# 2.0 PROJECT DESCRIPTION

## 2.1 OVERVIEW

The proposed Puente Power Project (P3 or project) will replace two aging gas-fired steam-generating units (Units 1 and 2) at the existing Mandalay Generating Station (MGS) with a new state-of-the-art General Electric (GE) Frame 7HA.01 single-fuel combustion turbine generator (CTG) and associated auxiliaries. P3 will be developed on approximately 3 acres of previously disturbed vacant brownfield land located within the existing boundaries of MGS. As shown on Figure 2.1-1, all construction laydown and parking areas will also be within the existing MGS site. To minimize environmental impacts associated with the construction of new operations, maintenance, warehouse, and transmission interconnections, existing ancillary systems will be upgraded and repurposed to serve P3 to the extent feasible. If P3 is approved and developed, MGS Units 1 and 2 would be retired by the completion of commissioning of P3.

The generator output from P3 will be stepped-up to 220-kilovolt (kV) transmission voltage from the GE 7HA.01 CTG operating in simple-cycle mode. The power block will provide peaking power and is expected to operate at up to approximately 30 percent capacity factor. Full-load output of the unit under expected operating and ambient (temperature/relative humidity) conditions will range from approximately 241 net megawatts (MW) to a peak of 271 net MW. The new generating unit will tie into the existing Mandalay Switchyard, owned by Southern California Edison (SCE), using one of the breaker positions that will be vacated when MGS Units 1 and 2 are removed from service.

P3 will use natural gas supplied by Southern California Gas Company (SoCalGas) and will connect to a new gas metering station adjacent to the P3 site. A new natural gas pipeline of approximately 500 feet will extend from the new gas metering station through a new gas compressor to the combustion turbine interface.

Total estimated annual water use for P3 is expected to be approximately 16 acre-feet per year (AFY). The process water and potable water source will be water from the City of Oxnard; the point of connection will be to the existing MGS potable water supply. Sanitary wastewater will be discharged to the MGS existing septic system. Process wastewater will be stored in one of the MGS existing basins, and ultimately discharged to the ocean via the existing outfall. Stormwater runoff from the project site will be directed via a new stormwater conveyance system to either the service water tank for reuse, offsetting potable water use, or to the existing North and South Basins and eventually discharged through the existing outfall to the Pacific Ocean.

Construction of P3 is expected to occur over a 21-month period (from October 2018 through June 2020). Construction is expected to cost approximately $235 to $270 million (in 2015 dollars). Commercial operation of P3 is expected by June 2020.

### 2.1.1 Sustainable Design Features

The project will integrate Leadership in Energy and Environmental Design (LEED) concepts. The LEED certification program is nationally accepted as a benchmark for high-performance green buildings. The program has been developed by the U.S. Green Building Council, a coalition of public and private organizations and individuals working together to promote environmentally responsible buildings.

LEED promotes a whole-building approach to sustainability by focusing on a number of credits organized under various categories of building performance. The LEED credits can be used as both a building rating system, simply evaluating a building's level of sustainability; and as a design tool, setting out the building's aspirations and offering guidance on how to achieve a high level of efficiency and sustainable performance.

The proposed project will use existing MGS facilities, thereby reducing construction waste. A portion of the existing MGS warehouse will be reconfigured to add a control room for the new plant. The existing administration building will be upgraded.

The new control room is expected to achieve LEED certification under the LEED v4 for Interior Design and Construction. It is anticipated that the new control room will achieve credits related primarily to the following categories: energy and atmosphere (e.g., optimization of energy performance); materials and resources (e.g., management and recycling of waste); and indoor environmental quality (e.g., insulation, ventilation, lighting and interior finishes).

Upgrades to the existing administration building may include upgrading electrical lighting, installing wall and roof insulation, replacing windows, upgrading the heating and ventilation system, and upgrading plumbing fixtures. The upgraded building is expected to achieve LEED certification under the LEED v4 for Operations and Maintenance: Existing Buildings. Credits are expected in the following categories: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality.

Preliminary LEED checklists are provided in Appendix A-1, and summarize the potential LEED concepts that could be integrated into P3 for the new control room and upgraded administration building. Based on the preliminary concepts identified, the project could receive a Certified rating for the new control room and a Silver rating for the improvements to the administration building.

## 2.2 EXISTING MGS

The MGS is an existing natural-gas–fired steam electric generating facility owned by NRG California South LP, in the City of Oxnard, Ventura County, California. MGS consists of two conventional steam turbine units (Units 1 and 2) and one gas combustion turbine unit (Unit 3).

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

MGS Units 1 and 2 are subject to the California State Water Resources Control Board's Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, also referred to as the Once-Through Cooling Policy. Irrespective of the proposed development of P3, pumping of ocean water for cooling MGS Units 1 and 2 must be reduced or eliminated as of the OTC Policy compliance date of December 31, 2020. If P3 is approved and developed, MGS Units 1 and 2 would be retired by the completion of commissioning of P3.

MGS Units 1 and 2 are interconnected to the adjacent SCE 220-kV switchyard, which serves the Moorpark Sub-Area. Units 1 and 2 have provided local reliability to the Big Creek/Ventura local reliability area since the 1950s.

MGS Unit 3 is a jet-engine–powered unit that was commissioned in 1970, and has a generating capacity of approximately 130 MW. Unit 3 is connected to the neighboring SCE 66-kV switchyard, and provides local reliability. Unit 3 will continue to operate and will not be affected by P3.

## 2.3 PROJECT NEED AND PURPOSE

SCE issued the 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-Area (Track 1) in September 2013. SCE wished to procure between 215 and 290 MW of electrical capacity in the Moorpark Sub-Area of the Big Creek/Ventura local reliability area to meet long-term local capacity requirements by 2021.

In November 2014, NRG was awarded a contract with SCE to replace MGS Units 1 and 2 with 262 MW of state-of-the-art, more flexible and efficient natural gas generation at the site of the existing MGS facility. NRG has entered into a 20-year Resource Adequacy Purchase Agreement with SCE. P3 is designed to ensure continued reliability and to help integrate renewable energy into the grid.

## 2.4 SITE LOCATION AND DESCRIPTION

Figure 2.4-1 shows the project location in relation to the surrounding area, as well as nearby roads and other area features. The existing MGS facility is in an industrial area that includes oil drilling and processing operations, and SCE-owned power-generating and transmission facilities. P3 will be sited on approximately 3 acres of the northern portion of the existing 36-acre MGS property at 393 North Harbor Boulevard in Oxnard, Ventura County, California, 93035. The MGS has been assigned Assessor's Parcel Number 183-0-022-025. The project site is in the Rio De Santa Clara Spanish Land Grant Sections inferred as 35 and 36, Township 2 North, Range 23 West, on the U.S. Geological Survey Oxnard/Oxnard OE Topographic Map Quadrangles (Latitude: 34.207115; Longitude: 119.250000). The project area is unsectioned and outside of the township and range system. The approximately 3-acre P3 site will be leased from NRG California South LP.

The site is bordered by sand dunes and the Pacific Ocean to the west, McGrath Lake State Park and land owned by SunCal to the north, industrial uses to the north, south, and east, and agricultural uses farther to the east. The closest existing residential neighborhood is the Oxnard Shores Mobile Home Park, approximately 0.75 mile (or approximately 3,900 feet) south from the proposed P3 stack, south of W. 5th Street and west of Harbor Boulevard. The North Shore at Mandalay Bay is a proposed residential development scheduled to commence construction in 2016. The distance from the proposed P3 stack to the closest North Shore at Mandalay Bay development boundary is approximately 0.47 mile, or approximately 2,460 feet.

The existing MGS property, including the 3-acre portion to be developed for P3, was graded during the development of the MGS in the 1950s, and is currently at approximately elevation 14 feet mean lower low water (MLLW). The top of the dunes to the west of the P3 site ranges from approximately elevation 20 to 30 feet MLLW. An artificial berm was constructed along the northern and eastern edges of the property in the early 1970s to protect the facility from flooding. The top of the engineered berm is at an elevation of approximately 20 feet MLLW. The site is underlain by eolian and alluvial deposits consisting predominantly of sand and silty sand with some interbedded sandy silt and clay (Ninyo & Moore, 2013).

Groundwater levels near the site are influenced by tidal fluctuation, precipitation, irrigation, and groundwater pumping. During a recent geotechnical investigation, groundwater was detected at approximately 9 feet below ground surface (bgs) (Ninyo & Moore, 2013), and historically has been reported as high as 5 feet bgs.

The portion of the MGS property where P3 will be located was originally slated for development of future steam-generating units (MGS Units 3 and 4); however, these were never constructed at this location (although an alternative MGS Unit 3 was constructed on the southern portion of the MGS property). A 30-inch-diameter gas line traverses the site; this gas line was intended to be the gas supply for the future steam-generating units. Previous uses of the portion of the MGS property where P3 will be constructed include the following:

- 1950s: Grading of the site for the original MGS construction, and installation of the 30-inch-diameter gas line.

- 1970s: Construction of the Flood Protection berm along the northern boundary of the property. An insulator testing facility was constructed in 1970, and was used from 1971 to 1978. The facility was built by SCE to study mean time to flash-over rates on various insulators in a coastal environment.

- 1983: Approximately 7,000 cubic yards of dredged spoils from the canal were temporarily stored.

- 1996-1997: Installation of the 10-inch-diameter gas line from the gas metering station to MGS Unit 3.

- 2000: Approximately 7,000 cubic yards of dredged spoils from the canal were temporarily stored.

- 2003-2005: Approximately 75,000 cubic yards of accumulated sediment from the canal were excavated and placed on the P3 site. Site preparation included excavation and placement of liner fabric. The dredged spoils were pumped into geotextile containment tubes, allowed to dry, and then transported to the Toland Road Landfill for disposal.

- 2011: As part of SCE's Retention Basin remediation project, the project site was used for temporary storage of contaminated soil stored on a plastic barrier. Gravel was placed along an access road that ran through the proposed P3 site.

## 2.5 EXISTING FACILITIES TO BE DECOMMISSIONED, REMOVED, OR REPURPOSED AS A RESULT OF P3

If P3 is approved and developed, MGS Units 1 and 2 would be retired and decommissioned (although not demolished) by the completion of commissioning of P3. Because the decommissioning of Units 1 and 2 is a reasonably foreseeable consequence of the development of P3, the decommissioning process and its potential environmental impacts are addressed in this Application for Certification (AFC). Note that, as required by the OTC Policy, ocean water withdrawals for cooling MGS Units 1 and 2 will be reduced or eliminated no later than December 31, 2020, irrespective and independent of the approval and development of P3. Therefore, the reduction or elimination of ocean water withdrawals is not a consequence of the development of P3, and is not within the scope of the CEC's review of P3.

Decommissioning will consist of the following activities:

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

Aside from MGS Units 1 and 2, certain existing ancillary facilities either will be removed to accommodate development of P3, or will be repurposed for future use in connection with P3. These activities, and any environmental impacts associated with them, are reasonably foreseeable consequences of P3, and are fully described and analyzed in this AFC.

The existing backup diesel generator, located near the warehouse building, will be retired. Approximately 500 linear feet of the abandoned 10-inch-diameter fuel oil pipeline south of MGS Unit 2 near the water storage tanks will be removed to make room for auxiliary equipment for P3.

The major MGS equipment and features to be repurposed for P3 are listed below and in Table 2.5-1:

- The existing MGS service water storage tank and demineralized water/reverse osmosis (RO) equipment, storage tanks, and systems will be retained and used as the source for evaporative cooling water for P3's CTG. A new 3-inch-diameter water pipeline will be installed from P3 to the point of contact at the existing demineralized water storage tanks.

- The existing MGS firewater pumps and tank (lower portion of the Service Water Tank) will be retained, and used to service the new facility. The firewater loop will be extended to service the new plant. The power supply to these two electric fire pumps will be changed. One pump will be connected to the new P3 switchgear and backed up by a new emergency diesel generator. The other will be connected to MGS Unit 3 switchgear, which is fed from the SCE 66-kV system, and will become the emergency backup fire pump.

- The existing ammonia receiving and storage system and tanks will be retained and reused, but the ammonia will be changed from 29 percent to 19 percent concentration. The ammonia line will be extended as required to interconnect to P3's ammonia distribution system.

- A portion of the existing MGS warehouse will be reconfigured to add a control room for the new plant, including all required heating, ventilation, and air conditioning (HVAC) modifications.

- Two of the existing MGS retention basins (North Basin and South Basin) will be reused to retain stormwater from the P3 area and the rest of the MGS site, and will also store the wastewater generated from P3.

- The existing MGS administration building will continue to be used as the administration building for the new P3 facility and the existing MGS Unit 3. Upgrades are likely to include new wall and roof insulation, new windows, new low-flow plumbing fixtures, new electrical lighting, and new heating, ventilation, and air conditioning units.

- The existing MGS septic system will continue to be used.

## 2.6 EXISTING FACILITIES UNAFFECTED BY P3 AND NOT PART OF THE PROPOSED PROJECT

Certain existing facilities, operations, and activities at the MGS facility, including the cooling water intake system for MGS Units 1 and 2, will be unaffected by development of P3, and therefore are not analyzed in this AFC.

The existing MGS Unit 3 will continue to operate and will not be affected by the proposed P3 project.

Closure activities associated with prior operations of retention basins and associated appurtenances on the MGS property are not part of the proposed project. These activities are SCE's obligations as the previous owner of the property, and include ongoing groundwater monitoring related to cleanup and closure of the three retention basins north of MGS Unit 2. These ponds were remediated in 2011, and groundwater monitoring has been ongoing. The Department of Toxic Substances Control is expected to issue a Closure Report in 2015.

## 2.7 POWER GENERATION FACILITY

P3 will consist of a 262 MW (nominal net) facility operating in simple-cycle mode. The combustion-gas turbine will be connected to an electric generator. The generator will be interconnected to the SCE switchyard adjacent to the MGS site. P3 will be interconnected to the transmission grid, and power generated by the facility will be available to serve energy needs throughout California. The proposed project is not required to provide blackstart capability. The following sections describe the power generation facility site arrangement, process flow diagrams, heat and material balances, major equipment, and ancillary systems (including buildings and structures) that constitute the proposed project. P3 will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards (LORS). Design criteria are provided in Appendices A through E.

The site arrangement drawings (plot plans, elevation views, and an oblique aerial view of the proposed power generation facility) are shown on Figures 2.7-1, 2.7-2, and 2.7-3b, respectively. An oblique aerial view of the existing MGS facility is shown in Figure 2.7-3a.

### 2.7.1 Process Description

The facility will consist of one GE 7HA.01 natural-gas–fired CTG (see Figure 2.7-1). The actual output of the CTG will vary in response to ambient air temperature conditions and the use of evaporative coolers. Full load output of the unit under expected operating and ambient (temperature/relative humidity) conditions will range from approximately 241 net MW to a peak of 271 net MW. The overall annual availability, as measured by equivalent availability factor (EAF) of the unit, is expected to be approximately 94 to 98 percent.

The process flow diagram for the simple-cycle generation process is shown on Figure 2.7-4. The heat and material balances for the facility are shown on Table 2.7-1. Ten cases are provided that represent summer design conditions (82°F), typical summer conditions (77°F), annual average conditions (59°F), and extreme winter conditions (39°F). For the summer cases, evaporative coolers are in operation; the evaporative coolers are not in operation in the annual average or winter case. The winter case is the lowest temperature in which the units would reasonably be expected to operate.

The simple-cycle CTG will be equipped with an emissions control system to include selective catalytic reduction (SCR) and oxidation catalyst, an ammonia system, tempering air skids, a continuous emissions monitoring system (CEMS), and stack.

### 2.7.2 Mechanical Equipment

This section describes the major components and systems of the project. A list of major mechanical equipment for the power block is provided in Table 2.7-2.

#### 2.7.2.1.1 Combustion Turbine Generator

Thermal energy is produced in the CTG through the combustion of natural gas, and is converted into mechanical energy in the CTG turbine that drives the CTG compressor and electric generator. The CTG is Model 7HA.01, and will be supplied by GE. An air filtration and silencing system is provided for air drawn into the compressor inlet.

The CTG will consist of a heavy-duty, single-shaft CTG and associated auxiliary equipment. The CTG will be equipped with dry low oxides of nitrogen ($NO_X$) natural-gas combustors designed to meet the following functional requirements:

- Air emissions at the gas turbine exhaust will not exceed the levels described in Section 4.1, Air Quality;
- Noise emissions will not exceed the near-field and property-line levels described in Section 4.7, Noise; and
- The CTG will be capable of operation across the broad range of 35 to 100 percent load, while meeting required air emission performance.

The CTG will be equipped with the following accessories required to provide efficient, safe, and reliable operation:

- Inlet air filters and on-line filter cleaning system;
- Inlet air evaporative coolers;
- On-line and off-line compressor-wash system;
- Metal acoustical enclosures;
- Fire detection and protection system;
- Lubrication oil system, including oil coolers and filters;
- Generator coolers;
- Starting system, auxiliary power system, and control system; and
- Battery backup power system for lube oil pumps and other critical loads.

The metal acoustical enclosure that contains the CTG and accessory equipment will be outdoors.

GE 7HA.01 CTG generators are high-efficiency, 3,600 revolutions per minute single-end-drive units designed to meet power industry standards for design and instrumentation. CTG generators are hydrogen-cooled, and are provided with a static excitation system. Space heaters are provided in the generator and excitation enclosures to inhibit moisture condensation during installation and periods of shutdown.

#### 2.7.2.1.2 Cooling Systems for Heat Rejection

All auxiliary systems will be air-cooled.

### 2.7.2.2 Project Noise Control Features

As part of the facilities design, specific noise control equipment will be incorporated that includes:

- CTG inlet air silencers;
- CTG enclosures;
- CTG accessory compartment enclosures;
- Tempering/Purge Air and Ammonia Dilution Fans sound attenuation, as required; and
- Gas compressor sound attenuation, as required.

The incorporation of these noise control devices has been included in the formulation of equipment noise generation values used in the noise analysis (see Section 4.7).

## 2.7.3 Major Electrical Systems and Equipment

The single-line electrical diagrams of the major and auxiliary plant electrical systems are presented on Figures 2.7-5a and 2.7-5b.

The bulk of the electric power produced by the facility will be transmitted to the grid. A small amount of electric power will be used on site to power auxiliaries such as pumps and fans, control systems, and general facility loads, including lighting, heating, and air conditioning. Some power will also be converted from alternating current (AC) to direct current (DC), which will be used as backup power for control systems and other uses. Transmission and auxiliary uses are discussed in the following subsections.

#### 2.7.3.1 AC Power Transmission

Power will be generated by the one simple-cycle CTG. The CTG will generate power at 18 kV. The generator voltage will then be stepped up by a dedicated generator step-up (GSU) transformer to 220 kV for transmission to the grid. The step-up transformer will be filled with oil. Surge arresters will be provided at the high-voltage bushings to protect the transformer from surges on the 220-kV system caused by lightning strikes or other system disturbances. The transformer will be set on a concrete pad in a containment designed to contain the transformer oil in the event of a leak or spill. The CTG will have a sulfur hexafluoride ($SF_6$) generator breaker on the low-voltage side of the GSU transformer. The breaker for the combustion turbine will be connected to the CTG and GSU by iso-phase bus duct. The high-voltage side of the step-up transformer of the unit will be connected to one 220-kV transmission line. The transmission line will connect to a $SF_6$ breaker in the 220-kV switchyard. The SCE switchyard will be the point of interconnection with the transmission system.

#### 2.7.3.2 DC Power Supply System

One 125-volt DC power supply system will be supplied for balance-of-plant equipment. It will consist of one 100 percent capacity battery bank; two 100 percent static battery chargers; a switchboard; and two or more distribution panels. The simple-cycle gas turbine will have dedicated battery systems with redundant chargers.

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

Under abnormal or emergency conditions, when power from the AC power supply system is unavailable, the batteries supply DC power to the DC system loads. Recharging of a discharged battery occurs whenever 480-volt power becomes available from the AC power supply system. The rate of charge depends 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 18-kV generator breaker, 4,160-volt switchgear, 480-volt load centers, critical control circuits, and emergency DC motors.

#### 2.7.3.3 Electrical System for Plant Auxiliaries

Auxiliary power to the CTG will be supplied at 4,160 volts AC by a single-ended 4,160-volt switchgear lineup. An oil-filled, unit auxiliary step-down transformer will supply primary power to the 4,160-volt switchgear. The high-voltage side of the unit auxiliary transformer will be connected to the output of the gas-turbine generator. This connection will allow the switchgear to be powered from the CTG or by back-feeding power from the 220-kV switchyard through the unit auxiliary transformer. A generator circuit breaker will be provided for the CTG. This circuit breaker is used to isolate and synchronize the generator, and will be between the generator and the connection to the auxiliary and GSU transformers. The 4,160-volt switchgear lineup supplies power to the various 4,160-volt motors, to the gas-turbine starting system, and to the load center transformer, rated 4,160 to 480-volts, for 480-volt power distribution. The 4,160-volt switchgear will have vacuum-interrupter circuit breakers for the main incoming feeds and for power distribution. All 4,160-volt switchgear will be arc-flash resistant.

The load center transformer will be oil-filled, supplying 480-volt, three-phase power to the single-ended load center.

The load center will provide power through feeder breakers to the various 480-volt motor control centers (MCCs). The MCCs will distribute power to 480-volt motors, to 480-volt power distribution panels, and to 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. Transformation of 480-volt power to 120/208-volt power will be provided by 480-120/208-volt dry-type transformers.

A backup diesel generator to facilitate safe shutdown and service house loads in the event of the loss of the single line feeding the auxiliary system will be included (see Section 2.7.3.5).

### 2.7.3.4 Uninterruptible Power Supply System

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

Redundant UPS inverters will supply 120-volt AC single-phase power to the UPS panel boards that supply critical AC loads. The UPS inverters 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.

Distributed control system (DCS) operator stations will be supplied from the UPS. CEMS equipment, DCS controllers, and input/output (I/O) modules will be fed using either UPS or 125-volt DC power directly.

### 2.7.3.5 Emergency Power System

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

Major components of the Emergency Power System are the diesel engine generator set, including generator circuit breaker, generator protection, and engine-generator controls, fuel oil day tank, automatic transfer switch, emergency MCC, and accessories.

The diesel generator will be furnished and installed in accordance with the latest revision of the following relevant U.S. Codes and Standards, including the following key high-level documents:

- IEEE C50.10 Rotating Electrical Machinery—Synchronous Machines
- NEMA MG-1 Motors and Generators

- IEEE 446 Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Application

The emergency loads will be grouped onto a separate MCC to facilitate energizing the appropriate loads from the diesel generator if normal AC power is lost.

The emergency MCC will normally be supplied from the 480-volt load center via the automatic transfer switch. The diesel generator will automatically start upon a loss of normal AC power. Within 10 seconds, the automatic transfer switch will transfer to the generator to re-energize the emergency MCC.

The diesel-generator will have sufficient real and reactive power capability to energize the emergency loads. Calculations will be prepared by the manufacturer to verify this capability. Where required, the diesel generator controls will include sequencing contact outputs to pick up the emergency loads in steps.

Speed and voltage control systems will be designed to maintain the frequency and voltage within acceptable limits for varying loading conditions:

The continuous rating of the emergency diesel generator will be sufficient to supply the following major loads:

- Battery chargers;
- UPS rectifier/chargers;
- Emergency diesel auxiliaries;
- Electric fire pump;
- Battery room and diesel generator room ventilating systems;
- HVAC and lighting for the GE Packaged Electronic and Electrical Control Compartment and Load Commutating Inverter and Excitation Compartment; and
- HVAC and lighting for the balance of plant (BOP) Power Distribution Center.

The generator neutral grounding will be consistent with the grounding of the 480-volt system as discussed in the Grounding section.

The diesel engine will be the turbo-charged, internally water-cooled, manufacturer's standard model for the intended service. The engine coolant will be air-cooled in a radiator mounted on the engine skid.

The engine will be capable of operating at rated load on No. 2 fuel oil or Grade 2-D diesel fuel.

The following features will be supplied:

- Generator-protective relaying;
- Controls and automatic synchronizing;
- 24 Volts Direct Current starting system;
- Local annunciator or modules for engine and generator alarms; and
- 12-hour fuel tank in machine base.

The diesel generator and controls will be supplied in an outdoor enclosure provided by the equipment supplier. As an alternate, the emergency diesel generator may be installed in a separate room with 2-hour-rated fire walls. Space requirements and clearance around the equipment will allow adequate air circulation, operation, inspection, and maintenance of equipment. The emergency diesel generator will be arranged to draw combustion air and cooling air from outside by way of louvers provide inside the room, and discharge exhaust gas and hot air outdoors.

### 2.7.4 Fuel Gas Supply and Consumption Use

The project will be fueled with pipeline-quality natural gas delivered by SoCalGas. Gas supplies will be acquired from gas providers in supply regions accessible through the SoCalGas transmission system. Over the life of the project, it is expected that a variety of different suppliers will contract to provide the gas commodity to the SoCalGas system for transport to the project site. Gas will be procured at market prices.

Nominal full-load fuel consumption will be approximately 2,500 million British Thermal Units (MMBtu) per hour, higher heating value (HHV). Total annual fuel consumption will be 6,790,000 MMBtu (HHV), based on a 30 percent dispatch. Fuel consumed during start-ups and shutdowns is expected to be 78,000 MMBtu (HHV), based on a total of 200 annual start-up/shutdown events.

The natural gas will be delivered to the site, and be routed from the new gas metering station area to the gas compression enclosure, where it will pass through the compressor to reach the required operational pressure of approximately 500 pounds per square inch gauge. Approximately 500 lineal feet of new 10-inch-diameter carbon steel gas line will be installed. Safety pressure relief valves will be provided to protect the natural gas system components from overpressurization. The new 3,200-horsepower gas compressor will operate whenever the CTG is in operation. The location of the proposed gas compressor enclosure is shown on Figure 2.7-1. The new gas line route is shown on Figure 2.7-8. The maximum depth of excavation for the gas line is approximately 4 feet.

The natural gas will be further conditioned on site. The fuel gas compression will include inlet scrubbers, finfan gas coolers, and discharge coalescing filters. A final fuel filter will be installed at the combustion turbine.

GE's specification for gas quality is summarized in Table 2.7-3. The table also includes analytical results for representative gas samples to show the expected range in gas quality, and to demonstrate expected compliance with the specification.

### 2.7.5 Water Supply and Treatment

This section provides estimated consumptive use of water, and describes its source, quality, and water treatment systems for P3. The power plant's various water uses will include water for the CTG inlet air evaporative coolers, service water system users, and potable water. The simple-cycle combustion turbine will use dry low $NO_X$ burners; therefore, $NO_X$ injection water will not be necessary**.**

The water balance diagram is provided on Figure 2.7-6, and details for winter, average, and maximum conditions are presented on Figure 2.7-7.

#### 2.7.5.1 Water Source and Quality

P3 will use potable water from the City of Oxnard. The City already supplies potable water to MGS. A representative water analysis of the water supply is summarized in Table 2.7-4. Depending on availability, P3 stormwater may be reclaimed and stored in the existing service water tank, thereby displacing a corresponding amount of potable water usage.

P3 will use the existing MGS service water storage tank. This 445,000-gallon storage tank provides storage capacity for service water and fire water. Approximately 100,000 gallons of the 445,000-gallon service water storage tank will be reserved for firefighting water usage. The remaining 345,000 gallons of water storage will be available for process/utility service. This equates to approximately 91 hours of capacity at maximum demand. The largest user of service water is the evaporative cooler, which is not necessary for operation, and only used to increase performance when ambient temperature is above an appropriate level.

New service water and demineralized water supply lines will be extended to P3 from the existing MGS system. No additional pumps are required. Figure 2.7-8 shows the points of connection and routes of the extended water supply lines to P3 (see Section 2.7.9 and Figure 2.7-9 for information on the firewater system). The new service water line and the new demineralized water line will each be approximately 1,450 feet long; these lines will be installed in the same trench and are both expected to be a 3-inch-diameter high-density polyethylene (HDPE) pipe. The new water supply lines will be installed using standard pipeline installation techniques, and in accordance with the manufacturer's requirements for the installation of HDPE piping. In addition, a new 2-inch-diameter, 630-foot-long domestic water line will be installed to connect to the existing MGS domestic water supply tie-in. The maximum depth of excavation for the pipeline installation is approximately 4 feet.

#### 2.7.5.2 Water Treatment Requirements

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

- Demineralized water will be produced on site by a membrane-based production facility comprising a 2-pass RO system preceded by a softener. The following plant demineralized water uses are anticipated:
  - The combustion turbine air inlet evaporative cooler makeup water will be a 50/50 blend of demineralized water and service water (from the Service Water Storage Tank) to meet equipment manufacturer requirements. This prevents precipitation and scaling of compounds that could foul or damage the combustion turbines, and extends the life of the packing material used inside the evaporative coolers without adding chemicals.
  - Demineralized water will also be used for miscellaneous plant uses, such as periodic combustion-turbine-compressor washes.
- Demineralized product water will be stored in the two demineralized water storage tanks. Each tank provides sufficient capacity for approximately 96 hours of peak-load operation coinciding with an outage of the water treatment system. The primary user of demineralized water is the evaporative cooler, which is used for power augmentation.

#### 2.7.5.3 Consumptive Water Requirements

Daily and annual water consumptive requirements of P3 are summarized in Table 2.7-5. Average daily water requirements depend on the ambient temperature, capacity factor, and operating profile. The capacity factor was assumed to be 30 percent.

Maximum daily requirements are based on water consumption at maximum operating conditions of 82ºF and 31 percent relative humidity (i.e., a hot summer day). Average and maximum consumption assume that evaporative coolers are in operation.

The annual water consumption value is the estimated total amount of water that will be used by the facility, in acre-feet (AF). The simple-cycle unit is expected to operate less than 30 percent of the time, during peak power demand periods. Therefore, total estimated annual water use at P3 is expected to be approximately 16 AFY.

The water balance diagram (Figure 2.7-6) shows P3's water treatment processes and the distribution of treated water. Figure 2.7-7 provides the estimated daily continuous water flow rates in gallons per minute, corresponding to the heat and material balance case descriptions presented on Figure 2.7-4. The major consumptive use of water at the site is evaporative cooling; the estimate for average annual water use assumes that evaporative cooling would be on when ambient temperature is at or above 82 degrees Fahrenheit, and conservatively assumes that this would occur for approximately 1,314 hours per year (i.e., half of the estimated P3 annual operating hours).

The following sections describe P3's water uses.

#### 2.7.5.3.1 CTG Evaporative Coolers

Makeup water for the CTG evaporative coolers will be a 50/50 blend of demineralized and service water. Water evaporates in the CTG evaporative cooler and passes through the CTG. Because evaporation will concentrate minerals in the circulating water that is not evaporated, a quantity of water will be removed continuously as blowdown to prevent minerals from concentrating to levels above the CTG design limits. The blowdown will maintain the water in the evaporative cooler sump at approximately five cycles of concentration. The blowdown will be discharged to the existing MGS wastewater system. From there, it will be pumped to the existing North and South Basins, and discharged to the existing outfall. As required, water will be added to the evaporative cooler to replace the water that is lost to evaporation and blowdown.

#### 2.7.5.3.2 Service Water

Utility or hose stations at various locations in the power block will provide service water to wash down tools, equipment, and areas adjacent to the utility station.

### 2.7.5.4 Potable Water

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

## 2.7.6 Waste Management

This section describes the waste management processes leading to proper collection, treatment, and disposal of wastes. Wastes include process wastewater, solid nonhazardous waste, and hazardous waste. Additional information on waste management is provided in Section 4.14, Waste Management.

### 2.7.6.1 Wastewater

The water balance diagram (Figures 2.7-6 and 2.7-7) shows the expected wastewater streams and flow rates for the various plant processes. The flow rates shown are based on daily average, annual average, and peak conditions. Plant process wastewater streams will be collected in the existing North and South Basins. The estimated composition of the P3 wastewater stream is shown in Table 2.7-6. The wastewater will be tested and discharged to the ocean in accordance with the MGS NPDES Permit No. CA0001180 discharge requirements.

Table 4.5-3 in the Hazardous Materials Handling section lists the chemicals to be used for water and wastewater treatment. The system is designed for continuous monitoring of control parameters and specified quantities for optimum operations.

The plant's wastewater streams and treatments are described below. Process wastewater (softener regeneration waste, RO concentrate, and evaporative cooler blowdown) will be collected in the existing

MGS basins. Based on available data for the City of Oxnard water supply, the constituents regulated in the existing facility NPDES permit are assumed to be nondetectable or not present. Therefore, no compliance problems are anticipated when discharging process wastewater to the existing outfall.

#### 2.7.6.1.1 Water Treatment System

Reject from the first pass reverse-osmosis unit will be discharged directly to the existing MGS basins, along with clear oil-water separator (OWS) effluent and evaporative cooler blowdown. Reject from the second pass RO will be recycled within the plant, and consequently will not generate wastewater.

#### Evaporative Cooler Blowdown

The blowdown stream from the CTG evaporative cooler will be sent directly to the existing wastewater sump via the existing oily wastewater system.

#### Oil-Water Separator System

An OWS system will be installed to collect wastewater from equipment washdowns, leakage, and miscellaneous plant drains. Water from areas that may accumulate small amounts of oil and miscible chemicals will be collected in a system of floor drains, equipment drains, curbed area drains, sumps, and piping, and routed through the OWS. After passing through the OWS, water from the clear effluent chambers will be discharged to the existing wastewater sump, and ultimately routed to the North or South Basin.

#### 2.7.6.1.2 Domestic/Sanitary Wastewater

The proposed project will use the existing MGS Administration Building, which has sanitary and kitchen facilities; therefore, no additional facilities are required. The existing domestic waste system collects discharge from sinks, toilets, and other sanitary facilities, and discharges to the MGS' existing sanitary sewer collection system, which consists of septic tanks and leach field. The amount of domestic water used and sanitary wastewater generated is expected to be approximately the same as current operations. Therefore, no modifications to the existing septic system are anticipated.

### 2.7.6.2 Stormwater Runoff

MGS currently manages stormwater discharges in compliance with the Discharge Prohibitions, Effluent Limitations, and Receiving Water limitation specified in the Los Angeles Regional Water Quality Control Board Order No. 94-131, NPDES No. CA0001180, and the MGS Storm Water Pollution Prevention Plan (SWPPP) (NRG, 2014).

MGS currently does not separate process wastewater from stormwater runoff. The stormwater and process wastewater from MGS is currently collected in two retention basins. Stormwater is collected from approximately 12 acres of the 36-acre MGS property. The stormwater drains discharge to the stormwater sump. The stormwater sump has three pumps that discharge into the two existing retention basins. The retention basins discharge to the ocean in accordance with the discharge requirements of the MGS' existing NPDES permit. During periods of prolonged high-precipitation events, stormwater runoff may be routed directly to the ocean if capacity of the North and South Basins is about to be exceeded.

The proposed project will be located on approximately 3 acres of previously disturbed land within the MGS property. Stormwater runoff from this portion of the MGS property currently does not drain into the retention basins. As shown in the preliminary site grading and drainage plan (see Figure 2.8-1), stormwater runoff from the project site will be directed via a new stormwater conveyance system to either the service water tank for reuse, offsetting potable water use; or to the existing North and South Basins. The combined maximum storage capacity, with no freeboard, will be approximately 2.5 AF.

For the proposed project, stormwater runoff from areas that collect miscible chemicals or volatile liquids, and from areas that could collect nonmiscible oil will be directed to a new OWS system, discussed above. Oil leakage from equipment is expected to be minimal; however, all equipment that has potential for leakage of oil or hazardous chemicals will be situated in spill containment areas. The oil from the oil containment chambers of the OWS will be collected and shipped off site for recycling. After passing through the OWS, water from the clear effluent chambers will be discharged to the existing wastewater sump en route to the North and South Basins. Stormwater runoff from the P3 site will be collected and stored in the North and/or South Basins, and will be discharged to the ocean.

With the retirement of MGS Units 1 and 2, process wastewater from these units will no longer be discharged into the retention basins. The North and South Basins will be reused to handle P3 process wastewater and P3 and MGS stormwater; see calculations provided in Appendix A-7. Up to an estimated 400,000 gallons per year of rain water (depending upon precipitation pattern) could be collected and used as service water and irrigation water to reduce the amount of potable water used by P3.

Ultimately, collected stormwater will be discharged to the ocean via the existing outfall in accordance with the MGS' existing NPDES permit. During construction, the project will also comply with the NPDES Construction General Permit.

#### 2.7.6.3 Solid Nonhazardous Waste

The construction, operation, and maintenance of P3 will generate nonhazardous solid wastes typical of power generation facilities. Construction wastes generally include soil, scrap wood, excess concrete, empty containers, scrap metal, paper products, and insulation. Typical wastes generated during operation and maintenance include scrap metal and plastic, insulation material, paper, glass, empty containers, and other miscellaneous solid wastes. These materials are collected for recycling or transfer to landfills in accordance with applicable regulatory requirements. A description of the types of wastes likely to be generated and their related quantities is included in Section 4.14, Waste Management, and shown in Tables 2.7-7 and 2.7-8 for construction and operation, respectively.

#### 2.7.6.4 Hazardous Waste

Hazardous wastes will be generated as a result of project construction, operation, and maintenance, as discussed in Section 4.5, Hazardous Materials Handling.

##### 2.7.6.4.1 Construction

Interface with existing equipment, as well as demolition/removal of an abandoned fuel oil pipe, will generate hazardous waste, including asbestos-containing material from equipment and pipeline insulation. The majority of hazardous waste generated during construction/demolition will be liquid wastes such as waste oil and other lubricants from machinery operations; solvents used for cleaning and materials preparation; waste paints; and other material coatings as well as residual fuel oil from the aforementioned demolition. A description of the types and quantities of hazardous wastes that are likely to be generated is given in Section 4.5, Hazardous Materials Handling, and shown in Table 2.7-7.

##### 2.7.6.4.2 Operation

The methods used to properly collect and dispose or recycle hazardous waste generated by the plant will depend on the nature of the waste. Hazardous wastes generated by P3 will include spent SCR and oxidation catalyst, used oil filters, used oil, and chemical cleaning wastes. Spent SCR and oxidation catalyst will be recycled by the catalyst supplier, if possible, or disposed in a Class I landfill. Used oil filters will be drained and disposed of in an offsite disposal facility. Used oil will be recovered and recycled by a waste-oil recycling contractor.

Chemical cleaning wastes consist of acid and alkaline cleaning solutions and washwater used in periodic cleaning of the CTG. These wastes, which may have elevated concentrations of metals, will be tested. These and all other hazardous solid and liquid wastes will be disposed of in accordance with applicable LORS.

Workers will be trained to handle waste generated at the site, as described in Section 4.16, Worker Safety and Health.

### 2.7.7 Hazardous Material Management

#### 2.7.7.1 Construction

Hazardous materials used during construction of the project will be kept in a designated area in the proposed laydown areas (see Figure 2.9-3). The area designated for construction office facilities will include areas designated for construction equipment fueling, maintenance, and parking. Appropriate measures will be provided, including approved dual-walled fuel tanks, fueling equipment, containment, supply of absorbent material, and disposal containers for waste lubricants. Temporary containments will be sized to hold the appropriate volumes. The Emergency Action Plan developed for the project will include a section that addresses accidental releases of hazardous materials. A hazardous material emergency response team will be assigned and trained to manage a hazardous material release. Stored hazardous materials will be inspected daily for leaks and container failure. These inspections are part of the safety manager's daily routine and are integrated parts of the Safe Behavior Observation and pre-Task Planning processes.

#### 2.7.7.2 Operation

A variety of hazardous reagents and materials will be stored and used at P3 in conjunction with operation and maintenance of the project, as described in Table 4.5-3. In general, the number of materials will be less than those currently used for the operation of MGS Units 1, 2, and 3, because there will no longer be a steam cycle as part of the generation facility. The type and character of other materials will be the same as or comparable to those used in the current operations. Hazardous materials that may be routinely stored in bulk and used in conjunction with the project include, but are not limited to, petroleum products, flammable and/or compressed gases, acids and caustics, aqueous ammonia, water treatment and cleaning chemicals, paints, and some solvents.

The Hazardous Material Business Plan (HMBP) developed for the MGS will be updated to reflect retirement of MGS Units 1 and 2, and operation of P3. The MGS is California Environmental Reporting System ID 1020100.

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

The storage, handling, and use of hazardous materials during operations will be in accordance with applicable LORS. P3 will use existing hazardous materials storage and handling facilities on the MGS site, as described in the HMBP. Additional facilities specific to the new P3 will also be provided. With retirement of MGS Units 1 and 2, several of the existing facilities where hazardous materials were stored and handled will no longer be used. All materials will be segregated and regulated independently. Bulk tanks will be provided with secondary containment to contain leaks or spills. Safety showers and eyewashes will be provided in appropriate chemical storage and use areas. Personnel who may be required to handle hazardous materials will be properly trained to perform their duties safely, and to respond to emergency situations that may occur in the event of an accidental spill or release.

The aqueous ammonia storage tank for the SCR system has containment structures and other safety features, as described in Section 2.7.9, Ammonia Storage Facility.

Safety showers and eyewashes will be provided in the chemical feed areas. Service water hose connections will be provided near the chemical feed areas to facilitate flushing of leaks and spills of materials that are not reactive in water to the chemical feed area drains. Appropriate safety gear will be provided for plant personnel for use during the handling, use, and cleanup of hazardous materials. Plant personnel will be properly trained in the handling, use, and cleanup of hazardous materials used at the plant, and procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials will be stored on site.

All electrical equipment will be specified to be free of polychlorinated biphenyls. A list of the hazardous materials anticipated to be used at the plant is provided in Table 4.5-3. Each material is identified by type, intended use, and estimated quantity to be stored on site. Additional information on hazardous materials management is provided in Section 4.5, Hazardous Materials Handling.

## 2.7.8 Air Emissions Control and Monitoring

Air emissions from the combustion of natural gas in the CTG will be controlled by state-of-the-art systems. Controlled emissions will include $NO_X$, carbon monoxide (CO), volatile organic compounds (VOCs), particulate matter less than or equal to 10 microns in diameter ($PM_{10}$), and sulfur dioxide ($SO_2$). CEMS will be installed to monitor the stack emissions. All emissions values stated in the following subsections are based on parts per million by volume, dry basis (ppmvd) corrected to 15 percent oxygen ($O_2$). Complete information on air quality matters, including startup emissions, is provided in Section 4.1, Air Quality.

### 2.7.8.1 $NO_X$ Emissions Control

Low $NO_X$ combustors in the CTG, followed by SCR at the CTG flue gas outlet, will control stack emissions of $NO_X$ to a maximum 2.5 ppmvd (corrected to 15 percent $O_2$, 1-hour average excluding startups). The low $NO_X$ combustors control $NO_X$ emissions to approximately 20 ppmvd at the CTG exhausts by pre-mixing fuel and air immediately before combustion. Pre-mixing inhibits $NO_X$ formation by minimizing the flame temperature and the concentration of $O_2$ at the flame front.

The SCR process will use 19 percent by weight aqueous ammonia as a reagent. Stack emissions of ammonia, referred to as “ammonia slip,” will not exceed 5 ppm. The SCR system includes a catalyst chamber at the CTG flue gas outlet, catalyst bed, ammonia storage system, ammonia vaporization system, and ammonia injection system. Tempering/dilution air fans will be used for the CTG SCR system to reduce the flue gas temperature to the effective catalyst operating temperature, and dilution air fans will transport the ammonia vapor into the SCR, while keeping the ammonia concentration below 25 percent of the lower flammability limit. The ammonia injection grid is upstream of the catalyst chamber. It is expected that the 15,000-gallon aqueous ammonia storage tank will have a 10-day storage capacity (based on 14,000 gallons of usable storage) of plant continuous load at full capacity.

### 2.7.8.2 CO and VOC Emissions Control

An oxidation catalyst will be provided at the CTG flue gas outlet to limit CO emissions to less than 4 ppmvd, and VOC emissions to less than 2 ppmvd (corrected to 15 percent $O_2$). These emission levels correspond to current best available control technology. This catalytic system will promote the oxidation of CO to carbon dioxide, and VOC to carbon dioxide and water vapor, without the need for additional reagents.

### 2.7.8.3 $PM_{10}$ and $SO_2$ Emissions Control

$PM_{10}$ emissions consist primarily of dust entrained in the air and hydrocarbon particles formed during combustion. $PM_{10}$ emissions will be controlled by inlet air filtration and by the use of natural gas fuel, which contains essentially zero particulate matter.

$SO_2$ emissions will be controlled by the use of pipeline-quality natural gas, which contains only trace quantities of sulfur from the injected mercaptan odorant. As shown in Table 2.7-3, sulfur content in natural gas is expected to be very low, based on gas sample analyses provided by the supplier. As noted in the table, sulfur was not detected by the high-sensitivity equipment used for the analysis.

### 2.7.8.4 Continuous Emissions Monitoring

The CEMS uses dilution and/or direct extractive sampling techniques for in-stack or in-duct monitoring. The CTG has a 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 stacks. The CEMS systems will transmit data to a data acquisition system that will store the data and generate emission reports in accordance with permit requirements. The data acquisition system will also include alarm features that will send signals to the plant DCS when the emissions approach or exceed pre-selected limits.

## 2.7.9 Fire Protection

The proposed project will use the existing MGS firewater pumps and service water tank to service the new facility. The existing firewater loop will be expanded as required, as shown on Figure 2.7-9. The plant fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. All fire protection equipment will be approved by Factory Mutual Research Corporation and/or listed by Underwriter Laboratories for fire protection equipment. The system will include a multi-zone water-mist fire protection system for the CTG furnished by the CTG manufacturer, fire hydrants, and portable fire extinguishers. The primary source of fire protection water will be water stored in the existing MGS Service Water Storage Tank. Approximately 100,000 gallons of water are reserved in the tank for fire water use. There are two existing electric fire pumps at the tank. The power supply to these pumps will be revised. One pump will be connected to the new P3 switchgear, with back up from the new P3 emergency diesel generator; and one pump will be connected to MGS Unit 3, which gets its electrical feed from a separate SCE 66-kV switchyard (this pump will become the emergency backup pump). Each pump is rated 1,000 gallons per minute at 120 pounds per square inch. The new gas turbine unit is equipped with a fire detection and water misting system that receives water supply from the fire water system. The fire pumps will start automatically when called for by the gas turbine fire detection system, or manually via the plant control system. New fire loops will be designed to protect P3, as shown in Figure 2.7-9. The system is designed in accordance with:

- Federal, state, and local fire codes, occupational health and safety regulations, and other jurisdictional requirements;
- California Building Code; and
- National Fire Protection Association (NFPA) standard practices.

The existing fire water supply and pumping system will provide an adequate quantity (volume and pressure) of fire-fighting water to yard hydrants and CTG-supplied water-based fire suppression systems as required. The system is capable of supplying maximum water demand for any automatic system, plus water for fire hydrants. Hydraulic calculations will be performed to demonstrate that the fire protection loop has sufficient capacity to provide all the required fire-fighting water for the new power plant. A plant firewater loop, designed and installed in accordance with NFPA 24, is provided to reach all parts of the facility. The existing MGS fire pumps will discharge to the new dedicated extension of the existing underground firewater loop piping system. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. The firewater system has sectionalizing valves to allow a failure in any part of the system to be isolated, so that the remainder of the system can continue to function properly.

Fixed water mist fire suppression systems for turbine lube oil and other CTG-supplied equipment will be factory supplied and installed, in accordance with NFPA 750, Water Mist Fire Protection Systems, by the CTG supplier and will be fed from the new fire water loop as required. Upon activation of the CTG extinguishing system or any detectors, the fire incident will be alarmed locally and in the main plant control room at the existing Main Fire Control Panel. The administration and control room buildings are existing, and will not receive additional fire protection equipment. Hydrants will be placed at appropriate spacing around the new power plant in accordance with NFPA 24 and local fire codes. Handheld fire extinguishers of the appropriate size and rating will be stored throughout the facilities, in accordance with NFPA 10. Valves requiring periodic testing will be made accessible.

Table 2.7-9 lists fire protection system design conditions.

### 2.7.10 Plant Auxiliary and Safety Systems

The plant auxiliary systems described below will support, protect, and control the power plant.

#### 2.7.10.1 Lighting System

The plant lighting system provides personnel with illumination for plant operation under normal conditions, means of egress under emergency conditions, emergency lighting to perform manual operations during a power outage of the normal power source, and construction lighting in areas where early installation is feasible. The lighting system will be designed in accordance with Illuminating Engineering Society of North America, and calculated average illumination levels with 0.8 maintenance factor, as shown on Table 2.7-10. Components of the lighting plan will include:

- Photo cells will control all outdoor lighting.
- Frequently switched indoor lighting (such as office and maintenance areas) will be controlled by wall-mounted lighting switches. Infrequently switched indoor lighting (such as the equipment buildings) will be controlled by panel board circuit breakers.
- Self-contained battery-backed emergency lighting and exit signs will be furnished to provide safe personnel egress from buildings during a total loss of plant power. Emergency lighting will be designed to maintain the necessary illumination for a minimum of 90 minutes.
- All 120-volt outdoor receptacles will be fed from ground-fault-circuit-interrupter-type receptacles. All 120-volt receptacles will be situated so that equipment at grade can be reached with a 75-foot extension cord.
- Fixtures will be placed to offer maximum illumination of operating work areas in compliance with Federal Occupational Safety and Health Administration (OSHA) safety standards, and will include shielding to minimize offsite illumination.

#### 2.7.10.2 Grounding System

The electrical system is susceptible to ground faults, lightning, and switching surges that result in high voltage, which constitutes a hazard to site personnel and electrical equipment. The station grounding system provides an adequate path to permit the dissipation of current to ground created by these events. The station grounding grid will be designed for adequate capacity to dissipate the ground fault current from the ground grid under the most severe conditions in areas of high ground fault current concentration. The grid spacing will maintain safe voltage gradients. Bare conductors will be installed below-grade in a grid pattern. Each junction of the grid will be bonded together by an exothermic weld. Ground-resistivity readings will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under severe fault conditions. Grounding conductors will be brought from the ground grid to connect to building steel and nonenergized metallic parts of electrical equipment.

#### 2.7.10.3 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 CTG and other systems in a coordinated manner;
- Controlling the balance-of-plant systems in response to plant demands;
- Monitoring controlled plant equipment and process parameters and delivery of this information to plant operators;
- Providing control displays (printed logs, LCD video monitors) for signals generated within the system or received from I/O;
- Providing consolidated plant process status information through displays presented in a timely and meaningful manner;
- Providing alarms for out-of-limit parameters or parameter trends, displaying on alarm video monitors(s), and recording on an alarm log printer; and
- Providing storage and retrieval of historical data.

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

- PC-based operator consoles with LCD video monitors;
- Engineer work station;
- Distributed processing units;
- I/O cabinets;
- Historical data unit;
- Printers;
- Network Cabinet; and
- Data links to the CTG 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 by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes. With redundant systems, 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 a UPS.

As part of the quality control program, daily operator logs will be available for review to determine the status of the operating equipment. The DCS will also transmit selected information to the California Independent System Operator remote terminal unit for grid and generation control purposes.

#### 2.7.10.4 Cathodic Protection System

The need for cathodic protection for buried metallic piping and tank bottoms will be determined, based on specific site parameters and local codes or requirements. The cathodic protection system will be designed to control the electrochemical corrosion of designated metal piping buried in the soil. Depending upon the corrosion potential and the site soils, either passive or impressed current cathodic protection will be provided.

#### 2.7.10.5 Freeze Protection Systems

Freeze protection for above-grade and below-grade piping and instrumentation lines will be evaluated and installed, as necessary, based on the expected minimum ambient temperature at the plant. For a minimum temperature of 39°F for the Oxnard area, freeze protection is not expected to be required for large piping, but may be required for smaller instrumentation air tubing.

#### 2.7.10.6 Service Air System

The service air system will supply compressed air to hose connections at intervals throughout the power plant. The service air system will use dry, filtered air from the instrument air system to eliminate the need for any type of freeze protection. The instrument air system will be protected from a service air failure or leak via back-pressure regulators or similar devices to ensure that adequate pressure always remains in the instrument air system.

#### 2.7.10.7 Instrument Air System

The instrument air system will provide dry, filtered air to pneumatic operators and devices throughout the power plant. The system consists of a single, electrically driven air compressor, a heatless desiccant dual-tower air dryer with pre-filter and after-filter, and an air receiver. Instrument air headers and distribution piping are also provided for the CTG and SCR areas.

The system capacity is based on the total quantity of air users and capacity of each user, plus a margin to account for leakage and plant modifications.

## 2.8 CIVIL/STRUCTURAL FEATURES

The following sections describe civil/structural features of P3, as illustrated in the plot plan presented on Figure 2.7-1. Table 2.8-1 lists the major structures of the power plant and gives their dimensions. In addition to the features described in this section, descriptions of the electric transmission interconnection are provided in Chapter 3, Transmission Facilities.

### 2.8.1 CTG and Balance-of-Plant Equipment

The CTG will be supported at grade elevation on reinforced-concrete mat foundations. The unit auxiliary and the main transformer are also supported at grade elevation on reinforced-concrete foundations. Balance-of-plant mechanical and electrical equipment will be supported at grade elevation on individual reinforced-concrete foundations. It is anticipated that deep foundations (such as driven piling up to a maximum depth of 70 feet) may be required in certain areas; up to 270 piles may be required. The concrete foundation design will be finalized as required by the final geotechnical report.

### 2.8.2 Stack

The CTG will be provided with a self-supporting steel stack. The stack will be approximately 22 feet in diameter and 188 feet tall. The stack will include U.S. Environmental Protection Agency sampling ports, ladders, side-step platforms, and electrical grounding. Aviation lighting is not anticipated, but will be provided if required by the Federal Aviation Administration (FAA).

### 2.8.3 Buildings

P3 will use the existing MGS administration building (4,000 square feet), which will be upgraded to meet current energy and water-efficiency requirements; improvements will include insulating the exterior walls and roofs, replacement of existing window units with more efficient units, and replacement of existing curtain walls and entrance doors. A portion (600 square feet) of the existing warehouse will be reconfigured to add a control room for the proposed project. A new gas compressor will be installed, including acoustical noise enclosure. Water treatment facilities will be housed in a modular unit. MGS has approximately 140 parking spaces to accommodate all employee and visitor vehicles, including handicapped parking; no additional parking is required for P3 because workforce for P3 will be the same as MGS. The existing administration building meets handicapped accessibility requirements. The reconfigured control room will be designed to meet handicapped accessibility requirements (refer to Appendix A-1).

### 2.8.4 Water Storage Tanks

P3 will reuse the following existing MGS water storage facilities:

- Service Water Storage Tank 445,000 gallons
- Demineralized-Water Storage Tanks (2) 144,000 gallons each

The tanks have a double-steel bottom with reinforced-concrete layer between the steel bottoms. The tanks sit on a layer of compacted sand and rocks.

### 2.8.5 Roads and Fencing

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

### 2.8.6 Sanitary Wastewater System

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

### 2.8.7 Site Drainage

The proposed grading and drainage plan is shown on Figure 2.8-1. The drainage areas and flows shown on Figure 2.8-2 are based on the proposed grading. Preliminary calculations to size the system are provided in Appendix A-7. The existing points of discharge will be maintained. Stormwater collected from the curbed portion of the plant site where oils and grease may be present will be routed first to the OWS, and then to the existing North and South Basins. P3 area stormwater will be collected, and may be stored in the service water tank and reused to the extent practicable to offset potable water usage. Surplus stormwater runoff will be discharged to the existing stormwater system and stored in the existing North and South Basins. The stormwater for the existing MGS area will also be stored in these basins, and eventually discharged through the existing outfall to the Pacific Ocean.

### 2.8.8 Earthwork and Foundation

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

Compaction will be performed in uniform layers of specified thickness as recommended in the geotechnical investigation report. Materials in each layer will be moistened properly to the optimum moisture content to facilitate compaction to the specified density. To verify the compaction, representative density and moisture content tests will be performed in the field during compaction. Structural fill material will be used under foundations, roads, parking areas, etc., and will be compacted as recommended in the project geotechnical investigation report. Before fill materials are placed, subgrades will be examined for loose or soft areas, and further excavated as necessary.

The estimated volumes of soil that will be handled are as follows, based on the full construction of the unit and the preliminary grading shown on Figure 2.8-1:

- Cut = 12,400 cubic yards
- Fill = 1,000 cubic yards
- Net export = 11,400 cubic yards

The final grading plans that will be prepared during the detail design phase may result in a different balance of cut and fill volumes. However, for purposes of this Application for Certification, the preliminary design assumes that there may be an excess of soil.

The project intends to reuse or recycle as much of the excess soil as appropriate. The excess soil will be characterized so that clean soils can be reused. Soil that cannot be reused will be transported to an appropriate landfill site. Although a specific beneficial reuse of the excess soil has not yet been identified, the Applicant will explore such reuse opportunities at the appropriate time.

The maximum excavation depths in feet bgs for the following project components are:

- 7 feet bgs for P3 turbine block;
- 5 feet bgs for the reminder of P3 foundations;
- 5 feet bgs for transmission poles; and
- 4 feet bgs for all requisite piping.

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

### 2.8.9 Ammonia Storage Facility

Operation of the SCR $NO_X$ emission control system will include the use of the existing aqueous ammonia tank and piping/delivery system. For P3, the aqueous ammonia solution consisting of water and ammonia at 19 percent (by volume) will be used for $NO_X$ control.

The proposed project will use the existing MGS ammonia receiving and storage system. The existing ammonia storage tank will be retained and reused. A new ammonia transfer pump will be installed (if necessary), and a new 1-inch-diameter, 550-foot-long ammonia line will be installed to interconnect to P3's ammonia distribution system (see Figure 2.7-8). The new ammonia line to P3 will be 1-inch-diameter carbon steel pipe. The ammonia storage tank has a dedicated concrete containment area, and a tanker truck offloading facility in a containment berm. The capacity of the storage tank is 15,000 gallons.

Area sensors will be added at the ammonia vaporization skid areas to monitor for ambient ammonia concentrations. Alarms will be designed to annunciate in the control room with local audible alarms for ammonia releases at the facilities.

Maximum ammonia demand for P3 will be 84 pounds of contained ammonia per hour at 19 percent aqueous ammonia (19 percent solution). This equates to approximately 441 pounds per hour of solution, or 57 gallons per hour.

## 2.9 PROJECT CONSTRUCTION

Site mobilization, grading, construction, and start-up/commissioning are estimated to take approximately 21 months (see Figure 2.9-1). Decommissioning of Units 1 and 2 is expected to occur from June 2020 to August 2020. The project construction schedule, construction staff, craft manpower, and average frequency of vehicle traffic are detailed in the sections below.

### 2.9.1 Power Generation Facility

Site mobilization of the project is expected to ensue following receipt of certification. Onsite construction is expected to commence in October 2018. Construction and startup of P3 would be completed by June 2020. The schedule has been estimated based on a single-shift, 10-hour day and 50-hour week. The majority of construction operations are expected to take place between 7:00 a.m. and 6:00 p.m. However, longer workdays or work weeks may be necessary to make up schedule delays or complete critical construction activities, such as extended concrete pours for plant foundations. During the start-up and testing phase of the project, some activities may continue 24 hours per day, 7 days per week. Projected construction staff by month is shown in Table 2.9-1, and on Figure 2.9-2. The onsite workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The estimated construction workforce (craft) by trade is shown in Table 2.9-1 and on Figure 2.9-2. The onsite workforce is expected to reach its peak of 90 individuals in May 2019. Construction access to the site will be via North Harbor Boulevard. The estimated average and peak numbers of construction staff vehicle round trips per day, and the estimated number of average and peak truck deliveries per day are shown in Table 2.9-2 and on Figure 2.9-3. Construction equipment usage is shown on Table 2.9-3.

### 2.9.2 Construction Plan

The project will be executed by an EPC contractor that will be responsible for the design, procurement, construction, and start-up of the facility. The EPC contractor will select subcontractors for certain specialty work as required. The major Power Island equipment will be procured and supplied by NRG for installation by the EPC Contractor.

#### 2.9.2.1 Mobilization

The EPC contractor construction force will mobilize in approximately October 2018. Site preparation work will include site grading and stormwater control. Crushed rock will be used for temporary roads, laydown, and work areas that are not currently paved.

### 2.9.2.2 Construction Staffing

Construction staffing is presented in Table 2.9-1. During peak construction in May 2019 (i.e., Month 8) 90 construction workers are expected to be on site (74 craft laborers plus 16 construction staff). It is expected that the majority of the construction workers will commute daily 90 minutes or less each way to the project site in Ventura County. Given the size of the labor force within commuting distance of the site, construction laborers are not expected to relocate for the construction period. It is expected that there would be enough construction workers/laborers available in the study area to meet project demands during the construction period.

### 2.9.2.3 Construction Laydown Areas, Offices, and Parking

Mobile trailers or similar suitable facilities (e.g., modular offices) will be used as construction offices for contractor and subcontractor personnel. Areas of the MGS that will be used for construction offices, laydown, and parking are shown on Figure 2.9-3. Site access will be controlled for personnel and vehicles. As necessary, temporary security fences will be installed around the construction laydown areas.

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

Access between the onsite laydown areas and the project site will be on internal plant roads. Deliveries to the onsite laydown areas will be via North Harbor Boulevard. The crushed rock surfacing will provide erosion protection. The laydown areas will be fenced around their perimeter as required. Gates will be provided for access control. At the end of construction, these areas will be cleaned up, but the crushed rock surfacing and fencing will remain in place. No additional restoration will be required at the end of construction.

### 2.9.2.4 Construction Materials and Equipment Delivery

Construction materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables will be delivered to the P3 site by truck, as shown on Table 2.9-2. The heavy equipment, such as the combustion turbine, GSU transformer and associated components will be transported by rail, and then trucked to the site. Union Pacific Railroad has a switchyard approximately 5 miles east of the site near Highway 1, 3rd Street, Rose Avenue, and 5th Street. The components will be lifted from the railcar at the approved siding by an overhead hydraulic gantry system, and transferred to a heavy-haul transporter (such as a self-propelled Goldhoffer) for transport to the site. Three deliveries would be anticipated for the project.

Table 2.9-3 shows the average construction equipment expected to be onsite during project construction.

### 2.9.2.5 Gas Pipeline Construction

The natural gas pipeline connection will be completed in time to support the construction interface in March 2019. Construction of the pipeline is considered in the overall construction schedule presented in Section 2.9-1. The pipeline workforce will consist of pipefitters, welders, equipment operators, supervisory personnel, and construction management personnel.

The new pipeline will be an approximately 10-inch-diameter all-welded steel pipe, installed and tested in accordance with American National Standards Institute B31.1 Power Piping Code. The final pipe size will be determined during detailed design. The underground portion of the pipeline will be coated with a fusion-bonded epoxy coating to protect the pipe from exterior corrosion. The total length of the new natural gas pipeline from the new gas metering station through the new gas compressor to the combustion turbine interface will be approximately 500 feet. The maximum depth of excavation is approximately 4 feet.

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

Construction staffing requirements for installation of the gas line are included in Table 2.9-1. Equipment required for installation of the gas line is included in Table 2.9-3. Equipment laydown will occur in the project construction laydown areas.

#### 2.9.2.6 Emergency Facilities

Emergency services will be coordinated with the City of Oxnard Fire Department and Community Hospital. An urgent care facility will be contacted to set up nonemergency physician referrals. At least one person trained in first aid will be part of the construction staff. Fire extinguishers will be available throughout the site at strategic locations at all times during construction.

#### 2.9.2.7 Construction Utilities and Site Services

Temporary utilities will be provided for the construction offices, the laydown areas, and the project site during construction. Temporary construction power will be furnished via the existing backfeed power distribution system. Area lighting will be provided and strategically located for safety and security.

Construction water will be supplied by the existing MGS water system, and by water truck deliveries as necessary. As shown on Table 2.9-4, average daily use of construction water over the 21-month construction period is estimated to be approximately 1,650 gallons, ,of which approximately 980 gallons is for dust suppression. The maximum monthly water use is estimated at 75,000 gallons, during hydrotesting of piping. The hydrotest water will be tested, and if suitable will be reused, or discharged appropriately. If the water quality is not suitable for discharge, the water will be transported by trucks to an approved offsite disposal facility. Other construction water uses include compaction, concrete placement, grouting, and cleaning. The total estimated amount of water that will be needed for construction of P3 is approximately 3.2 AF.

The following site services will be provided during construction:

- Environmental health and safety training;
- Site security;
- Site first aid;
- Construction testing;
- Site fire protection and extinguisher maintenance;
- Furnishing and servicing of sanitary facilities;
- Trash collection and disposal; and
- Disposal of hazardous materials and waste in accordance with local, state, and federal regulations.

### 2.9.3 Offsite Roadway Improvements

No offsite roadway improvements are required for P3.

### 2.9.4 Construction Land Disturbance Control Measures

The P3 site is within the existing MGS property. The EPC contractor will implement the following fugitive dust control measures during construction at the project site to minimize the formation of fugitive dust:

- Water unpaved roads and disturbed areas frequently (at least twice a day). Frequency of watering will be increased when wind speeds exceed 15 miles per hour.
- Limit speed of vehicles in construction areas to no more than 15 miles per hour.
- Sweep paved internal roads after the evening peak period.
- As necessary, sweep public roadways that are adjacent to the project site and used by construction and worker vehicles.
- Treat the entrance roadways to the construction site with soil stabilization compounds.
- Install windbreaks (optional and as necessary) at the windward sides on construction areas before soil is disturbed. The windbreaks will remain in place until the soil is stabilized or permanently covered. Watering of excavation areas before, during, and after excavation should make use of windbreaks unnecessary.
- Replace ground cover in disturbed areas as quickly as possible.
- Use gravel ramps before entering a public roadway to limit accumulated mud and dirt deposited on public roadways.
- Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain a minimum of 6 inches of freeboard between the top of the load and the top of the trailer.
- Limit equipment idle times (no more than 15 consecutive minutes).
- Use electric-motor–driven construction equipment when feasible.
- Apply covers or dust suppressants to soil storage piles and disturbed areas.
- Pre-wet soil to be excavated during construction.
- Designate a person to oversee the implementation of the fugitive dust control program.

As discussed in Section 4.1, Air Quality, the fugitive dust mitigation measures listed above are expected to control more than 90 percent of the fugitive dust that occurs during onsite construction.

In addition, a construction SWPPP will be prepared and implemented. A preliminary draft construction SWPPP is provided in Appendix A-8. This plan includes best management practices (BMPs) that may be used to minimize erosion. BMPs that may be implemented during construction activities to reduce pollutants in stormwater discharges can be categorized as follows:

- Soil Stabilization (Erosion Control) Practices;
- Sediment Control Practices;
- Tracking Control Practices;
- Wind Erosion Control;

- Nonstormwater Management;
- Concrete Management Practices; and
- Waste Management Practices.

#### 2.9.4.1 Site-Specific Health and Safety Plan

A site-specific health and safety plan (HSP) will be developed by the EPC contractor for its scope of work. The HSP will incorporate information and procedures to be followed by onsite personnel for the completion of the work. The HSP will outline requirements and provide guidance for control of construction safety hazards in compliance with safety standards and protection of public health.

#### 2.9.4.2 Air Monitoring and Dust Control Measures

Personnel monitoring and OSHA standards are addressed in the HSP. Dust control measures specified above in Section 2.9.4 will be implemented.

### 2.9.5 Construction Security Plan

It is a customary practice for a construction company's employees to work in and around existing facilities and not enter areas designated as unauthorized. Accordingly, contractors typically have established work rules and consequences for being in an unauthorized area.

As indicated on Figure 2.9-3, a number of construction laydown areas are within the existing MGS property. It will be necessary to control the entry of construction personnel into these areas. In the range of 15 to 25 construction employees will require access into the laydown areas on a somewhat routine basis—particularly in the early stages of construction—for unloading, loading, and trucking materials into the project work site.

#### 2.9.5.1 Security Plan for Construction Areas

The MGS has an existing perimeter fence; all construction activities will be inside the fenced area. A guard will be stationed at the designated gates to control access.

#### 2.9.5.2 Training

All construction employees will be trained on the requirements for entry and exit into the construction areas, and the requirement to stay out of unauthorized areas. A map of the plant site (similar to Figure 2.9-3) will be provided to construction personnel showing the areas they can access. All other areas are unauthorized for entry unless special permission is granted by the Applicant's onsite representative. All employees will be trained on the requirements for entry into unauthorized areas.

#### 2.9.5.3 Work Rules

If the construction companies do not have an established work rule for entry into unauthorized areas, such a rule will be created. Typical disciplinary techniques will include a written warning, suspension, and termination for the first, second, and third offense, respectively, though actual disciplinary action will be determined on a case-by-case basis.

### 2.9.6 Demolition Plan

Upon project approval, demolition and removal of the abandoned fuel oil pipe will begin. The demolition and removal will occur between MGS Unit 2 and the former fuel oil tank. The work force and equipment for demolition is included in the construction work force and construction equipment use tables (Tables 2.9-1 and 2.9-3).

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

Potential wastes generated during demolition generally include scrap metal, soil, concrete, and fuel oil residual waste. These materials are collected for recycling, or for transfer to landfills, in accordance with applicable regulatory requirements. A description of the types of wastes likely generated, and related quantities, is included in Section 4.14, Waste Management; and is shown in Tables 2.7-7 and 2.7-8 for construction and operation, respectively.

To reduce demolition impacts, BMPs will be employed. The BMPs include maintaining and using all concrete and asphalt pavement, sweeping and dampening pavements as necessary to prevent dust nuisances, watering for dust suppression, and covering all truck loads prior to exiting the demolition work zone area. Residual oil and oily water will be captured and containerized, and recycled or disposed of off site. Existing dust suppression and storm drain water will be managed by existing storm drain inlets and distribution lines.

### 2.9.7 Decommissioning Plan

Decommissioning of MGS Units 1 and 2 will consist of the following activities:

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

Following a 3-month commissioning process of the P3 facility and successful commercial operation in the summer of 2020, generation from the MGS Units 1 and 2 would no longer be necessary, and permanent decommissioning of these units would then begin. It is anticipated that decommissioning activities would take place over the course of approximately 3 months at the most, from June through August of 2020.

A small staff of electricians, millwrights, and laborers will perform the activities described above. The P3 operations staff would oversee this phase of work, which would be performed by the EPS workforce by employing up to nine workers (two electricians, two millwrights, three laborers, and two construction supervisors) on an intermittent basis.

There will be no heavy construction equipment required (e.g., cranes). Hazardous chemicals will be hauled away in their own containers, such as totes, if applicable. The largest hazardous fluid inventory is anticipated to be the lube oil from the steam turbines and other storage tanks, which will be pumped out and hauled away by truck. Other tasks such as de-energizing and disconnecting electrical equipment, and mechanically disconnecting and capping pumps, piping, and other equipment, will be performed by manual craft personnel,

In addition, all of the Ventura County Air Pollution Control District air permits for MGS Units 1 and 2, the existing MGS diesel emergency generator engine, and the diesel emergency fire pump engine would be retired at the beginning of this phase.

## 2.10 FACILITY OPERATION AND MAINTENANCE

The P3 operation will be controlled and monitored by highly trained operators during each operating shift. In addition, maintenance and supervisory personnel generally will be present during the day shift, and as required by specific operations or maintenance activities, during night shifts. Plant operation will require approximately 17 full-time permanent personnel (Table 2.10-1), with 12 employees working a day shift and 5 employees working a standard 8-hour day. The plant will be staffed 7 days a week, 24 hours a day. When the plant is not operating, personnel will be present as necessary for maintenance and to prepare the plant for start-up. P3 will use existing MGS staff.

Power produced by P3 will be sold into the California wholesale power market to support local reliability and serve electric demand in Southern California. Operations will depend on market demand and the provisions of bilateral sales. Peak-load operation most likely will occur during summer peak hours, and minimum-load operation during off-peak hours. Shutdown periods for annual maintenance will be scheduled during extended periods of low demand, which typically occur in the autumn or spring.

Ancillary services provided by the plant will be sold to the California Independent System Operator. These services include regulation, operating reserve to the extent the plant is not operating at full load, and reactive power production. Black start capability will not be provided.

The design of P3 provides for a wide range of operating flexibility; that is, an ability to start up quickly and operate efficiently across its dispatch range. Overall annual availability of the power plant as measured by EAF is expected to be in the range of 94 to 98 percent. The power plant’s output will depend on market conditions and dispatch requirements.

## 2.11 FACILITY CLOSURE

Facility closure can be temporary or permanent. Temporary closure consists of a cessation in operations for a period of time greater than the time required for normal maintenance, including overhauls or replacements of major equipment. Potential causes for temporary closure include economic conditions or repairable damage to the plant from earthquake, fire, storm, or other such events. Permanent closure consists of a cessation in operations with no intent to restart operations. Potential causes for permanent closure include age of the plant, economic conditions, or irreparable damage to the plant. Temporary and permanent facility closures are discussed in the following sections.

### 2.11.1 Temporary Closure

In the event of a temporary closure, 24-hour staffing for the proposed facility will be maintained and the California Energy Commission (CEC) will be notified. Actions taken will depend on whether the temporary closure involves a release of hazardous materials.

If there is no release or threatened release of hazardous materials, a contingency plan for the temporary cessation of operations will be implemented. The contingency plan will be conducted to ensure public health and safety; protection of the environment; and conformance with all applicable LORS. Appropriate procedures will depend on the expected duration of the shutdown. Accordingly, the contingency plan may include the draining of chemicals, water, and other fluids from storage tanks and plant equipment, and various other procedures to ensure worker safety and to protect plant equipment. All hazardous and nonhazardous waste materials will be collected and disposed of as described in Section 4.5, Hazardous Materials Handling.

If there is a release or threatened release of hazardous materials, procedures set forth in a Risk Management Plan (RMP) will be implemented. The RMP to be prepared is described in Section 4.5. Procedures include methods to control releases of hazardous materials, notification of appropriate authorities and the public, training for plant personnel, and other emergency response actions and preparation. When the release of hazardous materials has been contained and cleaned up, temporary closure will proceed, as in the case of a closure where there is no release of hazardous materials.

### 2.11.2 Permanent Closure

The planned operational life of the proposed facility is at least 30 years. If the facility continues to be economically viable, it could be operated for a longer period of time. Operation beyond 30 years would defer environmental impacts resulting from the construction of replacement facilities. It is also possible that the facility could become economically noncompetitive before 30 years, forcing early decommissioning. Whether the facility is closed at the expiration of 30 years, after more than 30 years, or prior to 30 years due to economic or other reasons, procedures set forth in a decommissioning plan will be implemented. The decommissioning plan to be prepared is described below.

To ensure public health and safety; protection of the environment; and conformance with applicable LORS, the decommissioning plan will be submitted to the CEC for review prior to commencement of permanent facility closure measures. Such measures may range from extensive “mothballing” to removal of all equipment and appurtenances, depending on circumstances at the time. However, future conditions that would affect decommissioning decisions are largely unknown at this time. It is therefore appropriate to present decommissioning details to the CEC and other jurisdictional agencies when more information is available, and the time for permanent facility closure has drawn closer.

The decommissioning plan for P3 will include the following:

- Description of the proposed decommissioning measures for the facility and for all appurtenances constructed as part of the facility;
- Description of the activities necessary to restore the site if the decommissioning plan calls for removal of all equipment and appurtenances;
- Discussion of decommissioning alternatives other than restoration of the site;
- Presentation of the costs associated with the proposed decommissioning measures and the source of funds to pay for the decommissioning; and
- Discussion of conformance with applicable LORS and with local and regional plans.

In general, the proposed decommissioning measures will attempt to maximize the recycling of all facility components. Unused chemicals will be sold back to the suppliers or other purchasers where practicable. All equipment will be shut down and drained so as to ensure public health and safety and protection of the environment. All hazardous and nonhazardous waste materials will be collected and disposed of as described in Sections 2.7.7. Until decommissioning activities have been completed, 24-hour staffing for the facility will be maintained.

## 2.12 SAFETY, AVAILABILITY, AND RELIABILITY

### 2.12.1 Facility Safety

P3 will be designed for safe operation. Potential hazards that could affect project facilities include earthquake, flood, and fire. Safe operation includes safety for the plant operating personnel, who will be trained to provide the proper response to hazards and to avoid unsafe operating conditions.

#### 2.12.1.1 Natural Hazards

A summary of geologic hazards in the P3 vicinity is provided in Section 4.4, Geologic Hazards and Resources. This summary includes a review of potential geologic hazards, seismic ground motion, and soil liquefaction. The principal natural hazard associated with the site is the potential for liquefaction

(Ninyo & Moore, 2013). All project structures will be designed in conformance with International Building Code (IBC, 2007) criteria to ensure safety for operating personnel, and adequate protection against structural and equipment damage. The project site is within 2.4 miles of an earthquake fault (Ninyo & Moore, 2013). The structural and seismic design criteria for project buildings and equipment are provided in Appendix A-3.

The existing site elevation is at approximately elevation 14 feet above mean sea level (NAVD 1988). The proposed grade for the main power block area will be approximately 14 feet NAVD88. The P3 site is not in a Federal Emergency Management Association-designated 100-year flood zone.

P3 has been designed to address potential implications of climate change, including sea-level rise, increased frequency and intensity of weather-related events, and shifts in the coastline. A site-specific analysis for P3 that includes the combined effects of sea-level rise, storm surge, wave events, erosion risk, etc., is contained in Section 4.15, Water Resources.

#### 2.12.1.2 Onsite Fire Protection Systems

Onsite fire protection systems will be provided to P3 to limit personnel injury, property loss, and plant downtime resulting from a fire. The fire protection systems are described in Section 2.7.9, Fire Protection. The facility will have a Fire Protection Plan as outlined in Section 4.16, Worker Safety and Health.

#### 2.12.1.3 Local Fire Protection Services

P3 will receive fire protection services from the nearest fire station, which is approximately 4 miles away. The project's RMP described in Section 4.5, Hazardous Materials Handling, will provide necessary information on hazardous materials to ensure that safe and effective fire-fighting measures are used. Additional information on local emergency services can be found in Section 4.10, Socioeconomics.

#### 2.12.1.4 Personnel Safety Programs

P3 will implement the personnel safety programs described in Section 4.16 to provide for personnel safety and ensure compliance with federal and state occupational safety and health requirements.

#### 2.12.1.5 Aviation Safety – Power Generation Stacks

The FAA Regulations Part 77 establishes standards for determining obstructions in navigation space and sets forth requirements for notification of proposed construction. These regulations require notification of any construction over 200 feet in height above ground level. The closest airfield is the Oxnard Municipal airport, which is approximately 1.8 miles southeast of the project site. The closest airfield with regularly scheduled commercial flights is approximately 44 miles away (Santa Barbara Airport). The stack will be 188 feet above ground. A Notice of Construction or Alteration will not be required to be filed with the FAA. Local air uses will be reviewed to determine the need for other aviation safety markings.

### 2.12.2 Reliability and Availability

This section discusses plant reliability and availability, equipment redundancy, fuel availability, water availability, and project quality control measures.

#### 2.12.2.1 Plant Reliability and Availability

The planned operational life of P3 is at least 30 years. For this operational life to be realized and the plant to operate reliably, a preventive maintenance program will be implemented for the project. This program will begin during engineering and procurement for the project, when designs and specifications will be reviewed for reliability and maintainability of plant systems and equipment. During the operational phase of the project, the preventive maintenance program will consist of monitoring, record-keeping, and maintenance work to detect and rectify deterioration in systems and equipment before such deterioration results in a forced outage or prolonged maintenance outage.

It is expected that the preventive maintenance program will result in high plant availability. Plant availability refers to the plant's available generating capability during a given period of time. The EAF is a weighted average measure of plant availability considering both full and partial outages. In determining the EAF, outages are weighted by magnitude (i.e., fractional reduction in available generating capacity) and duration. Outages consist of planned overhauls, maintenance outages, and forced outages. P3's annual EAF is expected to be in the range of 94 to 98 percent.

#### 2.12.2.2 Equipment Redundancy

The following subsections identify equipment redundancy as it applies to project availability. Equipment redundancy provides a means for avoiding outages and reducing the magnitude of outages. Redundancy of major equipment is shown in Table 2.12-1. Note that some elements may be subject to modification in the final design.

#### 2.12.2.3 Power Block

The CTG subsystem includes the combustion turbine, inlet air filtration and evaporative cooling system, generator and excitation systems, and combustion-turbine control and instrumentation. Redundancy is provided in combustion-turbine subsystems where practical. For example, the lube oil system consists of redundant pumps, filters, and coolers. The microprocessor-based control system consists of redundant microprocessors, as well as redundant sensors for critical measurements. Technology advancements, as well as the redundancy as illustrated above, have led to extremely high reliability for the combustion turbines considered for this project.

The emissions control system will include two 50 percent capacity tempering air fans.

#### 2.12.2.4 Power Plant Maturation

The anticipated maturation period of the P3 unit will range between 6 and 12 months following commercial operation. The unit's first year EAF is estimated to be 85 to 89 percent. Functional testing, performance testing, punchlist resolution, reliability runs, and warranty claims will accelerate the maturation process, as well as extensive quality assurance and control during the commission and start-up of the facility.

#### 2.12.2.5 Commercially Proven Technology

The P3 design incorporates commercially proven technologies from major equipment suppliers, including GE. These frame turbine designs are used throughout the world in this application.

#### 2.12.2.6 Fuel Availability

P3 will be fueled with pipeline-quality natural gas delivered by SoCalGas. The only major outages anticipated are related to in-line pipe integrity inspections performed by SoCalGas every 7 years. This inspection would result in a 3-day outage of the gas supply to P3. Historically, SoCalGas has scheduled routine maintenance work to coincide with MGS' regularly scheduled maintenance outages to minimize impacts to plant availability; the same would be expected during operation of P3.

### 2.12.2.7 Water Availability

Potable water will be supplied to P3 from the City of Oxnard via extension of an existing potable water distribution header in the MGS plant. The Oxnard Municipal Code establishes a general obligation for the City to supply water to all properties in its jurisdiction. As the sole supplier in its jurisdiction, the City assumes a duty to supply water without discrimination to any of its inhabitants who apply for water, under reasonable rules and regulations. The Municipal Code mandates that all "premises" (which would include the project) obtain a water service connection from the City. The application for a water service connection is ministerial, and the Municipal Code does not give the City discretion to deny an application, assuming the basic requirements and fees are satisfied. The Municipal Code enumerates only a narrow set of reasons allowing the City to discontinue water service to a customer, all of which are limited to nonpayment or noncompliance with Code provisions, and can be remedied once the customer addresses the issue.

The City's Urban Water Management Plan (UWMP) indicates that there is an ample existing and forecasted supply of water for the City. The UWMP indicates that the City has sufficient supply to meet water demands through 2035. The UWMP states that the City "has a consistent water supply through imported water and groundwater, which is sufficient to meet demands during normal, single-dry, and multiple-dry years" (Kennedy Jenks, 2012). The UWMP also indicates that for the "normal year scenario," the City will have existing and planned supplies that are 9,875 AF in excess of demand with conservation in 2015; 12,442 AF excess in 2020; 12,204 AF excess in 2025; and similar numbers for 2030 and 2035. The UWMP also notes that multiple consecutive dry years "are not anticipated to result in a supply decrease for the City due to future supply and reliability programs" (Kennedy Jenks, 2012).

Service water will be stored on site in an existing 445,000-gallon service water tank that has sufficient capacity for 102 hours of operation at full-load peak demand. In addition, each of the two demineralized water storage tanks provides sufficient capacity for approximately 96 hours of peak load operation, with evaporative cooling that would coincide with an outage of the water treatment system.

Section 4.15, Water Resources, contains additional information regarding the project's proposed water supply.

### 2.12.2.8 Electric Transmission Interconnection

Generation from P3 will be delivered to the SCE switchyard, immediately adjacent to the P3 site. The unit will be connected to one existing 220-kV breaker position in the Mandalay Switchyard. One auxiliary transformer will be provided and connected on the low side of the GSU transformer on the CTG. Single ended 4-kV and 480-volt switchgear lineups will be provided as required to serve the GE-supplied electrical loads, as well as all required BOP loads. A backup diesel generator to facilitate safe shutdown and service house loads in the event of the loss of the single line feeding the auxiliary system will be included. All structures will be inspected on a routine basis. Chapter 3, Transmission Facilities, contains more detailed information on the interconnection and Transmission Line Safety and Nuisance.

### 2.12.2.9 Project Quality Control Measures

The project will require quality control measures to be implemented by suppliers and contractors providing equipment and services to the project. This requirement will apply to the EPC and start-up phases of the project. It is expected that such measures will be part of quality assurance programs established by the suppliers and contractors. The project will audit the quality assurance programs, and supplement the programs with independent design reviews, shop inspections, and construction site inspections.

#### 2.12.2.10 Effects of Climate Change

Addressing climate change includes not only reducing the greenhouse gas emissions intensity of electricity generation, as P3 will do, but also adapting to a changing climate. P3 has been designed to address potential implications of climate change, including sea-level rise, increased frequency and intensity of weather-related events, and shifts in the coastline. A site-specific analysis for P3 that includes the combined effects of sea-level rise, storm surge, wave events, erosion risk, etc., is contained in Section 4.15, Water Resources.

## 2.13 APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Design, construction, and operation of P3, including transmission lines, pipelines, and ancillary facilities, will be conducted in accordance with all LORS pertinent to facility safety, transmission line safety and nuisance, and reliability and availability. LORS applicable to the project are shown in Table 2.13-1. LORS applicable to transmission line safety and nuisance are discussed in Chapter 3. Note that the design of all structures and facilities will be based on building codes, specifications, industry standards, and regulations. All building permits will be reviewed during the building permit approval process by the City of Oxnard.

The applicable LORS are discussed in the following sections.

#### 2.13.1.1 Power Plant Reliability

The following LORS are applicable to P3 in the context of power plant reliability and availability.

##### 2.13.1.1.1 Industry Codes and Standards

Currently, there are no industry codes or standards that govern power plant reliability; however, there are trade organizations and associations that are generally recognized as authorities and leaders in the field of power plant availability and reliability. Definitions used by these organizations have become generally accepted as a common means of communicating, and the data published have been found to be useful. The organizations are:

- Electric Power Research Institute (EPRI). Copies of reports can be obtained from the Research Reports Center:

  3412 Hillview Avenue
  Palo Alto, California 94304-1395
  (650) 855-2000

- North American Electric Reliability Council (NERC):

  Princeton Forrestal Village
  116-390 Village Boulevard
  Princeton, New Jersey 08540
  (609) 452-8060

##### 2.13.1.1.2 P3 Compliance with Power Plant Reliability

P3 will be designed for reliable operations for an expected project life of at least 30 years. To create and maintain reliable operations, P3 will include a maintenance program, equipment redundancy, dependable fuel source, and water supply.

#### 2.13.1.2 Efficiency

The California Environmental Quality Act (CEQA) requires that a power plant or other new project not waste energy. CEQA also requires that the project be more efficient in energy use than alternatives to the project.

Although the project would consume energy, it would do so in a sufficiently efficient manner to satisfy the project's objectives of producing peak-load electricity and ancillary load-following services. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No conditions of certification apply to Power Plant Efficiency.

The project would improve the overall thermal efficiency of energy production compared to MGS Units 1 and 2, due to the higher efficiency of the GE 7HA.01 CTG. This, along with an improved emission control system for the new gas turbine, leads to a reduction in emissions of most pollutants emitted per unit of electricity produced. It also leads to a reduction in the amount of natural gas fuel consumed to generate each MW-hour of power. Additionally, peaking facilities of this nature—which can be shut down when not needed, with quick-start capabilities and a high level of generating flexibility/turndown ratios—are needed to support California's efforts to increase the use of renewable resources, which will reduce systemwide criteria pollutant emissions from power generation.

#### 2.13.1.3 Engineering Geology

Unless specifically stated otherwise, the design of all structures and facilities will be based on the LORS, codes, specifications, and other reference documents in effect at the time of design. Applicable codes and industry standards with respect to the project's engineering geology are summarized in sections of Appendix A-2, Civil Engineering Design Criteria; and Appendix A-3, Structural Engineering Design Criteria.

#### 2.13.1.4 Civil and Structural Engineering

Unless specifically stated otherwise, the design of all structures and facilities will be based on the LORS, codes, specifications, and other reference documents in effect at the time of design. Applicable codes and industry standards with respect to the project's engineering design criteria, construction, and operation are summarized in Appendix A-2, Civil Engineering Design Criteria; and Appendix A-3, Structural Engineering Design Criteria.

#### 2.13.1.5 Mechanical Engineering

Unless specifically stated otherwise, the design of all structures and facilities will be based on the LORS, codes, specifications, and other reference documents in effect at the time of design. Applicable codes and industry standards with respect to the project's mechanical engineering design criteria, construction, and operation are summarized in Appendix A-4, Mechanical Engineering Design Criteria.

#### 2.13.1.6 Electrical and Control Systems Engineering

Unless specifically stated otherwise, the design of all structures and facilities will be based on the LORS, codes, specifications, and other reference documents in effect at the time of design. Applicable codes and industry standards with respect to the project's electrical engineering design criteria, construction, and operation are summarized in Appendix A-5, Electrical Engineering Design Criteria.

#### 2.13.1.7 Seismic Design

The project site is in a State of California Seismic Hazard Zone defined as an area susceptible to liquefaction (Ninyo & Moore, 2013). Structures, their foundations, and equipment will be designed in accordance with the 2007 International Building Code. Electrical substation equipment will be designed to meet the requirements of Institute of Electrical and Electronics Engineers (IEEE) 693-1997, Recommended Practice for Seismic Design Substations.

## 2.14 INVOLVED AGENCIES AND AGENCY CONTACTS

Agency contacts regarding facility design of P3 are provided in Table 2.14-1.

## 2.15 REFERENCES

IBC (International Building Code), 2007.

Kennedy Jenks Consultants, 2012. City of Oxnard, 2010 Urban Water Management Plan. May.

LARWQCB (Los Angeles Regional Water Quality Control Board), 2001. State of California Regional Water Quality Control Board, Los Angeles Region, Order No. 01-057, NPDES No. CA0001180. Waste Discharge Requirements for Reliant Energy Incorporated (Mandalay Generating Station). March 8, Revised March 23 and April 26.

Ninyo & Moore, 2013. Preliminary Geotechnical Evaluation Mandalay Generating Station Repowering Project. November 27.

NRG, 2014. Storm Water Pollution Prevention Plan, Mandalay Generating Station, 393 North Harbor Boulevard, Oxnard, California. September.

Tetratech, 2008. California's Coastal Power Plants: Alternative Cooling System Analysis. Prepared for California Ocean Protection Council, Oakland, California. February.

**Table 2.5-1**
**Existing MGS Facilities to be Used by P3**

| Facility | Year Installed/ Upgraded | Modifications Due to P3 | Changes in Use Due to P3 | Remarks |
|---|---|---|---|---|
| Administration building | 1950s | Upgrade insulation, lighting, heating, ventilation, and plumbing. | None (no increase in plant staff). | Upgrades will be to current codes. LEED certification to be pursued. |
| Warehouse building | 1950s/1970s | Portion to be reconfigured as control center for P3. No new sanitary/kitchen facilities. | Other functions of warehouse to remain the same for P3. | Upgrades will be to current codes. LEED certification to be pursued. |
| Service water storage tank (potable water) | 1950s | No modifications to tank. Potable water line to be extended to service P3. | P3 potable water use for process needs less than MGS potable water use. Domestic use approximately the same. No change in firewater use. | 455,000-gallon storage capacity. 96,000 gallons reserved for fire water. Potable water provided by City of Oxnard. |
| Demineralized water storage tank | 1950s | No modifications to tank. | P3 will use less than MGS Units 1 and 2. | |
| Aqueous ammonia storage tank and system | 1980 | Ammonia line to be extended to interconnect to P3's ammonia distribution system. | P3 will use 19 percent ammonia, instead of 29 percent ammonia. | Has secondary containment. |
| Firewater pump (electric) at Service Water tank | 1950s | Firewater loop to be extended to service P3. | None. | |
| Retention Basins | 1950s/recent | New interconnection to inflow piping/intake. | Basins will no longer store MGS Units 1 and 2 process wastewater. North and South Basins to be repurposed for stormwater retention (MGS + P3) and P3 process wastewater. Discharged via existing outfall to Pacific Ocean. | Comply with NPDES Industrial General Permit and NPDES Permit Number CA0001180. |

**Table 2.5-1**
**Existing MGS Facilities to be Used by P3 (Continued)**

| Facility | Year Installed/ Upgraded | Modifications Due to P3 | Changes in Use Due to P3 | Remarks |
|---|---|---|---|---|
| SCE Switchyard interconnection | 1950s | With retirement of MGS Units 1 and 2, a 220-kV switchyard bay position will be used for P3 interconnection. | P3 262-MW will replace 430-MW MGS Units 1 and 2 input to grid. | NRG filed a Generation Unit Repowering request for the project with the CAISO. SCE is preparing the Facilities Study to identify upgrades needed. |
| Natural Gas Supply | 1950s | New interconnection to existing gas line. New P3 gas metering station. New P3 gas compressor. | Expect P3 gas usage to be less than MGS Units 1 and 2 gas usage. | Natural gas provided by SoCalGas. |
| Septic System | 1950s/2004 | None. | None (assuming no increase in plant staff). | Operated and monitored in compliance with LARWQCB Order R4-2008-0087 |

Notes:

CAISO = California Independent System Operator
kV = kilovolt
LARWQCB = Los Angeles Regional Water Quality Control Board
LEED = Leadership in Energy and Environmental Design
MGS = Mandalay Generating Station
MW = megawatt
NPDES = National Pollutant Discharge Elimination System
OTC = once-through cooling
P3 = Puente Power Project
SCE = Southern California Edison
SoCalGas = Southern California Gas Company

**Table 2.7-1**
**Heat and Material Balance**

| Station on Figure 2.7-4 | Description | Units | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 | Case 8 | Case 9 | Case 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ambient Temperature | °F | 38.9 | 38.9 | 59 | 59 | 77.8 | 77.8 | 77.8 | 82 | 82 | 82 |
| | Relative Humidity | percent | 26 | 26 | 60 | 60 | 50 | 50 | 50 | 31 | 31 | 31 |
| | CTG Load | percent | 100 | 30 | 100 | 30 | 100 | 100 | 34.45 | 100 | 100 | 36.11 |
| | Evaporative Cooling | On/Off | Off | Off | Off | Off | On | Off | Off | On | Off | Off |
| | Gross Output | MW | 278.00 | 83.40 | 274.52 | 82.36 | 267.22 | 252.62 | 87.03 | 269.9 | 247.06 | 89.21 |
| | Heat Rate (HHV) | Btu/kWh | 9,504 | 14,917 | 9,584 | 14,898 | 9,640 | 9,717 | 14,298 | 9,624 | 9,755 | 14,081 |
| 3 | CTG Exhaust | lb/hr | 4,741,000 | 2,439,000 | 4,713,000 | 2,429,000 | 4,593,000 | 4,401,000 | 2,485,500 | 4,638,000 | 4,340,000 | 2,520,600 |
| 6 | Stack Exit(rounded off) | lb/hr | 6,147,000 | 3,496,000 | 6,272,000 | 3,506,000 | 6,203,000 | 6,006,000 | 3,586,000 | 6,252,000 | 5,955,000 | 3,634,000 |
| 7 | Evap Cooler Water Inlet | lb/hr | 0 | 0 | 0 | 0 | 15,056 | 0 | 0 | 23,544 | 0 | 0 |
| 8 | Evap Cooler Blowdown | lb/hr | 0 | 0 | 0 | 0 | 3,011 | 0 | 0 | 4,709 | 0 | 0 |
| 9 | Fuel Gas Inlet | lb/hr | 111,885 | 51,038 | 111,395 | 50,309 | 109,022 | 103,807 | 51,160 | 109,948 | 101,894 | 51,706 |
| 10 | 19% Aqueous Ammonia | lb/hr | 441 | 201 | 439 | 198 | 429 | 410 | 203 | 434 | 401 | 206 |

Source: AECOM, Performance Summary Revision G, March 14, 2015

Notes:

Btu/kWh = British thermal units per kilowatt-hour
CTG = combustion turbine generator
°F = degrees Fahrenheit
HHV = higher heating value
lb/hr = pounds per hour
MW = megawatt

**Table 2.7-2**
**Major Mechanical Equipment**

| Equipment | Quantity | Size/Capacity | Service/Remarks |
|---|---|---|---|
| Natural gas compressor | 1 | 198,000 lbs/hr each | Combustion turbine fuel (1 × 100 percent) |
| Combustion turbine fuel gas filter separators | 1 | 198,000 lbs/hr each | Natural gas fuel |
| Combustion turbine generator | 1 | GE 7HA.01 262 MW | Dry ULN combustion control with inlet air evaporative coolers |
| SCR catalyst | 1 | n/a | $NO_X$ control |
| Oxidation catalyst | 1 | n/a | VOC and CO control |
| SCR stack | 1 | 22 feet in diameter × 188 feet high | Includes silencers and damper |
| Continuous emissions monitoring system | 1 | n/a | Monitors $NO_X$, CO, and $O_2$ |
| Air Compressor | 1 | TBD | 1 × 100 percent |
| Air Dryer | 1 | TBD | 1 × 100 percent |
| Air Receiver | 1 | 330 gallons | 1 × 100 percent |
| Dilution/Tempering Air Fans | 2 | 1,400,000 lbs/hr total | Exhaust gas tempering fans (2 × 50 percent) |

Notes:
CO = carbon monoxide
GE = General Electric
lbs/hr = pounds per hour
MW = megawatts
n/a = not available
$NO_X$ = oxides of nitrogen
$O_2$ = oxygen
SCR = selective catalytic reduction
TBD = to be determined
ULN = ultra-low nitrogen
VOC = volatile organic compound

**Table 2.7-3**
**Natural Gas Analysis**

| Constituent | GE Basis for Performance | P3 Minimum Btu/scf Sample 04/03/2013 | P3 Maximum Btu/scf Sample 08/23/2010 |
|---|---|---|---|
| Methane | 96.570 | 96.02 | 91.77 |
| Ethane[1] | 1.741 | 2.23 | 3.89 |
| Propane[1] | 0.312 | 0.21 | 1.57 |
| n-Butane[1] | 0.007 | 0.03 | 0.29 |
| i-Butane[1] | 0.039 | 0.02 | 0.17 |
| n-Pentane[1] | 0.020 | ND | 0.04 |
| i-Pentane | ND | ND | 0.06 |
| Hexane +[1] | 0.043 | 0.012 | 0.034 |
| Nitrogen[1] | 0.226 | 0.52 | 0.56 |
| Carbon dioxide[1] | 1.088 | 0.94 | 1.61 |
| Total[1] | 100.0 | 100.0 | 100.0 |
| Sulfur (grains per 100 scf) | N/A | ND[1] | ND[1] |
| Lower Heating Value (Btu per scf)[1] | 917 | 916 | 953 |
| Higher Heating Value (Btu per scf)[1] | 1,018 | 1017 | 1056 |
| Modified Wobbe Index (at 59°F)[2] | 52.93 | 52.88 | 53.34 |

Notes:

[1] The federal standard for "pipeline quality natural gas" is 0.5 grain/100 scf. Four samples reported by the station quoted sulfur at "Not Detectable"; the detectability limit for these reports is 0.05 grain/100 scf.

[2] Although the gas samples showed a variation in heating value of nearly 4 percent, the critical parameter to compare is the "Modified Wobbe Index" = [(LHV, Btu/scf)/SQRT(T_Deg.R * Specific Gravity)] which, per the GE fuel gas specification, may not vary more than +/- 5 percent from the nominal value. These four samples had Modified Wobbe Indices ranging from 52.88 to 53.34, differing only -0.1 percent to +0.8 percent from the nominal value.

Btu = British thermal units
°F = degrees Fahrenheit
GE = General Electric
ND = Not Detectable
P3 = Puente Power Project
scf = standard cubic feet.

| **Table 2.7-4<br>Influent Water Quality and Specifications** | | | |
|---|---|---|---|
| **Constituent** | | **Influent (City Water)[1]** | **Evaporative Cooler Circulation Water** |
| **General** | | | |
| Alkalinity, M (Total) | mg/L $CaCO_3$ | 200 – 260 | **< 500** |
| Alkali metals | mg/L Na + K | | **< 500** |
| Conductivity | μmhos | | **< 5,000** |
| Oil and grease | mg/L | | **< 10** |
| pH | pH Units | 6.8 – 9.2 | **7 – 9** |
| Solids, total dissolved | mg/L ions | 950 – 1,600 | **< 3,000** |
| Solids, total suspended | mg/L | | **< 30** |
| **Trace Constituents** | | | |
| Iron, total | mg/L Fe | | **< 1** |
| Heavy metals | mg/L Fe, Mn, Cu, V, Pb | | **< 1** |
| Manganese, total | mg/L Mn | 0.0067 – 0.077 | **< 0.2** |
| **Cations** | | | |
| Calcium | mg/L Ca | 110 – 224 | **< 200** |
| **Anions** | | | |
| Chloride | mg/L Cl | | **< 300** |
| **Corrosion and Scaling Indices** | | | |
| Langelier (LSI) | | | 0.25 – 0.75 |
| Ryznar (RSI) | | | 5.5 – 6.5 |

Notes:
[1] From City of Oxnard, Consumer Confidence Report, 2013
Ca = calcium
$CaCO_3$ = calcium carbonate
Cl = chlorine
Cu = copper
Fe = iron
K = potassium
mg/L = milligrams per liter
μmhos = micromhos
Mn = manganese
Na = sodium
Pb = lead
V = vanadium

| Table 2.7-5<br>Daily and Annual Water Flows | | | |
|---|---|---|---|
| **Flow Stream[1]** | **Average Daily Use[2] (gpm)** | **Maximum Daily Use[3] (gpm)** | **Annual Use[4] (AFY)** |
| **Process Water Supply[5]** | | | |
| Evaporative cooler – service water makeup (E) | 12 | 24 | 5.7 |
| Softener service water (R ) | 19 | 37 | 9.0 |
| Plant Service water (D) | 2 | 2 | 0.9 |
| **Total (C)** | 34 | 65 | 16 |
| **Process Wastewater Discharge[6]** | | | |
| Oil-water separator discharge (D) | 2 | 2 | 0.9 |
| Softener regeneration waste (S) | 2 | 4 | 0.9 |
| Reverse osmosis reject (J) | 5 | 10 | 2.4 |
| Evaporative cooler blowdown (F) | 5 | 9 | 2.3 |
| **Total (V)** | 14 | 25 | 6.5 |
| **Domestic Water Supply (B)[5]** | 2 | 2 | 3 |
| **Sanitary Wastewater Discharge (B)[7]** | 2 | 2 | 3 |

Notes:

1 See Figure 2.7-6 for water balance figure; and Figure 2.6-7 for water balance details. Letter in parenthesis corresponds to Stream ID in Figure 2.7-6. Differences in values shown on this table and on Figure 2.7-7 may differ slightly due to rounding.

2 Average daily water use is based on full generating capacity with evaporative cooling whenever dry bulb temperature is above 59° F (50 percent of the time).

3 Maximum daily use is based on peak summer conditions (82° F) and 31 percent relative humidity for the unit operating at full generating capacity.

4 Average annual use takes downtime into account. It is therefore based on the average daily use attenuated by an average annual capacity factor of 30 percent. Values shown on table are based on the annual average normalized values shown on Figure 2.7-7.

5 Potable water used for process and domestic water supplies.

6 Process wastewater discharged to existing retention basin and then to ocean in accordance with NPDES Permit Number CA0001180.

7 Sanitary wastewater discharged to existing septic system.

AFY = acre-feet per year
°F = degrees Fahrenheit
gpm = gallons

**Table 2.7-6**
**P3 Process Wastewater Composition**

| Constituent | | Annual Average | Peak |
|---|---|---|---|
| **General** | | | |
| Alkalinity, M (Total) | mg/L $CaCO_3$ | 582 | 675 |
| Carbon dioxide | mg/L $CO_2$ | 30 | 18.9 |
| Conductivity | μmhos | 11,854 | 13,255 |
| Hardness, total | mg/L as $CaCO_3$ | 856 | 1,096 |
| Oil and grease | mg/L | <10 | <10 |
| pH | | 7.5 | 7.5 |
| Solids, total dissolved | mg/L ions | 7,299 | 8,240 |
| **Trace Constituents** | | | |
| Manganese, total | mg/L Mn | 0.087 | 0.20 |
| **Cations** | | | |
| Calcium | mg/L Ca | 641 | 804 |
| Magnesium | mg/L Mg | 224 | 292 |
| **Anions** | | | |
| Bicarbonate | mg/L $CaCO_3$ | 582 | 675 |
| Carbonate | mg/L $CaCO_3$ | 2.7 | 3.4 |
| Chloride | mg/L Cl | 2,776 | 2,694 |
| Fluoride | mg/L F | 2.1 | 2.4 |
| Nitrate | mg/L $NO_3$ | 51 | 148 |
| Sulfate | mg/L $SO_4$ | 1,451 | |
| **Corrosion and Scaling Indices** | | | |
| Langelier (LSI) | | 2.5 | 2.7 |
| **Diagnostics** | | | |
| **Charge Imbalance** | % | 0.0 | 0.0 |

Notes:

Assumes water supply is City of Oxnard potable water.

Ca = calcium
Cl = chlorine
$CO_2$ = carbon dioxide
F = fluoride
Mg = magnesium
mg/L = milligrams per liter
μmhos = micromhos
Mn = manganese
$NO_3$ = nitrate
P3 = Puente Power Project
$SO_4$ = sulfate

**Table 2.7-7**
**Summary of Anticipated Construction Waste Streams and Management Methods**

| Waste Stream | Anticipated Waste Stream Classification | Estimated Quantity | Estimated Frequency of Generation | Waste Management Method | |
|---|---|---|---|---|---|
| | | | | Onsite | Offsite Treatment |
| **Demolition** | | | | | |
| Residual Pipe Fuel Oil | Nonhazardous | 3,000-5,000 gallons | once | N/A | Local Recyclers |
| **Construction** | | | | | |
| Scrap wood, steel, glass, plastic, paper, calcium silicate insulation, mineral wool insulation, cardboard and corrugated packaging. | Nonhazardous solids | 60 cubic yards | Weekly | Containerize, housekeeping | Recycle and/or Class II/III landfill disposal |
| Empty hazardous material containers | Hazardous solids | Less than 1 cubic yard | Weekly | Store for less than 90 days | Recycle and/or Class I/II landfill disposal |
| Spent welding materials | Hazardous solid | Less than 1 cubic yard | Monthly | Containerize | Dispose at Class I landfill |
| Drained waste oil filters | Hazardous solid | 75 pounds | Monthly | Containerize | Dispose at Class II landfill |
| Used and waste lube oil during CTG lube oil flushes | Hazardous or nonhazardous liquids | 20,000 gallons | 360 drums over life of construction | Store for less than 90 days | Oil will be used for first fill after CTG flushes are complete. |
| Oil rags, oil absorbent generated during normal construction activities excluding lube oil flushes | Hazardous solids | Less than 2 cubic yards | Monthly | Store for less than 90 days | Oily rags would be recycled. Class I landfill disposal for other solids. |
| Solvents, paint, adhesives and aerosols | Hazardous liquids | 2 drums | Monthly | Store for less than 90 days | Recycle or disposal at TSDF. |
| Spent lead acid batteries | Hazardous solids | 2 batteries | Yearly | Store for less than 1 year | Recycle |

Notes:
CTG = combustion turbine generator
N/A=not applicable
TSDF = treatment, storage, and disposal facility

**Table 2.7-8**
**Summary of Anticipated Operating Waste Streams and Management Methods**

| Waste Stream | Waste Stream Classification | Estimated Amount | Estimated Frequency of Generation | Waste Management Method | |
|---|---|---|---|---|---|
| | | | | Onsite | Offsite Treatment |
| Used lubricating oil/oil solvents from small leaks and spills from turbine lubricating oil system | Hazardous liquid | 800 pounds | Yearly | Store for less than 90 days | Recycle |
| Used lubricating oil filters from turbine lubricating oil system | Hazardous solids | 1,100 pounds | Yearly | Store for less than 90 days | Disposal of drained filters to a Class II landfill |
| Used lubricating oil from maintenance of turbine equipment | Hazardous liquid | 4,400 pounds | Yearly | Store for less than 90 days | Recycle |
| Solvents, paint and adhesives | Hazardous liquid | 60 pounds | Monthly | | Disposal to a licensed TSDF |
| Laboratory analysis waste from water treatment | Hazardous solids | 60 gallons | Yearly | | Disposal to a licensed TSDF |
| Spent SCR catalyst (heavy metals, including vanadium) | Hazardous solids | 50 to 55 tons | Every 7 to 10 years | Removed to truck by licensed contractors | Recycled by SCR manufacturer or disposed in Class I landfill |
| Spend CO catalyst (heavy metals) | Hazardous solids | 9 to 10 tons | Every 7 to 10 years | | Recycled by manufacturer |
| Spent lead acid batteries | Hazardous solids | 6 batteries | Lead Acid – Yearly | Store for less than 1 year | Recycle |
| Spent alkaline batteries | Hazardous solids | 10 pounds | Alkaline – Monthly | Store for less than 1 year | Disposal to a licensed TSDF |
| Unbroken fluorescent bulbs, mercury vapor lamps | Hazardous solids | 15 pounds<br>30 pounds | Yearly | Store for 1 year | Reclaim mercury; disposal to a licensed TSDF |

**Table 2.7-8**
**Summary of Anticipated Operating Waste Streams and Management Methods**
**(Continued)**

| Waste Stream | Waste Stream Classification | Estimated Amount | Estimated Frequency of Generation | Waste Management Method | |
|---|---|---|---|---|---|
| | | | | Onsite | Offsite Treatment |
| Broken fluorescent bulbs | Hazardous solids | Less than 10 pounds | Monthly | Store for less than 90 days | Disposal to a licensed TSDF |
| Waste oil from oil-water separator | Hazardous liquid | Less than 2 U.S. gallons | Daily | Store for less than 90 days | Recycle |
| Oily rags, oil absorbent from CTG and other users of hydraulic actuators and lubricants | Hazardous solids | 100 pounds (approximately 250 rags) | Weekly | Store for less than 90 days | Oily rags would be recycled Class I landfill disposal for other solids |
| Chemical feed area drainage (spillage, tank overflow, or area washdown water) | May be hazardous if high or low pH | Minimal | Yearly | If contamination is suspect, immediately contain. Store onsite for less than 90 days or trucked offsite. | Test prior to discharge. If nonhazardous, discharge to ZLD. If hazardous, drummed or tanker trucked to a licensed TSDF |
| CTG used air filters | Nonhazardous solids | Several hundred filters | Every 5 years | Store for less than 90 days | Recycle/Class II/III landfill disposal |
| CTG water wash | Hazardous or nonhazardous liquids | 2,500 U.S. gallons | Quarterly | Sample. Store hazardous portion for less than 90 days | Test prior to discharge. Dispose to a TSDF if hazardous |
| Hydraulic Fluid | Hazardous | <50 gallons | Yearly | | Recycle |
| Sanitary wastewater | Nonhazardous liquids | 1,440 U.S. gallons | Daily | | Discharge to septic |

**Table 2.7-8**
**Summary of Anticipated Operating Waste Streams and Management Methods**
**(Continued)**

| Waste Stream | Waste Stream Classification | Estimated Amount | Estimated Frequency of Generation | Waste Management Method | |
|---|---|---|---|---|---|
| | | | | Onsite | Offsite Treatment |
| Stormwater | Nonhazardous liquids | 220,000 U.S. gallons | For a once in 2 year, 24-hour storm event (based on 3-acre P3 site) | Stormwater program | Stormwater collected from curbed areas of P3, conveyed to retention basins and discharged to Pacific Ocean |

Notes:

CO = carbon monoxide
CTG = combustion turbine generator
P3 = Puente Power Project
SCR = selective catalytic reduction
TSDF = treatment, storage, and disposal facility
ZLD = zero liquid discharge

| Table 2.7-9<br>Fire Protection Systems Design Conditions | |
|---|---|
| **Location** | **Type of System** |
| Buildings/Enclosures | A water mist system per NFPA 750 is provided for the CTG enclosures and/or multi-purpose dry chemical portable ABC rated fire extinguishers. |
| Turbines | A water mist system per NFPA 750 is provided for the Combustion Turbine. |
| Throughout Plant | Multi-purpose dry chemical portable ABC rated fire extinguishers in all areas. |
| Outside Areas | Dry barrel-type fire hydrants are designed, installed, and located as per NFPA 24 and as required per local jurisdiction. The location of the hydrants is not more than 250 feet apart in all outside areas as required by code. |

Notes:
CTG = combustion turbine generator
NFPA = National Fire Protection Association

**Table 2.7-10**
**Average Calculated Illumination Levels**

| Location | Maintained Average Foot-Candles | Illumination Lux |
|---|---|---|
| Air conditioning equipment room | 10 | 100 |
| Outdoor platforms and stairways (e.g., tanks) | 5 | 50 |
| Control room and administrative rooms (adjustable) | 50 | 500 |
| Control room emergency lighting | 15 | 150 |
| Electrical rooms | 30 | 300 |
| Toilet rooms | 20 | 200 |
| Combustion turbine area | 5 | 50 |
| Water treatment area | 2 | 20 |
| Chemical injection skids | 2 | 20 |
| Parking lot | 1 | 10 |
| Pipe rack | 2 | 20 |
| Main step-up transformers | 2 | 20 |
| Building perimeter | 2 | 20 |

**Table 2.8-1**
**Major Structures**

| Structure | Quantity | Size, L×W×H (feet) | Service/Remarks | Visual |
|---|---|---|---|---|
| **New P3 Structures** | | | | |
| Natural gas compressor enclosure[1] | 1 | 35 × 12 × 15 | Single compressor train | |
| CTG | 1 | 107 × 52 × 79 (top of air filter)[2] | GE Frame 7HA.01 w/evap coolers | Industrial equipment |
| SCR | 1 | 87 × 33 × 99[3] | Nitrogen oxide removal equipment | Industrial equipment |
| SCR stack | 1 | 22 feet diameter × 188 feet high | | Steel vertical cylinder, painted gray |
| Cooling fan module | 1 | 65 × 38 × 18 | Heat exchanger | |
| Transmission structure | 1 | 100-foot-high A-Frame | | Weathered or galvanized steel structure |
| Transmission structure | 3 | 100-foot-high single-circuit monopole | | Weathered or galvanized steel structure |
| **Existing MGS Structures to Be Reused by P3** | | | | |
| Water treatment building | 1 | 68 × 86 × 15 | | Corrugated steel, painted gray |
| Demineralized water storage tank | 2 | 28 feet diameter × 32 feet | 144,000 gallons | Steel tank, painted gray |
| Service water storage tank | 1 | 40 feet diameter × 48 feet | 445,000-gallon capacity | Steel tank, painted gray |
| Outfall structure | 1 | | | |
| Administration building | 1 | 43 × 142 × 12 | No modifications anticipated | Corrugated steel, painted gray |
| Aqueous ammonia storage tanks | 1 | 9 feet diameter × 30 feet | $NO_X$ control (29 wt percent ammonia solution) | Steel horizontal tank, painted white |
| Warehouse building, portion to be reconfigured as control center | 1 | 100 feet × 191 feet × 10 feet (total)<br>15 feet × 40 feet × 10 feet (new control center) | Remainder of building will continue to be used for storage | |

Notes:
1 Sound attenuation enclosure.
2 The 52-foot width dimension is based on the width of the intake filter. Used for envelope. Actual turbine enclosure width is approximately 28 feet.

All dimensions shown are considered accurate at this time and agree with electronic drawings/model.

Gray is Slate Gray, Sherwin Williams 4026 (LRV 36) or similar.

CTG = combustion turbine generator
GE = General Electric
HRSG = heat recovery steam generator
MGS = Mandalay Generating Station
$NO_X$ = oxides of nitrogen
P3 = Puente Power Project
SCR = selective catalytic reduction

**Table 2.9-1**
**Craft/Trade and Construction Staff**

| | 2018 | | | 2019 | | | | | | | | | | | | 2020 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** |
| **Craft/Trade** | | | | | | | | | | | | | | | | | | | | | |
| Boilermakers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 10 | 10 | 10 | 10 | 5 | 3 | 0 | 0 | 0 | 0 | 0 |
| Carpenters | 0 | 0 | 1 | 6 | 6 | 12 | 12 | 12 | 10 | 6 | 6 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 0 | 0 | 0 |
| Electricians | 2 | 4 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 6 | 4 | 2 | 2 | 2 | 2 |
| Ironworkers | 0 | 0 | 1 | 2 | 8 | 8 | 8 | 8 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Laborers | 1 | 2 | 4 | 4 | 4 | 6 | 10 | 10 | 10 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 2 | 2 | 3 | 3 | 3 |
| Pipe Fitters | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 4 | 2 | 0 | 0 | 0 | 0 |
| Painters and Insulators | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 4 | 4 | 8 | 8 | 4 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| Cement Finisher | 0 | 0 | 0 | 4 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Millwrights | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 2 | 0 | 0 | 2 | 2 | 2 |
| Operators | 1 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| Teamsters | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Craft** | **4** | **10** | **16** | **30** | **38** | **47** | **65** | **74** | **71** | **66** | **66** | **70** | **60** | **48** | **41** | **25** | **14** | **6** | **7** | **7** | **7** |

**Table 2.9-1**
**Craft/Trade and Construction Staff**
**(Continued)**

| | **2018** | | | **2019** | | | | | | | | | | | | **2020** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** |
| **Construction Staff** | | | | | | | | | | | | | | | | | | | | | |
| Construction Manager | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| Mechanical/Piping Superintendent | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Civil/Structural Superintendent | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | |
| Electrical Superintendent | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Field Engineering Manager | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Mechanical/Piping Engineer | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Civil/Structural Engineer | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | |
| Electrical Engineer | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Business Manager | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Project Controls Manager | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Document Control | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Payroll Clerk | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Procurement Manager | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |
| Receiving Manager | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | |

**Table 2.9-1**
**Craft/Trade and Construction Staff**
**(Continued)**

| Month | 2018 | | | 2019 | | | | | | | | | | | | 2020 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| Quality Control Manager | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Safety Manager | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Total Construction Staff | 5 | 11 | 12 | 13 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 14 | 13 | 5 | 5 | 2 | 2 | 2 |
| **Total Site Staff** | **9** | **21** | **28** | **43** | **52** | **63** | **81** | **90** | **87** | **82** | **82** | **85** | **75** | **63** | **55** | **38** | **19** | **11** | **9** | **9** | **9** |

**Table 2.9-2**
**Expected Construction Deliveries**

| Equipment | Units | Loads Per Unit | Total Loads (Rounded Up) | Delivery Duration Months |
|---|---|---|---|---|
| Gas turbine | 1 | 150 | 150 | 6 |
| Generator | 1 | 100 | 100 | 6 |
| GT exhaust | 1 | 10 | 10 | 6 |
| 90-foot stack | 1 | 4 | 4 | 2 |
| SCR module and catalyst | 1 | 10 | 10 | 3 |
| 220-kV breaker | 1 | 2 | 2 | 1 |
| Auxiliary transformer | 1 | 4 | 4 | 2 |
| 4-kV/480-volt switchgear | 8 | 1 | 8 | 2 |
| Diesel generator | 1 | 3 | 3 | 2 |
| Stack CEMS | 1 | 2 | 2 | 1 |
| DCS | 1 | 1 | 1 | 1 |
| Gas compressor/coolers/enclosure | 1 | 4 | 4 | 1 |
| PLC | 1 | 1 | 1 | 1 |
| Fuel gas conditioning | 1 | 2 | 2 | 2 |
| Piping support, valves | 200 | 1 | 200 | 6 |
| Warehouse/HVAC equipment | 10 | 1 | 10 | 3 |
| Electrical conduit and wire | 20 | 1 | 20 | 7 |
| Electrical lighting equipment | 3 | 1 | 3 | 2 |
| General electrical equipment | 110 | 1 | 110 | 6 |
| Structural steel and platforms | 15 | 1 | 15 | 4 |
| Earthwork (sand and gravel) | 100 | 1 | 100 | 6 |
| Structural fill (foundations) | 100 | 1 | 100 | 6 |
| Concrete foundations | 500 | 1 | 500 | 10 |
| Construction consumables | 270 | 1 | 270 | 15 |
| Office equipment and supplies | 250 | 1 | 250 | 15 |
| Contractor mobilization and demobilization | 6 | 1 | 6 | 2 |
| Construction equipment delivery and pickup | 40 | 1 | 40 | 8 |
| **Total** | | | **1,925** | |

Notes:

Loads per month average 16.

CEMS = continuous emissions monitoring system
DCS = distributed control system
GT = gas turbine
HVAC = heating, ventilation, and air conditioning
kV = kilovolt
PLC = programmable logic controller
SCR = selective catalytic reduction

## Table 2.9-3
## Average Construction Equipment On Site Per Month

| Construction Equipment | Percent Usage | HP | Fuel (Diesel/ Gas) | 2018 | | | 2019 | | | | | | | | | | | | 2020 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| **Construction** | | | | | | | | | | | | | | | | | | | | | | | | |
| Pickup truck | 75% | 150 | Gas | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| 1-ton flatbed truck | 50% | 150 | Gas | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 |
| Tractor | 50% | 200 | Diesel | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Forklift | 75% | 40 | Gas | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fuel/lube truck | 25% | 150 | Gas | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| M2250 ringer/2250 crawler crane | 25% | 500 | Diesel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150-ton crawler | 50% | 300 | Diesel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydraulic crane (55-ton) | 65% | 300 | Diesel | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Hydraulic crane (45-ton) | 65% | 250 | Diesel | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Articulating boom manlift (120, 80, 60, and 40) | 79% | 75 | Gas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 6 | 6 | 6 | 4 | 2 | 2 | 1 | 1 | 0 | 0 | 0 |
| Air compressor | 80% | 50 | Gas | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Backhoe loader | 40% | 80 | Diesel | 0 | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Front-end loader | 70% | 130 | Diesel | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dump truck (30-ton) | 100% | 300 | Diesel | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydraulic excavator | 85% | 250 | Diesel | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bulldozer | 80% | 300 | Diesel | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bulldozer w/ripper | 80% | 300 | Diesel | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vibratory roller | 80% | 125 | Gas | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Walk behind vibratory roller | 60% | 25 | Gas | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor grader | 80% | 200 | Diesel | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jumping jack compactors | 60% | 7.5 | Gas | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water truck | 50% | 300 | Diesel | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Concrete pumper truck | 15% | 350 | Diesel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Concrete mixer truck | 15% | 250 | Diesel | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Welding machine (diesel) | 70% | 25 | Diesel | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Light plant | 30% | 25 | Gas | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tanker truck | 30% | 25 | Gas | | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 3 | 3 |
| | | | **Construction Total** | **8** | **13** | **16** | **21** | **21** | **20** | **19** | **23** | **26** | **27** | **25** | **22** | **22** | **19** | **9** | **8** | **6** | **4** | **5** | **5** | **5** |
| **Demolition** | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydraulic excavator | 100% | 250 | Diesel | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1-ton flatbed truck | 100% | 150 | Gas | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Forklift | 100% | 40 | Gas | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fuel/lube truck | 50% | 150 | Gas | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water truck | 100% | 300 | Diesel | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Articulating boom manlift (120, 80.60, and 40) | 100% | 75 | Gas | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Air compressor | 100% | 50 | Gas | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydraulic crane (75-ton) | 50% | 350 | Diesel | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Table 2.9-4<br>Construction Water Requirements | | | | |
|---|---|---|---|---|
| **Construction Month** | | **Dust Suppression Gallons** | **Other Construction Gallons** | **Total Construction Gallons** |
| October 2018 | 1 | 30,000 | 20,000 | 50,000 |
| November 2018 | 2 | 30,000 | 20,000 | 50,000 |
| December 2018 | 3 | 30,000 | 20,000 | 50,000 |
| January 2019 | 4 | 30,000 | 20,000 | 50,000 |
| February 2019 | 5 | 30,000 | 20,000 | 50,000 |
| March 2019 | 6 | 30,000 | 20,000 | 50,000 |
| April 2019 | 7 | 30,000 | 20,000 | 50,000 |
| May 2019 | 8 | 30,000 | 20,000 | 50,000 |
| June 2019 | 9 | 40,000 | 35,000 | 75,000 |
| July 2019 | 10 | 40,000 | 35,000 | 75,000 |
| August 2019 | 11 | 40,000 | 35,000 | 75,000 |
| September 2019 | 12 | 40,000 | 35,000 | 75,000 |
| October 2019 | 13 | 40,000 | 35,000 | 75,000 |
| November 2019 | 14 | 30,000 | 20,000 | 50,000 |
| December 2019 | 15 | 30,000 | 20,000 | 50,000 |
| January 2020 | 16 | 30,000 | 20,000 | 50,000 |
| February 2020 | 17 | 30,000 | 20,000 | 50,000 |
| March 2020 | 18 | 30,000 | 20,000 | 50,000 |
| April 2020 | 19 | 10,000 | 20,000 | 30,000 |
| May 2020 | 20 | 10,000 | 5,000 | 15,000 |
| June 2020 | 21 | 10,000 | 5,000 | 15,000 |
| **Total (gallons)** | | 620,000 | 420,000 | 1,040,000 |
| **Total (acre-feet)** | | 1.9 | 1.3 | 3.2 |
| **Average Monthly (gallons)** | | 29,524 | 20,000 | 492,524 |
| **Average Daily (gallons)** | | 984 | 667 | 1,651 |

Notes:
Other Construction Gallons Column Includes Hydrostatic Testing, Flushing, Compaction, Concrete Placement, Grouting, Drinking, Cleaning, and any other miscellaneous Construction activity requiring water.
Months 9 – 13 include water for hydrotesting and flushing

**Table 2.10-1**
**Plant Operation Workforce[1]**

| Department | Personnel | Shift | Workdays |
|---|---|---|---|
| Operations and Maintenance | 10 Plant Operators<br>2 I&C Technicians | Rotating 12-hour shift, two employees per shift | 7 days a week |
| Administration | 1 Plant Manager<br>1 Supervisor<br>1 Plant Engineer<br>1 Environmental Health and Safety<br>1 Sourcing Specialist | Standard 8-hour days | 5 days a week with additional coverage as required. |
| Total | 17 Personnel | | |

Notes:
[1] P3 will use existing MGS workforce.
I&C = instrumentation and control

**Table 2.12-1**
**Major Equipment Redundancy**

| | | |
|---|---|---|
| CTG Main Transformer | One | One per CTG. If transformer is down, the CTG will be unavailable |
| Auxiliary Transformer | One | One tied to the output of the CTG. If transformer is down, the CTG will be unavailable |
| Tempering Air Fans for SCR | Two | Two 50 percent fans |

Notes:
CTG = combustion turbine generator
SCR = selective catalytic reduction

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**

| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| **Federal** | | | | |
| Engineering Geology | Occupational Safety and Health Act, 29 USC §651 et seq.;<br>29 CFR §§1901.1-1910, 1500,<br>29 CFR, Part 1926 | Federal OSHA; Cal/OSHA (per 29 CFR §1952.70-1952.175) | Specific occupational safety and health standards. NRG will meet all standards. | Appendix A-2, Civil Engineering Design Criteria; Appendix A-3, Structural Engineering Design Criteria; Section 4.16, Worker Safety and Health |
| Engineering Geology | CWA, 33 USC §1342 et seq. | RWQCB | Requires permits for specified discharges into waters of the United States. NRG will provide notice of intent to RWQCB to operate under and will comply with all General Industrial Activity Storm Water Permit requirements. | Appendices A-2 and A-3; Section 4.15, Water Resources |
| **State** | | | | |
| Engineering Geology | Business and Professions Code §6700 et seq.; 6730, 6736 | Board of Professional Engineers and Land Surveyors | Requires state registration to practice as a civil or structural engineer in California and that all plans, specifications, reports, or documents be prepared by or under the direction of a registered engineer. NRG will comply with all requirements. | Appendices A-2 and A-3; Section 4.4, Geologic Hazards and Resources |
| Engineering Geology | California Occupational Safety and Health Act, Labor Code §6500 et seq. | California Occupational Safety and Health Administration (Cal/OSHA) | Requires a permit for construction of trenches or excavation 5 feet or deeper into which personnel have to descend. | Appendices A-2 and A-3; Section 4.16, Worker Safety and Health |

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**
**(Continued)**

| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| Engineering Geology | CBC (latest edition available) | CEC | Sets building standards and requirements. NRG will comply with all CBC requirements. | Appendices A-2 and A-3; Section 4.4, Geologic Hazards and Resources |
| Engineering Geology | Labor Code §6300 et seq.; 8 CCR 1500 et seq.; 2300 et seq., §3200 et seq. | Cal/OSHA | Prescribes construction safety orders, industrial safety orders, and work safety requirements. NRG will comply with all safety requirements. | Appendices A-2 and A-3; Section 4.16, Worker Safety and Health |
| Engineering Geology | Vehicle Code §35780 et seq. | Caltrans | Requires a permit for transportation of oversize or overweight vehicles over state highways. NRG will obtain all necessary permits. | Section 4.12, Traffic and Transportation |
| **Local** | | | | |
| Engineering Geology | Code of Building Regulations | City of Oxnard | Sets building standards and requirements. NRG will meet all standards. | Appendices A-2 and A-3; Section 4.4, Geologic Hazards and Resources |
| **Federal** | | | | |
| Civil and Structural Engineering | 29 USC §651 et seq.; 29 CFR §§1901.1-1910, 1500; 29 CFR, Part 1926. | OSHA; Cal/OSHA (per 29 CFR §§1952.70-1952.175) | Specific occupational safety and health standards. NRG will meet all standards. | Appendices A-2 and A-3; Section 4.16, Worker Safety and Health |
| Civil and Structural Engineering | 33 USC §1342 et seq. | RWQCB | Requires permits for specified discharges into waters of the United States. NRG will provide notice of intent to RWQCB to operate under and will comply with all General Industrial Activity Storm Water Permit requirements. | Section 4.15, Water Resources |

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**
**(Continued)**

| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| **State** | | | | |
| Civil and Structural Engineering | Business and Professions Code §6700 et seq.; §§6730, 6736 | Board for Professional Engineers and Land Surveyors | Requires state registration to practice as a civil or structural engineer in California and that all plans, specifications, reports, or documents be prepared by or under the direction of a registered engineer. NRG will comply with all requirements. | Appendices A-2 and A-3 |
| Civil and Structural Engineering | Labor Code §6500 et seq. | Cal/OSHA | Requires a permit for construction of trenches or excavation 5 feet or deeper into which personnel have to descend. | Appendices A-2 and A-3; Section 4.16, Worker Safety and Health |
| Civil and Structural Engineering | CBC | CEC | Sets building standards and requirements. NRG will comply with all CBC requirements. | Appendices A-2 and A-3; Section 4.16, Worker Safety and Health |
| Civil and Structural Engineering | Labor Code §6300 et seq.; 8 CCR 1500 et seq.; 2300 et seq.; §3200 et seq. | Cal/OSHA | Prescribes construction safety orders, industrial safety orders, and work safety requirements. NRG will comply with all safety requirements. | Appendices A-2 and A-3; Section 4.16, Worker Safety and Health |
| Civil and Structural Engineering | Vehicle Code §35780 et seq. | Caltrans | Requires a permit for transportation of oversize or overweight vehicles over state highways. NRG will obtain all necessary permits. | Section 4.12, Traffic and Transportation |

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**
**(Continued)**

| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| **Local** | | | | |
| Civil and Structural Engineering | Code of Building Regulations | City of Oxnard | Sets building standards and requirements for City of Oxnard. NRG will meet all standards. | Appendices A-2 and A-3; Section 4.4, Geologic Hazards and Resources |
| Civil and Structural Engineering | Hydrology Manual | County Flood Control District | Specifies drainage requirements. NRG will comply with all drainage requirements. | Appendices A-2 and A-3; Section 4.15, Water Resources |
| **Federal** | | | | |
| Mechanical Engineering | 29 USC §651 et seq.; 29 CFR §§1901.1-1910, 1500; 29 CFR, Part 1926. | OSHA; Cal/OSHA (per 29 CFR §§1952.70-1952.175) | Specific occupational safety and health standards. NRG will meet all standards. | Appendix A-4; Section 4.16, Worker Safety and Health |
| **State** | | | | |
| Mechanical Engineering | CBC, California Plumbing Code | CEC | Sets building standards and requirements. NRG will comply with all CBC requirements. | Appendix A-4; Section 4.4, Geologic Hazards and Resources |
| Mechanical Engineering | Labor Code §6500 et seq.; 8 CCR 1500 et seq.; 2300 et seq.; §3200 et seq. | Cal/OSHA | Prescribes construction safety orders, industrial safety orders, and work safety requirements. NRG will comply with all safety requirements. | Appendix A-4; Section 4.16, Worker Safety and Health |
| Mechanical Engineering | 8 CCR Chapters 4-7 | CEC | Prescribes requirements for flammable liquids, gases, and vapors. NRG will comply with all requirements. | Appendix A-4; Section 4.5, Hazardous Materials Handling |

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**
**(Continued)**

| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| Mechanical Engineering | Business and Professions Code §6700 et seq., 6730, 6735 and 6736 | Board of Professional Engineers and Land Surveyors | Requires state registration to practice as a mechanical engineer and that all plans, specifications, reports, or documents be prepared by a registered engineer. NRG will use registered engineers. | Appendix A-4 |
| **Federal** | | | | |
| Electrical Engineering | 29 USC §651 et seq.; 29 CFR §§1901.1-1910, 1500, 29 CFR, Part 1926 | OSHA; Cal/OSHA (per 29 CFR §§1952.70-1952.175) | Specific occupational safety and health standards. NRG will meet all standards. | Appendix A-5; Section 4.16, Worker Safety and Health |
| **State** | | | | |
| Electrical Engineering | CBC, California Electrical Code | CEC | Sets building standards and requirements. NRG will comply with all CBC requirements. | Appendix A-5; Section 4.4, Geologic Hazards and Resources |
| Electrical Engineering | Labor Code §6500 et seq.; 8 CCR 1500 et seq.; 2300 et seq.; §3200 et seq. | Cal/OSHA | Prescribes construction safety orders, industrial safety orders, and work safety requirements. NRG will comply with all safety requirements. | Appendix A-5; Section 4.16, Worker Safety and Health |
| Electrical Engineering | 8 CCR Chapters 4-7 | CEC | Prescribes requirements for flammable liquids, gases, and vapors. NRG will comply with all requirements. | Appendix A-5; Section 4.5, Hazardous Materials Handling |
| Electrical Engineering | Business and Professions Code §6700 et seq., 6730, 6735, and 6736 | Board of Professional Engineers and Land Surveyors | Requires state registration to practice as an electrical engineer and also requires all plans, specifications, reports, or documents be prepared by a registered engineer. NRG will use registered engineers. | Appendix A-5 |

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**
**(Continued)**

| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| **Local** | | | | |
| Electrical Engineering | Code of Building Regulations | City of Oxnard Department of Building | Sets building standards and requirements for the City. NRG will meet all standards. | Appendix A-5; Section 4.4, Geologic Hazards and Resources |
| **Industry** | | | | |
| Power Plant Reliability | EPRI, NERC | | EPRI and NERC trade association standards will be followed | Appendix A-5; Section 2.12, Safety and Reliability |
| **Federal** | | | | |
| Public Health/Worker Safety Protection | OSHA, 29 USC §651 et seq.; 29 CFR 1910 et seq.; and 29 CFR 1926 et seq. | OSHA and Cal/OSHA | Project will meet employee health and safety standards for employer-employee communications, electrical operations, and chemical exposures. | Section 4.16, Worker Safety |
| Public Health/Worker Safety Protection | Department of Labor, Safety and Health Regulations for Construction promulgated under Section 333 of the Contract Work Hours and Safety Standards Act, 40 USC 327 et seq. | OSHA and Cal/OSHA | Project will meet employee health and safety standards for construction activities. Requirements addressed by CCR Title 8, General Construction Safety Orders. | Section 4.16, Worker Safety |
| **Federal** | | | | |
| Transmission Engineering | 47 USC §15.25 | Federal Aviation Administration | The project will not cause communication interference | Chapter 3 |
| **State** | | | | |
| Transmission System Engineering | GO-52 | CPUC | The project will not cause inductive interference | Chapter 3 |

**Table 2.13-1**
**Applicable Laws, Ordinances, Regulations, and Standards**
**(Continued)**

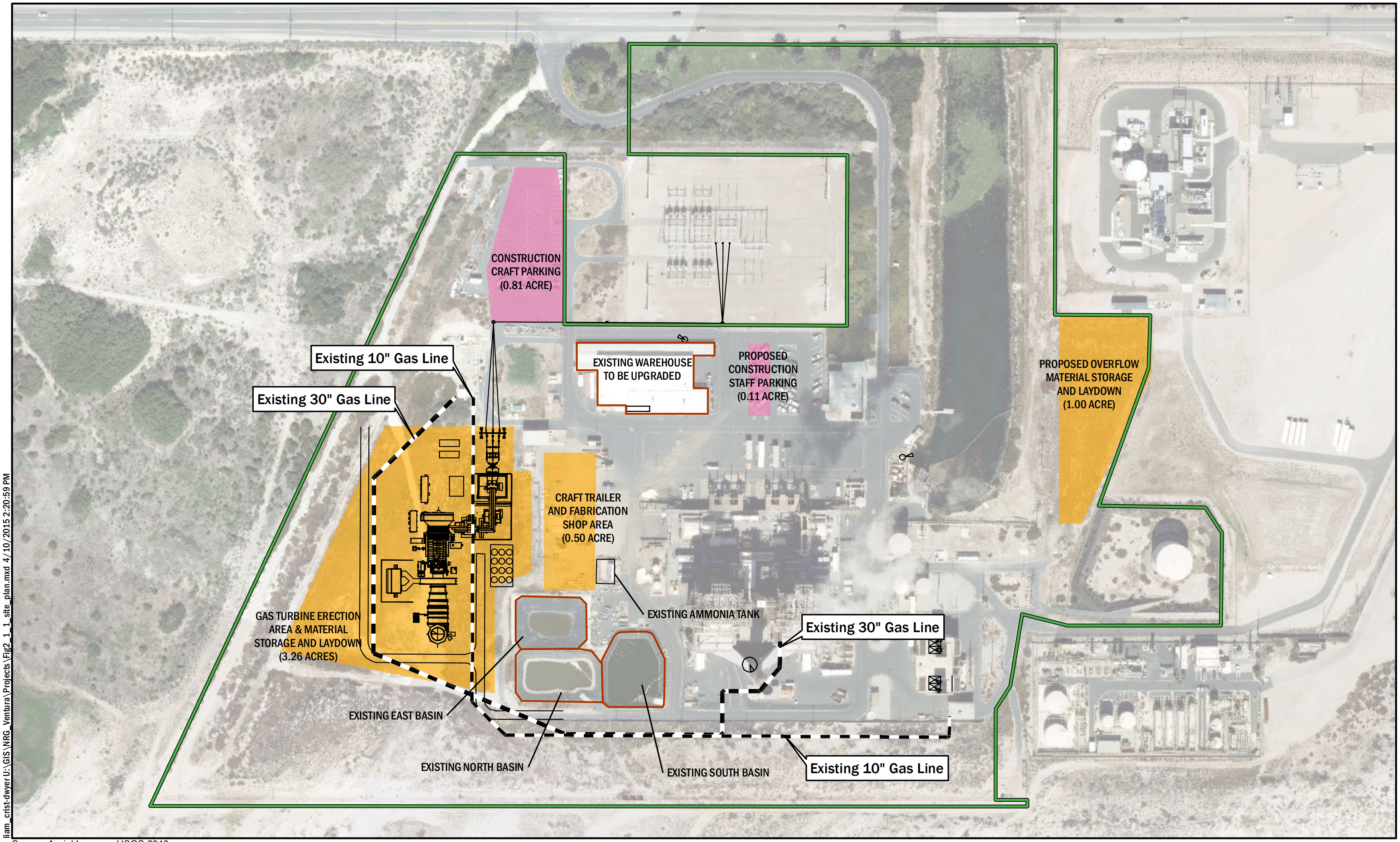
| Engineering Activity | Laws, Ordinances, Regulations, and Standards | Administering Agency | Applicability/Compliance | AFC Section |
|---|---|---|---|---|
| Transmission System Engineering | GO-95 | CPUC | Establishes rules and guidelines for transmission line construction. P3 transmission line clearances, grounding techniques, maintenance and inspection requirements will be provided in accordance with the GO-95 requirements. | Chapter 3 |
| Transmission System Engineering | CCR Section 2700 | CEC | Establishes essential requirement and minimum standards for installation, operation and maintenance of electrical equipment to provide practical safety and freedom from danger. The project will be constructed in conformance with these regulations. | Chapter 3 |

Notes:

AFC = Application for Certification
Cal/OSHA = California Occupational Safety and Health Administration
Caltrans = California Department of Transportation
CBC = California Building Code
CCR = California Code of Regulations
CEC = California Energy Commission
CFR = Code of Federal Regulations
CPUC = California Public Utilities Commission
CWA = Clean Water Act
EPRI = Electric Power Research Institute
GO = General Order
NERC = North American Electric Reliability Council
OSHA = Federal Occupational Safety and Health Administration
P3 = Puente Power Project
RWQCB = Regional Water Quality Control Board
USC = United States Code

**Table 2.14-1**
**Involved Agencies and Agency Contacts**

| Issue | Agency | Contact/Title | Telephone |
|---|---|---|---|
| Air Emissions | Ventura County Air Pollution Control District | Kerby Zozula | (805) 645-1421 |
| Stormwater Program | Los Angeles Regional Water Board(Region 4)<br>320 W 4th Street, Suite 200<br>Los Angeles, CA 90013 | Industrial:<br>Rosario Aston, Lead Staff<br>Construction:<br>Alex Alimohammadi | (213) 576-6653<br>(213) 620-2243 |
| Local City Land Development Permit, Water Supply, and Building Permit | Planning and Land Development Program, City of Oxnard. | Matthew Winegar, Development Services Director | (805) 385-7896 |
| Stormwater Program | County of Ventura | David Laak<br>David Kirby<br>Mark Bandurraga<br>Hydrology Section Manager | (805) 477-7139<br>(805) 662-6737<br>(805) 654-2015<br>(805) 650-4077 |

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Source: Aerial Imagery, USGS 2013.

Mandalay Generating Station Property
Construction and Laydown Areas
Existing Parking Used During Construction

0 125 250
Feet

**SITE PLAN**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.1-1**


Source: Imagery, USGS 2013

Mandalay Generating Station Property Boundary

Puente Power Project Proposed Boundary

**PROJECT LOCATION MAP**

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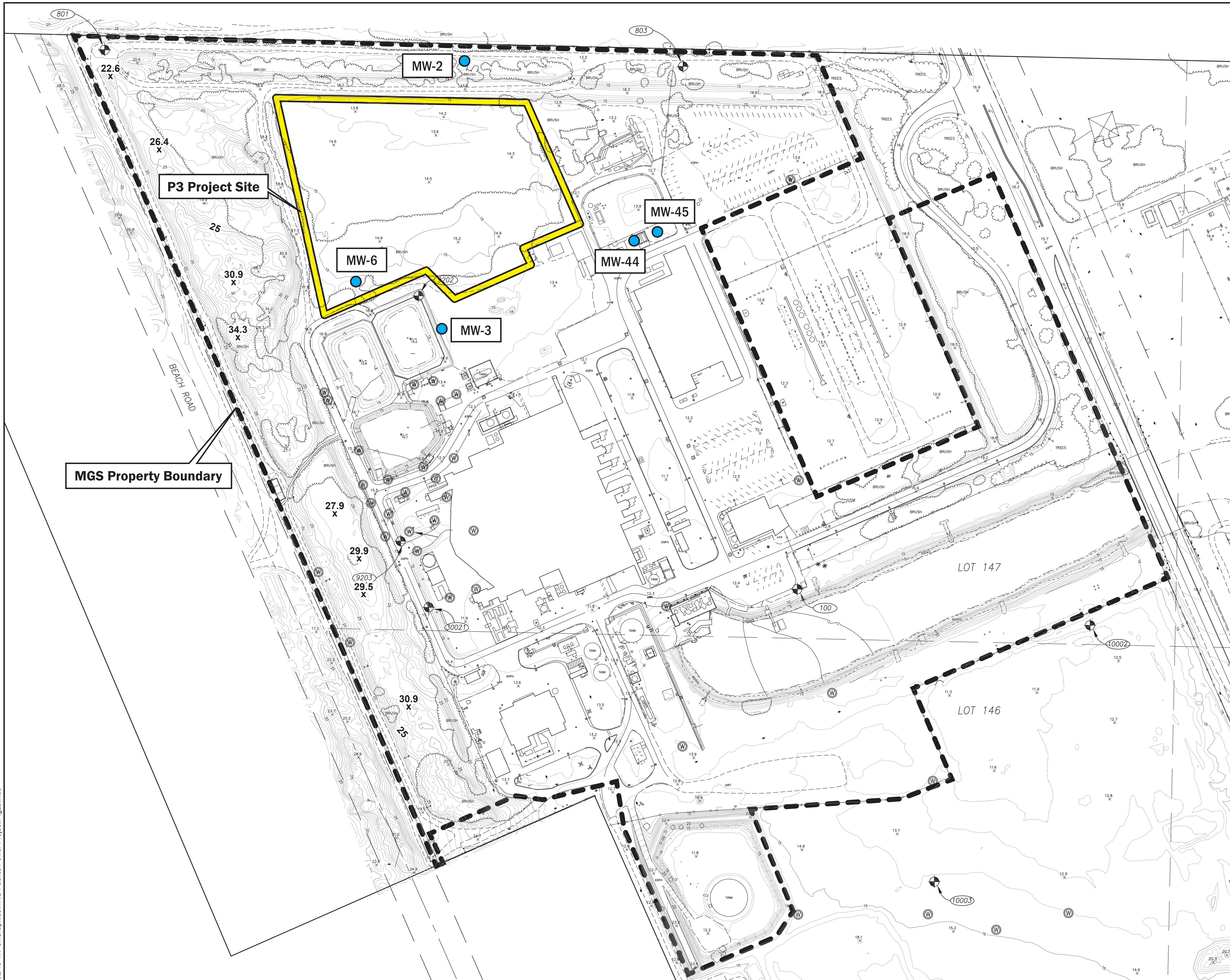
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.4-1**




Puente Power Project (P3)

Mandalay Generating Station Property

Groundwater Monitoring Location

**BASIS OF BEARINGS**

THE BEARINGS SHOWN HEREON ARE BASED ON THE GRID BEARING (N23°39'58"E) PER CONTROL POINTS NO. 100 AND 101 AS SHOWN HEREON, AS DETERMINED BY OPUS GPS STATIC ADJUSTMENT CONSTRAINED TO CORS STATIONS DL7674, DG4677 AND DL7677.

**DATUM STATEMENT**

COORDINATES SHOWN HEREON ARE GRID VALUES BASED ON THE CALIFORNIA COORDINATE SYSTEM (CC83) ZONE V, 1983 NAD83 (CORS96) (2002.00 EPOCH ADJUSTMENT).

ALL DISTANCES SHOWN HEREON, IF ANY, ARE GRID, UNLESS OTHERWISE NOTED.

**BENCHMARK**

ELEVATIONS SHOWN HEREON ARE ORTHOMETRIC HEIGHTS, NAVD 1988 DETERMINED BY GPS STATIC OBSERVATIONS AND GEOID 09 SEPARATIONS, CONSTRAINED TO OPUS.

0 100 200 FEET

**EXISTING SITE TOPOGRAPHY**

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Oxnard, California

April 2015

**FIGURE 2.4-2**

Source: Southern California Edison, 2011 Mandalay, Topographic Survey, March 2011.

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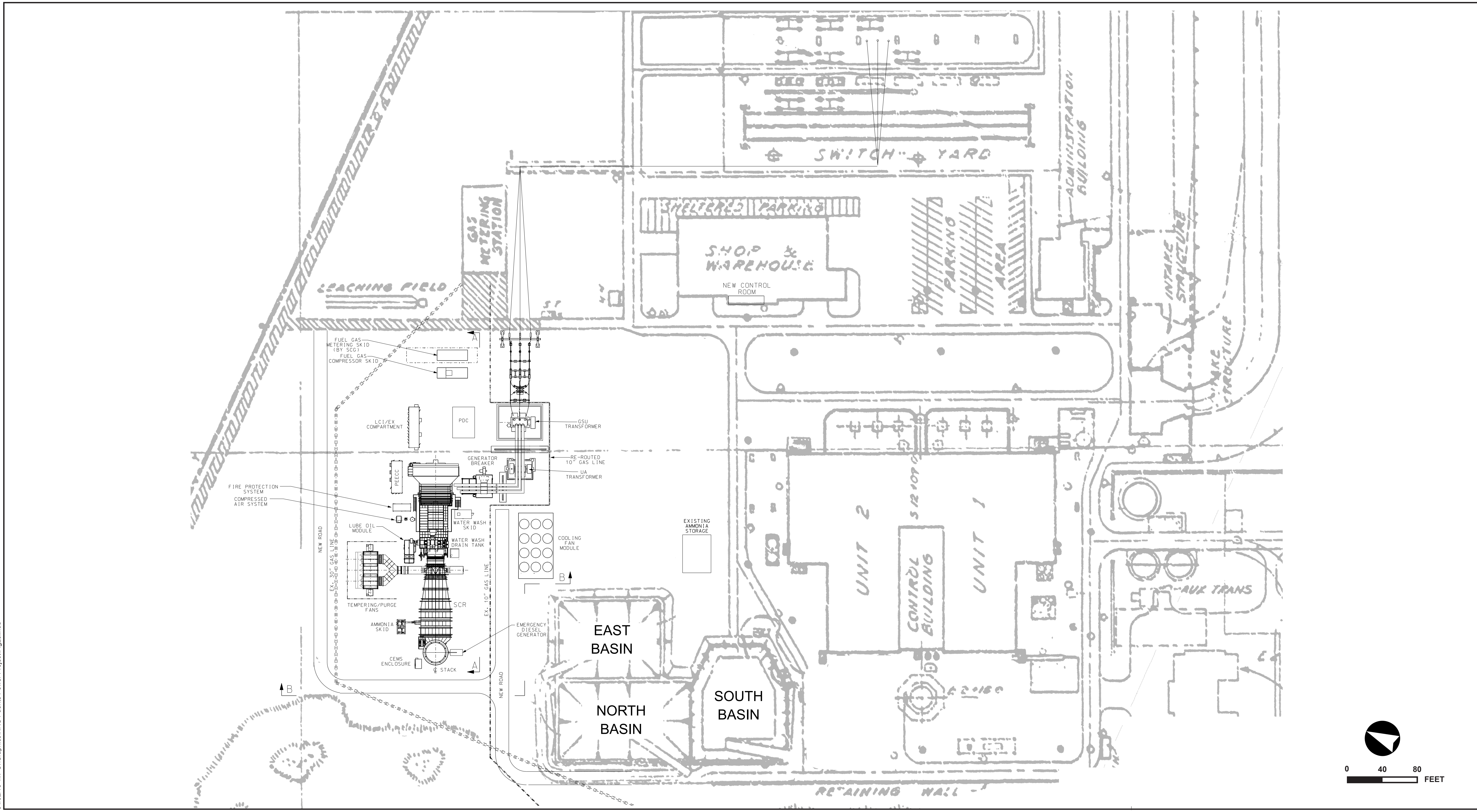


Source: URS DW. No. 31380-P029-MAN-SK 2 REV. D, 2/18/15.

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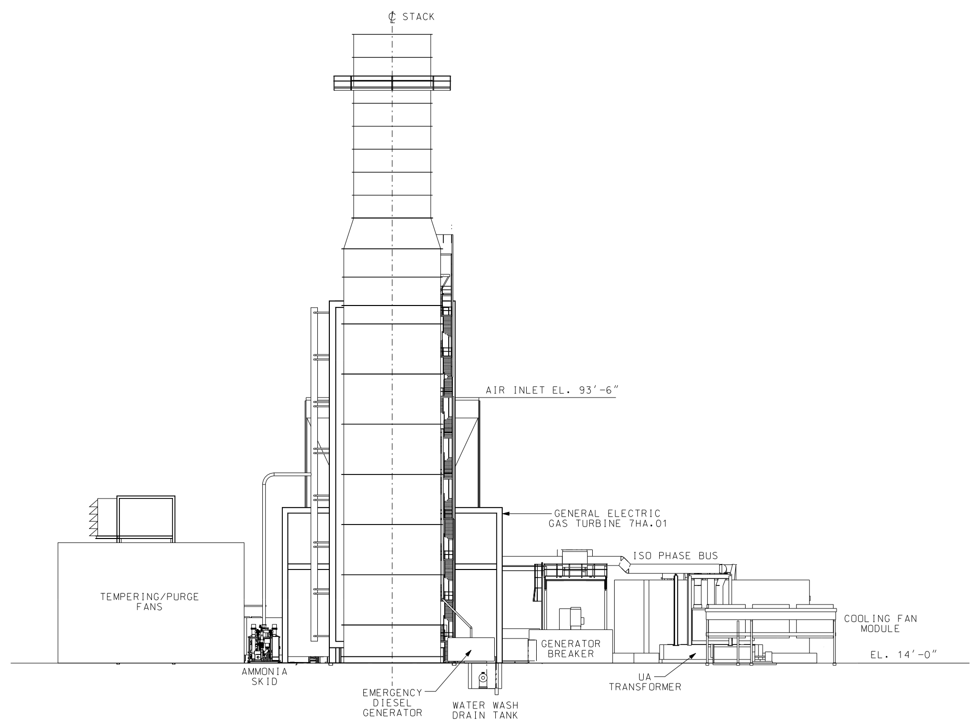
**PLOT PLAN**

NRG
Puente Power Project
Oxnard, California

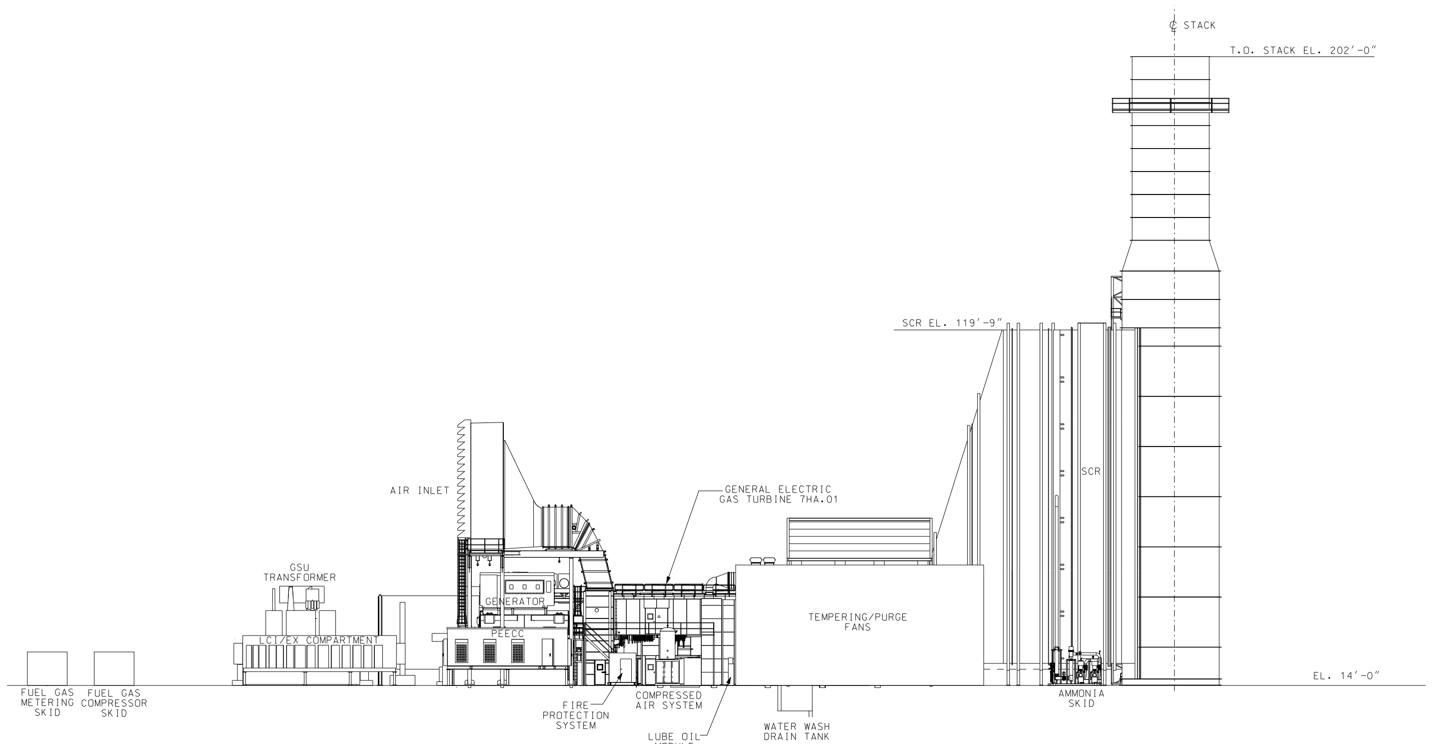
April 2015

**FIGURE 2.7-1**




SECTION B–B

LOOKING EAST




SECTION A–A

LOOKING SOUTH

0 25 50 FEET



Source: URS DW. No. 31380-P029-MAN-SKETCH 5 REV. B, 2/23/15.

**ELEVATION VIEWS**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-2**

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**VIEW OF EXISTING MGS FACILITY**

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Oxnard, California

April 2015

**FIGURE 2.7-3a**

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**AERIAL VIEW OF PROPOSED PROJECT**

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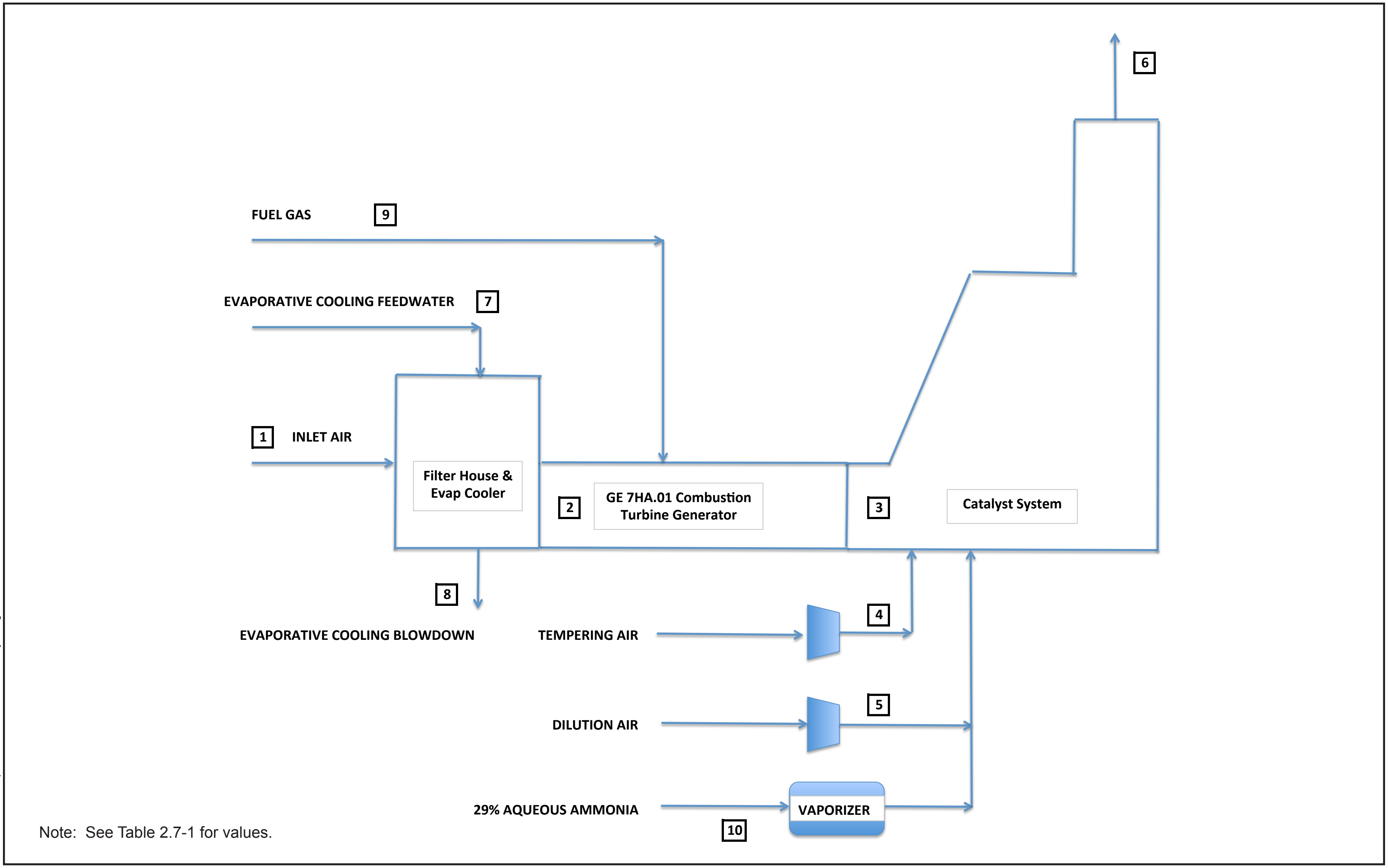
Oxnard, California

April 2015

**FIGURE 2.7-3b**



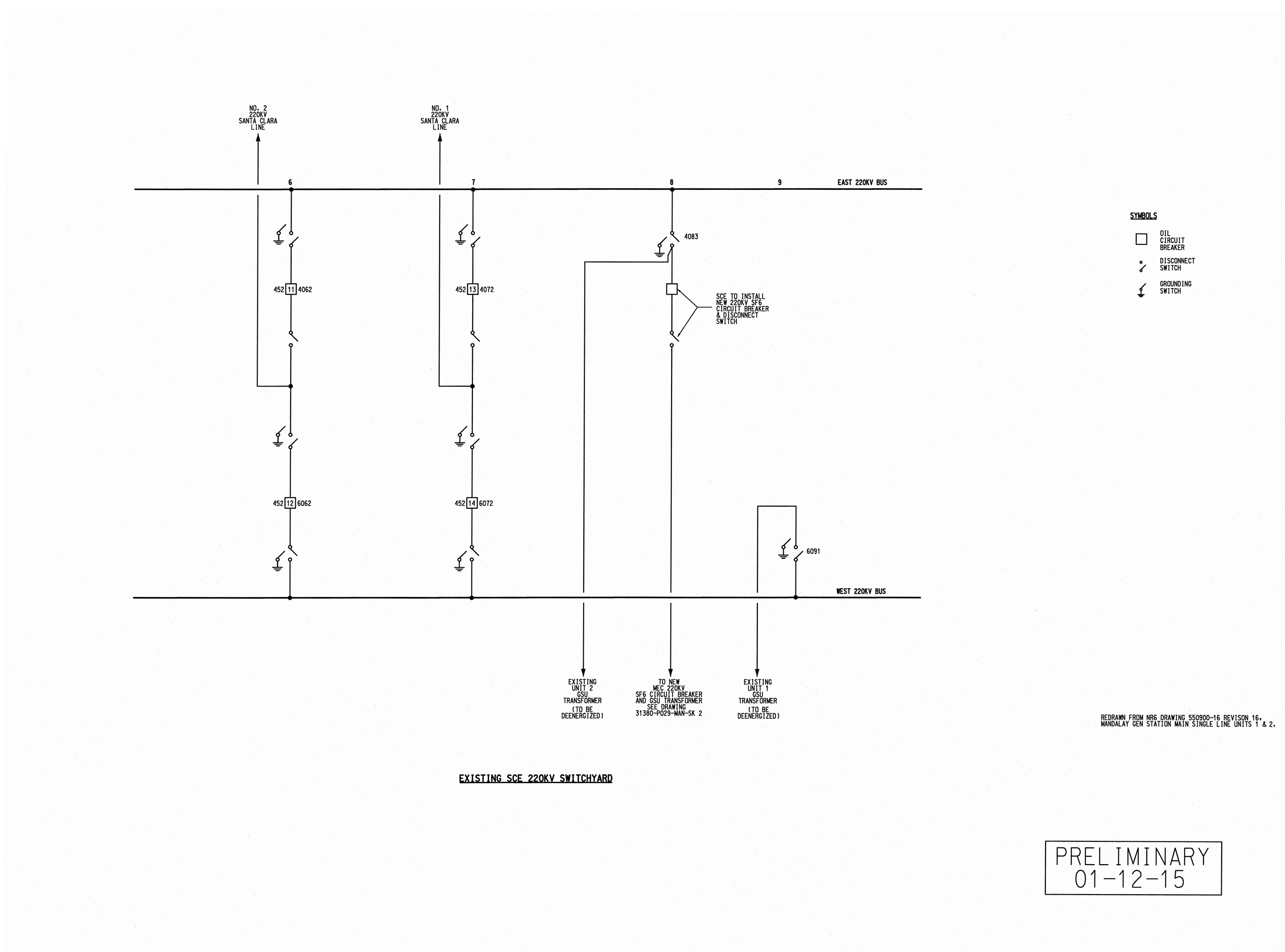



**HEAT AND MATERIAL BALANCE DIAGRAM**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-4**




Source: URS DW. No. 31380-P029-MAN-SK 3 REV. B, 01/12/15.



**SINGLE-LINE DIAGRAM – EXISTING SWITCHYARD**

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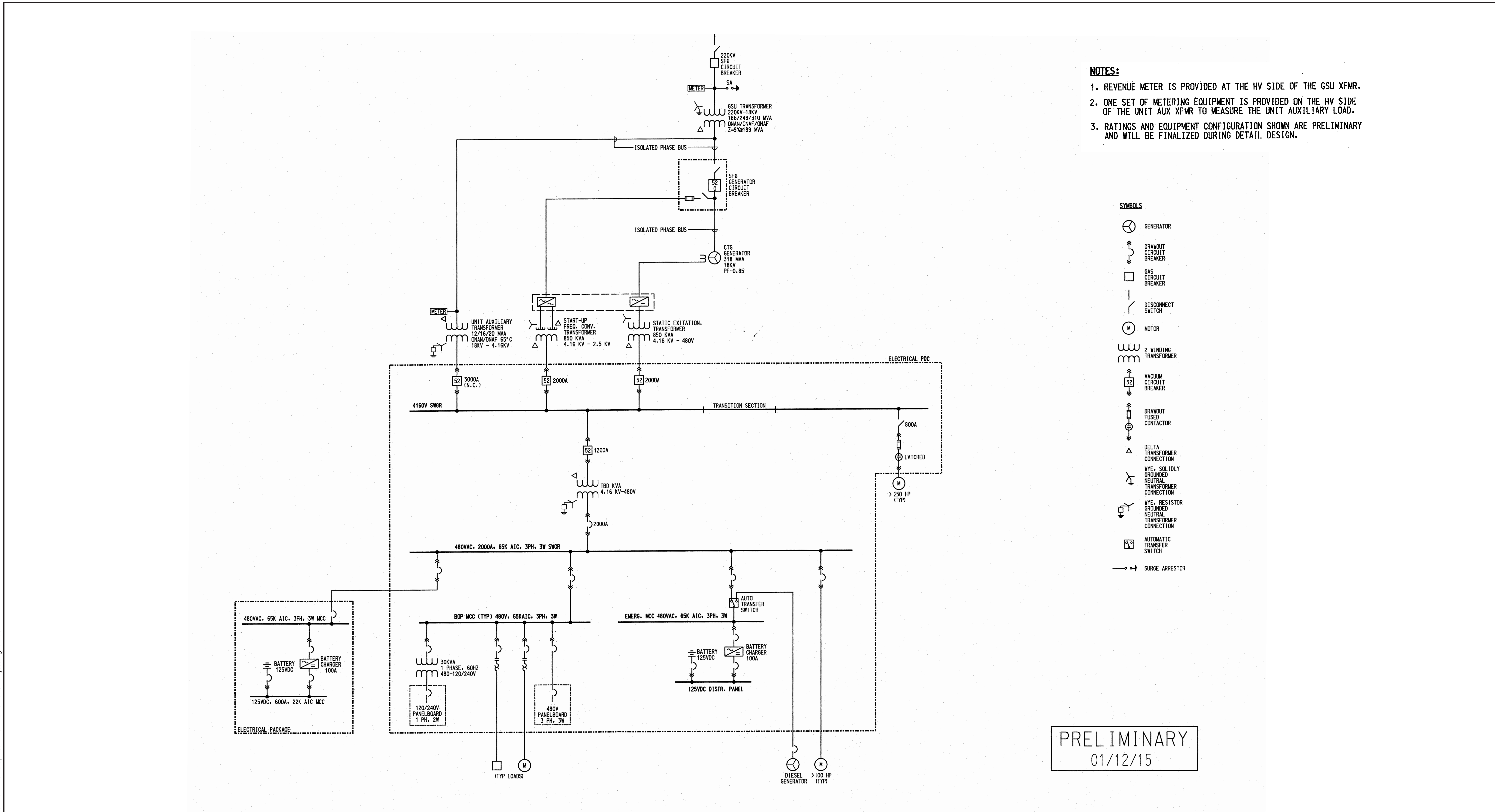
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-5a**




Source: URS DW. No. 31380-P029-MAN-SK 2 REV. B, 01/12/15.

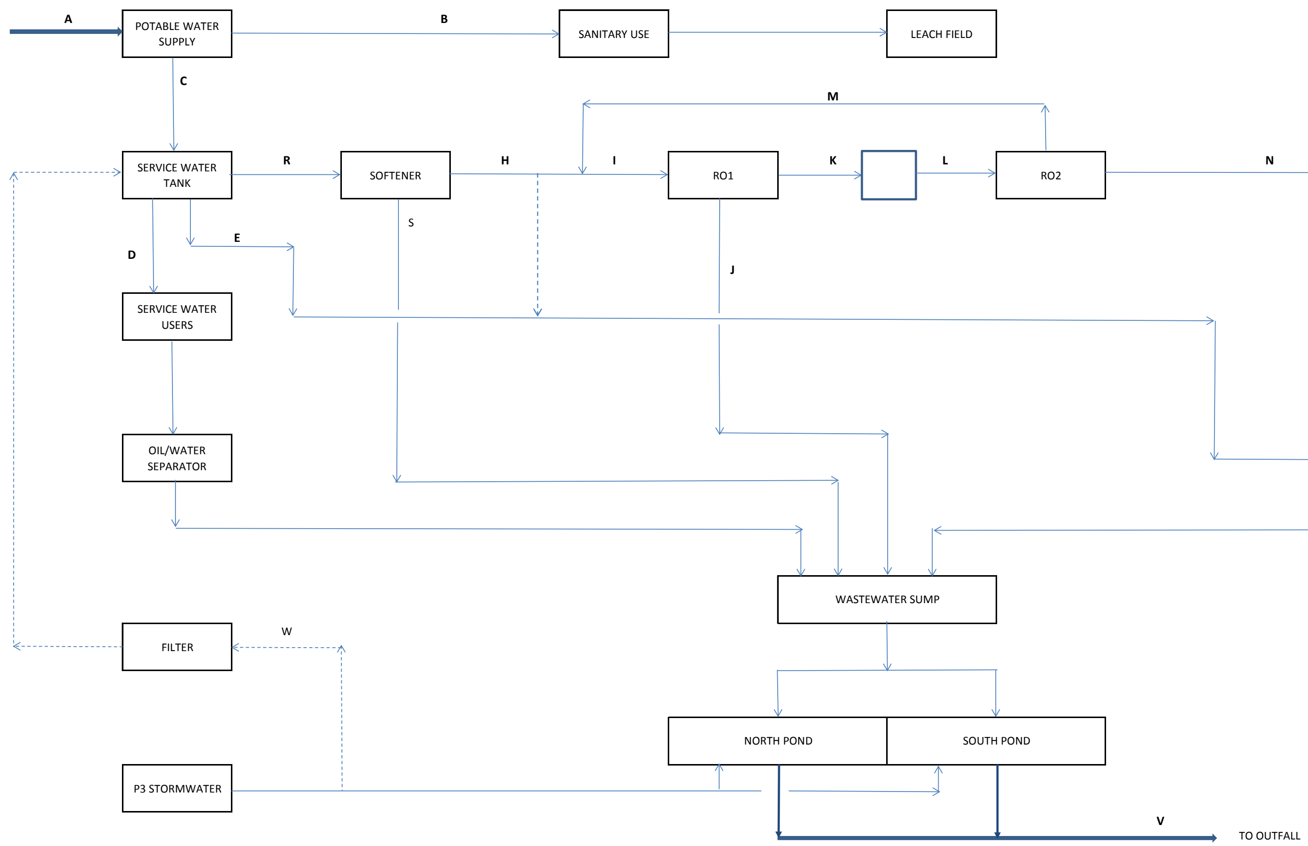


**SINGLE-LINE DIAGRAM – P3 UNIT**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-5b**




Note: See Table on Figure 2.7-7 for flows.



**WATER BALANCE DIAGRAM**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-6**

**NRG Puente Power Project Simple Cycle**

**PRELIMINARY**

**Plant Water Balance**

4/6/2015

WATER FLOWRATES FOR VARIOUS CASES; EVAPORATIVE COOLER AT 5.0 COC; 50/50 DEMIN BLEND

| Stream ID | Case ID | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 | Case 8 | Case 9 | Case 10 | Average Daily (DB > 59F) gpm | Maximum Daily Peak Summer (DB = 82F) gpm | Annual Flow, GPY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 99.6% Winter | 99.6% Winter | ISO | ISO | 1% Summer | 1% Summer | 1% Summer | 0.4% Summer | 0.4% Summer | 0.4% Summer | | | |
| | Hours per Year | 0 | 0 | 1,314 | 0 | 0 | 0 | 0 | 1,314 | 0 | 0 | | | |
| | Ambient Temperature, °F | 39 | 39 | 59 | 59 | 78 | 78 | 78 | 82 | 82 | 82 | | | |
| | Relative Humidity, % | 26% | 26% | 60% | 60% | 50% | 50% | 50% | 31% | 31% | 31% | | | |
| | Plant Gross Output (MW) | 278 | 83 | 275 | 82 | 267 | 253 | 87 | 270 | 247 | 89 | | | |
| | Inlet Air Cooler Status | Off | Off | Off | Off | On | Off | Off | On | Off | Off | | | |
| | Fuel Type | Gas | Gas | Gas | Gas | Gas | Gas | Gas | Gas | Gas | Gas | | | |
| Stream ID | Description / Number of CT's in Service | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| A | Plant Potable Water - Total Supply | 4 | 4 | 4 | 4 | 43 | 4 | 4 | 65 | 4 | 4 | 34 | 65 | 6,149,701 |
| B | Potable Water - Sanitary | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1,051,200 |
| C | Potable Water - Service Water Makeup | 2 | 2 | 2 | 2 | 41 | 2 | 2 | 63 | 2 | 2 | 32 | 63 | 5,098,501 |
| D | Service Water - Plant Users | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 315,360 |
| E | Evaporative Cooler - Service Water Makeup | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 24 | 0 | 0 | 12 | 24 | 1,857,668 |
| F | Evaporative Cooler - Blowdown | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 9 | 0 | 0 | 5 | 9 | 743,067 |
| G | Evaporative Cooler - Evaporation | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 38 | 0 | 0 | 19 | 38 | 2,972,268 |
| H | Softener Treated Effluent | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 33 | 0 | 0 | 17 | 33 | 2,631,696 |
| I | Makeup Water Treatment System - 1st Pass RO Feed | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 39 | 0 | 0 | 20 | 39 | 3,096,113 |
| J | Makeup Water Treatment System - 1st Pass RO Reject | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 10 | 0 | 0 | 5 | 10 | 774,028 |
| K | Makeup Water Treatment System - 1st Pass RO Effluent | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 29 | 0 | 0 | 15 | 29 | 2,322,084 |
| L | Makeup Water Treatment System - 2nd Pass RO Feed | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 29 | 0 | 0 | 15 | 29 | 2,322,084 |
| M | Makeup Water Treatment System - 2nd Pass RO Reject | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 6 | 0 | 0 | 3 | 6 | 464,417 |
| N | Makeup Water Treatment System - 2nd Pass RO Effluent | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 24 | 0 | 0 | 12 | 24 | 1,857,668 |
| P | Evaporative Cooler - Demin Makeup | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 24 | 0 | 0 | 12 | 24 | 1,857,668 |
| Q | Evaporative Cooler - Total Makeup | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 47 | 0 | 0 | 24 | 47 | 3,715,335 |
| R | Softener SW Feed | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 37 | 0 | 0 | 19 | 37 | 2,925,473 |
| S | Softener Regeneration Waste | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 4 | 0 | 0 | 2 | 4 | 293,778 |
| V | Total Process Wastewater | 2 | 2 | 2 | 2 | 17 | 2 | 2 | 25 | 2 | 2 | 13 | 25 | 2,126,233 |
| W | Stormwater Recycle to Service Water | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 400,000 |

| INPUTS | | |
|---|---|---|
| 1 | MEC Evaporative Cooler COC | 5.0 |
| 2 | Evaporative Cooler Demin Water Blend, % | 50% |
| 3 | Evaporative Cooler Softened Water, % | 0% |
| 4 | Plant Service Water Users Rate, gpm | 2.0 |
| 5 | 1st Pass RO Recovery Rate, % | 75% |
| 6 | 2nd Pass RO Recovery Rate, % | 80% |
| 7 | Plant Demin Water Users Rate, gpm | 0.0 |
| 8 | Potable Water Supply Rate (sanitary), gpm | 2.0 |

| OTHER DEMIN USERS | | |
|---|---|---|
| 1 | Chemical Feed Dilution, gpm | 0.0 |
| 2 | AUX Boiler Makeup, gpm | 0.0 |
| 3 | CTG Wash Water, gpm | 0.0 |

**NOTES**

1. All flows are in gallons per minute (GPM). Not all maxium flows occur simultaneously.
2. Flows represent water usage for the Puente Power Plant.
3. Recovery rates and cycles of concentration are estimated based on City of Oxnard Combined Wells.
4. Reuse of stormwater from Puente Power Plant (Stream W) is intermittent based on annual rain fall.
   It is estimated that +/- 400,000 gallons per year of stormwater can be utilized as service water makeup, which will result in a direct reduction of potable water of the same amount.

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**WATER BALANCE DETAILS**

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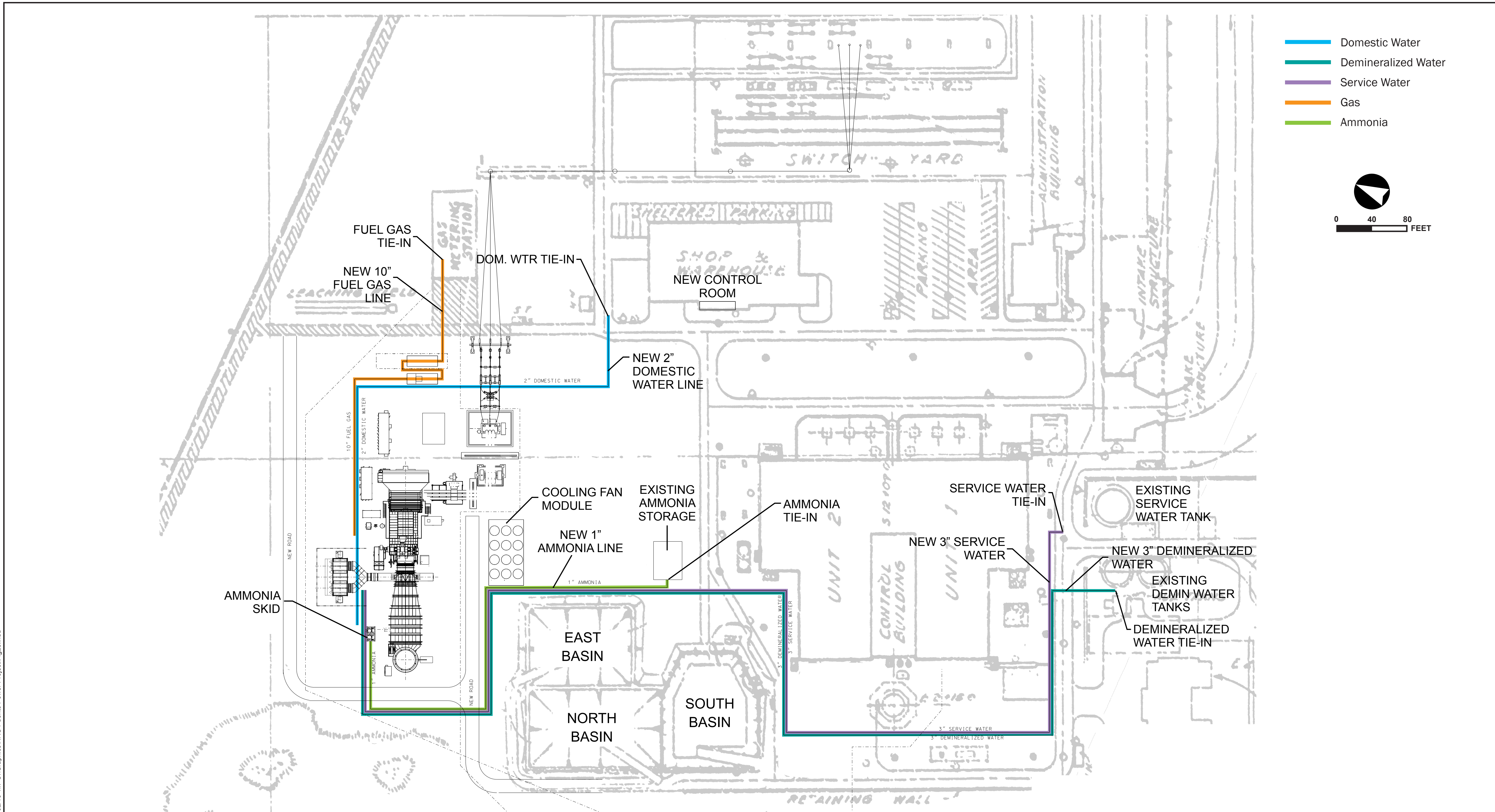
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-7**




Source: URS DW. No. 31380-P029-MAN-SKETCH 8 REV. A, 1/20/15.

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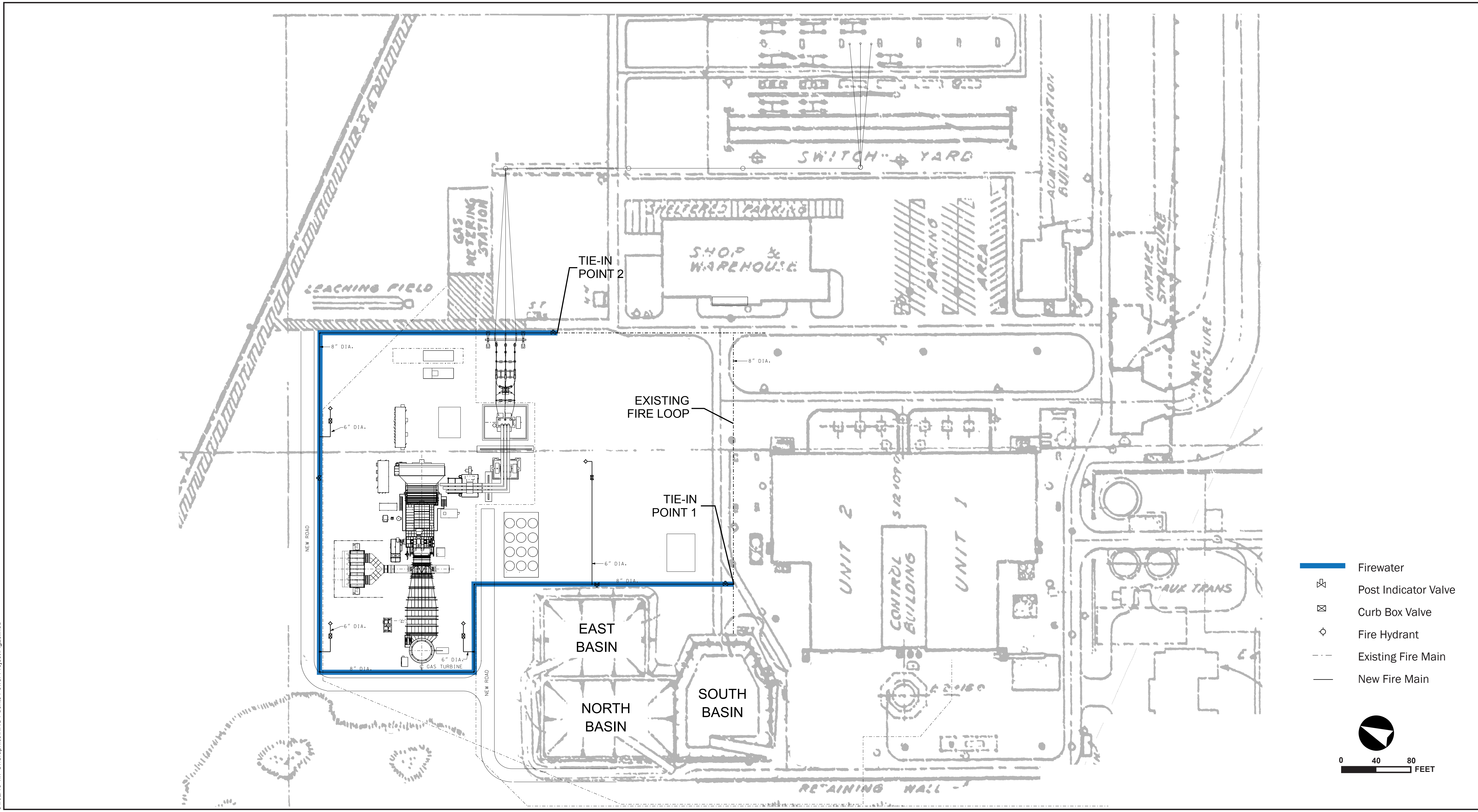
**GAS AND WATER LINES**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-8**

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Source: URS DW. No. 31380-P029-MAN-SKETCH 6 REV. A, 1/20/15.

**FIREWATER LOOP**

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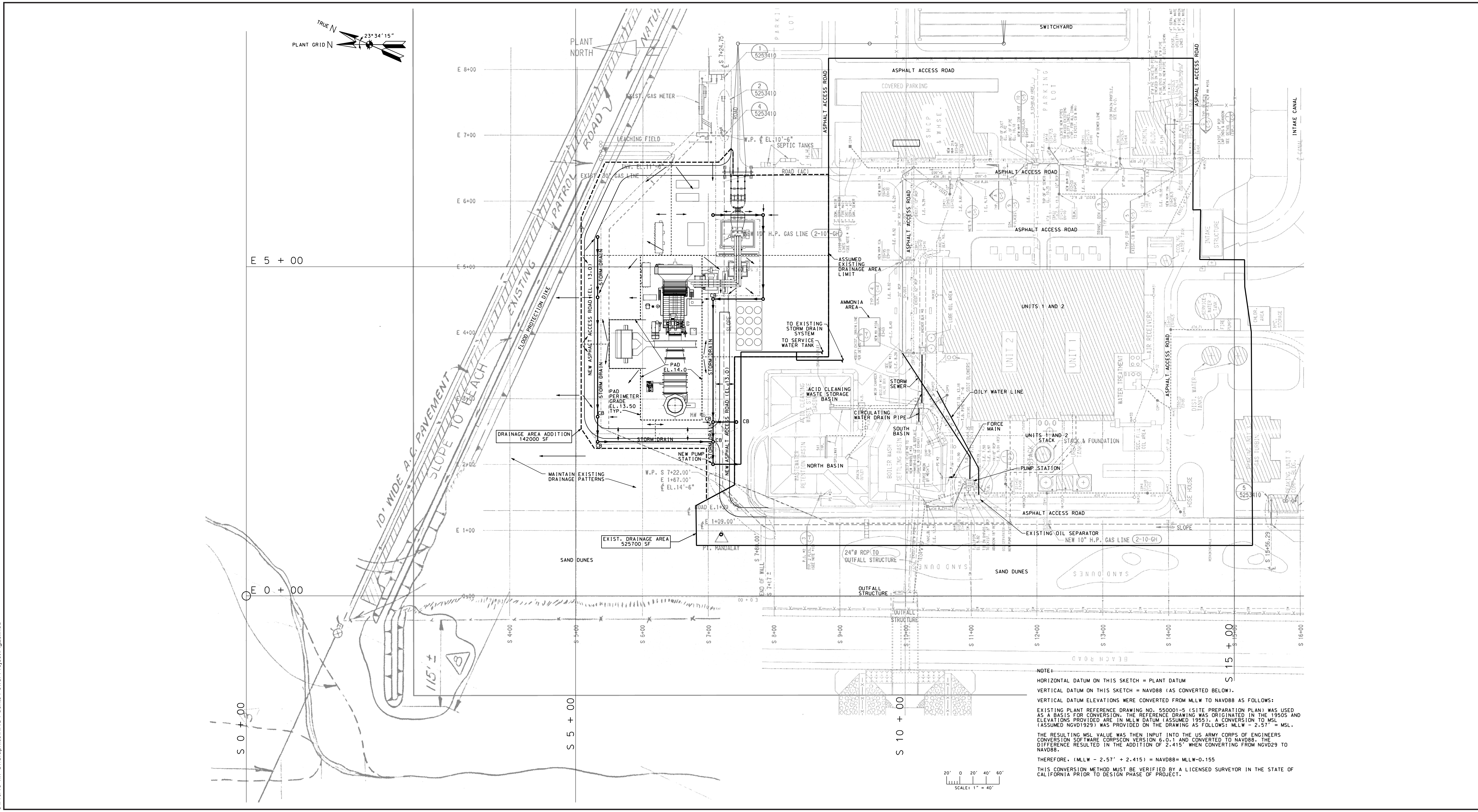
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.7-9**

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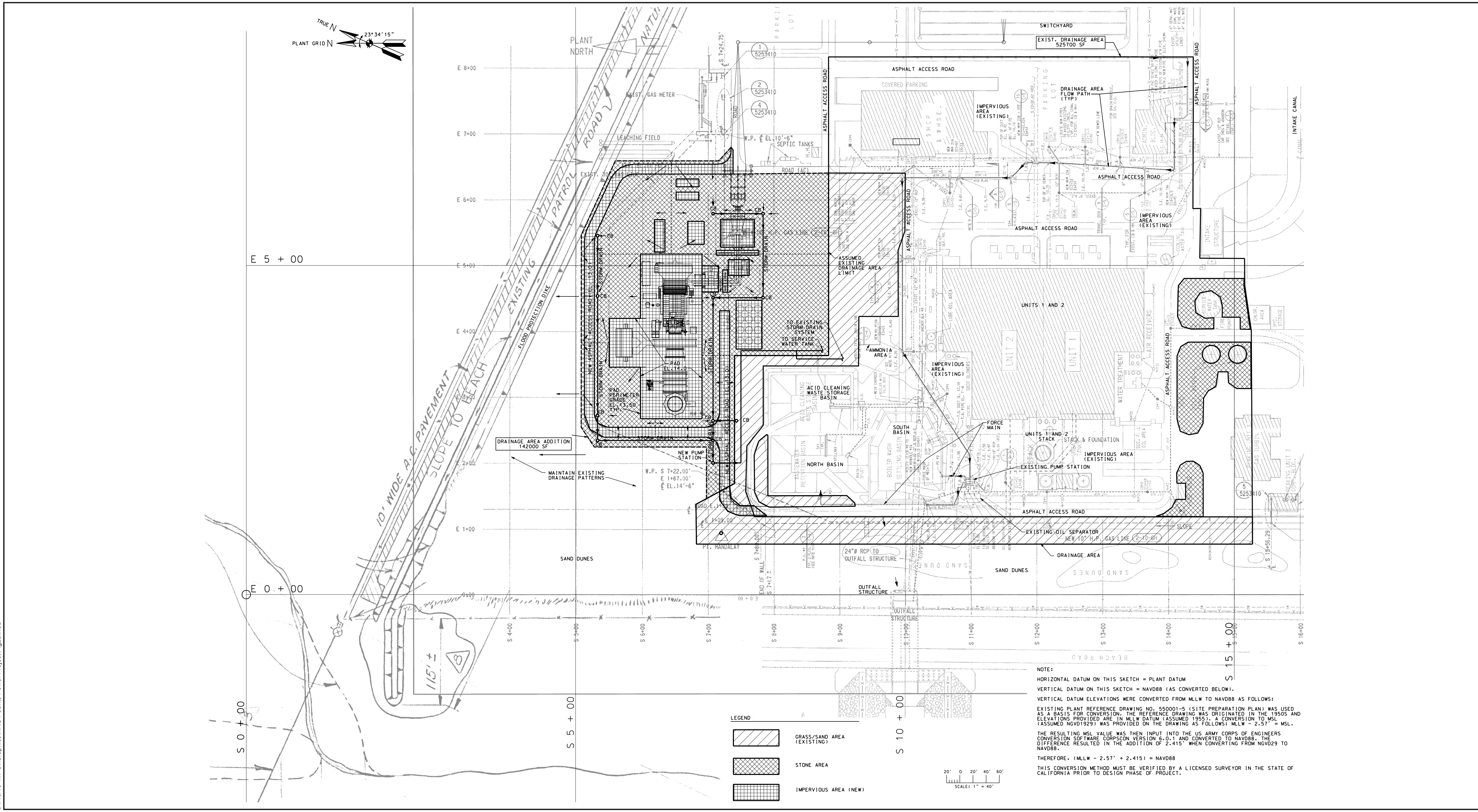
Source: URS DW. No. 31380-P029-MAN-SKETCH 11 REV. C, 4/06/15.

**SITE GRADING AND DRAINAGE PLAN**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.8-1**

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Source: URS DW. No. 31380-P029-MAN-SKETCH 12 REV. C, 4/06/15.

**SITE DRAINAGE AREAS**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.8-2**

JFS - OXNARD LEVEL 1 - Decommissioning

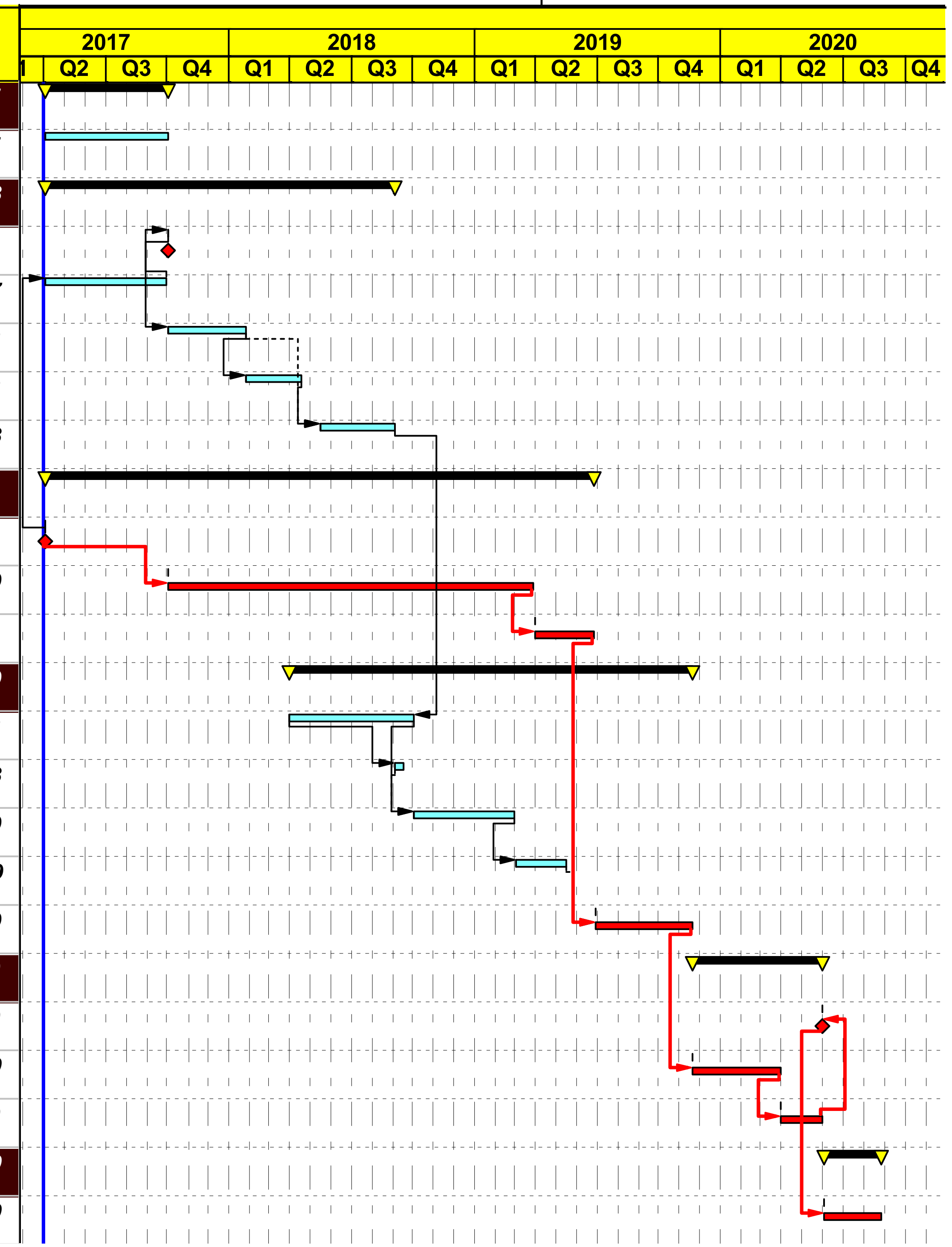
TASK filter: All Activities

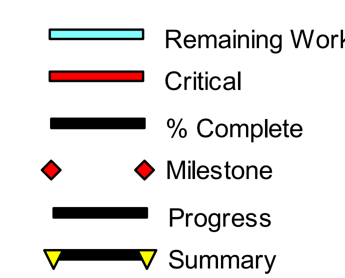
## Puente Power Project

06-Mar-15 11:02

DATA DATE 01-Apr-17

| Activity ID | Activity Name | Current Start | Current Finish |
|---|---|---|---|
| **PERMITTING** | | 03-Apr-17 | 02-Oct-17 |
| PMT-0005 | Permit Application and Approval | 03-Apr-17 | 02-Oct-17 |
| **DESIGN** | | 03-Apr-17 | 04-Sep-18 |
| ENG-0001 | Award EPC | 02-Oct-17 | |
| ENG-0005 | LNTP - Preliminary Engineering | 03-Apr-17 | 29-Sep-17 |
| ENG-0010 | Prepare P&ID's | 02-Oct-17 | 25-Jan-18 |
| ENG-0015 | One Line Diagrams/Schematics | 26-Jan-18 | 17-Apr-18 |
| ENG-0020 | Building Design/Civil Tasks | 16-May-18 | 04-Sep-18 |
| **FABRICATION/DELIVERY** | | 03-Apr-17 | 27-Jun-19 |
| FAB-0005 | LNTP - Award CTG's | 03-Apr-17* | |
| FAB-0010 | Manufacture CTG's | 02-Oct-17 | 29-Mar-19 |
| FAB-0015 | Deliver CTG's | 01-Apr-19 | 27-Jun-19 |
| **CONSTRUCTION** | | 30-Mar-18 | 19-Nov-19 |
| CON-0001 | CEC Authorization for Construction | 30-Mar-18 | 02-Oct-18 |
| CON-0005 | Site Mobilization | 04-Sep-18 | 17-Sep-18 |
| CON-0010 | Demolition/Site Preparation | 03-Oct-18 | 01-Mar-19 |
| CON-0015 | Install CTG & SCR Foundations | 04-Mar-19 | 17-May-19 |
| CON-0020 | Install CTG's & SCR's | 28-Jun-19 | 19-Nov-19 |
| **START-UP** | | 20-Nov-19 | 01-Jun-20 |
| COD | Commercial Operation | | 01-Jun-20 |
| SUT-0005 | Start-Up Testing & Commissioning | 20-Nov-19 | 30-Mar-20 |
| SUT-0010 | Construction Contingency | 31-Mar-20 | 01-Jun-20 |
| **DECOMMISSIONING** | | 02-Jun-20 | 25-Aug-20 |
| DEC-0005 | Decommissioning Units 1&2 | 02-Jun-20 | 25-Aug-20 |



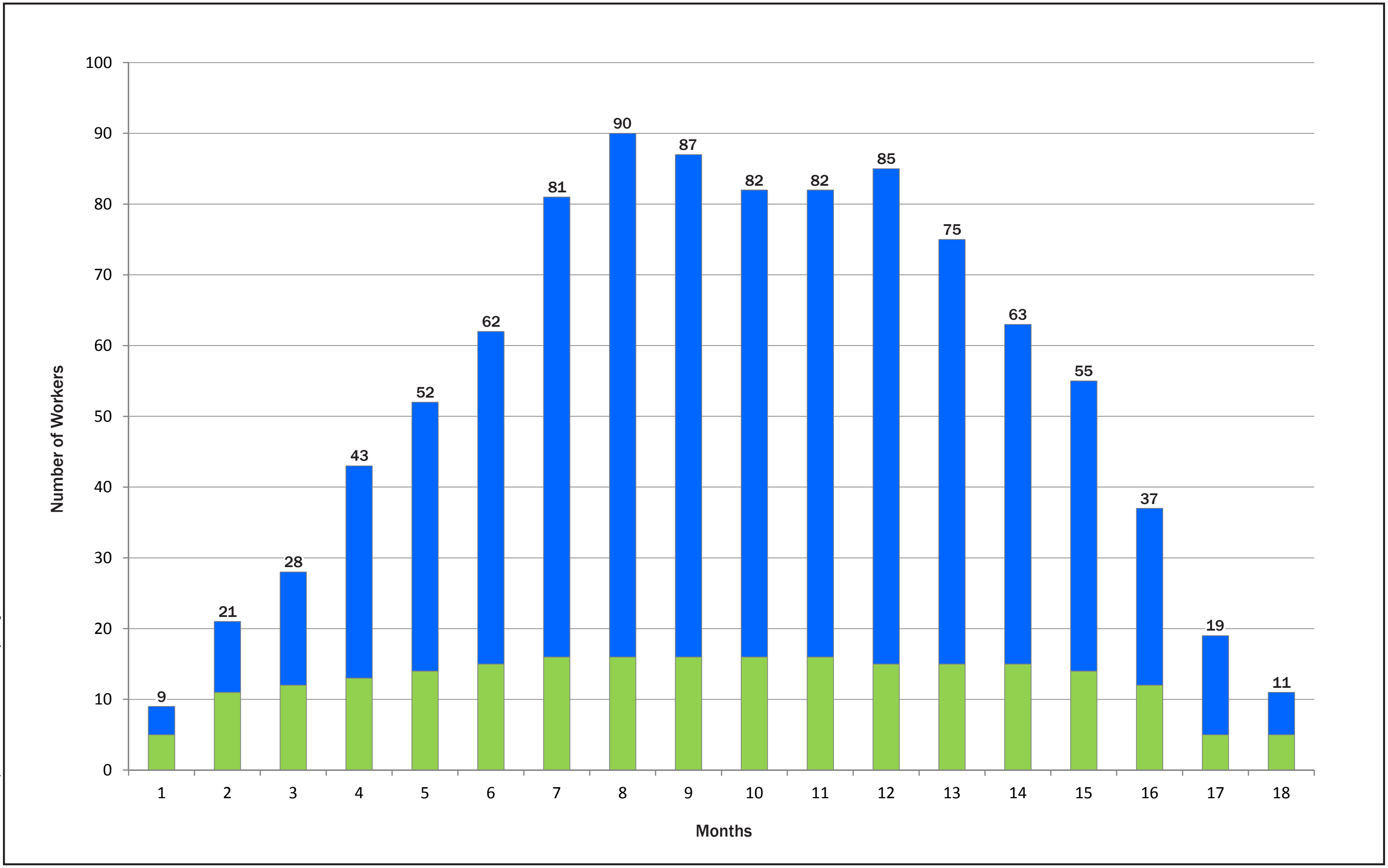

04/02/15 hk U:\Graphics\NRG Puente Power Project\Fig2s.indd

**PROJECT SCHEDULE**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.9-1**






Construction Staff

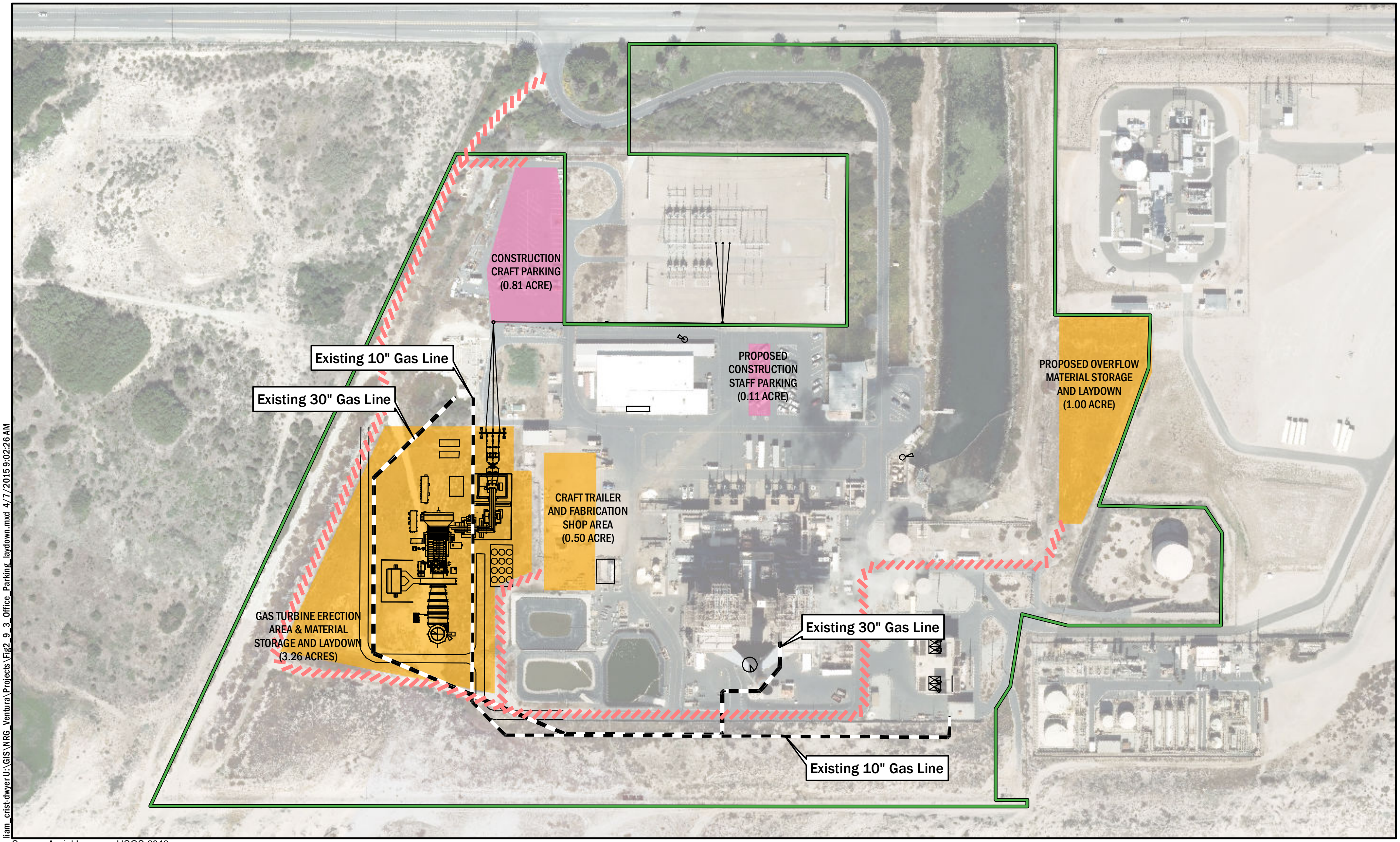
Craft Labor

**CONSTRUCTION STAFF BY MONTH**

NRG
Puente Power Project
Oxnard, California

April 2015

**FIGURE 2.9-2**




Source: Aerial Imagery, USGS 2013.

Construction Access on Existing Roads
Mandalay Generating Station Property
Construction and Laydown Areas
Existing Parking Used During Construction

0 125 250 Feet

**CONSTRUCTION OFFICE, PARKING AND LAYDOWN AREAS**

April 2015

NRG
Puente Power Project
Oxnard, California

**FIGURE 2.9-3**