PERIODIC ASSESSMENT OF THE INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
PLANT CRISP ASH POND
CRISP COUNTY POWER COMMISSION
40 C.F.R. Parts 257.82(c)(4) and (5)
Prepared by Geosyntec Consultants

BACKGROUND

Crisp County Power Commission (CCPC) is the owner of a 6.5-acre coal combustion residual (CCR) surface impoundment at Plant Crisp, Warwick, Georgia (Plant Crisp AP). On April 17, 2015, the United States Environmental Protection Agency (USEPA) published in the Federal Register requirements regarding the management and disposal of CCR [40 C.F.R. Parts 257 and 261: Hazardous and Solid Waste Management System; Disposal of Coal Combustible Residuals from Electric Utilities; Final Rule, 80 Fed. Reg. 21301 (April 17, 2015)] (USEPA CCR Rule). The USEPA CCR Rule, which became effective on October 19, 2015, established regulations regarding the design, operation, closure, post-closure care, monitoring, and corrective action for both existing and new CCR surface impoundments and landfills. In November 2016, the Georgia Environmental Protection Division (GA EPD) adopted amendments to the State's Rules for Solid Waste Management that address management of CCR (GA DNR Rule 391-3-4-.10 or GA EPD CCR Rule), effective November 22, 2016. The GA EPD CCR Rule incorporates by reference USEPA CCR Rule provisions at 80 Fed. Reg. 21468 (April 17, 2015); as amended at 80 Fed. Reg. 37988 (July 2, 2015) and 81 Fed. Reg. 51807 (August 5, 2016). Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One) 83 Fed, Reg. 86435 (July 30, 2018) have not been adopted by GA EPD and accordingly there are different timeframes and provisions for certain aspects of CCR compliance in federal and state law.

CCPC notified the USEPA and GA EPD of its intent to close the CCR unit by removal of CCR on October 17, 2016 in accordance with 40 C.F.R. Part 257. In October 2016, CCPC elected to close the impoundment in light of the intermittent use of the coal unit at Plant Crisp, uncertainties regarding USEPA CCR regulations due to litigation and other factors, and uncertainty regarding GA EPD's continued efforts at finalizing state regulations. CCPC's initial closure plan issued October 2016, noticed to GA EPD and the USEPA, and placed in CCPC's record and publicly available website in accordance with CCR regulations provided for completion of closure by removal by February 2018. However, in November 2016, GA EPD issued regulations restricting landfills including the Crisp County Landfill identified in the October 2016 closure plan from receiving CCR material and requiring new provisions for each landfill to develop and submit a CCR management plan to GA EPD for approval before CCR material could be received and disposed of at a Georgia landfill [GA DNR Rule 391-3-4-.07(5)]. GA EPD approved the CCR management plan proposed by the Crisp County Landfill on March 28, 2019. GA EPD's approval restricted disposal such that it will require several years to dispose of CCPC's CCR Unit and

restore the Site as per the Closure Plan. The Closure Plan has been amended to reflect this delay and change in schedule .

The coal burning and resulting ash disposal at the CCPC AP was conducted until August 2015. The coal burn unit was briefly re-activated in December 2016 to eliminate an existing small coal supply unable to be sold or transported. The last burning of coal took place on March 22, 2017. CCPC did not place CCR wastes in the CCPC AP after March 22, 2017. CCPC has not removed CCR at the impoundment pending GA EPD approval of the CCR management plan for the local solid waste landfill and GA EPD approval of CCPC's application for solid waste handling permit. Completion of closure has been delayed by the need to coordinate with and obtain necessary approvals and permits from a state or other agency.

GA DNR Rule 391-3-4-.10 required application for a solid waste handling permit for CCR units by November 2018. GA DNR Rule 391-3-4-.10.(9).(c).(5)(iii) requires a "description of how the CCR surface impoundment's operating criteria required by 40 CFR 257.80, 40 CFR 257.82, and 40 CFR 257.83 are met" to be provided as part of the CCR Permit application for Existing Surface Impoundments. 40 C.F.R. § 257.82 "Hydrologic and hydraulic capacity requirements for CCR surface impoundments" addresses inflow hydrologic and hydraulic design, construction, operation and maintenance. Rizzo Associates conducted the initial hydrologic and hydraulic capacity assessment of the AP in 2015, prior to the issuance of the USEPA CCR Rule ["Dam Safety Assessment, Plant Crisp Coal Combustion Waste Impoundment", Rizzo Associates, January 16, 2015) [Rizzo, 2015a]. See also "Assessment of Dam Safety of Coal Combustion Surface Impoundments – Final Report, Crisp County Power Commission, Plant Crisp, Warwick, Georgia" (CDM Smith, Feb. 25, 2014) [CDM Smith, 2014], prepared by CDM Smith for the USEPA. The assessments document that the AP, which does not receive appreciable stormwater flows from additional drainage area, safely can store and pass the flood resulting from the 25 percent-of-Probable Maximum Precipitation (PMP) event (i.e., design flood event for a small dam as classified by the GA EPD Safe Dams Program), and therefore, it is concluded that AP can also safely store and pass the smaller 100-year, 24-hour design storm event (i.e., inflow design flood for a low hazard potential CCR surface impoundment as indicated in 40 C.F.R. § 257.82(a)(3)(iii) and classified in 40 C.F.R. § 257.73(a)(2)). The 2015 Rizzo assessment of hydrology and hydraulics was completed prior to the federal deadline for existing surface impoundments of October 17, 2016 (see 40 C.F.R. § 257.82), and prior to the effective date of GA EPD CCR Rule (November 22, 2016). Supplemental information to CCPC's November 19, 2018 application for a state permit for an existing CCR surface impoundment, related to the requirements of 40 C.F.R. § 257.82, was provided by Geosyntec Consultants to GA EPD at their request on September 3, 2019 [Geosyntec, 2019].

PURPOSE

USEPA CCR Rule, Section § 257.82 requires that the owner or operator of an existing CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system, as follows:

- The inflow design flood control system must be capable of safely managing flow during and following the peak discharge of the specified inflow design flood.
- Discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.
- The owner or operator of the CCR unit must prepare a written plan documenting how the inflow flood control system has been designed and constructed to meet the requirements of 40 C.F.R. § 257.82.
- The plan will be amended, as needed, in accordance with the requirements of 40 C.F.R. § 257.82 (c) (2).
- The owner or operator of the CCR unit must prepare periodic inflow design flood control system plans every five years in accordance with the requirements of 40 C.F.R. § 257.82 (c) (4). The date of completing the initial plan is the basis for establishing the deadline to complete the first subsequent plan.

This document provides the first periodic inflow design flood control system plan, five years after the completion date of the initial plan. As stated in *Background*, the initial hydrologic and hydraulic capacity assessment of the AP was prepared by Rizzo Associates, dated January 16, 2015 [Rizzo, 2015a]. The 2015 Rizzo Report met the requirements of 40 C.F.R. § 257.82. Therefore, the first periodic plan must be completed by January 16, 2020.

This periodic inflow design flood control system plan is prepared as an assessment, reviewing the assumptions and calculation methodology documented in the 2015 Rizzo Report (i.e., initial plan), with supplemental annotations and updated information based on the review conducted by Geosyntec Consultants (Geosyntec) in December 2019 and January 2020 and site visit conducted by Geosyntec on December 30, 2019 (presented in *italic text* below). Plant personnel Ronnie Miller and Joseph Rogers accompanied John Barrett, P.E., Victoria Cheplak, P.E., and Mehmet Iscimen, P.E. with Geosyntec, during the site visit.

ASSESSMENT

The 2015 Rizzo Report documented the following, with the results of Geosyntec's period assessment, noted in *italics* as follows:

- Plant Crisp Coal Ash Pond (AP) is a 6.5-acre surface impoundment designed to store CCR and water. The primary drainage area to the AP is the limits of the surface impoundment, due to the existing diversions and dikes around the four sides of the ash pond.
    - *The AP also receives inflow via an 8-inch diameter polyvinyl chloride (PVC) pipe, which conveys flow that has collected from the "bag house sump." Flow into the "bag house sump" consists of stormwater runoff generated over the concrete footprint of the plant (approximately 0.32 acres) which drains to a series of inlets and troughs that discharge via four pipes into the "bag house sump." The sump discharges to the AP via a pump (i.e., not by gravity), and therefore, is <u>not</u> conveyed to the AP at the same timing as the runoff generated by direct rainfall over the pond. Geosyntec performed an analysis of AP system including stormwater runoff inflow assuming direct discharge*

from the plant concrete footprint to the AP (i.e., at the same timing as the runoff generated by direct rainfall over the pond); the results indicate an increase in the water level within the AP of less than 0.05 feet and an increase in the peak discharge rate from the AP of less than 0.1 cubic feet per second. Therefore, given that the operational constraints (e.g., on/off levels, priming water input, etc.) of the "bag house sump" are variable and unknown, and recognizing that a direct discharge from this contributing secondary area has a negligible impact on the results, it is reasonable to not include this inflow in the analysis of the inflow design flood event.

- During periods of high water, excess water will be discharged from the ash pond via a vertical 12-inch-diameter corrugated metal (CMP) spillway. The CMP acts as a morning glory spillway with a horizontal orifice crest elevation of 240.95 ft; the CMP discharges on the north side of the northern AP dike. An auxiliary spillway (grassed chute) is located near the northeast corner of the AP, approximately 6-inches deep by 80-feet long.
    - *Review of photographs included with the 2015 Rizzo Report and subsequent annual inspection reports prepared by Rizzo, indicate that the water level has not reached to the CMP spillway crest of the outfall structure since prior to 2015 [Rizzo, 2015a, 2015b, 2017, 2018, and 2019]. During Geosyntec's site visit on December 30, 2019, no standing water was located in the vicinity of the CMP spillway, and the full 12-foot tall vertical gauge attached to the walkway adjacent to the spillway was visible. A small pool of standing water was observed in the northwest corner of the AP, that was estimated to be less than one-foot deep and approximately 1/8 acre in area.*
- The stage-storage relationship for available capacity within the AP was established based on contours from a site survey conducted by J.B. Faircloth & Associates, dated May 2014.
    - *More recent topographic survey data is not available for the AP. During Geosyntec's site visit on December 30, 2019, the majority of the CCR surface appeared vegetated and did not appear to be recently altered; site representatives confirmed that no large quantities of CCR material had been added to the pond in the last five years. Small pockets of exposed material were observed in three locations within the AP: the southeast corner, the south central perimeter, and the east central perimeter, which was stated to be the area where the last coal was disposed into the ash pond in 2017. These observations are consistent with the Background provided above, as well as the subsequent annual inspection reports prepared by Rizzo, which indicated that in 2015, the Coal-fired Plant operated rarely, resulting in very limited deposition/accumulation of CCR material; in 2017, a small deposition of CCR material was made when the remaining on-site coal was burned; and in 2018 and 2019, no coal was burned and no deposits of CCR material were made [Rizzo, 2015a, 2015b, 2017, 2018, and 2019]. Based on the observations of the surface conditions, it is reasonable to assume that changes to the stage-storage relationship for available capacity within the AP due to CCR material added after the topographic survey was conducted are negligible, and the relationship utilized is still valid for the purposes of this analysis.*
- Hydrologic and hydraulic analyses were performed using the characteristics of the ash pond to evaluate if impoundment outflow structure capacity is sufficient to pass the inflow design flood

without overtopping of the embankment. The analysis considered the 100-year, 24-hour design storm event (8.57 inches) and the 25 percent-of-PMP, 24-hour event (11.05 inches). The 100-year precipitation depth was obtained from National Oceanic and Atmospheric Administration's (NOAA) Precipitation Frequency Data Server, Atlas-14 and represents the inflow design flood event for a low hazard potential CCR surface impoundment as indicated in 40 C.F.R. § 257.82(a)(3)(iii) and classified in 40 C.F.R. § 257.73(a)(2)); the 25 percent-of-PMP precipitation depth was obtained from the National Weather Service (NWS) Probable Maximum Precipitation Estimates found in Hydrometeorological Report (HMR) No. 51 and represents the design flood event for a small dam as classified by the Georgia Safe Dams Program. The 25 percent-of-PMP event produces greater precipitation depths; therefore, this event was conservatively used in the model.

  - *The NOAA Precipitation Frequency Data Server was reviewed in January 2020 for updated data for the facility location; the 100-year precipitation depths presented in the 2015 Rizzo Report are still valid [National Weather Service, 2020a]. Additionally, the NOAA NWS Hydrometeorological Design Studies Center, Current PMP Documents website was reviewed in January 2020, which confirms that HMR No. 51 is still the current document for obtaining PMP estimates for the eastern United States [National Weather Service, 2020b].*

- The site conditions were modeled using Hydrologic Modeling Software (HMS) from the Hydrologic Engineering Center (HEC) of the U.S. Army Corps of Engineers.
- The hydrologic and hydraulic analyses performed demonstrate that the capacity of the outflow structure at the ash pond is sufficient to pass the 25 percent-of-PMP flood event without overtopping of the embankment. From a starting elevation at normal maximum pool (Elevation 240.95 ft), this precipitation causes the water surface in the ash pond to peak at Elevation 241.6 ft (0.65 ft rise) and results in a peak outflow through the spillway of 2.7 cubic feet per second. The peak water surface elevation is approximately 1.4 ft below the lowest portion of the embankment.
  - *The periodic assessment of site conditions, inflow design flood analysis input parameters, and analysis methodology indicates that the hydrologic and hydraulic analyses performed and documented in the 2015 Rizzo Report appear to remain valid after five years, and can therefore, continue to be utilized as the inflow design flood control system plan.*

CONCLUSION

The analysis performed by Rizzo Associates [Rizzo, 2015a] indicates Plant Crisp AP can safely store and pass the 25 percent-of-PMP flood event and the 100-year, 24-hour design storm event, the applicable criteria under 40 C.F.R. § 257.82. *The periodic assessment of site conditions, inflow design flood analysis input parameters, and analysis methodology indicates that the hydrologic and hydraulic analyses performed and documented in the 2015 Rizzo Report appear to remain valid after five years, and can therefore, continue to be utilized as the inflow design flood control system plan.*

I hereby certify that for CCPC's Plant Crisp AP, the hydrologic and hydraulic capacity and the inflow design flood control system assessments performed by Rizzo Associates [Rizzo, 2015a] meet the requirements of 40 C.F.R. § 257.82 and the inflow design flood control system plans as described in the 2015 Rizzo Report meet the requirements of 40 C.F.R. § 257.82 and do not require an update.

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15 January 2020

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