

## **SUMMARY OF CHEROKEE 2x1 COMBINED CYCLE (Units 5, 6, 7) PROJECT**

### **Project Overview:**

The Cherokee 2X1 Combined Cycle Project (“Project”) involved the retirement of Cherokee Unit 3 and the start-up of a 569 megawatt (“MW”) 2x1 combined cycle (“CC”) gas plant, Cherokee Units 5, 6, 7, in 2015, to comply with the Clean Air - Clean Jobs Act (“CACJA”). The plant was placed in service in July 2015 and declared Commercial on August 20, 2015. The plant is currently being dispatched by Commercial Operations.

### **Project Scope:**

The Project consisted of the installation of two “F” class combustion turbine generators (“CTGs”), two heat recovery steam generators (“HRSGs”), one steam turbine generator (“STG”) and associated auxiliary equipment. The total generating capability of the new units exceeds the originally planned 569 MW. The net dependable capacity of the new units is set at 576 MW and the units are capable of generating over 600 MW in emergency situations.

### **Project Description:**

The Project consisted of two phases. The first phase, site development, involved making the site suitable for construction of the new units. The second phase involved installation of the new units.

### **Phase I - Site Development**

The Cherokee site required reconfiguration to provide a suitable location for siting a new CC plant. Three raw water ponds were closed, pumped out, and filled with engineered fill. In addition, raw water and fire water pumps that were located at the ponds were removed and replaced. The services previously provided by the raw water ponds were relocated to the existing on-site Northwest reservoir. New raw water and fire pumps were installed at the Northwest reservoir and connected to the existing plant infrastructure, as well as the new units.

Hydrogen storage equipment and the Cherokee parts warehouse were relocated to address conflicts with the location of new equipment and to improve construction efficiency.

To provide additional room for the new CC equipment and to provide construction laydown area, the boilers, air pollution control equipment, cooling towers, and common chimney from the retired Cherokee Units 1 and 2 were demolished and removed. These costs were assigned to the Cherokee Unit 1 & 2 Decommissioning CACJA project.

The balance of plant services were installed at the CC Project boundary to serve the new operating units. These services include potable water, sanitary sewer, storm water

discharge, fire water, and waste water discharge. A new on-site fuel gas pipeline was installed to provide fuel gas to the new units.

One transmission tower was replaced, and a new tower installed to provide clearance for construction and the new operating plant.

At the completion of the site development work, the site was cleared and ready for the installation of foundations, underground piping and electrical installations required for the new CC equipment. Phase I was completed on May 17, 2013.

### **Phase II - New Unit Installation**

The Company procured the major equipment for the Project, consisting of combustion turbines, HRSGs and generator step-up transformers. The steam turbine for the Project was already owned by the Company and in storage. A new generator for the steam turbine was provided by General Electric ("GE") under a pre-existing agreement.

The new units consist of two GE 7F.05 combustion turbines, two Nooter Eriksen HRSGs, and a GE D-11 steam turbine. The steam turbine was refurbished and modified to address known deficiencies and to improve cycling capability. A new exciter and new control system were purchased and installed for the STG.

The combustion turbines are equipped with evaporative cooling on the air inlet, a purge air credit system for quicker start times, and a dry low nitrous oxides ("NOx") combustion system.

The HRSGs include duct burners for additional steam generating capability, a carbon monoxide catalyst, and a selective catalytic reduction ("SCR") system using aqueous ammonia for NOx removal.

Other features of the Cherokee CC plant include a fiberglass wet cooling tower for cycle cooling, a water treatment system for supply of boiler make-up water, a fuel gas treatment system for cleanup of gas to combustion turbine standards, fuel gas preheating for improved combustion turbine efficiency, a 100 percent steam bypass system that will allow operation of the combustion turbines with the steam turbine off-line and a compressed air system for control and service air. Redundancy of critical equipment -- such as boiler feed pumps, condensate pumps and control power -- was included in the design.

Kiewit Power was hired for the role of Design Build Contract ("DBC") Contractor. Kiewit Power provided design services, supplied the balance of plant equipment (equipment and material not supplied by the Company), and constructed the plant. The Company performed checkout and commissioning of the plant with support from Kiewit Power.

The Cherokee switchyard was modified to connect the Cherokee 5, 6, and 7 generators to the Company's 115 kV transmission system.

**Key Changes Since the CPCN Filing (Proceeding No. 11A-609E):**

The overall cost of the Project was reduced from \$531.5 million to \$525.3 million. Higher construction costs were more than offset by lower than anticipated equipment and contingency costs. In addition, the Commercial Operation date was moved up from December 31, 2015, to August 20, 2015.

**2019 Activities – Overall Status Update:**

The plant was placed in service in July 2015 and was declared Commercial on August 20, 2015. The plant is currently being dispatched by Commercial Operations.

The plant is performing as designed and emissions are in compliance with air permit limits.

There were no capital expenditures in 2019 through September 30, 2019.

The final cost of the Project is \$525.3 million, or \$6.3 million lower than the CPCN estimate of \$531.5 million. As of September 30, 2019, we have spent \$525.3 million, which is the final cost of the Project. A detailed comparison of the spending to date, current projections of total capital expenditures and the estimated total capital expenditures provided in the CPCN proceeding is included as Attachment 1 to this Exhibit.

**Overall 2020 Financial Information:**

The 2020 estimated revenue requirement and the overall 2020 financial information for this Project is included in Exhibit 3, “Clean Air-Clean Jobs Act (“CACJA”) Overall Project Summary”, in Table 1.

**Specific 2020 Project Activities:**

The Project has been completed and there are no additional capital expenditures anticipated.

**2020 Variable Non-Fuel O&M:**

See Exhibit 7, “Summary of Variable Non-Fuel Operation and Maintenance (“O&M”) Costs” for the variable non-fuel O&M expenses for Cherokee Units 5, 6, 7 and the variable O&M savings from Cherokee’s Unit 3 retirement.

**Timeline:**

The Project is complete and no additional capital expenditures are anticipated.