INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
40 C.F.R. § 257.100(f)(3)(v) and 40 C.F.R. § 257.82(c)
PLANT HARLLEE BRANCH ASH POND B (AP-B)
GEORGIA POWER COMPANY

A rule amendment to the Federal CCR Rule became effective on November 8, 2024. S*ee* Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, 89 Fed. Reg. 38950 ("Legacy Rule"). The Legacy Rule defines the term "legacy CCR surface impoundment" and establishes regulatory requirements for units that meet the definition of a legacy CCR surface impoundment. The owner or operator of a legacy surface impoundment must prepare a written inflow design flood system plan documenting how the inflow design flood control system has been designed and constructed. *See* 40 C.F.R. § 257.100(f)(3)(v) and 40 C.F.R. § 257.82(c). 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).

The legacy CCR surface impoundment known as Ash Pond B (AP-B) at Georgia Power Company's (Georgia Power) Plant Harllee Branch (Plant Branch) property is located on the northern shore of Lake Sinclair, off State Route 24 (US 441) near Milledgeville and Eatonton in Putnam County, Georgia. AP-B encompasses approximately 55 acres and is impounded by a dam on the south and southwest sides and by natural ground on the remaining sides. AP-B is classified as a significant hazard potential CCR surface impoundment. Therefore, AP-B must adequately manage the peak discharge resulting from the 1,000-year (yr), 24-hour (hr) storm event without overtopping the dam.

Georgia Power submitted a CCR handling permit application to the Georgia Environmental Protection Division (GA EPD) in November 2018 in accordance with the Georgia Rules for Solid Waste Management, Chapter 391-3-4-.10 (State CCR Rule). The CCR handling permit application is currently under review by GA EPD. Georgia Power intends to close AP-B in accordance with 40 C.F.R. § 257.102(c) and corresponding State CCR Rule 391-3-4-.10(7)(b) by removing and relocating the CCR to a permitted on-site landfill and/or selling the CCR for beneficial use. The closure has been designed to have no negative impacts on the surface impoundment's hazard classification.

The attached calculation package presents the design criteria, analysis methodology, design parameters, and calculations and results for the hydraulic capacity of AP-B. The detailed evaluation included the hydrologic contributions to AP-B, Ash Pond C (AP-C), and Ash Pond D (AP-D), as well as the hydraulic connections amongst these features. These factors were analyzed to estimate the maximum allowable starting water surface elevation in AP-B, while adequately managing the peak discharge resulting from the 1,000-yr, 24-hr storm event without overtopping the dam. The maximum allowable starting water surface elevation in AP-B was calculated as El. 376.1 ft, and the resulting peak water surface elevation during the 1,000-yr, 24-hr storm event was calculated as El. 378.9 ft (i.e., the crest of the auxiliary spillway). For reference, the normal operating water surface elevation in AP-B is maintained at or below El. 370.0 ft and currently ponding only occurs in the central area of the impoundment. Therefore, AP-B can adequately manage the peak discharge from the 1,000-yr, 24-hr inflow design flood without overtopping the dam.

Discharge from AP-B is handled in accordance with the surface water requirements under § 257.3-3.

I hereby certify that the inflow design flood control system plan meets the requirements of 40 C.F.R. § 257.100(f)(3)(v) and 40 C.F.R. § 257.82(c).

__________________________ 05/06/2026

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Geosyntec consultants

CALCULATION PACKAGE COVER SHEET

Client: Georgia Power Company **Project:** Design and Operating Criteria Assessments for Plant Branch Legacy CCR Units **Project #:** GW11718

TITLE OF PACKAGE: INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM ANALYSIS FOR PLANT HARLLEE BRANCH ASH POND B (AP-B), ASH POND C (AP-C), AND ASH POND D (AP-D)

PREPARATION	**CALCULATION PREPARED BY:** (Calculation Preparer, CP)	Signature: [signature] Name: Sarah Herr, P.E.(GA)	05/06/2026 Date
REVIEW	**ASSUMPTIONS & PROCEDURES CHECKED BY:** (Assumptions & Procedures Checker, APC)	Signature: [signature] Name: Victoria Cheplak, P.E.(GA)	05/06/2026 Date
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REVISION HISTORY:

NO.	DESCRIPTION	DATE	CP	APC	CC	CA
0	Final Submittal	05/06/2026	SH	VC	BS	VC

INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM ANALYSIS FOR PLANT HARLLEE BRANCH ASH POND B (AP-B), ASH POND C (AP-C), AND ASH POND D (AP-D)

PURPOSE

This calculation package presents the design criteria, analysis methodology, design parameters, and calculations and results for the hydraulic capacities of the coal combustion residual (CCR) surface impoundments known as Plant Harllee Branch (Plant Branch) Ash Pond B (AP-B), Ash Pond C (AP-C), and Ash Pond D (AP-D) in Putnam County, Georgia. The dams at AP-B, AP-C, and AP-D, adjacent to Lake Sinclair, are classified as Category II Dams under the Georgia Environmental Protection Division (GA EPD) Safe Dams Program (SDP). Analyses were conducted to estimate the maximum allowable starting water surface elevations in AP-B, AP-C, and AP-D, while adequately managing the peak discharge resulting from the 1,000-year (yr), 24-hour (hr) storm event without overtopping the dams. This calculation package supports the preparation of the initial inflow design flood control system plans required by Title 40 of the Code of Federal Regulations (C.F.R.) Part 257 (40 C.F.R. §257, Federal CCR Rule) and Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments (89 Federal Register 38950, Legacy Rule) as promulgated by the United States Environmental Protection Agency (USEPA).

DESIGN CRITERIA

The Federal CCR Rule [USEPA, 2015] includes the following relevant requirements (with citations):

- §257.82(a): The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

- §257.82(a)(1): The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.

- §257.82(a)(2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.

- §257.82(a)(3)(ii): The inflow design flood is the 1,000-year flood for a significant hazard potential CCR surface impoundment.

AP-B, AP-C, and AP-D are classified as significant hazard potential CCR surface impoundments. Therefore, AP-B, AP-C, and AP-D must adequately manage the peak discharge resulting from the 1,000-yr, 24-hr storm event without overtopping the Category II Dams.

ANALYSIS METHODOLOGY

Stormwater flow rates, depths, and volumes were calculated using hydrology and hydraulic procedures presented in the Soil Conservation Service (SCS) Technical Release 55 (TR-55), Manning's kinematic equation, and other recognized engineering procedures encoded in the HydroCAD™ software and the USEPA's Storm Water Management Model (SWMM) software [SCS, 1986; HydroCAD™, 2024; USEPA, 2023]. HydroCAD™ was used to generate hydrographs for the various drainage areas, and these hydrographs were imported as time series into SWMM. SWMM was employed for hydraulic routing to simulate the impacts of backflow within the water management system.

DESIGN PARAMETERS

The following design parameters were utilized within this calculation package:

- Rainfall Distribution and Depths: **Figure 1** [SCS, 1986] shows the location of Plant Branch on the rainfall distribution map of the United States. The site is located in Putnam County, Georgia, which is categorized as having a Type II rainfall distribution. Rainfall depths for the design storm event and for calculating times of concentration (TOC) are: (i) 3.66 inches (in.) for the 2-yr, 24-hr storm and (ii) 10.7 in. for the 1,000-yr, 24-hr storm [National Oceanic and Atmospheric Administration (NOAA), 2017]. Relevant precipitation frequencies are presented in **Attachment 1**.

- Drainage Areas: Drainage areas were generally delineated to water management features (e.g., ponds) using the existing ground contours obtained from the Light Detection and Ranging (LiDAR) survey performed by Georgia Power Company (GPC) on 22 January 2024 [GPC, 2024a]. The drainage areas are presented in **Figure 2** and described in **Table 1**. No additional inflows, apart from direct rainfall and run-on, were considered in this analysis (e.g., inflow from Ash Pond E).

- Hydrologic Soil Groups (HSGs): **Attachment 2** presents the different soil classifications for the site from the United States Department of Agriculture (USDA) Natural Resources

Conservation Service (NRCS) Web Soil Survey (WSS) [USDA, 2021]. The major soil unit found within the area consisted of Davidson (HSG B). HSGs for the drainage areas specified above are described in **Table 1**.

- Curve Numbers (CNs): CNs corresponding to land cover shown in the site aerial presented in **Figure 3** and obtained from the LiDAR survey performed by GPC on 20 June 2024 [GPC, 2024b] were selected based on Table 2-2 of TR-55 [SCS, 1986]. Relevant excerpts from the reference material are provided in **Attachment 3**. CNs for the drainage areas specified above are described in **Table 1**.

- Times of Concentration: TOCs were calculated for the drainage areas. Computations for travel time for sheet flow were performed using the equation for Manning's kinematic solution [SCS, 1986]:

$$T_t = \frac{0.007(nL)^{0.8}}{P^{0.5}S^{0.4}} \quad (1)$$

where: T_t = travel time (hr); n = Manning's roughness coefficient equal to 0.8 for woods: dense underbrush and 0.15 for grass: short [SCS, 1986]; L = flow length (feet [ft]); P = 2-yr, 24-hr rainfall depth (in.); and S = land slope (ft/ft).

After a maximum flow length of 100 ft, sheet flow was assumed to become shallow concentrated flow (i.e., upland flow). Travel times for shallow concentrated flow were estimated from SCS TR-55 [SCS, 1986] as follows:

$$T_t = \frac{L}{3600V} \quad (2)$$

$$V = KS^{0.5} \quad (3)$$

where: T_t = travel time (hr); L = flow length (ft); V = average velocity (feet per second [fps]); K = velocity factor (fps) equal to 5.0 for woodland and 7.0 for short grass pasture [SCS, 1986]; and S = land slope (ft/ft).

Travel times for channel flow were calculated using Equation (2) [SCS, 1986] and Manning's equation as follows:

$$V = \frac{1.49r^{2/3}(S)^{1/2}}{n} \quad (4)$$

$$r = \frac{a}{w_p} \quad (5)$$

where: V = average velocity (fps); r = hydraulic radius (ft); a = cross-sectional flow area (square feet [sf]); w_p = wetted perimeter (ft); n = Manning's roughness coefficient equal to 0.030 for vegetative lining [SCS, 1986]; and S = land slope (ft/ft).

A minimum TOC of 5 minutes was selected for drainage areas with a calculated TOC less than 5 minutes, based on recommendations from the Federal Highway Administration (FHWA) National Highway Institute (NHI) [FHWA NHI, 2001] and the Atlanta Regional Commission (ARC) [ARC, 2016].

TOCs for the drainage areas specified above are presented in **Figures 2 and 3** and described in **Table 2**.

- Stage Storage Relationships: The stage storage relationships for AP-B, AP-C, and AP-D were generated from existing ground contours obtained from the LiDAR survey performed by GPC on 22 January 2024 [GPC, 2024a]. The stage storage relationships for AP-B, AP-C, and AP-D are described in **Table 3**.

- Discharge Mechanisms: The discharge mechanisms associated with AP-B include the following features:

  - The auxiliary spillway, permitted under National Pollutant Discharge Elimination System (NPDES) Permit Number GA0026051 as Outfall Number 06 [GA EPD, 2023], is located along the southern embankment of the CCR surface impoundment and includes a trapezoidal weir with a bottom width of 20 ft, height of 2 ft, and 3H:1V (horizontal:vertical) side slopes at Elevation (El.) 378.92 ft. The weir discharges to a 76-ft long, 36-in. diameter corrugated metal pipe (CMP) with an upgradient invert elevation of El. 371.12 ft, a downgradient invert elevation of El. 369.93 ft, and a Manning's n of 0.022 [FHWA NHI, 2012]. While only the auxiliary spillway is included in the capacity calculations, the operating water elevation within AP-B is controlled by three pumps working in parallel and discharging to the on-site wastewater treatment system, which is permitted under NPDES Permit Number GA0026051 as Outfall Number 03 [GA EPD, 2023].

  - The lowest elevation along the crest of the Category II Dam is approximately El. 380.0 ft.

  The discharge mechanisms associated with AP-C include the following features:

  - The auxiliary spillway, permitted under NPDES Permit Number GA0026051 as Outfall Number 04 [GA EPD, 2023], is located along the southwestern embankment of the CCR surface impoundment and includes two 24-in. diameter high-density polyethylene (HDPE) pipes. The northern pipe is approximately 250-ft long with an upgradient invert elevation of El. 395.70 ft, a downgradient invert elevation of El. 378.54 ft, and a Manning's n of 0.012 [FHWA NHI, 2012]. The southern pipe is approximately 250-ft long with an upgradient invert elevation of El. 395.91 ft, a downgradient invert elevation of El. 378.33 ft, and a Manning's n of 0.012 [FHWA NHI, 2012]. While the operating water elevation within AP-C is controlled by a siphon to AP-B, only the auxiliary spillway is included in the capacity calculations.

- The lowest elevation along the crest of the Category II Dam is approximately El. 400.0 ft.

The discharge mechanisms associated with AP-D include the following features:

- The primary outlet structure includes a HDPE pipe with accompanying upgradient and downgradient concrete flumes and discharges by gravity to AP-C. The upgradient concrete flume features a trapezoidal configuration with a bottom width of 8 ft, depth of 2 ft, 1H:1V side slopes, and length of 109 ft. The upgradient invert elevation (i.e., toe of the flume within AP-D) is El. 397.69 ft. The 48-in. diameter HDPE pipe connecting AP-D and AP-C is 48 ft long with an upgradient invert elevation of El. 398.45 ft, a downgradient invert elevation of El. 398.05 ft, and a Manning's n of 0.012 [FHWA NHI, 2012]. The downgradient concrete flume features a trapezoidal configuration with a bottom width of 8 ft, depth of 2 ft, 1H:1V side slopes, and length of 46 ft. The downgradient invert elevation (i.e., toe of the flume within AP-C) is El. 396.99 ft.

- AP-D does not include a permitted auxiliary spillway under NPDES Permit Number GA0026051 [GA EPD, 2023].

- The lowest elevation along the crest of the Category II Dam is approximately El. 402.0 ft.

CALCULATIONS AND RESULTS

HydroCAD™ was employed for the hydrologic analysis, while SWMM was employed for the hydraulic analysis to simulate the impacts of backflow within the water management system. HydroCAD™ and SWMM results supporting the analysis are provided in **Attachments 4** and **5**, respectively.

Table 4 presents the hydrologic and hydraulic results for AP-B, AP-C, and AP-D, including the maximum allowable starting water surface elevations and the resulting peak water surface elevations during the 1,000-yr, 24-hr storm event. The maximum allowable starting water surface elevations in AP-B, AP-C, and AP-D were set at El. 376.1 ft, El. 391.9 ft, and El. 397.8 ft, respectively. The resulting peak water surface elevations during the 1,000-yr, 24-hr storm event were El. 378.9 ft, El. 395.7 ft, and El. 401.2 ft for AP-B, AP-C, and AP-D, respectively. For reference, the normal operating water surface elevation in AP-B is maintained at or below El. 370.0 ft, while AP-C and AP-D do not currently hold ponded water.

SUMMARY AND CONCLUSIONS

This calculation package presents the design criteria, analysis methodology, design parameters, and calculations and results for the hydraulic capacities of the CCR surface impoundments known as Plant Branch AP-B, AP-C, and AP-D in Putnam County, Georgia. This analysis supports the preparation of the initial inflow design flood control system plans required by the Federal CCR Rule and Legacy Rule, as promulgated by the USEPA. The detailed evaluation included the hydrologic contributions to AP-B, AP-C, and AP-D, as well as the hydraulic connections amongst these features. These factors were analyzed to estimate the maximum allowable starting water surface elevations in AP-B, AP-C, and AP-D, while adequately managing the peak discharge resulting from the 1,000-yr, 24-hr storm event without overtopping the Category II Dams. The maximum allowable starting water surface elevations were calculated to be above the normal operating water surface elevations in AP-B, AP-C, and AP-D.

REFERENCES

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TABLES

CP: SH Date: 05/06/2026 APC: VC Date: 05/06/2026 CC: BS Date: 05/06/2026

Client: GPC Project: Design and Operating Criteria Assessments for Plant Branch Legacy CCR Units Project No: GW11718

Table 1. Drainage Areas and Curve Numbers

Subcatchment ID	Area (ac)	Total Area (%)	Total Area (ac)	Land Use Description	CN	Weighted CN
B101	33.001	28%	118.3	Pasture/grassland/range, Fair, HSG B	69	86
	7.850	7%		Woods, Fair, HSG B	60	
	51.055	43%		AP-B and CCR surface	98	
	4.396	4%		Wastewater treatment area (Impervious surface)	98	
	14.672	12%		Material stockpiles in former coal pile area (Newly graded area, HSG B)	86	
	7.281	6%		Equalization pond	98	
C101	4.291	6%	74.3	Pasture/grassland/range, Fair, HSG B	69	96
	0.573	1%		Woods, Fair, HSG B	60	
	69.408	93%		AP-C and CCR surface	98	
D101	11.696	20%	59.6	Pasture/grassland/range, Fair, HSG B	69	91
	2.278	4%		Woods, Fair, HSG B	60	
	45.587	77%		AP-D and CCR surface	98	

CP: SH Date: 05/06/2026 APC: VC Date: 05/06/2026 CC: BS Date: 05/06/2026

Client: GPC Project: Design and Operating Criteria Assessments for Plant Branch Legacy CCR Units Project No: GW11718

Table 2. Times of Concentration

Subcatchment ID	Sheet Flow				Shallow Concentrated Flow				Channel Flow			Total Time of Concentration (min)
	Flow Length (ft)	Surface Description	Manning's n	Land Slope (ft/ft)	Flow Length (ft)	Surface Description	Velocity Factor (ft/s)	Land Slope (ft/ft)	Flow Length (ft)	Surface Description	Land Slope (ft/ft)	
B101	100	Grass: Short	0.150	0.010	1,638	Short Grass Pasture	7.0	0.003	1,151	Coal Pile Diversion(1)	0.002	92.4
C101	Direct Entry											5.0
D101	100	Woods: Dense underbrush	0.800	0.126	378	Woodland	5.0	0.048	-	-	-	22.5

Note:

1. "Coal Pile Diversion" refers to an existing channel along the southwest edge of the former Coal Pile Area. The drawings entitled "Plant Branch Coal Pile Area Stormwater Diversion System, Putnam County, Georgia, 100% Issued for Construction, Revision 4" and dated March 2022 show conveyance of this channel to the Coal Pile Stormwater Pond with an auxiliary overflow into AP-B. This channel is included under the conservative assumption that the Coal Pile Stormwater Pond will overtop during the 1,000-yr, 24-hr storm event and discharge via the auxiliary spillway into AP-B. This channel was modeled with a cross-sectional area of 117 sf, perimeter of 126 ft, and Manning's n of 0.030 (i.e., vegetative lining).

Table 3. Stage Storage Relationship

Depth from Bottom Elevation(ft)	AP-B Surface Area (sf)	AP-C Surface Area (sf)	AP-D Surface Area (sf)
Pond Bottom Elevation (ft)	**367**	**380**	**396**
0	15,320	15,040	4,870
1	216,490	63,600	43,130
2	281,850	134,460	116,260
3	320,900	188,180	194,120
4	358,350	238,560	371,700
5	402,270	288,920	599,710
6	446,940	357,740	820,910
7	518,220	421,740	
8	675,990	502,480	
9	940,010	635,580	
10	1,322,000	716,500	
11	1,512,250	789,310	
12	1,718,510	859,840	
13	1,718,510	943,500	
14		1,141,970	
15		1,736,610	
16		2,284,690	
17		2,481,670	
18		2,583,560	
19		2,694,040	
20		2,694,040	

Note:

1. The surface area of the highest closed contour available in the ash pond surface was used as the surface area for elevations above the highest closed contour.

Table 4. Pond Summary

		AP-B	AP-C	AP-D
	Pond Bottom Elevation (ft)	**367.0**	**380.0**	**396.0**
	Maximum Allowable Starting Water Surface Elevation (ft)	**376.1**	**391.9**	**397.8**
	Auxiliary Discharge Elevation (ft)	**378.9**	**395.7**	
	Dam Crest Elevation (ft)	**380.0**	**400.0**	**402.0**
1,000-yr, 24-hr Storm Event	Peak Water Surface Elevation (ft)	378.9	395.7	401.2
	Dam Crest Freeboard (ft)	1.1	4.3	0.8
	Flow through Auxiliary Discharge Structure (cfs)	0	0	

FIGURES

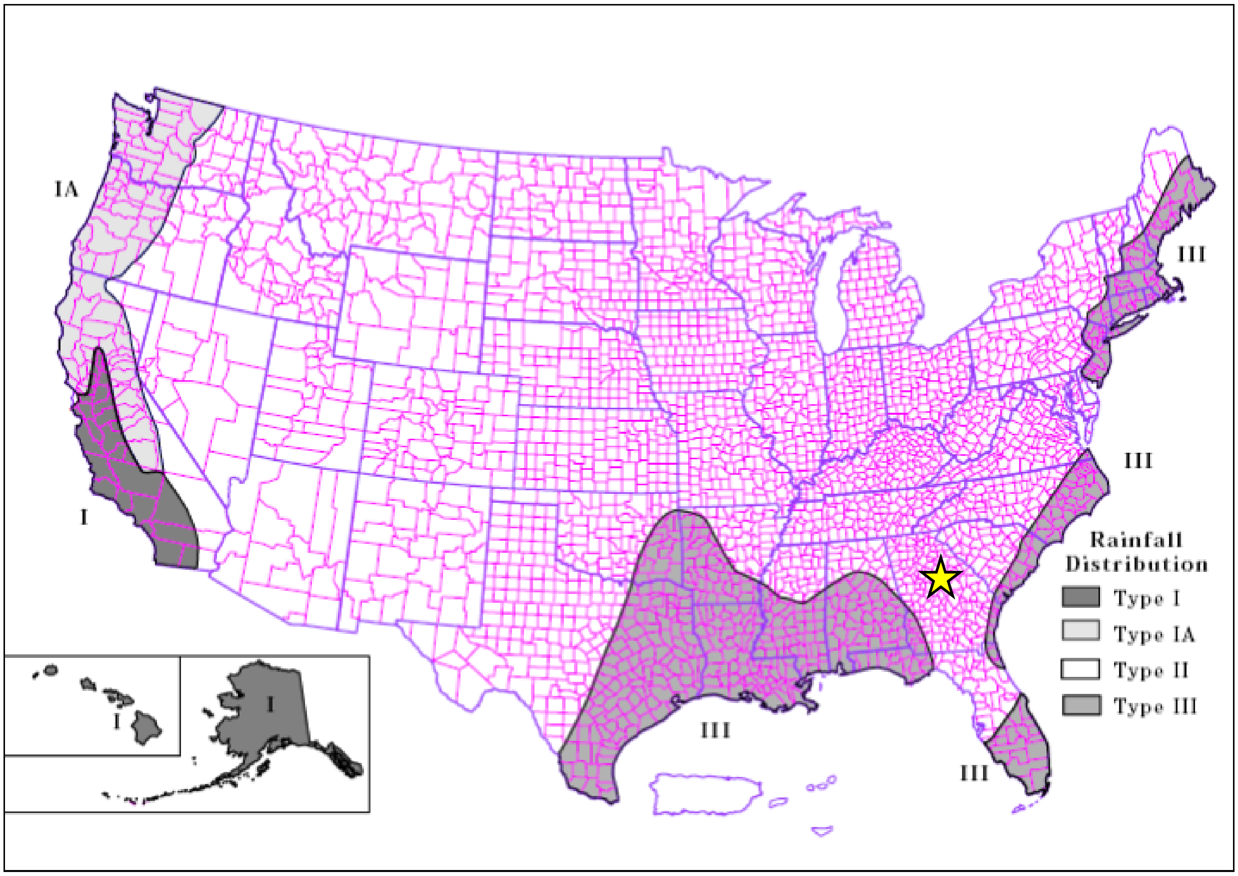
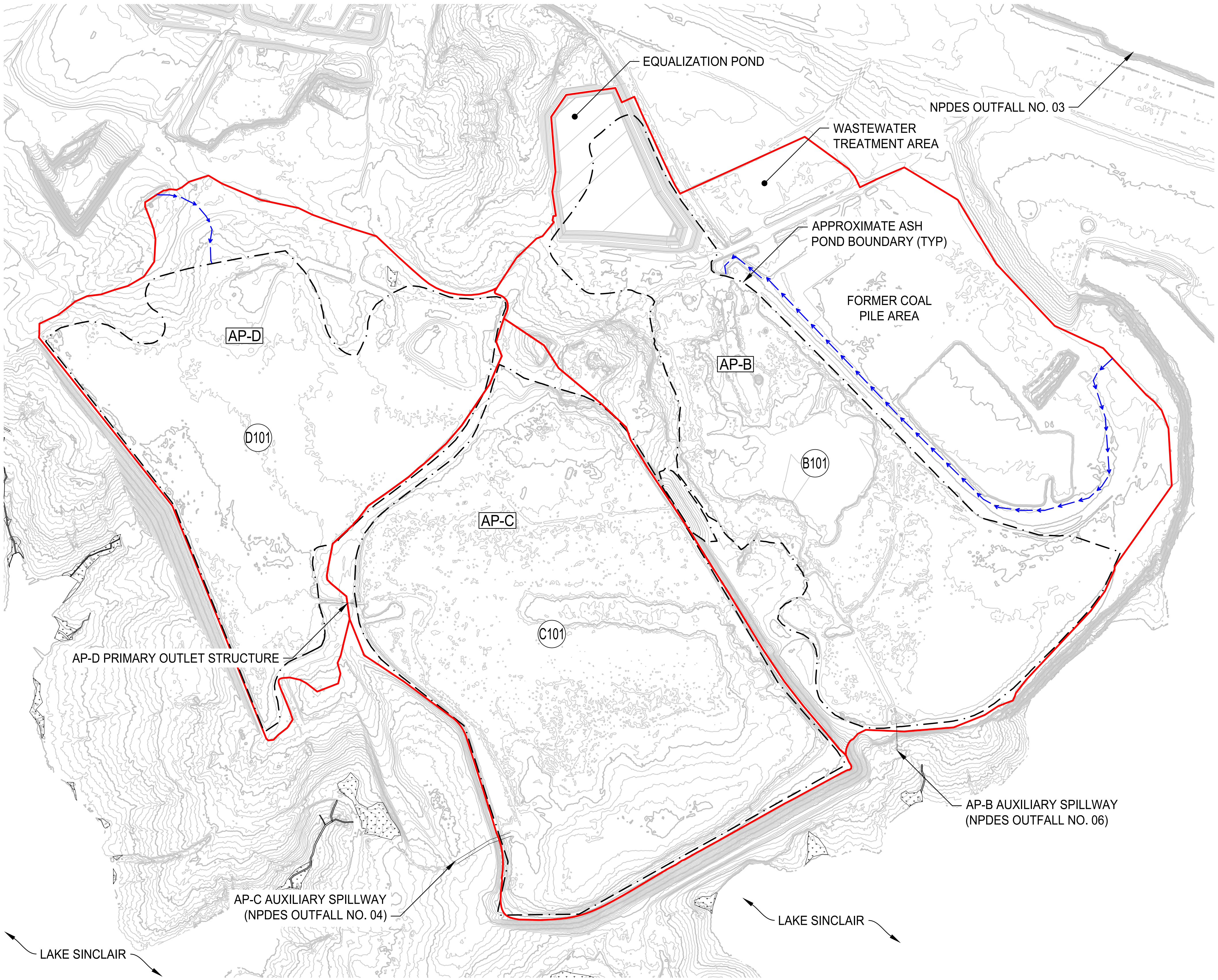


Figure 1. Rainfall Distribution [SCS, 1986]

Figure 2. Existing Conditions – Topography



NOTES:

1. EXISTING GROUND CONTOURS WERE OBTAINED FROM THE LIDAR SURVEY PERFORMED BY GEORGIA POWER COMPANY (GPC) ON 22 JANUARY 2024 AND PROVIDED WITH THE ELECTRONIC FILE TITLED "BRANCH_ORTHO_20240122" ON 6 MARCH 2024.
2. EQUALIZATION POND LOCATED IN AP-B FOOTPRINT WAS OBTAINED FROM THE DRAWING SET TITLED "PLANT BRANCH, EQUALIZATION POND DESIGN, PUTNAM COUNTY, GEORGIA, ISSUED FOR CONSTRUCTION, REVISION 1" PREPARED BY GEOSYNTEC CONSULTANTS AND DATED 6 SEPTEMBER 2024.

EXISTING CONDITIONS - TOPOGRAPHY

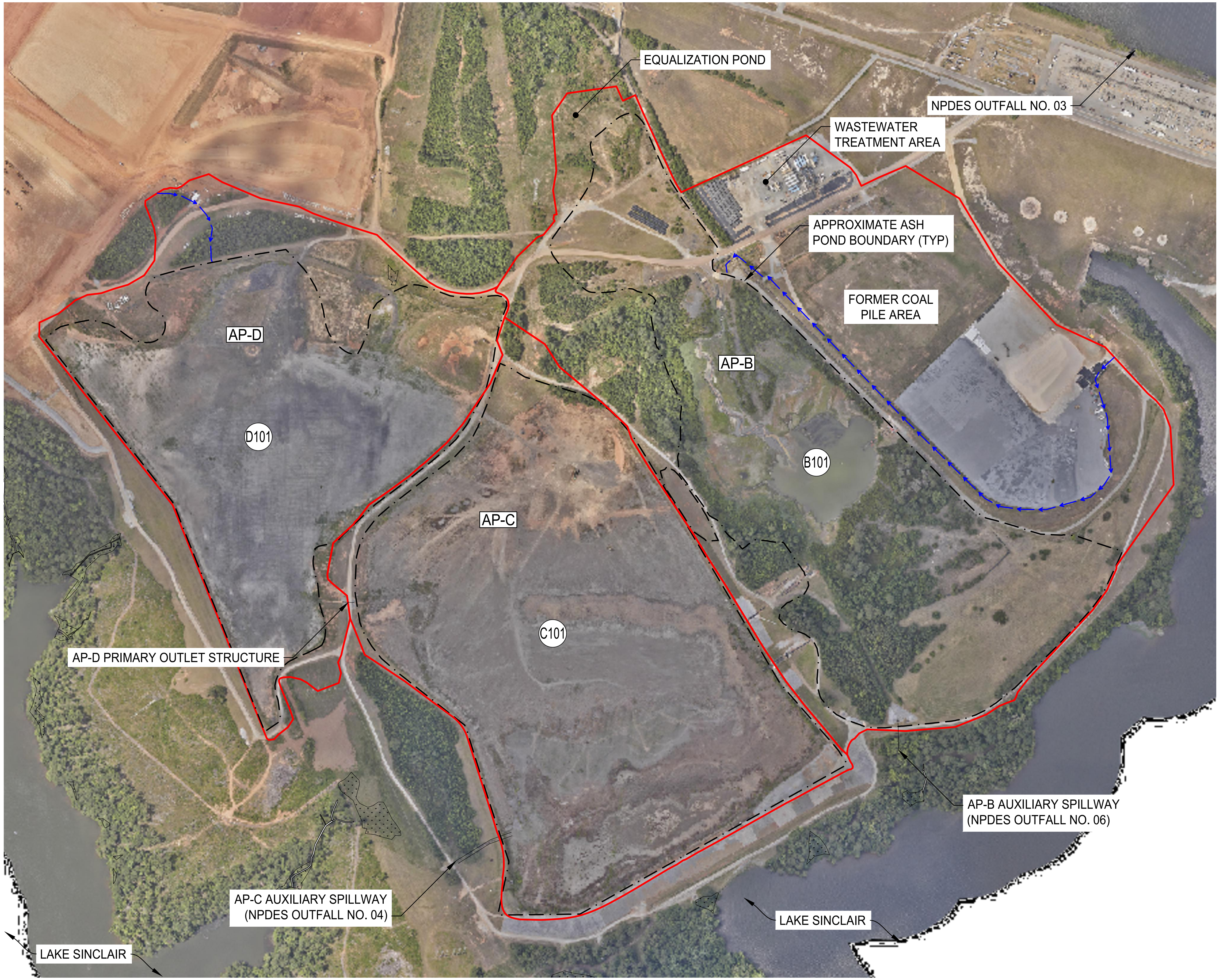
Geosyntec consultants

FIGURE 2

PROJECT NO: GW11718 | MAY 2026

C:_GEO-ACC\ACCDOCS\GEOSYNTEC\GA POWER -BRANCH\PROJECT FILES\25 - DESIGN CRITERIA ASSESSMENTS\2.FIGS\01_INFLOW DESIGN FLOOD\3.FIGS\GW11718.25-201_FIGURE 2

Figure 3. Existing Conditions – Site Aerial



LEGEND

- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION PATH
- STORMWATER PIPE
- B101 SUBCATCHMENT ID
- WETLAND

NOTE:

1. SITE AERIAL WAS OBTAINED FROM THE LIDAR SURVEY PERFORMED BY GEORGIA POWER COMPANY (GPC) ON 20 JUNE 2024 AND PROVIDED WITH THE ELECTRONIC FILE TITLED "BRANCH" ON 24 JULY 2024.

0 500' 1000'
SCALE IN FEET

EXISTING CONDITIONS - SITE AERIAL

Geosyntec consultants

FIGURE 3

PROJECT NO: GW11718 | MAY 2026

ATTACHMENTS

Attachment 1. Precipitation Frequencies [NOAA, 2017]

NOAA Atlas 14, Volume 9, Version 2
Location name: Eatonton, Georgia, USA*
Latitude: 33.2041°, Longitude: -83.3277°
Elevation: 423.28 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.413 (0.343-0.490)	0.476 (0.396-0.566)	0.580 (0.481-0.690)	0.665 (0.549-0.794)	0.781 (0.627-0.950)	0.869 (0.686-1.07)	0.957 (0.736-1.20)	1.05 (0.779-1.33)	1.16 (0.840-1.51)	1.25 (0.886-1.64)
10-min	0.604 (0.503-0.718)	0.698 (0.580-0.829)	0.849 (0.704-1.01)	0.973 (0.803-1.16)	1.14 (0.918-1.39)	1.27 (1.00-1.56)	1.40 (1.08-1.75)	1.53 (1.14-1.95)	1.70 (1.23-2.21)	1.83 (1.30-2.40)
15-min	0.737 (0.613-0.875)	0.851 (0.707-1.01)	1.03 (0.858-1.23)	1.19 (0.980-1.42)	1.39 (1.12-1.70)	1.55 (1.23-1.91)	1.71 (1.32-2.13)	1.87 (1.39-2.38)	2.07 (1.50-2.69)	2.23 (1.58-2.93)
30-min	1.07 (0.889-1.27)	1.24 (1.03-1.47)	1.51 (1.25-1.80)	1.73 (1.43-2.07)	2.04 (1.64-2.48)	2.28 (1.80-2.80)	2.51 (1.93-3.13)	2.74 (2.05-3.49)	3.05 (2.21-3.96)	3.28 (2.33-4.31)
60-min	1.39 (1.15-1.65)	1.60 (1.33-1.90)	1.94 (1.61-2.31)	2.23 (1.84-2.66)	2.63 (2.12-3.21)	2.95 (2.33-3.63)	3.26 (2.52-4.09)	3.59 (2.68-4.57)	4.02 (2.91-5.23)	4.35 (3.09-5.72)
2-hr	1.70 (1.43-2.00)	1.95 (1.64-2.30)	2.37 (1.98-2.80)	2.73 (2.27-3.23)	3.22 (2.62-3.91)	3.62 (2.89-4.42)	4.02 (3.13-5.00)	4.43 (3.34-5.61)	4.99 (3.65-6.44)	5.42 (3.88-7.07)
3-hr	1.89 (1.60-2.21)	2.16 (1.82-2.53)	2.61 (2.20-3.07)	3.01 (2.52-3.54)	3.56 (2.92-4.30)	4.01 (3.22-4.88)	4.47 (3.50-5.54)	4.95 (3.75-6.25)	5.61 (4.12-7.21)	6.12 (4.40-7.94)
6-hr	2.25 (1.92-2.62)	2.57 (2.19-2.98)	3.11 (2.64-3.62)	3.58 (3.03-4.18)	4.26 (3.53-5.11)	4.81 (3.90-5.82)	5.38 (4.25-6.62)	5.98 (4.57-7.50)	6.81 (5.05-8.71)	7.47 (5.41-9.62)
12-hr	2.69 (2.32-3.10)	3.08 (2.65-3.55)	3.75 (3.21-4.32)	4.32 (3.69-5.00)	5.15 (4.30-6.13)	5.82 (4.76-6.98)	6.51 (5.19-7.95)	7.24 (5.59-9.01)	8.25 (6.17-10.5)	9.04 (6.60-11.6)
24-hr	3.18 (2.77-3.63)	3.66 (3.17-4.17)	4.45 (3.86-5.09)	5.14 (4.43-5.89)	6.13 (5.16-7.22)	6.92 (5.71-8.22)	7.73 (6.21-9.35)	8.59 (6.67-10.6)	9.76 (7.35-12.3)	10.7 (7.86-13.5)
2-day	3.72 (3.26-4.20)	4.25 (3.73-4.80)	5.15 (4.51-5.83)	5.93 (5.16-6.73)	7.04 (5.98-8.21)	7.93 (6.61-9.33)	8.84 (7.17-10.6)	9.80 (7.69-12.0)	11.1 (8.44-13.9)	12.1 (9.01-15.3)
3-day	4.09 (3.61-4.59)	4.64 (4.09-5.21)	5.57 (4.90-6.27)	6.38 (5.58-7.20)	7.53 (6.44-8.75)	8.46 (7.10-9.92)	9.43 (7.69-11.2)	10.4 (8.23-12.7)	11.8 (9.02-14.7)	12.9 (9.63-16.2)
4-day	4.40 (3.90-4.92)	4.96 (4.39-5.56)	5.92 (5.23-6.64)	6.76 (5.94-7.60)	7.96 (6.84-9.21)	8.93 (7.51-10.4)	9.93 (8.13-11.8)	11.0 (8.69-13.3)	12.4 (9.53-15.4)	13.6 (10.2-17.0)
7-day	5.17 (4.62-5.74)	5.80 (5.17-6.44)	6.87 (6.11-7.64)	7.80 (6.91-8.71)	9.15 (7.92-10.5)	10.2 (8.68-11.9)	11.4 (9.38-13.4)	12.6 (10.0-15.1)	14.2 (11.0-17.5)	15.5 (11.7-19.3)
10-day	5.86 (5.26-6.47)	6.54 (5.87-7.23)	7.70 (6.89-8.53)	8.71 (7.76-9.68)	10.2 (8.84-11.6)	11.3 (9.66-13.1)	12.5 (10.4-14.7)	13.8 (11.1-16.6)	15.6 (12.1-19.1)	17.0 (12.8-21.0)
20-day	7.90 (7.17-8.65)	8.72 (7.91-9.55)	10.1 (9.12-11.1)	11.2 (10.1-12.4)	12.9 (11.3-14.5)	14.1 (12.2-16.1)	15.4 (12.9-17.9)	16.8 (13.5-19.9)	18.6 (14.5-22.6)	20.0 (15.3-24.6)
30-day	9.69 (8.84-10.5)	10.6 (9.70-11.6)	12.2 (11.1-13.3)	13.4 (12.2-14.7)	15.2 (13.3-17.0)	16.5 (14.2-18.7)	17.8 (14.9-20.5)	19.1 (15.5-22.5)	20.9 (16.4-25.1)	22.2 (17.0-27.1)
45-day	12.0 (11.0-13.0)	13.2 (12.1-14.3)	15.0 (13.7-16.3)	16.4 (14.9-17.9)	18.3 (16.1-20.2)	19.7 (17.0-22.0)	21.0 (17.6-23.9)	22.2 (18.0-25.9)	23.8 (18.7-28.4)	24.9 (19.2-30.2)
60-day	14.1 (13.0-15.2)	15.4 (14.2-16.6)	17.5 (16.1-18.9)	19.1 (17.4-20.7)	21.1 (18.6-23.2)	22.5 (19.5-25.0)	23.8 (20.1-27.0)	24.9 (20.3-28.9)	26.3 (20.7-31.2)	27.2 (21.0-33.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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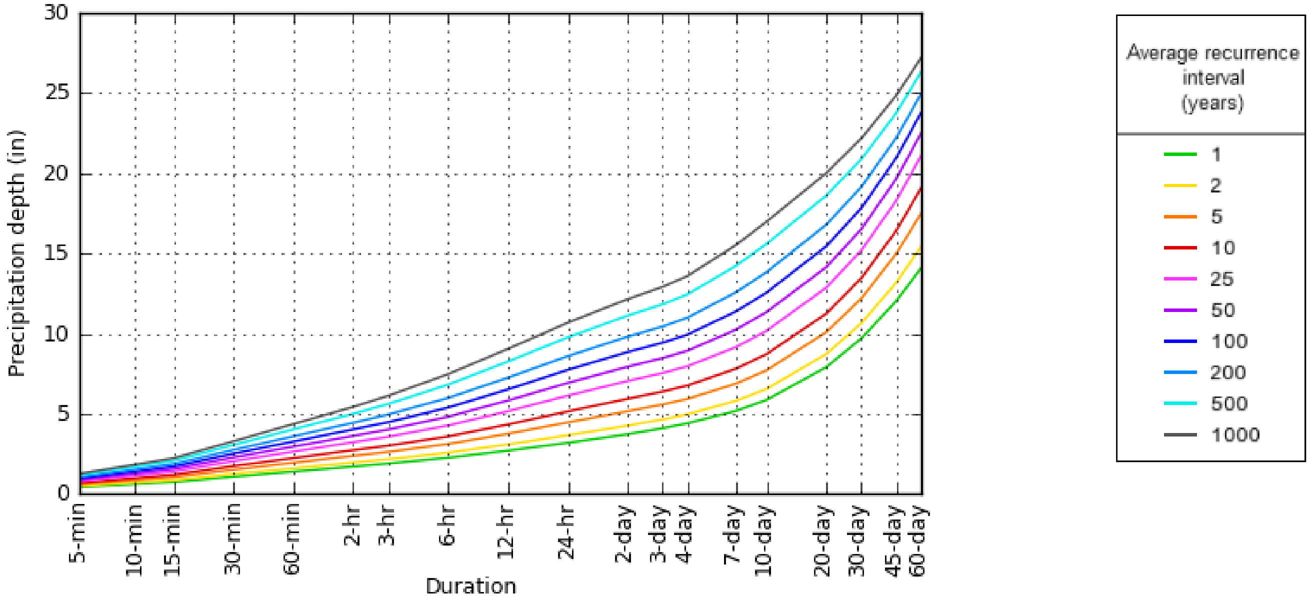
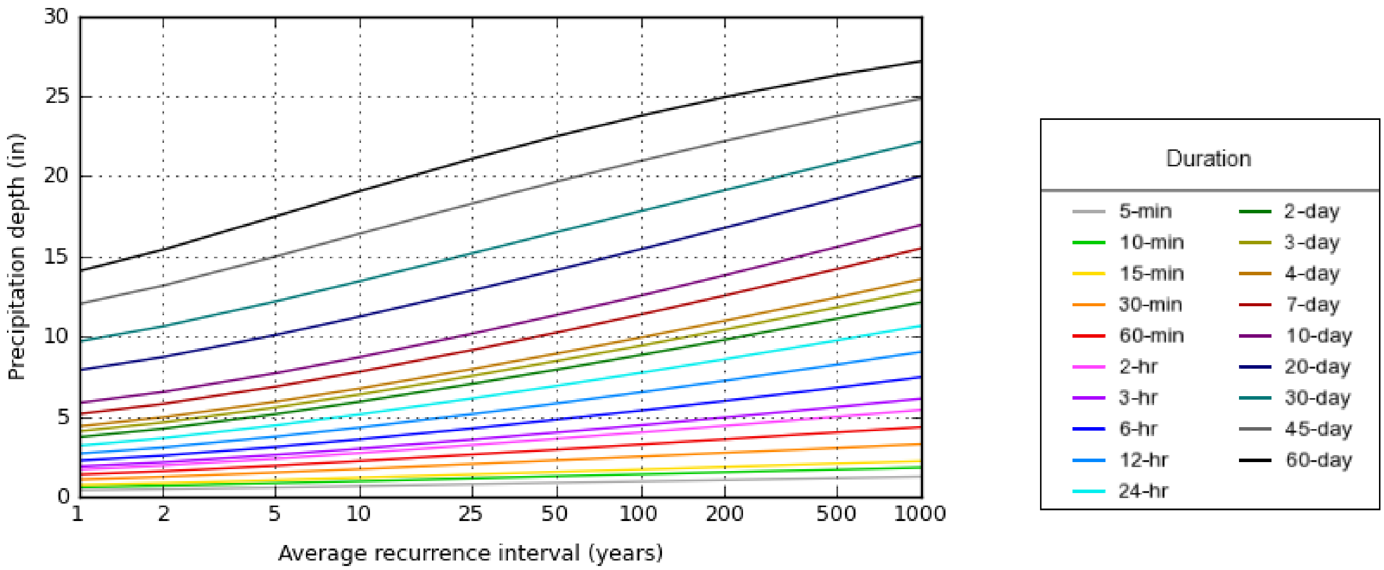
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.2041°, Longitude: -83.3277°





NOAA Atlas 14, Volume 9, Version 2 Created (GMT): Tue Nov 24 00:38:50 2020

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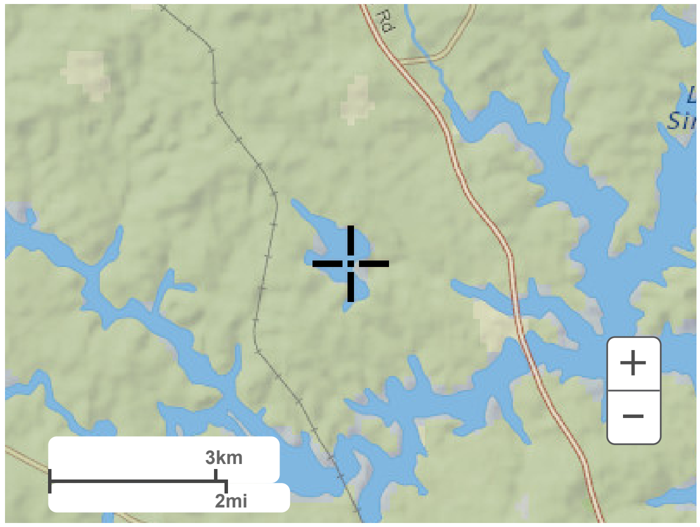
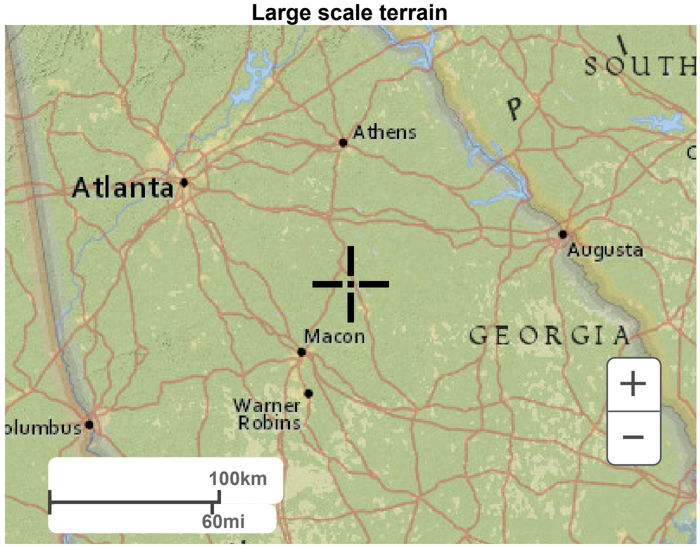
Maps & aerials

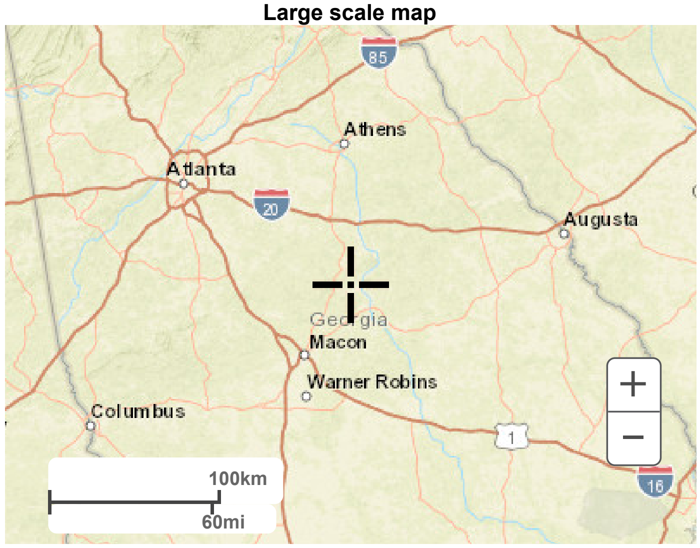
Small scale terrain



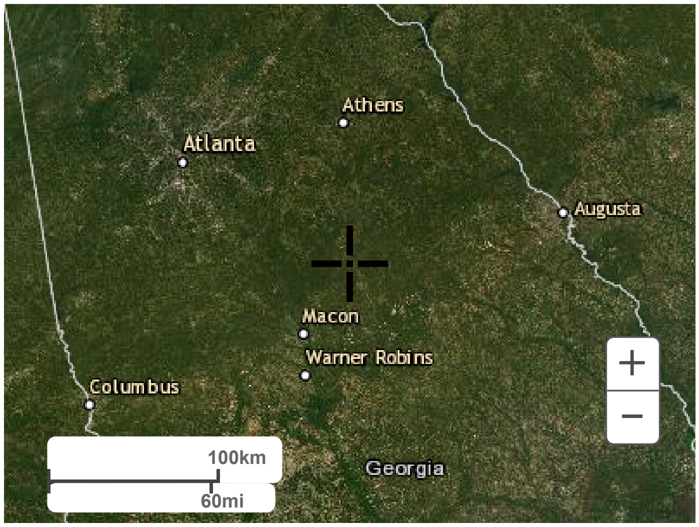
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Attachment 2. NRCS WSS Soil Classifications [USDA, 2021]

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for
Baldwin, Jones, and Putnam Counties, Georgia

December 31, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

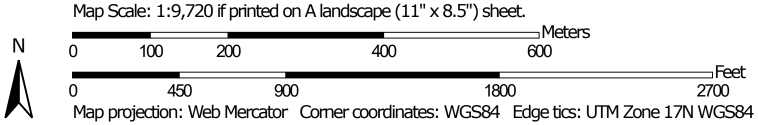
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:9,720 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Baldwin, Jones, and Putnam Counties, Georgia
Survey Area Data: Version 22, Aug 29, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 4, 2023—Feb 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DgB2	Davidson loam, 2 to 6 percent slopes, moderately eroded	114.2	45.3%
DgC2	Davidson loam, 6 to 10 percent slopes, moderately eroded	71.7	28.4%
DhC2	Davidson clay loam, 6 to 10 percent slopes, moderately eroded	2.6	1.0%
VaE2	Vance sandy loam, 10 to 25 percent slopes, eroded	13.2	5.2%
VbC2	Vance sandy clay loam, 2 to 10 percent slopes, eroded	2.5	1.0%
W	Water	47.9	19.0%
Totals for Area of Interest		**252.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Baldwin, Jones, and Putnam Counties, Georgia

DgB2—Davidson loam, 2 to 6 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2tx3f
Elevation: 400 to 1,200 feet
Mean annual precipitation: 44 to 60 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Davidson, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Davidson, Moderately Eroded

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Residuum weathered from amphibolite and/or residuum weathered from hornblende gneiss and/or residuum weathered from diorite and/or residuum weathered from granodiorite

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 12 inches: clay loam
Bt2 - 12 to 53 inches: clay
Bt3 - 53 to 72 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

DgC2—Davidson loam, 6 to 10 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2tx3j
Elevation: 400 to 1,200 feet
Mean annual precipitation: 44 to 60 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Davidson, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Davidson, Moderately Eroded

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Residuum weathered from amphibolite and/or residuum weathered from hornblende gneiss and/or residuum weathered from diorite and/or residuum weathered from granodiorite

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 12 inches: clay loam
Bt2 - 12 to 53 inches: clay
Bt3 - 53 to 72 inches: clay

Properties and qualities

Slope: 6 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

DhC2—Davidson clay loam, 6 to 10 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2tx3h
Elevation: 400 to 1,200 feet
Mean annual precipitation: 44 to 60 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Davidson, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Davidson, Moderately Eroded

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Residuum weathered from amphibolite and/or residuum weathered from hornblende gneiss and/or residuum weathered from diorite and/or residuum weathered from granodiorite

Typical profile

Ap - 0 to 7 inches: clay loam
Bt1 - 7 to 12 inches: clay loam
Bt2 - 12 to 53 inches: clay
Bt3 - 53 to 72 inches: clay

Properties and qualities

Slope: 6 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

VaE2—Vance sandy loam, 10 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 469v
Elevation: 250 to 640 feet
Mean annual precipitation: 44 to 60 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Vance and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vance

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from granite and gneiss and/or residuum weathered from schist

Typical profile

H1 - 0 to 5 inches: sandy loam
H2 - 5 to 29 inches: clay
H3 - 29 to 72 inches: loam

Properties and qualities

Slope: 10 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

VbC2—Vance sandy clay loam, 2 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: 469w
Elevation: 260 to 660 feet
Mean annual precipitation: 44 to 60 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Vance and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vance

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from granite and gneiss and/or residuum weathered from schist

Typical profile

H1 - 0 to 5 inches: sandy clay loam
H2 - 5 to 29 inches: clay
H3 - 29 to 72 inches: loam

Properties and qualities

Slope: 2 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F136XY820GA - Acidic upland forest, moist
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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Attachment 3. Relevant Excerpts from Table 2-2 of TR-55 [SCS, 1986]

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

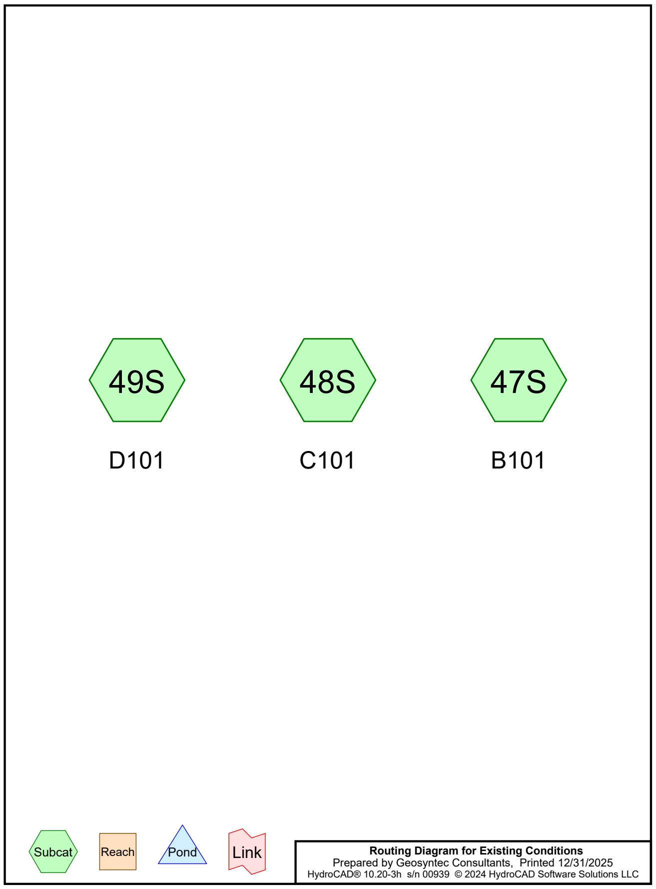
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Attachment 4. HydroCAD™ Results



Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1000-year	Type II 24-hr		Default	24.00	1	10.70	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
51.055	98	Ash Pond B and CCR surface (47S)
69.408	98	Ash Pond C and CCR surface (48S)
45.587	98	Ash Pond D and CCR surface (49S)
7.281	98	Equalization Pond surface (47S)
4.396	98	Impervious surface (47S)
14.672	86	Newly graded area, HSG B (47S)
48.988	69	Pasture/grassland/range, Fair, HSG B (47S, 48S, 49S)
10.701	60	Woods, Fair, HSG B (47S, 48S, 49S)
252.088	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
74.361	HSG B	47S, 48S, 49S
0.000	HSG C	
0.000	HSG D	
177.727	Other	47S, 48S, 49S
252.088		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	51.055	51.055	Ash Pond B and CCR surface	47S
0.000	0.000	0.000	0.000	69.408	69.408	Ash Pond C and CCR surface	48S
0.000	0.000	0.000	0.000	45.587	45.587	Ash Pond D and CCR surface	49S
0.000	0.000	0.000	0.000	7.281	7.281	Equalization Pond surface	47S
0.000	0.000	0.000	0.000	4.396	4.396	Impervious surface	47S
0.000	14.672	0.000	0.000	0.000	14.672	Newly graded area	47S
0.000	48.988	0.000	0.000	0.000	48.988	Pasture/grassland/range, Fair	47S, 48S, 49S
0.000	10.701	0.000	0.000	0.000	10.701	Woods, Fair	47S, 48S, 49S
0.000	**74.361**	**0.000**	**0.000**	**177.727**	**252.088**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 47S: B101 Runoff Area=118.255 ac 53.05% Impervious Runoff Depth=8.97"
Flow Length=2,889' Tc=92.4 min CN=86 Runoff=400.07 cfs 88.369 af

Subcatchment 48S: C101 Runoff Area=74.272 ac 93.45% Impervious Runoff Depth=10.22"
Tc=5.0 min CN=96 Runoff=1,168.01 cfs 63.229 af

Subcatchment 49S: D101 Runoff Area=59.561 ac 76.54% Impervious Runoff Depth=9.60"
Flow Length=478' Tc=22.5 min CN=91 Runoff=547.21 cfs 47.640 af

Total Runoff Area = 252.088 ac Runoff Volume = 199.238 af Average Runoff Depth = 9.48"
29.50% Pervious = 74.361 ac 70.50% Impervious = 177.727 ac

Summary for Subcatchment 47S: B101

[47] Hint: Peak is 162% of capacity of segment #3

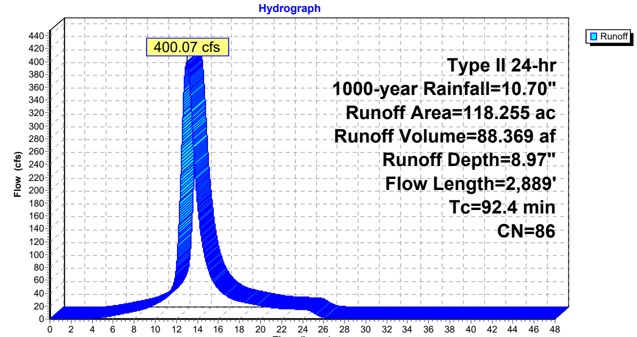
Runoff = 400.07 cfs @ 13.04 hrs, Volume= 88.369 af, Depth= 8.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1000-year Rainfall=10.70"

	Area (ac)	CN	Description
	33.001	69	Pasture/grassland/range, Fair, HSG B
	7.850	60	Woods, Fair, HSG B
*	51.055	98	Ash Pond B and CCR surface
*	4.396	98	Impervious surface
	14.672	86	Newly graded area, HSG B
*	7.281	98	Equalization Pond surface
	118.255	86	Weighted Average
	55.523		46.95% Pervious Area
	62.732		53.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	100	0.0100	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.66"
71.2	1,638	0.0030	0.38		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	1,151	0.0020	2.11	246.68	**Channel Flow,** Area= 117.0 sf Perim= 126.0' r= 0.93' n= 0.030 Earth, grassed & winding
92.4	2,889	Total			

Subcatchment 47S: B101



Summary for Subcatchment 48S: C101

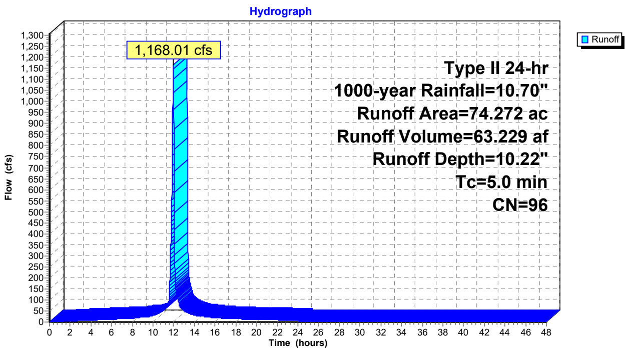
Runoff = 1,168.01 cfs @ 11.96 hrs, Volume= 63.229 af, Depth=10.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1000-year Rainfall=10.70"

	Area (ac)	CN	Description
	4.291	69	Pasture/grassland/range, Fair, HSG B
	0.573	60	Woods, Fair, HSG B
*	69.408	98	Ash Pond C and CCR surface
	74.272	96	Weighted Average
	4.864		6.55% Pervious Area
	69.408		93.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 48S: C101



Summary for Subcatchment 49S: D101

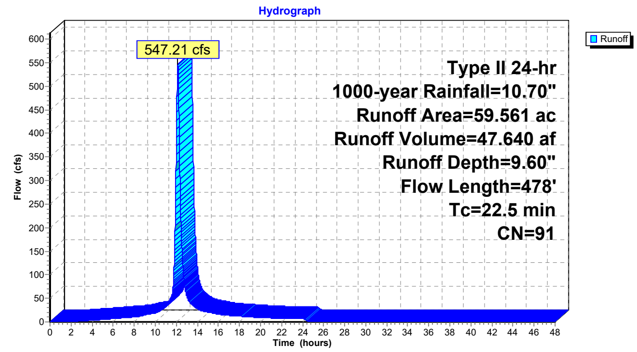
Runoff = 547.21 cfs @ 12.15 hrs, Volume= 47.640 af, Depth= 9.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1000-year Rainfall=10.70"

	Area (ac)	CN	Description
	11.696	69	Pasture/grassland/range, Fair, HSG B
	2.278	60	Woods, Fair, HSG B
*	45.587	98	Ash Pond D and CCR surface
	59.561	91	Weighted Average
	13.974		23.46% Pervious Area
	45.587		76.54% Impervious Area

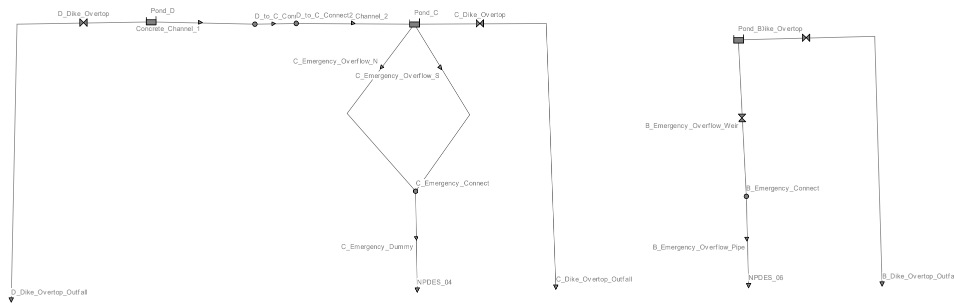
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.1260	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.66"
5.8	378	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.5	478	Total			

Subcatchment 49S: D101



Attachment 5. SWMM Results

01/01/2021 00:03:00



Existing_Conditions_1000yr

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

```
****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 01/01/2021 00:00:00
Ending Date .............. 01/04/2021 23:59:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:03:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.005000 ft


**************************        Volume         Volume
Flow Routing Continuity        acre-feet       10^6 gal
**************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........       199.229         64.922
External Outflow .........         0.000          0.000
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....       196.628         64.074
Final Stored Volume ......       395.857        128.996
Continuity Error (%) .....        -0.000


***************************
```

Time-Step Critical Elements
****
Link Circular_Pipe (2.88%)

****
Highest Flow Instability Indexes
****
All links are stable.

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.90 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	100.00 %
0.871 - 0.758 sec	:	0.00 %
0.758 - 0.660 sec	:	0.00 %
0.660 - 0.574 sec	:	0.00 %
0.574 - 0.500 sec	:	0.00 %

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
B_Emergency_Connect	JUNCTION	0.00	0.00	371.12	0 00:00	0.00
C_Emergency_Connect	JUNCTION	0.00	0.00	376.76	0 00:00	0.00
D_to_C_Connect1	JUNCTION	0.30	2.60	401.05	0 12:39	2.60
D_to_C_Connect2	JUNCTION	0.08	0.82	398.87	0 12:39	0.82
NPDES_06	OUTFALL	0.00	0.00	340.00	0 00:00	0.00

NPDES_04	OUTFALL	0.00	0.00	340.00	0	00:00	0.00
B_Dike_Overtop_Outfall	OUTFALL	0.00	0.00	340.00	0	00:00	0.00
C_Dike_Overtop_Outfall	OUTFALL	0.00	0.00	340.00	0	00:00	0.00
D_Dike_Overtop_Outfall	OUTFALL	0.00	0.00	340.00	0	00:00	0.00
Pond_C	STORAGE	15.15	15.66	395.66	3	23:58	15.66
Pond_B	STORAGE	11.47	11.87	378.87	1	04:55	11.87
Pond_D	STORAGE	2.73	5.17	401.17	0	12:39	5.17

****
Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
B_Emergency_Connect	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 gal
C_Emergency_Connect	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 gal
D_to_C_Connect1	JUNCTION	0.00	107.44	0	12:39	0	14.9	0.001
D_to_C_Connect2	JUNCTION	0.00	107.44	0	12:39	0	14.8	0.000
NPDES_06	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 gal
NPDES_04	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 gal
B_Dike_Overtop_Outfall	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 gal
C_Dike_Overtop_Outfall	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 gal
D_Dike_Overtop_Outfall	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 gal

Pond_C	STORAGE	1166.07	1203.53	0	11:57	20.6	70.5	0.000
Pond_B	STORAGE	399.97	399.97	0	13:02	28.8	57.2	-0.000
Pond_D	STORAGE	546.86	546.86	0	12:09	15.5	16.1	0.015

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Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft	Max Pcnt Full	Time of Max Occurrence days	Time of Max Occurrence hr:min	Maximum Outflow CFS
Pond_C	8733.971	42.8	0.0	0.0	9428.378	46.2	3	23:58	0.00
Pond_B	7068.918	73.8	0.0	0.0	7643.953	79.8	1	04:55	0.00
Pond_D	229.526	13.2	0.0	0.0	1135.358	65.3	0	12:39	107.44

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Outfall Loading Summary

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  -----------------------------------------------------------
                         Flow       Avg       Max       Total
                         Freq      Flow      Flow      Volume
  Outfall Node           Pcnt       CFS       CFS    10^6 gal
  -----------------------------------------------------------
  NPDES_06               0.00      0.00      0.00       0.000
  NPDES_04               0.00      0.00      0.00       0.000
  B_Dike_Overtop_Outfall   0.00      0.00      0.00       0.000
  C_Dike_Overtop_Outfall   0.00      0.00      0.00       0.000
  D_Dike_Overtop_Outfall   0.00      0.00      0.00       0.000
  -----------------------------------------------------------
  System                 0.00      0.00      0.00       0.000


  ********************
  Link Flow Summary
  ********************

  -----------------------------------------------------------------------------
                                 Maximum  Time of Max   Maximum    Max/    Max/
                                  |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type          CFS  days hr:min    ft/sec    Flow   Depth
  -----------------------------------------------------------------------------
  B_Emergency_Overflow_Pipe CONDUIT      0.00     0  00:00      0.00    0.00    
0.00
  C_Emergency_Dummy    CONDUIT      0.00     0  00:00      0.00    0.00    0.00
  C_Emergency_Overflow_N CONDUIT      0.00     0  00:00      0.00    0.00    0.00
  C_Emergency_Overflow_S CONDUIT      0.00     0  00:00      0.00    0.00    0.00
  Circular_Pipe        CONDUIT    107.44     0  12:39     20.94    0.76    0.43
  Concrete_Channel_1   CONDUIT    107.44     0  12:39      5.37    0.40    1.00
  Concrete_Channel_2   CONDUIT    107.44     0  12:39     14.84    0.22    0.41
  B_Emergency_Overflow_Weir WEIR         0.00     0  00:00                    
0.00
  B_Dike_Overtop       WEIR         0.00     0  00:00                      0.00
  C_Dike_Overtop       WEIR         0.00     0  00:00                      0.00
  D_Dike_Overtop       WEIR         0.00     0  00:00                      0.00


  ***************************
  Flow Classification Summary
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                    Adjusted    ---------- Fraction of Time in Flow Class
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Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
B_Emergency_Overflow_Pipe	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_Emergency_Dummy	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_Emergency_Overflow_N	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_Emergency_Overflow_S	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Circular_Pipe	1.00	0.08	0.00	0.00	0.00	0.92	0.00	0.00	0.17	0.00
Concrete_Channel_1	1.00	0.00	0.08	0.00	0.92	0.00	0.00	0.00	0.00	0.00
Concrete_Channel_2	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00

****
Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
Concrete_Channel_1	2.56	2.56	6.12	0.01	0.01

Analysis begun on: Wed Dec 31 15:00:44 2025
Analysis ended on: Wed Dec 31 15:01:00 2025
Total elapsed time: 00:00:16