

Written Closure Plan

Cherokee Station - Active CCR Impoundments

*Public Service Company of Colorado
Denver, Colorado*

October 17, 2016

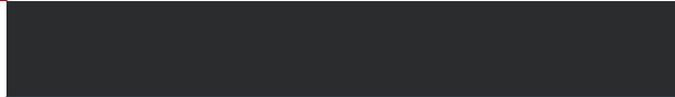


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Table of Abbreviations and Acronyms

Abbreviation	Definition
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
CY	Cubic Yards
PSCo	Public Service Company of Colorado

1.0 General Information

Cherokee Station, operated by Public Service Company of Colorado (PSCo), an Xcel Energy Company, is located at 6198 Franklin Street in Denver, Colorado. Cherokee Station began operating in 1957, and the historical maximum power production capability was 717 megawatts when all four (4) coal-fired steam generators were in service. Cherokee Station is in the process of completing a conversion from coal to natural gas. The conversion is expected to be complete by the end of 2017.

There are three (3) active Coal Combustion Residuals (CCR) impoundments at Cherokee Station, as follows:

- 1) West Ash Pond/Stormwater Pond;
- 2) Center Ash Pond; and
- 3) East Ash Pond.

Figure 1 provides a Site Location Map.

The impoundments are unlined and receive wastewaters including sluiced bottom ash, yard sump water, boiler seal water, clarifier underflow, clarifier effluent, storm water, and overflow from site facilities and ponds.

Sluicing of ash to the Center and East Ash Ponds is scheduled to end by December 31, 2017. The West Ash Pond previously ceased receiving ash and has been converted to a storm water impoundment; however, legacy ash is present below the clean soil layer that was placed when the pond was converted. Dewatering and CCR removal will commence in 2018 for all three impoundments.

In accordance with 40 Code of Federal Regulations (CFR) §257.102 - Criteria for conducting the closure or retrofit of CCR units [§102(b)],

“The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted engineering practices.”

This Closure Plan, prepared for the active CCR surface impoundments at the Cherokee Station, fulfills the requirements of 40 CFR §257.102(b).

Specific to closure by removal of CCR, 40 CFR §257.102(c) states,

“An owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standards.”

PSCo intends to close the Center, East, and West Ash Ponds via removal of CCR in accordance with 40 CFR §257.102(c).

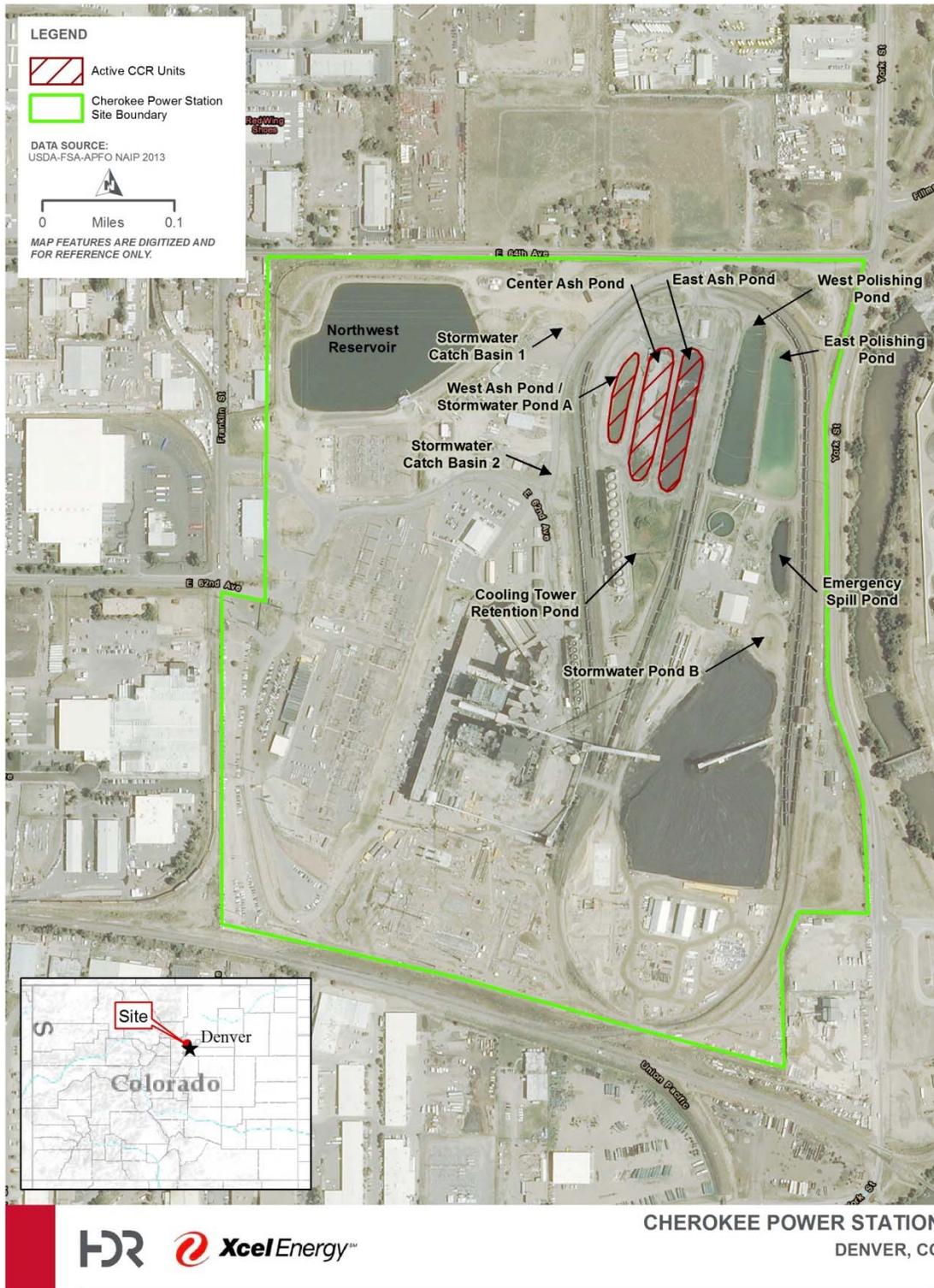


Figure 1. Cherokee Power Station Site Location Map

2.0 Description of Closure Plan – §257.102(b)(1)(i-iii)

The Center, East, and West Ash Ponds in combination encompass an irregularly shaped area with approximate dimensions of 400 feet by 640 feet. These impoundments historically accepted sluiced bottom ash from the Cherokee plant for dewatering. The closure of all three (3) impoundments will be by removal of all CCR and any affected media, typically referred to as a “clean-closure.” The closure will include removal and disposal of CCR and liner materials (if any), removal of contaminated soil (if any), and decommissioning of piping and ancillary equipment. CCR materials excavated will be characterized and will be transported to a licensed off-site landfill for disposal. Given the location of the ponds relative to the facility’s non-CCR process water ponds, the former CCR pond footprint has the potential to be used after clean closure to service other facility needs. Therefore, upon confirmation of clean closure, the pond footprint may be left in its current open and stable configuration. The ponds are incised and any storm water that collects within the clean native soil footprint will either infiltrate or can be discharged under the facility’s existing discharge permit. Alternatively, the former pond footprint may be re-graded using soil from the pond embankment, or other on-site or off-site borrow sources, and seeded with appropriate grass species.

All liquids present in the impoundments will be pumped to operating on-site impoundments permitted to receive the waste water or will be evaporated within the impoundment undergoing closure. Upon removal or evaporation of as much of the free liquid as possible, any residual liquids will be characterized and disposed of at a licensed off-site facility. Once dewatering is complete, excavation of CCR and contaminated materials will begin.

All closure work described in this plan will be conducted under supervision of a Colorado registered Professional Engineer who will be responsible for the certification of closure.

3.0 Inventory Estimate – §257.102(b)(1)(iv)

In accordance with 40 CFR §257.102(b)(1)(iv) an estimate of the maximum inventory of CCR ever on-site over the active life of the CCR units must be provided.

The combined area of the Center, East, and West Ash Ponds is approximately 3 acres. Each of the ponds was constructed to a depth of approximately 20 feet, and has an estimated potential combined CCR capacity of approximately 25,000 cubic yards (CY). However, prior to conversion of the West Pond to a storm water pond, ash was removed to a depth of approximately 10 feet, and approximately 5 feet of legacy ash below the clay liner will need to be removed. Therefore, the total estimated volume of CCR in the ponds is approximately 60,000 CY. In addition, borings advanced around the impoundment area show an estimated 12,700 CY of CCR present below grade. This ash was used beneficially over the years to stabilize the roads between the ponds, but will be removed as part of the closure. Based on these estimates, the maximum potential inventory of CCR on-site is estimated to be 72,700 CY.

4.0 Area Requiring Final Cover – §257.102(b)1(v)

The need for a final cover is eliminated when the owner closes the CCR unit via the clean closure option and all CCR is removed and confirmed with analytical testing results.

5.0 Schedule of Closure Activities –§257.102(b)1(vi)

Table 1. Schedule of Closure Activities		
Task	Start Date	Finish Date
Written Closure Plan	October 17, 2016	October 17, 2016
Last Receipt of CCR	Ongoing	December 31, 2017
Impoundment Closure	January 31, 2018	January 31, 2023

6.0 Qualified Professional Engineer Certification §257.102(b)(4)

According to 40 CFR §257.102(b)(4), the owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the initial and any amendment of the written closure plan meets the requirements of this section.

I, Christopher M. Koehler, being a registered Professional Engineer, in accordance with the Colorado State Board of Licensure for Architects, Professional Engineers and Professional Land Surveyors, do hereby certify to the best of my knowledge, information and belief, that the information contained in this written Closure Plan dated October 17, 2016, was conducted in accordance with the requirements of 40 CFR § 257.102(b), is true and correct and was prepared in accordance with recognized and generally accepted good engineering practices.

SIGNATURE:



Colorado PE 0051359

DATE:

October 14, 2016