OPERATING RECORD DOCUMENT
Required per §257.105(g)(4)

INTERNET POSTING Required per §257.107(g)(4)

PROFESSIONAL ENGINEER'S CERTIFICATION

40 CFR 257.82(c) Inflow Design Flood Control System Plan

I, John N. Browning, P.E., a professional engineer licensed in the State of Missouri, hereby certify in accordance with 40 CFR 257.82(c)(5) that the updated inflow design flood control system plan for the Sikeston Board of Municipal Utilities, Sikeston Power Station, Fly Ash Pond meets the requirements of 40 CFR 257.82(c)(1) as found in federal regulation 40 CFR 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments and has been prepared using good engineering and environmental judgement and standard accepted practices.

Name: John N. Browning, P.E.

Signature: _____

Date: 02-27-2024

Registration Number: E-20769
State of Registration: Missouri

GREDELL
ENGINEERING RESOURCES

Sikeston Board of Municipal Utilities
Sikeston Power Station
Fly Ash Pond
Periodic Inflow Design Flood Control System Plan

Prepared for:

BMU Sikeston
Board of Municipal Utilities

Sikeston Power Station
1551 West Wakefield Avenue
Sikeston, MO 63801

Updated January 2024

1505 East High Street
Jefferson City, Missouri 65101-4826

Telephone (573) 659-9078
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Sikeston Board of Municipal Utilities
Sikeston Power Station
Fly Ash Pond
Periodic Inflow Design Flood Control System Plan

Updated January 2024

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List of Appendices

1.0 INTRODUCTION

In accordance with the scope of services outlined in the Sikeston Board of Municipal Utilities (SBMU) Work Order No. 54 dated August 28, 2023, and authorized under Purchase Order #33632 issued September 13, 2023, GREDELL Engineering Resources, Inc. (GER) performed a periodic update to the inflow design flood control system plan for the SBMU, Sikeston Power Station (SPS) Fly Ash Pond, a coal combustion residual (CCR) surface impoundment. The purpose of this inflow design flood control system plan is document how the inflow design flood control system has been designed and constructed to meet the requirements of the Federal CCR Rule, section (§) 40 CFR 257.82. Excerpts from the Federal CCR Rule, §257.82(a)-(c), describing the hydrologic and hydraulic capacity requirements of CCR surface impoundments and the required contents of this inflow design flood control system plan are provided for reference below. §257.3-3 describing the surface water protection requirements is also provided for reference below.

1.1 §257.82(a) and (b) – Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments

Excerpts from §257.82(a) and (b), which regards the hydrologic and hydraulic capacity requirements for CCR surface impoundments completed by GER, are provided for reference below.

(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.

(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.

(a)(3)The inflow design flood is: for a high hazard potential CCR surface impoundment, the probable maximum flood; for a significant hazard potential CCR surface impoundment, the 1,000-year flood; for a low hazard potential CCR surface impoundment, the 100-year flood; and for an incised CCR surface impoundment, the 25-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.

1.2 §257.82(c) – Inflow Design Flood Control System Plan

Excerpts from §257.82(c), regarding the inflow design flood control system plan requirements for CCR surface impoundments completed by GER, are provided for reference below.

(c)(1) The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).

(c)(5) The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic inflow design flood control system plan meets the requirements of this section.

1.3 §257.3-3 – Surface Water

Excerpts from §257.3-3, which is referenced in §257.82(b), are provided for reference below.

(a) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.

(c) A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an area wide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.

2.0 POND DESCRIPTIONS

SPS is located west of the City of Sikeston, south of West Wakefield Avenue, and west of Route BB in Scott County, Missouri. The Fly Ash Pond resides to the northeast of SPS, and directly east of SPS's coal pile and north of the Bottom Ash Pond. The Fly Ash Pond occupies approximately 30 acres with a maximum and consistent berm elevation of 322 feet. Based on an aerial survey conducted by Surdex Corporation on May 6, 2016, the Fly Ash Pond has an approximate remaining capacity of 31.2 acre-feet (ac-ft) (1,359,000 cubic feet [ft^3]).

SPS and the Fly Ash Pond are located at a transition between agricultural and urban areas. The Fly Ash Pond is surrounded by agricultural, commercial, and residential areas. Residential areas are located approximately 350 feet north of the Fly Ash Pond. Commercial areas are located approximately 1,700 feet east of the Fly Ash Pond. The remaining area around the Fly Ash Pond is agricultural land. See Appendix A, Figure 1 – Aerial View for a depiction of the Fly Ash Pond.

2.1 Fly Ash Pond Influent and Discharge Systems

SPS discharges no influent into the Fly Ash Pond. The only influent is from precipitation within the limits of the pond. There is no discharge from the Fly Ash Pond through a 24-inch corrugated metal pipe in the northwest corner of the pond with an invert elevation of 316.75 feet. The 24-inch pipe could discharge Fly Ash Pond effluent into the Process Wastewater Pond, but the valve is closed. The discharge pipe inlet and outlet invert elevations are 316.75 feet and 307.0 feet respectively. The discharge pipe is about 916 feet long and the slope of the pipe varies. However, over 830 feet of the pipe has an approximate slope of 0.1 percent (%). There are no flow rates from the Fly Ash Pond into the Process Waste Pond.

The existing Fly Ash Pond outlet structure is constructed with a 24-inch steel outlet pipe that drains into the ditch on the north side of the site and a 24-inch corrugated metal pipe that drains into the Process Wastewater Pond. A hand-operated valve, which is located at the Fly Ash Pond's outlet structure near the northwest berm, is used to control the discharge from the Fly Ash Pond. Each pipe is controlled by a gate valve and the 24-inch corrugated metal pipe, and 24-inch steel pipe remain closed. The discharge structure is identified in Appendix A, Figure 2 – Fly Ash Pond Hydraulic Structures. Schematic details of the Fly Ash Pond outlet structure are provided in Appendix A, Figure 3 – Outlet Structure Details.

3.0 INFLOW DESIGN FLOOD

§257.82 requires owners and operators of CCR surface impoundments to have hydrologic and hydraulic systems designed to adequately manage the flow from the peak discharge of the inflow design flood into and out of the CCR surface impoundment. The inflow design flood is determined by the hazard potential classification for the CCR surface impoundment. As previously stated, §257.82(a)(3) defines the inflow design flood for each hazard potential classification. The potential inflow design flood for CCR surface impoundments are as follows:

- High Hazard Potential – probably maximum flood
- Significant Hazard Potential – 1,000-year flood
- Low Hazard Potential – 100 year flood

3.1 Fly Ash Pond Hazard Potential Classification

The hazard potential classification for the Fly Ash Pond was determined by modeling a worst-case scenario breach of the Fly Ash Pond Berms and its resulting flood waters impact on the surrounding land. A worst-case scenario breach of the Fly Ash Pond berm at SPS was modeled using HydroCAD. The flooded areas from the modeled breach include agricultural (owned by the City of Sikeston).

Flood water from a breach in the Fly Ash Pond berm under the worst-case scenario conditions is contained on property owned by the City of Sikeston and the agricultural area to the northwest of SPS. Additionally, environmental damage, economic loss, disruption of lifeline facilities, or other impact concerns are not expected from a breach in the Fly Ash Pond berm. There is no probable loss of human life due to the flood waters from the breach in the Fly Ash Pond berm. Therefore, the Fly Ash Pond at SPS was classified as: Low Hazard Potential.

3.2 Fly Ash Pond Inflow Design Flood

As stated above, §257.82(a)(3) requires the inflow design flood for CCR surface impoundments with low hazard potential classifications to be the 100-year flood. The 100-year flood is the volume of runoff generated by the 100-year rainfall event for a given location. The duration of the 100-year event was taken to be 24 hours. The 24 hour duration was used as it generated the maximum runoff volume. The 100-year, 24-hour rainfall event was modeled to determine if the existing hydrologic and hydraulic capacity of the Fly Ash Pond and other hydraulic structures impacted by the discharge from the Fly Ash Pond is adequate. From the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 8, Version 2, the 100-year, 24-hour depth of rainfall for Sikeston, Missouri is 8.44 inches.

4.0 INFLOW DESIGN FLOOD CONTROL SYSTEM

As previously stated above, §257.82(a)(1) and (2) pertaining to CCR surface impoundments states owners or operators of CCR surface impoundments must design, construct, operate, and maintain the inflow design flood control system to adequately manage flow into the CCR surface impoundment during and following the peak discharge of the inflow design flood, as well as adequately manage the flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood. Therefore, the inflow design flood control system for the Fly Ash Pond includes the following hydraulic structures which were modeled using Hydraflow.

- Fly Ash Pond
- Bottom Ash Pond
- Settling Pond
- Process Waste Pond

4.1 Fly Ash Pond Inflow and Outflow

The Fly Ash Pond was modeled using Hydraflow with one input, the 100-year storm event. The watershed for the Fly Ash Pond is solely the area within the berms of the Fly Ash Pond. The Fly Ash Pond berms elevations are above the surrounding topography and therefore, do not receive additional stormwater runoff.

There is no peak discharge from the 100-year flood as the 100-year storm event will be detained within the Fly Ash Pond with a peak elevation of 320.5 feet. The initial water elevation in the Fly Ash Pond was assumed to be 316.0 feet. Therefore, the Fly Ash Pond hydrologic and hydraulic capacity can adequately manage flow during and following the peak discharge from the inflow design flood as required by §257.82(a)(1). See Appendix B, Hydraflow Report - 100-year Design Flood for a detailed report of the hydrologic and hydraulic model.

4.2 Clean Water Act Surface Water Requirements

40 CFR 257.82 requires owners and operators of CCR surface impoundments to manage discharge during and following the inflow design flood in accordance with the surface water requirements of §257.3-3. As previously stated, §257.3-3 requires discharges from CCR surface impoundments into waters of the United States to be conducted in manner which does not violate NPDES requirements and which does not cause non-point source pollution of waters of the United States. Since there is no discharge as a direct result from the volume of stormwater generated during a 100-year event, it is presumed that there are no constituents present in the effluent. SPS will continue monitoring, sampling, and record keeping operations as required by the operating permit during a 100-year event to maintain compliance with the operating permit and thereby satisfy the requirements of §257.3-3.

It is noted that the Process Waste Pond discharges through Outfall #003, which is regulated by Missouri State Operating Permit MO-0095575. Under the regulating statutes, Chapter 644.076(4) RS MO states that,

> "*The liabilities which shall be imposed pursuant to any provision of sections 644.006 to 644.141 upon persons violating the provisions of sections 644.006 to 644.141 or any standard, rule, limitation, or regulation adopted pursuant thereto shall not be imposed due to any violation caused by an act of God, war, strike, riot, or other catastrophe."*

The 100-year flood is viewed as a common storm event. Even though it was determined that the berms would not be overtopped during the event, the provisions of 644.076(4) are presumed to be applicable. The Fly Ash Pond will not discharge during the 100-year storm event and stormwater will be contained in the berm area.

5.0 RECOMMENDATIONS

The presumed normal operating conditions are the Fly Ash Pond operating at an elevation of 316.0 feet. Under these conditions, it was determined that the CCR impoundment has sufficient hydrologic and hydraulic capacity to adequately manage flow during and following the peak discharge from the inflow design flood as required by §257.82(a)(1).

Furthermore, it was also determined that if the valves on the Fly Ash Pond are closed during the 100-year flood event, the Fly Ash Pond has capacity to store the entire 100-year flood event. With the valve completely closed during this event, the Fly Ash Pond would not discharge flows and the maximum water surface elevation was determined to be approximately 320.5 feet, leaving approximately 1.5 feet of freeboard in the pond.

It is recommended that the valves can be opened to release stored water in the FAP if the water elevation exceeds 316.0 feet for prolonged periods or during an anticipated heavy rainfall event (up to a 100-year event). The 24-inch corrugated metal pipe discharges to the Process Pond. The 24-inch steel pipe drains to an overflow monitoring structure outside the berm which drains to an open channel parallel to West Wakefield Avenue.

6.0 PLAN AMMENDMENTS

As per §257.82(c)(4), the owner or operator must prepare periodic inflow design flood control system plans every five years. The date of completing the periodic update is the basis for establishing the deadline to complete the next periodic update. The deadline for completing a subsequent plan is based on the date for completing the previous plan.

This Inflow Design Flood Control System Plan will be updated, as per §257.82(c)(2), whenever there is a change in conditions that would substantially affect the written plan in effect, such as modifications to hydraulic structures of the Fly Ash Pond, additional influents or additional effluents.

7.0 MISCELLANEOUS REQUIREMENTS

Section 257.82(d) states that SBMU must comply with:

- The recordkeeping requirements specified in 257.105(g);
- The notification requirements specified in 257.106(g); and,
- The Internet requirements specified in 257.107(g).

8.0 REFERENCES

GREDELL Engineering Resources, Inc., 2023, Sikeston Board of Municipal Utilities, Sikeston Power Station, Fly Ash Pond, Periodic Hazard Potential Classification Assessment, dated January 2023.

GREDELL Engineering Resources, Inc., 2018, Sikeston Board of Municipal Utilities, Sikeston Power Station, Fly Ash Pond, Inflow Design Flood Control System Plan, dated August 2018.

APPENDIX A

Figures

N

SCALE: 1" = 1500'
0 750 1500

NOTES:
1. PROPERTY LINE TAKEN FROM THE SCOTT COUNTY ASSESSOR'S WEBSITE (SCOTTGIS.COUNTYPORTAL.NET) 6-8-15
2. IMAGE PROVIDED BY BING MAPS 2023 IMAGE.

LEGEND
SBMU PROPERTY LINE (APPROXIMATE) ——PL——
SIKESTON RIDGE
DRAINAGE FEATURE

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
FLY ASH POND
SIKESTON POWER STATION

FIGURE 1 - AERIAL VIEW

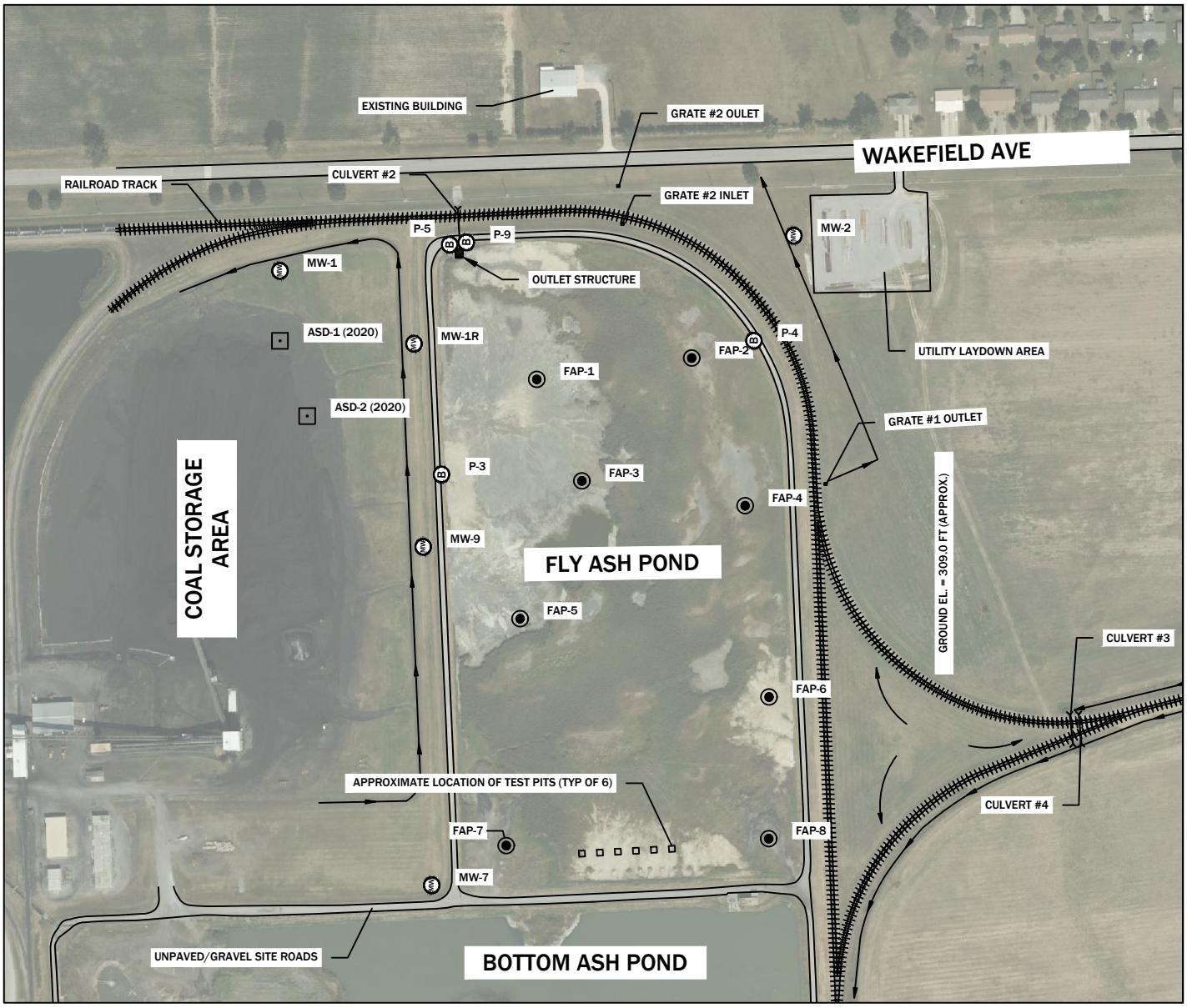
GREDELL ENGINEERING RESOURCES
CIVIL • GEOTECHNICAL • ENVIRONMENTAL • GEOLOGY • EARTH SCIENCES
1505 East High Street
Jefferson City, Missouri
Telephone: (573) 659-9078
Facsimile: (573) 659-9079
MO CORP. ENGINEERING LICENSE NO. E-2001001669-D

DATE	SCALE	PROJECT NAME	REVISION
01/2024	1" = 1500'	SIKESTON FAP 5-YEAR UPDATE	N/A
DRAWN	APPROVED	FILE NAME	SHEET #
CM	JB	BASE-SITE-07	1 OF 3

ORIGINAL SHEET SIZE: 8.5" X 11"

PRINTED ON: 1/23/24 BY: cm

FILE PATH AND FILENAME: O:\CADDFiles\SIKESTON\5-YEAR UPDATES\FAP\DRAWINGS\Base-Site-09.dwg



N

SCALE: 1" = 400'

0 200' 400'

LEGEND:

- PIEZOMETER — FAP-1
- MONITORING WELLS — MW-7
- FLUSH MOUNT PIEZOMETER (GEOTECHNOLOGY (2011)) — P-3
- APPROXIMATE SAMPLE LOCATIONS
- APPROXIMATE TEST PIT LOCATION — ASD-2 (2020)
- RAILROAD TRACKS
- DIRECTION OF STORMWATER FLOW

NOTES:

1. PIEZOMETER LOCATIONS APPROXIMATED WITH HANDHELD GPS.
2. IMAGE PROVIDED BY MICROSOFT BING MAPS; APPROXIMATE IMAGE DATE 2022.
3. GRATE #1 INLET NOT IDENTIFIED.
4. MW-1 NO LONGER USED FOR CCR MONITORING PURPOSES.

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
FLY ASH POND
SIKESTON POWER STATION

FIGURE 2 - FLY ASH POND HYDRAULIC STRUCTURES

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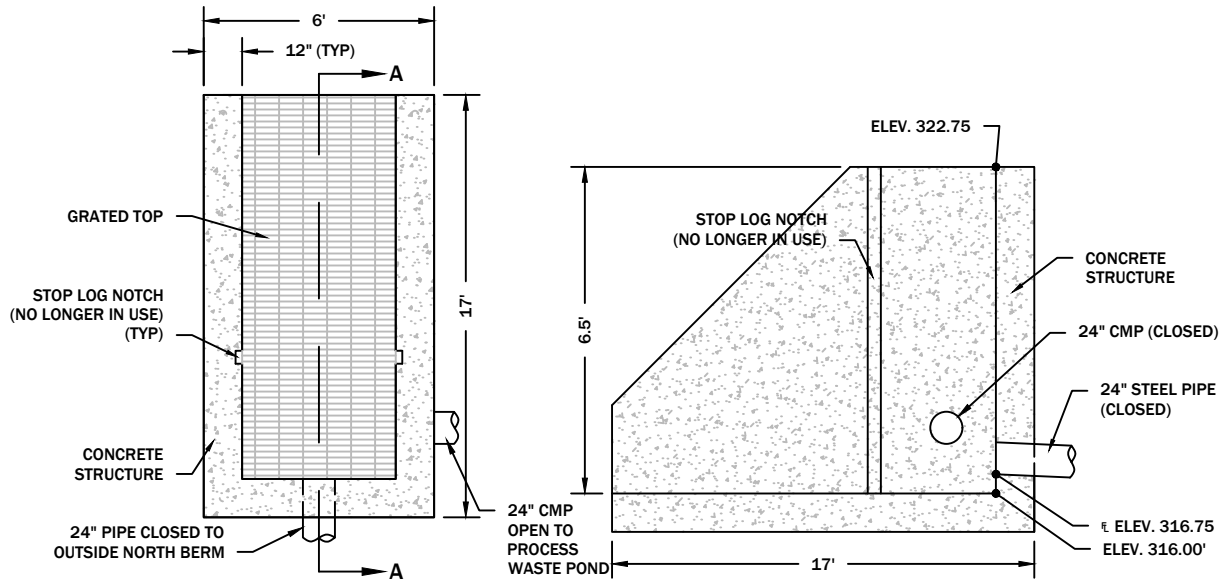
1505 East High Street
Jefferson City, Missouri
Telephone: (573) 659-9078
Facsimile: (573) 659-9079
MO CORP. ENGINEERING LICENSE NO. E-2001001669-D

DATE	SCALE	PROJECT NAME	REVISION
01/2024	1" = 500'	SIKESTON FAP 5-YEAR UPDATE	N/A
DRAWN	**APPROVED**	**FILE NAME**	**SHEET #**
CM	JB	BASE-SITE-09	2 OF 3

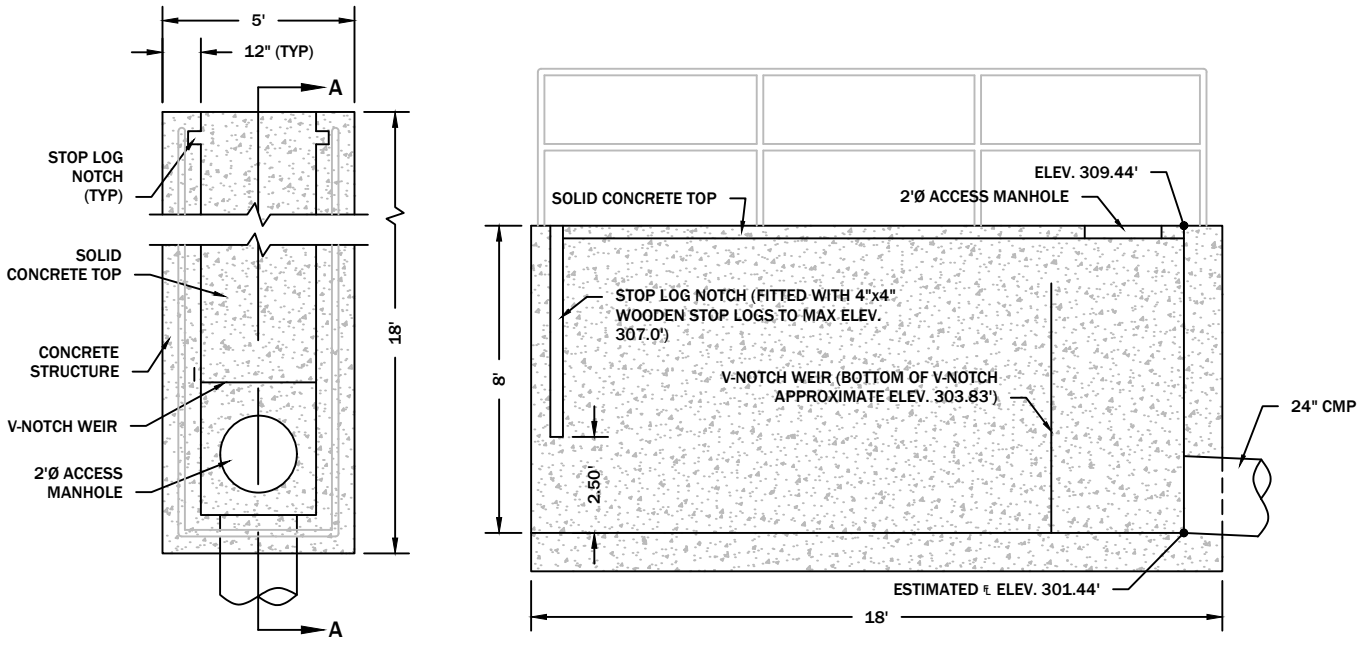


PLAN VIEW

SECTION A-A

FLY ASH POND
OUTLET STRUCTURE

SCALE: N.T.S.



PLAN VIEW

SECTION A-A

PROCESS WASTEWATER POND
OUTLET STRUCTURE

SCALE: N.T.S.

NOTE:
NO CONSTRUCTION PLANS WERE AVAILABLE FOR THE PROCESS WASTEWATER POND OUTLET STRUCTURE. SCHEMATIC DRAWINGS BASED ON LIMITED SITE OBSERVATIONS & ENGINEERING JUDGEMENT AS MOST OF THE OUTLET WAS SUBMERGED AT THE TIME OF THE SITE VISIT.

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
FLY ASH POND
SIKESTON POWER STATION

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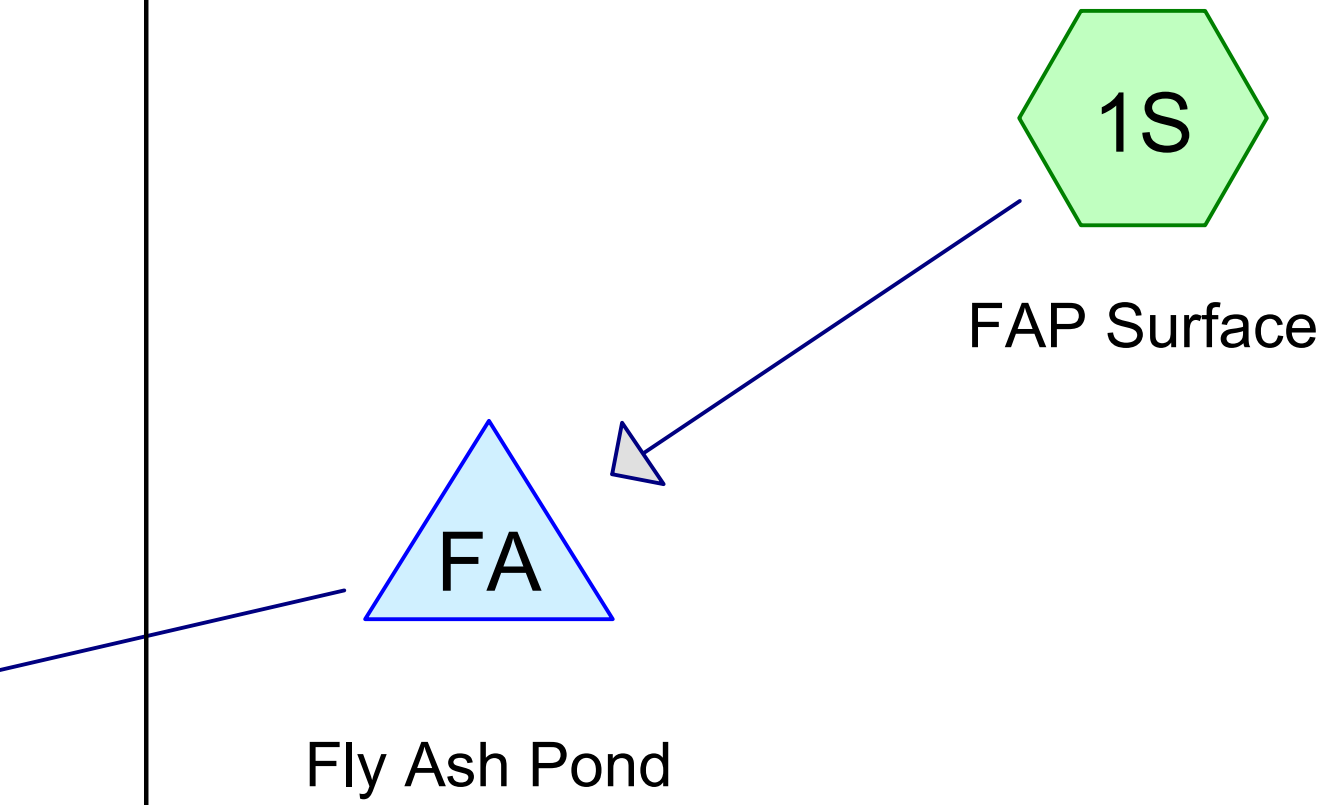
MO CORP. ENGINEERING LICENSE NO. E-2001001669-D

FIGURE 3 - OUTLET STRUCTURE DETAILS

DATE	SCALE	PROJECT NAME	REVISION
01/2024	N.T.S.	SIKESTON FAP 5-YEAR UPDATE	N/A
DRAWN	APPROVED	FILE NAME	SHEET #
CM	JB	BASE-SITE-01	3 OF 3

APPENDIX B

Hydraflow Report – 100 Year Design Flood



Subcat Reach Pond Link

Routing Diagram for SPS FAP Storm Detention 2023
Prepared by Gredell Engineering Resources, Printed 1/9/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type II 24-hr		Default	24.00	1	8.44	2

Summary for Subcatchment 1S: FAP Surface

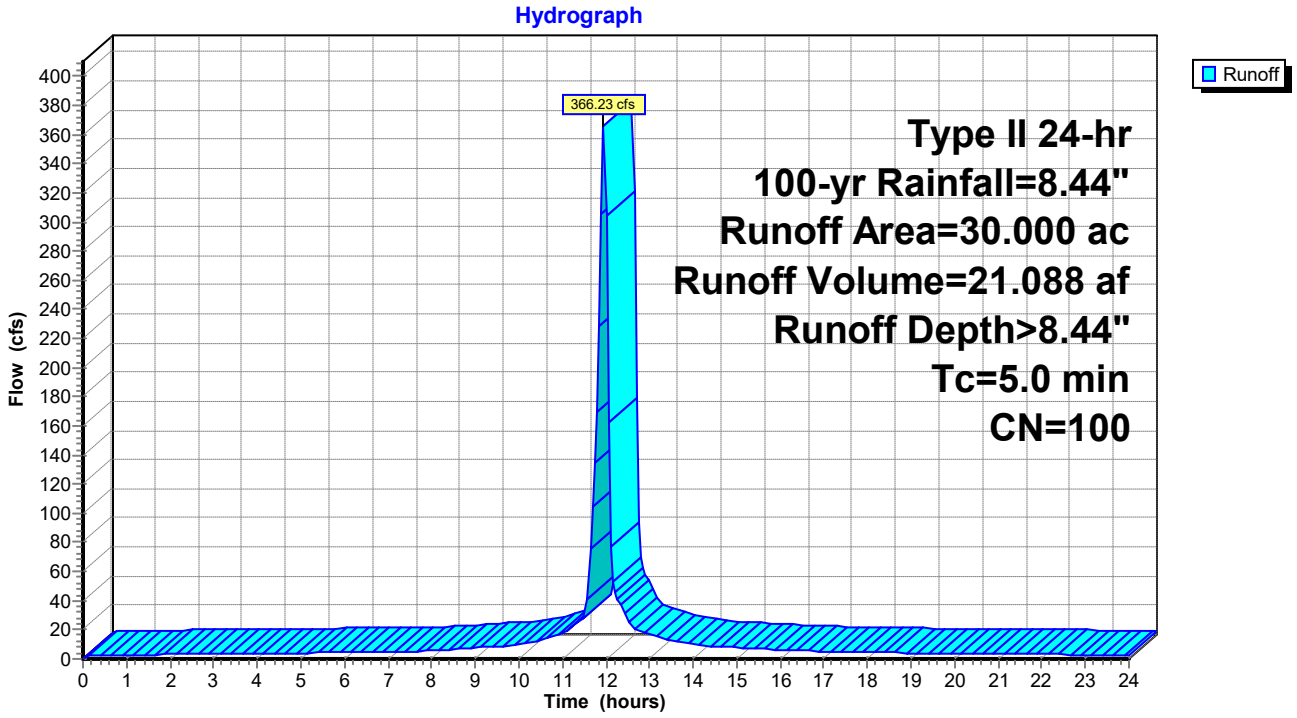
Runoff = 366.23 cfs @ 11.95 hrs, Volume= 21.088 af, Depth> 8.44"
Routed to Pond FA : Fly Ash Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=8.44"

	Area (ac)	CN	Description
*	30.000	100	for water surface
	30.000		100.00% Impervious Area

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

Subcatchment 1S: FAP Surface



Hydrograph for Subcatchment 1S: FAP Surface

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.01
0.25	0.02	0.02	2.59
0.50	0.04	0.04	2.66
0.75	0.07	0.07	2.72
1.00	0.09	0.09	2.79
1.25	0.11	0.11	2.85
1.50	0.14	0.14	2.92
1.75	0.16	0.16	2.98
2.00	0.19	0.19	3.04
2.25	0.21	0.21	3.11
2.50	0.24	0.24	3.17
2.75	0.26	0.26	3.24
3.00	0.29	0.29	3.30
3.25	0.32	0.32	3.36
3.50	0.35	0.35	3.43
3.75	0.38	0.38	3.49
4.00	0.41	0.41	3.55
4.25	0.44	0.44	3.66
4.50	0.47	0.47	3.79
4.75	0.50	0.50	3.92
5.00	0.53	0.53	4.05
5.25	0.57	0.57	4.17
5.50	0.60	0.60	4.30
5.75	0.64	0.64	4.43
6.00	0.68	0.68	4.56
6.25	0.71	0.71	4.68
6.50	0.75	0.75	4.81
6.75	0.79	0.79	4.94
7.00	0.84	0.84	5.07
7.25	0.88	0.88	5.19
7.50	0.92	0.92	5.32
7.75	0.97	0.97	5.45
8.00	1.01	1.01	5.58
8.25	1.06	1.06	6.06
8.50	1.12	1.12	6.70
8.75	1.18	1.18	7.33
9.00	1.24	1.24	7.97
9.25	1.31	1.31	8.17
9.50	1.38	1.38	8.17
9.75	1.45	1.45	8.88
10.00	1.53	1.53	9.90
10.25	1.62	1.62	11.27
10.50	1.72	1.72	12.80
10.75	1.84	1.84	15.04
11.00	1.98	1.98	17.59
11.25	2.16	2.16	22.62
11.50	2.39	2.39	28.75
11.75	3.27	3.27	**135.09**
12.00	5.60	5.60	**304.80**
12.25	5.96	5.96	41.35
12.50	6.20	6.20	26.71
12.75	6.37	6.37	19.92
13.00	6.52	6.52	16.60
13.25	6.64	6.64	14.34
13.50	6.74	6.74	12.55
13.75	6.84	6.84	11.12
14.00	6.92	6.92	9.84
14.25	7.00	7.00	9.14
14.50	7.07	7.07	8.69
14.75	7.14	7.14	8.24
15.00	7.20	7.20	7.80
15.25	7.26	7.26	7.35
15.50	7.32	7.32	6.90
15.75	7.38	7.38	6.46
16.00	7.43	7.43	6.01
16.25	7.48	7.48	5.76
16.50	7.52	7.52	5.60
16.75	7.57	7.57	5.44
17.00	7.61	7.61	5.28
17.25	7.65	7.65	5.12
17.50	7.69	7.69	4.96
17.75	7.73	7.73	4.80
18.00	7.77	7.77	4.64
18.25	7.81	7.81	4.49
18.50	7.85	7.85	4.33
18.75	7.88	7.88	4.17
19.00	7.91	7.91	4.01
19.25	7.95	7.95	3.85
19.50	7.98	7.98	3.69
19.75	8.01	8.01	3.53
20.00	8.03	8.03	3.37
20.25	8.06	8.06	3.30
20.50	8.09	8.09	3.26
20.75	8.12	8.12	3.23
21.00	8.14	8.14	3.20
21.25	8.17	8.17	3.17
21.50	8.19	8.19	3.14
21.75	8.22	8.22	3.11
22.00	8.25	8.25	3.07
22.25	8.27	8.27	3.04
22.50	8.30	8.30	3.01
22.75	8.32	8.32	2.98
23.00	8.35	8.35	2.95
23.25	8.37	8.37	2.91
23.50	8.39	8.39	2.88
23.75	8.42	8.42	2.85
24.00	**8.44**	**8.44**	2.81

Summary for Pond FA: Fly Ash Pond

Inflow Area = 30.000 ac,100.00% Impervious, Inflow Depth > 8.44" for 100-yr event
Inflow = 366.23 cfs @ 11.95 hrs, Volume= 21.088 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Coal Pile Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Starting Elev= 316.00' Storage= 2.800 af
Peak Elev= 320.50' @ 24.00 hrs Storage= 23.882 af (21.082 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

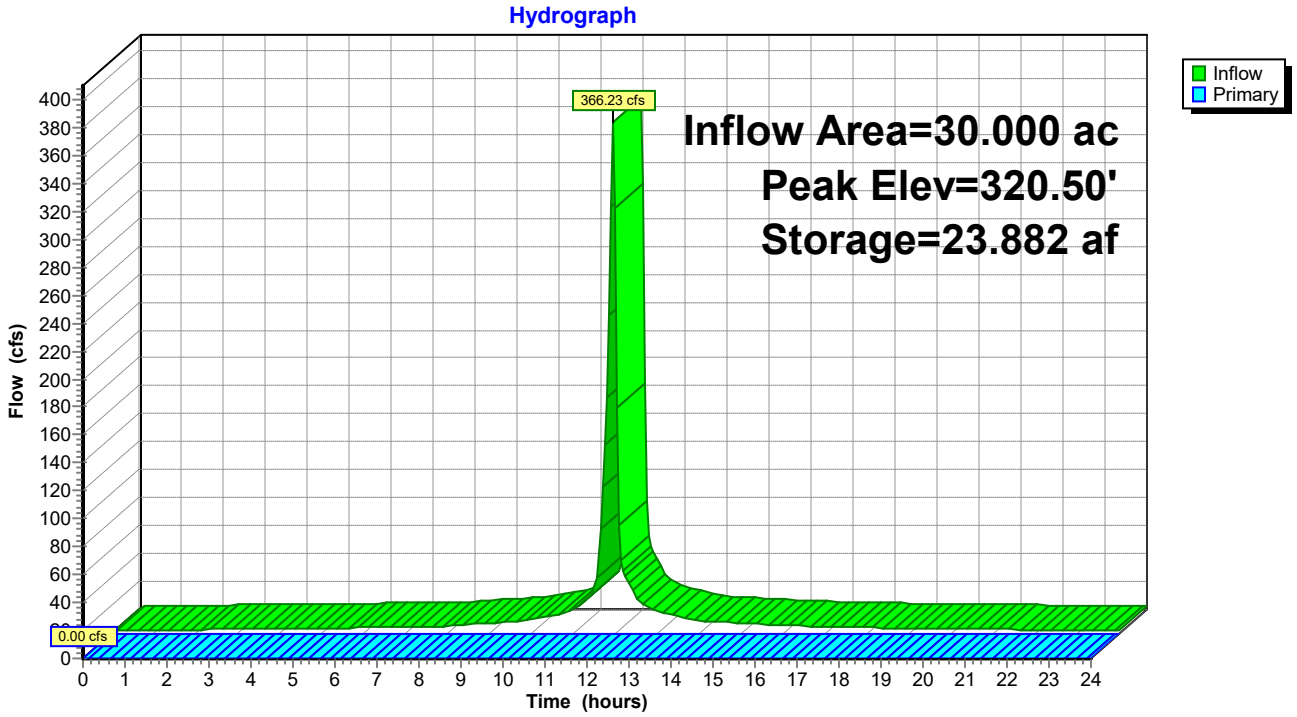
Volume	Invert	Avail.Storage	Storage Description
#1	305.00'	31.200 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
305.00	0.000
306.00	0.300
307.00	0.500
308.00	0.800
309.00	1.000
310.00	1.300
311.00	1.500
312.00	1.800
313.00	2.000
314.00	2.300
315.00	2.600
316.00	2.800
317.00	5.600
318.00	6.500
319.00	8.000
320.00	19.400
321.00	28.300
322.00	31.200

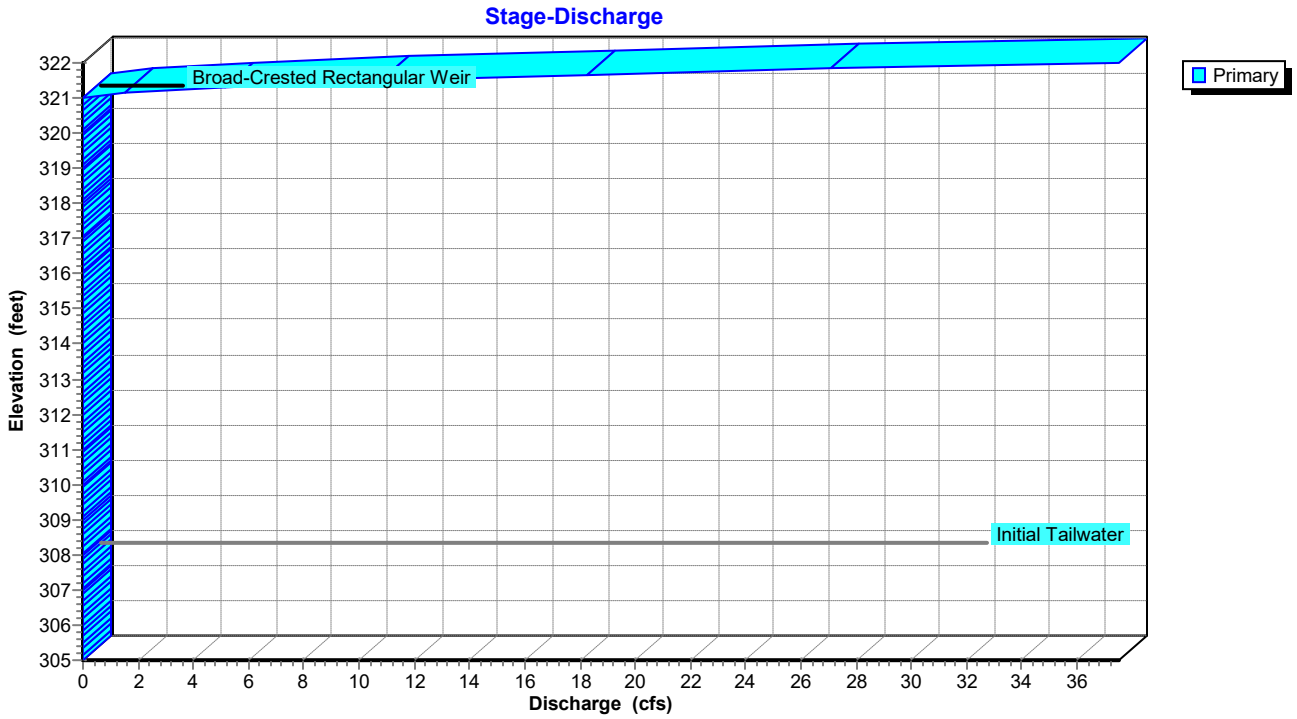
Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	**10.0' long + 5.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=316.00' TW=308.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

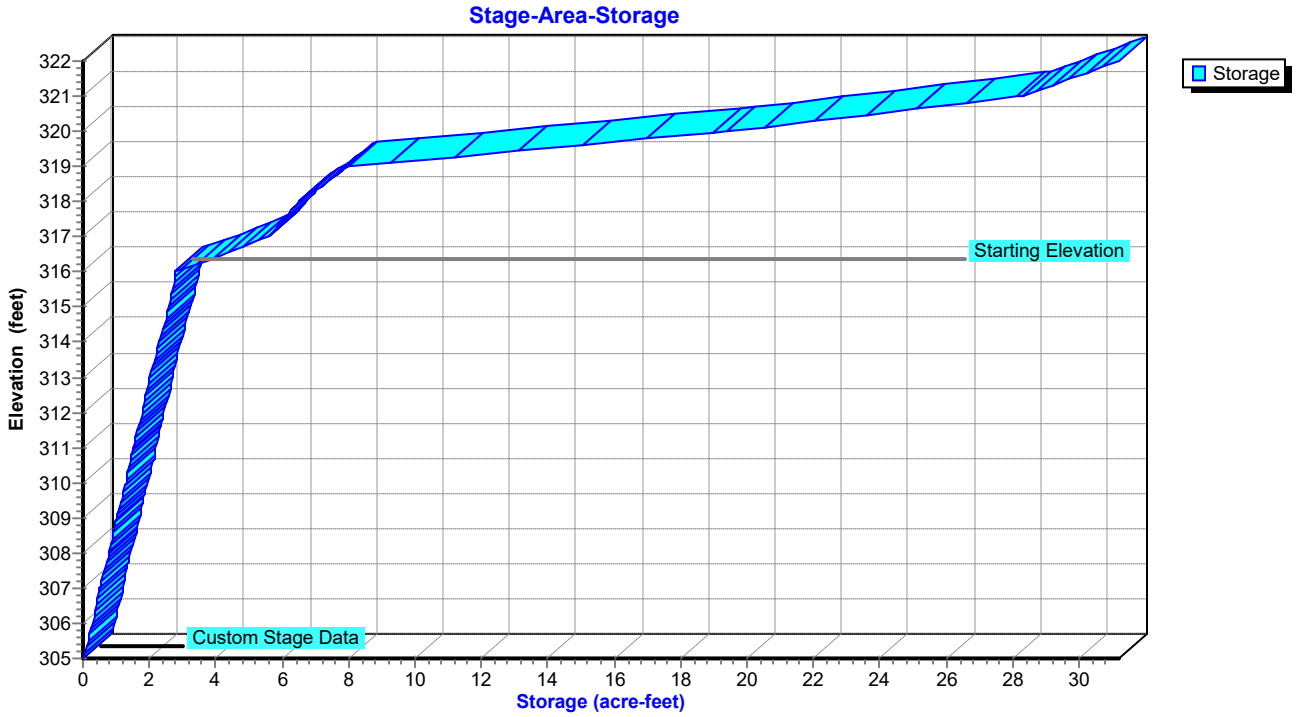
Pond FA: Fly Ash Pond



Pond FA: Fly Ash Pond



Pond FA: Fly Ash Pond



Hydrograph for Pond FA: Fly Ash Pond

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.01	2.800	316.00	**0.00**
0.50	2.66	2.891	316.03	0.00
1.00	2.79	3.004	316.07	0.00
1.50	2.92	3.122	316.11	0.00
2.00	3.04	3.245	316.16	0.00
2.50	3.17	3.373	316.20	0.00
3.00	3.30	3.507	316.25	0.00
3.50	3.43	3.646	316.30	0.00
4.00	3.55	3.790	316.35	0.00
4.50	3.79	3.941	316.41	0.00
5.00	4.05	4.103	316.47	0.00
5.50	4.30	4.276	316.53	0.00
6.00	4.56	4.459	316.59	0.00
6.50	4.81	4.652	316.66	0.00
7.00	5.07	4.856	316.73	0.00
7.50	5.32	5.071	316.81	0.00
8.00	5.58	5.296	316.89	0.00
8.50	6.70	5.547	316.98	0.00
9.00	7.97	5.850	317.28	0.00
9.50	8.17	6.187	317.65	0.00
10.00	9.90	6.555	318.04	0.00
10.50	12.80	7.022	318.35	0.00
11.00	17.59	7.644	318.76	0.00
11.50	**28.75**	8.584	319.05	0.00
12.00	**304.80**	15.333	319.64	0.00
12.50	26.71	18.147	319.89	0.00
13.00	16.60	18.985	319.96	0.00
13.50	12.55	19.580	320.02	0.00
14.00	9.84	20.040	320.07	0.00
14.50	8.69	20.419	320.11	0.00
15.00	7.80	20.759	320.15	0.00
15.50	6.90	21.063	320.19	0.00
16.00	6.01	21.330	320.22	0.00
16.50	5.60	21.568	320.24	0.00
17.00	5.28	21.793	320.27	0.00
17.50	4.96	22.005	320.29	0.00
18.00	4.64	22.204	320.32	0.00
18.50	4.33	22.389	320.34	0.00
19.00	4.01	22.561	320.36	0.00
19.50	3.69	22.720	320.37	0.00
20.00	3.37	22.866	320.39	0.00
20.50	3.26	23.002	320.40	0.00
21.00	3.20	23.136	320.42	0.00
21.50	3.14	23.267	320.43	0.00
22.00	3.07	23.395	320.45	0.00
22.50	3.01	23.521	320.46	0.00
23.00	2.95	23.644	320.48	0.00
23.50	2.88	23.764	320.49	0.00
24.00	2.81	**23.882**	**320.50**	0.00

Stage-Discharge for Pond FA: Fly Ash Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
305.00	0.00	310.20	0.00	315.40	0.00	320.60	0.00
305.10	0.00	310.30	0.00	315.50	0.00	320.70	0.00
305.20	0.00	310.40	0.00	315.60	0.00	320.80	0.00
305.30	0.00	310.50	0.00	315.70	0.00	320.90	0.00
305.40	0.00	310.60	0.00	315.80	0.00	321.00	0.00
305.50	0.00	310.70	0.00	315.90	0.00	321.10	0.82
305.60	0.00	310.80	0.00	316.00	0.00	321.20	2.41
305.70	0.00	310.90	0.00	316.10	0.00	321.30	4.65
305.80	0.00	311.00	0.00	316.20	0.00	321.40	7.51
305.90	0.00	311.10	0.00	316.30	0.00	321.50	11.16
306.00	0.00	311.20	0.00	316.40	0.00	321.60	15.56
306.10	0.00	311.30	0.00	316.50	0.00	321.70	20.20
306.20	0.00	311.40	0.00	316.60	0.00	321.80	25.41
306.30	0.00	311.50	0.00	316.70	0.00	321.90	31.18
306.40	0.00	311.60	0.00	316.80	0.00	322.00	**37.52**
306.50	0.00	311.70	0.00	316.90	0.00		
306.60	0.00	311.80	0.00	317.00	0.00		
306.70	0.00	311.90	0.00	317.10	0.00		
306.80	0.00	312.00	0.00	317.20	0.00		
306.90	0.00	312.10	0.00	317.30	0.00		
307.00	0.00	312.20	0.00	317.40	0.00		
307.10	0.00	312.30	0.00	317.50	0.00		
307.20	0.00	312.40	0.00	317.60	0.00		
307.30	0.00	312.50	0.00	317.70	0.00		
307.40	0.00	312.60	0.00	317.80	0.00		
307.50	0.00	312.70	0.00	317.90	0.00		
307.60	0.00	312.80	0.00	318.00	0.00		
307.70	0.00	312.90	0.00	318.10	0.00		
307.80	0.00	313.00	0.00	318.20	0.00		
307.90	0.00	313.10	0.00	318.30	0.00		
308.00	0.00	313.20	0.00	318.40	0.00		
308.10	0.00	313.30	0.00	318.50	0.00		
308.20	0.00	313.40	0.00	318.60	0.00		
308.30	0.00	313.50	0.00	318.70	0.00		
308.40	0.00	313.60	0.00	318.80	0.00		
308.50	0.00	313.70	0.00	318.90	0.00		
308.60	0.00	313.80	0.00	319.00	0.00		
308.70	0.00	313.90	0.00	319.10	0.00		
308.80	0.00	314.00	0.00	319.20	0.00		
308.90	0.00	314.10	0.00	319.30	0.00		
309.00	0.00	314.20	0.00	319.40	0.00		
309.10	0.00	314.30	0.00	319.50	0.00		
309.20	0.00	314.40	0.00	319.60	0.00		
309.30	0.00	314.50	0.00	319.70	0.00		
309.40	0.00	314.60	0.00	319.80	0.00		
309.50	0.00	314.70	0.00	319.90	0.00		
309.60	0.00	314.80	0.00	320.00	0.00		
309.70	0.00	314.90	0.00	320.10	0.00		
309.80	0.00	315.00	0.00	320.20	0.00		
309.90	0.00	315.10	0.00	320.30	0.00		
310.00	0.00	315.20	0.00	320.40	0.00		
310.10	0.00	315.30	0.00	320.50	0.00		

Stage-Area-Storage for Pond FA: Fly Ash Pond

Elevation (feet)	Storage (acre-feet)
305.00	0.000
305.20	0.060
305.40	0.120
305.60	0.180
305.80	0.240
306.00	0.300
306.20	0.340
306.40	0.380
306.60	0.420
306.80	0.460
307.00	0.500
307.20	0.560
307.40	0.620
307.60	0.680
307.80	0.740
308.00	0.800
308.20	0.840
308.40	0.880
308.60	0.920
308.80	0.960
309.00	1.000
309.20	1.060
309.40	1.120
309.60	1.180
309.80	1.240
310.00	1.300
310.20	1.340
310.40	1.380
310.60	1.420
310.80	1.460
311.00	1.500
311.20	1.560
311.40	1.620
311.60	1.680
311.80	1.740
312.00	1.800
312.20	1.840
312.40	1.880
312.60	1.920
312.80	1.960
313.00	2.000
313.20	2.060
313.40	2.120
313.60	2.180
313.80	2.240
314.00	2.300
314.20	2.360
314.40	2.420
314.60	2.480
314.80	2.540
315.00	2.600
315.20	2.640
315.40	2.680
315.60	2.720
315.80	2.760
316.00	2.800
316.20	3.360
316.40	3.920
316.60	4.480
316.80	5.040
317.00	5.600
317.20	5.780
317.40	5.960
317.60	6.140
317.80	6.320
318.00	6.500
318.20	6.800
318.40	7.100
318.60	7.400
318.80	7.700
319.00	8.000
319.20	10.280
319.40	12.560
319.60	14.840
319.80	17.120
320.00	19.400
320.20	21.180
320.40	22.960
320.60	24.740
320.80	26.520
321.00	28.300
321.20	28.880
321.40	29.460
321.60	30.040
321.80	30.620
322.00	**31.200**