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June 14, 2018
Project No. 17-5796A

Mr. Ronnie Miller
Manager of Production
Crisp County Power Commission
961 Power Dam Road
Warwick, GA 31796

via email: rmiller@crispcountypower.com

DAM SAFETY INSPECTION REPORT
PLANT CRISP CCW IMPOUNDMENT
CRISP COUNTY POWER COMMISSION
PROJECT NO. 17-5796A

Dear Mr. Miller:

This Letter Report summarizes the observations and resulting recommendations from our dam safety inspection of the Plant Crisp Coal Combustion Waste (CCW) Impoundment performed on Wednesday, May 9, 2018. RIZZO International, Inc. (RIZZO) services for this Project were performed in accordance with our March 26, 2018 Proposal submitted to Crisp County Power Commission (CCPC).

1.0 PROJECT UNDERSTANDING

Plant Crisp is a combined cycle coal and gas power plant located adjacent to Lake Blackshear Dam and Reservoir. The site is located in Worth County, Georgia, near the border of Lee and Crisp Counties. The plant historically was operated infrequently and typically used natural gas rather than coal when in operation. When operating as a coal - fired plant, Plant Crisp discharged wastewater containing CCW materials into a small impoundment west of the plant. The permit for the CCW Impoundment and the associated discharges from the pond are subject to Environmental Protection Division (EPD) regulation. This permit requires that a Georgia registered professional engineer inspect the impoundment annually and prepare a Report of Findings for submittal to EPD. Since the 2017 RIZZO Report, no coal has been on site nor burned at the plant. All CCW materials from the past use of the plant are now contained within the impoundment.

In 2014, RIZZO performed a more comprehensive evaluation of the CCW Impoundment which included a site survey and drawings, hydraulics and hydrologic analyses, and stability analyses in support of CCPC's responses to the Environmental Protection Agency (EPA).

2.0 GENERAL INFORMATION

The inspection of the CCW Impoundment was performed by Mr. Grady Adkins from RIZZO, a licensed professional engineer in the state of Georgia accompanied by Mr. Ronnie Miller, Manager of Production for CCPC. The inspection included a review of the weekly Ash Pond Inspection Reports, Daily Water level monitoring reports, and a walk down inspection of the ash pond. The impoundment inspection was performed starting from the East Embankment and proceeding in a counter clockwise direction to the North, West, and South Embankments, respectively. The weather was clear with temperatures in the mid to high 70's. The principal spillway drain was fully open resulting in a dry pool condition except for water trapped in low areas of the pool bottom.

The CCW Impoundment at Plant Crisp is located west of the plant and southwest of the Lake Blackshear Hydroelectric Project. The trapezoidal impoundment consists of built-up earthen embankments on all sides, ranging from 2 feet (ft) to 5 ft high (East and South Embankments) to approximately 22 ft high (West and North Embankments). The bottom of the impoundment generally slopes down from east to west. The West Embankment runs against the CCPC property line, with a sand-clay road along its toe on the adjacent property. ***Table 2-1*** summarizes the general details of the CCW Impoundment.

TABLE 2-1
CCW IMPOUNDMENT DETAILS

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: (Upstream and Downstream)	2H:1V
Crest Elevation:	245 ft
Normal Pool Elevation:	< 240.95 ft
Reservoir Area:	6.5 Acres

TABLE 2-1
CCW IMPOUNDMENT DETAILS
(CONTINUED)

ITEM	INFORMATION
Normal Storage Capacity:	29 ac-ft
Primary Spillway Type	Corrugated metal pipe drop inlet
Primary Spillway Diameter	12” inlet with 24” diameter screen 12” discharge
Primary Spillway Inlet Elevation	240.95 ft
Required Spillway Design Flood (SDF)	0.25 PMP (Based on Georgia Safe Dams Program Criteria)
Primary Spillway Capacity	> 3.2 cfs
Auxiliary Spillway Type	Earth chute at NE corner
Auxiliary Spillway Dimensions	Approximately 6” deep by 80’ long

Two discharge lines emptied into the CCW Impoundment: a ductile iron pipe that carried water and CCW byproducts from the fossil plant during plant operations and a polyvinyl chloride (PVC) line that carries miscellaneous runoff and process water from the bag house sump. No coal was burned in the past year; therefore no additional CCW materials were placed in the pond.

Photographs from our inspection of the pond and surrounding area are attached in ***Appendix A.***

3.0 OWNER’S PERIODIC MONITORING

The Owner conducts weekly walk-down inspections of the Ash Pond and surrounding areas and monitors fugitive dust and groundwater elevations. Since the pond has been drained groundwater has dropped below the bottom of some of the four monitoring wells around the pond. Weekly and monthly reports are available on the CCPC website. In addition, four monitoring wells were added to study groundwater elevations around the Ash Pond in preparation for executing the closure plan. These wells have been monitored monthly since February 2017.

4.0 FINDINGS

Based on the visual safety inspection and review of available documents the Plant Crisp CCW Impoundment with a suggested hazard classification of “Low Hazard”, was found in good overall condition. No signs of slope instability nor embankment distress such as sloughs, tension cracks, bulges at the toe of slopes, nor excessive crest settlement were noted.

The *Dam Safety Inspection Check List* included in ***Appendix B*** provides comprehensive listing of the items checked and photograph references. The following findings are of high importance **if the closure plan is not executed**:

1. The slopes of the North and West Embankment were somewhat overgrown at the time of inspection. In general the growth consists of low ground cover vines and grasses, but an occasional small tree 1- inch to 2-inch in diameter was noted. The embankments have been mowed since the inspection. See photographs.

2. The exterior slopes of the West Embankment are irregular, with hummocky areas and some vertical surfaces near the crest. Minor surface erosion was noted at several locations. The condition of the West Embankment should continue to be monitored especially if the pond water level is raised.

3. The downstream discharge basin of the spillway appeared to be in good condition. The flared end section and small stilling basin appear to be operating properly. At the time of inspection, no flow was occurring and a small pool of stagnant water was observed at the low point of the stilling basin. Vegetation and woody debris should periodically be removed from the stilling basin and outlet channel in order to not impede flow.

4. The vertical riser of the primary spillway was completely exposed at the time of inspection and appeared to be in good condition. No signs of excessive corrosion or damage were noted.

5.0 RECOMMENDATIONS

We understand that a CCW Closure Plan has been developed for this site. We offer the following recommendations and comments to assist CCPC in maintaining safe long- term performance of the dam structure and its appurtenant works if the closure plan is not executed.

- **Recommendation 1 –** The exterior slopes of the West Embankment should be stripped and restored to a consistent section with compacted engineered fill. After the section is restored, the area should be grassed by seeding or sodding as appropriate to prevent further erosion in the area.
- **Recommendation 2 –** Visual inspection of the spillway outlet is included in the existing weekly inspection performed by plant personnel. The results of the weekly inspection are documented on a form which is archived at the site. Changes to the volume and turbidity of the discharge should be recorded to provide a record of performance of the spillway over time. Such changes may be indicative of deterioration of the corrugated metal pipe spillway and may make additional activities such as camera inspection with a remotely operated vehicle necessary.
- **Recommendation 3 –** 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.

6.0 CONCLUSION

Overall, the CCW Impoundment is in good condition, with adequate vegetal cover and no signs of active slope instability nor other conditions that require immediate action so that the impoundment can continue to operate safely. The impoundment is maintained at its lowest practical elevation which provides additional storm water storage in the reservoir. Spillway capacity was determined in a previous study to be adequate for the design flood event, and the spillway outlet has been maintained to ensure that flow will not be obstructed when needed. All work performed in connection with this Report conforms to generally accepted engineering practices. All conclusions and recommendations in this Report have been made independent of the Owner, its Employees, and its Representatives.

If you have any questions or require any additional information, please contact me by telephone at (803) 673-1861 or via email at grady.adkins@rizzoassoc.com.

Sincerely yours,
RIZZO International, Inc.

H. Grady Adkins, Jr., P.E.
Engineering Director
Georgia P.E. No 032154

HGA/lk

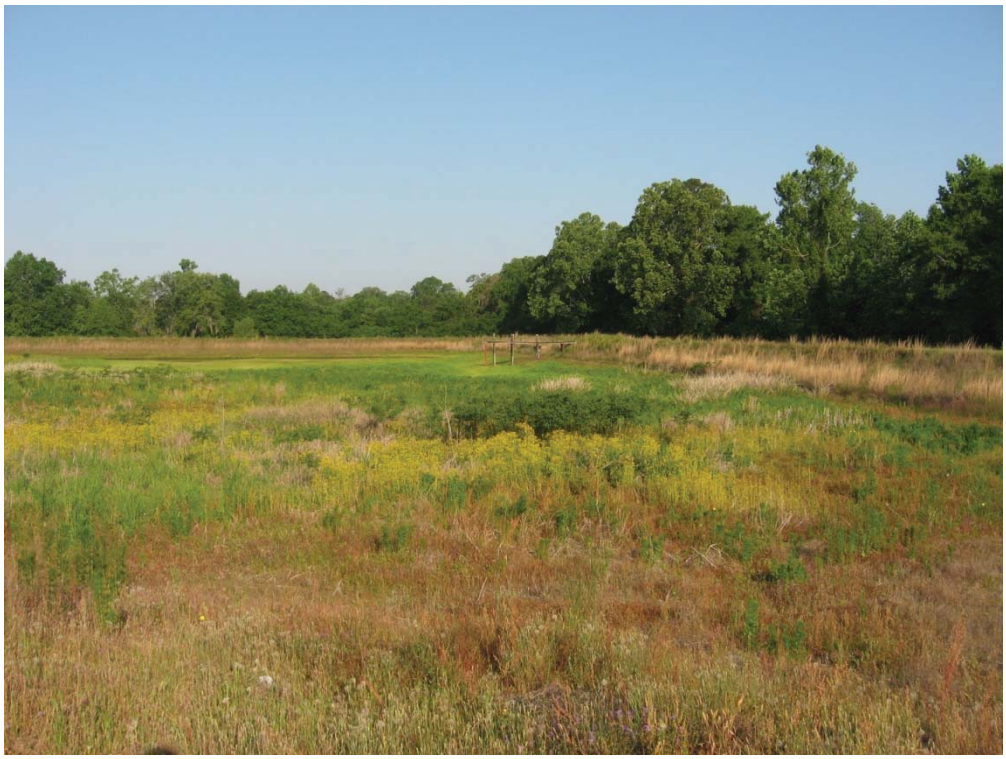
Appendices

GEORGIA REGISTERED No. PE032154 PROFESSIONAL ENGINEER HENRY GRADY ADKINS, JR.

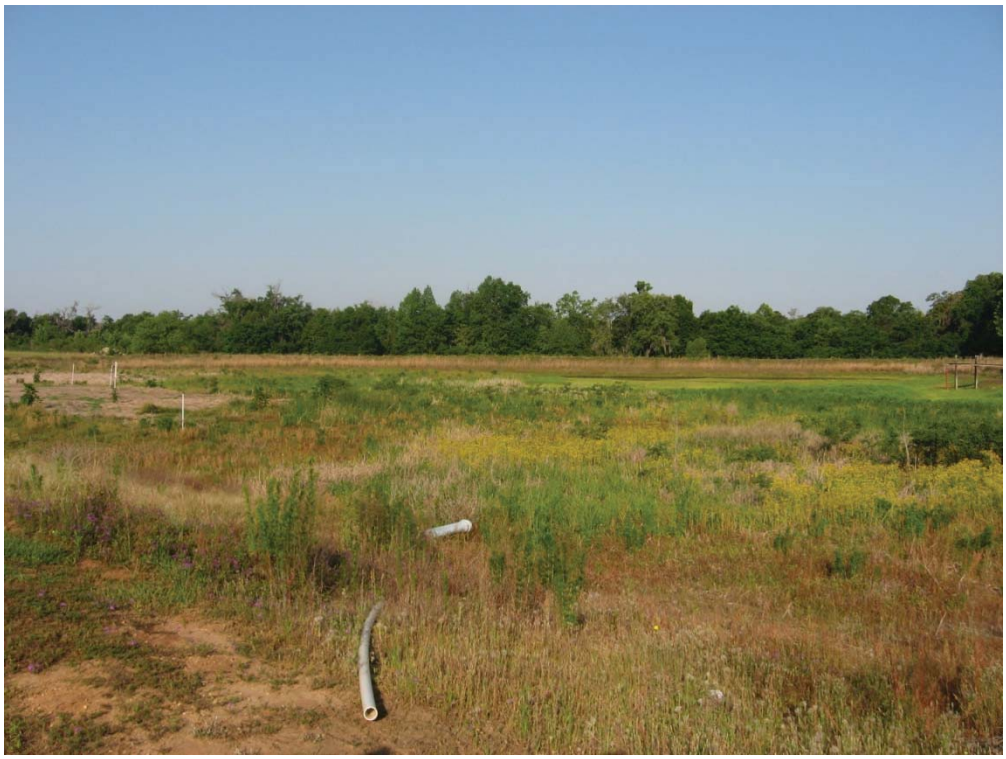
6-14-2018

APPENDIX A

PHOTOGRAPHS

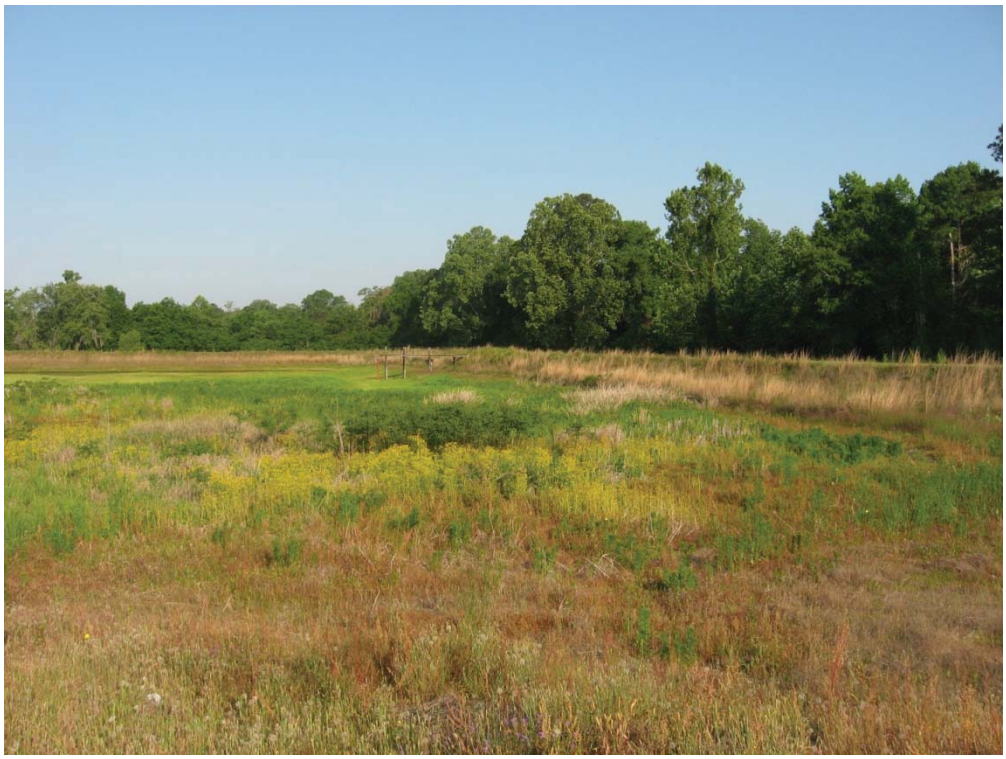


Looking toward Northwest Corner of Impoundment



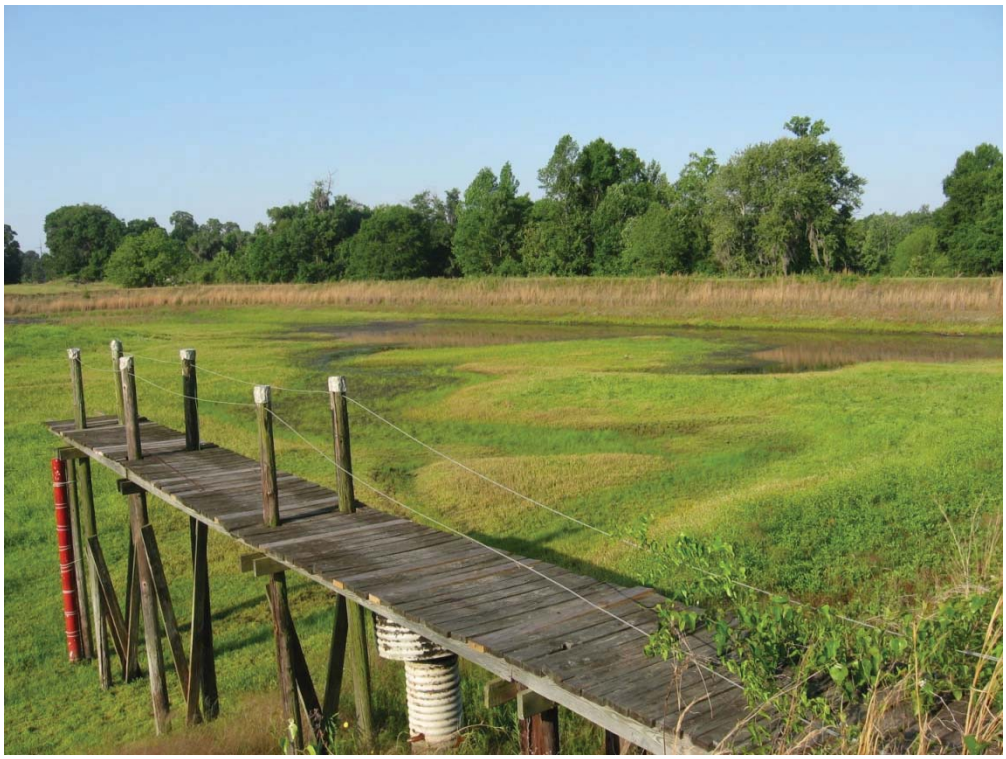
CCW Sluice Discharge at East Embankment

Looking Toward Southwest Corner

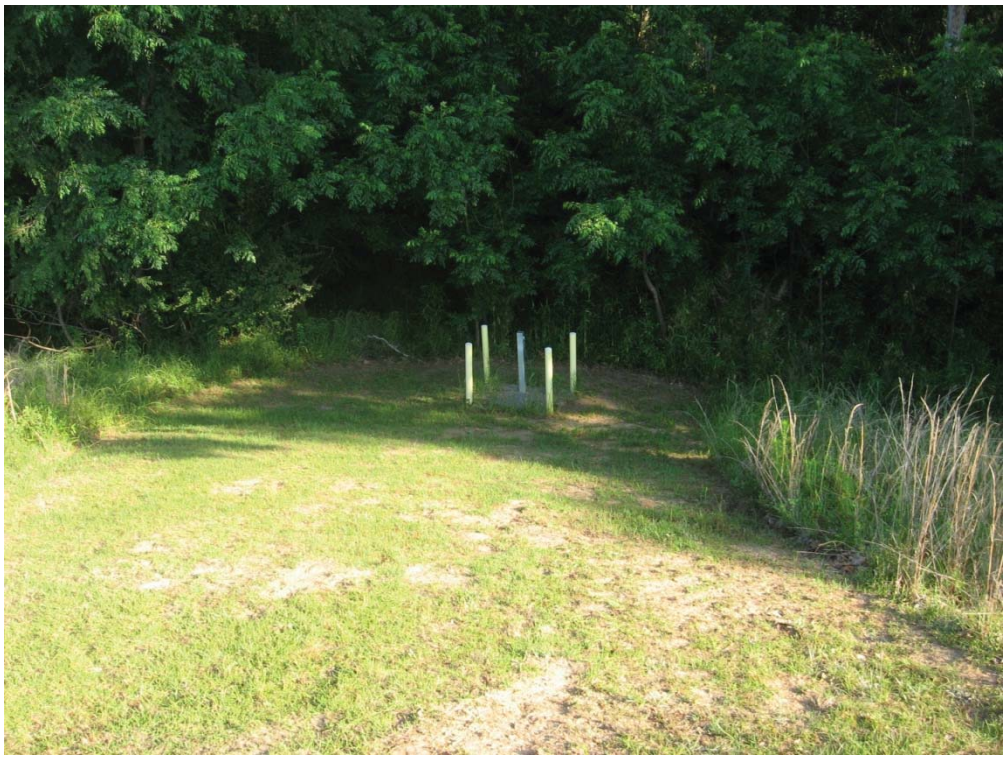


Looking Toward Northwest Corner

Looking To West Embankment

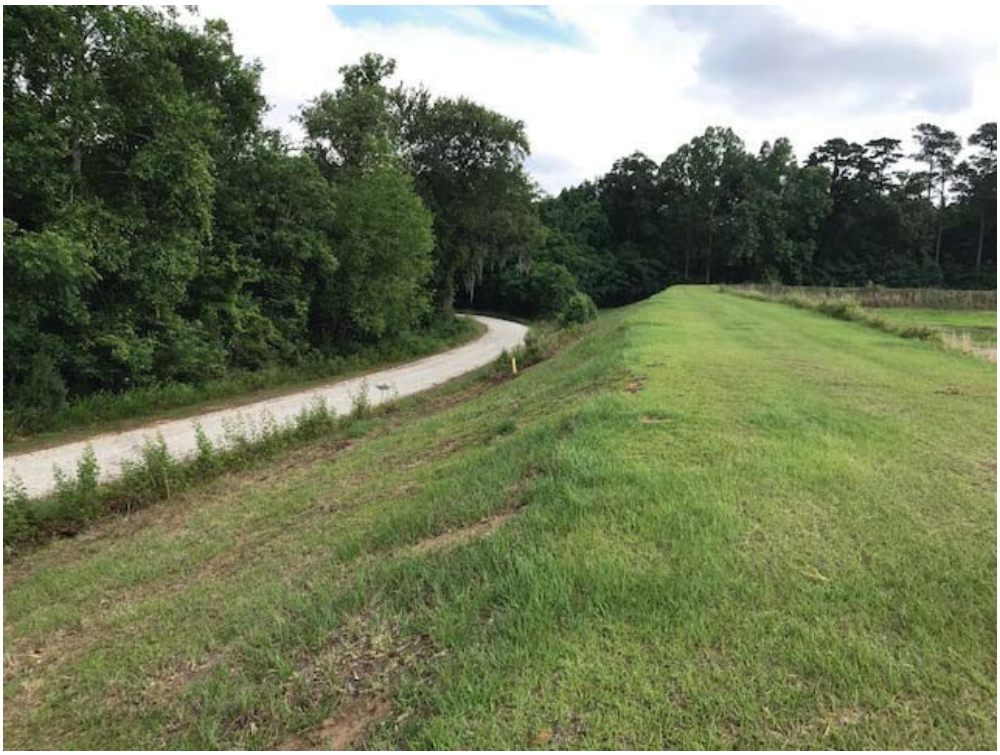


Principal Spillway Intake Riser Beneath Walkway

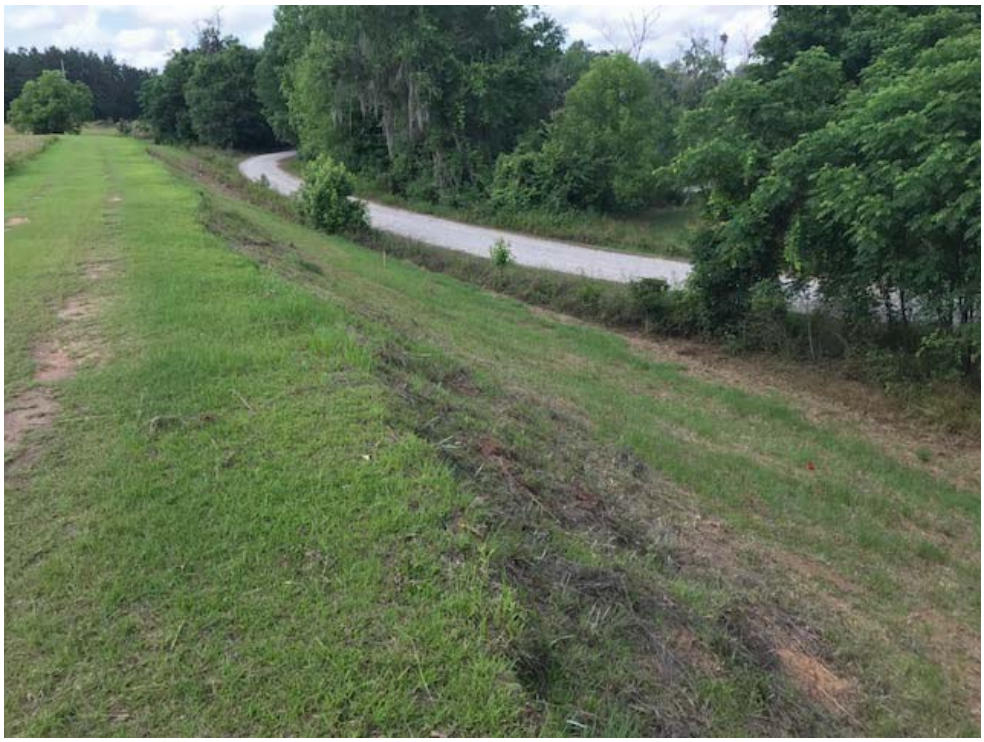


Groundwater Monitoring Well on North Toe of Dam

Principal Spillway Downstream Discharge Area



Looking North Along West Embankment After Mowing



Looking South Along West Embankment After Mowing

APPENDIX B

INSPECTION CHECKLIST

DAM SAFETY INSPECTION CHECKLIST
PLANT CRISP CCW IMPOUNDMENT

RESERVOIR AREA			
ITEMS	**YES**	**NO**	**REMARKS**
1. Signs of shoreline instability?		X	
2. Sedimentation?	X		Due to operation of the impoundment as a CCW Impoundment the rate of accumulation has been very slow due to very limited operation of coal plant. An automatic level control device pumps all runoff, wash and process water, etc. from a sump at the plant. Under current operating conditions, all discharge is storm water runoff delivered via an 8-inch diameter PVC pipe on the northern side of the East Embankment of the impoundment. CCW was sluiced into the impoundment via an 8-inch ductile iron pipe on the southern side of the East Embankment. CCW solids (bottom ash, other larger granular waste products) were periodically deposited in the impoundment from the east side.
3. Debris?		X	
4. Ice related problems?		X	
5. Operating constraints?		X	
6. Environmental concerns?		X	
7. Rim stability?		X	No issues. Some limited areas of poor vegetal cover.
8. Other?	X		Native revegetation is flourishing in former impounded area. Inside slopes are generally free of brush or tree growth.

SERVICE SPILLWAY 12-Inch Corrugated Metal Pipe (CMP) Drop Inlet with 24-Inch Mesh and CMP Trash Rack			
ITEMS	**YES**	**NO**	**REMARKS**
1. CMP Drop Inlet	X		
a. Settlements?		X	None apparent, original installation elevation not available.
b. Displacements?		X	Foundation of inlet unknown but appears to be plumb.
c. Cracking?		X	
d. Deterioration?		X	Galvanized CMP and strainer appear to be in good condition with very little corrosion. A valved/gated opening into the reservoir was included in original construction; Gate was near fully opened at time of inspection. Condition of interior of outlet pipe through embankment not scoped. Appears OK from outside Discharge of outlet pipe was found to be in good condition.
e. Exposed Reinforcement?			N/A
f. Boils Downstream?		X	
g. Springs?		X	None noted, existing ponds/swamp to N and W of impoundment
7. Discharge Channel		X	No discharge channel was provided for the outlet pipe, contributing to the discharge being covered and plugged. Discharge channel should be established.
a. Deterioration?		X	
b. Undercutting?		X	
c. Erosion?		X	
d. Obstruction?	X		Very shallow to no free draining outlet channel

EARTHEN EMBANKMENTS			
ITEMS	**YES**	**NO**	**REMARKS**
1. Alignment			
a. Alignment?		X	Crest and toe alignments appear uniform.
b. Displacement?		X	
c. Settlement?		X	
2. Deterioration			
a. Erosion?	X		Some minor surface erosion at locations of concentrated runoff or missing vegetal cover.
b. Sloughs or Slumps?	X		West Embankment – 1 to 1.5 ft high vertical faces along crest on outside slope at several locations. Exterior slopes on W. Embankment are somewhat irregular/hummocky. No circular slip surfaces or cracks observed. .
c. Riprap?		X	None N/A
d. Damage from nuisance wildlife?		X	No burrows or undercuts along the bank noted.
3. Seepage		X	2014 inspection noted wet area on toe of North Embankment. This area was dry and unyielding at the time of this inspection.
a. Where?			N/A
b. Quantity?			N/A
4. Abutment Contacts			
a. Abutment instability?		X	
b. Erosion?		X	
c. Undercutting?		X	
d. Visible Displacement?		X	
e. Seepage from Contact?		X	
f. Boils Downstream?		X	
g. Springs?		X	
h. Abutment Shoreline Freeboard?			>8 feet at NE and SE corner
e. Seepage from Contact?		X	
5. Instrumentation	X		4 Groundwater Elevation Monitors installed in 2017.

Other Comments:

- The outside slope of the West Embankment has several short vertical faces near the crest and hummocky areas. While no signs of active slope movement were noted, these slopes should be regraded to even slopes and reseeded or sodded to provide adequate vegetal cover.
- Minor bare areas and a few vertical faces were observed on the outside slope of the North Embankment. Small trees have grown up in a few places and should be removed if impoundment is not to be closed in the next 12 months.