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June 13, 2019
Project No. 17-5796B

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

via email: rmiller@crispcountypower.com

2019 DAM SAFETY INSPECTION REPORT
PLANT CRISP CCW IMPOUNDMENT
CRISP COUNTY POWER COMMISSION
PROJECT NO. 17-5796B

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 Friday, March 22, 2019. RIZZO International (RIZZO) services for this Project were performed in accordance with our March 6, 2019 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. Historically, the plant was operated infrequently and typically used natural gas fuel rather than coal when in operation. When operating as a coal - fired plant, wastewater containing CCW materials were discharged into a small impoundment to the west of the plant. The permit for the CCW Impoundment and the associated discharges from the pond are subject to State of Georgia 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 Georgia EPD. Since the 2018 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 that included a site survey and drawings, hydrologic and hydraulic analyses, and stability analyses in support of Crisp County Power Commission's responses to the US 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. He was accompanied by Mr. Ronnie Miller, Manager of Production for Crisp County Power Commission. 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 65 to 70 degrees range. The principal spillway drain was partially open resulting in a partially dry pool condition except for water trapped in upstream low areas of the pool bottom.

The CCW Impoundment at Plant Crisp is located to the west of the plant and southwest of the Lake Blackshear Hydroelectric Project. The trapezoidal shaped impoundment consists of built-up earth embankments on all sides ranging in height from 2 feet (ft) to 5 ft high on the East and South embankments to approximately 22 ft high on the West and North Embankments. The bottom of the impoundment generally slopes downward from the East to the West. The West embankment runs against the CCPC property line, with a sand-clay public 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

TABLE 2-1
CCW IMPOUNDMENT DETAILS
(CONTINUED)

ITEM	INFORMATION
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
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

When the plant was in operation, two discharge lines emptied into the CCW Impoundment: a ductile iron pipe that carried water and CCW byproducts from the fossil plant to the impoundment and a polyvinyl chloride (PVC) line that carried miscellaneous runoff and process water from the bag house sump. No coal was burned on site in the past four to five years that could generate additional CCW materials. Only minor quantities of CCW materials from site clean-up sweeping were placed in the pond since the last inspection.

Photos from our inspection of the Pond and surrounding area are attached in ***Appendix A.***

3.0 OWNER'S PERIODIC MONITORING

The Owner conducts and documents weekly walk-down inspections of the CCW Ash Pond and surrounding areas. Fugitive dust levels, ash pond surface and groundwater elevations, groundwater quality, and groundwater elevations around the ash pond are monitored and are published on the company website. Four groundwater quality monitoring wells (identified as MW-U1, MW-D1, MW-D2, and MW-D3) have been placed around the Ash Pond. These wells are generally sampled monthly. Plots of the measured groundwater elevations from February 2017 to November 2018 are attached in ***Appendix B.***

4.0 FINDINGS

Based on my visual safety inspection and review of available documents, it is my opinion that the Plant Crisp CCW Impoundment is properly classified as a Low Hazard Class Dam. The Impoundment was found in good overall condition. 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.

A wet seepage area at the downstream toe near MW-D-3 was noted and photographed. There was standing water in tire ruts in this area. The last groundwater measurement prior to the site visit showed a ground water table within 1 foot+/- of the surface. Minimize vehicle traffic in this area as much as practical.

The *Dam Safety Inspection Check List* included in ***Appendix C*** 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. Continue to fertilize, maintain, and mow the top and slopes of the West Embankment. Remove small trees while they are saplings and can be removed by mower. The exterior slopes of the West Embankment are irregular, with hummocky areas and some vertical surfaces near the crest. The condition of the West Embankment should continue to be monitored especially if the pond water level is to be raised.

2. 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, almost no flow was occurring and a small pool of stagnant water was observed at the low point of the stilling basin. Periodically clear and remove vegetation and woody debris from the stilling basin and outlet channel in order to not impede flow.

3. The vertical riser of the primary spillway was mostly 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. Clear any debris from around upstream and downstream ends of pipe spillway to provide full capacity for storm events.
- **Recommendation 3 –** Continue to mow the exterior slopes of the embankments to discourage tree growth. Remove small volunteer trees as early as practical.
- **Recommendation 4 –** Consider mitigating the seepage area MW-D3. This appears to be a relatively high traffic area that provides access to spillway and instrumentation. Recommend installing a hardstand area of gravel over geotextile.

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. Previous studies have confirmed that Spillway capacity was 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.

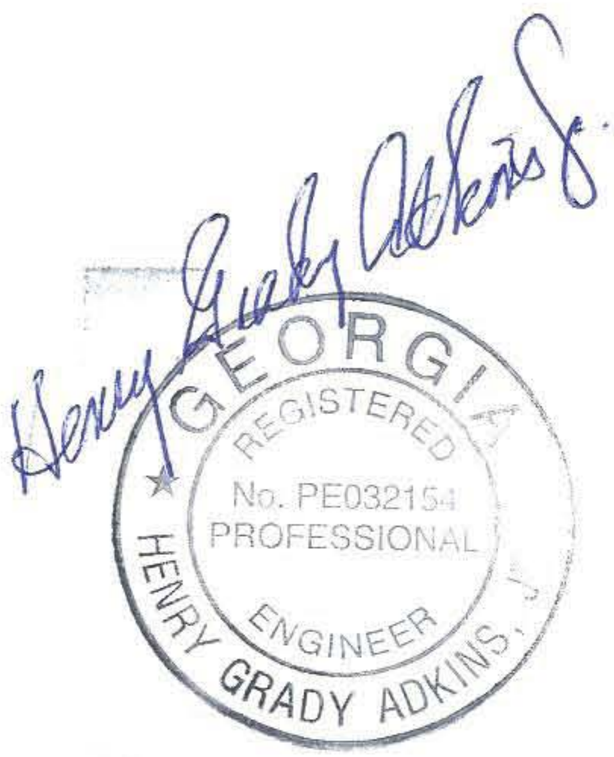
If you have any questions or require any additional information, please contact me at (803) 673-1861 or via e-mail at grady.adkins@rizzointl.com.

Sincerely yours,
RIZZO International, Inc.

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

HGA/ljr

Appendices



APPENDIX A

PHOTOGRAPHS

Looking West Across Ash Pond

Upper End of Ash Pond

Groundwater Monitoring Well MW-D2

Principal Spillway Inlet

Looking South Along West Embankment

Looking North Along West Bank – Spillway In Background

Principal Spillway Outlet Pipe and Channel – Remove Debris From Outlet

Seepage Area at MW-D3

Seepage Area at MW-D3

APPENDIX B

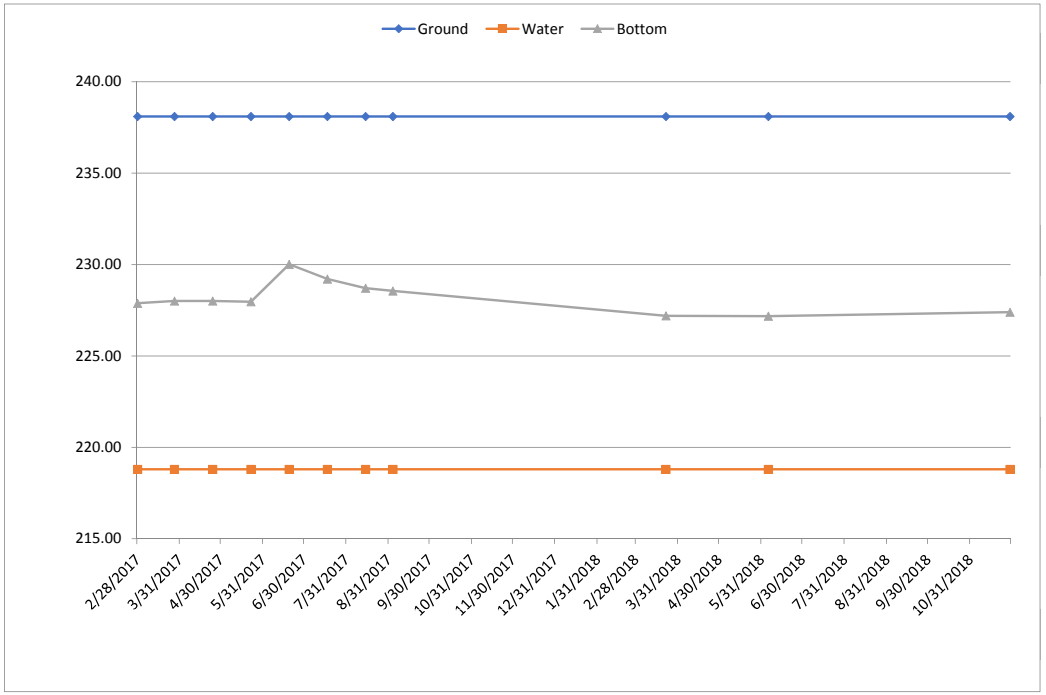
PLOTS

WELL MW-D1

	Elevation		Date	2/28/2017	3/27/2017	4/24/2017	5/22/2017	6/19/2017	7/17/2017	8/14/2017	9/3/2017	3/22/2018	6/5/2018	11/29/2018
WELL	Ground	Bottom												
MW-D1	238.1	218.80	Water Surface Elevation		238.48	238.48	237.05	241.44	241.00	239.08	238.08	238.48	238.76	239.23

Ground 246.28
Bottom 212.78 Bottom

Date	**Ground**	**Bottom**	**Water**
2/28/2017	238.10	218.80	227.88
3/27/2017	238.10	218.80	228.01
4/24/2017	238.10	218.80	228.01
5/22/2017	238.10	218.80	227.97
6/19/2017	238.10	218.80	230.01
7/17/2017	238.10	218.80	229.21
8/14/2017	238.10	218.80	228.71
9/3/2017	238.10	218.80	228.56
3/22/2018	238.10	218.80	227.20
6/5/2018	238.10	218.80	227.18
11/29/2018	238.10	218.80	227.40

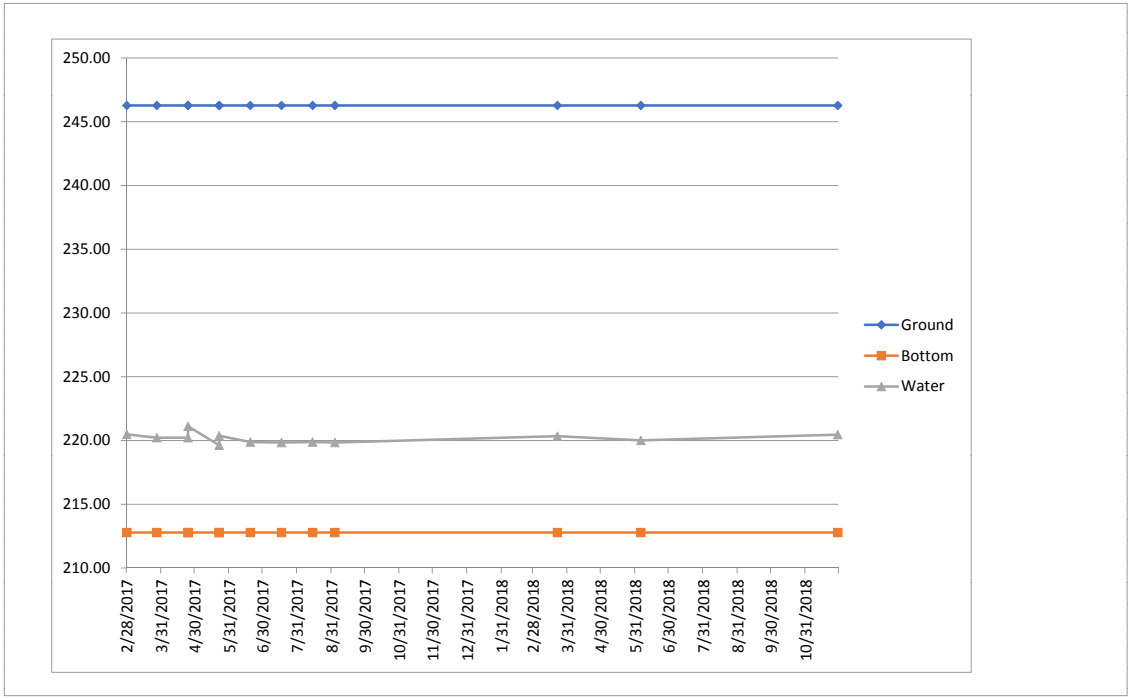


Well MW-D2

	Elevation		Date	2/28/2017	3/27/2017	4/24/2017	5/22/2017	6/19/2017	7/17/2017	8/14/2017	9/3/2017	3/22/2018	6/5/2018	11/29/2018
WELL	Ground	Bottom												
MW-D2	229.14	209.64	Water Surface E	220.48	220.22	220.22	219.63	221.11	220.37	219.88	219.84	220.34	220.01	220.46

Ground 246.28
Bottom 212.78

Date	Ground	Bottom	Water
2/28/2017	246.28	212.78	220.48
3/27/2017	246.28	212.78	220.22
4/24/2017	246.28	212.78	220.22
5/22/2017	246.28	212.78	219.63
4/24/2017	246.28	212.78	221.11
5/22/2017	246.28	212.78	220.37
6/19/2017	246.28	212.78	219.88
7/17/2017	246.28	212.78	219.84
8/14/2017	246.28	212.78	219.88
9/3/2017	246.28	212.78	219.84
3/22/2018	246.28	212.78	220.34
6/5/2018	246.28	212.78	220.01
11/29/2018	246.28	212.78	220.46

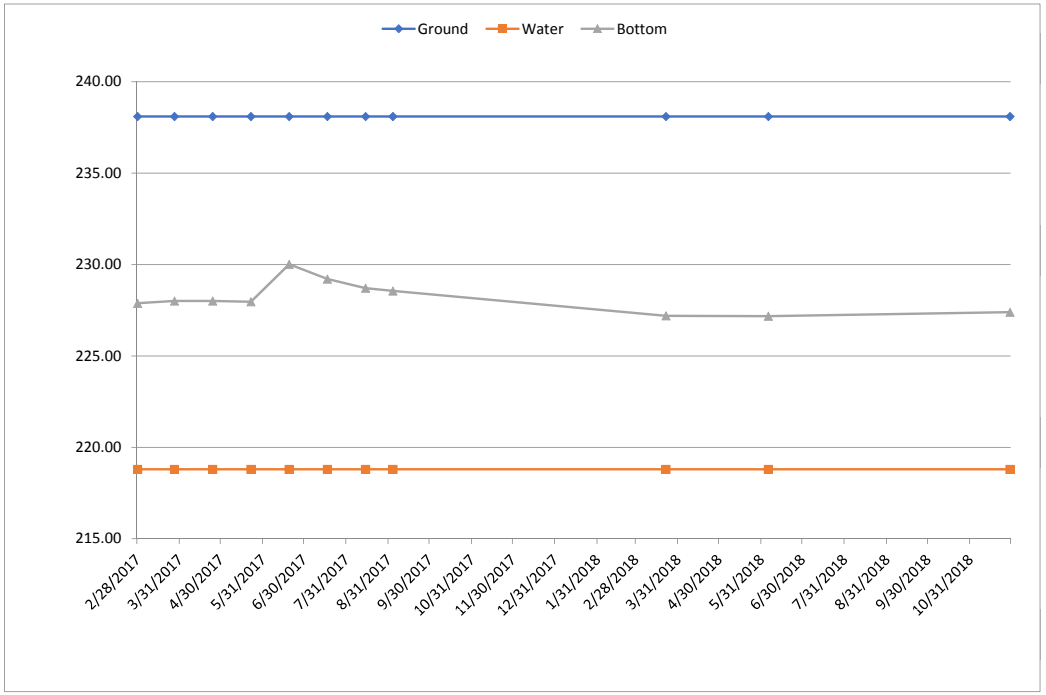


WELL MW-D3

	Elevation		Date	2/28/2017	3/27/2017	4/24/2017	5/22/2017	6/19/2017	7/17/2017	8/14/2017	9/3/2017	3/22/2018	6/5/2018	11/29/2018
WELL	Ground	Bottom												
MW-D3	229.27	210.47	Water Surface	228.31	228.37	228.37	228.16	228.57	228.59	228.66	228.48	227.68	227.45	227.52

Ground 246.28
Bottom 212.78

Date	Ground	Bottom	Water
		Bottom	
2/28/2017	238.10	218.80	227.88
3/27/2017	238.10	218.80	228.01
4/24/2017	238.10	218.80	228.01
5/22/2017	238.10	218.80	227.97
6/19/2017	238.10	218.80	230.01
7/17/2017	238.10	218.80	229.21
8/14/2017	238.10	218.80	228.71
9/3/2017	238.10	218.80	228.56
3/22/2018	238.10	218.80	227.20
6/5/2018	238.10	218.80	227.18
11/29/2018	238.10	218.80	227.40

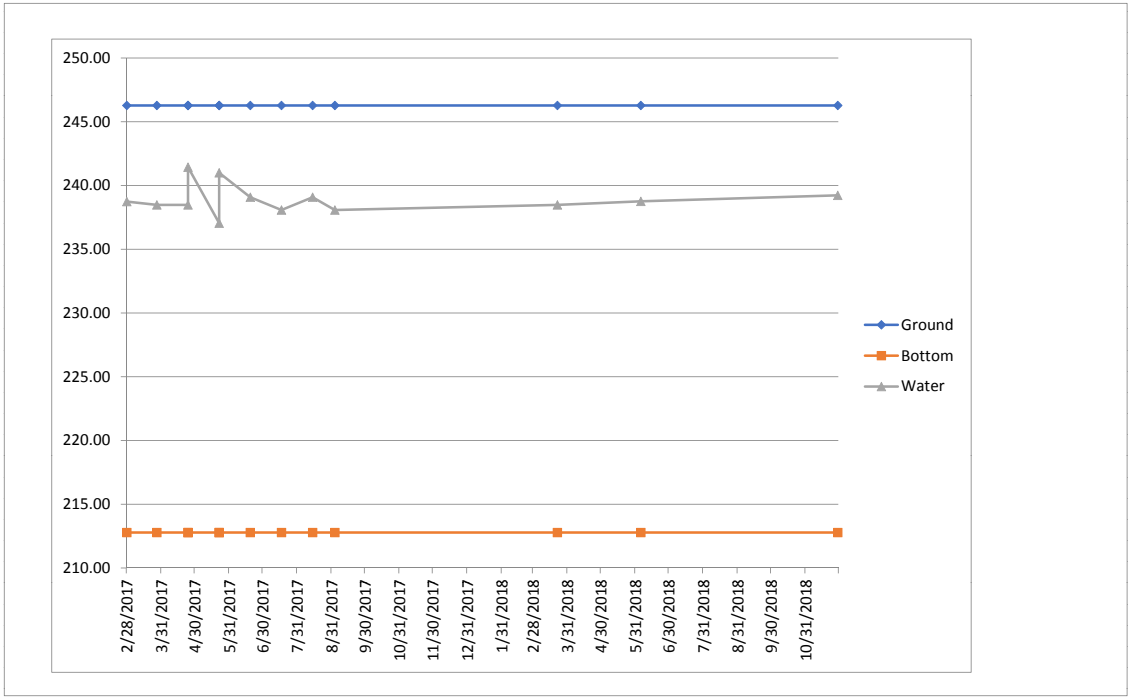


Well MW-U1

	Elevation		Date	2/28/2017	3/27/2017	4/24/2017	5/22/2017	6/19/2017	7/17/2017	8/14/2017	9/3/2017	3/22/2018	6/5/2018	11/29/2018
WELL	Ground	Bottom												
MW-U1	246.28	212.78	Water Surface E	238.74	238.48	238.48	237.05	241.44	241.00	239.08	238.08	238.48	238.76	239.23

Ground 246.28
Bottom 212.78

Date	Ground	Bottom	Water
2/28/2017	246.28	212.78	238.74
3/27/2017	246.28	212.78	238.48
4/24/2017	246.28	212.78	238.48
5/22/2017	246.28	212.78	237.05
4/24/2017	246.28	212.78	241.44
5/22/2017	246.28	212.78	241.00
6/19/2017	246.28	212.78	239.08
7/17/2017	246.28	212.78	238.08
8/14/2017	246.28	212.78	239.08
9/3/2017	246.28	212.78	238.08
3/22/2018	246.28	212.78	238.48
6/5/2018	246.28	212.78	238.76
11/29/2018	246.28	212.78	239.23



APPENDIX C

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		The coal fired plant has not been operated in the past year. Minimal amounts of CCW materials from routine plant clean-up activities were placed in the CCW Impoundment in the past year. An automatic level control device pumps all plant runoff from a sump at the plant to the Impoundment. Under current operating conditions, any discharge is storm water runoff delivered via an 8-inch diameter PVC pipe on the northern side of the East Embankment of the impoundment. Historically, 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		Scrub vegetation grows in impoundment. Inside slopes generally free of brush or tree growth. Outside slopes are kept mowed.

DAM SAFETY INSPECTION CHECKLIST
PLANT CRISP CCW IMPOUNDMENT

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; however the actuator has since been cut off due to corrosion. Condition of the valve/gate is unknown; however there is a very slight trickle flow through outlet with pool level below riser inlet elevation. Condition of outlet pipe through the embankment not observed. Discharge of outlet pipe was found to be in good condition but covered with light debris. Recommend periodic cleanout of the small pipe outlet channel to facilitate drainage to downstream wetland.
e. Exposed Reinforcement?			N/A
f. Boils Downstream?		X	
g. Springs?		X	No springs. Seepage in area of MW-D3 , existing ponds/swamp to N and W of impoundment
7. Discharge Channel		X	No significant discharge channel was provided for the outlet pipe, contributing to the discharge area being covered and plugged. Periodically clean out discharge channel area.
a. Deterioration?		X	
b. Undercutting?		X	
c. Erosion?		X	
d. Obstruction?	X		Very shallow to no free draining outlet channel

DAM SAFETY INSPECTION CHECKLIST

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 apparent change since last inspection. No circular slip surfaces or cracks observed.
c. Riprap?		X	None
d. Damage from nuisance wildlife?		X	No burrows nor undercuts along the bank were noted.
3. Seepage	X		Minor seepage or wet areas on downstream toe of the North Embankment have been observed and noted in this and previous inspections. The wet area is on the road downstream of MW-D-3. The groundwater level in this area averages about 1.5 feet below ground surface year round. At time of inspection, groundwater was about 1 foot below ground surface.
a. Where?			Downstream of MW-D-3
b. Quantity?			Minor
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 monitoring wells have been installed at this dam. 11 months of data collected to date.

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 sprouted in a few places and should be removed.