APPENDIX 10F

Chemical Engineering Design Criteria

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10F.1 Introduction

Control of the design, engineering, procurement, and construction activities on the project will be completed in accordance with predetermined standard practices and project-specific programs/practices. An orderly sequence of events for the implementation of the project is planned consisting of the following major activities:

- Conceptual design
- Licensing and permitting
- Detailed design
- Procurement
- Construction and construction management
- Startup, testing, and checkout
- Project completion

This appendix summarizes the general chemical engineering design criteria for the project. These criteria form the basis of the design for the chemical components and systems of the project. More specific design information will be developed during detailed design to support equipment and erection specifications. It is not the intent of this appendix to present the detailed design information for each component and system, but rather to summarize the codes, standards, and general criteria that will be used.

Subsection 10F.2 summarizes the applicable codes and standards, and Subsection 10F.3 includes the general criteria for design water quality, chemical conditioning, chemical storage, and wastewater treatment.

10F.2 Design Codes and Standards

The design of all work will be in accordance with the laws and regulations of the federal government and the State of California and local codes and ordinances. The following codes and standards are applicable to the chemical engineering aspects of the power facility:

- ANSI B31.1 Power Piping Code
- ASME Performance Test Code 31, Ion Exchange Equipment
- American Society for Testing and Materials (ASTM)
- California Building Standards Code (CBSC)
- Occupational Safety and Health Administration (OSHA)
- Steel Structures Painting Council Standards (SSPC)
- Underwriters Laboratories (UL)
- American Waterworks Association (AWWA)

Other recognized standards will be used as required to serve as design, fabrication, and construction guidelines when not in conflict with the above-listed standards.

The codes and industry standards used for design, fabrication, and construction will be the codes and industry standards, including all addenda, in effect as stated in equipment and construction purchase or contract documents.

10F.3 General Criteria

10F.3.1 Design Water Quality

10F.3.1.1 City of Vernon Wastewater Treatment Plant Reclaimed Water

The Central Basin Municipal Water District (CBMWD) will supply reclaimed water, and the City of Vernon will supply potable water to the Vernon Power Plant (VPP). These will be used, either treated or untreated, for industrial water needs in the VPP including cooling tower makeup, service water, heat recovery steam generator (HRSG) feedwater makeup, and combustion turbine evaporative cooling.

Typical water analyses for the water supplies are presented in Subsection 8.14.

10F.3.1.2 Demineralized Water System

High-quality demineralized water will be used for steam cycle makeup and combustion turbine washes.

Minimum demineralized water quality will be as follows:

- Total dissolved solids: 0.1 milligram per liter (mg/L)
- Silica as SiO_2: 0.005 mg/L
- Specific conductance: 0.1 microsiemen per centimeter (µS/cm)
- pH: 6.5 to 7.5

10F.3.1.3 Construction Water

Water for use during construction will be supplied by the City of Vernon potable water system.

10F.3.1.4 Fire Protection Water

The source of water for fire protection will be two potable water lines from the City of Vernon (one in Seville Avenue and one in Soto Street).

10F.3.2 Chemical Conditioning

10F.3.2.1 Cycle Chemical Conditioning

To control corrosion and deposit formation in the HRSG/steam turbine cycle, neutralizing amine and oxygen scavenger will be added to the condensate or feedwater, and a mixture of phosphates may be added to the HRSG.

10F.3.2.2 Circulating Water System Chemical Conditioning

Circulating water chemical conditioning will consist of chemicals to minimize the formation of mineral scale and biofouling. Scaling will be controlled by the use of sulfuric acid for alkalinity adjustment in conjunction with scale inhibitors. Sodium hypochlorite or chlorine dioxide will be used to minimize biofouling of the condenser tubes and the cooling tower. Systems will also be provided for the feeding of alternate biocides, such as stabilized bromine, sodium bromide, or a non-oxidizing biocide.

10F.3.3 Chemical Storage

10F.3.3.1 Storage Capacity

In general, chemical storage tanks will be sized to store a maximum of 10,000 gallons. One 20,000-gallon tank will be provided for the storage of aqueous ammonia for the selective catalytic reduction systems.

10F.3.3.2 Containment

Chemical storage tanks containing corrosive fluids will be surrounded by curbing. Curbing and drain-piping design will allow a full-tank capacity spill without overflowing the curbing. For multiple tanks within the same curbed area, the largest single tank will be used to size the curbing and drain piping. For outdoor chemical containment areas, additional containment volume will be included for stormwater.

10F.3.3.3 Closed Drains

Waste piping for volatile liquids and wastes with offensive odors will use closed drains to control noxious fumes and vapors.

10F.3.3.4 Coatings

Tanks, piping, and curbing for chemical storage applications will be provided with a protective coating system. The specific requirements for selection of an appropriate coating will be identified prior to equipment and construction contract procurements.

10F.3.4 Wastewater Treatment

Metal cleaning wastes from pre-operational and operational chemical cleaning of the boiler systems of the HRSG will be collected, treated, and disposed of offsite by the chemical cleaning contractor. Cooling tower blowdown and other plant process wastewaters will be collected and discharged into the Sanitation Districts of Los Angeles County (LACSD) sanitary system

Sanitary wastewater will be discharged to the City of Vernon sanitary sewer, which connects to the LACSD sanitary system.