



**Challenging today.
Reinventing tomorrow.**

Jacobs Engineering Group, Inc.

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May 13, 2022

Attn: Kathy A. VanScoy
Clerk, Borough of Paulsboro
1211 Delaware Street
Paulsboro, NJ 08066

Project name: EEW American Offshore Structures Phase I Upland PMT
Project no: 0800-20-0002.1

Subject: Public Notice for a Modification to a Waterfront Development Permit
EEW American Offshore Structures Phase I Upland Project
Paulsboro Marine Terminal
Borough of Paulsboro, Gloucester County, New Jersey

Dear Ms. VanScoy:

This letter is to provide you with legal notification that an application for a major technical modification of a Coastal Waterfront Development Individual Permit (DLUR File No. 0800-20-0002.1) has been submitted to the New Jersey Department of Environmental Protection, Division of Land Use Regulation for the development shown on the enclosed plans is being modified. Enclosed is a complete copy of the modification application that was submitted to the NJDEP for review by the public.

Should you have any questions regarding this information, please contact me at the number listed below.

Regards,

Sonny Rutkowski
Professional Engineer

215 845 6924
Sonny.Rutkowski@jacobs.com



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May 13, 2022

New Jersey Department of Environmental Protection
Division of Land Use Regulation
P.O. Box 420, Mail Code 501-02A
Trenton, New Jersey 08625-0420
Attention: Application Support

Subject: Paulsboro Marine Terminal – Phase 1 Upland WDP Offshore Wind
Major Technical Modification Waterfront Development Upland Individual Permit
Paulsboro Borough, Gloucester County, New Jersey
DEP File No. 0800-20-0002.1 LUP 200001

Dear Application Support:

Jacobs is supporting the South Jersey Port Corporation (SJPC) and the Gloucester County Improvement Authority (GCIA) in the development of Phase 1 of the Paulsboro Marine Terminal (PMT) development project located in Paulsboro, Gloucester County, New Jersey. The Phase 1 upland project, currently being constructed on PMT, is a critical part of an overall effort to manufacture and ship monopile foundations for construction of ocean wind farms off the coast of New Jersey. On behalf of the GCIA (Applicant), Jacobs Engineering Group, Inc. (Agent) requests a modification to

The PMT Phase 1 Upland WDP IP was approved on March 17, 2021 by the NJDEP Department of Land Use on the basis of the plan set and supporting documentation submitted by Marathon Engineering and Environmental Services in October of 2020 and March of 2021 (NJDEP File No 0800-20-0002.1 LUP 200001). Modifications to the site arrangement required revisions to specific elements of the stormwater management system, primarily the replacement of the previously proposed underground detention systems and filters with bioretention systems.

Subsequent to approval, the proposed buildings have been relocated and reduced in size, both the total project area and the paved area have been reduced, and the layout and location of the pavement and open-graded gravel areas have been revised. Areas that have been eliminated as part of the proposed modification include the large gravel area at the north end of the site and an area of pavement and gravel in the southeast corner. The area in the southeast corner is now included in the PMT - Phase 2 Upland WDP IP project area, recently submitted to NJDEP as a new a Land Use permit application (NJDEP File No. 0800-07-0003.4 LUP220001).

The stormwater management design in some areas of the Phase 1 area was also revised. Runoff from the modified pavement areas, as well as a portion of the gravel areas, outside of the "interior" pavement areas between the buildings will be treated by either bioretention or a manufactured treatment device (MTD). However, the drainage areas and associated treatment practices (underground CMP detention systems with Contech StormFilters) for those "interior" pavement areas remain substantively unchanged from the approved design.



May 13, 2022

Paulsboro Marine Terminal – Phase 1 Site Development

To document the updated stormwater management design, we have prepared the following modified plans: site/grading plans, storm sewer/stormwater management plans, drainage area plan, details sheets, and erosion and sediment control plans. In addition, we have prepared a revised/updated stormwater management report that summarizes the design methodology for the modified stormwater features for Phase 1. For the sake of clarity, the areas and associated stormwater features of Phase 1 previously approved by NJDEP, which will not change per this proposed modification, were not included in the updated plans or stormwater management report.

The current Phase 1 permit includes approval for a Flood Hazard Area (FHA) Individual Permit and a Verification-Method 2 (FEMA Tidal Method) which verified the flood hazard area as Zone AE 9.0' 10.0' and Zone VE 11.0' per NJAC 7:13-3.4(d). The revisions proposed as part of this Phase 1 permit modification will occur in areas above the FHA elevations and outside of the on-site riparian zones. **Therefore, the applicant is not seeking a modification to the approved FHA Individual Permit for the site as it is not required. Both the existing and proposed grades within the modified Phase 1 area will remain above the Zone AE and Zone VE elevations and therefore outside flood hazard areas.**

Should you have questions regarding this submission, please do not hesitate to contact me at 610-513-9627 or Keith D'Angiolillo at 973-242-7037.

Sincerely,

Jacobs Engineering Group, Inc.

A handwritten signature in black ink that reads "Sonny Rutkowski".

Sonny Rutkowski, P.E.
Senior Project Manager

Copies by email to: South Jersey Port Corporation
Gloucester County Improvement Authority

Section 1: Completed Application Form



State of New Jersey
Department of Environmental Protection
Division of Land Use Regulation
Application Form for Permit(s)/Authorization(s)
501 E. State Street Mail Code 501-02A P.O. Box 420
Trenton, NJ 08625-0420
Phone #: (609) 777-0454 Web: www.nj.gov/dep/landuse



Please print legibly or type the following: Complete all sections and pages unless otherwise noted.

Initial Application ☐ Response to DLUR Deficiency ☐ Extension / Modification ☒ Is this project a NJDOT Priority 2 Repair Project? Yes ☐ No ☐

1. **Applicant Name:** Gloucester County Improvement Authority E-Mail: mchristina@gcijan.com
Address: 109 Budd Blvd. Daytime Phone: 856-241-9705 Ext. _____
City/State: Woodbury, New Jersey Zip Code 08096 Cell Phone: _____
2. **Agent Name:** Mr. Sigmond (Sonny) Rutkowski III
Firm Name: Jacobs Engineering Group Inc E-Mail: Sonny.Rutkowski@jacobs.com
Address: 2001 Market Street Suite 900 Daytime Phone: 610-513-9627 Ext. _____
City/State: Philadelphia, PA Zip Code 19103 Cell Phone: 610-513-9627
3. **Property Owner:** Borough of Paulsboro E-mail: sjaobuicci@paulsboronj.org
Address: 1211 Delaware Street Daytime Phone: 856-423-1500 Ext. _____
City/State: Paulsboro, NJ Zip Code 08066 Cell Phone: _____
4. **Project Name:** Paulsboro Marine Terminal Phase 1 Upland WDP Offshore Wind Address/Location: 50 Universal Road, Paulsboro, NJ
Municipality: Paulsboro, NJ County: Gloucester Zip Code 08066
Block(s) & Lots (s): Block(s) [1.2] [1.20-24] [1.4] [1.5] [1.8] [1.07,26] [1.14,45] [135, 24.01] Lot(s): _____
N.A.D. 1983 State Plane Coordinates (feet) E(x): 285.909.8 N(y): 369.929.6 **Not Longitude/Latitude**
Watershed: Delaware River Subwatershed: Mantua Creek
Nearest Waterway: Delaware River and Mantua Creek
5. **Project Description:** Modification to WDP IP, specifically changes to the building and paved areas arrangement, stormwater retention, & reduction of the project area

Provide if applicable: Previous LUR File # (s): 0800-07-0003.3 (WFD 10002)
0800-20-0002.1 LUP200001

Waiver request ID # (s): _____

A. SIGNATURE OF APPLICANT (required):

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment. If the applicant is an organization such as a corporation, municipal entity, home-owners association etc., the party responsible for the application shall sign on behalf of the organization.

Signature of Applicant

Date

Print Name

Signature of Co-Applicant

Date

Print Name

B. PROPERTY OWNER'S CERTIFICATION

I hereby certify that the undersigned is the **owner of the property** upon which the proposed work is to be done. This endorsement is certification that the owner/easement holder grants permission for the conduct of the proposed activity. In addition, written consent is hereby given to allow access to the site by representatives or agents of the Department for the purpose of conducting a site inspection(s) or survey(s) of the property in question.

In addition, the undersigned property owner hereby certifies:

- | | |
|--|---|
| 1. Whether any work is to be done within an easement? | Yes ☐ No ☒ |
| (If answer is "Yes" – Signature/title of responsible party is required below) | |
| 2. Whether any part of the entire project will be located within property belonging to the State of New Jersey? | Yes ☐ No ☒ |
| 3. Whether any work is to be done on any property owned by any public agency that would be encumbered by Green Acres? | Yes ☐ No ☒ |
| 4. Whether this project requires a Section 106 (National Register of Historic Places) Determination as part of a federal approval? | Yes ☐ No ☒ |

Signature of Owner

Date

Administrator, Borough of Paulsboro

N/A

Signature of Owner/Easement Holder

Date

Print Name/Title

C. APPLICANT'S AGENT

I, **Mario Christina**, the Applicant/Owner and **[N/A]**, co-Applicant/Owner authorize to act as my agent/representative in all matters pertaining to my application the following person:

Sigmond S. Rutkowski III

Name of Agent

Professional Engineer

Occupation/Profession of Agent

Signature of Applicant/Owner

Signature of co-Applicant/Owner

AGENT'S CERTIFICATION:

I, **Sigmond Rutkowski**, agree to serve as agent for the above-referenced applicant:

Sigmond Stephen Rutkowski III

Signature of Agent

Jacobs Engineering Group, Inc.

Name of Firm

D. STATEMENT OF PREPARER OF PLANS, SPECIFICATIONS, SURVEYOR'S OR ENGINEER'S REPORT

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

Sigmond Stephen Rutkowski III

Signature

Sigmond S. Rutkowski III

Print Name

Sr. Project Manager, Jacobs Engineering Group

Position & Name of Firm

GE042937

May 12, 2022

Professional License #

Date

E. STATEMENT OF PREPARER OF APPLICATION, REPORTS AND/OR SUPPORTING DOCUMENTS (other than engineering)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

Sigmond Stephen Rutkowski III

Signature

Sigmond S. Rutkowski III

Print Name

Sr. Project Manager, Jacobs Engineering Group

Position & Name of Firm

GE042937

May 12, 2022

Professional License #

(If Applicable)

Date



Effective October 5, 2021, applications for most land use authorizations and permits **must** be submitted electronically through [NJDEP Online](https://www.nj.gov/dep/landuse/eservices/lur_auth_permits.html). Such applications include general permits, individual permits, water quality certificates, freshwater wetland transition area waivers, and associated flood hazard area verifications. Paper applications will **NOT** be accepted for the aforementioned types of authorizations and permits.

Paper applications **will be** accepted for Letters of Interpretations, modifications to existing permits/authorizations, extension requests for existing permits/authorizations, applicability determinations, Highlands Area applications, stand-alone Flood Hazard Verifications, and consistency determinations. If an application type is not listed on this form and you are unsure if a paper application is acceptable please contact the Division at <https://www.nj.gov/dep/landuse/contact.html>. For more information, please visit https://www.nj.gov/dep/landuse/eservices/lur_auth_permits.html.

FEE CALCULATION TIPS:

- Whenever the calculation requires an acreage figure (including the Stormwater calculations), you will need to round UP to the nearest whole number, for example: 0.25 acres gets rounded up to one (1) acre or 2.61 acres gets rounded up to three (3) acres.
- The stormwater review fee is applied only one time per project, maximum of \$20,000, regardless of multiple applications.

APPLICATION(S) FOR: Please check each permit/authorization that you are applying for and fill in the calculated fee (for each) in the "Fee Paid" column

	Coastal Applications	Fee Amount	Fee Paid
☐	Modification of a Coastal GP	\$500	
☐	Minor Technical Modification of a Coastal Wetland Permit	\$500 x ____ # of items to be revised	
☐	Minor Technical Modification of a CAFRA IP	\$500 x ____ # of items to be revised	
☐	Minor Technical Modification of a Waterfront IP	\$500 x ____ # of items to be revised	
☐	Major Technical Modification of a Coastal Wetland Permit	0.30 x ____ original fee = Fee (Minimum \$500)	
☐	Major Technical Modification of a CAFRA IP	0.30 x ____ original fee = Fee (Minimum \$500)	
☒	Major Technical Modification of a Waterfront IP	0.30 x \$30,000 original fee = Fee (Minimum \$500)	\$9,000
☐	Zane Letter (Waterfront Development Exemption)	\$500	
☐	CAFRA Exemption Request	\$500	
☐	CZM General Permit Extension	\$240 x ____ # of GPs to be extended	
☐	Waterfront Development Individual Permit – Extension (Waterward of MHWL)	0.25 x ____ original fee = Fee (Maximum \$3,000)	
☐	Meadowlands District Water Quality Certificate	\$5,000 + (\$2,500 x ____ # acres regulated area disturbed)	
☐	Individual Permit Equivalency/CERCLA	No Fee	

	Consistency Determination	Fee Amount	Fee Paid
☐	Water Quality Certificate (NOTE: No fee required under the coastal program when reviewed in conjunction with a WFD permit))	\$5,000 + (\$2,500 x ____ # acres regulated area disturbed)	
☐	Federal Consistency	No Fee	

	Applicability Determinations	Fee Amount	Fee Paid
☐	Coastal Applicability Determination	No Fee	No Fee
☐	Flood Hazard Applicability Determination	No Fee	No Fee
☐	Highlands Jurisdictional Determination	No Fee	No Fee
☐	Executive Order 215	No Fee	No Fee

	Letter of Interpretation	Fee Amount	Fee Paid
☐	LOI Presence Absence	\$1,000.00	
☐	LOI Footprint of Disturbance (3 Maximum)	\$1,000.00 each	
☐	LOI Delineation < 1.00 Acres	\$1,000.00	
☐	LOI Verification	\$1,000 + (\$100 x ____ # of acres of the site)	
☐	LOI Partial Site Verification	\$1,000 + (\$100 x ____ # of acres of the site subject to LOI)	
☐	LOI Extension Presence/Absence, Footprint, Delineation < 1 acre (Re-Issuance)	\$500	
☐	LOI Extension Line Verification (Re-Issuance)	0.50 x ____ original fee (Minimum \$500)	

	Freshwater Wetlands Authorizations	Fee Amount	Fee Paid
☐	FWGP Administrative Modification	No fee	
☐	FWGP Minor technical modification	\$500.00	
☐	FWGP Major technical modification	\$500.00	
☐	Individual Permit Administrative Modification	No Fee	
☐	Individual Permit Minor Technical Modification	\$500.00	
☐	Individual Permit Major Technical Modification	0.30 x ____ original fee (Minimum \$500)	
☐	TAW Administrative Modification	No Fee	
☐	TAW Minor Technical Modification	\$500.00	
☐	TAW Major Technical Modification	0.30 x ____ original fee (Minimum \$500)	
☐	FWGP Extension	\$500 x ____ # of items to be extended	
☐	Individual Permit/Open Water Permit Extension	0.30 x ____ original fee (Minimum \$500)	
☐	TAW Extension	\$500 x ____ # of items to be extended	
☐	Freshwater Wetlands Exemption	\$500.00	
☐	TAW Exemption	\$500.00	
☐	Permit Equivalency/CERCLA	No Fee	

APPLICATION(S) FOR: Please check each permit/authorization that you are applying for and fill in the calculated fee (for each) in the "Fee Paid" column

	Flood Hazard Area Authorizations	Fee Amount	Fee Paid
☐	FHA GP Administrative Modification	No Fee	No Fee
☐	FHA GP Minor technical modification	\$500 x ____ # of project elements to be revised	
☐	FHA GP Major technical modification	0.30 x ____ original fee (Minimum \$500)	
☐	FHA Individual Permit Administrative Modification	No Fee	No Fee
☐	FHA Individual Permit Minor Technical Modification	\$500 x ____ # of project elements to be revised	
☒	FHA Individual Permit Major Technical Modification	0.30 x \$3,000 original fee (Minimum \$500)	\$900
☐	FHA Verification Administrative Modification	No Fee	No Fee
☐	FHA Verification Minor Technical Modification	\$500 x ____ # of project elements to be revised	
☐	FHA Verification Major Technical Modification	0.30 x ____ original fee (Minimum \$500)	
☐	FHA GP Extension	\$240	
☐	FHA Individual Permit Extension	0.25 x ____ original fee	
☐	FHA Verification Extension of Methods 1, 2, 3, 5, or Riparian Zone Only	\$240	
☐	FHA Verification Extension of Methods 4 or 6	0.25 x ____ original fee	
☐	FHA Individual Permit Equivalency/CERCLA	No Fee	No Fee

NOTE: Flood Hazard verifications may be submitted via a paper application **ONLY** when not submitted in conjunction with any permit/authorization required to be submitted electronically.

	Flood Hazard Area Verifications	Fee Amount	Fee Paid
☐	Verification-Delineation of Riparian Zone Only	\$1,000	
☐	Verification-Method 1 (DEP Delineation) *	\$1,000	
☐	Verification-Method 2 (FEMA Tidal Method) *	\$1,000	
☐	Verification-Method 3 (FEMA Fluvial Method) *	\$1,000	
☐	Verification-Method 4 (FEMA Hydraulic Method)	\$4,000 + (\$400 x per 100 linear feet)	
☐	Verification-Method 5 (Approximation Method)*	\$1,000	
☐	Verification-Method 6 (Calculation Method)	\$4,000+(\$400 x per 100 linear feet)	

*Fee not applicable to (1) SFH

	Stormwater Review Fee (Maximum Fee = \$20,000)	Fee Amount	Fee Paid
☒	Stormwater Review (Fee is calculated by adding the base fee to the specific elements below)	\$3,000 Base Fee	N/A Modification
	Review of Groundwater Calculations	+ \$250 x ____ # acres disturbed	
	Review of Runoff Quantity Calculations	+ \$250 x ____ # acres disturbed	
	Review of Water Quality Calculations	+ \$250 x ____ # acres impervious surface	
	Total	Stormwater Review Fee	\$0.00

	Highlands Authorizations*	Fee Amount	Fee Paid
☐	Pre-application Meeting	\$500.00	
☐	Resource Area Determination Boundary Delineation < one acre	\$500.00	
☐	Resource Area Footprint of Disturbance	\$500 + (\$50 x ____ # of acres of the site)	
☐	Resource Area Determination Verification (> one acre)	\$750 + (\$100 x ____ # of acres of the site)	
☐	Resource Area Determination Extension	0.25 x ____ original fee (Minimum \$250)	
☐	Preservation Area Approval (PAA)		
☐	PAA with Waiver (Specify type below)		
	Waiver Type:		
☐	HPAAGP 1/ Habitat Creation/Enhance	No Fee	No Fee
☐	HPAAGP 2 Bank Stabilization	\$500	
☐	HPAA Extension	\$1,000	

*Highlands Applicability Determinations (HAD Exemptions) use a different form available at www.nj.gov/dep/landuse/forms.html

TOTAL FEE:	\$9,900
CHECK NUMBER:	

APPLICANT NAME: _____

FILE # (if known): _____

APPLICATION FORM - APPENDIX I

Section 1: Please provide the following information for the overall project site. All area measurements shall be recorded **in acres to the nearest thousandth** (0.001 acres).

<u>PROPOSED:</u>	<u>PRESERVED</u>	<u>UNDISTURBED</u>	<u>DISTURBED</u>
RIPARIAN ZONE	0	0	0
CZMRA FORESTED (CZMRA IP – Only)	0	0	0
E & THABITAT Endangered and/or Threatened	0	0	0
FRESHWATER WETLANDS	0	0	0

Section 2: Please provide the following information for each permit/authorization requested pursuant to the Freshwater Wetlands Protection Act. All area measurements shall be recorded **in acres to the nearest thousandth** (0.001 acres). Use additional sheets if necessary

PERMIT TYPE	N/A	WETLAND TYPE	N/A	RESOURCE CLASSIFICATION	N/A
_____		Emergent, Forest, Shrub, Etc. NA	_____	Ordinary, Intermediate, Exceptional, EPA, Etc.	_____

<u>PROPOSED DISTURBANCE:</u>	<u>WETLANDS</u>	<u>TRANSITION AREA</u>	<u>SOW</u>
FILLED	0	0	0
EXCAVATED	0	0	0
CLEARED	0	0	0
TEMPORARY DISTURBANCE	0	0	0

PERMIT TYPE	N/A	WETLAND TYPE	N/A	RESOURCE CLASSIFICATION	N/A
_____		Emergent, Forest, Shrub, Etc.	_____	Ordinary, Intermediate, Exceptional, EPA, Etc.	_____

<u>PROPOSED DISTURBANCE:</u>	<u>WETLANDS</u>	<u>TRANSITION AREA</u>	<u>SOW</u>
FILLED	0	0	0
EXCAVATED	0	0	0
CLEARED	0	0	0
TEMPORARY DISTURBANCE	0	0	0

Section 2: Application Fee

(Copies of checks – Originals mailed separately)

Permit Fee Calculation

Type of Permit*	Fee
In-water Waterfront Development Individual Permit Modification \$9,000	\$9,000
Flood Hazard Area Modification \$900	\$900
Total .	\$9,900

NOTE: Original checks mailed to NJDEP separately.

Section 3: Scope and Purpose

(See also Cover letter, Storm Water Management Report, Compliance Statement, and Project Plans)

Project Scope & Purpose

The project is located on a portion of the Paulsboro Marine Terminal, on Universal Road in the Borough of Paulsboro, Gloucester County, New Jersey within the limits of the existing marine terminal property lease area. The site occupies Borough of Paulsboro Tax Map Block 1, Lots 2, 4, 5, 8, 20-24, Block 1.07, Lot 26, Block 1.14, Lot 45, Block 135, Lot 24.01; owned by the Borough of Paulsboro and South Jersey Port Corporation. This project was previously approved by the NJDEP Department of Land Use on the basis of the plan set and supporting documentation submitted by Marathon Engineering and Environmental Services in October of 2020 and March of 2021. Since approval, the project has been modified, reducing the total project footprint from approximately 82 +/- acres to 64.3 +/- acres the total pavement area, relocating buildings, revising the layout of pavement and open-graded gravel areas, proposed buildings have been relocated, the total area has been reduced, the amount of pavement has been reduced, and the layout of the pavement and open-graded gravel areas has been revised.

Overall, the proposed facility is for the purpose of supporting the construction and maintenance of offshore wind farms off the coast of New Jersey. The project is planned in two (2) phases. Both Phase 1 and Phase 2 will occupy the western half of the Paulsboro Marine Terminal property. The Phase 1 development will include two paint and blast buildings, a circumferential welding building, and a segment weld building, and roadway and utility infrastructure collectively totaling 5.96 acres.

The stormwater management design was also revised. Runoff will be treated by either bioretention or a manufactured treatment device (MTD). The stormwater management elements are as depicted on the modified plan set entitled, *Paulsboro Marine Terminal, South Jersey Port Corporation, Modified Phase 1 Site Development, NJDEP Permit Plans, Borough of Paulsboro, Block 1, Lots 2, 4, 5, 8, 20-24, Block 1.07, Lot 26, Block 1.14, Lot 45, Block 135, Lot 24.01, Gloucester County, New Jersey* prepared by Jacobs Engineering, dated May 6, 2022. These can be viewed by appointment at the Paulsboro Clerk's Office, address as follows:

1211 Delaware Street
Paulsboro, NJ 08066

NJDEP approved the in-water work for the PMT RoRo Berth (0800-20-0002.1 LUP210001 on December 13, 2021) which includes the construction of mooring dolphins, dredging, and placement of dredged material within the Phase 1 and Phase 2 areas scheduled to begin July 1, 2022.

Under the previous approvals for the overall site, the site has been raised above the 100-year tidal flood elevation, and this proposed stormwater management plan has been prepared in accordance with the version of N.J.A.C. 7:8 – Stormwater Management in effect at the time of the previous approval.

Section 4: Site Plans

Section 5: Permit Authorization WDP IP (0800-20-0002.1 LUR200001)



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF LAND RESOURCE PROTECTION
Mail Code 501-02A, P.O. Box 420, Trenton, New Jersey 08625-0420
Telephone: (609) 777-0454 or Fax: (609) 777-3656
www.nj.gov/dep/landuse



PERMIT

In accordance with the laws and regulations of the State of New Jersey, the Department of Environmental Protection hereby grants this permit to perform the activities described below. This permit is revocable with due cause and is subject to the terms, conditions, and limitations listed below and on the attached pages. For the purpose of this document, "permit" means "approval, certification, registration, authorization, waiver, etc." Violation of any term, condition, or limitation of this permit is a violation of the implementing rules and may subject the permittee to enforcement action.		Approval Date March 17, 2021
		Expiration Date March 16, 2026
Permit Number(s): 0800-20-0002.1 LUP200001	Type of Approval(s): FHA Individual Permit-Other Verification-Method 2 (FEMA Tidal Method) WFD-IP-Commercial/Industry/Public(Landward)	Governing Rule(s): N.J.A.C. 7:13-1.1(b) N.J.A.C. 7:7-1.1(a)
Permittee: Mario Christina c/o Gloucester County Improvement Authority 109 Budd Boulevard Woodbury, New Jersey 08096		Site Location: Block(s) & Lot(s): [1, 2] [1, 20] [1, 21] [1, 22] [1, 23] [1, 24] [1, 4] [1, 5] [1, 8] [1.07, 26] [1.14, 45] [135, 24.01] Municipality: Paulsboro Borough County: Gloucester
Description of Authorized Activities: This document authorizes the construction of manufacturing facility at the existing Paulsboro Marine Terminal to support the construction of offshore wind farms off the coast of New Jersey. The overall facility consists of the construction of six (6) buildings, the construction of monopile and equipment storage areas, parking areas, drive aisles/access road, landscaping, utilities, stormwater management facilities, and associated improvements. The portion of the project within Waterfront Development jurisdiction will consist of the construction of a portion of the proposed two-way access road and monopile laydown/storage area. This project is authorized under and in conditional compliance with the applicable Coastal Zone Management Rules (N.J.A.C. 7:7-1.1 et seq.), as amended on February 20, 2020, provided that all conditions to follow are met. The flood hazard area on site is verified as Zone AE 9.0', 10.0' and Zone VE 11.0' as per the FEMA Tidal Method at N.J.A.C. 7:13-3.4(d). The riparian zone on site is verified as 50 feet from the top of bank. The Department has determined that the herein approved activities meet the requirements of the (FHACA/CZM) rules. This approval does not obviate the local Floodplain Administrator's responsibility to ensure all development occurring within their community's Special Flood Hazard Area is compliant with the local Flood Damage Prevention Ordinance, and minimum NFIP standards, regardless of any state-issued permits. FEMA requires communities to review and permit all proposed construction or other development within their SFHA in order to participate in the NFIP.		
Prepared by:  Lindsey J. Davis, Environmental Scientist 3		Received and/or Recorded by County Clerk:
If the permittee undertakes any regulated activity, project, or development authorized under this permit, such action shall constitute the permittee's acceptance of the permit in its entirety as well as the permittee's agreement to abide by the requirements of the permit and all conditions therein.		
This permit is not valid unless authorizing signature appears on the last page.		

STATEMENT OF AUTHORIZED IMPACTS:

The authorized activities allow for the permittee to undertake impacts to regulated areas as described herein. Additional impacts to regulated areas without prior Department approval shall constitute a violation of the rules under which this document is issued and may subject the permittee and/or property owner to enforcement action, pursuant to N.J.A.C. 7:13-21.8; N.J.A.C. 7:7-2.1.

PRE-CONSTRUCTION CONDITIONS:

1. **Recording of Permit:** This permit shall be recorded in its entirety in the office of the County Clerk or the Registrar of Deeds and Mortgages for each county where this project is located. Verified notice of this action shall be forwarded to the Division immediately thereafter. **NOTE:** The following information is to be submitted to the clerk for all FHA Verifications:
 - a. The Department file number for the verification;
 - b. The approval and expiration dates of the verification;
 - c. A metes and bounds description of any flood hazard area limit and/or floodway limit approved under the verification;
 - d. The flood hazard area design flood elevation, or range of elevations if variable, approved under the verification; and
 - e. The width and location of any riparian zone approved under the verification; and
 - f. The following statement: "The State of New Jersey has determined that all or a portion of this lot lies in a flood hazard area. Certain activities in flood hazard areas are regulated by the New Jersey Department of Environmental Protection and some activities may be prohibited on this site or may first require a permit. Contact the Division of Land Use Regulation at (609) 777-0454 for more information prior to any construction onsite."
2. Prior to or concurrent with construction of the authorized project, the permittee shall plant additional trees in the area of the Mantua Avenue Esplanade as indicated on the approved plans.
3. All sediment barriers and other soil erosion control measures must be installed prior to the start of any clearing, grading or construction on site, and must be maintained in proper working condition throughout the entire duration of the project. The sediment barrier shall be sufficient to prevent the sedimentation of the wetlands and transition areas on site.

SPECIAL CONDITIONS:

1. This permit is issued subject to compliance with N.J.A.C 7:7-27.2, Conditions that apply to all coastal permits.
2. To protect sensitive habitat for the State-listed Osprey, the permittee shall adhere to a seasonal restriction on the use of heavy construction equipment/machinery within 300 meters (1000 feet) of any active osprey nest along the project's limit of disturbance from April 1 through August 31 of each calendar year. The initiation and implementation of work which generates disturbance (e.g., sound levels, visual interruption) that is out of character with what currently exists at or surrounding the anticipated work area during the restricted time period recommended above may result in the permittee being in violation of the "take" clause within State of New Jersey Endangered and Nongame Species Conservation Act (NJSA 23:2A-1). Please note that adherence to this seasonal restriction shall also be applied if nest building activity is observed at any given

osprey nest location prior to April 1 of the given calendar year of work. Please also note that there is no known osprey nest currently located within 300 meters of the limit of disturbance for the authorized work.

3. The Department has approved this permit because the project satisfies the requirements of the Flood Hazard Area Control Act Rules and Coastal Rules. The Department has not reviewed the proposed structure/s to determine compliance with the International Building Code or any other local construction codes or flood ordinances. The proposed building/s may therefore not fully comply with any such requirements. Please contact your municipal construction official for further information.
4. All foundations, slabs, footings, and walls of the proposed structure/s shall be designed to resist uplift, flotation, collapse, and displacement due to hydrostatic and hydrodynamic forces resulting from flooding up to an elevation 11.0 feet NAVD. Furthermore, all structural components shall be designed to resist the same forces.
5. The elevation of 11.0' NAVD shall be the minimum elevation of the bottom of the lowest horizontal member of the proposed building/s. The construction of any habitable area below this elevation, such as a basement is prohibited.
6. The Department has determined that this project meets the requirements of the Stormwater Management rules at N.J.A.C. 7:8. Any future expansion or alteration of the approved stormwater management system, which would affect water quality, increase the rate or volume of stormwater leaving the site, affect the infiltration capacity on the site, or alter the approved low impact site design, shall be reviewed and approved by the Department prior to construction. This includes any proposed changes to the discharge characteristics of any basin, the construction of new inlets or pipes that tie into the storm sewer network and/or the replacement of existing inlets or pipes with structures of different capacity.
7. The applicant shall make specific arrangements to ensure the continuous maintenance and efficient operation of all proposed stormwater management measures onsite. This includes the inspection (and cleaning where necessary) of any and all constructed swales, basins, inlets, and mechanical treatment devices at least four times per year and after every major storm totaling 1 inch of rainfall or more, the use of appropriate soil conservation practices onsite, and any other reasonable effort required to maintain the stormwater management system in good working order.
8. Landscaping of the property shall be done with native plants to maximum extent practicable. The use of plastic under landscape or gravel areas is prohibited. All subgravel liners must be made of filter cloth or other permeable material.
9. No vegetation within 50 feet of the top of any stream bank onsite shall be disturbed for any reason. This condition applies to all channels onsite regardless of contributory drainage area.
10. All excavated material must be lawfully disposed of outside any flood plain, open water, freshwater wetlands or transition area.
11. No construction equipment shall be stored, staged or driven within any channel, wetland or transition area.

STANDARD CONDITIONS:

1. The issuance of a permit shall in no way expose the State of New Jersey or the Department to liability for the sufficiency or correctness of the design of any construction or structure(s). Neither the State nor the Department shall, in any way, be liable for any loss of life or property that may occur by virtue of the activity or project conducted as authorized under a permit.
2. The issuance of a permit does not convey any property rights or any exclusive privilege.
3. The permittee shall obtain all applicable Federal, State, and local approvals prior to commencement of regulated activities authorized under a permit.
4. A permittee conducting an activity involving soil disturbance, the creation of drainage structures, or changes in natural contours shall obtain any required approvals from the Soil Conservation District or designee having jurisdiction over the site.
5. The permittee shall take all reasonable steps to prevent, minimize, or correct any adverse impact on the environment resulting from activities conducted pursuant to the permit, or from noncompliance with the permit.
6. The permittee shall immediately inform the Department of any unanticipated adverse effects on the environment not described in the application or in the conditions of the permit. The Department may, upon discovery of such unanticipated adverse effects, and upon the failure of the permittee to submit a report thereon, notify the permittee of its intent to suspend the permit.
7. The permittee shall immediately inform the Department by telephone at (877) 927-6337 (WARN DEP hotline) of any noncompliance that may endanger public health, safety, and welfare, or the environment. The permittee shall inform the Division of Land Resource Protection by telephone at (609) 777-0454 of any other noncompliance within two working days of the time the permittee becomes aware of the noncompliance, and in writing within five working days of the time the permittee becomes aware of the noncompliance. Such notice shall not, however, serve as a defense to enforcement action if the project is found to be in violation of this chapter. The written notice shall include:
 - i. A description of the noncompliance and its cause;
 - ii. The period of noncompliance, including exact dates and times;
 - iii. If the noncompliance has not been corrected, the anticipated length of time it is expected to continue; and
 - iv. The steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
8. Any noncompliance with a permit constitutes a violation of this chapter and is grounds for enforcement action, as well as, in the appropriate case, suspension and/or termination of the permit.
9. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the authorized activity in order to maintain compliance with the conditions of the permit.

10. The permittee shall employ appropriate measures to minimize noise where necessary during construction, as specified in N.J.S.A. 13:1G-1 et seq. and N.J.A.C. 7:29.
11. The issuance of a permit does not relinquish the State's tidelands ownership or claim to any portion of the subject property or adjacent properties.
12. The issuance of a permit does not relinquish public rights to access and use tidal waterways and their shores.
13. The permittee shall allow an authorized representative of the Department, upon the presentation of credentials, to:
 - i. Enter upon the permittee's premises where a regulated activity, project, or development is located or conducted, or where records must be kept under the conditions of the permit;
 - ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit; and
 - iii. Inspect, at reasonable times, any facilities, equipment, practices, or operations regulated or required under the permit. Failure to allow reasonable access under this paragraph shall be considered a violation of this chapter and subject the permittee to enforcement action.
14. The permittee shall not cause or allow any unreasonable interference with the free flow of a regulated water by placing or dumping any materials, equipment, debris or structures within or adjacent to the channel while the regulated activity, project, or development is being undertaken. Upon completion of the regulated activity, project, or development, the permittee shall remove and dispose of in a lawful manner all excess materials, debris, equipment, and silt fences and other temporary soil erosion and sediment control devices from all regulated areas.
15. The permittee and its contractors and subcontractors shall comply with all conditions, site plans, and supporting documents approved by the permit.
16. All conditions, site plans, and supporting documents approved by a permit shall remain in full force and effect, so long as the regulated activity, project, or development, or any portion thereof, is in existence, unless the permit is modified pursuant to the rules governing the herein approved permits.
17. The permittee shall perform any mitigation required under the permit in accordance with the rules governing the herein approved permits.
18. If any condition or permit is determined to be legally unenforceable, modifications and additional conditions may be imposed by the Department as necessary to protect public health, safety, and welfare, or the environment.
19. Any permit condition that does not establish a specific timeframe within which the condition must be satisfied (for example, prior to commencement of construction) shall be satisfied within six months of the effective date of the permit.
20. A copy of the permit and all approved site plans and supporting documents shall be maintained at the site at all times and made available to Department representatives or their designated agents immediately upon request.

21. The permittee shall provide monitoring results to the Department at the intervals specified in the permit.
22. A permit shall be transferred to another person only in accordance with the rules governing the herein approved permits.
23. A permit can be modified, suspended, or terminated by the Department for cause.
24. The submittal of a request to modify a permit by the permittee, or a notification of planned changes or anticipated noncompliance, does not stay any condition of a permit.
25. Where the permittee becomes aware that it failed to submit any relevant facts in an application, or submitted incorrect information in an application or in any report to the Department, it shall promptly submit such facts or information.
26. The permittee shall submit written notification to the Bureau of Coastal and Land Use Compliance and Enforcement, 401 East State Street, 4th Floor, PO Box 420, Mail Code 401-04C, Trenton, NJ 08625, at least three working days prior to the commencement of regulated activities.
27. The permittee shall record the permit, including all conditions listed therein, with the Office of the County Clerk (the Registrar of Deeds and Mortgages, if applicable) of each county in which the site is located. The permit shall be recorded within 30 calendar days of receipt by the permittee, unless the permit authorizes activities within two or more counties, in which case the permit shall be recorded within 90 calendar days of receipt. Upon completion of all recording, a copy of the recorded permit shall be forwarded to the Division of Land Resource Protection at the address listed on page one of this permit.

APPROVED PLAN(S):

The project is shown on four sets of plans. The first set of plans contains forty-one (41) sheets and is entitled “Preliminary and Final Site Plans, Paulsboro Marine Terminal, Block 1, Lots 2, 4, 5, 8, 20-24; Block 1.07, Lot 26; Block 1.14, Lot 45; Block 135, Lot 24.01, Borough of Paulsboro, Gloucester County, New Jersey”, signed and last revised on 03/01/2021, prepared by David J. Fleming, P.E. from Marathon Engineering & Environmental Services.

The second set of plans contains four (4) sheets, one (1) of which is approved, and is entitled “Paulsboro Marine Terminal, Block 1, Lots 2, 4, 5, 8, 20-24; Block 1.07, Lot 26; Block 1.14, Lot 45; Block 135, Lot 24.01, Borough of Paulsboro, Gloucester County, New Jersey”, signed and last revised on 03/12/2021, prepared by David J. Fleming, P.E. from Marathon Engineering & Environmental Services, and further identified as:

Sheet 4 of 4 – “Waterfront Development Permit Plan”

The third set of plans contains three (3) sheets and is entitled “Existing Flood Hazard Area Permit Plan, Paulsboro Marine Terminal, Block 1, Lots 2, 4, 5, 8, 20-24; Block 1.07, Lot 26; Block 1.14, Lot 45; Block 135, Lot 24.01, Borough of Paulsboro, Gloucester County, New Jersey”, signed and last revised on 03/01/2021, prepared by David J. Fleming, P.E. from Marathon Engineering & Environmental Services.

The fourth set of plans contains one (1) sheet and is entitled “Proposed Flood Hazard Area Permit Plan, Paulsboro Marine Terminal, Block 1, Lots 2, 4, 5, 8, 20-24; Block 1.07, Lot 26; Block 1.14, Lot 45; Block 135, Lot 24.01, Borough of Paulsboro, Gloucester County, New Jersey”, signed and last revised

on 03/01/2021, prepared by David J. Fleming, P.E. from Marathon Engineering & Environmental Services.

APPEAL OF DECISION:

Any person who is aggrieved by this decision may submit an adjudicatory hearing request within 30 calendar days after public notice of the decision is published in the DEP Bulletin (available at www.nj.gov/dep/bulletin). If a person submits the hearing request after this time, the Department shall deny the request. The hearing request must include a completed copy of the Administrative Hearing Request Checklist (available at www.nj.gov/dep/landuse/forms.html). A person requesting an adjudicatory hearing shall submit the original hearing request to: NJDEP Office of Legal Affairs, Attention: Adjudicatory Hearing Requests, Mail Code 401-04L, P.O. Box 402, 401 East State Street, 7th Floor, Trenton, NJ 08625-0402. Additionally, a copy of the hearing request shall be submitted to the Director of the Division of Land Resource Protection at the address listed on page one of this permit. In addition to your hearing request, you may file a request with the Office of Dispute Resolution to engage in alternative dispute resolution. Please see www.nj.gov/dep/odr for more information on this process.

If you need clarification on any section of this permit or conditions, please contact the Division of Land Resource Protection's Technical Support Call Center at (609) 777-0454.

Approved By:

Janet L. Stewart, Section Chief
Division of Land Resource Protection

c: Municipal Clerk, Paulsboro Borough
Municipal Construction Official, Paulsboro Borough
Agent (original) – Donald Brickner

Section 6: Site Photographs

Project Title: EEW American Offshore Structures Phase I Upland PMT

Location: Paulsboro Borough, New Jersey

Photolog, EEW American Offshore Structures Phase I



Photograph 1: Facing northeast, typical view of the roadway that provides access to the Paulsboro Marine Terminal.

Taken by: Prior Survey

Date taken: July 23, 2020



Photograph 2: Facing southwest, typical view in the southern portion of the Project Site.

Taken by: Prior Survey

Date taken: July 23, 2020

Section 5: Site Photographs



Photograph 3: Facing east, view of railroad track in the southeastern portion of the Project Site.

Taken by: Prior Survey

Date taken: July 23, 2020



Photograph 4: Facing south, typical view in the western portion of the Project Site.

Taken by: Prior Survey

Date taken: July 23, 2020



Photograph 5: View of a bioretention swale in the western portion of the Project Site. The BP groundwater treatment facility is visible in the background.

Taken by: Prior Survey

Date taken: July 23, 2020



Photograph 6: Facing southwest, typical view in the southeastern portion of the Project Site.

Taken by: Prior Survey

Date taken: July 23, 2020

Section 5: Site Photographs



Photograph 7: View of a bioretention swale in the northeastern portion of the Project Site.

Taken by: Prior Survey

Date taken: July 23, 2020



Photograph 8: Facing northwest, typical view in the northern portion of the Project Site. Two cranes atop the wharf are visible in the background.

Taken by: Prior Survey

Date taken: July 23, 2020

Section 7: Modified Compliance Statement

1.0 INTRODUCTION

This Environmental Report / Compliance Statement has been prepared for a modification to a permit issued for Phase 1 upland development of Paulsboro Marine Terminal by NJDEP Department of Land Use (0800-20-0002.1 LUP200001, Issued March 17th, 2021). The original multi-permit application submitted by Marathon Engineering & Environmental Services, Inc. ("Marathon"), on behalf of the Gloucester County Improvement Authority ("Applicant") to construct an offshore wind manufacturing facility on a portion of the Paulsboro Marine Terminal property. The proposed facility will support wind farms off the coast of New Jersey and other East coast states.

The Modification proposed project does not change the project purpose and use, location, or tax parcels utilized. The changes associated with the modification are detailed in the project plans and other documentation included with this submittal and summarized as follows:

- Reduction of the project area from 82 acres to 64.3 acres of the Paulsboro Marine Terminal property.
- Relocation and size reduction, and arrangement of buildings
- Replacement of underground stormwater detention systems and filters with bioretention systems.
- Rearrangement and resizing of pavement and open-graded gravel areas
- Elimination of a large gravel area adjacent to the wharf structure
- Removal of a large gravel area in the southeast area for inclusion in a separate Phase 2 permit, submitted separately on May 5, 2022 (LUP220001)

2.0 PROJECT DESCRIPTION

For a general description of the Phase 1 project, please refer to the materials submitted with the original Phase 1 application. For changes associated with the proposed Major Technical Modification, please refer to the cover letter, site plans, Stormwater Management Report, and other materials submitted with this modification package.

3.0 EXISTING CONDITIONS

The previously approved Phase 1 development includes two paint and blast buildings, a circumferential welding building, and a segment weld building. In addition to the buildings, Phase 1 will include parking areas, drive aisles, and open-graded gravel areas for storage of completed monopiles.

Construction of the buildings and stormwater management associated with the buildings is underway. Specific aspects of the stormwater management design have been revised in the proposed modification. However, the drainage areas and associated treatment practices (underground CMP detention systems with Contech StormFilters) for the “interior” pavement areas between the buildings remained substantively unchanged from the approved design. Runoff from the modified pavement areas, as well as a portion of the gravel areas, outside of those “interior” pavement areas will be treated by either bioretention or a manufactured treatment device (MTD) subject to approval of this modification.

Dredging of the new RoRo slip and beneficial use of dredged material as fill on PMT including Phase 1 areas is to be completed under a separate permit and scheduled to begin this summer.

Existing and proposed ground elevations on the modified Project Site range from 10.5 ft to 17 ft (NAVD 1988), with the lower elevations located within the man-made bioretention swales and the higher elevations situated atop soil stockpiles. The flatter portions of the Project Site are at elevations of 13 ft to 14 ft (NAVD 1988). The entirety of the footprint of the modified Phase 1 project site is outside the Flood Hazard Zone.

4.0 COMPLIANCE SUMMARY

The proposed project permit modification requires authorization for a Major Technical Modification from the NJDEP, Division of Land Use Regulation in the form of an Upland Waterfront Development Individual Permit.

Project elements evaluated in this report were submitted with the application materials in October, 2020 and March 2021, and are depicted on the original permit drawings reviewed and approved as part of the March 17, 2021 permit **(0800-20-0002.1 LUP200001)**

The following sections summarize the project's compliance with the applicable rules associated with these NJDEP land use approvals and are formatted to display the regulation in non- italicized text followed by the compliance statement in *italicized* text. Responses which have been changed from the original submission, as necessary to reflect the proposed changes, are shown as underlined italics.

For reference, please refer to the plan set entitled, *Paulsboro Marine Terminal, South Jersey Port Corporation, Modified Phase 1 Site Development, NJDEP Permit Plans, Borough of Paulsboro, Block 1, Lots 2, 4, 5, 8, 20-24, Block 1.07, Lot 26, Block 1.14, Lot 45, Block 135, Lot 24.01, Gloucester County, New Jersey* prepared by Jacobs Engineering, dated May 6, 2022 included with this request for Technical Modification and other application materials.

4.1 NJ Coastal Zone Management Rules (N.J.A.C. 7:7)

The Applicant is requesting Upland Waterfront Development Individual Permit authorization to construct new structures and impervious cover within the upland Waterfront Development jurisdictional area at the Project Site (i.e., within 500 ft landward of the mean high water line). The proposed development activities within the upland Waterfront Development zone are construction of gravel (DGA) storage areas and a paved roadway connected to the existing wharf. The project does not propose to construct a building in the upland Waterfront Development zone.

This project's compliance with the applicable New Jersey Coastal Zone Management Rules, as amended through October 5, 2021, is summarized in the following sections.

4.1.1 Subchapter 9: Special Areas

4.1.1.1 Purpose and Scope (7:7-9.1)

(a) Special Areas are areas that are so naturally valuable, important for human use, hazardous, sensitive to impact, or particular in their planning requirements, as to merit focused attention and special management rules. This subchapter

divides special areas into four categories:

1. Special Water Areas, as defined at N.J.A.C. 7:7-9.2 through N.J.A.C. 7:7-9.15, extend landward to the spring high water line or the level of normal flow in non-tidal waters;
2. Special Water's Edge Areas, as defined at N.J.A.C. 7:7-9.16 through N.J.A.C. 7:7-9.30, are located next to tidal and non-tidal waters;
3. Special Land Areas, as defined at N.J.A.C. 7:7-9.31 through N.J.A.C. 7:7-9.33, are generally located landward of the Special Water's Edge Areas; and,
4. Coastwide Special Areas, as defined at N.J.A.C. 7:7-9.34 through N.J.A.C. 7:7-9.47, may include Special Water Areas, Special Water's Edge Areas, or Special Land Areas.

(b) All land or water areas, except certain special water's edge areas, are subject to either the general land area rules at N.J.A.C. 7:7-13 or the general water area rules at N.J.A.C. 7:7-12. In addition, certain land or water areas are subject to one or more special area rules. All special water's edge areas are subject to one or more special area rules. In some cases, a portion of a site is subject to both general area rules and special area rules. Where the applicable general area rules and special area rules conflict, the special area rules shall govern.

The following table is a summary of the special area rules applicable to the proposed project. The project's compliance with the applicable special area rules is summarized in the following sections.

Table 2. Special Area Rules

Special Area	Regulation	Applicability	Notes
Shellfish habitat	7:7-9.2	N/A	No in-water work proposed
Surf clam areas	7:7-9.3	N/A	No in-water work proposed
Prime fishing areas	7:7-9.4	N/A	See below
Finfish migratory pathways	7:7-9.5	N/A	No in-water work proposed
Submerged vegetation habitat	7:7-9.6	N/A	No in-water work proposed
Navigation channels	7:7-9.7	N/A	No in-water work proposed
Canals	7:7-9.8	N/A	No in-water work proposed
Inlets	7:7-9.9	N/A	No in-water work proposed
Marina moorings	7:7-9.10	N/A	No in-water work proposed
Ports	7:7-9.11	Applicable	See below
Submerged infrastructure routes	7:7-9.12	N/A	No in-water work proposed
Shipwreck and artificial reef habitats	7:7-9.13	N/A	No in-water work proposed
Wet borrow pits	7:7-9.14	N/A	Not present
Intertidal and subtidal shallows	7:7-9.15	N/A	No work proposed at or below SHWL
Dunes	7:7-9.16	N/A	Not present
Overwash areas	7:7-9.17	N/A	Not present
Coastal high hazard areas	7:7-9.18	Applicable	See below
Erosion hazard areas	7:7-9.19	N/A	Not present; the adjacent shoreline of the Delaware River is protected by bulkhead
Barrier island corridor	7:7-9.20	N/A	
Bay islands	7:7-9.21	N/A	
Beaches	7:7-9.22	N/A	Not present
Filled water's edge	7:7-9.23	Applicable	See below
Existing lagoon edges	7:7-9.24	N/A	
Flood hazard areas	7:7-9.25	Applicable	See below
Riparian zones	7:7-9.26	Applicable	See below
Wetlands	7:7-9.27	N/A	Not present; see below
Wetlands buffers	7:7-9.28	N/A	Not present; see below

Special Area	Regulation	Applicability	Notes
Coastal bluffs	7:7-9.29	N/A	Not present
Intermittent stream corridors	7:7-9.30	N/A	Not present
Farmland conservation areas	7:7-9.31	N/A	Site is an existing marine terminal
Steep slopes	7:7-9.32	N/A	Not present
Dry borrow pits	7:7-9.33	N/A	Not present
Historic and archaeological resources	7:7-9.34	N/A	See below
Specimen trees	7:7-9.35	N/A	Not present
Endangered or threatened wildlife or plant species habitats	7:7-9.36	N/A	See below
Critical wildlife habitat	7:7-9.37	N/A	
Public open space	7:7-9.38	N/A	Site is an existing marine terminal
Special hazard areas	7:7-9.39	Applicable	See below
Excluded Federal lands	7:7-9.40	N/A	
Special urban areas	7:7-9.41	N/A	
Pinelands National Reserve and Pinelands Protection Area	7:7-9.42	N/A	
Meadowlands District	7:7-9.43	N/A	
Wild and scenic river corridors	7:7-9.44	N/A	
Geodetic control reference marks	7:7-9.45	N/A	See below
Hudson River waterfront area	7:7-9.46	N/A	
Atlantic City	7:7-9.47	N/A	
Lands and waters subject to public trust rights	7:7-9.48	Applicable	See below

4.1.1.2 Prime Fishing Areas (7:7-9.4)

(a) Prime fishing areas include tidal water areas and water's edge areas which have a demonstrable history of supporting a significant local intensity of recreational or commercial fishing activity. These areas include all coastal jetties, groins, public fishing piers or docks, and artificial reefs. Prime fishing areas also include features such as rock outcroppings, sand ridges or lumps, rough bottoms, aggregates such as cobblestones, coral, shell and tubeworms, slough areas and offshore canyons. Prime fishing areas also include areas

identified in “New Jersey’s Recreational and Commercial Fishing Grounds of Raritan Bay, Sandy Hook Bay and Delaware Bay and The Shellfish Resources of Raritan Bay and Sandy Hook Bay” (Figley and McCloy 1988), and those areas identified on the map entitled, “New Jersey’s Specific Sport Ocean Fishing Grounds.”

There are no prime fishing areas or designated public fishing areas on or adjacent to the Project Site. There are no fishing piers, docks, or rock outcrops at, or in the immediate vicinity of, the Project Site. Therefore, this project does not present direct or indirect impact to prime fishing areas. The Project Site includes properties that have been and are currently privately owned and used for industrial purposes; the Paulsboro Marine Terminal is not open to the public for recreational fishing purposes.

4.1.1.3 Ports (7:7-9.11)

(a) Ports are water areas having, or lying immediately adjacent to, concentrations of shoreside marine terminals and transfer facilities for the movement of waterborne cargo (including fluids), and including facilities for loading, unloading, and temporary storage.

(b) Any use which would preempt or interfere with port uses of this water area is prohibited.

The proposed project complies with this rule. The project involves an industrial use that will occupy a portion (approximately 64.3 acres as modified) of the Paulsboro Marine Terminal property. The proposed use requires port facilities to receive and export monopiles for offshore wind turbines. Prefabricated monopiles will be shipped to the proposed facility via barge from the manufacturing facility located in Germany. Once ready for installation at offshore locations, monopiles will be shipped via barge to installation locations off the coast of New Jersey. The proposed project will utilize the existing wharf at the Paulsboro Marine Terminal. This application does not request authorization for any improvement or alteration associated with the existing wharf structure.

4.1.1.4 Coastal High Hazard Areas (7:7-9.18)

(a) Coastal high hazard areas are flood prone areas subject to high velocity waters (V zones) as delineated on FEMA flood mapping, and areas within 25 feet of oceanfront shore protection structures, which are subject to wave run-up and overtopping. The coastal high hazard area extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The inland limit of the V zone is defined as the V zone boundary line as designated on FEMA flood mapping or the inland limit of the primary frontal dune, whichever is most landward.

Per the Flood Hazard Area Individual Permit approved on March 17, 2021, the flood hazard area on the site has been verified as Zone AE 9.0 feet and 10.0 feet, and Zone VE as 11.0 feet. Within the EEW lease area (Project Site), the ground surface elevations have been raised above 11.0 feet. The project as modified, and with consideration of the existing and proposed grades, the modified project is outside the limits of both the AE and VE flood zone at the Project Site are depicted on the Flood Hazard Area Permit Plans.

(b) Except as provided at N.J.A.C. 7:7-9.18(c), (d), (e), and (f), residential and commercial development is prohibited in coastal high hazard areas.

The project does not propose development within a coastal high hazard area (V zone).

4.1.1.5 Filled Water's Edge (7:7-9.23)

(a) Filled water's edge areas are existing filled water, wetland, or upland areas lying between wetlands or water areas, and either the upland limit of fill, or the first paved public road or railroad landward of the adjacent water area, whichever is closer to the water.

(b) Filled water's edge areas shall be determined through analysis of historic data including United States Department of Agriculture soil surveys, Tidelands maps, or aerial photography. Some existing or former dredged material disposal sites and excavation fill areas are filled water's edge.

(c) The "waterfront portion" is defined as a contiguous area at least equal in size to the area within 100 feet of navigable water, measured from the mean high water line. This contiguous area must be accessible to a public road and occupy at least 30 percent of its perimeter along the navigable water's edge.

According to the Natural Resources Conservation Service Web Soil Survey, the entire Project Site is underlain by the Udorthents, dredged coarse materials, 0 to 8 percent slopes (UddcB) soil map unit. According to the Soil Survey of Gloucester County, New Jersey (NRCS 1962), the majority of the Project Site is underlain by the Made land, coarse materials (Mc) map unit. Therefore, the Project Site is a filled water's edge area.

(d) On filled water's edge sites with direct water access (that is, those sites without extensive intertidal shallows or wetlands between the upland and navigable water), development shall comply with N.J.A.C. 7:7-9.23(d)1 through 3 unless it is demonstrated that a water dependent use is not feasible on the site in accordance with (e) below. Where it is determined that a water dependent use is not feasible, the site may be developed with a non-water dependent use.

The proposed project is part of the larger Paulsboro Marine Terminal property that has direct access to the Delaware River and Mantua Creek. The proposed

project complies with this rule. The project involves an industrial, water-dependent use that will occupy a portion (approximately 64.3 acres as modified) of the Paulsboro Marine Terminal property. The proposed use requires port facilities to receive and export monopiles for offshore wind turbines. Prefabricated monopiles will be shipped to the proposed facility via barge from the manufacturing facility located in Germany. Once ready for installation at offshore locations, monopiles will be shipped via barge to installation locations off the coast of New Jersey. The proposed project will utilize the existing wharf at the Paulsboro Marine Terminal.

4.1.1.6 Flood Hazard Areas (7:7-9.25)

(a) Flood hazard areas are areas subject to flooding from the flood hazard area design flood, as defined by the NJDEP under the Flood Hazard Area Control Act rules (N.J.A.C. 7:13). Flood hazard areas include those areas mapped as such by the NJDEP, areas defined or delineated as an A or a V zone by the Federal Emergency Management Agency (FEMA), and any unmapped areas subject to flooding by the flood hazard area design flood. Flood hazard areas are subject to either tidal or fluvial flooding and the extent of flood hazard areas shall be determined or calculated in accordance with the procedures at N.J.A.C. 7:13-3.

Per the Flood Hazard Area Individual Permit approved on March 17, 2021, the flood hazard area on the site has been verified as Zone AE 9.0 feet and 10.0 feet, and Zone VE as 11.0 feet. Within the EEW lease area (Project Site), the ground surface elevations have been raised above 11.0 feet. The project as modified, and with consideration of the existing and proposed grades, the modified project is outside the limits of both the AE and VE flood zone. The permit modification requires no modification to the FHA since both existing and proposed elevations within the project area are not within FHAs.

(b) In a tidal flood hazard area below the mean high water line, this section shall apply only to the following activities:

1. Development of habitable buildings; and
2. Construction of railroads, roadways, bridges and/or culverts.

The project does not propose work below the mean high water line.

(d) In an undeveloped portion of a flood hazard area that is within 100 feet of a navigable water body, development is prohibited unless the development is one or two single-family homes or duplexes in accordance with N.J.A.C. 7:7-15.2(e) or is for a water dependent use. For the purposes of this subsection, an “undeveloped” area is an area that has no impervious cover.

The project involves a water-dependent use and, therefore, complies with this rule.

(e) In a portion of an undeveloped flood hazard area that is 100 feet or farther from a navigable waterway, development is conditionally acceptable provided the development would not prevent potential water-dependent use in any portion of the flood hazard area within 100 feet of a navigable water body.

The project involves a water-dependent use and, therefore, complies with this rule. The proposed redevelopment project will not prevent the development of another potential water-dependent use within 100 ft of the Delaware River on the Paulsboro Marine Terminal property.

(f) Development in flood hazard areas shall conform with the applicable design and construction standards of the following:

1. The Flood Hazard Area Control Act (N.J.S.A. 58:16A-50 et seq.) and implementing rules at N.J.A.C. 7:13, except in lands regulated under the Wetlands Act of 1970 (N.J.S.A. 13:9A-1 et seq.), pursuant to N.J.S.A. 58:16A-60;
2. The Uniform Construction Code (N.J.A.C. 5:23); and,
3. The Federal flood reduction standards (44 C.F.R. Part 60).

The project's compliance with the New Jersey Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) is summarized in Section 4.2 of this report.

4.1.1.7 Riparian Zones (7:7-9.26)

(a) A riparian zone is the land and vegetation within and adjacent to a regulated water. A riparian zone exists along both sides of every regulated water and includes the regulated water itself, except as provided in N.J.A.C. 7:7-9.26(b). The extent of a riparian zone is determined in accordance with N.J.A.C. 7:7-9.26(c), (d), and (e).

The Delaware River is the only regulated water located within 300 ft of the Project Site. The development plans approved by the DLUR multi-permit issued for the Paulsboro Marine Terminal project on October 15, 2010 (File No. 0800-07-0003.3) depict a 50-ft riparian zone associated with the Delaware River.

The top-of-bank of the Delaware River and the associated 50-ft riparian zone are plotted on the enclosed site plans and permit plans.

(h) Development in riparian zones shall conform with the requirements of the Flood Hazard Area Control Act Rules for a permit-by-rule at N.J.A.C. 7:13-6 and 7, a general permit-by-certification at N.J.A.C. 7:13-6 and 8, a general permit at N.J.A.C. 7:13-6 and 9, or an individual permit at N.J.A.C. 7:13-10, 11, and 12, as applicable.

Construction of the proposed project requires disturbance within disturbed riparian zone that is devoid of vegetation. The riparian zone areas to be disturbed are currently covered by gravel (DGA) and used for the staging and operation of construction equipment associated with the ongoing construction of the wharf at the Paulsboro Marine Terminal. The project is compliance with the New Jersey Flood Hazard Area Control Act Rules (N.J.A.C. 7:13).

4.1.1.8 Wetlands (7:7-9.27) & Wetlands Buffers (7:7-9.28)

(a) Wetlands or wetland means an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

The Project Site does not contain freshwater wetlands under existing conditions. According to the plans approved under the 2010 DLUR permit for the Paulsboro Marine Terminal (File No. 0800-07-0003.3), there were two (2) patches of freshwater wetlands located in the southeastern portion of the Project Site, west of the existing solar facility on Lot 1 (Block 1). These patches of freshwater wetlands were eliminated in accordance with the Freshwater Wetlands Individual Permit (File No. 0800-07-0003.3 FWW10001).

The Project Site does not contain mapped coastal wetlands. Waterward of the Project Site, the waterfront portion of the Paulsboro Marine Terminal property is developed with a wharf.

4.1.1.9 Historic and Archaeological Resources (7:7-9.34)

(a) Historic and archaeological resources include objects, structures, shipwrecks, buildings, neighborhoods, districts, and man-made or man-modified features of the landscape and seascape, including historic and prehistoric archaeological sites, which either are on or are eligible for inclusion on the New Jersey or National Register of Historic Places.

(b) Development that detracts from, encroaches upon, damages, or destroys the value of historic and archaeological resources is discouraged.

(c) Development that incorporates historic and archaeological resources in sensitive adaptive reuse is encouraged.

(e) New development in undeveloped areas near historic and archaeological resources is conditionally acceptable, provided that the design of the proposed development is compatible with the appearance of the historic and archaeological resource. For archaeological resources within the area of the undertaking, avoidance and protection is appropriate. When this is not feasible

and prudent, and these resources are of value solely for the information which they contain, archaeological data recovery to mitigate the project impact will be required.

During a pre-application conference call with NJDEP staff on October 15, 2020, Jesse West-Rosenthal from the State Historic Preservation Office reported that the "HPO has no concerns in the areas where the project is proposed."

4.1.1.10 Endangered or Threatened Wildlife or Plant Species Habitats (7:7-9.36)

(a) Endangered or threatened wildlife or plant species habitats are terrestrial and aquatic (marine, estuarine, or freshwater) areas known to be inhabited on a seasonal or permanent basis by or to be critical at any stage in the life cycle of any wildlife or plant identified as "endangered" or "threatened" species on official Federal or State lists of endangered or threatened species, or under active consideration for State or Federal listing. The definition of endangered or threatened wildlife or plant species habitats includes a sufficient buffer area to ensure continued survival of the population of the species as well as areas that serve an essential role as corridors for movement of endangered or threatened wildlife. Absence of such a buffer area does not preclude an area from being endangered or threatened wildlife or plant species habitat.

According to the New Jersey Natural Heritage Database (provided as Attachment K with the original application), there is no documented occurrence of an endangered plant on the Project Site.

According to the New Jersey Natural Heritage Database (Attachment K), there is documented habitat of the following threatened or endangered species of wildlife located on the Project Site:

- *Bald eagle (foraging and nest);*
- *Osprey (foraging and nest);*
- *Atlantic sturgeon (migration corridor – juvenile sighting);*
- *Shortnose sturgeon (migration corridor – adult sighting).*

The Project Site does not contain forest or other suitable habitat for bald eagle. Waterward of the Project Site, the waterfront portion of the Paulsboro Marine Terminal property is developed with a wharf. Waterfront trees will not be disturbed as a result of this project.

The applicant is not aware of an active osprey nest on or within 500 ft of the Project Site. During a pre-application conference call with NJDEP staff on October 15, 2020, Chris Lawrence, Jacobs Engineering, reported that a formerly active osprey nest on the Paulsboro Marine Terminal property has been removed. Mr. Lawrence has been involved with the civil engineering and permitting associated with the Paulsboro Marine Terminal project since the

original DLUR permit was issued in 2010 (File No. 0800-07-0003.3).

The project does not propose any in-water work and, therefore, will not adversely affect spawning or migratory activities of Atlantic sturgeon or shortnose sturgeon.

4.1.1.11 Special Hazard Areas (7:7-9.39)

(a) Special hazard areas include areas with a known actual or potential hazard to public health, safety, and welfare, or to public or private property, such as the navigable air space around airports and seaplane landing areas, potential evacuation zones, and areas where hazardous substances as defined at N.J.S.A. 58:10-23.11b are used or disposed, including adjacent areas and areas of hazardous material contamination.

(b) Coastal development, especially residential and labor-intensive economic development, within special hazard areas is discouraged. All development within special hazard areas must include appropriate mitigating measures to protect the public health and safety.

The Paulsboro Marine Terminal property, including the Project Site, is currently undergoing remediation under the supervision of a Licensed Site Remediation Professional (Kevin Wheeler, Sovereign). A soil remedial action permit (RAP) and groundwater remedial action permit for the Paulsboro Marine Terminal

property were recently issued and became effective on August 21, 2020. In addition, Restricted Use Response Action Outcomes (RAOs) were issued for soils and site wide groundwater on September 4, 2020. The perimeter groundwater treatment system was recently shut down and post-remedial groundwater monitoring is continuing at the site in accordance with the approval RAP. The groundwater treatment system will remain ready to be re-activated should groundwater analytical results show it to be necessary. The soil RAP approved a Deed Notice with Engineering Controls. In accordance with the deed notice, a total of 18 distinct areas of the site must remain covered by a minimum of 2 ft of surficial clean soil cover or paving (concrete or asphalt) at least 0.5 ft thick. Current contaminants in site soil consist of various volatile and semi-volatile organic compounds as well as lead and arsenic. Current contaminants in groundwater consist of various volatile organic compounds.

4.1.1.12 Geodetic Control Reference Marks (7:7-9.45)

(a) Geodetic control reference marks are traverse stations and benchmarks established or used by the New Jersey Geodetic Control Survey pursuant to P.L. 1934, c.116.

(b) The disturbance of a geodetic control reference mark is discouraged. When a geodetic control reference mark must be moved, raised or lowered to accommodate construction, the New Jersey Geodetic Control Survey shall be

contacted at least 60 days prior to disturbance, and arrangements shall be made to protect the position.

According to the National Geodetic Survey Data Explorer (accessed October 2020), there is no geodetic control reference mark on or adjacent to the Project Site.

4.1.1.13 Lands and Waters Subject to Public Trust Rights (7:7-9.48)

(a) Lands and waters subject to public trust rights are tidal waterways and their shores, including both lands now or formerly below the mean high water line, and shores above the mean high water line. Tidal waterways and their shores are subject to the Public Trust Doctrine and are held in trust by the State for the benefit of all the people, allowing the public to fully enjoy these lands and waters for a variety of public uses. Public trust rights include public access which is the ability of the public to pass physically and visually to, from and along the ocean shore and other waterfronts subject to public trust rights and to use these lands and waters for activities such as navigation, fishing and recreational activities including, but not limited to, swimming, sunbathing, surfing, sport diving, bird watching, walking, and boating. Public trust rights also include the right to perpendicular and linear access.

(b) Public access to lands and waters subject to public trust rights shall be provided in accordance with the public access rule, N.J.A.C. 7:7-16.9. Development that does not comply with N.J.A.C. 7:7-16.9, Public Access, is discouraged in lands and waters subject to public trust rights.

The project is subject to this coastal rule because the adjacent watercourse, Delaware River, is tidally influenced and subject to the Public Trust Doctrine. The project's compliance with the public access rule (N.J.A.C. 7:7-16.9) is addressed in Section 4.1.6.6 of this report.

4.1.2 Subchapter 12: General Water Areas

4.1.2.1 Purpose and Scope (7:7-12.1)

(a) General water areas are all water areas which are located below either the spring high water line or the normal water level of non-tidal waters. General water areas are subject to this subchapter and to special area rules.

The project does not propose work in a tidal water or non-tidal water.

The proposed project will utilize the existing wharf at the Paulsboro Marine Terminal. This application does not request authorization for any improvement or alteration associated with the existing wharf structure.

4.1.3 Subchapter 13: Requirements for Impervious Cover and Vegetative Cover for General Land Areas and Certain Special Areas

The impervious cover and vegetative cover requirements were met as part of the NJDEP approval issued March 17th, 2021 (0800-20-0002.1 LUP200001). The activities proposed as part of this modification will result in a reduction in the areas to be disturbed and will not increase impervious cover or decrease vegetative cover over the previous approval.

4.1.4 Subchapter 14: General Location Rules

4.1.4.1 Basic Location Rule (7:7-14.2)

(a) A location may be acceptable for development under N.J.A.C. 7:7-9, 12, 13, and 14, but the NJDEP may reject or conditionally approve the proposed development of the location as reasonably necessary to:

1. Promote the public health, safety, and welfare;
2. Protect public and private property, wildlife and marine fisheries; and,
3. Preserve, protect and enhance the natural environment.

The project is consistent with the basic location rule. The proposed project is part of the larger Paulsboro Marine Terminal property that has direct access to the Delaware River and Mantua Creek. The project involves an industrial, water-dependent use that will occupy a portion (approximately 64.3 acres as modified) of the Paulsboro Marine Terminal property. The proposed use requires port facilities to receive and export monopiles for offshore wind turbines. Prefabricated monopiles will be shipped to the proposed facility via barge from the manufacturing facility located in Germany. Once ready for installation at offshore locations, monopiles will be shipped via barge to installation locations off the coast of New Jersey. The proposed project will utilize the existing wharf at the Paulsboro Marine Terminal.

The Paulsboro Marine Terminal project is a large port project that involves redevelopment of a former industrial, contaminated property. The Paulsboro Marine Terminal property, including the Project Site, is currently undergoing remediation under the supervision of a Licensed Site Remediation Professional (Kevin Wheeler, Sovereign).

4.1.4.2 Secondary Impacts (7:7-14.3)

(a) Secondary impacts are the effects of additional development likely to be constructed as a result of the approval of a particular proposal. Secondary impacts can also include traffic increases, increased recreational demand and any other offsite impacts generated by onsite activities which affect the site and surrounding region.

Coastal development that induces further development shall demonstrate, to the maximum extent practicable, that the secondary impacts of the development will satisfy this chapter (N.J.A.C. 7:7). The Department may restrict coastal development from connecting to an approved infrastructure in order to prevent adverse impacts to special areas as defined at N.J.A.C. 7:7-9 and to protect and preserve coastal resources.

The proposed use is consistent with the intended uses of the Paulsboro Marine Terminal project, which has already been approved by the NJDEP (File No. 0800-07-0003.3 WFD10001) and other agencies with jurisdiction. Site preparation activities for the Paulsboro Marine Terminal project, including filling, construction of the access roadway, construction of the wharf, and construction of other supportive infrastructure, have been completed or are ongoing.

The proposed redevelopment will not induce further development in the vicinity of the Project Site, as the area surrounding the Project Site is already developed with industrial, commercial, and residential uses.

4.1.5 Subchapter 15: Use Rules

4.1.5.1 Purpose and Scope (7:7-15.1)

Use rules are rules and conditions applicable to particular kinds of development. Use rules do not preempt location rules (N.J.A.C. 7:7-9 through 7:7-14) which restrict development, unless specifically stated. In general, conditions contained in the use rules must be satisfied in addition to the location rules (N.J.A.C. 7:7-9 through 7:7-14) and the resource rules described in N.J.A.C. 7:7-16.

4.1.5.2 Energy Facility (7:7-15.4)

(a) Energy facilities include facilities, plants or operations for the production, conversion, exploration, development, distribution, extraction, processing, or storage of energy or fossil fuels. Energy facilities also include onshore support bases and marine terminals. Energy facilities do not include operations conducted by a retail dealer, such as a gas station, which is considered a commercial development.

The project complies with the energy facility rule, as explained below.

- *The project will not cause adverse impact to a special area [7:7-15.4(b)1].*
- *The Project Site is not located in the CAFRA area, Western Ocean, Southern, Mullica Southern Ocean, Great Egg Harbor River, or Delaware Estuary regions [7:7-15.4(b)2, 7:7-15.4(b)3].*
- *The public access requirement associated with the Paulsboro Marine Terminal has been satisfied [7:7-15.4(b)4].*

- *The project will not adversely affect the quality of scenic and visual resources [7:7-15.4(b)5, 7:7-15.4(r)1.vi]. The Project Site is part of the Paulsboro Marine Terminal project, an ongoing redevelopment project. The proposed use is consistent with the intended uses of the Paulsboro Marine Terminal site.*
- *The proposed use is in support of offshore wind farms; a wind turbine is not proposed at the Project Site [7:7-15.4(r)1.vii-viii].*

4.1.5.3 Port (7:7-15.9)

(a) Port uses are concentrations of shoreside marine terminals and transfer facilities for the movement of waterborne cargo (including fluids), and including facilities for loading, unloading and temporary storage.

(b) Port-related development and marine commerce is encouraged in and adjacent to established port areas. Water-dependent development shall not be preempted by non-water dependent development in these areas.

The Project Site is part of the Paulsboro Marine Terminal project, an ongoing redevelopment project. The project involves an industrial, water-dependent use that will occupy a portion (approximately 64.3 acres as modified) of the Paulsboro Marine Terminal property. The proposed use requires port facilities to receive and export monopiles for offshore wind turbines. Prefabricated monopiles will be shipped to the proposed facility via barge from the manufacturing facility located in Germany. Once ready for installation at offshore locations, monopiles will be shipped via barge to installation locations off the coast of New Jersey. The proposed project will utilize the existing wharf at the Paulsboro Marine Terminal.

4.1.6 Subchapter 16: Resource Rules

4.1.6.1 Purpose and Scope (7:7-16.1)

In addition to satisfying the location rules (N.J.A.C. 7:7-9 through 7:7-14) and use rules (N.J.A.C. 7:7-15), a proposed development must satisfy the requirements of the resource rules (N.J.A.C. 7:7-16). Subchapter 16 contains the standards the NJDEP utilizes to analyze the proposed development in terms of its effects on various resources of the built and natural environment of the coastal zone, both at the proposed site as well as in its surrounding region.

4.1.6.2 Water Quality (7:7-16.3)

(a) As required by Section 307(f) of the Federal Coastal Zone Management Act (P.L. 92-583), Federal, State and local water quality requirements established under the Clean Water Act (33 U.S.C. 1251) shall be the water resource standards of the coastal management program. These requirements include not only the minimum requirements imposed under the Clean Water Act but also the additional requirements adopted by states, localities, and interstate agencies

pursuant to Section 510 of the Clean Water Act and such statutes as the New Jersey Water Pollution Control Act. In the Delaware River Basin, the requirements include the prevailing "Basin Regulations-Water Quality" adopted by the Delaware River Basin Commission as part of its Comprehensive Plan. In the waters under the jurisdiction of the Interstate Sanitation Commission in the New Jersey-New York metropolitan area, the requirements include the Interstate Sanitation Commission's Water Quality Regulations. NJDEP rules related to water pollution control and applicable throughout the entire coastal zone include, for example, the Surface Water Quality Standards (N.J.A.C. 7:9-4), the rules concerning Wastewater Discharge Requirements (N.J.A.C. 7:9-5), the Ground-Water Quality Standards (N.J.A.C. 7:9-6), and the Regulations Concerning the New Jersey Pollutant Discharge Elimination System (N.J.A.C. 7:14A).

(b) Coastal development which would violate the Federal Clean Water Act, or State laws, rules and regulations enacted or promulgated pursuant thereto, is prohibited. In accordance with N.J.A.C. 7:15 concerning the Water Quality Management Planning and Implementation process, coastal development that is inconsistent with an approved Water Quality Management (208) Plan under the New Jersey Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq., is prohibited.

In accordance with federal and state water quality regulations, the proposed project is designed with water quality controls, including stormwater management basins, low-impact best management practices (i.e., vegetative conveyance drainage features), offsite treatment of sanitary wastewater, and soil erosion and sediment control techniques. The following water quality-related approvals were secured for the project:

- *Water Quality Certificate from the NJDEP, Division of Land Use Regulation;*
- *Treatment Works Approval from the NJDEP, Bureau of Engineering and Permitting; and,*
- *Soil Erosion & Sediment Control Plan Certification from the Gloucester County Soil Conservation District.*

The project does not propose wastewater discharge to surface water or groundwater. Sanitary sewage to be generated by the proposed industrial development will be conveyed directly to the Gloucester County Utilities Authority wastewater treatment system via existing and proposed infrastructure. As part of the Treatment Works Approval process, the NJDEP, Bureau of Engineering and Permitting has reviewed the project for consistency with the relevant Water Quality Management Plan.

4.1.6.3 Stormwater Management (7:7-16.6)

(a) If a project or activity meets the definition of “major development” at N.J.A.C. 7:8-1.2, then the project or activity shall comply with the Stormwater Management rules at N.J.A.C. 7:8.

The overall project is considered “major development,” as defined under the New Jersey Stormwater Management Rules (N.J.A.C. 7:8-1.2), since the proposed area of disturbance is greater than 1.0 acre and the net increase of impervious cover is greater than one-quarter (1/4) acre. Therefore, the project is required to satisfy the standards for water quality established under the New Jersey Stormwater Management Rules (N.J.A.C. 7:8). This project is exempt from the runoff quantity standards at N.J.A.C. 7:8 because it affects a tidal floodplain. The project is also exempt from the groundwater recharge standards at N.J.A.C. 7:8 due to the documented soil and groundwater contamination at the Project Site.

The proposed stormwater management facilities are designed in accordance with the New Jersey Stormwater Management Regulations (N.J.A.C. 7:8), the New Jersey Stormwater Best Management Practices (“BMP”) Manual, and the New Jersey Soil Erosion and Sediment Control Standards. The engineering analysis for the proposed stormwater management system is explained in the Stormwater Management Report (Attachment L).

4.1.6.4 Vegetation (7:7-16.7)

(a) Vegetation is the plant life or total plant cover that is found on a specific area, whether indigenous or introduced by humans.

(b) Coastal development shall preserve, to the maximum extent practicable, existing vegetation within a development site. Coastal development shall plant new vegetation, particularly appropriate coastal species, native to New Jersey to the maximum extent practicable.

The vegetative cover requirements (N.J.A.C. 7:7-13.14) for the entire Paulsboro Marine Terminal site, including the Project Site, were satisfied by a combination of on-site tree and herbaceous planting/preservation and offsite tree and herbaceous planting/preservation (refer to Waterfront Development Permit No. 0800-07-0003.3 WFD10001, issued 10/15/2010). The proposed modifications will not result in any additional areas of vegetation disturbance.

4.1.6.5 Air Quality (7:7-16.8)

(a) The protection of air resources refers to the protection from air contaminants that injure human health, welfare or property, and the attainment and maintenance of State and Federal air quality goals and the prevention of degradation of current levels of air quality.

(b) Coastal development shall conform to all applicable State and Federal

regulations, standards and guidelines and be consistent with the strategies of New Jersey's State Implementation Plan (SIP).

(c)

(d) Coastal development shall be located and designed to take full advantage of existing or planned mass transportation infrastructures and shall be managed to promote mass transportation services, in accordance with the traffic rule, N.J.A.C. 7:7-16.12.

The project does not require a Title V air permit. The proposed use will involve operations (i.e., blasting, welding, metalization, and painting) that require air permits from the NJDEP, the applications for which were pending as of the date of this report/application.

The 2010 DLUR permit for the Paulsboro Marine Terminal project (File No. 0800-07-0003.3) (Attachment F in the original application) includes "air quality conditions" applicable to the entire port facility, including the Project Site.

4.1.6.6 Public Access (7:7-16.9)

(a) Public access to the waterfront is the ability of the public to pass physically and visually to, from, and along tidal waterways and their shores and to use such shores, waterfronts and waters for activities such as navigation, fishing, and recreational activities including, but not limited to, swimming, sunbathing, surfing, sport diving, bird watching, walking, and boating. Public accessways and public access areas include streets, paths, trails, walkways, easements, paper streets, dune walkovers/walkways, piers and other rights-of way. No authorization or approval under this chapter shall be deemed to relinquish public rights of access to and use of lands and waters subject to public trust rights in accordance with N.J.A.C. 7:7-9.48. Further, no authorization or approval under this chapter shall be considered a Tidelands approval or shall exempt an applicant from the obligation to obtain a Tidelands approval, if needed.

The 2010 DLUR permit for the Paulsboro Marine Terminal project (File No. 0800-07-0003.3) (provided as Attachment F in the original application) includes "public access" conditions applicable to the entire port facility, including the Project Site. The proposed project will not preclude or interfere with existing public access features.

4.1.6.7 Public Access Bill (2018)

The 2010 DLUR permit for the Paulsboro Marine Terminal project (File No. 0800-07-0003.3) (provided as Attachment F in the original application) includes "public access" conditions applicable to the entire port facility, including the Project Site. The proposed project will not preclude or interfere with existing public access features.

4.1.6.8 Scenic Resources and Design (7:7-16.10)

- (a) Scenic resources include the views of the natural and/or built landscape.
- (b) Large-scale elements of building and site design are defined as the elements that compose the developed landscape such as size, geometry, massing, height and bulk structures.
- (c) New coastal development that is visually compatible with its surroundings in terms of building and site design, and enhances scenic resources is encouraged. New coastal development that is not visually compatible with existing scenic resources in terms of large-scale elements of building and site design is discouraged.

The proposed project will not adversely affect scenic resources. The Project Site was formerly developed as a large-scale oil tank farm, including several tall aboveground storage tanks. This former industrial development was demolished sometime between 2002 and 2007.

The effects of the Paulsboro Marine Terminal project on scenic resources were evaluated as part of the 2010 Waterfront Development permit application for this project (File No. 0800-07-0003.3 WFD10001). The proposed use is consistent with the intended uses of the Paulsboro Marine Terminal project, which has already been approved by the NJDEP (File No. 0800-07-0003.3 WFD10001) and other agencies with jurisdiction. The proposed project is similar in scale to the previously approved, partially constructed redevelopment on the Project Site. The proposed project will occupy the footprint of the area identified as Bulk/Break Bulk Terminals B, C, D, E, F, and G, as identified on the 2010 Site Plan for the Paulsboro Marine Terminal. According to the 2010 Site Plan for the Paulsboro Marine Terminal, six (6) buildings and one (1) silo were proposed on the Project Site (i.e., the EEW lease area). As part of the currently proposed project, a total of six (6) buildings are proposed, including one (1) building to contain office space and a circular welding area, one (1) building for roll bending, one (1) plate welding building, one (1) building to contain blasting and painting units to apply a 3-layer epoxy paint, and two (2) segment welding buildings. The remainder of the facility will be used for storage of monopiles and ancillary equipment.

4.1.6.9 Buffers and Compatibility of Uses (7:7-16.11)

- (a) Buffers are natural or man-made areas, structures, or objects that serve to separate distinct uses or areas. Compatibility of uses is the ability for uses to exist together without aesthetic or functional conflicts.
- (b) Development shall be compatible with adjacent land uses to the maximum extent practicable.

1. Development that is likely to adversely affect adjacent areas, particularly

special areas, N.J.A.C. 7:7-9, or residential or recreation uses, is prohibited unless the impact is mitigated by an adequate buffer. The purpose, width, and type of the required buffer shall vary depending upon the type and degree of impact and the type of adjacent area to be affected by the development and shall be determined on a case-by-case basis.

As part of the 2010 Waterfront Development permit application for the Paulsboro Marine Terminal project (File No. 0800-07-0003.3 WFD10001), the NJDEP determined that the project was in compliance with this rule (7:7-16.11). The proposed use is consistent with the intended uses of the Paulsboro Marine Terminal project, which has already been approved by the NJDEP (File No. 0800-07-0003.3 WFD10001) and other agencies with jurisdiction. The proposed project is similar in scale to the previously approved, partially constructed redevelopment on the Project Site.

There is an existing wall (visual barrier) along the Project Site's entire frontage with Mantua Avenue and at the southwestern corner of the Project Site, at the intersection of Mantua Avenue and Universal Road. The purpose of this wall is to function as a visual barrier between the Project Site and offsite uses to the west and southwest, including residential and recreational.

4.1.6.10 Traffic (7:7-16.12)

- (a) Traffic is the movement of vehicles, pedestrians or ships along a route.
- (b) Coastal development shall be designed, located and operated in a manner to cause the least possible disturbance to traffic systems. Alternative means of transportation, that is, public and private mass transportation facilities and services, shall be considered and, wherever feasible, incorporated into the design and management of a proposed development, to reduce the number of individual vehicle trips generated as a result of the facility.
- (c) When the level of service of traffic systems is disturbed by approved development, the necessary design modifications or funding contribution toward an area wide traffic improvement shall be prepared and implemented in conjunction with the coastal development, to the satisfaction of the New Jersey Department of Transportation and/or any regional agencies, as applicable.
- (d) Any development that causes a location on a roadway to operate in excess of capacity Level D is discouraged. A developer shall undertake mitigation or other corrective measures as may be necessary so that the traffic levels at any affected intersection remain at capacity Level D or better. A developer may, by incorporating design modification or by contributing to the cost of traffic improvements, be able to address traffic problems resulting from the development, in which case development would be conditionally acceptable. Determinations of traffic levels which will be generated will be made by the New Jersey Department of Transportation.

As part of the 2010 Waterfront Development permit application for the Paulsboro Marine Terminal project (File No. 0800-07-0003.3 WFD10001), the NJDEP determined that the project was in compliance with this rule (7:7-16.12). The proposed use is consistent with the intended uses of the Paulsboro Marine Terminal project, which has already been approved by the NJDEP (File No. 0800-07-0003.3 WFD10001) and other agencies with jurisdiction.

The proposed project will utilize the existing wharf at the Paulsboro Marine Terminal. This application does not request authorization for any improvement or alteration associated with the existing wharf structure.

4.2 NJ Flood Hazard Area Control Act Rules (N.J.A.C. 7:13)

Within the EEW lease area, the ground surface elevations have been raised above the base flood elevations shown on the FEMA Flood Insurance Rate Maps (effective August 17, 2016), in accordance with the multi-permit issued by the DLUR on October 15, 2010 (File No. 0800-07-0003.3). No FHA permit modification is requested because the project is not within FHA areas

Section 8: Modified Stormwater Management Report

Modified Stormwater Management Report For Paulsboro Marine Terminal South Jersey Port Corporation– Phase 1 Site Development

Block 1, Lots 2, 4, 5, 8, 20-24; Block 1.07, Lot 26; Block 1.14, Lot 45; Block 135,
Lot 24.01
Borough of Paulsboro, Gloucester County, New Jersey

May 11, 2022

Prepared for:
Gloucester County Improvement Authority
109 Budd Boulevard
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Modified Stormwater Management Report For Paulsboro Marine Terminal South Jersey Port Corporation– Phase 1 Site Development

Client name: Gloucester County Improvement Authority

Project name: Phase 1 Site Development

Client reference:

Project no: L7020700

Document no: 1

Project manager: Chris Lawrence, P.E.

Revision no: 0

Prepared by: Jacobs Engineering

Date: May 11, 2022

File name: PMT-Phase1-SWMR

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
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Project Summary

The project is located on a portion of the Paulsboro Marine Terminal, at the convergence on Universal Road and Mantua Creek in the Borough of Paulsboro, Gloucester County, New Jersey. The development area is proposed to be an approximate 64.3 +/- acre lease area within the limits of the existing marine terminal property, shown on the Borough of Paulsboro Tax Maps as Block 1, Lots 2, 4, 5, 8, 20-24, Block 1.07, Lot 26, Block 1.14, Lot 45, Block 135, Lot 24.01 and owned by the Borough of Paulsboro and South Jersey Port Corporation. The stormwater management elements evaluated in this report are as depicted on the modified plan set entitled, *Paulsboro Marine Terminal, South Jersey Port Corporation, Modified Phase 1 Site Development, NJDEP Permit Plans, Borough of Paulsboro, Block 1, Lots 2, 4, 5, 8, 20-24, Block 1.07, Lot 26, Block 1.14, Lot 45, Block 135, Lot 24.01, Gloucester County, New Jersey* prepared by Jacobs Engineering, dated May 6, 2022.

Overall, the proposed facility is for the purpose of supporting the construction and maintenance of offshore wind farms off the coast of New Jersey. The project is planned in two (2) phases. Both Phase 1 and Phase 2 will occupy the western half of the Paulsboro Marine Terminal property. The Phase 1 development, which is the focus of this Stormwater Management Report, will include two paint and blast buildings, a circumferential welding building, and a segment weld building, collectively totaling 5.96 acres. In addition to the buildings, Phase 1 will include parking areas, drive aisles, and open-graded gravel areas for storage of completed monopiles.

Phase 1 was previously approved for Land Use on the basis of the plan set and supporting documentation submitted by Marathon Engineering and Environmental Services in March of 2021. Since that submission and subsequent approval, the proposed buildings have been relocated, the total area has been reduced, the amount of pavement has been reduced, and the layout of the pavement and open-graded gravel areas has been revised. The stormwater management design was also revised. However, the drainage areas and associated treatment practices (underground CMP detention systems with Contech StormFilters) for the “interior” pavement areas between the buildings remained relatively unchanged from the approved design. Runoff from the modified pavement areas, as well as a portion of the gravel areas, outside of those “interior” pavement areas will be treated by either bioretention or a manufactured treatment device (MTD).

Table 1 provides a comparison between the approved Phase 1 layout and the amended Phase 1 layout, as well as the runoff implications for the 100-year, 24-hour storm. As indicated in Table 1, the modified site design will produce less runoff than the previously approved Phase 1 layout.

Table 1 Summary of Stormwater Runoff for Phase 1

	Total Area (Ac)	Pavement	Buildings	Gravel	Open Space		
Approved Phase 1 Layout	81.98	28.84	7.95	36.73	8.46		
Amended Phase 1 Layout	64.30	24.05	5.96	29.21	5.08		
100-yr, 24-hr P (rainfall, inches)	7.77						
Approved	CN	98	98	91	80	(Assume HSG-D)	
Phase 1	S=	0.204	0.204	0.989	2.500		
Stormwater	Q (in) =	7.53	7.53	6.70	5.41		
Runoff	Runoff (CF) =	788,347	217,315	892,969	166,131	2,064,761	CF TOTAL
Amended	CN	98	98	91	80	(Assume HSG-D)	
Phase 1	S=	0.204	0.204	0.989	2.500		
Stormwater	Q (in) =	7.53	7.53	6.70	5.41		
Runoff	Runoff (CF) =	657,411	162,918	710,145	99,757	1,630,231	CF TOTAL

NJDEP approved the in-water work for the PMT RoRo Berth (0800-20-0002.1 LUP210001 on December 13, 2021) which includes the construction of mooring dolphins, dredging, and placement of dredged material within the Phase 1 and Phase 2 areas scheduled to begin July 1, 2022.

Under the previous approvals for the overall site, the site has been raised above the 100-year tidal flood elevation, and this proposed stormwater management plan has been prepared in accordance with the version of N.J.A.C. 7:8 – Stormwater Management in effect at the time of the previous approval.

Techniques of Analysis

The proposed stormwater management approach was based in part on the following documents, which were prepared as part of the prior Waterfront Development approval:

- A report titled “Appendix F – Paulsboro Marine Terminal - Stormwater Management Analysis and Approach – Issued for Permit Review” prepared by CH2M Hill, dated January 2010.
- Plan titled “Stormwater Plan”, revised October 12, 2010 (Final Revision), as included in the site plan drawing set titled “Paulsboro Marine Terminal & Access Road and Bridge – Borough of Paulsboro and Township of West Deptford”, revised October 12, 2010 (Final Revision), prepared by CH2M Hill and consisting of 37 sheets.

In addition, the stormwater management approach was designed according to the following guidance document:

- Chapter 9.1 –Bioretention Systems of the New Jersey Stormwater Best Management Practices Manual, dated February 2016.

Stormwater Design Strategy

The following is a summary of the stormwater design strategy for this project:

Water Quantity: The site is exempt from the Water Quantity standard since the stormwater discharges to the Delaware River, which is a tidal waterway.

Groundwater Recharge: The site is exempt from the Groundwater Recharge standard since the site is currently undergoing soil/groundwater remediation. It is also exempt since the site is a previously disturbed area in an urban redevelopment area (i.e., in a Planning Area 1 region).

Water Quality: Most of the proposed paved surfaces are to be treated for a minimum of 80% TSS removal via several bioretention systems. In addition, there is an area of proposed pavement that will be treated by a Peak Diversion StormFilter.

Non-Structural Strategies

Non-structural strategies need to be incorporated into the stormwater management design for all projects that are deemed a “major development.” The following is a description of the required non-structural measures and how they were either incorporated into the site and stormwater management design or else were considered not applicable:

1. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.

- a. Not applicable. The site was previously designed to have 90% impervious coverage. The proposed use will be an industrial use. The site has historically been used as an industrial use.
2. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.
 - a. Not applicable. The majority of the Phase 1 site will be comprised of buildings and pavement. However, the use of open graded aggregate has been maximized in the updated design layout to minimize the amount of paved surfaces and several bioretention systems are proposed at the perimeter of the site to receive and treat runoff.
3. Maximize the protection of natural drainage features and vegetation.
 - a. Not applicable. The site was previously designed to have 90% impervious coverage. The proposed use will be an industrial use. The site has historically been used as an industrial use.
4. Minimize the decrease in the time of concentration from pre-construction to post-construction.
 - a. Not applicable. The majority of the Phase 1 site will be comprised of buildings and pavement. However, the use of open graded aggregate has been maximized in the updated design layout to minimize the amount of paved surfaces.
5. Minimize land disturbance including clearing and grading.
 - a. Not applicable. The site was previously designed to have 90% impervious coverage. The proposed use will be an industrial use. The site has historically been used as an industrial use.
6. Minimize soil compaction.
 - a. Not applicable. The site was previously designed to have 90% impervious coverage. The proposed use will be an industrial use. The site has historically been used as an industrial use.
7. Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.
 - a. Not applicable - the proposed use will be an industrial use. The site was previously designed to have 90% impervious coverage. However, the proposed bioretention systems will be landscaped with native and low maintenance vegetation.
8. Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.
 - a. Bioretention systems are proposed.

9. Provide preventative source controls.

- a. All storm inlet grates are Bicycle Safe "Eco" grates to mini, and a detail is provided on the Storm Sewer Detail Sheet.

Storm Sewer

Storm sewer structures were designed to sustain a minimum of 18 inches of cover over all stormwater pipes, regardless of material type and land cover. Regarding slopes, a minimum of 0.20% was utilized for the hydraulic benefit of the drainage system. Additionally, a minimum of 15" diameter piping was assumed.

The storm sewer design assumed a drainage area breakdown into sub catchments according to the proposed drainage areas in Table 2. Due to the proposed bioretention systems, the proposed design will not have an adverse impact on the existing storm sewers. Additionally, the proposed drainage areas follow the existing design drainage areas to the maximum extent possible.

Overall, the system was designed to convey the 25-year, 24-hour storm event without flooding, however any storm higher than the Water Quality Flow event was diverted into the existing stormwater systems. Diversion structures have outlet pipes that convey the WQF to the proposed bioretention systems, and larger pipes at inverts above the WQF water surface level.

Modeling Methodology for Bioretention Systems

In order to appropriately size the various bioretention systems proposed for Phase 1, the Natural Resources Conservation Service Technical Release 55 (TR-55) method was used in calculating site runoff rates and volumes for various storm events utilizing the SCS Unit Hydrograph. These calculations have been performed within the HydroCAD stormwater modeling software by Software Solutions, LLC. Due to the developed condition of the site, a minimum time of concentration (TC) of 0.1 hours was assigned to all drainage areas.

Curve numbers (CN) were generated for the drainage areas based on the NRCS Web Soil Survey hydrologic soil group and proposed land use cover. The CN calculations can be found in the appendix for each of the respective routings. Impervious areas and pervious areas connected to the bioretention systems via storm sewers were calculated as separate subareas to generate hydrographs without weighted CNs, as outlined in Chapter 5 of the New Jersey Stormwater Best Management Practices Manual, dated March 2021.

Rainfall data was obtained for Paulsboro, New Jersey as determined by the NOAA Atlas 14, Volume 2, Version 3, Online Point Precipitation Frequency Estimates, (Latitude: 39.8481o, Longitude: -75.2337o). These rainfall results from NOAA are included in the appendix of this report for reference. Stormwater routing calculations utilize a 24-hour, Type C rainfall distribution. The full NOAA Atlas 14 data is summarized below:

- 25-year rainfall depth = 5.88 inches (for a 24-hour rainfall event)

- 100-year rainfall depth = 7.77 inches (for a 24-hour rainfall event)
- 25-year rainfall intensity = 5.72 in/hr (for a 10-min TC)

Modeling Methodology for Storm Sewer Systems

The storm sewer system was modeled using a combination of HydroCAD and one-dimensional (1D)/two-dimensional (2D) Personal Computer Stormwater Management Methods (PCSWMM; [CHI, n.d.]) software. The proposed storm sewer was designed to convey the both the Water Quality Flow and 25-year, 24-hour storm event efficiently. Runoff rates were determined utilizing total rainfall amounts from NOAA for Paulsboro, New Jersey. The water quality flow storm event, 1.25 inches over 2 hours, was sourced from the New Jersey Stormwater Best Management Practices Manual, *Chapter 5*. Time of concentrations were calculated based on longest flow path in the design for all developed drainage areas that directly connect to proposed storm sewer.

Additionally, a tailwater condition of 5.10' NAVD88 was set at the outfall of the existing stormwater main stormwater line that proposed drainage structures tie into. Outfalling into the Delaware River, the tailwater condition is based off the "minor" flood stage in this reach of the river. According to the FEMA and the NWS, this stage level is one in which there is minimal or no property damage yet possibly some public threat. Appendix B contains a printout of the nearest Delaware River stage gauge, detailing the varying flood stages in this area. Regarding the proposed systems that outfall into the small scale bioretention systems, a free water surface elevation boundary condition was assumed.

Proposed Drainage Areas

The proposed bioretention system drainage areas for Phase 1 are summarized in Table 2. Approximately 5.37 acres of pavement area was not included in this evaluation as it was located in an area of the site that was not modified and that already has an approved stormwater treatment design consisting of underground CMP storage systems with StormFilters (as depicted on March 2021 Marathon plans).

Table 2 Bioretention System Drainage Area Summary

ID	Total Area (ac)	Pavement Area (ac)	Non-Pavement Area (Gravel) (ac)	Non-Pavement Area (Bioretention/Grass) (ac)	Treatment Strategy
DA-1	10.84	4.68	5.70	0.46	Bio. System #1
DA-2A	1.55	1.55	0.00	0.00	Bio. System #2A/B/C
DA-2B	9.34	3.77	4.03	1.54	Bio. System #2A/B/C
DA-2C	10.44	7.28	3.16	0.00	Bio. System #2A/B/C
DA-3	1.41	0.64	0.62	0.14	Bio. System #3
DA-4	0.99	0.76	0.00	0.22	Bio. System #4
<i>Total</i>	<i>34.56</i>	<i>18.68</i>	<i>13.51</i>	<i>2.36</i>	

Note that building areas are conveyed separately to the existing storm sewers. No water quality treatment is required for those areas.

The configuration of the drainage areas with respect to their treatment systems can be found in the hydraulic model (HydroCAD) report (Appendix A) and are depicted on the drainage area map located in Appendix C.

In addition to the bioretention systems, one area of pavement will be treated by a Peak Diversion StormFilter, which is an NJCAT-approved MTD. The StormFilter will consist of 66 cartridges (27-inch) placed in two 8'x22' precast vaults and will treat approximately 1.05 acres of impervious area. The StormFilter will need to be modified with non-standard concrete thicknesses (16" top slab, 10" walls, 14" base slab) in order to accommodate the heavy loading anticipated at the site.

As indicated on the drainage area map, there are several small areas of pavement that are not treated by either bioretention or an MTD. (Note: one of these areas is a portion of the northern 100' wide access drive connected to the port. The grading and drainage of this portion was designed to match the existing conditions, in which this portion drains toward the port.) However, these areas are more than offset by the 13.51 acres of gravel area that will be treated by bioretention systems even though they are not required to be treated. It should also be noted that most of these small untreated pavement areas will drain toward the open-graded gravel areas prior to draining to an inlet.

Water Quality Strategy

In accordance with N.J.A.C. 7:8-5.5, the water quality regulations require the removal of 80% of TSS from runoff associated with paved surfaces generated by the water quality design storm (defined as 1.25 inches of rainfall over 2 hours). For areas that are to be treated by bioretention systems with underdrains, the maximum storage depth is one foot and the underdrain has to be sized so that the storage volume can be drained within 72 hours.

Phase 1 will receive water quality via bioretention systems with underdrains. As summarized in Table 2, 18.68 acres of paved surfaces areas will be directed to the bioretention systems, which have been designed in accordance with the New Jersey Stormwater Best Management Practices Manual, dated February 2016. These bioretention systems will have underdrains and provide 80% TSS removal by consisting of the following components: 24" soil bed (with 20% void space), 6" of sand (with 37.5% void space), and 12-26.4" of gravel (with 40% void space; 26.4" for Bioretention System #1; 18" for #2; 12" for #3 and #4) with a 4-6" underdrain (6" for Bioretention Systems #1, #2, and #3; 4" for #4) 3" above the bottom of the gravel layer. Each bioretention system will also have 3:1 side slopes and one or more 3' x 3' outlet control structures with a 4-6" underdrain opening. As summarized in Table 3, the proposed bioretention systems provide sufficient volume to completely filter runoff from the water quality design storm, completely contain up to the 100-year storm without overtopping (Bioretention Systems #3 and #4), and completely draindown in less than 72 hours.

Table 3 Bioretention Systems Design Summary

	Surface Elev.	Outlet Control Structure Grate Elev.	Water Quality Design Storm (1.25 inches in 2 hrs) W.S.E.	Top of Storage Elev.	100-year, 24- hour W.S.E.	Draindown Duration (hrs)
Bio. System #1	8.00	9.00	9.04	12.00	N/A	36 (WQ storm)
Bio. System #2	6.00	7.00	6.91	11.00	N/A	72 (WQ storm)
Bio. System #3	11.00	11.50	8.96	12.00	11.95	48 (100-yr, 24-hr storm)
Bio. System #4	11.00	12.00	8.91	13.00	12.20	56 (100-yr, 24-hr storm)

Note: Bioretention System #2 consists of three hydraulically connected bioretention systems (#2A, #2B, and #2C).

As depicted on the stormwater management plans, strategically placed diversion structures are proposed to direct runoff from the water quality storm into Bioretention Systems #1 and #2. Runoff from storms exceeding the water quality storm will be diverted into separate storm pipes that ultimately drain into the existing storm pipes on site. Bioretention Systems #3 and #4 will receive runoff via sheet flow from their respective (relatively smaller) drainage areas and thus will not have diversion structures. Thus, only Bioretention Systems #3 and #4 were modeled up to the 100-year, 24-hour storm in HydroCAD.

The proposed Peak Diversion StormFilter has been sized to treat approximately 1.05 acres of impervious area. The water quality flow rate from that area is 3.27 cfs, while the 100-year flow rate is 9.38 cfs.

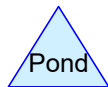
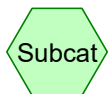
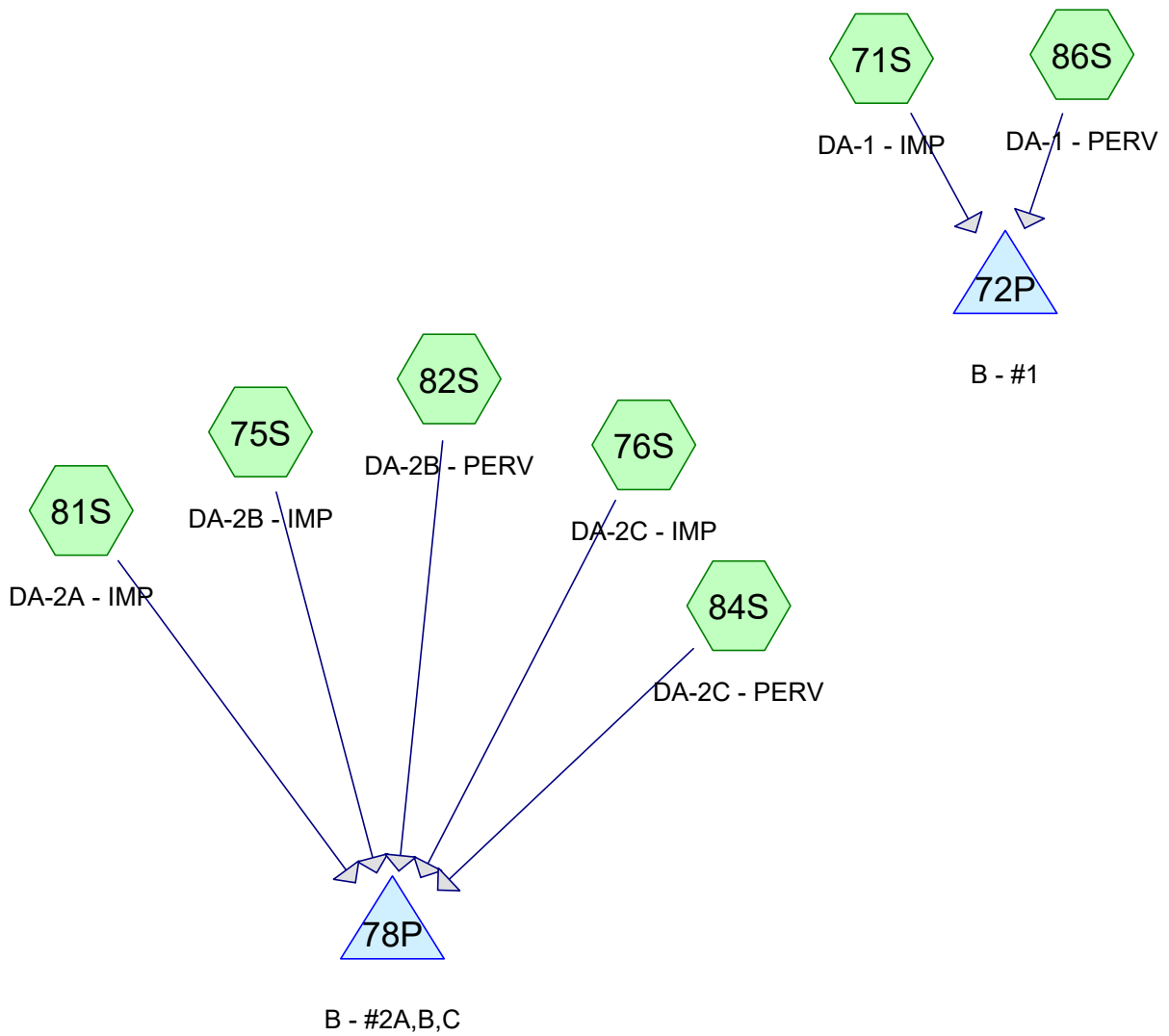
Storm Sewer Summary

Overall, the proposed stormwater design displayed no surcharges at any junctions while conveying the WQF and diverting the 25-year, 24-hour storm event. Hydraulic and storm routing calculation results and layout map can be found in Appendix B.

Design Summary

The proposed stormwater management design for Phase 1 of the proposed monopile manufacturing facility has been designed in accordance with the State stormwater regulations (N.J.A.C. 7:8) and the New Jersey Stormwater Best Management Practices Manual, dated February 2016, and is consistent with the prior NJDEP approval in regard to Water Quantity, Water Quality, Groundwater Recharge, Low Impact Development, and storm sewer capacity.

Appendix A. HydroCAD Output Report



EEW00101-PMT-Jacobs-Phase 1

Prepared by Jacobs

Printed 5/6/2022

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Page 2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
17.280	98	(71S, 75S, 76S, 81S)
1.997	80	>75% Grass cover, Good, HSG D (82S, 86S)
12.889	89	Gravel (82S, 84S, 86S)
32.166	93	TOTAL AREA

EEW00101-PMT-Jacobs-Phase 1

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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	
1.997	HSG D	82S, 86S
30.169	Other	71S, 75S, 76S, 81S, 82S, 84S, 86S
32.166		TOTAL AREA

EEW00101-PMT-Jacobs-Phase 1

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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	17.280	17.280		71S, 75S, 76S, 81S
0.000	0.000	0.000	1.997	0.000	1.997	>75% Grass cover, Good	82S, 86S
0.000	0.000	0.000	0.000	12.889	12.889	Gravel	82S, 84S, 86S
0.000	0.000	0.000	1.997	30.169	32.166	TOTAL AREA	

EEW00101-PMT-Jacobs-Phase 1

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	72P	3.30	2.78	104.0	0.0050	0.013	18.0	0.0	0.0
2	78P	2.00	1.90	20.0	0.0050	0.013	18.0	0.0	0.0

EEW00101-PMT-Jacobs-Phase 1

NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment71S: DA-1 - IMP	Runoff Area=203,861 sf 100.00% Impervious Runoff Depth=1.03" Tc=6.0 min CN=98 Runoff=13.70 cfs 0.403 af
Subcatchment75S: DA-2B - IMP	Runoff Area=164,221 sf 100.00% Impervious Runoff Depth=1.03" Tc=6.0 min CN=98 Runoff=11.04 cfs 0.325 af
Subcatchment76S: DA-2C - IMP	Runoff Area=317,117 sf 100.00% Impervious Runoff Depth=1.03" Tc=6.0 min CN=98 Runoff=21.31 cfs 0.628 af
Subcatchment81S: DA-2A - IMP	Runoff Area=67,518 sf 100.00% Impervious Runoff Depth=1.03" Tc=6.0 min CN=98 Runoff=4.54 cfs 0.134 af
Subcatchment82S: DA-2B - PERV	Runoff Area=242,629 sf 0.00% Impervious Runoff Depth=0.37" Tc=6.0 min CN=WQ Runoff=6.47 cfs 0.173 af
Subcatchment84S: DA-2C - PERV	Runoff Area=137,650 sf 0.00% Impervious Runoff Depth=0.45" Tc=6.0 min CN=89 Runoff=4.50 cfs 0.118 af
Subcatchment86S: DA-1 - PERV	Runoff Area=268,150 sf 0.00% Impervious Runoff Depth=0.43" Tc=6.0 min CN=WQ Runoff=8.33 cfs 0.220 af
Pond 72P: B - #1	Peak Elev=9.04' Storage=0.466 af Inflow=21.89 cfs 0.623 af Outflow=2.41 cfs 0.594 af
Pond 78P: B - #2A,B,C	Peak Elev=6.91' Storage=1.224 af Inflow=47.54 cfs 1.378 af Outflow=1.98 cfs 1.244 af

Total Runoff Area = 32.166 ac Runoff Volume = 2.001 af Average Runoff Depth = 0.75"
46.28% Pervious = 14.886 ac 53.72% Impervious = 17.280 ac

Summary for Subcatchment 71S: DA-1 - IMP

Runoff = 13.70 cfs @ 1.11 hrs, Volume= 0.403 af, Depth= 1.03"

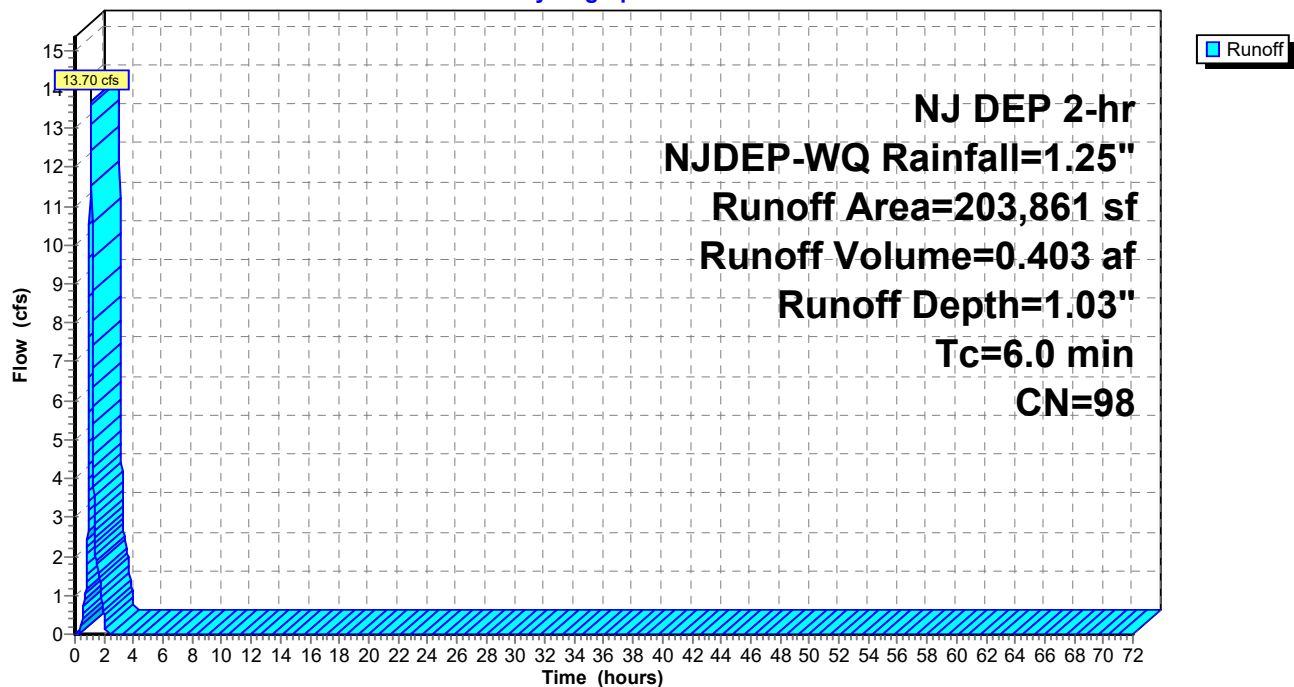
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
* 203,861	98	
203,861		100.00% Impervious Area

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

Subcatchment 71S: DA-1 - IMP

Hydrograph



Summary for Subcatchment 75S: DA-2B - IMP

Runoff = 11.04 cfs @ 1.11 hrs, Volume= 0.325 af, Depth= 1.03"

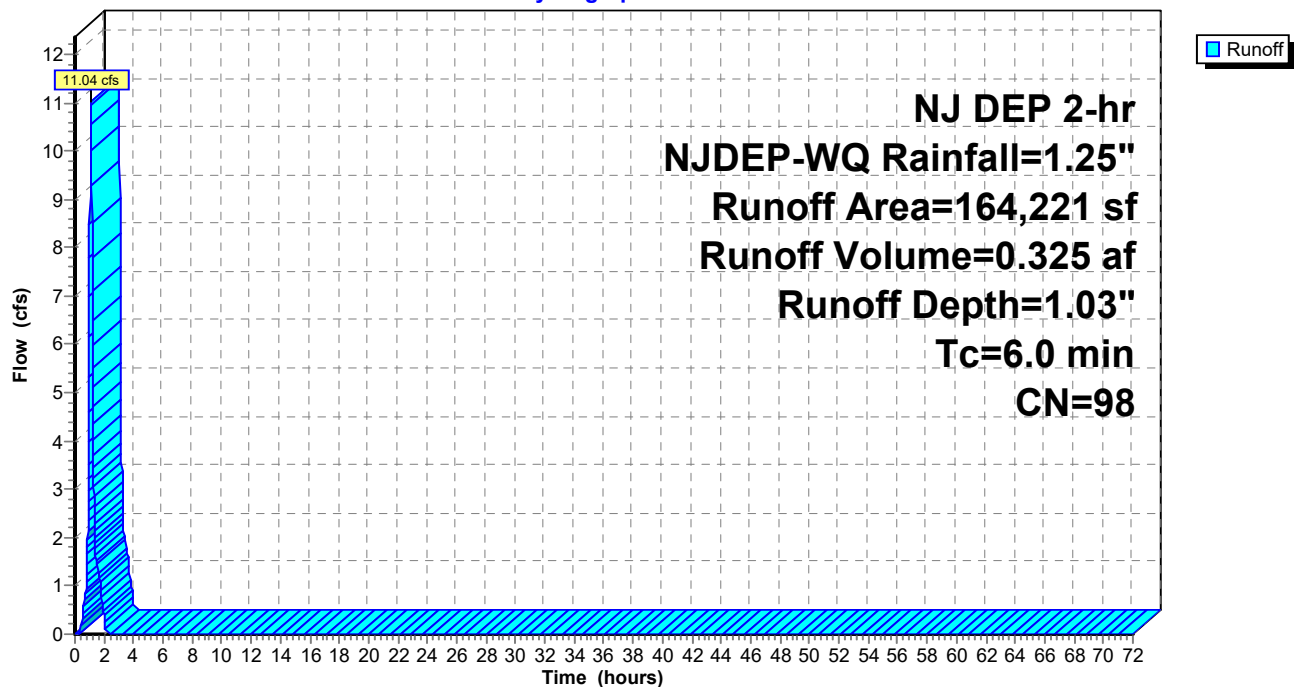
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
* 164,221	98	
164,221		100.00% Impervious Area

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

Subcatchment 75S: DA-2B - IMP

Hydrograph



Summary for Subcatchment 76S: DA-2C - IMP

Runoff = 21.31 cfs @ 1.11 hrs, Volume= 0.628 af, Depth= 1.03"

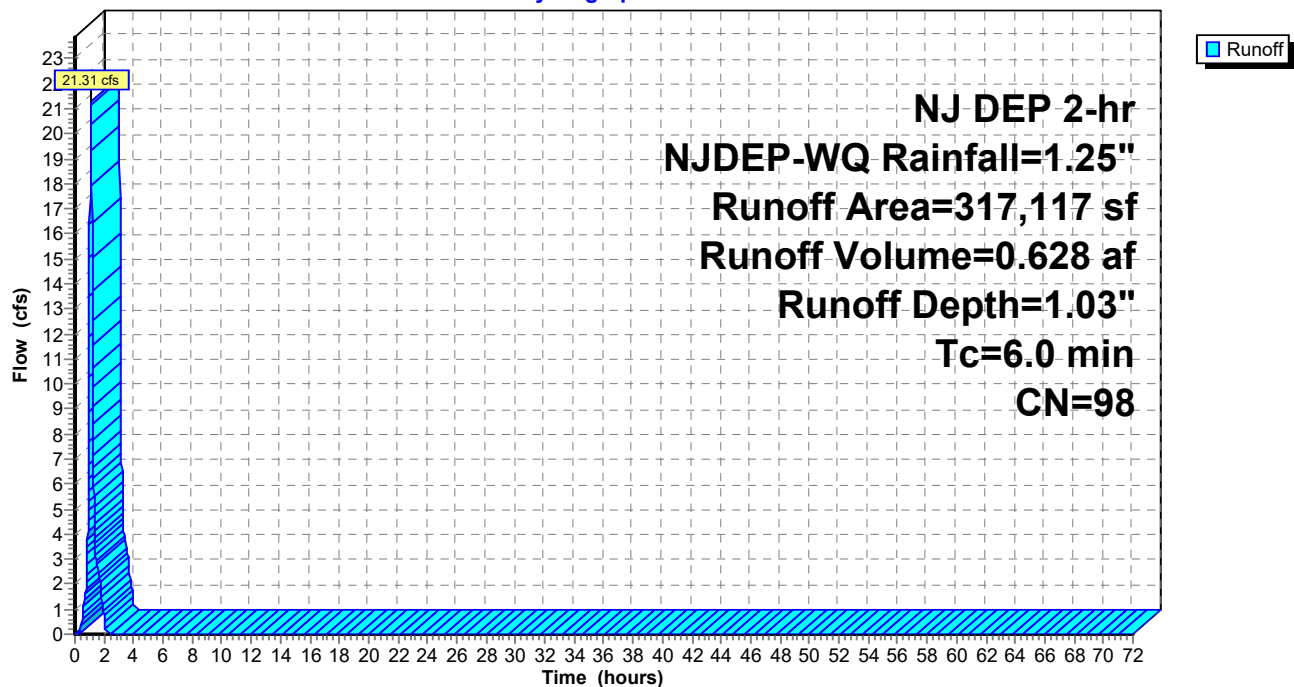
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
* 317,117	98	
317,117		100.00% Impervious Area

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

Subcatchment 76S: DA-2C - IMP

Hydrograph



Summary for Subcatchment 81S: DA-2A - IMP

Runoff = 4.54 cfs @ 1.11 hrs, Volume= 0.134 af, Depth= 1.03"

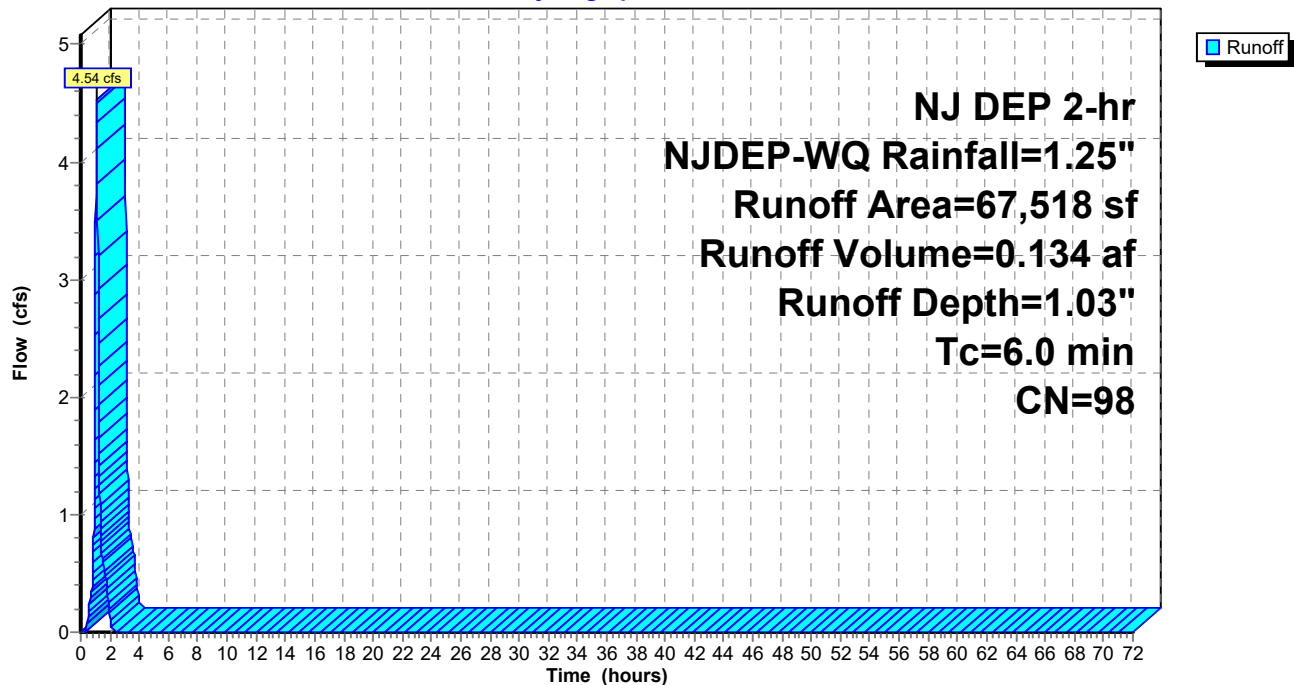
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
* 67,518	98	
67,518		100.00% Impervious Area

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

Subcatchment 81S: DA-2A - IMP

Hydrograph



Summary for Subcatchment 82S: DA-2B - PERV

Runoff = 6.47 cfs @ 1.13 hrs, Volume= 0.173 af, Depth= 0.37"

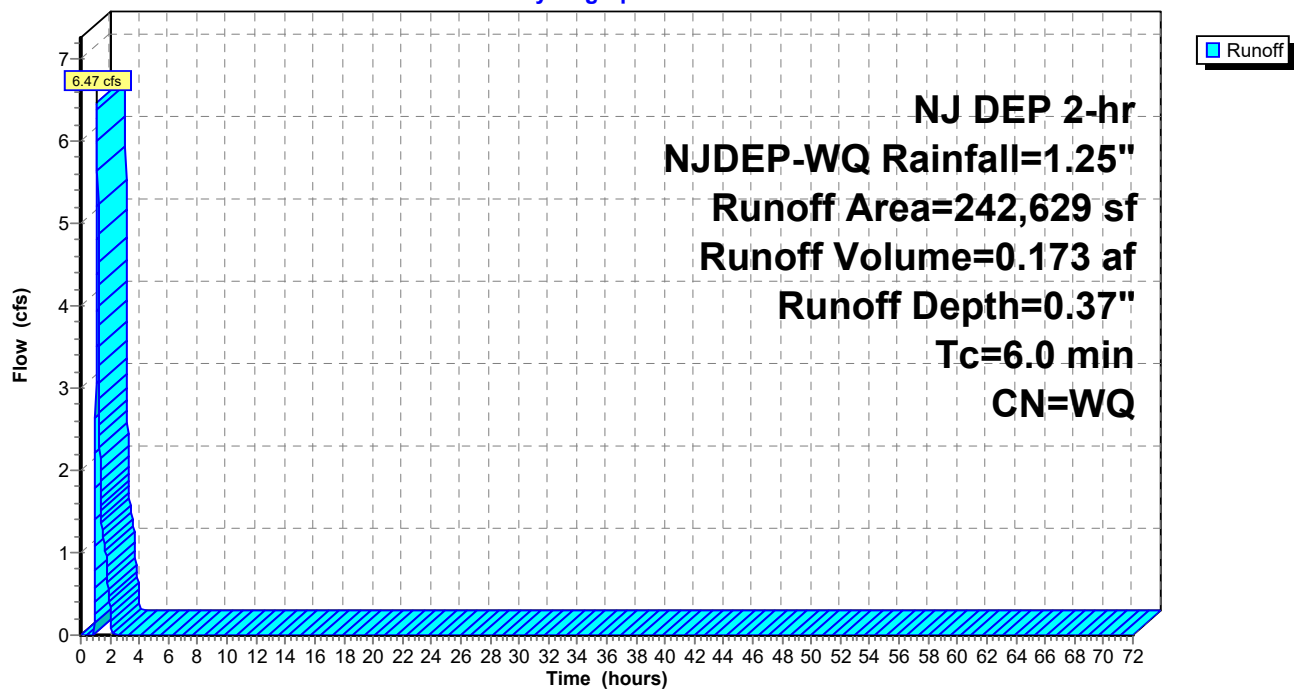
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

	Area (sf)	CN	Description
*	175,507	89	Gravel
	67,122	80	>75% Grass cover, Good, HSG D
	242,629		Weighted Average
	242,629		100.00% Pervious Area

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

Subcatchment 82S: DA-2B - PERV

Hydrograph



Summary for Subcatchment 84S: DA-2C - PERV

Runoff = 4.50 cfs @ 1.12 hrs, Volume= 0.118 af, Depth= 0.45"

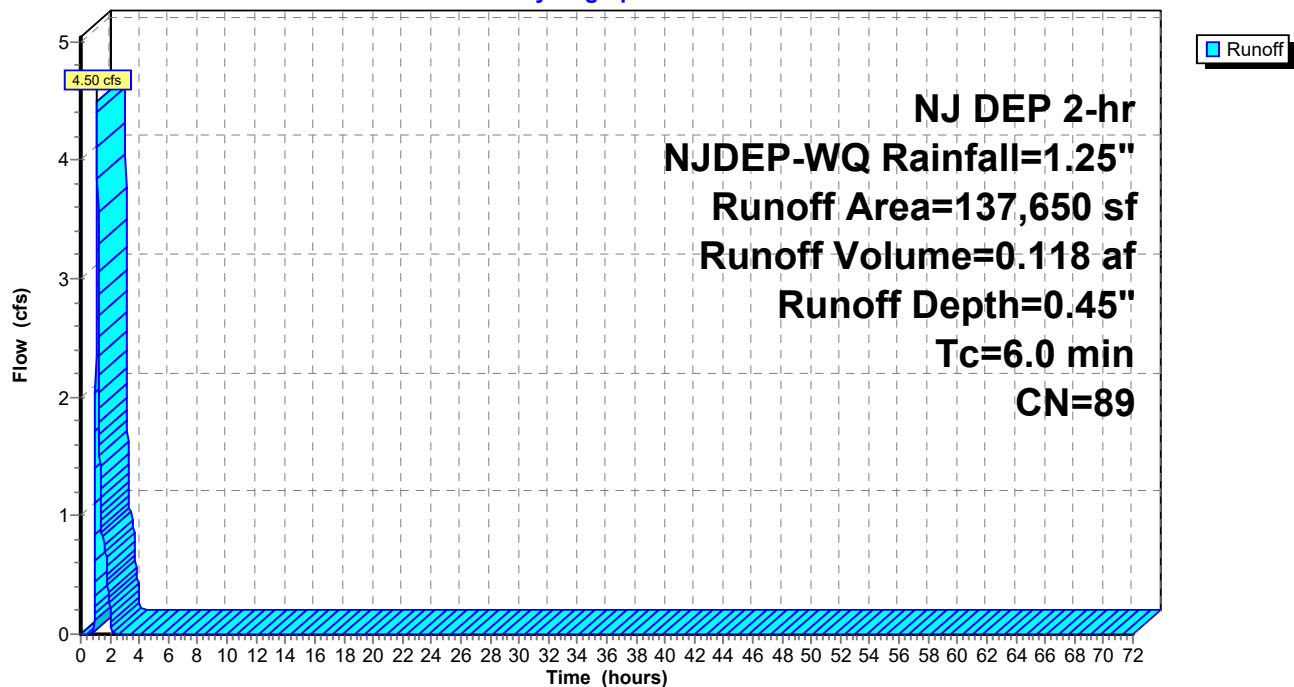
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

	Area (sf)	CN	Description
*	137,650	89	Gravel
	137,650		100.00% Pervious Area

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

Subcatchment 84S: DA-2C - PERV

Hydrograph



Summary for Subcatchment 86S: DA-1 - PERV

Runoff = 8.33 cfs @ 1.12 hrs, Volume= 0.220 af, Depth= 0.43"

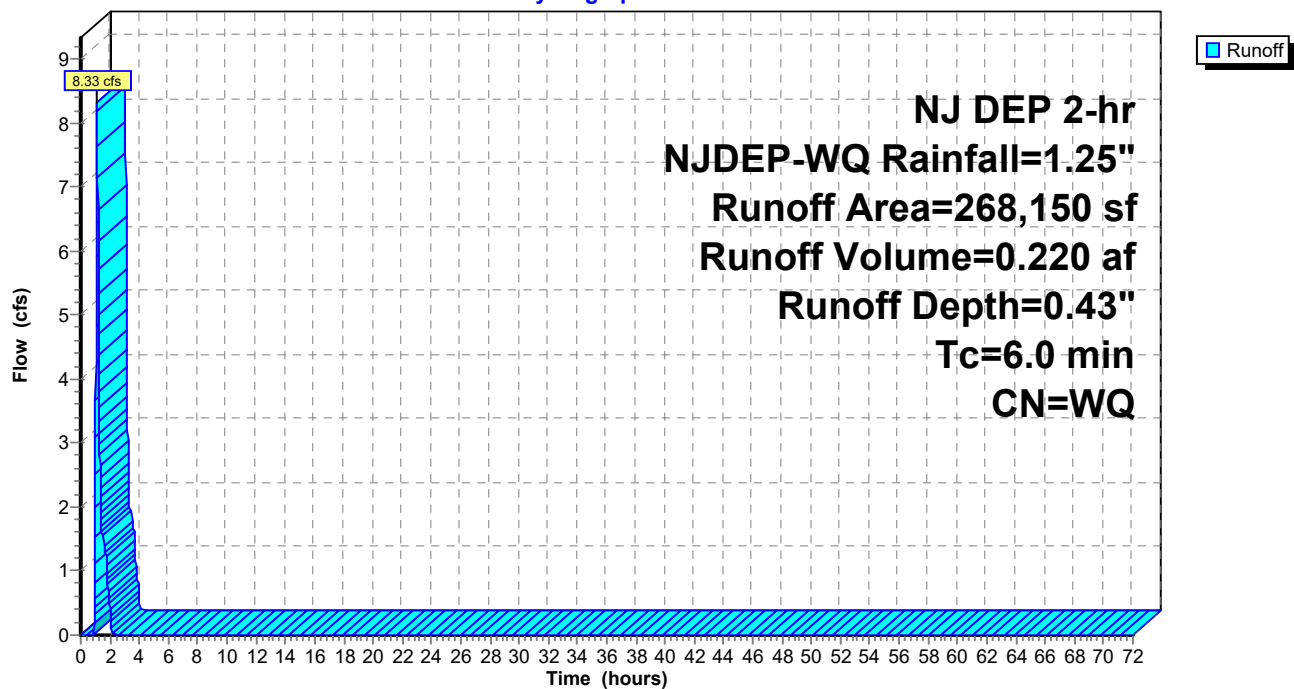
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
19,858	80	>75% Grass cover, Good, HSG D
* 248,292	89	Gravel
268,150		Weighted Average
268,150		100.00% Pervious Area

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

Subcatchment 86S: DA-1 - PERV

Hydrograph



Summary for Pond 72P: B - #1

Inflow Area = 10.836 ac, 43.19% Impervious, Inflow Depth = 0.69" for NJDEP-WQ event
 Inflow = 21.89 cfs @ 1.12 hrs, Volume= 0.623 af
 Outflow = 2.41 cfs @ 1.80 hrs, Volume= 0.594 af, Atten= 89%, Lag= 40.9 min
 Primary = 2.41 cfs @ 1.80 hrs, Volume= 0.594 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 9.04' @ 1.80 hrs Surf.Area= 0.682 ac Storage= 0.466 af

Plug-Flow detention time= 132.9 min calculated for 0.594 af (95% of inflow)
 Center-of-Mass det. time= 130.8 min (203.6 - 72.8)

Volume	Invert	Avail.Storage	Storage Description
#1	3.30'	0.249 af	111.00'W x 111.00'L x 2.20'H Gravel (extends to below elev 10) 0.622 af Overall x 40.0% Voids
#2	5.50'	0.024 af	74.00'W x 74.00'L x 0.50'H Sand 0.063 af Overall x 37.5% Voids
#3	6.00'	0.050 af	74.00'W x 74.00'L x 2.00'H Soil 0.251 af Overall x 20.0% Voids
#4	8.00'	0.684 af	74.00'W x 74.00'L x 4.00'H Surface Z=3.0
		1.006 af	Total Available Storage

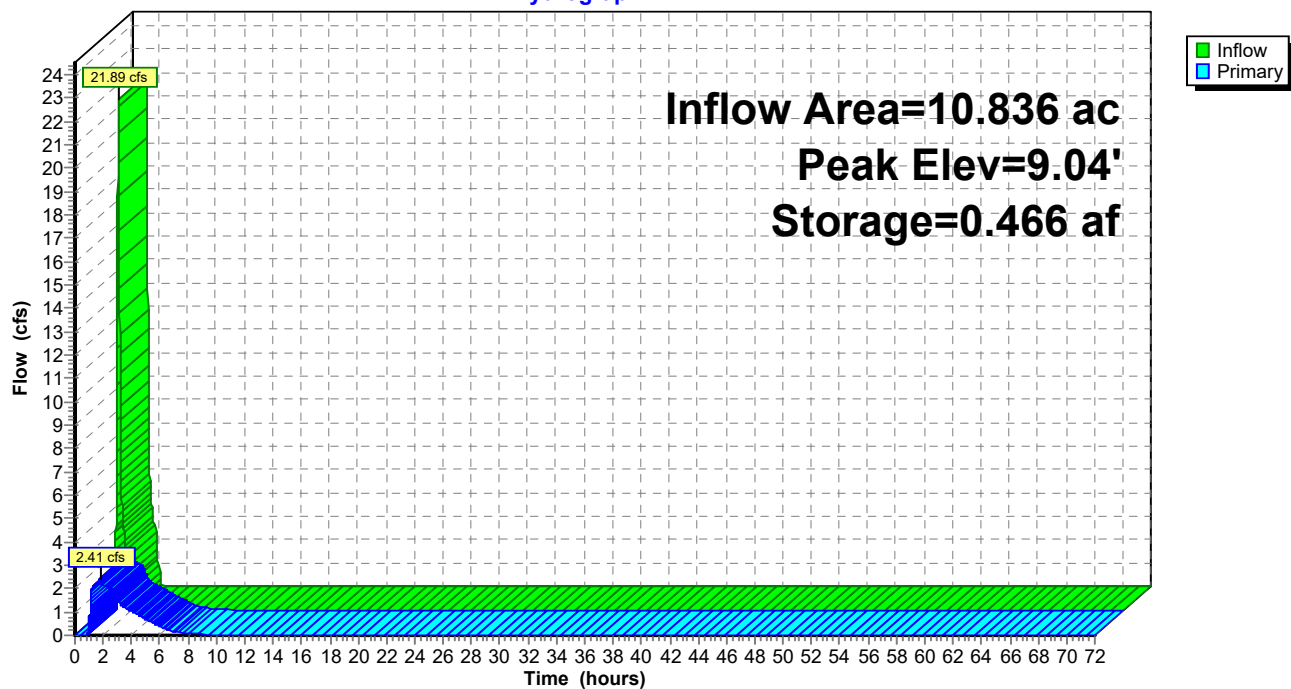
Device	Routing	Invert	Outlet Devices
#1	Device 2	9.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	3.30'	18.0" Round Culvert L= 104.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 3.30' / 2.78' S= 0.0050 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Device 2	3.55'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.41 cfs @ 1.80 hrs HW=9.04' (Free Discharge)

↑ **2=Culvert** (Passes 2.41 cfs of 16.78 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 0.24 cfs @ 0.69 fps)
 ↑ **3=Orifice/Grate** (Orifice Controls 2.17 cfs @ 11.03 fps)

Pond 72P: B - #1

Hydrograph



Summary for Pond 78P: B - #2A,B,C

Inflow Area = 21.330 ac, 59.07% Impervious, Inflow Depth = 0.78" for NJDEP-WQ event
 Inflow = 47.54 cfs @ 1.11 hrs, Volume= 1.378 af
 Outflow = 1.98 cfs @ 1.93 hrs, Volume= 1.244 af, Atten= 96%, Lag= 49.1 min
 Primary = 1.98 cfs @ 1.93 hrs, Volume= 1.244 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 6.91' @ 1.93 hrs Surf.Area= 2.216 ac Storage= 1.224 af

Plug-Flow detention time= 406.8 min calculated for 1.244 af (90% of inflow)
 Center-of-Mass det. time= 403.4 min (475.3 - 71.9)

Volume	Invert	Avail.Storage	Storage Description
#1	2.00'	0.716 af	228.00'W x 228.00'L x 1.50'H Gravel (extends to below elev 10) 1.790 af Overall x 40.0% Voids
#2	3.50'	0.062 af	120.00'W x 120.00'L x 0.50'H Sand 0.165 af Overall x 37.5% Voids
#3	4.00'	0.132 af	120.00'W x 120.00'L x 2.00'H Soil 0.661 af Overall x 20.0% Voids
#4	6.00'	2.101 af	120.00'W x 120.00'L x 5.00'H Surface Z=3.0
		3.011 af	Total Available Storage

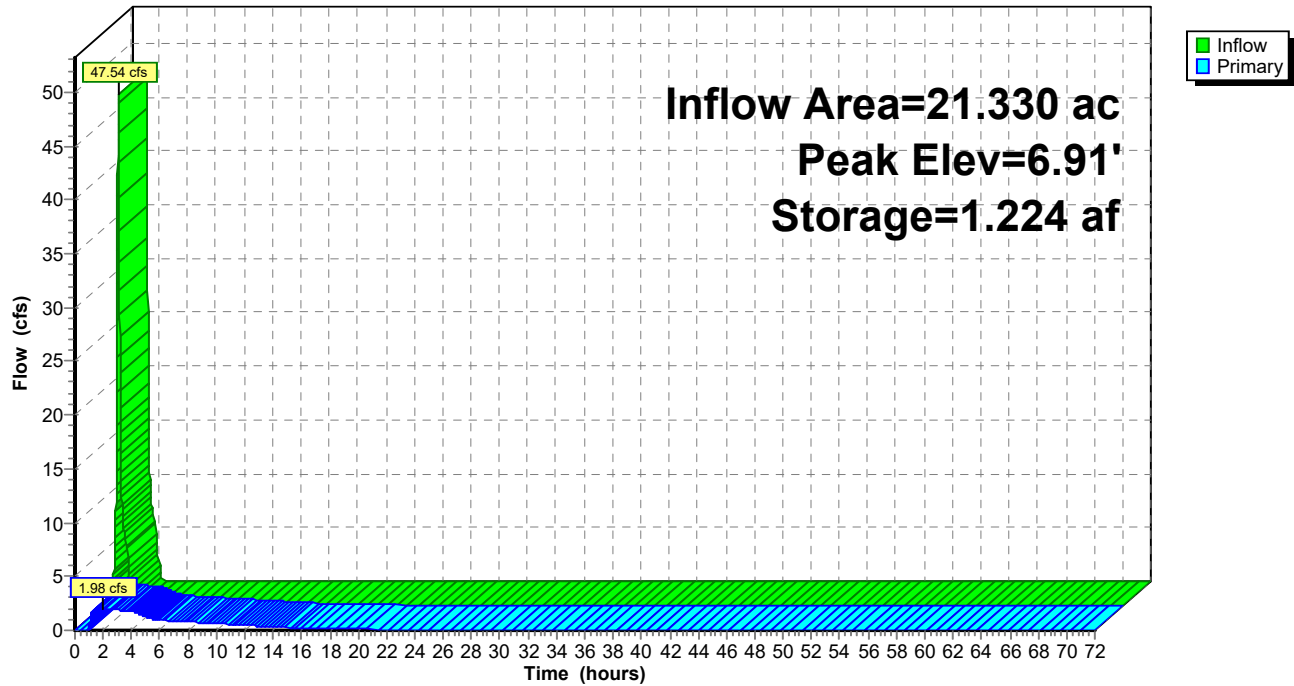
Device	Routing	Invert	Outlet Devices
#1	Device 2	7.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	2.00'	18.0" Round Culvert L= 20.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2.00' / 1.90' S= 0.0050 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Device 2	2.25'	6.0" Vert. Orifice/Grate C= 0.600

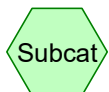
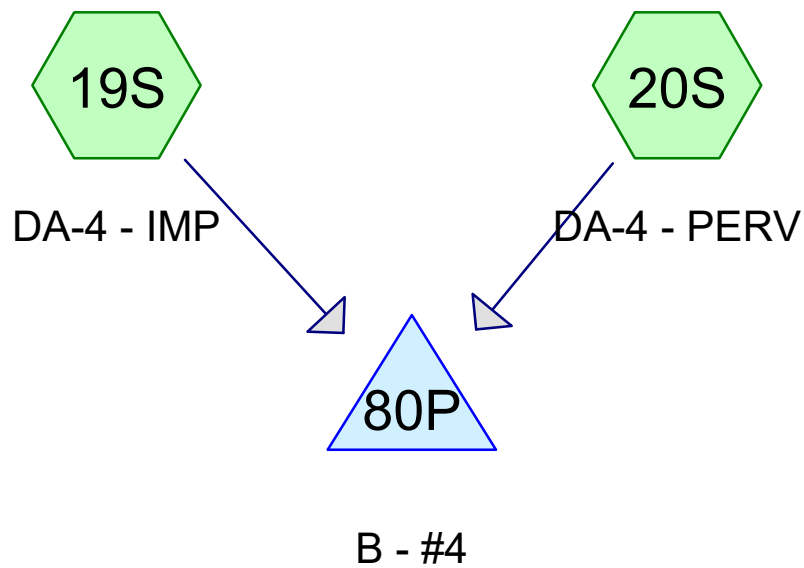
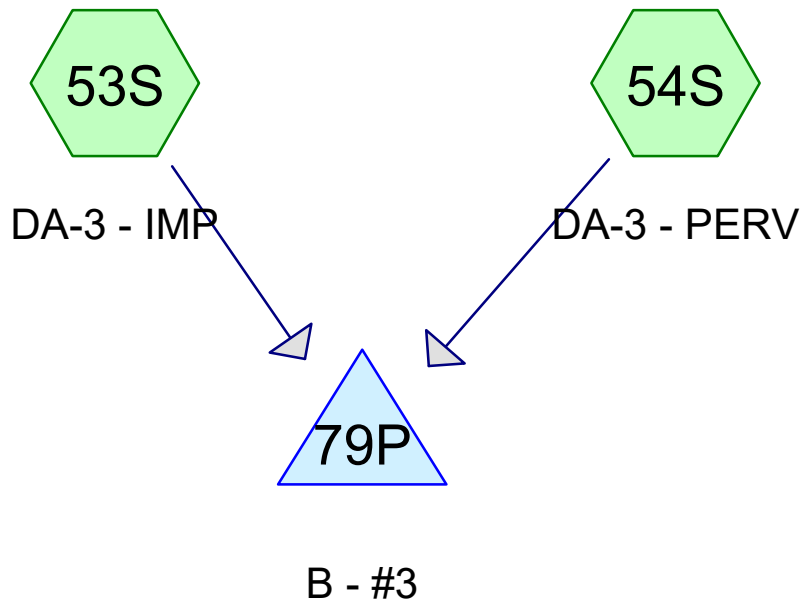
Primary OutFlow Max=1.98 cfs @ 1.93 hrs HW=6.91' (Free Discharge)

↑ **2=Culvert** (Passes 1.98 cfs of 17.35 cfs potential flow)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 1.98 cfs @ 10.11 fps)

Pond 78P: B - #2A,B,C

Hydrograph

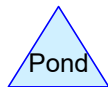




Subcat



Reach



Pond



Link

Routing Diagram for EEW00101-PMT-Jacobs-Phase 1
Prepared by Jacobs, Printed 5/6/2022
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EEW00101-PMT-Jacobs-Phase 1

Prepared by Jacobs

Printed 5/6/2022

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.365	80	>75% Grass cover, Good, HSG D (20S, 54S)
0.624	89	Gravel (54S)
1.404	98	Paved parking, HSG D (19S, 53S)
2.393	93	TOTAL AREA

EEW00101-PMT-Jacobs-Phase 1

Prepared by Jacobs

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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	
1.769	HSG D	19S, 20S, 53S, 54S
0.624	Other	54S
2.393		TOTAL AREA

EEW00101-PMT-Jacobs-Phase 1

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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	0.365	0.000	0.365	>75% Grass cover, Good	20S, 54S
0.000	0.000	0.000	0.000	0.624	0.624	Gravel	54S
0.000	0.000	0.000	1.404	0.000	1.404	Paved parking	19S, 53S
0.000	0.000	0.000	1.769	0.624	2.393	TOTAL AREA	

EEW00101-PMT-Jacobs-Phase 1

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	79P	7.50	7.29	41.0	0.0051	0.013	24.0	0.0	0.0
2	80P	7.54	6.80	148.0	0.0050	0.013	24.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment19S: DA-4 - IMP Runoff Area=33,263 sf 100.00% Impervious Runoff Depth=7.53"
Tc=6.0 min CN=98 Runoff=6.35 cfs 0.479 af

Subcatchment20S: DA-4 - PERV Runoff Area=9,690 sf 0.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=80 Runoff=1.54 cfs 0.100 af

Subcatchment53S: DA-3 - IMP Runoff Area=27,909 sf 100.00% Impervious Runoff Depth=7.53"
Tc=6.0 min CN=98 Runoff=5.33 cfs 0.402 af

Subcatchment54S: DA-3 - PERV Runoff Area=33,368 sf 0.00% Impervious Runoff Depth=6.27"
Tc=6.0 min CN=WQ Runoff=5.87 cfs 0.400 af

Pond 79P: B - #3 Peak Elev=11.95' Storage=0.151 af Inflow=11.20 cfs 0.802 af
Outflow=9.65 cfs 0.795 af

Pond 80P: B - #4 Peak Elev=12.20' Storage=0.193 af Inflow=7.89 cfs 0.579 af
Outflow=3.23 cfs 0.571 af

Total Runoff Area = 2.393 ac Runoff Volume = 1.382 af Average Runoff Depth = 6.93"
41.31% Pervious = 0.988 ac 58.69% Impervious = 1.404 ac

Summary for Subcatchment 19S: DA-4 - IMP

Runoff = 6.35 cfs @ 12.13 hrs, Volume= 0.479 af, Depth= 7.53"

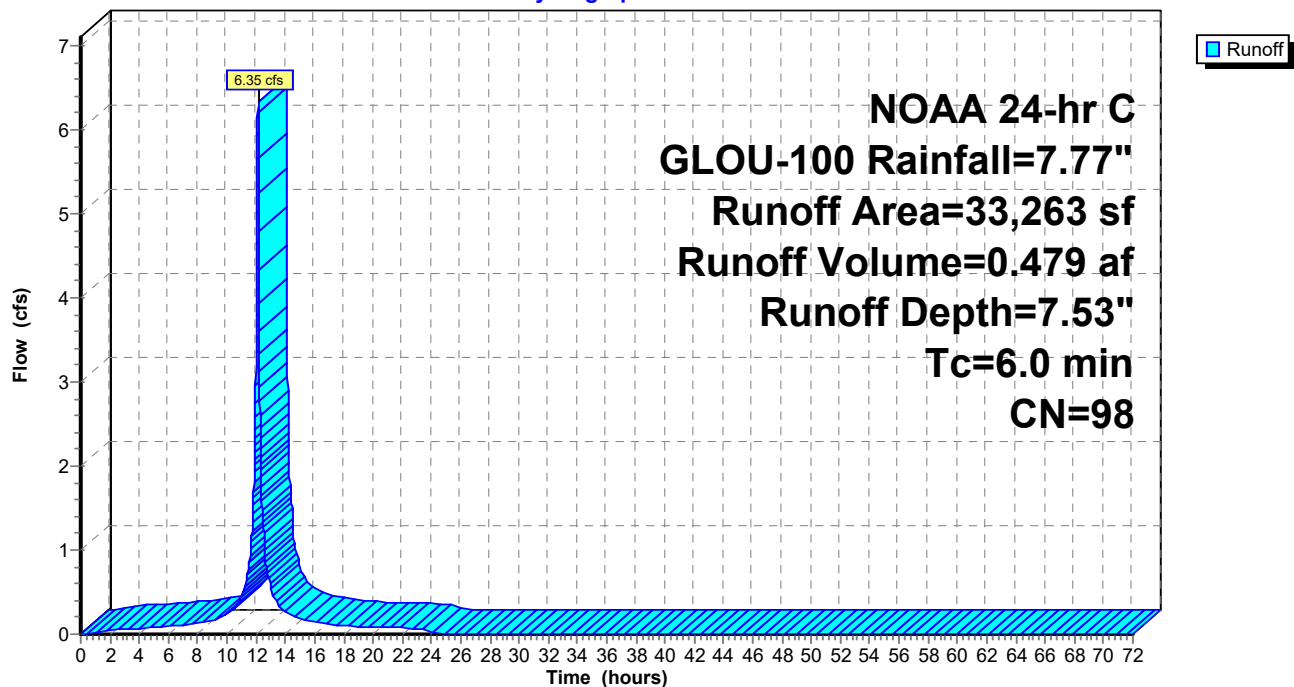
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr C GLOU-100 Rainfall=7.77"

Area (sf)	CN	Description
33,263	98	Paved parking, HSG D
33,263		100.00% Impervious Area

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

Subcatchment 19S: DA-4 - IMP

Hydrograph



Summary for Subcatchment 20S: DA-4 - PERV

Runoff = 1.54 cfs @ 12.13 hrs, Volume= 0.100 af, Depth= 5.41"

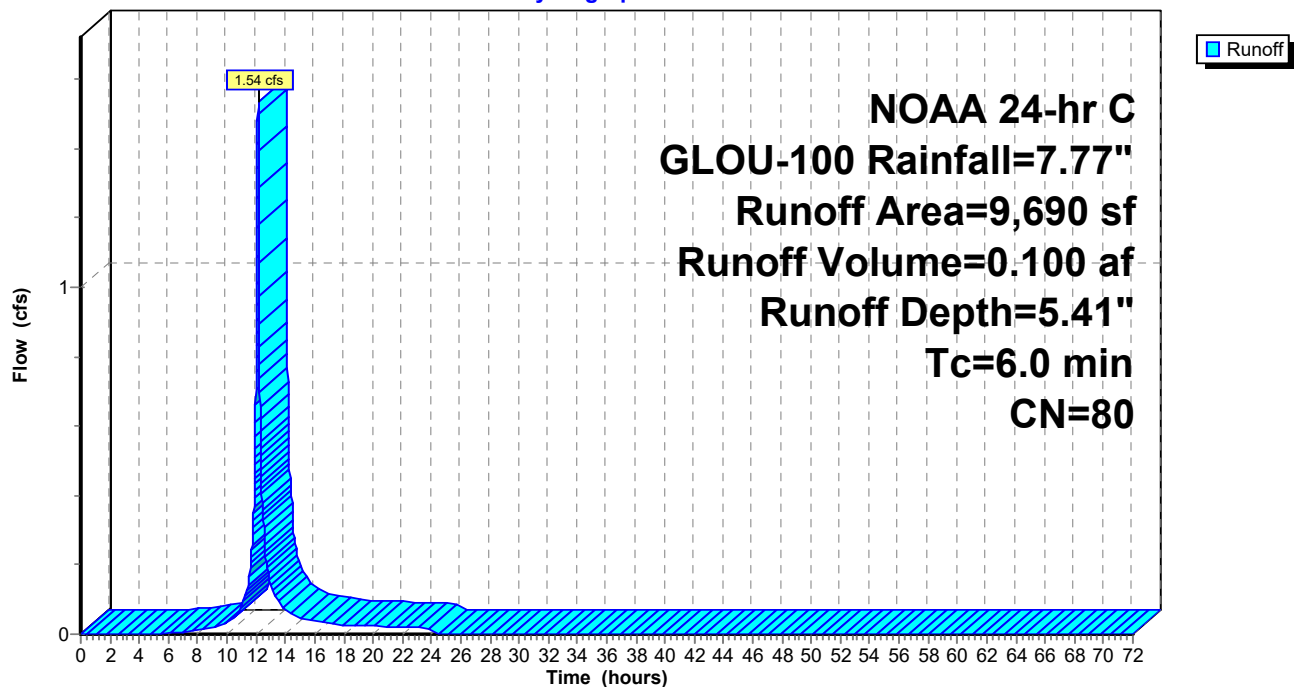
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr C GLOU-100 Rainfall=7.77"

Area (sf)	CN	Description
9,690	80	>75% Grass cover, Good, HSG D
9,690		100.00% Pervious Area

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

Subcatchment 20S: DA-4 - PERV

Hydrograph



Summary for Subcatchment 53S: DA-3 - IMP

Runoff = 5.33 cfs @ 12.13 hrs, Volume= 0.402 af, Depth= 7.53"

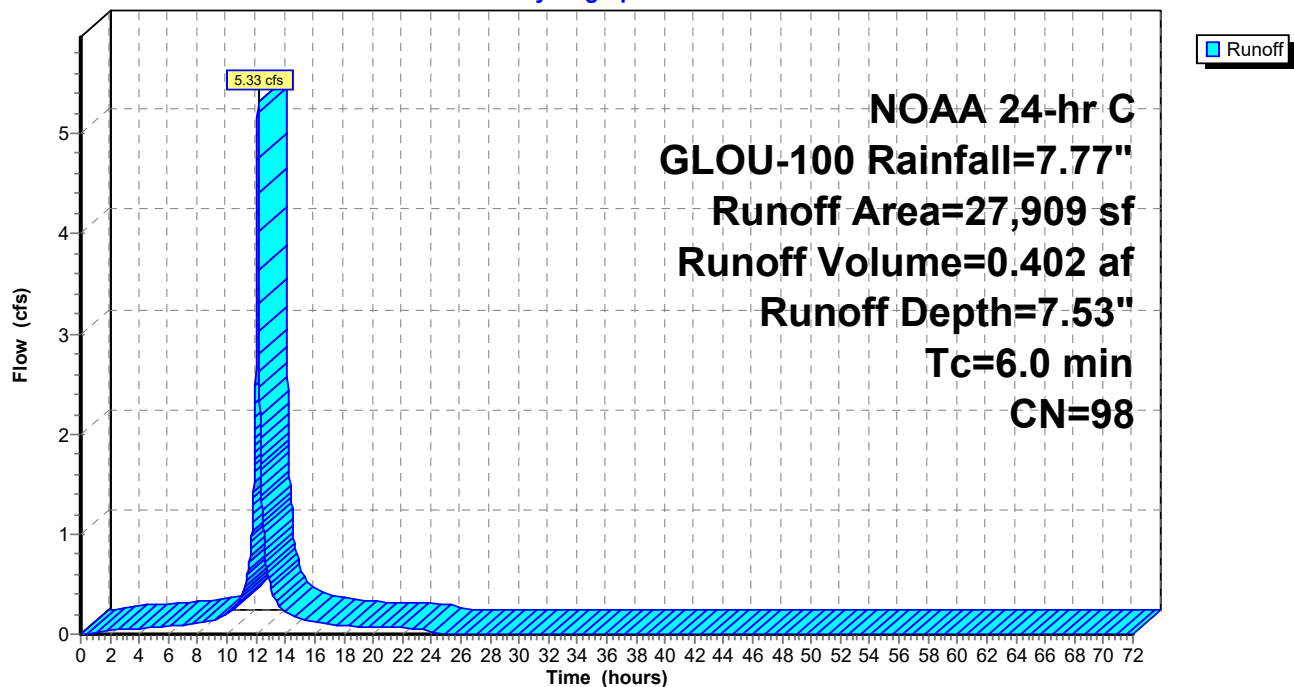
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr C GLOU-100 Rainfall=7.77"

Area (sf)	CN	Description
27,909	98	Paved parking, HSG D
27,909		100.00% Impervious Area

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

Subcatchment 53S: DA-3 - IMP

Hydrograph



Summary for Subcatchment 54S: DA-3 - PERV

Runoff = 5.87 cfs @ 12.13 hrs, Volume= 0.400 af, Depth= 6.27"

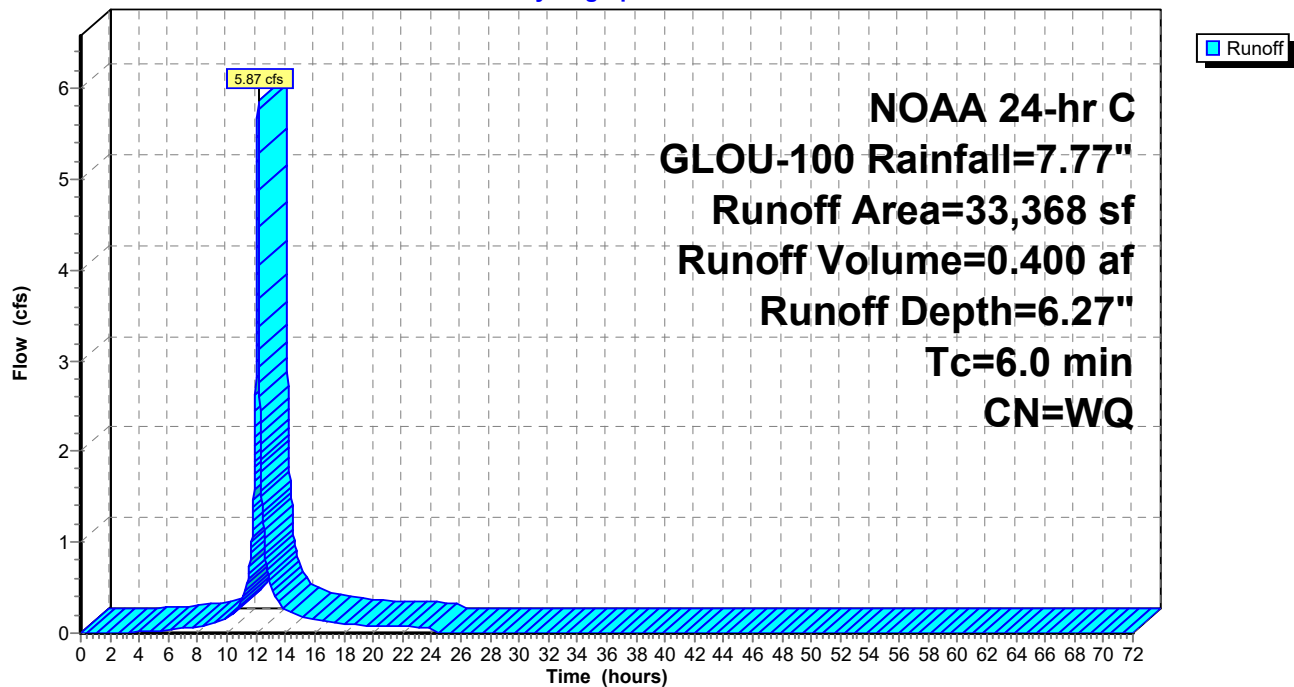
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr C GLOU-100 Rainfall=7.77"

Area (sf)	CN	Description
6,207	80	>75% Grass cover, Good, HSG D
* 27,161	89	Gravel
33,368		Weighted Average
33,368		100.00% Pervious Area

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

Subcatchment 54S: DA-3 - PERV

Hydrograph



Summary for Pond 79P: B - #3

Inflow Area = 1.407 ac, 45.55% Impervious, Inflow Depth = 6.84" for GLOU-100 event
 Inflow = 11.20 cfs @ 12.13 hrs, Volume= 0.802 af
 Outflow = 9.65 cfs @ 12.17 hrs, Volume= 0.795 af, Atten= 14%, Lag= 2.2 min
 Primary = 9.65 cfs @ 12.17 hrs, Volume= 0.795 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 11.95' @ 12.17 hrs Surf.Area= 0.314 ac Storage= 0.151 af

Plug-Flow detention time= 40.2 min calculated for 0.795 af (99% of inflow)
 Center-of-Mass det. time= 33.9 min (797.9 - 764.0)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	0.030 af	57.00'W x 57.00'L x 1.00'H Gravel 0.075 af Overall x 40.0% Voids
#2	8.50'	0.014 af	57.00'W x 57.00'L x 0.50'H Sand 0.037 af Overall x 37.5% Voids
#3	9.00'	0.030 af	57.00'W x 57.00'L x 2.00'H Soil 0.149 af Overall x 20.0% Voids
#4	11.00'	0.083 af	57.00'W x 57.00'L x 1.00'H Surface Z=3.0
		0.156 af	Total Available Storage

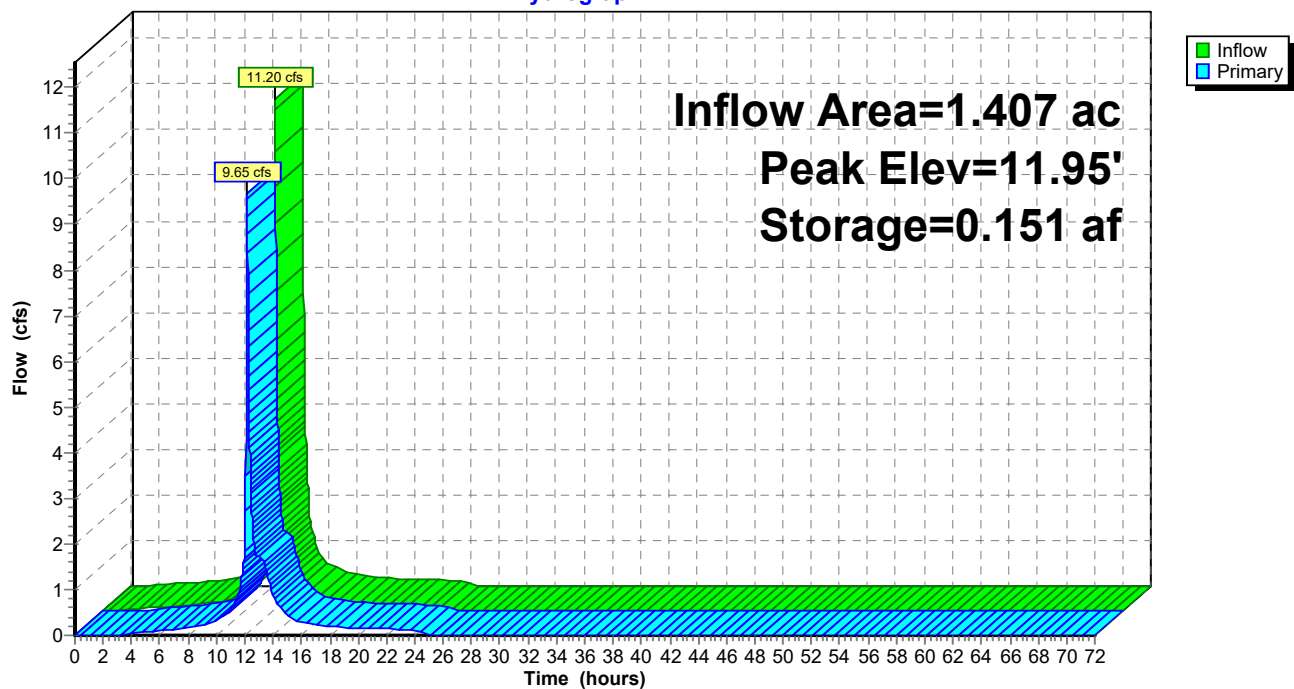
Device	Routing	Invert	Outlet Devices
#1	Device 2	11.50'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	7.50'	24.0" Round Culvert L= 41.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.50' / 7.29' S= 0.0051 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#3	Device 2	7.75'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=9.63 cfs @ 12.17 hrs HW=11.94' (Free Discharge)

↑ **2=Culvert** (Passes 9.63 cfs of 28.07 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 7.75 cfs @ 2.18 fps)
 ↑ **3=Orifice/Grate** (Orifice Controls 1.88 cfs @ 9.56 fps)

Pond 79P: B - #3

Hydrograph



Summary for Pond 80P: B - #4

Inflow Area = 0.986 ac, 77.44% Impervious, Inflow Depth = 7.05" for GLOU-100 event
 Inflow = 7.89 cfs @ 12.13 hrs, Volume= 0.579 af
 Outflow = 3.23 cfs @ 12.26 hrs, Volume= 0.571 af, Atten= 59%, Lag= 8.0 min
 Primary = 3.23 cfs @ 12.26 hrs, Volume= 0.571 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 12.20' @ 12.26 hrs Surf.Area= 0.352 ac Storage= 0.193 af

Plug-Flow detention time= 96.8 min calculated for 0.571 af (99% of inflow)
 Center-of-Mass det. time= 87.5 min (840.8 - 753.4)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	0.033 af	60.00'W x 60.00'L x 1.00'H Gravel 0.083 af Overall x 40.0% Voids
#2	8.50'	0.015 af	60.00'W x 60.00'L x 0.50'H Sand 0.041 af Overall x 37.5% Voids
#3	9.00'	0.033 af	60.00'W x 60.00'L x 2.00'H Soil 0.165 af Overall x 20.0% Voids
#4	11.00'	0.480 af	60.00'W x 60.00'L x 4.00'H Surface Z=3.0
		0.562 af	Total Available Storage

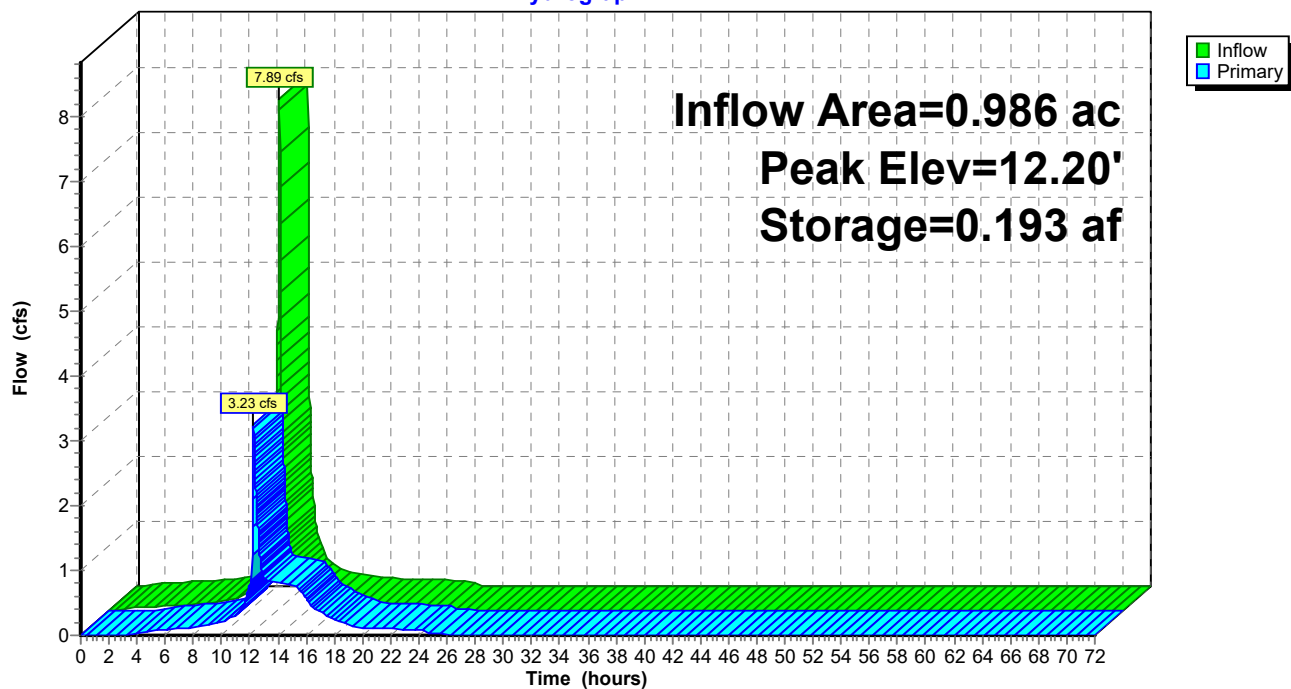
Device	Routing	Invert	Outlet Devices
#1	Device 2	12.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	7.54'	24.0" Round Culvert L= 148.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.54' / 6.80' S= 0.0050 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#3	Device 2	7.75'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=3.23 cfs @ 12.26 hrs HW=12.20' (Free Discharge)

↑ **2=Culvert** (Passes 3.23 cfs of 25.42 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 2.36 cfs @ 1.47 fps)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.87 cfs @ 9.97 fps)

Pond 80P: B - #4

Hydrograph



EEW00101-PMT-Jacobs-Phase 1*NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"*

Prepared by Jacobs

Printed 5/6/2022

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment19S: DA-4 - IMP Runoff Area=33,263 sf 100.00% Impervious Runoff Depth=1.03"
Tc=6.0 min CN=98 Runoff=2.24 cfs 0.066 af

Subcatchment20S: DA-4 - PERV Runoff Area=9,690 sf 0.00% Impervious Runoff Depth=0.17"
Tc=6.0 min CN=80 Runoff=0.11 cfs 0.003 af

Subcatchment53S: DA-3 - IMP Runoff Area=27,909 sf 100.00% Impervious Runoff Depth=1.03"
Tc=6.0 min CN=98 Runoff=1.88 cfs 0.055 af

Subcatchment54S: DA-3 - PERV Runoff Area=33,368 sf 0.00% Impervious Runoff Depth=0.40"
Tc=6.0 min CN=WQ Runoff=0.96 cfs 0.025 af

Pond 79P: B - #3 Peak Elev=8.96' Storage=0.043 af Inflow=2.81 cfs 0.081 af
Outflow=0.93 cfs 0.073 af

Pond 80P: B - #4 Peak Elev=8.91' Storage=0.046 af Inflow=2.33 cfs 0.069 af
Outflow=0.42 cfs 0.061 af

Total Runoff Area = 2.393 ac Runoff Volume = 0.150 af Average Runoff Depth = 0.75"
41.31% Pervious = 0.988 ac 58.69% Impervious = 1.404 ac

Summary for Subcatchment 19S: DA-4 - IMP

Runoff = 2.24 cfs @ 1.11 hrs, Volume= 0.066 af, Depth= 1.03"

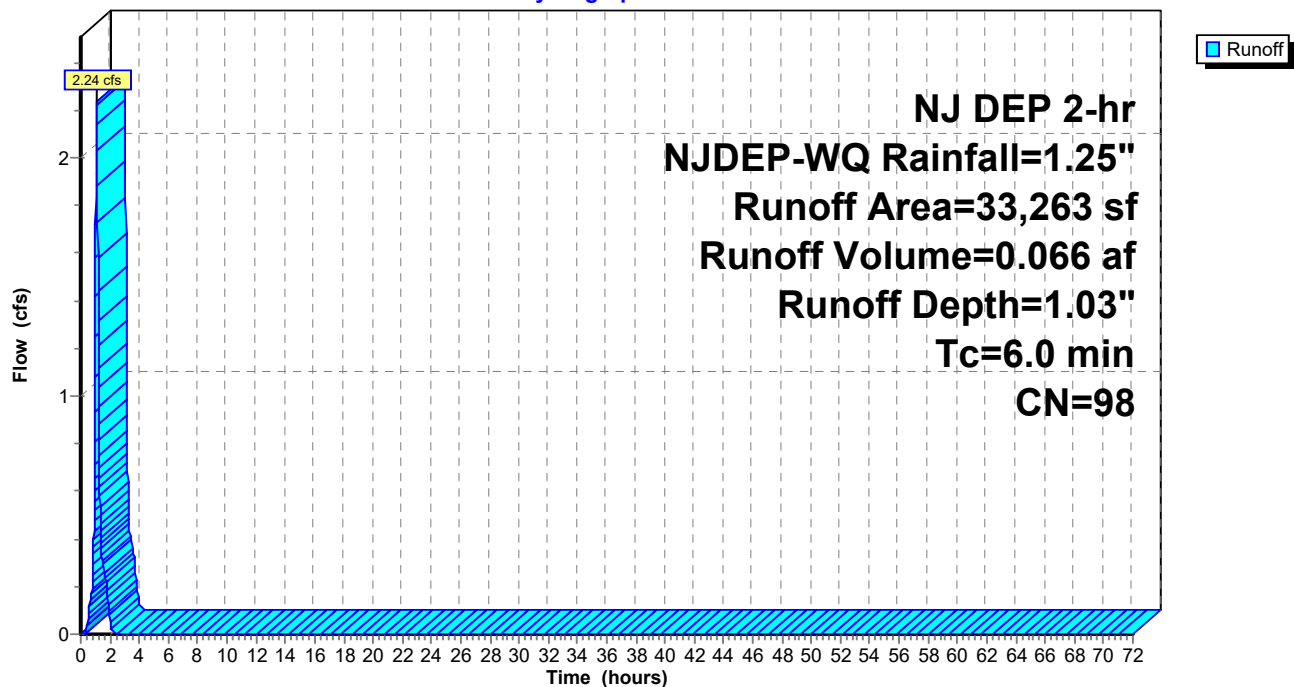
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
33,263	98	Paved parking, HSG D
33,263		100.00% Impervious Area

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

Subcatchment 19S: DA-4 - IMP

Hydrograph



Summary for Subcatchment 20S: DA-4 - PERV

Runoff = 0.11 cfs @ 1.14 hrs, Volume= 0.003 af, Depth= 0.17"

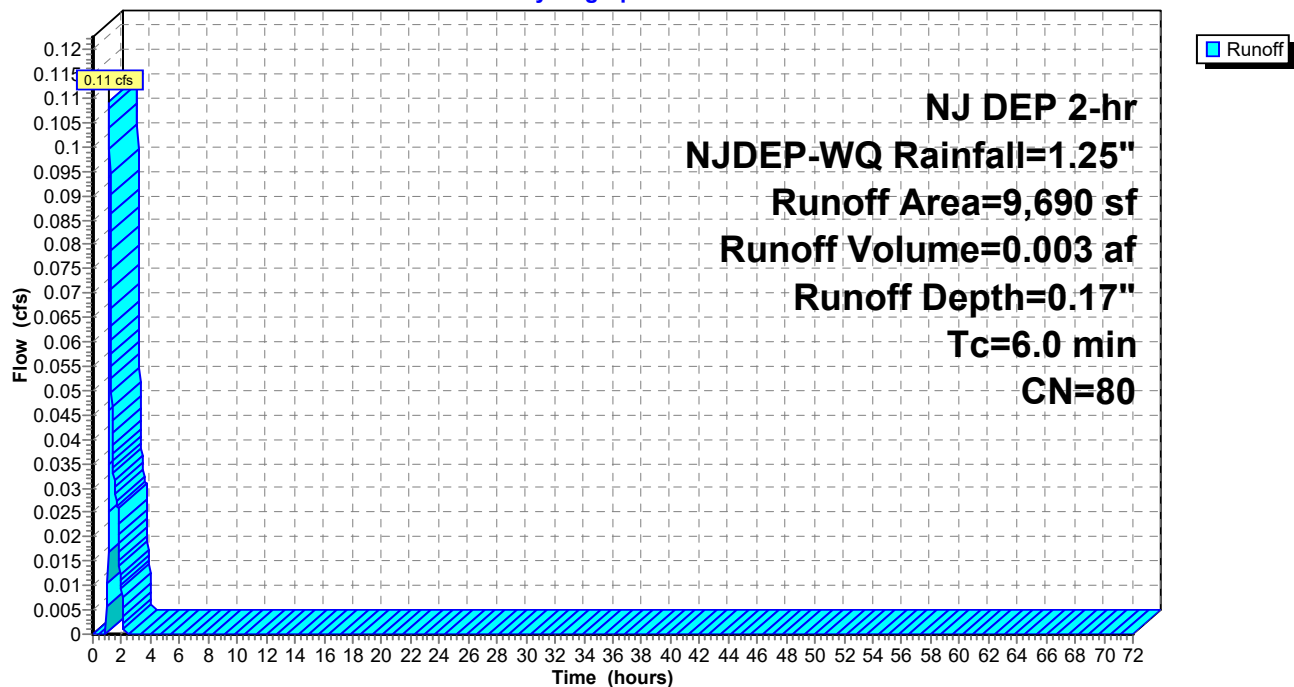
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
9,690	80	>75% Grass cover, Good, HSG D
9,690		100.00% Pervious Area

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

Subcatchment 20S: DA-4 - PERV

Hydrograph



Summary for Subcatchment 53S: DA-3 - IMP

Runoff = 1.88 cfs @ 1.11 hrs, Volume= 0.055 af, Depth= 1.03"

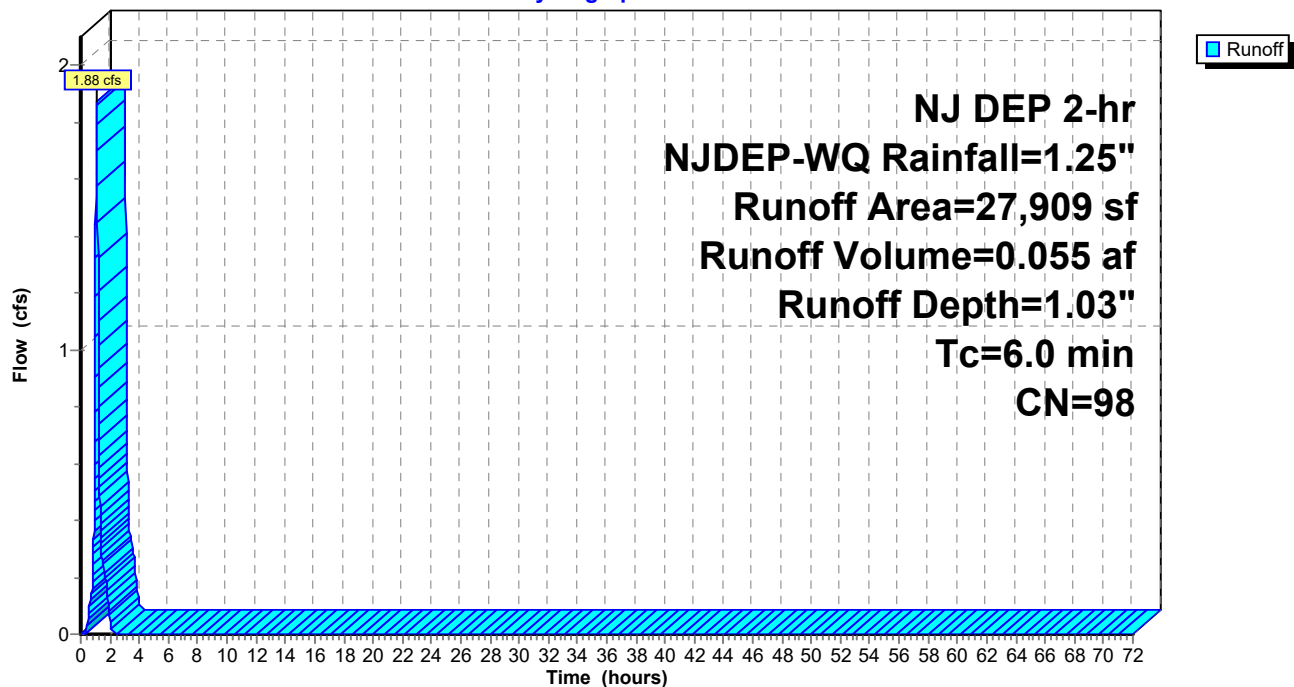
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
27,909	98	Paved parking, HSG D
27,909		100.00% Impervious Area

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

Subcatchment 53S: DA-3 - IMP

Hydrograph



Summary for Subcatchment 54S: DA-3 - PERV

Runoff = 0.96 cfs @ 1.12 hrs, Volume= 0.025 af, Depth= 0.40"

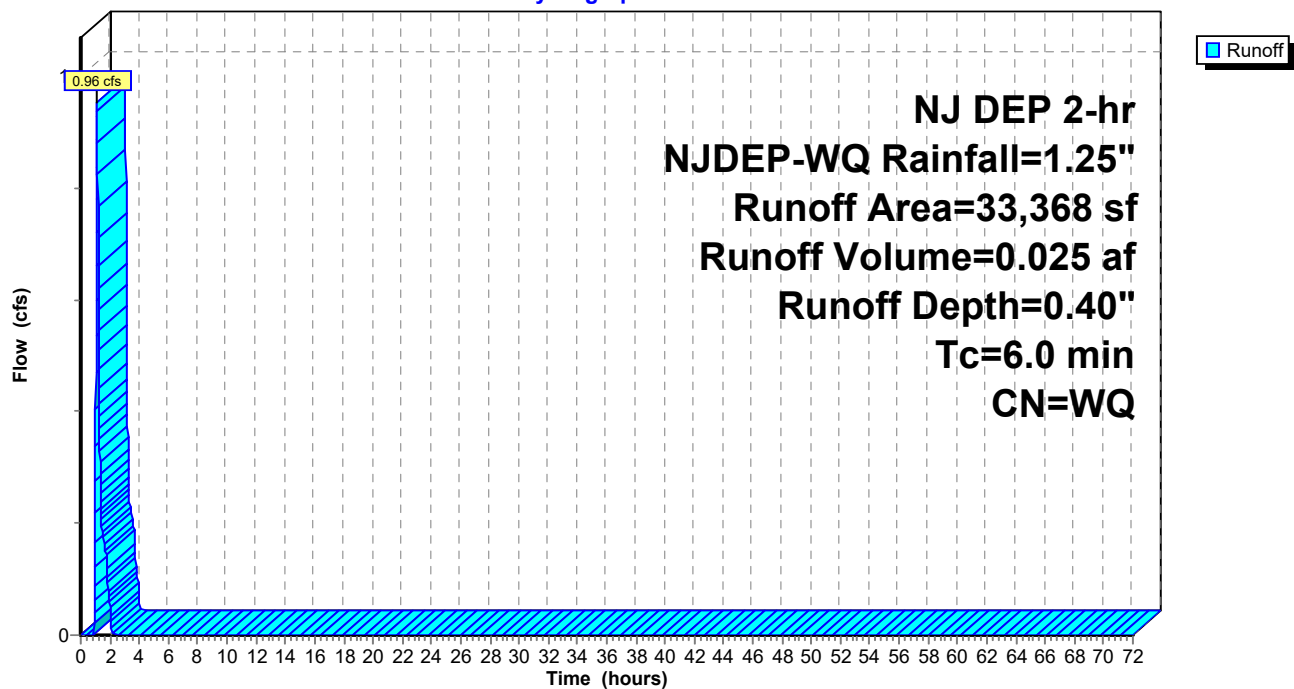
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NJ DEP 2-hr NJDEP-WQ Rainfall=1.25"

Area (sf)	CN	Description
6,207	80	>75% Grass cover, Good, HSG D
* 27,161	89	Gravel
33,368		Weighted Average
33,368		100.00% Pervious Area

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

Subcatchment 54S: DA-3 - PERV

Hydrograph



Summary for Pond 79P: B - #3

Inflow Area = 1.407 ac, 45.55% Impervious, Inflow Depth = 0.69" for NJDEP-WQ event
 Inflow = 2.81 cfs @ 1.11 hrs, Volume= 0.081 af
 Outflow = 0.93 cfs @ 1.28 hrs, Volume= 0.073 af, Atten= 67%, Lag= 9.9 min
 Primary = 0.93 cfs @ 1.28 hrs, Volume= 0.073 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 8.96' @ 1.28 hrs Surf.Area= 0.149 ac Storage= 0.043 af

Plug-Flow detention time= 40.4 min calculated for 0.073 af (91% of inflow)
 Center-of-Mass det. time= 37.2 min (109.8 - 72.6)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	0.030 af	57.00'W x 57.00'L x 1.00'H Gravel 0.075 af Overall x 40.0% Voids
#2	8.50'	0.014 af	57.00'W x 57.00'L x 0.50'H Sand 0.037 af Overall x 37.5% Voids
#3	9.00'	0.030 af	57.00'W x 57.00'L x 2.00'H Soil 0.149 af Overall x 20.0% Voids
#4	11.00'	0.083 af	57.00'W x 57.00'L x 1.00'H Surface Z=3.0
		0.156 af	Total Available Storage

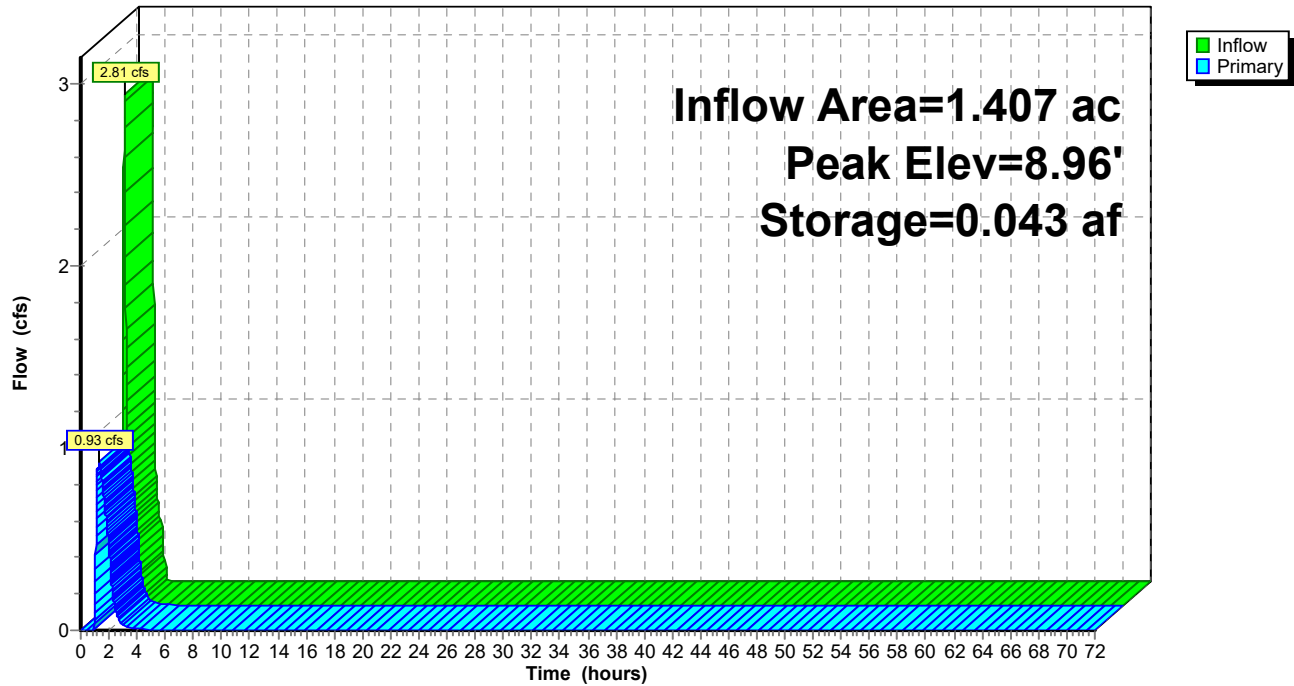
Device	Routing	Invert	Outlet Devices
#1	Device 2	11.50'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	7.50'	24.0" Round Culvert L= 41.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.50' / 7.29' S= 0.0051 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#3	Device 2	7.75'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.93 cfs @ 1.28 hrs HW=8.96' (Free Discharge)

↑ **2=Culvert** (Passes 0.93 cfs of 7.60 cfs potential flow)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.93 cfs @ 4.71 fps)

Pond 79P: B - #3

Hydrograph



Summary for Pond 80P: B - #4

Inflow Area = 0.986 ac, 77.44% Impervious, Inflow Depth = 0.84" for NJDEP-WQ event
 Inflow = 2.33 cfs @ 1.11 hrs, Volume= 0.069 af
 Outflow = 0.42 cfs @ 1.36 hrs, Volume= 0.061 af, Atten= 82%, Lag= 15.1 min
 Primary = 0.42 cfs @ 1.36 hrs, Volume= 0.061 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 8.91' @ 1.36 hrs Surf.Area= 0.165 ac Storage= 0.046 af

Plug-Flow detention time= 78.0 min calculated for 0.061 af (88% of inflow)
 Center-of-Mass det. time= 73.3 min (144.2 - 70.9)

Volume	Invert	Avail.Storage	Storage Description
#1	7.50'	0.033 af	60.00'W x 60.00'L x 1.00'H Gravel 0.083 af Overall x 40.0% Voids
#2	8.50'	0.015 af	60.00'W x 60.00'L x 0.50'H Sand 0.041 af Overall x 37.5% Voids
#3	9.00'	0.033 af	60.00'W x 60.00'L x 2.00'H Soil 0.165 af Overall x 20.0% Voids
#4	11.00'	0.480 af	60.00'W x 60.00'L x 4.00'H Surface Z=3.0
		0.562 af	Total Available Storage

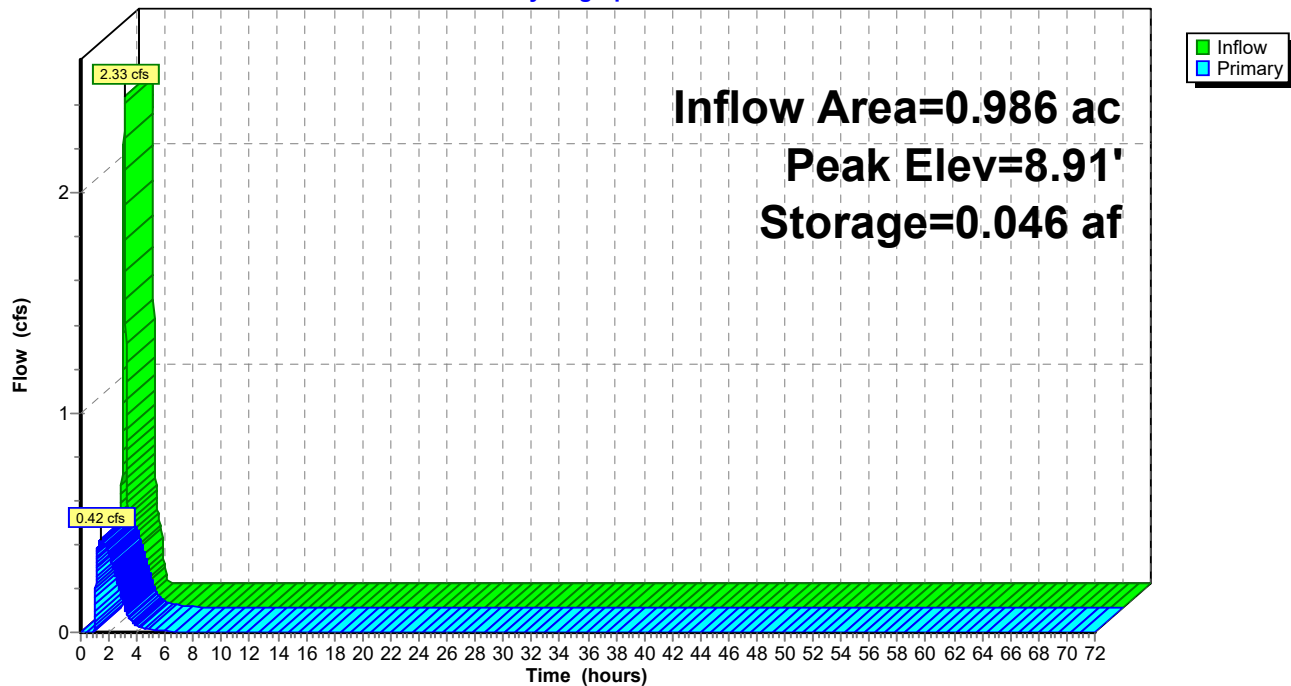
Device	Routing	Invert	Outlet Devices
#1	Device 2	12.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	7.54'	24.0" Round Culvert L= 148.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.54' / 6.80' S= 0.0050 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#3	Device 2	7.75'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.42 cfs @ 1.36 hrs HW=8.91' (Free Discharge)

↑ **2=Culvert** (Passes 0.42 cfs of 7.47 cfs potential flow)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.42 cfs @ 4.80 fps)

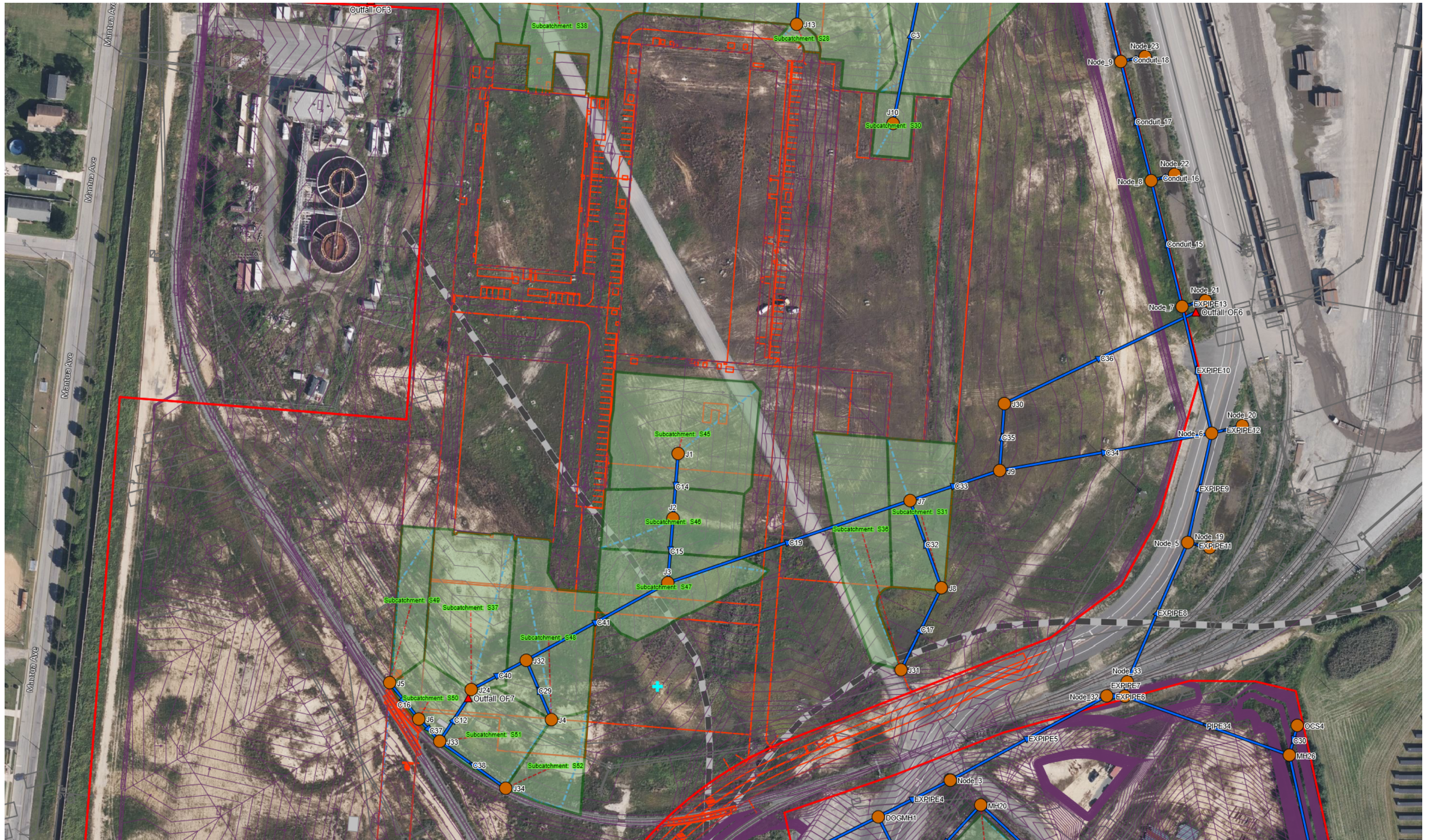
Pond 80P: B - #4

Hydrograph



Appendix B. Storm Sewer Calculations





EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

WARNING 01: wet weather time step reduced to recording interval for Rain Gage WQ_Gauge

Element Count

Number of rain gages 2
 Number of subcatchments ... 56
 Number of nodes 116
 Number of links 110
 Number of pollutants 0
 Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
25YR_NOAA_Type_C_5.88in	25YR_NOAA_Type_C_5.88in	INTENSITY	6 min.
WQ_Gauge	WQ_FLOW	CUMULATIVE	1 min.

Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage
Outlet					
S1	0.23	39.86	100.00	8.0000	WQ_Gauge
MH6					
S10	0.14	86.39	100.00	1.0000	WQ_Gauge
IN9					
S11	0.05	29.12	100.00	8.0000	WQ_Gauge
MH11					
S12	0.31	45.90	100.00	8.0000	WQ_Gauge
MH5					
S13	0.29	55.52	100.00	8.0000	WQ_Gauge
MH4					
S14	0.11	57.48	100.00	8.0000	WQ_Gauge
MH3					
S15	0.08	47.01	100.00	8.0000	WQ_Gauge
MH2					
S16	0.04	20.50	100.00	8.0000	WQ_Gauge
MH1					
S17	0.40	105.85	100.00	1.0000	WQ_Gauge
IN10					
S18	0.66	186.16	100.00	1.0000	WQ_Gauge
IN5					
S19	1.13	251.36	100.00	1.0000	WQ_Gauge
IN6					
S2	0.29	74.50	100.00	8.0000	WQ_Gauge
MH7					

S20	0.59	81.75	100.00	8.0000	WQ_Gauge
MH22					
S21	1.14	157.94	100.00	8.0000	WQ_Gauge
MH21					
S22	0.52	76.31	100.00	8.0000	WQ_Gauge
MH20					
S23	0.10	25.31	100.00	8.0000	WQ_Gauge
MH12					
S24	0.25	52.87	100.00	8.0000	WQ_Gauge
MH14					
S25	0.40	87.05	100.00	8.0000	WQ_Gauge
MH15					
S26	0.34	77.92	100.00	8.0000	WQ_Gauge
MH16					
S27	0.55	79.36	100.00	8.0000	WQ_Gauge
MH17					
S28	0.04	43.78	100.00	0.5000	WQ_Gauge
J13					
S29	2.09	322.02	75.00	0.5000	WQ_Gauge
J12					
S3	0.27	40.29	100.00	8.0000	WQ_Gauge
MH9					
S30	0.13	107.72	100.00	0.5000	WQ_Gauge
J10					
S31	0.49	88.86	100.00	0.5000	WQ_Gauge
J8					
S32	1.84	265.76	40.00	0.5000	WQ_Gauge
J14					
S33	0.71	166.69	100.00	0.5000	WQ_Gauge
J19					
S34	1.46	178.39	55.00	0.5000	WQ_Gauge
J16					
S35	0.98	165.58	0.00	0.5000	WQ_Gauge
J29					
S36	0.62	86.46	100.00	0.5000	WQ_Gauge
J31					
S37	0.67	119.80	100.00	0.5000	WQ_Gauge
J24					
S38	0.38	59.88	100.00	0.5000	WQ_Gauge
J18					
S39	0.43	88.15	25.00	0.5000	WQ_Gauge
J20					
S4	0.41	97.57	100.00	1.0000	WQ_Gauge
IN4					
S40	0.48	107.76	100.00	0.5000	WQ_Gauge
J20					
S41	0.78	165.74	100.00	0.5000	WQ_Gauge
J20					
S42	2.05	282.27	100.00	0.5000	WQ_Gauge
J15					
S43	2.94	350.87	30.00	0.5000	WQ_Gauge
J23					
S44	1.72	378.83	30.00	0.5000	WQ_Gauge
J17					
S45	0.89	246.83	100.00	0.5000	WQ_Gauge
J1					
S46	0.48	178.07	100.00	0.5000	WQ_Gauge
J2					
S47	0.53	111.52	90.00	0.5000	WQ_Gauge
J3					

S48	0.66	100.99	100.00	0.5000	WQ_Gauge
J4					
S49	0.25	44.01	100.00	0.5000	WQ_Gauge
J5					
S5	0.51	127.48	100.00	1.0000	WQ_Gauge
IN3					
S50	0.19	65.44	100.00	0.5000	WQ_Gauge
J6					
S51	0.35	65.22	100.00	0.5000	WQ_Gauge
J33					
S52	0.28	46.55	100.00	0.5000	WQ_Gauge
J34					
S53	0.75	164.66	33.00	0.5000	WQ_Gauge
J27					
S56	1.42	214.33	0.00	0.5000	WQ_Gauge
J41					
S57	1.80	261.65	0.00	0.5000	WQ_Gauge
J40					
S58	0.02	50.00	0.00	0.5000	WQ_Gauge
J42					
S6	0.48	124.12	100.00	1.0000	WQ_Gauge
IN2					
S7	0.38	103.63	100.00	1.0000	WQ_Gauge
IN1					
S8	0.09	49.69	100.00	1.0000	WQ_Gauge
IN7					
S9	0.10	85.53	100.00	1.0000	WQ_Gauge
IN8					

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
DOGMH1	JUNCTION	5.09	9.81	0.0	
EXMH20	JUNCTION	6.26	11.24	0.0	
EXMH21	JUNCTION	5.83	8.41	0.0	
EXMH22	JUNCTION	5.44	8.96	0.0	
EXMH23	JUNCTION	4.23	9.72	0.0	
IN1	JUNCTION	12.71	4.65	0.0	
IN10	JUNCTION	12.20	5.01	0.0	
IN2	JUNCTION	12.71	4.65	0.0	
IN3	JUNCTION	12.56	4.80	0.0	
IN4	JUNCTION	12.96	4.25	0.0	
IN5	JUNCTION	12.20	4.88	0.0	
IN6	JUNCTION	11.10	5.52	0.0	
IN7	JUNCTION	14.27	4.50	0.0	
IN8	JUNCTION	13.74	4.78	0.0	
IN9	JUNCTION	13.22	5.30	0.0	
J1	JUNCTION	11.92	3.00	0.0	
J10	JUNCTION	13.00	3.00	0.0	
J11	JUNCTION	9.15	5.25	0.0	
J12	JUNCTION	9.65	4.53	0.0	
J13	JUNCTION	10.00	5.59	0.0	
J14	JUNCTION	8.92	5.08	0.0	
J15	JUNCTION	9.75	3.50	50.0	

J16	JUNCTION	9.22	4.03	0.0	
J17	JUNCTION	9.10	3.68	0.0	
J18	JUNCTION	9.70	4.10	0.0	
J19	JUNCTION	9.85	4.17	0.0	
J2	JUNCTION	11.45	3.35	0.0	
J20	JUNCTION	9.55	3.79	0.0	
J21	JUNCTION	8.85	5.40	0.0	
J22	JUNCTION	8.40	5.70	0.0	
J23	JUNCTION	8.77	3.50	0.0	
J24	JUNCTION	11.17	3.00	0.0	
J25	JUNCTION	8.50	5.00	0.0	
J26	JUNCTION	8.80	5.40	0.0	
J27	JUNCTION	8.98	2.75	0.0	
J28	JUNCTION	8.25	5.90	0.0	
J29	JUNCTION	8.65	4.60	0.0	
J3	JUNCTION	10.35	4.45	0.0	
J30	JUNCTION	8.70	6.75	0.0	
J31	JUNCTION	10.85	2.75	0.0	
J32	JUNCTION	10.97	4.21	0.0	
J33	JUNCTION	9.50	4.20	0.0	
J34	JUNCTION	10.55	3.15	0.0	
J4	JUNCTION	11.17	3.00	0.0	
J40	JUNCTION	8.15	4.82	0.0	
J41	JUNCTION	9.60	3.50	0.0	
J42	JUNCTION	8.20	5.40	0.0	
J43	JUNCTION	8.20	5.70	0.0	
J5	JUNCTION	10.25	3.52	0.0	
J6	JUNCTION	10.05	3.72	0.0	
J7	JUNCTION	9.33	6.37	0.0	
J8	JUNCTION	10.50	4.00	0.0	
J9	JUNCTION	8.95	6.50	0.0	
MH1	JUNCTION	14.24	4.75	0.0	
MH10	JUNCTION	10.17	8.65	0.0	
MH11	JUNCTION	13.97	4.93	0.0	
MH12	JUNCTION	13.91	4.25	0.0	
MH13	JUNCTION	13.25	4.75	0.0	
MH14	JUNCTION	12.51	5.33	0.0	
MH15	JUNCTION	12.01	5.83	0.0	
MH16	JUNCTION	11.25	6.33	0.0	
MH17	JUNCTION	9.92	7.91	0.0	
MH18	JUNCTION	9.12	8.96	0.0	
MH19	JUNCTION	7.93	9.96	0.0	
MH2	JUNCTION	13.93	5.06	0.0	
MH20	JUNCTION	8.73	8.67	0.0	
MH21	JUNCTION	10.45	7.05	0.0	
MH22	JUNCTION	12.75	4.66	0.0	
MH23	JUNCTION	13.75	4.28	0.0	
MH25	JUNCTION	7.40	6.94	0.0	Yes
MH26	JUNCTION	6.00	8.00	0.0	Yes
MH3	JUNCTION	13.40	5.59	0.0	
MH4	JUNCTION	12.88	6.11	0.0	
MH5	JUNCTION	10.56	8.30	0.0	
MH6	JUNCTION	13.97	4.90	0.0	
MH7	JUNCTION	12.37	6.62	0.0	
MH8	JUNCTION	12.12	6.73	0.0	
MH9	JUNCTION	10.52	8.30	0.0	
Node_10	JUNCTION	1.67	12.44	0.0	

Node_11	JUNCTION	1.54	12.49	0.0	
Node_12	JUNCTION	1.35	12.65	0.0	
Node_13	JUNCTION	0.99	13.05	0.0	
Node_14	JUNCTION	0.47	13.55	0.0	
Node_15	JUNCTION	-0.02	14.05	0.0	
Node_19	JUNCTION	6.86	5.17	0.0	Yes
Node_20	JUNCTION	5.09	6.29	0.0	Yes
Node_21	JUNCTION	6.50	5.65	0.0	Yes
Node_22	JUNCTION	6.43	5.50	0.0	Yes
Node_23	JUNCTION	6.48	5.52	0.0	Yes
Node_24	JUNCTION	6.63	5.44	0.0	Yes
Node_25	JUNCTION	6.62	5.26	0.0	Yes
Node_26	JUNCTION	6.54	5.39	0.0	Yes
Node_27	JUNCTION	6.67	5.33	0.0	Yes
Node_3	JUNCTION	4.84	10.26	0.0	
Node_32	JUNCTION	4.32	9.63	0.0	
Node_33	JUNCTION	4.16	9.79	0.0	
Node_5	JUNCTION	3.59	9.91	0.0	
Node_6	JUNCTION	2.98	10.35	0.0	
Node_7	JUNCTION	2.67	11.45	0.0	
Node_8	JUNCTION	2.51	11.66	0.0	
Node_9	JUNCTION	2.36	11.72	0.0	
OCS1	JUNCTION	6.50	4.50	0.0	Yes
OCS2	JUNCTION	6.50	4.50	0.0	Yes
OCS3	JUNCTION	6.50	4.50	0.0	Yes
OCS4	JUNCTION	6.50	4.50	0.0	Yes
OCS5	JUNCTION	8.50	4.50	0.0	Yes
OF1	OUTFALL	-0.12	5.00	0.0	
OF10	OUTFALL	8.00	2.00	0.0	
OF2	OUTFALL	10.00	2.00	0.0	
OF3	OUTFALL	4.32	2.00	0.0	
OF4	OUTFALL	8.00	1.50	0.0	
OF5	OUTFALL	8.00	1.50	0.0	
OF6	OUTFALL	8.00	1.50	0.0	
OF7	OUTFALL	6.00	1.50	0.0	
OF8	OUTFALL	8.00	1.50	0.0	
OF9	OUTFALL	8.00	1.25	0.0	

Link Summary

Name		From Node	To Node	Type	Length	%
Slope	Roughness					

C1		J13	J12	CONDUIT	139.8	
0.2503	0.0100					
C10		J20	J17	CONDUIT	179.8	
0.2502	0.0100					
C11		J21	J43	CONDUIT	247.0	
0.2632	0.0100					
C12		J33	OF7	CONDUIT	80.0	
4.3784	0.0100					
C13		J14	J26	CONDUIT	47.2	
0.2544	0.0100					
C14		J1	J2	CONDUIT	100.0	
0.4700	0.0100					

C15		J2	J3	CONDUIT	99.9
0.8512	0.0100				
C16		J5	J6	CONDUIT	71.9
0.2781	0.0100				
C17		J31	J8	CONDUIT	141.1
0.2481	0.0100				
C18		J16	J29	CONDUIT	221.7
0.2571	0.0100				
C19		J3	J7	CONDUIT	395.8
0.2577	0.0100				
C2		J12	J11	CONDUIT	194.6
0.2570	0.0100				
C20		J26	J28	CONDUIT	27.0
6.6785	0.0100				
C21		J26	OF5	CONDUIT	134.3
0.5956	0.0100				
C22		J11	J14	CONDUIT	88.4
0.2602	0.0100				
C23		J22	OF8	CONDUIT	148.4
0.2696	0.0100				
C24		J27	J42	CONDUIT	318.1
0.2452	0.0100				
C25		J25	Node_13	CONDUIT	112.2
7.1586	0.0100				
C26		J25	J22	CONDUIT	35.1
0.2850	0.0100				
C27		J28	Node_10	CONDUIT	115.0
5.7321	0.0100				
C28		J21	OF3	CONDUIT	153.6
4.1237	0.0100				
C29		J4	J32	CONDUIT	99.4
0.2011	0.0100				
C3		J10	J11	CONDUIT	279.2
1.1103	0.0100				
C30		OCS4	MH26	CONDUIT	47.3
0.5289	0.0120				
C31		OCS5	MH25	CONDUIT	18.3
3.2794	0.0120				
C32		J8	J7	CONDUIT	142.8
0.4692	0.0100				
C33		J7	J9	CONDUIT	146.2
0.2599	0.0100				
C34		J9	Node_6	CONDUIT	333.0
2.5442	0.0100				
C35		J9	J30	CONDUIT	103.4
0.2417	0.0100				
C36		J30	OF6	CONDUIT	328.2
0.2133	0.0100				
C37		J6	J33	CONDUIT	47.2
1.1656	0.0100				
C38		J34	J33	CONDUIT	125.2
0.8388	0.0100				
C4		J15	J16	CONDUIT	218.7
0.2423	0.0100				
C40		J24	J32	CONDUIT	96.3
0.2076	0.0100				
C41		J32	J3	CONDUIT	249.6
0.2484	0.0100				
C46		J43	OF4	CONDUIT	81.8
0.2446	0.0100				

C47		J41	J43	CONDUIT	114.1
1.0078	0.0100				
C48		J42	OF9	CONDUIT	78.3
0.2553	0.0100				
C49		J40	OF10	CONDUIT	78.1
0.1920	0.0100				
C5		J18	J20	CONDUIT	50.0
0.3000	0.0100				
C6		J19	J20	CONDUIT	100.7
0.2980	0.0100				
C7		J17	J21	CONDUIT	95.5
0.2616	0.0100				
C8		J23	J40	CONDUIT	325.6
0.1904	0.0100				
C9		J29	J25	CONDUIT	53.6
0.2796	0.0100				
Conduit_0		OCS1	EXMH20	CONDUIT	28.4
0.4581	0.0120				
Conduit_15		Node_7	Node_8	CONDUIT	199.7
0.0801	0.0100				
Conduit_16		Node_22	Node_8	CONDUIT	37.6
0.2661	0.0100				
Conduit_17		Node_8	Node_9	CONDUIT	189.6
0.0791	0.0100				
Conduit_18		Node_23	Node_9	CONDUIT	38.4
0.3905	0.0100				
Conduit_19		Node_9	Node_10	CONDUIT	238.5
0.2893	0.0100				
Conduit_2		OCS2	EXMH21	CONDUIT	34.3
0.4669	0.0120				
Conduit_20		Node_24	Node_10	CONDUIT	36.1
0.8305	0.0100				
Conduit_21		Node_10	Node_11	CONDUIT	82.6
0.1574	0.0100				
Conduit_22		Node_11	Node_12	CONDUIT	90.7
0.2095	0.0100				
Conduit_23		Node_25	Node_12	CONDUIT	37.0
0.7828	0.0100				
Conduit_24		Node_12	Node_13	CONDUIT	199.1
0.1808	0.0100				
Conduit_25		Node_26	Node_13	CONDUIT	37.3
0.5626	0.0100				
Conduit_26		Node_13	Node_14	CONDUIT	231.1
0.2250	0.0100				
Conduit_27		Node_27	Node_14	CONDUIT	35.4
0.9603	0.0100				
Conduit_28		Node_14	Node_15	CONDUIT	126.3
0.3880	0.0100				
Conduit_29		Node_15	OF1	CONDUIT	140.5
0.0712	0.0100				
Conduit_4		OCS3	EXMH22	CONDUIT	35.6
0.4489	0.0120				
EXPIPE1		EXMH20	EXMH21	CONDUIT	194.1
0.2216	0.0100				
EXPIPE10		Node_6	Node_7	CONDUIT	200.7
0.1545	0.0100				
EXPIPE11		Node_19	Node_5	CONDUIT	34.9
0.5012	0.0100				
EXPIPE12		Node_20	Node_6	CONDUIT	48.9
0.4909	0.0100				

EXPIPE13	Node_21	Node_7	CONDUIT	37.4
0.4551 0.0100				
EXPIPE2	EXMH21	EXMH22	CONDUIT	190.2
0.2050 0.0100				
EXPIPE3	EXMH22	DOGMH1	CONDUIT	192.2
0.1821 0.0100				
EXPIPE4	DOGMH1	Node_3	CONDUIT	125.0
0.2000 0.0100				
EXPIPE5	Node_3	Node_32	CONDUIT	274.8
0.1892 0.0100				
EXPIPE6	Node_32	EXMH23	CONDUIT	28.1
0.1782 0.0100				
EXPIPE7	EXMH23	Node_33	CONDUIT	22.5
0.3105 0.0100				
EXPIPE8	Node_33	Node_5	CONDUIT	234.3
0.2433 0.0100				
EXPIPE9	Node_5	Node_6	CONDUIT	172.4
0.3538 0.0100				
PIPE1	MH1	MH2	CONDUIT	59.6
0.5203 0.0120				
PIPE10	MH7	MH8	CONDUIT	50.0
0.4999 0.0120				
PIPE11	MH8	MH9	CONDUIT	320.0
0.5000 0.0120				
PIPE12	MH11	MH10	CONDUIT	50.0
0.5000 0.0120				
PIPE13	MH10	EXMH21	CONDUIT	108.1
2.3974 0.0120				
PIPE14	IN4	IN10	CONDUIT	102.7
0.7403 0.0100				
PIPE15	IN10	IN6	CONDUIT	130.4
0.6520 0.0100				
PIPE16	IN6	OF2	CONDUIT	402.0
0.2736 0.0100				
PIPE17	IN5	IN6	CONDUIT	130.3
0.4606 0.0100				
PIPE18	MH12	MH13	CONDUIT	160.0
0.4125 0.0120				
PIPE19	MH13	MH14	CONDUIT	49.2
0.4881 0.0120				
PIPE2	IN7	MH2	CONDUIT	17.3
0.5210 0.0100				
PIPE20	IN1	MH14	CONDUIT	40.0
0.4999 0.0100				
PIPE21	MH14	MH15	CONDUIT	100.0
0.5000 0.0120				
PIPE22	IN2	MH15	CONDUIT	40.0
1.1498 0.0100				
PIPE23	MH15	MH16	CONDUIT	100.0
0.7599 0.0120				
PIPE24	IN3	MH16	CONDUIT	40.0
1.3998 0.0100				
PIPE25	MH16	MH17	CONDUIT	217.2
0.6124 0.0100				
PIPE26	MH17	MH18	CONDUIT	160.0
0.5000 0.0100				
PIPE27	MH18	MH19	CONDUIT	220.0
0.5409 0.0100				
PIPE28	MH23	MH22	CONDUIT	150.0
0.5000 0.0120				

PIPE29		MH22	MH21	CONDUIT	360.0
0.5000	0.0120				
PIPE3		MH2	MH3	CONDUIT	106.4
0.4979	0.0120				
PIPE30		MH21	MH20	CONDUIT	360.0
0.4778	0.0120				
PIPE31		MH20	MH19	CONDUIT	160.0
0.5000	0.0120				
PIPE32		MH19	DOGMH1	CONDUIT	180.0
1.0223	0.0120				
PIPE33		MH25	MH26	CONDUIT	281.9
0.3192	0.0100				
PIPE34		MH26	EXMH23	CONDUIT	270.2
0.2849	0.0100				
PIPE35		MH9	MH10	CONDUIT	70.0
0.5000	0.0120				
PIPE4		IN8	MH3	CONDUIT	17.3
0.5211	0.0100				
PIPE5		MH3	MH4	CONDUIT	106.5
0.4883	0.0120				
PIPE6		IN9	MH4	CONDUIT	17.3
0.5215	0.0100				
PIPE7		MH4	MH5	CONDUIT	427.5
0.5427	0.0120				
PIPE8		MH5	EXMH20	CONDUIT	94.9
2.9507	0.0100				
PIPE9		MH6	MH7	CONDUIT	320.0
0.5000	0.0120				

Cross Section Summary

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels

C1	CIRCULAR	2.00	3.14	0.50	2.00	1
14.71						
C10	CIRCULAR	2.00	3.14	0.50	2.00	1
14.71						
C11	CIRCULAR	1.50	1.77	0.38	1.50	1
7.01						
C12	CIRCULAR	1.50	1.77	0.38	1.50	1
28.57						
C13	CIRCULAR	2.00	3.14	0.50	2.00	1
14.83						
C14	CIRCULAR	1.50	1.77	0.38	1.50	1
9.36						
C15	CIRCULAR	1.50	1.77	0.38	1.50	1
12.60						
C16	CIRCULAR	1.00	0.79	0.25	1.00	1
2.44						
C17	CIRCULAR	1.25	1.23	0.31	1.25	1
4.18						
C18	CIRCULAR	2.50	4.91	0.63	2.50	1
27.03						
C19	CIRCULAR	2.50	4.91	0.63	2.50	1

C2	CIRCULAR	2.00	3.14	0.50	2.00	1
14.91						
C20	CIRCULAR	2.00	3.14	0.50	2.00	1
76.00						
C21	CIRCULAR	1.50	1.77	0.38	1.50	1
10.54						
C22	CIRCULAR	2.00	3.14	0.50	2.00	1
15.00						
C23	CIRCULAR	1.50	1.77	0.38	1.50	1
7.09						
C24	CIRCULAR	1.25	1.23	0.31	1.25	1
4.16						
C25	CIRCULAR	2.00	3.14	0.50	2.00	1
78.69						
C26	CIRCULAR	1.50	1.77	0.38	1.50	1
7.29						
C27	CIRCULAR	2.00	3.14	0.50	2.00	1
70.41						
C28	CIRCULAR	2.00	3.14	0.50	2.00	1
59.72						
C29	CIRCULAR	1.50	1.77	0.38	1.50	1
6.12						
C3	CIRCULAR	1.25	1.23	0.31	1.25	1
8.85						
C30	CIRCULAR	1.25	1.23	0.31	1.25	1
5.09						
C31	CIRCULAR	1.50	1.77	0.38	1.50	1
20.61						
C32	CIRCULAR	1.50	1.77	0.38	1.50	1
9.35						
C33	CIRCULAR	2.50	4.91	0.63	2.50	1
27.19						
C34	CIRCULAR	2.50	4.91	0.63	2.50	1
85.05						
C35	CIRCULAR	1.50	1.77	0.38	1.50	1
6.71						
C36	CIRCULAR	1.50	1.77	0.38	1.50	1
6.31						
C37	CIRCULAR	1.50	1.77	0.38	1.50	1
14.74						
C38	CIRCULAR	1.50	1.77	0.38	1.50	1
12.51						
C4	CIRCULAR	2.00	3.14	0.50	2.00	1
14.48						
C40	CIRCULAR	1.50	1.77	0.38	1.50	1
6.22						
C41	CIRCULAR	2.50	4.91	0.63	2.50	1
26.58						
C46	CIRCULAR	1.50	1.77	0.38	1.50	1
6.75						
C47	CIRCULAR	1.50	1.77	0.38	1.50	1
13.71						
C48	CIRCULAR	1.25	1.23	0.31	1.25	1
4.24						
C49	CIRCULAR	2.00	3.14	0.50	2.00	1
12.89						
C5	CIRCULAR	2.00	3.14	0.50	2.00	1
16.11						
C6	CIRCULAR	2.00	3.14	0.50	2.00	1
16.05						

C7	CIRCULAR	2.00	3.14	0.50	2.00	1
15.04						
C8	CIRCULAR	2.00	3.14	0.50	2.00	1
12.83						
C9	CIRCULAR	2.50	4.91	0.63	2.50	1
28.20						
Conduit_0	CIRCULAR	1.00	0.79	0.25	1.00	1
2.61						
Conduit_15	CIRCULAR	5.00	19.63	1.25	5.00	1
95.83						
Conduit_16	CIRCULAR	1.50	1.77	0.38	1.50	1
7.04						
Conduit_17	CIRCULAR	5.00	19.63	1.25	5.00	1
95.22						
Conduit_18	CIRCULAR	3.00	7.07	0.75	3.00	1
54.18						
Conduit_19	CIRCULAR	5.00	19.63	1.25	5.00	1
182.11						
Conduit_2	CIRCULAR	1.50	1.77	0.38	1.50	1
7.78						
Conduit_20	CIRCULAR	3.00	7.07	0.75	3.00	1
79.02						
Conduit_21	CIRCULAR	5.00	19.63	1.25	5.00	1
134.33						
Conduit_22	CIRCULAR	5.00	19.63	1.25	5.00	1
154.96						
Conduit_23	CIRCULAR	1.50	1.77	0.38	1.50	1
12.08						
Conduit_24	CIRCULAR	5.00	19.63	1.25	5.00	1
143.98						
Conduit_25	CIRCULAR	1.50	1.77	0.38	1.50	1
10.24						
Conduit_26	CIRCULAR	5.00	19.63	1.25	5.00	1
160.61						
Conduit_27	CIRCULAR	2.00	3.14	0.50	2.00	1
28.82						
Conduit_28	CIRCULAR	5.00	19.63	1.25	5.00	1
210.90						
Conduit_29	CIRCULAR	5.00	19.63	1.25	5.00	1
90.31						
Conduit_4	CIRCULAR	1.50	1.77	0.38	1.50	1
7.62						
EXPIPE1	CIRCULAR	3.00	7.07	0.75	3.00	1
40.81						
EXPIPE10	CIRCULAR	5.00	19.63	1.25	5.00	1
133.07						
EXPIPE11	CIRCULAR	1.50	1.77	0.38	1.50	1
9.67						
EXPIPE12	CIRCULAR	2.00	3.14	0.50	2.00	1
20.61						
EXPIPE13	CIRCULAR	2.00	3.14	0.50	2.00	1
19.84						
EXPIPE2	CIRCULAR	3.00	7.07	0.75	3.00	1
39.26						
EXPIPE3	CIRCULAR	3.00	7.07	0.75	3.00	1
37.00						
EXPIPE4	CIRCULAR	3.00	7.07	0.75	3.00	1
38.78						
EXPIPE5	CIRCULAR	3.00	7.07	0.75	3.00	1
37.72						

EXPIPE6 36.60	CIRCULAR	3.00	7.07	0.75	3.00	1
EXPIPE7 72.89	CIRCULAR	3.50	9.62	0.88	3.50	1
EXPIPE8 64.51	CIRCULAR	3.50	9.62	0.88	3.50	1
EXPIPE9 77.80	CIRCULAR	3.50	9.62	0.88	3.50	1
PIPE1 8.21	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE10 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE11 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE12 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE13 10.84	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE14 11.75	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE15 11.03	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE16 15.38	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE17 9.27	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE18 4.49	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE19 7.95	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE2 6.06	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE20 9.65	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE21 17.33	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE22 9.00	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE23 21.36	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE24 9.94	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE25 23.01	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE26 20.79	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE27 21.63	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE28 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE29 8.05	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE3 8.03	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE30 16.94	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE31 17.33	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE32 24.78	CIRCULAR	2.00	3.14	0.50	2.00	1

PIPE33	CIRCULAR	2.00	3.14	0.50	2.00	1
16.62						
PIPE34	CIRCULAR	2.50	4.91	0.63	2.50	1
28.46						
PIPE35	CIRCULAR	1.25	1.23	0.31	1.25	1
4.95						
PIPE4	CIRCULAR	1.25	1.23	0.31	1.25	1
6.06						
PIPE5	CIRCULAR	1.50	1.77	0.38	1.50	1
7.95						
PIPE6	CIRCULAR	1.25	1.23	0.31	1.25	1
6.06						
PIPE7	CIRCULAR	1.50	1.77	0.38	1.50	1
8.38						
PIPE8	CIRCULAR	1.50	1.77	0.38	1.50	1
23.46						
PIPE9	CIRCULAR	1.25	1.23	0.31	1.25	1
4.95						

 NOTE: The summary statistics displayed in this report are
 based on results found at every computational time step,
 not just on results from each reporting time step.

Analysis Options

Flow Units CFS

Process Models:

Rainfall/Runoff YES

RDII NO

Snowmelt NO

Groundwater NO

Flow Routing YES

Ponding Allowed NO

Water Quality NO

Infiltration Method CURVE_NUMBER

Flow Routing Method DYNWAVE

Surcharge Method EXTRAN

Starting Date 03/21/2022 00:01:00

Ending Date 03/21/2022 02:00:00

Antecedent Dry Days 0.0

Report Time Step 00:01:00

Wet Time Step 00:01:00

Dry Time Step 00:05:00

Routing Time Step 5.00 sec

Variable Time Step YES

Maximum Trials 8

Number of Threads 6

Head Tolerance 0.005000 ft

Runoff Quantity Continuity

Volume

acre-feet

Depth

inches

Total Precipitation	3.669	1.247
Evaporation Loss	0.000	0.000
Infiltration Loss	0.552	0.188
Surface Runoff	2.833	0.962
Final Storage	0.290	0.099
Continuity Error (%)	-0.142	

	Volume acre-feet	Volume 10^6 gal
	-----	-----
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	2.828	0.921
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	22.342	7.280
External Outflow	22.427	7.308
Flooding Loss	1.705	0.556
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.039	0.013
Final Stored Volume	1.099	0.358
Continuity Error (%)	-0.091	

Highest Continuity Errors

Node J28 (3.72%)

Node MH19 (1.69%)

Node EXMH20 (1.17%)

Node J40 (1.03%)

Node J42 (1.01%)

Time-Step Critical Elements

Link Conduit_27 (61.84%)

Link Conduit_28 (23.61%)

Link C26 (6.46%)

Link EXPIPE7 (4.21%)

Link C31 (1.23%)

Highest Flow Instability Indexes

Link C13 (48)

Link Conduit_4 (11)

Link Conduit_2 (11)

Link C31 (7)

Link Conduit_0 (6)

Routing Time Step Summary

Minimum Time Step : 0.34 sec
Average Time Step : 1.79 sec
Maximum Time Step : 2.30 sec
Percent in Steady State : -0.00
Average Iterations per Step : 2.63
Percent Not Converging : 6.89
Time Step Frequencies :
5.000 - 3.155 sec : 0.00 %
3.155 - 1.991 sec : 65.16 %
1.991 - 1.256 sec : 5.49 %
1.256 - 0.792 sec : 9.54 %
0.792 - 0.500 sec : 19.81 %

Subcatchment Runoff Summary

Perv	Total	Total	Total	Total	Total	Total	Imperv
Runoff	Runoff	Precip	Peak	Runoff	Evap	Infil	Runoff
Subcatchment	Runoff	Runoff	Runoff	Runoff	in	in	in
in	in	10^6 gal	in	Coeff	in	in	in

S1			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	0.73	0.987			
S10			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.00	0.46	0.990			
S11			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.00	0.16	0.995			
S12			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	0.99	0.986			
S13			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	0.94	0.988			
S14			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.00	0.37	0.995			
S15			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.00	0.25	0.995			
S16			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.00	0.12	0.995			
S17			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.01	1.27	0.981			
S18			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.02	2.13	0.982			
S19			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.04	3.61	0.978			
S2			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.01	0.92	0.991			
S20			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.02	1.91	0.985			
S21			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.04	3.68	0.985			
S22			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.02	1.68	0.986			

S23			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.00	0.32	0.991			
S24			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	0.80	0.989			
S25			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	1.30	0.989			
S26			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	1.09	0.990			
S27			1.25	0.00	0.00	0.00	1.18
0.00	1.18	0.02	1.77	0.949			
S28			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.00	0.12	0.993			
S29			1.25	0.00	0.00	0.08	0.90
0.20	1.10	0.06	5.88	0.883			
S3			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.01	0.88	0.986			
S30			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.00	0.43	0.990			
S31			1.25	0.00	0.00	0.00	1.21
0.00	1.21	0.02	1.54	0.968			
S32			1.25	0.00	0.00	0.25	0.49
0.35	0.84	0.04	3.32	0.670			
S33			1.25	0.00	0.00	0.00	1.21
0.00	1.21	0.02	2.22	0.970			
S34			1.25	0.00	0.00	0.17	0.66
0.29	0.95	0.04	3.22	0.764			
S35			1.25	0.00	0.00	0.55	0.00
0.41	0.41	0.01	0.53	0.326			
S36			1.25	0.00	0.00	0.00	1.19
0.00	1.19	0.02	1.84	0.954			
S37			1.25	0.00	0.00	0.00	1.20
0.00	1.20	0.02	2.06	0.963			
S38			1.25	0.00	0.00	0.00	1.20
0.00	1.20	0.01	1.15	0.959			
S39			1.25	0.00	0.00	0.62	0.30
0.17	0.47	0.01	0.43	0.379			
S4			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.01	1.32	0.979			
S40			1.25	0.00	0.00	0.00	1.21
0.00	1.21	0.02	1.49	0.969			
S41			1.25	0.00	0.00	0.00	1.21
0.00	1.21	0.03	2.42	0.968			
S42			1.25	0.00	0.00	0.00	1.19
0.00	1.19	0.07	6.08	0.954			
S43			1.25	0.00	0.00	0.58	0.37
0.13	0.50	0.04	3.15	0.400			
S44			1.25	0.00	0.00	0.58	0.37
0.17	0.54	0.03	1.99	0.434			
S45			1.25	0.00	0.00	0.00	1.21
0.00	1.21	0.03	2.81	0.974			
S46			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.02	1.54	0.979			
S47			1.25	0.00	0.00	0.04	1.09
0.08	1.17	0.02	1.64	0.936			
S48			1.25	0.00	0.00	0.00	1.19
0.00	1.19	0.02	1.98	0.958			
S49			1.25	0.00	0.00	0.00	1.21
0.00	1.21	0.01	0.79	0.967			
S5			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.02	1.62	0.980			

S50			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.01	0.62	0.978			
S51			1.25	0.00	0.00	0.00	1.20
0.00	1.20	0.01	1.09	0.963			
S52			1.25	0.00	0.00	0.00	1.20
0.00	1.20	0.01	0.85	0.960			
S53			1.25	0.00	0.00	0.56	0.41
0.17	0.57	0.01	0.94	0.459			
S56			1.25	0.00	0.00	0.55	0.00
0.39	0.39	0.01	0.72	0.312			
S57			1.25	0.00	0.00	0.55	0.00
0.38	0.38	0.02	0.89	0.307			
S58			1.25	0.00	0.00	0.55	0.00
0.61	0.61	0.00	0.05	0.492			
S6			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.02	1.55	0.980			
S7			1.25	0.00	0.00	0.00	1.22
0.00	1.22	0.01	1.21	0.981			
S8			1.25	0.00	0.00	0.00	1.23
0.00	1.23	0.00	0.30	0.989			
S9			1.25	0.00	0.00	0.00	1.24
0.00	1.24	0.00	0.33	0.992			

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
DOGMH1	JUNCTION	4.03	9.81	14.90	0 00:02	5.29
EXMH20	JUNCTION	3.30	7.21	13.47	0 00:04	4.48
EXMH21	JUNCTION	3.70	8.41	14.24	0 00:04	4.90
EXMH22	JUNCTION	3.97	6.77	12.21	0 00:02	5.18
EXMH23	JUNCTION	4.15	7.02	11.25	0 00:03	6.30
IN1	JUNCTION	0.13	0.38	13.09	0 01:06	0.38
IN10	JUNCTION	0.17	0.49	12.69	0 01:06	0.49
IN2	JUNCTION	0.12	0.36	13.07	0 01:06	0.36
IN3	JUNCTION	0.12	0.34	12.90	0 01:06	0.34
IN4	JUNCTION	0.12	0.34	13.30	0 01:06	0.34
IN5	JUNCTION	0.17	0.49	12.69	0 01:06	0.49
IN6	JUNCTION	0.34	1.05	12.15	0 01:06	1.05
IN7	JUNCTION	0.07	0.19	14.46	0 01:05	0.19
IN8	JUNCTION	0.07	0.20	13.94	0 01:05	0.20
IN9	JUNCTION	0.09	0.28	13.50	0 01:06	0.28
J1	JUNCTION	0.19	0.57	12.49	0 01:06	0.57
J10	JUNCTION	0.07	0.19	13.19	0 01:05	0.19
J11	JUNCTION	0.31	1.00	10.15	0 01:06	1.00
J12	JUNCTION	0.29	0.89	10.54	0 01:06	0.89
J13	JUNCTION	0.09	0.54	10.54	0 01:06	0.54
J14	JUNCTION	0.38	1.13	10.05	0 01:06	1.13
J15	JUNCTION	0.30	0.92	10.67	0 01:06	0.92
J16	JUNCTION	0.34	1.03	10.25	0 01:06	1.03
J17	JUNCTION	0.41	1.51	10.61	0 01:06	1.50
J18	JUNCTION	0.22	0.99	10.69	0 01:06	0.98

J19	JUNCTION	0.20	0.83	10.68	0	01:06	0.82
J2	JUNCTION	0.20	0.62	12.07	0	01:06	0.62
J20	JUNCTION	0.34	1.14	10.69	0	01:06	1.13
J21	JUNCTION	0.45	1.72	10.57	0	01:06	1.70
J22	JUNCTION	0.43	1.48	9.88	0	01:07	1.48
J23	JUNCTION	0.26	0.67	9.44	0	01:06	0.67
J24	JUNCTION	0.20	0.61	11.78	0	01:06	0.61
J25	JUNCTION	0.43	1.54	10.04	0	01:07	1.53
J26	JUNCTION	0.35	1.12	9.92	0	01:06	1.11
J27	JUNCTION	0.15	0.40	9.38	0	01:06	0.40
J28	JUNCTION	0.00	0.30	8.55	0	00:04	0.30
J29	JUNCTION	0.39	1.38	10.03	0	01:07	1.38
J3	JUNCTION	0.36	1.23	11.58	0	01:08	1.23
J30	JUNCTION	0.57	2.30	11.00	0	01:07	2.26
J31	JUNCTION	0.20	0.85	11.70	0	01:06	0.85
J32	JUNCTION	0.22	0.65	11.62	0	01:06	0.65
J33	JUNCTION	0.47	0.74	10.24	0	00:57	0.74
J34	JUNCTION	0.09	0.26	10.81	0	01:06	0.26
J4	JUNCTION	0.20	0.60	11.77	0	01:06	0.60
J40	JUNCTION	0.29	0.72	8.87	0	01:06	0.71
J41	JUNCTION	0.09	0.23	9.83	0	01:16	0.23
J42	JUNCTION	0.15	0.40	8.60	0	01:06	0.40
J43	JUNCTION	0.45	1.41	9.61	0	01:06	1.41
J5	JUNCTION	0.13	0.37	10.62	0	01:06	0.37
J6	JUNCTION	0.11	0.31	10.36	0	01:06	0.31
J7	JUNCTION	0.50	2.26	11.59	0	01:06	2.25
J8	JUNCTION	0.24	1.15	11.65	0	01:07	1.06
J9	JUNCTION	0.60	2.62	11.57	0	01:07	2.56
MH1	JUNCTION	0.05	0.13	14.37	0	01:05	0.13
MH10	JUNCTION	0.15	0.60	10.77	0	01:06	0.60
MH11	JUNCTION	0.06	0.15	14.12	0	01:05	0.15
MH12	JUNCTION	0.08	0.23	14.14	0	01:05	0.23
MH13	JUNCTION	0.07	0.21	13.46	0	01:06	0.21
MH14	JUNCTION	0.17	0.49	13.00	0	01:06	0.49
MH15	JUNCTION	0.23	0.68	12.69	0	01:06	0.68
MH16	JUNCTION	0.27	0.81	12.06	0	01:06	0.81
MH17	JUNCTION	0.35	1.61	11.53	0	01:06	1.60
MH18	JUNCTION	0.43	3.03	12.15	0	01:02	2.30
MH19	JUNCTION	1.32	5.79	13.72	0	00:06	3.26
MH2	JUNCTION	0.10	0.29	14.22	0	01:05	0.29
MH20	JUNCTION	0.57	3.62	12.35	0	01:01	2.60
MH21	JUNCTION	0.27	1.01	11.46	0	01:06	1.01
MH22	JUNCTION	0.17	0.50	13.25	0	01:06	0.50
MH23	JUNCTION	0.00	0.00	13.75	0	00:00	0.00
MH25	JUNCTION	5.08	6.94	14.34	0	00:00	5.78
MH26	JUNCTION	4.39	8.00	14.00	0	00:00	6.56
MH3	JUNCTION	0.15	0.42	13.82	0	01:05	0.42
MH4	JUNCTION	0.21	0.62	13.50	0	01:06	0.62
MH5	JUNCTION	0.14	0.41	10.97	0	01:06	0.41
MH6	JUNCTION	0.11	0.32	14.29	0	01:06	0.32
MH7	JUNCTION	0.17	0.50	12.87	0	01:06	0.50
MH8	JUNCTION	0.17	0.50	12.62	0	01:06	0.50
MH9	JUNCTION	0.21	0.63	11.15	0	01:06	0.63
Node_10	JUNCTION	4.25	7.01	8.68	0	00:04	6.29
Node_11	JUNCTION	4.33	12.49	14.03	0	00:03	6.33
Node_12	JUNCTION	4.46	8.85	10.20	0	00:04	6.46
Node_13	JUNCTION	4.66	6.64	7.63	0	00:04	6.42

Node_14	JUNCTION	4.96	6.15	6.62	0	00:04	5.90
Node_15	JUNCTION	5.29	14.05	14.03	0	00:00	5.77
Node_19	JUNCTION	0.99	5.17	12.03	0	00:03	3.45
Node_20	JUNCTION	1.60	6.29	11.38	0	00:03	5.54
Node_21	JUNCTION	0.52	5.65	12.15	0	00:03	5.65
Node_22	JUNCTION	0.64	5.50	11.93	0	00:03	2.05
Node_23	JUNCTION	0.46	2.12	8.60	0	00:04	2.09
Node_24	JUNCTION	0.38	2.40	9.03	0	00:04	1.38
Node_25	JUNCTION	0.82	3.75	10.37	0	00:04	1.29
Node_26	JUNCTION	0.91	1.21	7.75	0	00:00	1.15
Node_27	JUNCTION	0.67	0.96	7.63	0	00:00	0.67
Node_3	JUNCTION	4.05	10.26	15.10	0	00:02	5.48
Node_32	JUNCTION	4.10	8.60	12.92	0	00:02	6.21
Node_33	JUNCTION	4.13	7.09	11.25	0	00:03	6.36
Node_5	JUNCTION	3.80	9.91	13.50	0	00:03	7.07
Node_6	JUNCTION	3.63	10.35	13.33	0	00:03	8.29
Node_7	JUNCTION	3.77	11.45	14.12	0	00:03	10.04
Node_8	JUNCTION	3.72	11.66	14.17	0	00:03	5.97
Node_9	JUNCTION	3.65	6.22	8.58	0	00:05	6.15
OCS1	JUNCTION	4.49	4.50	11.00	0	00:00	4.50
OCS2	JUNCTION	3.48	4.50	11.00	0	00:00	4.50
OCS3	JUNCTION	3.26	4.50	11.00	0	00:00	4.45
OCS4	JUNCTION	4.47	4.50	11.00	0	00:00	4.50
OCS5	JUNCTION	4.21	4.50	13.00	0	00:00	4.50
OF1	OUTFALL	5.22	5.22	5.10	0	00:00	5.22
OF10	OUTFALL	0.26	0.68	8.68	0	01:06	0.68
OF2	OUTFALL	0.33	1.03	11.03	0	01:06	1.03
OF3	OUTFALL	2.00	2.00	6.32	0	00:00	2.00
OF4	OUTFALL	0.42	1.19	9.19	0	01:07	1.19
OF5	OUTFALL	0.35	1.11	9.11	0	01:06	1.10
OF6	OUTFALL	0.43	1.22	9.22	0	01:07	1.22
OF7	OUTFALL	4.00	4.00	10.00	0	00:00	4.00
OF8	OUTFALL	0.40	1.17	9.17	0	01:07	1.17
OF9	OUTFALL	0.14	0.38	8.38	0	01:06	0.38

Node Inflow Summary

Total Flow			Maximum Lateral	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume
Inflow Volume	Balance Error	Type	Inflow CFS	Inflow CFS	days hr:min	10^6 gal 10^6
DOGMH1		JUNCTION	0.00	47.68	0 01:06	0
1.92	0.549					
EXMH20		JUNCTION	0.00	14.62	0 00:04	0
0.479	1.187					
EXMH21		JUNCTION	0.00	27.75	0 00:01	0
1.18	0.922					

EXMH22		JUNCTION	0.00	37.53	0	00:01	0
1.75	0.585						
EXMH23		JUNCTION	0.00	90.08	0	01:02	0
4.29	0.032						
IN1		JUNCTION	1.21	1.21	0	01:06	0.0125
0.0125	0.055						
IN10		JUNCTION	1.27	2.59	0	01:06	0.0131
0.0268	0.304						
IN2		JUNCTION	1.55	1.55	0	01:06	0.0161
0.0161	0.057						
IN3		JUNCTION	1.62	1.62	0	01:06	0.0168
0.0168	0.053						
IN4		JUNCTION	1.32	1.32	0	01:06	0.0137
0.0137	0.092						
IN5		JUNCTION	2.13	2.13	0	01:06	0.022
0.022	0.419						
IN6		JUNCTION	3.61	8.32	0	01:06	0.0374
0.086	0.227						
IN7		JUNCTION	0.30	0.30	0	01:05	0.00309
0.00309	0.118						
IN8		JUNCTION	0.33	0.33	0	01:05	0.00343
0.00343	0.108						
IN9		JUNCTION	0.46	0.46	0	01:05	0.00478
0.00478	0.116						
J1		JUNCTION	2.81	2.81	0	01:06	0.0293
0.0293	0.098						
J10		JUNCTION	0.43	0.43	0	01:05	0.00443
0.00443	1.304						
J11		JUNCTION	0.00	6.35	0	01:06	0
0.0679	0.245						
J12		JUNCTION	5.88	5.98	0	01:06	0.0625
0.0638	0.338						
J13		JUNCTION	0.12	0.22	0	00:57	0.00122
0.00129	0.281						
J14		JUNCTION	3.32	9.53	0	01:06	0.0415
0.109	0.153						
J15		JUNCTION	6.08	6.08	0	01:06	0.0661
0.0661	0.223						
J16		JUNCTION	3.22	9.25	0	01:06	0.0378
0.104	0.425						
J17		JUNCTION	1.99	9.34	0	01:06	0.0252
0.107	0.271						
J18		JUNCTION	1.15	1.15	0	01:06	0.0123
0.0123	0.098						
J19		JUNCTION	2.22	2.22	0	01:06	0.0233
0.0233	0.119						
J2		JUNCTION	1.54	4.35	0	01:06	0.016
0.0452	0.424						
J20		JUNCTION	4.34	7.60	0	01:06	0.0466
0.0822	0.306						
J21		JUNCTION	0.00	9.11	0	01:06	0
0.107	0.378						
J22		JUNCTION	0.00	9.23	0	01:06	0
0.114	0.204						
J23		JUNCTION	3.15	3.15	0	01:06	0.0397
0.0397	0.642						
J24		JUNCTION	2.06	2.06	0	01:06	0.0219
0.0219	0.124						
J25		JUNCTION	0.00	9.34	0	01:06	0
0.114	0.121						

J26		JUNCTION	0.00	9.50	0	01:06	0
0.109	0.149						
J27		JUNCTION	0.94	0.94	0	01:06	0.0117
0.0117	0.710						
J28		JUNCTION	0.00	1.83	0	00:04	0
0.000221	3.867						
J29		JUNCTION	0.53	9.64	0	01:06	0.0108
0.114	0.352						
J3		JUNCTION	1.64	9.94	0	01:06	0.0168
0.105	0.359						
J30		JUNCTION	0.00	10.05	0	01:07	0
0.139	0.349						
J31		JUNCTION	1.84	1.84	0	01:06	0.02
0.02	0.190						
J32		JUNCTION	0.00	4.02	0	01:06	0
0.0431	0.486						
J33		JUNCTION	1.09	3.34	0	01:06	0.0116
0.0497	0.945						
J34		JUNCTION	0.85	0.85	0	01:06	0.00911
0.00911	0.274						
J4		JUNCTION	1.98	1.98	0	01:06	0.0213
0.0213	0.140						
J40		JUNCTION	0.89	3.85	0	01:06	0.0186
0.058	1.040						
J41		JUNCTION	0.72	0.72	0	01:16	0.0149
0.0149	0.481						
J42		JUNCTION	0.05	0.98	0	01:06	0.000394
0.012	1.021						
J43		JUNCTION	0.00	9.60	0	01:06	0
0.121	0.407						
J5		JUNCTION	0.79	0.79	0	01:06	0.00827
0.00827	0.128						
J6		JUNCTION	0.62	1.40	0	01:06	0.00641
0.0147	0.156						
J7		JUNCTION	0.00	12.63	0	01:04	0
0.14	0.381						
J8		JUNCTION	1.54	3.34	0	01:05	0.0162
0.0361	0.790						
J9		JUNCTION	0.00	11.62	0	01:05	0
0.14	0.250						
MH1		JUNCTION	0.12	0.12	0	01:05	0.00124
0.00124	0.159						
MH10		JUNCTION	0.00	2.68	0	01:06	0
0.0279	0.169						
MH11		JUNCTION	0.16	0.16	0	01:05	0.00164
0.00164	0.202						
MH12		JUNCTION	0.32	0.32	0	01:05	0.00337
0.00337	0.197						
MH13		JUNCTION	0.00	0.32	0	01:05	0
0.00336	0.442						
MH14		JUNCTION	0.80	2.33	0	01:06	0.00828
0.0241	0.125						
MH15		JUNCTION	1.30	5.17	0	01:06	0.0134
0.0535	0.133						
MH16		JUNCTION	1.09	7.88	0	01:06	0.0113
0.0815	0.166						
MH17		JUNCTION	1.77	9.64	0	01:06	0.0177
0.0992	0.244						
MH18		JUNCTION	0.00	9.66	0	01:02	0
0.101	0.240						

MH19		JUNCTION	0.00	16.48	0	01:06	0
0.193	1.720						
MH2		JUNCTION	0.25	0.67	0	01:05	0.00262
0.00694	0.191						
MH20		JUNCTION	1.68	8.05	0	00:05	0.0173
0.0793	0.581						
MH21		JUNCTION	3.68	5.59	0	01:06	0.038
0.0577	0.292						
MH22		JUNCTION	1.91	1.91	0	01:06	0.0198
0.0198	0.901						
MH23		JUNCTION	0.00	0.00	0	00:00	0
0	0.000 gal						
MH25		JUNCTION	12.80	30.99	0	00:00	0.684
1.35	0.490						
MH26		JUNCTION	12.80	52.38	0	00:00	0.684
2.42	0.430						
MH3		JUNCTION	0.37	1.37	0	01:05	0.00386
0.0142	0.185						
MH4		JUNCTION	0.94	2.77	0	01:05	0.00971
0.0287	0.442						
MH5		JUNCTION	0.99	3.76	0	01:06	0.0103
0.039	0.264						
MH6		JUNCTION	0.73	0.73	0	01:06	0.00755
0.00755	0.410						
MH7		JUNCTION	0.92	1.65	0	01:05	0.00957
0.0171	0.335						
MH8		JUNCTION	0.00	1.65	0	01:06	0
0.017	0.379						
MH9		JUNCTION	0.88	2.53	0	01:06	0.00915
0.0261	0.367						
Node_10		JUNCTION	0.00	193.97	0	00:01	0
5.61	0.422						
Node_11		JUNCTION	0.00	147.84	0	00:01	0
5.62	0.091						
Node_12		JUNCTION	0.00	160.42	0	00:01	0
6	0.311						
Node_13		JUNCTION	0.00	179.66	0	00:01	0
6.38	0.526						
Node_14		JUNCTION	0.00	201.12	0	00:00	0
6.75	0.417						
Node_15		JUNCTION	0.00	211.87	0	00:00	0
6.76	0.252						
Node_19		JUNCTION	7.00	13.63	0	00:03	0.374
0.374	0.077						
Node_20		JUNCTION	8.00	12.92	0	00:03	0.427
0.427	0.166						
Node_21		JUNCTION	2.50	28.64	0	00:03	0.134
0.135	-0.354						
Node_22		JUNCTION	2.50	12.24	0	00:03	0.134
0.134	-0.082						
Node_23		JUNCTION	2.50	8.29	0	00:03	0.134
0.134	0.134						
Node_24		JUNCTION	2.50	11.76	0	00:04	0.134
0.134	-0.001						
Node_25		JUNCTION	7.00	7.60	0	00:04	0.374
0.374	0.049						
Node_26		JUNCTION	7.00	7.00	0	00:00	0.374
0.374	0.074						
Node_27		JUNCTION	7.00	7.00	0	00:00	0.374
0.374	0.066						

Node_3		JUNCTION	0.00	47.69	0	01:06	0
1.9	0.564						
Node_32		JUNCTION	0.00	47.69	0	01:06	0
1.9	0.399						
Node_33		JUNCTION	0.00	90.05	0	01:06	0
4.28	0.224						
Node_5		JUNCTION	0.00	97.15	0	01:02	0
4.65	0.324						
Node_6		JUNCTION	0.00	113.90	0	00:03	0
5.06	0.511						
Node_7		JUNCTION	0.00	159.77	0	00:03	0
5.17	0.445						
Node_8		JUNCTION	0.00	126.14	0	00:02	0
5.3	0.445						
Node_9		JUNCTION	0.00	120.68	0	00:07	0
5.45	0.469						
OCS1		JUNCTION	12.80	12.80	0	00:00	0.684
0.684	0.024						
OCS2		JUNCTION	12.80	12.80	0	00:00	0.684
0.684	0.068						
OCS3		JUNCTION	10.88	10.88	0	00:00	0.581
0.581	0.084						
OCS4		JUNCTION	12.80	13.18	0	00:04	0.684
0.684	0.072						
OCS5		JUNCTION	12.59	12.59	0	00:00	0.672
0.672	0.021						
OF1		OUTFALL	0.00	211.87	0	00:00	0
6.76	0.000						
OF10		OUTFALL	0.00	3.81	0	01:06	0
0.0574	0.000						
OF2		OUTFALL	0.00	8.31	0	01:06	0
0.0858	0.000						
OF3		OUTFALL	0.00	0.00	0	00:00	0
0	0.000 gal						
OF4		OUTFALL	0.00	9.57	0	01:07	0
0.121	0.000						
OF5		OUTFALL	0.00	9.50	0	01:06	0
0.109	0.000						
OF6		OUTFALL	0.00	10.05	0	01:07	0
0.139	0.000						
OF7		OUTFALL	0.00	4.50	0	00:59	0
0.0636	0.000						
OF8		OUTFALL	0.00	9.18	0	01:07	0
0.113	0.000						
OF9		OUTFALL	0.00	0.96	0	01:06	0
0.0119	0.000						

Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
DOGMH1	JUNCTION	1.93	6.810	0.000

EXMH20	JUNCTION	1.91	4.208	4.032
EXMH21	JUNCTION	1.92	5.410	0.000
EXMH22	JUNCTION	1.92	3.771	2.189
EXMH23	JUNCTION	1.92	3.521	2.699
J30	JUNCTION	0.26	0.803	4.447
MH18	JUNCTION	0.09	1.031	5.929
MH19	JUNCTION	0.25	3.789	4.171
MH20	JUNCTION	0.13	1.621	5.049
MH25	JUNCTION	1.97	4.940	0.000
MH26	JUNCTION	1.97	5.500	0.000
Node_11	JUNCTION	0.04	7.490	0.000
Node_12	JUNCTION	0.01	2.372	3.798
Node_15	JUNCTION	1.95	9.050	0.000
Node_19	JUNCTION	0.05	3.670	0.000
Node_20	JUNCTION	0.06	4.290	0.000
Node_21	JUNCTION	0.01	3.650	0.000
Node_22	JUNCTION	0.03	4.000	0.000
Node_25	JUNCTION	0.01	2.254	1.506
Node_3	JUNCTION	1.94	7.260	0.000
Node_32	JUNCTION	1.94	5.602	1.028
Node_33	JUNCTION	1.92	3.590	2.700
Node_5	JUNCTION	0.05	5.315	0.000
Node_6	JUNCTION	0.04	5.350	0.000
Node_7	JUNCTION	0.02	5.790	0.000
Node_8	JUNCTION	0.03	6.340	0.000
OCS1	JUNCTION	1.98	3.500	0.000
OCS2	JUNCTION	1.98	3.000	0.000
OCS3	JUNCTION	1.95	3.000	0.000
OCS4	JUNCTION	1.98	3.250	0.000
OCS5	JUNCTION	1.97	3.000	0.000

Node Flooding Summary

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Depth Feet
DOGMH1	0.01	32.16	0 00:02	0.000	0.000
EXMH21	0.01	10.64	0 00:04	0.000	0.000
MH25	0.01	7.63	0 00:00	0.000	0.000
MH26	0.01	22.80	0 00:00	0.000	0.000
Node_11	0.01	76.38	0 00:03	0.000	0.000
Node_15	0.01	121.86	0 00:00	0.001	0.000
Node_19	0.01	13.56	0 00:03	0.000	0.000
Node_20	0.01	11.92	0 00:03	0.001	0.000
Node_21	0.01	28.53	0 00:03	0.001	0.000
Node_22	0.01	10.84	0 00:03	0.000	0.000
Node_3	0.01	27.94	0 00:02	0.000	0.000
Node_5	0.01	30.50	0 00:03	0.000	0.000
Node_6	0.01	100.18	0 00:03	0.001	0.000
Node_7	0.01	123.02	0 00:03	0.001	0.000

Node_8	0.01	33.40	0	00:03	0.000	0.000
OCS1	1.94	10.53	0	00:00	0.243	0.000
OCS2	0.15	5.06	0	00:00	0.007	0.000
OCS3	0.01	3.21	0	00:00	0.000	0.000
OCS4	1.97	13.13	0	00:04	0.292	0.000
OCS5	0.28	6.89	0	00:00	0.005	0.000

 Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OF1	100.00	124.54	211.87	6.759
OF10	90.64	1.02	3.81	0.057
OF2	93.84	1.51	8.31	0.086
OF3	0.00	0.00	0.00	0.000
OF4	90.04	2.17	9.57	0.121
OF5	93.24	1.91	9.50	0.109
OF6	92.94	2.38	10.05	0.139
OF7	99.95	1.08	4.50	0.064
OF8	89.06	2.06	9.18	0.113
OF9	89.83	0.22	0.96	0.012
System	83.95	136.87	214.17	7.460

 Link Flow Summary

Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Veloc ft/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.30	0 01:07	0.34	0.02	0.36
C10	CONDUIT	7.35	0 01:06	3.81	0.50	0.66
C11	CONDUIT	8.99	0 01:06	5.13	1.28	0.97
C12	CONDUIT	4.50	0 00:59	3.80	0.16	0.75
C13	CONDUIT	9.50	0 01:06	5.27	0.64	0.56
C14	CONDUIT	2.81	0 01:06	4.34	0.30	0.40
C15	CONDUIT	4.34	0 01:06	5.73	0.34	0.48
C16	CONDUIT	0.79	0 01:06	3.31	0.32	0.34
C17	CONDUIT	1.86	0 01:07	3.08	0.45	0.77
C18	CONDUIT	9.17	0 01:06	4.15	0.34	0.48
C19	CONDUIT	9.65	0 01:05	4.13	0.36	0.69
C2	CONDUIT	5.93	0 01:06	4.05	0.40	0.47
C20	CONDUIT	0.00	0 00:00	0.00	0.00	0.07
C21	CONDUIT	9.50	0 01:06	6.75	0.90	0.74
C22	CONDUIT	6.35	0 01:06	3.83	0.42	0.53
C23	CONDUIT	9.18	0 01:07	5.59	1.30	0.88
C24	CONDUIT	0.93	0 01:06	2.74	0.22	0.32

C25	CONDUIT	0.04	0	01:07	0.03	0.00	0.51
C26	CONDUIT	9.23	0	01:06	5.23	1.27	0.99
C27	CONDUIT	1.97	0	00:05	1.08	0.03	0.57
C28	CONDUIT	0.00	0	00:00	0.00	0.00	0.50
C29	CONDUIT	1.97	0	01:06	2.82	0.32	0.42
C3	CONDUIT	0.43	0	01:05	3.71	0.05	0.17
C30	CONDUIT	12.80	0	00:00	10.43	2.52	1.00
C31	CONDUIT	18.19	0	00:00	15.76	0.88	1.00
C32	CONDUIT	3.23	0	01:07	4.39	0.35	0.88
C33	CONDUIT	11.62	0	01:05	3.65	0.43	0.95
C34	CONDUIT	1.28	0	00:03	0.47	0.02	0.54
C35	CONDUIT	10.05	0	01:07	5.69	1.50	1.00
C36	CONDUIT	10.05	0	01:07	5.97	1.59	0.91
C37	CONDUIT	1.40	0	01:06	4.88	0.10	0.32
C38	CONDUIT	0.85	0	01:06	3.29	0.07	0.30
C4	CONDUIT	6.05	0	01:06	4.00	0.42	0.49
C40	CONDUIT	2.05	0	01:06	2.91	0.33	0.42
C41	CONDUIT	3.99	0	01:06	2.70	0.15	0.36
C46	CONDUIT	9.57	0	01:07	5.87	1.42	0.87
C47	CONDUIT	0.72	0	01:16	3.44	0.05	0.46
C48	CONDUIT	0.96	0	01:06	2.92	0.23	0.31
C49	CONDUIT	3.81	0	01:06	3.90	0.30	0.35
C5	CONDUIT	1.11	0	01:06	0.74	0.07	0.53
C6	CONDUIT	2.14	0	01:06	1.72	0.13	0.49
C7	CONDUIT	9.11	0	01:06	3.94	0.61	0.81
C8	CONDUIT	3.11	0	01:06	3.23	0.24	0.35
C9	CONDUIT	9.34	0	01:06	3.46	0.33	0.58
Conduit_0	CONDUIT	12.81	0	00:00	16.31	4.90	1.00
Conduit_15	CONDUIT	108.44	0	00:06	6.41	1.13	1.00
Conduit_16	CONDUIT	9.74	0	00:03	5.55	1.38	1.00
Conduit_17	CONDUIT	118.20	0	00:07	6.87	1.24	1.00
Conduit_18	CONDUIT	7.63	0	00:04	4.25	0.14	0.73
Conduit_19	CONDUIT	127.38	0	00:06	7.16	0.70	1.00
Conduit_2	CONDUIT	12.98	0	00:04	7.46	1.67	1.00
Conduit_20	CONDUIT	9.26	0	00:04	8.06	0.12	0.72
Conduit_21	CONDUIT	191.46	0	00:01	13.16	1.43	1.00
Conduit_22	CONDUIT	147.84	0	00:01	9.62	0.95	1.00
Conduit_23	CONDUIT	9.03	0	00:04	8.02	0.75	1.00
Conduit_24	CONDUIT	153.42	0	00:01	8.45	1.07	1.00
Conduit_25	CONDUIT	8.60	0	00:00	6.81	0.84	0.81
Conduit_26	CONDUIT	172.58	0	00:01	9.59	1.07	1.00
Conduit_27	CONDUIT	9.44	0	00:00	9.00	0.33	0.42
Conduit_28	CONDUIT	194.84	0	00:00	12.81	0.92	1.00
Conduit_29	CONDUIT	211.87	0	00:00	10.88	2.35	1.00
Conduit_4	CONDUIT	11.16	0	00:00	6.59	1.46	1.00
EXPIPE1	CONDUIT	14.95	0	00:01	3.96	0.37	1.00
EXPIPE10	CONDUIT	105.21	0	01:06	6.34	0.79	1.00
EXPIPE11	CONDUIT	8.43	0	00:00	6.42	0.87	1.00
EXPIPE12	CONDUIT	10.00	0	00:00	6.83	0.49	1.00
EXPIPE13	CONDUIT	26.14	0	00:03	8.32	1.32	1.00
EXPIPE2	CONDUIT	26.65	0	00:01	5.09	0.68	1.00
EXPIPE3	CONDUIT	38.17	0	00:02	7.27	1.03	1.00
EXPIPE4	CONDUIT	47.69	0	01:06	7.29	1.23	1.00
EXPIPE5	CONDUIT	47.69	0	01:06	6.75	1.26	1.00
EXPIPE6	CONDUIT	47.69	0	01:06	7.68	1.30	1.00
EXPIPE7	CONDUIT	90.05	0	01:06	9.36	1.24	1.00
EXPIPE8	CONDUIT	90.18	0	01:02	9.37	1.40	1.00

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class							
Inlet Conduit Ctrl	/Actual Length	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	
C1 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.76	
C10 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.78	
C11 0.00	1.00	0.03	0.00	0.00	0.93	0.05	0.00	0.41	

C12 0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09
C13 0.00	1.00	0.02	0.00	0.00	0.24	0.74	0.00	0.00	0.28
C14 0.00	1.00	0.02	0.00	0.00	0.17	0.82	0.00	0.00	0.69
C15 0.00	1.00	0.02	0.00	0.00	0.05	0.11	0.00	0.82	0.11
C16 0.00	1.00	0.01	0.01	0.00	0.51	0.47	0.00	0.00	0.05
C17 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.78
C18 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.42
C19 0.00	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.63
C2 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.54
C20 0.00	1.00	0.71	0.29	0.00	0.00	0.00	0.00	0.00	0.00
C21 0.00	1.00	0.03	0.00	0.00	0.03	0.94	0.00	0.00	0.41
C22 0.00	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.65
C23 0.00	1.00	0.07	0.00	0.00	0.89	0.03	0.00	0.00	0.00
C24 0.00	1.00	0.02	0.00	0.00	0.95	0.03	0.00	0.00	0.44
C25 0.00	1.00	0.01	0.97	0.00	0.02	0.00	0.00	0.00	0.44
C26 0.00	1.00	0.05	0.00	0.00	0.94	0.01	0.00	0.00	0.05
C27 0.00	1.00	0.00	0.71	0.00	0.29	0.00	0.00	0.00	0.96
C28 0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
C29 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.68
C3 0.00	1.00	0.02	0.00	0.00	0.00	0.05	0.00	0.93	0.04
C30 0.00	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
C31 0.00	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
C32 0.00	1.00	0.02	0.00	0.00	0.13	0.01	0.00	0.84	0.05
C33 0.00	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.60
C34 0.00	1.00	0.00	0.96	0.00	0.04	0.00	0.00	0.00	0.45
C35 0.00	1.00	0.05	0.00	0.00	0.93	0.01	0.00	0.00	0.11
C36 0.00	1.00	0.06	0.00	0.00	0.85	0.09	0.00	0.00	0.00
C37 0.00	1.00	0.00	0.01	0.00	0.86	0.13	0.00	0.00	0.90
C38 0.00	1.00	0.00	0.03	0.00	0.90	0.08	0.00	0.00	0.98
C4 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.76

C40	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.63
0.00									
C41	1.00	0.02	0.02	0.00	0.96	0.00	0.00	0.00	0.96
0.00									
C46	1.00	0.06	0.00	0.00	0.92	0.02	0.00	0.00	0.00
0.00									
C47	1.00	0.34	0.18	0.00	0.27	0.18	0.00	0.03	0.56
0.00									
C48	1.00	0.04	0.00	0.00	0.90	0.06	0.00	0.00	0.00
0.00									
C49	1.00	0.03	0.00	0.00	0.92	0.05	0.00	0.00	0.00
0.00									
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.22
0.00									
C6	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.84
0.00									
C7	1.00	0.02	0.00	0.00	0.97	0.02	0.00	0.00	0.09
0.00									
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.46
0.00									
C9	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.07
0.00									
Conduit_0	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
0.00									
Conduit_15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_16	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00
0.00									
Conduit_17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_18	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.97	0.00
0.00									
Conduit_19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_2	1.00	0.00	0.00	0.00	0.98	0.00	0.00	0.02	0.00
0.00									
Conduit_20	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00
0.00									
Conduit_21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_22	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_23	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
Conduit_24	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_25	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00
0.00									
Conduit_26	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_27	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
Conduit_28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_4	1.00	0.00	0.00	0.00	0.97	0.00	0.00	0.03	0.00
0.00									

EXPIPE10 0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
EXPIPE11 0.00	1.00	0.00	0.00	0.00	0.12	0.04	0.00	0.85	0.00
EXPIPE12 0.00	1.00	0.00	0.00	0.00	0.95	0.00	0.00	0.05	0.00
EXPIPE13 0.00	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.96	0.00
EXPIPE2 0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
EXPIPE3 0.00	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00
EXPIPE4 0.00	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00
EXPIPE5 0.00	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.01
EXPIPE6 0.00	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00
EXPIPE7 0.00	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.01
EXPIPE8 0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
EXPIPE9 0.00	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00
PIPE1 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.98
PIPE10 0.00	1.00	0.02	0.00	0.00	0.34	0.64	0.00	0.00	0.49
PIPE11 0.00	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.98
PIPE12 0.00	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
PIPE13 0.00	1.00	0.02	0.02	0.00	0.96	0.00	0.00	0.00	0.90
PIPE14 0.00	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.00	0.97
PIPE15 0.00	1.00	0.02	0.00	0.00	0.09	0.09	0.00	0.80	0.17
PIPE16 0.00	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.00	0.14
PIPE17 0.00	1.00	0.02	0.00	0.00	0.00	0.07	0.00	0.92	0.02
PIPE18 0.00	1.00	0.02	0.00	0.00	0.90	0.08	0.00	0.00	0.09
PIPE19 0.00	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00
PIPE2 0.00	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
PIPE20 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.83
PIPE21 0.00	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.99
PIPE22 0.00	1.00	0.02	0.00	0.00	0.00	0.09	0.00	0.89	0.02
PIPE23 0.00	1.00	0.02	0.00	0.00	0.05	0.93	0.00	0.00	0.83
PIPE24 0.00	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
PIPE25 0.00	1.00	0.02	0.00	0.00	0.11	0.87	0.00	0.00	0.77

PIPE26	1.00	0.02	0.00	0.00	0.21	0.77	0.00	0.00	0.40
0.00									
PIPE27	1.00	0.03	0.02	0.00	0.95	0.00	0.00	0.00	0.80
0.00									
PIPE28	1.00	0.83	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
PIPE29	1.00	0.02	0.00	0.00	0.00	0.01	0.00	0.97	0.01
0.00									
PIPE3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.99
0.00									
PIPE30	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.91
0.00									
PIPE31	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.04
0.00									
PIPE32	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.00
0.00									
PIPE33	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
0.00									
PIPE34	1.00	0.00	0.00	0.00	0.96	0.00	0.00	0.04	0.00
0.00									
PIPE35	1.00	0.02	0.00	0.00	0.09	0.89	0.00	0.00	0.21
0.00									
PIPE4	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
0.00									
PIPE5	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.92
0.00									
PIPE6	1.00	0.02	0.00	0.00	0.09	0.02	0.00	0.87	0.00
0.00									
PIPE7	1.00	0.02	0.00	0.00	0.08	0.90	0.00	0.00	0.03
0.00									
PIPE8	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.01	0.98
0.00									
PIPE9	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.99
0.00									

Conduit Surcharge Summary

Conduit	----- Both Ends	Hours Full Upstream	----- Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C11	0.01	0.08	0.01	0.16	0.01
C12	0.01	0.01	1.98	0.01	0.01
C23	0.01	0.01	0.01	0.15	0.01
C25	0.01	0.01	0.88	0.01	0.01
C26	0.01	0.03	0.01	0.14	0.01
C27	0.01	0.01	1.91	0.01	0.01
C30	1.98	1.98	1.98	1.80	1.81
C31	1.97	1.97	1.97	0.01	0.01
C32	0.01	0.01	0.11	0.01	0.01
C33	0.01	0.01	0.07	0.01	0.01
C34	0.01	0.01	1.92	0.01	0.01
C35	0.26	0.28	0.26	0.31	0.25
C36	0.01	0.26	0.01	0.32	0.01
C46	0.01	0.01	0.01	0.19	0.01

Conduit_0	1.98	1.98	1.98	1.98	1.98
Conduit_15	0.04	0.04	0.04	1.88	0.02
Conduit_16	0.03	0.03	0.03	0.01	0.01
Conduit_17	0.03	0.04	0.03	1.89	0.02
Conduit_19	0.03	0.03	0.04	0.01	0.01
Conduit_2	1.94	1.98	1.94	1.98	1.94
Conduit_21	0.03	0.04	0.03	0.01	0.02
Conduit_22	0.03	0.03	0.04	0.01	0.02
Conduit_23	0.01	0.01	0.01	0.01	0.01
Conduit_24	0.03	0.04	0.05	0.01	0.02
Conduit_26	0.04	0.05	1.73	0.01	0.03
Conduit_28	1.72	1.73	1.95	0.01	0.02
Conduit_29	1.95	1.95	1.98	1.93	1.94
Conduit_4	1.94	1.95	1.94	1.98	1.94
EXPIPE1	1.91	1.91	1.92	0.01	0.01
EXPIPE10	0.04	0.04	0.04	0.01	0.01
EXPIPE11	0.05	0.05	0.05	0.01	0.01
EXPIPE12	0.06	0.06	0.23	0.01	0.01
EXPIPE13	0.01	0.01	0.02	0.01	0.01
EXPIPE2	1.92	1.92	1.92	0.01	0.01
EXPIPE3	1.92	1.92	1.93	0.01	0.01
EXPIPE4	1.92	1.93	1.93	0.33	0.35
EXPIPE5	1.93	1.93	1.94	0.41	0.43
EXPIPE6	1.94	1.94	1.94	0.51	0.52
EXPIPE7	1.92	1.92	1.92	1.88	1.87
EXPIPE8	1.92	1.92	1.92	1.90	1.90
EXPIPE9	1.92	1.92	1.93	1.88	1.88
PIPE13	0.01	0.01	1.92	0.01	0.01
PIPE26	0.01	0.01	0.09	0.01	0.01
PIPE27	0.09	0.09	0.25	0.01	0.01
PIPE30	0.01	0.01	0.13	0.01	0.01
PIPE31	0.13	0.13	0.25	0.01	0.01
PIPE32	0.25	0.25	1.93	0.01	0.01
PIPE33	1.97	1.97	1.97	1.97	1.97
PIPE34	1.92	1.97	1.92	1.97	1.92
PIPE8	0.01	0.01	1.91	0.01	0.01

Analysis begun on: Wed May 11 10:45:26 2022
 Analysis ended on: Wed May 11 10:45:27 2022
 Total elapsed time: 00:00:01

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

Element Count

Number of rain gages 2
 Number of subcatchments ... 56
 Number of nodes 116
 Number of links 110
 Number of pollutants 0
 Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
25YR_NOAA_Type_C_5.88in	25YR_NOAA_Type_C_5.88in	INTENSITY	6 min.
WQ_Gauge	WQ_FLOW	CUMULATIVE	1 min.

Subcatchment Summary

Name Outlet	Area	Width	%Imperv	%Slope	Rain Gage
S1	0.23	39.86	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH6					
S10	0.14	86.39	100.00	1.0000	
25YR_NOAA_Type_C_5.88in IN9					
S11	0.05	29.12	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH11					
S12	0.31	45.90	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH5					
S13	0.29	55.52	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH4					
S14	0.11	57.48	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH3					
S15	0.08	47.01	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH2					
S16	0.04	20.50	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH1					
S17	0.40	105.85	100.00	1.0000	
25YR_NOAA_Type_C_5.88in IN10					
S18	0.66	186.16	100.00	1.0000	
25YR_NOAA_Type_C_5.88in IN5					
S19	1.13	251.36	100.00	1.0000	
25YR_NOAA_Type_C_5.88in IN6					
S2	0.29	74.50	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH7					
S20	0.59	81.75	100.00	8.0000	
25YR_NOAA_Type_C_5.88in MH22					

S21	1.14	157.94	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH21				
S22	0.52	76.31	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH20				
S23	0.10	25.31	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH12				
S24	0.25	52.87	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH14				
S25	0.40	87.05	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH15				
S26	0.34	77.92	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH16				
S27	0.55	79.36	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH17				
S28	0.04	43.78	100.00	0.5000
25YR_NOAA_Type_C_5.88in J13				
S29	2.09	322.02	75.00	0.5000
25YR_NOAA_Type_C_5.88in J12				
S3	0.27	40.29	100.00	8.0000
25YR_NOAA_Type_C_5.88in MH9				
S30	0.13	107.72	100.00	0.5000
25YR_NOAA_Type_C_5.88in J10				
S31	0.49	88.86	100.00	0.5000
25YR_NOAA_Type_C_5.88in J8				
S32	1.84	265.76	40.00	0.5000
25YR_NOAA_Type_C_5.88in J14				
S33	0.71	166.69	100.00	0.5000
25YR_NOAA_Type_C_5.88in J19				
S34	1.46	178.39	55.00	0.5000
25YR_NOAA_Type_C_5.88in J16				
S35	0.98	165.58	0.00	0.5000
25YR_NOAA_Type_C_5.88in J29				
S36	0.62	86.46	100.00	0.5000
25YR_NOAA_Type_C_5.88in J31				
S37	0.67	119.80	100.00	0.5000
25YR_NOAA_Type_C_5.88in J24				
S38	0.38	59.88	100.00	0.5000
25YR_NOAA_Type_C_5.88in J18				
S39	0.43	88.15	25.00	0.5000
25YR_NOAA_Type_C_5.88in J20				
S4	0.41	97.57	100.00	1.0000
25YR_NOAA_Type_C_5.88in IN4				
S40	0.48	107.76	100.00	0.5000
25YR_NOAA_Type_C_5.88in J20				
S41	0.78	165.74	100.00	0.5000
25YR_NOAA_Type_C_5.88in J20				
S42	2.05	282.27	100.00	0.5000
25YR_NOAA_Type_C_5.88in J15				
S43	2.94	350.87	30.00	0.5000
25YR_NOAA_Type_C_5.88in J23				
S44	1.72	378.83	30.00	0.5000
25YR_NOAA_Type_C_5.88in J17				
S45	0.89	246.83	100.00	0.5000
25YR_NOAA_Type_C_5.88in J1				
S46	0.48	178.07	100.00	0.5000
25YR_NOAA_Type_C_5.88in J2				
S47	0.53	111.52	90.00	0.5000
25YR_NOAA_Type_C_5.88in J3				
S48	0.66	100.99	100.00	0.5000
25YR_NOAA_Type_C_5.88in J4				

S49	0.25	44.01	100.00	0.5000
25YR_NOAA_Type_C_5.88in J5				
S5	0.51	127.48	100.00	1.0000
25YR_NOAA_Type_C_5.88in IN3				
S50	0.19	65.44	100.00	0.5000
25YR_NOAA_Type_C_5.88in J6				
S51	0.35	65.22	100.00	0.5000
25YR_NOAA_Type_C_5.88in J33				
S52	0.28	46.55	100.00	0.5000
25YR_NOAA_Type_C_5.88in J34				
S53	0.75	164.66	33.00	0.5000
25YR_NOAA_Type_C_5.88in J27				
S56	1.42	214.33	0.00	0.5000
25YR_NOAA_Type_C_5.88in J41				
S57	1.80	261.65	0.00	0.5000
25YR_NOAA_Type_C_5.88in J40				
S58	0.02	50.00	0.00	0.5000
25YR_NOAA_Type_C_5.88in J42				
S6	0.48	124.12	100.00	1.0000
25YR_NOAA_Type_C_5.88in IN2				
S7	0.38	103.63	100.00	1.0000
25YR_NOAA_Type_C_5.88in IN1				
S8	0.09	49.69	100.00	1.0000
25YR_NOAA_Type_C_5.88in IN7				
S9	0.10	85.53	100.00	1.0000
25YR_NOAA_Type_C_5.88in IN8				

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
DOGMH1	JUNCTION	5.09	9.81	0.0	
EXMH20	JUNCTION	6.26	11.24	0.0	
EXMH21	JUNCTION	5.83	8.41	0.0	
EXMH22	JUNCTION	5.44	8.96	0.0	
EXMH23	JUNCTION	4.23	9.72	0.0	
IN1	JUNCTION	12.71	4.65	0.0	
IN10	JUNCTION	12.20	5.01	0.0	
IN2	JUNCTION	12.71	4.65	0.0	
IN3	JUNCTION	12.56	4.80	0.0	
IN4	JUNCTION	12.96	4.25	0.0	
IN5	JUNCTION	12.20	4.88	0.0	
IN6	JUNCTION	11.10	5.52	0.0	
IN7	JUNCTION	14.27	4.50	0.0	
IN8	JUNCTION	13.74	4.78	0.0	
IN9	JUNCTION	13.22	5.30	0.0	
J1	JUNCTION	11.92	3.00	0.0	
J10	JUNCTION	13.00	3.00	0.0	
J11	JUNCTION	9.15	5.25	0.0	
J12	JUNCTION	9.65	4.53	0.0	
J13	JUNCTION	10.00	5.59	0.0	
J14	JUNCTION	8.92	5.08	0.0	
J15	JUNCTION	9.75	3.50	50.0	
J16	JUNCTION	9.22	4.03	0.0	
J17	JUNCTION	9.10	3.68	0.0	

J18	JUNCTION	9.70	4.10	0.0	
J19	JUNCTION	9.85	4.17	0.0	
J2	JUNCTION	11.45	3.35	0.0	
J20	JUNCTION	9.55	3.79	0.0	
J21	JUNCTION	8.85	5.40	0.0	
J22	JUNCTION	8.40	5.70	0.0	
J23	JUNCTION	8.77	3.50	0.0	
J24	JUNCTION	11.17	3.00	0.0	
J25	JUNCTION	8.50	5.00	0.0	
J26	JUNCTION	8.80	5.40	0.0	
J27	JUNCTION	8.98	2.75	0.0	
J28	JUNCTION	8.25	5.90	0.0	
J29	JUNCTION	8.65	4.60	0.0	
J3	JUNCTION	10.35	4.45	0.0	
J30	JUNCTION	8.70	6.75	0.0	
J31	JUNCTION	10.85	2.75	0.0	
J32	JUNCTION	10.97	4.21	0.0	
J33	JUNCTION	9.50	4.20	0.0	
J34	JUNCTION	10.55	3.15	0.0	
J4	JUNCTION	11.17	3.00	0.0	
J40	JUNCTION	8.15	4.82	0.0	
J41	JUNCTION	9.60	3.50	0.0	
J42	JUNCTION	8.20	5.40	0.0	
J43	JUNCTION	8.20	5.70	0.0	
J5	JUNCTION	10.25	3.52	0.0	
J6	JUNCTION	10.05	3.72	0.0	
J7	JUNCTION	9.33	6.37	0.0	
J8	JUNCTION	10.50	4.00	0.0	
J9	JUNCTION	8.95	6.50	0.0	
MH1	JUNCTION	14.24	4.75	0.0	
MH10	JUNCTION	10.17	8.65	0.0	
MH11	JUNCTION	13.97	4.93	0.0	
MH12	JUNCTION	13.91	4.25	0.0	
MH13	JUNCTION	13.25	4.75	0.0	
MH14	JUNCTION	12.51	5.33	0.0	
MH15	JUNCTION	12.01	5.83	0.0	
MH16	JUNCTION	11.25	6.33	0.0	
MH17	JUNCTION	9.92	7.91	0.0	
MH18	JUNCTION	9.12	8.96	0.0	
MH19	JUNCTION	7.93	9.96	0.0	
MH2	JUNCTION	13.93	5.06	0.0	
MH20	JUNCTION	8.73	8.67	0.0	
MH21	JUNCTION	10.45	7.05	0.0	
MH22	JUNCTION	12.75	4.66	0.0	
MH23	JUNCTION	13.75	4.28	0.0	
MH25	JUNCTION	7.40	6.94	0.0	Yes
MH26	JUNCTION	6.00	8.00	0.0	Yes
MH3	JUNCTION	13.40	5.59	0.0	
MH4	JUNCTION	12.88	6.11	0.0	
MH5	JUNCTION	10.56	8.30	0.0	
MH6	JUNCTION	13.97	4.90	0.0	
MH7	JUNCTION	12.37	6.62	0.0	
MH8	JUNCTION	12.12	6.73	0.0	
MH9	JUNCTION	10.52	8.30	0.0	
Node_10	JUNCTION	1.67	12.44	0.0	
Node_11	JUNCTION	1.54	12.49	0.0	
Node_12	JUNCTION	1.35	12.65	0.0	

Node_13	JUNCTION	0.99	13.05	0.0	
Node_14	JUNCTION	0.47	13.55	0.0	
Node_15	JUNCTION	-0.02	14.05	0.0	
Node_19	JUNCTION	6.86	5.17	0.0	Yes
Node_20	JUNCTION	5.09	6.29	0.0	Yes
Node_21	JUNCTION	6.50	5.65	0.0	Yes
Node_22	JUNCTION	6.43	5.50	0.0	Yes
Node_23	JUNCTION	6.48	5.52	0.0	Yes
Node_24	JUNCTION	6.63	5.44	0.0	Yes
Node_25	JUNCTION	6.62	5.26	0.0	Yes
Node_26	JUNCTION	6.54	5.39	0.0	Yes
Node_27	JUNCTION	6.67	5.33	0.0	Yes
Node_3	JUNCTION	4.84	10.26	0.0	
Node_32	JUNCTION	4.32	9.63	0.0	
Node_33	JUNCTION	4.16	9.79	0.0	
Node_5	JUNCTION	3.59	9.91	0.0	
Node_6	JUNCTION	2.98	10.35	0.0	
Node_7	JUNCTION	2.67	11.45	0.0	
Node_8	JUNCTION	2.51	11.66	0.0	
Node_9	JUNCTION	2.36	11.72	0.0	
OCS1	JUNCTION	6.50	4.50	0.0	Yes
OCS2	JUNCTION	6.50	4.50	0.0	Yes
OCS3	JUNCTION	6.50	4.50	0.0	Yes
OCS4	JUNCTION	6.50	4.50	0.0	Yes
OCS5	JUNCTION	8.50	4.50	0.0	Yes
OF1	OUTFALL	-0.12	5.00	0.0	
OF10	OUTFALL	8.00	2.00	0.0	
OF2	OUTFALL	10.00	2.00	0.0	
OF3	OUTFALL	4.32	2.00	0.0	
OF4	OUTFALL	8.00	1.50	0.0	
OF5	OUTFALL	8.00	1.50	0.0	
OF6	OUTFALL	8.00	1.50	0.0	
OF7	OUTFALL	6.00	1.50	0.0	
OF8	OUTFALL	8.00	1.50	0.0	
OF9	OUTFALL	8.00	1.25	0.0	

Link Summary

Name		From Node	To Node	Type	Length	%
Slope	Roughness					

C1		J13	J12	CONDUIT	139.8	
0.2503	0.0100					
C10		J20	J17	CONDUIT	179.8	
0.2502	0.0100					
C11		J21	J43	CONDUIT	247.0	
0.2632	0.0100					
C12		J33	OF7	CONDUIT	80.0	
4.3784	0.0100					
C13		J14	J26	CONDUIT	47.2	
0.2544	0.0100					
C14		J1	J2	CONDUIT	100.0	
0.4700	0.0100					
C15		J2	J3	CONDUIT	99.9	
0.8512	0.0100					

C16		J5	J6	CONDUIT	71.9
0.2781	0.0100				
C17		J31	J8	CONDUIT	141.1
0.2481	0.0100				
C18		J16	J29	CONDUIT	221.7
0.2571	0.0100				
C19		J3	J7	CONDUIT	395.8
0.2577	0.0100				
C2		J12	J11	CONDUIT	194.6
0.2570	0.0100				
C20		J26	J28	CONDUIT	27.0
6.6785	0.0100				
C21		J26	OF5	CONDUIT	134.3
0.5956	0.0100				
C22		J11	J14	CONDUIT	88.4
0.2602	0.0100				
C23		J22	OF8	CONDUIT	148.4
0.2696	0.0100				
C24		J27	J42	CONDUIT	318.1
0.2452	0.0100				
C25		J25	Node_13	CONDUIT	112.2
7.1586	0.0100				
C26		J25	J22	CONDUIT	35.1
0.2850	0.0100				
C27		J28	Node_10	CONDUIT	115.0
5.7321	0.0100				
C28		J21	OF3	CONDUIT	153.6
4.1237	0.0100				
C29		J4	J32	CONDUIT	99.4
0.2011	0.0100				
C3		J10	J11	CONDUIT	279.2
1.1103	0.0100				
C30		OCS4	MH26	CONDUIT	47.3
0.5289	0.0120				
C31		OCS5	MH25	CONDUIT	18.3
3.2794	0.0120				
C32		J8	J7	CONDUIT	142.8
0.4692	0.0100				
C33		J7	J9	CONDUIT	146.2
0.2599	0.0100				
C34		J9	Node_6	CONDUIT	333.0
2.5442	0.0100				
C35		J9	J30	CONDUIT	103.4
0.2417	0.0100				
C36		J30	OF6	CONDUIT	328.2
0.2133	0.0100				
C37		J6	J33	CONDUIT	47.2
1.1656	0.0100				
C38		J34	J33	CONDUIT	125.2
0.8388	0.0100				
C4		J15	J16	CONDUIT	218.7
0.2423	0.0100				
C40		J24	J32	CONDUIT	96.3
0.2076	0.0100				
C41		J32	J3	CONDUIT	249.6
0.2484	0.0100				
C46		J43	OF4	CONDUIT	81.8
0.2446	0.0100				
C47		J41	J43	CONDUIT	114.1
1.0078	0.0100				

C48		J42	OF9	CONDUIT	78.3
0.2553	0.0100				
C49		J40	OF10	CONDUIT	78.1
0.1920	0.0100				
C5		J18	J20	CONDUIT	50.0
0.3000	0.0100				
C6		J19	J20	CONDUIT	100.7
0.2980	0.0100				
C7		J17	J21	CONDUIT	95.5
0.2616	0.0100				
C8		J23	J40	CONDUIT	325.6
0.1904	0.0100				
C9		J29	J25	CONDUIT	53.6
0.2796	0.0100				
Conduit_0		OCS1	EXMH20	CONDUIT	28.4
0.4581	0.0120				
Conduit_15		Node_7	Node_8	CONDUIT	199.7
0.0801	0.0100				
Conduit_16		Node_22	Node_8	CONDUIT	37.6
0.2661	0.0100				
Conduit_17		Node_8	Node_9	CONDUIT	189.6
0.0791	0.0100				
Conduit_18		Node_23	Node_9	CONDUIT	38.4
0.3905	0.0100				
Conduit_19		Node_9	Node_10	CONDUIT	238.5
0.2893	0.0100				
Conduit_2		OCS2	EXMH21	CONDUIT	34.3
0.4669	0.0120				
Conduit_20		Node_24	Node_10	CONDUIT	36.1
0.8305	0.0100				
Conduit_21		Node_10	Node_11	CONDUIT	82.6
0.1574	0.0100				
Conduit_22		Node_11	Node_12	CONDUIT	90.7
0.2095	0.0100				
Conduit_23		Node_25	Node_12	CONDUIT	37.0
0.7828	0.0100				
Conduit_24		Node_12	Node_13	CONDUIT	199.1
0.1808	0.0100				
Conduit_25		Node_26	Node_13	CONDUIT	37.3
0.5626	0.0100				
Conduit_26		Node_13	Node_14	CONDUIT	231.1
0.2250	0.0100				
Conduit_27		Node_27	Node_14	CONDUIT	35.4
0.9603	0.0100				
Conduit_28		Node_14	Node_15	CONDUIT	126.3
0.3880	0.0100				
Conduit_29		Node_15	OF1	CONDUIT	140.5
0.0712	0.0100				
Conduit_4		OCS3	EXMH22	CONDUIT	35.6
0.4489	0.0120				
EXPIPE1		EXMH20	EXMH21	CONDUIT	194.1
0.2216	0.0100				
EXPIPE10		Node_6	Node_7	CONDUIT	200.7
0.1545	0.0100				
EXPIPE11		Node_19	Node_5	CONDUIT	34.9
0.5012	0.0100				
EXPIPE12		Node_20	Node_6	CONDUIT	48.9
0.4909	0.0100				
EXPIPE13		Node_21	Node_7	CONDUIT	37.4
0.4551	0.0100				

EXPIPE2		EXMH21	EXMH22	CONDUIT	190.2
0.2050	0.0100				
EXPIPE3		EXMH22	DOGMH1	CONDUIT	192.2
0.1821	0.0100				
EXPIPE4		DOGMH1	Node_3	CONDUIT	125.0
0.2000	0.0100				
EXPIPE5		Node_3	Node_32	CONDUIT	274.8
0.1892	0.0100				
EXPIPE6		Node_32	EXMH23	CONDUIT	28.1
0.1782	0.0100				
EXPIPE7		EXMH23	Node_33	CONDUIT	22.5
0.3105	0.0100				
EXPIPE8		Node_33	Node_5	CONDUIT	234.3
0.2433	0.0100				
EXPIPE9		Node_5	Node_6	CONDUIT	172.4
0.3538	0.0100				
PIPE1		MH1	MH2	CONDUIT	59.6
0.5203	0.0120				
PIPE10		MH7	MH8	CONDUIT	50.0
0.4999	0.0120				
PIPE11		MH8	MH9	CONDUIT	320.0
0.5000	0.0120				
PIPE12		MH11	MH10	CONDUIT	50.0
0.5000	0.0120				
PIPE13		MH10	EXMH21	CONDUIT	108.1
2.3974	0.0120				
PIPE14		IN4	IN10	CONDUIT	102.7
0.7403	0.0100				
PIPE15		IN10	IN6	CONDUIT	130.4
0.6520	0.0100				
PIPE16		IN6	OF2	CONDUIT	402.0
0.2736	0.0100				
PIPE17		IN5	IN6	CONDUIT	130.3
0.4606	0.0100				
PIPE18		MH12	MH13	CONDUIT	160.0
0.4125	0.0120				
PIPE19		MH13	MH14	CONDUIT	49.2
0.4881	0.0120				
PIPE2		IN7	MH2	CONDUIT	17.3
0.5210	0.0100				
PIPE20		IN1	MH14	CONDUIT	40.0
0.4999	0.0100				
PIPE21		MH14	MH15	CONDUIT	100.0
0.5000	0.0120				
PIPE22		IN2	MH15	CONDUIT	40.0
1.1498	0.0100				
PIPE23		MH15	MH16	CONDUIT	100.0
0.7599	0.0120				
PIPE24		IN3	MH16	CONDUIT	40.0
1.3998	0.0100				
PIPE25		MH16	MH17	CONDUIT	217.2
0.6124	0.0100				
PIPE26		MH17	MH18	CONDUIT	160.0
0.5000	0.0100				
PIPE27		MH18	MH19	CONDUIT	220.0
0.5409	0.0100				
PIPE28		MH23	MH22	CONDUIT	150.0
0.5000	0.0120				
PIPE29		MH22	MH21	CONDUIT	360.0
0.5000	0.0120				

PIPE3		MH2	MH3	CONDUIT	106.4
0.4979	0.0120				
PIPE30		MH21	MH20	CONDUIT	360.0
0.4778	0.0120				
PIPE31		MH20	MH19	CONDUIT	160.0
0.5000	0.0120				
PIPE32		MH19	DOGMH1	CONDUIT	180.0
1.0223	0.0120				
PIPE33		MH25	MH26	CONDUIT	281.9
0.3192	0.0100				
PIPE34		MH26	EXMH23	CONDUIT	270.2
0.2849	0.0100				
PIPE35		MH9	MH10	CONDUIT	70.0
0.5000	0.0120				
PIPE4		IN8	MH3	CONDUIT	17.3
0.5211	0.0100				
PIPE5		MH3	MH4	CONDUIT	106.5
0.4883	0.0120				
PIPE6		IN9	MH4	CONDUIT	17.3
0.5215	0.0100				
PIPE7		MH4	MH5	CONDUIT	427.5
0.5427	0.0120				
PIPE8		MH5	EXMH20	CONDUIT	94.9
2.9507	0.0100				
PIPE9		MH6	MH7	CONDUIT	320.0
0.5000	0.0120				

Cross Section Summary

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels

C1	CIRCULAR	2.00	3.14	0.50	2.00	1
14.71						
C10	CIRCULAR	2.00	3.14	0.50	2.00	1
14.71						
C11	CIRCULAR	1.50	1.77	0.38	1.50	1
7.01						
C12	CIRCULAR	1.50	1.77	0.38	1.50	1
28.57						
C13	CIRCULAR	2.00	3.14	0.50	2.00	1
14.83						
C14	CIRCULAR	1.50	1.77	0.38	1.50	1
9.36						
C15	CIRCULAR	1.50	1.77	0.38	1.50	1
12.60						
C16	CIRCULAR	1.00	0.79	0.25	1.00	1
2.44						
C17	CIRCULAR	1.25	1.23	0.31	1.25	1
4.18						
C18	CIRCULAR	2.50	4.91	0.63	2.50	1
27.03						
C19	CIRCULAR	2.50	4.91	0.63	2.50	1
27.07						
C2	CIRCULAR	2.00	3.14	0.50	2.00	1

C20	CIRCULAR	2.00	3.14	0.50	2.00	1
76.00						
C21	CIRCULAR	1.50	1.77	0.38	1.50	1
10.54						
C22	CIRCULAR	2.00	3.14	0.50	2.00	1
15.00						
C23	CIRCULAR	1.50	1.77	0.38	1.50	1
7.09						
C24	CIRCULAR	1.25	1.23	0.31	1.25	1
4.16						
C25	CIRCULAR	2.00	3.14	0.50	2.00	1
78.69						
C26	CIRCULAR	1.50	1.77	0.38	1.50	1
7.29						
C27	CIRCULAR	2.00	3.14	0.50	2.00	1
70.41						
C28	CIRCULAR	2.00	3.14	0.50	2.00	1
59.72						
C29	CIRCULAR	1.50	1.77	0.38	1.50	1
6.12						
C3	CIRCULAR	1.25	1.23	0.31	1.25	1
8.85						
C30	CIRCULAR	1.25	1.23	0.31	1.25	1
5.09						
C31	CIRCULAR	1.50	1.77	0.38	1.50	1
20.61						
C32	CIRCULAR	1.50	1.77	0.38	1.50	1
9.35						
C33	CIRCULAR	2.50	4.91	0.63	2.50	1
27.19						
C34	CIRCULAR	2.50	4.91	0.63	2.50	1
85.05						
C35	CIRCULAR	1.50	1.77	0.38	1.50	1
6.71						
C36	CIRCULAR	1.50	1.77	0.38	1.50	1
6.31						
C37	CIRCULAR	1.50	1.77	0.38	1.50	1
14.74						
C38	CIRCULAR	1.50	1.77	0.38	1.50	1
12.51						
C4	CIRCULAR	2.00	3.14	0.50	2.00	1
14.48						
C40	CIRCULAR	1.50	1.77	0.38	1.50	1
6.22						
C41	CIRCULAR	2.50	4.91	0.63	2.50	1
26.58						
C46	CIRCULAR	1.50	1.77	0.38	1.50	1
6.75						
C47	CIRCULAR	1.50	1.77	0.38	1.50	1
13.71						
C48	CIRCULAR	1.25	1.23	0.31	1.25	1
4.24						
C49	CIRCULAR	2.00	3.14	0.50	2.00	1
12.89						
C5	CIRCULAR	2.00	3.14	0.50	2.00	1
16.11						
C6	CIRCULAR	2.00	3.14	0.50	2.00	1
16.05						
C7	CIRCULAR	2.00	3.14	0.50	2.00	1
15.04						

C8	CIRCULAR	2.00	3.14	0.50	2.00	1
12.83						
C9	CIRCULAR	2.50	4.91	0.63	2.50	1
28.20						
Conduit_0	CIRCULAR	1.00	0.79	0.25	1.00	1
2.61						
Conduit_15	CIRCULAR	5.00	19.63	1.25	5.00	1
95.83						
Conduit_16	CIRCULAR	1.50	1.77	0.38	1.50	1
7.04						
Conduit_17	CIRCULAR	5.00	19.63	1.25	5.00	1
95.22						
Conduit_18	CIRCULAR	3.00	7.07	0.75	3.00	1
54.18						
Conduit_19	CIRCULAR	5.00	19.63	1.25	5.00	1
182.11						
Conduit_2	CIRCULAR	1.50	1.77	0.38	1.50	1
7.78						
Conduit_20	CIRCULAR	3.00	7.07	0.75	3.00	1
79.02						
Conduit_21	CIRCULAR	5.00	19.63	1.25	5.00	1
134.33						
Conduit_22	CIRCULAR	5.00	19.63	1.25	5.00	1
154.96						
Conduit_23	CIRCULAR	1.50	1.77	0.38	1.50	1
12.08						
Conduit_24	CIRCULAR	5.00	19.63	1.25	5.00	1
143.98						
Conduit_25	CIRCULAR	1.50	1.77	0.38	1.50	1
10.24						
Conduit_26	CIRCULAR	5.00	19.63	1.25	5.00	1
160.61						
Conduit_27	CIRCULAR	2.00	3.14	0.50	2.00	1
28.82						
Conduit_28	CIRCULAR	5.00	19.63	1.25	5.00	1
210.90						
Conduit_29	CIRCULAR	5.00	19.63	1.25	5.00	1
90.31						
Conduit_4	CIRCULAR	1.50	1.77	0.38	1.50	1
7.62						
EXPIPE1	CIRCULAR	3.00	7.07	0.75	3.00	1
40.81						
EXPIPE10	CIRCULAR	5.00	19.63	1.25	5.00	1
133.07						
EXPIPE11	CIRCULAR	1.50	1.77	0.38	1.50	1
9.67						
EXPIPE12	CIRCULAR	2.00	3.14	0.50	2.00	1
20.61						
EXPIPE13	CIRCULAR	2.00	3.14	0.50	2.00	1
19.84						
EXPIPE2	CIRCULAR	3.00	7.07	0.75	3.00	1
39.26						
EXPIPE3	CIRCULAR	3.00	7.07	0.75	3.00	1
37.00						
EXPIPE4	CIRCULAR	3.00	7.07	0.75	3.00	1
38.78						
EXPIPE5	CIRCULAR	3.00	7.07	0.75	3.00	1
37.72						
EXPIPE6	CIRCULAR	3.00	7.07	0.75	3.00	1
36.60						

EXPIPE7 72.89	CIRCULAR	3.50	9.62	0.88	3.50	1
EXPIPE8 64.51	CIRCULAR	3.50	9.62	0.88	3.50	1
EXPIPE9 77.80	CIRCULAR	3.50	9.62	0.88	3.50	1
PIPE1 8.21	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE10 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE11 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE12 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE13 10.84	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE14 11.75	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE15 11.03	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE16 15.38	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE17 9.27	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE18 4.49	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE19 7.95	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE2 6.06	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE20 9.65	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE21 17.33	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE22 9.00	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE23 21.36	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE24 9.94	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE25 23.01	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE26 20.79	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE27 21.63	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE28 4.95	CIRCULAR	1.25	1.23	0.31	1.25	1
PIPE29 8.05	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE3 8.03	CIRCULAR	1.50	1.77	0.38	1.50	1
PIPE30 16.94	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE31 17.33	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE32 24.78	CIRCULAR	2.00	3.14	0.50	2.00	1
PIPE33 16.62	CIRCULAR	2.00	3.14	0.50	2.00	1

PIPE34	CIRCULAR	2.50	4.91	0.63	2.50	1
28.46						
PIPE35	CIRCULAR	1.25	1.23	0.31	1.25	1
4.95						
PIPE4	CIRCULAR	1.25	1.23	0.31	1.25	1
6.06						
PIPE5	CIRCULAR	1.50	1.77	0.38	1.50	1
7.95						
PIPE6	CIRCULAR	1.25	1.23	0.31	1.25	1
6.06						
PIPE7	CIRCULAR	1.50	1.77	0.38	1.50	1
8.38						
PIPE8	CIRCULAR	1.50	1.77	0.38	1.50	1
23.46						
PIPE9	CIRCULAR	1.25	1.23	0.31	1.25	1
4.95						

 NOTE: The summary statistics displayed in this report are
 based on results found at every computational time step,
 not just on results from each reporting time step.

Analysis Options

Flow Units CFS

Process Models:

Rainfall/Runoff YES

RDII NO

Snowmelt NO

Groundwater NO

Flow Routing YES

Ponding Allowed NO

Water Quality NO

Infiltration Method CURVE_NUMBER

Flow Routing Method DYNWAVE

Surcharge Method EXTRAN

Starting Date 03/21/2022 00:00:00

Ending Date 03/21/2022 23:54:00

Antecedent Dry Days 0.0

Report Time Step 00:01:00

Wet Time Step 00:05:00

Dry Time Step 00:05:00

Routing Time Step 5.00 sec

Variable Time Step YES

Maximum Trials 8

Number of Threads 6

Head Tolerance 0.005000 ft

	Volume	Depth
Runoff Quantity Continuity	acre-feet	inches
*****	-----	-----
Total Precipitation	17.284	5.872
Evaporation Loss	0.000	0.000

Infiltration Loss	0.994	0.338
Surface Runoff	16.150	5.487
Final Storage	0.170	0.058
Continuity Error (%)	-0.175	

	Volume acre-feet	Volume 10 ⁶ gal
	-----	-----
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	16.145	5.261
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	264.392	86.156
External Outflow	261.840	85.324
Flooding Loss	17.678	5.761
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.039	0.013
Final Stored Volume	1.082	0.352
Continuity Error (%)	-0.008	

Time-Step Critical Elements

Link Conduit_28 (89.16%)
Link Conduit_27 (9.67%)

Highest Flow Instability Indexes

Link C13 (6)

Routing Time Step Summary

Minimum Time Step	:	0.34 sec
Average Time Step	:	0.69 sec
Maximum Time Step	:	2.30 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.04
Percent Not Converging	:	0.46
Time Step Frequencies	:	
5.000 - 3.155 sec	:	0.00 %
3.155 - 1.991 sec	:	9.84 %
1.991 - 1.256 sec	:	0.31 %
1.256 - 0.792 sec	:	0.67 %
0.792 - 0.500 sec	:	89.18 %

Subcatchment Runoff Summary

Perv	Total	Total	Total	Total	Total	Total	Imperv
Runoff	Runoff	Runoff	Precip	Runoff	Evap	Infil	Runoff
Subcatchment	Subcatchment	Subcatchment	in	Coeff	in	in	in
in	in	10^6 gal	CFS	in	in	in	in
S1			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.04	1.56	1.000			
S10			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.02	0.99	1.000			
S11			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.01	0.34	1.000			
S12			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.05	2.12	1.000			
S13			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.05	2.01	1.000			
S14			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.02	0.79	1.000			
S15			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.01	0.54	1.000			
S16			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.01	0.25	1.000			
S17			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.06	2.72	0.999			
S18			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.11	4.55	0.999			
S19			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.18	7.72	0.999			
S2			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.05	1.98	1.000			
S20			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.09	4.10	1.000			
S21			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.18	7.87	1.000			
S22			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.08	3.59	1.000			
S23			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.02	0.70	1.000			
S24			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.04	1.71	1.000			
S25			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.06	2.78	1.000			
S26			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.05	2.33	1.000			
S27			5.87	0.00	0.00	0.00	5.82
0.00	5.82	0.09	3.79	0.992			
S28			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.01	0.25	0.999			
S29			5.87	0.00	0.00	0.10	4.40
1.35	5.75	0.33	13.51	0.978			
S3			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.04	1.89	1.000			
S30			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.02	0.91	1.000			
S31			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.08	3.31	0.998			

S32			5.87	0.00	0.00	0.35	2.35
3.10	5.45	0.27	9.97	0.928			
S33			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.11	4.77	0.998			
S34			5.87	0.00	0.00	0.22	3.22
2.37	5.60	0.22	8.49	0.953			
S35			5.87	0.00	0.00	0.85	0.00
4.88	4.88	0.13	3.68	0.830			
S36			5.87	0.00	0.00	0.00	5.85
0.00	5.85	0.10	3.99	0.997			
S37			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.11	4.43	0.998			
S38			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.06	2.48	0.997			
S39			5.87	0.00	0.00	1.32	1.46
3.00	4.46	0.05	1.90	0.759			
S4			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.07	2.83	0.999			
S40			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.08	3.21	0.998			
S41			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.12	5.20	0.998			
S42			5.87	0.00	0.00	0.00	5.85
0.00	5.85	0.33	13.22	0.997			
S43			5.87	0.00	0.00	1.23	1.76
2.78	4.54	0.36	12.14	0.773			
S44			5.87	0.00	0.00	1.23	1.76
2.80	4.57	0.21	8.08	0.777			
S45			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.14	6.02	0.999			
S46			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.08	3.30	0.999			
S47			5.87	0.00	0.00	0.05	5.28
0.53	5.81	0.08	3.57	0.989			
S48			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.10	4.29	0.997			
S49			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.04	1.69	0.998			
S5			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.08	3.47	0.999			
S50			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.03	1.32	0.999			
S51			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.06	2.35	0.998			
S52			5.87	0.00	0.00	0.00	5.86
0.00	5.86	0.04	1.84	0.997			
S53			5.87	0.00	0.00	1.17	1.94
2.69	4.62	0.09	3.64	0.787			
S56			5.87	0.00	0.00	0.85	0.00
4.87	4.87	0.19	5.09	0.829			
S57			5.87	0.00	0.00	0.85	0.00
4.87	4.87	0.24	6.36	0.829			
S58			5.87	0.00	0.00	0.85	0.00
4.97	4.97	0.00	0.15	0.846			
S6			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.08	3.32	0.999			
S7			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.06	2.58	0.999			
S8			5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.01	0.64	1.000			

S9		5.87	0.00	0.00	0.00	5.87
0.00	5.87	0.02	0.71	0.999		

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
DOGMH1	JUNCTION	3.90	9.81	14.90	0 00:02	6.09
EXMH20	JUNCTION	3.16	7.21	13.47	0 00:04	4.77
EXMH21	JUNCTION	3.57	6.39	12.22	0 00:04	5.19
EXMH22	JUNCTION	3.83	6.76	12.20	0 00:02	5.57
EXMH23	JUNCTION	4.11	7.15	11.38	0 00:03	6.31
IN1	JUNCTION	0.08	4.65	17.36	0 12:04	4.65
IN10	JUNCTION	0.10	0.79	12.99	0 12:06	0.78
IN2	JUNCTION	0.08	4.65	17.36	0 12:03	4.65
IN3	JUNCTION	0.08	4.80	17.36	0 12:04	4.67
IN4	JUNCTION	0.07	0.52	13.48	0 12:05	0.51
IN5	JUNCTION	0.10	0.78	12.98	0 12:06	0.78
IN6	JUNCTION	0.20	1.83	12.93	0 12:06	1.82
IN7	JUNCTION	0.04	0.27	14.54	0 12:05	0.27
IN8	JUNCTION	0.04	0.32	14.06	0 12:06	0.32
IN9	JUNCTION	0.05	0.59	13.81	0 12:06	0.59
J1	JUNCTION	0.11	3.00	14.92	0 12:04	2.14
J10	JUNCTION	0.04	0.27	13.27	0 12:06	0.27
J11	JUNCTION	0.18	1.93	11.08	0 12:06	1.90
J12	JUNCTION	0.17	1.71	11.36	0 12:06	1.69
J13	JUNCTION	0.03	1.38	11.38	0 12:06	1.35
J14	JUNCTION	0.23	1.97	10.89	0 12:06	1.97
J15	JUNCTION	0.18	1.66	11.41	0 12:06	1.65
J16	JUNCTION	0.21	1.83	11.05	0 12:06	1.83
J17	JUNCTION	0.24	3.02	12.12	0 12:06	3.02
J18	JUNCTION	0.10	3.09	12.79	0 12:06	3.08
J19	JUNCTION	0.11	2.96	12.81	0 12:06	2.96
J2	JUNCTION	0.12	3.29	14.74	0 12:05	2.41
J20	JUNCTION	0.21	3.25	12.80	0 12:05	3.20
J21	JUNCTION	0.26	2.52	11.37	0 12:06	2.52
J22	JUNCTION	0.26	1.94	10.34	0 12:06	1.92
J23	JUNCTION	0.18	1.60	10.37	0 12:06	1.59
J24	JUNCTION	0.12	3.00	14.17	0 12:05	2.39
J25	JUNCTION	0.26	2.07	10.57	0 12:06	2.06
J26	JUNCTION	0.21	1.76	10.56	0 12:06	1.75
J27	JUNCTION	0.10	0.90	9.88	0 12:06	0.90
J28	JUNCTION	0.00	0.53	8.78	0 12:06	0.52
J29	JUNCTION	0.23	2.03	10.68	0 12:06	2.03
J3	JUNCTION	0.21	3.99	14.34	0 12:05	3.04
J30	JUNCTION	0.30	2.82	11.52	0 12:06	2.81
J31	JUNCTION	0.12	2.75	13.60	0 12:05	2.59
J32	JUNCTION	0.14	4.15	15.12	0 12:05	2.48
J33	JUNCTION	0.50	0.74	10.24	0 12:06	0.74
J34	JUNCTION	0.06	0.39	10.94	0 12:06	0.39
J4	JUNCTION	0.12	3.00	14.17	0 12:05	2.39

J40	JUNCTION	0.22	1.72	9.87	0	12:06	1.70
J41	JUNCTION	0.08	0.65	10.25	0	12:06	0.64
J42	JUNCTION	0.11	0.84	9.04	0	12:06	0.84
J43	JUNCTION	0.29	2.06	10.26	0	12:06	2.06
J5	JUNCTION	0.08	0.57	10.82	0	12:06	0.57
J6	JUNCTION	0.06	0.50	10.55	0	12:06	0.50
J7	JUNCTION	0.25	3.52	12.85	0	12:05	3.35
J8	JUNCTION	0.13	2.76	13.26	0	12:05	2.59
J9	JUNCTION	0.29	3.28	12.23	0	12:06	3.27
MH1	JUNCTION	0.03	0.18	14.42	0	12:06	0.18
MH10	JUNCTION	0.09	1.62	11.79	0	12:05	1.59
MH11	JUNCTION	0.03	0.22	14.19	0	12:05	0.22
MH12	JUNCTION	0.05	4.25	18.16	0	12:04	3.44
MH13	JUNCTION	0.05	4.75	18.00	0	12:04	4.12
MH14	JUNCTION	0.11	5.33	17.84	0	12:04	4.84
MH15	JUNCTION	0.14	5.64	17.65	0	12:04	5.31
MH16	JUNCTION	0.17	6.28	17.53	0	12:04	5.90
MH17	JUNCTION	0.20	6.85	16.77	0	12:04	6.59
MH18	JUNCTION	0.20	6.74	15.86	0	12:05	6.67
MH19	JUNCTION	1.08	6.95	14.88	0	12:05	6.85
MH2	JUNCTION	0.06	0.43	14.36	0	12:06	0.43
MH20	JUNCTION	0.28	6.86	15.59	0	12:05	6.71
MH21	JUNCTION	0.16	7.05	17.50	0	12:01	7.05
MH22	JUNCTION	0.10	4.66	17.41	0	12:04	4.07
MH23	JUNCTION	0.00	4.28	18.03	0	12:05	3.08
MH25	JUNCTION	5.07	6.94	14.34	0	00:00	5.78
MH26	JUNCTION	4.37	8.00	14.00	0	00:00	6.56
MH3	JUNCTION	0.08	0.63	14.03	0	12:06	0.63
MH4	JUNCTION	0.12	0.94	13.82	0	12:06	0.94
MH5	JUNCTION	0.08	0.83	11.39	0	12:06	0.82
MH6	JUNCTION	0.06	0.48	14.45	0	12:06	0.48
MH7	JUNCTION	0.10	0.77	13.14	0	12:06	0.77
MH8	JUNCTION	0.10	0.77	12.89	0	12:06	0.76
MH9	JUNCTION	0.12	2.72	13.24	0	12:05	1.64
Node_10	JUNCTION	4.29	7.05	8.72	0	00:04	6.22
Node_11	JUNCTION	4.37	11.98	13.52	0	00:02	6.29
Node_12	JUNCTION	4.50	8.62	9.97	0	00:04	6.45
Node_13	JUNCTION	4.70	6.66	7.65	0	00:04	6.38
Node_14	JUNCTION	5.00	6.03	6.50	0	00:04	5.95
Node_15	JUNCTION	5.31	14.05	14.03	0	00:00	5.82
Node_19	JUNCTION	0.95	5.17	12.03	0	00:03	3.91
Node_20	JUNCTION	1.54	6.29	11.38	0	00:03	5.84
Node_21	JUNCTION	0.48	5.65	12.15	0	00:03	5.54
Node_22	JUNCTION	0.61	5.50	11.93	0	00:03	2.91
Node_23	JUNCTION	0.44	2.26	8.74	0	00:03	2.21
Node_24	JUNCTION	0.37	2.57	9.20	0	00:04	1.32
Node_25	JUNCTION	0.82	3.49	10.11	0	00:04	1.27
Node_26	JUNCTION	0.91	1.21	7.75	0	00:00	1.13
Node_27	JUNCTION	0.67	0.96	7.63	0	00:00	0.67
Node_3	JUNCTION	3.96	10.26	15.10	0	00:02	5.85
Node_32	JUNCTION	4.07	6.94	11.26	0	00:03	6.17
Node_33	JUNCTION	4.10	7.30	11.46	0	00:03	6.41
Node_5	JUNCTION	3.79	9.91	13.50	0	00:03	7.40
Node_6	JUNCTION	3.64	10.35	13.33	0	00:03	8.41
Node_7	JUNCTION	3.80	11.45	14.12	0	00:03	9.27
Node_8	JUNCTION	3.75	11.66	14.17	0	00:03	7.39
Node_9	JUNCTION	3.67	6.24	8.60	0	00:05	6.20

OCS1	JUNCTION	4.50	4.50	11.00	0	00:00	4.50
OCS2	JUNCTION	3.33	4.50	11.00	0	00:00	4.50
OCS3	JUNCTION	3.10	4.50	11.00	0	00:00	4.50
OCS4	JUNCTION	4.50	4.50	11.00	0	00:00	4.50
OCS5	JUNCTION	4.20	4.50	13.00	0	00:00	4.50
OF1	OUTFALL	5.22	5.22	5.10	0	00:00	5.22
OF10	OUTFALL	0.20	1.54	9.54	0	12:06	1.53
OF2	OUTFALL	0.18	1.50	11.50	0	12:06	1.50
OF3	OUTFALL	2.00	2.00	6.32	0	00:00	2.00
OF4	OUTFALL	0.27	1.38	9.38	0	12:06	1.38
OF5	OUTFALL	0.20	1.35	9.35	0	12:06	1.35
OF6	OUTFALL	0.25	1.29	9.29	0	12:06	1.28
OF7	OUTFALL	4.00	4.00	10.00	0	00:00	4.00
OF8	OUTFALL	0.24	1.29	9.29	0	12:06	1.29
OF9	OUTFALL	0.09	0.78	8.78	0	12:06	0.78

Node Inflow Summary

Total	Flow		Maximum	Maximum		Lateral	
Inflow	Balance		Lateral	Total	Time of Max	Inflow	
Volume	Error		Inflow	Inflow	Occurrence	Volume	
Node		Type	CFS	CFS	days hr:min	10^6 gal	10^6
gal	Percent						

DOGMH1		JUNCTION	0.00	49.62	0 12:02	0	
22	0.048						
EXMH20		JUNCTION	0.00	14.63	0 00:04	0	
5.92	0.096						
EXMH21		JUNCTION	0.00	27.75	0 00:01	0	
14.2	0.077						
EXMH22		JUNCTION	0.00	37.53	0 00:01	0	
21.2	0.048						
EXMH23		JUNCTION	0.00	90.84	0 12:02	0	
51.6	0.003						
IN1		JUNCTION	2.58	2.58	0 12:06	0.0599	
0.0599	-0.004						
IN10		JUNCTION	2.72	5.56	0 12:06	0.0631	
0.129	0.034						
IN2		JUNCTION	3.32	3.32	0 12:06	0.0771	
0.0771	-0.007						
IN3		JUNCTION	3.47	3.47	0 12:06	0.0806	
0.0806	0.011						
IN4		JUNCTION	2.83	2.83	0 12:06	0.066	
0.066	0.010						
IN5		JUNCTION	4.55	4.55	0 12:06	0.106	
0.106	0.049						
IN6		JUNCTION	7.72	17.63	0 12:05	0.18	
0.415	0.032						
IN7		JUNCTION	0.64	0.64	0 12:06	0.0147	
0.0147	0.019						

IN8		JUNCTION	0.71	0.71	0	12:06	0.0163
0.0163	0.023						
IN9		JUNCTION	0.99	0.99	0	12:06	0.0227
0.0227	0.016						
J1		JUNCTION	6.02	6.02	0	12:06	0.141
0.141	0.006						
J10		JUNCTION	0.91	0.91	0	12:06	0.0211
0.0211	0.154						
J11		JUNCTION	0.00	14.12	0	12:06	0
0.353	0.015						
J12		JUNCTION	13.51	13.63	0	12:06	0.327
0.333	0.033						
J13		JUNCTION	0.25	0.34	0	12:02	0.00577
0.00592	0.045						
J14		JUNCTION	9.97	23.75	0	12:06	0.272
0.625	0.018						
J15		JUNCTION	13.22	13.22	0	12:06	0.326
0.326	0.023						
J16		JUNCTION	8.49	21.58	0	12:06	0.223
0.548	0.035						
J17		JUNCTION	8.08	25.65	0	12:06	0.213
0.638	0.023						
J18		JUNCTION	2.48	2.48	0	12:06	0.0604
0.0604	0.002						
J19		JUNCTION	4.77	4.77	0	12:06	0.113
0.113	0.007						
J2		JUNCTION	3.30	9.33	0	12:06	0.0769
0.218	0.030						
J20		JUNCTION	10.31	17.56	0	12:05	0.252
0.425	0.032						
J21		JUNCTION	0.00	25.64	0	12:06	0
0.638	0.035						
J22		JUNCTION	0.00	11.39	0	12:06	0
0.619	0.014						
J23		JUNCTION	12.14	12.14	0	12:06	0.362
0.362	0.043						
J24		JUNCTION	4.43	4.43	0	12:06	0.107
0.107	0.010						
J25		JUNCTION	0.00	25.27	0	12:06	0
0.678	0.008						
J26		JUNCTION	0.00	23.74	0	12:06	0
0.625	0.007						
J27		JUNCTION	3.64	3.64	0	12:06	0.0947
0.0947	0.051						
J28		JUNCTION	0.00	10.70	0	12:06	0
0.037	0.030						
J29		JUNCTION	3.68	25.22	0	12:06	0.13
0.678	0.024						
J3		JUNCTION	3.57	22.17	0	12:06	0.0839
0.514	0.017						
J30		JUNCTION	0.00	11.36	0	12:06	0
0.63	0.037						
J31		JUNCTION	3.99	3.99	0	12:06	0.0983
0.0983	0.011						
J32		JUNCTION	0.00	8.73	0	12:06	0
0.211	0.033						
J33		JUNCTION	2.35	7.18	0	12:06	0.0565
0.286	0.408						
J34		JUNCTION	1.84	1.84	0	12:06	0.0446
0.0446	0.032						

J4		JUNCTION	4.29	4.29	0	12:06	0.105
0.105	0.010						
J40		JUNCTION	6.36	18.27	0	12:06	0.238
0.6	0.041						
J41		JUNCTION	5.09	5.09	0	12:06	0.187
0.187	0.015						
J42		JUNCTION	0.15	3.74	0	12:06	0.0032
0.0978	0.060						
J43		JUNCTION	0.00	14.21	0	12:06	0
0.756	0.026						
J5		JUNCTION	1.69	1.69	0	12:06	0.0403
0.0403	0.017						
J6		JUNCTION	1.32	3.01	0	12:06	0.0309
0.0712	0.023						
J7		JUNCTION	0.00	29.46	0	12:06	0
0.69	0.029						
J8		JUNCTION	3.31	7.30	0	12:06	0.0787
0.177	0.071						
J9		JUNCTION	0.00	29.46	0	12:06	0
0.69	0.025						
MH1		JUNCTION	0.25	0.25	0	12:06	0.00585
0.00585	0.028						
MH10		JUNCTION	0.00	5.62	0	12:06	0
0.133	0.025						
MH11		JUNCTION	0.34	0.34	0	12:06	0.00777
0.00777	0.033						
MH12		JUNCTION	0.70	4.57	0	12:04	0.016
0.0165	-0.189						
MH13		JUNCTION	0.00	4.38	0	12:04	0
0.0178	-0.126						
MH14		JUNCTION	1.71	5.16	0	12:03	0.0394
0.116	-0.001						
MH15		JUNCTION	2.78	10.71	0	12:05	0.064
0.256	0.005						
MH16		JUNCTION	2.33	16.46	0	12:05	0.0536
0.39	0.004						
MH17		JUNCTION	3.79	20.24	0	12:05	0.087
0.477	0.020						
MH18		JUNCTION	0.00	20.22	0	12:05	0
0.479	0.033						
MH19		JUNCTION	0.00	35.46	0	12:05	0
0.855	0.372						
MH2		JUNCTION	0.54	1.43	0	12:06	0.0124
0.0329	0.026						
MH20		JUNCTION	3.59	15.58	0	12:05	0.0829
0.364	0.099						
MH21		JUNCTION	7.87	11.99	0	12:05	0.182
0.276	-0.059						
MH22		JUNCTION	4.10	4.11	0	12:05	0.0948
0.0955	0.252						
MH23		JUNCTION	0.00	3.42	0	12:05	0
0.000864	-3.037						
MH25		JUNCTION	12.80	30.99	0	00:00	8.24
16.3	0.040						
MH26		JUNCTION	12.80	52.38	0	00:00	8.24
29.6	0.035						
MH3		JUNCTION	0.79	2.93	0	12:06	0.0183
0.0675	0.024						
MH4		JUNCTION	2.01	5.91	0	12:06	0.0463
0.136	0.060						

MH5		JUNCTION	2.12	7.97	0	12:06	0.049
0.186	0.037						
MH6		JUNCTION	1.56	1.56	0	12:06	0.036
0.036	0.051						
MH7		JUNCTION	1.98	3.52	0	12:06	0.0455
0.0815	0.045						
MH8		JUNCTION	0.00	3.48	0	12:06	0
0.0814	0.054						
MH9		JUNCTION	1.89	5.28	0	12:06	0.0438
0.125	0.030						
Node_10		JUNCTION	0.00	193.97	0	00:01	0
67.8	0.035						
Node_11		JUNCTION	0.00	147.85	0	00:01	0
67.8	0.006						
Node_12		JUNCTION	0.00	160.42	0	00:01	0
72.3	0.025						
Node_13		JUNCTION	0.00	179.66	0	00:01	0
76.9	0.043						
Node_14		JUNCTION	0.00	201.12	0	00:00	0
81.4	0.034						
Node_15		JUNCTION	0.00	211.87	0	00:00	0
81.4	0.021						
Node_19		JUNCTION	7.00	14.92	0	00:03	4.51
4.51	0.007						
Node_20		JUNCTION	8.00	15.32	0	00:03	5.15
5.15	0.014						
Node_21		JUNCTION	2.50	30.04	0	00:03	1.61
1.61	-0.009						
Node_22		JUNCTION	2.50	10.34	0	00:03	1.61
1.61	-0.008						
Node_23		JUNCTION	2.50	9.84	0	00:03	1.61
1.61	0.011						
Node_24		JUNCTION	2.50	14.19	0	00:04	1.61
1.61	-0.002						
Node_25		JUNCTION	7.00	7.00	0	00:00	4.51
4.51	0.004						
Node_26		JUNCTION	7.00	7.00	0	00:00	4.51
4.51	0.006						
Node_27		JUNCTION	7.00	7.00	0	00:00	4.51
4.51	0.005						
Node_3		JUNCTION	0.00	49.61	0	12:02	0
22	0.049						
Node_32		JUNCTION	0.00	49.61	0	12:02	0
22	0.034						
Node_33		JUNCTION	0.00	90.98	0	12:02	0
51.6	0.018						
Node_5		JUNCTION	0.00	98.15	0	12:02	0
56.1	0.026						
Node_6		JUNCTION	0.00	118.61	0	12:05	0
61.3	0.042						
Node_7		JUNCTION	0.00	156.97	0	00:03	0
62.9	0.037						
Node_8		JUNCTION	0.00	126.06	0	00:02	0
64.5	0.037						
Node_9		JUNCTION	0.00	122.56	0	12:08	0
66.1	0.038						
OCS1		JUNCTION	12.80	13.80	0	12:06	8.24
8.24	0.002						
OCS2		JUNCTION	12.80	13.64	0	12:06	8.24
8.24	0.006						

OCS3		JUNCTION	10.88	10.88	0	00:00	7
7	0.007						
OCS4		JUNCTION	12.80	12.94	0	00:04	8.24
8.24	0.006						
OCS5		JUNCTION	12.59	12.59	0	00:00	8.1
8.1	0.002						
OF1		OUTFALL	0.00	211.87	0	00:00	0
81.4	0.000						
OF10		OUTFALL	0.00	18.28	0	12:06	0
0.6	0.000						
OF2		OUTFALL	0.00	17.39	0	12:06	0
0.414	0.000						
OF3		OUTFALL	0.00	16.42	0	12:06	0
0.0697	0.000						
OF4		OUTFALL	0.00	14.21	0	12:06	0
0.755	0.000						
OF5		OUTFALL	0.00	13.04	0	12:06	0
0.588	0.000						
OF6		OUTFALL	0.00	11.36	0	12:06	0
0.63	0.000						
OF7		OUTFALL	0.00	7.15	0	12:06	0
0.399	0.000						
OF8		OUTFALL	0.00	11.39	0	12:06	0
0.619	0.000						
OF9		OUTFALL	0.00	3.72	0	12:06	0
0.0978	0.000						

Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
DOGMH1	JUNCTION	23.84	6.810	0.000
EXMH20	JUNCTION	23.83	4.215	4.025
EXMH21	JUNCTION	23.83	3.392	2.018
EXMH22	JUNCTION	23.84	3.760	2.200
EXMH23	JUNCTION	23.84	3.652	2.568
IN1	JUNCTION	0.09	3.150	0.000
IN2	JUNCTION	0.10	3.400	0.000
IN3	JUNCTION	0.11	3.550	0.000
J1	JUNCTION	0.04	1.500	0.000
J17	JUNCTION	0.27	1.023	0.657
J18	JUNCTION	0.14	1.086	1.014
J19	JUNCTION	0.12	0.961	1.209
J2	JUNCTION	0.07	1.793	0.057
J20	JUNCTION	0.16	1.246	0.544
J22	JUNCTION	0.41	0.435	3.765
J24	JUNCTION	0.09	1.500	0.000
J3	JUNCTION	0.05	1.487	0.463
J30	JUNCTION	0.59	1.319	3.931
J31	JUNCTION	0.20	1.500	0.000
J32	JUNCTION	0.01	1.649	0.061

J4	JUNCTION	0.09	1.500	0.000
J43	JUNCTION	0.30	0.311	3.639
J7	JUNCTION	0.22	1.022	2.848
J8	JUNCTION	0.20	1.258	1.242
MH12	JUNCTION	0.05	3.000	0.000
MH13	JUNCTION	0.06	3.250	0.000
MH14	JUNCTION	0.07	3.330	0.000
MH15	JUNCTION	0.09	3.641	0.189
MH16	JUNCTION	0.14	4.280	0.050
MH17	JUNCTION	0.23	4.846	1.064
MH18	JUNCTION	0.29	4.739	2.221
MH19	JUNCTION	0.58	4.945	3.015
MH20	JUNCTION	0.35	4.863	1.807
MH21	JUNCTION	0.15	5.050	0.000
MH22	JUNCTION	0.06	3.160	0.000
MH23	JUNCTION	0.03	3.030	0.000
MH25	JUNCTION	23.89	4.940	0.000
MH26	JUNCTION	23.88	5.500	0.000
MH9	JUNCTION	0.05	1.474	5.576
Node_11	JUNCTION	0.14	6.980	0.510
Node_12	JUNCTION	0.01	2.138	4.032
Node_15	JUNCTION	23.87	9.050	0.000
Node_19	JUNCTION	0.16	3.670	0.000
Node_20	JUNCTION	0.27	4.290	0.000
Node_21	JUNCTION	0.01	3.650	0.000
Node_22	JUNCTION	0.03	4.000	0.000
Node_25	JUNCTION	0.01	1.995	1.765
Node_3	JUNCTION	23.85	7.260	0.000
Node_32	JUNCTION	23.85	3.941	2.689
Node_33	JUNCTION	23.84	3.802	2.488
Node_5	JUNCTION	0.19	5.315	0.000
Node_6	JUNCTION	0.04	5.350	0.000
Node_7	JUNCTION	0.02	5.790	0.000
Node_8	JUNCTION	0.03	6.340	0.000
OCS1	JUNCTION	23.90	3.500	0.000
OCS2	JUNCTION	23.90	3.000	0.000
OCS3	JUNCTION	23.86	3.000	0.000
OCS4	JUNCTION	23.90	3.250	0.000
OCS5	JUNCTION	23.89	3.000	0.000

Node Flooding Summary

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Depth Feet
DOGMH1	0.01	32.20	0 00:02	0.000	0.000
IN1	0.03	1.83	0 12:04	0.000	0.000
IN2	0.02	0.83	0 12:04	0.000	0.000
IN3	0.01	0.44	0 12:04	0.000	0.000
J1	0.01	0.51	0 12:04	0.000	0.000

J24	0.01	0.53	0	12:05	0.000	0.000
J31	0.01	0.01	0	12:05	0.000	0.000
J4	0.01	0.51	0	12:05	0.000	0.000
MH12	0.01	3.82	0	12:04	0.000	0.000
MH13	0.01	2.99	0	12:04	0.000	0.000
MH14	0.01	1.09	0	12:04	0.000	0.000
MH21	0.01	2.42	0	12:01	0.000	0.000
MH22	0.01	1.97	0	12:04	0.000	0.000
MH23	0.01	3.22	0	12:05	0.000	0.000
MH25	0.01	7.63	0	00:00	0.000	0.000
MH26	0.01	22.80	0	00:00	0.000	0.000
Node_15	0.01	121.86	0	00:00	0.001	0.000
Node_19	0.01	13.03	0	00:03	0.000	0.000
Node_20	0.01	14.67	0	00:03	0.000	0.000
Node_21	0.01	29.55	0	00:03	0.002	0.000
Node_22	0.01	9.55	0	00:03	0.000	0.000
Node_3	0.01	28.26	0	00:02	0.000	0.000
Node_5	0.01	26.41	0	00:03	0.000	0.000
Node_6	0.01	96.01	0	00:03	0.001	0.000
Node_7	0.01	115.30	0	00:03	0.001	0.000
Node_8	0.01	27.53	0	00:03	0.000	0.000
OCS1	23.86	13.80	0	12:06	2.500	0.000
OCS2	0.36	13.63	0	12:06	0.057	0.000
OCS3	0.25	9.94	0	12:06	0.026	0.000
OCS4	23.89	12.89	0	00:04	3.155	0.000
OCS5	0.56	6.89	0	00:00	0.013	0.000

 Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OF1	100.00	126.06	211.87	81.396
OF10	99.72	0.53	18.28	0.600
OF2	99.88	0.40	17.39	0.414
OF3	0.94	7.06	16.42	0.070
OF4	99.71	0.69	14.21	0.755
OF5	99.82	0.54	13.04	0.588
OF6	99.75	0.60	11.36	0.630
OF7	99.88	0.44	7.15	0.399
OF8	99.68	0.57	11.39	0.619
OF9	99.69	0.09	3.72	0.098
System	89.91	136.98	278.96	85.570

 Link Flow Summary

Maximum	Time of Max	Maximum	Max/	Max/
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Link	Type	Flow CFS	Occurrence days hr:min	Veloc ft/sec	Full Flow	Full Depth
C1	CONDUIT	0.64	0 12:08	0.30	0.04	0.77
C10	CONDUIT	17.57	0 12:06	5.59	1.19	1.00
C11	CONDUIT	9.21	0 12:03	5.21	1.31	1.00
C12	CONDUIT	7.15	0 12:06	5.05	0.25	0.75
C13	CONDUIT	23.74	0 12:06	7.79	1.60	0.93
C14	CONDUIT	6.02	0 12:06	4.74	0.64	1.00
C15	CONDUIT	9.33	0 12:05	5.61	0.74	1.00
C16	CONDUIT	1.69	0 12:06	4.00	0.69	0.53
C17	CONDUIT	3.99	0 12:06	3.25	0.95	1.00
C18	CONDUIT	21.57	0 12:06	5.32	0.80	0.77
C19	CONDUIT	22.18	0 12:06	4.52	0.82	1.00
C2	CONDUIT	13.21	0 12:06	4.43	0.89	0.91
C20	CONDUIT	10.70	0 12:06	16.62	0.14	0.26
C21	CONDUIT	13.04	0 12:06	7.52	1.24	0.95
C22	CONDUIT	14.32	0 12:07	4.64	0.95	0.97
C23	CONDUIT	11.39	0 12:06	6.66	1.61	0.93
C24	CONDUIT	3.60	0 12:06	3.94	0.87	0.70
C25	CONDUIT	13.89	0 12:06	6.52	0.18	0.64
C26	CONDUIT	11.39	0 12:06	6.45	1.56	1.00
C27	CONDUIT	10.69	0 12:06	5.11	0.15	0.63
C28	CONDUIT	16.42	0 12:06	7.23	0.28	0.68
C29	CONDUIT	4.29	0 12:06	3.11	0.70	1.00
C3	CONDUIT	0.91	0 12:06	3.46	0.10	0.58
C30	CONDUIT	12.80	0 00:00	10.43	2.52	1.00
C31	CONDUIT	18.19	0 00:00	15.76	0.88	1.00
C32	CONDUIT	7.30	0 12:06	4.17	0.78	1.00
C33	CONDUIT	29.46	0 12:06	6.00	1.08	1.00
C34	CONDUIT	17.90	0 12:06	5.25	0.21	0.66
C35	CONDUIT	11.36	0 12:06	6.43	1.69	1.00
C36	CONDUIT	11.36	0 12:06	6.64	1.80	0.93
C37	CONDUIT	3.00	0 12:06	5.34	0.20	0.41
C38	CONDUIT	1.83	0 12:06	3.62	0.15	0.38
C4	CONDUIT	13.12	0 12:06	4.52	0.91	0.87
C40	CONDUIT	4.44	0 12:06	3.21	0.71	1.00
C41	CONDUIT	9.62	0 12:06	2.82	0.36	1.00
C46	CONDUIT	14.21	0 12:06	8.14	2.10	0.96
C47	CONDUIT	5.09	0 12:06	3.78	0.37	0.72
C48	CONDUIT	3.72	0 12:06	4.42	0.88	0.65
C49	CONDUIT	18.28	0 12:06	6.68	1.42	0.81
C5	CONDUIT	2.50	0 12:06	0.79	0.15	1.00
C6	CONDUIT	4.77	0 12:05	1.53	0.30	1.00
C7	CONDUIT	25.64	0 12:06	8.16	1.70	1.00
C8	CONDUIT	11.95	0 12:06	4.29	0.93	0.83
C9	CONDUIT	25.27	0 12:06	5.87	0.90	0.82
Conduit_0	CONDUIT	12.81	0 00:00	16.31	4.90	1.00
Conduit_15	CONDUIT	116.70	0 12:06	6.46	1.22	1.00
Conduit_16	CONDUIT	7.84	0 00:03	5.26	1.11	1.00
Conduit_17	CONDUIT	119.91	0 12:08	6.92	1.26	1.00
Conduit_18	CONDUIT	8.26	0 00:04	4.25	0.15	0.73
Conduit_19	CONDUIT	128.05	0 00:06	7.16	0.70	1.00
Conduit_2	CONDUIT	13.00	0 00:04	7.46	1.67	1.00
Conduit_20	CONDUIT	11.69	0 00:04	8.34	0.15	0.76
Conduit_21	CONDUIT	191.47	0 00:01	13.16	1.43	1.00
Conduit_22	CONDUIT	147.85	0 00:01	9.62	0.95	1.00

Conduit_23	CONDUIT	8.99	0	00:00	8.02	0.74	1.00
Conduit_24	CONDUIT	153.42	0	00:01	8.45	1.07	1.00
Conduit_25	CONDUIT	8.60	0	00:00	6.81	0.84	0.83
Conduit_26	CONDUIT	172.58	0	00:01	9.59	1.07	1.00
Conduit_27	CONDUIT	9.44	0	00:00	9.00	0.33	0.42
Conduit_28	CONDUIT	194.84	0	00:00	12.81	0.92	1.00
Conduit_29	CONDUIT	211.87	0	00:00	10.88	2.35	1.00
Conduit_4	CONDUIT	11.17	0	00:04	6.59	1.46	1.00
EXPIPE1	CONDUIT	14.95	0	00:01	3.96	0.37	1.00
EXPIPE10	CONDUIT	115.88	0	12:06	6.34	0.87	1.00
EXPIPE11	CONDUIT	8.43	0	00:00	6.42	0.87	1.00
EXPIPE12	CONDUIT	10.00	0	00:00	6.83	0.49	1.00
EXPIPE13	CONDUIT	27.54	0	00:03	8.77	1.39	1.00
EXPIPE2	CONDUIT	26.65	0	00:01	5.09	0.68	1.00
EXPIPE3	CONDUIT	38.17	0	00:02	7.27	1.03	1.00
EXPIPE4	CONDUIT	49.61	0	12:02	7.29	1.28	1.00
EXPIPE5	CONDUIT	49.61	0	12:02	7.02	1.32	1.00
EXPIPE6	CONDUIT	49.64	0	12:02	7.68	1.36	1.00
EXPIPE7	CONDUIT	90.98	0	12:02	9.46	1.25	1.00
EXPIPE8	CONDUIT	91.17	0	12:02	9.48	1.41	1.00
EXPIPE9	CONDUIT	97.60	0	11:59	10.14	1.25	1.00
PIPE1	CONDUIT	0.25	0	12:06	0.99	0.03	0.20
PIPE10	CONDUIT	3.48	0	12:06	4.43	0.70	0.61
PIPE11	CONDUIT	3.44	0	12:06	3.30	0.69	0.81
PIPE12	CONDUIT	0.34	0	12:05	2.31	0.07	0.18
PIPE13	CONDUIT	5.77	0	12:06	4.71	0.53	1.00
PIPE14	CONDUIT	2.85	0	12:06	4.00	0.24	0.43
PIPE15	CONDUIT	5.46	0	12:05	3.84	0.50	0.76
PIPE16	CONDUIT	17.39	0	12:06	6.26	1.13	0.83
PIPE17	CONDUIT	4.51	0	12:05	4.05	0.49	0.70
PIPE18	CONDUIT	3.90	0	12:04	3.81	0.87	1.00
PIPE19	CONDUIT	4.19	0	12:04	2.72	0.53	1.00
PIPE2	CONDUIT	0.64	0	12:05	3.21	0.11	0.22
PIPE20	CONDUIT	3.15	0	12:03	3.23	0.33	1.00
PIPE21	CONDUIT	5.81	0	12:09	3.42	0.34	1.00
PIPE22	CONDUIT	3.43	0	12:03	4.84	0.38	1.00
PIPE23	CONDUIT	10.73	0	12:06	5.10	0.50	1.00
PIPE24	CONDUIT	3.84	0	12:02	6.56	0.39	1.00
PIPE25	CONDUIT	16.46	0	12:05	5.72	0.72	1.00
PIPE26	CONDUIT	20.22	0	12:05	6.43	0.97	1.00
PIPE27	CONDUIT	20.21	0	12:05	6.43	0.93	1.00
PIPE28	CONDUIT	3.42	0	12:05	3.31	0.69	1.00
PIPE29	CONDUIT	4.60	0	12:10	3.80	0.57	1.00
PIPE3	CONDUIT	1.43	0	12:06	2.57	0.18	0.35
PIPE30	CONDUIT	12.00	0	12:05	3.82	0.71	1.00
PIPE31	CONDUIT	15.59	0	12:05	4.96	0.90	1.00
PIPE32	CONDUIT	35.47	0	12:05	11.29	1.43	1.00
PIPE33	CONDUIT	26.79	0	00:00	8.56	1.61	1.00
PIPE34	CONDUIT	49.56	0	00:03	10.21	1.74	1.00
PIPE35	CONDUIT	5.28	0	12:06	4.81	1.07	1.00
PIPE4	CONDUIT	0.71	0	12:05	2.85	0.12	0.28
PIPE5	CONDUIT	2.92	0	12:06	3.13	0.37	0.52
PIPE6	CONDUIT	0.99	0	12:05	2.35	0.16	0.51
PIPE7	CONDUIT	5.88	0	12:06	5.66	0.70	0.59
PIPE8	CONDUIT	7.90	0	12:06	5.37	0.34	0.78
PIPE9	CONDUIT	1.55	0	12:06	2.53	0.31	0.50

Flow Classification Summary

		Adjusted	----- Fraction of Time in Flow Class -----						
		/Actual							
			Up	Down	Sub	Sup	Up	Down	Norm
Inlet									
Conduit		Length	Dry	Dry	Dry	Crit	Crit	Crit	Ltd
Ctrl									

C1		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.93
0.00									
C10		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.96
0.00									
C11		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.94
0.00									
C12		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02
0.00									
C13		1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.09
0.00									
C14		1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.96
0.00									
C15		1.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02
0.00									
C16		1.00	0.00	0.00	0.00	0.95	0.05	0.00	0.00
0.00									
C17		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.97
0.00									
C18		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.76
0.00									
C19		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.97
0.00									
C2		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.92
0.00									
C20		1.00	0.98	0.02	0.00	0.00	0.01	0.00	0.49
0.00									
C21		1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.12
0.00									
C22		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91
0.00									
C23		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
0.00									
C24		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91
0.00									
C25		1.00	0.00	0.99	0.00	0.01	0.00	0.00	0.50
0.00									
C26		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
0.00									
C27		1.00	0.00	0.98	0.00	0.02	0.00	0.00	1.00
0.00									
C28		1.00	0.00	0.99	0.00	0.01	0.00	0.00	0.50
0.00									
C29		1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.95
0.00									
C3		1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99 0.02 0.

C30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 C31	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 C32	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.01
0.00 C33	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.92
0.00 C34	1.00	0.00	0.99	0.00	0.01	0.00	0.00	0.00	0.50
0.00 C35	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.70
0.00 C36	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
0.00 C37	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.98
0.00 C38	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	1.00
0.00 C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.97
0.00 C40	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.95
0.00 C41	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98
0.00 C46	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 C47	1.00	0.19	0.00	0.00	0.03	0.04	0.00	0.74	0.23
0.00 C48	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
0.00 C49	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
0.00 C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.74
0.00 C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96
0.00 C7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.76
0.00 C8	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.97
0.00 C9	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.51
0.00 Conduit_0	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 Conduit_15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 Conduit_16	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00 Conduit_17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 Conduit_18	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00 Conduit_19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 Conduit_2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00 Conduit_20	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00 Conduit_21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00

Conduit_22	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_23	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
Conduit_24	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_25	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
Conduit_26	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_27	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
Conduit_28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
Conduit_4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE11	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
EXPIPE12	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE13	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
EXPIPE2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE8	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
EXPIPE9	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
PIPE1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
0.00									
PIPE10	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.49
0.00									
PIPE11	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
0.00									
PIPE12	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
PIPE13	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98
0.00									
PIPE14	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.99
0.00									
PIPE15	1.00	0.00	0.00	0.00	0.01	0.01	0.00	0.98	0.04
0.00									
PIPE16	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.03
0.00									

PIPE17	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
PIPE18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.47
0.00									
PIPE19	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
PIPE2	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
PIPE20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96
0.00									
PIPE21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.99
0.00									
PIPE22	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00
0.00									
PIPE23	1.00	0.00	0.00	0.00	0.12	0.88	0.00	0.00	0.97
0.00									
PIPE24	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00
0.00									
PIPE25	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	0.98
0.00									
PIPE26	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	0.06
0.00									
PIPE27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.97
0.00									
PIPE28	1.00	0.50	0.01	0.00	0.01	0.00	0.00	0.49	0.02
0.00									
PIPE29	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
PIPE3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
0.00									
PIPE30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98
0.00									
PIPE31	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
PIPE32	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
PIPE33	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
PIPE34	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
PIPE35	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	0.04
0.00									
PIPE4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									
PIPE5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.99
0.00									
PIPE6	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
PIPE7	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
0.00									
PIPE8	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.99
0.00									
PIPE9	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
0.00									

 Conduit Surcharge Summary

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C10	0.16	0.16	0.27	0.07	0.07
C11	0.52	0.55	0.52	0.63	0.52
C12	0.01	0.01	23.90	0.01	0.01
C13	0.01	0.01	0.01	0.17	0.01
C14	0.04	0.04	0.07	0.01	0.01
C15	0.07	0.07	0.17	0.01	0.01
C17	0.20	0.20	0.28	0.01	0.01
C19	0.05	0.05	0.22	0.01	0.01
C21	0.01	0.18	0.01	0.32	0.01
C23	0.01	0.41	0.01	0.61	0.01
C25	0.01	0.01	11.96	0.01	0.01
C26	0.41	0.43	0.41	0.59	0.41
C27	0.01	0.01	23.83	0.01	0.01
C28	0.01	0.01	11.96	0.01	0.01
C29	0.09	0.09	0.12	0.01	0.01
C30	23.90	23.90	23.90	23.50	23.50
C31	23.89	23.89	23.89	0.01	0.01
C32	0.20	0.20	0.40	0.01	0.01
C33	0.22	0.22	0.36	0.03	0.03
C34	0.01	0.01	23.84	0.01	0.01
C35	0.59	0.61	0.59	0.70	0.59
C36	0.01	0.59	0.01	0.74	0.01
C40	0.09	0.09	0.12	0.01	0.01
C41	0.01	0.01	0.05	0.01	0.01
C46	0.01	0.52	0.01	0.82	0.01
C47	0.01	0.01	0.30	0.01	0.01
C49	0.01	0.01	0.01	0.18	0.01
C5	0.14	0.14	0.16	0.01	0.01
C6	0.12	0.12	0.16	0.01	0.01
C7	0.27	0.27	0.33	0.17	0.17
Conduit_0	23.90	23.90	23.90	23.74	23.73
Conduit_15	0.05	0.07	0.06	23.80	0.04
Conduit_16	0.03	0.03	0.03	0.01	0.01
Conduit_17	0.03	0.06	0.03	23.80	0.02
Conduit_19	0.03	0.03	0.14	0.01	0.01
Conduit_2	23.86	23.90	23.86	23.72	23.68
Conduit_21	0.13	0.14	0.14	0.04	0.07
Conduit_22	0.14	0.14	0.18	0.01	0.02
Conduit_23	0.01	0.01	0.01	0.01	0.01
Conduit_24	0.17	0.18	0.22	0.01	0.05
Conduit_26	0.22	0.22	7.59	0.04	0.07
Conduit_28	7.59	7.59	23.87	0.01	0.02
Conduit_29	23.87	23.87	23.90	23.85	23.85
Conduit_4	23.86	23.86	23.86	23.77	23.73
EXPIPE1	23.83	23.83	23.83	0.01	0.01
EXPIPE10	0.04	0.04	0.07	0.01	0.01
EXPIPE11	0.16	0.16	0.19	0.01	0.01
EXPIPE12	0.27	0.27	0.46	0.01	0.01
EXPIPE13	0.01	0.01	0.02	0.01	0.01
EXPIPE2	23.83	23.83	23.84	0.01	0.01
EXPIPE3	23.84	23.84	23.84	0.01	0.01
EXPIPE4	23.84	23.84	23.85	0.98	1.00

EXPIPE5	23.85	23.85	23.85	1.12	1.13
EXPIPE6	23.85	23.85	23.86	1.62	1.63
EXPIPE7	23.84	23.84	23.84	23.80	23.78
EXPIPE8	23.84	23.84	23.84	23.81	23.81
EXPIPE9	23.84	23.84	23.84	23.79	23.80
PIPE11	0.01	0.01	0.05	0.01	0.01
PIPE13	0.08	0.08	23.83	0.01	0.01
PIPE15	0.01	0.01	0.03	0.01	0.01
PIPE16	0.01	0.01	0.01	0.07	0.01
PIPE18	0.05	0.05	0.08	0.01	0.01
PIPE19	0.06	0.06	0.07	0.01	0.01
PIPE20	0.09	0.09	0.10	0.01	0.01
PIPE21	0.07	0.07	0.09	0.01	0.01
PIPE22	0.10	0.10	0.13	0.01	0.01
PIPE23	0.09	0.09	0.14	0.01	0.01
PIPE24	0.11	0.11	0.14	0.01	0.01
PIPE25	0.14	0.14	0.23	0.01	0.01
PIPE26	0.23	0.23	0.29	0.01	0.01
PIPE27	0.29	0.29	0.58	0.01	0.01
PIPE28	0.03	0.03	0.06	0.01	0.01
PIPE29	0.06	0.06	0.15	0.01	0.01
PIPE30	0.15	0.15	0.35	0.01	0.01
PIPE31	0.35	0.35	0.58	0.01	0.01
PIPE32	0.58	0.58	23.84	0.11	0.11
PIPE33	23.88	23.89	23.88	23.89	23.88
PIPE34	23.84	23.88	23.84	23.88	23.84
PIPE35	0.05	0.05	0.08	0.03	0.03
PIPE8	0.01	0.01	23.83	0.01	0.01

Analysis begun on: Wed May 11 10:42:11 2022
 Analysis ended on: Wed May 11 10:42:21 2022
 Total elapsed time: 00:00:10

For more information on your flood risk go to www.floodsmart.gov.

☐ Show FEMA's National Flood Hazard Layers

Flood Impacts & Photos

Collapse

If you notice any errors in the below information, please contact our Webmaster

10.62 (Mean Lower Low Water (MLLW)) The level reached during Post Tropical Cyclone Sandy on October 30, 2012.

10.49 (MLLW) The level reached on November 25, 1950.

10.46 (MLLW) The level reached on April 17, 2011.

10.36 (MLLW) The level reached on October 29, 2021.

10.35 (MLLW) The level reached on December 21, 2012.

10.2 (MLLW) MAJOR FLOODING. At this level, widespread roadway flooding begins near the river and its tidal tributaries in Philadelphia and in the New Jersey counties of Camden and Gloucester. Vulnerable homes and businesses may be damaged as water levels rise further above this threshold. Numerous roads become impassable and some neighborhoods may be isolated. The flood waters become a danger to anyone who attempts to cross on foot or in a vehicle.

9.2 (MLLW) MODERATE FLOODING. At this level, additional roadways near the river and its tidal tributaries in Philadelphia and in the New Jersey counties of Camden and Gloucester begin to flood. Lives may be at risk when people put themselves in harm's way. Some damage to vulnerable structures may begin to occur. COASTAL FLOOD WARNING LEVEL.

9 (MLLW) Flooding begins along Columbus Boulevard in Philadelphia near the Ben Franklin Bridge. Generally, it is not a case of the river spilling over onto the roadway. The flooding problems tend to occur when the river is high and water begins to backup into the storm drains.

8.8 (MLLW) Flooding begins on North Park Drive in Pennsauken NJ. Water backs up into Cooper River Lake in Camden County NJ. Flooding begins on South Park Drive in Collingswood and Haddon Township NJ. Flooding begins along Woodbury Creek in Woodbury NJ.

8.6 (MLLW) Flooding begins along the Little Timber Creek between Gloucester City and Brooklawn NJ and around the Brooklawn Circle. Flooding begins along Timber Avenue, Edgewater Avenue and NJ Route 47 in Westville NJ. Flooding begins along Woodbury Creek and Hessian Run in West Deptford Township NJ, affecting Crown Point Road. Flooding begins along River Road Drive in West Deptford Township NJ.

8.5 (MLLW) COASTAL FLOOD ADVISORY LEVEL.

8.4 (MLLW) Flooding begins at the east end of Linden Avenue in Northeast Philadelphia. Flooding begins at the former Navy Shipyard in Philadelphia from both the Delaware River and the Schuylkill River. Flooding begins along Admiral Wilson Boulevard (US Route 30) and Baird Avenue in Camden NJ as the Cooper River overflows.

8.2 (MLLW) MINOR FLOODING.

About This Location

Collapse

Latitude: 39.933056° N, Longitude: 75.141389° W, Horizontal Datum: NAD83/WGS84

River Stage Reference Frame	Gauge Height	Flood Stage	Uses
NWS stage	0 ft	8.2 ft	Interpreting hydrographs and NWS watch, warnings, and forecasts, and inundation maps
Vertical Datum	Elevation (gauge height = 0)	Elevation (gauge height = flood stage)	Elevation information source
NAVD88	-3.1	5.1	Survey grade GPS equipment, FEMA flood plain maps, newer USGS topographic maps
NGVD 29	Not Available	Not Available	Older USGS topographic maps, NGVD29 benchmarks
MSL	Not Available	Not Available	Older USGS topographic maps, MSL benchmarks
Other	-3.59	1.51	NAVD88 to MHHW conversion from NOAA Vertical Datum Transformation (VDatum)

Additional Information

Collapse

All gage data is referenced in MLLW. During winter months, cold and ice may result in inaccurate real-time stages. Adjustments or deletions of this data can only be done after detailed analysis.

Resources

Collapse

Hydrologic Resources

► Text Products

► Past Precipitation

► Forecast Precipitation

► River Forecast Centers

► River Stage Summary

► Inundation Mapping Locations

Additional Resources

► Area Hydrographs

► NWS Precipitation and River Forecasting

► AHPS Iframes for Developers

► Mobile iNWS for emergency management

► Snow Information

► Ensemble River Forecasts

► Hourly Precipitation

Collaborative Agencies

Collapse

The National Weather Service prepares its forecasts and other services in collaboration with agencies like the US Geological Survey, US Bureau of Reclamation, US Army Corps of Engineers, Natural Resource Conservation Service, National Park Service, ALERT Users Group, Bureau of Indian Affairs, and many state and local emergency managers across the country. For details, [please click here](#).

NWS Information

National Weather Service
Philadelphia/Mount Holly Weather Forecast Office
732 Woodlane Road
Mount Holly, NJ 08060-9615
(609) 261-6600
Ask Questions/Webmaster
Page last modified: 2-Nov-2020 7:30 PM

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Career Opportunities

https://water.weather.gov/ahps2/hydrograph.php?wfo=phi&gage=phbp1&prob_type=stage&source=hydrograph

2/2

Appendix C. Post-Development Drainage Area Plan

Appendix D. StormFilter Design Summary

Paulsboro Marine Terminal

Paulsboro, NJ

5/6/22

Information Provided by Engineer:

- Water quality flow rate = 3.27 cfs
- 100yr peak flow rate = 9.38 cfs
- Impervious drainage area = 1.05 acres
- Required TSS removal rate = 80%
- Presiding agency = NJDEP

StormFilter Information and Cartridge Data:

The Stormwater Management StormFilter® is a passive, siphon-actuated, flow-through stormwater filtration system consisting of a precast concrete structure that houses rechargeable, media-filled filter cartridges. The StormFilter works by passing stormwater through the media-filled cartridges, which trap particulates and adsorb pollutants such as dissolved metals, nutrients, and hydrocarbons. **The StormFilter has received final certification from the NJDEP for 80% TSS removal as a stand-alone treatment system.**

- StormFilter cartridge filter media = Perlite
- StormFilter cartridge media height = 27 inches (nominal)
- StormFilter cartridge surface area = 10.61 square feet (nominal)
- StormFilter cartridge specific treatment flow rate = 2.12 gallons/minute per square foot (nominal)
- StormFilter cartridge treatment flow = 22.5 gpm
- **Hydraulic head required: 3.05 feet** (with 27 inch cartridge)
- Minimum physical drop between inlet and outlet pipe = 6 inches

Design Summary:

The StormFilter is sized based on the NJDEP certification, which lists an approved treatment flow rate and maximum impervious acreage limit per cartridge in Table 1. The number of cartridges required based on the impervious drainage area is compared with the number of cartridges required based on the treatment flow rate; the larger number of cartridges governs the sizing.

The StormFilter for this site was sized to provide **66 cartridges** in order to meet the hydraulic load requirement (calculations shown below). To house this number of cartridges, Contech Engineered Solutions recommends a Parallel System comprised of (2) 8' x 22' precast Peak Diversion StormFilter vaults.

$$N_{\text{cartridges hyd.load}} = \frac{Q_{\text{treat}} \times 449 \frac{\text{gpm}}{\text{cfs}}}{Q_{\text{cartridge}}} = \frac{3.27 \text{ cfs} \times 449 \frac{\text{gpm}}{\text{cfs}}}{22.5 \frac{\text{gpm}}{\text{cartridge}}} = 65.25 \Rightarrow (66) \text{ 27" Cartridges}$$

$$N_{\text{cartridges mass load}} = \frac{\text{Area}_{\text{site}}}{\text{Max Area}_{\text{cartridge}}} = \frac{1.05 \text{ acre}}{0.136 \frac{\text{acres}}{\text{cartridge}}} = 7.72 \Rightarrow (8) \text{ 27" Cartridges}$$



StormFilter Design Summary

Maintenance:

Maintenance of Stormwater best management practices is required per the New Jersey Administrative Code 7:8-5.8. Recommendations for maintenance are included in chapters 8 & 9 of the New Jersey Stormwater Best Management Practices Manual. To comply with requirements, CONTECH offers a network of Preferred Service Providers that have the capability to perform all necessary inspections, compliance reporting and cleaning services. CONTECH recommends inspecting the system annually and maintaining the system at the recommendation of the annual inspection. Full maintenance is typically required every 24-36 months. Disposal of material should be handled in accordance with local regulations. Please contact CONTECH's Maintenance Department for all questions regarding maintenance at (503) 258-3157 or visit our website at www.conteches.com/maintenance.

Thank you for the opportunity to present this information to you and your client. If you have any questions, please call me at (443-457-1529).

Sincerely,

Taylor Murdock
Contech Engineered Solutions LLC

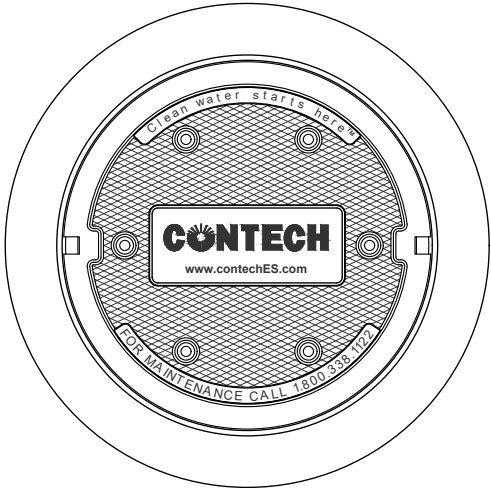
STORMFILTER DESIGN NOTES

- THE 8' x 22' PEAK DIVERSION STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.
- THE PEAK DIVERSION STORMFILTER IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR RIGHT INLET CONFIGURATION.
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"			18"			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05'			2.3'			1.8'		
HEIGHT OF WEIR (W)	3.00'			2.25'			1.75'		
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	11.25	15	12.53	7.5	10	8.35	5

* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC
DATA REQUIREMENTS

STRUCTURE ID	*		
WATER QUALITY FLOW RATE (cfs)	*		
PEAK FLOW RATE (cfs)	*		
RETURN PERIOD OF PEAK FLOW (yrs)	*		
CARTRIDGE HEIGHT (27", 18", LOW DROP(LD))	*		
NUMBER OF CARTRIDGES REQUIRED	*		
CARTRIDGE FLOW RATE	*		
MEDIA TYPE (PERLITE, ZPG, PSORB)	*		
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE	*	*	*
OUTLET PIPE	*	*	*
UPSTREAM RIM ELEVATION			
DOWNSTREAM RIM ELEVATION			
ANTI-FLOTATION BALLAST			
		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

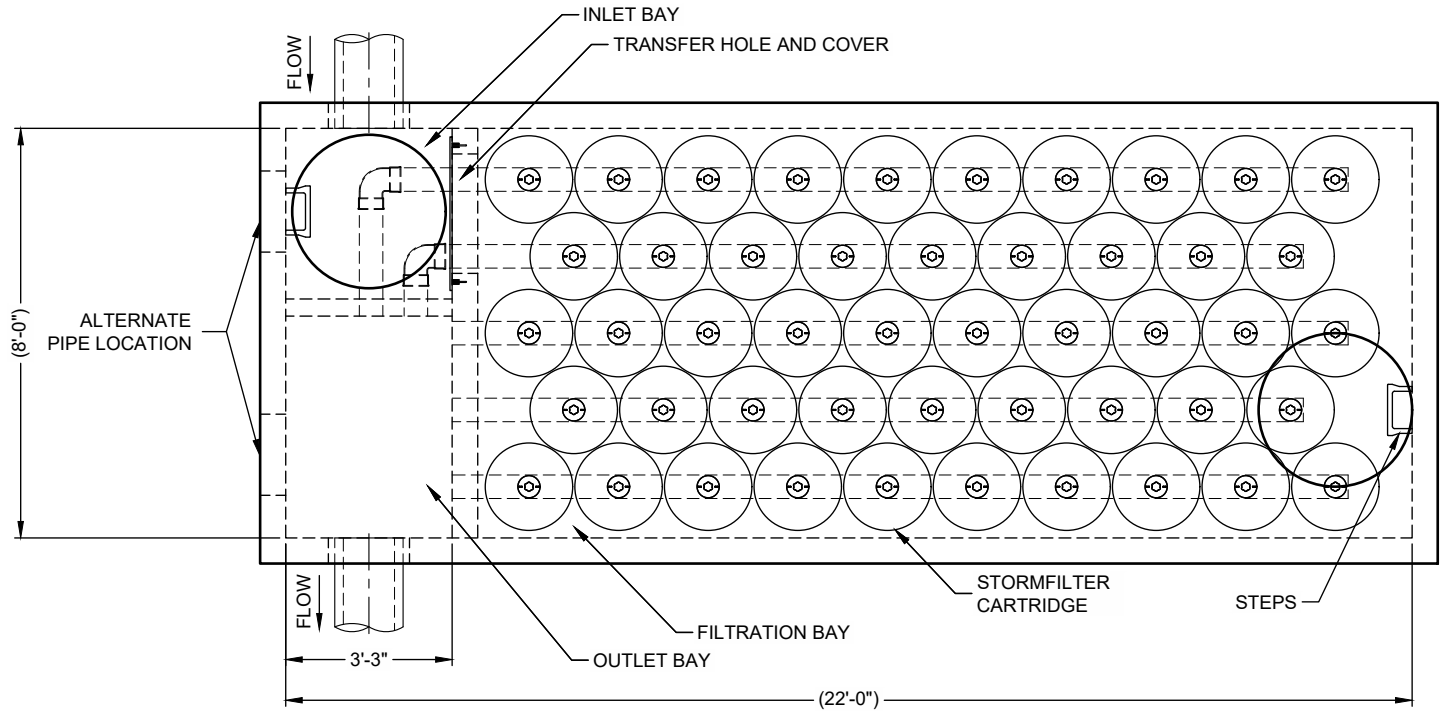
PERFORMANCE SPECIFICATION
FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. **RADIAL MEDIA DEPTH SHALL BE 7-INCHES.** FILTER MEDIA CONTACT TIME SHALL BE AT LEAST **38 SECONDS.**
SPECIFIC FLOW RATE SHALL BE **2 GPM/SF (MAXIMUM).** SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW (GPM) DIVIDED BY THE MEDIA SURFACE CONTACT AREA (SF). MEDIA VOLUMETRIC FLOW RATE SHALL BE **6 GPM/CF OF MEDIA (MAXIMUM).**

GENERAL NOTES

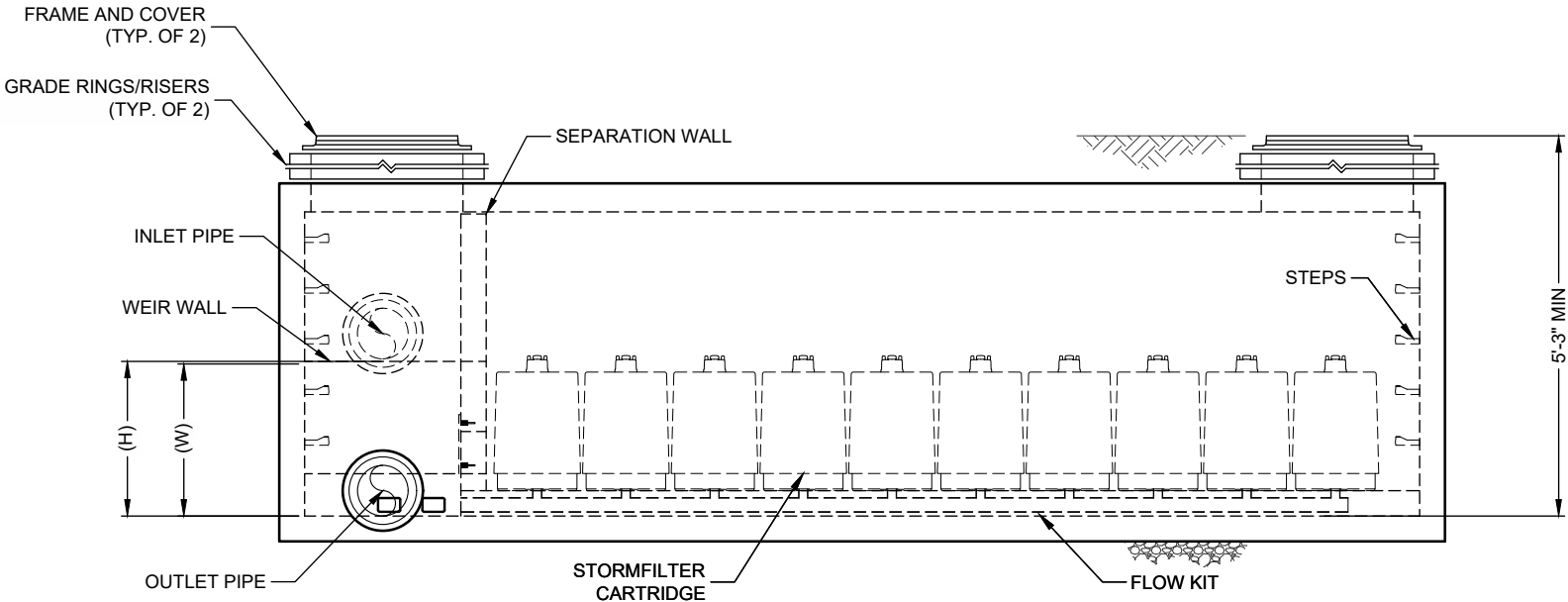
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.contechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.

INSTALLATION NOTES

- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
- C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
- D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
- E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
- F. CONTRACTOR TO REMOVE THE TRANSFER HOLE COVER WHEN THE SYSTEM IS BROUGHT ONLINE.



PLAN VIEW



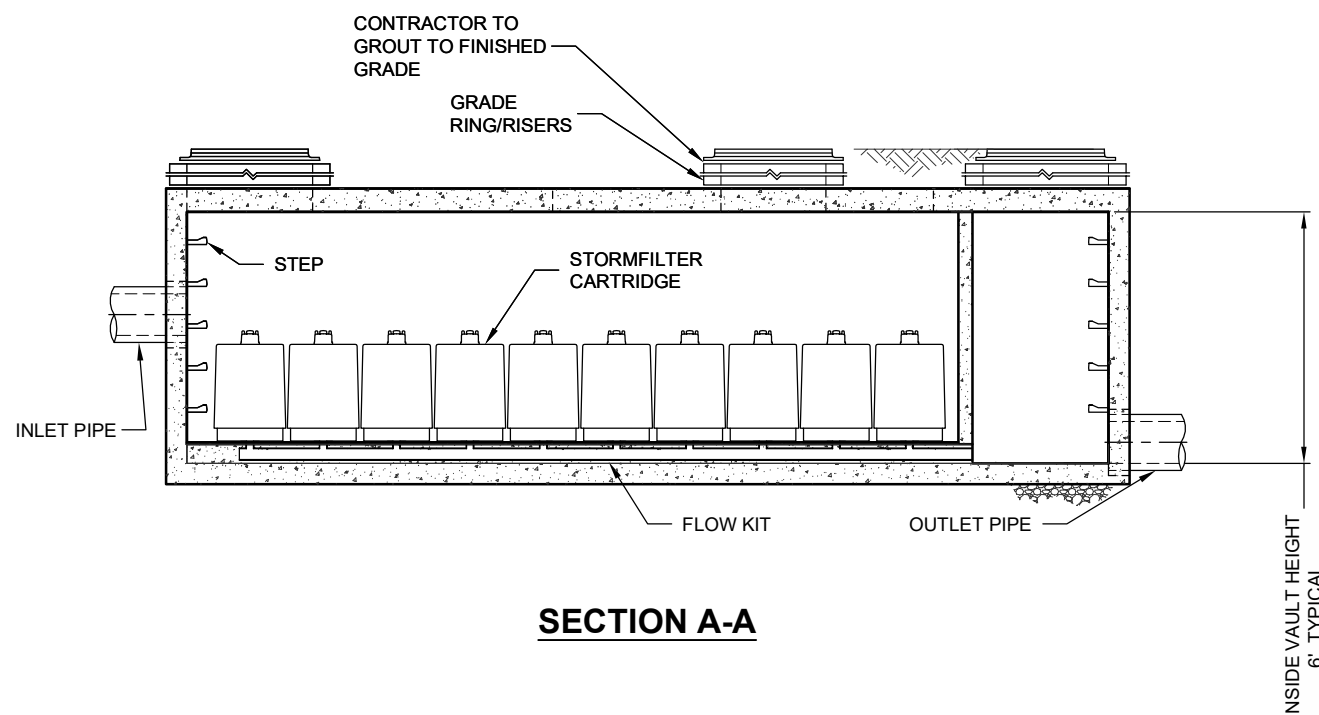
ELEVATION



CONTECH
ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

THE STORMWATER MANAGEMENT STORMFILTER
8' x 22' PEAK DIVERSION STORMFILTER
STANDARD DETAIL

PLAN VIEW
VAULT STYLE: OUTLET SUMP (NIB)



SECTION A-A



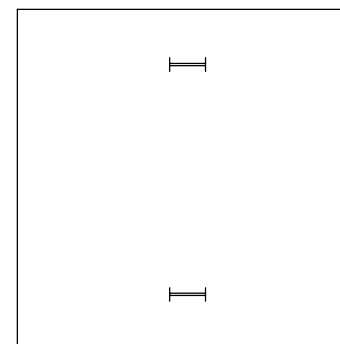
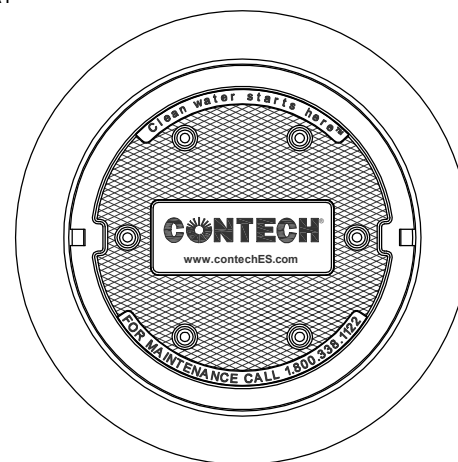
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (56). VAULT STYLE OPTIONS INCLUDE INLET BAY (49), INLET BAY/OUTLET BAY (46), OUTLET BAY (51), NLET BAY/FULL HEIGHT BAFFLE WALL (41), FULL HEIGHT BAFFLE WALL (46). STORMFILTER 8X22 PEAK HYDRAULIC CAPACITY IS 1.8 CFS. IF THE SITE CONDITIONS EXCEED 1.8 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"			18"			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05'			2.3'			1.8'		
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	11.25	15	12.53	7.5	10	8.35	5

* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



FRAME, COVER, AND HATCH

(SIZE AND CONFIGURATION VARY)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (27", 18", LOW DROP(LD))	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

UPSTREAM RIM ELEVATION	*
DOWNSTREAM RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONFORMING TO ASTM C-857 AND AASHTO LOAD FACTOR DESIGN METHOD.

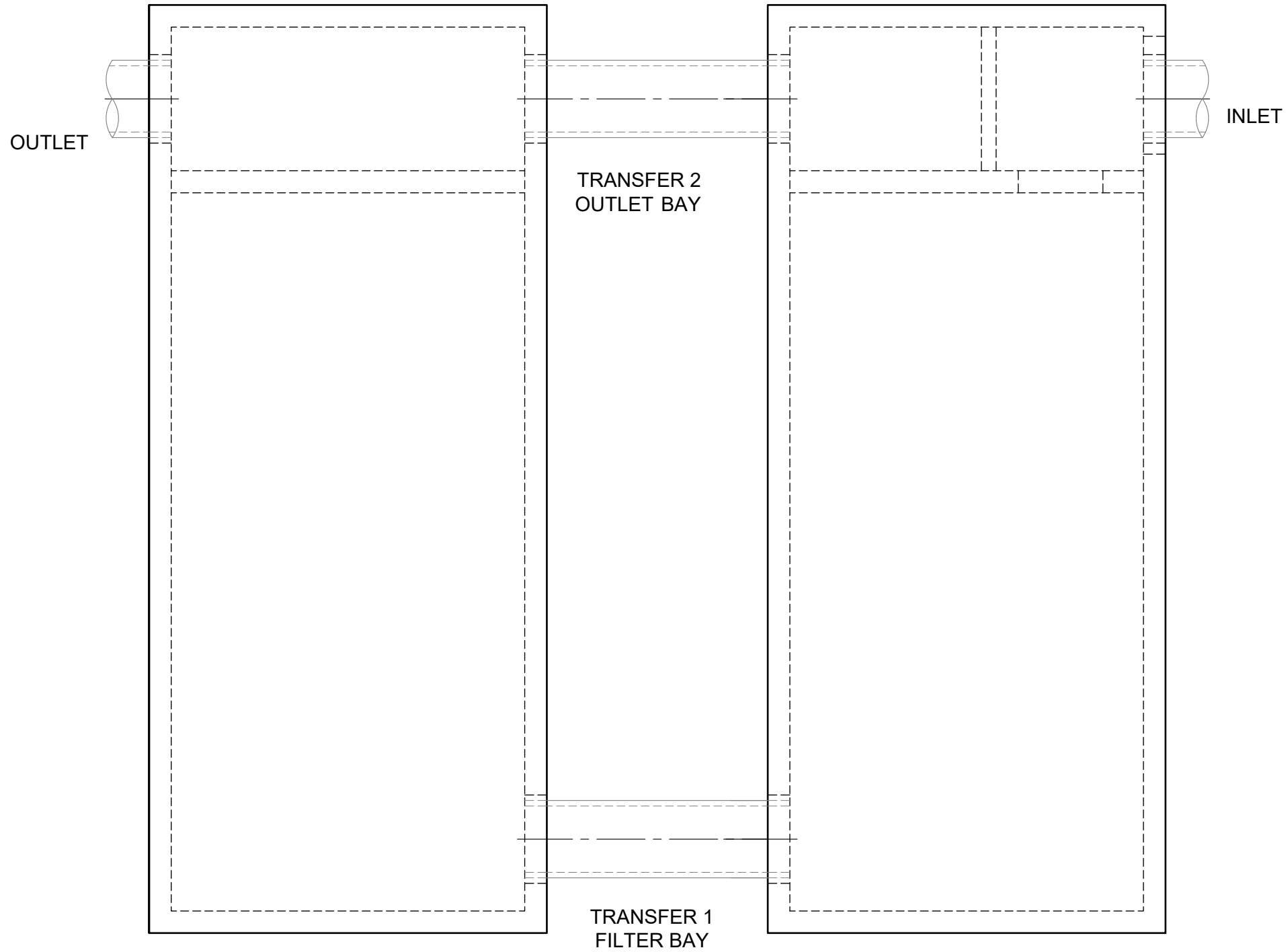
INSTALLATION NOTES

- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT (LIFTING CLUTCHES PROVIDED).
- C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
- D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
- E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.



www.contechES.com
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 800-338-1122 513-645-7000 513-645-7993 FAX

SF0822
STORMFILTER W/ FULL HEIGHT BAFFLE WALL
STANDARD DETAIL





CONTECH
ENGINEERED SOLUTIONS LLC

www.ContechES.com

5970 Greenwood Plaza Blvd., Suite 530, Greenwood Village, CO 80111

800-526-3999 720-597-2700 720-597-2855 FAX



StormFilter
The Stormwater Technology

THE PROCEEDING HAS BEEN REVIEWED BY ONE OR MORE OF THE FOLLOWING
REGISTERED PROFESSIONAL ENGINEERS AND/OR PROFESSIONAL LAND SURVEYORS
AND HAS BEEN FOUND TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE
RELEVANT APPLICABLE PATENTS AND/OR COPYRIGHTED RIGHTS TRADING

DATE:		5/31/19	
DESIGNED:	TKM	DRAWN:	TKM
CHECKED:		APPROVED:	
PROJECT NUMBER:		52622	
SHEET:			
1		OF 1	

[illegible]

PEAK DIVERION STORMFILTER PARALLEL VAULT LAYOUT



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control

Division of Water Quality

Mail Code 401-02B

Post Office Box 420

Trenton, New Jersey 08625-0420

609-633-7021 Fax: 609-777-0432

http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE

Governor

KIM GUADAGNO

Lt. Governor

BOB MARTIN

Commissioner

December 14, 2016

Derek M. Berg
Director - Stormwater Regulatory Management - East
Contech Engineered Solutions LLC
71 US Route 1, Suite F
Scarborough, ME 04074

Re: MTD Laboratory Certification
Stormwater Management StormFilter® (StormFilter) by Contech Engineered Solutions LLC
Off-line Installation

TSS Removal Rate 80%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Contech Engineered Solutions LLC has requested a Laboratory Certification for the StormFilter System.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the StormFilter System by Contech Engineered Solutions LLC at a TSS removal rate of 80%, when designed, operated and maintained in accordance with the information provided in the Verification Appendix and subject to the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 2.12 gpm/sf of effective filtration treatment area.
2. The StormFilter System shall be installed using the same configuration as the unit tested by NJCAT, and sized in accordance with the criteria specified in item 6 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter), to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the StormFilter, which is attached to this document. However, it is recommended to review the maintenance website at <http://www.conteches.com/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=2813&PortalId=0&DownloadMethod=attachment> for any changes to the maintenance requirements.
6. Sizing Requirements:

The example below demonstrates the sizing procedure for a StormFilter System.

Example: A 0.25 acre impervious site is to be treated to 80% TSS removal using a StormFilter System. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs or 354.58 gpm.

The calculation of the minimum number of cartridges for use in the StormFilter System is based upon both the MTFR and the maximum inflow drainage area. It is necessary to calculate the required cartridges using both methods and to rely on the method that results in the highest minimum number of cartridges determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the StormFilter System in this example is 0.25 acres. Based upon the information in Table 1 below, the following minimum number of cartridges are required in a StormFilter System to treat the impervious area without exceeding the maximum drainage area:

1. Five (5) 12" cartridges,
2. Three (3) 18" cartridges, or
3. Two (2) 27" cartridges

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was determined based on the following:

time of concentration = 10 minutes

i=3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)

c=0.99 (runoff coefficient for impervious)

$Q=ciA=0.99 \times 3.2 \times 0.25 = 0.79$ cfs = 0.79×448.83 gpm = 354.58 gpm

Based on a flow rate of 354.58 gpm, the following minimum number of cartridges are required in a StormFilter System to treat the impervious area without exceeding the MTFR:

1. Thirty-six (36) 12" cartridges,
2. Twenty-four (24) 18" cartridges, or
3. Sixteen (16) 27" cartridges

The MTFR Evaluation results will be used since that method results in the higher minimum number of cartridges determined by the two methods.

The sizing table corresponding to the available system models are noted below:

TABLE 1 STORMFILTER CARTRIDGE HEIGHTS AND NEW JERSEY TREATMENT CAPACITIES

StormFilter Cartridge Heights and New Jersey Treatment Capacities				
StormFilter Cartridge Height	Filtration Surface Area (sq.ft)	MTFR ¹ (GPM)	Mass Capture Capacity (lbs)	Maximum Allowable Inflow Area ² (acres)
Low Drop (12")	4.71	10	36.3	0.061
18"	7.07	15	54.5	0.09
27"	10.61	22.5	81.8	0.136

Notes:

1. MTFR calculated based on 4.72×10^{-3} cfs/sf (2.12 gpm/sf) of effective filtration treatment area.

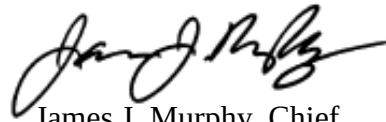
2. Based upon the equation found in the NJDEP Filter Protocol Maximum Inflow Drainage Area (acres) = weight of TSS before 10% loss in MTFR (lbs)/600 lbs/acre of drainage area annually.

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of

indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Shashi Nayak of my office at (609) 633-7021.

Sincerely,

A handwritten signature in black ink, appearing to read "James J. Murphy".

James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

cc: Chron File

Richard Magee, NJCAT

Vince Mazzei, NJDEP - DLUR

Ravi Patraju, NJDEP - BES

Gabriel Mahon, NJDEP - BNPC

Shashi Nayak, NJDEP - BNPC

StormFilter Inspection and Maintenance Procedures



Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are many effective maintenance options, we believe the following procedure to be efficient, using common equipment and existing maintenance protocols. The following two-step procedure is recommended::

1. Inspection

- Inspection of the vault interior to determine the need for maintenance.

2. Maintenance

- Cartridge replacement
- Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, during dryer months in late summer to early fall.

Maintenance Frequency

The primary factor for determining frequency of maintenance for the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis, in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

The average maintenance lifecycle is approximately 1-5 years. Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

Regulatory requirements or a chemical spill can shift maintenance timing as well. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs..





Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to whether or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)

1. Sediment loading on the vault floor.
 - a. If $>4"$ of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
 - a. If $>1/4"$ of accumulation, maintenance is required.
3. Submerged cartridges.
 - a. If $>4"$ of static water above cartridge bottom for more than 24 hours after end of rain event, maintenance is required. (Catch basins have standing water in the cartridge bay.)
4. Plugged media.
 - a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
 - a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
 - a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
 - a. If pronounced scum line (say $\geq 1/4"$ thick) is present above top cap, maintenance is required.



Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Contech Engineered Solutions.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

- A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Contech Engineered Solutions for suggested attachment devices.

- B. Remove the used cartridges (up to 250 lbs. each) from the vault.



Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner.

- C. Set the used cartridge aside or load onto the hauling truck.
- D. Continue steps a through c until all cartridges have been removed.

Method 2:

- A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.
- B. Unscrew the cartridge cap.
- C. Remove the cartridge hood and float.
- D. At location under structure access, tip the cartridge on its side.
- E. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.
- F. Set the empty, used cartridge aside or load onto the hauling truck.
- G. Continue steps a through e until all cartridges have been removed.

8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used **empty** cartridges to Contech Engineered Solutions.

Related Maintenance Activities - Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.



Inspection Report

Date: Personnel:

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Estimated Flow from Drainage Pipes (if available): _____

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: _____

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: _____

☐ Minor Structural Repairs: _____

☐ Drainage Area Report _____

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

Items Needing Further Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

List Safety Procedures and Equipment Used: _____

System Observations

Months in Service: _____

Oil in Forebay (if present): Yes ☐ No ☐

Sediment Depth in Forebay (if present): _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: _____

Replace Cartridges: Yes ☐ No ☐ Details: _____

Sediment Removed: Yes ☐ No ☐ Details: _____

Quantity of Sediment Removed (estimate?): _____

Minor Structural Repairs: Yes ☐ No ☐ Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:



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800-338-1122

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Support

- Drawings and specifications are available at www.conteches.com.
- Site-specific design support is available from our engineers.

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Section 9: Notice of Application

(Municipal Clerk, Government Entities and Adjacent Property Owners)



**Challenging today.
Reinventing tomorrow.**

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Philadelphia, PA 19103

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F +1.215.569.5963
www.jacobs.com

May 13, 2022

Attn: Kathy A. VanScoy
Clerk, Borough of Paulsboro
1211 Delaware Street
Paulsboro, NJ 08066

Project name: EEW American Offshore Structures Phase I Upland PMT
Project no: 0800-20-0002.1

Subject: Public Notice for a Modification to a Waterfront Development Permit
EEW American Offshore Structures Phase I Upland Project
Paulsboro Marine Terminal
Borough of Paulsboro, Gloucester County, New Jersey

Dear Ms. VanScoy:

This letter is to provide you with legal notification that an application for a major technical modification of a Coastal Waterfront Development Individual Permit (DLUR File No. 0800-20-0002.1) has been submitted to the New Jersey Department of Environmental Protection, Division of Land Use Regulation for the development shown on the enclosed plans is being modified. Enclosed is a complete copy of the modification application that was submitted to the NJDEP for review by the public.

Should you have any questions regarding this information, please contact me at the number listed below.

Regards,

Sonny Rutkowski
Professional Engineer

215 845 6924
Sonny.Rutkowski@jacobs.com



**Challenging today.
Reinventing tomorrow.**

Jacobs

Two Commerce Square
2001 Market Street
9th Floor, Suite 900
Philadelphia, PA 19103

T +1.215.569.2900
F +1.215.569.5963
www.jacobs.com

May 11, 2022

Project name: EEW American Offshore Structures Phase I Upland PMT
DLUR File No.: 0800-20-0002.1

**Subject: Public Notice for a Modification to a Waterfront Development Permit
EEW American Offshore Structures Phase I Upland Project
Paulsboro Marine Terminal
Borough of Paulsboro, Gloucester County, New Jersey**

**Regarding Property at:
Paulsboro Marine Terminal
Mantua Avenue and Universal Road
Borough of Paulsboro, Gloucester County, New Jersey
Block 1, Lots: 2, 4, 5, 8, 20, 21, 22, 23, and 24
Block 1.07, Lot: 26
Block 1.14, Lot 45
Block 135, Lot 24.01**

To Whom This Concerns:

This letter is to provide you with legal notification that an application for a major technical modification of a Coastal Waterfront Development Individual Permit (DLUR File No. 0800-20-0002.1) has been submitted to the New Jersey Department of Environmental Protection, Division of Land Use Regulation for the development shown on the enclosed plans is being modified.

A brief description of the proposed project and modification are as follows: The project is located on a portion of the Paulsboro Marine Terminal. The proposed facility is for the purpose of supporting the construction and maintenance of offshore wind farms off the coast of New Jersey. Phase 1 of the project received approval from the NJDEP Department of Land Resource Protection in October of 2020 and March of 2021. Since approval, the design of the project has been modified and the applicant is seeking a modification of the NJDEP approval. The proposed revisions consist of relocating buildings, revising the layout of pavement and open-graded gravel areas and redesigning the stormwater management system. This has resulted in the reduction of the total project footprint from approximately 82 +/- acres to 64.3 +/- acres.

The complete permit application package can be reviewed at the municipal clerk's office in the municipality in which the site subject to the application is located or by appointment at the Department's Trenton Office. The County Clerk Office is located at 2 South Broad Street, Woodbury New Jersey 08096. The Department of Environmental Protection welcomes comments and any information that you may provide concerning the proposed development and site. Please submit your written comments within 15 calendar days of receiving this letter to:

New Jersey Department of Environmental Protection
Division of Land Use Regulation
P.O. Box 420, Code 501-02A
Trenton, New Jersey 08625
Attn: Paulsboro Supervisor

Date: 11 May 2022

Subject: Public Notice for a Modification to a Waterfront Development Permit
EEW American Offshore Structures Phase I Upland Project
Paulsboro Marine Terminal
Borough of Paulsboro, Gloucester County, New Jersey

Jacobs

Regards,



Sonny Rutkowski
Professional Engineer

Jacobs Engineering Group, Inc.

Enclosures: 8.5" x 11" Copy of Site Plan

Copies to: Paulsboro Construction Official Paulsboro Environmental Commission
Paulsboro Planning Board Gloucester County Planning Board
Gloucester County Soil Conservation District.
Property owners within 200 feet of the project

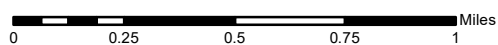


Legend

- Phase 2 Site Boundary
- Roads

Notes:

1. Sources: Aerial Imagery, Topographic Map, ESRI 2022; Roads, NJGIN 2021; Federal Navigation Channel, NOAA, 2021.



VICINITY MAP

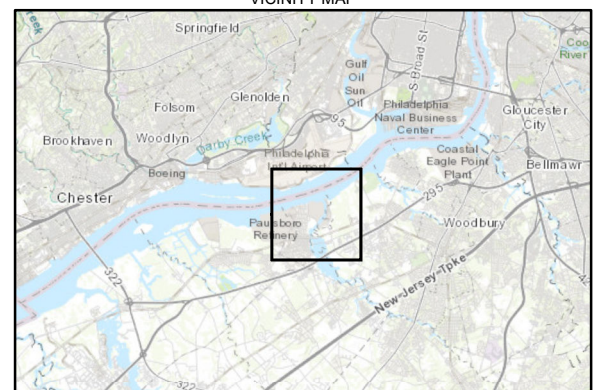


FIGURE 2
Road Map

PMT Phase 2 NJDEP WFD Permit
South Jersey Port Corporation



- EXISTING UTILITY INFORMATION SHOWN ON THESE PLANS IS FURNISHED BY THE UTILITY COMPANIES AND/OR THE SURVEYOR AND THE ACCURACY THEREOF IS NOT THE RESPONSIBILITY OF JACOBS ENGINEERING, INC. IT IS THE RESPONSIBILITY OF THE OWNERS AND/OR CONTRACTOR TO CALL 1-800-272-1000 FOR FIELD LOCATION OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.



C1301.dwg

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
0	1"
DATE	MAY 2022
PROJ	L7019200
DWG	C-0601
SHEET	1 OF 1



Jacobs
2001 MARKET STREET
SUITE 900
PHILADELPHIA, PA 19103
TEL: (215) 638-0145

[illegible]

IGMOND S. RUTKOWSKI III
N.J. PROFESSIONAL
ENGINEER NO. GE42937
2022. ALL RIGHTS RESERVED.



Gloucester County - Office of Taxation

Created On 5/26/2021

Certified Adjoining Property List

This table is a listing of adjoining properties within 200' of the subject property.

Prepared by: Craig Black, CTA

Selected Parcel(s)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1	2		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	4		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	5		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	8		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	20		50A UNIVERSAL AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1	21		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	22		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	23		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	24		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,

Adjoining Properties (30)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1	1		UNIVERSAL AVE REAR	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1	18		UNIVERSAL AVE	GLOUCESTER COUNTY IMPROVEMENT AUTHO	109 BUDD BOULEVARD	WOODBURY, NJ 08096	
Paulsboro Borough	1	25		UNIVERSAL AVE	GLOUCESTER COUNTY IMPROVEMENT AUTH	109 BUDD BLVD	WOODBURY, NJ 08066	
Paulsboro Borough	1.07	20		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1.07	21		MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	24
Paulsboro Borough	1.07	23		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1.07	24		MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	24
Paulsboro Borough	1.07	26		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1.08	51		MANTUA AVE	RODGERS, DANIELLE T & BEUKERS, CARM	266 ASHTON DR	GIBBSTOWN, NJ 08027	
Paulsboro Borough	1.08	52		325 MANTUA AVE	HAYNES, NORMA J LISA	325 MANTUA AVE	PAULSBORO, NJ 08066	

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1.08	53		329 MANTUA AVE	US BANK NA TRUSTEE C/O HUDSON	3701 REGENT BLVD STE 200	IRVING, TX 75063	
Paulsboro Borough	1.08	54		337 MANTUA AVE	101 M EXCELLENCE ACADEMY LLC	27 TARPON CT	SEWELL, NJ 08080	
Paulsboro Borough	1.14	45		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1.19	3	QFARM	UNIVERSAL RD	GALLENTHIN, GEORGE A III	26 S BAYARD AVE	WOODBURY, NJ 08096	
Paulsboro Borough	2	10		105 RIVERVIEW AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	2	11		RIVERFRONT	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	3	1		RIVERVIEW AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	2		RIVERVIEW AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	3
Paulsboro Borough	3	3		RIVERVIEW AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	3
Paulsboro Borough	3	4		14 RIVERVIEW AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	6		116 MANTUA AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	6.01		118 MANTUA AVE	BP PRODUCTS NORTH AMERICA INC	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	7		120 MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	3	8		124 MANTUA AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	9		128 MANTUA AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	13		BEACON AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	14		BEACON AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	135	1		THROUGHOUT BORO	CONSOLIDATED RAIL CORP	1717 ARCH ST SUITE 1310	PHILADELPHIA, PA 19103	9,19
Paulsboro Borough	135	24.01		INDUSTRIAL RD	BOROUGH OF PAULSBORO	1211 DELAWARE ST	PAULSBORO, NJ 08066	

G. Blair



Gloucester County - Office of Taxation

Created On 5/26/2021

Certified Adjoining Property List

This table is a listing of adjoining properties within 200' of the subject property.

Prepared by: Craig Black, CTA

Selected Parcel(s)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1.07	26		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	

Adjoining Properties (22)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1	5		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	8		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1.07	21		MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	24
Paulsboro Borough	1.07	23		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1.07	24		MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	24
Paulsboro Borough	1.14	45		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	3	9		128 MANTUA AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	3	10		MANTUA AVE	SALVATORE, GABRIELLE & KRAWCHAK, KE	136 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	3	11		136 MANTUA AVE	SALVATORE, GABRIELLE	136 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	3	12		25 SECOND ST	WILSON, VIVIAN J	25 SECOND ST	PAULSBORO, NJ 08066	
Paulsboro Borough	3	19		141 BEACON AVE	BP EXPLORATION & OIL C/O BP AMERICA	PO BOX 941709	HOUSTON, TX 77094	
Paulsboro Borough	4	1		MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	4	5		254 MANTUA AVE	RATLIFF, LOUIS	254 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	4	6		256 MANTUA AVE	VALENTIN, JOSE M	1110 N COMMERCE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	4	7		258 MANTUA AVE	GATTUSO, EILEEN	258 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	4	8		260 MANTUA AVE	VIRDEN, WILLIAM K & EVA	150 SWEDESBO RO AVE	GIBBSTOWN, NJ 08027	
Paulsboro Borough	4	9		BEACON AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	4	14		BEACON AVE	HORTON, CLINTON S & LISA A	265 BEACON AVE	PAULSBORO, NJ 08066	

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	4	15		265 BEACON AVE	HORTON, CLINTON S & LISA A	265 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	1		MANTUA AVE	KOCH, BRUCE J & BETTY J	213 HARDING AVE	WESTMONT, NJ 08108	
Paulsboro Borough	5	16		301 BEACON AVE	SZOVATI, DEBORAH J	301 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	12	1		252 MANTUA AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	

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Gloucester County - Office of Taxation

Created On 5/26/2021

Certified Adjoining Property List

This table is a listing of adjoining properties within 200' of the subject property.

Prepared by: Craig Black, CTA

Selected Parcel(s)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1.14	45		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	

Adjoining Properties (19)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1	5		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	8		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1.07	26		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1.08	51		MANTUA AVE	RODGERS, DANIELLE T & BEUKERS, CARM	266 ASHTON DR	GIBBSTOWN, NJ 08027	
Paulsboro Borough	1.08	52		325 MANTUA AVE	HAYNES, NORMA J LISA	325 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	1.08	53		329 MANTUA AVE	US BANK NA TRUSTEE C/O HUDSON	3701 REGENT BLVD STE 200	IRVING, TX 75063	
Paulsboro Borough	4	6		256 MANTUA AVE	VALENTIN, JOSE M	1110 N COMMERCE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	4	7		258 MANTUA AVE	GATTUSO, EILEEN	258 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	4	8		260 MANTUA AVE	VIRDEN, WILLIAM K & EVA	150 SWEDESBO RO AVE	GIBBSTOWN, NJ 08027	
Paulsboro Borough	5	1		MANTUA AVE	KOCH, BRUCE J & BETTY J	213 HARDING AVE	WESTMONT, NJ 08108	
Paulsboro Borough	5	5		316-318 MANTUA AVE	CHILA, DOMENIC	325 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	6		MANTUA AVE	CHILA, DOMENIC A	325 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	7		324 MANTUA AVE	CHILA, DOMENIC A & TOMARCHIO, CATHE	325 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	8		328 MANTUA AVE	TIGHE, MADELEINE M	328 MANTUA AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	16		301 BEACON AVE	SZO VATI, DEBORAH J	301 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	18		309 BEACON AVE	MAGIN, EDWARD R & SALLY V	313 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	19		313 BEACON AVE	MAGIN, EDWARD R & SALLY V	313 BEACON AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	5	20		319 BEACON AVE	LICCIARDELLO, MAUREEN P	335 BEACON AVE	PAULSBORO, NJ 08066	



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Selected Parcel(s)

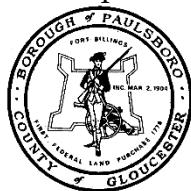
Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	135	24.01		INDUSTRIAL RD	BOROUGH OF PAULSBORO	1211 DELAWARE ST	PAULSBORO, NJ 08066	

Adjoining Properties (15)

Municipality	Block	Lot	Qualifier	Address	Owner Name	Owner Address	Owner CSZ	Additional Lots
Paulsboro Borough	1	2		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	5		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	8		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	20		50A UNIVERSAL AVE	BOROUGH OF PAULSBORO	1211 N DELAWARE ST	PAULSBORO, NJ 08066	
Paulsboro Borough	1	21		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	22		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	23		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1	24		MANTUA AVE	BOROUGH OF PAULSBORO BP	1211 N DELAWARE ST	PAULSBORO, NJ 08066	2,4,5,8,19,21,22,24,
Paulsboro Borough	1.09	1		391 DUPONT AVE	WIND UP LLC	1092 LOCKSLEY CT	WEST DEPTFORD, NJ 08096	
Paulsboro Borough	1.09	2		393 DUPONT AVE	WIND UP LLC	1092 LOCKSLEY CT	WEST DEPTFORD, NJ 08096	
Paulsboro Borough	1.09	3		395 DUPONT AVE	FAUST, JOSHUA	PO BOX 196	PAULSBORO, NJ 08066	
Paulsboro Borough	1.09	4		397 DUPONT AVE	DENNEY, DORI ANN	397 DUPONT AVE	PAULSBORO, NJ 08066	
Paulsboro Borough	1.19	3	QFARM	UNIVERSAL RD	GALLENTHIN, GEORGE A III	26 S BAYARD AVE	WOODBURY, NJ 08096	
Paulsboro Borough	135	1		THROUGHOUT BORO	CONSOLIDATED RAIL CORP	1717 ARCH ST SUITE 1310	PHILADELPHIA, PA 19103	9,19

BOROUGH OF PAULSBORO

Administration Building
1211 Delaware Street, Paulsboro, New Jersey 08066
Telephone: (856) 423-1500
Fax: (856) 423-9117
Website: www.paulsboronj.org



UTILITY LIST

Gloucester County Planning Division

Rt. 47 Delsea Drive
Clayton, NJ 08312

Comcast Cablevision

1846 N. W. Blvd.
Vineland, NJ 08360
Attn: James Parkinson

State of New Jersey

Department of Transportation
1035 Parkway Avenue
P.O. Box 600
Trenton, N 08625-0600

Verizon

540 Broad Street
Newark, NJ 07101

South Jersey Gas Company

#1 South Jersey Plaza
Hammonton, NJ 08037

Conectiv

Real Estate Department
5100 Harding Highway, Suite 399
Mays Landing, NJ 08330-9902

Sun Pipe Line Company

Right of Way Dept. – 26th Floor
1801 Market Street
Philadelphia, PA 19103-1699

Sunoco Pipeline, L.P.

Right of Way Dept.
Montello Complex
525 Fritztown Road
Sinking Spring, PA 19608

Sincerely,

Kathy A. VanScoy,
RMC/CMC/CMR
Borough Clerk

Attachment A: Site Plans

(1 copy full sized signed and sealed plans)

