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SECTION 4 NATURAL GAS SUPPLY

4.1 INTRODUCTION

This section discusses the natural gas supply for the Rio Mesa Solar Electric Generating Facility ("Rio Mesa SEGF" or "Project"). Natural gas is used at the Rio Mesa SEGF to provide for equipment protection overnight such as where steam is needed to maintain seals on the turbine/generator, preheating of the piping systems in the morning to accelerate the time at which solar generation may commence, to augment solar generation during transient cloud occurrences, and to extend electrical generation past dusk when system electrical demand requires it. Section 4.2 describes the proposed natural gas supply pipeline. The natural gas supply pipeline construction methods and metering stations are described in Section 4.3. Pipeline operations are described in Section 4.4.

4.2 PROPOSED INTERCONNECTION

The Rio Mesa SEGF will receive natural gas from the TransCanada Gas Transmission (TCGT) North Baja Pipeline which runs adjacent the WAPA electric transmission line along the eastern edge of the developed solar fields for all three plants. Since TCGT is not a natural gas retailer, the Project will obtain natural gas from one or more gas suppliers who own firm capacity on the TCGT North Baja Pipeline. Separate contracts for Rio Mesa I, II, and III will be executed with such suppliers.

4.3 CONSTRUCTION PRACTICES

4.3.1 Gas Pipeline Connection

Natural gas will be delivered to the Project by installing one or more tap and meter station(s) on the existing TCGT North Baja Pipeline. From the tap, natural gas will go through a master metering station where the total flow of natural gas will be measured. This metering station will require a minimum area of approximately 150 feet by 150 feet. Tap and metering station(s) will be permitted, built, owned and operated by TCGT or its subsidiary. Custody transfer of the natural gas will be downstream from the master metering station(s). Natural gas will be delivered to each plant through a high pressure (HP) gas lateral pipe that will run along project roads. Each plant will have its own meter to measure the amount of natural gas delivered to the power block. In addition, facilities will be installed at each power block to regulate the pressure of the natural gas and to remove any liquids, solid particles, or other impurities.

Construction activities related to the tap and metering station(s) include: trenching and excavating, grading, installing above- and below-ground gas piping, metering equipment, gas natural conditioning and pigging (pipe cleaning and inspection) facilities. An electrical distribution service line, PV system, or thermal generator will supply electrical power for tap and metering station-operations, lighting, and communication equipment. An access road and a perimeter chain-link fence for security will also be installed.

The connection of the natural gas pipeline will consist of the following:

Trenching-width depends on the type of soils encountered and requirements of the governing agencies. The optimal trench will be approximately 36 inches wide and 4 to 10 feet deep. With loose soil, a trench up to 8 feet wide at the top and 3 feet wide at the bottom may be required. The pipeline will be buried to

provide a minimum cover of 36 inches, or deeper if required by regulations. The excavated soil will be piled on one side of the trench and used for backfilling after the pipe is installed. The pipeline will be installed through trenching at all locations.

Trenching shall include the removal of material and obstructions, the installation and removal of sheeting and bracing, and the control of water as necessary to provide the required utilities and services. Trenches shall be excavated to the lines, grades, and dimensions indicated on the drawings. When the trench bottom is a soft or unstable material as determined by the engineer, it shall be made firm and solid by removing the unstable material to a sufficient depth and replacing it with material compacted per requirements of the engineer. Where water is encountered in the trench, the contractor must provide materials necessary to drain the water and stabilize the bed.

Stringing consists of transporting lengths of pre-fabricated pipe and laying them on wooden skids beside the open trench.

Installation consists of bending, welding, and coating the weld-joint areas of the pipe after it has been strung, padding the ditch with sand or fine spoil, and lowering the pipe string into the trench. Welding will meet the applicable API standards and will be performed by qualified welders. Welds will be inspected in accordance with API Standard 1104. Welds will undergo 100 percent radiographic inspection by an independent, qualified radiography contractor. All coating will be checked for defects and will be repaired before lowering the pipe into the trench.

Backfilling consists of returning spoil back into the trench around and on top of the pipe, ensuring that the surface is returned to its original grade or level. The backfill will be compacted to protect the stability of the pipe and to minimize subsequent subsidence.

Trenches must be backfilled within 2 days of excavation to minimize desiccation. Trenches shall be backfilled as indicated or required and compacted with suitable equipment as defined by the engineer.

Plating consists of covering any open trench in areas of foot or vehicle traffic at the end of a workday. Plywood plates will be used in areas of foot or wildlife traffic and steel plates will be used in areas of vehicle crossing to ensure public safety. Plates will be removed at the start of each workday. Efforts will be made to minimize the length of open trench along the ROW.

Trenchless construction methods may be used for short crossings under existing waterlines or other buried pipelines.

The boring method may be used for moderately short crossings under roads, highways, canals, etc., where dictated by a government agency or where it would be environmentally unsound to use the open-cut trenching method. Boring pits will be dug on each side of the crossing.

Hydrostatic testing consists of filling the pipeline with water, venting all air, increasing the pressure to the specified code requirements, and holding the pressure for a period of time. Carbon steel piping will be pressure tested using treated groundwater. After hydrostatic testing, the test water will be chemically analyzed for contaminants and discharged to an authorized location (or into a dewatering structure consisting of hay bales, geotextile fabric, and silt fencing) unless the analysis shows that the water is contaminated; in which case, the water will be trucked to an appropriate disposal facility. Temporary

approvals for test water use and permits for discharge will be obtained by the construction contractor, as required. Hydrostatic pressure test will be performed according to ASME Code requirements.

Cleanup consists of restoring the surface of the roadway or pipe route by removing any construction debris, grading to the original grade and contour.

Commissioning consists of cleaning and drying the inside of the pipeline, purging air from the pipeline, and filling the pipeline with natural gas.

Safety consists of using a standard safety plan for the Project, or if constructed by others, the contractor will prepare a safety plan for review and approval by the project owner.

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

4.3.2 TCGT Tap and Metering Station

The tap and meter station will be installed adjacent the tap point on the TCGT pipeline. This will be the "master" meter and will measure and record gas volumes for custody transfer.

Construction activities related to the metering station and metering sets will include: Trenching and excavating, grading a pad, installing concrete foundations and installing above- and below-ground gas piping, metering equipment, gas conditioning, and pigging facilities.

4.4 PIPELINE OPERATIONS

The Project natural gas supply lateral pipes will be designed and operated in accordance with Title 49, Code of Federal Regulations, Section 192 (49 CFR 192) and

California Public Utilities Commission General Order No. 112. The lateral pipeline will be designed to the same Maximum Allowable Working Pressure (MAWP) as the TCGT North Baja pipeline and pressure relief devices will be provided downstream of the tap and meter station custody transfer flange. Isolation block valves will be installed at both ends of the pipeline. These valves will be manually controlled, lockable, gear-operated ball valves.

An operations and maintenance plan will be in place, addressing both normal procedures and conditions and any upset or abnormal conditions that could occur. Periodic leak surveys and cathodic protection surveys will be performed along the lateral pipeline, as required by 49 CFR 192. The lateral pipeline will be continuously protected from corrosion by a cathodic protection system, if warranted.

The cathodic protection system will be designed to control the external 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.

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