the entire county. The contribution of the Carlsbad area to the north coastal total range was 35 to 37.

5.9.3 Environmental Analysis

This section discusses the sources and different kinds of air emissions associated with the construction and operation of the Amended CECP (see Section 5.1, Air Quality, for additional information on these emissions sources), the methodology used in performing the screening level health risk assessment, and the results of this risk assessment. Other potential public health risks associated with the proposed project are discussed in different sections of the PTA as follows:

- Potential exposure to wastes generated by the proposed project is discussed in Section 5.14, Waste Management.
- Potential exposure to the hypothetical accidental release of aqueous ammonia onsite or during offsite transport is discussed in Section 5.5, Hazardous Materials.
- Potential safety and health impacts relative to the work environment of project employees are discussed in Section 5.15, Worker Health and Safety.

Emissions associated with the operation of the Amended CECP will consist of combustion byproducts from the natural gas-fired turbines and from routine testing of the diesel emergency engines. After dispersion to ground-level, inhalation is the main pathway by which air pollutants can potentially cause public health

impacts. Other pathways, including ingestion of soil, fish, homegrown produce, and mother's milk, and dermal absorption, also were evaluated.

5.9.3.1 Significance Criteria

Significance criteria exist for both carcinogenic and non-carcinogenic risks, and are discussed separately.

5.9.3.1.1 Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are assumed to have no threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). Under state and SDAPCD regulations, an incremental cancer risk greater than 10-in-1 million is considered to be a significant impact on public health for equipment using Toxics Best Available Control Technology (T-BACT), which is the case for the Amended CECP.[2] The 10-in-one-million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

5.9.3.1.2 Non-Cancer Risk

Non-cancer health effects can be either long-term (chronic) or short-term (acute). In determining potential non-cancer health risks from air toxics, it is assumed there is a dose of the TAC below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). A non-cancer health risk is measured in terms of a health hazard quotient, which is the calculated maximum exposure (concentration) of each TAC divided by its REL. Health hazard quotients for TACs affecting the same target organ are typically summed with the resulting totals expressed as health hazard indices for each organ system.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic hazard index was calculated using the hazard quotients calculated with annual concentrations.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all acute health hazard quotients are typically summed to calculate the acute health hazard index. The maximum 1-hour average concentration of each TAC with acute health effects is divided by the TAC's acute REL to obtain a health hazard index for health effects caused by relatively high, short-term exposure to air toxics. An additional conservative procedure in this health risk assessment is that the health hazard quotients for all TACs having potential acute impacts were summed regardless of target organ. This method leads to an upper bound assessment. RELs used in the hazard index calculations were those published in the CARB/OEHHA listings dated January 30, 2014.

5.9.3.2 Demolition/Construction Impacts

The demolition/construction of the proposed project is scheduled to occur in the following two phases:

- Construction of the new equipment (24-month period); and
- Demolition of the existing Encina Power Station (22-month period).

[2] The threshold would be 1-in-one-million if the emitting units were determined not to be applying T-BACT.

There is no overlap between these phases. The emissions were calculated for each phase. The demolition/construction emission estimates include emissions from vehicle and equipment exhaust and fugitive dust generated from material handling and paved/unpaved road travel. A dispersion modeling analysis and a screening health risk assessment were conducted based on these emissions. The detailed analysis of the demolition/construction emissions and ambient impacts is included in Appendix 5.1F.

5.9.3.3 Operations Impacts

Potential human health impacts associated with the Amended CECP stem from exposure to air emissions from operation of the natural gas-fired simple-cycle units, and routine testing of the emergency Diesel engines. The non-criteria pollutants emitted from the proposed project include certain volatile organic compounds and polycyclic aromatic hydrocarbons (PAHs) from the combustion of natural gas, ammonia from the SCR NO_x control systems, and DPM from combustion of diesel fuel in the emergency engines. These pollutants are listed in Table 5.9-2, and the detailed emission summaries and calculations are presented in Appendix 5.9B.

For criteria pollutants, the proposed project will include the use of Best Available Control Technology (BACT) as required under SDAPCD rules.

TABLE 5.9-2
Pollutants Emitted to the Air from the Amended CECP

Criteria Pollutants	Non-criteria Pollutants (Continued)	
Carbon monoxide	Formaldehyde	Ammonia
Oxides of nitrogen	Hexane	Acetaldehyde
Particulate matter	Naphthalene	Acrolein
Oxides of sulfur	Propylene	1,3-Butadiene
Volatile organic compounds	Propylene oxide	Benzene
	Toluene	Dichlorobenzene
	Xylene	Diesel Exhaust Particulate Matter
	Hexane	Ethylbenzene
	PAHs	
	Benzo(α)anthracene	
	Benzo(α)pyrene	
	Benzo(β)fluoranthene	
	Benzo(k)fluoranthene	
	Chrysene	
	Dibenz(a,h)anthracene	
	Indeno(1,2,3-cd)pyrene	

Air dispersion modeling results (see Section 5.1.4) indicate that the Amended CECP will not cause or contribute to violations of state or federal air quality standards, with the exception of the annual state PM_{10}/$PM_{2.5}$ standards and annual federal $PM_{2.5}$ standard. For these pollutants and averaging periods, existing background concentrations already exceed state/federal standards. These standards are intended to protect the general public with a wide margin of safety. Therefore, the proposed project will not have a significant impact on public health from emissions of criteria pollutants

5.9.3.4 Public Health Impact Study Method

As discussed above, the health risk assessment was conducted in accordance with guidance established by OEHHA, CARB, and the SDAPCD.

Emissions of non-criteria pollutants from the proposed project were estimated using emission factors approved by the SDAPCD, CARB, and the U.S. Environmental Protection Agency (EPA). Included in Appendix 5.9B are the detailed non-criteria pollutant emission calculations for the proposed new gas turbines and emergency engines and the existing units at the Encina Power Station. In addition to an analysis of the acute/chronic/cancer risk impacts during the normal operation of the new equipment (gas turbines/emergency engines), the SDAPCD requires an analysis of the acute impacts during gas turbine startups/shutdowns and during the commissioning phase of the new gas turbines. Therefore, the detailed non-criteria pollutant calculations in Appendix 5.9B include separate non-criteria emission calculations for each of these three cases (normal operation, startups/shutdown, commissioning).

As shown in the calculations in Appendix 5.9B, compared to normal operating levels the hourly non-criteria pollutant emission levels will be higher during gas turbine startups/shutdowns and during the commissioning period. Hourly non-criteria pollutant emissions will be elevated during these two operating cases because the oxidation catalyst system (which controls organic compounds including non-criteria pollutants) may not be operating at all times during these periods. During a gas turbine startup/shutdown, the oxidation catalyst system may not be fully functional during the entire hour in question because the proper catalyst operating temperature was not reached for a portion of the hour. During the commissioning phase of a new gas turbine, there will be test runs performed prior to the installation/operation of the oxidation catalyst system. The health risk assessment performed for the proposed project includes an analysis of the impacts during gas turbine startups/shutdowns and the commissioning period. Because it will be necessary to continue to operate the existing Units 1-5 and the peaker gas turbine at the Encina Power Station during the commissioning period of the new gas turbines, the health risk assessment for the commissioning period also includes the impacts for the existing Encina units.

The SDAPCD also requires new power plant projects to analyze the long-term impacts (chronic/cancer risk) associated with commissioning activities. Although the Amended CECP is a newly proposed configuration of a licensed facility, the Project Owner has included this analysis to ensure the thoroughness of its evaluation of the Amended CECP's impacts on public health. This analysis is for comparison purposes only (to compare long-term normal operating impacts against commissioning impacts), and the results are not added to the normal operating impacts. For this analysis, it is assumed that the gas turbine commissioning activities (approximately 213 hours per gas turbine per year) occur each year for 70 years. The detailed non-criteria pollutant emission calculations in Appendix 5.9B show the resulting annual emissions for this long-term commissioning case. The health risk assessment performed for the proposed project includes the chronic/cancer risk results for the long-term commissioning case.

The health risk assessment was performed using the CARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4f, May 2012 using the latest HARP Health Database table updated in November 2013), and associated guidance. Also used was the CARB software program that allows AERMOD dispersion modeling data to be imported into the HARP model, called HARP On-Ramp. The same approach for modeling of criteria pollutants (discussed in Section 5.1.4) was also used to model non-criteria pollutant impacts using the AERMOD model. The HARP model was used to assess cancer risk as well as non-cancer chronic and acute health hazards. In addition to inhalation, the HARP modeling included the additional pathways for dermal absorption, soil ingestion, mother's milk ingestion, home-grown produce ingestion, and fish ingestion.

Health risks were evaluated for a hypothetical maximum exposed individual (MEI) located at the Point of Maximum Impact (PMI). In addition, health risks were evaluated at the Maximally Exposed Individual Resident (MEIR). The MEIR is an individual assumed to be located at an actual residential receptor where the highest concentrations of air pollutants associated with facility emissions are predicted to occur, based on air dispersion modeling.

Evaluation of potential non-cancer health effects from exposure to short-term and long-term concentrations in air was performed by comparing modeled concentrations with the RELs. An REL is a concentration in air at

or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in air and the REL. This ratio is referred to as a hazard quotient. The inhalation cancer potency factors and RELs used to characterize health risks associated with modeled concentrations in air are embedded in the risk module of HARP and in the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB, 2014), and are presented in Table 5.9-3.

TABLE 5.9-3
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	—
Acrolein	—	0.35	2.5
Ammonia	—	200	3,200
Benzene	0.10	60	1,300
1,3-Butadiene	0.60	2.0	660
Diesel PM	1.1	5.0	—
Ethylbenzene	—	2,000	—
Formaldehyde	0.021	9.0	55
Hexane	—	7,000	—
Naphthalene	0.12	9.0	—
PAHs (as BaP for HRA)	3.9	—	—
Propylene	—	3,000	—
Propylene oxide	0.013	30	3,100
Toluene	—	300	37,000
Xylene	—	700	22,000

Source: CARB, 2014.

5.9.3.5 Characterization of Risks from Toxic Air Pollutants

The estimated potential maximum cancer risks associated with the operation of the proposed project are shown in Table 5.9-4. The maximum carcinogenic risk is below the 10×10^{-6} SDAPCD threshold of significance.

TABLE 5.9-4
Summary of Potential Health Risks

Receptor	Carcinogenic Risk [a] (per million)	Cancer Burden	Acute Health Hazard Index	Chronic Health Hazard Index
New Equipment Normal Operation (gas turbines/emergency engines)				
Maximally Exposed Individual (MEI) at PMI	2.9	0	2.7×10^{-2}	1.5×10^{-3}
Maximally Exposed Individual Resident (MEIR)	7.8×10^{-2}		1.6×10^{-2}	4.7×10^{-4}
Maximally Exposed Individual Worker [b] (MEIW)	4.5×10^{-1}		2.7×10^{-2}	—
Gas Turbine Startups/Shutdowns				
MEI (acute impact only)	N/A	N/A	9.0×10^{-2}	N/A

TABLE 5.9-4
Summary of Potential Health Risks

Receptor	Carcinogenic Risk [a] (per million)	Cancer Burden	Acute Health Hazard Index	Chronic Health Hazard Index
Gas Turbine Commissioning Period (includes impacts for existing Encina units)				
MEI (acute impact only)	N/A	N/A	7.8×10^{-2}	N/A
Gas Turbine Long-Term Commissioning Case				
MEI (cancer risk/chronic impacts only)	7.4×10^{-3}	0	n/a	9.0×10^{-5}
Significance Level	10	1.0	1.0	1.0

[a] Based on High Point Method which results in the maximum cancer risk.

[b] 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.

Cancer risks potentially associated with the project also were assessed in terms of cancer burden. Cancer burden is a hypothetical upper-bound estimate of the additional number of cancer cases that could be associated with emissions from the project. Cancer burden is calculated as the maximum product of any potential carcinogenic risk greater than 1 in 1 million and the number of individuals at that risk level. Because the area with a MEI cancer risk above 1 in 1 million extends for only approximately 100 meters to the east and west of the project fenceline where the rail tracks to the west and I-5 to the east are located, the potential cancer burden is zero due to a lack of residences in those areas.

The maximum potential acute non-cancer health hazard index associated with operation of the proposed project is shown in Table 5.9-5. The acute non-cancer health hazard index for all target organs falls below 1.0, the SDAPCD threshold of significance.

Similarly, the maximum potential chronic non-cancer health hazard index associated with operation of the proposed project is also shown in Table 5.9-5. The chronic non-cancer health hazard index falls below 1.0, the SDAPCD threshold of significance.

Included in Section 5.1, Air Quality (Section 5.1.4) are comparisons between the criteria pollutant and GHG emissions for the Amended CECP versus the Licensed CECP. These comparisons show a significant net reduction in emissions for the Amended CECP when compared to the Licensed CECP. Because of the direct correlation between criteria/GHG emissions and non-criteria emissions (both based on fuel combustion and/or activity levels), the same conclusion can be reached that there is an expected net reduction in non-criteria pollutant emissions for the Amended CECP when compared to the Licensed CECP.

A separately transmitted DVD containing the HARP modeling input and output files will be submitted to the CEC and SDAPCD.

5.9.4 Cumulative Effects

An analysis of potential cumulative air quality impacts that may result from the Amended CECP and other reasonably foreseeable projects is required by the CEC. As discussed in Section 5.1.4, a cumulative impact analysis was performed for criteria pollutants. This conclusion was reached because the emissions for the nearby new projects were *de minimis*, or there were no expected operational emissions associated with these projects, or the nearby projects did not result in an increase in emissions compared to baseline conditions. This analysis concluded, therefore, that there are no expected significant cumulative impacts for the Amended CECP and other nearby reasonably foreseeable projects. Because of the direct correlation between criteria and non-criteria emissions (both based on fuel combustion and/or activity levels), the same conclusion can be reached that there are no expected significant cumulative impacts for non-criteria pollutant for the Amended CECP and other reasonably foreseeable projects.

5.9.5 Laws, Ordinances, Regulations, and Standards

An overview of the regulatory process for public health issues is presented in this section. Table 5.9-5 summarizes the relevant LORS that affect public health that are applicable to the Amended CECP, along with the compliance of the proposed project with each of the applicable LORS. The LORS identified below for the Amended CECP are consistent with the LORS listed for the Licensed CECP. The only new LORS listed below is SDAPCD Rule 51 – Nuisance.

TABLE 5.9-5
Laws, Ordinances, Regulations, and Standards Applicable to Public Health

LORS	Requirements/ Applicability	Administering Agency	PTA Section Explaining Conformance
Federal			
Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42USC 7470-7491), Title 40 Code of Federal Regulations (CFR)	Protect public health by limiting emissions and resulting exposure to air pollutants	SDAPCD, with CARB and EPA oversight	Based on a health risk assessment that follows CARB/OEHHA and SDAPCD guidelines, project emissions of non-criteria pollutants do not result in a significant health risk (see Section 5.9.3.5). Based on an ambient air quality modeling analysis performed in accordance with SDAPCD and EPA guidance, project criteria pollutant impacts would not exceed primary ambient air quality standards established to protect public health.
40 CFR Part 68 (Risk Management Plan)	Public exposure to acutely hazardous materials	EPA, San Diego Dept of Environmental Health	As discussed in Section 5.5, Hazardous Materials, an RMP will be developed prior to commencement of facility operations
State			
California Health and Safety Code (H&SC) 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	Inform public at a facility of potential exposure to chemicals known to cause cancer or reproductive toxicity	OEHHA	Based on a health risk assessment that follows CARB/OEHHA and SDAPCD guidelines, non-criteria pollutant emission rates and resulting doses and carcinogenic risks (see Section 5.9.3.5) will not exceed thresholds that require Proposition 65 exposure warnings.
H&SC, Sections 25531 to 25541; CCR Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Public exposure to regulated substances	San Diego County Department of Environmental Health	As discussed in Section 5.5, Hazardous Materials, an RMP will be prepared prior to commencement of facility operations.
California Public Resources Code §25523(a); 20 CCR 1752.5, 2300-2309, and Division 2 Chapter 5, Article 1, Appendix B, Part (1)	Ensure protection of environmental quality; requires a quantitative HRA	CEC	Based on a health risk assessment that follows CARB/OEHHA and SDAPCD guidelines, project emissions of non-criteria pollutants do not result in a significant health risk (Section 5.9.3.5).
California Clean Air Act, TAC Program, HSC §39650, et seq.	Requires quantification of TAC emissions, use of BACT, and preparation of an HRA	SDAPCD with CARB oversight	Based on a health risk assessment that follows CARB/OEHHA and SDAPCD guidelines, project emissions of non-criteria pollutants do not result in a significant health risk (Section 5.9.3.5).

TABLE 5.9-5
Laws, Ordinances, Regulations, and Standards Applicable to Public Health

LORS	Requirements/ Applicability	Administering Agency	PTA Section Explaining Conformance
HSC §41700	Prohibits emissions in quantities that adversely affect public health, other businesses, or property	SDAPCD with CARB oversight	Based on a health risk assessment that follows CARB/OEHHA and SDAPCD guidelines, project emissions of non-criteria pollutants do not result in a significant health risk (Section 5.9.3.5).
Local			
SDAPCD Regulation XII – Toxic Air Contaminants, Rule 1200 - Toxic Air Contaminants New Source Review	Limit public exposure to toxic air contaminants based on specified cancer and non-cancer risk thresholds	SDAPCD	The project health risk assessment in Section 5.9.3 confirms that project design features and application of T-BACT will assure that potential health risks are less than Rule 1200 thresholds.
SDAPCD Regulation IV – Rule 51 – Nuisance	Prevents creation of a public nuisance	SDAPCD with CARB oversight	Based on a health risk assessment that follows CARB/OEHHA and SDAPCD guidelines, project emissions of non-criteria pollutants do not result in a significant health risk (Section 5.9.3.5).

5.9.6 Conditions of Certification

In the June 2012 approval of the CECP, the CEC imposed a single public health COC on the project. The Amended CECP will not require any additional COCs, but will require that the existing COC be revised due to the retirement and demolition of the EPS. Also, the COC was revised to clarify that natural gas will be the fuel for the CECP gas turbines. The emergency engines proposed as part of the Amended CECP will be fueled with CARB certified Diesel. The proposed changes to this condition are provided below using strikethrough/underline format:

PUBLIC HEALTH-1: The project owner shall only use pipeline quality natural gas in the Carlsbad Energy Center Project gas turbines~~, Encina Unit 4, Encina Unit 5, and Encina EGT.~~

Verification: The project owner shall provide a statement to the CPM in the yearly compliance report that only natural gas has been used to fuel the CECP gas turbines ~~and the Encina Power Station~~.

5.9.7 Mitigation Measures

No mitigation measures are needed for the Amended CECP TAC emissions because the potential air quality and public health impacts are less than significant.

5.9.8 Involved Agencies and Agency Contacts

Table 5.9-6 provides contact information for agencies involved with public health.

TABLE 5.9-6
Agency Contacts for Public Health

Issue	Agency	Contact
Public exposure to air pollutants	CARB	Cynthia Marvin, Chief Stationary Source Division California Air Resources Board 1001 I Street Sacramento, CA 95814 (916) 322-7236
	San Diego Air Pollution Control District	Tom Weeks Chief, Engineering Division 10124 Old Grove Road San Diego, CA 92131 (858) 586-2715
Public exposure to chemicals known to cause cancer or reproductive toxicity	Cal-EPA, Office of Environmental Health and Hazard Assessment (OEHHA)	Cynthia Oshita or Susan Luong Office of Environmental Health Hazard Assessment 1001 I Street, Sacramento, CA 95814 (916) 322-2068 (Oshita) (916) 327-3015 (Luong)
Public exposure to accidental releases of hazardous materials	California Office of Emergency Services	Trevor Anderson Governor's Office of Emergency Services 3650 Schriever Avenue Mather, CA 95655 (916) 845-8788
	San Diego County Department of Environmental Health	Dave Cammall, Supervisor, Hazardous Incident Response Team County of San Diego Department of Environmental Health 5500 Overland Avenue #170 San Diego, CA 92123 (858) 505-6974

5.9.9 Permits Required and Permit Schedule

Agency-required permits related to public health are listed in Table 5.9-7; these include a Risk Management Plan for hazardous materials, and the SDAPCD Determination of Compliance (DOC). Upon approval of the Amended CECP by the CEC, the DOC serves as the SDAPCD Authority to Construct. These requirements are discussed in detail in Sections 5.1, Air Quality) and 5.5, Hazardous Materials.

TABLE 5.9-7
Permits and Permit Schedule for Public Health

Permit	Agency	Schedule
Determination of Compliance / Authority to Construct	San Diego Air Pollution Control District	District must issue a Preliminary DOC within 180 days after issuing the Application Completeness Determination Letter.
Risk Management Plan (CalARP)	San Diego County Department of Environmental Health	RMP application must be approved before arrival of hazardous materials on site.

5.9.10 References

California Air Resources Board (CARB). 2009. The California Almanac of Emissions and Air Quality, 2009 Edition. Available online at: http://www.arb.ca.gov/aqd/almanac/almanac07/almanac2009all.pdf

California Air Resources Board (CARB). 2014. Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. January 30. Available online at: http://arbis.arb.ca.gov/toxics/healthval/contable.pd).

California Air Resources Board (CARB). HARP Model, Version 1.4f, http://www.arb.ca.gov/toxics/harp/harp.htm.

County of San Diego Health and Human Services Agency. 2011. County of San Diego Community Profiles by Region and Subregional Area, North Coastal Region, p. 38. Available online at: http://www.sdcounty.ca.gov/hhsa/programs/phs/documents/CHS-Community_Profiles_Chronic_Disease_2011.pdf

County of San Diego Health and Human Services Agency. 2013. Asthma Hospitalizations among San Diego County Residents. Available online at: http://www.sdcounty.ca.gov/hhsa/programs/phs/documents/CHS-NonCommunicableProfile_2013.pdf

Office of Environmental Health Hazard Assessment (OEHHA). 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, California Environmental Protection Agency.

San Diego Air Pollution Control District (SDAPCD). 2006. Supplemental Guidelines for Submission of Air Toxics “Hot Spots” Program Health Risk Assessments (HRAs). June.

5.10 Socioeconomics

This section provides the Project Owner's evaluation of how the Amended CECP could impact socioeconomics and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to socioeconomics. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to socioeconomics that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.10.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230 kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings, will be demolished. Upon completion of demolition of EPS portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.10.2 Affected Environment

The Amended CECP socioeconomic study area is in the City of Carlsbad (City), in San Diego County (County), California. The facility location, from a socioeconomic perspective, remains unchanged.

Since the preparation of the AFC and the subsequent PEAR, the socioeconomic environment has changed. The following subsections explain these changes and their impact on the Amended CECP.

5.10.2.1 Population

With a January 1, 2013 estimated population of about 3,150,180 (California Department of Finance [DOF] 2014a) and a projected population of 3,530,900 by the year 2030 (San Diego Association of Governments [SANDAG] 2014), San Diego County's growth rate is slightly less than the state average. The County's growth has slowed since the AFC was submitted in 2007. The population is expected to increase by about 6 percent between 2013 and 2020, for an average annual compounded growth rate of 0.8 percent.

The City of Carlsbad, with an estimated January 1, 2013 population of about 108,330, remains the fifth largest city in the County, after San Diego, Chula Vista, Oceanside, and Escondido. Historical population data for the City, County, and the State of California (State) are summarized in Table 5.10-1. In the next 7-year period (from 2013 to 2020), as in the previous 7-year period, Carlsbad's population is expected to grow faster than the County or the State (see Table 5.10-2). Population projections for the City are made by SANDAG.

TABLE 5.10-1
Historical and Projected Populations*

Area	2000	2010	2013	2020(p)	2030(p)	2040(p)
City of Carlsbad	78,306	105,328	108,246	117,700	123,500	127,400
San Diego County	2,813,833	3,095,313	3,150,178	3,334,000	3,530,900	3,749,200
California	33,873,086	37,253,956	37,966,471	40,643,600	44,279,400	47,690,200

Source: DOF, 2014a; 2014b; 2014c; SANDAG, 2014.
* Population projections rounded to nearest 100.
(p) = projected

Based on population projections by the DOF, San Diego County was projected to have the same annual average population growth rate during the next several decades. Historically, the County's growth rate has been the same as that of the State; however, the county's projected growth rate is expected to be less than that of the State through 2040.

TABLE 5.10-2
Historical and Projected Annual Average Compounded Population Growth Rates

Area	2000-2010 Percent	2010-2013 Percent	2013-2020 Percent	2020-2030 Percent	2030-2040 Percent
City of Carlsbad	3.0	0.9	1.2	0.5	0.3
San Diego County	1.0	0.6	0.8	0.6	0.6
California	1.0	0.6	1.0	0.9	0.7

5.10.2.2 Housing

As shown in Table 5.10-3, housing stock for San Diego County as of January 1, 2013, was about 1,174,866 units. Single-family homes accounted for about 713,225 units, multiple-family dwellings accounted for 415,761 units, and mobile homes accounted for 45,880 units (DOF, 2014a). New housing authorizations for San Diego County in 2010 totaled about 3,346 units; about 67 percent were single-family units and 33 percent were multi-family units. These authorizations were valued at about $974.5 million (DOF, 2014d). The median home price in San Diego County in February 2014 was $410,000 (San Diego Union Tribune, 2014), less than the price of a median home there in 2007. San Diego County's vacancy rate has remained at more than 6 percent since the downturn in the housing sector began in 2007 (DOF, 2014e). The most current (January 2013) vacancy rate is 6.6 percent. As such, housing supply is not limited in the County based on the federal standard vacancy rate of 5 percent.

According to the San Diego Union Tribune (2014) median home prices by zip code for the City ranged from $530,000 in Northeast Carlsbad to $740,000 in Southwest Carlsbad. These prices represent all home prices combined for the month of February 2014 and include new and existing single-family and condominiums.

TABLE 5.10-3
Housing Estimates by City, County, and State, January 1, 2013

Area	Total Units	Single-Family	Multi-Family	Mobile Homes	Percent Vacant
City of Carlsbad	45,522	31,650	12,592	1,280	7.4
San Diego County	1,174,866	713,225	415,761	45,880	6.6
California	13,785,797	8,983,275	4,243,133	559,389	8.1

Source: DOF, 2014a

5.10.2.3 Economy and Employment

Between 2008 and 2013, employment in the San Diego-Carlsbad-San Marcos Metropolitan Statistical Area (MSA) decreased by 500 jobs, or about 4 tenths of 1 percent. This slight decrease is slightly better than the decrease observed for California (0.5 percent) during the 2008 to 2013 period (California Employment Development Department [CEDD], 2014a). As shown in Table 5.10-4, most sectors experienced a reduction in employment during this period, with the largest reduction in total employment (14,900) occurring in the construction sector. Hence, the project will temporarily provide a needed boost to the local construction employment situation. The information sector lost 7,300 jobs (or 23.2 percent) during the 5-year period shown in the table. The services sector gained 33,900 jobs during this period, an increase over the 2008 employment numbers of 5.8 percent. However, the increase in services sector jobs was not enough to counteract the job losses in the other sectors and thus the MSA.

TABLE 5.10-4
Employment Distribution in San Diego-Carlsbad-San Marcos MSA, 2008 to 2013

	2008		2013		2008-2013	
Industry	Number of Employees	Employment Share (%)	Number of Employees	Employment Share (%)	Percentage Change (%)	Average Annual Compound Growth Rate (%)
Agriculture	10,800	0.8%	9,800	0.7%	-9.3%	-1.9%
Natural Resources, Mining	400	0.0%	400	0.0%	0.0%	0.0%
Construction	76,100	5.8%	61,200	4.6%	-19.6%	-4.3%
Manufacturing	102,800	7.8%	94,600	7.2%	-8.0%	-1.6%
Wholesale Trade	44,900	3.4%	44,300	3.4%	-1.3%	-0.3%
Retail Trade	142,000	10.7%	140,800	10.7%	-0.8%	-0.2%

TABLE 5.10-4
Employment Distribution in San Diego-Carlsbad-San Marcos MSA, 2008 to 2013

Industry	2008		2013		2008-2013	
	Number of Employees	Employment Share (%)	Number of Employees	Employment Share (%)	Percentage Change (%)	Average Annual Compound Growth Rate (%)
Transportation, Warehousing, and Utilities	29,000	2.2%	27,200	2.1%	-6.2%	-1.3%
Information	31,400	2.4%	24,100	1.8%	-23.2%	-5.2%
Financial Activities	75,200	5.7%	71,400	5.4%	-5.1%	-1.0%
Services	584,700	44.2%	618,600	46.8%	5.8%	1.1%
Government	225,100	17.0%	229,500	17.4%	2.0%	0.4%
Total Employment	**1,322,400**	100.0%	**1,321,900**	100.0%	0.0%	0.0%

Source: CEDD, 2014a

Table 5.10-5 provides detail on the characteristics of the County labor force. It shows 2013 annual average employment data for San Diego County and the City of Carlsbad compared to California. Both San Diego County and the City of Carlsbad continue to have unemployment rates that are lower than the state average. CEDD does not project future unemployment rates.

TABLE 5.10-5
Annual Average Employment Data, 2013

Area	Labor Force	Employment	Unemployment	Unemployment Rate (%)
City of Carlsbad	48,600	46,200	2,400	5.0
San Diego County	1,590,000	1,470,000	120,000	7.5
California	18,596,800	16,933,300	1,663,500	8.9

Source: CEDD, 2014b

5.10.2.4 Fiscal Resources

The local agencies with taxing power include San Diego County and the City of Carlsbad. San Diego County's General Fund expenditures and revenues are presented in Table 5.10-6. The County's General Fund revenues increased by about 4 percent between fiscal year (FY) 2011 and FY 2012 and about 2 percent between FY 2012 and FY 2013. Aid from other government agencies contributed over half the revenues and taxes contributed between 28 and 29 percent of the County's total General Fund revenues.

TABLE 5.10-6
San Diego County Revenues and Expenditures ($ million)

	FY 2011	FY 2012	FY 2013
Expenditures:			
General Government	$209	$203	$213
Public Protection	$1,080	$1,141	$1,178
Public Ways and Facilities	$6	$1	$1
Health and Sanitation	$671	$736	$790
Public Assistance	$1,056	$1,035	$1,040
Education	$1	$1	$1
Recreation and Cultural	$31	$31	$29
Capital Outlay	$22	$33	$18
Debt Service	$42	$41	$44
Total Expenditures	**$3,117**	**$3,222**	**$3,313**
Revenues:			
Taxes	$894	$926	$904
Licenses, Permits, and Franchises	$43	$43	$43
Fines, Forfeitures, and Penalties	$52	$51	$46
Use of Money and Property	$24	$17	$13
Aid from Other Government Agencies	$1,781	$1,856	$1,991
Charges for Current Service	$321	$336	$337
Other Revenue	$52	$54	$27
Total Revenue	**$3,167**	**$3,282**	**$3,361**

Source: San Diego County, 2014a; 2014b; 2014c.
Numbers may not add up due to independent rounding.

As shown in Table 5.10-7, and unlike the period between FY 2005 and 2008, the General Fund revenue for the City of Carlsbad has been somewhat stagnant over the last few fiscal years. This is primarily related to the recent Great Recession, which resulted in reduced revenues to the City. Tax revenues remain the largest contributor to General Fund revenues, averaging about 87 percent of the City's General Fund revenues during the period shown in Table 5.10-7.

TABLE 5.10-7
City of Carlsbad General Fund Revenues and Expenditures ($ million)

Grade Level	FY 2011 Actual	FY 2012 Adopted	FY 2013 Estimated
Expenditures			
Genera Government	$18.2	$16.7	$16.8
Interdepartmental Charges	-$3.0	-$3.7	-$3.9
Public Safety	$44.2	$44.5	$45.7
Community Development	$9.5	$7.5	$7.5
Community Services	$23.4	$22.6	$21.9
Public Works	$9.8	$8.6	$8.4
Capital Outlay	$0.0	$0.0	$0.0
Total General Expenditures	**$102.1**	**$96.2**	**$96.4**

TABLE 5.10-7
City of Carlsbad General Fund Revenues and Expenditures ($ million)

Grade Level	FY 2011 Actual	FY 2012 Adopted	FY 2013 Estimated
Revenues			
Taxes	$95.5	$99.2	$105.2
Intergovernmental	$1.9	$1.1	$1.5
Licenses and Permits	$1.6	$1.9	$2.0
Charges for Services	$6.5	$6.6	$6.7
Fines and Forfeitures	$1.0	$0.8	$0.8
Income from Investments and Property	$2.6	$2.1	$1.4
Miscellaneous	$2.5	$0.7	$1.9
Total Revenues	**$111.6**	**$112.4**	**$119.5**

Source: City of Carlsbad, 2014a; 2014b; 2014c
Numbers may not add up due to independent rounding.

5.10.2.5 Education

There are 43 elementary, high school, and unified school districts in San Diego County. The CECP site is situated in the Carlsbad Unified School District. Current and recent historical enrollment figures for the school district are presented in Table 5.10-8, and remain roughly the same as they were during the permitting period of the Licensed CECP. Projected enrollment figures are not available.

TABLE 5.10-8
Current and Projected Enrollment by Grade

	Carlsbad Unified School District		
Grade Level	Enrollment (2010-11)	Enrollment (2011-12)	Current Enrollment (2012-13)
Kindergarten	783	813	729
First	897	844	850
Second	891	892	814
Third	861	883	883
Fourth	885	851	895
Fifth	907	876	819
Sixth	853	914	860
Seventh	906	865	922
Eighth	833	878	873
Ungraded Elementary	0	0	0
Ninth	868	809	880
Tenth	790	865	802
Eleventh	793	782	847
Twelfth	763	774	765
Ungraded Secondary	16	17	17
TOTAL	**11,046**	**11,063**	**10,956**

Source: California Department of Education (CDE), 2014

5.10.2.6 Public Services and Facilities

No major changes to the socioeconomic conditions associated with public services and facilities have occurred since preparation of the AFC and the PEAR.

5.10.3 Environmental Analysis

As discussed in detail in Section 2.0, Project Description, the Amended CECP includes modifications to the Licensed CECP that necessitate an evaluation of environmental impacts and potential amendments to existing COCs.

The capital cost for the Licensed CECP and subsequent amendments was estimated to be approximately $350 to $450 million. The changes proposed in this PTA are expected to increase the project's capital costs to approximately $650 to $850 million, an amount that is almost double the cost estimated in the AFC/PEAR.

The Amended CECP is not expected to result in any signification unmitigated adverse environmental or public health impacts (environmental justice impacts) beyond those analyzed and approved for the Licensed CECP. Any potential air quality, public health, and hazardous materials handling impacts to the public will continue to be mitigated to less-than-significant levels through the existing and proposed modifications to COCs (modifications proposed for Air Quality and Public Health COCs), as explained in more detail in Sections 5.1, Air Quality; 5.5, Hazardous Materials; and 5.9, Public Health.

5.10.3.1 Project Capital Costs and Tax Revenue

The capital cost estimate for the Licensed CECP was approximately $350 to $450 million, in 2007 dollars. The capital cost of the Amended CECP has nearly doubled ($650 to $850 million) due to the change in technology and increases in labor and materials costs since the original AFC was filed in 2007.

In the Final Decision, the project was estimated to result in annual property tax revenues to the City of $3.56 to $4.58 million in 2007 dollars. Adjusted for inflation, the annual property tax revenues for the Licensed CECP are estimated at $4.1 million to $5.2 million, in 2014 dollars. Using the revised capital costs estimates of $650 million to $850 million, the project would be expected to generate annual property tax revenues of $6.98 million to $9.13 million, in 2014 dollars.

Because the Amended CECP includes the demolition of the EPS, the property tax basis will be different than that for the Licensed CECP. The net taxable value of the existing EPS (in 2013) was $116.8 million; of this, approximately $61.1 million was the value of the land only. Assuming that no redevelopment occurs on the land after the demolition of the EPS and the CECP is not built, the estimated property tax revenues going to the City would be approximately $598,800 (in 2013 dollars). The annual property tax revenues for the Licensed CECP are estimated at $4.1 million to $5.2 million. These estimates assume that the EPS is not demolished and thus include the property tax revenues of $598,800 associated with the land.

The Amended CECP will generate higher property tax revenues for the City. The difference between the property tax revenues generated under the Amended and Licensed CECP is $1.8 million[2] to $3.9 million[3]. Thus, the Amended CECP will generate higher property tax revenues for the City.

Therefore, the Amended CECP, like the Licensed CECP, presents a local economic benefit. Consistent with the COCs for the Licensed CECP, the City of Carlsbad, San Diego County, and the Carlsbad Unified School District will receive increased tax revenues from the Amended CECP following construction, based on the improved and reassessed property value.

[2] The $1.8 million is the difference between the $6.98 million (minimum property tax revenues estimated for the Amended CECP) and the $5.2 million (maximum property tax revenues estimated for the Licensed CECP).

[3] The $3.9 million is the difference between the $9.13 million (maximum property tax revenues estimated for the Amended CECP) and the $5.2 million (maximum property tax revenues estimated for the Licensed CECP).

5.10.3.2 Demolition, Construction, and Operations

The Amended CECP will require a 24 percent increase in the volume of local labor required for construction and demolition activities in comparison to the Licensed CECP. The estimated total labor requirement for the Licensed CECP was 4,494 man-months. The construction and demolition of the Amended CECP will require, at its peak, approximately 280 construction workers over a 46-month period, with an estimated total construction labor requirement of 5,580 man-months. This net increase in construction labor is 1,086 man-months, representing a 24 percent increase in labor. The increase in labor is due in part to demolition of the EPS.

The estimated cost of materials and supplies required by the Amended CECP during construction (including demolition of EPS) is approximately $445 million to $595 million. The estimated value of materials and supplies that will be purchased locally is between $55.7 million and $56.7 million (in 2014 dollars). This is in contrast to the estimated $245 to $315 million cost of materials and supplies required by the CECP (Final Decision of AFC [07-AFC-06C]) and the $30 million in estimated value of materials and supplies purchased locally for the CECP. The CECP AFC/PEAR costs were reported in 2007 dollars. Adjusted for inflation, the estimated cost (in 2014 dollars) of materials and supplies required for the Licensed CECP is $279 million to $359 million. The estimated value of materials and supplies purchased locally for the Licensed CECP is approximately $34.2 million. Thus, the costs for the Amended CECP are higher than those for the Licensed CECP.

The construction payroll of the Amended CECP project is estimated to be between $90 and $100 million in 2014 dollars. The construction payroll (in 2007 dollars) of the CECP AFC/PEAR for the Single Phased construction was estimated at $54.6 million while that for that for Phased construction was estimated at $53.9 million. The estimated construction payroll (in 2014 dollars) for the Single Phased construction is $62.2 million while that for the Phased construction is $61.4 million. After accounting for inflation, construction payroll is higher for the Amended CECP compared to the Licensed CECP.

5.10.3.2.1 Population and Housing Impacts

As with the Licensed CECP, it is anticipated most of the construction and demolition workforce for the Amended CECP will be drawn from San Diego County. Construction and demolition workforce also could be drawn from other nearby counties or from out of state, if necessary. Because of the size of the local construction workforce, for the purposes of this analysis, like that for the Licensed CECP, it has been assumed that 90 percent of the construction and demolition workers for the Amended CECP will be drawn from the local area. Because most workers are expected to commute to the Amended Project site, they will not contribute to an increase in the population of the area.

Similarly to the Licensed CECP, the construction and demolition workforce will most likely commute daily to the Amended CECP site. However, if needed, there are many hotels/motels with at least 22,000 rooms in San Diego County (San Diego County Hotel-Motel Association, 2014) to accommodate workers who may choose to commute to the Project site on a workweek basis. In addition to the available hotel/motel accommodation, there are several recreational vehicle (RV) parks within driving distance of the City of Carlsbad. As a result, construction and demolition of the Amended CECP, like the Licensed CECP, is not expected to increase the demand for local housing.

5.10.3.2.2 Impacts on the Local Economy and Employment

The estimated value of materials and supplies for the Amended CECP that will be purchased locally is between $55.7 million and $56.7 million over the 46-month construction and demolition period. Assuming, conservatively, that 90 percent of the construction and demolition workforce for the Amended CECP will reside in San Diego County, it is expected that approximately $81 million to $90 million will stay in the local

area during the entire construction period[4]. These additional funds will cause a temporary beneficial impact on the local economy by creating the potential for other employment opportunities for local workers in other service areas, such as transportation and retail. All cost estimates are in constant 2014 dollars, as are the economic benefits noted in this section.

As with the Licensed CECP, construction and demolition activities for the Amended CECP would result in secondary economic impacts (indirect and induced impacts) within San Diego County. These secondary economic impacts were evaluated using an IMPLAN Input-Output model of San Diego County. The estimated indirect and induced employment within the County would be 59 and 113 jobs, respectively. These additional jobs would result from the $14.53 million[5] in annual local construction expenditures and the $14.79 million in spending by local construction workers. The $14.79 million represents the disposable portion of the annual construction payroll (here assumed to be 70 percent of $21.13 million[6]). Assuming an average direct construction employment of 121, the employment multiplier associated with the construction phase of the Amended Project is approximately 2.4 (i.e., [121 + 59 + 113]/121). This project construction phase employment multiplier is based on a Type SAM model.

Indirect and induced income impacts for the Amended Project were estimated at $2,717,670 and $5,495,550, respectively. Assuming a total annual local construction expenditure (payroll, materials, and supplies) for the Amended CECP of $29.33 million ($14.79 million in payroll + $14.53 million in materials and supplies), the Amended Project's construction phase income multiplier based on a Type SAM model is approximately 1.3 (i.e., [$29,325,470 + $2,717,670 + $5,495,550]/$29,325,470).

Assuming that annual local construction expenditures are only $14.78 million instead of $14.53 million and that annual construction payroll is $16.43 million results in indirect and induced employment estimates within San Diego County of 60 and 125 jobs, respectively. Based on the same average construction employment of 121, the construction phase employment multiplier based on a Type SAM model is approximately 2.5.

Indirect and induced income impacts based on the total annual construction expenditure of $31.22 million ($16.43 million in payroll + $14.78 million in materials and supplies) were estimated at $2,764,130 and $6,049,200, respectively. Based on these estimates, the construction phase income multiplier based on a Type SAM model is estimated at approximately 1.3.

Although the total local construction expenditures (on labor and materials and supplies) are higher for the Amended CECP compared to the Licensed CECP (after adjusting for inflation), the annual impacts with respect to employment and income, as measured through the IMPLAN model, are lower for the Amended CECP compared to the Licensed CECP. The annual impacts are lower for the Amended CECP because of the longer construction and demolition period (46 months) compared to the shorter construction period for the Licensed CECP (25 months for the Phased construction and 19 months for the Single Phase construction). Even though the annual economic benefits are lower for the Amended CECP, these benefits last longer.

5.10.3.2.3 Fiscal Impacts

The Amended CECP's capital cost is estimated at between $650 million and $850 million; of this cost, materials and supplies are estimated at approximately $455 million to $595 million. The estimated value of materials and supplies that will be purchased locally (within San Diego County) is estimated to be between $55.7 million and $56.7 million. The effect on fiscal resources during construction will be from sales taxes

[4] The $81 million to $90 million is much higher than the estimated construction payroll, in 2007 dollars, of $49.1 million to $48.5 million in the Licensed CECP. The estimated construction payroll for the Licensed CECP in 2014 dollars is $55.3 million to $56 million.

[5] Annual local portion of construction expenditures = $57.51 million/(46 months/12 months) = $14.53 million.

[6] Annual local portion of construction payroll = $90 million/(46 months/12 months) x 90% = $21.13 million. The disposable portion of the annual local construction payroll = $21.13 million x 70% = $14,791,300.

realized on equipment and materials purchased in the County and from sales taxes from expenditures. The sales tax rate in the City of Carlsbad is 8 percent (as of April 1, 2014). Of this amount, 7 percent goes to the state; 0.75 percent goes to the place of sale (here assumed to be Carlsbad); and 0.25 percent goes to the special districts (California Board of Equalization [BOE], 2014). The total local sales tax expected to be generated annually during construction is between $1.16 million and $1.18 million (i.e., 8 percent of local sales). Assuming all local sales are made in Carlsbad, the maximum sales tax the City could receive is estimated to be between $145,340 and $147,830 annually. By comparison, the maximum sales tax the City could receive from the Licensed CECP is estimated to be between $164,100 and $216,000 (in 2014 dollars) The additional sales tax revenues that would go to the City annually during construction are less than 1 percent (0.15 percent) of the City's General Fund revenues from taxes (see Table 5.10-7). The total sales tax revenue estimated to be generated during the 46-month construction and demolition phase of the Amended CECP is approximately $4.46 million to $4.53 million. Of this amount, the total portion that would be received by the County, the place of sale, and the special district is between $557,140 and $566,670. The remainder (between $3.9 million and $3.97 million) would be paid to the State.

5.10.3.3 Operations

The Final Decision assumed that there would be a total of 14 operational employees at the CECP, all of whom were expected to be drawn from the EPS. The same workforce will be employed at the Amended CECP. As such, no changes in operation payroll were assumed or modeled for this PTA. At the Amended CECP, operational payroll is assumed to be between $2 million and $3 million. However, this is also not modeled here because the operational workforce is assumed to come from the EPS.

5.10.3.3.1 Population and Housing Impacts

Because the existing workforce at the EPS is assumed to be the workforce that will operate the Amended CECP, the Amended CECP's operations will not create an influx of new workers to the community, and thus will not result in a demand for new housing. Hence, the Amended CECP will not significantly impact population or housing.

5.10.3.3.2 Impacts on the Local Economy and Employment

As with the Licensed CECP, the Amended CECP would permanently, beneficially impact the local economy through purchases of local materials and supplies for the project. The estimated value of materials and supplies purchased locally (within San Diego County) during the operational phase of the Amended CECP is between $1.5 million and $2 million annually. These local annual direct purchases are expected to result in secondary economic impacts (indirect and induced impacts) within San Diego County. These secondary economic impacts were evaluated using an IMPLAN Input-Output model of San Diego County. The estimated indirect employment would be between three and four jobs, and the induced employment would be two jobs. Indirect income impacts were estimated to be between $391,310 and $521,750, and the induced income impacts were estimated between $87,440 and $116,580.

5.10.3.3.3 Fiscal Impacts

The annual operations and maintenance budget, assumed to be spent locally within San Diego County, is expected to be approximately $1.5 million to $2 million (in 2014 dollars). The annual operations and maintenance budget for the Licensed CECP was estimated to be approximately $5.1 million (in 2014 dollars).

During Amended CECP operations, additional sales tax revenues will be obtained by the City of Carlsbad and San Diego County. Based on the assumed local operations and maintenance (O&M) expenditures of between $1.5 million and $2 million, the estimated sales taxes expected to go to the City of Carlsbad will be approximately $15,000 to $20,000. The overall anticipated increase in sales tax revenue due to the Amended CECP would be beneficial but not significant, because it would constitute such a small percent of total City and County revenues. The estimated sales taxes, adjusted for inflation, on the Licensed CECP O&M expenditures that is expected to go to the City of Carlsbad is $64,100. Thus, the sales tax revenues expected

to be generated during the operational phase of the project are higher for the Licensed CECP compared to the Amended CECP because the local O&M costs are higher under the Licensed CECP.

The Amended CECP is expected to bring increased property tax revenue to the City of Carlsbad. The BOE has jurisdiction over the valuation of a power-generating facility for property tax purposes, if the power plant produces 50 MW or more (Young, 2007). Because the Amended CECP is a 632-MW power-generating facility, BOE is responsible for assessing property value. Although, the BOE assesses the property value, the property tax rate is set by the County of San Diego Office of Property Tax Services. For the Cabrillo Parcel, this rate is 1.07428 percent for the most recent fiscal year (FY 2013-14). Assuming a capital cost of $650 to $850 million, the Amended CECP will generate between $6.98 million and $9.13 million in property taxes annually. Because the property taxes are collected at the county level, their disbursement is also at the county level.

In FY 2013, the County's total revenues were estimated at $3,361 million (see Table 5.10-6). Of this amount, $904 million was in tax revenues. The increase in property taxes resulting from the Amended CECP would be between 0.8 percent and 1 percent of the County's total FY 2013 tax revenues. Therefore, no significant, adverse fiscal impacts are expected to result from the Amended CECP's operations.

The property taxes under the Licensed CECP, adjusted for inflation, of $4.1 million to $5.2 million account for 0.4 to 0.6 percent of the County's total FY 2013 tax revenues.

5.10.3.4 Utilities and Public Services

Like the Licensed CECP, the Amended CECP will not increase demands on utilities or public services. Specifically, the Amended CECP will not significantly increase impacts on fire or police protection or hospital services, as the scale of project construction and operation is similar to the Licensed CECP, although it has slightly increased labor needs and construction phase duration.

5.10.3.5 Offsite Construction Laydown and Construction Worker Parking Areas

Construction laydown and parking areas for the Amended CECP will be situated immediately north of the Amended CECP facility location, in the former footprints of fuel oil tanks 1, 2, and 4 located to the west of the existing railroad tracks, and in other areas of the Cabrillo Parcel. No offsite construction worker parking or construction equipment/material laydown is anticipated to be necessary.

5.10.4 Demolition of Encina Power Station

Demolition of the EPS is discussed in Section 5.10.3.2

5.10.5 Cumulative Impacts

The changes to the Licensed CECP necessary to construct and operate the Amended CECP will not result in any significant cumulative socioeconomic impacts beyond those addressed in the Final Decision.

5.10.6 Laws, Ordinances, Regulations, and Standards

The Final Decision found the project to be in compliance with all applicable LORS. The Amended CECP is also consistent with all applicable socioeconomic-related LORS and will not alter the assumptions or conclusions made in the Final Decision. Therefore, no additional or revised LORS have been identified for the Amended CECP.

5.10.7 Conditions of Certification

The analysis provided herein indicates that the socioeconomic impact of the Amended CECP, and its impact on environmental justice will not significantly differ from that of the Licensed CECP. Therefore, COC SOCIO-1 is adequate to address any new potential impacts from the Amended CECP, and no new socioeconomic COC is required for the Amended CECP. The text of COC SOCIO-1 is as follows:

SOCIO-1: The project owner shall pay or reimburse the City of Carlsbad for costs incurred in accordance with actual services performed by the City that the City would normally receive for a power plant or similar industrial development.

Verification: The project owner shall provide proof of payment prior to the start of commercial operation.

5.10.8 References

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5.11 Soil and Water Resources

This section provides the Project Owner's evaluation of how the Amended CECP could impact soil and water resources and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to soil and water resources. Consistent with this PTA, this section focuses on changes to the impacts or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to soil and water resources that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.11.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will remain immediately north of the CECP facility and in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling.

Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.11.2 Affected Environment

Despite the changes proposed in this PTA, these modifications will not result in any new or potential impacts on soil and water resources beyond those previously identified in the Final Decision. The Amended CECP expands the CECP footprint, and thereby causes an increased area of soil to be disturbed. However, the Amended CECP is consistent with the Licensed CECP, adheres to the integrity of the approved COCs, and is compliant with all applicable LORS.

5.11.3 Environmental Analysis

5.11.3.1 Construction and Operation of the Amended CECP

Although slightly greater due to the expanded footprint of the Amended CECP, impacts on soil and water resources from the construction and operation of the Amended CECP remain nearly the same as those analyzed in the Final Decision for the Licensed CECP.

5.11.3.2 Demolition of Encina Power Station

Demolition of the EPS will cause minor additional impacts on soil and water resources during grading activities and removal of foundation structures. These impacts will be minor considering the previously disturbed nature of the site. In addition, implementation of the Construction Stormwater Pollution Prevention Plan (SWPPP) as required by COC SOIL&WATER-1 would reduce any related impacts to a less-than-significant level. Estimates of erosion by water and wind are provided in Tables 5.11-1 and 5.11-2. It is not expected that the Amended CECP would utilize or encounter groundwater; therefore, no impacts to groundwater would occur. The construction water supply for the Amended CECP would be the same as described in the Final Decision for the Licensed CECP.

The removal of the EPS units will create substantial environmental benefits including, but not limited to, eliminating intake of 857 million gallons per day of ocean water for cooling of the existing EPS units, and ceasing the discharge of wastewaters to the Pacific Ocean from the existing EPS units.

5.11.3.3 Soil Erosion during Demolition Activities

Because the conditions that could lead to excessive soil erosion are not present at the project site, little soil erosion is expected during demolition and remediation activities for the Amended CECP, as for the Licensed CECP. Estimates of water and wind erosion from PTA activities are provided below.

5.11.3.3.1 Water Erosion

An estimate of soil loss from water erosion during demolition and remediation activities is found in Table 5.11-1. These estimates were developed using the Revised Universal Soil Loss Equation (RUSLE2). Erosion estimates from the Licensed CECP are also included in Table 5.11-1 for reference.

With the implementation of the Construction SWPPP and its best management practices (BMP), as required by the National Pollutant Discharge Elimination System (NPDES) permit, the total estimated soil loss from the Amended CECP is 7.6 tons. It should be recognized that these estimates are very conservative (i.e., overestimate soil loss), because they only assume a single BMP, whereas the project's SWPPP includes multiple soil erosion control measures.

5.11.3.3.2 Wind Erosion

The potential for wind erosion of surface material was estimated by calculating the total suspended particulates (TSP) that could be emitted as a result of grading and the wind erosion of exposed soil. The total

site area and grading duration were multiplied by emission factors to estimate the TSP emitted from the site. Fugitive dust from site grading was calculated using the default particulate matter less than 10 microns in equivalent matter (PM_{10}) emission factor used in URBEMIS2002 (Jones & Stokes Associates, 2003) and the ratio of 0.5 fugitive TSP to PM_{10} published by the South Coast Air Quality Management District (SCAQMD, 1993). Fugitive dust resulting from the wind erosion of exposed soil was calculated using the emission factor in AP-42 (EPA, 1995).

Table 5.11-2 summarizes the mitigated TSP predicted to be emitted from the project site from demolition and remediation activities, and the wind erosion of exposed soil at the Amended CECP location. Erosion estimates from the Licensed CECP (from the PEAR) are also included in Table 5.11-2 for reference. Without mitigation, the maximum predicted erosion of material from the activities of the Amended CECP is estimated at 1.4 tons over the course of demolition. This estimate is reduced to 0.5 ton by implementing basic mitigation measures such as water application (see mitigation measures below). These estimates are conservative because they make use of emission rates for a generalized soil rather than for specific soil properties. However, these estimates for the Amended CECP are considerably less than the anticipated wind erosion for the Licensed CECP.

TABLE 5.11-1
Estimated Soil Loss during Construction/Demolition from Water Erosion

Feature (acreage)	Activity	Duration (months)	Soil Loss (tons) without BMPs	Soil Loss (tons) with BMPs	Soil Loss (tons/yr) No Project
Encina Power Station	Demolition	22	249.8	6.97	0.3167
	Grading	2	50.2	0.63	—
Project Soil Loss Estimates		**—**	**299.9**	**7.6**	**0.32**
Licensed CECP Erosion Estimate (includes all areas)		***47.8***	***67.4***	***1.5***	***1.3***

Notes:

Soil losses (tons/acre/year) are estimated using RUSLE2 software available online [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Program.htm].

-The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped soil unit.
-Soil loss (R-factors) was estimated using 2-year, 6-hour point precipitation frequency amount for the site coordinates [online at http://www.nws.noaa/ohd/hdsc/noaaatlas2.htm].
-Estimates of actual soil losses use the RUSLE2 soil loss multiplied by the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.

TABLE 5.11-2
Estimated Soil Loss during Construction/Demolition from Grading and Wind Erosion

Emission Source	Affected Acreage	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Grading Dust:				
Demo – Encina Power Station	11.4	2	0.392	0.137
Wind Blown Dust:				
Demo – Encina Power Station	6.0	22	1.041	0.364
Total		—	**1.4**	**0.5**
Licensed CECP Erosion Estimate (includes all areas)			***5.314***	***1.860***

Note: Assumptions for these calculations are provided in Appendix 5.11A.

5.11.3.4 Water Supply and Use

The Amended CECP will retire the older EPS generating system and will eliminate the use of once-through sea water cooling. For the Amended CECP's raw water needs, the project will preferentially use California Code of Regulations (CCR) Title 22 reclaimed water from the City of Carlsbad as the primary water source, provided it is available, thereby minimizing the use of potable water onsite. The purified ocean water alternative approved in the Licensed CECP will be implemented as a backup water supply in the event reclaimed water is unavailable. Also, as planned for the Licensed CECP, potable water will remain available as a back-up water source in the event neither reclaimed water nor purified ocean water is available. As the City Agreement requires, and the City Letter indicates, the Project Owner and the City are working together to enable the City to provide recycled water and potable water, as well as, sanitary and industrial sewer services, to the Amended CECP (see Appendixes 2A and 2B). Figures 2.1-3a and 2.1-3b, provided in Section 2.0, Project Description, show daily average consumption with the six combustion turbine generators (CTG) operating at up to a 31 percent capacity factor with CTG evaporative cooling, for reclaimed water and ocean water, respectively. While high-purity demineralized water will no longer be required for the steam cycle, it will be required for emission control via direct injection into the combustion turbines and turbine wash water.

The Amended CECP fire protection system will be modified from the Licensed CECP to have a common but larger raw water tank for fire protection and process use, as well as expanded fire loops for the expanded Amended CECP site. Both the power block area and rim area hydrants will be charged by this source, eliminating the tie to the existing EPS. Potable water from the existing City of Carlsbad supply will be used for the new administration/control building, warehouse, and emergency eyewash and safety showers, and will also serve as an emergency connection for the fire water tank should reclaimed or ocean water become interrupted.

The reclaimed water balance diagram (Figure 2.1-3a) shows the equipment required as well as water uses and waste streams for both a daily maximum and yearly average use. The ocean water balance diagram (Figure 2.1-3b) shows the equipment required as well as daily average water use. Up to approximately 30 gallons per minute (gpm) of reclaimed water will be used to irrigate site landscaping, which is included in the water balance diagrams. In addition, water will be used during construction for dust and erosion control, equipment washing, and other short term uses in similar amounts as described in the AFC.

5.11.3.5 Water Requirements

The Amended CECP will use no more than 336 afy of CCR Title 22 reclaimed water provided by the City of Carlsbad for evaporative cooling make-up, as feed water to the demineralizers that will provide high-purity water for the CTGs and miscellaneous plant uses. This is a decrease in water use from the Licensed CECP. A comparison of the estimated average daily, maximum daily, and maximum annual quantity of reclaimed water required for operation of the Licensed CECP and Amended CECP is presented in Table 5.11-3. A comparison of the alternate source ocean water requirements are presented in Table 5.11-4. The daily water requirements shown are estimated quantities based on the simple-cycle plant operating at a 31 percent capacity factor, with evaporative cooling.[2]

[2] Peak water requirements shown in Tables 5.11-3 and 5.11-4 are based on the plant operating at full load, with evaporative cooling, and an ambient temperature of 96.0°F and 36.0 percent relative humidity.

TABLE 5.11-3
Daily and Annual Water Use—Reclaimed Water Supply

Water Use	Average Daily Use (gpm)	Maximum Daily Use (gpm)	Maximum Annual Use (afy)
Licensed CECP Operations			
Reclaimed Water	320	945	517[a]
Potable Water	12	12	19[a]
Amended CECP Operations			
Reclaimed Water	210[b]	675	336[b]
Potable Water	12	12	19

[a]Based on an annual operation of 3,504 hours/year at full plant output, excluding Units 4 and 5 contribution as licensed

[b]Based on an annual operation of 2,700 hours/year at full plant output

TABLE 5.11-4
Daily and Annual Water Use—Ocean Water Supply

Water Use	Average Daily Use (gpm)	Maximum Daily Use (gpm)	Maximum Annual Use (afy)
Licensed CECP Operations			
Ocean Water	420	848	271[a]
Potable Water	12	12	19[a]
Amended CECP Operations			
Ocean Water	450[b]	1,460	726[b]
Potable Water	12	12	19

[a]Based on an annual operation of 3,504 hours/year at full plant output, excluding Units 4 and 5 contribution as licensed

[b]Based on an annual operation of 2,700 hours/year at full plant output

5.11.4 Cumulative Impacts

The modifications proposed in this PTA will result in similar subsurface activities as were required for construction of the Licensed CECP, its supporting equipment and structures. Subsurface demolition and construction activities are expected to occur in areas of the Amended CECP site that have been previously disturbed by historical power plant operations. Impacts beyond those described in the Final Decision are not anticipated. The resource protection measures included in existing COCs SOIL&WATER-1 through SOIL&WATER-8 and WASTE-1 are adequate to address potential impacts of the Amended CECP on soil and water resources. Therefore, the proposed modifications to the Licensed CECP will not result in any significant cumulative impacts beyond those addressed in the Final Decision.

Cumulative projects identified in the approved AFC include the following:

- Carlsbad Seawater Desalination Project at EPS
- I-5 North Coast Corridor Improvements (new lanes and interchanges)
- City of Carlsbad facility improvements (three sewer interceptors segments and a lift station)
- Carlsbad Boulevard bridge over the EPS outlet channel
- A future development plan for the 300-acre Flower Fields Area (current strawberry fields)

Additional cumulative projects to be considered in conjunction with the Amended CECP are:

- Los Angeles to San Diego (LOSSAN) Double Tracking Project
- Coastal Rail Trail

It is expected that the cumulative projects listed above would employ good engineering practices and comply with all applicable federal, state, and local LORS. Therefore, the potential for cumulative impacts of the Amended CECP combined with other nearby projects on soil loss and erosion is not expected to be significant.

5.11.5 Laws, Ordinances, Regulations, and Standards

The Final Decision found the Licensed CECP to be in compliance with applicable soil and water resource LORS. The Amended CECP is consistent with applicable soil and water resource-related LORS, and the amendment will not alter the assumptions or conclusions in the CEC Final Decision. No additional or revised LORS compliance requirements have been identified.

5.11.6 Conditions of Certification

Existing COCs SOIL&WATER-1 through SOIL&WATER-8 and WASTE-1,[3] are adequate to address the changes to the Licensed CECP as part of the Amended CECP. In particular, the resource protection measures included in these COCs are adequate to address potential impacts on soil resources from the expanded power plant, and the demolition activities for the EPS. Furthermore, the Project Owner will construct and operate the Amended CECP in accordance with these COCs and applicable LORs.

The COCs are provided below.

SOIL&WATER-1: The project owner shall comply with the requirements of the San Diego County Municipal Storm Water Permit (Order R9-20070001, NPDES No CAS0108758) and City of Carlsbad (City) Municipal Code Title 15, Chapter 15.12. The project owner shall develop and implement a Tier 3 Construction Storm Water Pollution Prevention Plan (Construction SWPPP) for the construction of the CECP site, laydown and parking areas, and all linear facilities. The Tier 3 Construction SWPPP shall be submitted to the City for review and comment and to the CPM for approval and shall contain all of the elements required by the General Permit for Construction Activities (WQO-99-08-DQM), the Municipal Permit (Order R9-2007-0001), and the City's current Storm Water Standards Manual.

Verification: Prior to site mobilization, the project owner shall submit to the Compliance Project Manager (CPM) a copy of the Tier 3 Construction SWPPP that has been reviewed by the City and retain a copy on site.

The project owner shall submit to the CPM all copies of correspondence between the project owner and the City regarding the Tier 3 Construction SWPPP within 10 days of its receipt or submittal. This information shall include copies of the Notice of Intent and Notice of Termination submitted to the State Water Resources Control Board for enrollment under the NPDES General Permit for Construction Activities.

SOIL&WATER-2: Potable water shall not be used for any construction activity that is suitable for non-potable water use if a non-potable water source is available at the project site. Prior to site mobilization, the project owner shall submit to the CPM a Non-Potable Construction Water Use Plan (plan) for the supply and use of non-potable water in construction activities. The plan shall consider the use of ocean water and reclaimed water available at the site. The plan shall specify those construction activities that would use non-potable water and those construction activities that would use potable water.

Verification: Prior to site mobilization, the project owner shall submit to the CPM for review and approval the Non-Potable Construction Water Use Plan.

[3] WASTE-1 is more fully described in Section 5.14 Waste Management.

Within the Monthly Compliance Report, the project owner shall report the volume of potable and non-potable water used and the construction activities for which each was used.

SOIL&WATER-3: The project owner shall comply with the requirements of the San Diego County Municipal Storm Water Permit (Order R9-20070001, NPDES No CAS0108758) and City of Carlsbad (City) Municipal Code Title 15, Chapter 15.12. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (Industrial SWPPP) for the operation of CECP. The industrial SWPPP shall be submitted to the City for review and comment and to the CPM for review and approval and shall be prepared in accordance with the requirements of the NPDES General Permit for Industrial Activities (WQO-97-03-DQM) and the City's Storm Water Standards Manual.

Verification: Prior to commercial operation, the project owner shall submit to the CPM a copy of the Industrial SWPPP and retain a copy on site.

The project owner shall submit to the CPM all copies of all correspondence between the project owner and the City regarding the Industrial SWPPP within 10 days of its receipt or submittal. This information shall include a copy of the Notice of Intent submitted to the State Water Resources Control Board for enrollment under the NPDES General Permit for Industrial Activity.

SOIL&WATER-4: The project owner shall submit to the San Diego Regional Water Quality Control Board (SDRWQCB) all information required by the SDRWQCB to obtain a Waste Discharge Requirements (WDR) Order for the discharge of CECP industrial wastewater to the Pacific Ocean. The project owner shall submit to the CPM all copies of correspondence between the project owner and the SDRWQCB regarding the WDR Order within 10 days of its receipt or submittal.

Verification: At least two weeks prior to the operation of the CECP ocean-water purification system, the project owner shall submit to the CPM a copy of the approved WDR Order for the discharge of CECP industrial wastewater to the Pacific Ocean.

The project owner shall submit to the CPM the annual water quality monitoring report required by the SDRWQCB in the annual compliance report. The project owner shall notify the CPM of all WDR Order violations, the actions taken or planned to bring the project back into compliance with the WDR Order, and the date compliance was reestablished.

SOIL&WATER-5: Prior to the use of potable water from the City of Carlsbad (City) for any purpose related to the construction or operation of the CECP, the project owner shall provide the CPM with copies of all permit(s) for the delivery and hookup of potable water. The project owner shall comply with the City's Municipal Code Title 14, Chapter 14.08 for the supply and use of potable water. Potable water shall not be used for any construction or operation activity that is suitable for non-potable water use.

Verification: No later than 30 days prior to the connection to the City's potable water system, the project owner shall provide the CPM with copies of all permits for the delivery and hookup of potable water.

The project owner shall submit to the CPM any water quality monitoring reports required by the City in the annual compliance report. The project owner shall notify the CPM of any violations of the permit(s) and conditions, the actions taken or planned to bring the project back into compliance with the permit(s), and the date compliance was reestablished.

SOIL&WATER-6: Prior to the use of potable, recycled, or ocean water during the operation of the CECP, the project owner shall install and maintain metering devices as part of the water supply and distribution system to monitor and record in gallons per day the volume of all water sources used by the CECP. The metering devices shall be operational for the life of the project, and an annual summary of daily water use by the CECP, differentiating between potable, recycled, and ocean water, shall be submitted to the CPM in the annual compliance report.

Verification: At least 60 days prior to use of any water source for CECP operation, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on all water

supply pipelines serving the project. The project owner shall provide a report on the servicing, testing, and calibration of the metering devices in the annual compliance report.

The project owner shall submit a water use summary report to the CPM in the annual compliance report for the life of the project. The annual summary report shall be based on and shall distinguish recorded daily use of potable, recycled, and ocean water. The report shall include calculated monthly range, monthly average, and annual use by the project in both gallons per minute and acre-feet. After the first year and for subsequent years, this information shall also include the yearly range and yearly average potable and ocean water used by the project.

SOIL&WATER-7: Prior to connection to the City of Carlsbad's (City) sanitary sewer system, the project owner shall submit to the City all information and documentation required to satisfy City of Carlsbad Municipal Code Title 13, Chapters 13.04, 13.10, and 13.16 for the discharge of recycled and sanitary wastewater to the City's sewer system. During CECP operation, any monitoring reports provided to the City shall also be provided to the CPM. The CPM shall be notified of any violations of discharge limits or amounts.

Verification: At least 60 days prior to commercial operation, the project owner shall submit the information and documentation required to satisfy Municipal Code Title 13, Chapters 13.04, 13.10, and 13.16 and provide the CPM a copy of the City permits for the discharge of recycled and sanitary wastewater to the City's sewer system.

During operations, the project owner shall submit to the CPM any wastewater quality monitoring reports required by the City in the annual compliance report. The project owner shall submit any notices of violation from the City to the CPM within 10 days of receipt and fully explain the corrective actions taken in the annual compliance report.

SOIL&WATER-8: If the project owner relies on recycled water for CECP water supply, the project owner shall provide the CPM two copies of the executed Recycled Water Purchase Agreement (agreement) with the recycled water producer and the City of Carlsbad (City) for the supply and delivery of tertiary treated recycled water to the CECP. The CECP shall not connect to the City's recycled water pipeline without the final agreement in place. The project owner shall comply with the requirements of Title 22 and Title 17 of the California Code of Regulations and section 13523 of the California Water Code.

Verification: No later than 180 days prior to the connection to the City's recycled water pipeline, the project owner shall submit two copies of the executed agreement for the long-term supply and delivery of tertiary treated recycled water to the CECP. The agreement shall specify a maximum delivery rate of ~~945~~ 675 gpm and shall specify all terms and costs for the delivery and use of recycled water by the CECP.

No later than 60 days prior to connection to the City's recycled water pipeline, the project owner shall submit to the CPM a copy of the Engineering Report and Cross Connection inspection and approval report from the California Department of Public Health and all water reuse requirements issued by the San Diego Regional Water Quality Control Board.

5.11.7 References

Jones & Stokes Associates. 2003. *Software User's Guide: URBEMIS-2002 for Windows with Enhanced Construction Module, Version 7.4*.

South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook*. Diamond Bar, California.

U.S. Environmental Protection Agency (EPA). 1995. Compilation of Air Pollutant Emission Factors AP 42. Volume I: Stationary Point and Area Sources, 5th edition (Online). Available at http://www.epa.gov/ttn/chief/ap42/index.html.

5.12 Traffic and Transportation

This section provides the Project Owner's evaluation of how the Amended CECP could impact traffic and transportation and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to traffic and transportation. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

The Amended CECP is not likely to create any new significant impacts to traffic and transportation that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less than significant impacts.

5.12.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 turbines simple-cycle to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings, will be demolished.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.12.2 Affected Environment

The CECP site is located north of the intersection of Carlsbad Boulevard and Cannon Road within the EPS site. The site is surrounded to the north by the Agua Hedionda Lagoon, to the east by I-5, to the south by Cannon Road and the SDG&E Cannon Substation, and to the west by the north/south transept of the Atchison, Topeka and Santa Fe (AT&SF) Railway/North County Transit District (NCTD) Rail Corridor and Carlsbad Boulevard. Primary site access to the CECP site will continue to be through the EPS main gate at Carlsbad Boulevard. No major changes to the existing transportation infrastructure have occurred since preparation of the AFC (07-AFC-06C). The surrounding regional and local roadway networks are shown in Figure 5.12-1 and described below.

5.12.2.1 Surrounding Road Network

The key roadways in the project area include:

Interstate 5 (I-5) is a major north-south freeway that extends from the Mexican Border to the Canadian border. In the site vicinity, I-5 has four lanes in each direction. I-5 carries 198,000 average daily trips (ADT) in the vicinity of the project (Caltrans, 2012). Truck traffic accounts for approximately 4.8 percent of all trips on I-5 near Cannon Road (Caltrans, 2012). Access to the CECP site from I-5 is provided via the Cannon Road exit.

Cannon Road is an east-west divided arterial with two lanes in each direction. An interchange is provided at I-5 and Cannon Road. Cannon Road carries 23,284 ADT, east of I-5. The San Diego Northern Railway (SDNR) tracks run north/south at a signalized crossing on Cannon Road just west of Avenida Encinas.

Carlsbad Boulevard (Coast Highway 101) is a north-south divided arterial that varies from two to four lanes in the project study area. The road is called Carlsbad Boulevard within the City of Carlsbad, however, it is also part of the longer regional Coast Highway 101 or “Historic Route 101” that begins in San Diego to the south and ends in Oceanside to north. Carlsbad Boulevard carries 17,319 ADT between Cannon Road and Tamarack Avenue.

5.12.2.2 Existing Roadway and Intersections Operations

The AFC evaluated roadway and intersection operations based on level of service (LOS) for existing (2007) and existing plus CECP construction conditions. LOS is identified by a letter designation from A to F, with A as the optimum operating LOS and F designating service as very poor. The City of Carlsbad considers LOS C or better acceptable for mid-block roadway operations during the AM and PM peak hours and LOS D or better acceptable for intersection operations during the AM and PM peak hours. The AFC analyzed the potential project impacts for the following road segments and intersections:

Roadway Segments

- Cannon Road (between I-5 Southbound Ramps and Avenida Encinas)
- Cannon Road (between Avenida Encinas and Carlsbad Boulevard)
- Carlsbad Boulevard (between Cannon Road and CECP)

Intersections

- Cannon Road/I-5 Northbound Ramps
- Cannon Road/I-5 Southbound Ramps
- Cannon Road/Avenida Encinas
- Cannon Road/Carlsbad Boulevard

As part of this PTA, the roadway and intersection levels of service from the AFC were compared against traffic data contained in the City of Carlsbad 2013 Traffic Monitoring Program (City of Carlsbad, 2013) to assess whether traffic conditions in the study area have changed significantly since the preparation of the AFC.

Every year, as part of its Growth Management Plan, the City of Carlsbad conducts a Traffic Monitoring Program, which includes the collection and analysis of data on critical mid-block roadway segments and at major intersections throughout the city. The Traffic Monitoring Program includes data for generally the same area as analyzed for and approved in the Final Decision. However, the specific roadway segments and intersections vary slightly from those in existence when the Project Owner applied for certification. A comparison of the roadway and intersection LOS (for locations where data is available) is presented in Tables 5.12-1 and 5.12-2. Three additional roadway segments and one additional intersection is included for comparison purposes.

TABLE 5.12-1
2007 and 2013 Roadway Operations

Roadway	Segment	2007 Conditions		2013 Conditions	
		ADT	LOS	ADT	LOS
Carlsbad Boulevard	Tamarack Avenue to Tierra del Orzo	—		17,319	A
	Cannon Road to Cerezo Drive	—		16,755	A
	CECP driveway to Cannon Road	23,600	C	—	
Cannon Road	Paseo Del Norte to Car County Drive	—		26,399	A
	I-5 Southbound ramps to Avenida Encinas	13,600	A	—	
	Avenida Encinas to Carlsbad Boulevard	7,950	A	—	

Note: 2007 data obtained from the AFC. 2013 data obtained from the City of Carlsbad 2013 Traffic Monitoring Program. Data shown where available.

TABLE 5.12-2
2007 and 2013 Intersection Operations

Intersection	AM Peak Hour[a]				PM Peak Hour[a]			
	2007 Conditions		2013 Conditions		2007 Conditions		2013 Conditions	
	Delay (Sec.)	LOS	ICU Ratio	LOS	Delay (Sec.)	LOS	ICU Ratio	LOS
1. Cannon Road/I-5 Northbound Ramps	10.6	B	0.50	A	11.2	B	0.67	B
2. Cannon Road/I-5 Southbound Ramps	16.7	B	0.53	A	13.8	B	0.51	A
3. Cannon Road/Avenida Encinas[b]	15.3	B	—		14.7	B	—	
4. Cannon Road/Carlsbad Boulevard	16.6	B	0.43	A	27.8	C	0.65	B
5. Cannon Road/Paseo Del Norte[c]	—		0.59	A	—		0.56	A

[a] 2007 data obtained from the Final Decision. 2013 data obtained from the City of Carlsbad 2013 Traffic Monitoring Program. Data shown where available.

[b] Current (2013) traffic data is not available for this intersection.

[c] This intersection was not analyzed for the Licensed CECP. The LOS information is shown to support the findings that the intersections in the project study area are operating at an acceptable LOS.

All of the study roadways and intersections are currently operating at LOS B or better and in all cases the 2013 conditions are estimated to be operating at a better LOS than was previously identified when the CECP was licensed.

5.12.3 Environmental Analysis

The impact of a project is measured by its potential to change the traffic operations of surrounding intersections and roadways. Traffic associated with the Amended Project after the 24-month construction period is expected to be minimal. Consistent with the Final Decision, traffic impacts associated with the peak construction period for the Amended CECP have been subjected to a conservative analysis.

5.12.3.1 Construction Project Trip Generation

Implementation of the Amended CECP will result in fewer construction trips than for the Licensed CECP, primarily due to the smaller amount of construction workers needed for the modified project. Based on the proposed construction activities and workforce estimates, the Amended CECP would generate 645 ADT, with 285 trips occurring during the morning and afternoon peak hours. The project trip distribution pattern for the Amended Project is assumed to be the same as previously analyzed for the Licensed Project. The project trips are summarized in Table 5.12-3 and discussed in further detail below.

TABLE 5.12-3
Project Construction Trip Generation

		AM Peak Hour Trips			PM Peak Hour Trips		
	Daily Trips	In	Out	Total	In	Out	Total
Autos	558	279	0	279	0	279	279
Trucks	58	2	2	4	2	2	4
PCE - 1.5*	87	3	3	6	3	3	6
Total PCEs	**645**	**282**	**3**	**285**	**3**	**282**	**285**

*Truck trips were converted to passenger car equivalent units (PCEs) at a ratio of 1.5 passenger cars for each truck, consistent with the 2010 HCM guidelines

5.12.3.1.1 Workforce Trips

The number of construction workers will fluctuate throughout the 24-month construction period, with the peak construction effort onsite occurring during Month 13, when 279 workers are projected. As a conservative estimate it was assumed that none of the construction workers would carpool. Based on this assumption, the Amended CECP would generate a total of 558 daily auto trips, with 279 trips occurring during the morning peak hour and 279 trips occurring during the afternoon peak hour. As a comparison, the Final Decision assumed a peak construction workforce of 357 workers.

5.12.3.1.2 Truck Trips

The number of truck deliveries is assumed to be similar as the Final Decision estimate. Truck deliveries will be spread throughout the day, beginning at approximately 6:00 AM and ending at approximately 6:00 PM. The truck trips will peak during Month 6 when 29 deliveries (or 58 one-way trips) per day are expected. The truck trips were converted to PCEs at a ratio of 1.5 passenger cars for each truck, resulting in 87 daily PCEs and 6 peak hour PCEs.

5.12.3.2 Construction Project Traffic Impacts

5.12.3.2.1 Intersection and Roadway Operations

As identified in the AFC and reflected in the CEC Final Decision, most of the traffic generated during peak hours would be from construction workers arriving and departing the site. The Amended CECP would

generate a maximum of 645 daily trips and 285 peak hour trips during the peak construction period. Based on a review of the existing traffic conditions in the area, the study roadways and intersections are operating at LOS B or better and in all cases, operating at a better LOS than previously estimated in 2007.

Only one potential impact was identified in the AFC as result of construction of the Licensed CECP. The Carlsbad Boulevard segment near the CECP site was determined to be operating at LOS C under 2007 conditions and LOS D under 2007 plus construction project conditions. However, since the number of construction trips for the Amended CECP will be fewer than was previously identified for the Licensed Project, the Amended Project's impacts would be less than those identified in the AFC, and approved in the Final Decision. As shown in Table 5.12-1, and based on the City of Carlsbad 2013 Traffic Monitoring Program, Carlsbad Boulevard, adjacent to the project site (between Tamarack Avenue and Cerezo Drive) is currently operating at LOS A. The Amended CECP would add 645 daily trips to this roadway, which would continue to operate at LOS A with the project-added traffic. There would be no impact.

The Final Decision also determined that the project-added trips would not cause the study intersections to drop below their existing LOS. Consistent with this finding, the Amended CECP would not cause the intersections to drop below their existing LOS. Therefore, there would be no impact.

To minimize the temporary increase in traffic, the Amended Project will continue to implement the Conditions of Certification (described in Section 5.12.7) that were included in the CEC's 2012 Final Decision for CECP.

5.12.3.2.2 Hazardous Materials Management

As described in Section 5.5, a variety of chemicals will be stored and used during construction and operation of the Amended CECP, similar to the Licensed CECP. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, LORS. The Amended CECP will continue to require aqueous ammonia deliveries; however, system upgrades and changes in operating conditions will not be required. It estimated that two deliveries per month will occur during the summer (over an approximately four-month period) and one delivery every two months during the off-peak months (over an approximately eight-month period). This is annual average of one delivery per month.

Emergency response vehicles will continue to use Cannon Road to Avenida Encinas to access the Amended Project site, as addressed in the Construction Traffic Control Plan and Implementation Program required by COC TRANS-1.

5.12.3.2.3 Traffic Safety

Consistent with the findings of the Final Decision, Amended CECP construction-related traffic is not expected to result in safety impacts to the general public because it will not be routed through residential areas. The railroad crossing on Cannon Road near the site is signalized with safety crossing arms visible to drivers. The Amended Project workforce traffic will continue to use the EPS gate on Carlsbad Boulevard, which has adequate visibility in both directions. Site access for truck deliveries to the Amended CECP will be continue to be provided on Avenida Encinas at Cannon Road to avoid the railroad crossing. The Project Owner's Traffic Construction Plan and Implementation Program required by COC TRANS-1 will address the timing of heavy equipment and building materials deliveries; the use of flaggers, signing, lighting, and traffic control devices; access for emergency vehicles; temporary lane closures; specification of construction-related haul routes; and identification of safety procedures for exiting and entering the site access gate. Some of the heavy haul deliveries may continue to be transported by rail from the mainline to the private rail spur within the project site. As for the Licensed CECP, the Amended CECP's rail deliveries will be off-loaded within the CECP site, and would not result in safety impacts to the general public.

Condition of Certification TRANS-4 requires the project to implement a Crossing Safety Plan for all phases of project construction to address foot traffic, construction-related vehicle crossing, and the transport of

heavy/oversize loads over the internal rail crossing, located between the EPS site and the east side of the site.

The potential for damage to roads by heavy construction vehicles and equipment within the project area will be mitigated by COC TRANS-5, which requires the project owner to ensure that any road damaged by project construction will be restored to its original condition to ensure that any damage to local roadways will not create a safety hazard to motorists.

Condition TRANS-6 requires all CECP-related, oversized construction vehicles on public roadways to comply with Caltrans and other relevant jurisdiction's restrictions on vehicle sizes and weights. Finally, Condition TRANS-8 requires the project owner to comply with limitations for encroachment into public rights-of-way imposed by Caltrans and other relevant jurisdictions and to obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

5.12.3.2.4 Parking

No impacts to parking are anticipated as a result of the project modifications under Amended CECP. The construction workforce will use the designated on-site parking in compliance with COC TRANS-7.

5.12.4 Demolition of Encina Power Station

The demolition of the EPS is included in Amended CECP and is anticipated to take 22 months. This demolition will require an average of 74 construction/demolition workers, with a peak construction force of 194 workers. Major demolition of EPS will not occur until the Amended CECP is fully operational and the existing generating units at EPS are retired from service. During EPS demolition, there will be an approximately four-month period when the demolition workforce will exceed 100 workers. Demolition truck trips will peak during Month 6 when 18 deliveries per day are expected. Assuming two trips per employee and truck, demolition of the EPS will result in 424 daily trips during peak construction, as compared to 645 daily trips for the Amended CECP construction.

Demolition of the EPS will occur after the Amended CECP is operational and will therefore not coincide with construction-related traffic for the CECP. Based on the traffic analysis provided above, the EPS construction-added traffic would not change the existing LOS for the study roadways or intersections. The roadways and intersections would continue to operate at an acceptable LOS. There would be no impact.

5.12.5 Cumulative Impacts

The proposed Amended CECP will not result in any significant cumulative impacts to traffic and transportation beyond those addressed in the CEC's 2012 Final Decision. Table 5.12-4 provides a list of projects proposed within the CECP vicinity that could be under construction and/or in operation concurrent with construction of the Amended CECP.

TABLE 5.12-4
Cumulative Projects

Project Name	Location	Description	Status
Carlsbad Seawater Desalination Plant	Encina Power Station	50 million gallon per day seawater desalination plant, pipelines, pumps, and other appurtenant and ancillary water facilities to produce and distribute potable water.	Currently under construction, more than 25% complete; operation expected in 2016.
Interstate 5 (I-5) North Coast Corridor	Northern San Diego County. La Jolla Village Drive (I-5) and Mira Mesa Boulevard (I-805) to Vandgrift Boulevard.	27 mile project adding highway lanes and operational improvements to provide mobility choices for motorists on I-5 in northern the San Diego region.	The overall corridor project is expected to be complete in 2016.

TABLE 5.12-4
Cumulative Projects

Project Name	Location	Description	Status
CIP – Vista/Carlsbad Interceptor Agua Hedionda Lift Station (VC 12)	South shore of Agua Hedionda Lagoon adjacent to the east side of the railroad tracks.	Upgrade the existing pump station to increase capacity for buildout conditions. The project would also include replacement of existing pumps with larger capacity pumps and associated appurtenances.	Expected to be constructed in 2014
Los Angeles to San Diego (LOSSAN) Double-Tracking Project	AT&SF Railroad LOSSAN corridor	Double-tracking of main line and bridges, curve realignment and the addition of crossovers to increase capacity and enhance reliability of the railroad corridor for freight rail service. Double-tracking has been completed on the portion of rail line that crosses through EPS.	Projects are in various stages of development from preliminary engineering and environmental review to completion.
Coastal Rail Trail (CRT)	44 miles within the railroad right-of-way from Oceanside to downtown San Diego	Multi-modal transportation route that is separated from the roadway.	The CRT route location has not been finalized in the area of the EPS. The City of Carlsbad and NRG are working cooperatively to identify a final route for CRT in the area of EPS.

Other proposed projects in the area must conduct impact analyses, implement mitigation, and conform with applicable plans, policies, and regulations in order to obtain permit approval similar to the measures required for the CECP. Conditions TRANS-1 through TRANS-8 ensure that any potentially significant traffic impacts associated with Amended CECP construction are reduced to insignificant levels so that the Amended CECP's cumulative contribution to traffic impacts will also be reduced to insignificance.

5.12.6 Laws, Ordinances, Regulations, and Standards

The CEC's 2012 Final Decision found the project to be in compliance with all applicable LORS. As described in this PTA, the Amended CECP is consistent with applicable traffic and transportation-related LORS and the Amendment will not alter the assumptions or conclusions made in the CEC's 2012 Final Decision and no additional or revised LORS compliance have been identified.

5.12.7 Conditions of Certification

The traffic and transportation requirements subject to approved Conditions TRANS-1 through TRANS-8 are adequate to address any new potential impacts of the Amended Project. The Project Owner's analysis of the Amended CECP concludes that no modifications to the Conditions of Certification set forth in the CEC's 2012 Final Decision are necessary and no new Conditions of Certification are required for the Amended Project. The Conditions of Certification are provided below.

TRANS-1: The project owner shall consult with the City of Carlsbad and prepare and submit to the Compliance Project Manager (CPM) for approval a Construction Traffic Control Plan and Implementation Program which addresses the following issues:

- Timing of heavy equipment and building materials deliveries;
- Redirecting construction traffic with a flag person;
- Signing, lighting, and traffic control device placement if required;
- Need for construction work hours and arrival/departure times outside peak traffic periods;

- Assurance of access for emergency vehicles to the project site;
- Temporary closure of travel lanes;
- Access to adjacent residential and commercial property during the construction of all pipelines;
- Specification of construction-related haul routes; and
- Identification of safety procedures for exiting and entering the site access gate.

Verification: At least 30 days prior to site mobilization, the project owner shall provide to the CPM a copy of the above-referenced documents and proof of implementation.

TRANS-2: The project owner shall submit to the FAA Form 7460-1, Notice of Proposed Construction or Alteration, regarding the Carlsbad Energy Center Project (CECP) stack and shall secure a Determination of No Hazard to Navigable Airspace. The stacks shall have all lighting and marking required by the FAA so that the stacks do not create a hazard to air navigation.

Verification: At least 30 days prior to the start of construction, the project owner shall provide copies of the approved FAA Form 7460-1 and copies of the FAA Determination of No Hazard to Navigable Airspace to the CPM and the City of Carlsbad Planning Department. The project owner shall also provide pictures of the CECP stack after the lighting and marking have been completed.

TRANS-3: Prior to start-up and testing activities of the plant and all related facilities, the project owner shall consult with the FAA to notify all pilots using the McClellan-Palomar Airport and airspace above the CECP of potential air hazards. These requirements shall include, but not be limited to the project owner's working with the FAA in issuing a Notice To Airmen (NOTAM) of the identified air hazard and updating the Terminal Area Chart and all other FAA-approved airspace charts used by pilots that include the CECP site to indicate that pilots should avoid direct overflight of the site.

Verification: At least 60 days prior to start of project operation, the project owner shall submit to the CPM for review and approval a letter from the FAA showing compliance with these measures plus copies of the NOTAM and the updated Terminal Area Chart.

TRANS-4: Prior to construction of the plant and all related facilities, the project owner shall develop a Crossing Safety Plan for all phases of project construction to address foot traffic as well as construction-related vehicle crossing and the transport of heavy/oversize loads over the internal rail crossing.

Verification: At least 60 days prior to start of site mobilization, the project owner shall submit the plan to the CPM for review and approval.

TRANS-5: Following completion of project construction, the project owner shall repair any damage to roadways caused by construction activity along with the primary roadways identified in the traffic control plan for construction traffic to the road's pre-project construction condition. Prior to the start of construction, the project owner shall photograph, videotape, or digitally record images of the roadways that will be affected by pipeline construction and heavy construction traffic. The project owner shall provide the CPM and the City of Carlsbad with a copy of the images for the roadway segments under its jurisdiction. Also prior to start of construction, the project owner shall notify the City about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction-related activities associated with other projects.

Verification: Within 30 days after completion of the redevelopment project, the project owner shall meet with the CPM and the City of Carlsbad to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near-original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from the City of Carlsbad if work occurred within its jurisdictional public right-of-way stating its satisfaction with the road improvements.

TRANS-6: The project owner shall comply with Caltrans and other relevant jurisdictions limitations on vehicle sizes and weights. In addition, the project owner shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-7: During construction of the plant and all related facilities, the project owner shall develop a Parking and Staging Plan for all phases of project construction to enforce a policy that all project-related parking occurs on site or in designated off-site parking areas.

Verification: At least 60 days prior to start of site mobilization, the project owner shall submit the plan to the City of Carlsbad and other jurisdictions affected by site selection, such as the City and/or County of San Diego, for review and comment and to the CPM for review and approval.

TRANS-8: The project owner shall comply with limitations for encroachment into public rights-of-way imposed by Caltrans and other relevant jurisdictions and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

5.12.8 References

California Department of Transportation (Caltrans). 2012. Traffic Management Branch. 2012 Traffic Counts.

City of Carlsbad and RBF Consulting. 2013. City of Carlsbad Growth Management Plan 2013 Traffic Monitoring Program. November. Website: http://www.carlsbadca.gov/services/traffic/operations/Pages/default.aspx

Transportation Research Board. 2010. Highway Capacity Manual.

LEGEND

Carlsbad Energy Center Project

Study Intersections

0 500 1,000
Feet

N

Figure 5.12-1
Regional and Local Road Network
Carlsbad Energy Center Project

5.13 Visual Resources

Visual resources are the natural and cultural features of the environment that can be seen and that contribute to the public's enjoyment of the environment. Visual resource or aesthetic impacts are generally defined in terms of a project's physical characteristics and potential visibility, and the extent that the project's presence would change the visual character and quality of the environment in which it would be located.

This section provides the Project Owner's evaluation of how the Amended CECP could impact visual resources and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to visual resources. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to visual resources that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.13.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

1. Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
2. Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired, and the above-grade elements of the main EPS power building and all support buildings will be demolished. Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to CECP, such as for transportation access, electrical interconnection and water or gas supply.

5.13.2 Environmental Analysis

5.13.2.1 Analysis Procedure

Visual analyses prepared for the CECP for the original CEC 2012 license determined that the visual effects of the CECP, with mitigation, would be less than significant. Because the Amended CECP would have an appearance that would differ somewhat from that of the Licensed CECP, an analysis was conducted to determine whether the Amended CECP would alter the visual conditions at the CECP site in a way that would change this finding of less-than-significant impact. To make this determination, updated site reconnaissance and photography were performed and updated visual simulations were prepared to depict the conditions that would exist with construction of the Licensed CECP, and the visual conditions that would exist with implementation of the changes requested under this Amendment. A systematic comparison was made of the simulations depicting the baseline views (i.e., the views with development of the Licensed CECP) with the views depicting the project requested in the Amendment. The goal of the comparison was to determine whether the changes brought about by the Amended CECP would adversely affect the appearance of the site and create impacts that would exceed those of the Licensed CECP to the extent that they would be so substantial as to be significant. Comparisons were made of the visual conditions in the views from each Key Observation Point (KOP) seen in the simulations of the Licensed Project with the visual conditions that would be created by the Amended CECP. Additionally, an overall assessment was made of the visual changes that would be brought about by the Amended CECP in terms of the four questions the California Environmental Quality Act (CEQA) Guidelines have established to determine the significance of visual impacts.

The analysis evaluated the effects of the Licensed CECP and the Amended CECP on the views from the KOPs used in preparing the 2007 AFC Visual Resources Analysis and from two additional KOPs. Figure 5.13-1 is a map of the project area that depicts the layout of the Amended CECP on the project site and the locations of the KOPs used as the basis for the analysis (figures are provided at the end of this section). Figures 5.13-2 through 5.13-10 present the simulations of the baseline views (the views as they would appear with the Licensed CECP in place), and of the Amended CECP without and with the removal of the EPS. The visual impacts of the Amended CECP were identified based on assessment of the visual simulations, and these impacts were compared to those of the CECP that were identified by the visual resources analyses that the CEC adopted as a part of the 2012 Final Decision. This provided a basis for determining whether the Amended CECP would alter any of the conclusions that the CEC made about the Licensed CECP.

The simulations used in this analysis were developed based on photographs taken during field visits to the project area by CH2M HILL staff from late December 2013 through mid-March 2014. The photos of the existing conditions were modified to remove the construction cranes and a construction dirt pile associated with the construction of the Poseidon desalination project, which are temporary visual conditions. These photos were further modified to remove Tanks 1, 2, and 4, whose removal is part of a separate Petition that is expected to be approved before consideration of this PTA. Additionally, the completed Poseidon desalination facility, which is now under construction, was added to these photos because it would be in place at the time either the Licensed or Amended CECP is developed. The modified existing condition photos were used to prepare the simulations depicting the appearance of the views with the Licensed CECP and with the Amended CECP. The simulations of the Licensed CECP and the Amended CECP do not include the

landscaping that the Project Owner had proposed as a mitigation measure for the Licensed CECP, and which the Project Owner will refine in coordination with the City (see Appendix 2A).

The simulations were produced in accordance with CH2M HILL's standard protocols for simulation preparation. The photos used as the basis for preparing the simulations were taken with a single-lens reflex digital camera set to take photos with a focal length equivalent to that of photos taken with a 35 millimeter (mm) camera with a 50-mm lens (view angle 40 degrees). Computer modeling and rendering techniques were used to produce the simulated images of the views of the site as they would appear with the Licensed CECP and the Amended CECP. Existing topographic and site data provided the basis for developing an initial digital model. The project engineers provided site plans and digital data for the Licensed and Amended CECP generation facility and site plans, and typical elevations for the components of the electrical transmission interconnections to the two substations on the existing EPS site. These data were used to create three-dimensional (3-D) digital models of these facilities. These models were combined with the digital site model to produce a complete computer model of the generating facility and the overhead transmission system.

For each viewpoint, viewer location was identified based on electronic location coordinates, and the eye level was assumed to be 5 feet. Computer "wire frame" perspective plots were then overlaid on the photographs of the views from the KOPs to verify scale and viewpoint location. Digital visual simulation images were produced as a next step, based on computer renderings of the 3-D model combined with high-resolution digital versions of base photographs. The final "hardcopy" visual simulation images that appear in this PTA were produced from the digital image files using a color printer.

5.13.2.2 Assessment of Visual Effects from Key Observation Points

The visual effects of the Licensed and Amended CECP were evaluated using nine KOPs. Seven of the KOPs (KOPs 1, 2, 3, 4, 5, 6, and 7) were used in the AFC prepared for the project. Two new views were used for the Amended CECP. One of these views, KOP 3A, represents the view from Adams Street, located on the hillside on the northeast side of the Agua Hedionda Lagoon, opposite the project site. The other, KOP CP (Figure 5.13-10a) represents the view from Cannon Park, a small city park located at the southwest corner of the EPS site. These KOPs and the differences in visual effects between the conditions that would exist with the Licensed CECP and the Amended CECP are described below.

5.13.2.2.1 KOP 1 – View from Carlsbad Boulevard Looking South

KOP 1 is on Carlsbad Boulevard, on the western shore of the Agua Hedionda Lagoon, and approximately 0.4 mile northwest of the site of the Amended CECP. Figure 5.13-2a depicts the baseline view from KOP 1, that is, the view as it would appear with development of the Licensed CECP. In this view, the CECP as currently licensed would be visible across the lagoon on the left side of the image. One of the project's large air intake structures would be visible, as well as its stacks, HRSGs, and transmission system. In this simulation, Tanks 1 and 2, which are located in the elevated area on the opposite shore of the lagoon to the left of the center of the view, have been removed, to reflect the implementation of the project amendment requested in the previously submitted Petition to Remove. The completed Poseidon desalination facility has been added to this view, and is partially visible behind the trees in the elevated area on the opposite side of the lagoon in the center and to the right of the center of the view.

Figure 5.13-2b is a simulation of the KOP 1 view as it would appear with the modifications to the project site that would occur under the Amended CECP, except for the removal of the EPS. Figure 5.13-2c is a simulation of the KOP 1 view with all proposed modifications to the project site, including removal of the EPS. In this view, the Amended CECP Unit 6 air intake unit and the Unit 6 and 7 stacks would be visible across the lagoon at the far side of the view. To the right of the Unit 6 and 7 stacks, small portions of the tops of the Unit 8 and 9 stacks would be visible above the trees. The rest of the power generation equipment would be screened by the intervening tree cover. The Amended CECP transmission system would be barely visible.

Comparison of the simulation of the view with Amended CECP (Figure 5.13-2c) to the baseline view (Figure 5.13-2a) makes it evident that compared to the Licensed CECP, the Amended CECP would bring

about a net improvement in the visual character and quality of the view from KOP 1. Under the Amended CECP, the power generation structures would be smaller in scale and less visually prominent than the power generation units that would be built under the Licensed CECP. Removal of the EPS eliminates a very large-scale industrial-appearing facility that currently dominates the view. Because the visual changes under the Amendment would be positive, there would be no adverse visual impacts to this view from the Amended CECP.

5.13.2.2.2 KOP 2 – View from Pannonia Trail at Capri Park

KOP 2 is on the hillside that frames the northern side of the Agua Hedionda Lagoon. It is along the Pannonia Trail in Capri Park, approximately 0.75 mile northeast of the project site. This viewpoint offers a panoramic vista of the lagoon and surrounding landscape and represents a scenic vista identified in the City of Carlsbad LCP. This view is representative of views toward the project site from residential areas located on nearby areas of the hillside. Figure 5.13-3a depicts the baseline view from KOP 2. In this view, the Licensed CECP would be fully visible on the ridge on the opposite side of the lagoon. The two stacks would be visible against the sky, and the HRSGs and air intake structures would be visible against the backdrop created by the ocean.

Figure 5.13-3b is a simulation of the KOP 2 view as it would appear with the modifications to the project site that would occur under the Amended CECP, except for the removal of the EPS. Figure 5.13-3c is a simulation of the KOP 2 view with the proposed modifications to the project site, including removal of the EPS. In this view, the three sets of stacks would be visible, but these stacks would considerably lower in height and less massive than the stacks that would be a part of the Licensed CECP. The Amended CECP equipment is much lower in height and less bulky than that of the Licensed CECP. Most of the structures and equipment for Units 8, 9, 11, and 12 would be substantially screened by trees. The equipment that is a part of Units 6 and 7 would be less screened, but it would be seen against a backdrop of vegetation. The Amended CECP transmission system would be visible, but would not stand out or attract special attention because the transmission structures would be similar in height to the stacks that they are located near and would be visually absorbed to some degree by structures and vegetation seen behind them.

When the simulation of the view with Amended CECP (Figure 5.13-3c) is compared to the baseline view (Figure 5.13-3a), it becomes clear that there would be a net improvement in the visual character and quality of the view from KOP 2 with the Amended CECP versus the Licensed CECP. Under the Amended CECP, the power generation structures would be smaller in scale and less visually prominent than the power generation units that would be built under the Licensed CECP. Removal of the EPS eliminates a very large-scale, industrial-appearing facility that currently dominates the view. Because the visual changes under the Amendment would be positive, there would be no adverse visual impacts to this view.

5.13.2.2.3 KOP 3 – View from the end of Cove Drive

KOP 3 is a view from the public use area along the shoreline of the Agua Hedionda Lagoon that is accessed from the end of Cove Drive. The project site lies approximately 0.6 mile to the west across the lagoon. This view is representative of views seen by people recreating along the eastern edge of the lagoon and by occupants of nearby residences. This view also represents a City of Carlsbad LCP scenic vista.

Figure 5.13-4a depicts the baseline view from KOP 3 as it would appear with development of the Licensed CECP. The power plant would be readily visible on the elevated area on the opposite side of the lagoon. The two stacks, the HRSGs, and much of the air intake structures would be visible against the sky. Figure 5.13-4b is a simulation of the KOP 3 view as it would appear with the Amended CECP, except for the removal of the EPS.

Figure 5.13-4c is a simulation of the KOP 3 view with all proposed modifications to the project site, including removal of the EPS. In this view, the top portions of two of the three sets of stacks would be visible above the tree line, but the Unit 6 and 7 stacks would be heavily screened by intervening trees. The portions of the stacks that would be visible would be short and small in scale. Other project equipment (for example, the

generation units and air inlet filters) are completely screened. The Amended CECP transmission system would be visible, but because the transmission structures would be similar in height to the stacks they are located near and would be partially screened by vegetation, they would not stand out or attract special attention.

Comparison of the simulation of the view with Amended CECP (Figure 5.13-4c) to the baseline view (Figure 5.13-4a) makes it clear that there would be a substantial improvement in the visual character and quality of the view from KOP 3 with the Amended CECP versus the Licensed CECP. Under the Amended CECP, the power generation structures would be much smaller in scale and less visually prominent than the power generation units that would be built under the Licensed CECP. Removal of the EPS eliminates a very large-scale industrial-appearing facility that currently dominates the view. Because the visual changes would be highly positive under the Amended CECP, there would be no adverse visual impacts to this view.

5.13.2.2.4 KOP 3A – View from Adams Street

KOP 3A is a new viewpoint established along Adams Street on the hillside that frames the eastern side of the Agua Hedionda Lagoon. This viewpoint is located approximately 0.4 mile to the northeast across the lagoon from the project site. It is representative of views seen by motorists traveling along Adams Street and occupants of nearby hillside residences. Figure 5.13-5a depicts the baseline view from KOP 3A as it would appear with development of the Licensed CECP. The power plant would be highly visible on the elevated plateau on the opposite side of the lagoon. The two stacks, the HRSGs, and one of the air intake structures would be visible, although the unit on the left would be back-dropped by, and to some extent, visually absorbed by the EPS. Figure 5.13-5b is a simulation of the KOP 3A view as it would appear with Amended CECP, except for the removal of the EPS. Figure 5.13-5c is a simulation of the KOP 3A view with the proposed modifications to the project site, including removal of the EPS. In this view, the top portions of the three sets of stacks would be visible above the tree line, but the portions of the stacks that would be visible would be short and small in scale. Other project equipment (for example, the generation units and air inlet filters) would be screened to a large degree. The Amended CECP transmission system would be visible; however, because the transmission structures would be similar in height to the stacks and would be partially screened by vegetation, they would not stand out or attract special attention.

When the simulation of the view with the Amended CECP (Figure 5.13-5c) is compared to the baseline view (Figure 5.13-5a), it is apparent that there would be a major improvement in the visual character and quality of the view from KOP 3A with the Amended CECP versus the Licensed CECP. Under the Amended CECP, the power generation structures would be much smaller in scale and less visually prominent than the power generation units that would be built under the current project license. Removal of the EPS eliminates the very large-scale industrial-appearing facility that has long dominated this view. Because the visual effects of the Amended CECP would be positive, there would be no adverse visual impacts to this view.

5.13.2.2.5 KOP 4 – View from the end of Hoover Street

KOP 4 is in an open area on the eastern shoreline of the Agua Hedionda Lagoon at the end of Hoover Street, approximately 0.4 mile to the northeast of the project site. This view is representative of views seen by people who might be recreating on the northeastern shoreline of the lagoon and occupants of nearby residences. Figure 5.13-6a depicts the baseline view from KOP 4. The licensed power plant would be visible in front of the EPS on the elevated plateau on the opposite side of the lagoon. The tops of the two stacks would be fully exposed above the trees. One of the stacks would be seen against the backdrop of the Encina stack, and the other would be seen silhouetted against the sky. Some of the power plant equipment would be hidden behind the trees, and much of the rest would be visually absorbed by blending into the mass of the EPS. Figure 5.13-6b is a simulation of the KOP 4 view as it would appear with Amended CECP, except for the removal of the EPS. Figure 5.13-6c is a simulation of the KOP 4 view with the proposed modifications to the project site, including removal of the EPS. In this view, the top portions of the three sets of stacks would be visible above the tree line, but the portions of the stacks that would be visible would be short and small in scale. The rest of the project equipment would be completely hidden behind the trees. The Amended

CECP transmission system would be visible; however, because the transmission structures would be similar in height to the stacks and would be partially screened by vegetation, they would not stand out or attract special attention.

Comparison of the view with the Amended CECP (Figure 5.13-6c) to the baseline view (Figure 5.13-6a) makes it evident that there would be a substantial improvement in the visual character and quality of the view from KOP 4 with the Amended CECP versus the Licensed CECP. Under the Amended CECP, the power generation structures would barely apparent and would be much smaller in scale and considerably less visible than the power generation units that would be built under the Licensed CECP. Removal of the EPS is of the greatest consequence because it eliminates a very large-scale industrial-appearing facility that currently dominates this view. The visual changes with the Amended CECP would be positive, and there would be no adverse visual impacts to this view.

5.13.2.2.6 KOP 5 – View from the end of Harbor Drive

KOP 5 is in a small parklet at the end of Harbor Drive that provides an elevated panorama looking south across the Agua Hedionda Lagoon toward the project site, which is 0.25 mile away. This view is representative of the view from this small open space area and nearby multi-family residences. In the baseline view (Figure 5.13-7a), the licensed power plant would be mostly hidden by the tall trees along the northern end of the spit on which the facility would be located. The most visible elements of the Licensed CECP would be the tops of several of the transmission structures that would be visible at the right edge of the site. The EPS would be the most dominant element of this view. Figure 5.13-7b is a simulation of the KOP 5 view as it would appear with Amended CECP, except for the removal of the EPS. Figure 5.13-7c is a simulation of the KOP 5 view with all the proposed modifications to the project site, including removal of the EPS. The only visible element of the Amended CECP is the warehouse/administration building that would be partially screened by the trees that line the site.

When the view with Amended CECP (Figure 5.13-7c) is compared to the baseline view (Figure 5.13-7a), a dramatic difference can be seen. With the removal of the EPS under the Amended CECP, the very large-scale industrial-appearing facility that currently dominates this view would be eliminated, creating a view with higher levels of visual intactness and unity. The result would be to substantially improve the visual character and quality of the view from KOP 5 over the conditions that would exist with the Licensed CECP. Under the Amended CECP, the power generation structures would be barely apparent, much smaller in scale, and considerably less visible than the power generation units that would be built under the Licensed CECP. Because the visual changes to this view under the Amended CECP would be highly positive, there would be no adverse visual impacts to this view.

5.13.2.2.7 KOP 6 – View from southbound U.S. Interstate 5 at Agua Hedionda Lagoon

KOP 6 is in the southbound lanes of I-5, approximately 0.15-mile north of the project site and represents the views of southbound motorists on I-5 as they approach the site. In the baseline view (Figure 5.13-8a), the licensed power plant would be essentially hidden by the tall trees along the northern end of the spit on which the facility would be located. The power plant's equipment and stacks would be visible to only a small degree behind the visual screen created by the trees, and one of the transmission towers would be partially visible in a gap in the tree cover. The top of the EPS stack would be visible above the tree line. Figure 5.13-8b is a simulation of the KOP 6 view as it would appear with the Amended CECP, except for the removal of the EPS. Figure 5.13-8c is a simulation of the KOP 6 view with all the proposed modifications to the project site, including removal of the EPS. The only visible element of the Amended CECP is the warehouse/administration building that would be partially screened by the trees that line the site. The integration of this feature into the view would be aided by use of a dark green color on the exterior of the building that relates to the color of the screening vegetation. Implementation of the landscaping required under COC VIS-2 would further reduce the visibility of this structure.

Comparison of the view with the Amended CECP (Figure 5.13-8c) to the baseline view (Figure 5.13-8a) indicates that, although the Amended CECP warehouse/administration building would be partially visible behind the trees, the removal of the EPS would eliminate the stack that is now the most visually prominent developed feature in the view. The overall effect would be to leave the visual character and quality of this view about the same as it would be under the baseline condition. In its decision on the Licensed CECP, the CEC found the overall visual change to this view to be low and less than significant. With the Amended CECP, this assessment would not change.

5.13.2.2.8 KOP 7 – View from northbound U.S. Interstate 5 north of Cannon Road

KOP 7 is in the northbound lanes of I-5, just north of Cannon Road, and represents the views of northbound motorists on I-5 as they approach the site. In the baseline view (Figure 5.13-9a), the tops of the licensed power plant's two stacks would be visible above the trees in the area just beyond the existing transmission corridor that crosses the freeway. The Licensed CECP transmission system would be visible in the middle ground to the left of the stacks. The rest of the Licensed CECP equipment would be hidden by the intervening tree cover. Figure 5.13-9b is a simulation of the KOP 6 view as it would appear with the Amended CECP. Because the EPS lies outside this view, for this KOP it is unnecessary to have a third simulation that depicts the removal of the EPS facility. In this view, the tops of one of the Amended CECP's pairs of stacks would be visible above the trees in the area behind one of the transmission towers located to the left of the freeway. Farther in the distance, a very small portion of another pair of stacks also would be visible above the trees. Three of the Amended CECP transmission poles would be visible above the trees to the left of the freeway. Because these transmission structures would be partially screened by vegetation, would not be too dissimilar to the stacks in terms of height, and would be of a height that is in scale with some of the trees in the view, they would not stand out or attract a high degree of attention on the part of motorists traveling by at freeway speeds. Comparison of the view with the Amended CECP (Figure 5.13-9b) to the baseline view (Figure 5.13-9a) indicates that, overall, the Amended CECP would be less visible than the Licensed CECP and that the level of visual change would be noticeably less. In its decision on the Licensed CECP, the CEC found the overall visual change to this view to be moderate and less than significant. With the Amended CECP, this assessment would change in that the level of visual change would be low and would remain less than significant.

5.13.2.2.9 KOP CP – View from Cannon Park

KOP CP is a new viewpoint established in Cannon Park, a City of Carlsbad park located at the northeast corner of Carlsbad Boulevard and Cannon Road. This viewpoint is approximately 0.4 mile southwest of the area where the new power plant facilities would be developed under the Amended CECP. This viewpoint was selected to capture the views seen by those using the park and, more generally, to represent the views toward the project site seen by northbound travelers on Carlsbad Boulevard and residents of the nearby residential areas. Figure 5.13-10a depicts the baseline view from KOP CP. The only elements of the Licensed CECP that would be visible are the stacks and several of the transmission structures, which can be seen in the simulation in the area behind the play structure and to the left of the white tanks. Figure 5.13-10b is a simulation of the view from Cannon Park as it would appear with the Amended CECP, except for the removal of the EPS. Figure 5.13-10c is a simulation of the KOP CP view with all the proposed modifications to the project site, including removal of the EPS. In this view, virtually all of the proposed power generation facilities are completely hidden. All that can be seen are the tops of one of the three pairs of stacks, which are barely detectable in the area above the large spools of cable visible on the parking structure in the area behind and to the right of the play structure. Several of the Amended CECP transmission structures are also visible in the middle ground in the areas to the right and left of the play structure. Comparison of the simulation of the view with the Amended CECP (Figure 5.13-5c) to the baseline view (Figure 5.13-5a) makes it clear that the Amended CECP would bring about a major and positive transformation of the visual character and quality of the view from this KOP over the conditions that would exist with the Licensed CECP. Under the Amended CECP, the massive EPS and the large white tanks on the right side of the view would be removed. These changes would eliminate large industrial-appearing features that now dominate views from

the park and would open up views toward a distant ridge line. Because the visual effects of the Amended CECP on this view would be overwhelmingly positive, there would be no adverse visual impacts to this view.

5.13.2.3 Impact Significance

A discussion regarding whether the visual effects of the project would be significant pursuant to CEQA is provided in this section. The assessment of these impacts applies the criteria set forth in Appendix G of the CEQA Guidelines. The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including objects of historic or aesthetic significance" (14 CCR 15382). The four questions related to aesthetics that are posed for lead agencies and the answers to them are as follows:

A. Would the project have a substantial adverse effect on a scenic vista?

No. Because the overall effect of the changes brought about by the Amended CECP would be positive, the Amendment would not create adverse effects on a scenic vista.

B. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No. This criterion is not applicable because the Amended CECP site does not lie within either the right-of-way or viewshed of an adopted state scenic highway. I-5, which lies adjacent to the project site, has been identified as eligible for state scenic highway status, but has not been adopted as a part of the State Scenic Highway System. The Amended CECP will be visible for a limited area along I-5 alongside and near the site, where the views are represented by KOPs 6 and 7. As the assessments of the project's effects on these views document, the Amended CECP will not have significant adverse visual effects on views from nearby areas of I-5.

C. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

No. As the evaluations of the changes to the views from each of the individual KOPs document, the Amended CECP will not have adverse effects on any of the views. In fact, the overall effect of the visual changes with the Amended CECP will be to improve the views of the site.

D. Would the project create a new source of substantial light and glare that would adversely affect day or nighttime views in the area?

No. The proposed modifications to the project would not increase the amount of night lighting visible within and emanating from the site. In most views, less of the project's lighting would be visible from offsite locations because the Amended CECP equipment would appear lower than that of the Licensed CECP and would be more hidden behind the intervening topography and vegetation. Additionally, all the lighting required by the new facilities will conform to the Project Owner-proposed lighting impact mitigation measures specified in the Licensed CECP AFC and in COC VIS-4, which will ensure that project lighting will be the minimal required for operations and safety, will be kept off when not in use, and will make use of fixtures that are hooded and directed downward and toward the area where the light is needed to minimize offsite light trespass and impacts on the night sky. With removal of the massive Encina Generating Station and all the lighting associated with it that dates from an era when less attention was given to light attenuation than is now the case, there will be a substantial decrease in the amount of light visible on and emanating from the Cabrillo Parcel.

5.13.2.4 Demolition of Encina Power Station

As documented in the analysis of the Amended CECP's visual impacts on each of the KOPs presented in Section 5.13.2.2, removal of the EPS will have substantial positive effects on views from all of the KOPs. Removal of the EPS facility, with its tall stack, will eliminate a large, bulky, industrial-appearing feature from the views, substantially improving their levels of visual intactness and unity and opening up vistas toward the ocean, distant mountains, and other features that are now blocked.

5.13.2.5 Cumulative Impacts

The Final Decision concluded that for many of the other projects planned for the project area, including the Carlsbad (Poseidon) Seawater Desalination Project, potential future non-industrial uses of the decommissioned EPS site, development on other nearby sites, and the LOSSAN (San Diego-Los Angeles-San Luis Obispo) rail corridor improvement project, the visual impacts of the Licensed CECP would not combine with the visual impacts of these other projects to create significant cumulative impacts and/or create significant visual impacts to views experienced by users present on these sites in the future. The Final Decision also concluded that in the case of the visual changes potentially created by the North Coast Interstate 5 HOV/Managed Lanes Project and the City of Carlsbad Sewer Interceptor and Lift Projects, there could be some potential for cumulative impacts related to removal of existing vegetation that provides screening for the project site. The Final Decision concluded that with implementation of COC VIS-2, these potential impacts could be mitigated to a level that would be less than significant. In preparing the simulations of the with-Amended-CECP views from KOPs 5 and 6, the views in which the sewer interceptor and lift projects would have the theoretical potential to be visible, these facilities were included in the 3-D model. It turned out that in both views, because of the location of these facilities at a low elevation on the slope and because of vegetative screening that would remain around the perimeter of the site, neither of these facilities or any tree clearing associated with them would be readily visible in the with-Amended-CECP views. Based on this evidence, it can be concluded that the Amended CECP would not combine with the sewer interceptor and lift projects to create cumulative visual impacts. Under the Amended CECP, views toward the site would be generally improved because the power generation facility would have a lower profile and, therefore, less of a potential visual impact than the Licensed CECP and because the Amended CECP would entail removal of the EPS. As a consequence, the potential for the Amended CECP to create cumulative impacts would be lower than that of the Licensed CECP. With retention of COC VIS-2, any potential cumulative impacts related to development of the North Coast Interstate 5 HOV/Managed Lanes Project and the City of Carlsbad Sewer Interceptor and Lift Projects would be kept at a level that would be less than significant.

5.13.3 Laws, Ordinances, Regulations, and Standards

The Final Decision found that with implementation of the COCs, the CECP would meet all applicable LORs related to visual resources. The changes proposed in this PTA will not alter the assumptions or conclusions made in the Final Decision regarding LORs, and no additional or revised LORS applicable to the project's visual issues have been identified.

5.13.4 Conditions of Certification

In the Final Decision, the CEC imposed five COCs on the project that remain applicable to the amended project. However, two of these COCs require slight adjustment to facilitate the proposed changes to the facility. These proposed revisions are provided below using strikethrough (~~text~~) to show text proposed for deletion and underlining (<u>text</u>) to show text proposed to be added.

- **VIS-1:** Surface Treatment of Project Structures and Buildings – ***Minor changes to the text to reflect the differences in the equipment that will be installed at the site.***
- **VIS-2:** Additional Perimeter Landscape Screening – ***No change.***
- **VIS-3:** Landscape Screening of Construction Staging Sites D and E – ***No change.***
- **VIS-4:** Temporary and Permanent Exterior Lighting - ***Minor change related to the fact that that Federal Aviation Administration lighting will no longer be required.***
- **VIS-5:** Cumulative Impact Buffer Zone, Coordination with Caltrans, and Mitigation Plan – ***No change.***

VIS-1 Surface Treatment of Project Structures and Buildings: The project owner shall treat the surfaces of all project structures and buildings visible to the public such that: a) their colors minimize visual intrusion

and contrast by blending with the landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive.

Surface color treatment shall include painting of ~~HRSGs,~~ turbine inlet filters, cooling towers, generators, and other features ~~below 88 feet~~ that are low in height in a dark color and value to match the surrounding tree canopy; and painting of exhaust and VBV stacks of a light color and value to blend with the sky.

The project owner shall submit for CPM review and approval, a specific surface treatment plan that will satisfy these requirements. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. One set of 11" x 17" color photo simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture, from Key Observation Points 2 and 5 (locations shown on Visual Resources Figure 1 of the Staff Assessment);

E. A specific schedule for completion of the treatment; and

F. A procedure to ensure proper treatment maintenance for the life of the project.

G. The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to the ~~[specify local jurisdiction]~~ City of Carlsbad for review and comment.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and they are ready for inspection and shall submit one set of electronic color photographs from the same key observation points identified in (d) above.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify: a) the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

VIS-2 Additional Perimeter Landscape Screening: The project owner shall provide landscaping that reduces the visibility of the power plant structures in accordance with local policies and ordinances and with findings and recommendations of Applicant Data Responses DR70-1, DR106 and DR107. Trees and other vegetation consisting of informal groupings of tall, fast-growing evergreen shrubs and trees shall be strategically placed along the eastern, western, and northern facility boundaries as called for in the above-referenced data responses, consistent with transmission line safety requirements. The objective shall be to create landscape

screening of sufficient density and height to screen the power plant structures to the greatest feasible extent in the shortest feasible time; and to provide timely replacement for aging or diseased tree specimens on site in order to avoid future loss of existing visual screening. The design approach shall include both fast-growing tall shrubs to provide quick screening, and tall evergreen trees similar to those existing on site, to provide an ultimate overall canopy height comparable to that existing atop the CECP site earth berms.

In addition, the project owner shall, in coordination with the City of Carlsbad, prepare and submit supplemental, modified landscape plans to provide for replacement tree planting as needed, to the greatest feasible extent, in the future event of loss of existing tree screening due to City of Carlsbad sewer and/or lift station projects. Such supplemental landscape plans shall also provide the plan components described in items a through d, below, and be subject to the same verification procedures.

The project owner shall submit to the CPM for review and approval and simultaneously to the City of Carlsbad for review and comment a landscaping plan whose proper implementation will satisfy these requirements. The plan shall include:

A. A detailed landscape, grading, and irrigation plan, at a reasonable scale. The plan shall demonstrate how the requirements stated above shall be met. The plan shall provide a detailed installation schedule demonstrating installation of as much of the landscaping as early in the construction process as is feasible in coordination with project construction;

B. A list (prepared by a qualified professional arborist familiar with local growing conditions) of proposed species, specifying installation sizes, growth rates, expected time to maturity, expected size at five years and at maturity, spacing, number, availability, and a discussion of the suitability of the plants for the site conditions and mitigation objectives, with the objective of providing the widest possible range of species from which to choose;

C. Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project;

D. A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project; and

E. One set of 11”x17” color photo-simulations of the proposed landscaping at five years and 20 years after planting, as viewed from adjoining segments of I-5.

The plan shall not be implemented until the project owner receives final approval from the CPM.

Verification: The landscaping plan shall be submitted to the CPM for review and approval and simultaneously to the City of Carlsbad for review and comment at least 90 days prior to installation.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM and simultaneously to the City of Carlsbad a revised plan for review and approval by the CPM.

The planting must occur during the first optimal planting season following site mobilization. The project owner shall simultaneously notify the CPM and the City of Carlsbad within seven days after completing installation of the landscaping, that the landscaping is ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead or dying vegetation, for the previous year of operation in each Annual Compliance Report. The City of Carlsbad, with the concurrence of the CPM, shall have authority to require replacement planting of dead or dying vegetation through the life of the project

VIS-3 Landscape Screening of Construction Staging Sites D and E: The project owner shall provide landscaping that reduces the visibility of construction staging activities, equipment and materials at proposed Staging Sites ‘D’ and ‘E’ of the EPS site (near EPS fuel tanks 1 and 2) as seen from Carlsbad Boulevard and other public viewpoints, and that complies with local policies and ordinances. Trees and other vegetation consisting of informal groupings of fast-growing evergreens shall be strategically placed along the northern and western boundaries of the staging sites as appropriate, of sufficient density and

height provide the greatest feasible screening within the shortest feasible time. Planting of the landscape screening shall be implemented as soon after start of project construction as feasible, in order to maximize growing time and screening of staging activities during the construction period.

If necessary to provide visual screening of staging activities, equipment and materials in the short term, the project owner shall provide temporary dark-colored, opaque fencing to provide visual screening until landscape screening described above has achieved sufficient maturity to provide visual screening.

The project owner shall submit to the CPM for review and approval, and simultaneously to the City of Carlsbad for review and comment a landscaping plan whose proper implementation will satisfy these requirements. The plan shall include:

A. A detailed landscape, grading, and irrigation plan, at a reasonable scale. The plan shall demonstrate how the requirements stated above shall be met. The plan shall provide a detailed installation schedule demonstrating installation of as much of the landscaping as early in the construction process as is feasible in coordination with project construction.

B. A list (prepared by a qualified professional arborist familiar with local growing conditions) of proposed species, specifying installation sizes, growth rates, expected time to maturity, expected size at five years and at maturity, spacing, number, availability, and a discussion of the suitability of the plants for the site conditions and mitigation objectives, with the objective of providing the widest possible range of species from which to choose;

C. Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project;

D. A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project; and

E. One set of 11”x17” color photo-simulations of the proposed landscaping at five years and 20 years after planting, as viewed from Key Observation Point 1 (location shown on Visual Resources Figure 3 of the Staff Assessment).

The plan shall not be implemented until the project owner receives final approval from the CPM.

Verification: The landscaping plan shall be submitted to the CPM for review and approval and simultaneously to the City of Carlsbad for review and comment at least 90 days prior to installation.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM and simultaneously to the City of Carlsbad a revised plan for review and approval by the CPM.

The planting must occur during the first optimal planting season following site mobilization. The project owner shall simultaneously notify the CPM and the City of Carlsbad within seven days after completing installation of the landscaping, that the landscaping is ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead or dying vegetation, for the previous year of operation in each Annual Compliance Report.

VIS-4 Temporary and Permanent Exterior Lighting: To the extent feasible, consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting such that: a) lamps and reflectors are not visible from beyond the project site, including any off-site security buffer areas; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky; d) illumination of the project and its immediate vicinity is minimized; and e) the plan complies with local policies and ordinances.

The project owner shall submit to the CPM for review and approval and simultaneously to the City of Carlsbad for review and comment a lighting mitigation plan that includes the following:

A. Location and direction of light fixtures shall take the lighting mitigation requirements into account;

B. Lighting design shall consider setbacks of project features from the site boundary to aid in satisfying the lighting mitigation requirements;

C. Lighting shall incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated;

D. Light fixtures that are visible from beyond the project boundary shall have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security;

E. All lighting shall be of minimum necessary brightness consistent with operational safety and security;

F. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied; and

G. In order to conform with Condition of Certification BIO-7, if FAA-required exhaust stack lighting is required it shall be white strobe-type lighting.

Verification: At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to discuss the documentation required in the lighting mitigation plan.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and simultaneously to the City of Carlsbad for review and comment a lighting mitigation plan.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM.

The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If, after inspection, the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days.

VIS-5 Cumulative Impact Buffer Zone, Coordination with Caltrans, and Mitigation Plan: In order to address potential cumulative visual impacts resulting from I-5 widening, the Applicant shall maintain a permanent buffer zone, including the existing vegetative visual screening, on the eastern portion of the CECP site, between the existing NRG fence line and storage tank perimeter road. This measure shall be coordinated with Conditions of Certification LAND-1 and HAZ-8. The existing landscape screening within the buffer zone shall be maintained and enhanced per Condition of Certification VIS-2 after start of project construction. The buffer zone shall be kept available to maintain existing visual screening, accommodate future possible I-5 widening to the extent necessary, and to accommodate both future hazard protection features and visual screening.

In addition, the Applicant shall work with Caltrans to develop a Mitigation Plan for accommodating the widening project while maintaining visual screening of the CECP to acceptable levels. This plan could include complete or partial avoidance of the CECP site, complete or partial berm retention or replacement, complete or partial retention of existing landscape screening, and replacement screening as needed. The objective of the plan shall be to accommodate the I-5 widening within the designated buffer zone to the

extent that encroachment is unavoidable, while providing needed hazard protection and acceptable levels of visual screening of the power plant.

If construction of a new landscaped berm west of the existing berm and proposed future Caltrans right-of-way is determined to be the most feasible measure to address potential cumulative impacts of the I-5 Widening Project, then design and construction of the new berm shall be implemented at the earliest feasible time, in order to maximize growing time for trees planted on the new berm. Landscaping of a replacement berm shall include installation of large-container (24-inch box or larger, as needed), fast-growing evergreen trees in sufficient density to provide comparable or better visual screening of the CECP site than currently exists, within the shortest feasible period. Trees shall be selected and located so as to achieve substantial screening within a period of five years from start of project operation. The plan shall, at a minimum, include the following components:

A. A record of discussions, meetings and planning activities conducted with Caltrans;

B. The conclusions of these coordination activities;

C. A detailed Mitigation Plan providing plans, elevations, cross-sections or other details, including a detailed list of plants and container size, sufficient to fully convey how the objectives of effective visual screening of the CECP are to be achieved; and

D. A proposed construction schedule.

Verification: At the earliest feasible time, Applicant shall coordinate with Caltrans to discuss specific hazard and visual mitigation strategies. Following publication of the I-5 Widening DEIS, Applicant shall work with Caltrans to devise a specific Cumulative Impact Mitigation Plan for accommodating hazard protection and visual screening.

Following coordination and plan development with Caltrans, the project owner shall submit a draft of the Cumulative Impact Mitigation Plan to the City of Carlsbad for review and comment and to the CPM for review and approval. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall not implement the plan until receiving approval from the CPM. After receiving approval, the project owner shall commence implementation of the Mitigation Plan at the earliest feasible opportunity, and shall commence implementation not later than 180 days after plan approval. The project owner shall notify the CPM within seven days after implementing the approved plan that the plan is ready for inspection. Planting must be completed and approved by the CPM prior to start of project operation.

5.13.5 References

California Department of Transportation. 2009. California Scenic Highway Program. http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm

LEGEND

- Encina Power Station Site
- Amended CECP Project Site
- Poseidon Desalinization Site
- Footprint of the Amended Project's Major Features
- KOP

0 500 1,000 Feet

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Figure 5.13-1
Project Site in its Landscape Context and Locations of Key Observation Points
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend

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Baseline view toward project site from Carlsbad Boulevard with the licensed CECP and the Poseidon Desalinization Project in place.

Figure 5.13-2A
KOP 1 – View from Carlsbad Boulevard Looking South – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from Carlsbad Boulevard toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-2B
KOP 1 – View from Carlsbad Boulevard Looking South – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from Carlsbad Boulevard toward the toward project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-2C
KOP 1 – View from Carlsbad Boulevard Looking South – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from the Pannonia Trail toward the project site with the licensed CECP in place.

Figure 5.13-3A
KOP 2 – View from Pannonia Trail at Capri Park – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the Pannonia Trail toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-3B
KOP 2 – View from Pannonia Trail at Capri Park – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the Pannonia Trail toward the project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-3C
KOP 2 – View from Pannonia Trail at Capri Park – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from the end of Cove Drive toward the project site with the licensed CECP in place.

Figure 5.13-4A
KOP 3 – View from the End of Cove Drive – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the end of Cove Drive toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-4B
KOP 3 – View from the End of Cove Drive – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the end of Cove Drive toward the project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-4C
KOP 3 – View from the End of Cove Drive – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from Adams Street toward the project site with the licensed CECP in place.

Figure 5.13-5A
KOP 3A – View from Adams Street – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from Adams Street toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-5B
KOP 3A – View from Adams Street – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from Adams Street toward the project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-5C
KOP 3A – View from Adams Street – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from the end of Hoover Street toward the project site with the licensed CECP in place.

Figure 5.13-6A
KOP 4 – View from the End of Hoover Street – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the end of Hoover Street toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-6B
KOP 4 – View from the End of Hoover Street – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the end of Hoover Street toward the project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-6C
KOP 5 – View from the End of Hoover Street – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from the end of Harbor Drive toward the project site with the licensed CECP in place.

Figure 5.13-7A
KOP 5 – View from the End of Harbor Drive – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the end of Harbor Drive toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-7B
KOP 5 – View from the End of Harbor Drive – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from the end of Harbor Drive toward the project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-7C
KOP 5 – View from the End of Harbor Drive – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from Southbound I-5 toward the project site with the licensed CECP in place.

Figure 5.13-8A
KOP 6 – View from Southbound I-5 at Agua Hedionda Lagoon – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from Southbound I-5 toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-8B
KOP 6 – View from Southbound I-5 at Agua Hedionda Lagoon – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

View from Southbound I-5 toward the project site with the Amended Project in place, including removal of the Encina Power Station.

Figure 5.13-8C
KOP 7 – View from Southbound I-5 at Agua Hedionda Lagoon – Amended Project with Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

Baseline view from Northbound I-5 toward the project site with the licensed CECP in place.

Figure 5.13-9A
KOP 7 – View from Northbound I-5 North of Cannon Road – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 20

View from Northbound I-5 toward the project site with the Amended Project in place. Because the Encina Power Station is not visible in this view, this view will not be affected by the power station's removal.

Figure 5.13-9B
KOP 7 – View from Northbound I-5 North of Cannon Road – Amended Project
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 20

Baseline view from Cannon Park toward the project site with the licensed CECP in place.

Figure 5.13-10A
KOP CP – View from Cannon Park – Baseline Conditions
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 20

View from Cannon Park toward the project site with the Amended Project power generation and transmission facilities in place, before removal of the Encina Power Station.

Figure 5.13-10B
KOP CP – View from Cannon Park – Amended Project before Removal of the Encina Power Station
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06)
Petition to Amend – Amendment No. 2

5.14 Waste Management

This section provides the Project Owner's evaluation of how the Amended CECP could affect waste management and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to waste management. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to waste management that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less-than-significant impacts.

5.14.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PT proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230 kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operation, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings will be demolished. Upon completion of demolition of EPS portions of the western areas of the Cabrillo Parcel will be removed

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection and water or gas supply.

5.14.2 Affected Environment

Nonhazardous and hazardous wastes will be generated during construction and operation of the Amended CECP including demolition of the EPS.

5.14.2.1 Project Waste Generation

As with the Licensed CECP, waste will be generated at the Amended CECP during its construction and operation, and during demolition of the EPS. Types of waste produced during this project will include wastewater, solid nonhazardous waste, and liquid and solid hazardous waste. The Amended CECP, like the Licensed CECP, will also generate solid nonhazardous waste during construction of the electric transmission line, natural gas supply line, and water supply interconnects to the existing site service feeders.

5.14.2.1.1 Construction of Amended CECP Phase

During construction, the primary waste generated at the Amended CECP will be solid nonhazardous waste. The estimates for the amount of waste to be produced, compared with the amounts listed in the AFC, are presented in Table 5.14-1.

TABLE 5.14-1
Wastes Generated during Construction Phase at the Amended CECP Facility

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Scrap wood, glass, plastic, paper, calcium silicate insulation, and mineral wool insulation	Construction	Normal refuse	56 tons during construction ~~8,000 tons during construction~~	Nonhazardous	Recycle and/or dispose of in a Class II or III landfill
Scrap Metals	Construction	Parts, containers	11 tons during construction ~~1,000 tons during construction~~	Nonhazardous	Recycle and/or dispose of in a Class III landfill
Concrete	Construction	Concrete	39 tons during construction ~~60 tons during construction~~	Nonhazardous	Recycle and/or dispose of in a Class III landfill
Empty liquid material containers	Construction	Drums, containers, totes	100 containers*	Nonhazardous solids	Containers <5 gallons will be disposed as normal refuse. Containers >5 gallons will be returned to vendors for recycling or reconditioning.
Spent welding materials, i.e. welding rods	Construction	Solid	100 lbs/mo	Nonhazardous	Recycle with vendors or Dispose at a Class I landfill if hazardous
Waste oil filters	Construction equipment and vehicles	Solids	100 lbs/mo	Nonhazardous	Recycle at a permitted TSDF

TABLE 5.14-1
Wastes Generated during Construction Phase at the Amended CECP Facility

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Used and waste lube oil	CT and ST lube oil flushes	Hydrocarbons	50 drums (life of project construction) ~~200 drums (life of project construction)~~	Hazardous	Recycle at a permitted TSDF
Oily rags, oil sorbent excluding lube oil flushes	Cleanup of small spills	Hydrocarbons	100 lb/mo	Hazardous	Recycle or dispose at a permitted TSDF
Solvents, paint, adhesives	Maintenance	Varies	180 lbs/mo	Hazardous	Recycle at a permitted TSDF
Spent lead acid batteries	Construction equipment, trucks.	Heavy metals	4 batteries per year ~~5 batteries per year~~	Hazardous	Store no more than 10 batteries (up to 1-year) – recycle offsite.
Spent alkaline batteries	Equipment	Metals	35 batteries per month ~~10 batteries per month~~	Universal Waste solids	Recycle or dispose offsite at an Universal Waste Destination Facility
Steam turbine cleaning waste	Pre-boiler piping	Corrosive cleaning chemicals	200 gallons before plant startup	Hazardous or nonhazardous liquid	Dispose at a permitted TSDF
Waste oil	Equipment, vehicles	Hydrocarbons	20 gal/mo	Non-RCRA Hazardous Liquid	Dispose at a permitted TSDF
Sanitary waste	Portable toilet holding tanks	Sewage	2,500 gal/day ~~500 gal/day~~	Nonhazardous Liquid	Remove by contracted sanitary service
Storm water	Rainfall	Water	2 acre-feet (from 10-yr storm event)	Nonhazardous Liquid	Discharge to storm water drain
Fluorescent, mercury vapor lamps	Lighting	Metals and PCBs	100 lbs/yr	Universal Waste solids	Recycle or dispose offsite at an Universal Waste Destination Facility
Passivating and chemical cleaning fluid waste	Pipe cleaning and flushing	Varies	600,000 gal (life of project construction)	Hazardous or nonhazardous liquid	Sample and characterize – if clean, dispose of in sanitary sewer; otherwise, manage appropriately offsite
Hydrotest water	Testing equipment and piping integrity	Water	300,000 gallons (life of project construction)	Hazardous or nonhazardous liquid	Sample and characterize – if clean, dispose of in storm drain; otherwise, manage appropriately offsite

Notes: Changes from the Licensed CECP are shown in underlined/strikeout text.
Containers include <5-gallon containers and 55-gallon drums or totes

5.14.2.1.2 Operation Phase

Due to the change in generation equipment, anticipated waste types and amounts have been revised slightly and are provided in Table 5.14-2. Table 5.14-2 replaces the list of wastes previously analyzed for the Licensed CECP.

TABLE 5.14-2
Hazardous Wastes Generated at the Amended CECP Facility during Operation

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Lubricating oil/oil sorbents	Small leaks and spills from the gas turbine lubricating oil system	Hydrocarbons	575lb/yr ~~700lb/yr~~	Hazardous	Cleaned up using sorbent and rags – disposed of by certified oil recycler
Lubricating oil filters	Gas turbine lubricating oil system	Paper, metal, and hydrocarbons	800 lb/yr ~~1,000 lb/yr~~	Hazardous	Recycled by certified oil recycler
Lubricating oil	Maintenance of turbine, equipment	Hydrocarbons	400 lb/yr ~~500 lb/yr~~	Hazardous	Recycled by certified oil recycler
Solvents, paint, adhesives	Maintenance	Varies	200 lbs/mo	Hazardous	Recycle at a permitted TSDF
Laboratory analysis waste	Water treatment	Waste reagents/ laboratory chemicals	50 gals/yr	Hazardous	Recycled by certified recycler
SCR catalyst units	SCR system (Warranty is 3 years-use tends to be 3 to 5 years)	Metal and heavy metals, including vanadium	60 to 70 tons every 3 to 5 yrs	Hazardous	Recycled by SCR manufacturer or disposed of in Class I landfill
~~CO catalyst units~~	~~HRSG (Use tends to be 3 to 5 years)~~	~~Metal and heavy metals, including vanadium~~	~~6 to 7 tons every 3 to 5 yrs~~	~~Hazardous~~	~~Recycled by Manufacturer~~
Spent lead acid batteries	Electrical room, equipment	Metals	5 batteries/year	Hazardous	Store no more than 10 batteries (up to 1-year) – recycle offsite.
Spent alkaline batteries	Equipment	Metals	50 lbs/year	Universal waste solids	Recycle or dispose offsite at an Universal Waste Destination Facility
Fluorescent tubes	Lighting of maintenance areas	Metals	50 lbs/year	Universal waste solids	Recycle or dispose offsite at an Universal Waste Destination Facility
Oily rags	Maintenance, wipe down of equipment, etc.	Hydrocarbons, cloth	200 lb/yr (~500 rags/yr) ~~300 lb/yr (~88 rags/yr)~~	Hazardous	Recycled by certified oil recycler
Chemical feed area drainage	Spillage, tank overflow, area washdown water	Water with water treatment chemicals	Minimal	May be hazardous if corrosive	Discharged to sewer if nonhazardous; shipped offsite for disposal if hazardous
Filtered Cake (dry)	Operational waste from water purification system	Heavy metals and sludge	150-300 pounds/ day	Hazardous/ Nonhazardous	Class II or III Landfill

TABLE 5.14-2
Hazardous Wastes Generated at the Amended CECP Facility during Operation

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Filtered Cake (wet)	Operational waste from water purification system	Heavy metals and liquefied sludge	300-600 pounds/ day	Hazardous/ Nonhazardous	Class II or III Landfill
CTG periodic operational chemical cleaning	Chemical cleaning		100 gal per cleaning (Two cleanings every 5 years)	Hazardous	Class I landfill

Note: Changes from the Licensed CECP are shown in underlined/strikeout text.

5.14.2.1.3 Demolition of Encina Power Station

Due to the EPS demolition, the Amended CECP will generate more waste than the Licensed CECP. Table 5.14-3 identifies the anticipated additional wastes to be generated by EPS demolition activities.

Key environmental resources and concerns related to demolition of the EPS include asbestos and lead, commonly referred to as Hazardous Building Materials (HBM). The Project Owner will adhere to appropriate regulatory provisions and agency requirements for demolition activities.

Asbestos is one of the most prevalent HBM present in the EPS powerhouse complex structures. The current U.S. Environmental Protection Agency regulation for the removal of asbestos in buildings, the National Emission Standard for Hazardous Air Pollutants (NESHAP, 40 CFR 61, Subpart M) requires asbestos-containing materials (ACM) to be properly removed prior to performing renovation and demolition activities that would disturb them. The San Diego Air Pollution Control District (APCD) regulates asbestos abatement/removal activities through the issuance of permits and oversight of abatement activities.

Asbestos removal will be monitored in accordance with APCD's rules and in accordance with the specific APCD permit that the Project Owner will obtain for the EPS demolition to ensure that no asbestos is released into ambient air. During enclosed asbestos removals, only licensed independent or third-party consultants will monitoring the abatement activities and validate air quality prior to removal of the containment or enclosure barriers. If concealed ACM is later discovered during demolition activities as access is gained to previously inaccessible areas, it will be necessary to investigate and collect bulk samples of each potential ACM to confirm the presence or absence of asbestos. Inaccessible locations include: inside wall cavities or other finishing/structural/architectural materials; above fixed ceiling systems; inside mechanical systems, boilers, ducts, equipment, or manufacturing/production equipment and areas that were previously unsafe to access.

A comprehensive inventory of hazardous materials will be completed prior to demolition to confirm the full scope of environmental remediation necessary. Potential hazardous materials and environmental conditions that will be addressed include:

- Lead-based paint (LBP) in structural and equipment coating systems, as well as the materials and residuals in the paint house located between the U1-5 power houses and the switch yard
- Mercury-containing equipment such as switches, manometers, other
- Polychlorinated biphenyls (PCB) in ballasts, equipment, and elastomeric materials
- Radioactive sources
- Chlorofluorocarbon (CFC) containing equipment; refrigeration equipment, canisters, other
- Duct, tank, trench, pit, and pipe residues; dusts, liquids, other

- Contaminated soils; associated with spills, underground petroleum tanks, other
- Miscellaneous containers of unidentified chemicals and hazardous substances
- Characterize concrete and masonry for salvage and offsite reuse /recycle in lieu of disposal

A limited HBM survey was performed by Shaw Environmental & Infrastructure, Inc., in September 2006. The survey identified the primary HBMs for remediation. Additional areas of potential environmental concern will be considered for further investigation depending on the final scope of site disposition.

HBMs will be identified, characterized, removed, and disposed at offsite regulated facilities in accordance with local, state, and federal regulations. All nonhazardous building materials will also be characterized prior to on- or offsite storage.

TABLE 5.14-3
Wastes Generated during EPS Demolition

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Scrap wood, glass, plastic, paper, calcium silicate insulation, and mineral wool insulation	Demolition of Piping, Structure, tanks and equipment	General Construction waste	3,000 tons	Nonhazardous	Recycle and/or dispose of in a Class II or III landfill
Scrap Metals	Demolition of Piping, Structure	Metal	36,000 tons [a]	Nonhazardous	Recycle and/or dispose of in a Class III landfill
Concrete	Demolition	Concrete	45,000 tons	Nonhazardous	Recycle and/or dispose of in a Class III landfill
Asphalt	Demolition of roads and berms	Hydrocarbons	None	Nonhazardous	Recycle and/or dispose of in a Class III landfill
Spent welding and cutting materials	Construction	Solid	100 lbs/mo	Nonhazardous	Recycle with vendors or Dispose at a Class I landfill if hazardous
Waste oil filters	Construction equipment and vehicles	Solids	200 lbs/mo	Nonhazardous	Recycle at a permitted TSDF
Used and waste lube oil	Turbine lube oil draining	Hydrocarbons	400 drums	Hazardous	Recycle at a permitted TSDF
Oily rags, oil sorbent excluding lube oil flushes	Cleanup of small spills	Hydrocarbons	100 lb/mo	Hazardous	Recycle or dispose at a permitted TSDF
Residual fuel oil from decommissioned storage tanks and piping	Demolition	Hydrocarbons	3,000 gallons	Hazardous	Recycle at a permitted TSDF
Spent lead acid batteries	Construction equipment, trucks.	Heavy metals	5 batteries per year	Hazardous	Store no more than 10 batteries (up to 1-year) – recycle offsite.

TABLE 5.14-3
Wastes Generated during EPS Demolition

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Spent alkaline batteries	Equipment, flashlights	Metals	10 batteries per month	Universal Waste solids	Recycle or dispose offsite at an Universal Waste Destination Facility
Asbestos waste	Demolition of unabated areas in old plant	Asbestos	3,800 tons [b]	Hazardous	Disposal in licensed and permitted landfill
Waste oil	Equipment, vehicles	Hydrocarbons	250 gal/mo	Non-RCRA Hazardous Liquid	Dispose at a permitted TSDF
Sanitary waste	Portable toilet holding tanks	Sewage	160 gal/day	Nonhazardous Liquid	Remove by contracted sanitary service
Storm water	Rainfall	Water	17.9 acre-feet (from 10-yr storm event)	Nonhazardous Liquid	Discharge to storm water drain
Fluorescent, mercury vapor lamps	Lighting	Metals and PCBs	29,000 lbs	Universal Waste solids	Recycle or dispose offsite at an Universal Waste Destination Facility

[a] 85% is ferrous material and 15% is copper-based or alloy materials

[b] Includes water as part of the asbestos containing material weight

[c] Calculated from *Orange County Hydrology Manual* for 10-year storm event

RCRA = Resource Conservation and Recovery Act
TSDF = treatment, storage, and disposal facility

5.14.2.2 Waste Disposal Sites

5.14.2.2.1 Nonhazardous Waste Disposal Facilities

Approximately 84,000 tons of nonhazardous solid waste will be generated during construction and operation of the Amended CECP and demolition of the EPS. This includes approximately 203 tons of nonhazardous solid waste to be generated during construction of the CECP; approximately less than 1 ton of nonhazardous solid waste to be generated during CECP operation; and approximately 84,018 tons of nonhazardous solid waste to be generated during demolition of the EPS. Other solid wastes will be recycled to the extent possible, and what cannot be recycled will be disposed of at a permitted landfill as discussed below.

It is anticipated that excavated soil will be used onsite for grading and leveling purposes. In the event that some of the excavated soil will not be reused onsite, classification of the soil for disposal would be made on the basis of sampling completed once the soil is excavated and stockpiled. Soil that is determined to be nonhazardous on the basis of the sampling conducted could be suitable for reuse at a construction site or disposal at a regional disposal facility, depending on the chemical quality.

The City of Carlsbad has contracts with both Waste Management and Clean Harbors to collect trash and recycle “typical” municipal waste. The primary disposal facility used by Waste Management is the Otay Landfill, located in Chula Vista, California. Table 5.14-4 shows the waste disposal facilities in the area. At this time it is unknown where demolition waste will be sent for disposal, however as shown in Table 5.14-4,

adequate landfill capacity exists, and disposal of solid nonhazardous waste will not be a constraint on the Amended CECP.

TABLE 5.14-4
Solid Waste Disposal Facilities in the Vicinity of the CECP

Landfill/MRF/ Transfer Station	Location	Class	Permitted Capacity (cubic yards)*	Remaining Capacity (cubic yards)*	Permitted Throughput (tons per day)*	Estimated Closure Date*	Enforcement Action Taken*
Sycamore Sanitary Landfill	San Diego, CA	III	71,233,171	42,246,551 as of 2/28/11	3,800	10/01/2031	None in 2014
West Miramar Sanitary Landfill	San Diego, CA	III	87,760,000	14,846,602 as of 11/30/13	8,000	8/31/2022	Yes 2014 - Report of Disposal Site Information, Gas Monitoring and Control, Operator Complies with Terms & Conditions
Otay Landfill	Chula Vista, CA	III	61,154,000	25,514,904 as of 3/31/12	5,830	2/28/2028	None in 2014
Buttonwillow Landfill	Buttonwillow, CA	I	14,293,760	23,194,883	10,482	1/01/2040	None in 2014

*Based on CalRecycle Solid Waste Information System Database (CalRecycle, 2014a).

5.14.2.2.2 Hazardous Waste Disposal Facilities

According to the DTSC, there are currently 68 facilities in California that can accept hazardous waste for treatment and recycling (DTSC, 2014). For ultimate disposal, California has three hazardous waste (Class I) landfills, which are described below. The closest disposal facility to CECP is Clean Harbors Buttonwillow Landfill in Kern County.

Clean Harbors' Buttonwillow Landfill, Kern County

This landfill is permitted at 13.1 million cubic yards and can accept 4,050 tons per day (Linton, 2012). As of January 2012, it is approximately 2 percent full (Linton, 2012). The landfill is permitted to accept waste until 2040 (CalRecycle, 2013a). Buttonwillow has been permitted to manage a wide range of hazardous wastes, including RCRA hazardous wastes, California hazardous waste, and nonhazardous waste for stabilization treatment, solidification, and landfill. The landfill can handle waste in bulk (solids and liquids) and in containers. Typical waste streams include nonhazardous soil, California hazardous soil, hazardous soil for direct landfill, hazardous waste for treatment of metals, plating waste, hazardous and nonhazardous liquid, and debris for microencapsulation (Clean Harbors, 2013).

Clean Harbors' Westmorland Landfill in Imperial County

This facility is not currently open or accepting waste because the Buttonwillow facility can accommodate the current hazardous waste generation rate. The facility is, however, available in reserve and could be reopened if necessary. The landfill's conditional use permit prohibits the acceptance of some types of waste, including radioactive (except geothermal) waste, flammables, biological hazard waste (medical), PCBs, dioxins, air- and water-reactive wastes, and strong oxidizers.

Waste Management, Inc.'s Kettleman Hills Landfill in Kings County

This facility accepts Class I and II waste. The B-18 landfill is permitted for and will accept all hazardous wastes except radioactive, medical, and unexploded ordnance. Currently, B-18 landfill phase 1 and 2 are in operation with a permitted capacity of 10.7 million cubic yards. B-18 phase 1 and 2 are near capacity, but B-18 phase 3 will be opening with a permitted capacity of approximately 5 million cubic yards and a life expectancy of 8 years (Henry, 2012). After B-18 closes, a new B-20 landfill will be opened on currently undeveloped land on the site. B-20 has a permitted capacity of 15 million cubic yards and a life expectancy of 24 years (Henry, 2012). As a whole, Kettleman Hills Landfill will be accepting waste for the next 32 years, until 2044. However, they are continuously searching for more expansion opportunities (Henry, 2012).

Additional Commercial Hazardous Waste Treatment and Recycling Facilities

In addition to hazardous waste landfills, there are numerous offsite commercial liquid hazardous waste treatment and recycling facilities in California. NRG currently contracts with Waste Management, Veolia, NRC Environmental Services, and Pacific Transportation for disposal of hazardous waste. In addition, some of the closest facilities include Demenno/Kerdoon in the City of Compton, Safety Kleen Systems in Los Angeles and El Monte, Pacific Resource Recovery Services in Los Angeles, and Quemetco in Los Angeles (DTSC, 2014). In accordance with the existing Waste Management COCs, all hazardous waste not treated or recycled by these facilities would then be transported to one of the permitted hazardous waste landfills previously discussed.

5.14.3 Environmental Analysis

The Amended CECP facility will generate nonhazardous solid waste that will add to the total waste generated in San Diego County and in California. However, as concluded in the Final Decision, there is adequate recycling and landfill capacity in California to recycle and dispose of the waste generated by the Amended CECP. It is estimated that the Amended CECP will generate: (a) during construction, approximately 203 tons of nonhazardous solid waste and less than 1 ton of hazardous solid waste (for a combined total of approximately 203 tons of solid waste); (b) during operations, less than 1 ton of nonhazardous solid waste and approximately 33 tons of hazardous solid waste annually (for a combined total of approximately 33 tons of solid waste a year); and (c) during demolition of the EPS, approximately 84,018 tons of nonhazardous solid waste and approximately 3,800 tons of hazardous solid waste (for a combined total of approximately 87,818 tons of solid waste). Considering that 2,936,261 tons of solid waste was landfilled in San Diego County in the year 2013, the solid waste generated by the construction of the Amended CECP and the demolition of the EPS will likely represent less than 3 percent of the County's total solid waste generation (CalRecycle, 2014b). Therefore, as with the Licensed CECP, the impact of the Amended CECP on local solid waste recycling and disposal capacity will not be significant.

Hazardous waste generated from the activities associated with the Amended CECP will consist of waste oil, filters, SCR and oxidation catalysts, and fluids used to clean piping. The waste oil, catalysts, and the deionization trailer unit will be recycled. Hazardous waste treatment and disposal capacity in California is more than adequate to accommodate waste from the Amended CECP. Therefore, the effect of the Amended CECP on hazardous waste recycling, treatment, and disposal capability will not be significant.

The Project Owner's compliance with the Conditions of Certification included in the Final Decision approving the Licensed CECP, and with the applicable LORS, would reduce potential adverse impacts of the Amended CECP to insignificant levels, and ensure that project-related wastes would be handled in an environmentally safe manner. No new significant impacts to waste management would result from the changes as proposed in this PTA.

5.14.4 Demolition of Encina Power Station

Table 5.14-3 lists the types and amounts of wastes anticipated to be generated by demolition of the existing EPS.

The PTA modifications will increase the amount of hazardous waste generated by the project, due to the demolition of the EPS. While this demolition will produce greater quantities of hazardous waste, the types of wastes for the Amended CECP are the same as those permitted and approved for the Licensed CECP in the Final Decision.

The additional demolition and asbestos waste will be documented in the permit requirements included in COC WASTE-2 and WASTE-6. The Project Owner would submit the WASTE-2 SDCDEH Hazardous Waste Tank Certification form (provided to the City of Carlsbad Fire Department) and WASTE-6 SDCDEH Asbestos Demolition Notification Form (provided to the SDCDEH) for review and approval prior to commencing demolition activities. These WASTE COCs, and the other WASTE COCs required by the Final Decision, should apply without change to the Amended CECP, as they will adequately manage the additional hazardous waste generated by the Amended CECP.

The COCs and applicable LORS that are included in the Final Decision would reduce potential adverse impacts of the Amended CECP to insignificant levels, and ensure that project wastes are handled in an environmentally safe manner. No new significant impacts to waste management would result from the changes as proposed in this PTA, and therefore, no new COCs and no revisions to existing COCs are necessary for the Amended CECP.

5.14.5 Cumulative Impacts

Similar to the Licensed CECP, multiple projects within the City of Carlsbad and adjacent to the project site may have a cumulative effect on the Amended CECP. These projects include the Carlsbad Seawater Desalination project (Poseidon) located on a portion of the Cabrillo Parcel that is leased to Poseidon, I-5 North Coast Corridor, the Cities of Vista and Carlsbad's Interceptor Agua Hedionda Lift Station project, the Los Angeles to San Diego Double-Tracking Project, and the San Diego Coaster Rail Trail. These projects are on various schedules of completion. Refer to Section 5.6, Land Use, for a more detailed discussion of cumulative projects.

Although the Amended CECP facility, like the Licensed CECP facility, will generate nonhazardous solid waste and hazardous waste that will add to the total waste generated in San Diego County and in California, as discussed in Section 5.14.1 above and in the Final Decision, there is adequate recycling and landfill capacity in California to recycle and dispose of the waste generated by CECP as well as any additional projects in the City of Carlsbad. Therefore, similarly to the impact of the Licensed CECP, the Amended CECP's impact on solid waste recycling and disposal capacity will not be significant.

The Amended CECP will result in similar waste management impacts as the Licensed CECP, and will not result in any significant cumulative impacts associated with the generation or disposal of wastes beyond those addressed in the Final Decision.

5.14.6 Laws, Ordinances, Regulations, and Standards

The Final Decision found the project to be in compliance with all applicable LORS. Likewise, the Amended CECP is in compliance with applicable worker-safety-related LORS, and the PTA will not alter the assumptions or conclusions made in the Final Decision. An updated research analysis has been conducted to determine if the LORS referenced in the CECP AFC are still current. Only new and updated LORS are provided in Table 5.14-5.

TABLE 5.14-5
Laws, Ordinances, Regulations, and Standards Applicable to Waste Management

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Voluntary Assessment Plan through San Diego County DEH Site Assessment and Mitigation Division	DEH will manage the development and implementation of the remediation work plan. Work plans will document management of hazardous materials, wastes, and recyclable materials for the demolition of the tanks.	San Diego County DEH Site Assessment and Mitigation Division and Hazardous Materials Division; RWQCB	5.14.2.3
County of San Diego Ordinance No. 9840	Outlines requirements for construction and debris management, or a Construction and Demolition Materials Diversion Program, to comply with Public Resources Code Section 41780, et seq., also known as the Integrated Waste Management Act.	San Diego County Department of Public Works	5.14.2.3

Note: Only new and updated LORS are included in this table.

5.14.7 Conditions of Certification

The Amended CECP is subject to COCs WASTE-1 through 11, which were included in the Final Decision for the Licensed CECP. The analysis in this PTA concludes that no new COCs or modifications to existing COCs are necessary to address waste management and potential impacts to waste management resulting from the Amended CECP. The existing COCs are provided below.

WASTE-1: The project owner shall ensure that the CECP site is properly characterized and remediated as necessary pursuant to the Corrective Action Plan reviewed and approved by the San Diego County Department of Environmental Health (SDCDEH). In no event shall project construction commence in areas requiring characterization and remediation until SDCDEH and the CPM have determined that all necessary remediation has been accomplished.

Verification: At least 30 days prior to remediation the project owner shall submit to the CPM for review and approval copies of all pertinent correspondence, work plans, agreements, and authorizations between CECP and SDCDEH regarding the Corrective Action Plan requirements and activities at the CECP site. At least 60 days prior to the start of site mobilization, the project owner shall provide to the CPM for review and approval written notice from SDCDEH that the CECP site has been investigated and remediated as necessary in accordance with the Correction Action Plan.

WASTE-2: Prior to removal of the aboveground storage tanks (ASTs), the project owner shall complete a SDCDEH Hazardous Waste Tank Certification form and obtain a permit from the City of Carlsbad Fire Department. Prior to demolition of the ASTs, SDCDEH and the Fire Department must acknowledge the form is complete, and provide written concurrence that the information presented is adequate to comply with permitting requirements for removal. This information and written concurrence must be submitted to the CPM for review and approval.

Verification: At least 60 days prior to commencement of site mobilization, the project owner shall provide the form and permits to remove the ASTs to the CPM for review and approval. The project owner shall inform the CPM via the monthly compliance report, of the date when all ASTs were removed from the site.

WASTE-3: The project owner shall provide the résumé of an experienced and qualified professional engineer or professional geologist, who shall be available for consultation during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The résumé shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given full authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the résumé to the CPM for review and approval.

WASTE-4: If potentially contaminated soil is identified during site characterization, demolition, excavation, or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, authorized representatives of Department of Toxic Substances Control (DTSC), the SDCDEH, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the authorized representatives of DTSC, the SDCDEH, and the CPM for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the professional engineer or professional geologist to the authorized representatives of DTSC, the SDCDEH, and the CPM for approval within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-5: The project owner shall prepare a Demolition and Construction Waste Management Plan for all wastes generated during demolition and construction of the facility and shall submit the plan to the CPM for review and approval. The plan may be submitted in two sections: Demolition activities and Construction activities. Both sections of the plan shall contain, at a minimum, the following:

- A description of all demolition and construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and
- Management methods to be used for each waste stream, including temporary onsite storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.
- A reuse/recycling Debris Management Plan for demolition and construction materials that meets or exceeds the waste diversion goals established by the Integrated Waste Management Compliance Act (Pub. Resources Code, § 41780 et seq.) and San Diego County Ordinance No. 9840.

Verification: The project owner shall submit the Demolition section of the Demolition and Construction Waste Management Plan to the CPM for approval at least 30 days prior to the initiation of demolition activities at the site. The project owner shall submit the Construction section of the Demolition and Construction Waste Management Plan to the CPM for approval at least 30 days prior to the initiation of construction activities at the site.

WASTE-6: Prior to demolition of existing structures, the project owner shall complete and submit a copy of a SDCDEH Asbestos Demolition Notification Form to the CPM and the SDCDEH for approval. After receiving approval, the project owner shall remove all ACM from the site prior to demolition.

Verification: At least 60 days prior to commencement of structure demolition, the project owner shall provide the Asbestos Demolition Notification Form to the CPM for review and approval. The project owner shall inform the CPM via the monthly compliance report, of the date asbestos is removed.

WASTE-7: The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency prior to generating any hazardous waste during construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide the number to the CPM in the next Monthly Compliance Report.

WASTE-8: Upon becoming aware of any impending waste management related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-9: The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the facility and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- Management methods to be used for each waste stream, including temporary onsite storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- All information and reports of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- A detailed description of how facility wastes will be managed and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- A detailed description of how facility wastes will be managed and disposed upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval at least 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-10: The project owner shall ensure that the Ocean-Water Purification System's filter cake is tested pursuant to the requirements of California Code of Regulations, Title 22, Section 66262.10, report the findings to the CPM, and ensure that the filter cake is properly transported and deposited at an appropriate disposal facility.

Verification: The project owner shall report the results of filter cake testing to the CPM. If two consecutive tests show that the sludge is nonhazardous, the project owner may apply to the CPM to discontinue testing.

WASTE-11: The project owner shall ensure that all spills or releases of hazardous substances, materials, or waste are reported, cleaned up, and remediated as necessary, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document all unauthorized releases and spills of hazardous substances, materials, or wastes that occur on the project property or related pipeline and transmission corridors. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; amount of contaminated soil/material generated; how release was managed and material cleaned up; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. Copies of the unauthorized spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

5.14.8 References

CalRecycle. 2014a. Solid Waste Information System (SWIS) Database, San Diego County. Available online at: http://www.calrecycle.ca.gov/SWFacilities/Directory/Default.htm. March.

CalRecycle. 2014b. *2013 Landfill Summary Tonnage* Report. Available online at: http://www.calrecycle.ca.gov/SWFacilities/Landfills/Tonnages/. March.

Clean Harbors. 2013. Buttonwillow Landfill Facility Fact Sheet. Available online at: http://www.cleanharbors.com/locations/index.asp?id=53. June.

Department of Toxic Substance Control (DTSC). 2014. *California Commercial Offsite Hazardous Waste Management Facilities*. Available online at: http://www.envirostor.dtsc.ca.gov/public/commercial_offsite.asp. March.

Henry, Bob/Waste Management – Kettleman Hills Landfill. 2012. Personal communication with Beth Smoker/CH2M HILL. January.

Linton, Ken/Clean Harbors. 2012. Clean Harbor's Buttonwillow Landfill. Personal communication with Beth Smoker/CH2M HILL. January.

5.15 Worker Health and Safety

This section provides the Project Owner's evaluation of how the Amended CECP could meet worker health and safety and how the Amended CECP would comply with laws, ordinances, regulations, and standards (LORS) applicable to worker health and safety. Consistent with this PTA, this section focuses on changes to the impact or compliance of the project as it was previously evaluated and approved in the original Application for Certification (AFC) process. Any proposed changes to Conditions of Certification (COCs) are provided.

Generally, the Amended CECP is not likely to create any new significant impacts to worker health and safety that were not previously identified and/or mitigated in the original permitting process. As with the Licensed CECP, the COCs will ensure project compliance with LORS and less than significant impacts.

5.15.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, the Amended CECP would be different than the project as approved in the Final Decision. For that reason, an evaluation of environmental impacts including the potential for changes or additions to COCs for the project is required. This PTA proposes implementing the following general changes to the Licensed CECP:

- Change in generation equipment and technology from Siemens fast response, combined-cycle to GE LMS 100 simple-cycle turbines to allow better support of renewable energy integration and local and regional demand. The Amended CECP will have six natural-gas-fired combustion GE LMS 100 turbines with approximately 632 MW[1] net output of simple-cycle electrical generating capacity.
- Add retirement and demolition of Encina Power Station (EPS). Units 1 through 5 of EPS will be retired and all above-grade elements of the EPS power and support buildings will be demolished.

As previously discussed in the Project Description, the Amended CECP would continue to occupy a portion of the Cabrillo Parcel, which is located in a City of Carlsbad Public Utility zone (as depicted in Figure 2.0-1). The CECP will continue to be situated adjacent to EPS, in the eastern portion of the Cabrillo Parcel, between the existing railroad tracks and I-5, but the Amended CECP will have a larger footprint, occupying most of that area. Construction equipment/material laydown and construction worker parking areas for the project will continue to be located immediately north of the CECP facility, as well as in various areas west of the existing railroad tracks. No offsite parking or laydown areas (outside of use of the 95-acre Cabrillo Parcel) are anticipated to be necessary for the construction of the Amended CECP.

The Amended CECP will continue to interconnect to the electrical transmission system via 138-kilovolt (kV) and 230-kV lines that connect to the respective San Diego Gas and Electric Company (SDG&E) switchyards situated on and adjacent to the Cabrillo Parcel. Natural gas will be delivered to the Amended CECP from the existing SDG&E transmission pipeline (Line TL 2009, "Rainbow line") via an approximate 1,100-foot-long interconnection pipeline west of the Amended CECP site that runs parallel to the existing railroad tracks. At the facility, the natural gas will flow through a flow-metering station, gas scrubber/filtering equipment, a gas pressure control station, and a fuel gas compressor station prior to injection into the combustion turbines. Similar to the Licensed CECP, with the exception of short, onsite interconnections, no offsite gas supply lines are required for the Amended CECP. The Amended CECP will use reclaimed water and/or potable water from the City of Carlsbad, or ocean water, and will connect to an existing City of Carlsbad (Encina Wastewater Authority) sanitary sewer line.

Upon completion of construction of the CECP and achievement of commercial operations, EPS will be retired and the above-grade elements of the main EPS power building and all support buildings, will be demolished.

[1] Rated at an average annual ambient temperature of 60.3 degrees Fahrenheit [°F] 79 percent relative humidity and with inlet air evaporative cooling

Upon completion of demolition of EPS, portions of the western areas of the Cabrillo Parcel will be removed from CEC jurisdiction and made available for redevelopment plans along with any other available adjacent lands. Some portions of the western areas of the Cabrillo Parcel will remain dedicated to the CECP, such as for transportation access, electrical interconnection, and water or gas supply.

5.15.2 Affected Environment

The changes proposed in this PTA include a change in generation technology and demolition of the EPS. Demolition of the EPS will increase the amount of demolition and excavation involved in the project; however, the COCs for the Licensed CECP are adequate to mitigate any impacts of the Amended CECP, including these activities.

The change in generation technology and resulting changes to the general arrangement include:

- Improved fire access routes onsite including inter-plant access roads, and an increased turning radius on the northern boundary of the plant, as well as a modified secondary dirt access road route at the plant.
- A combined, 500,000-gallon fire water and raw water tank (the Licensed CECP had a separate 250,000-gallon fire water tank).
- Expanded water supply options for the fire water/raw water tank. It may draw on two water sources, either reclaimed water from the City of Carlsbad or ocean water (as previously approved in the Licensed CECP).

These modifications will not result in any new or additional impacts to worker safety and fire protection beyond those previously identified in the Final Decision. These project revisions were made in consultation with the City Fire Department to ensure that the Amended CECP adequately addressed the City's fire safety concerns with the project site, in compliance with the City Agreement. And as the City Letter states, due to these modifications, the City has agreed to act as the primary emergency responder for the Amended CECP (see Appendixes 2A and 2B). The Amended CECP is consistent with the permitted CECP license, adheres to the integrity of the approved COCs, and is compliant with all applicable LORS.

5.15.2.1 Site Access during Incident

The transmission lines will be owned and operated by the Project Owner. In the event of an emergency in which the Project Owner requires assistance from the fire department, the Project Owner will provide the fire department with up-to-date information as to the status of the transmission line. A pole has been relocated to reduce the span of the overhead transmission line in accordance with discussions with the fire department and will facilitate continued department access to either the north or sound end of the facility in event of a downed transmission line.

Both ends of the transmission line are equipped with HV circuit breakers and redundant current differential protective relays will be installed to protect each transmission line. The redundant current differential protective relays will be selected from two different manufacturers to eliminate the likelihood of common mode failures.

Current differential protective relays continuously monitor the current in each conductor in a transmission line, and automatically trip (open) the circuit breakers on both ends of the transmission line if the current flowing into one end of the conductor does not equal the current flowing out of the other end of the conductor. This protective action would occur if, for example, there is a break in the conductor, or there is a line-to-ground fault. The total time to clear the current from the line, from the time at which the relay senses the fault (or breaking of the conductor) to the time at which the relay opens the circuit breakers is less than five cycles, or 0.083 seconds. In addition, the circuit breakers are equipped with other relays that provide short circuit protections.

5.15.3 Environmental Analysis

The proposed modifications to the Licensed CECP will result in changes to the fire access routes at the facility (both onsite and the offsite dirt access road), fire water/raw water tank size, and fire water/raw water sources. COC WORKER SAFETY-11, as set forth in the Final Decision, has been modified to reflect the change in tank size and water source, as described in the following discussion. By implementing the existing and modified COCs and complying with the applicable LORS contained in the Final Decision, potential adverse impacts of the Amended CECP would be reduced to insignificant levels and would ensure that worker health and safety is preserved. No new significant impacts to worker safety and fire protection would result from the changes proposed in this PTA.

5.15.3.1 Fire Access Route

The Amended CECP will require slight modifications to the onsite fire access route and the secondary offsite fire access route. The Project Owner has worked closely with the Carlsbad Fire Department and representatives of the City of Carlsbad to develop a mutually agreeable, revised, fire access route on the Cabrillo Parcel (see Appendixes 2A and 2B). This route was designed to allow access to each of the six units, onsite appurtenances, and support facilities at the Amended CECP (e.g., O&M and Administration building). This plan refines the fire access route included in the Final Decision. Figure 2.1-5 identifies the refined fire access routes at the site, which include an east–west connecting road within the Cabrillo Parcel and an increased turning radius on the northern end of the parcel. The refined secondary offsite fire access route will exit Cannon Road to the north and follow a dirt road adjacent to the existing railroad tracks to the southwest corner of the Amended CECP boundary. The refined fire access routes will comply with COCs WORKER SAFETY-6 and WORKER SAFETY-9, contained in the Final Decision, and no changes will be needed to these COCs for the Amended CECP.

5.15.3.2 Fire Water/Raw Water Tank

The fire protection system has been modified for the Amended CECP to have a common but larger tank to store raw water for both fire protection and process use. Raw water will be allocated for firefighting and stored in an approximately 500,000-gallon, aboveground storage tank. This tank will have a minimum of 150,000 gallons reserved at all times for fire protection. The remaining portion of the tank (approximately 350,000 gallons) will be allocated for storing process water. Both the power block area and rim area hydrants will be charged by this source, eliminating the Licensed CECP's tie-in to the EPS. Potable water from the EPS source will be rerouted and used for the new administration building, warehouse, and emergency eyewash and safety showers, and will also serve as an emergency connection for make-up to the fire water/raw water tank. The source of this water supply would be either reclaimed water from the City of Carlsbad or, as a secondary option, ocean water as previously approved in the Licensed CECP. Because the fire protection water supply and size of the tank have been updated, a change to COC WORKER SAFETY-11 is necessary.

The modified fire water/raw water tank size and water supply for the Amended CECP will not increase any potential impacts to worker health and safety beyond those previously analyzed for the Licensed CECP.

5.15.3.3 Excavations during Demolition Activities

The change in generation technology at the Amended CECP may require slightly more excavation than originally addressed in the AFC and PEAR, and approved in the Final Decision. Although demolition earthwork may temporarily expose workers to contaminated soils, causing the Amended CECP to slightly increase the potential risks to workers beyond those of the Licensed CECP, the COCs contained in the Final Decision would adequately protect workers. In conclusion, all activities at the Amended CECP, as at the Licensed CECP, would be conducted in accordance with all applicable LORS, and implementation of the Amended CECP will not increase the project's potential impacts on worker health and safety.

5.15.4 Demolition of Encina Power Station

Demolition of the EPS will require additional demolition and excavation to that previously approved in the Final Decision. However, the COCs for the Licensed CECP would adequately protect workers performing these activities. Therefore, the EPS demolition activities that are incorporated into the Amended CECP will not increase the potential impacts to worker health and safety beyond those anticipated for the Licensed CECP.

5.15.5 Cumulative Impacts

The Amended CECP will not result in any significant cumulative impacts to worker health and safety beyond those addressed in the CEC's Final Decision.

5.15.6 Laws, Ordinances, Regulations, and Standards

The Final Decision found the Licensed CECP to be in compliance with all applicable LORS. A review has been conducted to determine if the LORS referenced in the AFC and PEAR are still current; two new California LORS and one modified California LORS apply to the CECP, and are included in Table 5.15-1. The Amended CECP is consistent with applicable worker safety-related LORS, and the Amendment does not alter the assumptions or conclusions made in the Final Decision.

TABLE 5.15-1
Laws, Ordinances, Regulations, and Standards Applicable to Worker Health and Safety

Law, Ordinance, Regulation, or Standard	Applicability
New	
California 8 CCR § 5155, et seq.	Requirements for use of respirators and for controlling employee exposure to airborne contaminants
California 8 CCR § 5193, et seq.	Requirements for controlling employee exposure to blood-borne pathogens associated with exposure to raw sewage water and body fluids associated with first aid/CPR duties
Modified	
California Health and Safety Code Section 25503<u>1</u>, et seq.	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan

5.15.7 Conditions of Certification

Existing COCs WORKER SAFETY-1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 are adequate to address the Amended CECP without being modified. As discussed previously, existing COC WORKER SAFETY-11 has been revised to address changes to the facility's water supply and fire water/raw water storage tank that will be implemented as part of the Amended CECP. The proposed COCs for the Amended CECP are listed below.

WORKER SAFETY-1: The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

1. A Construction Personal Protective Equipment Program
2. A Construction Exposure Monitoring Program
3. A Construction Injury and Illness Prevention Program
4. A Construction Emergency Action Plan
5. A Construction Fire Prevention Plan

The Personal Protective Equipment Program, the Exposure Monitoring Program, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Carlsbad Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Carlsbad Fire Department stating the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

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

1. An Operation Injury and Illness Prevention Plan
2. An Emergency Action Plan
3. Hazardous Materials Management Program
4. Fire Prevention Plan (8 Cal Code Regs., § 3221)
5. Personal Protective Equipment Program (8 Cal Code Regs., §§ 3401—3411)

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the Carlsbad Fire Department for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Carlsbad Fire Department stating the fire department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3: The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards; is capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

1. Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
2. Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
3. Assure that all construction and commissioning workers and supervisors receive adequate safety training; 4. complete accident and safety-related incident investigations and emergency response reports for injuries and inform the CPM of safety-related incidents; and
4. Assure that all the plans identified in Conditions of Certification Worker Safety-1 and -2 are implemented.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement CSS shall be submitted to the CPM within one business day. The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

1. Record of all employees trained for that month (all records shall be kept on site for the duration of the project)

2. Summary report of safety management actions and safety-related incidents that occurred during the month
3. Report of any continuing or unresolved situations and incidents that may pose danger to life or health
4. Report of accidents and injuries that occurred during the month

WORKER SAFETY-4: The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO and will be responsible for verifying that the Construction Safety Supervisor, as required in Condition of Certification Worker Safety-3, and for implementing all appropriate Cal/OSHA and Energy Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 60 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5: The project owner shall ensure that a portable automatic external defibrillator (AED) is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable automatic external defibrillator (AED) exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6: The project owner shall ensure that the below-grade site fire lanes, access points, and ramps (with no more than a 10 percent grade) are constructed as per the dimensions shown in Worker Safety Figure 1 and that at least two access points through the site perimeter and into the below-grade power plant site are available to the CFD and other emergency response providers. The access roads, below-grate perimeter road, and ramps shall be no less than 28 feet wide. The project owner shall guarantee that the two fire access ramps down into the project site and the fire lane around the perimeter of the below-grade site are free and clear of all vehicles, equipment, or any other object (mobile or stationary) at all times and that the boundaries or curbs of the ramps and lanes are painted red and contain signage to indicate that they are fire roads and lanes on which parking is not allowed. The final blueprints for the site shall be submitted at least 30 days prior to the start of site mobilization to the Carlsbad Fire Department for review and comment and to the CPM for review and approval. Any requested changes in the fire lanes, ramps, and access points shall be made is writing to the CPM and the CBO for review and approval after obtaining comments from the CFD.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit a copy of the final site blueprints to the Carlsbad Fire Department for review and comments and to the CPM for review and approval. The project owner shall also submit to the CPM a copy of the transmittal letter to the CFD.

At least 60 days prior to the start of commissioning or the arrival on-site of any liquid fuel, natural gas, or hazardous material, whichever occurs first, the project owner shall submit to the CBO for information, to the Carlsbad Fire Department for review and comment, and to the CPM for review and approval a signed

declaration along with photographic evidence that the access ramps and fire lanes are guaranteed to always be clear and unobstructed and that signs and red paint have been placed in the appropriate locations.

WORKER SAFETY-7: The project owner shall place a barrier of sufficient strength and height at the eastern fence line of the project at the widened I-5 Right-of-Way so as to prevent a runaway car or semitrailer truck from piercing the barrier and going over the edge and down into the power plant site. This barrier shall also serve to prevent line-of-sight viewing of the power plant site from the shoulder of I-5. In designing this barrier, the project owner shall consult with Caltrans and then submit a final plan to the CPM for review and approval. The project owner may also negotiate cost-sharing of this barrier with Caltrans and if the project owner chooses to do so, the cost-sharing contract with Caltrans shall be submitted to the CPM for review and approval.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit a copy of the final plans for the barrier and any cost-sharing contract to the CPM for review and approval.

WORKER SAFETY-8: The project owner shall ensure that not less than two workers—two technical workers or one technical and one security staff—will be present on the site (the "bowl") at all times whenever the CECP is operating. When the units are dispatched from a shutdown condition, the project owner shall send the two workers to the site while commencing startup; and those two workers shall proceed directly to the site. The project owner shall prepare a plan describing the workforce that shall be present on the power plant site (the "bowl"), their shifts, their duties, their training, the method(s) of real-time continuous communication with the control room they will have available, their enclosed stations (e.g., portable office building), and facilities for personal hygiene on the site, to the CPM for review and approval.

Verification: At least 60 days prior to the start of commercial operations, the project owner shall submit a copy of the staffing plan to the CPM for review and approval.

WORKER SAFETY-9: The project owner shall maintain the current dirt access road located on the western perimeter fenceline in a sufficient state so as to serve as an emergency response road. In no event shall the project owner grant or dedicate an easement for the Coastal Rail Trail east of the Rail Corridor on the CECP site.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM for review and approval a copy of the final plans for maintaining this access road.

WORKER SAFETY-10: The project owner shall prepare a Transformer Fire Protection Plan which shall evaluate any feasible methods that can be used to prevent, contain, and/or control a transformer fire, including the use of new dielectric fluids, pressure sensors with shut-down capability, dissolved gas analyzers, use of compressed-air-foam for fire suppression, on-site storage of suppressants, and sub-surface vaults to contain spilled/leaked dielectric fluids. The project owner shall submit this Plan to the CBO for information, to the Carlsbad Fire Department for review and comment, and to the CPM for review and approval.

Verification: At least 60 days before the arrival of a transformer on site, the project owner shall submit a copy of the Transformer Fire Protection Plan to the CBO for information, to the Carlsbad Fire Department for review and comment, and to the CPM for review and approval.

WORKER SAFETY-11: The project owner shall ensure that the primary source of fire protection water is the City of Carlsbad reclaimed water system or ocean water, and that the on-site ~~250~~500,000-gallon storage tank is the back-up supply.

Verification: At least 60 days before commencing commissioning, the project owner shall submit to the Carlsbad Fire Department for review and comment, and to the CPM for review and approval engineering drawings showing the source and piping of the primary and back-up fire protection water supplies and a statement that the primary supply is the City of Carlsbad water system.

SECTION 6 .0

Potential Effects on the Public

This section discusses the potential effects on the public that may result from the modifications proposed in this Petition to Amend application, pursuant to CEC Siting Regulations (Title 20, CCR, Section 1769[a][1][G]).

The modifications proposed in this Amendment will benefit the public and local economy by (a) increasing the availability of this facility's power to the grid and (b) removing an aging power plant, and thereby opening up land for future redevelopment. As discussed and documented in this PTA, no long-term adverse effects on the public will occur from the Amended CECP. In fact, as shown in the Visual Resources section of this PTA, the Amended CECP configuration will result in beneficial visual changes as compared to the Licensed CECP. As shown in the Visual Resources section of this PTA, the Amended CECP power generation units will appear to be much smaller in scale than the existing units, and will be considerably less visible than the power generation units approved under the current project license.

In addition, the decommissioning and demolition/removal of existing EPS Units 1 through 5 will eliminate a large-scale industrial facility that currently dominates local views in the area and will provide the opportunity to redevelop this area for non-power-production uses. Further, the decommissioning and demolition/removal of the EPS will create substantial environmental benefits, including (a) permanent air emission reductions; (b) elimination of the 857 million gallons per day of cooling water (seawater) intake capacity of the existing units, and the resulting decrease in impingement and entrainment of marine organisms attributed to those units' cooling water flow; and (c) cessation of discharge of wastewaters to the Pacific Ocean from Units 1 through 5.