

225 North Pearl Street
Jacksonville, FL 32202-
4513



Nate Senn
Florida Department of Environmental Protection
Office of Siting Coordination
2600 Blair Stone Road, MS 5500
Tallahassee, FL 32399-2400

Re: JEA St. Johns River Power Park Unit 3, PA 81-13A2
Response to Second Determination of Incompleteness

Dear Mr. Senn,

Pursuant to Section 403.5066(2)(b), Florida Statutes, JEA hereby submits information responsive to the Florida Department of Environmental Protection's Second Determination of Incompleteness issued September 8, 2026.

Electronic copies of these responses are being provided via email to the other reviewing agencies and parties, along with copies to the public library, as indicated on the attached distribution list.

We look forward to continuing to work with you, the Department and other agencies participating in the site certification process. Should you or any other agency representatives have any questions regarding this submittal please do not hesitate to contact me at (904) 537-6948 or via email at holbke@jea.com.

Sincerely,

Kevin Holbrooks

Kevin Holbrooks,
JEA
Sr Director, Environmental Services

**Distribution List for
JEA St. Johns River Power Park Unit 3
Completeness Responses – September 10, 2026**

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303 N. Laura St.
Jacksonville, FL 32202
(352) 357-5686

1 paper copy; 1 electronic copy

JEA Responses to Completeness Questions from FDEP NED

- 1. The proposed Oil/Water Separator Maintenance Requirements would allow oil discharge to stormwater Pond B-01 up to 15 ppm and does not have monitoring for any other chemicals when receiving contact water and water from chemical secondary containment. Since stormwater pond discharges to surface water, any effluent to stormwater pond must meet surface water quality standards. The proposal does not provide reasonable assurance meeting such standards and therefore should be removed. Please revise the design to disconnect between the oil/water separator and the stormwater pond. Refer to rule 62-330.301(1), F.A.C.**

The previous note regarding a 15-ppm oil content was a misstatement and has been corrected on the Contact Stormwater Management Plan (CSMP). The proposed oil/water separator (OWS) would be specified per UL-SU2215 standards. Facility controls including the OWS are intended to ensure compliance with the 5.0 mg/L dissolved or emulsified oil and grease criterion for Class III waters contained in Rule 62-302.530(50), F.A.C. Notes have been added to the CSMP describing the contact stormwater system process. JEA has agreed to the addition of isolation valves and sampling and inspection both upstream and downstream of the OWS prior to release of treated stormwater to Pond B-01. Additional sampling will be conducted at the B-01 outfall in accordance with the Facility Monitoring Program. Monitoring, operational controls, inspection procedures, sampling requirements, and release authorization protocols will be implemented through the facility Spill Prevention and Control Countermeasure (SPCC) Plan, SWPPP, and Operation and Maintenance Procedures. Therefore, the additional check values along with sampling and monitoring should provide reasonable assurance that system has been designed and will be operated such that discharges from the stormwater management system will not cause or contribute to exceedances of applicable Florida Surface Water Quality Standards, including the 5.0 mg/L dissolved or emulsified oil and grease criterion for Class III Waters contained in Rule 62-320.530(50), F.A.C. No undissolved oil or visible oil is anticipated to be discharged in compliance with Rule 62-320.530(50)(b), F.A.C. Further, the stormwater management system will not cause degradation to any Outstanding Florida Waters per Rule 62-4.242(2)(a), F.A.C.

In addition, the referenced chemical containment that routes to the OWS is the Ammonia Secondary Containment. The secondary containment area for the Ammonia Bulk Storage Tank would have an integrated manual isolation valve. In accordance with standard industry practice, this valve remains closed to isolate the basin. Accumulated rainwater will only be discharged to the OWS after a physical inspection and release confirmation. In the event of an ammonia spill, proper emergency cleanup procedures will be executed in accordance with the site's Environmental Control Plan. The isolation

valve will remain locked, and no stormwater or chemical runoff will be released from the basin until the cleanup is completed. A note has been added to the CSMP addressing the release of accumulated stormwater.

2. **Outflow pipes from the proposed riser structures will be connect to the existing 30" (B-01) and 36" (B-02) culverts according to design. Therefore, the control elevations are the riser weir elevations (B-01 8.50', B-02 14.50'). However, HydroCAD model Summary for Pond POND B-01: POND B-01 and Summary for Pond POND B-02: POND B-02 still show that primary discharges from the retention ponds are existing 30" and 36" culverts at the pond bottoms (B-01 6.60', B-02 12.00'). Such input artificially lowers the pond peak stages in the model report resulting in an unintended design error. Please verify and update the report and design. Refer to Section 5.1 of Volume II Applicant's Handbook.**

As shown in the Stage-Discharge reports, the culvert outlets are not activated until the water surface overtops the riser weir. See Basin 1 example from the report below:

Elevation (feet)	Discharge (cfs)	^{"INFILTRATION OUTLET"} Discarded (cfs)	^{"CULVERT OUTLET"} Primary (cfs)	^{"EMERGENCY SPILLWAY WEIR"} Secondary (cfs)
5.60	0.00	0.00	0.00	0.00
5.80	2.40	2.40	0.00	0.00
6.00	2.58	2.58	0.00	0.00
6.20	2.75	2.75	0.00	0.00
6.40	2.93	2.93	0.00	0.00
6.60	5.33	5.33	0.00	0.00
6.80	5.62	5.62	0.00	0.00
7.00	5.93	5.93	0.00	0.00
7.20	6.24	6.24	0.00	0.00
7.40	6.55	6.55	0.00	0.00
7.60	6.87	6.87	0.00	0.00
7.80	7.18	7.18	0.00	0.00
8.00	7.49	7.49	0.00	0.00
8.20	7.80	7.80	0.00	0.00
8.40	8.12	8.12	0.00	0.00
8.60	8.43	8.43	0.00	0.00
8.80	8.89	8.75	0.15	0.00
9.00	10.68	9.06	1.61	0.00
9.20	13.24	9.38	3.86	0.00
9.40	16.33	9.70	6.63	0.00
9.60	19.83	10.01	9.81	0.00
9.80	23.66	10.33	13.33	0.00
10.00	27.78	10.65	17.14	0.00
10.20	32.15	10.96	21.18	0.00
10.40	36.72	11.28	25.44	0.00
10.60	41.47	11.60	29.87	0.00
10.80	46.38	11.92	34.46	0.00
11.00	51.42	12.24	39.18	0.00
11.20	56.57	12.56	44.02	0.00
11.40	61.83	12.88	48.95	0.00
11.60	69.23	13.20	56.03	0.00
11.80	72.24	13.52	58.72	0.00
12.00	74.03	13.84	60.19	0.00
12.20	75.78	14.16	61.62	0.00
12.40	77.50	14.48	63.02	0.00
12.60	81.62	14.81	64.39	2.43
12.80	94.30	15.13	65.73	13.44
13.00	114.11	15.45	67.05	31.61
13.20	140.30	15.77	68.34	56.19
13.40	170.97	16.09	69.60	85.28

FIRST ACTIVATION OF THE PRIMARY OUTLET (I.E. RISER WEIR OVERFLOW TO CULVERT) DOES NOT OCCUR UNTIL THE WATER OVERTOPS THE RISER WEIR AT AN ELEVATION OF 8.75'.

At Elev. 8.60 ft, no primary discharge occurs, while at Elev. 8.80 ft the primary outlet first activates (0.41 cfs), confirming that the riser weir controls the pond discharge as

intended. Prior to overtopping the weir, all outflow is handled through the exfiltration ("Discarded") outlet. In addition, HydroCAD screenshots that show the routing of each outlet have been added to Appendix I of the report.

- 3. BMPTrains indicate that in addition to swale volumes, Pond B-01 retention volume needs to be 19.0 acft to achieve total treatment efficiency of 95%. However, pond stage-volume data shown in the report indicates that the pond volume at control elevation of 8.50' (serving as treatment volume elevation) is only 17.2 acft. Please verify. Also, please add a pond stage-area-volume table including both B-01 and B-02 ponds to the design plan set. Refer to Part 1 of ERP form Section E.**

The 19 ac-ft storage volume accounted for the 20% void storage within the sand medium in addition to the pond storage volume. Storage from the sand medium has been subtracted from the stage-storage tables for B-01 in this revision. The weir elevation from pond B-01 has been raised from 8.50' to 8.75' to make up for the difference in retention volume noted here.

Stage-area-volume tables for both B-01 and B-02 have been added to sheet DS-1111.

- 4. Since swales are part of treatment series according to the updated BMPTrains and will function via percolation, please demonstrate that each swale can recover the required treatment volume via percolation within 72 hours following a storm event. Also, please provide a complete Drawdown Time report for Pond B-01 beginning from hour 0.00 (instead of hour 23.5) so that drawdown volume can be verified. Refer to Section 5.3 of Volume II Applicant's Handbook.**

Swale recovery calculations have been added to Appendix J to demonstrate percolation within 72 hours.

The B-01 drawdown report has been revised in Appendix I of the report to begin at hour 0.00.

- 5. There are no activities proposed in the 28-ac B-03 area according to the design plans, HydroCAD, and BMPTrains. Pond B-01 and B-02 are not proposed to treat this area according BMPTrains; and HydroCAD quantity modeling shows no change in land cover from predevelopment conditions to post conditions. Therefore, it is suggested to change the Unit 3 project area across all documents from 195 acres to 167 acres to avoid any confusion. Any future activities in the 28-ac will require a separate Amendment authorization. Refer to rule 62-330.060(1), F.A.C.**

The SJRPP Unit 3 Site for purposes of this certification is 194 acres. The approximately 28 acres within B-03 basin will not be disturbed during construction and therefore no stormwater treatment is required, nor proposed for this basin. The basin drainage areas and summary tables in the Stormwater Management System Plans have been revised to reflect only 167.7 acres within the drainage analysis. The Stormwater Report has also been revised to reflect the difference between the Project Site and the area managed by the stormwater management system. It is understood that future proposed land disturbance activities within the B-03 basin will require additional authorization from DEP.

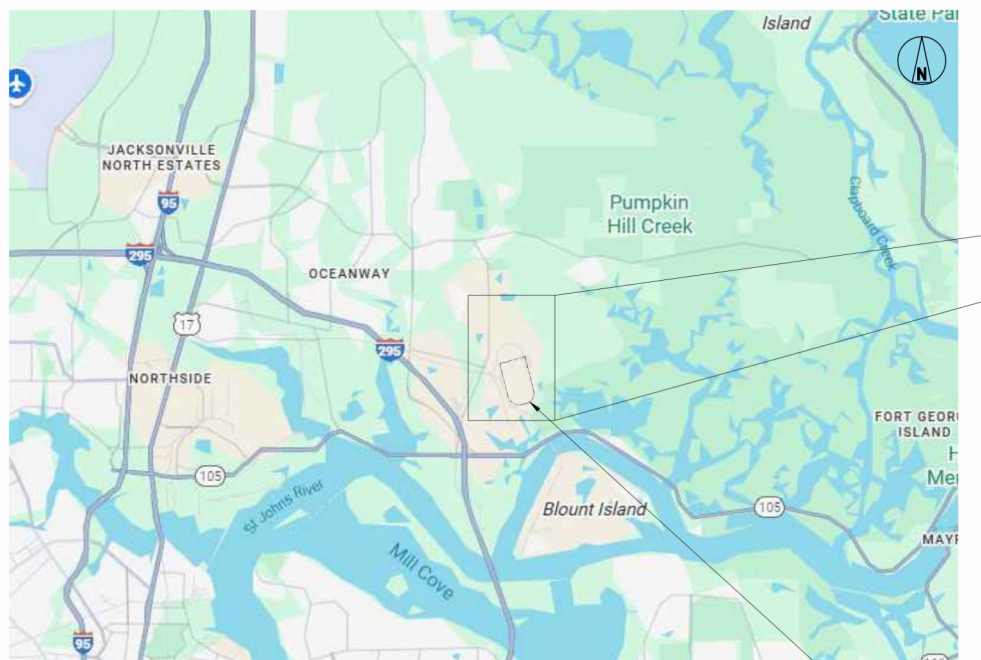
6. The design plan set is very blurry. Please provide a clear, signed, and sealed set. Refer to Part 2 of ERP form Section E.

A revised set of clearly legible signed and sealed plans is attached.

JEA St Johns River Power Park Unit 3
Stormwater Management System
Plans

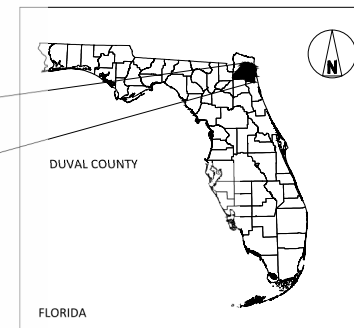
**SECTION 12, 13, TOWNSHIP 15, RANGE 27E
11201 NEW BERLIN ROAD
CITY OF JACKSONVILLE, DUVAL COUNTY, FLORIDA**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
24014-D5-0000	COVER SHEET
24014-D5-1000	OVERALL PLOT PLAN
24014-D5-1001	SITE ARRANGMENT
24014-D5-1101	PRE-DEVELOPMENT STORMWATER MANAGEMENT PLAN- PERMANENT REDEVELOPMENT AREA
24014-D5-1102	PROPOSED STORMWATER MANAGEMENT PLAN- PERMANENT REDEVELOPMENT AREA
24014-D5-1103	CONTACT STORMWATER MANAGEMENT PLAN
24014-D5-1104	PROPOSED STORMWATER MANAGEMENT SECTIONS AND DETAILS
24014-D5-1110	PROPOSED GRADING & DRAINAGE PLAN
24014-D5-1111	GRADING & DRAINAGE PLAN SECTIONS AND DETAILS
24014-D5-1120	EROSION AND SEDIMENT CONTROL PLAN
24014-D5-1121	EROSION CONTROL SECTIONS AND DETAILS



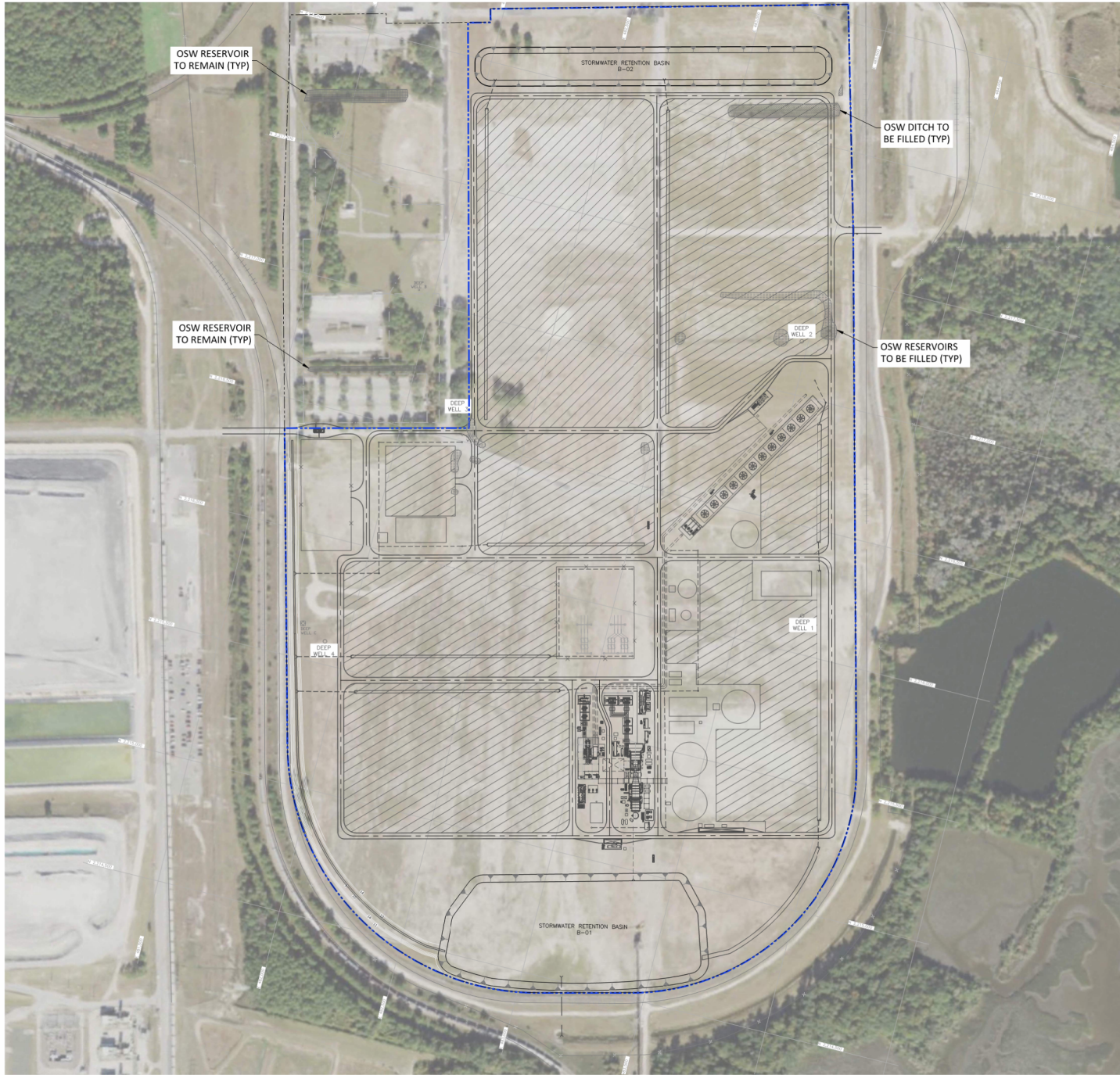
LOCATION MAP

NOT TO SCALE

— JEA ST. JOHNS RIVER
POWER PLANT PROJECTISSUED FOR
PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

[illegible]



JEA ST JOHNS RIVER POWER PLANT PROJECT

LAND OWNER: JEA

APPLICANT/LESSEE/PROJECT DEVELOPER: JEA

ENGINEER:

SURVEYOR:

JOHN BARRANCO JR, P.E.

SEE NOTE ON PRE-DEVELOPMENT STORMWATER MANAGEMENT PLAN PERMANENT REDEVELOPMENT AREA (DS-1101) REGARDING SURVEY.

12740 GRAN BAY PKWY, SUITE 250

JACKSONVILLE, FL 32216

1. PROJECT NAME:

JEA SIRPP UNIT 3

2. LOCATION:

JACKSONVILLE, FLORIDA

3. LAND USE:

EXISTING LAND USE: PUBLIC BUILDINGS AND FACILITIES
FUTURE LAND USE: INDUSTRIAL SACTUARY

4. PROJECT DESCRIPTION:

706MW NEW COMBINED CYCLE NATURAL GAS FACILITY

5. SEC/TOWN/RANGE:

SECTIONS 12, 13, TOWNSHIP 1S, RANGE 27E

6. TOTAL PROPERTY AREA:

1,600 AC

7. TOTAL SCA CERTIFICATION AREA:

194 AC

8. TOTAL PROJECT DEVELOPMENT/STORMWATER ANALYSIS AREA:

167.7 AC

9. ZONING:

PBF-1 (PUBLIC BUILDING AND FACILITIES)

10. FLOOD ZONE:

PROJECT LIMITS ARE COVERED UNDER FEMA FIRM MAP NUMBER 12031C0216J
EFFECTIVE DATE: NOVEMBER 02, 2018.

PROJECT LIMITS ARE WITHIN FEMA ZONE X, WITH THE NEAREST ADJACENT ZONE AE HAVING AN ESTABLISHED BFE OF 6FT - NAVD88. THE LOWEST SITE GRADE ELEVATION AROUND EQUIPMENT IS 18FT - NAVD88 THEREFORE SIGNIFICANTLY HIGHER THAN THE NEAREST ESTABLISHED 100 YEAR ELEVATION

11. UTILITY SERVICE:

JEA

12. PROPERTY SETBACKS:

NONE (PBF-1 ZONING)

13. MAXIMUM HEIGHT OF STRUCTURE:

NONE (PBF-1 ZONING)

14. OTHER SURFACE WATER (OSW) IMPACTS:

1.3 AC

15. PROPOSED IMPERVIOUS AND PERVIOUS TABLE SUMMARY

SUB BASIN	OPERATION PHASE SITE ACREAGE AND SURFACING				BASIN SURFACE AREA IMPERVIOUS
	TOTAL AREA	PERVIOUS	IMPERVIOUS*		
	ACRES	% IMPERVIOUS	ACRES	ACRES	ACRES
B-01	111.2	77%	35.6	75.6	10.5
B-02	56.4	85%	13.7	42.8	5.0
Total	167.7	80%	49.3	118.4	15.5

*Impervious areas include equipment areas, storage tanks, laydown areas, roads, and proposed buildings.

16. PROPOSED PROJECT LIMITS SURFACING SUMMARY

POST-DEVELOPMENT PROJECT LIMITS SURFACING SUMMARY			
SUB BASIN	ACRES	CURVE NUMBER	STORMWATER SYSTEM
B-01	111.2	95	Proposed Pond - B-01
B-02	56.4	94	Proposed Pond - B-02
Total Drainage Area/ Weighted CN	167.7	95	

17. EXISTING PROJECT LIMITS SURFACING SUMMARY

PRE-DEVELOPMENT PROJECT LIMITS SURFACING SUMMARY			
SUB BASIN	ACRES	CURVE NUMBER*	STORMWATER SYSTEM
PR-2 MODIFIED	20.0	77	Existing offsite perimeter drainage channel
PR-3 MODIFIED	34.9	70	Existing offsite perimeter drainage channel
PR-4 MODIFIED	20.8	77	Existing offsite perimeter drainage channel
PR-6	91.4	67	Existing offsite perimeter drainage channel
POND OVERFLOW MODIFIED	0.7	97	Existing offsite perimeter drainage channel
Total Drainage Area/ Weighted CN	167.7	70	

*For the purposes of this study, the curve number assumptions from the JEA St. Johns River Power Park Decommissioning and Restoration Drainage Analysis Report (Adkinson Engineering, November 2017) was used for all pre-development basins.

ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

1	06/01/2024	ISSUED FOR CLIENT REVIEW	JMB/AEL/OC/KSB/JCB	1	06/01/2024	ISSUED FOR CLIENT REVIEW	JMB/AEL/OC/KSB/JCB
2	06/01/2024	ISSUED FOR INFORMATION	JMB/AEL/OC/KSB/JCB	2	06/01/2024	ISSUED FOR INFORMATION	JMB/AEL/OC/KSB/JCB
3	03/28/2024	ISSUED FOR INFORMATION	JMB/AEL/OC/KSB/JCB	3	03/28/2024	ISSUED FOR INFORMATION	JMB/AEL/OC/KSB/JCB
4	03/29/2024	ISSUED FOR INFORMATION	JMB/AEL/OC/KSB/JCB	4	03/29/2024	ISSUED FOR INFORMATION	JMB/AEL/OC/KSB/JCB
5	03/29/2024	ISSUED FOR PERMITTING	JMB/AEL/OC/KSB/JCB	5	03/29/2024	ISSUED FOR PERMITTING	JMB/AEL/OC/KSB/JCB

BLACK & VEATCH CORPORATION
13401 LAMAR AVENUE
OVERLAND PARK, KANSAS 66211
FLORIDA REGISTRATION NO. 8332

BLACK & VEATCH

ENGINEERING

JEA
SIRPP UNIT 3
OVERALL FLOT PLAN

PROJECT
424014-DS-1000

DATE
06/01/2024

1"=150'

150' 75' 0' 150' 300'

PLANT NORTH
TRUE NORTH

14°

424014-DS-1000

4



PRE-DEVELOPMENT PROJECT LIMITS SURFACING SUMMARY			
SUB BASIN	ACRES	CURVE NUMBER	STORMWATER SYSTEM
PR-2 MODIFIED	20.0	77	Existing offsite perimeter drainage channel
PR-3 MODIFIED	34.9	70	Existing offsite perimeter drainage channel
PR-4 MODIFIED	20.8	77	Existing offsite perimeter drainage channel
PR-6	91.4	67	Existing offsite perimeter drainage channel
POND OVERFLOW MODIFIED	0.7	97	Existing offsite perimeter drainage channel
Total Drainage Area/Weighted CN		167.7	70

*For the purposes of this study, the curve number assumptions from the IEA St. Johns River Power Park Decommissioning and Restoration Drainage Analysis Report (Adkins on Engineering, November 2017) was used for all pre-development basins.

NOTES

- ELEVATIONS ARE REPORTED AS NAVD83.
- ALL EXISTING FEATURES SHOWN ON THIS DRAWING ARE REFERENCED FROM IEA PROVIDED AS-BUILT SURVEY: SRPP POST-DEMOLITION UNDERGROUND STRUCTURES (DATED 8-8-22).
- EXISTING ELEVATIONS ARE REFERENCED FROM IEA PROVIDED CONSTRUCTION AS-BUILT SURVEY: 2021-1389-CLIENT NO ZONES (DATED 2021).
- IEA 300-YEAR FLOOD ELEVATIONS ARE BASED ON THE NATIONAL FLOOD INSURANCE FIRM MAP NO. 1309-020350 EFFECTIVE DATE OF 11/02/2018. THE PROPOSED PROJECT DEVELOPMENT IS WITHIN FEMA ZONE K, HOWEVER ZONE AE IS DIRECTLY ADJACENT TO THE SITE AND SHOWN FOR REFERENCE.
- THE PERIMETER CHANNEL IS THE LINEAR POINT OF ANALYSIS FOR PRE- AND POST-DEVELOPMENT CONDITIONS.
- THE EXISTING POND IS CURRENTLY THE PERMITTED SCA OUTFALL LOCATION. THE EXISTING POND DISCHARGES TO BROWNS CREEK. FOR ADDITIONAL INFORMATION REGARDING THIS OUTFALL LOCATION AND ASSOCIATED PERMITTING LIMITS, REFER TO THE IEA ST. JOHNS RIVER POWER PARK DECOMMISSIONING AND DEMOLITION PLANS PREPARED BY ATKINSON ENGINEERING, DATED NOVEMBER 30, 2017.
- THE PROJECT UTILIZES THE PROJECT BOUNDARY AS THE HYDROLOGIC CONTROL POINT FOR PRE- AND POST-DEVELOPMENT STORMWATER CALCULATIONS. PROPOSED PROJECT IMPROVEMENTS ARE LOCATED UPSTREAM OF THIS CONTROL POINT. NO MODIFICATIONS ARE PROPOSED BETWEEN THE PROJECT BOUNDARY AND THE EXISTING PERMITTED OUTFALL; ACCORDINGLY, BASED ON THE PROPOSED CONDITIONS, PRE- AND POST-DEVELOPMENT DISCHARGE CRITERIA ARE DEMONSTRATED TO BE MET AT THE EXISTING PERMITTED OUTFALL.

LEGEND

	PRE-DEVELOPMENT BASIN LINEWORK
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	PROPOSED PROJECT DEVELOPMENT BOUNDARY
	PROPOSED PROJECT BOUNDARY
	GRADE SURFACE FLOW INDICATOR
	FEMA 300-YEAR FLOOD ZONE
	OSW RESERVOIRS
	OSW DITCHES
	BASIN OUTFALL LOCATION



ISSUED FOR PERMITTING

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JEA
ST. JOHNS RIVER POWER PARK
PERMANENT REDEVELOPMENT AREA

PROJECT
424014-05-1101

DATE
4/24/24

1	08/01/2024	ISSUED FOR CLIENT REVIEW	JCM/AKH	DC	JCB	JCB
2	05/15/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
3	03/18/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
4	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
5	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
6	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
7	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
8	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
9	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
10	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
11	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
12	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
13	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
14	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
15	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
16	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
17	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
18	01/25/2024	ISSUED FOR INFORMATION	JCM/AKH	DC	JCB	JCB
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NOTE: SEE SEDIMENT

- SKIMMER SEDIMENT BASIN AND ROCK CHECK DAM NOTES



- NOT TO SCALE

SEEDING MIXTURES, RATES AND DATES

EROSION & SEDIMENT CONTROL MAINTENANCE SCHEDULE

THE FOLLOWING PROCEDURES WILL BE USED TO MAINTAIN EROSION AND SEDIMENTATION CONTROLS:

1. A RECORD OF THE RAINFALL AMOUNTS AND DATES SHALL BE KEPT BY THE CONTRACTOR.
2. FIELD SENSING SHALL BE CONDUCTED AT LEAST ONCE PER WEEK, ATTACHMENT TO POST AND STABILITY. COMPOST FIBER SODS SHALL BE INSPECTED PER CHECKLIST ON SHEET 55-1231.
3. FOR SPECIFIC MAINTENANCE REQUIREMENTS FOR EACH SPECIFIC EROSION CONTROL BMP, REFER TO STATE SHEET 55-1231.
4. EROSION CONTROL MAINTENANCE SCHEDULES SHALL BE DEVELOPED FOR EACH EROSION CONTROL BMP AND SHALL BE REVIEWED AND APPROVED BY THE CONTRACTOR AND THE DISTRICT ENGINEER.
5. INSPECTOR CONVEYANCE DOCUMENTS RATING FROM THE SITE TO DETERMINE IF ANY SEDIMENT HAS BEEN DISPOSED OFFSITE.
6. INSPECTOR SURVEYS AREA FOR BARE SOILS AND WASHING.
7. THE CONTRACTOR WILL SELECT INDIVIDUALS QUALIFIED FOR INSPECTIONS, MAINTENANCE, REPAIRS AND REPORTING. THE DESIGNATED INSPECTORS WILL RECORD THE NECESSARY TRAINING FROM THE CONTRACTOR TO PROPERLY INSPECT AND MAINTAIN THE EROSION & SEDIMENT WORKING AREAS.
8. AN INSPECTION FORM WILL BE COMPLETED AFTER EACH INSPECTION.
9. WHEN EROSION CONTROL BMPs ARE REMOVED DRAINAGE SHALL BE FILLED WITH STABILIZED COMPACTED BACKFILL, DISTURBED AREAS SHALL BE RESEED AND REVEGETATION SHALL BE ESTABLISHED.

NOTES

1. SEE DRAWINGS 05-120 FOR EROSION CONTROL PLANS.
2. EROSION AND SEDIMENT CONTROL MEASURE DETAILS CAN BE ALTERED AS NEEDED BY THE PROJECT SITE MANAGER WITH THE APPROVAL OF THE ENGINEER. RECORDS OF CHANGES SHALL BE MAINTAINED ON THE DRAWINGS AND SUPPLY THROUGH THE END OF CONSTRUCTION. IF DESIGN CHANGES ARE DEEMED NECESSARY, THE PROJECT MANAGER SHALL CONTACT THE DESIGN ENGINEER TO DISCUSS DESIGN CHANGE/CONSTRUCTION.
3. INSTALL A STABILIZATION/CONSTRUCTION ENTRANCE WITH FILTER FABRIC UNDERLAIN AT THE ACCESS ROAD ENTRANCE AND ANY SECONDARY ENTRANCES. SEE DETAIL ON THIS DRAWING.
4. CONTRACTOR SHALL PROVIDE DUST CONTROL AS NEEDED.
5. ALL TEMPORARY CONSTRUCTION FACILITIES AND AREAS SHALL BE RESTORED TO PRE-EXISTING DRAINAGE PATHS AND SURFACING CONDITIONS AT THE END OF CONSTRUCTION.
6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO THE PAVED ROADSWAYS. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.



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JEA St Johns River Power Park Unit 3 Stormwater Management Calculations



Calculation Record

Client Name JEA

Project Name St. John's River Power Park Unit 3 Project No. 424014

Calculation Title Stormwater Management Calculation

Calculation No./File No. 58.1101.1101

Verification Method: ☒ Check and Review ☐ Alternate Calculations

Objective: The purpose of this stormwater management system calculation is to support the Site Certification Application for the proposed new combined cycle natural gas facility to be constructed at the St. Johns River Power Park.

Software-Generated Calculations Information

BV Standard Application
Program Name/Version Bentley StormCAD, Civil 3D, 2025 Edition, HydroCAD 10.20-5c

Review and Approval

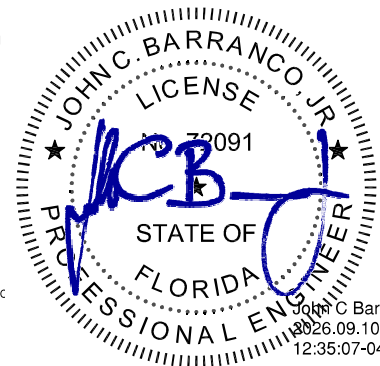
***Full name and signature required*

Rev	Prepared By**	Date	Verified By**	Date	Approved By**	Date
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3	Allison Kovarik	09/03/2026	Orinta Camacho	09/03/2026	John Barranco	09/04/2026

Contents of this calculation are to be considered confidential and proprietary business information of Black & Veatch

*Professional seal is only needed where project jurisdiction or client requirements dictate that calculations be signed/sealed.

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Stormwater Calculation Report

BLACK & VEATCH PROJECT NO. 424014
BLACK & VEATCH FILE NO. 58.1101.1101

PREPARED FOR



3 SEPTEMBER 2026



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2.0 Overall Project Description

JEA is proposing to construct a new combined cycle natural gas facility providing approximately 706 megawatts (MW) of electric generation. The Site is located in Duval County, Florida.

The purpose of this stormwater management system calculation is to support the Site Certification Application for the proposed new combined cycle natural gas facility to be located at St. Johns River Power Park (SJRPP). This calculation is provided to document stormwater design assumptions, system capacity, and compliance considerations consistent with applicable regulatory requirements. The Project Site is located within portions of Sections 12 and 13, Township 1 South, Range 27 East, and is currently subject to the Florida Department of Environmental Protection Site Certification Conditions of Certification PA 81-13Q, as modified on October 31, 2023.

The proposed Project will add 194 acres to the existing certified area. The existing certified areas outside of the proposed modification limits will continue to operate in accordance with the existing Conditions of Certification. All major existing offsite drainage parameters and outfall locations will remain intact, such as drainage ponds, outfall culverts, and all permanent stormwater ponds. The proposed stormwater management systems and best management practices described herein are limited to the proposed Project area and are designed to discharge to the existing certified conveyance and outfall locations. Within this report, stormwater management systems located outside the Project boundary are described as 'offsite' to differentiate them from systems located within the Project area.

The current drainage analysis and design encompass 167.7 acres which encompasses the true development area. This area is a subset of the overall post-demolition boundary of 524.5 acres and the total property boundary of approximately 1,600 acres. The M&R yard could not be excluded from the drainage analysis because it is centrally located within a larger contributing drainage area and hydraulically influences downstream stormwater flows. The construction laydown areas are included in the overall stormwater system analysis and are modeled as impervious areas.

The surface water management system for the Project will be designed to meet the requirements of the applicable local, regional, state, and federal requirements, which include the rules and regulations of the Client, SJRWMD, Duval County, The City of Jacksonville, Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA). The design philosophy for this Project is to provide water quality treatment for the volume of stormwater runoff from the Project via a dry retention pond and attenuate the post vs. pre-development stormwater runoff from a 25-year 24-hour design storm via outfall structures as required by the FDEP Rule 62-330 of the Florida Administrative Code. Refer to Appendix A for the proposed Site location.

3.0 Site Conditions

3.1 Land Cover and Land Use

3.1.1 Pre-Development Site Conditions

The existing stormwater management system for the proposed Project consists of multiple drainage areas that discharge to perimeter channels located outside the property boundary. These perimeter channels ultimately convey flow to a shared discharge point, an offsite stormwater pond situated east of the Project boundary which has ultimate discharge to the St. John's River. The existing land cover on the Site consists of mostly bare earth with sparse vegetation along with some impervious areas.

Curve numbers previously established in the JEA St. Johns River Power Park Decommissioning and Restoration Drainage Analysis Report prepared by Adkinson Engineering in November 2017 were used as the basis to establish existing pre-development conditions for each drainage basin. These values were approved under prior

stormwater permitting and were utilized to support the proposed stormwater management system for this application. Refer to Appendix H for more information.

Pre-Development drainage areas for this study were delineated from the larger existing basins identified in the Adkinson Engineering report to align with the proposed Project boundary. This approach allows for a direct comparison of the total pre- vs. post-development runoff directed toward the Site perimeter from our proposed development. For each sub-basin, the existing-condition curve number of the corresponding larger basin, as documented in the Adkinson Engineering report, was used as the basis. These curve numbers were then applied to develop the existing-condition hydrologic parameters for the sub-basins. Refer to Table 3-1 and Appendix H for a summary of pre-development peak runoff results and calculations for the 25-year, 24-hour storm.

Table 3-1 : Pre-Development Time-of-Concentration Calculations

PRE-DEVELOPMENT TIME OF CONCENTRATION (T _c) CALCULATIONS										
DRAINAGE AREA	TOTAL TIME OF CONC. TC (MIN)	SHEET FLOW					SHALLOW CONCENTRATED FLOW			
		tsheet = $0.007 (n^*L)0.8 / (P20.5*S0.4) / 60$					tshallow_unpaved = $L / (16.10*S0.5) / 60$			
		Manning's n	Flow L (ft)	P2 (in)	Slope (ft/ft)	tsheet (min)	Paved/ Unpaved	Flow L (ft)	Slope (ft/ft)	tshallow (min)
PR-2 MODIFIED	17.75	0.01	100.00	4.73	0.02	0.91	P	1626.90	0.010	16.84
PR-3 MODIFIED	13.02	0.01	100.00	4.73	0.01	1.22	P	1140.45	0.010	11.81
PR-4 MODIFIED	9.42	0.01	100.00	4.73	0.04	0.70	P	842.50	0.010	8.72
PR-6**	70.20	0.01	-	-	-	-	-	-	-	-
POND OVERFLOW MODIFIED	5.00	-	-	-	-	-	-	-	-	-

**Basin EX-6 parameters were not modified from the Adkinson Engineering decommissioning report. The original T_c values were retained.

Table 3-2: Pre-Development Peak Flow Summary

PRE-DEVELOPMENT DRAINAGE AREA SUMMARY						
SUB-BASIN ID	TOTAL DRAINAGE AREA (AC)	CN**	T _c	25-YR, 24-HR PEAK FLOW (CFS)	MEAN ANNUAL 24-HR PEAK FLOW (CFS)	TIME OF PEAK (HOURS)
PR-2 MODIFIED	20.0	77	17.75	56.22	23.95	12.5
PR-3 MODIFIED	34.9	70	13.02	93.44	35.03	12.5
PR-4 MODIFIED	20.8	77.00	9.42	70.31	30.00	12.25
PR-6	91.4	67.00	70.20	105.10	36.06	13.25
POND OVERFLOW MODIFIED	0.7	97	5.00	3.48	1.92	12.25
TOTAL	167.7	-	-	263.74*	101.57*	12.5

* Total peak flow represents the combined basin hydrograph routed through HydroCAD at 12.50 hours.
 **CN is assumed as the CN from the greater drainage area of the decommissioning report.

3.1.2 Post-Development Site Conditions

A plant loop road will surround the main equipment areas (power block) and will be asphalt surfaced. Maintenance access roads will also be asphalt surfaced. The area inside the plant loop road around the equipment foundations will be aggregate surfaced, along with the switchyard, plant equipment, and maintenance/laydown areas outside of the plant loop road. Areas outside the equipment areas and loop roads will be grass vegetated. The pond slopes and swales will be vegetated with seed or sodded. Major components of the existing drainage infrastructure will remain in place, including the exterior perimeter drainage ditches, the offsite stormwater pond, and most of the existing underground piping network. Refer to Appendix F for the proposed Site layout and stormwater management system.

The stormwater management system for the proposed facility has been designed in accordance with applicable requirements of the St. Johns River Water Management District (SJRWMD). Onsite surface flows will be modified through grading and a network of swales and catch basin inlets to direct runoff to the proposed dry retention ponds located on the Site. This system will provide water quality treatment, nutrient reduction, and discharge attenuation while maintaining the same ultimate downstream discharge point at the existing offsite wet pond located east of the Project boundary.

Flows routed to the offsite wet pond will be discharged at a rate lower than the existing condition. As a result, no adverse impacts to offsite surface water are anticipated from the construction or operation of the proposed facility. Refer to Table 3-3, Table 3-4, Table 4-3, and Appendix H for a summary of post-development peak results and calculations for the 25-year, 24-hour storm prior to pond routing.

Table 3-3: Post-Development Drainage Area Summary

POST-DEVELOPMENT DRAINAGE AREA SUMMARY										
BASIN ID	TOTAL DRAINAGE AREA (AC)	HSG A		HSG D		Impervious		Basin Area (Impervious Area)		Weighted CN
		GRASS (Poor)		GRASS (Poor)						
		Area (ac)	CN	Area (ac)	CN	Area (ac)	CN	Area (ac)	CN	
B-01	111.2	9.16	68	15.98	89	75.62	98	10.49	98	95
B-02	56.4	7.06	68	1.61	89	42.77	98	5.01	98	94

Table 3-4: Post-Development Peak Flow Summary

POST-DEVELOPMENT PEAK FLOW SUMMARY						
SUB-BASIN ID	TOTAL DRAINAGE AREA (AC)	CN	Tc	25-YR, 24-HR PEAK FLOW (CFS)	MEAN ANNUAL 24-HR PEAK FLOW (CFS)	TIME OF PEAK (HOURS)
B-01	111.2	95	28.02**	328.85	178.89	12.25
B-02	56.4	94	19.81**	189.74	102.34	12.25
TOTAL	167.7	-	-	514.86*	279.26*	12.25
* Total peak flow represents the combined basin hydrograph routed through HydroCAD at 12.25 hours.						
**Time of concentration represents the longest system flow time per basin from the StormCAD model.						

3.2 Contact Stormwater Management Plan

All potential oil-contaminated plant drains, including bell ups and floor drains will be conveyed to an oil/water separator for treatment. Following separation, the treated wastewater will be discharged to the existing blowdown system, which ultimately conveys flows to the Northside Generating Station (NGS).

Secondary containment areas that are fully bermed (bundled) and subject to oil contact will also be routed through the oil/water separator prior to discharge to the onsite detention pond. See Black & Veatch Drawing 424014-DS-1103 for a layout of the contact stormwater management plan (Appendix F).

Non-contact stormwater from the power block and switchyard areas will be conveyed to the pond via a stormwater sewer system, ditches and culverts. Non-Contact stormwater from the areas outside of the power block including the Construction Laydown/Maintenance areas will be conveyed to the ponds via the combination of overland flow, the storm sewer system, and swales.

3.3 Water Table and Infiltration Data

A geotechnical report was prepared by Terracon (Reference 15). According to the preliminary report, the groundwater elevation at the proposed pond location was observed at 3.017 feet and 8.837 feet for basins 1 and 2 respectively.

Infiltration testing was performed at all proposed pond locations. During review of the B-02 infiltration test results, an outlier was identified at location DRI-5. This value was not consistent with the remaining dataset and was therefore excluded from the calculation of the average infiltration rate for pond B-02. The average measured infiltration rates were found to be the following:

- B-01 Basin: 0.5 in/hr
- B-02 Basin: 1.6 in/hr

For design purposes, Black & Veatch applied a factor of safety of 2 to each pond's average infiltration rate to comply with SJRWMD design recommendations (Reference 2). The resulting design infiltration rates used in the stormwater calculations after applying this safety factor are as follows:

- B-01 Basin with Safety Factor of 2: 0.25 in/hr
- B-02 Basin with Safety Factor of 2: 0.8 in/hr

The basins were also checked with a Safety Factor of 4 to ensure City of Jacksonville requirements were met (Reference 14). The resulting design infiltration rates used in the stormwater calculations after applying this safety factor are as follows:

- B-01 Basin with Safety Factor of 4: 0.125 in/hr
- B-02 Basin with Safety Factor of 4: 0.4 in/hr

These adjusted infiltration rates were incorporated into the HydroCAD model for the pond analysis.

3.4 Precipitation Data

NOAA Atlas 14 precipitation frequency estimates (Reference 5) were used to determine the cumulative rainfall depths for the 24-hour design storms. The mean annual 24-hour storm depth was obtained from SJRWMD ERP Volume II, Figure 2.7.1-1 (Reference 2). Refer to Appendix C for cumulative rainfall depths obtained from NOAA Atlas 14, and to Table 3-5 below for a summary of rainfall depths.

Table 3-5: NOAA Atlas 14 Cumulative Rainfall Depths

NOAA Atlas 14 Cumulative Rainfall Depths			
Design Storm	Design Purpose	Cumulative Rainfall Depth (inches)	Source
Mean Annual 24-Hour Storm	Stormwater Quantity – Design Storm (Limit pre-vs-post discharge)	5.0	SJRWMD ERP Vol. II Figure 2.7.1-1 (Reference 2)
25-Year, 24-Hour	Stormwater Quantity – Design Storm (Limit pre-vs-post discharge)	8.95	NOAA Atlas 14 (Reference 5)
100-Year, 24-Hour	Flood Control – Ensure Emergency Weir can Manage Storm Event	12.30	NOAA Atlas 14 (Reference 5)

3.5 FEMA Floodplains

The Project is located within FEMA Flood Insurance Rate Map (FIRM) 12031C0216J (effective November 2, 2018) and lies entirely within Flood Zone X (unshaded). Flood Zone AE is present adjacent to the outfall locations, where the highest established 1-percent-annual-chance (100-year) flood elevation is 6.0 feet NAVD88.

The lowest proposed nominal grade is 17.0 feet NAVD88, and the lowest onsite elevation will be the bottom of the proposed retention pond at 6.6 feet NAVD88. All proposed grading and placement of fill are located outside of Flood Zone A; therefore, impacts to the 100-year floodplain will not occur and a flood compensatory storage analysis is not required.

Flood Zone X (shaded) and Flood Zone A areas are located offsite to the east and south and will not be affected by Project construction. The Project will comply with St. Johns River Water Management District (SJRWMD) flood regulations and will not adversely impact offsite flood zones or base flood elevations. Refer to Appendix E for more information.

3.6 Soil Properties

Soil data was obtained from the USDA National Resources Conservation Service (NRCS) Web Soil Survey (Reference 6). Much of the Site is made up of sandy soils that are classified as hydrologic soil group (HSG) A and HSG D. Refer to the USDA soils map provided in Appendix D and the Terracon Technical Memorandum Report of Geotechnical Field Exploration Services (Reference 15) for more information.

3.7 Topography

3.7.1 Existing Topography

Client-provided survey data, referenced to the NAD83 State Plane Florida East coordinate system (US Survey Foot), was used for this report and its associated calculations. The existing Site topography consists of low relief terrain with elevations ranging from approximately 6 to 19 feet. Slopes within the proposed Site boundary generally average between 1 and 5 percent. Refer to Appendix B for the client provided survey.

3.7.2 Proposed Topography

The Site will be graded to direct stormwater runoff toward the proposed catch basin inlets, swales, and retention ponds while maintaining positive drainage across all developed areas. The Project Site will be elevated with

equipment elevations/finished floor elevations of 19 to 20 ft (NAVD88). Pond interior embankments and swale side slopes will be graded at a 4:1 minimum slope, and slopes within the power block and laydown areas will average at 0.25%. The grading plan for the Project is provided in Appendix F.

3.8 Wetlands

Refer to the SJRPP Site Certification Application (SCA) Sections 5.4.1.2 and 5.4.1.3 (Reference 13) for information regarding wetland impacts and wetland mitigation practices.

3.9 Proximity to Outstanding Florida Waters

The Project Site lies within the Clapboard Creek–St. Johns River HUC-12 subwatershed (HUC ID 030801031602, Reference 9), which encompasses approximately **26,637 acres**. Based on the Florida Department of Environmental Protection's Outstanding Florida Waters (OFW) designation map, this subwatershed includes the Timucuan Ecological and Historic Preserve, which is recognized as an OFW.

Because the Project boundary falls within the same HUC-12 watershed as this designated OFW, the stormwater system must comply with the additional water quality standards outlined in Sections 8.3.3 and 8.3.4 of the SJRWMD Volume II handbook (Reference 2).

3.10 Tailwater Conditions

Tailwater conditions for the 25-year design storm are consistent with the basis established under the previously approved JEA permit, with a tailwater elevation of 2.3 feet NGVD, which corresponds to 1.08 feet NAVD88. For the 100-year design storm, a tailwater elevation of 6.0 feet NAVD88, equivalent to the FEMA Base Flood Elevation (BFE) was used as the basis. Refer to Table 3-6 for a summary of tailwater conditions used for the design.

Table 3-6: Tailwater Elevations

Tailwater Elevations		
Design Storm Frequency	NAVD88 Tailwater Elevation	Source
25-Year	1.08 ft	JEA SJRPP Decommissioning Report
100-Year	6.00 ft	FEMA Flood Insurance Rate Map (FIRM) 12031C0216J

4.0 Post-Development Stormwater Calculation

4.1 Retention Basin Design

Dry retention basins are proposed to allow the required treatment volume to infiltrate into the ground, thereby reducing discharge of total nitrogen (TN), phosphorus (TP) and sediment (TSS) from the proposed development. A dry retention basin allows the required treatment volume to infiltrate into the ground through permeable soils. Two dry retention basins will be used to reduce the total nitrogen (TN), phosphorous (TP), and sediment (TSS) from the proposed development.

The proposed dry retention basins will be the primary BMP used to meet the water quality and quantity requirements as outlined in Volume I and II of the St. John's River Water Management District's ERP manuals (Reference 1, 2) as well as the City of Jacksonville Land Development Procedures Manual (Reference 14). The proposed dry retention basins were designed according to the criteria outlined in Section 5.1 of the SJRWMD ERP Volume II manual (Reference 2) and Section 5.0 of the FDEP ERP Stormwater Quality Applicant's Handbook

(Reference 3). The ponds provide a treatment volume adequate to reduce the TN, TP, and TSS to the required rates, demonstrate a recovery time of less than 72 hours with a safety factor of two (36 hours), and are sized to attenuate runoff from the 25-year, 24-hour and the mean annual 24-hour storm events. The City of Jacksonville requires use of an infiltration rate safety factor of 4 and the pond to fully recover in 72 hours. The ponds were also evaluated for compliance with all applicable City of Jacksonville design criteria (Reference 14).

The ponds include a concrete box riser with a rectangular weir used to control the 25-year, 24-hour storm peak which will discharge to the existing culverts on the Site and an emergency spillway weir sized for the 100-year storm to prevent overtopping. Infiltration rates and groundwater elevation of the existing soil were based on the client-provided geotechnical report (Reference 15, Section 3.3) and a sand infiltration medium is proposed on the bottom of the pond to recovery time. A void percentage of 20% was used for the sand medium based on HydroCAD guidance (Reference 12). A hydrograph peaking factor of 256 was used to match the basis of the previous conditions as shown in Appendix G. Interior slopes of the pond embankments are 4:1.

The dry retention ponds were designed using HydroCAD software (Reference 12). The retention pond HydroCAD report is provided in Appendix I and a summary table of modeling results is shown below in Table 4-2.

The retention volumes were determined using the methodology provided in Appendix D of the FDEP Stormwater Quality Handbook (Reference 3) based on the non-directly connected impervious area (DCIA) curve number and the percentage of DCIA within the drainage basin. As described in Table 4-1 below, the FDEP manual specifies a minimum dry retention depth of 1.76-inches for B-01 and 1.70-inches for B-02 applied uniformly over the total pond catchment areas. When this depth is multiplied by the contributing drainage area, it equates to a minimum dry retention volume of 16.32 and 8.00 acre-feet for B-01 and B-02 respectively. Per Section 5.4 of the FDEP Stormwater Quality Handbook, the retention basin must have the capacity to retain the required treatment volume without considering soil storage and therefore the provided storage in the sand medium was not considered when calculating the total provided retention depths in the ponds. This calculated volume represents the baseline storage requirement necessary to ensure that the proposed basin meets the stormwater treatment criteria for nutrient and solids reduction as described in Section 4.1.1. The provided retention depths were checked in the BMP Trains analysis software (Reference 10) and revised as needed in the detailed design to meet the specified treatment criteria for this Project Site.

Table 4-1: Required Dry-Retention Volume Calculation

Minimum Dry Retention Depth Calculation				
REQUIREMENTS/ METRICS	VALUE		UNIT	REFERENCE/ EXPLANATION
	B-01	B-02		
Post-Dev Directly Connected Impervious Area (DCIA)	68	76	%	
Post-Dev CN of Non DCIA Areas	87	81	-	Composite curve number of all areas contributing to the pond and outside of the DCIA
Min. Dry Retention Depth	1.76	1.70	IN	FDEP Stormwater Quality Handbook Appendix D
Min. Dry Retention Volume	16.32	8.00	AC-FT	Min retention depth * entire treatment area

Table 4-2: Dry Retention Basin Summary Tables

Dry Retention Basin Calculation - B-01						
Total Area Draining to Pond (ac)	=	111.2				
Rainfall Depth (25-yr, 24-hr) in	=	8.95				
Rainfall Depth (Mean Annual 24-hr) in	=	5				
Min. Dry Retention Depth (in)	=	1.76				
Min. Dry Retention Volume (ac-ft)	=	16.32				
Dry Retention Basin Summary Table						
Bottom of Sand Medium (ft)	5.6	0				
Top of Sand Medium (ft)	6.6	0				
Bottom of Basin Elevation	6.60	0				
Elevation at Minimum Required Dry Retention Storage (ft)	8.40	709045				
Rectangular Weir Elevation	8.75	850840				
25-Year, 24-Hr Duration Storm Peak	11.43	1979658				
Riser Crest Elevation (riser grate) (ft)	11.50	2010233				
Emergency Overflow Weir	12.50	2452010				
100-Year, 24-Hr Duration Storm Peak (BV Check)	13.02	2688136				
Top of Embankment	13.50	2904364				
Dry Retention Basin Conclusions						
Freeboard for 25-Year Design High Water and Top of Embankment (ft)	=	2.07	PASS	Min.	1	ft
Check to Ensure 100-Year Design High Water does not Overtop Embankment (ft)	=	13.02	PASS	Max.	13.50	ft
Freeboard for Top of Riser and Spillway Crest (ft)	=	1.00	PASS	Min.	1	ft
25-Year Design Highway Check (ft)	=	11.43	PASS	Max.	12.50	ft
Dry Retention Volume (ac-ft)	=	19.53	PASS	Min.	16.32	ac-ft
Recovery Time to Recover Specified Dry Retention Volume (hrs)**	=	34.50	PASS	Max.	36	hrs
25-Year, 24-Hour Peak Flow (cfs)	=	49.69				
Mean Annual 24-Hour Peak Flow (cfs)	=	6.65				
*Volumes reported on the table do not account for any soil storage provided by the sand infiltration medium.						
**Recovery time was determined based on HydroCAD outputs using the slug load method.						

*Volumes reported on the table do not account for any soil storage provided by the sand infiltration medium.

**Recovery time was determined based on HydroCAD outputs using the slug load method.

Dry Retention Basin Calculation - B-02										
Total Area Draining to Pond (ac)	=	56.4								
Rainfall Depth (25-yr, 24-hr) in	=	8.95								
Rainfall Depth (Mean Annual 24-hr) in	=	5								
Min. Dry Retention Depth (in)	=	1.70								
Min. Dry Retention Volume (ac-ft)	=	8.00								
Dry Retention Basin Summary Table										
Basin Side Slopes:	=	4								
	Elevation (ft)	Cumulative Volume (cf)*								
Bottom of Sand Medium (ft)	11	0								
Top of Sand Medium (ft)	12	0								
Bottom of Basin Elevation	12.00	0								
Elevation at Minimum Required Dry Retention Storage (ft)	14.20	350024								
Rectangular Weir Elevation	14.50	402,176								
25-Year, 24-Hr Duration Storm Peak	16.44	765,358								
Riser Crest Elevation (riser grate) (ft)	16.00	679,056								
Emergency Overflow Weir	17.00	878,674								
100-Year, 24-Hr Duration Storm Peak (BV Check)	17.40	961,530								
Top of Embankment	18.00	1,090,434								
Dry Retention Basin Conclusions										
Freeboard for 25-Year Design High Water and Top of Embankment (ft)	=	1.56					PASS	Min.	1	ft
Check to Ensure 100-Year Design High Water does not Overtop Embankment (ft)	=	17.40					PASS	Max.	18.00	ft
Freeboard for Top of Riser and Spillway Crest (ft)	=	1.00	PASS	Min.	1	ft				
25-Year Design Highwater Check (ft)	=	16.44	PASS	Max.	17.00	ft				
Dry Retention Volume (ac-ft)	=	9.23	PASS	Min.	8.00	ac-ft				
Recovery Time to Recover Specified Dry Retention Volume (hrs)**	=	12.00	PASS	Max.	36	hrs				
25-Year, 24-Hour Peak Flow (cfs)	=	51.02								
Mean Annual 24-Hour Peak Flow (cfs)	=	1.12								
*Volumes reported on the table do not account for any soil storage provided by the sand infiltration medium.										
**Recovery time was determined based on HydroCAD outputs using the slug load method.										

*Volumes reported on the table do not account for any soil storage provided by the sand infiltration medium.

**Recovery time was determined based on HydroCAD outputs using the slug load method.

Table 4-3: Water Quality Attenuation Summary

Water Quality Attenuation Summary		
	25-Year, 24-Hour Water Quality Attenuation Check (cfs)	Mean Annual 24-Hour Stormwater Quality Attenuation Check (cfs)
Pre-Development - Combined Basins	263.74	101.57
Post-Development - Combined Basins - No Pond	514.86	279.26
Post-Development - Combined Basins - With Ponds	100.71	7.77

4.1.1 Water Quality Calculations

Per Florida SJRWMD Volume I (Reference 1), the proposed retention basin is designed to comply with the following stormwater quality requirements:

Section 8.3.1 Stormwater treatment systems shall be designed to achieve at least an 80 percent reduction of the average annual post-development total suspended solids (TSS) load, or 95 percent of the average annual post-development TSS load for those proposed Projects located within a HUC 12 sub-watershed containing an Outstanding Florida Water (OFW) and located upstream of that OFW. There is a rebuttable presumption that this standard is met when structural stormwater best management practices (BMPs) are designed to meet the applicable design standards in Sections 8.3.2 through 8.3.5 below.

Section 8.3.4: Stormwater treatment systems located within a HUC 12 subwatershed which contains an impaired water, and is located upstream of that impaired water, shall provide a level of treatment sufficient to accomplish:

1. 95 percent reduction of average annual loading of TP and TN from the proposed project when located within such a HUC 12 subwatershed containing an OFW and located upstream of that OFW; and
2. A reduction such that the post-development condition average annual loading of nutrients does not exceed the predevelopment condition nutrient loading; and
3. The post-development condition average annual loading of those pollutants not meeting water quality standards, that is less than that of the predevelopment condition.

Per Florida SJRWMD Volume I (Reference 1), the proposed retention basin is designed to comply with the stormwater quality requirements outlined in Sections 8.3.1 and 8.3.4.

Nutrient removal efficiency was evaluated using BMP Trains water quality modeling software and manual (Reference 10, 7). The "Light Industrial" land use condition was applied to both the pre-development and post-development scenarios because the Site had already been developed and subsequently decommissioned and therefore could not reasonably be considered an undeveloped condition. Directly connected impervious areas (DCIA) were incorporated into the post-development model to reflect the impervious areas discharging directly to swales or the catch basin network in the proposed Site layout. The post-development catchment areas were routed in series via the proposed swales and through dry retention ponds to estimate nutrient load reductions after BMP routing. Treatment through the swales was calculated based on the Environmental Resource Permit Applicants Handbook V.1 - Appendix O: Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention for Zone 4 by Percent DCIA Table (Reference 1).

Refer to Table 4-4 below for a summary of the modeling results and Appendix K for the detailed calculation.

For Section 8.3.1, the Project is located within a HUC 12 sub-watershed containing an OFW. Structural BMPs have been designed in accordance with the applicable standards in Sections 8.3.2 through 8.3.5 of the SJRWMD Volume I manual, which establishes a presumption of compliance with the TSS reduction requirement. By

meeting these design standards, the proposed retention basin is assumed to achieve the required $\geq 95\%$ reduction in average annual post-development TSS load.

For Section 8.3.4, the Project is located within a HUC 12 sub-watershed containing a water body impaired for metals, include copper and iron. The proposed power plant development will not result in an increase in metals loading to stormwater discharges to receiving waters, including impaired water bodies, in accordance with the FDEP ERP Applicant's Handbook Volume I and Chapter 62-330, Florida Administrative Code (FAC). The project does not include any wastewater discharges to the stormwater management system. All runoff entering the system will consist solely of non-contact stormwater from precipitation events, and therefore no additional sources of metals associated with industrial, or process activities are introduced. As a result, the project will not contribute to exceedances of applicable water quality criteria for metals in downstream receiving waters.

Table 4-4: BMP Trains Nutrient Reduction Summary Table

Water Quality Summary Table - TN and TP																		
Catchment ID	Area (ac)	Rainfall Zone	Mean Annual Rainfall (in)	Pre-Development			Post Development - Prior to BMPs					BMP Applied	Provided Retention Depth (in)	Required Removal Efficiency - Fixed (TP ≥95%, TN ≥95%)	Required Removal Efficiency - Calculated (Post ≤ Pre)	Actual TP Removal (%)	Actual TN Removal (%)	Compliance Check
				Pre-Dev Non-DCIA CN	Pre-Dev DCIA (%)	Pre-Dev TP Load (kg/yr)	Pre-Dev TN Load (kg/yr)	Post-Dev Non-DCIA CN	Post-Dev DCIA (%)	Post-Dev TP Load (kg/yr)	Post-Dev TN Load (kg/yr)							
B-01	111.2	Zone 4	53.4	71	0	12.37	57.091	87	68%	87.831	405.374	Dry Retention Pond + Treatment Swales	2.11	TP ≥95%, TN ≥95%	TP = 88%, TN = 88%	95	95	Meets greater of both removal efficiency criteria
B-02	56.4	Zone 4	53.4	71	0	5.539	25.565	81	76%	28.789	132.783	Dry Retention Pond + Treatment Swales	1.96	TP ≥95%, TN ≥95%	TP = 88%, TN = 88%	95	95	Meets greater of both removal efficiency criteria
Total*	167.7	-	-	-	-	17.91	82.66	-	-	116.62	538.16	-	-	TP ≥95%, TN ≥95%	TP ≥88%, TN ≥88%	95	95	Meets greater of both removal efficiency criteria

*Undisturbed basin B-03 not included in overall nutrient loading totals. No disturbance is proposed in this basin.

*Undisturbed basin B-03 not included in overall nutrient loading totals. No disturbance is proposed in this basin.

4.1.2 Water Quantity Calculations

Per Florida SJRWMD Volume II (Reference 2), the proposed retention basin is designed to follow the following stormwater quantity requirements:

Section 3.2.1: The post-development peak discharge rate must not exceed the pre-development peak rate of discharge for the mean annual 24-hour storm.

Section 3.2.1: The post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year frequency, 24-hour duration storm for all areas of the district.

The proposed retention basin meets SJRWMD Volume II stormwater quantity requirements. Modeled post-development peak discharge rates do not exceed pre-development rates for both the mean annual 24-hour storm and the 25-year, 24-hour storm. The basin provides adequate attenuation and ensures no adverse impacts to downstream features. Refer to Table 4-5 for a summary of pre- and post-development peak discharges.

4.2 Dewatering Operations

During installation of deep foundations and deep underground utilities, wellpoint and sock systems will be used to dewater excavations to facilitate installation and backfill operations. Dewatering effluent will be discharged to the stormwater retention ponds, where it will infiltrate without discharge through the pond emergency overflow weirs. Dewatering activities shall be managed to maintain pond water levels at least 1 foot below the riser weir elevation, and dewatering will not occur immediately before or after forecasted major storm events. Surface water entering excavations will be collected in turbidity-filtered sumps and conveyed to the stormwater retention ponds for additional treatment. Specific dewatering means and methods will be determined by the construction contractor. Offsite discharge generated during dewatering activities will be monitored to ensure turbidity does not exceed 29 NTU above background levels. If turbidity approaches 29 NTU, best management practices will be modified to provide additional turbidity control.

Following construction, the ponds shall be fully cleared of accumulated sediment and verified to ensure infiltration rates meet or exceed the design infiltration rates.

4.3 Overall Conveyance System Design

A series of storm drain inlets, culverts, and swales will be utilized to route onsite runoff to the proposed dry retention pond. Each component of the system has been designed for the 25-year, 24-hour storm event, with freeboard accounted for as described in Sections 4.3.1 and 4.3.2. Peak flows were estimated using the Rational Method in accordance with the FDOT Drainage Manual (Reference 4). An adjustment factor of 1.1 was applied to the 25-year design storm for peak flow calculations.

Runoff coefficients were selected based on land use classifications provided in Table B-4 of the FDOT Drainage Manual (Reference 4). A coefficient of 0.95 was applied to impervious areas, consistent with the "Commercial and Industrial" land use category, while a coefficient of 0.15 was applied to pervious areas, consistent with "Pasture, Grass, and Farmland – Sandy Soils" category. A minimum time-of-concentration value of 10-minutes was utilized for all calculations per FDOT guidance (Reference 4). Refer to Table 4-5, Table 4-7, and Table 4-7 below for detailed rational method calculations.

The conveyance system evaluated herein is intended to establish an initial design basis for stormwater routing and capacity. The final conveyance layout, sizing, and configuration may be refined during detailed design of the power plant to accommodate final grading, equipment layouts, and discipline coordination.

Table 4-5: Catch Basin and Conveyance Swale Drainage Area Summary

CATCH BASIN AND CONVEYANCE SWALE DRAINAGE AREA SUMMARY						
ID	Area	Impervious Area (ac)	Commercial and Industrial Land Use C Value	Grassed Area (ac)	Grassed Area C Value	Composite C
CH-10	23.0	23.03	0.95		0.15	0.95
CH-2	7.4	5.96	0.95	1.45	0.15	0.79
CH-3	14.9	12.80	0.95	2.08	0.15	0.84
CH-4	5.1	0.16	0.95	4.96	0.15	0.17
CH-5	21.5	19.72	0.95	1.76	0.15	0.88
CB-1	1.2	1.25	0.95		0.15	0.95
CB-2	1.3	1.29	0.95		0.15	0.95
CB-3	1.3	1.29	0.95		0.15	0.95
CB-4	1.2	1.24	0.95		0.15	0.95
CB-9	0.9	0.93	0.95		0.15	0.95
CH-7	8.55	8.55	0.95		0.15	0.95
CH-9	13.2	12.62	0.95		0.15	0.91
CB-5	0.9	0.88	0.95		0.15	0.95
CB-6	1.4	1.40	0.95		0.15	0.95
CB-7	0.9	0.88	0.95		0.15	0.95
CB-8	1.4	1.40	0.95		0.15	0.95
CH-8	9.7	6.82	0.95		0.15	0.67
CH-1	13.4	2.79	0.95	10.65	0.15	0.32
CB-10	1.5	1.52	0.95		0.15	0.95
CB-18	2.6	2.56	0.95		0.15	0.95
CB-13	1.3	1.30	0.95		0.15	0.95
CB-14	0.9	0.72	0.95		0.15	0.73
CB-15	0.9	0.89	0.95		0.15	0.95
CB-16	0.9	0.90	0.95		0.15	0.95
CB-17	1.2	1.21	0.95		0.15	0.95
CB-11	1.1	1.06	0.95		0.15	0.95
CB-12	1.4	1.39	0.95		0.15	0.95
CB-19	1.9	1.90	0.95		0.15	0.95

Table 4-6: Catch Basin and Conveyance Swale Time-of-Concentration Summary

CATCH BASIN AND CONVEYANCE SWALE TIME OF CONCENTRATION CALCULATIONS										
ID	TOTAL TIME OF CONC. T _c (HRS)	TOTAL TIME OF CONC. T _c (MIN)	SHEET FLOW					SHALLOW CONCENTRATED FLOW		
			t _{sheet} = 0.007 (nL) ^{0.8} / P ^{20.5} S ^{0.4} / 60					t _{PAVED} = L / (20.3*S ^{0.5}) / 60 t _{UNPAVED} = L / (20.3*S ^{0.5}) / 60		
			Manning's n	Flow L (ft)	P ₂ (in)	Slope (ft/ft)	t _{sheet} (min)	Flow L (ft)	Slope (ft/ft)	t _{shallow} (min)
CH-10	0.222	13.35	0.011	100.00	4.73	0.003	2.29	1346.905	0.0100	11.06
CH-2	0.167	10.00	0.011	100.00	4.73	0.010	1.32	937.596	0.0100	7.70
CH-3	0.170	10.18	0.011	100.00	4.73	0.010	1.32	1079.766	0.0100	8.87
CH-4	0.251	15.08	0.150	100.00	4.73	0.010	10.63	429.307	0.0100	4.44
CH-5	0.167	10.00	0.011	100.00	4.73	0.003	2.29	449.461	0.0100	3.69
CB-1	0.167	10.00	-	-	-	-	-	-	-	-
CB-2	0.167	10.00	-	-	-	-	-	-	-	-
CB-3	0.167	10.00	-	-	-	-	-	-	-	-
CB-4	0.167	10.00	-	-	-	-	-	-	-	-
CB-9	0.167	10.00	-	-	-	-	-	-	-	-
CH-7	0.167	10.00	0.011	100.00	4.73	0.003	2.29	648.7109	0.0100	5.33
CH-9	0.167	10.00	0.011	100.00	4.73	0.003	2.29	894.452	0.0100	7.34
CB-5	0.167	10.00	-	-	-	-	-	-	-	-
CB-6	0.167	10.00	-	-	-	-	-	-	-	-
CB-7	0.167	10.00	-	-	-	-	-	-	-	-
CB-8	0.167	10.00	-	-	-	-	-	-	-	-
CH-8	0.167	10.00	-	-	-	-	-	-	-	-
CH-1	0.264	15.85	0.150	100.00	4.73	0.010	10.63	503.7478	0.0100	5.21
CB-10	0.167	10.00	-	-	-	-	-	-	-	-
CB-13	0.167	10.00	-	-	-	-	-	-	-	-
CB-14	0.167	10.00	-	-	-	-	-	-	-	-
CB-15	0.167	10.00	-	-	-	-	-	-	-	-
CB-16	0.167	10.00	-	-	-	-	-	-	-	-
CB-17	0.167	10.00	-	-	-	-	-	-	-	-
CB-11	0.167	10.00	-	-	-	-	-	-	-	-
CB-12	0.167	10.00	-	-	-	-	-	-	-	-
*AVERAGE SLOPE OF 0.25% USED ACROSS ALL GRADED AREAS										

Table 4-7: Catch Basin and Conveyance Swale Peak Flow Summary

CATCH BASIN AND CONVEYANCE SWALE RATIONAL METHOD PEAK RUNOFF CALCULATIONS						
ID	T _c (MIN)	A (ACRES)	C	I ₂₅ (IN/HR)	25-YEAR ADJUSTMENT FACTOR X(t)	Q ₂₅ (CFS) Q = CIA _X (t)
CH-10	13.35	23.03	0.95	8.94	1.1	215.19
CH-2	10.00	7.41	0.79	8.94	1.1	57.81
CH-3	10.18	14.88	0.84	8.88	1.1	121.80
CH-4	15.08	5.11	0.17	7.23	1.1	7.09
CH-5	10.00	21.48	0.88	8.94	1.1	186.84
CB-1	10.00	1.25	0.95	8.94	1.1	11.65
CB-2	10.00	1.29	0.95	8.94	1.1	12.09
CB-3	10.00	1.29	0.95	8.94	1.1	12.07
CB-4	10.00	1.24	0.95	8.94	1.1	11.58
CB-9	10.00	0.93	0.95	8.94	1.1	6.87
CH-7	10.00	8.55	0.95	8.94	1.1	79.86
CH-9	10.00	13.21	0.91	8.94	1.1	117.88
CB-5	10.00	0.88	0.95	8.94	1.1	8.22
CB-6	10.00	1.40	0.95	8.94	1.1	13.11
CB-7	10.00	0.88	0.95	8.94	1.1	8.21
CB-8	10.00	1.40	0.95	7.14	1.1	10.46
CH-8	10.00	9.69	0.67	8.94	1.1	63.76
CH-1	15.85	13.44	0.32	7.12	1.1	33.25
CB-10	10.00	1.52	0.95	8.94	1.1	14.18
CB-18	10.00	2.56	0.95	8.94	1.1	23.88
CB-13	10.00	1.30	0.95	8.94	1.1	12.14
CB-14	10.00	0.94	0.73	8.94	1.1	6.74
CB-15	10.00	0.89	0.95	8.94	1.1	8.35
CB-16	10.00	0.90	0.95	8.94	1.1	8.45
CB-17	10.00	1.21	0.95	8.94	1.1	11.29
CB-11	10.00	1.06	0.95	8.94	1.1	9.88
CB-12	10.00	1.39	0.95	8.94	1.1	13.03
CB-19	10.00	1.90	0.95	8.94	1.1	17.78

4.3.1 Internal Storm Sewer Design

A storm sewer network will be used on the proposed development to convey runoff from the equipment areas to the proposed stormwater pond. Major equipment areas within the power plant such as the power block will have an internal storm sewer system to capture stormwater runoff and convey it to the stormwater pond for treatment.

The system was designed in accordance with the FDOT Drainage Manual (Reference 4). The system will utilize storm grate inlets located at low points to capture runoff. The system was designed to convey the runoff for the 25-year, 24-hour storm and peak flows were estimated using the Rational Method as described in Section 4.3. The system was modeled in StormCAD (Reference 11). Corrugated HDPE pipe was selected, with a minimum slope of 0.25% to maintain positive drainage. A minimum of one foot of freeboard was maintained between the hydraulic grade line and the top of concrete elevations of the equipment foundations. Refer to Appendix J for detailed calculations.

4.3.2 Swale Design

Swales will be constructed within each basin to capture flow draining off the equipment blocks and route it to the pond for treatment. In addition, the onsite swales will be used as pre-treatment BMPs to provide nutrient reduction for the site before the water enters the retention ponds. Refer to Section 4.1.1 for detailed water quality calculations.

The swales were designed in accordance with FDOT Drainage Manual (Reference 4) and the FDEP ERP Stormwater Quality Applicant's Handbook (Reference 3). Sod lining was selected as the stabilization method, and the minimum side slopes are 4:1. The system was designed to convey the 25-year, 24-hour storm and peak flows were estimated using the Rational Method as described in Section 4.3. A Manning's roughness coefficient of 0.03 was used for swale calculations, consistent with a grassed, rough channel assumption listed in StormCAD (Reference 11). A minimum slope of 0.25% was utilized in the design and the swales were modeled to ensure at least one foot of freeboard was maintained between the hydraulic grade line and the top of the swale bank.

SJRWMD guidance does not prescribe a specific procedure for evaluating swale recovery time via hand calculations. Therefore, the methodology provided in Section 1.3 of the Northwest Florida Water Management District's *References and Design Aids* (Reference 16) was used as a reasonable engineering approach to verify that each swale recovers within the required 72-hour period. Refer to Appendix J for dewatering calculations. Based on Table 2.5 of the FDOT Drainage Manual, the maximum allowable velocity for sod lining is 4 ft/s. The maximum calculated velocity in the swales is 3.73 ft/sec therefore sod lining has been selected as the appropriate surfacing. To better ensure the system is free from erosion, additional rock check dams and rip rap outlets will be installed within the swales that will further help reduce the proposed velocities. Refer to Appendix J for detailed swale calculations.

5.0 Conclusion

Stormwater management for the JEA SJRPP Unit 3 combined-cycle natural gas facility was designed in accordance with SJRWMD, FDEP, FDOT, and local requirements. The design includes a dry retention basin, storm sewer network, culverts, and swales used to route stormwater, prevent flooding, and provide water quality treatment and quantity control. The retention basins and upstream swales achieve the required reductions in TN, TP, and TSS, maintain recovery times within regulatory limits, attenuate runoff from the 25-yr, 24-hr storm, and pass the 100-yr storm through the emergency spillway. The storm sewer and swale network is designed to maintain a minimum of one foot of freeboard between the HGL and the finished grade, stable velocities, and positive drainage. Post-development discharges do not exceed pre-development rates, and overall flows routed to the offsite wet pond are reduced compared to existing conditions. The Project meets the defined applicable regulatory criteria as shown in Table 5-1 and, based on the analyses performed and the proposed design, is not anticipated to result in adverse impacts to downstream waters, FEMA floodplains, or OFWs.

Table 5-1: SJRWMD Water Quality and Quantity Requirements Summary

St. Johns River Water Management District Dry Retention Requirements Summary									
Standard	Pre-Condition	Post-Condition	Required	Actual	Source	Notes	Report Location		
Water Quantity: Post-Dev 25-year, 24-hour peak flow < Pre-Dev 25-year, 24-hour peak flow (SJRWMD Tier I Manual)	263.74	100.71	-	-	SJRWMD Vol II	-	Section 4.1 and Section 4.1.2		
Water Quantity: Post-Dev Mean Annual 24-hour peak flow < Pre-Dev Mean Annual 24-hour peak flow (SJRWMD Tier I Manual)	101.57 (Mean Annual 24-hour peak flow)	7.77 (Mean Annual 24-hour peak flow)							
Post-Dev 25-year, 24-hour peak flow < 25-year, 24-hour peak flow (SJRWMD Tier I Manual)	263.74 (25-year, 24-hour peak flow)	100.71 25-year, 24-hour peak flow)	-	-	SJRWMD Vol II	-	Section 4.1 and Section 4.1.2		
Water Quality: 1. 95 percent of the average annual post-development TSS load for those proposed projects located within a HUC 12 sub-watershed containing an Outstanding Florida Water (OFW). 2. Reduce TP by ≥90% and TN by ≥80%, or Ensure post-development nutrient loading is less than pre-development.	TSS:	(see notes)	95% reduction	95% reduction	SJRWMD Vol I	Compliance with SJRWMD Vol. I Sections 8.3.2–8.3.5 provides presumption that the proposed retention basin achieves the required ≥95% TSS reduction.	Section 4.1.1		
	TN:	78.392 kg/yr	95% reduction	95% reduction			Section 4.1.1		
	TP:	16.985 kg/yr	95% reduction	95% reduction			Section 4.1.1		
Retention Volume: The first portion of runoff should be routed to the retention basin and percolated into the ground to meet the treatment criteria in sections 8.3 and 9.0 of Volume I.	B-01	-	15.30	18.97	FDEP Stormwater Quality Handbook - Appendix D	FDEP Appendix D was used to determine and initial minimum retention depth to reach an 85% nutrient reduction which was used as a starting point for retention depth calculations. Retention depth was increased as needed.	Section 4.1		
	B-02	-	8.00	9.23					
Recovery Time: Demonstrates a recovery time of less than 72 hours with a safety factor of two (36 hours) for the treatment volume.	B-01	-	Max. 36 Hours	34.50	SJRWMD Vol II	-	Section 4.1		
	B-02	-		12.00					

St. Johns River Water Management District Dry Retention Requirements Summary

Standard	Pre-Condition		Post-Condition	Required	Actual	Source	Notes	Report Location
Outlet Structures: Pond includes a rectangular concrete riser structure with a rectangular weir outlet and a broad crested weir emergency spillway outlet. The Required Treatment Volume must be fully stored below the weir crest elevation. The 25-year, 24-hour storm highwater elevation must not overtop the outlet structure. 1-foot of freeboard must be maintained between the emergency spillway and the top of the embankment.						FDEP Stormwater Quality Handbook	-	Section 4.1
						SJRWMD Vol II		
Side Slopes: No steeper than 3:1 (SJRWMD Tier I Manual) and 4:1 per FDEP Manual.				-	4:1	FDEP Stormwater Quality Handbook	-	Section 4.1
Pond Depth: Max pond depth of 12 feet. Mean depth should be at least 6' unless calcs show alternate depth is appropriate for the Site-specific conditions.	B-01		-	Max: 12' Mean: at least 6'	Max: 6.9' Mean: 6.9'	FDEP Stormwater Quality Handbook	-	-
	B-02		-	Max: 12' Mean: at least 6'	Max: 6' Mean: 6'			-
	B-01		-	2:1 or greater	2:1	SJRWMD Vol I	-	-
Pond Configuration: Basin L:W = 2:1 or greater	B-02		-	2:1 or greater	13:1			-

Appendix A. Site Location Map

This map is intended to be used for planning purposes only. It is not a survey product.

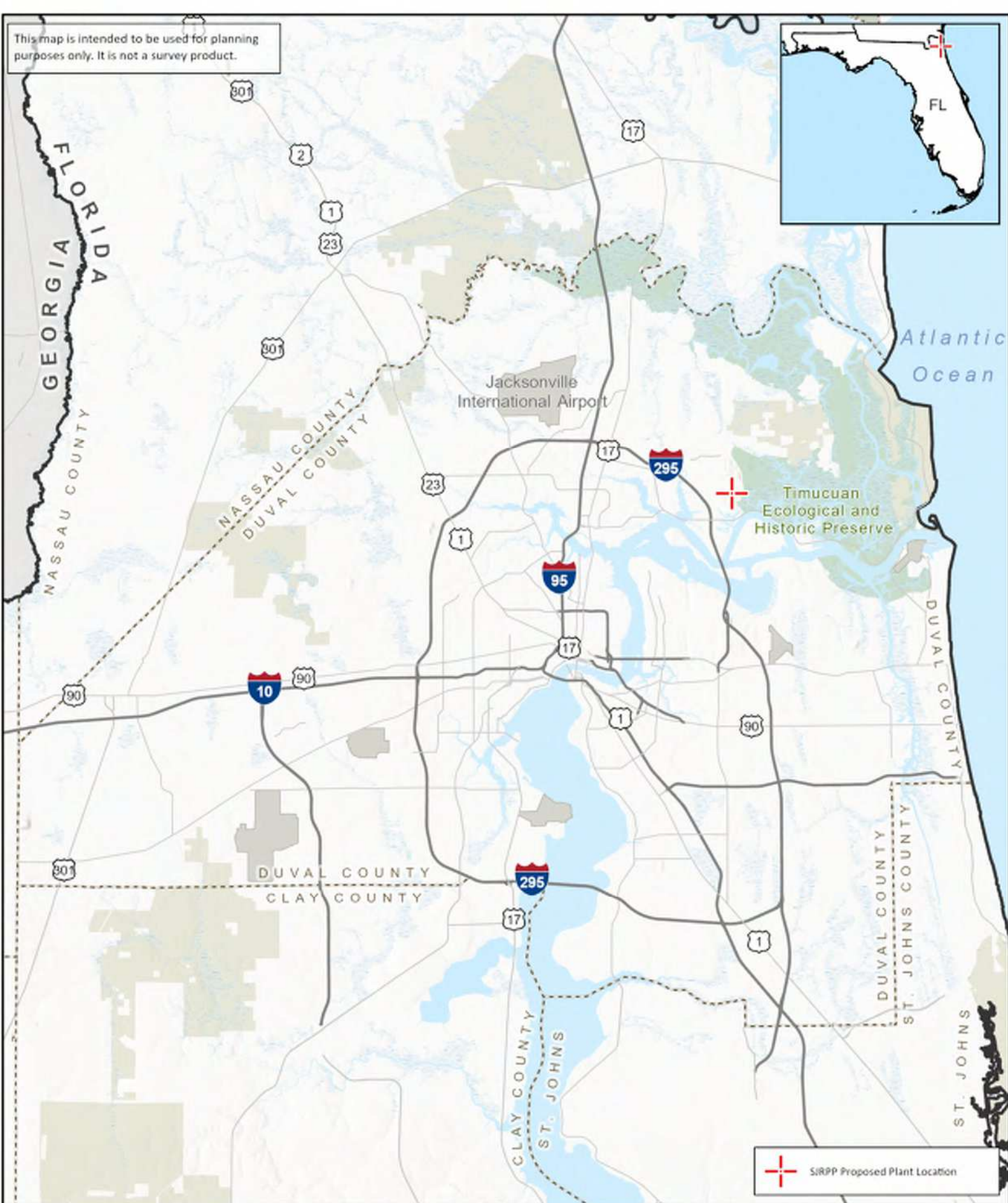


FIGURE 1-1
REGIONAL LOCATION OF SJRPP SITE



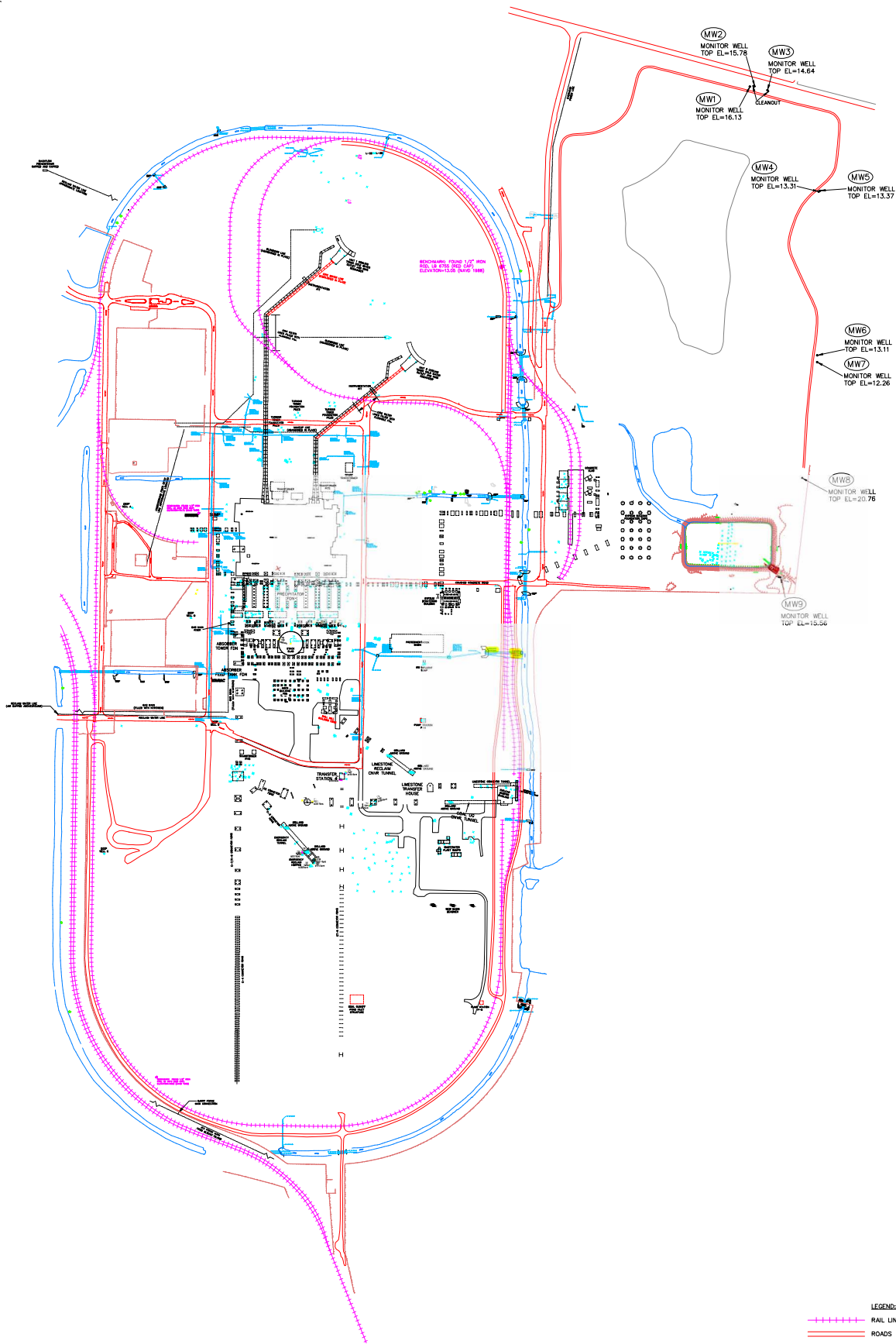
0 2.5 5
Miles
Scale: 1:325,000

PCS- NAO 1983 2011 StatePlane Florida East FIPS 0901 ft US

Sources: U.S. Census Bureau TIGER/Line Shapefiles.



Appendix B. JEA SJRPP Post-Demolition Underground Structures As-Build Survey – Dated 8/5/22



10. THE FIRE PROTECTION PIPING LOOP AROUND THE COAL YA
COMPLETELY REMOVED.

DESIGNED:	DRAWN:	PROJECT NO:
CS	CS-15	CS-15

Appendix C. NOAA Rainfall Precipitation Data

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	0.544 (0.456-0.649)	0.627 (0.525-0.749)	0.761 (0.634-0.911)	0.869 (0.720-1.05)	1.02 (0.806-1.26)	1.12 (0.871-1.42)	1.23 (0.917-1.61)	1.34 (0.950-1.80)	1.48 (1.00-2.06)	1.58 (1.04-2.25)
10-min	0.796 (0.667-0.950)	0.918 (0.768-1.10)	1.11 (0.928-1.34)	1.27 (1.05-1.53)	1.49 (1.18-1.85)	1.65 (1.28-2.09)	1.80 (1.34-2.35)	1.96 (1.39-2.64)	2.16 (1.47-3.01)	2.31 (1.53-3.29)
15-min	0.971 (0.814-1.16)	1.12 (0.937-1.34)	1.36 (1.13-1.63)	1.55 (1.28-1.87)	1.81 (1.44-2.25)	2.01 (1.56-2.54)	2.20 (1.64-2.87)	2.39 (1.70-3.22)	2.64 (1.79-3.67)	2.82 (1.86-4.02)
30-min	1.44 (1.20-1.71)	1.66 (1.39-1.99)	2.03 (1.69-2.43)	2.33 (1.93-2.81)	2.73 (2.17-3.39)	3.03 (2.35-3.84)	3.33 (2.48-4.34)	3.62 (2.57-4.88)	3.99 (2.71-5.56)	4.27 (2.82-6.08)
60-min	1.89 (1.58-2.25)	2.17 (1.81-2.59)	2.64 (2.20-3.16)	3.04 (2.52-3.66)	3.61 (2.88-4.53)	4.06 (3.16-5.18)	4.53 (3.38-5.95)	5.02 (3.57-6.80)	5.68 (3.87-7.96)	6.20 (4.10-8.83)
2-hr	2.34 (1.97-2.77)	2.67 (2.25-3.16)	3.24 (2.72-3.86)	3.75 (3.12-4.48)	4.49 (3.62-5.62)	5.10 (4.00-6.48)	5.74 (4.32-7.51)	6.42 (4.61-8.68)	7.37 (5.06-10.3)	8.12 (5.40-11.5)
3-hr	2.59 (2.20-3.06)	2.94 (2.49-3.47)	3.56 (3.00-4.22)	4.14 (3.47-4.94)	5.02 (4.09-6.31)	5.77 (4.56-7.35)	6.58 (4.99-8.63)	7.46 (5.39-10.1)	8.72 (6.03-12.2)	9.75 (6.51-13.8)
6-hr	3.04 (2.60-3.57)	3.44 (2.93-4.04)	4.20 (3.56-4.94)	4.93 (4.16-5.84)	6.10 (5.02-7.67)	7.11 (5.67-9.06)	8.24 (6.31-10.8)	9.49 (6.92-12.8)	11.3 (7.88-15.7)	12.8 (8.61-18.0)
12-hr	3.53 (3.03-4.10)	4.03 (3.46-4.70)	5.00 (4.27-5.84)	5.94 (5.04-6.98)	7.43 (6.17-9.30)	8.74 (7.02-11.1)	10.2 (7.85-13.3)	11.8 (8.66-15.8)	14.1 (9.92-19.6)	16.1 (10.9-22.4)
24-hr	4.09 (3.54-4.72)	4.73 (4.09-5.48)	5.95 (5.12-6.91)	7.12 (6.09-8.30)	8.95 (7.47-11.1)	10.5 (8.52-13.2)	12.3 (9.53-15.9)	14.2 (10.5-19.0)	17.0 (12.0-23.4)	19.3 (13.2-26.7)
2-day	4.74 (4.14-5.44)	5.54 (4.82-6.36)	7.00 (6.07-8.07)	8.37 (7.21-9.70)	10.5 (8.81-12.9)	12.3 (10.0-15.3)	14.3 (11.2-18.3)	16.5 (12.3-21.8)	19.6 (13.9-26.7)	22.2 (15.2-30.5)
3-day	5.16 (4.52-5.90)	6.03 (5.27-6.90)	7.60 (6.62-8.73)	9.07 (7.85-10.5)	11.3 (9.52-13.8)	13.2 (10.8-16.4)	15.3 (12.0-19.5)	17.6 (13.1-23.1)	20.8 (14.8-28.2)	23.4 (16.1-32.1)
4-day	5.52 (4.85-6.29)	6.42 (5.63-7.32)	8.05 (7.03-9.21)	9.56 (8.29-11.0)	11.9 (10.0-14.4)	13.8 (11.3-17.0)	15.9 (12.5-20.2)	18.2 (13.6-23.9)	21.5 (15.4-29.1)	24.2 (16.7-33.1)
7-day	6.49 (5.74-7.36)	7.42 (6.54-8.41)	9.09 (7.99-10.3)	10.6 (9.29-12.2)	13.0 (11.0-15.7)	15.0 (12.3-18.4)	17.1 (13.5-21.6)	19.5 (14.6-25.4)	22.8 (16.4-30.7)	25.6 (17.7-34.7)
10-day	7.39 (6.56-8.34)	8.34 (7.39-9.42)	10.0 (8.86-11.4)	11.6 (10.2-13.2)	14.0 (11.9-16.8)	16.0 (13.2-19.4)	18.1 (14.3-22.7)	20.4 (15.4-26.4)	23.7 (17.1-31.7)	26.4 (18.4-35.7)
20-day	10.0 (8.95-11.2)	11.1 (9.94-12.5)	13.1 (11.6-14.7)	14.7 (13.0-16.7)	17.1 (14.6-20.2)	19.1 (15.8-22.9)	21.1 (16.8-26.1)	23.3 (17.6-29.8)	26.2 (19.0-34.7)	28.6 (20.0-38.4)
30-day	12.2 (10.9-13.6)	13.6 (12.2-15.1)	15.8 (14.1-17.7)	17.7 (15.7-19.9)	20.3 (17.3-23.7)	22.3 (18.5-26.6)	24.4 (19.4-29.9)	26.4 (20.1-33.5)	29.2 (21.2-38.3)	31.3 (22.0-41.9)
45-day	14.9 (13.4-16.5)	16.7 (15.0-18.6)	19.5 (17.5-21.8)	21.8 (19.5-24.5)	24.9 (21.2-28.8)	27.1 (22.6-32.0)	29.3 (23.4-35.6)	31.4 (23.9-39.5)	34.1 (24.8-44.4)	36.0 (25.5-48.0)
60-day	17.2 (15.5-19.0)	19.4 (17.5-21.5)	22.9 (20.6-25.4)	25.6 (22.9-28.6)	29.2 (24.9-33.5)	31.7 (26.4-37.2)	34.1 (27.3-41.2)	36.4 (27.7-45.4)	39.1 (28.4-50.6)	41.0 (29.0-54.5)

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

Appendix D. NRCS Soil Map And Data



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 **Duval County, Florida**



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.

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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

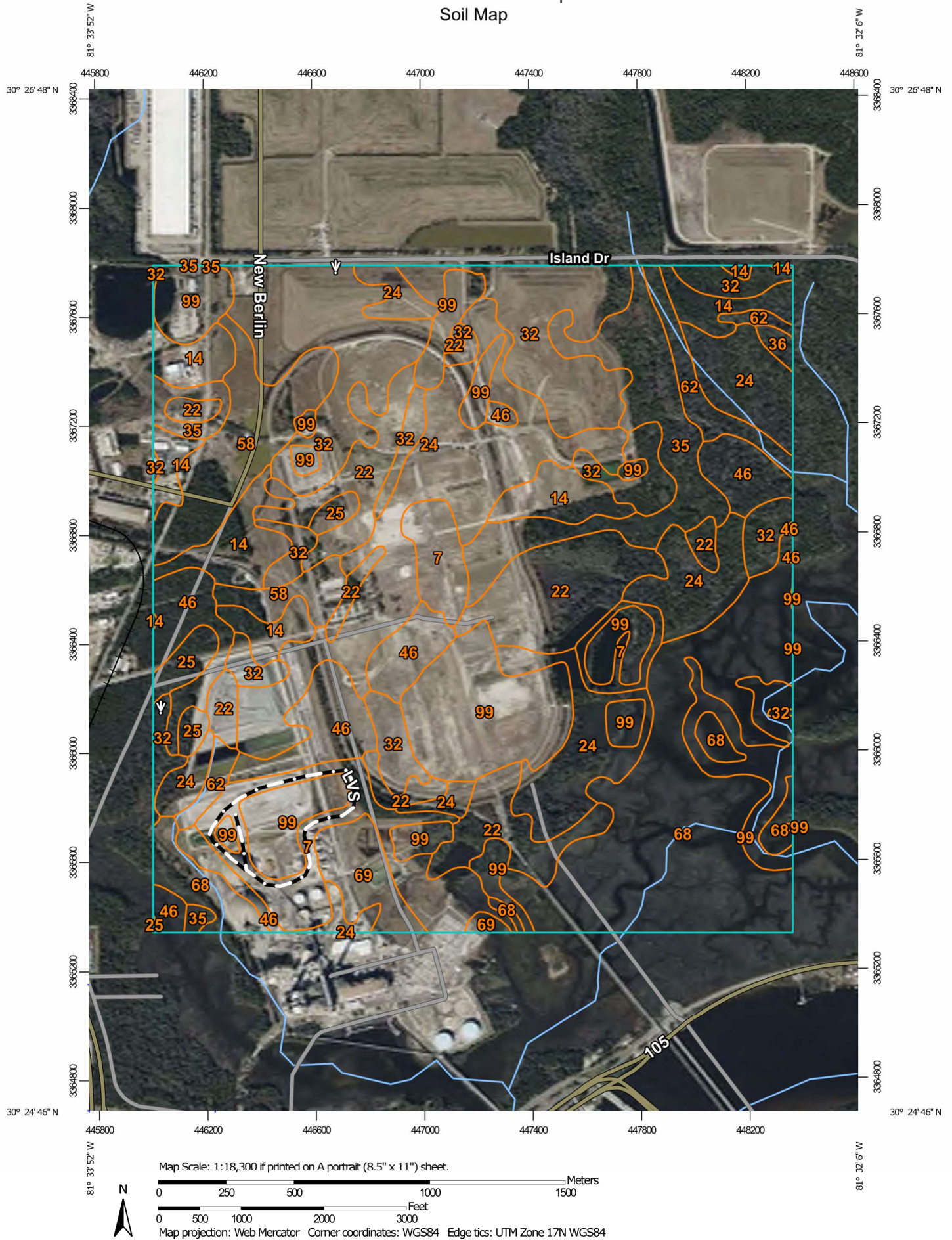
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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.

Custom Soil Resource Report Soil Map



MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Area of Interest (AOI)		Stony Spot
Soils			Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
Special Point Features		Water Features	
	Blowout		Streams and Canals
	Borrow Pit	Transportation	
	Clay Spot		Rails
	Closed Depression		Interstate Highways
	Gravel Pit		US Routes
	Gravelly Spot		Major Roads
	Landfill		Local Roads
	Lava Flow		Aerial Photography
	Marsh or swamp	Background	
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Duval County, Florida
Survey Area Data: Version 20, Aug 28, 2025

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

Date(s) aerial images were photographed: Jan 7, 2022—Feb 14, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background 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
7	Arents, nearly level	83.5	5.8%
14	Boulogne fine sand, 0 to 2 percent slopes	85.2	6.0%
22	Evergreen-Wesconnett complex, depressional, 0 to 2 percent slopes	133.6	9.3%
24	Hurricane and Ridgewood soils, 0 to 5 percent slopes	227.8	15.9%
25	Kershaw fine sand, 2 to 8 percent slopes	16.7	1.2%
32	Leon fine sand, 0 to 2 percent slopes	207.9	14.5%
35	Lynn Haven fine sand, 0 to 2 percent slopes	78.1	5.5%
36	Mandarin fine sand, 0 to 2 percent slopes	3.2	0.2%
46	Ortega fine sand, 0 to 5 percent slopes	99.1	6.9%
58	Pottsburg fine sand, high, 0 to 3 percent slopes	68.3	4.8%
62	Rutlege mucky fine sand, 0 to 2 percent slopes, frequently flooded	26.3	1.8%
68	Tisonia mucky peat, 0 to 1 percent slopes, very frequently flooded	193.1	13.5%
69	Urban land	24.9	1.7%
99	Water	183.6	12.8%
Totals for Area of Interest		1,431.3	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

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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.

Duval County, Florida

7—Arents, nearly level

Map Unit Setting

National map unit symbol: sssw

Elevation: 0 to 120 feet

Mean annual precipitation: 48 to 60 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 240 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 94 percent

Minor components: 6 percent

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

Description of Arents

Setting

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Altered marine deposits

Typical profile

AC - 0 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: No

Minor Components

Corolla

Percent of map unit: 6 percent

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Landform: Rises on dunes on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

14—Boulogne fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: sst3
Elevation: 0 to 150 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Boulogne and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boulogne

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
Bh - 6 to 16 inches: fine sand
E - 16 to 31 inches: fine sand
B'h1 - 31 to 39 inches: fine sand
B'h2 - 39 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
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: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

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Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: No

Minor Components

Lynn haven

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: Yes

Pottsburg, high

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY050NC - Moist Spodosol Rises and Flats

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G153AA131FL)

Hydric soil rating: No

Wesconnett

Percent of map unit: 1 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in
depressions (G153AA145FL)

Hydric soil rating: Yes

22—Evergreen-Wesconnett complex, depressional, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: sstc
Elevation: 0 to 150 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Evergreen and similar soils: 63 percent
Wesconnett and similar soils: 33 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Evergreen

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material over sandy marine deposits

Typical profile

Oa - 0 to 11 inches: muck
A - 11 to 17 inches: fine sand
E - 17 to 26 inches: fine sand
Bh - 26 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.20 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D

Custom Soil Resource Report

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Forage suitability group: Organic soils in depressions and on flood plains
(G153AA645FL)
Other vegetative classification: Organic soils in depressions and on flood plains
(G153AA645FL)
Hydric soil rating: Yes

Description of Wesconnett

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 2 inches: fine sand
Bh - 2 to 32 inches: fine sand
E/Bh - 32 to 44 inches: fine sand
B'h - 44 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Forage suitability group: Sandy soils on stream terraces, flood plains, or in
depressions (G153AA145FL)
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in
depressions (G153AA145FL)
Hydric soil rating: Yes

Minor Components

Pamlico

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY100NC - Flooded Organic Soil Flood Plains and Terraces

Custom Soil Resource Report

Other vegetative classification: Organic soils in depressions and on flood plains
(G153AA645FL)

Hydric soil rating: Yes

Pottsburg

Percent of map unit: 1 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY050NC - Moist Spodosol Rises and Flats

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: No

Leon

Percent of map unit: 1 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: No

Lynn haven

Percent of map unit: 1 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: Yes

24—Hurricane and Ridgewood soils, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: sstf

Elevation: 0 to 190 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 263 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Hurricane and similar soils: 53 percent

Custom Soil Resource Report

Ridgewood and similar soils: 35 percent

Minor components: 12 percent

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

Description of Hurricane

Setting

Landform: Rises on marine terraces, flats on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand

E - 5 to 68 inches: fine sand

Bh - 68 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: A

Ecological site: F153AY050NC - Moist Spodosol Rises and Flats

Forage suitability group: Sandy soils on rises and knolls of mesic uplands
(G153AA131FL)

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G153AA131FL)

Hydric soil rating: No

Description of Ridgewood

Setting

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand

C - 7 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent

Custom Soil Resource Report

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F153AY020NC - Moist Sands
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Minor Components

Pottsburg

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Mandarin

Percent of map unit: 2 percent
Landform: Rises on marine terraces, flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Leon

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)

Custom Soil Resource Report

Hydric soil rating: No

Ortega

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY020NC - Moist Sands

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)

Hydric soil rating: No

Boulogne

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)

Hydric soil rating: No

Lynn haven

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)

Hydric soil rating: Yes

25—Kershaw fine sand, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: sstg

Elevation: 0 to 190 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 263 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Kershaw and similar soils: 94 percent

Minor components: 6 percent

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

Description of Kershaw

Setting

Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
C - 3 to 80 inches: fine sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F153AY010NC - Dry Sands
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G153AA111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G153AA111FL)
Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Ortega

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Linear

Ecological site: F153AY020NC - Moist Sands

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)

Hydric soil rating: No

32—Leon fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sxqv

Elevation: 0 to 250 feet

Mean annual precipitation: 47 to 61 inches

Mean annual air temperature: 55 to 81 degrees F

Frost-free period: 267 to 347 days

Farmland classification: Not prime farmland

Map Unit Composition

Leon, non-hydric, and similar soils: 89 percent

Minor components: 11 percent

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

Description of Leon, Non-hydric

Setting

Landform: Flatwoods

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 8 inches: fine sand

E - 8 to 18 inches: fine sand

Bh - 18 to 37 inches: fine sand

E' - 37 to 45 inches: fine sand

B'h - 45 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 2.00 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: No

Minor Components

Leon, hydric

Percent of map unit: 5 percent

Landform: Flatwoods

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Mandarin

Percent of map unit: 3 percent

Landform: Rises

Landform position (three-dimensional): Rise, talf

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G153AA131FL)

Hydric soil rating: No

Mascotte

Percent of map unit: 3 percent

Landform: Flatwoods

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

35—Lynn Haven fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: ssts

Elevation: 0 to 150 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 263 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Lynn haven and similar soils: 92 percent

Custom Soil Resource Report

Minor components: 8 percent

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

Description of Lynn Haven

Setting

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 13 inches: fine sand

E - 13 to 21 inches: fine sand

Bh - 21 to 62 inches: fine sand

B/C - 62 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Very low

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 6.00 in/hr)*

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

*Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)*

*Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)*

Hydric soil rating: Yes

Minor Components

Leon

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

*Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)*

Hydric soil rating: No

Evergreen

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Organic soils in depressions and on flood plains (G153AA645FL)
Hydric soil rating: Yes

Wesconnett

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)
Hydric soil rating: Yes

Boulogne

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

36—Mandarin fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sxql
Elevation: 0 to 250 feet
Mean annual precipitation: 39 to 62 inches
Mean annual air temperature: 53 to 81 degrees F
Frost-free period: 209 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Mandarin and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mandarin

Setting

Landform: Rises
Landform position (three-dimensional): Rise, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
E - 7 to 13 inches: fine sand
Bh - 13 to 18 inches: fine sand
E' - 18 to 62 inches: fine sand
B'h - 62 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.28 to 19.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Minor Components

Leon

Percent of map unit: 5 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Centenary

Percent of map unit: 1 percent
Landform: Rises
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear, convex

Custom Soil Resource Report

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)

Hydric soil rating: No

Rutlege

Percent of map unit: 1 percent

Landform: Drainageways, depressions

Down-slope shape: Linear, concave

Across-slope shape: Concave

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)

Hydric soil rating: Yes

Ortega

Percent of map unit: 1 percent

Landform: Ridges, marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)

Hydric soil rating: No

46—Ortega fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: ssv4

Elevation: 0 to 190 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 263 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Ortega and similar soils: 93 percent

Minor components: 7 percent

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

Description of Ortega

Setting

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand

C - 5 to 82 inches: fine sand

Custom Soil Resource Report

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F153AY020NC - Moist Sands
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Minor Components

Hurricane

Percent of map unit: 2 percent
Landform: Rises on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Ridgewood

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Kershaw

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY010NC - Dry Sands

Custom Soil Resource Report

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands
(G153AA111FL)

Hydric soil rating: No

Albany

Percent of map unit: 1 percent

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve, talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY040NC - Moist Loamy Rises and Flats

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G153AA131FL)

Hydric soil rating: No

58—Pottsburg fine sand, high, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: ssvj

Elevation: 10 to 190 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 64 to 72 degrees F

Frost-free period: 263 to 293 days

Farmland classification: Not prime farmland

Map Unit Composition

Pottsburg, high, and similar soils: 93 percent

Minor components: 7 percent

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

Description of Pottsburg, High

Setting

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 3 inches: fine sand

E - 3 to 57 inches: fine sand

Bh - 57 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Custom Soil Resource Report

Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Minor Components

Hurricane

Percent of map unit: 2 percent
Landform: Rises on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Boulogne

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Leon

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Ridgewood

Percent of map unit: 1 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Pottsburg

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

62—Rutlege mucky fine sand, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: ssvn
Elevation: 0 to 190 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Rutlege, flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rutlege, Flooded

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits and/or fluviomarine deposits

Typical profile

A1 - 0 to 10 inches: mucky fine sand
A2 - 10 to 14 inches: fine sand
Cg - 14 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Custom Soil Resource Report

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces

Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)

Hydric soil rating: Yes

Minor Components

Boulogne

Percent of map unit: 3 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)

Hydric soil rating: No

Evergreen

Percent of map unit: 3 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Organic soils in depressions and on flood plains (G153AA645FL)

Hydric soil rating: Yes

Surrency, flooded

Percent of map unit: 2 percent

Landform: Flood plains on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F153AY060NC - Wet Loamy Flats and Depressions

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G153AA245FL)

Hydric soil rating: Yes

Lynn haven

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

68—Tisonia mucky peat, 0 to 1 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: ssvv
Elevation: 0 to 150 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Tisonia and similar soils: 96 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tisonia

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over clayey alluvium

Typical profile

Oe - 0 to 18 inches: mucky peat
Cg - 18 to 65 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)

Custom Soil Resource Report

Sodium adsorption ratio, maximum: 35.0

Available water supply, 0 to 60 inches: Very high (about 12.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Ecological site: R153BY140NC - Tidal Marsh on Organic Soil

Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)

Hydric soil rating: Yes

Minor Components

Boulogne

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F153BY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G153AA141FL)

Hydric soil rating: No

Leon, tidal

Percent of map unit: 1 percent

Landform: Tidal marshes on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: F153BY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)

Hydric soil rating: Yes

Maurepas

Percent of map unit: 1 percent

Landform: Flood plains on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F153AY100NC - Flooded Organic Soil Flood Plains and Terraces

Other vegetative classification: Organic soils in depressions and on flood plains
(G153AA645FL)

Hydric soil rating: Yes

69—Urban land

Map Unit Setting

National map unit symbol: ssvw
Elevation: 0 to 190 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Minor Components

Pelham, hydric

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Yes

Hurricane

Percent of map unit: 1 percent
Landform: Rises on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear

Custom Soil Resource Report

Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)
Hydric soil rating: No

Leon

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)
Hydric soil rating: No

Ortega

Percent of map unit: 1 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)
Hydric soil rating: No

Albany

Percent of map unit: 1 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)
Hydric soil rating: No

99—Water

Map Unit Composition

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

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned
(G153AA999FL)
Hydric soil rating: Unranked

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

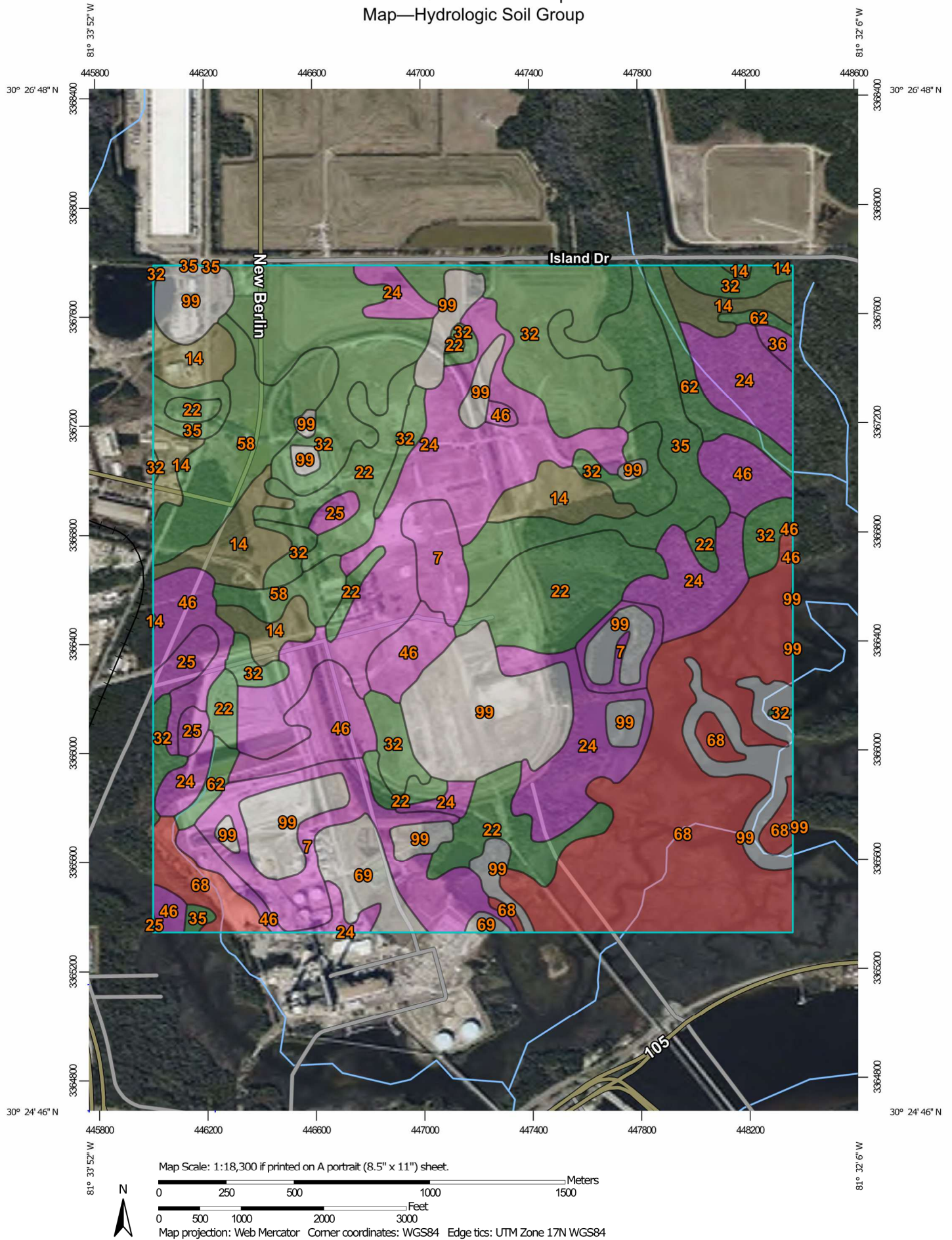
Custom Soil Resource Report

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

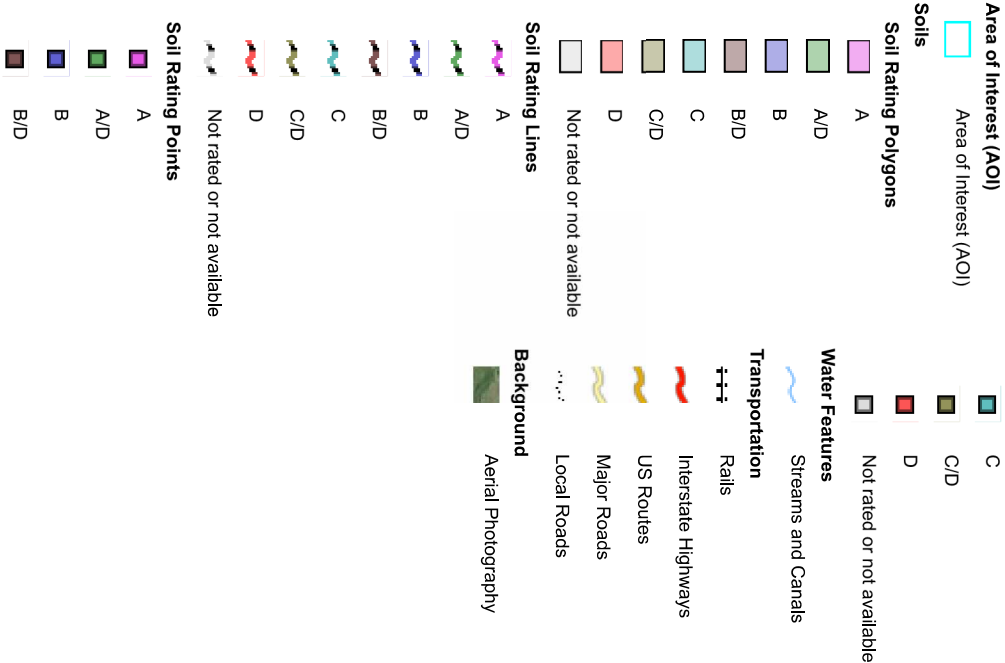
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report Map—Hydrologic Soil Group



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Duval County, Florida
Survey Area Data: Version 20, Aug 28, 2025

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

Date(s) aerial images were photographed: Jan 7, 2022—Feb 14, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7	Arents, nearly level	A	83.5	5.8%
14	Boulogne fine sand, 0 to 2 percent slopes	C/D	85.2	6.0%
22	Evergreen-Wesconnett complex, depressional, 0 to 2 percent slopes	A/D	133.6	9.3%
24	Hurricane and Ridgewood soils, 0 to 5 percent slopes	A	227.8	15.9%
25	Kershaw fine sand, 2 to 8 percent slopes	A	16.7	1.2%
32	Leon fine sand, 0 to 2 percent slopes	A/D	207.9	14.5%
35	Lynn Haven fine sand, 0 to 2 percent slopes	A/D	78.1	5.5%
36	Mandarin fine sand, 0 to 2 percent slopes	A	3.2	0.2%
46	Ortega fine sand, 0 to 5 percent slopes	A	99.1	6.9%
58	Pottsburg fine sand, high, 0 to 3 percent slopes	A/D	68.3	4.8%
62	Rutledge mucky fine sand, 0 to 2 percent slopes, frequently flooded	A/D	26.3	1.8%
68	Tisonia mucky peat, 0 to 1 percent slopes, very frequently flooded	D	193.1	13.5%
69	Urban land		24.9	1.7%
99	Water		183.6	12.8%
Totals for Area of Interest			1,431.3	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method: Dominant Condition**Component Percent Cutoff: None Specified**Tie-break Rule: Higher*

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Appendix E. FEMA Flood Map

This map is intended to be used for planning purposes only. It is not a survey product.

The map displays an aerial view of the SIRPP Unit 3 Site, which is highlighted by a red outline. Surrounding the site are various flood zones labeled "Zone X" and "Zone AE". A legend in the bottom right corner provides the following information:

- SIRPP Unit 3 Site**: Indicated by a red outline.
- Flood Zone**:
 - 0.2% Annual Chance Flood Hazard in Coastal Zone**: Represented by light blue shading.
 - Coastal Floodplain**: Represented by medium blue shading.

FIGURE 3-5
100-YEAR FLOOD ZONES ON SJRPP SITE



0 500 1,000
US Feet
Scale: 1:13,000

Sources: Duval County, 2023; FEMA, 2025

The logo for Jacksonville Electric Authority (JEA) is displayed in blue. It features the letters 'JEA' in a stylized, bold font, with a registered trademark symbol (®) to the right. A light blue arc is positioned behind the letter 'A'.

Appendix F. Post-Development Stormwater Design Drawings

DRAWING INDEX

DRAWING NO.	REV.	DESCRIPTION
424014-DS-0000	4	COVER SHEET
424014-DS-1000	4	OVERALL PLOT PLAN
424014-DS-1001	3	SITE ARRANGEMENT
424014-DS-1101	4	PRE-DEVELOPMENT STORMWATER MANAGEMENT PLAN - PERMANENT REDEVELOPMENT AREA
424014-DS-1102	4	PROPOSED STORMWATER MANAGEMENT PLAN - PERMANENT REDEVELOPMENT AREA
424014-DS-1103	4	CONTACT STORMWATER MANAGEMENT PLAN
424014-DS-1104	4	PROPOSED STORMWATER MANAGEMENT SECTIONS AND DETAILS
424014-DS-1110	4	PROPOSED GRADING & DRAINAGE PLAN
424014-DS-1111	4	GRADING & DRAINAGE PLAN SECTIONS AND DETAILS
424014-DS-1120	4	EROSION AND SEDIMENT CONTROL PLAN
424014-DS-1121	4	EROSION CONTROL SECTIONS AND DETAILS

(drawings included in a separate file attachment)

Appendix G. Select Pages From JEA St. John's River Power Park Decommissioning Drainage Report

Appendix G

1.3 DESIGN STORMS RAINFALL INTENSITIES

The Interconnected Channel and Pond Routing Model (ICPR) provided has used the following rainfall intensities for pre-demolition and post demolition. The rainfall distribution used for this simulation is the SCS method. The rainfall amounts were obtained from the previous permit conditions.

1.4 DESIGN CRITERIA AND CONSTRAINTS

Based on the regulatory criteria, the discharge from the post-demolition site cannot exceed the pre-demolition existing conditions.

Browns Creek is designated as an Outstanding Florida Water, as a result an additional 50% treatment volume has been provided in both the existing pond and the proposed northeast treatment pond. **Table 1.4.1** below summarizes a comparison of the pre- and post-demolition runoff curve numbers for the site

Table 1.4.1

CURVE NUMBER COMPARISON					
PRE-DEMOLITION			POST-DEMOLITION		
AREA NAME	CN	ACRES	AREA NAME	CN	ACRES
EX-1	88	113.3	PR-1	81	113.3
EX-2	83	110.4	PR-2	77	110.4
EX-3	90	60.1	PR-3	70	45
			PR-3 East	61	15.1
EX-4	88	70.3	PR-4	77	70.3
EX-5	95	6.2	PR-5	88	6.2
EX-6	96	90.2	PR-6	67	90.2
EX-7	82	13.7	PR-7	82	13.7
POND	97	22.6	POND	97	22.6
LF2		37.7	LF2		37.7

CN ASSUMPTIONS
USED FOR
PRE-DEVELOPMENT
DRAINAGE AREAS

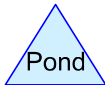
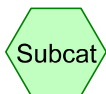
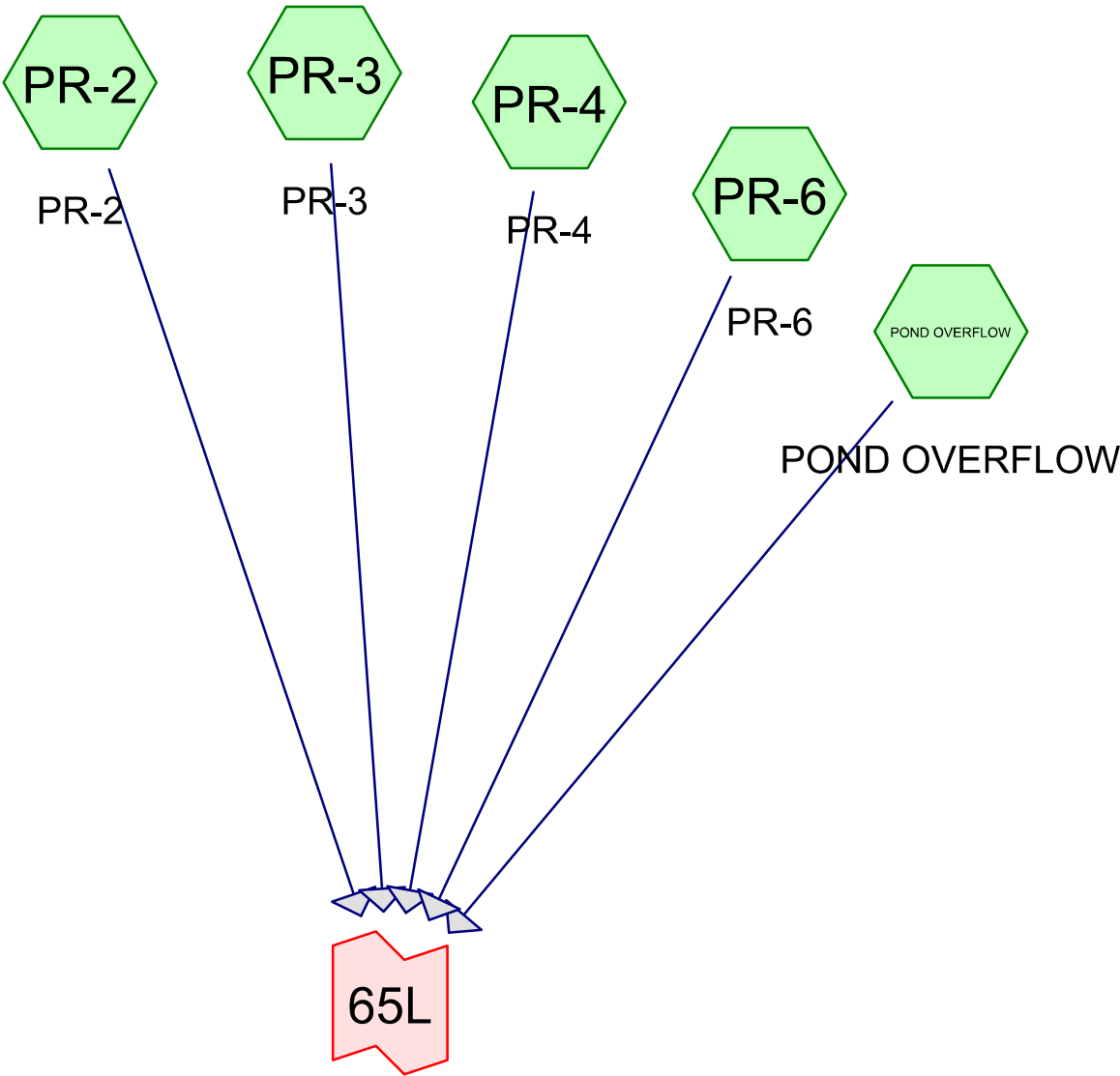
Table 1.4.2 below summarizes the comparison of pre- and post-demolition treatment volumes. Specific water quality calculations are provided in Section 3.2 of this design package.

Table 1.4.2

TREATMENT VOLUME COMPARISON		
	PRE-DEMOLITION	POST-DEMOLITION
EXISTING POND	50.3 Ac-Ft	61.1 Ac-Ft
NORTHEAST POND	N/A	4.4 Ac-Ft
TOTAL	50.3 Ac-Ft	65.5 Ac-Ft

Appendix H. Pre- And Post-Development Peak Flow Hydrocad Report

PRE-DEVELOPMENT
MODEL



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR, 24-HR	Type II FL 24-hr		Default	24.00	1	8.95	2
2	Mean Annual 24 Hour Storm	Type II FL 24-hr		Default	24.00	1	5.00	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.730	97	(POND OVERFLOW)
40.790	77	(PR-2, PR-4)
34.870	70	(PR-3)
91.370	67	(PR-6)
167.760	70	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
167.760	Other	POND OVERFLOW, PR-2, PR-3, PR-4, PR-6
167.760		TOTAL AREA

JEA SJRPP

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Ground Covers (selected 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	167.760	167.760		POND OVERFLOW, PR-2, PR-3, PR-4, PR-6
0.000	0.000	0.000	0.000	167.760	167.760	TOTAL AREA	

JEA SJRPP*Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"*

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Time span=0.00-500.00 hrs, dt=0.05 hrs, 10001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPOND OVERFLOW: POND Runoff Area=0.730 ac 0.00% Impervious Runoff Depth=8.59"
Tc=5.0 min CN=97 Runoff=3.48 cfs 0.523 af

SubcatchmentPR-2: PR-2 Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=6.15"
Tc=17.7 min CN=77 Runoff=56.22 cfs 10.254 af

SubcatchmentPR-3: PR-3 Runoff Area=34.870 ac 0.00% Impervious Runoff Depth=5.29"
Tc=13.0 min CN=70 Runoff=93.44 cfs 15.375 af

SubcatchmentPR-4: PR-4 Runoff Area=20.790 ac 0.00% Impervious Runoff Depth=6.15"
Tc=9.4 min CN=77 Runoff=70.31 cfs 10.659 af

SubcatchmentPR-6: PR-6 Runoff Area=91.370 ac 0.00% Impervious Runoff Depth=4.92"
Tc=70.2 min CN=67 Runoff=105.10 cfs 37.473 af

Link 65L: PRE-DEVELOPMENTPEAK DISCHARGE Inflow=263.74 cfs 74.284 af
Primary=263.74 cfs 74.284 af

Total Runoff Area = 167.760 ac Runoff Volume = 74.284 af Average Runoff Depth = 5.31"
100.00% Pervious = 167.760 ac 0.00% Impervious = 0.000 ac

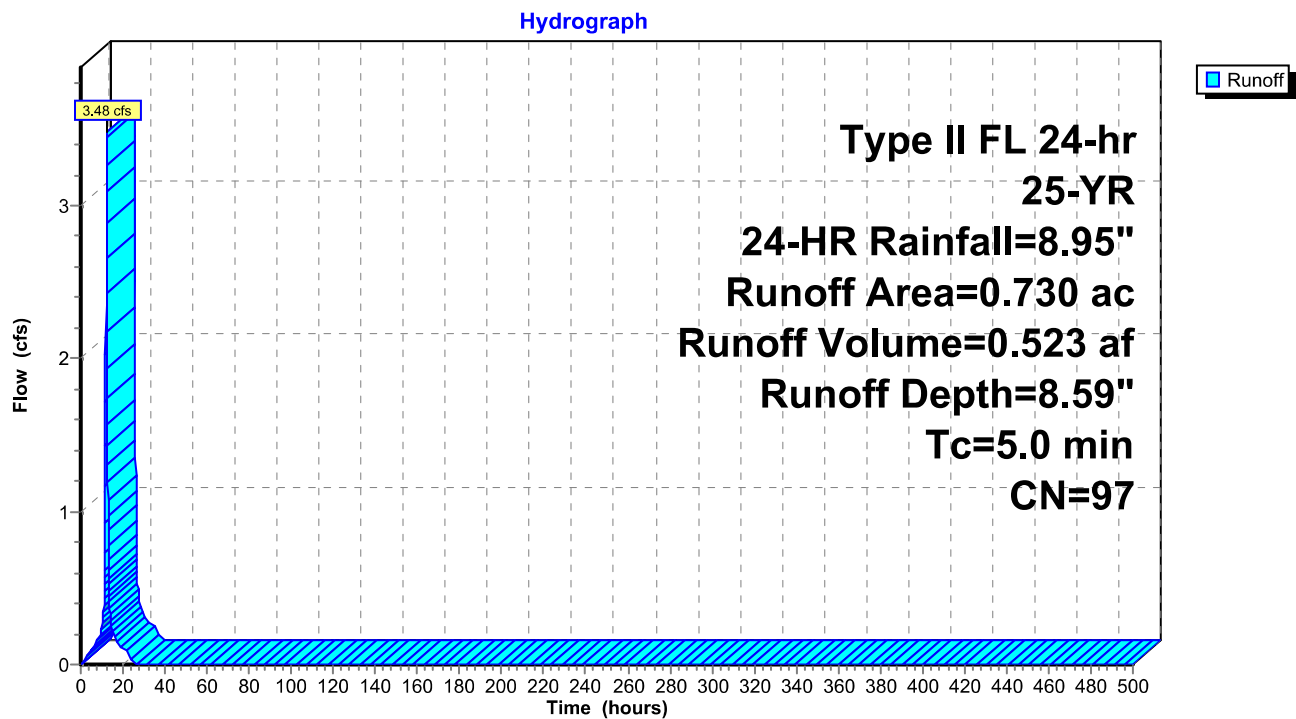
Summary for Subcatchment POND OVERFLOW: POND OVERFLOW[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 3.48 cfs @ 12.13 hrs, Volume= 0.523 af, Depth= 8.59"
 Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, $dt=0.05$ hrs
 Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 0.730	97	
0.730		100.00% Pervious Area

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

Subcatchment POND OVERFLOW: POND OVERFLOW

Summary for Subcatchment PR-2: PR-2

Runoff = 56.22 cfs @ 12.43 hrs, Volume= 10.254 af, Depth= 6.15"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

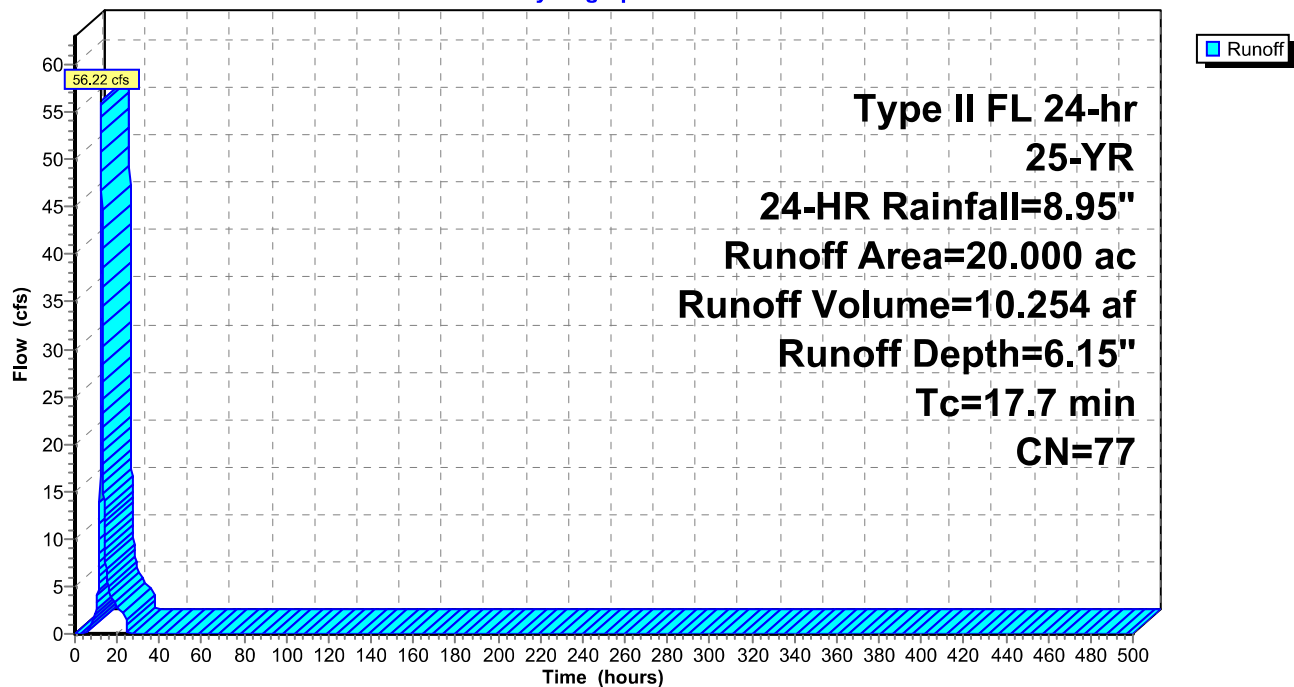
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 20.000	77	
20.000		100.00% Pervious Area

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

Subcatchment PR-2: PR-2

Hydrograph



Summary for Subcatchment PR-3: PR-3

Runoff = 93.44 cfs @ 12.37 hrs, Volume= 15.375 af, Depth= 5.29"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

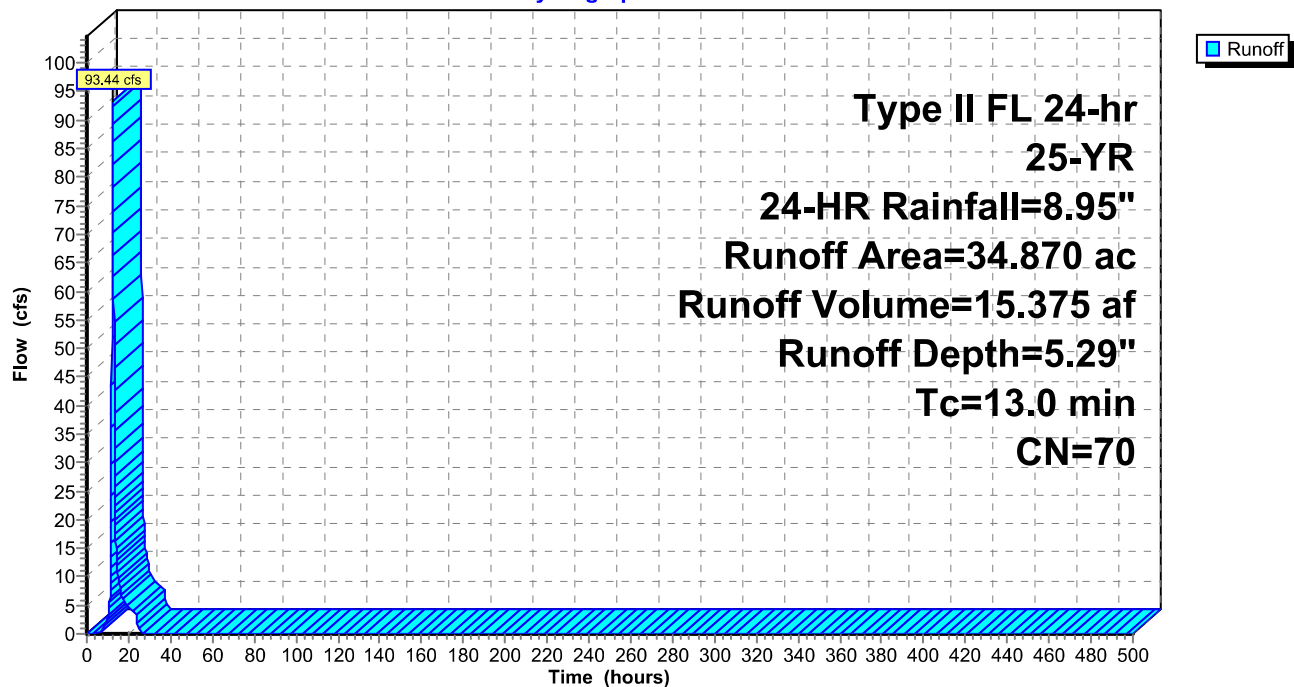
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 34.870	70	
34.870		100.00% Pervious Area

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

Subcatchment PR-3: PR-3

Hydrograph



Summary for Subcatchment PR-4: PR-4

Runoff = 70.31 cfs @ 12.27 hrs, Volume= 10.659 af, Depth= 6.15"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

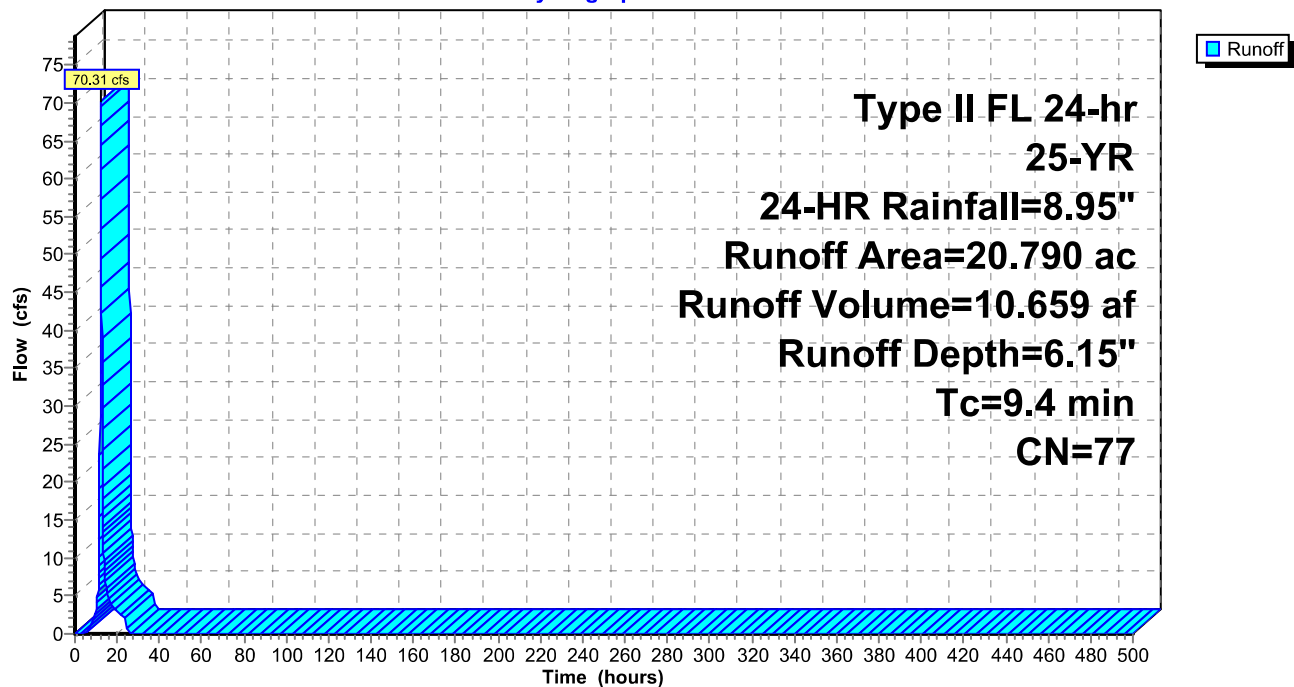
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 20.790	77	
20.790		100.00% Pervious Area

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

Subcatchment PR-4: PR-4

Hydrograph



Summary for Subcatchment PR-6: PR-6

Runoff = 105.10 cfs @ 13.24 hrs, Volume= 37.473 af, Depth= 4.92"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

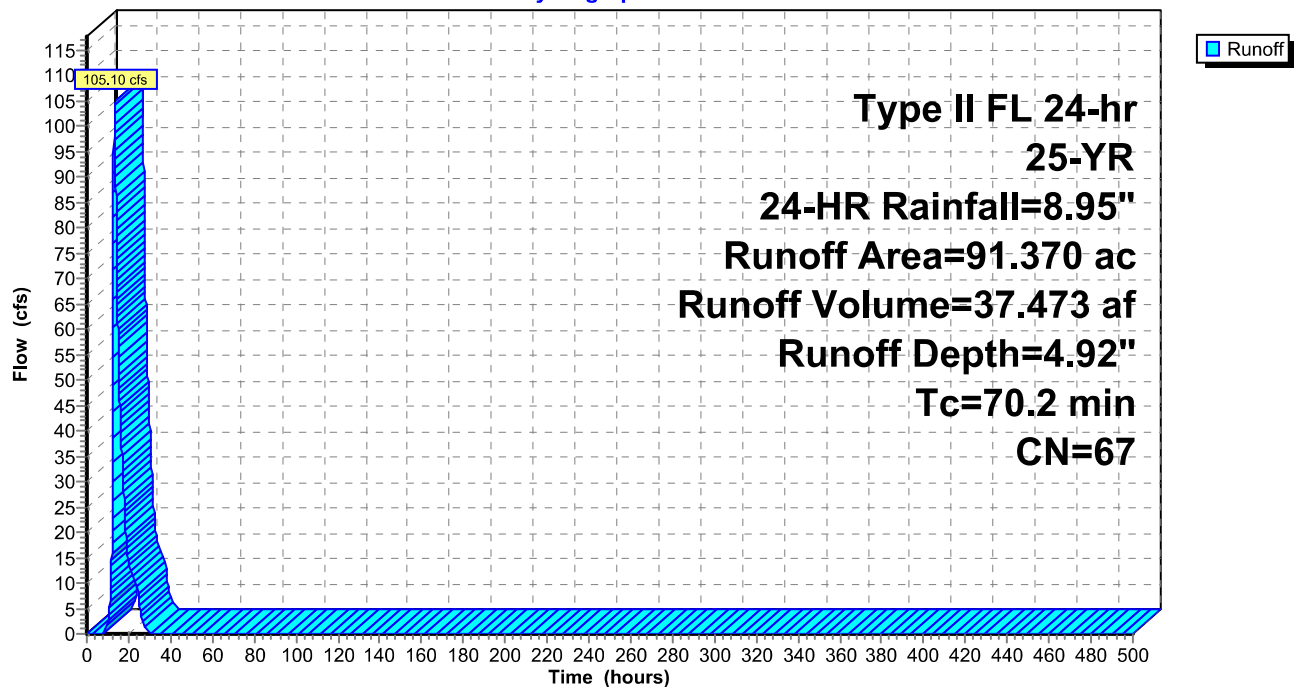
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 91.370	67	
91.370		100.00% Pervious Area

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

Subcatchment PR-6: PR-6

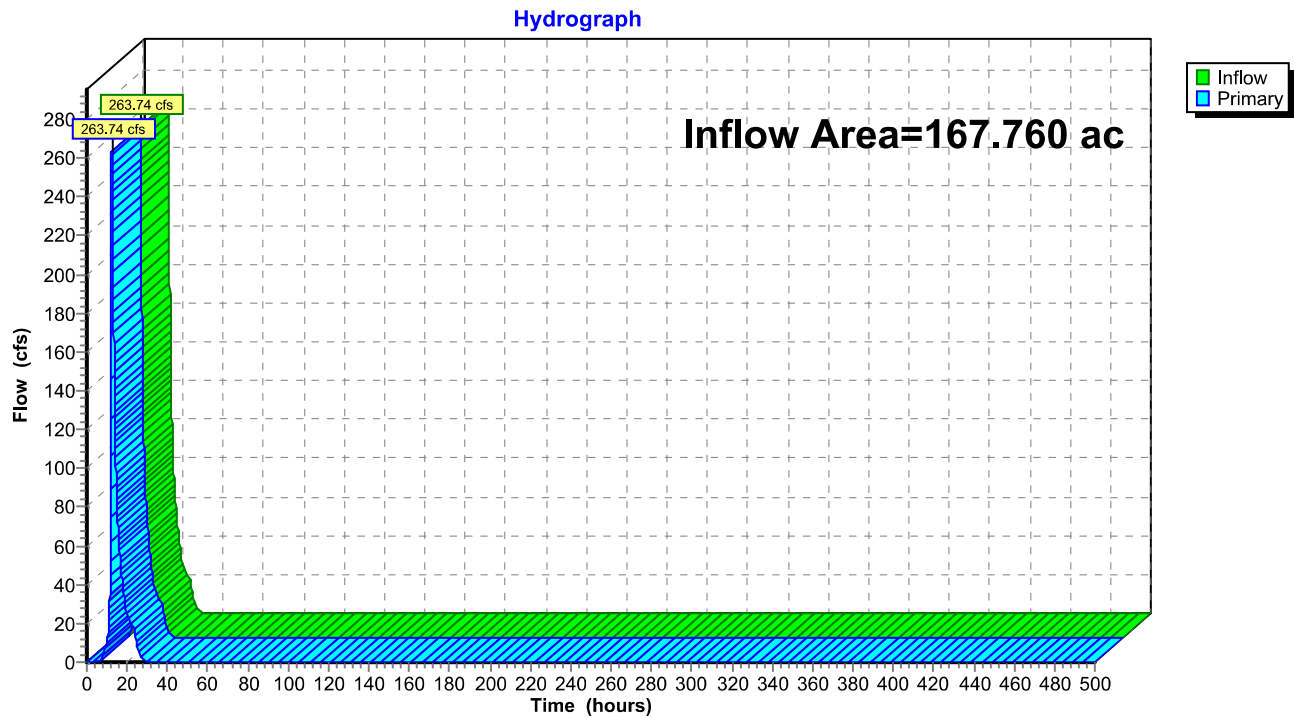
Hydrograph



Summary for Link 65L: PRE-DEVELOPMENT PEAK DISCHARGE

Inflow Area = 167.760 ac, 0.00% Impervious, Inflow Depth = 5.31" for 25-YR, 24-HR event
Inflow = 263.74 cfs @ 12.45 hrs, Volume= 74.284 af
Primary = 263.74 cfs @ 12.45 hrs, Volume= 74.284 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Link 65L: PRE-DEVELOPMENT PEAK DISCHARGE

JEA SJRPP*Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"*

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Time span=0.00-500.00 hrs, dt=0.05 hrs, 10001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPOND OVERFLOW: POND Runoff Area=0.730 ac 0.00% Impervious Runoff Depth=4.65"
Tc=5.0 min CN=97 Runoff=1.92 cfs 0.283 af

SubcatchmentPR-2: PR-2 Runoff Area=20.000 ac 0.00% Impervious Runoff Depth=2.62"
Tc=17.7 min CN=77 Runoff=23.95 cfs 4.372 af

SubcatchmentPR-3: PR-3 Runoff Area=34.870 ac 0.00% Impervious Runoff Depth=2.04"
Tc=13.0 min CN=70 Runoff=35.03 cfs 5.917 af

SubcatchmentPR-4: PR-4 Runoff Area=20.790 ac 0.00% Impervious Runoff Depth=2.62"
Tc=9.4 min CN=77 Runoff=30.00 cfs 4.544 af

SubcatchmentPR-6: PR-6 Runoff Area=91.370 ac 0.00% Impervious Runoff Depth=1.80"
Tc=70.2 min CN=67 Runoff=36.06 cfs 13.729 af

Link 65L: PRE-DEVELOPMENTPEAK DISCHARGE Inflow=101.57 cfs 28.844 af
Primary=101.57 cfs 28.844 af

Total Runoff Area = 167.760 ac Runoff Volume = 28.844 af Average Runoff Depth = 2.06"
100.00% Pervious = 167.760 ac 0.00% Impervious = 0.000 ac

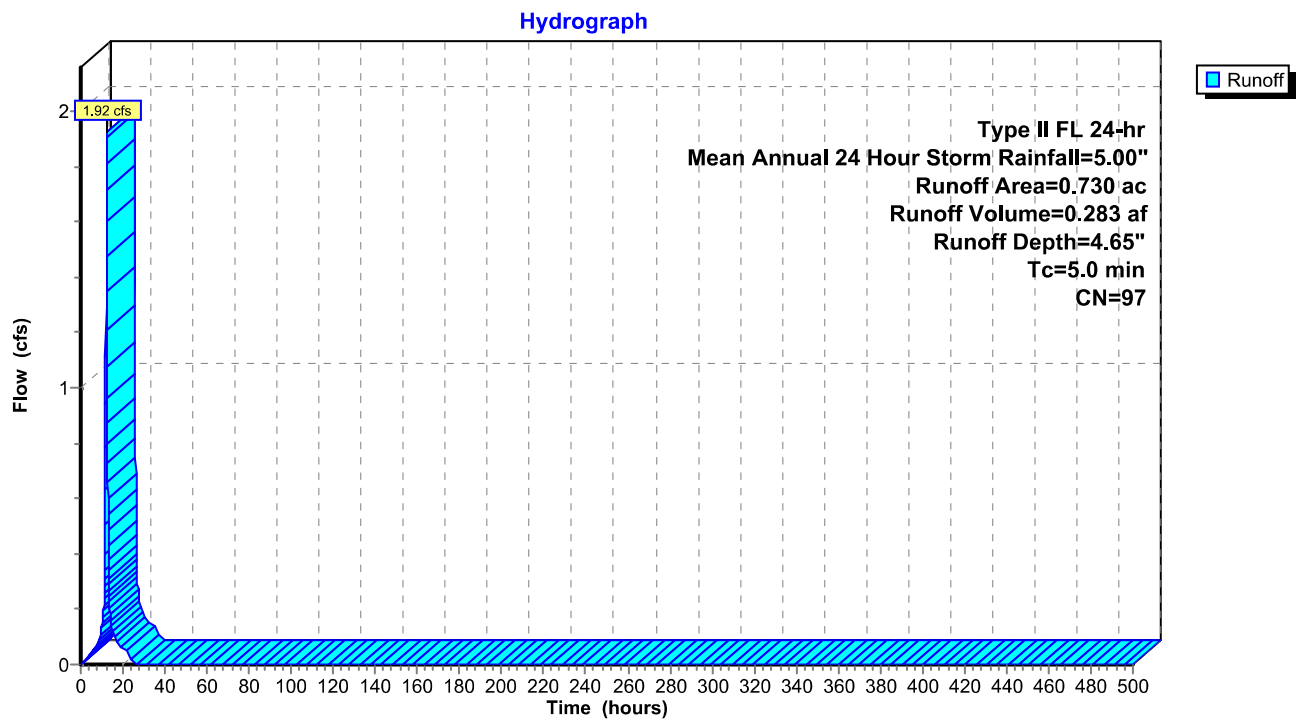
Summary for Subcatchment POND OVERFLOW: POND OVERFLOW[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.92 cfs @ 12.13 hrs, Volume= 0.283 af, Depth= 4.65"
 Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, $dt=0.05$ hrs
 Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

Area (ac)	CN	Description
* 0.730	97	
0.730		100.00% Pervious Area

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

Subcatchment POND OVERFLOW: POND OVERFLOW

Summary for Subcatchment PR-2: PR-2

Runoff = 23.95 cfs @ 12.46 hrs, Volume= 4.372 af, Depth= 2.62"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

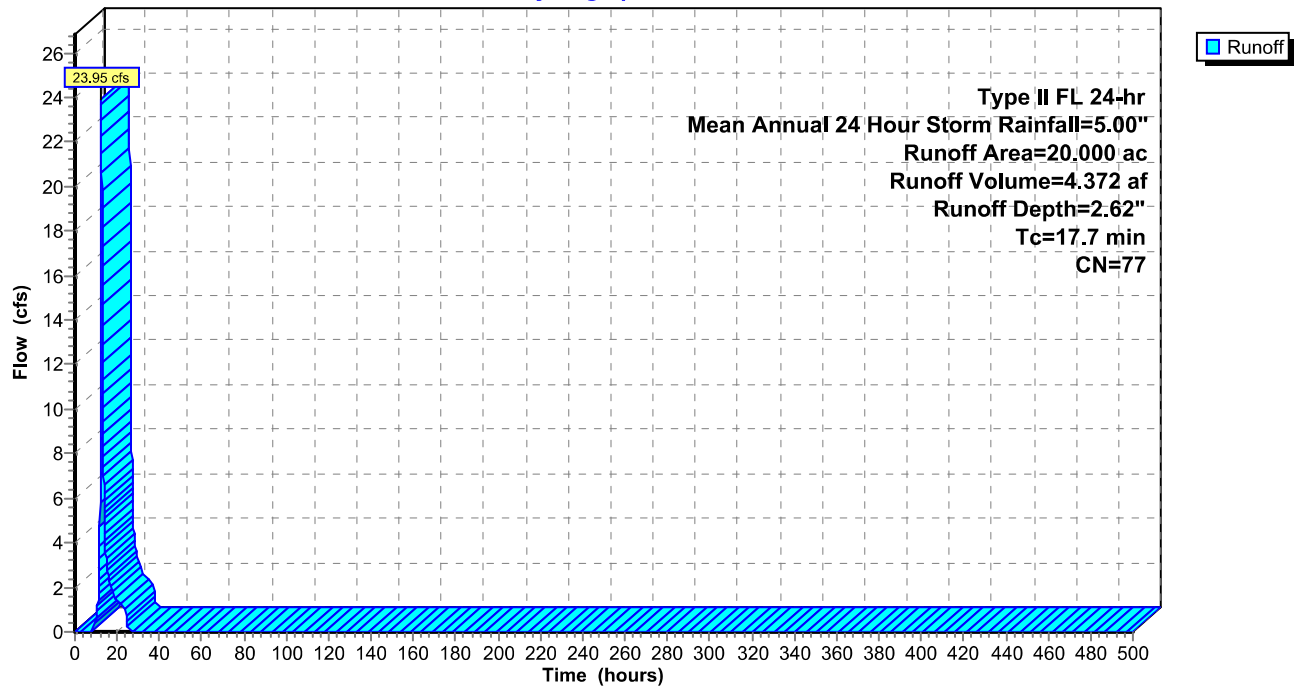
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

Area (ac)	CN	Description
* 20.000	77	
20.000		100.00% Pervious Area

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

Subcatchment PR-2: PR-2

Hydrograph



Summary for Subcatchment PR-3: PR-3

Runoff = 35.03 cfs @ 12.42 hrs, Volume= 5.917 af, Depth= 2.04"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

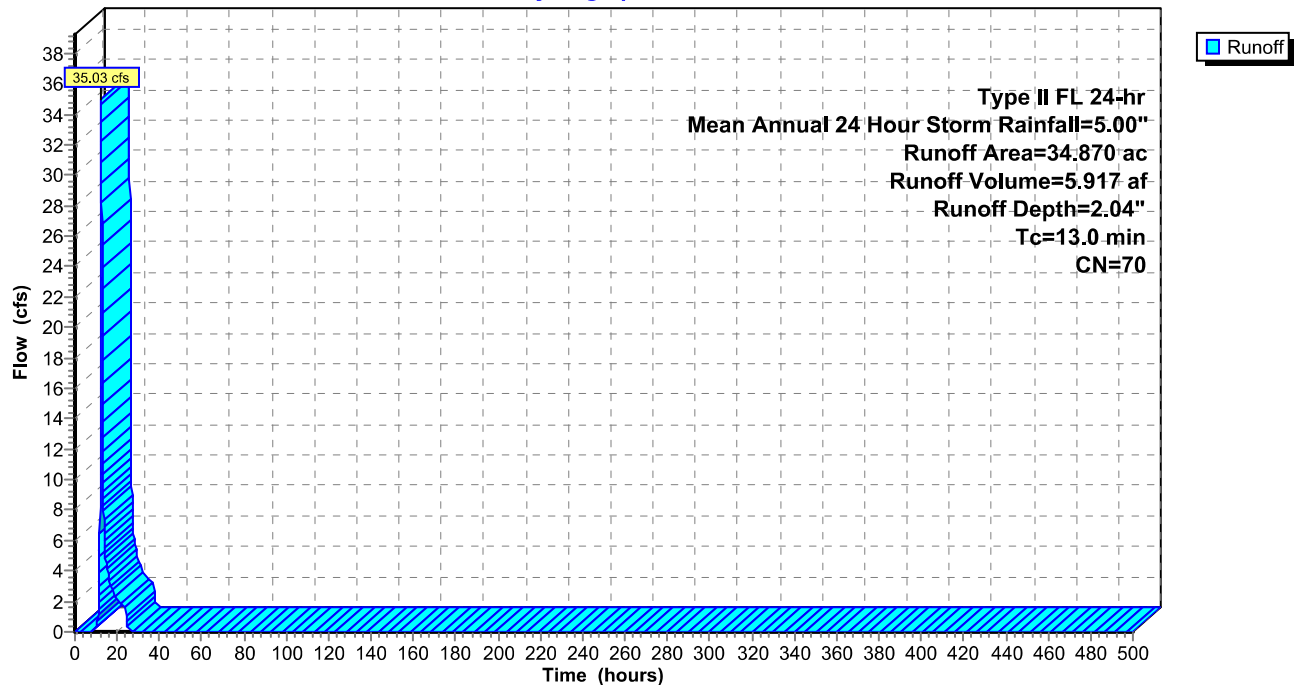
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

Area (ac)	CN	Description
* 34.870	70	
34.870		100.00% Pervious Area

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

Subcatchment PR-3: PR-3

Hydrograph



Summary for Subcatchment PR-4: PR-4

Runoff = 30.00 cfs @ 12.31 hrs, Volume= 4.544 af, Depth= 2.62"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

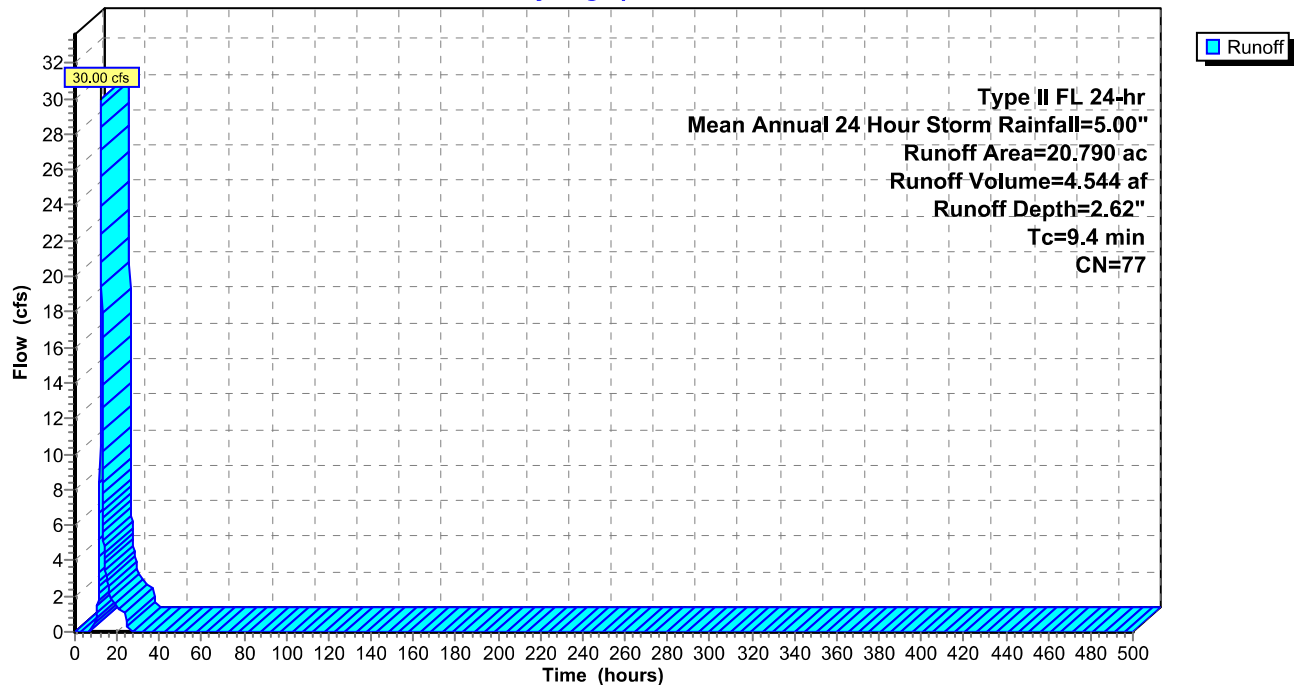
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

Area (ac)	CN	Description
* 20.790	77	
20.790		100.00% Pervious Area

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

Subcatchment PR-4: PR-4

Hydrograph



Summary for Subcatchment PR-6: PR-6

Runoff = 36.06 cfs @ 13.30 hrs, Volume= 13.729 af, Depth= 1.80"

Routed to Link 65L : PRE-DEVELOPMENT PEAK DISCHARGE

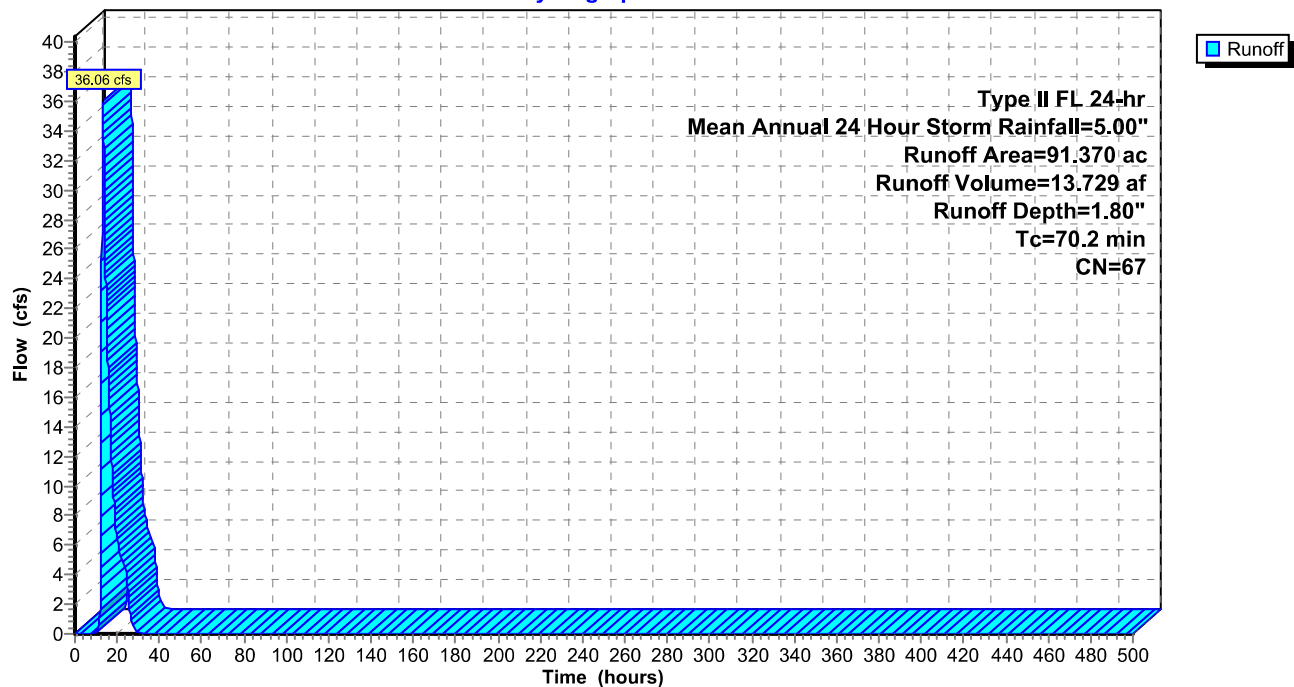
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

Area (ac)	CN	Description
* 91.370	67	
91.370		100.00% Pervious Area

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

Subcatchment PR-6: PR-6

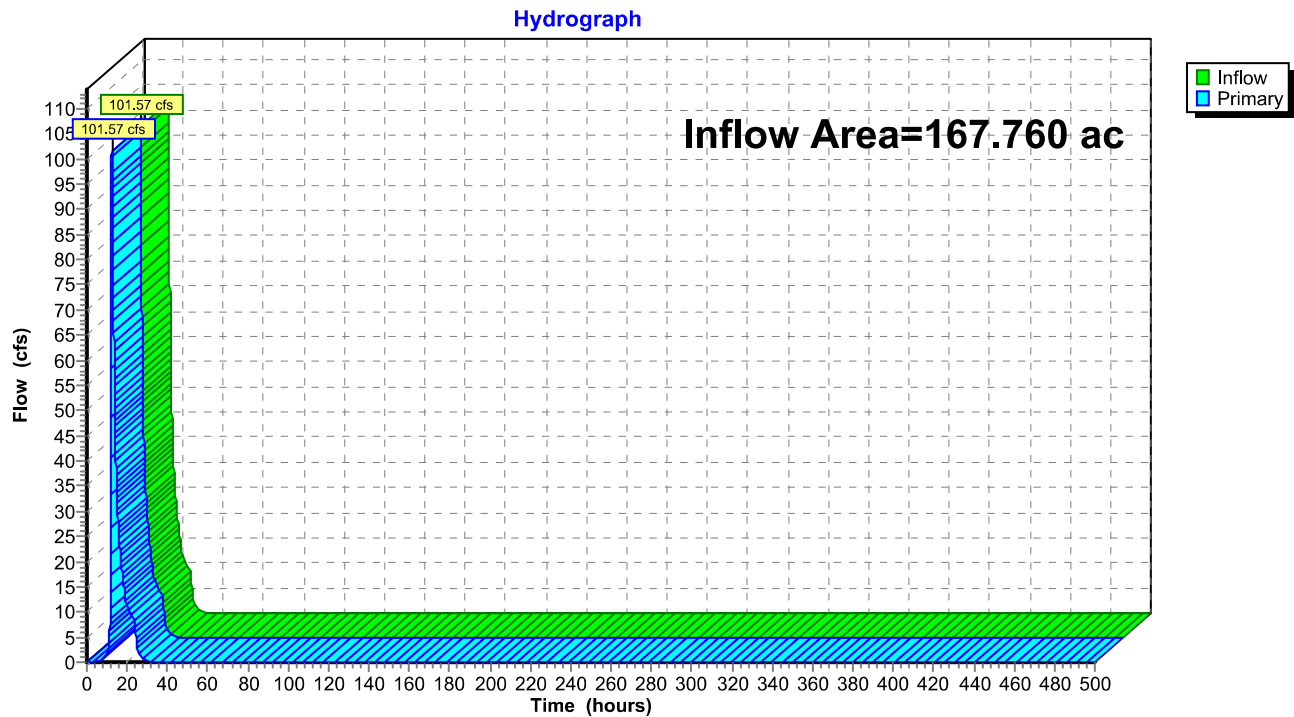
Hydrograph



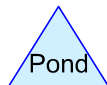
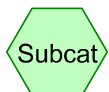
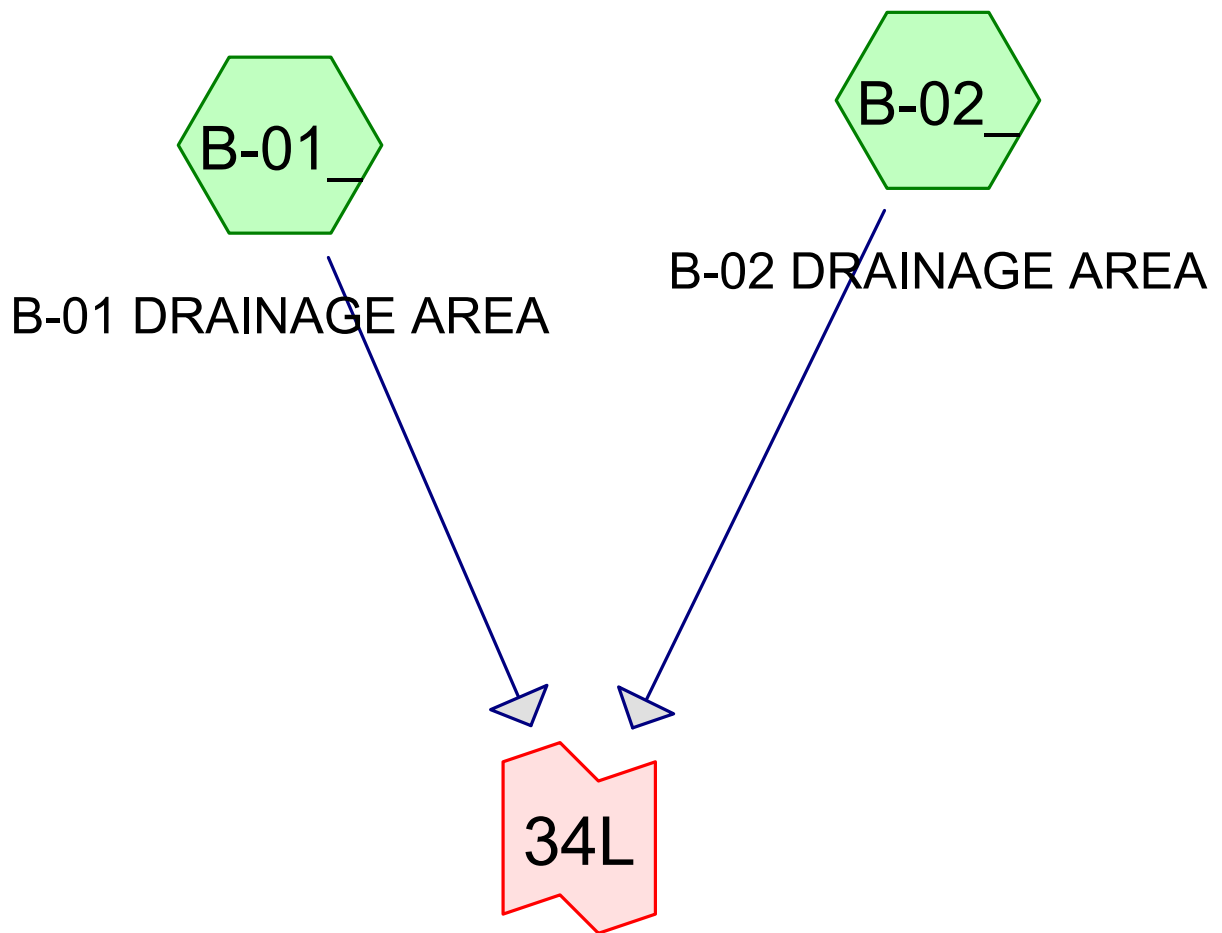
Summary for Link 65L: PRE-DEVELOPMENT PEAK DISCHARGE

Inflow Area = 167.760 ac, 0.00% Impervious, Inflow Depth = 2.06" for Mean Annual 24 Hour Storm event
Inflow = 101.57 cfs @ 12.47 hrs, Volume= 28.844 af
Primary = 101.57 cfs @ 12.47 hrs, Volume= 28.844 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Link 65L: PRE-DEVELOPMENT PEAK DISCHARGE

POST-DEVELOPMENT
- NO POND



Routing Diagram for JEA SJRPP

Prepared by Black & Veatch, Printed 9/3/2026

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JEA SJRPP

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR, 24-HR	Type II FL 24-hr		Default	24.00	1	8.95	2
2	100-YR, 24-HR	Type II FL 24-hr		Default	24.00	1	12.30	2

JEA SJRPP

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
111.250	95	(B-01_)
56.440	94	(B-02_)
167.690	95	TOTAL AREA

JEA SJRPP

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
167.690	Other	B-01_, B-02_
167.690		TOTAL AREA

JEA SJRPP

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Ground Covers (selected 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	167.690	167.690		B-01_, B-02_
0.000	0.000	0.000	0.000	167.690	167.690	TOTAL AREA	

JEA SJRPP*Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"*

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Time span=0.00-500.00 hrs, dt=0.05 hrs, 10001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentB-01_: B-01 DRAINAGE Runoff Area=111.250 ac 0.00% Impervious Runoff Depth=8.35"
Tc=28.0 min CN=95 Runoff=328.85 cfs 77.393 af

SubcatchmentB-02_: B-02 DRAINAGE Runoff Area=56.440 ac 0.00% Impervious Runoff Depth=8.23"
Tc=19.8 min CN=94 Runoff=189.74 cfs 38.695 af

Link 34L: POST-DEVELOPMENTPEAK FLOW - NO POND Inflow=514.86 cfs 116.088 af
Primary=514.86 cfs 116.088 af

Total Runoff Area = 167.690 ac Runoff Volume = 116.088 af Average Runoff Depth = 8.31"
100.00% Pervious = 167.690 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment B-01_: B-01 DRAINAGE AREA

Runoff = 328.85 cfs @ 12.55 hrs, Volume= 77.393 af, Depth= 8.35"

Routed to Link 34L : POST-DEVELOPMENT PEAK FLOW - NO POND

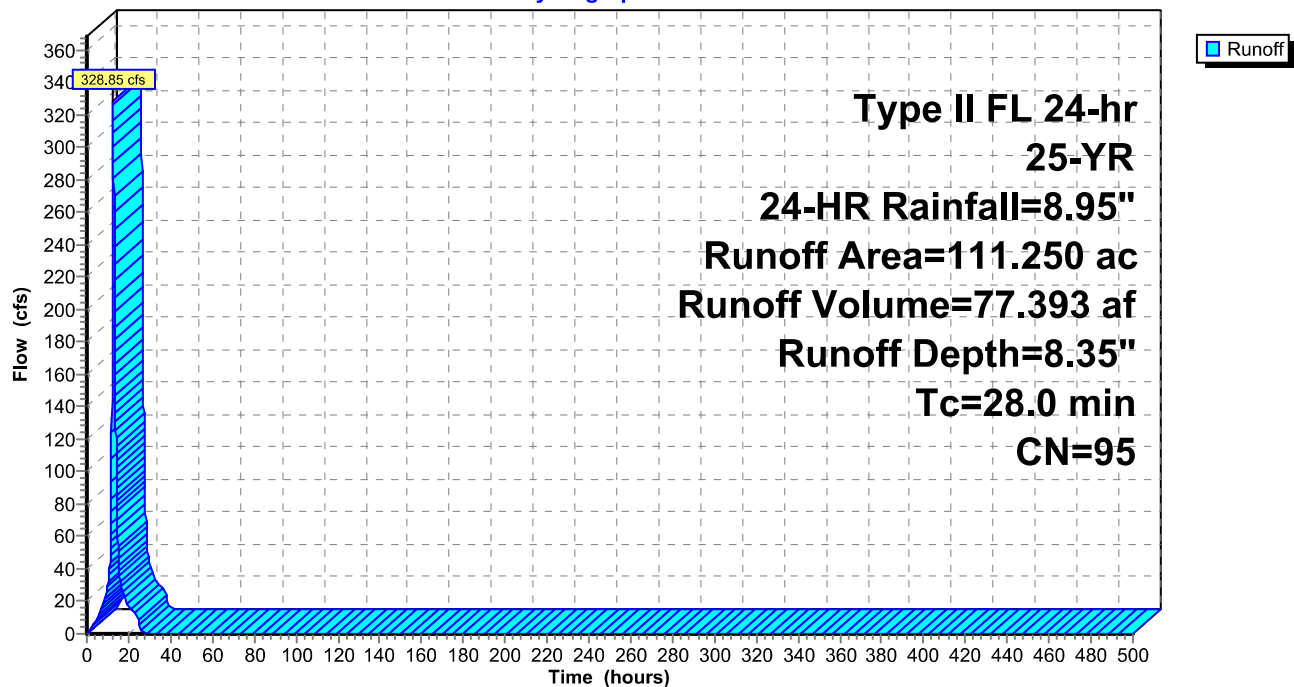
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 111.250	95	
111.250		100.00% Pervious Area

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

Subcatchment B-01_: B-01 DRAINAGE AREA

Hydrograph



Summary for Subcatchment B-02_: B-02 DRAINAGE AREA

Runoff = 189.74 cfs @ 12.43 hrs, Volume= 38.695 af, Depth= 8.23"

Routed to Link 34L : POST-DEVELOPMENT PEAK FLOW - NO POND

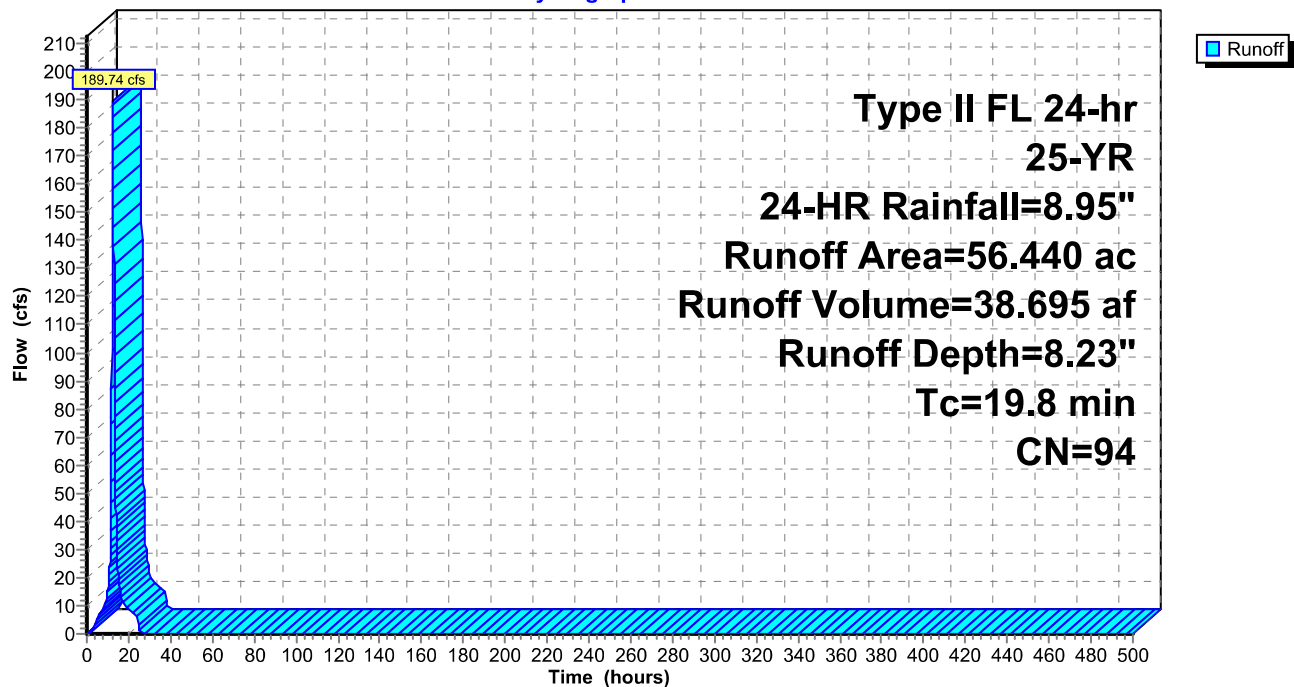
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 56.440	94	
56.440		100.00% Pervious Area

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

Subcatchment B-02_: B-02 DRAINAGE AREA

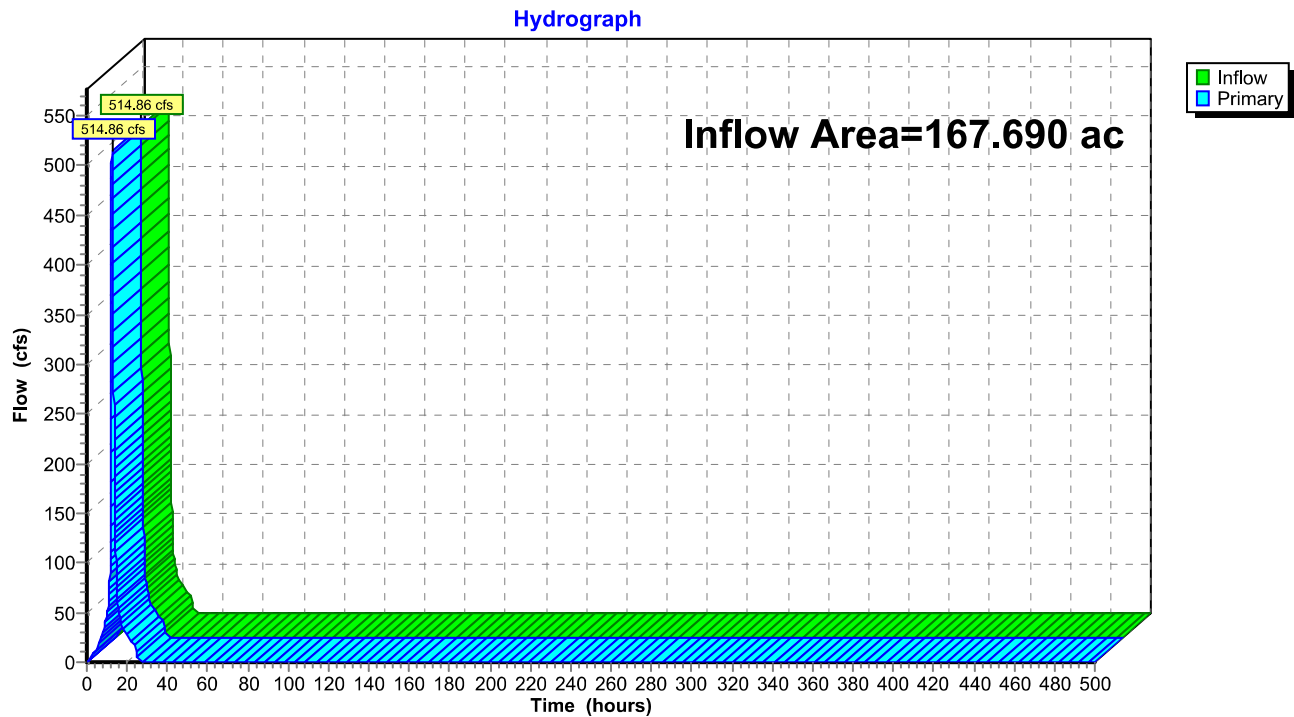
Hydrograph



Summary for Link 34L: POST-DEVELOPMENT PEAK FLOW - NO POND

Inflow Area = 167.690 ac, 0.00% Impervious, Inflow Depth = 8.31" for 25-YR, 24-HR event
Inflow = 514.86 cfs @ 12.50 hrs, Volume= 116.088 af
Primary = 514.86 cfs @ 12.50 hrs, Volume= 116.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Link 34L: POST-DEVELOPMENT PEAK FLOW - NO POND

JEA SJRPP*Type II FL 24-hr 100-YR, 24-HR Rainfall=12.30"*

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Time span=0.00-500.00 hrs, dt=0.05 hrs, 10001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentB-01_: B-01 DRAINAGE Runoff Area=111.250 ac 0.00% Impervious Runoff Depth=11.69"
Tc=28.0 min CN=95 Runoff=454.97 cfs 108.378 af

SubcatchmentB-02_: B-02 DRAINAGE Runoff Area=56.440 ac 0.00% Impervious Runoff Depth=11.57"
Tc=19.8 min CN=94 Runoff=263.19 cfs 54.398 af

Link 34L: POST-DEVELOPMENTPEAK FLOW - NO POND

Inflow=712.86 cfs 162.776 af
Primary=712.86 cfs 162.776 af

Total Runoff Area = 167.690 ac Runoff Volume = 162.776 af Average Runoff Depth = 11.65"
100.00% Pervious = 167.690 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment B-01_: B-01 DRAINAGE AREA

Runoff = 454.97 cfs @ 12.55 hrs, Volume= 108.378 af, Depth=11.69"

Routed to Link 34L : POST-DEVELOPMENT PEAK FLOW - NO POND

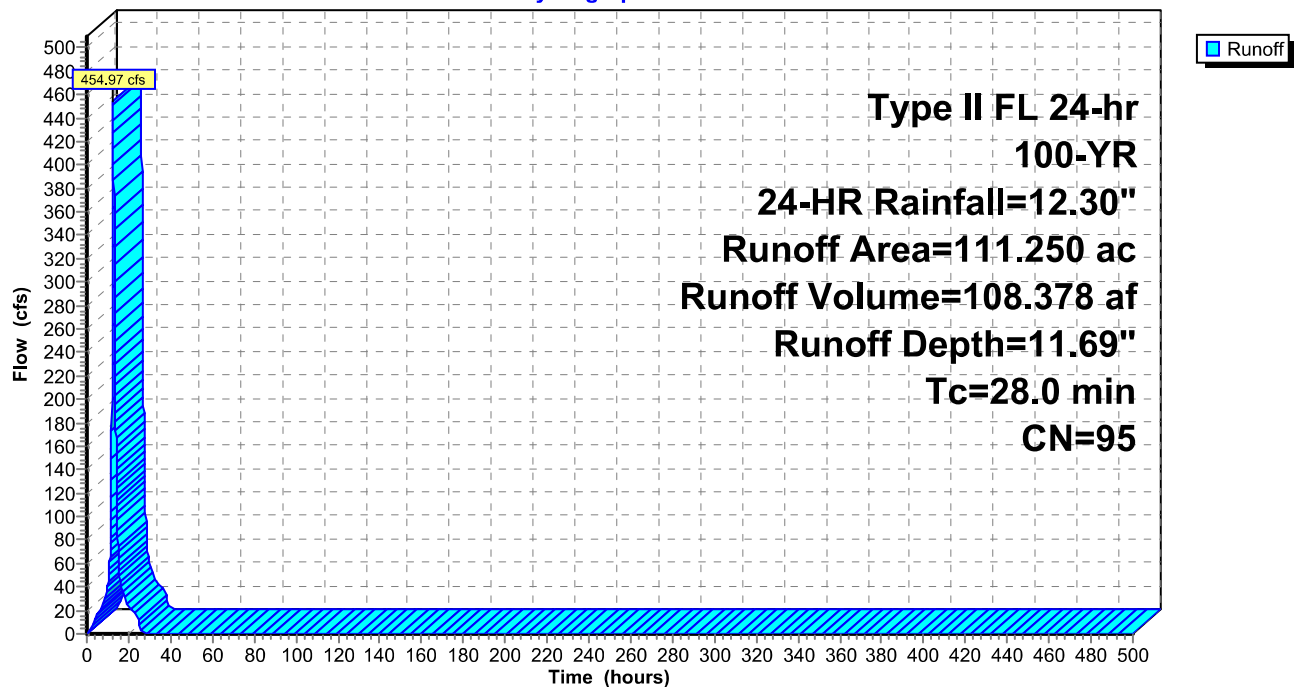
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 100-YR, 24-HR Rainfall=12.30"

Area (ac)	CN	Description
* 111.250	95	
111.250		100.00% Pervious Area

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

Subcatchment B-01_: B-01 DRAINAGE AREA

Hydrograph



Summary for Subcatchment B-02_: B-02 DRAINAGE AREA

Runoff = 263.19 cfs @ 12.42 hrs, Volume= 54.398 af, Depth=11.57"

Routed to Link 34L : POST-DEVELOPMENT PEAK FLOW - NO POND

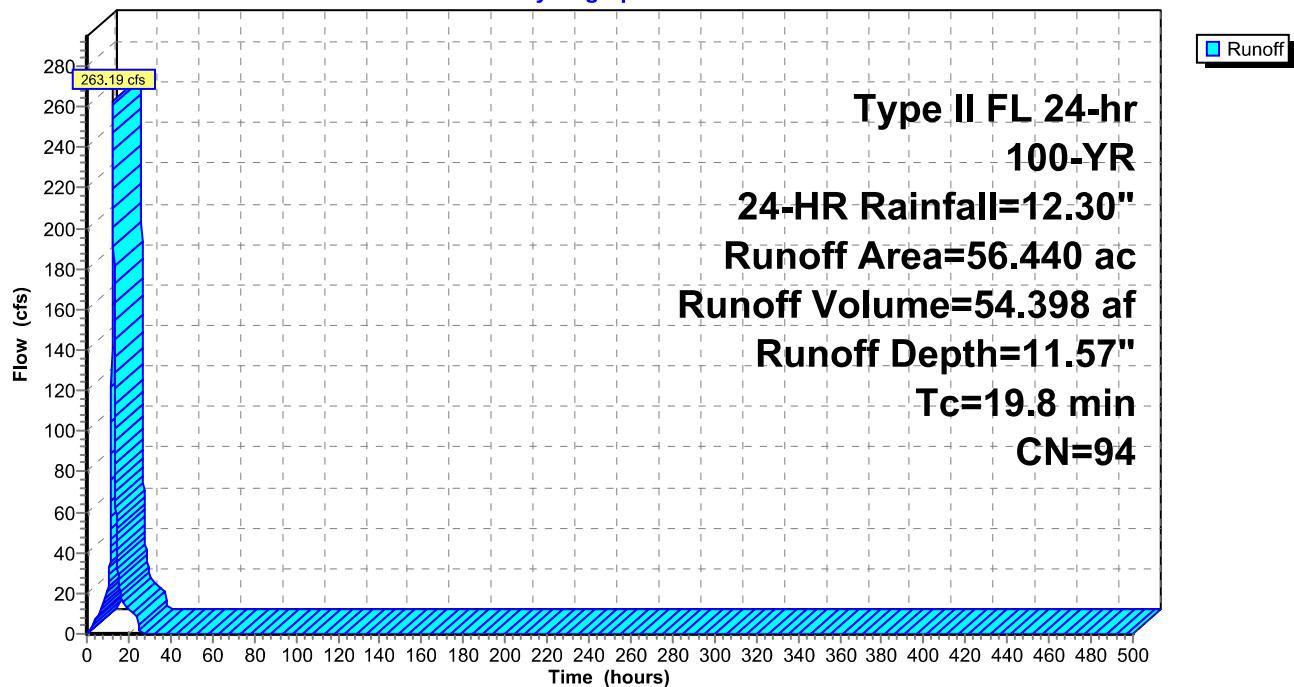
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
Type II FL 24-hr 100-YR, 24-HR Rainfall=12.30"

Area (ac)	CN	Description
* 56.440	94	
56.440		100.00% Pervious Area

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

Subcatchment B-02_: B-02 DRAINAGE AREA

Hydrograph



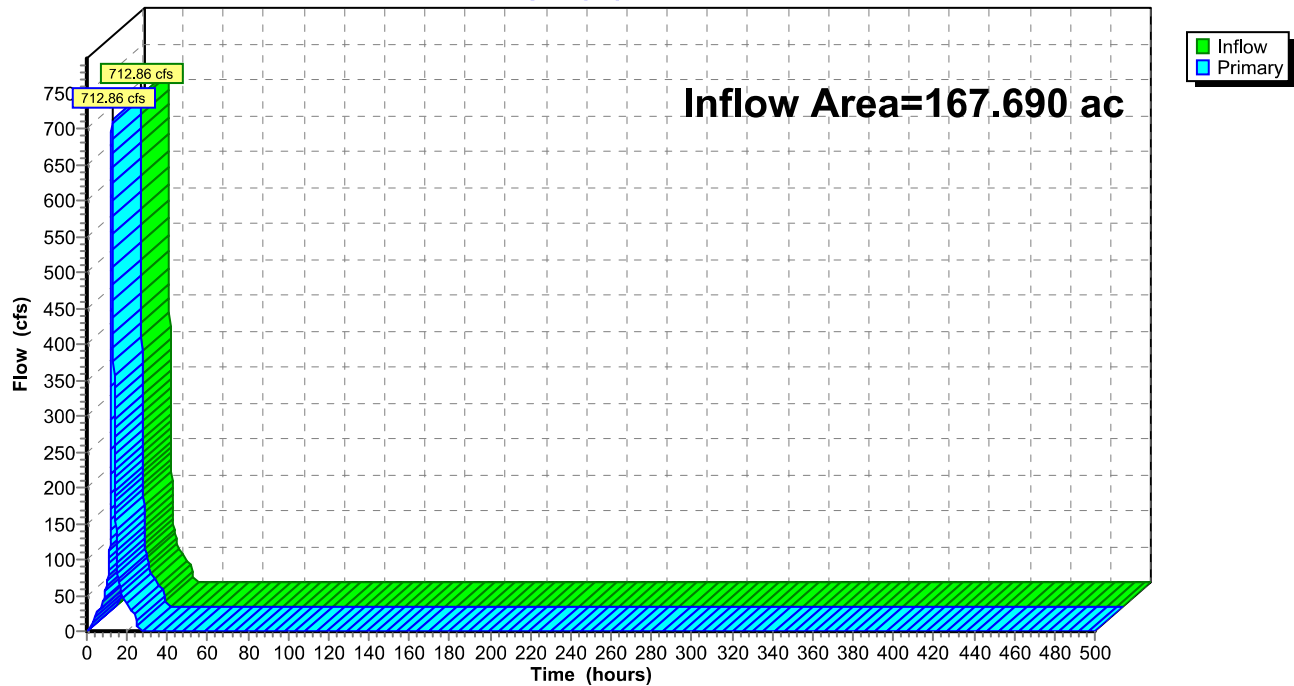
Summary for Link 34L: POST-DEVELOPMENT PEAK FLOW - NO POND

Inflow Area = 167.690 ac, 0.00% Impervious, Inflow Depth = 11.65" for 100-YR, 24-HR event
Inflow = 712.86 cfs @ 12.50 hrs, Volume= 162.776 af
Primary = 712.86 cfs @ 12.50 hrs, Volume= 162.776 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Link 34L: POST-DEVELOPMENT PEAK FLOW - NO POND

Hydrograph



Appendix I. HydroCAD Retention Basin Report

Appendix

POND B-01 DRAWDOWN TIME

JEA SJRPP

Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

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Hydrograph for Pond POND B-01: POND B-01

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	927,799	8.75	8.67	8.67	0.00	0.00
1.00	0.00	896,806	8.67	8.55	8.55	0.00	0.00
2.00	0.00	866,242	8.60	8.43	8.43	0.00	0.00
3.00	0.00	836,103	8.52	8.31	8.31	0.00	0.00
4.00	0.00	806,382	8.45	8.20	8.20	0.00	0.00
5.00	0.00	777,074	8.38	8.08	8.08	0.00	0.00
6.00	0.00	748,175	8.31	7.97	7.97	0.00	0.00
7.00	0.00	719,679	8.24	7.86	7.86	0.00	0.00
8.00	0.00	691,581	8.17	7.75	7.75	0.00	0.00
9.00	0.00	663,875	8.10	7.64	7.64	0.00	0.00
10.00	0.00	636,558	8.03	7.53	7.53	0.00	0.00
11.00	0.00	609,623	7.96	7.43	7.43	0.00	0.00
12.00	0.00	583,067	7.89	7.32	7.32	0.00	0.00
13.00	0.00	556,883	7.83	7.22	7.22	0.00	0.00
14.00	0.00	531,068	7.76	7.12	7.12	0.00	0.00
15.00	0.00	505,617	7.70	7.02	7.02	0.00	0.00
16.00	0.00	480,525	7.63	6.92	6.92	0.00	0.00
17.00	0.00	455,786	7.57	6.82	6.82	0.00	0.00
18.00	0.00	431,397	7.51	6.73	6.73	0.00	0.00
19.00	0.00	407,354	7.45	6.63	6.63	0.00	0.00
20.00	0.00	383,650	7.39	6.54	6.54	0.00	0.00
21.00	0.00	360,283	7.33	6.44	6.44	0.00	0.00
22.00	0.00	337,247	7.27	6.35	6.35	0.00	0.00
23.00	0.00	314,539	7.21	6.26	6.26	0.00	0.00
24.00	0.00	292,153	7.16	6.17	6.17	0.00	0.00
25.00	0.00	270,085	7.10	6.09	6.09	0.00	0.00
26.00	0.00	248,332	7.04	6.00	6.00	0.00	0.00
27.00	0.00	226,890	6.99	5.91	5.91	0.00	0.00
28.00	0.00	205,752	6.93	5.83	5.83	0.00	0.00
29.00	0.00	184,916	6.88	5.75	5.75	0.00	0.00
30.00	0.00	164,377	6.83	5.66	5.66	0.00	0.00
31.00	0.00	144,131	6.77	5.58	5.58	0.00	0.00
32.00	0.00	124,174	6.72	5.50	5.50	0.00	0.00
33.00	0.00	104,502	6.67	5.43	5.43	0.00	0.00
34.00	0.00	85,111	6.62	5.35	5.35	0.00	0.00
35.00	0.00	69,630	6.50	3.02	3.02	0.00	0.00
36.00	0.00	58,975	6.37	2.90	2.90	0.00	0.00
37.00	0.00	48,749	6.23	2.78	2.78	0.00	0.00
38.00	0.00	38,936	6.11	2.67	2.67	0.00	0.00
39.00	0.00	29,517	5.98	2.56	2.56	0.00	0.00
40.00	0.00	20,477	5.87	2.46	2.46	0.00	0.00
41.00	0.00	11,800	5.75	2.36	2.36	0.00	0.00
42.00	0.00	3,949	5.65	1.49	1.49	0.00	0.00
43.00	0.00	1,014	5.61	0.38	0.38	0.00	0.00
44.00	0.00	260	5.60	0.10	0.10	0.00	0.00
45.00	0.00	67	5.60	0.03	0.03	0.00	0.00
46.00	0.00	17	5.60	0.01	0.01	0.00	0.00
47.00	0.00	4	5.60	0.00	0.00	0.00	0.00
48.00	0.00	1	5.60	0.00	0.00	0.00	0.00
49.00	0.00	0	5.60	0.00	0.00	0.00	0.00
50.00	0.00	0	5.60	0.00	0.00	0.00	0.00
51.00	0.00	0	5.60	0.00	0.00	0.00	0.00

POND B-02 DRAWDOWN TIME

JEA SJRPP

Type II FL 24-hr Mean Annual 24 Hour Storm Rainfall=5.00"

Prepared by Black & Veatch

Printed 9/1/2026

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Hydrograph for Pond POND B-02: POND B-02

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	431,425	14.50	12.64	12.64	0.00	0.00
1.00	0.00	387,047	14.25	12.02	12.02	0.00	0.00
2.00	0.00	344,872	14.00	11.42	11.42	0.00	0.00
3.00	0.00	304,819	13.76	10.84	10.84	0.00	0.00
4.00	0.00	266,805	13.53	10.28	10.28	0.00	0.00
5.00	0.00	230,749	13.31	9.75	9.75	0.00	0.00
6.00	0.00	196,570	13.10	9.24	9.24	0.00	0.00
7.00	0.00	164,188	12.89	8.75	8.75	0.00	0.00
8.00	0.00	133,528	12.69	8.28	8.28	0.00	0.00
9.00	0.00	104,516	12.50	7.84	7.84	0.00	0.00
10.00	0.00	77,077	12.32	7.41	7.41	0.00	0.00
11.00	0.00	51,137	12.15	7.00	7.00	0.00	0.00
12.00	0.00	27,478	11.94	3.91	3.91	0.00	0.00
13.00	0.00	14,447	11.49	3.34	3.34	0.00	0.00
14.00	0.00	3,320	11.11	2.85	2.85	0.00	0.00
15.00	0.00	27	11.00	0.04	0.04	0.00	0.00
16.00	0.00	0	11.00	0.00	0.00	0.00	0.00
17.00	0.00	0	11.00	0.00	0.00	0.00	0.00
18.00	0.00	0	11.00	0.00	0.00	0.00	0.00
19.00	0.00	0	11.00	0.00	0.00	0.00	0.00
20.00	0.00	0	11.00	0.00	0.00	0.00	0.00
21.00	0.00	0	11.00	0.00	0.00	0.00	0.00
22.00	0.00	0	11.00	0.00	0.00	0.00	0.00
23.00	0.00	0	11.00	0.00	0.00	0.00	0.00
24.00	0.00	0	11.00	0.00	0.00	0.00	0.00
25.00	0.00	0	11.00	0.00	0.00	0.00	0.00
26.00	0.00	0	11.00	0.00	0.00	0.00	0.00
27.00	0.00	0	11.00	0.00	0.00	0.00	0.00
28.00	0.00	0	11.00	0.00	0.00	0.00	0.00
29.00	0.00	0	11.00	0.00	0.00	0.00	0.00
30.00	0.00	0	11.00	0.00	0.00	0.00	0.00
31.00	0.00	0	11.00	0.00	0.00	0.00	0.00
32.00	0.00	0	11.00	0.00	0.00	0.00	0.00
33.00	0.00	0	11.00	0.00	0.00	0.00	0.00
34.00	0.00	0	11.00	0.00	0.00	0.00	0.00
35.00	0.00	0	11.00	0.00	0.00	0.00	0.00
36.00	0.00	0	11.00	0.00	0.00	0.00	0.00
37.00	0.00	0	11.00	0.00	0.00	0.00	0.00
38.00	0.00	0	11.00	0.00	0.00	0.00	0.00
39.00	0.00	0	11.00	0.00	0.00	0.00	0.00
40.00	0.00	0	11.00	0.00	0.00	0.00	0.00
41.00	0.00	0	11.00	0.00	0.00	0.00	0.00
42.00	0.00	0	11.00	0.00	0.00	0.00	0.00
43.00	0.00	0	11.00	0.00	0.00	0.00	0.00
44.00	0.00	0	11.00	0.00	0.00	0.00	0.00
45.00	0.00	0	11.00	0.00	0.00	0.00	0.00
46.00	0.00	0	11.00	0.00	0.00	0.00	0.00
47.00	0.00	0	11.00	0.00	0.00	0.00	0.00
48.00	0.00	0	11.00	0.00	0.00	0.00	0.00
49.00	0.00	0	11.00	0.00	0.00	0.00	0.00
50.00	0.00	0	11.00	0.00	0.00	0.00	0.00
51.00	0.00	0	11.00	0.00	0.00	0.00	0.00

FDEP Quality Manual Appendix D
Recommended Dry Retention Depths:

Calculated Dry Retention Depth
For an Annual Mass Removal Efficiency of 85 Percent
Coastal (Zone 4)

NDCIA CN	Percent DCIA																		
	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.25	0.36	0.45	0.51	0.62	0.71	0.79	0.90	0.98	1.08	1.17	1.28	1.38	1.45	1.54	1.64	1.73	1.82	1.91
35	0.28	0.39	0.48	0.54	0.64	0.72	0.81	0.91	0.99	1.09	1.18	1.27	1.38	1.45	1.54	1.64	1.73	1.82	1.91
40	0.35	0.43	0.48	0.57	0.66	0.74	0.83	0.92	1.01	1.10	1.19	1.28	1.37	1.48	1.55	1.64	1.73	1.82	1.91
45	0.45	0.47	0.53	0.61	0.69	0.77	0.88	0.94	1.03	1.12	1.21	1.29	1.38	1.47	1.58	1.65	1.74	1.83	1.91
50	0.58	0.55	0.59	0.68	0.73	0.81	0.89	0.97	1.05	1.14	1.22	1.31	1.40	1.48	1.57	1.66	1.74	1.83	1.91
55	0.74	0.67	0.69	0.73	0.79	0.88	0.94	1.01	1.09	1.17	1.25	1.33	1.42	1.50	1.58	1.68	1.75	1.83	1.91
60	0.92	0.82	0.80	0.82	0.87	0.93	0.99	1.08	1.13	1.21	1.28	1.36	1.44	1.51	1.59	1.69	1.76	1.85	1.91
65	1.10	0.99	0.95	0.95	0.97	1.0	1.08	1.16	1.22	1.30	1.37	1.44	1.50	1.57	1.64	1.73	1.79	1.85	1.91
70	1.28	1.16	1.10	1.09	1.09	1.1	1.18	1.26	1.32	1.39	1.46	1.53	1.59	1.67	1.73	1.79	1.85	1.91	1.91
75	1.45	1.34	1.27	1.24	1.24	1.2	1.28	1.36	1.42	1.48	1.55	1.61	1.68	1.75	1.81	1.87	1.91	1.91	1.91
80	1.60	1.50	1.44	1.41	1.39	1.39	1.41	1.43	1.45	1.48	1.52	1.56	1.61	1.65	1.70	1.75	1.81	1.86	1.91
85	1.73	1.66	1.61	1.58	1.56	1.55	1.55	1.56	1.57	1.59	1.62	1.65	1.68	1.71	1.75	1.79	1.83	1.87	1.91
90	1.84	1.79	1.76	1.73	1.72	1.71	1.70	1.70	1.71	1.72	1.73	1.74	1.76	1.78	1.81	1.83	1.86	1.89	1.91
95	1.91	1.89	1.88	1.87	1.86	1.85	1.85	1.84	1.84	1.85	1.85	1.85	1.86	1.88	1.87	1.88	1.89	1.90	1.91
98	1.91	1.91	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.91	1.91	1.91	1.91

B-01 MINIMUM
RETENTION
DEPTH = 1.76 IN

B-02 MINIMUM
RETENTION
DEPTH = 1.71 IN

POND OUTLETS AND ROUTING

Pond POND B-01 Sharp-Crested Rectangular Weir O...

Description: Sharp-Crested Rectangular Weir

Invert Elevation: (feet) 8.75

Crest Length: (feet) 4.0

Crest Height: (feet)

Discharge: 1.00

End Co: 2

Routing: Device 2

Rise: (feet)

OK Cancel Help

Edit Pond POND B-01 - JEA SJRPP

General | Storage | Outlets | Tailwater | Advanced | Notes

#	Invert (feet)	Description	Routing
1	5.60	Exfiltration	Discarded
2	6.60	Culvert - EXISTING	Primary
3	8.75	Sharp-Crested Rectangular Weir	Device 2
4	11.50	Concrete Box Riser Structure with Gr	Device 2
5	12.50	Broad-Crested Rectangular Weir	Secondary
6			
7			
8			
9			
10			
11			

Tip: For standpipes and other compound outlets, enter the final outlet device FIRST. Click here for details.

Edit Outlet...

OK Cancel Apply Help

Pond POND B-02 Sharp-Crested Rectangular Weir O...

Description: Sharp-Crested Rectangular Weir

Invert Elevation: (feet) 14.50

Crest Length: (feet) 4.0

Crest Height: (feet)

Discharge: 1.00

End Co: 2

Routing: Device 2

Rise: (feet)

OK Cancel Help

Edit Pond POND B-02 - JEA SJRPP

General | Storage | Outlets | Tailwater | Advanced | Notes

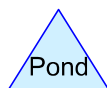
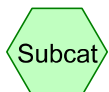
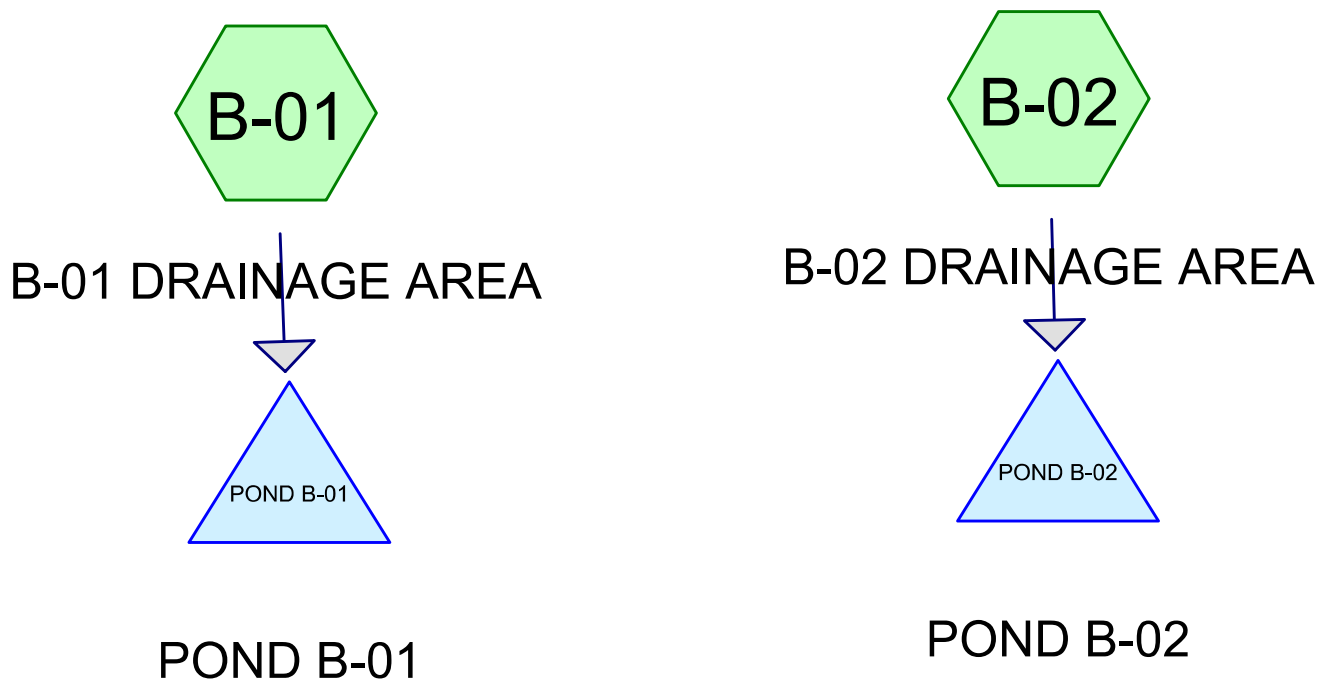
#	Invert (feet)	Description	Routing
1	11.00	Exfiltration	Discarded
2	12.00	Culvert	Primary
3	14.50	Sharp-Crested Rectangular Weir	Device 2
4	16.00	Concrete Box Riser Structure with Gr	Device 2
5	17.00	Broad-Crested Rectangular Weir	Secondary
6			
7			
8			
9			
10			
11			

Tip: For standpipes and other compound outlets, enter the final outlet device FIRST. Click here for details.

Edit Outlet...

OK Cancel Apply Help

POST-DEVELOPMENT
- MEAN ANNUAL
24-HOUR STORM -
TAILWATER = 1.08'



JEA SJRPP

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Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-YR, 24-HR	Type II FL 24-hr		Default	24.00	1	8.95	2

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Page 3

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
111.250	95	(B-01)
56.440	94	(B-02)
167.690	95	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
167.690	Other	B-01, B-02
167.690		TOTAL AREA

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Ground Covers (selected 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	167.690	167.690		B-01, B-02
0.000	0.000	0.000	0.000	167.690	167.690	TOTAL AREA	

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Page 6

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	POND B-01	6.60	2.85	163.1	0.0230	0.011	0.0	30.0	0.0	
2	POND B-02	12.00	4.22	144.8	0.0537	0.011	0.0	36.0	0.0	

JEA SJRPP*Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"*

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Time span=0.00-500.00 hrs, dt=0.05 hrs, 10001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentB-01: B-01 DRAINAGE Runoff Area=111.250 ac 0.00% Impervious Runoff Depth=8.35"
Tc=28.0 min CN=95 Runoff=328.85 cfs 77.393 af

SubcatchmentB-02: B-02 DRAINAGE AREA Runoff Area=56.440 ac 0.00% Impervious Runoff Depth=8.23"
Tc=19.8 min CN=94 Runoff=189.74 cfs 38.695 af

Pond POND B-01: POND B-01 Peak Elev=11.43' Storage=2,056,617 cf Inflow=328.85 cfs 77.393 af
Discarded=12.93 cfs 43.876 af Primary=49.69 cfs 33.517 af Secondary=0.00 cfs 0.000 af Outflow=62.62 cfs 77.393 af

Pond POND B-02: POND B-02 Peak Elev=16.44' Storage=794,607 cf Inflow=189.74 cfs 38.695 af
Discarded=17.47 cfs 27.782 af Primary=51.02 cfs 10.913 af Secondary=0.00 cfs 0.000 af Outflow=68.50 cfs 38.695 af

Total Runoff Area = 167.690 ac Runoff Volume = 116.088 af Average Runoff Depth = 8.31"
100.00% Pervious = 167.690 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment B-01: B-01 DRAINAGE AREA

Runoff = 328.85 cfs @ 12.55 hrs, Volume= 77.393 af, Depth= 8.35"
 Routed to Pond POND B-01 : POND B-01

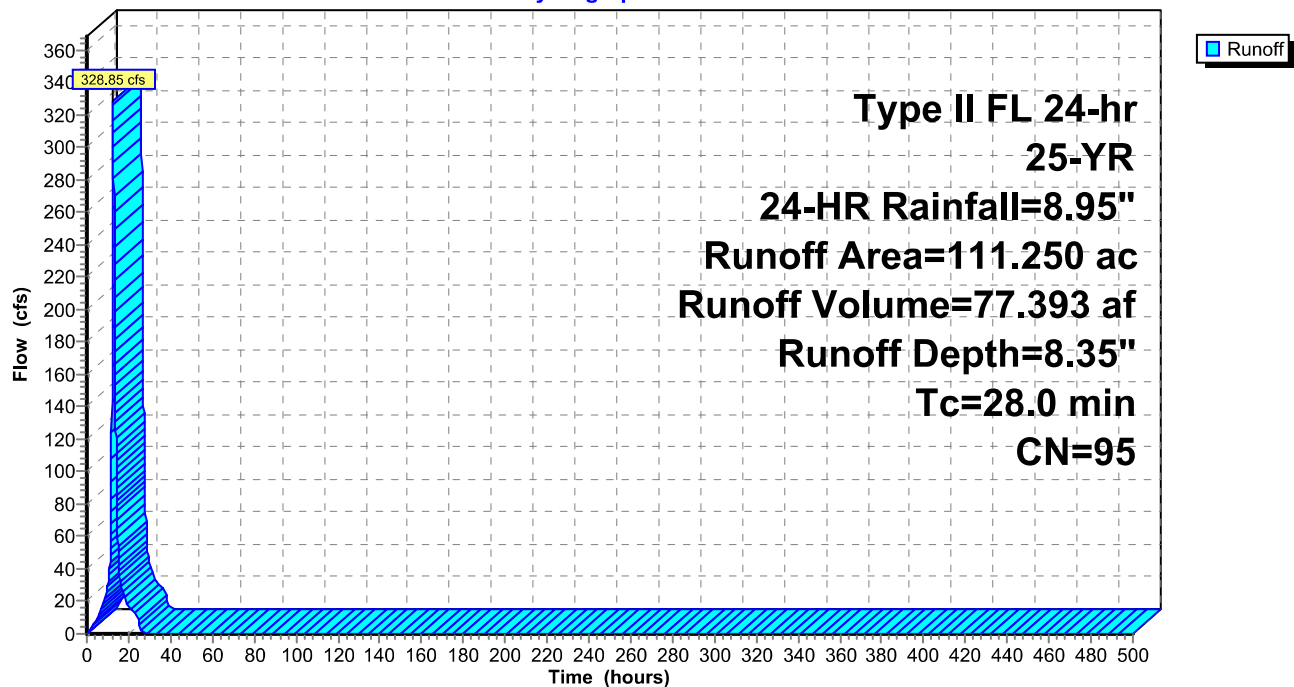
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
 Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 111.250	95	
111.250		100.00% Pervious Area

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

Subcatchment B-01: B-01 DRAINAGE AREA

Hydrograph



Hydrograph for Subcatchment B-01: B-01 DRAINAGE AREA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	8.95	8.35	0.00
5.00	0.60	0.24	10.31	265.00	8.95	8.35	0.00
10.00	1.71	1.21	30.47	270.00	8.95	8.35	0.00
15.00	7.48	6.89	47.84	275.00	8.95	8.35	0.00
20.00	8.47	7.87	17.65	280.00	8.95	8.35	0.00
25.00	8.95	8.35	3.23	285.00	8.95	8.35	0.00
30.00	8.95	8.35	0.00	290.00	8.95	8.35	0.00
35.00	8.95	8.35	0.00	295.00	8.95	8.35	0.00
40.00	8.95	8.35	0.00	300.00	8.95	8.35	0.00
45.00	8.95	8.35	0.00	305.00	8.95	8.35	0.00
50.00	8.95	8.35	0.00	310.00	8.95	8.35	0.00
55.00	8.95	8.35	0.00	315.00	8.95	8.35	0.00
60.00	8.95	8.35	0.00	320.00	8.95	8.35	0.00
65.00	8.95	8.35	0.00	325.00	8.95	8.35	0.00
70.00	8.95	8.35	0.00	330.00	8.95	8.35	0.00
75.00	8.95	8.35	0.00	335.00	8.95	8.35	0.00
80.00	8.95	8.35	0.00	340.00	8.95	8.35	0.00
85.00	8.95	8.35	0.00	345.00	8.95	8.35	0.00
90.00	8.95	8.35	0.00	350.00	8.95	8.35	0.00
95.00	8.95	8.35	0.00	355.00	8.95	8.35	0.00
100.00	8.95	8.35	0.00	360.00	8.95	8.35	0.00
105.00	8.95	8.35	0.00	365.00	8.95	8.35	0.00
110.00	8.95	8.35	0.00	370.00	8.95	8.35	0.00
115.00	8.95	8.35	0.00	375.00	8.95	8.35	0.00
120.00	8.95	8.35	0.00	380.00	8.95	8.35	0.00
125.00	8.95	8.35	0.00	385.00	8.95	8.35	0.00
130.00	8.95	8.35	0.00	390.00	8.95	8.35	0.00
135.00	8.95	8.35	0.00	395.00	8.95	8.35	0.00
140.00	8.95	8.35	0.00	400.00	8.95	8.35	0.00
145.00	8.95	8.35	0.00	405.00	8.95	8.35	0.00
150.00	8.95	8.35	0.00	410.00	8.95	8.35	0.00
155.00	8.95	8.35	0.00	415.00	8.95	8.35	0.00
160.00	8.95	8.35	0.00	420.00	8.95	8.35	0.00
165.00	8.95	8.35	0.00	425.00	8.95	8.35	0.00
170.00	8.95	8.35	0.00	430.00	8.95	8.35	0.00
175.00	8.95	8.35	0.00	435.00	8.95	8.35	0.00
180.00	8.95	8.35	0.00	440.00	8.95	8.35	0.00
185.00	8.95	8.35	0.00	445.00	8.95	8.35	0.00
190.00	8.95	8.35	0.00	450.00	8.95	8.35	0.00
195.00	8.95	8.35	0.00	455.00	8.95	8.35	0.00
200.00	8.95	8.35	0.00	460.00	8.95	8.35	0.00
205.00	8.95	8.35	0.00	465.00	8.95	8.35	0.00
210.00	8.95	8.35	0.00	470.00	8.95	8.35	0.00
215.00	8.95	8.35	0.00	475.00	8.95	8.35	0.00
220.00	8.95	8.35	0.00	480.00	8.95	8.35	0.00
225.00	8.95	8.35	0.00	485.00	8.95	8.35	0.00
230.00	8.95	8.35	0.00	490.00	8.95	8.35	0.00
235.00	8.95	8.35	0.00	495.00	8.95	8.35	0.00
240.00	8.95	8.35	0.00	500.00	8.95	8.35	0.00
245.00	8.95	8.35	0.00				
250.00	8.95	8.35	0.00				
255.00	8.95	8.35	0.00				

Summary for Subcatchment B-02: B-02 DRAINAGE AREA

Runoff = 189.74 cfs @ 12.43 hrs, Volume= 38.695 af, Depth= 8.23"
 Routed to Pond POND B-02 : POND B-02

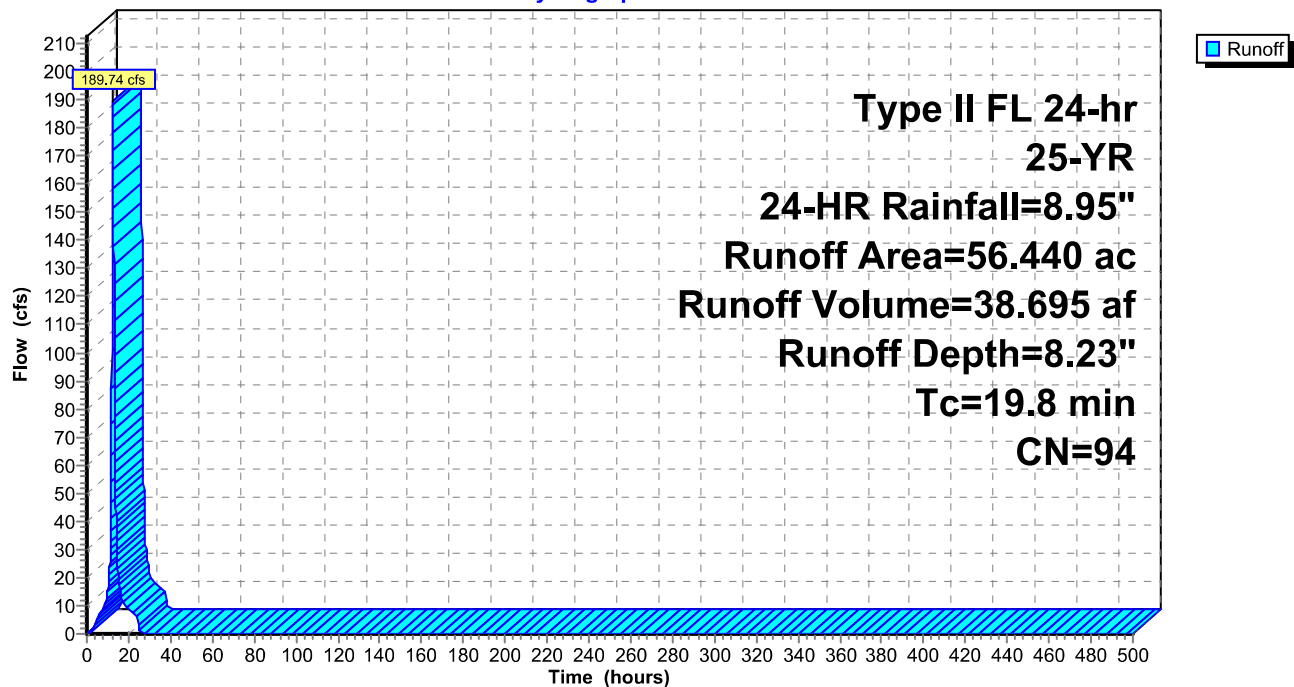
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
 Type II FL 24-hr 25-YR, 24-HR Rainfall=8.95"

Area (ac)	CN	Description
* 56.440	94	
56.440		100.00% Pervious Area

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

Subcatchment B-02: B-02 DRAINAGE AREA

Hydrograph



Hydrograph for Subcatchment B-02: B-02 DRAINAGE AREA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	8.95	8.23	0.00
5.00	0.60	0.20	5.01	265.00	8.95	8.23	0.00
10.00	1.71	1.13	15.90	270.00	8.95	8.23	0.00
15.00	7.48	6.77	19.98	275.00	8.95	8.23	0.00
20.00	8.47	7.75	8.79	280.00	8.95	8.23	0.00
25.00	8.95	8.23	0.84	285.00	8.95	8.23	0.00
30.00	8.95	8.23	0.00	290.00	8.95	8.23	0.00
35.00	8.95	8.23	0.00	295.00	8.95	8.23	0.00
40.00	8.95	8.23	0.00	300.00	8.95	8.23	0.00
45.00	8.95	8.23	0.00	305.00	8.95	8.23	0.00
50.00	8.95	8.23	0.00	310.00	8.95	8.23	0.00
55.00	8.95	8.23	0.00	315.00	8.95	8.23	0.00
60.00	8.95	8.23	0.00	320.00	8.95	8.23	0.00
65.00	8.95	8.23	0.00	325.00	8.95	8.23	0.00
70.00	8.95	8.23	0.00	330.00	8.95	8.23	0.00
75.00	8.95	8.23	0.00	335.00	8.95	8.23	0.00
80.00	8.95	8.23	0.00	340.00	8.95	8.23	0.00
85.00	8.95	8.23	0.00	345.00	8.95	8.23	0.00
90.00	8.95	8.23	0.00	350.00	8.95	8.23	0.00
95.00	8.95	8.23	0.00	355.00	8.95	8.23	0.00
100.00	8.95	8.23	0.00	360.00	8.95	8.23	0.00
105.00	8.95	8.23	0.00	365.00	8.95	8.23	0.00
110.00	8.95	8.23	0.00	370.00	8.95	8.23	0.00
115.00	8.95	8.23	0.00	375.00	8.95	8.23	0.00
120.00	8.95	8.23	0.00	380.00	8.95	8.23	0.00
125.00	8.95	8.23	0.00	385.00	8.95	8.23	0.00
130.00	8.95	8.23	0.00	390.00	8.95	8.23	0.00
135.00	8.95	8.23	0.00	395.00	8.95	8.23	0.00
140.00	8.95	8.23	0.00	400.00	8.95	8.23	0.00
145.00	8.95	8.23	0.00	405.00	8.95	8.23	0.00
150.00	8.95	8.23	0.00	410.00	8.95	8.23	0.00
155.00	8.95	8.23	0.00	415.00	8.95	8.23	0.00
160.00	8.95	8.23	0.00	420.00	8.95	8.23	0.00
165.00	8.95	8.23	0.00	425.00	8.95	8.23	0.00
170.00	8.95	8.23	0.00	430.00	8.95	8.23	0.00
175.00	8.95	8.23	0.00	435.00	8.95	8.23	0.00
180.00	8.95	8.23	0.00	440.00	8.95	8.23	0.00
185.00	8.95	8.23	0.00	445.00	8.95	8.23	0.00
190.00	8.95	8.23	0.00	450.00	8.95	8.23	0.00
195.00	8.95	8.23	0.00	455.00	8.95	8.23	0.00
200.00	8.95	8.23	0.00	460.00	8.95	8.23	0.00
205.00	8.95	8.23	0.00	465.00	8.95	8.23	0.00
210.00	8.95	8.23	0.00	470.00	8.95	8.23	0.00
215.00	8.95	8.23	0.00	475.00	8.95	8.23	0.00
220.00	8.95	8.23	0.00	480.00	8.95	8.23	0.00
225.00	8.95	8.23	0.00	485.00	8.95	8.23	0.00
230.00	8.95	8.23	0.00	490.00	8.95	8.23	0.00
235.00	8.95	8.23	0.00	495.00	8.95	8.23	0.00
240.00	8.95	8.23	0.00	500.00	8.95	8.23	0.00
245.00	8.95	8.23	0.00				
250.00	8.95	8.23	0.00				
255.00	8.95	8.23	0.00				

Summary for Pond POND B-01: POND B-01

Inflow Area = 111.250 ac, 0.00% Impervious, Inflow Depth = 8.35" for 25-YR, 24-HR event
 Inflow = 328.85 cfs @ 12.55 hrs, Volume= 77.393 af
 Outflow = 62.62 cfs @ 14.66 hrs, Volume= 77.393 af, Atten= 81%, Lag= 126.7 min
 Discarded = 12.93 cfs @ 14.66 hrs, Volume= 43.876 af
 Primary = 49.69 cfs @ 14.66 hrs, Volume= 33.517 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Peak Elev= 11.43' @ 14.66 hrs Surf.Area= 820,385 sf Storage= 2,056,617 cf

Plug-Flow detention time= 869.2 min calculated for 77.393 af (100% of inflow)

Center-of-Mass det. time= 869.1 min (1,674.2 - 805.1)

Volume	Invert	Avail.Storage	Storage Description
#1	6.60'	2,904,364 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	5.60'	76,959 cf	1.0' Drainage Medium (Conic) Listed below (Recalc)
			384,796 cf Overall x 20.0% Voids
2,981,323 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
6.60	384,796	0	0	384,796
7.00	388,677	154,694	154,694	388,776
8.00	399,096	393,875	548,569	399,430
9.00	409,615	404,344	952,913	410,188
10.00	420,234	414,913	1,367,826	421,049
11.00	430,954	425,583	1,793,409	432,016
12.00	441,775	436,353	2,229,762	443,087
13.00	452,696	447,224	2,676,987	454,263
13.50	456,817	227,377	2,904,364	458,554

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.60	384,796	0	0	384,796
6.60	384,796	384,796	384,796	386,995

Device	Routing	Invert	Outlet Devices
#1	Discarded	5.60'	0.250 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 3.02'
#2	Primary	6.60'	30.0" Round Culvert - EXISTING L= 163.1' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 6.60' / 2.85' S= 0.0230 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#3	Device 2	8.75'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	11.50'	60.0" x 60.0" Horiz. Concrete Box Riser Structure with Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	12.50'	30.0' long + 10.0 ' 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

Discarded OutFlow Max=12.93 cfs @ 14.66 hrs HW=11.43' (Free Discharge)

↑ **1=Exfiltration** (Controls 12.93 cfs)

Primary OutFlow Max=49.69 cfs @ 14.66 hrs HW=11.43' TW=1.08' (Fixed TW Elev= 1.08')

↑ **2=Culvert - EXISTING** (Passes 49.69 cfs of 55.90 cfs potential flow)

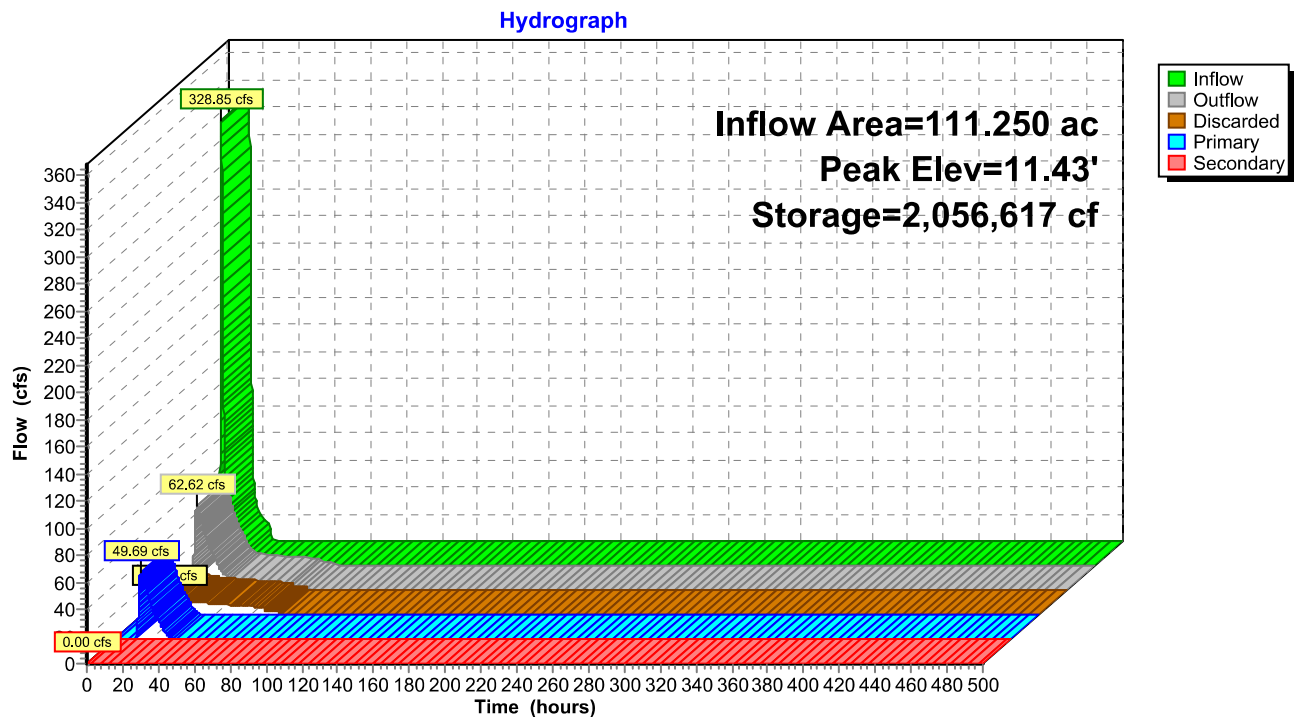
↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 49.69 cfs @ 5.35 fps)

↑ **4=Concrete Box Riser Structure with Grate** (Controls 0.00 cfs)

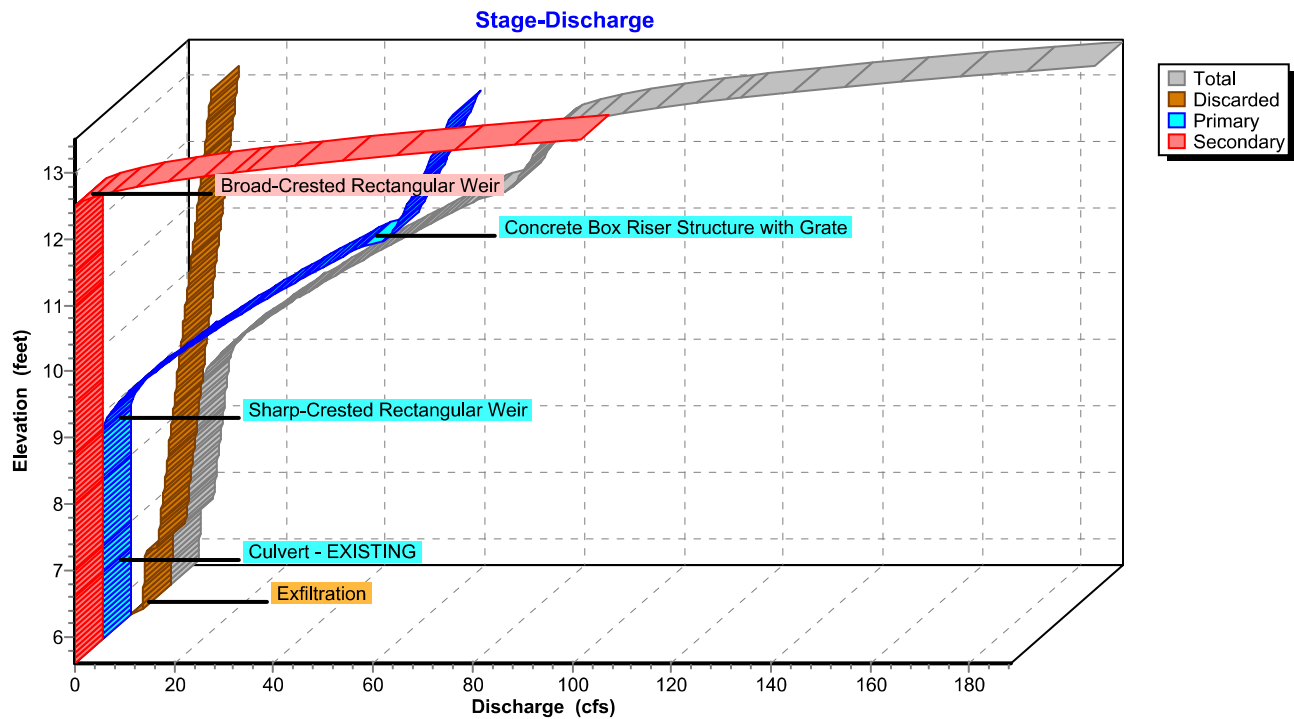
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=5.60' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

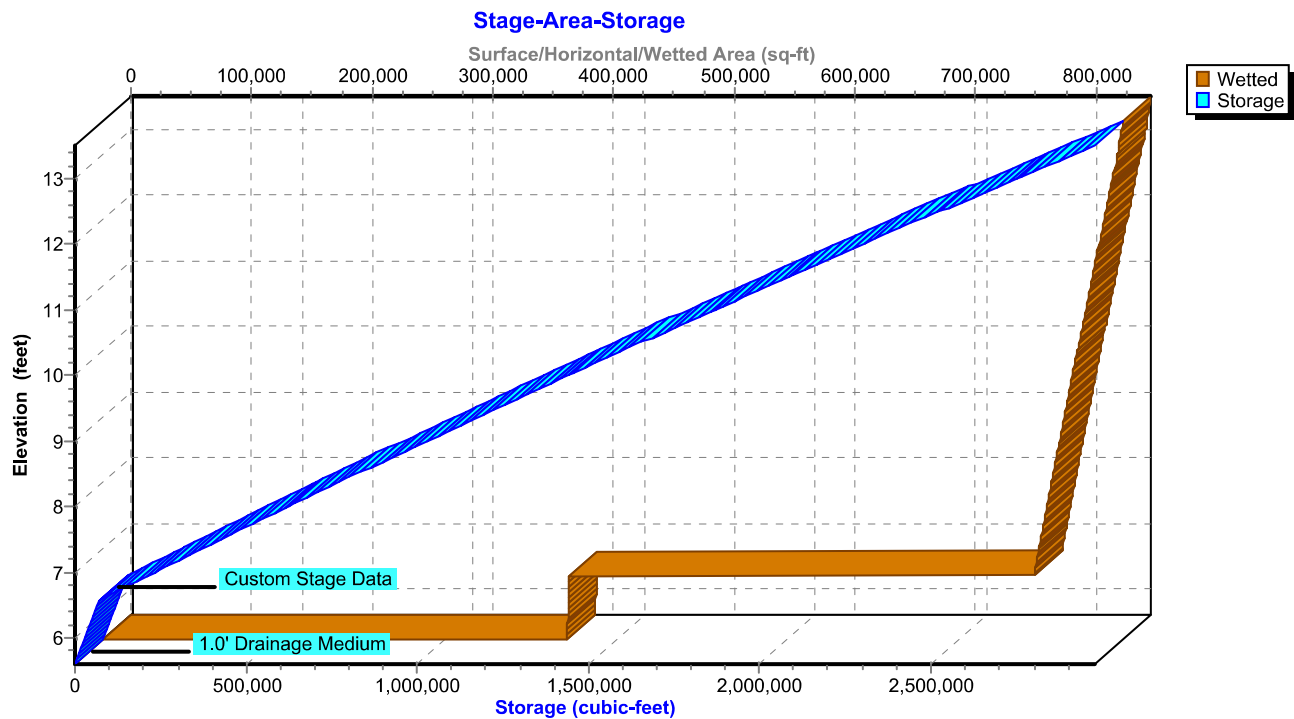
Pond POND B-01: POND B-01



Pond POND B-01: POND B-01



Pond POND B-01: POND B-01



Hydrograph for Pond POND B-01: POND B-01

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	5.60	0.00	0.00	0.00	0.00
10.00	30.47	283,441	7.13	6.14	6.14	0.00	0.00
20.00	17.65	1,624,586	10.43	37.32	11.32	25.99	0.00
30.00	0.00	1,053,112	9.06	11.35	9.15	2.20	0.00
40.00	0.00	735,947	8.28	7.92	7.92	0.00	0.00
50.00	0.00	469,909	7.61	6.88	6.88	0.00	0.00
60.00	0.00	239,130	7.02	5.96	5.96	0.00	0.00
70.00	0.00	54,544	6.31	2.85	2.85	0.00	0.00
80.00	0.00	10	5.60	0.00	0.00	0.00	0.00
90.00	0.00	0	5.60	0.00	0.00	0.00	0.00
100.00	0.00	0	5.60	0.00	0.00	0.00	0.00
110.00	0.00	0	5.60	0.00	0.00	0.00	0.00
120.00	0.00	0	5.60	0.00	0.00	0.00	0.00
130.00	0.00	0	5.60	0.00	0.00	0.00	0.00
140.00	0.00	0	5.60	0.00	0.00	0.00	0.00
150.00	0.00	0	5.60	0.00	0.00	0.00	0.00
160.00	0.00	0	5.60	0.00	0.00	0.00	0.00
170.00	0.00	0	5.60	0.00	0.00	0.00	0.00
180.00	0.00	0	5.60	0.00	0.00	0.00	0.00
190.00	0.00	0	5.60	0.00	0.00	0.00	0.00
200.00	0.00	0	5.60	0.00	0.00	0.00	0.00
210.00	0.00	0	5.60	0.00	0.00	0.00	0.00
220.00	0.00	0	5.60	0.00	0.00	0.00	0.00
230.00	0.00	0	5.60	0.00	0.00	0.00	0.00
240.00	0.00	0	5.60	0.00	0.00	0.00	0.00
250.00	0.00	0	5.60	0.00	0.00	0.00	0.00
260.00	0.00	0	5.60	0.00	0.00	0.00	0.00
270.00	0.00	0	5.60	0.00	0.00	0.00	0.00
280.00	0.00	0	5.60	0.00	0.00	0.00	0.00
290.00	0.00	0	5.60	0.00	0.00	0.00	0.00
300.00	0.00	0	5.60	0.00	0.00	0.00	0.00
310.00	0.00	0	5.60	0.00	0.00	0.00	0.00
320.00	0.00	0	5.60	0.00	0.00	0.00	0.00
330.00	0.00	0	5.60	0.00	0.00	0.00	0.00
340.00	0.00	0	5.60	0.00	0.00	0.00	0.00
350.00	0.00	0	5.60	0.00	0.00	0.00	0.00
360.00	0.00	0	5.60	0.00	0.00	0.00	0.00
370.00	0.00	0	5.60	0.00	0.00	0.00	0.00
380.00	0.00	0	5.60	0.00	0.00	0.00	0.00
390.00	0.00	0	5.60	0.00	0.00	0.00	0.00
400.00	0.00	0	5.60	0.00	0.00	0.00	0.00
410.00	0.00	0	5.60	0.00	0.00	0.00	0.00
420.00	0.00	0	5.60	0.00	0.00	0.00	0.00
430.00	0.00	0	5.60	0.00	0.00	0.00	0.00
440.00	0.00	0	5.60	0.00	0.00	0.00	0.00
450.00	0.00	0	5.60	0.00	0.00	0.00	0.00
460.00	0.00	0	5.60	0.00	0.00	0.00	0.00
470.00	0.00	0	5.60	0.00	0.00	0.00	0.00
480.00	0.00	0	5.60	0.00	0.00	0.00	0.00
490.00	0.00	0	5.60	0.00	0.00	0.00	0.00
500.00	0.00	0	5.60	0.00	0.00	0.00	0.00

Stage-Discharge for Pond POND B-01: POND B-01

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.60	0.00	0.00	0.00	0.00
5.80	2.40	2.40	0.00	0.00
6.00	2.58	2.58	0.00	0.00
6.20	2.75	2.75	0.00	0.00
6.40	2.93	2.93	0.00	0.00
6.60	5.33	5.33	0.00	0.00
6.80	5.62	5.62	0.00	0.00
7.00	5.93	5.93	0.00	0.00
7.20	6.24	6.24	0.00	0.00
7.40	6.55	6.55	0.00	0.00
7.60	6.87	6.87	0.00	0.00
7.80	7.18	7.18	0.00	0.00
8.00	7.49	7.49	0.00	0.00
8.20	7.80	7.80	0.00	0.00
8.40	8.12	8.12	0.00	0.00
8.60	8.43	8.43	0.00	0.00
8.80	8.89	8.75	0.15	0.00
9.00	10.68	9.06	1.61	0.00
9.20	13.24	9.38	3.86	0.00
9.40	16.33	9.70	6.63	0.00
9.60	19.83	10.01	9.81	0.00
9.80	23.66	10.33	13.33	0.00
10.00	27.78	10.65	17.14	0.00
10.20	32.15	10.96	21.18	0.00
10.40	36.72	11.28	25.44	0.00
10.60	41.47	11.60	29.87	0.00
10.80	46.38	11.92	34.46	0.00
11.00	51.42	12.24	39.18	0.00
11.20	56.57	12.56	44.02	0.00
11.40	61.83	12.88	48.95	0.00
11.60	69.23	13.20	56.03	0.00
11.80	72.24	13.52	58.72	0.00
12.00	74.03	13.84	60.19	0.00
12.20	75.78	14.16	61.62	0.00
12.40	77.50	14.48	63.02	0.00
12.60	81.62	14.81	64.39	2.43
12.80	94.30	15.13	65.73	13.44
13.00	114.11	15.45	67.05	31.61
13.20	140.30	15.77	68.34	56.19
13.40	170.97	16.09	69.60	85.28

Stage-Area-Storage for Pond POND B-01: POND B-01

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
5.60	384,796	0	10.80	816,807	1,784,393
5.70	385,016	7,696	10.90	817,908	1,827,327
5.80	385,236	15,392	11.00	819,011	1,870,368
5.90	385,456	23,088	11.10	820,112	1,913,517
6.00	385,676	30,784	11.20	821,214	1,956,774
6.10	385,895	38,480	11.30	822,318	2,000,139
6.20	386,115	46,176	11.40	823,423	2,043,612
6.30	386,335	53,871	11.50	824,529	2,087,192
6.40	386,555	61,567	11.60	825,637	2,130,881
6.50	386,775	69,263	11.70	826,747	2,174,678
6.60	771,791	76,959	11.80	827,857	2,218,584
6.70	772,784	115,487	11.90	828,969	2,262,598
6.80	773,778	154,112	12.00	830,082	2,306,722
6.90	774,774	192,834	12.10	831,194	2,350,953
7.00	775,771	231,653	12.20	832,307	2,395,294
7.10	776,830	270,573	12.30	833,421	2,439,743
7.20	777,890	309,596	12.40	834,536	2,484,301
7.30	778,952	348,723	12.50	835,653	2,528,969
7.40	780,016	387,953	12.60	836,771	2,573,745
7.50	781,080	427,288	12.70	837,891	2,618,631
7.60	782,146	466,727	12.80	839,012	2,663,626
7.70	783,214	506,271	12.90	840,134	2,708,731
7.80	784,283	545,919	13.00	841,258	2,753,946
7.90	785,353	585,671	13.10	842,114	2,799,257
8.00	786,425	625,528	13.20	842,972	2,844,650
8.10	787,494	665,490	13.30	843,830	2,890,125
8.20	788,565	705,557	13.40	844,689	2,935,683
8.30	789,637	745,728	13.50	845,549	2,981,323
8.40	790,711	786,004			
8.50	791,786	826,385			
8.60	792,863	866,872			
8.70	793,941	907,464			
8.80	795,020	948,161			
8.90	796,100	988,964			
9.00	797,183	1,029,872			
9.10	798,262	1,070,887			
9.20	799,344	1,112,006			
9.30	800,426	1,153,232			
9.40	801,511	1,194,564			
9.50	802,596	1,236,001			
9.60	803,683	1,277,545			
9.70	804,771	1,319,196			
9.80	805,861	1,360,952			
9.90	806,952	1,402,815			
10.00	808,044	1,444,785			
10.10	809,135	1,486,862			
10.20	810,227	1,529,045			
10.30	811,320	1,571,336			
10.40	812,414	1,613,733			
10.50	813,510	1,656,237			
10.60	814,608	1,698,848			
10.70	815,706	1,741,567			

Summary for Pond POND B-02: POND B-02

Inflow Area = 56.440 ac, 0.00% Impervious, Inflow Depth = 8.23" for 25-YR, 24-HR event
 Inflow = 189.74 cfs @ 12.43 hrs, Volume= 38.695 af
 Outflow = 68.50 cfs @ 13.50 hrs, Volume= 38.695 af, Atten= 64%, Lag= 64.7 min
 Discarded = 17.47 cfs @ 13.50 hrs, Volume= 27.782 af
 Primary = 51.02 cfs @ 13.50 hrs, Volume= 10.913 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Peak Elev= 16.44' @ 13.50 hrs Surf.Area= 345,120 sf Storage= 794,607 cf

Plug-Flow detention time= 335.4 min calculated for 38.695 af (100% of inflow)

Center-of-Mass det. time= 335.3 min (1,130.9 - 795.6)

Volume	Invert	Avail.Storage	Storage Description
#1	12.00'	1,090,434 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	11.00'	29,249 cf	1' Drainage Medium (Conic) Listed below (Recalc)
			146,245 cf Overall x 20.0% Voids
1,119,683 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
12.00	146,245	0	0	146,245
13.00	157,934	152,052	152,052	158,015
14.00	169,723	163,793	315,845	169,891
15.00	181,613	175,634	491,480	181,874
16.00	193,603	187,576	679,056	193,962
17.00	205,694	199,618	878,674	206,156
18.00	217,886	211,761	1,090,434	218,457

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
11.00	146,245	0	0	146,245
12.00	146,245	146,245	146,245	147,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	11.00'	0.800 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 8.84'
#2	Primary	12.00'	36.0" Round Culvert L= 144.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 12.00' / 4.22' S= 0.0537 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#3	Device 2	14.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	16.00'	60.0" x 60.0" Horiz. Concrete Box Riser Structure with Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	17.00'	40.0' long + 10.0 ' / 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

Discarded OutFlow Max=17.47 cfs @ 13.50 hrs HW=16.44' (Free Discharge)

↑ **1=Exfiltration** (Controls 17.47 cfs)

Primary OutFlow Max=50.97 cfs @ 13.50 hrs HW=16.44' TW=1.08' (Fixed TW Elev= 1.08')

↑ **2=Culvert** (Passes 50.97 cfs of 72.94 cfs potential flow)

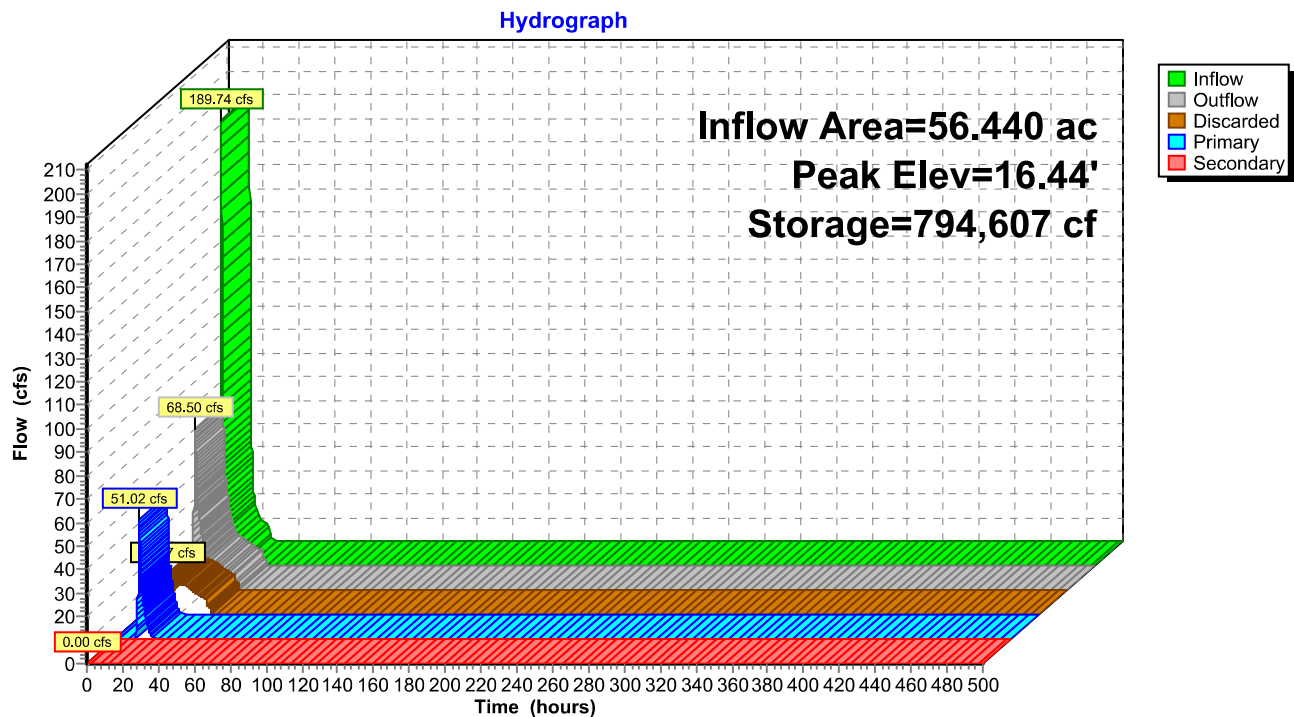
↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 31.91 cfs @ 4.55 fps)

↑ **4=Concrete Box Riser Structure with Grate**(Weir Controls 19.07 cfs @ 2.17 fps)

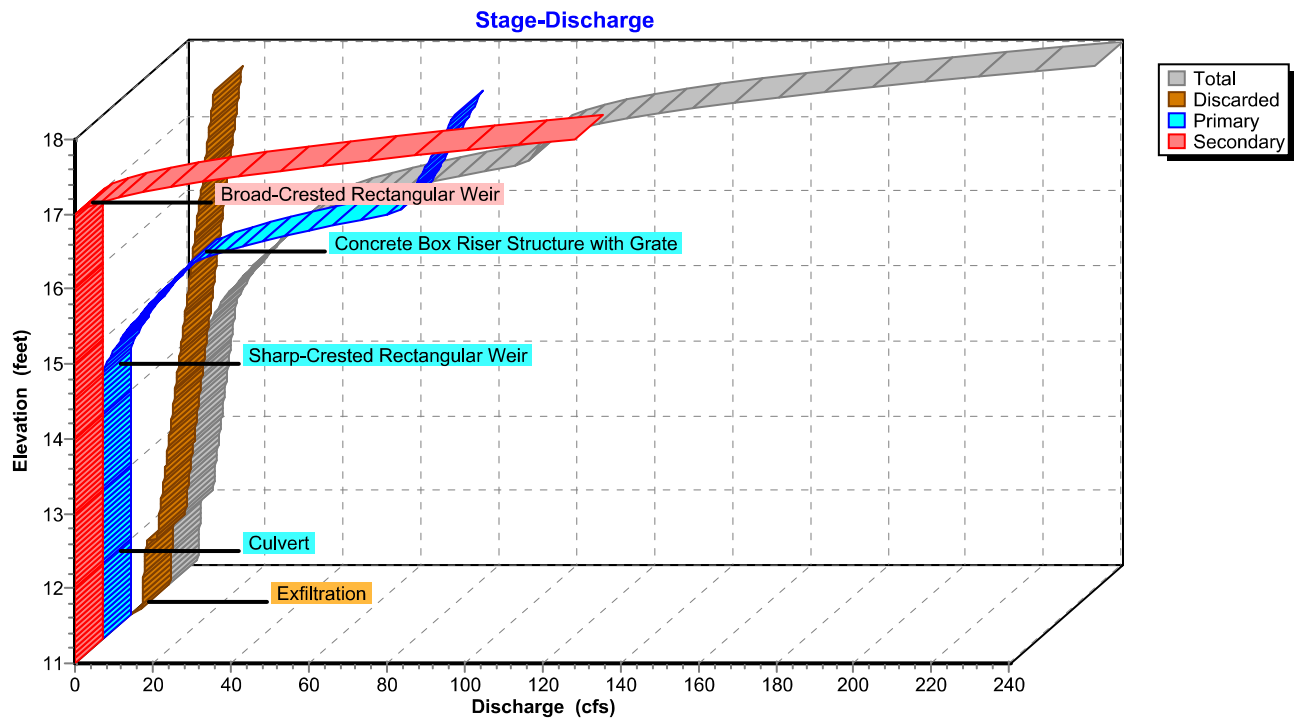
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=11.00' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

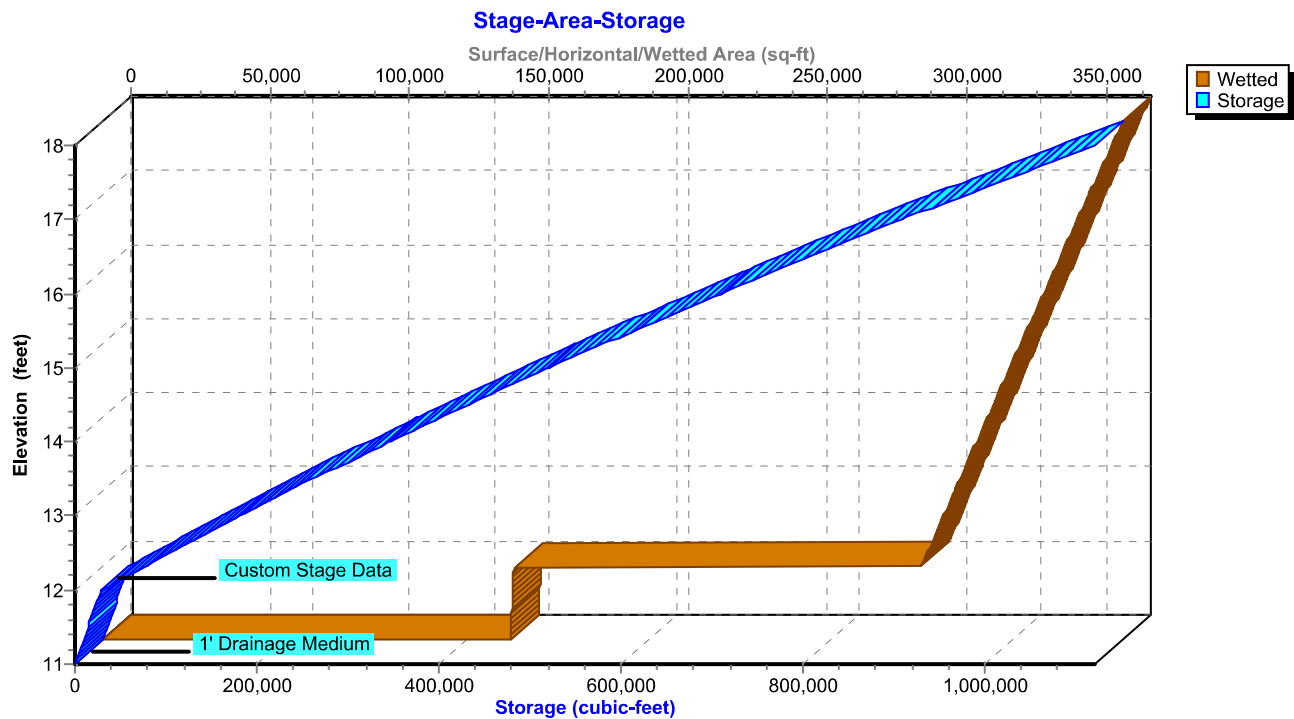
Pond POND B-02: POND B-02



Pond POND B-02: POND B-02



Pond POND B-02: POND B-02



Hydrograph for Pond POND B-02: POND B-02

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	11.00	0.00	0.00	0.00	0.00
10.00	15.90	75,984	12.32	7.39	7.39	0.00	0.00
20.00	8.79	487,555	14.82	15.72	13.42	2.30	0.00
30.00	0.00	181,762	13.00	9.02	9.02	0.00	0.00
40.00	0.00	0	11.00	0.00	0.00	0.00	0.00
50.00	0.00	0	11.00	0.00	0.00	0.00	0.00
60.00	0.00	0	11.00	0.00	0.00	0.00	0.00
70.00	0.00	0	11.00	0.00	0.00	0.00	0.00
80.00	0.00	0	11.00	0.00	0.00	0.00	0.00
90.00	0.00	0	11.00	0.00	0.00	0.00	0.00
100.00	0.00	0	11.00	0.00	0.00	0.00	0.00
110.00	0.00	0	11.00	0.00	0.00	0.00	0.00
120.00	0.00	0	11.00	0.00	0.00	0.00	0.00
130.00	0.00	0	11.00	0.00	0.00	0.00	0.00
140.00	0.00	0	11.00	0.00	0.00	0.00	0.00
150.00	0.00	0	11.00	0.00	0.00	0.00	0.00
160.00	0.00	0	11.00	0.00	0.00	0.00	0.00
170.00	0.00	0	11.00	0.00	0.00	0.00	0.00
180.00	0.00	0	11.00	0.00	0.00	0.00	0.00
190.00	0.00	0	11.00	0.00	0.00	0.00	0.00
200.00	0.00	0	11.00	0.00	0.00	0.00	0.00
210.00	0.00	0	11.00	0.00	0.00	0.00	0.00
220.00	0.00	0	11.00	0.00	0.00	0.00	0.00
230.00	0.00	0	11.00	0.00	0.00	0.00	0.00
240.00	0.00	0	11.00	0.00	0.00	0.00	0.00
250.00	0.00	0	11.00	0.00	0.00	0.00	0.00
260.00	0.00	0	11.00	0.00	0.00	0.00	0.00
270.00	0.00	0	11.00	0.00	0.00	0.00	0.00
280.00	0.00	0	11.00	0.00	0.00	0.00	0.00
290.00	0.00	0	11.00	0.00	0.00	0.00	0.00
300.00	0.00	0	11.00	0.00	0.00	0.00	0.00
310.00	0.00	0	11.00	0.00	0.00	0.00	0.00
320.00	0.00	0	11.00	0.00	0.00	0.00	0.00
330.00	0.00	0	11.00	0.00	0.00	0.00	0.00
340.00	0.00	0	11.00	0.00	0.00	0.00	0.00
350.00	0.00	0	11.00	0.00	0.00	0.00	0.00
360.00	0.00	0	11.00	0.00	0.00	0.00	0.00
370.00	0.00	0	11.00	0.00	0.00	0.00	0.00
380.00	0.00	0	11.00	0.00	0.00	0.00	0.00
390.00	0.00	0	11.00	0.00	0.00	0.00	0.00
400.00	0.00	0	11.00	0.00	0.00	0.00	0.00
410.00	0.00	0	11.00	0.00	0.00	0.00	0.00
420.00	0.00	0	11.00	0.00	0.00	0.00	0.00
430.00	0.00	0	11.00	0.00	0.00	0.00	0.00
440.00	0.00	0	11.00	0.00	0.00	0.00	0.00
450.00	0.00	0	11.00	0.00	0.00	0.00	0.00
460.00	0.00	0	11.00	0.00	0.00	0.00	0.00
470.00	0.00	0	11.00	0.00	0.00	0.00	0.00
480.00	0.00	0	11.00	0.00	0.00	0.00	0.00
490.00	0.00	0	11.00	0.00	0.00	0.00	0.00
500.00	0.00	0	11.00	0.00	0.00	0.00	0.00

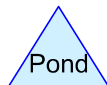
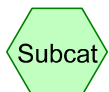
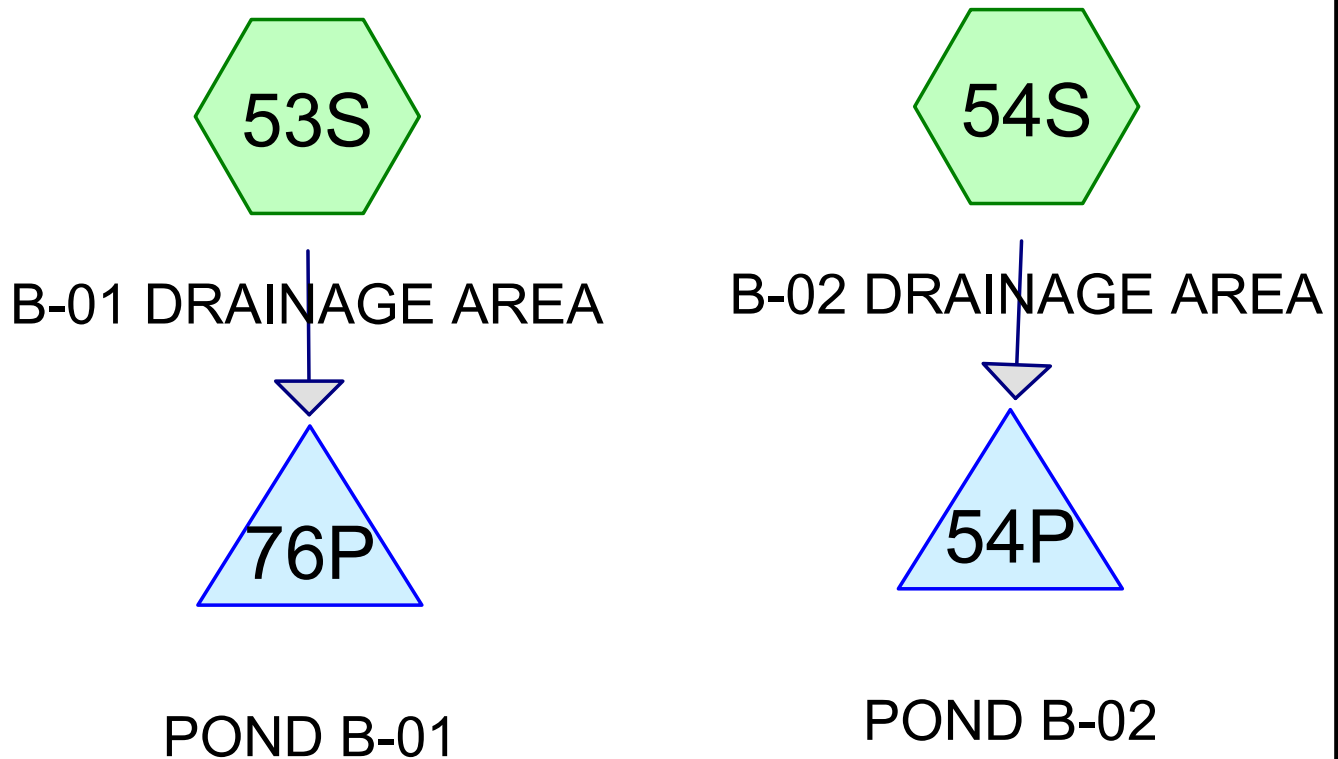
Stage-Discharge for Pond POND B-02: POND B-02

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
11.00	0.00	0.00	0.00	0.00
11.20	2.96	2.96	0.00	0.00
11.40	3.22	3.22	0.00	0.00
11.60	3.48	3.48	0.00	0.00
11.80	3.73	3.73	0.00	0.00
12.00	6.70	6.70	0.00	0.00
12.20	7.12	7.12	0.00	0.00
12.40	7.59	7.59	0.00	0.00
12.60	8.06	8.06	0.00	0.00
12.80	8.54	8.54	0.00	0.00
13.00	9.01	9.01	0.00	0.00
13.20	9.49	9.49	0.00	0.00
13.40	9.97	9.97	0.00	0.00
13.60	10.45	10.45	0.00	0.00
13.80	10.93	10.93	0.00	0.00
14.00	11.42	11.42	0.00	0.00
14.20	11.91	11.91	0.00	0.00
14.40	12.40	12.40	0.00	0.00
14.60	13.30	12.89	0.41	0.00
14.80	15.50	13.38	2.12	0.00
15.00	18.38	13.87	4.51	0.00
15.20	21.76	14.37	7.39	0.00
15.40	25.53	14.87	10.67	0.00
15.60	29.62	15.36	14.26	0.00
15.80	33.99	15.86	18.13	0.00
16.00	38.59	16.37	22.23	0.00
16.20	49.25	16.87	32.38	0.00
16.40	64.92	17.37	47.55	0.00
16.60	83.90	17.88	66.02	0.00
16.80	95.67	18.38	77.28	0.00
17.00	98.48	18.89	79.59	0.00
17.20	110.50	19.40	81.83	9.26
17.40	131.90	19.91	84.02	27.98
17.60	162.78	20.42	86.14	56.22
17.80	198.46	20.93	88.22	89.31
18.00	240.34	21.45	90.25	128.64

Stage-Area-Storage for Pond POND B-02: POND B-02

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
11.00	146,245	0	16.20	343,972	747,264
11.10	146,381	2,925	16.30	345,182	766,923
11.20	146,516	5,850	16.40	346,396	786,702
11.30	146,652	8,775	16.50	347,613	806,602
11.40	146,787	11,700	16.60	348,835	826,623
11.50	146,923	14,625	16.70	350,060	846,765
11.60	147,058	17,549	16.80	351,288	867,029
11.70	147,194	20,474	16.90	352,521	887,415
11.80	147,330	23,399	17.00	353,757	907,923
11.90	147,465	26,324	17.10	354,971	928,552
12.00	293,846	29,249	17.20	356,188	949,302
12.10	295,002	43,931	17.30	357,410	970,173
12.20	296,164	58,728	17.40	358,634	991,165
12.30	297,329	73,640	17.50	359,863	1,012,279
12.40	298,500	88,669	17.60	361,095	1,033,515
12.50	299,674	103,814	17.70	362,330	1,054,873
12.60	300,854	119,076	17.80	363,569	1,076,353
12.70	302,037	134,455	17.90	364,811	1,097,957
12.80	303,226	149,952	18.00	366,057	1,119,683
12.90	304,419	165,567			
13.00	305,616	181,301			
13.10	306,784	197,152			
13.20	307,957	213,120			
13.30	309,134	229,204			
13.40	310,315	245,405			
13.50	311,501	261,724			
13.60	312,690	278,161			
13.70	313,884	294,715			
13.80	315,083	311,389			
13.90	316,285	328,182			
14.00	317,492	345,094			
14.10	318,672	362,125			
14.20	319,856	379,273			
14.30	321,044	396,539			
14.40	322,236	413,923			
14.50	323,433	431,425			
14.60	324,633	449,046			
14.70	325,837	466,787			
14.80	327,046	484,647			
14.90	328,258	502,628			
15.00	329,474	520,729			
15.10	330,666	538,949			
15.20	331,861	557,288			
15.30	333,060	575,745			
15.40	334,263	594,322			
15.50	335,470	613,018			
15.60	336,681	631,834			
15.70	337,895	650,770			
15.80	339,114	669,827			
15.90	340,336	689,005			
16.00	341,562	708,305			
16.10	342,765	727,725			

POST-DEVELOPMENT
- WITH PONDS - 100
YR TAILWATER = 6'



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-YR, 24-HR	Type II FL 24-hr		Default	24.00	1	12.30	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
111.250	95	(53S)
56.440	94	(54S)
167.690	95	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
167.690	Other	53S, 54S
167.690		TOTAL AREA

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Ground Covers (selected 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	167.690	167.690		53S, 54S
0.000	0.000	0.000	0.000	167.690	167.690	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	54P	12.00	4.22	144.8	0.0537	0.011	0.0	36.0	0.0	
2	76P	6.60	2.85	163.1	0.0230	0.011	0.0	30.0	0.0	

JEA SJRPP*Type II FL 24-hr 100-YR, 24-HR Rainfall=12.30"*

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Time span=0.00-500.00 hrs, dt=0.05 hrs, 10001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment53S: B-01 DRAINAGE Runoff Area=111.250 ac 0.00% Impervious Runoff Depth=11.69"
Tc=28.0 min CN=95 Runoff=454.97 cfs 108.378 af

Subcatchment54S: B-02 DRAINAGE AREA Runoff Area=56.440 ac 0.00% Impervious Runoff Depth=11.57"
Tc=19.8 min CN=94 Runoff=263.19 cfs 54.398 af

Pond 54P: POND B-02 Peak Elev=17.40' Storage=990,779 cf Inflow=263.19 cfs 54.398 af
Discarded=19.91 cfs 31.083 af Primary=84.00 cfs 21.794 af Secondary=27.96 cfs 1.521 af Outflow=131.86 cfs 54.398 af

Pond 76P: POND B-01 Peak Elev=13.02' Storage=2,765,095 cf Inflow=454.97 cfs 108.378 af
Discarded=15.49 cfs 48.096 af Primary=67.21 cfs 56.195 af Secondary=34.40 cfs 4.088 af Outflow=117.10 cfs 108.378 af

Total Runoff Area = 167.690 ac Runoff Volume = 162.776 af Average Runoff Depth = 11.65"
100.00% Pervious = 167.690 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 53S: B-01 DRAINAGE AREA

Runoff = 454.97 cfs @ 12.55 hrs, Volume= 108.378 af, Depth=11.69"
 Routed to Pond 76P : POND B-01

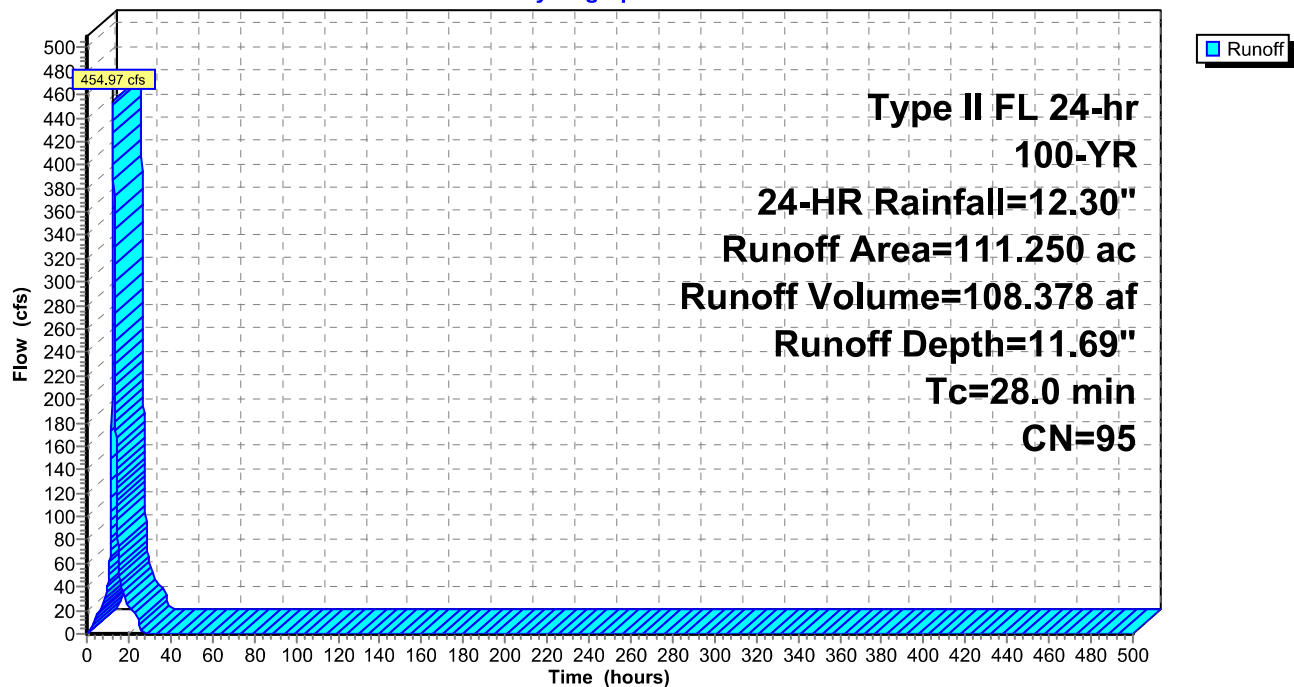
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
 Type II FL 24-hr 100-YR, 24-HR Rainfall=12.30"

Area (ac)	CN	Description
* 111.250	95	
111.250		100.00% Pervious Area

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

Subcatchment 53S: B-01 DRAINAGE AREA

Hydrograph



Hydrograph for Subcatchment 53S: B-01 DRAINAGE AREA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	12.30	11.69	0.00
5.00	0.82	0.41	16.41	265.00	12.30	11.69	0.00
10.00	2.36	1.82	43.29	270.00	12.30	11.69	0.00
15.00	10.28	9.68	65.90	275.00	12.30	11.69	0.00
20.00	11.64	11.03	24.30	280.00	12.30	11.69	0.00
25.00	12.30	11.69	4.45	285.00	12.30	11.69	0.00
30.00	12.30	11.69	0.00	290.00	12.30	11.69	0.00
35.00	12.30	11.69	0.00	295.00	12.30	11.69	0.00
40.00	12.30	11.69	0.00	300.00	12.30	11.69	0.00
45.00	12.30	11.69	0.00	305.00	12.30	11.69	0.00
50.00	12.30	11.69	0.00	310.00	12.30	11.69	0.00
55.00	12.30	11.69	0.00	315.00	12.30	11.69	0.00
60.00	12.30	11.69	0.00	320.00	12.30	11.69	0.00
65.00	12.30	11.69	0.00	325.00	12.30	11.69	0.00
70.00	12.30	11.69	0.00	330.00	12.30	11.69	0.00
75.00	12.30	11.69	0.00	335.00	12.30	11.69	0.00
80.00	12.30	11.69	0.00	340.00	12.30	11.69	0.00
85.00	12.30	11.69	0.00	345.00	12.30	11.69	0.00
90.00	12.30	11.69	0.00	350.00	12.30	11.69	0.00
95.00	12.30	11.69	0.00	355.00	12.30	11.69	0.00
100.00	12.30	11.69	0.00	360.00	12.30	11.69	0.00
105.00	12.30	11.69	0.00	365.00	12.30	11.69	0.00
110.00	12.30	11.69	0.00	370.00	12.30	11.69	0.00
115.00	12.30	11.69	0.00	375.00	12.30	11.69	0.00
120.00	12.30	11.69	0.00	380.00	12.30	11.69	0.00
125.00	12.30	11.69	0.00	385.00	12.30	11.69	0.00
130.00	12.30	11.69	0.00	390.00	12.30	11.69	0.00
135.00	12.30	11.69	0.00	395.00	12.30	11.69	0.00
140.00	12.30	11.69	0.00	400.00	12.30	11.69	0.00
145.00	12.30	11.69	0.00	405.00	12.30	11.69	0.00
150.00	12.30	11.69	0.00	410.00	12.30	11.69	0.00
155.00	12.30	11.69	0.00	415.00	12.30	11.69	0.00
160.00	12.30	11.69	0.00	420.00	12.30	11.69	0.00
165.00	12.30	11.69	0.00	425.00	12.30	11.69	0.00
170.00	12.30	11.69	0.00	430.00	12.30	11.69	0.00
175.00	12.30	11.69	0.00	435.00	12.30	11.69	0.00
180.00	12.30	11.69	0.00	440.00	12.30	11.69	0.00
185.00	12.30	11.69	0.00	445.00	12.30	11.69	0.00
190.00	12.30	11.69	0.00	450.00	12.30	11.69	0.00
195.00	12.30	11.69	0.00	455.00	12.30	11.69	0.00
200.00	12.30	11.69	0.00	460.00	12.30	11.69	0.00
205.00	12.30	11.69	0.00	465.00	12.30	11.69	0.00
210.00	12.30	11.69	0.00	470.00	12.30	11.69	0.00
215.00	12.30	11.69	0.00	475.00	12.30	11.69	0.00
220.00	12.30	11.69	0.00	480.00	12.30	11.69	0.00
225.00	12.30	11.69	0.00	485.00	12.30	11.69	0.00
230.00	12.30	11.69	0.00	490.00	12.30	11.69	0.00
235.00	12.30	11.69	0.00	495.00	12.30	11.69	0.00
240.00	12.30	11.69	0.00	500.00	12.30	11.69	0.00
245.00	12.30	11.69	0.00				
250.00	12.30	11.69	0.00				
255.00	12.30	11.69	0.00				

Summary for Subcatchment 54S: B-02 DRAINAGE AREA

Runoff = 263.19 cfs @ 12.42 hrs, Volume= 54.398 af, Depth=11.57"
 Routed to Pond 54P : POND B-02

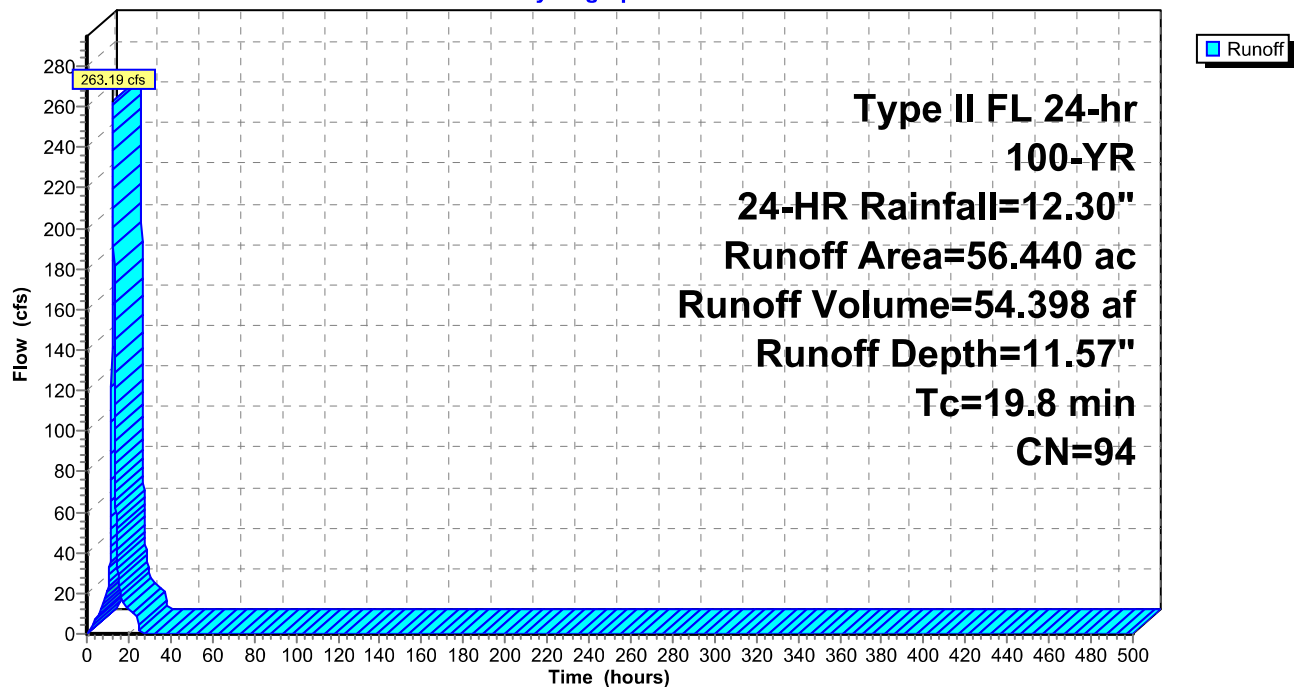
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs
 Type II FL 24-hr 100-YR, 24-HR Rainfall=12.30"

Area (ac)	CN	Description
* 56.440	94	
56.440		100.00% Pervious Area

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

Subcatchment 54S: B-02 DRAINAGE AREA

Hydrograph



Hydrograph for Subcatchment 54S: B-02 DRAINAGE AREA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	260.00	12.30	11.57	0.00
5.00	0.82	0.36	8.16	265.00	12.30	11.57	0.00
10.00	2.36	1.73	22.77	270.00	12.30	11.57	0.00
15.00	10.28	9.56	27.55	275.00	12.30	11.57	0.00
20.00	11.64	10.91	12.11	280.00	12.30	11.57	0.00
25.00	12.30	11.57	1.16	285.00	12.30	11.57	0.00
30.00	12.30	11.57	0.00	290.00	12.30	11.57	0.00
35.00	12.30	11.57	0.00	295.00	12.30	11.57	0.00
40.00	12.30	11.57	0.00	300.00	12.30	11.57	0.00
45.00	12.30	11.57	0.00	305.00	12.30	11.57	0.00
50.00	12.30	11.57	0.00	310.00	12.30	11.57	0.00
55.00	12.30	11.57	0.00	315.00	12.30	11.57	0.00
60.00	12.30	11.57	0.00	320.00	12.30	11.57	0.00
65.00	12.30	11.57	0.00	325.00	12.30	11.57	0.00
70.00	12.30	11.57	0.00	330.00	12.30	11.57	0.00
75.00	12.30	11.57	0.00	335.00	12.30	11.57	0.00
80.00	12.30	11.57	0.00	340.00	12.30	11.57	0.00
85.00	12.30	11.57	0.00	345.00	12.30	11.57	0.00
90.00	12.30	11.57	0.00	350.00	12.30	11.57	0.00
95.00	12.30	11.57	0.00	355.00	12.30	11.57	0.00
100.00	12.30	11.57	0.00	360.00	12.30	11.57	0.00
105.00	12.30	11.57	0.00	365.00	12.30	11.57	0.00
110.00	12.30	11.57	0.00	370.00	12.30	11.57	0.00
115.00	12.30	11.57	0.00	375.00	12.30	11.57	0.00
120.00	12.30	11.57	0.00	380.00	12.30	11.57	0.00
125.00	12.30	11.57	0.00	385.00	12.30	11.57	0.00
130.00	12.30	11.57	0.00	390.00	12.30	11.57	0.00
135.00	12.30	11.57	0.00	395.00	12.30	11.57	0.00
140.00	12.30	11.57	0.00	400.00	12.30	11.57	0.00
145.00	12.30	11.57	0.00	405.00	12.30	11.57	0.00
150.00	12.30	11.57	0.00	410.00	12.30	11.57	0.00
155.00	12.30	11.57	0.00	415.00	12.30	11.57	0.00
160.00	12.30	11.57	0.00	420.00	12.30	11.57	0.00
165.00	12.30	11.57	0.00	425.00	12.30	11.57	0.00
170.00	12.30	11.57	0.00	430.00	12.30	11.57	0.00
175.00	12.30	11.57	0.00	435.00	12.30	11.57	0.00
180.00	12.30	11.57	0.00	440.00	12.30	11.57	0.00
185.00	12.30	11.57	0.00	445.00	12.30	11.57	0.00
190.00	12.30	11.57	0.00	450.00	12.30	11.57	0.00
195.00	12.30	11.57	0.00	455.00	12.30	11.57	0.00
200.00	12.30	11.57	0.00	460.00	12.30	11.57	0.00
205.00	12.30	11.57	0.00	465.00	12.30	11.57	0.00
210.00	12.30	11.57	0.00	470.00	12.30	11.57	0.00
215.00	12.30	11.57	0.00	475.00	12.30	11.57	0.00
220.00	12.30	11.57	0.00	480.00	12.30	11.57	0.00
225.00	12.30	11.57	0.00	485.00	12.30	11.57	0.00
230.00	12.30	11.57	0.00	490.00	12.30	11.57	0.00
235.00	12.30	11.57	0.00	495.00	12.30	11.57	0.00
240.00	12.30	11.57	0.00	500.00	12.30	11.57	0.00
245.00	12.30	11.57	0.00				
250.00	12.30	11.57	0.00				
255.00	12.30	11.57	0.00				

Summary for Pond 54P: POND B-02

Inflow Area = 56.440 ac, 0.00% Impervious, Inflow Depth = 11.57" for 100-YR, 24-HR event
 Inflow = 263.19 cfs @ 12.42 hrs, Volume= 54.398 af
 Outflow = 131.86 cfs @ 13.23 hrs, Volume= 54.398 af, Atten= 50%, Lag= 48.4 min
 Discarded = 19.91 cfs @ 13.23 hrs, Volume= 31.083 af
 Primary = 84.00 cfs @ 13.23 hrs, Volume= 21.794 af
 Secondary = 27.96 cfs @ 13.23 hrs, Volume= 1.521 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Peak Elev= 17.40' @ 13.23 hrs Surf.Area= 356,751 sf Storage= 990,779 cf

Plug-Flow detention time= 283.7 min calculated for 54.393 af (100% of inflow)

Center-of-Mass det. time= 283.7 min (1,072.2 - 788.5)

Volume	Invert	Avail.Storage	Storage Description
#1	12.00'	1,090,434 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	11.00'	29,249 cf	1' Drainage Medium (Conic) Listed below (Recalc)
			146,245 cf Overall x 20.0% Voids
1,119,683 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
12.00	146,245	0	0	146,245
13.00	157,934	152,052	152,052	158,015
14.00	169,723	163,793	315,845	169,891
15.00	181,613	175,634	491,480	181,874
16.00	193,603	187,576	679,056	193,962
17.00	205,694	199,618	878,674	206,156
18.00	217,886	211,761	1,090,434	218,457

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
11.00	146,245	0	0	146,245
12.00	146,245	146,245	146,245	147,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	11.00'	0.800 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 8.84'
#2	Primary	12.00'	36.0" Round Culvert L= 144.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 12.00' / 4.22' S= 0.0537 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#3	Device 2	14.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	16.00'	60.0" x 60.0" Horiz. Concrete Box Riser Structure with Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	17.00'	40.0' long + 10.0 ' / 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

Discarded OutFlow Max=19.90 cfs @ 13.23 hrs HW=17.40' (Free Discharge)

↑ **1=Exfiltration** (Controls 19.90 cfs)

Primary OutFlow Max=83.99 cfs @ 13.23 hrs HW=17.40' TW=6.00' (Fixed TW Elev= 6.00')

↑ **2=Culvert** (Inlet Controls 83.99 cfs @ 11.88 fps)

↑ **3=Sharp-Crested Rectangular Weir** (Passes < 55.16 cfs potential flow)

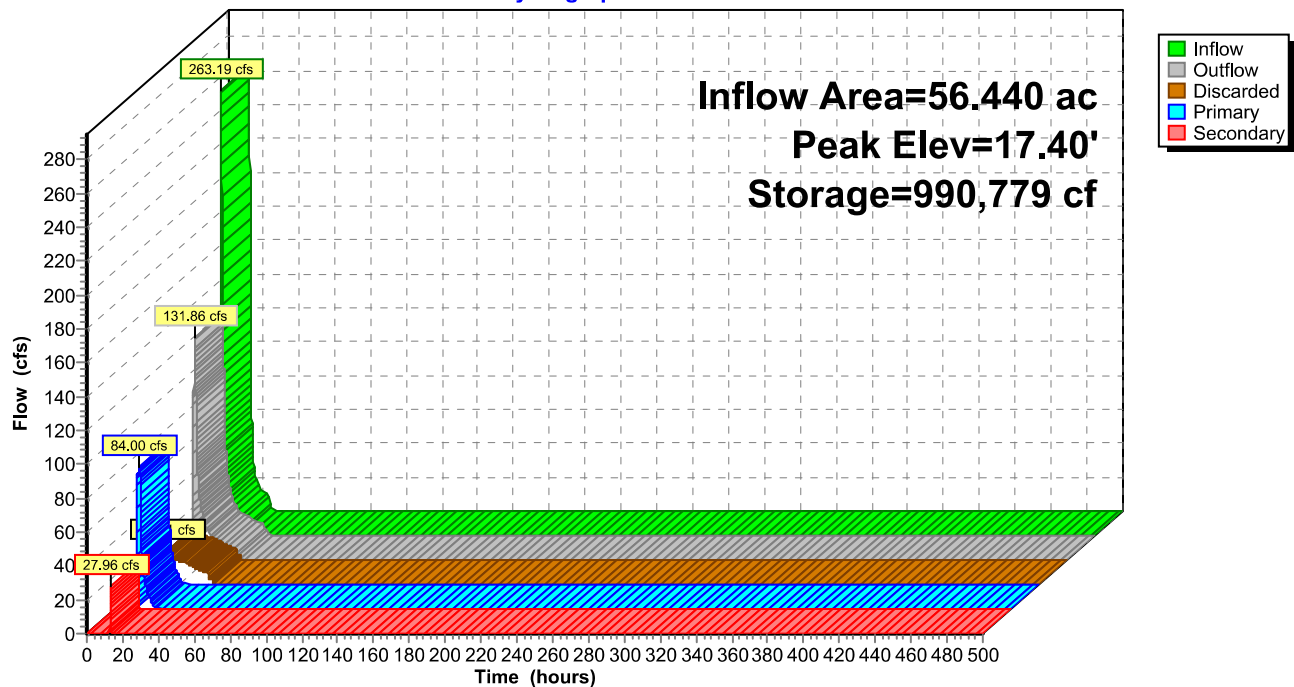
↑ **4=Concrete Box Riser Structure with Grate** (Passes < 108.03 cfs potential flow)

Secondary OutFlow Max=27.68 cfs @ 13.23 hrs HW=17.40' (Free Discharge)

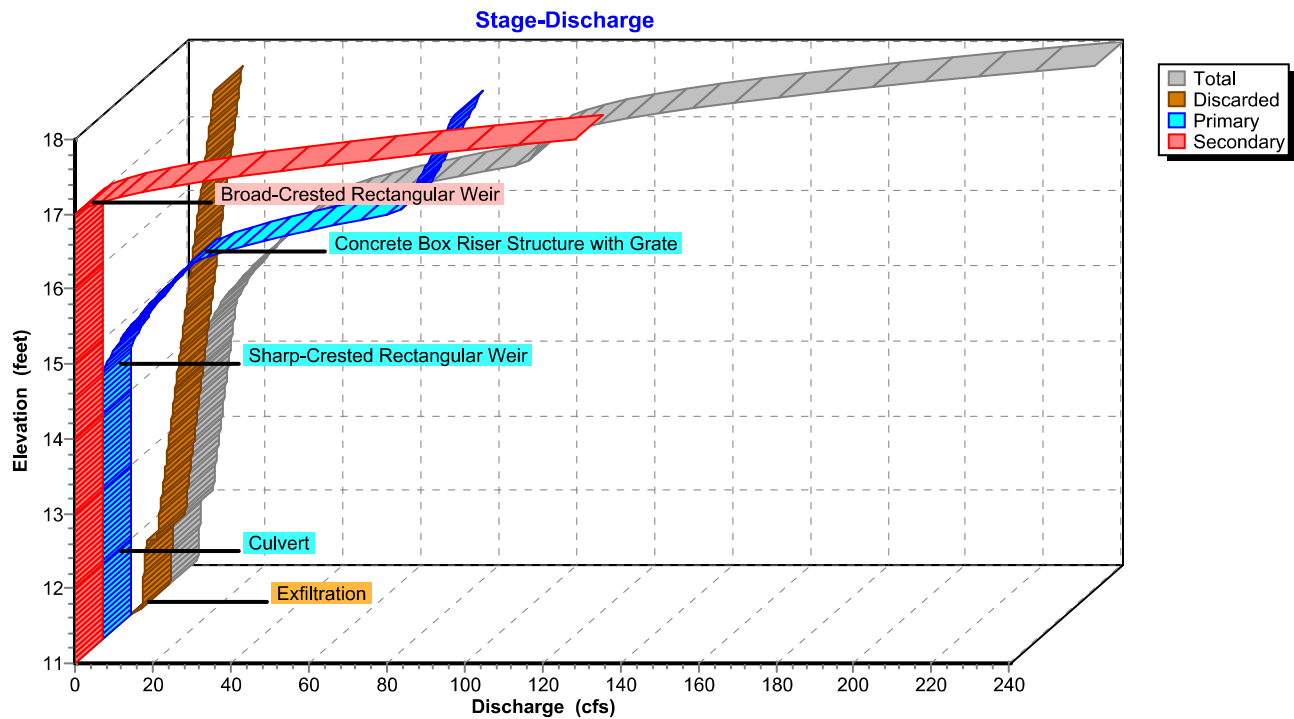
↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 27.68 cfs @ 1.58 fps)

Pond 54P: POND B-02

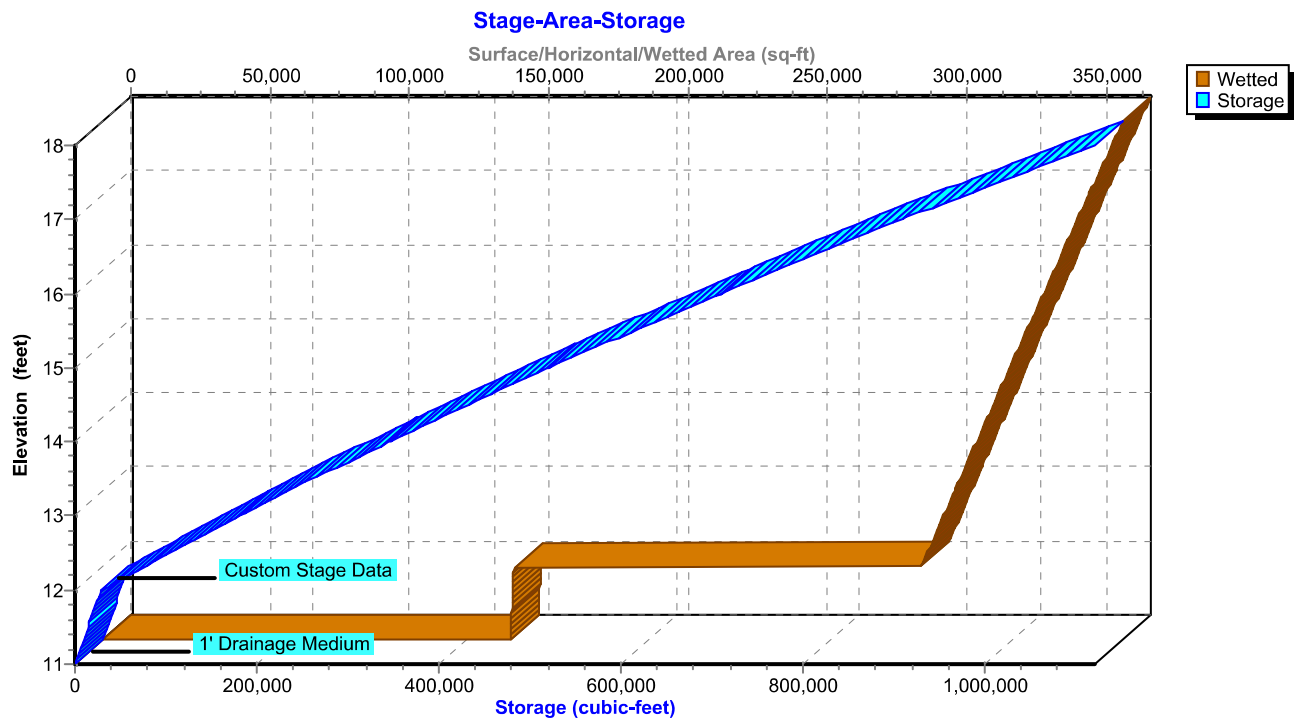
Hydrograph



Pond 54P: POND B-02



Pond 54P: POND B-02



Hydrograph for Pond 54P: POND B-02

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	11.00	0.00	0.00	0.00	0.00
10.00	22.77	146,289	12.78	8.48	8.48	0.00	0.00
20.00	12.11	530,412	15.05	19.24	14.01	5.24	0.00
30.00	0.00	219,915	13.24	9.59	9.59	0.00	0.00
40.00	0.00	6	11.00	0.01	0.01	0.00	0.00
50.00	0.00	0	11.00	0.00	0.00	0.00	0.00
60.00	0.00	0	11.00	0.00	0.00	0.00	0.00
70.00	0.00	0	11.00	0.00	0.00	0.00	0.00
80.00	0.00	0	11.00	0.00	0.00	0.00	0.00
90.00	0.00	0	11.00	0.00	0.00	0.00	0.00
100.00	0.00	0	11.00	0.00	0.00	0.00	0.00
110.00	0.00	0	11.00	0.00	0.00	0.00	0.00
120.00	0.00	0	11.00	0.00	0.00	0.00	0.00
130.00	0.00	0	11.00	0.00	0.00	0.00	0.00
140.00	0.00	0	11.00	0.00	0.00	0.00	0.00
150.00	0.00	0	11.00	0.00	0.00	0.00	0.00
160.00	0.00	0	11.00	0.00	0.00	0.00	0.00
170.00	0.00	0	11.00	0.00	0.00	0.00	0.00
180.00	0.00	0	11.00	0.00	0.00	0.00	0.00
190.00	0.00	0	11.00	0.00	0.00	0.00	0.00
200.00	0.00	0	11.00	0.00	0.00	0.00	0.00
210.00	0.00	0	11.00	0.00	0.00	0.00	0.00
220.00	0.00	0	11.00	0.00	0.00	0.00	0.00
230.00	0.00	0	11.00	0.00	0.00	0.00	0.00
240.00	0.00	0	11.00	0.00	0.00	0.00	0.00
250.00	0.00	0	11.00	0.00	0.00	0.00	0.00
260.00	0.00	0	11.00	0.00	0.00	0.00	0.00
270.00	0.00	0	11.00	0.00	0.00	0.00	0.00
280.00	0.00	0	11.00	0.00	0.00	0.00	0.00
290.00	0.00	0	11.00	0.00	0.00	0.00	0.00
300.00	0.00	0	11.00	0.00	0.00	0.00	0.00
310.00	0.00	0	11.00	0.00	0.00	0.00	0.00
320.00	0.00	0	11.00	0.00	0.00	0.00	0.00
330.00	0.00	0	11.00	0.00	0.00	0.00	0.00
340.00	0.00	0	11.00	0.00	0.00	0.00	0.00
350.00	0.00	0	11.00	0.00	0.00	0.00	0.00
360.00	0.00	0	11.00	0.00	0.00	0.00	0.00
370.00	0.00	0	11.00	0.00	0.00	0.00	0.00
380.00	0.00	0	11.00	0.00	0.00	0.00	0.00
390.00	0.00	0	11.00	0.00	0.00	0.00	0.00
400.00	0.00	0	11.00	0.00	0.00	0.00	0.00
410.00	0.00	0	11.00	0.00	0.00	0.00	0.00
420.00	0.00	0	11.00	0.00	0.00	0.00	0.00
430.00	0.00	0	11.00	0.00	0.00	0.00	0.00
440.00	0.00	0	11.00	0.00	0.00	0.00	0.00
450.00	0.00	0	11.00	0.00	0.00	0.00	0.00
460.00	0.00	0	11.00	0.00	0.00	0.00	0.00
470.00	0.00	0	11.00	0.00	0.00	0.00	0.00
480.00	0.00	0	11.00	0.00	0.00	0.00	0.00
490.00	0.00	0	11.00	0.00	0.00	0.00	0.00
500.00	0.00	0	11.00	0.00	0.00	0.00	0.00

Stage-Discharge for Pond 54P: POND B-02

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
11.00	0.00	0.00	0.00	0.00
11.20	2.96	2.96	0.00	0.00
11.40	3.22	3.22	0.00	0.00
11.60	3.48	3.48	0.00	0.00
11.80	3.73	3.73	0.00	0.00
12.00	6.70	6.70	0.00	0.00
12.20	7.12	7.12	0.00	0.00
12.40	7.59	7.59	0.00	0.00
12.60	8.06	8.06	0.00	0.00
12.80	8.54	8.54	0.00	0.00
13.00	9.01	9.01	0.00	0.00
13.20	9.49	9.49	0.00	0.00
13.40	9.97	9.97	0.00	0.00
13.60	10.45	10.45	0.00	0.00
13.80	10.93	10.93	0.00	0.00
14.00	11.42	11.42	0.00	0.00
14.20	11.91	11.91	0.00	0.00
14.40	12.40	12.40	0.00	0.00
14.60	13.30	12.89	0.41	0.00
14.80	15.50	13.38	2.12	0.00
15.00	18.38	13.87	4.51	0.00
15.20	21.76	14.37	7.39	0.00
15.40	25.53	14.87	10.67	0.00
15.60	29.62	15.36	14.26	0.00
15.80	33.99	15.86	18.13	0.00
16.00	38.59	16.37	22.23	0.00
16.20	49.25	16.87	32.38	0.00
16.40	64.92	17.37	47.55	0.00
16.60	83.90	17.88	66.02	0.00
16.80	95.67	18.38	77.28	0.00
17.00	98.48	18.89	79.59	0.00
17.20	110.50	19.40	81.83	9.26
17.40	131.90	19.91	84.02	27.98
17.60	162.78	20.42	86.14	56.22
17.80	198.46	20.93	88.22	89.31
18.00	240.34	21.45	90.25	128.64

Stage-Area-Storage for Pond 54P: POND B-02

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
11.00	146,245	0	16.20	343,972	747,264
11.10	146,381	2,925	16.30	345,182	766,923
11.20	146,516	5,850	16.40	346,396	786,702
11.30	146,652	8,775	16.50	347,613	806,602
11.40	146,787	11,700	16.60	348,835	826,623
11.50	146,923	14,625	16.70	350,060	846,765
11.60	147,058	17,549	16.80	351,288	867,029
11.70	147,194	20,474	16.90	352,521	887,415
11.80	147,330	23,399	17.00	353,757	907,923
11.90	147,465	26,324	17.10	354,971	928,552
12.00	293,846	29,249	17.20	356,188	949,302
12.10	295,002	43,931	17.30	357,410	970,173
12.20	296,164	58,728	17.40	358,634	991,165
12.30	297,329	73,640	17.50	359,863	1,012,279
12.40	298,500	88,669	17.60	361,095	1,033,515
12.50	299,674	103,814	17.70	362,330	1,054,873
12.60	300,854	119,076	17.80	363,569	1,076,353
12.70	302,037	134,455	17.90	364,811	1,097,957
12.80	303,226	149,952	18.00	366,057	1,119,683
12.90	304,419	165,567			
13.00	305,616	181,301			
13.10	306,784	197,152			
13.20	307,957	213,120			
13.30	309,134	229,204			
13.40	310,315	245,405			
13.50	311,501	261,724			
13.60	312,690	278,161			
13.70	313,884	294,715			
13.80	315,083	311,389			
13.90	316,285	328,182			
14.00	317,492	345,094			
14.10	318,672	362,125			
14.20	319,856	379,273			
14.30	321,044	396,539			
14.40	322,236	413,923			
14.50	323,433	431,425			
14.60	324,633	449,046			
14.70	325,837	466,787			
14.80	327,046	484,647			
14.90	328,258	502,628			
15.00	329,474	520,729			
15.10	330,666	538,949			
15.20	331,861	557,288			
15.30	333,060	575,745			
15.40	334,263	594,322			
15.50	335,470	613,018			
15.60	336,681	631,834			
15.70	337,895	650,770			
15.80	339,114	669,827			
15.90	340,336	689,005			
16.00	341,562	708,305			
16.10	342,765	727,725			

Summary for Pond 76P: POND B-01

Inflow Area = 111.250 ac, 0.00% Impervious, Inflow Depth = 11.69" for 100-YR, 24-HR event
 Inflow = 454.97 cfs @ 12.55 hrs, Volume= 108.378 af
 Outflow = 117.10 cfs @ 14.31 hrs, Volume= 108.378 af, Atten= 74%, Lag= 106.0 min
 Discarded = 15.49 cfs @ 14.31 hrs, Volume= 48.096 af
 Primary = 67.21 cfs @ 14.31 hrs, Volume= 56.195 af
 Secondary = 34.40 cfs @ 14.31 hrs, Volume= 4.088 af

Routing by Stor-Ind method, Time Span= 0.00-500.00 hrs, dt= 0.05 hrs

Peak Elev= 13.02' @ 14.31 hrs Surf.Area= 837,695 sf Storage= 2,765,095 cf

Plug-Flow detention time= 743.4 min calculated for 108.367 af (100% of inflow)

Center-of-Mass det. time= 743.7 min (1,542.4 - 798.7)

Volume	Invert	Avail.Storage	Storage Description
#1	6.60'	2,904,364 cf	Custom Stage Data (Conic) Listed below (Recalc)
#2	5.60'	76,959 cf	1.0' Drainage Medium (Conic) Listed below (Recalc)
			384,796 cf Overall x 20.0% Voids
2,981,323 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
6.60	384,796	0	0	384,796
7.00	388,677	154,694	154,694	388,776
8.00	399,096	393,875	548,569	399,430
9.00	409,615	404,344	952,913	410,188
10.00	420,234	414,913	1,367,826	421,049
11.00	430,954	425,583	1,793,409	432,016
12.00	441,775	436,353	2,229,762	443,087
13.00	452,696	447,224	2,676,987	454,263
13.50	456,817	227,377	2,904,364	458,554

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.60	384,796	0	0	384,796
6.60	384,796	384,796	384,796	386,995

Device	Routing	Invert	Outlet Devices
#1	Discarded	5.60'	0.250 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 3.02'
#2	Primary	6.60'	30.0" Round Culvert - EXISTING L= 163.1' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 6.60' / 2.85' S= 0.0230 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#3	Device 2	8.75'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#4	Device 2	11.50'	60.0" x 60.0" Horiz. Concrete Box Riser Structure with Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	12.50'	30.0' long + 10.0 ' /' 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

Discarded OutFlow Max=15.49 cfs @ 14.31 hrs HW=13.02' (Free Discharge)

↑ **1=Exfiltration** (Controls 15.49 cfs)

Primary OutFlow Max=67.21 cfs @ 14.31 hrs HW=13.02' TW=1.08' (Fixed TW Elev= 1.08')

↑ **2=Culvert - EXISTING** (Inlet Controls 67.21 cfs @ 13.69 fps)

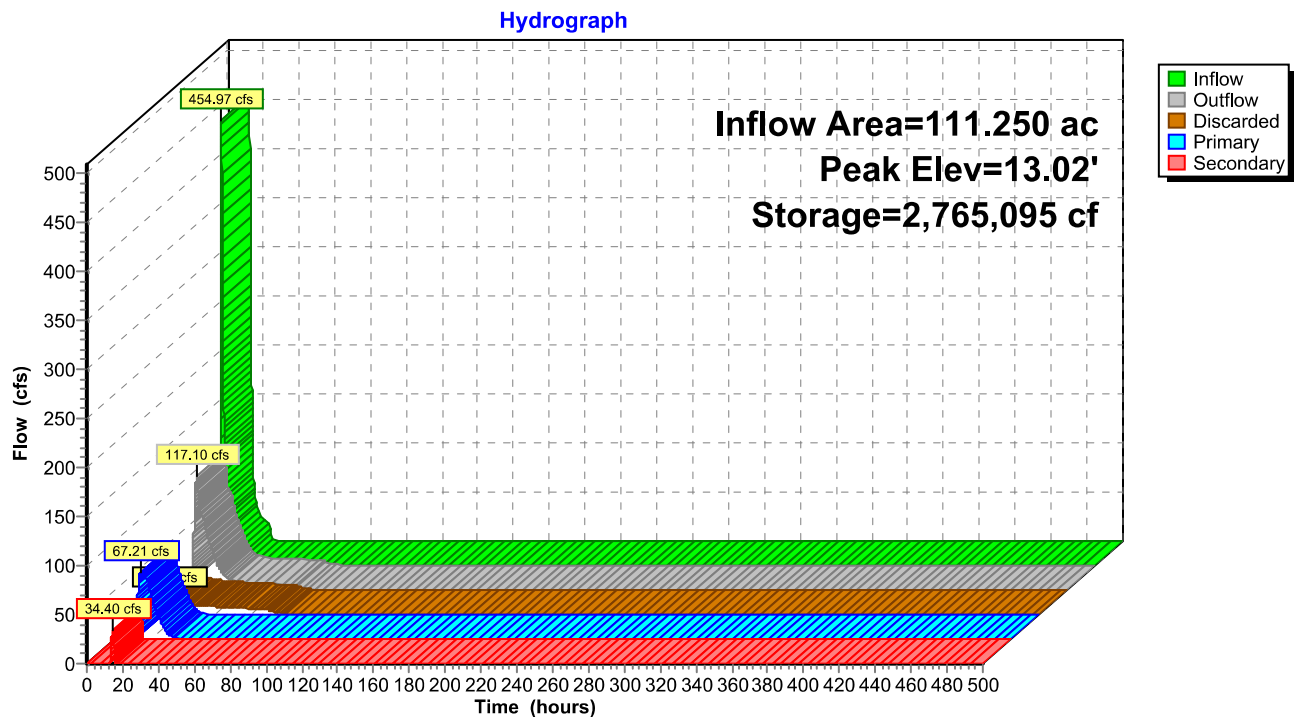
↑ **3=Sharp-Crested Rectangular Weir** (Passes < 90.89 cfs potential flow)

↑ **4=Concrete Box Riser Structure with Grate** (Passes < 123.09 cfs potential flow)

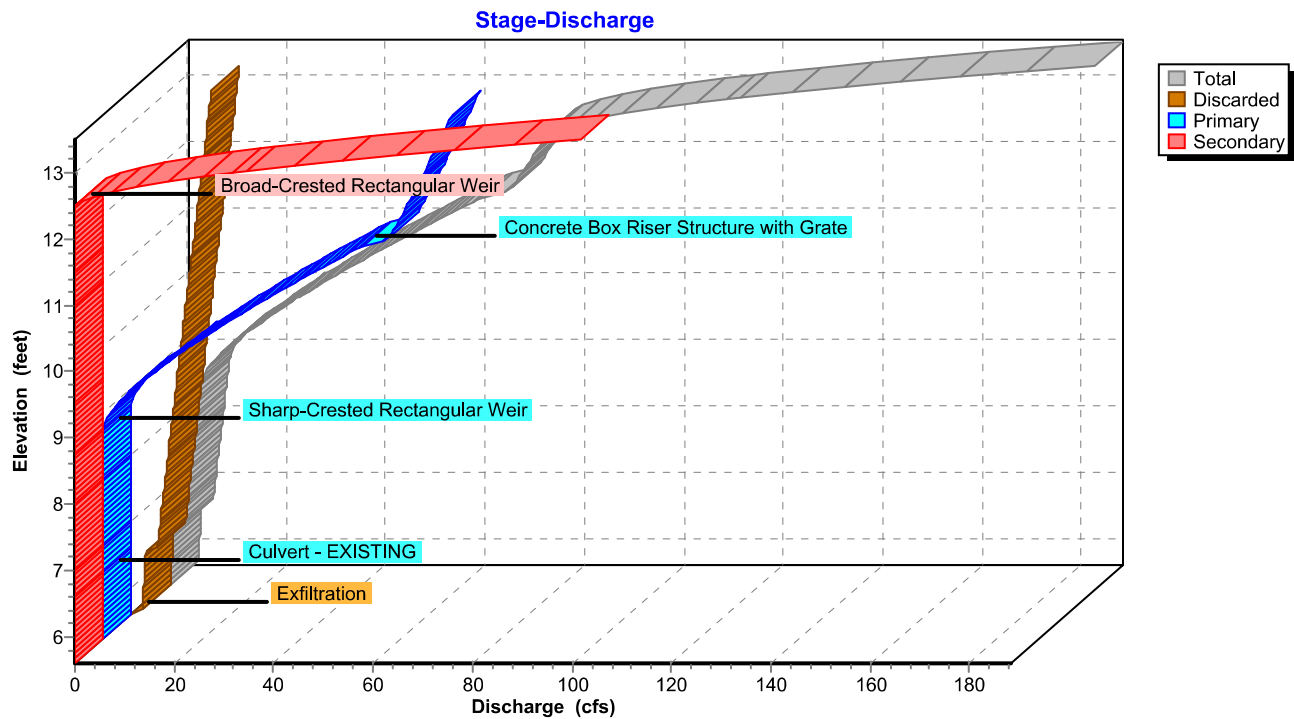
Secondary OutFlow Max=34.38 cfs @ 14.31 hrs HW=13.02' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 34.38 cfs @ 1.86 fps)

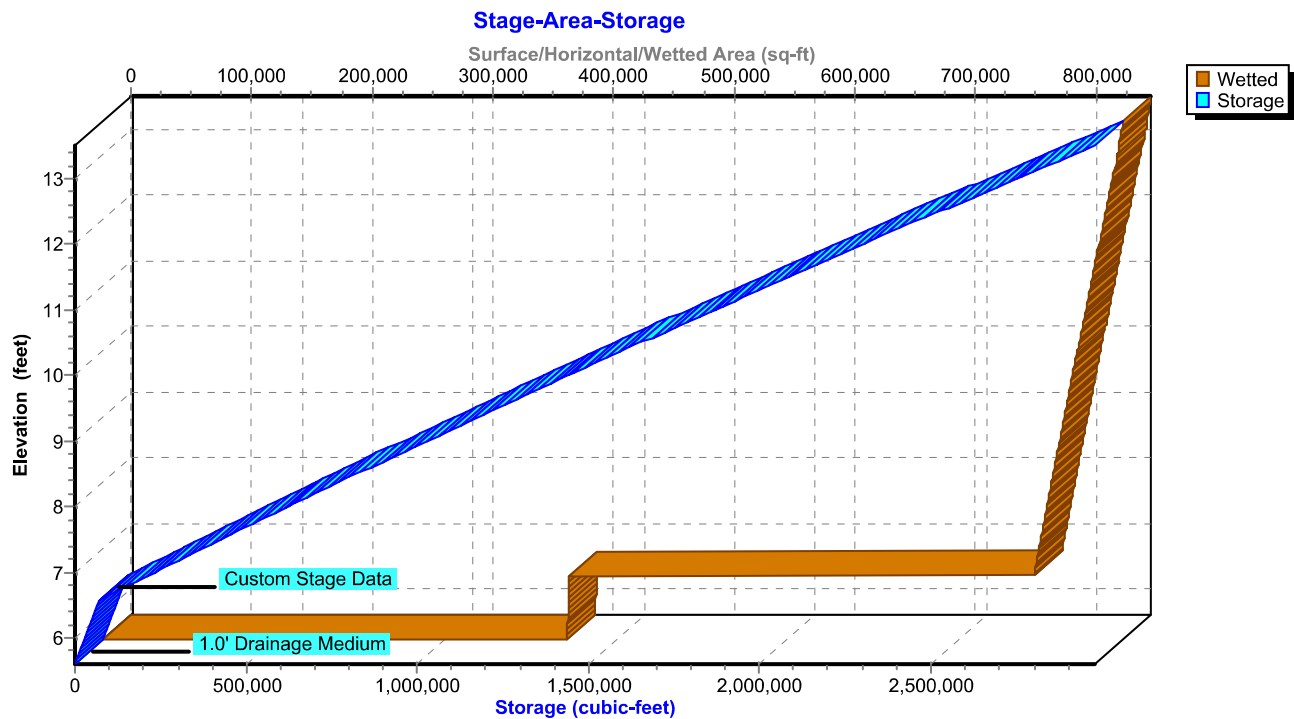
Pond 76P: POND B-01



Pond 76P: POND B-01



Pond 76P: POND B-01



Hydrograph for Pond 76P: POND B-01

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	5.60	0.00	0.00	0.00	0.00
10.00	43.29	467,190	7.60	6.87	6.87	0.00	0.00
20.00	24.30	1,987,632	11.27	58.43	12.67	45.76	0.00
30.00	0.00	1,143,678	9.28	14.38	9.50	4.88	0.00
40.00	0.00	793,023	8.42	8.15	8.15	0.00	0.00
50.00	0.00	519,467	7.73	7.07	7.07	0.00	0.00
60.00	0.00	282,093	7.13	6.13	6.13	0.00	0.00
70.00	0.00	76,409	6.59	5.02	5.02	0.00	0.00
80.00	0.00	140	5.60	0.05	0.05	0.00	0.00
90.00	0.00	0	5.60	0.00	0.00	0.00	0.00
100.00	0.00	0	5.60	0.00	0.00	0.00	0.00
110.00	0.00	0	5.60	0.00	0.00	0.00	0.00
120.00	0.00	0	5.60	0.00	0.00	0.00	0.00
130.00	0.00	0	5.60	0.00	0.00	0.00	0.00
140.00	0.00	0	5.60	0.00	0.00	0.00	0.00
150.00	0.00	0	5.60	0.00	0.00	0.00	0.00
160.00	0.00	0	5.60	0.00	0.00	0.00	0.00
170.00	0.00	0	5.60	0.00	0.00	0.00	0.00
180.00	0.00	0	5.60	0.00	0.00	0.00	0.00
190.00	0.00	0	5.60	0.00	0.00	0.00	0.00
200.00	0.00	0	5.60	0.00	0.00	0.00	0.00
210.00	0.00	0	5.60	0.00	0.00	0.00	0.00
220.00	0.00	0	5.60	0.00	0.00	0.00	0.00
230.00	0.00	0	5.60	0.00	0.00	0.00	0.00
240.00	0.00	0	5.60	0.00	0.00	0.00	0.00
250.00	0.00	0	5.60	0.00	0.00	0.00	0.00
260.00	0.00	0	5.60	0.00	0.00	0.00	0.00
270.00	0.00	0	5.60	0.00	0.00	0.00	0.00
280.00	0.00	0	5.60	0.00	0.00	0.00	0.00
290.00	0.00	0	5.60	0.00	0.00	0.00	0.00
300.00	0.00	0	5.60	0.00	0.00	0.00	0.00
310.00	0.00	0	5.60	0.00	0.00	0.00	0.00
320.00	0.00	0	5.60	0.00	0.00	0.00	0.00
330.00	0.00	0	5.60	0.00	0.00	0.00	0.00
340.00	0.00	0	5.60	0.00	0.00	0.00	0.00
350.00	0.00	0	5.60	0.00	0.00	0.00	0.00
360.00	0.00	0	5.60	0.00	0.00	0.00	0.00
370.00	0.00	0	5.60	0.00	0.00	0.00	0.00
380.00	0.00	0	5.60	0.00	0.00	0.00	0.00
390.00	0.00	0	5.60	0.00	0.00	0.00	0.00
400.00	0.00	0	5.60	0.00	0.00	0.00	0.00
410.00	0.00	0	5.60	0.00	0.00	0.00	0.00
420.00	0.00	0	5.60	0.00	0.00	0.00	0.00
430.00	0.00	0	5.60	0.00	0.00	0.00	0.00
440.00	0.00	0	5.60	0.00	0.00	0.00	0.00
450.00	0.00	0	5.60	0.00	0.00	0.00	0.00
460.00	0.00	0	5.60	0.00	0.00	0.00	0.00
470.00	0.00	0	5.60	0.00	0.00	0.00	0.00
480.00	0.00	0	5.60	0.00	0.00	0.00	0.00
490.00	0.00	0	5.60	0.00	0.00	0.00	0.00
500.00	0.00	0	5.60	0.00	0.00	0.00	0.00

Stage-Discharge for Pond 76P: POND B-01

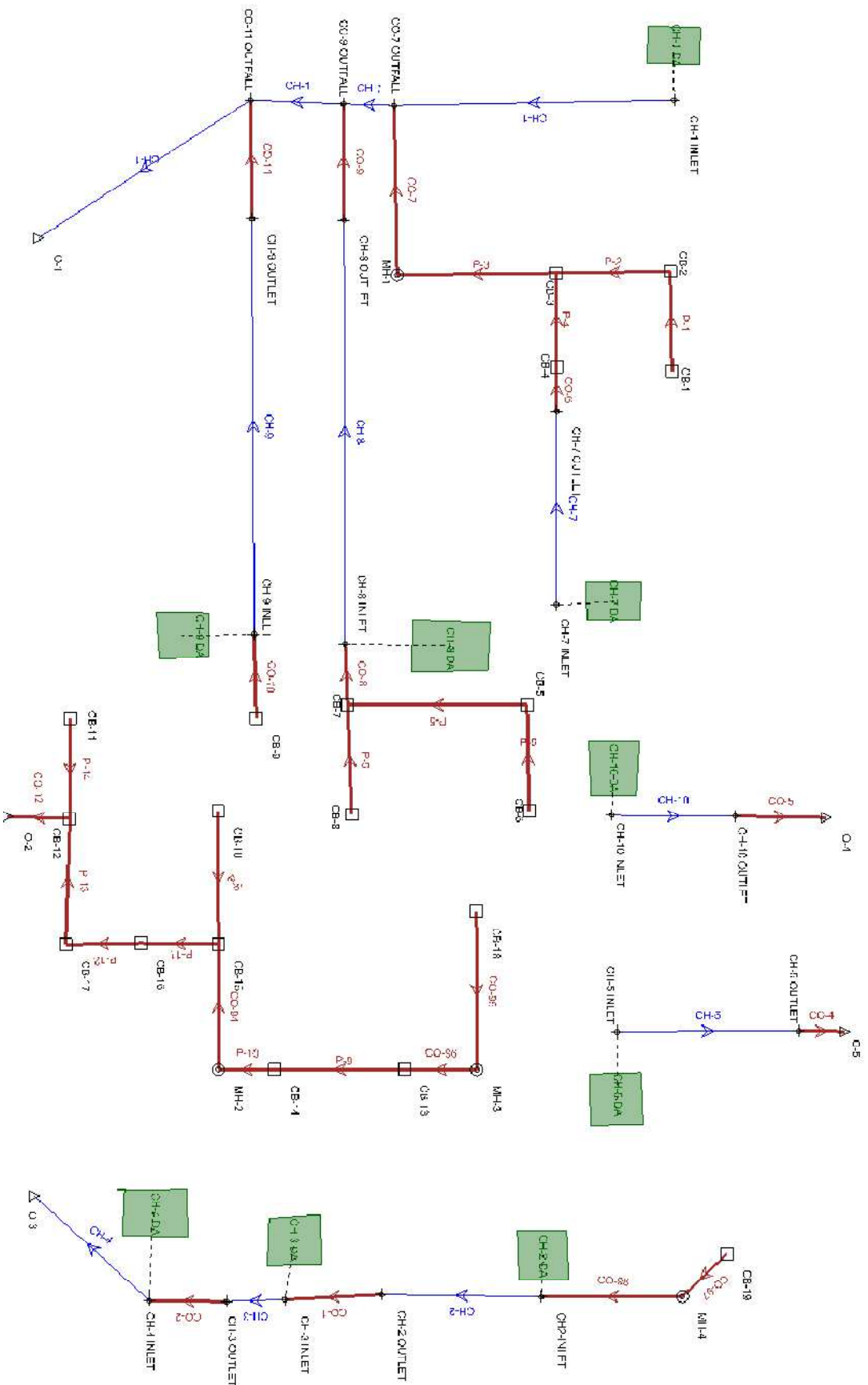
Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.60	0.00	0.00	0.00	0.00
5.80	2.40	2.40	0.00	0.00
6.00	2.58	2.58	0.00	0.00
6.20	2.75	2.75	0.00	0.00
6.40	2.93	2.93	0.00	0.00
6.60	5.33	5.33	0.00	0.00
6.80	5.62	5.62	0.00	0.00
7.00	5.93	5.93	0.00	0.00
7.20	6.24	6.24	0.00	0.00
7.40	6.55	6.55	0.00	0.00
7.60	6.87	6.87	0.00	0.00
7.80	7.18	7.18	0.00	0.00
8.00	7.49	7.49	0.00	0.00
8.20	7.80	7.80	0.00	0.00
8.40	8.12	8.12	0.00	0.00
8.60	8.43	8.43	0.00	0.00
8.80	8.89	8.75	0.15	0.00
9.00	10.68	9.06	1.61	0.00
9.20	13.24	9.38	3.86	0.00
9.40	16.33	9.70	6.63	0.00
9.60	19.83	10.01	9.81	0.00
9.80	23.66	10.33	13.33	0.00
10.00	27.78	10.65	17.14	0.00
10.20	32.15	10.96	21.18	0.00
10.40	36.72	11.28	25.44	0.00
10.60	41.47	11.60	29.87	0.00
10.80	46.38	11.92	34.46	0.00
11.00	51.42	12.24	39.18	0.00
11.20	56.57	12.56	44.02	0.00
11.40	61.83	12.88	48.95	0.00
11.60	69.23	13.20	56.03	0.00
11.80	72.24	13.52	58.72	0.00
12.00	74.03	13.84	60.19	0.00
12.20	75.78	14.16	61.62	0.00
12.40	77.50	14.48	63.02	0.00
12.60	81.62	14.81	64.39	2.43
12.80	94.30	15.13	65.73	13.44
13.00	114.11	15.45	67.05	31.61
13.20	140.30	15.77	68.34	56.19
13.40	170.97	16.09	69.60	85.28

Stage-Area-Storage for Pond 76P: POND B-01

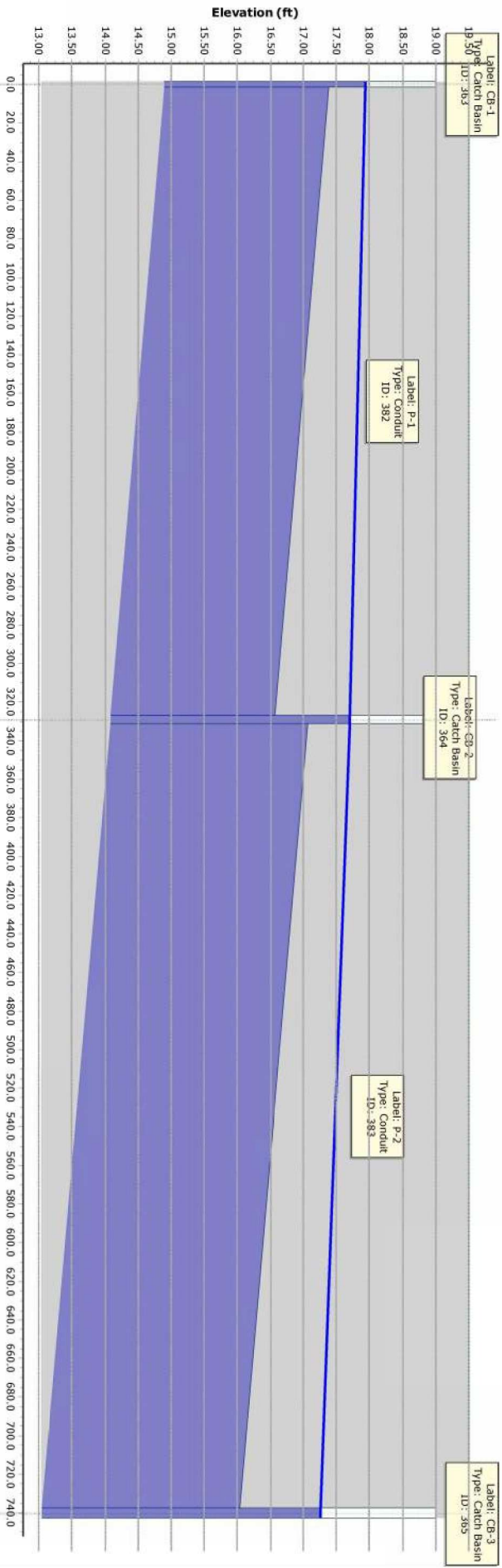
Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
5.60	384,796	0	10.80	816,807	1,784,393
5.70	385,016	7,696	10.90	817,908	1,827,327
5.80	385,236	15,392	11.00	819,011	1,870,368
5.90	385,456	23,088	11.10	820,112	1,913,517
6.00	385,676	30,784	11.20	821,214	1,956,774
6.10	385,895	38,480	11.30	822,318	2,000,139
6.20	386,115	46,176	11.40	823,423	2,043,612
6.30	386,335	53,871	11.50	824,529	2,087,192
6.40	386,555	61,567	11.60	825,637	2,130,881
6.50	386,775	69,263	11.70	826,747	2,174,678
6.60	771,791	76,959	11.80	827,857	2,218,584
6.70	772,784	115,487	11.90	828,969	2,262,598
6.80	773,778	154,112	12.00	830,082	2,306,722
6.90	774,774	192,834	12.10	831,194	2,350,953
7.00	775,771	231,653	12.20	832,307	2,395,294
7.10	776,830	270,573	12.30	833,421	2,439,743
7.20	777,890	309,596	12.40	834,536	2,484,301
7.30	778,952	348,723	12.50	835,653	2,528,969
7.40	780,016	387,953	12.60	836,771	2,573,745
7.50	781,080	427,288	12.70	837,891	2,618,631
7.60	782,146	466,727	12.80	839,012	2,663,626
7.70	783,214	506,271	12.90	840,134	2,708,731
7.80	784,283	545,919	13.00	841,258	2,753,946
7.90	785,353	585,671	13.10	842,114	2,799,257
8.00	786,425	625,528	13.20	842,972	2,844,650
8.10	787,494	665,490	13.30	843,830	2,890,125
8.20	788,565	705,557	13.40	844,689	2,935,683
8.30	789,637	745,728	13.50	845,549	2,981,323
8.40	790,711	786,004			
8.50	791,786	826,385			
8.60	792,863	866,872			
8.70	793,941	907,464			
8.80	795,020	948,161			
8.90	796,100	988,964			
9.00	797,183	1,029,872			
9.10	798,262	1,070,887			
9.20	799,344	1,112,006			
9.30	800,426	1,153,232			
9.40	801,511	1,194,564			
9.50	802,596	1,236,001			
9.60	803,683	1,277,545			
9.70	804,771	1,319,196			
9.80	805,861	1,360,952			
9.90	806,952	1,402,815			
10.00	808,044	1,444,785			
10.10	809,135	1,486,862			
10.20	810,227	1,529,045			
10.30	811,320	1,571,336			
10.40	812,414	1,613,733			
10.50	813,510	1,656,237			
10.60	814,608	1,698,848			
10.70	815,706	1,741,567			

Appendix J. Conveyance Channel and Storm Drain Design

Culvert + Channel Design Summary																		
Inlet ID	Downstream Connection	Culvert ID	Barrel/Channel Length to Downstream Connection (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Slope%	No. of Barrels	Pipe Diameter (in)	Average Channel Depth (ft)	Channel Side Slopes (ft/ft)	Min. Channel Bottom Depth (ft)	Channel Velocity (ft/s)	Channel Lining	Max Permissible Channel Lining Velocity (ft/s)	Top of Grade Elevation (ft)	Edge of Pad (ft)	Road Peak Elevation (ft)	Top of Foundation Elevation (ft)
CH-10	CO-5	-	1231.51	15.68	13.22	0.20	-	-	4.00	4.00	9.50	3.30	Sod	4.00	-	-	-	-
CO-5	0-4	CO-5	108.52	13.22	13.00	0.20	2.00	36.00	-	-	-	-	-	-	-	-	-	-
CB-19	MH-4	-	95.00	14.14	13.90	0.25	1.00	24.00	-	-	-	-	-	-	19.00	19.25	19.50	20
MH-4	CH-2	-	87.99	13.90	13.68	0.25	1.00	30.00	-	-	-	-	-	-	19.00	19.25	19.50	20
CH-2	CO-1	-	504.78	13.68	12.42	0.25	-	-	4.00	4.00	11.00	2.82	Sod	4.00	-	-	-	-
CO-1	CH-3	CO-1	106.23	12.42	12.15	0.25	2.00	42.00	-	-	-	-	-	-	-	-	-	-
CH-3	CO-2	-	878.26	12.15	9.96	0.25	-	-	4.00	4.00	11.00	3.54	Sod	4.00	-	-	-	-
CO-2	CH-4	CO-2	73.12	9.96	9.77	0.25	2.00	42.00	-	-	-	-	-	-	-	-	-	-
CH-4	0-3	-	709.12	9.77	8.00	0.25	-	-	4.00	4.00	11.00	3.48	Sod	4.00	-	-	-	-
CH-5	CO-4	-	1254.02	15.70	13.19	0.20	-	-	3.50	4.00	11.00	3.31	Sod	4.00	-	-	-	-
CO-4	0-5	CO-4	94.13	13.19	13.00	0.20	2.00	48.00	-	-	-	-	-	-	-	-	-	-
CB-1	CB-2	-	329.10	14.89	14.07	0.25	1.00	30.00	-	-	-	-	-	-	19.00	19.25	19.5	20
CB-2	CB-3	-	411.18	14.07	13.04	0.25	1.00	36.00	-	-	-	-	-	-	19.00	19.25	19.5	20
CB-3	MH-1	-	102.39	13.04	12.79	0.25	1.00	48.00	-	-	-	-	-	-	19.00	19.25	19.5	20
CB-4	CB-3	-	329.10	13.86	13.04	0.25	1.00	48.00	-	-	-	-	-	-	19.00	19.25	19.5	20
CH-7	CO-6	-	660.12	15.74	14.09	0.25	-	-	4.00	4.00	6.00	3.06	Sod	-	-	-	-	-
CO-6	CB-4	CO-6	89.25	14.09	13.86	0.25	1.00	42.00	-	-	-	-	-	-	-	-	-	-
MH-1	CH-1	CO-7	310.47	12.79	12.01	0.25	1.00	54.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-9	CH-9	CO-10	115.71	13.97	13.68	0.25	1.00	30.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CH-9	CO-11	-	835.37	13.68	11.59	0.25	-	-	5.00	4.00	6.00	3.40	Sod	-	-	-	-	-
CO-11	CH-1	CO-11	203.10	11.59	11.09	0.25	1.00	48.00	-	-	-	-	-	-	-	-	-	-
CB-5	CB-7	-	342.70	14.82	13.96	0.25	1.00	30.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-6	CB-5	-	288.13	15.54	14.82	0.25	1.00	24.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-7	CH-8	CO-8	27.04	13.96	13.89	0.25	1.00	36.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-8	CB-7	-	288.67	14.68	13.96	0.25	1.00	24.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CH-8	CO-9	-	816.07	13.89	11.85	0.25	-	-	5.00	4.00	7.00	3.33	Sod	-	-	-	-	-
CO-9	CH-1	CO-9	203.44	11.85	11.34	0.25	1.00	54.00	-	-	-	-	-	-	-	-	-	-
CH-1	0-1	-	2295.20	13.09	8.50	0.20	-	-	5.00	4.00	6.00	3.68	Sod	-	-	-	-	-
CB-10	CB-15	-	142.62	11.52	11.16	0.25	1.00	24.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-18	MH-3	-	102.82	13.10	12.85	0.25	1.00	24.00	-	-	-	-	-	-	19.00	19.25	19.50	20
MH-3	CB-13	-	196.08	12.85	12.36	0.25	1.00	24.00	-	-	-	-	-	-	19.00	19.25	19.50	20
CB-13	CB-14	-	260.83	12.36	11.71	0.25	1.00	36.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-14	MH-2	-	89.20	11.71	11.48	0.25	1.00	36.00	-	-	-	-	-	-	18.00	18.25	18.5	19
MH-2	CB-15	-	128.63	11.48	11.16	0.25	1.00	48.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-15	CB-16	-	228.40	11.16	10.59	0.25	1.00	48.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-16	CB-17	-	309.32	10.59	9.82	0.25	1.00	48.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-17	CB-12	-	128.2541	9.82	9.50	0.25	1.00	48.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-11	CB-12	-	162.4624	9.90	9.50	0.25	1.00	18.00	-	-	-	-	-	-	18.00	18.25	18.5	19
CB-12	0-2	CO-12	198.355	9.50	9	0.25	1.00	48.00	-	-	-	-	-	-	18.00	18.25	18.5	19



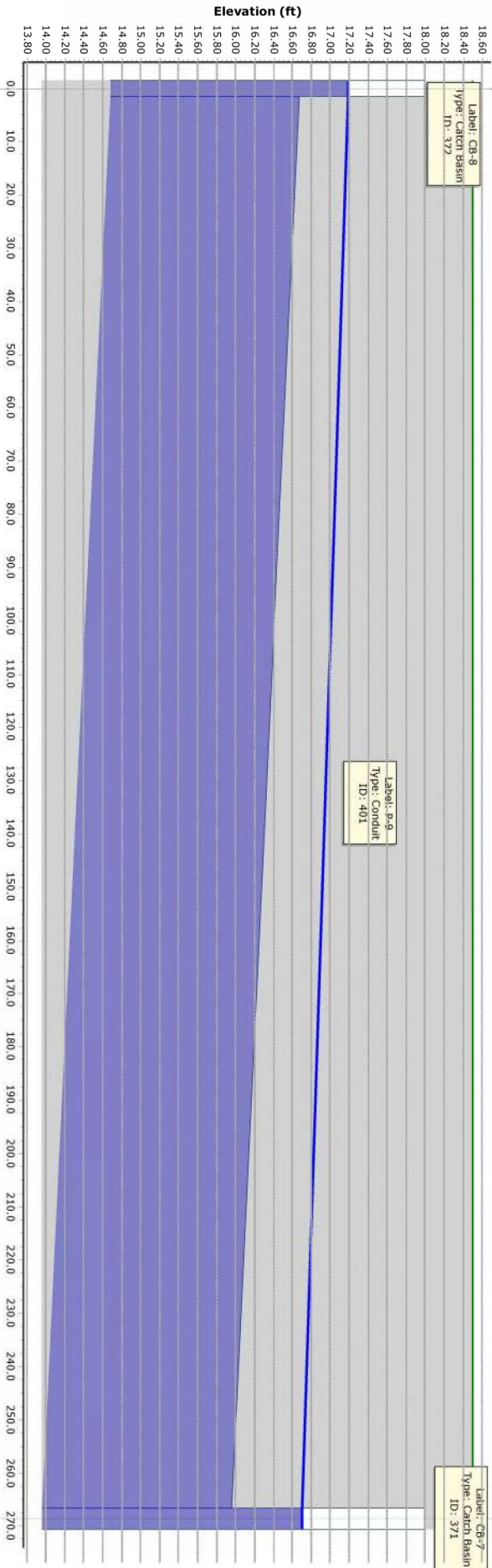
CB-1 to CB-3 - Base



- HGL

ID\Label	382 \ P-1		383 \ P-2	
Link Length (ft)	329.1		411.2	
Rise (in)\Material	30.0 \ Corrugated HDPE (Smooth Interior)			
Flow (cfs)	11.65		23.74	
Slope (ft/ft)	0.002		0.003	
ID\Label	363 \ CB-1		364 \ CB-2	
Ground (ft)	19.50		19.50	
Invert (ft)	14.89		14.07	
Station (ft)	0+0		329.1	
			740.3	

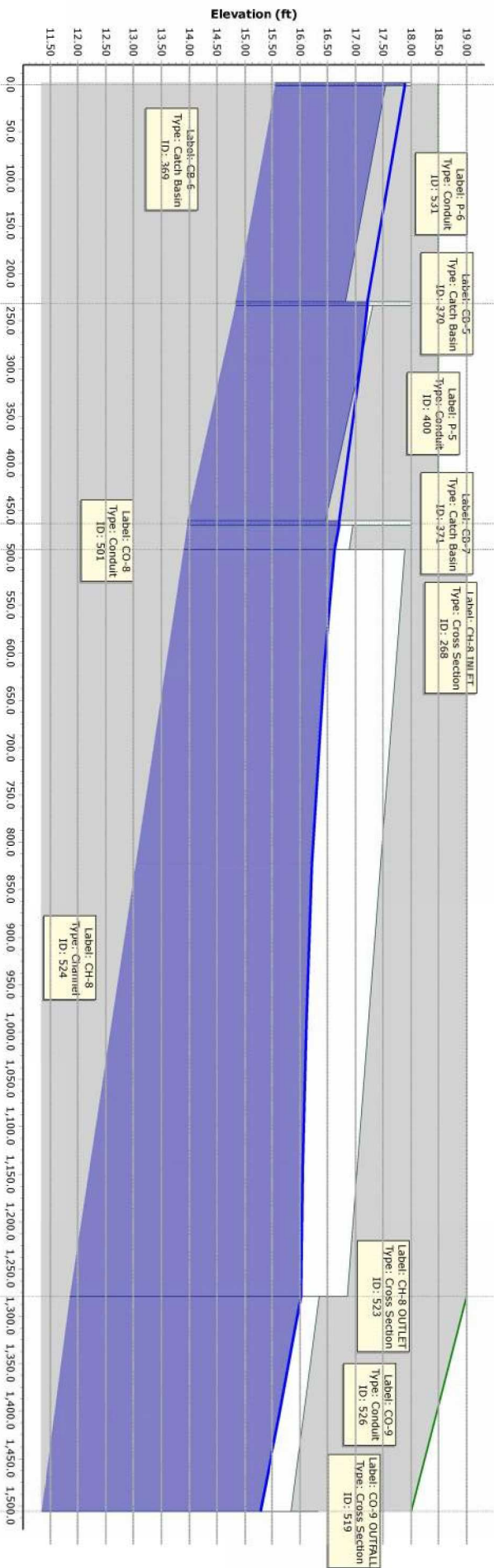
CB-8 to CB-7 - Base



- HGL

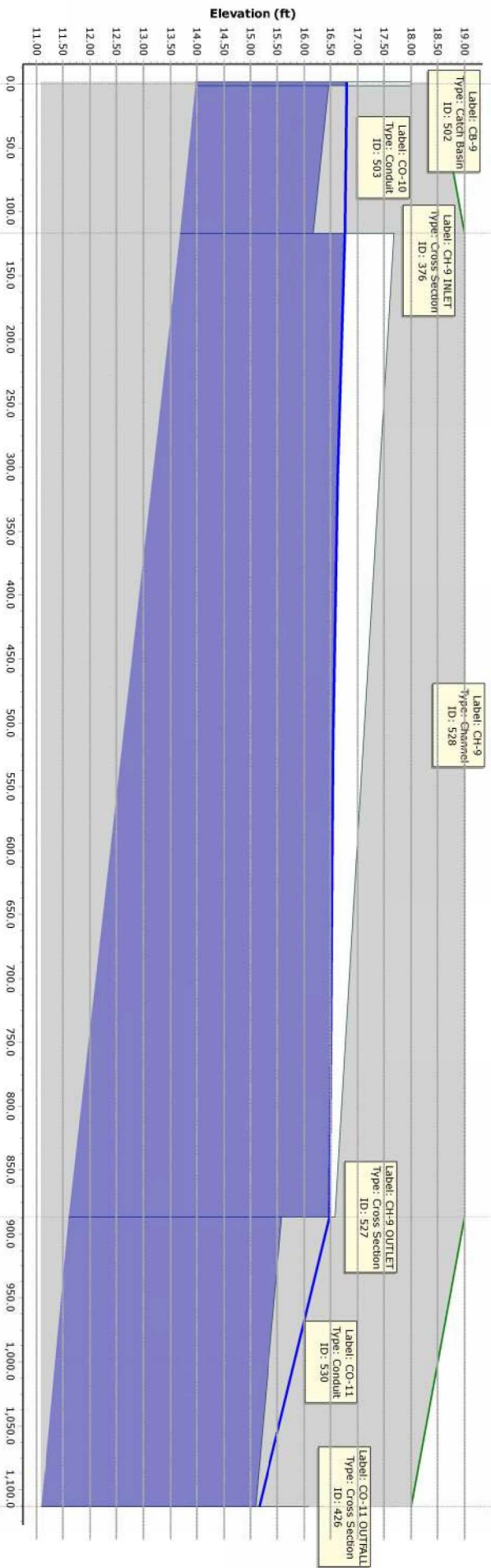
ID\Label	401 \ P.O
Link Length (ft)	288.6
Rise (in)\Material	24.0 \ Corrugated HDPE (Smooth Interior)
Flow (cfs)	10.46
Slope (ft/ft)	0.003
ID\Label	372 \ CB-8
Ground (ft)	18.50
Invert (ft)	14.68
Station (ft)	0.0
ID\Label	371 \ CB-7
Ground (ft)	18.50
Invert (ft)	13.96
Station (ft)	268.6

CB-6 to CO-9 OUTFALL - Base



ID\Label	531 \ P-6	400 \ P-5	501 \ CO-7	524 \ CH-8	526 \ CO-9
Link Length (ft)	231.4	231.4	28.6	787.6	227.0
Rise (in)\Material	24.0 \ Corrugated HDPE (Smooth Interior)	30.0 \ Corrugated HDPE (Smooth Interior)	30.0 \ Corrugated HDPE (Smooth Interior)	48.0 \ Rough channel, with grass	54.0 \ Corrugated HDPE (Smooth Interior)
Flow (cfs)	13.11	21.33	40.00	136.02	121.62
Slope (ft/ft)	0.003	0.004	0.002	0.003	0.002
ID\Label	369 \ CB-6	370 \ CB-5	371 \ CO-7 INLET	523 \ CH-8 OUTLET	519 \ CO-9 OUTFALL
Ground (ft)	18.50	18.50	18.50 \ 19.00	19.00	18.00
Invert (ft)	15.54	14.82	13.96 \ 13.89	11.85	11.34
Station (ft)	0.0	231.4	462.9 \ 491.4	1279.0	1506.0

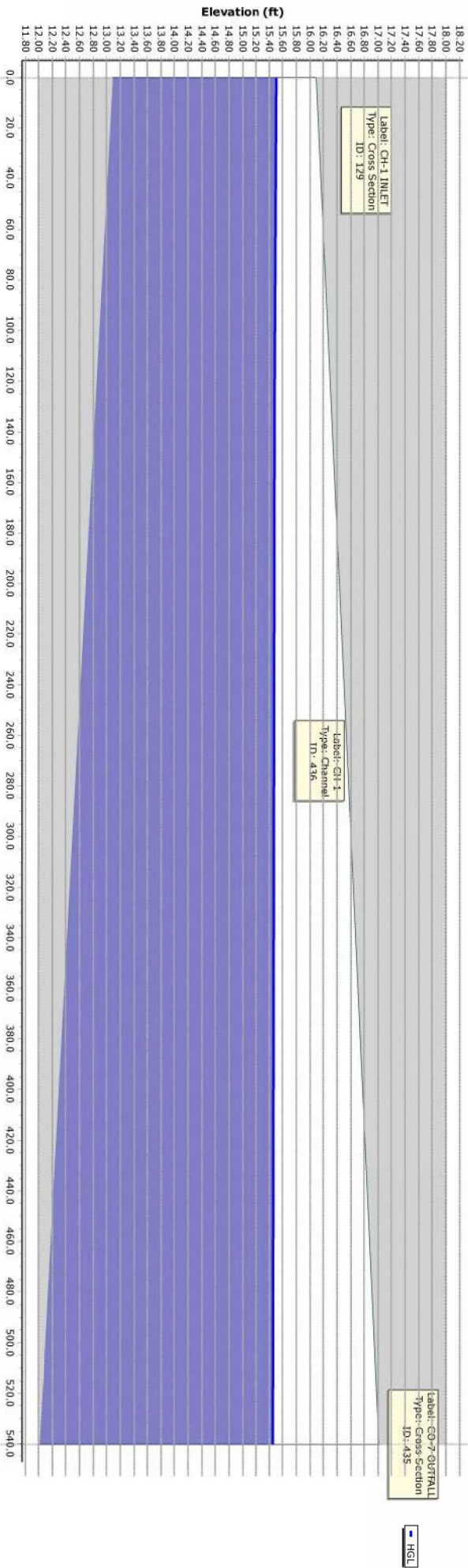
CB-9 to CO-11 OUTFALL - Base



- HGL

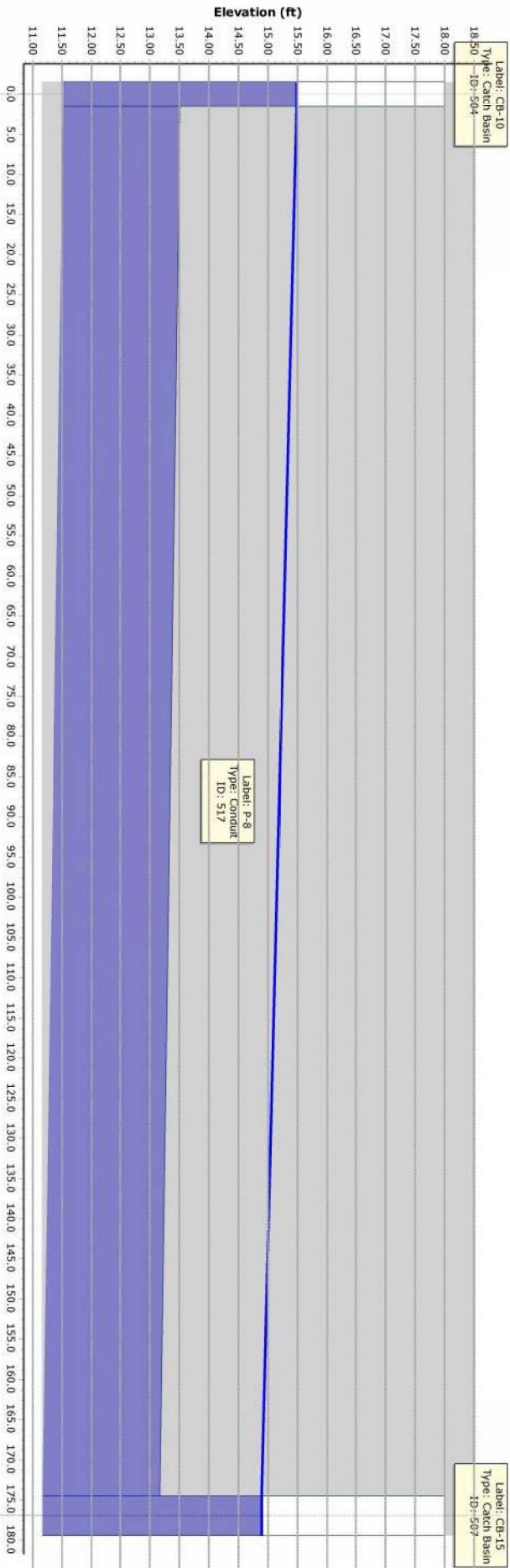
ID\Label	503 \ CO-10	528 \ CH-9	530 \ CO-11	
Link Length (ft)	117.0	769.4	227.0	
Rise (in)\Material	30.0 \ Corrugated HDPE (Smooth Interior)	48.0 \ Rough channel, with grass	48.0 \ Corrugated HDPE (Smooth Interior)	
Flow (cfs)	6.67	137.80	119.01	
Slope (ft/ft)	0.002	0.003	0.002	
ID\Label	802 \ CB-9	376 \ CH-9 INLET	527 \ CH-9 OUTLET	426 \ CO-11 OUTFALL
Ground (ft)	16.50	19.00	19.00	18.00
Invert (ft)	13.97	13.66	11.59	11.09
Station (ft)	0.0	117.0	886.4	1113.4

CH-1 INLET to CO-7 OUTFALL - Base



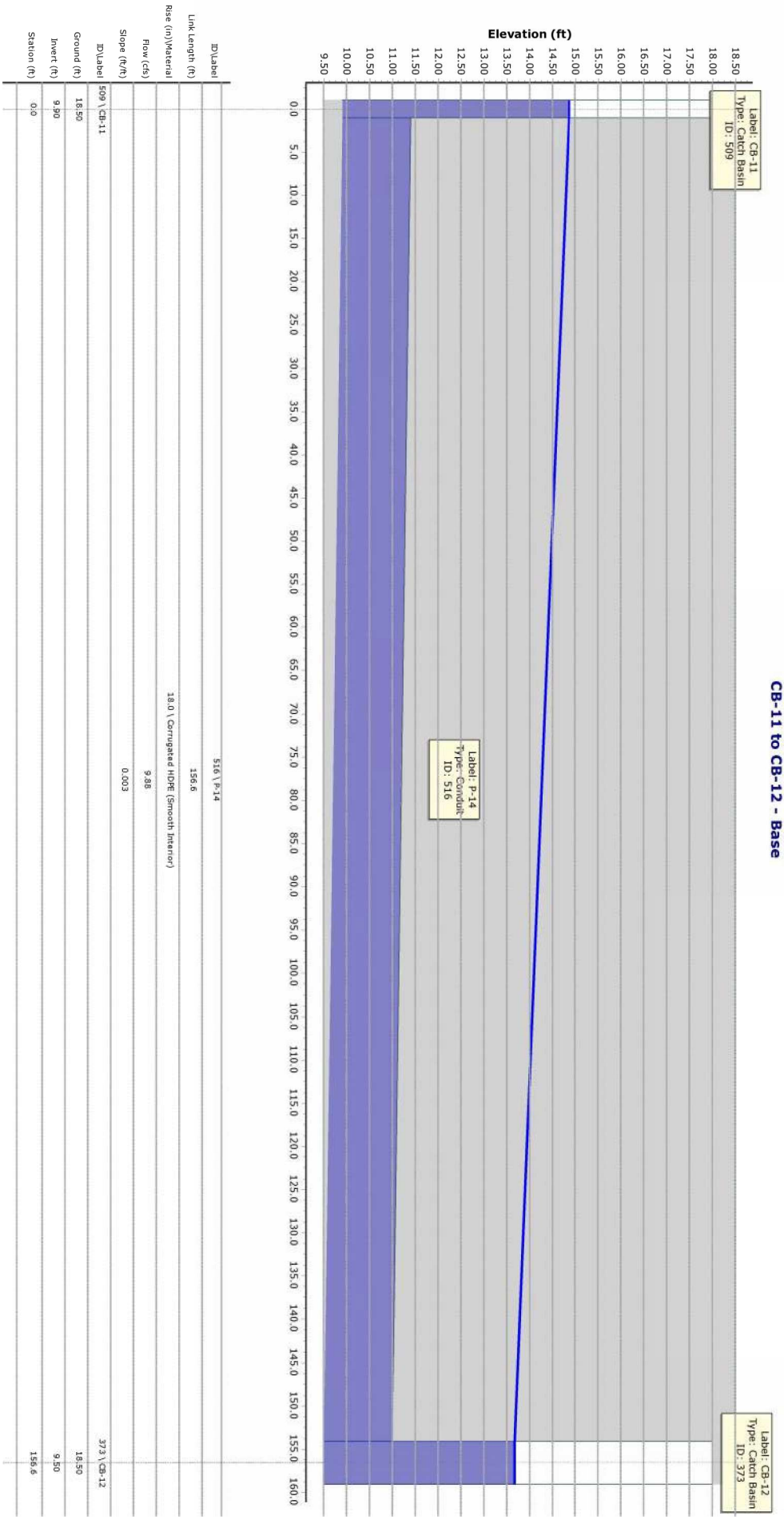
ID\Label	436 \ CH-1
Link Length (ft)	540.3
Rise (in)\Material	36.0 \
Flow (cfs)	37.45
Slope (ft/ft)	0.002
ID\Label	435 \ CO-7 OUTFALL
Ground (ft)	18.00
Invert (ft)	12.01
Station (ft)	540.3

CB-10 to CB-15 - Base



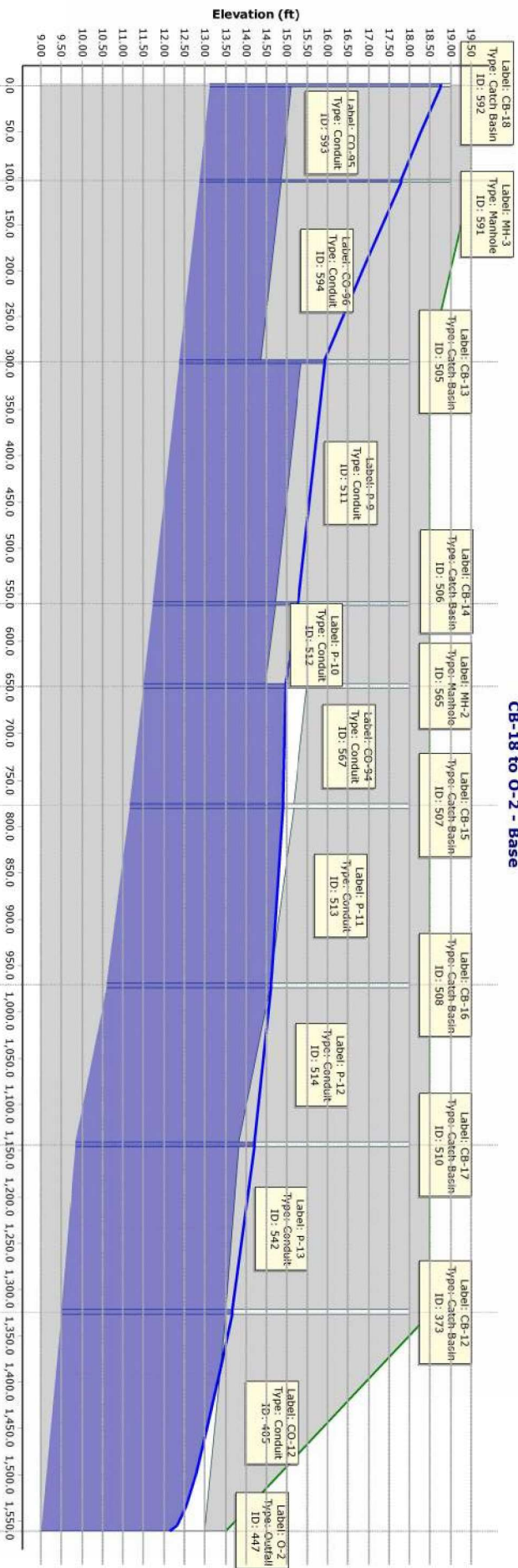
- HGL

ID\Label	517 \ P-8
Link Length (ft)	177.0
Rise (in)\Material	24.0 \ Corrugated HDPE (Smooth Interior)
Flow (cfs)	14.18
Slope (ft/ft)	0.002
ID\Label	504 \ CB-10
Ground (ft)	18.50
Invert (ft)	11.52
Station (ft)	0.0
ID\Label	507 \ CB-15
Ground (ft)	18.50
Invert (ft)	11.16
Station (ft)	177.0



- HGL

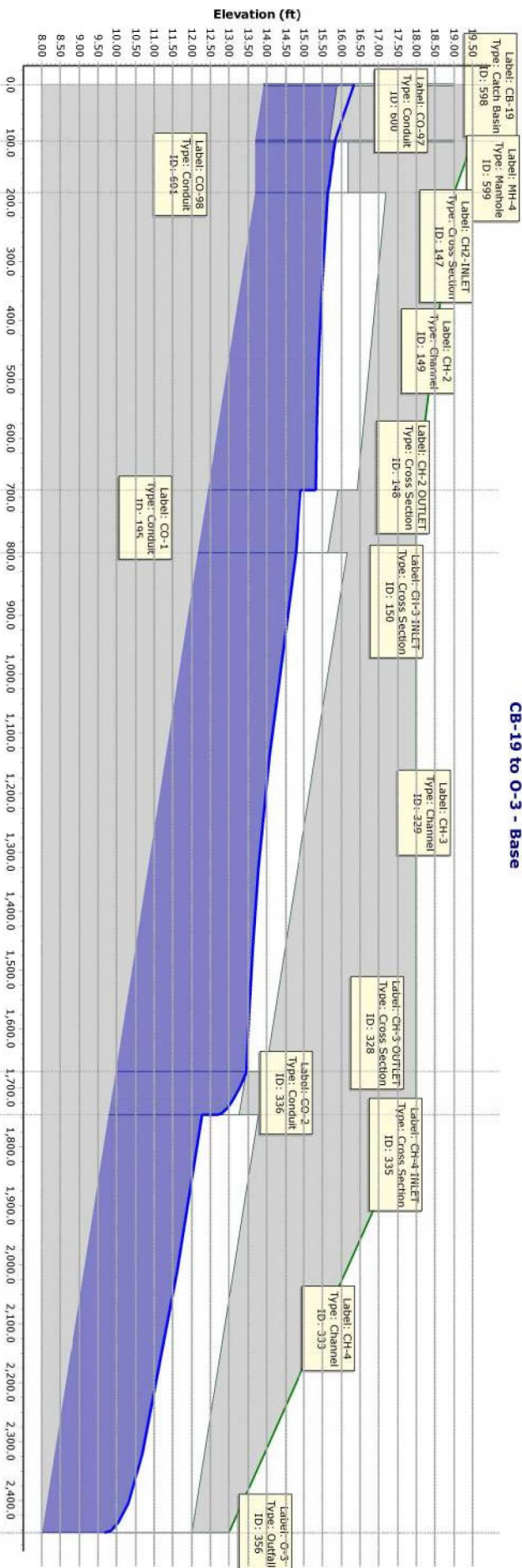
CB-18 to O-2 - Base



ID\Label	593 \ CD-95	594 \ CD-96	511 \ P-9	512 \ P-10	567 \ CD-94	513 \ P-11	514 \ P-12	542 \ P-13	405 \ CD-12	
Link Length (ft)	102.8	196.1	269.8	89.2	128.6	193.8	172.1	180.6	236.9	
Rise (in)\(ft\in100ft)	Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	Corrugated HDPE (Smooth Interior)	36.0 \ Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	Corrugated HDPE (Smooth Interior)\Corrugated HDPE (Smooth Interior)	48.0 \ Corrugated HDPE (Smooth Interior)	
Flow (cfs)	23.86	23.86	36.02	42.76	42.76	65.29	73.74	85.03	107.94	
Slope (ft/ft)	0.002	0.002	0.002	0.003	0.002	0.003	0.004	0.002	0.002	
ID\Label	592 \ CB-18	591 \ MH-3	505 \ CB-13	506 \ CB-14	565 \ MH-2	507 \ CB-15	508 \ CB-16	510 \ CB-17	373 \ CB-12	447 \ O-2
Ground (ft)	19.50	19.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	13.50
Invert (ft)	13.10	12.85	12.36	11.71	11.48	11.16	10.59	9.82	9.50	9.00
Station (ft)	0+0	102.8	298.9	559.7	648.9	777.6	971.4	1143.5	1324.1	1561.0

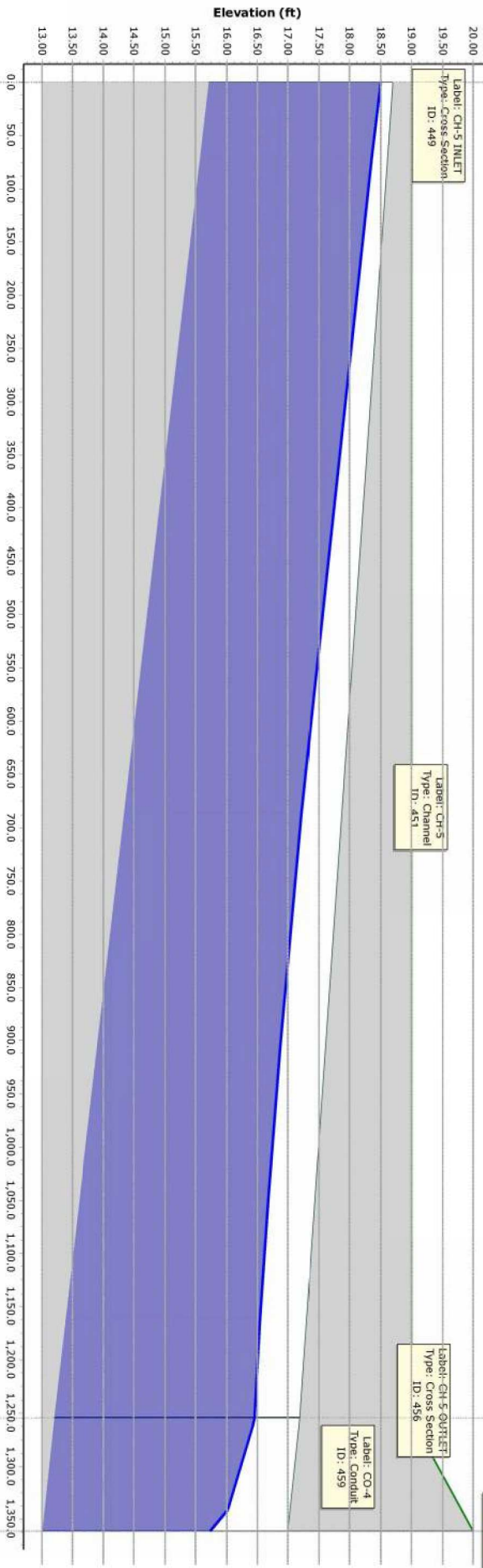
HGL

CB-19 to O-3 - Base



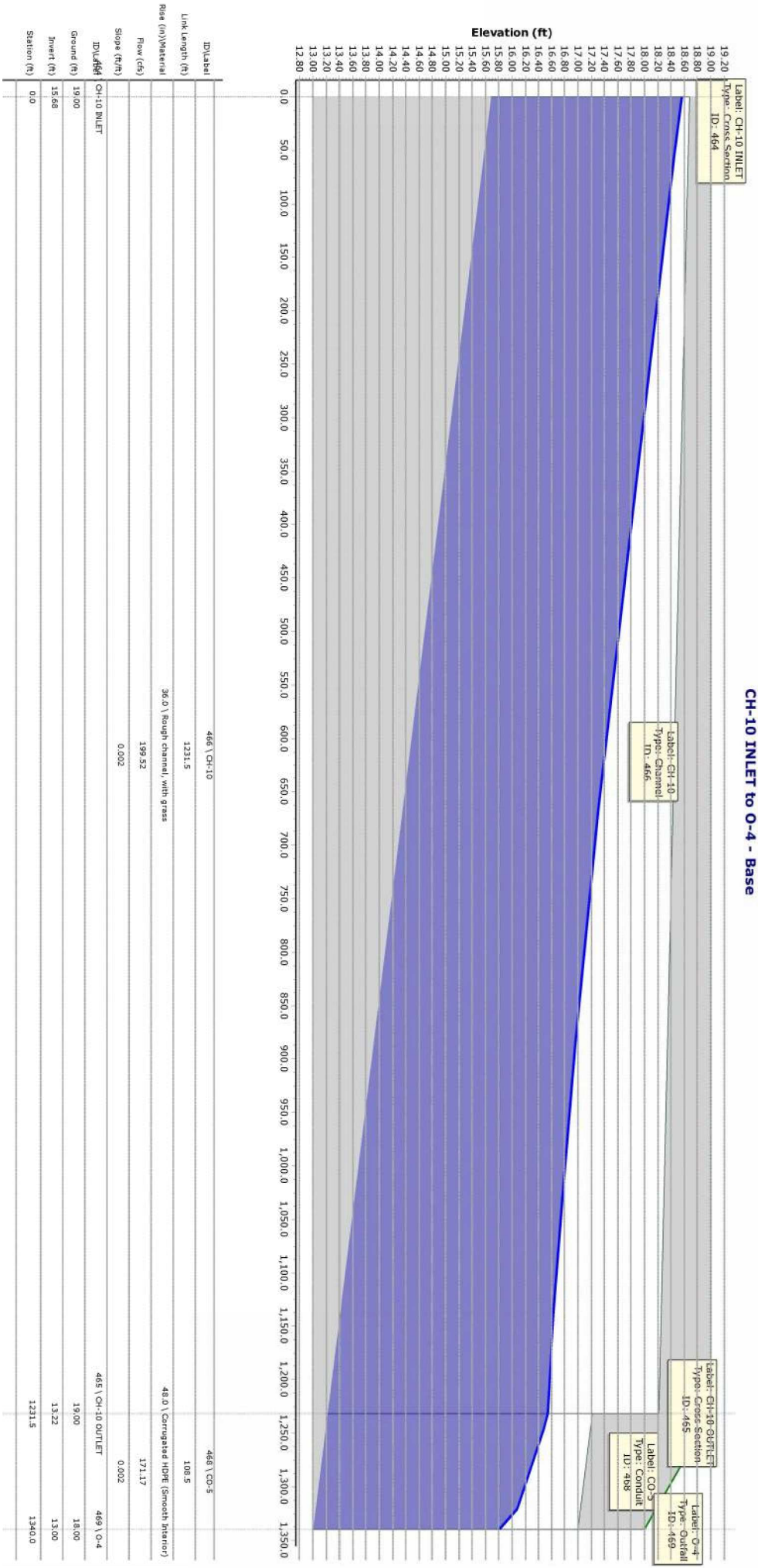
ID\Label	600 \ CO-97 601 \ CO-98	149 \ CH-2	195 \ CO-1	329 \ CH-3	396 \ CO-2	333 \ CH-4	356 \ O-3
Link Length (ft)	95.0	88.0	504.8	106.2	878.3	721.1	709.1
Rise (in)	17.78	17.78	86.40	78.61	197.08	177.15	184.15
Slope (ft/ft)	0.002	0.000	0.002	0.003	0.002	0.003	0.002
ID\Label	600 \ CO-97 601 \ CO-98	149 \ CH-2	195 \ CO-1	329 \ CH-3	396 \ CO-2	333 \ CH-4	356 \ O-3
Ground (ft)	19.50	19.50	19.00	18.00	18.00	18.00	13.00
Invert (ft)	13.90	13.68	13.68	12.42	12.15	9.96	8.00
Station (ft)	0.0	95.0	183.0	687.8	794.0	1672.2	2454.4

CH-5 INLET TO O-5 - Base



HGL

ID\Label	451 \ CH-5	459 \ CO-4
Link Length (ft)	1254.0	106.8
Rise (in)\Material	36.0 \ Rough channel, with grass	48.0 \ Corrugated HDPE (Smooth Interior)
Flow (cfs)	205.96	163.26
Slope (ft/ft)	0.002	0.002
ID\Label	456 \ CH-5 OUTLET	460 \ O-5
Ground (ft)	19.00	20.00
Invert (ft)	15.70	13.00
Station (ft)	0.0	1254.0



CHANNEL 2 RECOVERY TIME CALCULATION			
Parameter	Variable	Value	Unit
Unsaturated Hydraulic Conductivity (field data) <i>*The average of the site's infiltration test results (excluding outliers) was assumed for all swales: (0.5in/hr + 1.6in/hr)/2 = 1.05 in/hr = 2.1 ft/day</i>	Kvu	2.1	ft/day
Safety Factor	FS	2	-
Design Infiltration Rate <i>=Kvu / FS</i>	Id	1.05	ft/day
Average horizontal hydraulic conductivity (ft/day) <i>*Average of geotech slug test results / FS</i>	Kh	1.57	ft/day
Saturated Hydraulic Conductivity <i>Kvu = (2/3) Kvs</i>	Kvs	3.15	ft/day
Fillable porosity (generally 0.2 to 0.3)	f	0.2	-
Bottom of Swale Elevation	Bs	13	ft
Bottom Width	W	11.00	ft
Bottom Length	L	504.78	ft
Seasonal High Ground Water Table Elevation <i>*Geotech Reference (CPT 6 = closest datapoint to swale location)</i>	SHGWT	8	ft
Height of Basin Above Groundwater Table	hb	5	ft
Impervious Layer Elevation <i>*none identified, bottom of well elevation from geotech report is assumed</i>	Imp	-6.983	ft

The proposed swale has the following stage-storage relationship:	
Stage	Storage
(ft)	(ft³)
13	0
14	10973
15	26005
16	45190
17	68628
18	96415

Step 1. Calculate the height of the treatment volume in the basin:

Required Treatment	Rt	54516.1536	ft³
Elevation at Required Treatment	H	16.43	ft

UNSATURATED VERTICAL FLOW ANALYSIS

Step 2. Determine if saturated lateral (Stage Two) flow will occur.

Treatment Volume depth	hv	3.4	ft
Height of Water to Saturate Soil <i>=f * hb</i>	hu	1	ft
hv>hu? (i.e. will lateral flow occur)	Yes		

Step 3. Calculate the volume of water infiltrated in unsaturated vertical (Stage One) flow and the time to infiltrate this volume.

Area at bottom of basin <i>= W * L</i>	Ab	5552.5712	ft²
Volume Infiltrated during Stage One <i>Vu = Ab * hb * f</i>	Vu	5552.5712	ft³
Time to saturate soil beneath the basin <i>tsat = (f * hb) / Id</i>	tsat	0.952380952	days

SATURATED VERTICAL FLOW ANALYSIS

Step 4. Calculate the remaining treatment volume to be recovered under saturated lateral (Stage Two) flow conditions.

Remaining volume to be infiltrated under saturated lateral flow <i>= Rt - Vu</i>		48963.5824	ft³
Treatment volume elev.at start of saturated lateral flow (HydroCAD)		16.18	ft

Step 5. Calculate Fy and Fx

height of the water level above the initial groundwater table at t = t(total)	hc	5	ft
The height of water in the basin at the start of saturated lateral flow	h2	3.18	ft
The height of water in the basin above the initial groundwater table at the start of saturated lateral (Stage Two) flow <i>ht = hb +h2</i>	ht	8.18	ft
Dimensionless parameter representing percent of water level decline below a maximum level (y-axis) <i>Fy=hc/ht</i>	Fy	0.611246944	-
Swale L/W Ratio	L/W	46	-
Dimensionless parameter representing physical and hydraulic characteristics of the retention basin and effective aquifer system (x-axis) - <i>Figure 1-7</i>	Fx	0.75	-

Step 6. Calculate the time to recover the remaining treatment volume under saturated lateral flow.

Initial saturated thickness of the aquifer <i>=SHGWT-Imp</i>	H	14.983	ft
Average saturated thickness <i>=H+(hc/2)</i>	D	17.483	
Time to recover the remaining treatment volume under lateral saturated flow conditions.	t	1.96	days

$$t = \frac{W^2}{4K_H D F_x^2}$$

Step 7. Total time to recover the treatment volume (tTotal)

Total recovery time <i>=t+tsat</i>	t(total)	2.92	days
Total recovery time	t(total)	69.97	hours

CHANNEL 3 RECOVERY TIME CALCULATION			
Parameter	Variable	Value	Unit
Unsaturated Hydraulic Conductivity (field data) <i>*The average of the site's infiltration test results (excluding outliers) was assumed for all swales: (0.5in/hr + 1.6in/hr)/2 = 1.05 in/hr = 2.1 ft/day</i>	Kvu	2.1	ft/day
Safety Factor	FS	2	-
Design Infiltration Rate <i>=Kvu / FS</i>	Id	1.05	ft/day
Average horizontal hydraulic conductivity (ft/day) <i>*Average of geotech slug test results / FS</i>	Kh	3.13	ft/day
Saturated Hydraulic Conductivity <i>Kvu = (2/3) Kvs</i>	Kvs	3.15	ft/day
Fillable porosity (generally 0.2 to 0.3)	f	0.2	-
Bottom of Swale Elevation	Bs	12	ft
Bottom Width	W	11.00	ft
Bottom Length	L	878.26	ft
Seasonal High Ground Water Table Elevation <i>*Geotech Reference (CPT 22 = closest datapoint to swale location)</i>	SHGWT	4.8	ft
Height of Basin Above Groundwater Table	hb	7.2	ft
Impervious Layer Elevation <i>*none identified, bottom of well elevation from geotech report is assumed</i>	Imp	-6.983	ft

The proposed swale has the following stage-storage relationship:	
Stage	Storage
(ft)	(ft³)
12	0
13	22026
14	52344
15	91039
16	138207
17	193943
18	258346

Step 1. Calculate the height of the treatment volume in the basin:	
Required Treatment	Rt 94851.7 ft³
Elevation at Required Treatment	H 15.09 ft

UNSATURATED VERTICAL FLOW ANALYSIS			
Step 2. Determine if saturated lateral (Stage Two) flow will occur.			
Treatment Volume depth	hv	3.1	ft
Height of Water to Saturate Soil <i>=f * hb</i>	hu	1.44	ft
hv>hu? (i.e. will lateral flow occur)	Yes		
Step 3. Calculate the volume of water infiltrated in unsaturated vertical (Stage One) flow and the time to infiltrate this volume.			
Area at bottom of basin <i>= W * L</i>	Ab	9660.82	ft²
Volume Infiltrated during Stage One <i>Vu = Ab * hb * f</i>	Vu	13911.6	ft³
Time to saturate soil beneath the basin <i>tsat = (f * hb) / Id</i>	tsat	1.37143	days

SATURATED VERTICAL FLOW ANALYSIS			
Step 4. Calculate the remaining treatment volume to be recovered under saturated lateral (Stage Two) flow conditions.			
Remaining volume to be infiltrated under saturated lateral flow <i>= Rt - Vu</i>		80940.1	ft³
Treatment volume elev.at start of saturated lateral flow (HydroCAD)		14.76	ft
Step 5. Calculate Fy and Fx			
height of the water level above the initial groundwater table at t = t(total)	hc	7.2	ft
The height of water in the basin at the start of saturated lateral flow	h2	2.76	ft
The height of water in the basin above the initial groundwater table at the start of saturated lateral (Stage Two) flow <i>ht = hb +h2</i>	ht	9.96	ft
Dimensionless parameter representing percent of water level decline below a maximum level (y-axis) <i>Fy=hc/ht</i>	Fy	0.72289	-
Swale L/W Ratio	L/W	80	-
Dimensionless parameter representing physical and hydraulic characteristics of the retention basin and effective aquifer system (x-axis) - <i>Figure 1-7</i>	Fx	1.20	-
Step 6. Calculate the time to recover the remaining treatment volume under saturated lateral flow.			
Initial saturated thickness of the aquifer <i>=SHGWT-Imp</i>	H	11.783	ft
Average saturated thickness <i>=H+(hc/2)</i>	D	15.383	
Time to recover the remaining treatment volume under lateral saturated flow conditions. $t = \frac{W^2}{4K_H D F_x^2}$	t	0.44	days
Step 7. Total time to recover the treatment volume (tTotal)			
Total recovery time <i>=t+tsat</i>	t(total)	1.81	days
Total recovery time	t(total)	43.37	hours

CHANNEL 4 RECOVERY TIME CALCULATION			
Parameter	Variable	Value	Unit
Unsaturated Hydraulic Conductivity (field data) <i>*The average of the site's infiltration test results (excluding outliers) was assumed for all swales: (0.5in/hr + 1.6in/hr)/2 = 1.05 in/hr = 2.1 ft/day</i>	Kvu	2.1	ft/day
Safety Factor	FS	2	-
Design Infiltration Rate <i>=Kvu / FS</i>	Id	1.05	ft/day
Average horizontal hydraulic conductivity (ft/day) <i>*Average of geotech slug test results / FS</i>	Kh	3.13	ft/day
Saturated Hydraulic Conductivity <i>Kvu = (2/3) Kvs</i>	Kvs	3.15	ft/day
Fillable porosity (generally 0.2 to 0.3)	f	0.2	-
Bottom of Swale Elevation	Bs	8	ft
Bottom Width	W	11.00	ft
Bottom Length	L	709.12	ft
Seasonal High Ground Water Table Elevation <i>*Geotech Reference (CPT 23 = closest datapoint to swale location)</i>	SHGWT	4	ft
Height of Basin Above Groundwater Table	hb	4	ft
Impervious Layer Elevation <i>*none identified, bottom of well elevation from geotech report is assumed</i>	Imp	-6.983	ft

The proposed swale has the following stage-storage relationship:	
Stage	Storage
(ft)	(ft ³)
8	0
9	11589
10	26513
11	45194
12	68631

Step 1. Calculate the height of the treatment volume in the basin:
Required Treatment
Elevation at Required Treatment

Rt
H

26946.4 ft³
10.03 ft

UNSATURATED VERTICAL FLOW ANALYSIS			
Step 2. Determine if saturated lateral (Stage Two) flow will occur.			
Treatment Volume depth	hv	2.0	ft
Height of Water to Saturate Soil <i>=f * hb</i>	hu	0.8	ft
hv>hu? (i.e. will lateral flow occur)	Yes		
Step 3. Calculate the volume of water infiltrated in unsaturated vertical (Stage One) flow and the time to infiltrate this volume.			
Area at bottom of basin <i>= W * L</i>	Ab	7800.27	ft ²
Volume Infiltrated during Stage One <i>Vu = Ab * hb * f</i>	Vu	6240.21	ft ³
Time to saturate soil beneath the basin <i>tsat = (f * hb) / Id</i>	tsat	0.7619	days

SATURATED VERTICAL FLOW ANALYSIS			
Step 4. Calculate the remaining treatment volume to be recovered under saturated lateral (Stage Two) flow conditions.			
Remaining volume to be infiltrated under saturated lateral flow <i>= Rt - Vu</i>		20706.2	ft ³
Treatment volume elev.at start of saturated lateral flow (HydroCAD)		9.64	ft
Step 5. Calculate Fy and Fx			
height of the water level above the initial groundwater table at t = t(total)	hc	4	ft
The height of water in the basin at the start of saturated lateral flow	h2	1.64	ft
The height of water in the basin above the initial groundwater table at the start of saturated lateral (Stage Two) flow <i>ht = hb +h2</i>	ht	5.64	ft
Dimensionless parameter representing percent of water level decline below a maximum level (y-axis) <i>Fy=hc/ht</i>	Fy	0.70922	-
Swale L/W Ratio	L/W	64	-
Dimensionless parameter representing physical and hydraulic characteristics of the retention basin and effective aquifer system (x-axis) <i>Figure 1-7</i>	Fx	1.10	-
Step 6. Calculate the time to recover the remaining treatment volume under saturated lateral flow.			
Initial saturated thickness of the aquifer <i>=SHGWT-Imp</i>	H	10.983	ft
Average saturated thickness <i>=H+(hc/2)</i>	D	12.983	
Time to recover the remaining treatment volume under lateral saturated flow conditions.	t	0.61	days
$t = \frac{W^2}{4K_H D F_x^2}$			
Step 7. Total time to recover the treatment volume (tTotal)			
Total recovery time <i>=t+tsat</i>	t(total)	1.38	days
Total recovery time	t(total)	33.031	hours

CHANNEL 1 RECOVERY TIME CALCULATION			
Parameter	Variable	Value	Unit
Unsaturated Hydraulic Conductivity (field data) <i>*The average of the site's infiltration test results (excluding outliers) was assumed for all swales: (0.5in/hr + 1.6in/hr)/2 = 1.05 in/hr = 2.1 ft/day</i>	Kvu	2.1	ft/day
Safety Factor	FS	2	-
Design Infiltration Rate <i>=Kvu / FS</i>	Id	1.05	ft/day
Average horizontal hydraulic conductivity (ft/day) <i>*Average of geotech slug test results / FS</i>	Kh	3.13	ft/day
Saturated Hydraulic Conductivity <i>Kvu = (2/3) Kvs</i>	Kvs	3.15	ft/day
Fillable porosity (generally 0.2 to 0.3)	f	0.2	-
Bottom of Swale Elevation	Bs	8	ft
Bottom Width	W	6.00	ft
Bottom Length	L	2295.20	ft
Seasonal High Ground Water Table Elevation <i>*Geotech Reference (P-01 = closest datapoint to swale location)</i>	SHGWT	3.017	ft
Height of Basin Above Groundwater Table	hb	4.983	ft
Impervious Layer Elevation <i>*none identified, bottom of well elevation from geotech report is assumed</i>	Imp	-6.983	ft
The proposed swale has the following stage-storage relationship:			
Stage	Storage		
(ft)	(ft ³)		
8	0		
9	13877		
10	37413		
11	73159		
12	124697		
13	194221		
14	274621		
Step 1. Calculate the height of the treatment volume in the basin:			
Required Treatment	Rt	194221	ft ³
Elevation at Required Treatment	H	13	ft
UNSATURATED VERTICAL FLOW ANALYSIS			
Step 2. Determine if saturated lateral (Stage Two) flow will occur.			
Treatment Volume depth	hv	5	ft
Height of Water to Saturate Soil <i>=f * hb</i>	hu	0.9966	ft
hv>hu? (i.e. will lateral flow occur)		Yes	
Step 3. Calculate the volume of water infiltrated in unsaturated vertical (Stage One) flow and the time to infiltrate this volume.			
Area at bottom of basin <i>= W * L</i>	Ab	13771.1814	ft ²
Volume Infiltrated during Stage One <i>Vu = Ab * hb * f</i>	Vu	13724.35938	ft ³
Time to saturate soil beneath the basin <i>tsat = (f * hb) / Id</i>	tsat	0.949142857	days
SATURATED VERTICAL FLOW ANALYSIS			
Step 4. Calculate the remaining treatment volume to be recovered under saturated lateral (Stage Two) flow conditions.			
Remaining volume to be infiltrated under saturated lateral flow <i>= Rt - Vu</i>		180496.6406	ft ³
Treatment volume elev.at start of saturated lateral flow (HydroCAD)		12.98	ft
Step 5. Calculate Fy and Fx			
height of the water level above the initial groundwater table at t = t(total)	hc	4.983	ft
The height of water in the basin at the start of saturated lateral flow	h2	4.98	ft
The height of water in the basin above the initial groundwater table at the start of saturated lateral (Stage Two) flow <i>ht = hb +h2</i>	ht	9.963	ft
Dimensionless parameter representing percent of water level decline below a maximum level (y-axis) <i>Fy=hc/ht</i>	Fy	0.500150557	-
Swale L/W Ratio	L/W	383	-
Dimensionless parameter representing physical and hydraulic characteristics of the retention basin and effective aquifer system (x-axis) - <i>Figure 1-7</i>	Fx	0.50	-
Step 6. Calculate the time to recover the remaining treatment volume under saturated lateral flow.			
Initial saturated thickness of the aquifer <i>=SHGWT-Imp</i>	H	10	ft
Average saturated thickness <i>=H+(hc/2)</i>	D	12.4915	
Time to recover the remaining treatment volume under lateral saturated flow conditions. $t = \frac{W^2}{4K_H D F_x^2}$	t	0.92	days
Step 7. Total time to recover the treatment volume (tTotal)			
Total recovery time <i>=t+tsat</i>	t(total)	1.87	days
Total recovery time	t(total)	44.85	hours

CHANNEL 5 RECOVERY TIME CALCULATION			
Parameter	Variable	Value	Unit
Unsaturated Hydraulic Conductivity (field data) *The average of the site's infiltration test results (excluding outliers) was assumed for all swales: (0.5in/hr + 1.6in/hr)/2 = 1.05 in/hr = 2.1 ft/day	Kvu	2.1	ft/day
Safety Factor	FS	2	-
Design Infiltration Rate =Kvu / FS	Id	1.05	ft/day
Average horizontal hydraulic conductivity (ft/day) *Average of geotech slug test results / FS	Kh	3.13	ft/day
Saturated Hydraulic Conductivity Kvu = (2/3) Kvs	Kvs	3.15	ft/day
Fillable porosity (generally 0.2 to 0.3)	f	0.2	-
Bottom of Swale Elevation	Bs	14	ft
Bottom Width	W	11.00	ft
Bottom Length	L	1254.02	ft
Seasonal High Ground Water Table Elevation *Geotech Reference (CPT 2 = closest datapoint to swale location)	SHGWT	7.7	ft
Height of Basin Above Groundwater Table	hb	6.3	ft
Impervious Layer Elevation *none identified, bottom of well elevation from geotech report is assumed (P-2)	Imp	-1.163	ft

The proposed swale has the following stage-storage relationship:	
Stage	Storage
(ft)	(ft³)
14	0
15	16977
16	46275
17	85615
18	135081
19	194768

Step 1. Calculate the height of the treatment volume in the basin:			
Required Treatment	Rt	109726.96	ft³
Elevation at Required Treatment	H	17.52	ft

UNSATURATED VERTICAL FLOW ANALYSIS			
Step 2. Determine if saturated lateral (Stage Two) flow will occur.			
Treatment Volume depth	hv	3.5	ft
Height of Water to Saturate Soil =f * hb	hu	1.26	ft
hv>hu? (i.e. will lateral flow occur)	Yes		
Step 3. Calculate the volume of water infiltrated in unsaturated vertical (Stage One) flow and the time to infiltrate this volume.			
Area at bottom of basin = W * L	Ab	13794.246	ft²
Volume Infiltrated during Stage One Vu = Ab * hb * f	Vu	17380.75	ft³
Time to saturate soil beneath the basin tsat = (f * hb) / Id	tsat	1.2	days

SATURATED VERTICAL FLOW ANALYSIS			
Step 4. Calculate the remaining treatment volume to be recovered under saturated lateral (Stage Two) flow conditions.			
Remaining volume to be infiltrated under saturated lateral flow = Rt - Vu		92346.21	ft³
Treatment volume elev.at start of saturated lateral flow (HydroCAD)		17.15	ft
Step 5. Calculate Fy and Fx			
height of the water level above the initial groundwater table at t = t(total)	hc	6.3	ft
The height of water in the basin at the start of saturated lateral flow	h2	3.15	ft
The height of water in the basin above the initial groundwater table at the start of saturated lateral (Stage Two) flow ht = hb +h2	ht	9.45	ft
Dimensionless parameter representing percent of water level decline below a maximum level (y-axis) Fy=hc/ht	Fy	0.666667	-
Swale L/W Ratio	L/W	114	-
Dimensionless parameter representing physical and hydraulic characteristics of the retention basin and effective aquifer system (x-axis) - Figure 1-7	Fx	0.80	-
Step 6. Calculate the time to recover the remaining treatment volume under saturated lateral flow.			
Initial saturated thickness of the aquifer =SHGWT-Imp	H	8.863	ft
Average saturated thickness =H+(hc/2)	D	12.013	ft
Time to recover the remaining treatment volume under lateral saturated flow conditions.	t	1.26	days
$t = \frac{W^2}{4K_H D F_x^2}$			
Step 7. Total time to recover the treatment volume (tTotal)			
Total recovery time =t+tsat	t(total)	2.46	days
Total recovery time	t(total)	58.93	hours

CHANNEL 10 RECOVERY TIME CALCULATION			
Parameter	Variable	Value	Unit
Unsaturated Hydraulic Conductivity (field data) *The average of the site's infiltration test results (excluding outliers) was assumed for all swales: (0.5in/hr + 1.6in/hr)/2 = 1.05 in/hr = 2.1 ft/day	Kvu	2.1	ft/day
Safety Factor	FS	2	-
Design Infiltration Rate =Kvu / FS	Id	1.05	ft/day
Average horizontal hydraulic conductivity (ft/day) *Average of geotech slug test results / FS	Kh	3.13	ft/day
Saturated Hydraulic Conductivity Kvu = (2/3) Kvs	Kvs	3.15	ft/day
Fillable porosity (generally 0.2 to 0.3)	f	0.2	-
Bottom of Swale Elevation	Bs	14	ft
Bottom Width	W	9.50	ft
Bottom Length	L	1231.51	ft
Seasonal High Ground Water Table Elevation *Geotech Reference (CPT 2 = closest datapoint to swale location)	SHGWT	7.7	ft
Height of Basin Above Groundwater Table	hb	6.3	ft
Impervious Layer Elevation *none identified, bottom of well elevation from geotech report is assumed (P-2)	Imp	-1.163	ft

The proposed swale has the following stage-storage relationship:	
Stage	Storage
(ft)	(ft³)
14	0
15	17406
16	47445
17	87772
18	138474
19	199644

Step 1. Calculate the height of the treatment volume in the basin:			
Required Treatment	Rt	87772	ft³
Elevation at Required Treatment	H	17	ft

UNSATURATED VERTICAL FLOW ANALYSIS			
Step 2. Determine if saturated lateral (Stage Two) flow will occur.			
Treatment Volume depth	hv	3.00	ft
Height of Water to Saturate Soil =f * hb	hu	1.26	ft
hv>hu? (i.e. will lateral flow occur)		Yes	
Step 3. Calculate the volume of water infiltrated in unsaturated vertical (Stage One) flow and the time to infiltrate this volume.			
Area at bottom of basin = W * L	Ab	11699.322	ft²
Volume Infiltrated during Stage One Vu = Ab * hb * f	Vu	14741.146	ft³
Time to saturate soil beneath the basin tsat = (f * hb) / Id	tsat	1.2	days

SATURATED VERTICAL FLOW ANALYSIS			
Step 4. Calculate the remaining treatment volume to be recovered under saturated lateral (Stage Two) flow conditions.			
Remaining volume to be infiltrated under saturated lateral flow = Rt - Vu		73030.854	ft³
Treatment volume elev.at start of saturated lateral flow (HydroCAD)		16.67	ft
Step 5. Calculate Fy and Fx			
height of the water level above the initial groundwater table at t = t(total)	hc	6.3	ft
The height of water in the basin at the start of saturated lateral flow	h2	2.67	ft
The height of water in the basin above the initial groundwater table at the start of saturated lateral (Stage Two) flow ht = hb +h2	ht	8.97	ft
Dimensionless parameter representing percent of water level decline below a maximum level (y-axis) Fy=hc/ht	Fy	0.7023411	-
Swale L/W Ratio	L/W	130	-
Dimensionless parameter representing physical and hydraulic characteristics of the retention basin and effective aquifer system (x-axis) - Figure 1-7	Fx	1.10	-
Step 6. Calculate the time to recover the remaining treatment volume under saturated lateral flow.			
Initial saturated thickness of the aquifer =SHGWT-Imp	H	8.863	ft
Average saturated thickness =H+(hc/2)	D	12.013	
Time to recover the remaining treatment volume under lateral saturated flow conditions.			
$t = \frac{W^2}{4K_H D F_x^2}$	t	0.50	days
Step 7. Total time to recover the treatment volume (tTotal)			
Total recovery time =t+tsat	t(total)	1.70	days
Total recovery time	t(total)	40.69	hours

Appendix K. BMP Trains Nutrient Reduction Analysis

Appendix K - BMP

SWALE WATER QUALITY TREATMENT CALCULATION												
Drainage Basin ID	Total Area Draining to Swales	Total Drainage Area within Basin	Percentage of drainage area within treatment train	Total Swale Volume Provided (B-02 = CH-5 AND CH-6) (B-01 = CH-1, CH-2, CH-3, CH-4)	Inches of Retention from Treatment Swales	Swale Blocks?	DQIA CN*	Percent Impervious**	Environmental Resource Permit Applicants Handbook V.1 - Appendix O:	Environmental Resource Permit Applicants Handbook V.1 - Appendix O:	TP Adjustment for Percentage of total basin drainage area being treated (BMP Trains Input)	TN Adjustment for Percentage of total basin drainage area being treated (BMP Trains Input)
									%	%		
B-01 Swales	AC	AC	%	AC+FT	IN	Y	95	95	73.30	73.30	52	52
B-02 Swales	44.51	56.4	71.28%	8.31	1.32	Y	95	95	73.30	73.30	58	58
* Conservatively assumed a CN of 98 for the combined basins.												
** Conservatively assumed and average impervious percentage of 95% for the combined basins.												
** BMP TRAINS USER INPUT												

Mean Annual Mass Removal Efficiencies for 1.25-inches of Retention for Zone 4 by Percent DCIA

Non DCIA CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.3	98.0	98.0	97.5	96.8	95.8	94.6	93.3	91.8	90.2	88.5	86.8	85.0	83.2	81.4	79.6	77.9	76.2	74.5	72.9
35	95.9	97.2	97.3	96.9	96.2	95.3	94.2	92.9	91.5	89.9	88.3	86.6	84.8	83.0	81.3	79.5	77.8	76.2	74.5	72.9
40	94.5	96.0	96.3	96.1	95.5	94.6	93.6	92.4	91.1	89.6	88.0	86.3	84.6	82.9	81.2	79.5	77.8	76.1	74.5	72.9
45	92.7	94.6	95.1	95.0	94.6	93.9	93.0	91.8	90.6	89.1	87.6	86.0	84.4	82.7	81.0	79.3	77.7	76.1	74.5	72.9
50	90.7	93.1	93.8	93.8	93.6	93.0	92.1	91.1	89.9	88.6	87.2	85.7	84.1	82.4	80.8	79.2	77.6	76.0	74.5	72.9
55	88.6	91.3	92.2	92.5	92.3	91.9	91.2	90.3	89.2	88.0	86.6	85.2	83.7	82.1	80.6	79.0	77.5	75.9	74.4	72.9
60	86.4	89.3	90.5	90.9	90.8	90.6	90.0	89.2	88.3	87.2	86.0	84.6	83.2	81.8	80.3	78.8	77.3	75.8	74.3	72.9
65	84.3	87.2	88.5	89.1	89.2	89.0	88.6	88.0	87.2	86.3	85.2	84.0	82.7	81.3	79.9	78.5	77.1	75.7	74.3	72.9
70	82.1	85.0	86.4	87.1	87.4	87.3	87.0	86.8	85.9	85.1	84.2	83.1	82.0	80.7	79.5	78.2	76.9	75.6	74.3	72.9
75	80.1	82.7	84.1	84.9	85.3	85.4	85.2	84.9	84.4	83.7	82.9	82.0	81.1	80.0	78.9	77.7	76.6	75.4	74.2	72.9
80	78.2	80.4	81.7	82.5	83.0	83.2	83.1	82.9	82.5	82.0	81.4	80.7	79.9	79.1	78.1	77.1	76.1	75.1	74.0	72.9
85	76.4	78.3	79.3	80.1	80.6	80.7	80.7	80.6	80.4	80.1	79.6	79.1	78.5	77.8	77.1	76.4	75.5	74.7	73.8	72.9
90	75.4	76.3	77.0	77.5	77.8	78.0	78.1	78.0	77.9	77.7	77.5	77.1	76.8	76.3	75.9	75.3	74.8	74.2	73.6	72.9
95	74.2	74.5	74.7	74.9	75.0	75.1	75.1	75.1	75.1	75.0	74.9	74.8	74.6	74.5	74.3	74.0	73.8	73.5	73.3	72.9
98	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.7	73.6	73.6	73.6	73.5	73.4	73.4	73.3	73.2	73.1	73.0	72.9

Complete Report (not including cost) Ver 4.3.5

Project: JEA SJRPP

Date: 9/1/2026 4:18:07 PM

Site and Catchment Information

Analysis: BMP Analysis

Catchment Name	B-01	B-02
Rainfall Zone	Florida Zone 4	Florida Zone 4
Annual Mean Rainfall	53.40	53.40

Pre-Condition Landuse Information

Landuse	Light Industrial: TN=1.200 TP=0.260	Light Industrial: TN=1.200 TP=0.260
Area (acres)	111.25	56.44
Rational Coefficient (0-1)	0.07	0.07
Non DCIA Curve Number	70.00	70.00
DCIA Percent (0- 100)	0.00	0.00
Nitrogen EMC (mg/l)	1.200	1.200
Phosphorus EMC (mg/l)	0.260	0.260
Runoff Volume (ac- ft/yr)	35.149	17.832
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	52.007	26.385
Phosphorus Loading (kg/yr)	11.268	5.717

Post-Condition Landuse Information

Landuse	Light Industrial: TN=1.200 TP=0.260	Light Industrial: TN=1.200 TP=0.260
Area (acres)	111.25	56.44

Rational Coefficient (0-1)	0.63	0.66
Non DCIA Curve Number	87.00	81.00
DCIA Percent (0-100)	68.00	76.00
Wet Pond Area (ac)	0.00	0.00
Nitrogen EMC (mg/l)	1.200	1.200
Phosphorus EMC (mg/l)	0.260	0.260
Runoff Volume (ac-ft/yr)	311.315	165.593
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	460.622	245.012
Phosphorus Loading (kg/yr)	99.801	53.086

Catchment Number: 1 Name: B-01

Project: JEA SJRPP

Date: 9/1/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1 **TREATMENT SWALES**
~~BMP Type: User Defined BMP~~

Contributing Catchment Area (acres) 111.250

Provided Nitrogen Treatment Efficiency (%) 52

Provided Phosphorus Treatment Efficiency (%) 52

BMP in Series Number: 2 **DRY RETENTION POND**
~~BMP Type: Retention~~

Retention Depth (in) 2.110

Retention Volume (ac-ft) 19.561

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

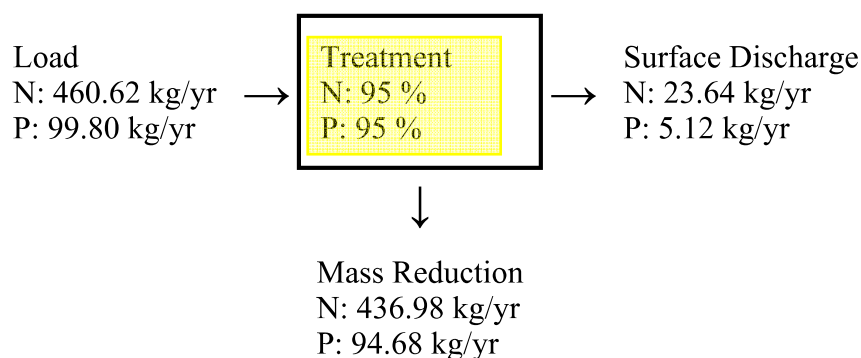
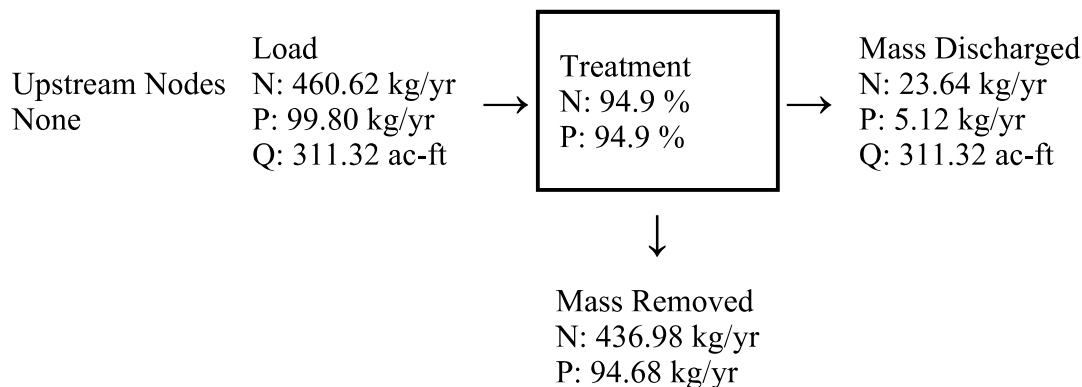
BMP Type: None

Watershed Characteristics

Catchment Area (acres) 111.25
 Contributing Area (acres) 111.250
 Non-DCIA Curve Number 87.00
 DCIA Percent 68.00
 Rainfall Zone Florida Zone 4
 Rainfall (in) 53.40

Surface Water Discharge

Required TN Treatment Efficiency (%)
 Provided TN Treatment Efficiency (%) 95
 Required TP Treatment Efficiency (%)
 Provided TP Treatment Efficiency (%) 95

Load for Multiple BMP in Series**Load Diagram for Multiple BMP (As Used In Routing)****Catchment Number: 2 Name: B-02**

Project: JEA SJRPP**Date:** 9/1/2026**Multiple BMP in Series Design Parameters**

BMP in Series Number: 1

BMP Type: User Defined BMP

**TREATMENT
SWALES**

Contributing Catchment Area (acres) 56.440

Provided Nitrogen Treatment Efficiency (%) 58

Provided Phosphorus Treatment Efficiency (%) 58

BMP in Series Number: 2

BMP Type: Retention

**DRY RETENTION
POND**

Retention Depth (in) 1.960

Retention Volume (ac-ft) 9.219

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

Catchment Area (acres) 56.44

Contributing Area (acres) 56.440

Non-DCIA Curve Number 81.00

DCIA Percent 76.00

Rainfall Zone Florida Zone 4

Rainfall (in) 53.40

Surface Water Discharge

Required TN Treatment Efficiency (%)

Provided TN Treatment Efficiency (%) 95

Required TP Treatment Efficiency (%)

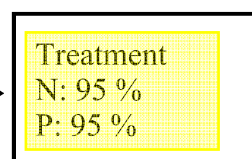
Provided TP Treatment Efficiency (%) 95

Load for Multiple BMP in Series

Load

N: 245.01 kg/yr

P: 53.09 kg/yr



Surface Discharge

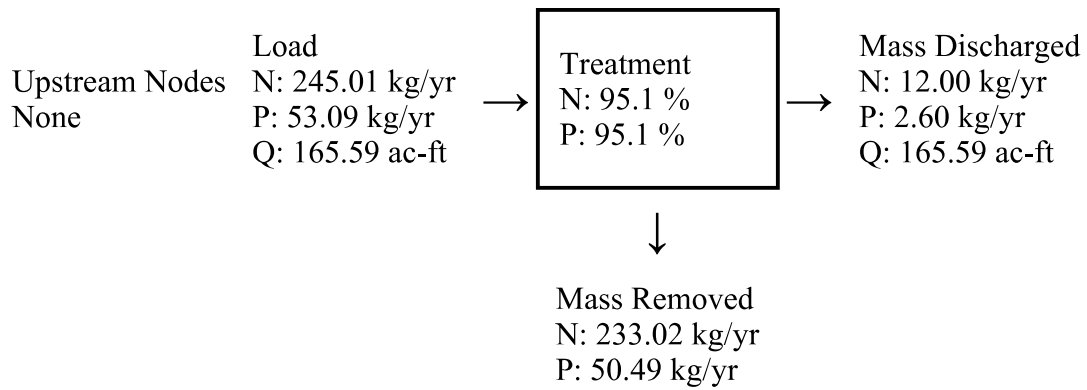
N: 12.00 kg/yr

P: 2.60 kg/yr



Mass Reduction
N: 233.02 kg/yr
P: 50.49 kg/yr

Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: JEA SJRPP

Analysis Type: BMP Analysis

Date:9/1/2026

BMP Types:

Catchment 1 - (B-01) Multiple BMP **Routing Summary**
 Catchment 2 - (B-02) Multiple BMP Catchment 1 Routed to Outlet

Summary Report

Nitrogen

Surface Water Discharge

Total N post load	705.63 kg/yr	
Percent N load reduction	95 %	
Provided N discharge load	35.63 kg/yr	78.57 lb/yr
Provided N load removed	670 kg/yr	1477.35 lb/yr

Phosphorus

Surface Water Discharge

Total P post load	152.887 kg/yr	
Percent P load reduction	95 %	
Provided P discharge load	7.721 kg/yr	17.02 lb/yr
Provided P load removed	145.167 kg/yr	320.092 lb/yr

JEA St Johns River Power Park Unit 3 Maintenance Plan

JEA ST JOHNS RIVER POWER PARK UNIT 3 MAINTENANCE PLAN

Prepared By: John Barranco

Project No: 424250.0600

FDEP Certification No: TBD

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References

1. St. Johns River Water Management District (SJRWMD). *Environmental Resource Permit Applicant's Handbook, Volume I: General and Environmental*. June 28, 2024.

INTRODUCTION AND BACKGROUND

JEA is proposing to construct a new combined cycle natural gas facility providing approximately 706 megawatts (MW) of electric generation. The Site currently occupies approximately 194 acres within the larger SJRPP property, which encompasses approximately 1,600 acres and was previously developed as a coal-fired power generation facility. The Site is located in Duval County, Florida.

The Site includes areas designated for the construction of a combustion turbine, steam turbine, warehouse/maintenance building, administration building, storage tanks, and additional supporting facilities/equipment. Topography across the Site consists of gently rolling terrain, with proposed elevations generally ranging from approximately 6 to 19 feet NAVD88. Slopes across the Site are relatively mild, typically ranging between 1 and 5 percent. The Site will be graded to provide positive drainage, directing stormwater runoff toward a system of catch basins, conveyance channels, and retention facilities. Underlying soils at the Site are predominantly classified within Hydrologic Soil Groups B/D and C, indicating moderate to low infiltration potential with higher runoff characteristics. Refer to Figure 1-1 below for the proposed site location.

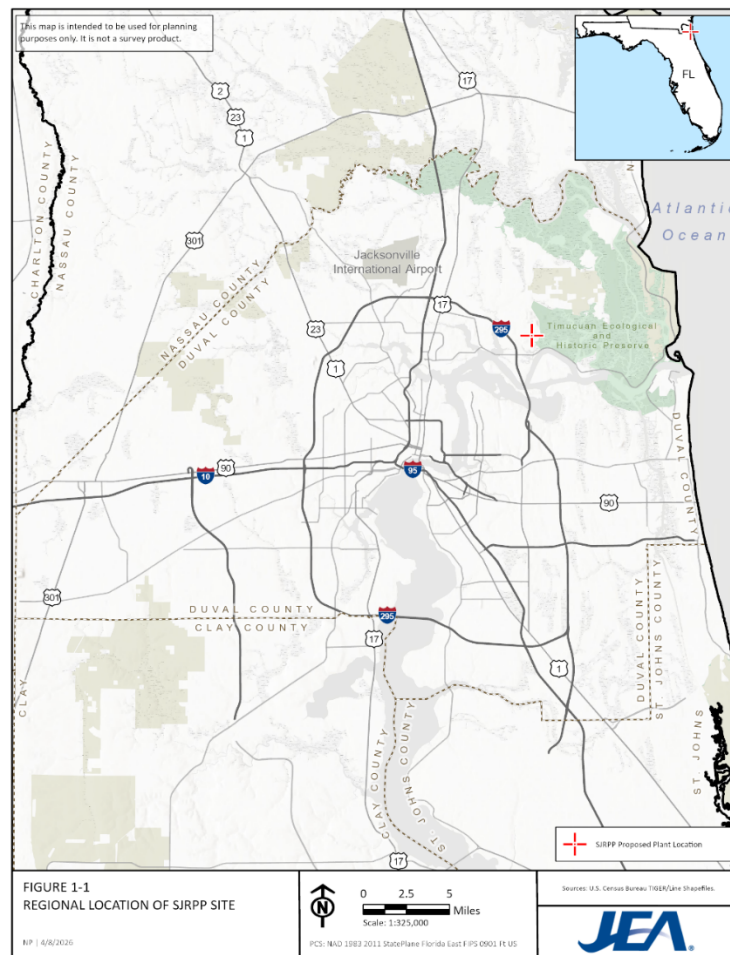


Figure 1-1 JEA SJRPP Project Location Map

RESPONSIBLE PARTIES

- Name: Andrew Sears
- Organization: JEA
- Address: 21 N Pearl St, Jacksonville, FL 32202
- Phone number: (904) 635-0223
- Email address: searar@jea.com
- List of after-hours telephone numbers for key maintenance personnel names and job titles in case of emergencies: JEA Incident Response (904) 620-9921

JEA will be responsible for the inspection, operation, and maintenance of the stormwater management system. Maintenance activities will be conducted at the frequencies described in this document, or more frequently as necessary based on observed site conditions, to ensure that the system continues to operate in accordance with the permitted design. The stormwater management system will be operated such that discharges from the stormwater management system will not cause or contribute to exceedances of applicable Florida Surface Water Quality Standards, including the 5.0 mg/L dissolved or emulsified oil and grease criterion for Class III Waters contained in Rule 62-320.530(50), F.A.C. No undissolved oil or visible oil is anticipated to be discharged in compliance with Rule 62-320.530(50)(b), F.A.C. Further, the stormwater management system will not cause degradation to any Outstanding Florida Waters per Rule 62-4.242(2)(a), F.A.C.

SJRPP Unit 3 will also comply with requirements outlined in the National Pollutant Discharge Elimination System (NPDES) permits and Spill Prevention and Control Countermeasures (SPCC) Plan associated with the facility.

Maintenance records will be retained and made available to the regulatory agency upon request. Adequate funding and resources will be provided to support long-term operation and maintenance.

This operation and maintenance cost estimate is a planning level estimate prepared in accordance with the ERP Applicant's Handbook requirements and reflects anticipated annual and long-term maintenance needs for the stormwater management system.

STORMWATER FACILITIES/COMPONENTS

The stormwater management system for the proposed facility has been designed in accordance with all applicable St. Johns River Water Management District (SJRWMD), and FDEP Environmental Resource Permit (ERP) requirements. Onsite runoff will be managed through site grading and a network of channels and catch basin inlets that convey flows to two proposed dry retention ponds. These ponds will provide water quality treatment, nutrient reduction, and discharge attenuation while maintaining the existing ultimate discharge point to the offsite wet pond located east of the project boundary.

The offsite wet pond is the currently certified outfall and ultimately discharges to Browns Creek. Additional details regarding this outfall and associated permitting limits are provided in the JEA St. Johns River Power Park Decommissioning and Demolition Plans prepared by Adkinson Engineering, dated November 30, 2017.

The proposed dry retention basins provide adequate treatment volume to meet required reductions for total nitrogen, total phosphorus, and total suspended solids. The basins demonstrate a recovery time of less than 72 hours, incorporating a conservative safety factor of two (36 hours), and are sized to attenuate runoff from the 25-year, 24-hour storm and the mean annual 24-hour storm events. Post development flows routed to the offsite wet pond will be discharged at rates lower than existing conditions.

The drainage plan for the JEA SJRPP site is divided into three basins:

- B-01: Area draining to the south dry retention pond.
- B-02: Area draining to the north dry retention pond.
- B-03: Undisturbed area within the site certification boundary where no drainage improvements are proposed; runoff is primarily captured between two existing water quality treatment areas and discharged to an offsite conveyance channel.

A detailed overview of the drainage system and supporting calculations is provided in *424014-DS-1102 Proposed Stormwater Management Plan – Permanent Redevelopment Area* and *424014.1101.1101 - JEA SJRPP Stormwater Calculation Report*.

The permanent post-development stormwater BMPs proposed at the Project Site are summarized below:

Dry Retention Ponds

Dry retention ponds are proposed to provide stormwater quantity and quality treatment for post-development runoff generated at the Project Site. These ponds are designed to temporarily store stormwater runoff and promote infiltration into the underlying soils, thereby reducing post-development discharge rates and volumes. The ponds provide water quality treatment through retention and filtration, allowing suspended solids and associated pollutants to settle before infiltration or controlled release.

Conveyance Channels

Conveyance channels are proposed to safely route stormwater runoff between on-site drainage features and the dry retention ponds. The channels are designed to convey design storm flows without erosion or overtopping and are graded to maintain stable velocities.

Catch Basin Network

A network of catch basins and underground storm piping is proposed to collect and convey stormwater runoff from developed areas of the Site, including access roads and disturbed ground surfaces. This system minimizes surface ponding and improves drainage efficiency.

Seeding/ Slope Stabilization

Slope stabilization is proposed throughout the Site to prevent erosion and maintain long-term slope integrity. These measures may include grading to stable slopes, vegetative stabilization, and erosion-resistant materials where necessary.

Rock Aprons

Rock aprons are proposed throughout the Site and will consist of loose, durable stone placed at the inlet and/or outlet of culverts, pipes, or channels. Their primary function will be to dissipate the energy of flowing water, reduce erosion and scouring, and stabilize the surrounding soil.

The temporary erosion and sediment control BMPs proposed at the Project Site are summarized below:

Silt Fence

Silt fence will be installed along the perimeter of the Site to act as a temporary sediment barrier. The fabric ponds sediment-laden stormwater runoff, causing sediment to be retained by the settling processes.

Stockpiles

Sediment barriers will be installed on the downgradient perimeter of any stockpiled soil or land debris. Silt fence will be used as the perimeter control surrounding stockpiles.

Stabilized Construction Entrance

Temporary stabilized construction entrances will be installed at locations where the Project is accessed and prior to any earth moving activities such as discing and rolling. The stone reduces sediment transfer onto public roads. Additional stone may be needed as construction progresses.

Catch Basin Inlet Protection

Catch basin inlet protection will be installed on storm drain inlets during construction to prevent sediment-laden runoff from entering the storm drainage system. These measures will temporarily filter runoff and allow sediments to settle prior to discharge into downstream conveyance systems. Inlet protection will remain in place until contributing drainage areas are permanently stabilized, and the potential for sediment transport has been minimized.

Compost Filter Sock

Compost filter sock check dams will be installed and placed in all on-Site drainage channels during construction. The check dams will dissipate stormwater velocity and filter out sediment as the water flows downstream.

Oil/Water Separator

An Oil/Water Separator (OSW) will be installed during construction between contact water drains and the dry retention ponds to filter oily water prior to discharging into ponds.

DESCRIPTION OF MAINTENANCE ACTIVITIES

The following maintenance activities are described at a high level for the operational phase of the project. Prior to conversion of the site to the operation phase, a project-specific operational Stormwater Pollution Prevention Plan (SWPPP) shall be developed by the EPC contractor. All inspection and maintenance activities will be conducted in accordance with the approved operational SWPPP to ensure compliance with applicable regulatory requirements.

Permanent BMP Controls:

Dry Retention Ponds

Maintenance Requirements: Rock aprons will be inspected daily to prevent washout, scouring, and embankment blow-outs. Inspections will focus on embankment stability, looking for riling, settling, or slumping, vegetative stabilization, positive flow to the retention basin, and that discharge structures are not clogged. Routine maintenance will include regrading, stabilizing side slopes, sediment removal, and clearing any trash or debris from discharge structures.

Conveyance Channels

Maintenance Requirements: Conveyance channels will be inspected routinely and after storm events to verify proper function. Accumulated sediment should be removed as soon as practicable, and any erosion of the swale should be repaired immediately. If the vegetation is damaged or sparse, the area should be seeded, and erosion control blankets be added to prevent further erosion.

Rock Aprons

Maintenance Requirements: Rock aprons will be inspected routinely and after storm events to verify their effectiveness and structural stability. Inspections will focus on identifying displaced or missing stones, signs of erosion around the apron, and sediment buildup that may impede flow. Routine maintenance will include repositioning or replacing stones as needed, removing accumulated sediment or debris, and verifying the apron continues to provide adequate energy dissipation and erosion control.

Catch Basin Network

Maintenance Requirements: Catch basins and associated storm piping will be inspected routinely and after storm events to ensure proper operation and unobstructed flow. Inspections will focus on identifying sediment accumulation, debris, structural damage, and evidence of clogging at inlets, grates, or within the basin sump. Sediment, trash, and debris will be removed as necessary to maintain hydraulic capacity and prevent upstream ponding. Damaged grates, frames, or basin structures will be repaired or replaced promptly. Downstream piping will be monitored for blockages or excessive sediment buildup and maintained as needed to ensure proper conveyance to receiving stormwater facilities.

Seeding/ Slope Stabilization

Maintenance Requirements: Prior to full construction activities, the Site will be seeded and mulched to allow for vegetation growth and stabilization. The optimal erosion control practice is to maintain existing vegetation or when the lands are disturbed, establish new vegetation as soon as possible. Vegetation can serve two (2) purposes: capture sediment and minimize erosion. Implementation of stabilization activities must begin within seven (7) calendar days after construction activities have temporarily or permanently ceased. Seeded areas and plantings will be inspected routinely and after rain events for bare spots, washouts, and healthy growth. Reseeding will occur as necessary. Grassed areas shall be mowed periodically, or about once per month during operation.

Oil/Water Separator

Maintenance Requirements: Oil content metering to be provided on the discharge of each Oil/Water Separator (OWS). The meter shall continuously monitor effluent oil concentration and

provide an alarm signal to the Plant DCS when oil concentration approaches 5 ppm. Upon alarm, Plant Operators shall isolate the OWS discharge by closing the discharge isolation valve and evaluate the system for maintenance, cleaning, or other corrective actions necessary to reduce oil concentration to acceptable operating levels prior to restoring discharge.

Temporary ESC Controls:

Stockpiles

Maintenance Requirements: Stockpiles on the Project will be inspected routinely and after storm events to verify they are stable and not contributing to erosion. All sediment controls surrounding the stockpile will also be inspected regularly and repaired within 24 hours of any identified issues or deficiencies.

Stabilized Construction Entrance

Maintenance Requirements: Stabilized construction entrances will be inspected routinely and after storm events, for integrity and buildup of sediment. Maintenance will consist of top dressing the entrance with clean aggregate as needed, replacement of rock, sediment removal, and removal of sediment on adjacent public roads. Sediment removal from adjacent public roads will be completed as soon as possible, but at the end of each workday at the latest.

Catch Basin Inlet Protection

Maintenance Requirements: Catch basin inlet protection devices will be inspected routinely and after storm events to ensure they are properly installed and functioning as intended. Inspections will focus on identifying sediment accumulation, clogging, displacement, or damage to filter fabric, gravel barriers, or prefabricated inserts. Accumulated sediment will be removed when it reaches approximately one-half the height of the protection device or when flow is impeded. Damaged or nonfunctional inlet protection will be repaired or replaced promptly to maintain effective sediment control. Inlet protection will be removed once contributing areas are permanently stabilized, and the risk of sediment transport has been minimized.

Silt Fence

Maintenance Requirements: Silt fences will be inspected routinely and after storm events to determine whether maintenance is necessary due to heavy sedimentation or damage resulting from construction equipment. Inspections shall verify material is trenched and staked properly, fabric is securely anchored to the post, fabric is not clogged with sediment, stakes are not on the upstream side, and that fabric is properly trenched/sliced and backfilled. Silt fence will also be inspected for tears in the fabric or wind damage, and to verify water is not undercutting or flowing around the silt fence. Sediment deposits should be removed when they reach one-third (1/3) of the aboveground height of the silt fence. Silt fence shall be replaced or repaired where damaged or torn. Where silt fence occurs outside of the Project security fence, Project personnel shall only access the area between the security fence and silt fence to ensure work remains within the LOD.

Compost Filter Sock

Maintenance Requirements: Compost filter sock will be inspected routinely and after storm events to verify that the material is staked properly, that water is not flowing under, around or over the compost filter sock, that traffic has not “flattened” the structure. Compost filter sock shall also be inspected upon initial installation to verify the correct specifications have been met (the correct compost media has been used, mesh netting is photo- or biodegradable knitted fabric with 1/8-

inch to 3/8-inch openings, etc.). Maintenance will consist of repair/replacement of filter sock (if needed) and removal of visible sediment accumulation.

MAINTENANCE SCHEDULES

Table 1 shown below outlines the frequency for maintenance activities.

Table 1: Frequencies for Maintenance Activities

Activity	Frequency	Additional Note
Remove Sediment from Dry Retention Ponds	Need to be evaluated annually	Maintain storage capacity and function.
Remove Trash/Debris from Pond Discharge Structures	Need to be evaluated annually	Prevent clogging and maintain positive flow.
Remove Sediment from Conveyance Channels	Need to be evaluated annually	Prevent loss of conveyance capacity.
Repair Erosion in Conveyance Channels	Need to be evaluated annually	Stabilize swale to prevent further degradation.
Reseed/Vegetate Conveyance Channels	Need to be evaluated annually	Apply when vegetation is sparse or damaged.
Install Erosion Control Blankets in Channels	Frequency to be specified by SWPPP	Use where vegetation alone is insufficient.
Reposition/Replace Rock Apron Stone	Need to be evaluated annually	
Remove Sediment and Debris from Rock Aprons	Need to be evaluated annually	
Repair Erosion Around Rock Aprons	Need to be evaluated annually	
Remove Sediment, Trash, and Debris from Catch Basins	Need to be evaluated annually	
Repair/Replace Catch Basin Structures (grates, frames)	Need to be evaluated annually	
Maintain/Repair Storm Piping (clear blockages, sediment)	Need to be evaluated annually	
Reseed Disturbed or Bare Areas	Frequency to be specified by SWPPP	Required when bare spots or washouts occur.
Stabilize Slopes (mulching, vegetation, etc.)	Within 7 days of disturbance cessation	Required for temporary or permanent stabilization during construction.
Mow Vegetated Areas (ponds, slopes, and swales)	Monthly/ As needed	
Repair Sediment Controls Around Stockpiles	Frequency to be specified by SWPPP	
Top Dress Stabilized Construction Entrance with Aggregate	Frequency to be specified by SWPPP	
Replace Rock in Construction Entrance	Frequency to be specified by SWPPP	
Remove Sediment from Construction Entrance	Frequency to be specified by SWPPP	

Activity	Frequency	Additional Note
Remove Sediment from Adjacent Public Roads	Frequency to be specified by SWPPP	
Clean Catch Basin Inlet Protection	Frequency to be specified by SWPPP	When sediment reaches ~50% of device height or impedes flow.
Repair/Replace Inlet Protection Devices	Frequency to be specified by SWPPP	
Remove Inlet Protection	Once site stabilized	After sediment transport risk is minimized
Remove Sediment from Silt Fence	Frequency to be specified by SWPPP	When sediment reaches ~1/3 of fence height.
Repair/Replace Damaged Silt Fence	Frequency to be specified by SWPPP	Includes any tears, undermining, or installation failure.
Repair/Replace Compost Filter Sock	Frequency to be specified by SWPPP	Address damage, tears, or deformation.
Remove Sediment from Compost Filter Sock	Frequency to be specified by SWPPP	

INSPECTION REQUIREMENTS

The operation and maintenance entity shall conduct periodic inspections to ensure the stormwater management system continues to function as designed and permitted. If deficiencies are identified, they shall be corrected in a timely manner to restore the system to permitted conditions.

At a minimum, inspections shall verify the following:

- Erosion is controlled and soils are stabilized.
- The system is free of debris, trash, oils, grease, and other refuse.
- Oil and grease control devices are functioning properly.
- System components are not clogged or obstructed by sediment or vegetation.
- Sediment and debris are removed to maintain design capacity and dimensions.
- Water quality treatment components are functioning properly and maintained per the O&M plan.

All inspections shall be documented using Form 62-330.311(3), "Inspection Checklists," included in Appendix A. Unless otherwise specified in the permit, the operation and maintenance entity must maintain a record of each inspection, including the date of inspection, the name and contact information of the inspector, whether the system was functioning as designed and permitted, and make such record available upon request of the Agency (1).

FREQUENCY OF INSPECTIONS

This section identifies the inspection frequencies for the stormwater management system components. Inspection frequencies have been established in accordance with the Environmental Resource Permit (ERP) Applicant's Handbook Volume I (Reference 1).

Table 2 shown below summarizes the accepted inspection frequencies for the proposed systems as provided in the ERP Applicant's Handbook Volume I.

Table 2: Inspection Frequencies for common BMPs

TYPE OF SYSTEM	INSPECTION FREQUENCY
Dry Retention basins	Once every 3 years
Underdrain System	Once every 2 Years
All other	Once every Year

EASEMENTS OR COVENANTS FOR MAINTENANCE

Not applicable.

FUTURE CAPITAL AND MAINTENANCE EXPENDITURES

This cost estimate requirement applies only to maintenance during the operational phase of the facility on an annual basis. The operation and maintenance cost estimate has been developed in accordance with Section 12.3.5 of the Applicant's Handbook Volume I. The estimate includes routine maintenance activities expressed in current dollars.

Costs were approximated using the Florida Department of Transportation (FDOT) 2025 Maintenance Contract Cost Summary by Pay Item Number (OOM_20260403), supplemented with project-specific assumptions to reflect the characteristics of the stormwater management system. A breakdown of costs for each maintenance category is provided below:

Total Estimated Annual Maintenance Cost by Category:

Sediment Removal and Debris Management: \$3,328.89

Mowing and Vegetation Management: \$31,078.25

Storm Sewer and Structure Maintenance: \$52,516.46

Ditch and Conveyance System Maintenance: \$27,600.00

Erosion Repair and Stabilization: \$4,689.67

Pretreatment Device Maintenance: \$10,000.00

Administrative and Compliance Activities: \$5,000.00

Total: \$134,213.26

The total estimated annual operation and maintenance cost for the stormwater management system is \$134,213.26. This value represents a planning-level estimate based on current dollars and reflects routine maintenance associated with the system.

APPENDIX A: Form 62-330.311(3) - Inspection Checklists