PERIODIC DAM SAFETY ASSESSMENT
PLANT CRISP ASH POND
CRISP COUNTY POWER COMMISSION
40 C.F.R. Parts 257.83 (b) and 257.73(a)(2), (d), and (e)
Prepared by Geosyntec Consultants

INTRODUCTION AND PURPOSE

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 required 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)(ii) requires "a description of the CCR surface impoundment's design criteria required by 40 C.F.R. § 257.71 and 40 C.F.R. § 257.73" to be provided as part of the CCR Permit application for Existing Surface Impoundments. 40 C.F.R. § 257.73 "Structural integrity criteria for existing CCR surface impoundments" requires initial and periodic hazard potential classification, initial and periodic structural stability assessments, and initial and periodic safety factor assessments for the impoundments. Also, USEPA's CCR Rule, Section § 257.83 requires that if the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment is subject to the periodic structural stability assessment requirements under 40 C.F.R. § 257.73(d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.

The objective of this document is to provide the findings of the recently completed site inspection and periodic dam safety assessment in accordance with the requirements outlined in 40 C.F.R. § 257.73 and § 257.83. The initial dam safety assessment was completed by Rizzo Associates [2015a]. Additional site information was included in the dam safety assessment performed by CDM Smith [2014]. Both the CDM Smith and the Rizzo assessments were completed prior to the effective date of the GA EPD CCR Rule, and prior to the effective date of USEPA's regulations issued April 2015 and went into effect in October 2015. 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. § 257.73 and 257.83, was provided by Geosyntec Consultants to GA EPD at their request on September 3, 2019 [Geosyntec, 2019a and b].

The requirement for frequency of conducting periodic stability assessments is in 40 C.F.R. § 257.73 (f) (3). 40 C.F.R. § 257.73 (f) requires that the date of completing the initial assessment is the basis for establishing the deadline to complete the first subsequent assessment. If the owner or operator elects to use a previously completed assessment(s) in lieu of the initial assessment, the date of the report for the previously completed assessment is the basis for establishing the deadline to complete the first subsequent assessment. Following the initial assessment, periodic assessments are to be completed every five years and the assessment must be completed in

accordance with 40 C.F.R. § 257.73 Sections (a) (2), (d), and (e). As described above, the initial dam safety assessment of the AP was prepared by Rizzo Associates, dated January 16, 2015 [Rizzo, 2015a].[1] Therefore, the first periodic assessment has been completed by January 16, 2020.

This document is organized to present a summary of the site inspection (40 C.F.R § 257.83 (b)) and the periodic review of the: (i) the Hazard Potential Classification (40 C.F.R. § 257.73 (a)(2)); (ii) the Structural Stability Assessment (40 C.F.R. § 257.73 (d)); and (iii) the Safety Factor Assessment (40 C.F.R. § 257.73 (e)) of the impoundment.

ASH POND INSPECTION - (40 C.F.R. § 257.83 (B))

Background

40 C.F.R. § 257.83 requires that if the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment is subject to the periodic structural stability assessment requirements under 40 C.F.R. § 257.73(d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices. The inspection must, at a minimum, include:

(i) a review of available information regarding the status and condition of the CCR unit, including, but not limited to files available in the operating record (e.g., CCR unit design and construction information required by §257.73(c)(1), previous periodic structural stability assessments required under § 257.73(d), the results of inspections by a qualified person, and results of previous annual inspections);

(ii) a visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures; and

(iii) a visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

The objective of this section is to document the dam safety inspection conducted by Geosyntec Consultants (Geosyntec) on 30 December 2019 in accordance with the requirements outlined in 40 C.F.R. § 257.83. The previous annual inspection was completed by Rizzo International, Inc. (Rizzo) in March 2019.

General Information

The following documents were reviewed prior to the site visit:

- Weekly Ash Pond Inspection Reports (CCPC, 2015 through 2019);
- CDM Smith Assessment of Dam Safety of Coal Combustion Surface Impoundments Final Report [CDM Smith, 2014];
- Rizzo Associates Dam Safety Assessment Report [Rizzo, 2015a];

[1] The 2015 Rizzo assessment is incorporated by reference. Note that this report was developed prior to the effective date of USEPA CCR regulations and prior to the effective date of EPD CCR regulations.

- 2016 – 2019 Annual Ash Pond Inspection Reports [Rizzo, 2015b, 2017, 2018, and 2019]; and
- History of construction information.

The visual dam safety inspection was performed by Ms. Victoria Cheplak, P.E. (Geosyntec), Mr. Mehmet Iscimen, P.E. (Geosyntec), and Mr. John Barrett, P.E. (Geosyntec), acting as the Georgia EPD Safe Dams Program Engineer of Record. They were accompanied by Mr. Ronnie Miller, Manager of Production for CCPC Plant Crisp, and Mr. Joseph Rogers with CCPC.

The inspection included a walk down inspection of the AP and was performed starting from the East Embankment and proceeding in a clockwise direction to the South, West, and then North Embankments, respectively, followed by a walkdown of the toe in a counter clockwise direction. The weather was clear with temperatures in the low 60s, with approximately 0.54 inches of rain received at the Site the night prior to the inspection and a total of approximately 2.40 inches of rain received during the week before the inspection. The principal spillway outlet was not discharging; however, standing water was observed at the pipe end; and the pool condition within the impoundment was mostly dry except for water trapped in the northwest corner of the pool bottom (i.e., estimated to be less than one foot deep and approximately 1/8 acre in area).

The AP is located to the west of the CCPC Plant Crisp and southwest of the Lake Blackshear Hydroelectric Plant. The trapezoidal shaped impoundment consists of earth embankments on all sides ranging in height from 2 feet (ft) to 5 ft high on the East and South embankments to approximately up to 22 ft high on the West and North Embankments. The West embankment runs against the CCPC property line, with a sand-clay private road along its toe on the adjacent property. **Table 1** summarizes the general details of the CCR Impoundment.

Two discharge lines run into the AP: (i) a ductile iron pipe for conveying water and CCR byproducts from the power plant to the AP; and a polyvinyl chloride (PVC) line from the bag house sump that collects runoff from the power plant. The ductile iron pipe has been inactive since Plant Crisp discontinued the burning of coal in March 2017; however, the PVC line continues to carry small quantities of stormwater to the AP.

No changes in geometry of the impounding structure since the previous annual inspection have been noted. There were no instrumentation or hydraulic structures (other than the outlet structure discharge pipe) underneath the base of the AP available for inspection and reporting.

Photos from Geosyntec's inspection of the AP and surrounding area are provided in **Attachment 1**.

Table 1. General Details of the AP

ITEM	INFORMATION
Geographical Location:	Worth County, GA Latitude: 31º 50' 40.81' N Longitude: 83º 56' 28.74" W
GA Safe Dams Program Size Classification:	Small
EPA-Recommended Hazard Classification:	Low Hazard
Drainage Area:	6.5 Acres
Dam Type:	Earthen Embankment
Maximum Dam Height:	22 ft
Dam Length (Approximate):	Total Embankment: 2,222 ft North Embankment: 720 ft East Embankment: 570 ft South Embankment: 448 ft West Embankment: 484 ft
Design Slopes:	2H:1V
Crest Elevation:	245 ft
Normal Pool Elevation:	varies but <240.95 ft
Reservoir Area:	6.5 Acres
Normal Storage Capacity:	29 ac-ft
Primary Spillway Type	Corrugated metal pipe drop inlet
Primary Spillway Diameter	12" inlet with 24" diameter screen
Primary Spillway Inlet Elevation	240.95 ft
Spillway Design Flood	0.25 PMP
Primary Spillway Capacity	± 3.2 cfs
Auxiliary (Emergency) Spillway Type	Grassed chute at northeast corner
Auxiliary (Emergency) Spillway Dimensions	Approximately 6-in deep by 80-ft long

Findings and Recommendations

Overall, the AP is in acceptable condition, with adequate vegetative cover and no signs of active slope instability or other conditions that require immediate action. Previous and recent studies [Rizzo, 2015a; Geosyntec, 2020] have confirmed that spillway capacity was adequate for the design flood event, and the spillway outlet has been maintained such that flow will not be obstructed if discharge occurs. No signs of general slope instability or embankment distress such as sloughs, tension cracks, bulges at the toe of the slope, or excessive crest settlement were noted. At the time of the inspection, the area in the immediate vicinity of monitoring well MW-D3 was observed to be wet (approximately 85 feet long); however, there were no signs of active seepage (flow) or soft ground at the time of the inspection. Mr. Ronnie Miller and Mr. Joe Rogers of CCPC indicated that this wet zone occurs every year starting in the late fall and remains wet through the

rainy season, which typically ends in April or May of each year. This was confirmed for this calendar year by review of the 2019 weekly inspection reports, for which the wet area was observed to have dried up during the inspection performed the week of 28 May 2019. The wet area is located adjacent to potential wetlands to the north of the AP and review of the measured groundwater levels from MW-D3 indicate that piezometric levels varied from 1.1 to 3.7 feet below ground surface (ft bgs) in this area from February 2017 to December 2019. The most recent two readings on 23 October 2019 and 30 December 2019 recorded water levels at approximately 3.7 and 1.8 ft bgs, respectively. Tire rutting was apparent in the area and, therefore, vehicle traffic at the toe of the north slope should be minimized as much as practical.

The Dam Safety Inspection Check List utilized for this inspection was consistent with those utilized for past inspections and is included as **Attachment 2**.

The following visual observations were made during the inspection:

1. In general, the embankment slopes and crest are in acceptable condition, with no sloughs, cracking, or other evidence of active slope instability.
2. Overall grass cover on the north, east, south, and west slopes is acceptable, with grass heights less than six inches.
3. No erosion was observed in the interior slopes of the AP due to wave action or other conditions. Due to the small area of the ash pond (i.e., 6.5 acres) and even a smaller area of the free water in the ash pond, wave action is not considered a concern for the AP.
4. The visual inspection identified no signs of distress or malfunction of the CCR unit and appurtenant structures.
5. The visual inspection of the outlet structure discharge pipe underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity demonstrated continued safe and reliable operation.

The following recommendations are made and are consistent with those from previous inspections and should continue up to and until GA EPD approval of removal of the AP and construction to physically remove the AP:

1. Continue to inspect the impoundment for changes of condition and document these reports in accordance with 40 C.F.R. § 257.
2. Continue to mow the slopes and tops of the embankments. Remove the small tree from the west exterior slope. Trees allowed to grow and develop root systems in the slopes of dams can create preferential seepage pathways.
3. Periodically clear and remove trees, vegetation, and woody debris from the outlet channel in order to not impede flow.
4. Continue monitoring the wet area near the toe of the North Embankment for presence of active seeps, discoloration, soft zones, sloughing, cracking, or other evidence of slope instability. This area and the slope immediately upstream of the wet area should be closely monitored during periods when the AP impounds water behind the dike. If signs of turbid

seepage are observed in this area, it is recommended to have the condition inspected by a licensed engineer.

HAZARD POTENTIAL CLASSIFICATION ASSESSMENT - (40 C.F.R. § 257.73 (A)(2))

40 C.F.R. § 257.73(a)(2) requires that the owner or operator of an existing CCR surface impoundment must conduct initial and periodic hazard potential classifications. The owner or operator must document the hazard potential classification of the CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment.

The owner or operator of the CCR unit may elect to use a previously completed assessment to serve as the initial assessment provided that the previously completed assessment(s):

- Was completed no earlier than 42 months prior to October 17, 2016; and
- Meets the applicable requirements of paragraphs 40 C.F.R. § 257.73(a)(2).

The Plant Crisp AP was previously assessed in two different reports and determined to be low hazard. CDM Smith [2014] indicated the impoundment was 'Low Hazard,' as summarized in **Table 2.**

Table 2. Recommended Impoundment Hazard Classification Rating
[Source: 2014 CDM Smith Report, Table 2-3]

Impoundment	Recommended Hazard Rating	Basis
Ash Pond	Low Hazard	• Failure or miss-operation would result in low economic loss and environmental damage to adjacent waterways and downstream areas; • Losses would be limited to Owner's property; and • Loss of human life as a result of failure is not anticipated.

Rizzo Associates [2015] reviewed the hazard classification rating and applied two different classification systems as a part of their assessment: Federal Emergency Management Agency (FEMA) and Georgia Safe Dams Act regulations (See Section 6.1 of Rizzo Report). Under FEMA's hazard classification system, the Plant Crisp AP is a low hazard structure, indicating that a hypothetical failure would not result in loss of life or major economic and/or environmental losses. Under Georgia Safe Dams Act regulations, Rizzo Associates determined that the Plant Crisp AP has a maximum embankment height of 22 ft and a maximum storage volume of 42.1

acre-ft. Therefore, according to the State of Georgia, the structure is considered a small dam (i.e., a dam with storage capacity less than 500 acre-ft and a height not exceeding 25 ft).

The basis for these classifications were reviewed and the qualitative criteria for low hazard classification remains valid. Additionally, no modifications to the embankment height nor storage capacity have been made to the AP. Furthermore, the AP was receiving CCR at the time of the 2014 and 2015 determinations. At the time of this 2020 determination, the AP does not receive CCR. Therefore, the "low hazard" classifications based on the FEMA and Georgia Safe Dams Act regulations continue to be appropriate for CCPC's Plant Crisp AP.

I hereby certify that for CCPC's Plant Crisp AP, the Impoundment Hazard Classification Ratings included in both the 2014 CDM Smith Report and 2015 Rizzo Report, that classify CCPC's Plant Crisp AP as a low hazard CCR surface impoundment, meet the requirements of 40 C.F.R. § 257.73(a)(2), and continues to be appropriate.

PERIODIC STRUCTURAL STABILITY ASSESSMENT - (40 C.F.R. § 257.73 (D))

40 C.F.R. § 257.73 (d) requires the owner or operator of the CCR unit to conduct periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment will, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with the requirements listed in 40 C.F.R. § 257.73 (d).

Review of the site documents listed under *General Information* of the *Ash Pond Inspection* section of this document, and the site inspection conducted by Geosyntec on December 30, 2019 indicated the following related to the design, construction, operation, and maintenance of the CCR unit:

- In general, the embankment slopes and crest are in acceptable condition, with no sloughs, cracking, or other evidence of active slope instability.
- The foundations and abutments generally consist of loose to medium-dense, silty sands and silty-clayey sands with fair to good geotechnical material properties.
- There are no records available to verify whether the dikes were mechanically compacted as per 40 C.F.R. 257.73(d)(1)(iii).
- Overall vegetative cover is good; vegetated slopes of dikes and surrounding areas generally do not to exceed a height of six inches above the slope of the dike as per 40 C.F.R. 257.73(d)(1)(iv). Adequate vegetative slope protection is present to protect against surface erosion as per 40 C.F.R. 257.73(d)(1)(iv). Under current operating conditions and future conditions wherein no CCR will be introduced into the AP, slope protection is adequate to protect against surface erosion, wave action, and adverse effects of sudden drawdown as per 40 C.F.R. 257.73(d)(1)(ii);
- Construction records for the AP are limited as presented by CDM Smith [2014]; however, based upon discussions with Mr. Ronnie Miller and Mr. Joseph Rogers, there have been

no known performance issues with the impoundment dikes since its original construction in approximately 1974. Additionally, to their knowledge, there have been no major modifications to the project over its service life with the exception of routine maintenance such as the removal of trees from the west slope which has resulted in the hummocky surface referenced in previous inspection reports.

- Due to the small area of the ash pond (i.e., 6.5 acres) and even a smaller area of the free water in the ash pond (approximately 1/8 acres during the inspection), wave action is not a concern.
- The ash pond is maintained in such a manner that it is not likely to be subjected to rapid drawdown conditions.
- During periods of high water in the impoundment, excess water would be discharged from the pond via a vertical 12-inch (in.)-diameter corrugated metal pipe (CMP) spillway. Also, there is an auxiliary spillway (chute) near the northeast corner of ash pond, approximately 6-in. deep by 80-ft long.
- Spillway capacity is adequate for the GA EPD and USEPA CCR Rule design flood event (i.e., 100-year, 24-hour flood for the low hazard potential ash pond as per 40 C.F.R. 257.73(d)(1)(v)), and the spillway outlet has been improved such that flow will not be obstructed during discharges. There is no evidence of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the spillway.
- There are no hydraulic structures (other than the outlet structure discharge pipe) underlying the base of the CCR unit.

The original low-level outlet pipe was constructed as a twelve-inch diameter slide gate with a 20-ft frame as observed on the original drawing [CDM Smith, 2014]; however, site personnel indicated that this gate was removed due to corrosion in the 1990s and a plug was installed within the end of the pipe to prevent erosion into the pipe and future clogging of the pipe. Therefore, the spillway capacity for the impoundment is provided by a twelve-inch diameter overflow inlet at elevation 240.95 ft and a grassed emergency spillway located on the northeast section of the dike. 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 [Geosyntec, 2020].

The AP is approximately 800 feet away from the adjacent Flint River and the upstream Lake Blackshear Dam. There is no specific discussion in the 2015 Rizzo Report for the potential for the downstream slopes being inundated by the pool of the Flint River and there is no known record of any damage to the dikes due to inundation during the operational history of the ash pond.

Based on the findings presented herein and available information, the design, construction, operation, and maintenance of the CCR unit appears to be consistent with recognized and generally

accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein.

I hereby certify that for CCPC's Plant Crisp AP, the periodic structural stability assessment has been conducted in accordance with the requirements of 40 C.F.R. § 257.73(d).

PERIODIC SAFETY FACTOR ASSESSMENT - (40 C.F.R. § 257.73 (E))

40 C.F.R. § 257.73 (e) requires the owner or operator to conduct periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in 40 C.F.R. § 257.73 (e).

USEPA's CCR Rule, Section § 257.73(e) requires that the owner or operator of an existing CCR surface impoundment must conduct initial and periodic safety factor assessments and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified below for the critical cross section of the embankment. The owner or operator of the CCR unit may elect to use a previously completed assessment to serve as the initial assessment provided that the previously completed assessment(s):

- Was completed no earlier than 42 months prior to October 17, 2016; and
- Meets the applicable requirements of paragraphs 40 C.F.R. § 257.73(e).

Review of the 2015 Rizzo Report indicated the following calculated factors of safety, as summarized in **Table 3**. For CCPC's Plant Crisp AP, the initial safety factor assessments by the 2015 Rizzo Report were completed within 42 months prior to October 17, 2016.

Table 3. Estimated Factors of Safety
(Source: 2015 Rizzo Report, Table 5-1 and 40 C.F.R. § 257.73(e))

Loading Condition	**Minimum Calculated Safety Factor[2]**	**Minimum Required Safety Factor**
Long Term Maximum Storage Pool (Static)	1.26	1.50
Maximum Surcharge Pool (Static)	1.15	1.40
Seismic	0.92	1.00
Liquefaction	([3])	1.20

While the 2015 Rizzo Report was properly completed in a timely manner, the Report does not demonstrate minimum safety factors required by 40 C.F.R. § 257.73(e). Maximum storage pool

[2] The loading conditions selected from the 2015 Rizzo Report are equivalent to the loading conditions required by the 40 C.F.R. § 257.73(e).

[3] The 2015 Rizzo Report indicates that the majority of the subsurface materials are not expected to be subject to liquefaction, with the exception of a loose (N=4) layer of silty-clayey sand encountered in boring W-1 at the base of the west dike. Strength reductions were applied to the layer of interest in the stability analysis to evaluate the effect of the weakened layer on slope stability.

and maximum surcharge pool elevations as utilized in the 2015 assessments are based upon the maximum design capacities of the Plant Crisp AP, not the actual maximum pool elevations. Due to the historically infrequent use of the Plant Crisp AP, actual maximum pool elevations have been historically reported well below the design maximum storage pool and design maximum surcharge pool. Additionally, the Plant Crisp AP was not used for CCR disposal since August 2015 except for a brief re-activation from December 2016 to March 22, 2017 to address a small amount of remaining coal unable to be sold or transported. The small amount of CCR generated in this period was disposed near the sluice pipe near the eastern edge of the AP and away from the western and northern dikes. Based on the minimal CCR disposition (located in the far corner from critical cross sections of the embankment) and low levels of ponded water, the actual loading against the dikes are estimated to be at or below the loading scenarios analyzed in the 2015 Rizzo Report and use of maximum storage pool provides an additional margin of safety factor.

40 C.F.R. § 257.73(f)(4) requires that any CCR unit failing to demonstrate minimum safety factors as required by 40 C.F.R. § 257.73(e) of this section is subject to the requirements of 40 C.F.R. § 257.101 (b)(2). 40 C.F.R. § 257.101 (b)(2) requires that the owner or operator of the CCR surface impoundment must cease placing CCR and non-CCR waste streams into such CCR unit and close the CCR unit in accordance with the requirements of 40 C.F.R. § 257.102. CCPC determined that it would close the Plant Crisp AP by removal and notified the USEPA and GA EPD on October 17, 2016.

I certify that the initial safety factor assessments for the Plant Crisp AP CCR surface impoundment were properly completed by Rizzo Associates [2015], less than 42 months prior to October 17, 2016. The site conditions and loading scenarios used in the Rizzo analysis referenced above are still applicable and valid for this periodic safety factor assessment. I have reviewed the Rizzo report and concur with the conclusions regarding the safety factor assessment contained therein.

CONCLUSIONS AND RECOMMENDATIONS

As referenced above, CCPC determined that it would close the Plant Crisp AP CCR surface impoundment by removal and notified the USEPA and GA EPD on October 17, 2016. Based upon the requirements of 40 C.F.R. § 257, the findings of the periodic structural stability and safety factor assessments documented above support CCPC's decision to close the CCR surface impoundment by removal.

As a means of continued maintenance of the AP and with the understanding that the impoundment will be closed by removal, Geosyntec recommends the following until GA EPD approval of removal of the AP and solid waste handling to remove the AP and construction to remove the AP:

- Continue to inspect the impoundment for changes of condition and document these reports in accordance with 40 C.F.R. § 257.
- Continue monitoring the wet area near the toe of the North Embankment for presence of active seeps, discoloration, soft zones, sloughing, cracking, or other evidence of slope

instability. This area and the slope immediately upstream of the wet area should be closely monitored during periods when the AP impounds water behind the dike. If signs of turbid seepage are observed in this area, we recommend having the condition inspected by a licensed engineer.

- Continue to mow the slopes and tops of the embankments. In particular, small trees should be removed from the slope to prevent negative impacts on the embankments caused by extending root systems.
- Periodically clear and remove trees, vegetation, and woody debris from the outlet channel in order to not impede flow.

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Georgia P.E. License No. 044253
Geosyntec Consultants
15 January 2020

REFERENCES

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USEPA. (2015). "Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," Title 40 Code of Federal Regulations, Pt. 257, April 2015.

Attachment 1
Inspection Photolog

Geosyntec consultants engineers | scientists | innovators	PROJECT: Crisp Power Plant CCW Pond Dam	DATE.: 30 December 2019
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Photograph No. 01 **Date: 12/30/2019** **Direction: W** **Description:** **Panorama of East Embankment**	
Photograph No. 02 **Date: 12/30/2019** **Direction: From SE Corner of Embankment** **Description:** **Panorama of CCW Impoundment**	

Photograph No. 03 **Date: 12/30/2019** **Direction: From SW Corner of Embankment** **Description:** **Panorama of CCW Impoundment**	
Photograph No. 04 **Date: 12/30/2019** **Direction: From NW Corner Toe of Embankment** **Description:** **Panorama of West Embankment**	

Photograph No. 05 **Date: 12/30/2019** **Direction: W** **Description:** **Interior Slopes of North Embankment from NE Corner**	
Photograph No. 06 **Date: 12/30/2019** **Direction: W** **Description:** **Exterior Slopes of North Embankment from NE Corner**	

Photograph No. 07 **Date: 12/30/2019** **Direction: W** **Description:** **Exterior Slopes at Toe of North Embankment**	
Photograph No. 08 **Date: 12/30/2019** **Direction: E** **Description:** **Exterior Slopes at Toe of North Embankment**	

Photograph No. 09 **Date: 12/30/2019** **Direction: NW** **Description:** **Exterior Slopes of North Embankment near NW Corner. Dam Safety Inspectors at the outfall of the outlet structure.**	
Photograph No. 10 **Date: 12/30/2019** **Direction: E** **Description:** **Exterior Slopes of North Embankment from NW Corner**	

Photograph No. 11 **Date: 12/30/2019** **Direction: W** **Description:** **Interior Slopes of North Embankment**	
Photograph No. 12 **Date: 12/30/2019** **Direction: SE** **Description:** **Boardwalk, CMP Drop Inlet, and Trash Screen**	

Photograph No. 13 **Date: 12/30/2019** **Direction: S** **Description:** **12" CMP Drop Inlet with 24" Trash Screen**	
Photograph No. 14 **Date: 12/30/2019** **Direction: SW** **Description:** **12' Tall Gage at Boardwalk to CMP Drop Inlet. No ponded water was observed in the vicinity of the outlet structure; Ash Pond appeared to be mostly dry at time of inspection, .**	

Photograph No. 15 **Date: 12/30/2019** **Direction: W** **Description:** **Interior Slopes of North Embankment from Boardwalk**	
Photograph No. 16 **Date: 12/30/2019** **Direction: E** **Description:** **Interior Slopes of North Embankment from Boardwalk**	

Photograph No. 17 **Date: 12/30/2019** **Direction: N/A** **Description:** **Flared End-Section Added to Drop Inlet Outlet Structure Outfall (protective grating for animal control removed for photo). No flow/discharge observed.**	
Photograph No. 18 **Date: 12/30/2019** **Direction: N/A** **Description:** **Grate To Be Reinstalled Over Outfall**	

Photograph No. 19 **Date: 12/30/2019** **Direction: NE** **Description:** **NE Corner of Embankments (riprap stockpiled for maintenance at Lake Blackshear Dam)**	
Photograph No. 20 **Date: 12/30/2019** **Direction: S** **Description:** **Interior Slope of East Embankment, the 8-inch diameter PVC discharge pipe, and the 2-inch diameter PVC hook-up pipe for the AP sprinkler system**	

Photograph No. 21 **Date: 12/30/2019** **Direction: N** **Description:** **Exterior Slope of East Embankment**	
Photograph No. 22 **Date: 12/30/2019** **Direction: N/A** **Description:** **Permanent AP Identification Marker**	

Photograph No. 23 **Date: 12/30/2019** **Direction: N/A** **Description:** **8" Ductile Iron Discharge Pipe (Inactive)**	
Photograph No. 24 **Date: 12/30/2019** **Direction: W** **Description:** **Exterior Slopes of South Embankment from SE Corner**	

Photograph No. 25 **Date: 12/30/2019** **Direction: W** **Description:** **Interior Slopes of South Embankment from SE Corner**	
Photograph No. 26 **Date: 12/30/2019** **Direction: W** **Description:** **Interior Slopes of South Embankment**	

Photograph No. 27 **Date: 12/30/2019** **Direction: N** **Description:** **West Embankment Exterior Slope from SW Corner**	
Photograph No. 28 **Date: 12/30/2019** **Direction: N** **Description:** **West Embankment Exterior Slope in Hummocky/ Bare Area**	

Photograph No. 29 **Date: 12/30/2019** **Direction: S** **Description:** **West Embankment Exterior Slope**	
Photograph No. 30 **Date: 12/30/2019** **Direction: W** **Description:** **West Embankment Irregular Exterior Slope**	

Photograph No. 31 **Date: 12/30/2019** **Direction: N/A** **Description:** **Vertical Surfaces at Crest of West Embankment**	
Photograph No. 32 **Date: 12/30/2019** **Direction: NE** **Description:** **Irregular Exterior Slopes on West Embankment**	

Photograph No. 33 **Date: 12/30/2019** **Direction: NE** **Description:** **Exterior Slopes at NW Corner of Embankment**	
Photograph No. 34 **Date: 12/30/2019** **Direction: N** **Description:** **Interior Slopes of West and North Embankments**	

Photograph No. 35

Date: 12/30/2019

Direction: NW

Description:

Interior Slopes of West Embankment and Pond Bottom Near NW Corner; Small Pool of Standing Water Observed

Attachment 2
Dam Safety Inspection Checklist

DAM SAFETY INSPECTION CHECKLIST
PLANT CRISP CCR IMPOUNDMENT

RESERVOIR AREA			
ITEMS	**YES**	**NO**	**REMARKS**
Signs of Shoreline Instability		x	
Sedimentation		x	Under current operating conditions, direct stormwater runoff from rainfall over the pond surface constitutes the majority of discharge; additional stormwater runoff generated from the concrete pad of the power plant is delivered from the bag house sump pump via an 8”-diameter PVC pipe on the northern side of the impoundment’s East Embankment.
Debris		x	
Ice-Related Problems		x	
Operating Constraints		x	
Environmental Concerns		x	
Rim Stability		x	No issues.
Other	x		Shrub vegetation grows in the impoundment on the east side. The inside and outside slopes are generally free of brush and tree growth.

SERVICE SPILLWAY 12” Corrugated Metal Pipe (CMP) Drop Inlet with 24” Mesh and CMP Trash Rack			
ITEMS	**YES**	**NO**	**REMARKS**
CMP Drop Inlet			
a. Settlements		x	None apparent. The original installation elevation data are unavailable.
b. Displacements		x	The foundation of the inlet is unknown but appears to be plumb.
c. Cracking		x	

SERVICE SPILLWAY 12” Corrugated Metal Pipe (CMP) Drop Inlet with 24” Mesh and CMP Trash Rack			
ITEMS	**YES**	**NO**	**REMARKS**
d. Deterioration		x	The galvanized CMP and strainer appear to be in acceptable condition. The original construction included a valved/gated opening into the reservoir; however, the actuator has since been cut off due to corrosion. While the condition of the valve/gate is unknown, previous inspections noted that it appears to be intact, based on flow through the outlet following removal of an obstruction. Elements of rusting observed on the galvanized CMP pipe.
e. Exposed Reinforcement			N/A
f. Downstream Boils		x	
g. Springs		x	None noted. There are ponds/swampland to the north and west of the impoundment.
2. Discharge Channel		x	
a. Deterioration			n/a
b. Undercutting			n/a
c. Erosion			n/a
d. Obstruction			n/a

EARTHEN EMBANKMENTS			
ITEMS	**YES**	**NO**	**REMARKS**
1. Alignment			
a. Alignment		x	The crest and toe alignments appear uniform.
b. Displacement		x	
c. Settlement		x	None noticeable during walkdown
2. Deterioration			
a. Erosion	x		There is some minor surface erosion/ missing grass cover on the exterior embankment slopes. Some tire rutting was also observed. Refrain from driving on the slopes and at the toe as practical.
b. Sloughs or Slumps	x		There are 1- to 1.5-ft-high vertical faces along the crest on the outside slope at several locations on the west embankment. The exterior slopes on the west embankment are somewhat irregular/hummocky. No circular slip surfaces or cracks were observed. Based on conversations with site personnel, the irregular surface may be due to removal of extra material during previous brush-clearing operations.
c. Riprap		x	None
d. Damage from Nuisance Wildlife		x	No burrows or undercuts along the bank were noted. At least two paths over the embankment where animals approach the impoundment were noted (North and South embankments).

ITEMS	YES	NO	REMARKS
3. Seepage		x	None
a. Where			The site had received approximately 0.54 inches of rainfall the night before the inspection, and a total of approximately 2.40 inches of rain during the week before the inspection. The area in the immediate vicinity of monitoring well MW-D3 was observed to be wet (approximately 85 feet long); however, there were no signs of active seepage (flow) or soft ground at the time of the inspection. The area of the north embankment historically remains wet from the late fall through the spring.
b. Quantity			
4. Abutment Contacts			
a. Abutment Instability		x	
b. Erosion		x	
c. Undercutting		x	
d. Visible Displacement		x	
e. Seepage from Contact		x	
f. Downstream Boils		x	
g. Springs		x	
h. Abutment Shoreline Freeboard			>5 feet at northeast and southeast corners
5. Instrumentation		x	There is no dam safety instrumentation at this dam.