PERIODIC RUN-ON AND RUN-OFF CONTROL PLAN
391-3-4-.10(5) and 40 C.F.R. PART 257.81
PLANT WANSLEY COAL COMBUSTION BY-PRODUCT PRIVATE INDUSTRIAL SOLID WASTE DISPOSAL FACILITY (PLANT WANSLEY GYPSUM LANDFILL)
GEORGIA POWER COMPANY

The Federal CCR Rule, and, for Existing CCR Landfills where applicable, the Georgia CCR Rule (391-3-4-.10) require the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill to prepare a run-on and run-off control system plan to document how these control systems have been designed and constructed to meet the applicable requirements of this section of the Rule. *See* 40 C.F.R. § 257.81; Ga. Comp. R. & Regs. r. 391.3-4-.10(5)(a). In addition, the Rules require periodic run-on and run-off control system plans every five years. *See* 40 C.F.R. § 257.81(c)(4); Ga. Comp. R. & Regs. r. 391.3-4-.10(4)(b).

The CCR landfill known as the Plant Wansley Gypsum Landfill is located on Plant Wansley property in Heard and Carroll Counties, Carrollton, Georgia. The landfill consists of three constructed cells (numbered 1 thru 3), two constructed sedimentation ponds, and a constructed clean water (return) pond. Each cell is lined with a composite liner system consisting of a 60-mil HDPE liner underlain with a geosynthetic clay liner, and a minimum 24-inch thick compacted clay liner with a maximum hydraulic conductivity of 1×10^{-5} cm/sec. Cells 1 through 3 are all currently being utilized for CCR storage.

Storm water flows used for development of the run-on and run-off control plan were calculated using the Natural Resources Conservation Service (NRCS) method (also known as the Soil Conservation Service (SCS) method) for a 25-yr 24-hr storm event. The stormwater detention system has been designed in accordance with the Georgia Soil and Water Conservation Commission requirements as well as other local, city, and government codes. The post developed storm water discharge was designed to be less than the pre-developed storm water discharge in accordance with the requirements of the State of Georgia.

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) Atlas 14.

The NRCS provided information on the soil characteristics and hydrologic groups present at the site. It was determined that hydrological group "B" best reflects the characteristics of the soils on site and was used to generate inputs for the calculations. This information was placed into Hydraflow Hydrographs 2019 and used to generate appropriate precipitation curves, runoff curve numbers and storm basin runoff values.

Cells 1-3 of the Plant Wansley Gypsum Landfill were designed and constructed with perimeter berms and drainage ditches around the cells that prevent stormwater run-on during the peak discharge of a 24-hr, 25-yr storm from flowing onto the active portion of the landfill. The perimeter berms and drainage ditches also route the stormwater run-off from the cells internally through the system of sedimentation/clarifying ponds designed to handle the run-off from a 24-hr, 25-yr storm.

Stormwater runoff from Cell 1 is directed to and decanted in the South Sedimentation Pond, while stormwater runoff from Cell 2 is directed to and decanted in the North Sedimentation Pond. Run-off from Cell 3 is collected in a 60" riser structure connected to a 36" HDPE pipe that flows into a ditch and connects to the perimeter ditch of Cell 2. From there, the run-off from Cell 3 flows into the North sedimentation pond. Decanted water from the two sedimentation ponds is then routed to the return water pond via two 36-inch HDPE pipes. Pumps located in the return water pond are utilized to send water back to the Plant for use as process water. Calculations indicate that rainfall occurring during a 24-hr, 25-yr storm is safely stored and passed. 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 run-on and run-off control system plan meets the requirements of 40 C.F.R. Part 257.81.

10/15/2024

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

Run-on and Run-off Control System Plan for Landfills:
Calculation Summary

for

Plant Wansley Gypsum Landfill

Prepared by:

Southern Company T&PS Environmental Solutions

Originator: Ashley O. Grissom 10/06/2021
Ashley O. Grissom Date

Reviewer: Joshua K Myers 10/8/21
Josh K. Myers Date

Approval: James C. Pegues 10/8/21
James C. Pegues Date

1. Purpose of Calculation

The purpose of this report is to demonstrate the run-on and run-off controls of the Plant Wansley Gypsum landfill in order to prepare a run-on and run-off control system plan as required by the United States Environmental Protection Agency's (EPA) final rule for Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (EPA 40 CFR 257) and the Georgia CCR Rule (391-3-4-.10).

Summary of Conclusions

Site Overview/Narrative

Georgia Power Company's Plant Wansley is located in Heard County, Georgia, 12 miles south of Carrollton and just north of the Chattahoochee River. The gypsum storage facility is located within the plant property and is comprised of three HDPE lined cells, two sedimentation ponds, and a return water pond. Cells 1 through 3 vary in size from approximately 31, 40, and 26 acres, respectively. The facility includes a perimeter dike around the gypsum cells to contain surface rainfall run-off. Run-off from this area is directed into the sedimentation ponds/return water pond via interior perimeter ditches and culverts. Water from the return water pond is pumped back to the plant and returned to the process. Gypsum disposal is contained within earthen berms to prevent stormwater from the surrounding area from entering the gypsum facility. Gypsum placement is confined to within these berms. Run-off from the active portion, as well as any disturbed areas, is routed into the sedimentation pond designed to collect and control flow resulting from a 100-year, 24-hour storm which is greater than the required 25-year, 24-hour design storm.

An overview of the facility is provided in Table 1 below.

Table 1. Landfill Site Characteristics

Description	Cell 1	Cell 2	Cell 3	North Sed. Pond	South Sed. Pond	Return Water Pond
Size (Acres)	31	40	26	4.2	2.9	0.8
Outlet Type	60" Riser connected to 36" pipe	60" Riser connected to 36" pipe	60" Riser connected to 36" pipe	Two 36" pipes	Two 36" pipes	Two 16" pumped lines
Outlets To	South Sed. Pond	North Sed. Pond	North Sed. Pond	Return Water Pond	Return Water Pond	Plant

1. Run-on Control System Plan

There is no stormwater run-on into the facility because it is contained within earthen berms that prevent stormwater from the surrounding area from entering the gypsum facility.

2. Run-off Control System Plan

A hydrologic and hydraulic model was developed for the Plant Wansley Gypsum cells to determine the hydraulic capacity of the sedimentation ponds/return water pond. The design storm for the purposes of run-off control system plans is the 24-hour, 25-year rainfall event. The results of routing the design storm event through the landfill are presented in the following table:

Table 2. Flood Routing Results

Plant Wansley	Normal Pool El (ft)	Top of embankment El (ft)	Peak Water Surface Elevation (ft	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
North Sedimentation Pond	729	741.36	737.47	1.89	583.51	0
South Sedimentation Pond	729	741.36	736.66	2.70	367.89	0

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

Methodology

3. HYDROLOGIC ANALYSES

The design storm for all run-on/run-off analyses is a 24-hour, 25-year rainfall event. A summary of the design storm parameters and rainfall distribution methodology for these calculations is summarized below in Table 3.

Table 3. Plant Wansley Gypsum Landfill Design Storm Distribution

Return Frequency (years)	Storm Duration (hours)	Rainfall Total (Inches)	Rainfall Source	Storm Distribution
25	24	6.35	NOAA Atlas 14	SCS Type II

The drainage area for the Plant Wansley Gypsum Landfill was delineated based on LiDAR data acquired for the Plant in December 2020. Run-off characteristics were developed based on the Soil Conservation Service (SCS) methodologies as outlined in TR-55. An overall SCS curve number for the drainage area was developed based on methods prescribed in TR-55. Soil types were obtained from the Natural Resources Conservation Service. Land use areas were delineated based on aerial photography. Time of Concentration was also developed based on methodologies prescribed in TR-55.

A table of the pertinent basin characteristics of the landfill is provided below in Table 4:

Table 4. Landfill Hydrologic Information

	Cell 1	Cell 2	Cell 3
Drainage Basin Area (acres)	45.3	45.2	26.3
Hydrologic Curve Number, CN	95	96	95
Hydrologic Methodology	SCS Method	SCS Method	SCS Method
Time of Concentration (minutes)	8.1	9.6	6
Hydrologic Software	Hydraflow Hydrographs	Hydraflow Hydrographs	Hydraflow Hydrographs

Run-off values were determined by importing the characteristics developed above into a hydrologic model with the Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2019.

4. HYDRAULIC ANALYSES

Storage values for the sedimentation ponds/return water pond were determined by developing a stage-storage relationship utilizing contour data. The spillway system at the Plant Wansley Gypsum Landfill consists of a pump structure and an auxiliary spillway. The pump structure consists of two 16" HDPE lines that pump water back to the plant to be returned to the process. The auxiliary spillway is a gravel trapezoidal weir sloped at 0.5% slope with a crest elevation of EL 739.36. A summary of spillway information is presented below in Table 5.

Table 5. Spillway Attribute Table

Spillway Component	US Invert El (feet)	DS Invert El (feet)	Dimension (ft)	Slope (ft/ft)	Length (ft)	Spillway Capacity (cfs)
North Pond, Aux.	739.36	739.28	20' span, 2' rise	0.5%	16	307.9
South Pond, Aux	739.36	739.20	20' span, 2' rise	0.5%	32	307.9

Based on the spillway attributes listed above, the data was inserted into Hydraflow Hydrographs to determine the pond performance during the design storm. Results are shown in Table 2.

2. SUPPORTING INFORMATION

1. CURVE NUMBER

Terrain Type	Area (ac)	Curve Number
Water	8.1	100
Bare Gypsum over liner	108.7	95

STAGE-STORAGE TABLE OF SEDIMENTATION PONDS

North Pond:

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	720.00	3,093	0	0
2.00	722.00	41,807	37,511	37,511
4.00	724.00	82,825	122,305	159,816
5.50	725.50	93,135	131,881	291,697
6.00	726.00	97,337	47,609	339,307
8.00	728.00	122,631	219,460	558,766
10.00	730.00	149,335	271,501	830,267
12.00	732.00	160,792	310,026	1,140,293
14.00	734.00	172,484	333,174	1,473,467
16.00	736.00	184,414	356,796	1,830,263
18.00	738.00	196,579	380,890	2,211,153
19.36	739.36	204,987	273,018	2,484,171

South Pond:

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	722.00	45,239	0	0
2.00	724.00	75,648	119,579	119,579
3.50	725.50	84,374	119,945	239,524
4.00	726.00	86,504	42,714	282,238
6.00	728.00	95,162	181,579	463,817
8.00	730.00	104,057	199,133	662,950
10.00	732.00	113,188	217,159	880,110
12.00	734.00	122,555	235,657	1,115,767
14.00	736.00	132,158	254,627	1,370,394
16.00	738.00	141,997	274,069	1,644,463
17.36	739.36	148,820	197,718	1,842,181

TIME OF CONCENTRATION

Cell 1:

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No. 1

Cell 1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.91		0.00		0.00		
Land slope (%)	= 7.00		0.00		0.00		
Travel Time (min)	**= 1.60**	**+**	**0.00**	**+**	**0.00**	**=**	**1.60**
Shallow Concentrated Flow							
Flow length (ft)	= 670.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 5.02**	**+**	**0.00**	**+**	**0.00**	**=**	**5.02**
Channel Flow							
X sectional flow area (sqft)	= 117.50		0.00		0.00		
Wetted perimeter (ft)	= 33.40		0.00		0.00		
Channel slope (%)	= 0.60		0.00		0.00		
Manning's n-value	= 0.020		0.015		0.015		
Velocity (ft/s)	=13.40						
			0.00				
					0.00		
Flow length (ft)	({0})1156.0		0.0		0.0		
Travel Time (min)	**= 1.44**	**+**	**0.00**	**+**	**0.00**	**=**	**1.44**

Total Travel Time, Tc ..... 8.10 min

Cell 2:

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No. 2

Cell 2

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.91		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	= 3.48	+	0.00	+	0.00	=	3.48
Shallow Concentrated Flow							
Flow length (ft)	= 1000.00		0.00		0.00		
Watercourse slope (%)	= 3.20		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.89		0.00		0.00		
Travel Time (min)	= 5.77	+	0.00	+	0.00	=	5.77
Channel Flow							
X sectional flow area (sqft)	= 640.00		0.00		0.00		
Wetted perimeter (ft)	= 162.00		0.00		0.00		
Channel slope (%)	= 0.70		0.00		0.00		
Manning's n-value	= 0.020		0.015		0.015		
Velocity (ft/s)	=15.65						
			0.00				
					0.00		
Flow length (ft)	({0})287.0		0.0		0.0		
Travel Time (min)	= 0.31	+	0.00	+	0.00	=	0.31
Total Travel Time, Tc							9.60 min

(Cell 3 uses the minimum recommended by TR-55, 6 minutes.)

RESULTS

Hydrograph Report

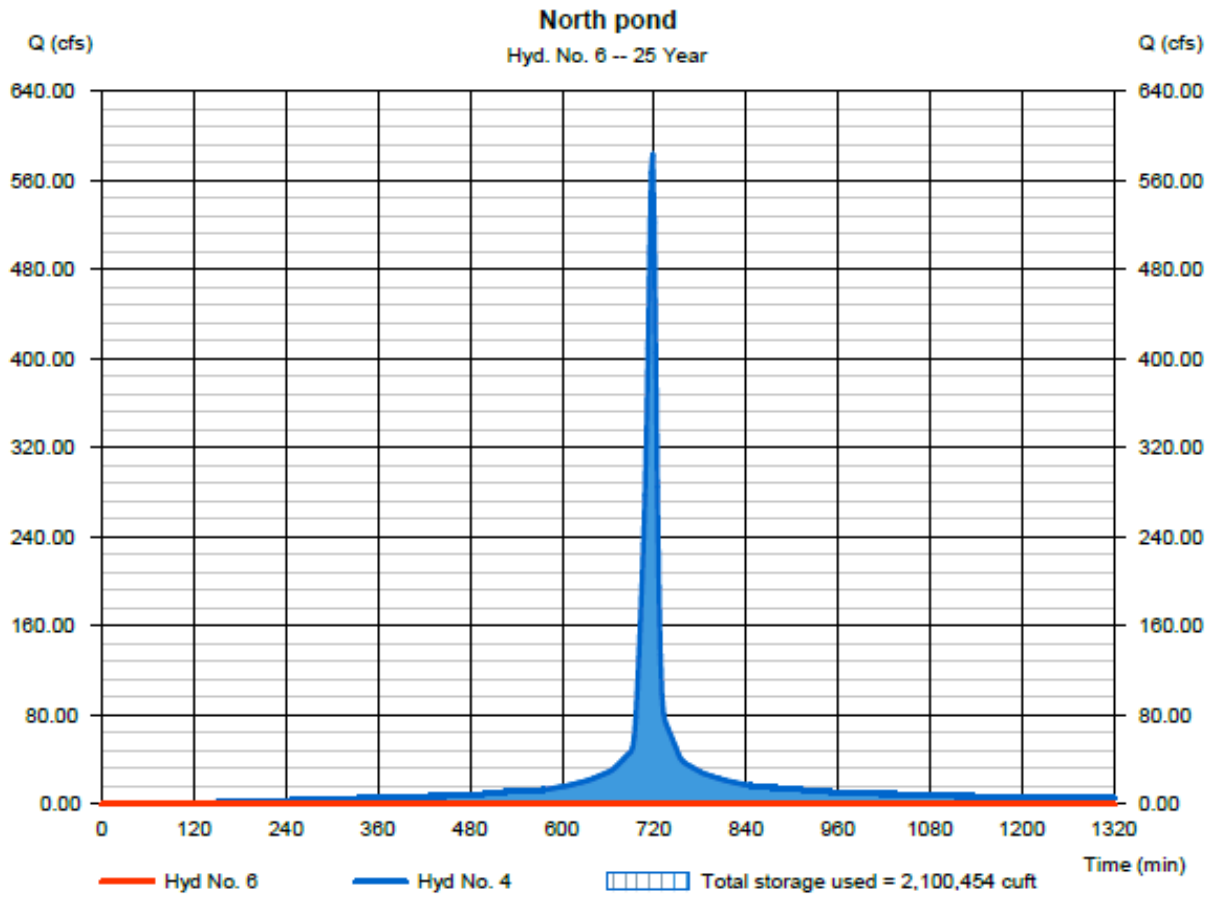
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12 — Wednesday, 05 / 26 / 2021

Hyd. No. 6

North pond

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 4 - Cells 2 & 3 to North pond	Max. Elevation	= 737.47 ft
Reservoir name	= North Sed. Pond	Max. Storage	= 2,100,454 cuft

Storage Indication method used. Wet pond routing start elevation = 728.50 ft.



Hydrograph Report

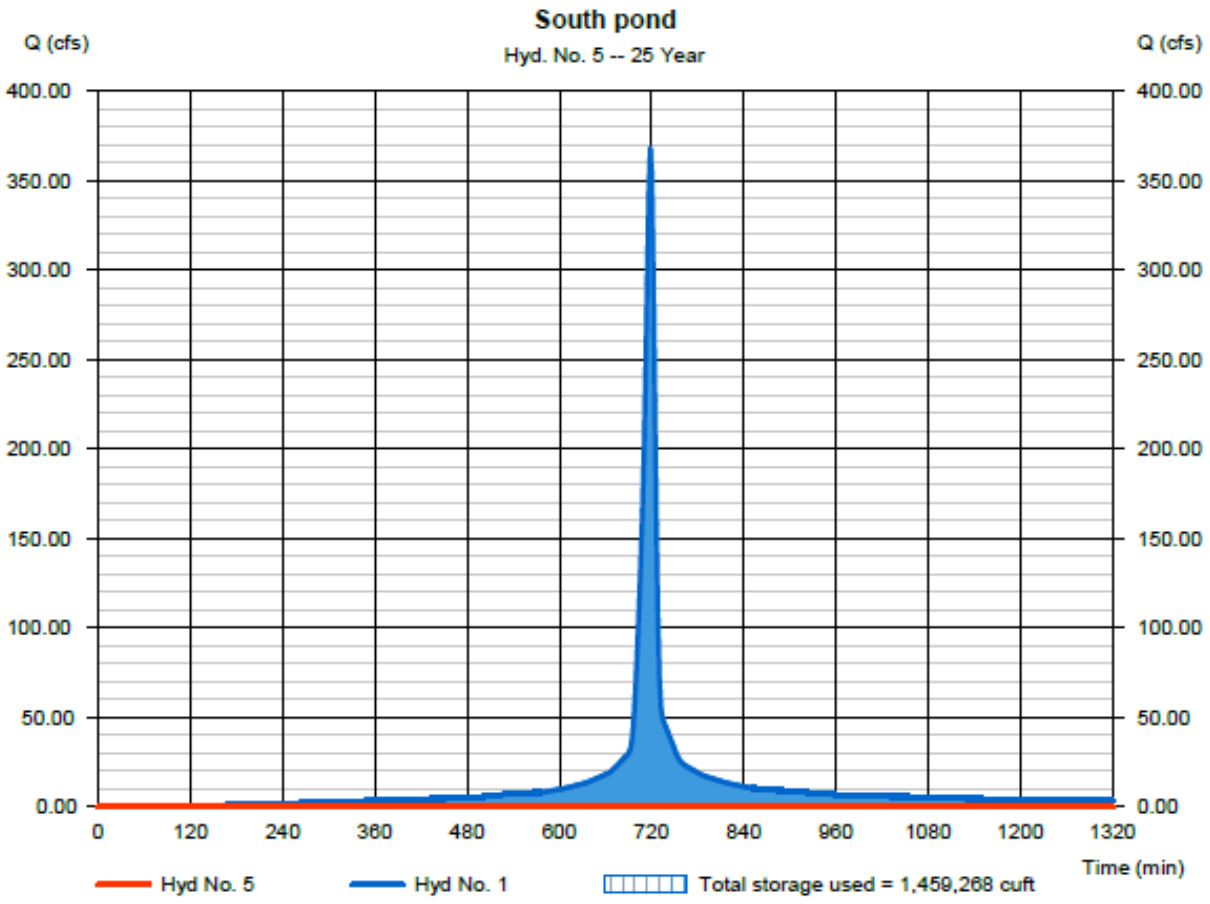
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12 — Wednesday, 05 / 26 / 2021

Hyd. No. 5

South pond

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Cell 1	Max. Elevation	= 736.66 ft
Reservoir name	= South Sed. Pond	Max. Storage	= 1,459,268 cuft

Storage Indication method used. Wet pond routing start elevation = 728.50 ft.



FACILITY LAYOUT