PERIODIC INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
391-3-4-.10(5) and 40 C.F.R. PART 257.82
PLANT SCHERER ASH POND (AP-1)
GEORGIA POWER COMPANY

The Federal CCR Rule, and, for Existing Surface Impoundments where applicable, the Georgia CCR Rule (391-3-4-.10) require the owner or operator of a CCR surface impoundment to design, construct, operate and maintain an inflow design flood control system capable of adequately managing flow during and following the peak discharge of the specified inflow design flood. The owner or operator must prepare an inflow design flood system written plan documenting how the inflow design flood control system has been designed and constructed. *See* 40 C.F.R. § 257.82; Ga. Comp. R. & Regs. r. 391.3-4-.10(5)(b). In addition, the Rules require periodic inflow design flood control system plans within 5 years of development of the previous plan. *See* 40 C.F.R. § 257.82(c)(4); Ga. Comp. R. & Regs. r. 391.3-4-.10(5)(b).

The existing CCR surface impoundment known as the Plant Scherer Ash Pond (AP-1), is located at Plant Scherer approximately 8 miles northeast of Forsyth, GA. The facility consists of a 550-acre CCR storage area. The Notice of Intent to Initiate Closure was placed in the Operating Record on 10/30/2020 and closure has been designed to have no negative impacts on the inflow design flood control plan.

The inflow design flood consists of the rainfall that falls within the limits of the surface impoundment and runoff from approximately 221 acres of adjoining watershed. Stormwater is temporarily stored within the limits of AP-1 and discharged through the primary spillway. The primary spillway is a morning glory drop-inlet structure located along the west side of AP-1 and it is constructed of 72-inch diameter reinforced concrete pipe. The auxiliary spillway is an 85-foot wide concrete broad crested weir that flows into a vegetated trapezoidal channel.

The inflow design flood has been calculated using the Natural Resources Conservation Service (NRCS) method, also known as the Soil Conservation Service (SCS) method, using the probable maximum flood (PMF) storm event required for a high hazard potential surface impoundment. Runoff curve number data was determined using Table 2-2A from the Urban Hydrology for Small Watersheds (TR-55). Appendix A and B from the TR-55 were used to determine the rainfall distribution methodology.

Precipitation values were determined from National Oceanic and Atmospheric Administration (NOAA)'s National Weather Service Hydrometeorological Report No. 51 (HMR-51).

The NRCS provided information on the soil characteristics and hydrologic groups present at the site. It was determined that the hydrological group "B" should be used to best reflect the characteristics of the soils on site. This information was placed into Autodesk Storm and Sanitary Analysis 2019 and used to generate appropriate precipitation curves, storm basin routing information, and resulting rating curves to evaluate surface impoundment capacity.

Resulting calculations indicate that the Plant Scherer Ash Pond 1 can safely store and pass the inflow design storm. This plan is supported by appropriate engineering calculations which are attached.

The facility is operated subject to and in accordance with § 257.3-3 of EPA's regulations.

I hereby certify that the inflow design flood control system plan meets the requirements of 40 C.F.R. § 257.82.

GEORGIA REGISTERED No. PE0017419 PROFESSIONAL JAMES C. PEGUES JR.

10/15/2021

James C. Pegues, P.E.
Licensed State of Georgia, PE No. 17419

Inflow Design Control System Plan:
Hydrologic and Hydraulic Calculation Summary

for

Plant Scherer Ash Pond

Prepared by:

Southern Company T&PS Environmental Solutions

Originator: Daniel E. Drennen 10/6/21
Daniel E. Drennen Date

Reviewer: Jason S. Wilson 10-7-21
Jason S. Wilson Date

Approval: James C. Pegues 10/7/21
James C. Pegues Date

1.0 Purpose of Calculation

The purpose of this report is to demonstrate the hydraulic capacity of the subject CCR impoundment in order to prepare an inflow design flood control plan as required by the United States Environmental Protection Agency's (EPA) final rule for Disposal of CCR from Electric Utilities (EPA 40 CFR 257) and the Georgia CCR Rule (391-3-4-.10).

2.0 Summary of Conclusions

A hydrologic and hydraulic model was developed for Ash Pond 1 (AP-1) to determine the hydraulic capacity of the impoundment. AP-1 has been designated a High Hazard Potential surface impoundment. The design storm for AP-1 is therefore the Probable Maximum Precipitation (PMP) event. Southern Company has selected a storm length of 24-hours for all inflow design flood control plans. The results of routing the 24-hour PMP event through the impoundment are presented below:

Name	Normal Pool Elevation (ft, NAVD 88)	Top of Embankment Elevation (ft, NAVD 88)	Principal Spillway Crest Elevation (ft, NAVD 88)	Peak Water Surface Elevation (ft, NAVD 88)	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
Ash Pond (AP-1)	494.6	504.1	498.3	501.3	2.8	26,934	1,590

*Freeboard is measured from the spillway crest to the peak water surface elevation

3.0 Methodology

3.1 HYDROLOGIC ANALYSES

The AP-1 Dam is classified as a High Hazard structure, indicating that failure would result in probable loss of human life. The ash pond is required to safely manage the run-off resulting from the PMP storm event. A summary of the design storm parameters and rainfall distribution methodology used for these calculations is summarized below:

Hazard Classification	Return Freq (yrs)	Storm Duration (hrs)	Rainfall Total (in)	Rainfall Source	Storm Distribution
High	PMP	24	42.8	HMR-51	HMR-52

The Plant Scherer AP-1 drainage basin was delineated utilizing topographic data generated by Georgia Power Company Land Department dated June 2018. The NRCS web-soil survey of the watershed area was utilized to estimate the run-off potential of the basin. Run-off curve numbers for land cover were obtained using values contained in the Natural Resource Conservation Services' (NRCS, formerly SCS) Technical Release TR-55. A table of the pertinent basin characteristics of the ash pond is provided below.

Drainage Basin Area (sq mi)	1.21
Hydrologic Curve Number, CN	93
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	25
Hydrologic Software	Autodesk Storm and Sanitary Analysis 2019

3.2 HYDRAULIC ANALYSES

Storage values for AP-1 were determined by developing a stage-storage relationship utilizing contour data. The principal spillway is a morning glory drop-inlet structure located along the west side of AP-1 and it is constructed of 72-inch diameter reinforced concrete pipe. The auxiliary spillway is an 85-foot wide concrete broad crested weir that flows into a vegetated trapezoidal channel with a 100-foot bottom width. Normal pool elevation for AP-1 is approximately 494.6-feet NAVD 88.

Based on the discharge data listed previously, the data was inserted into Autodesk Storm and Sanitary Analysis 2019 to determine the pond performance during the design storm. Results are shown in the table that follows.

4.0 SUPPORTING INFORMATION

4.1 CURVE NUMBER

LAND USE	HYDROLOGIC SOIL GROUP	CN (ARCIII)	AREA (AC)	CN x A
WATER	-	100	276	27600
ASH	B	100	228	22800
WOODS	B	78	274	21372
∑			778	71772
∑CN x A / ∑ A	92.25		**~ 93**	

4.2 STAGE-STORAGE TABLE

Storage Nodes

Storage Node : Stor-05

Input Data

Invert Elevation (ft)	420.00
Max (Rim) Elevation (ft)	510.00
Max (Rim) Offset (ft)	90.00
Initial Water Elevation (ft)	494.60
Initial Water Depth (ft)	74.60
Ponded Area (ft²)	16219378.70
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Storage-01

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	0	0.000
10	585270.5	2926352.50
20	1622495.5	13965182.50
30	3021824.4	37186782.00
40	4663268.3	75612245.50
50	6553794.6	131697560.00
60	8579922.3	207366144.50
70	10201866.1	301275086.50
74.6	10786116.06	349547445.47
75	10836920.4	353872052.76
80	13496789.5	414706327.51
90	16219378.7	563287168.51

4.3 TIME OF CONCENTRATION

Subbasin Hydrology

Subbasin : Sub-01

Input Data

Area (ac) 775.80
Weighted Curve Number 92.39
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
water	503.40	-	100.00
bare areas	6.40	B	92.00
woods	266.00	B	78.00
Composite Area & Weighted CN	775.80		92.39

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

User-Defined TOC override (minutes): 25.2

Subbasin Runoff Results

Total Rainfall (in) 42.80
Total Runoff (in) 41.83
Peak Runoff (cfs) 27633.43
Weighted Curve Number 92.39
Time of Concentration (days hh:mm:ss) 0 00:25:12

4.4 DRAINAGE BASIN