STORMWATER REPORT

Proposed Site Redevelopment
Scrub-A-Dub Car Wash
171 Pelham Street
Methuen, MA 01844

Prepared for: ***Scrub-A-Dub Auto Wash Centers***
172 Worcester Street
Natick, MA 01760

Prepared by: ***MetroWest Engineering, Inc.***
75 Franklin Street
Framingham, MA 01702
(508) 626-0063

Original: August, 2023
Revised: November, 2023

STORMWATER REPORT INDEX:

CHAPTER 1: HYDROLOGIC ANALYSIS

Hydrologic Analysis:
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Appendix A:
Hydrologic Analysis Model

Hydrologic Assessment
Proposed Site Redevelopment
171 Pelham Street, Methuen MA

Introduction

The purpose of this Hydrologic Assessment is to evaluate, analyze and mitigate post-development impacts for the property located at 171 Pelham Street in Methuen, Massachusetts.

Existing Conditions

The subject property, shown as Methuen Assessors' Map 512, Block 126B, Lot 1, contains approximately 47,763 square feet (1.1-acres) of land, and is located at the corner of Cross Street and Pelham Street. The property is bounded by Cross Street to the east, Pelham Street to the south and Dan O'Brien Car Dealership along the northern and western boundary lines. The site is presently improved with a one-story restaurant & pub building, paved parking lot, freestanding sign, outdoor dining area and supporting utilities.

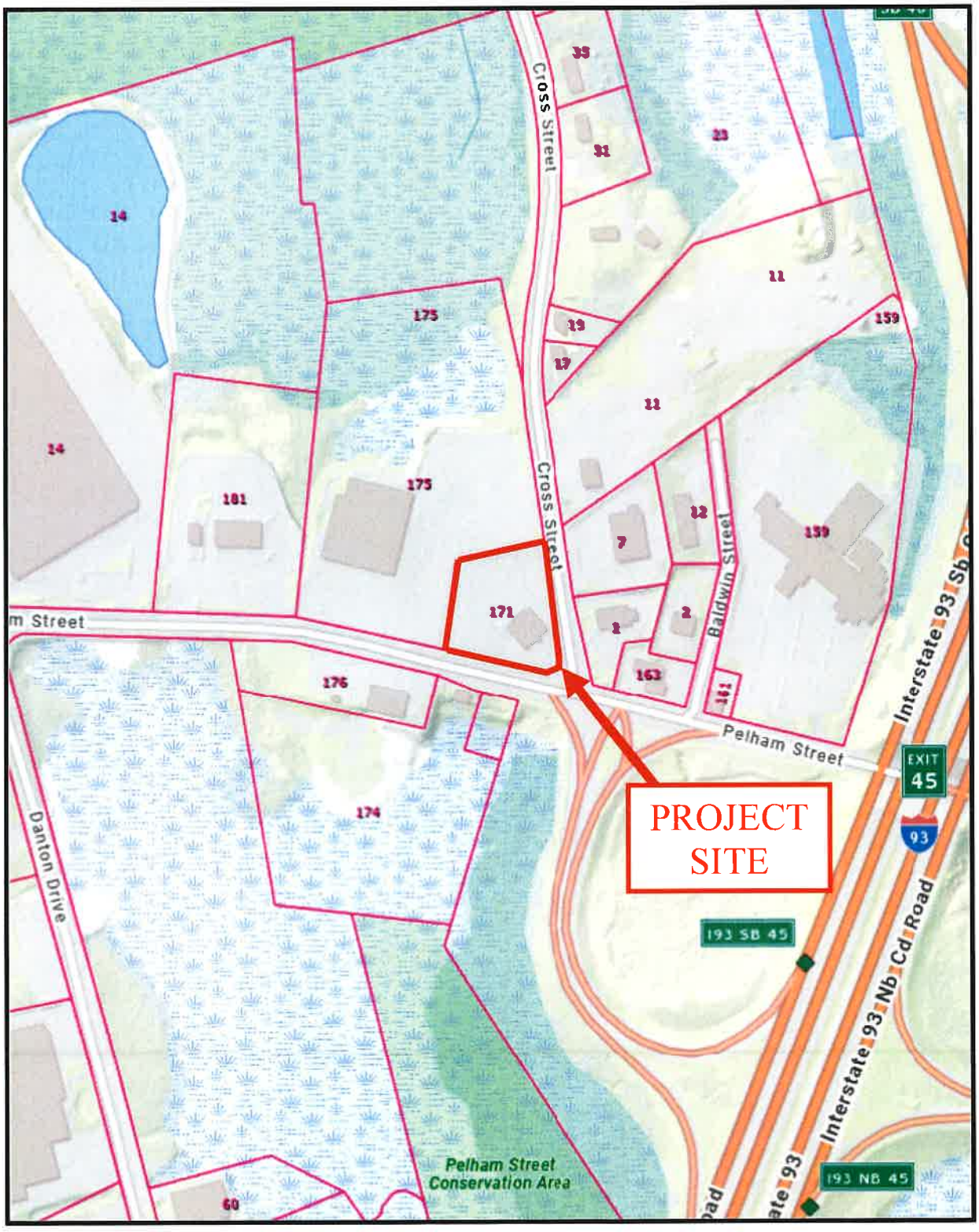
The majority of the site is covered by impervious surfaces with landscaping along the northern and western edges of the parking lot. Site vegetation is minimal with small shrubs located within the landscape beds. The site contains no existing trees. A bordering vegetated wetland is located across Pelham Street. However, the jurisdictional 100-foot Wetland Buffer Zone does not extend onto the subject property. The project site is shown in *Figure One: Locus Map, 171 Pelham Street, Methuen MA*.

Soil Conditions

According to the Natural Resources Conservation Service (NRCS) Soil Survey, soils on and around the site belong to the Hinckley Loamy Sand (253B), Windsor Loamy Sand (255B), Pits, Gravel (600) and Udorthents, Smoothed (651) soil series. The soil series, except the Pits, Gravel soil series, have a defined hydrologic soil group rating of "A". For this project, Pits, Gravel soil series was given a hydrologic soil group of "A" to perform the hydrologic analysis.

An onsite soil evaluation program consisting of one deep test hole, DTH-1, was performed by MetroWest Engineering on June 5, 2023. DTH-1 was excavated approximately seven-feet north of the existing parking lot in the northeast corner of the property. DTH-1 contained fill, A and B soil horizons to an approximate depth of 2.5-feet below ground surface. C horizons consisted of sand to a depth of 13-feet below ground surface. No redoximorphic features were observed in DTH-1.

Figure One: Locus Map
171 Pelham Street, Methuen MA



Site Redevelopment

The scope of work for this project is comprised of demolishing the existing restaurant and parking lot followed by the construction of a car wash facility, parking lot with vacuum stalls, water reclamation system, stormwater management system, supporting utilities, hardscape and landscaped areas.

The proposed car wash facility has a footprint of approximately 4,575 square feet and will be located in the center of the lot. Traffic will enter the property from the Pelham Street curb cut and be directed right, along the front of the building, to Point of Sale (P.O.S.) stations covered by a roof canopy. Once sale transactions have been completed, traffic is directed to the car wash entrance located on the north side of the facility. A 14-foot wide escape lane is also provide between the car wash entrance and the parking area for vehicles to bypass the car wash tunnel entrance in case of an emergency. Traffic will exit the car wash facility on the south side of the building. Cars can either turn left to exit the site on to Pelham Street or turn right towards a paved parking area. The paved parking area will contain 15 vacuum stalls for interior car cleaning. All traffic that enters the parking area will be directed to either the right turn only exit going westbound on Pelham Street or the exit driveway on Cross Street.

The proposed car wash facility will feature an underground water reclamation system that will collect, filter and recycle wastewater from the car wash process. The recycling system will reduce water consumption from the city water system and wastewater discharge into the city sewer system.

Drainage Approach

The property presently has no stormwater controls in place to manage stormwater runoff rates, volumes, or stormwater quality leaving the property. Stormwater runoff leaving the site flows towards a municipal storm sewer catch basin located in the southeastern corner of the property. A new stormwater management system has been designed for this project to collect and treat stormwater runoff, reduce runoff rates and volumes for all design storms compared to the existing conditions and promote groundwater recharge through the use of a subsurface infiltration system, a Low Impact Development (LID) technique. The proposed stormwater management system consists of roof gutters, downspouts, trench drains, deep-sump catch basins, drainage pipes, manholes, proprietary treatment devices and a subsurface infiltration system. The system has been designed in compliance with MADEP Stormwater Management Standards.

Subsurface Infiltration System

The proposed infiltration system is located underneath the parking lot, approximately 35-feet west of the proposed car wash facility. The infiltration system consists of 50 Shea precast concrete leaching galleys that will be surrounded by two-feet of double-washed stone. Stormwater runoff is collected from the roof of the car wash building, paved driveway and parking lot through the use of roof gutters, downspouts, trench drains and

deep-sump catch basins. Runoff will then be routed through a series of drainage pipes, manholes and proprietary devices (Stormceptor) prior to discharging into the infiltration system. The proposed infiltration system is designed to reduce peak runoff rates and volumes leaving the project site for all storm events. The location, purpose and durability of the infiltration system offers numerous benefits to the project. No disturbance to the natural vegetation will be required, as the infiltration system's location is within a previously disturbed area and located underneath the proposed parking lot.

Stormwater Impacts

The proposed stormwater management system, combined with a substantial reduction of impervious area, will significantly reduce runoff rates and volumes from the subject parcel for all storm events. Overall reductions in runoff rates and volumes can be found in the Model Results section of this report and a detailed hydrologic analysis and basin models can be found in Appendix A.

The new stormwater management system will also improve the quality of stormwater runoff leaving the site. With the use of deep-sumps catch basins, Stormceptors, infiltration system and routine site sweeping, Total Suspended Solids (TSS) carried by stormwater will decrease by approximately 93%. The Stormceptor provides a major improvement in the pretreatment of stormwater as it's designed to filter out TSS, oil and trash. While the Stormceptor is reported to provide a TSS remove rate of 80%, a conservative removal rate of 50% was used in assessing TSS removal efficiency. Detailed calculations and information about TSS removal rates can be found in Chapter 6 of this Stormwater Report.

Hydrologic Analysis

A hydrologic analysis of the project has been performed to establish pre-development conditions, assess post-development impacts and evaluate the effectiveness of the proposed stormwater management system. The analysis employs an SCS TR-55 hydrologic computer model and analyzes design storms with return periods of 2, 10, 25 and 100-years. An SCS Type-3, 24-hour rainfall distribution pattern is used for the theoretical design storm. Time of concentration values were determined by the LAG Method or manually entered at five minutes for watersheds having relatively small areas or hydraulic lengths to allow for the use of a three-minute time interval for all hydrograph computations. Precipitation rates were set at 3.2, 4.7, 6.0 and 8.5-inches for 24-hour precipitation events for the 2, 10, 25 and 100-year storm, respectively. Longest flow path segment properties for both pre and post-development models are shown on Figures Two and Three, respectively.

Existing Conditions

The existing conditions model analyzes the site as one drainage basin; Existing Conditions Basin One.

Existing Conditions Basin 1 (E.C.B.-1) has an area of 47,763 square feet and flows in a southeasterly direction to Design Point A located on a municipal storm sewer catch basin in the southeastern corner of the property.

The Existing Conditions Basin delineation is shown on Figure Two, the Existing Conditions Watershed Delineation Plan.

Existing Conditions Basin 1 (E.C.B.-1)

Basin area = 47,763 square feet
Impervious area = 45,280 square feet, curve number = 98.0
Landscape area (good condition) = 2,483 square feet, curve number = 30.0
Hydrologic soil group A
Weighted Curve Number = 94.5
Basin slope = N/A
Hydraulic length = N/A
Time of concentration = 5.0 minutes (Manually Set)

Proposed Conditions

The proposed condition model analyzes the site as two post-development drainage basins, Post-Development Basins One and Two.

Post-Development Basin 1 (P.D.B.-1) has an area of 4,549 square feet and flows in a southeasterly direction to Design Point A located on a municipal storm sewer catch basin within Pelham Street.

Post-Development Basin 2 (P.D.B.-2) has an area of 43,214 square feet and flows into Proposed Infiltration System-1, located approximately 35-feet west of proposed car wash facility. Stormwater runoff from the proposed driveway, parking lot and roof of the car wash building is collected by roof gutters, catch basins and trench drains, and discharges the runoff into the infiltration system. Any overflow from the infiltration system will overflow towards Design Point A located at the municipal drainage catch basin within Pelham Street.

The Proposed Conditions Basins are shown on Figure Three, *The Post-Development Watershed Delineation Plan* and information for all Post Development Basins is listed on the plan and shown below.

NOTES:

1. SUBJECT PARCEL IS SHOWN AS ASSESSORS MAP 512, BLOCK 126B, LOT 1. RECORD TITLE FROM DEED BOOK 17513, PAGE 108.
2. THE PROPERTY DESCRIBED ON THIS SURVEY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY; THE PROPERTY LIES WITHIN ZONE "X" OF THE FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NUMBER 25009C0202F, BEARING AN EFFECTIVE DATE OF JULY 03, 2012.

SOIL TEST RESULTS

DTH-1 (ELEV.= 124.1')

0"-16"		FILL (HTM)	
16"-20"	A	LOAMY SAND	10YR 5/3
20"-32"	Bw	LOAMY SAND	7.5YR 7/4
32"-96"	C1	SAND	2.5Y 7/4
96"-156"	C2	FINE SAND	2.5Y 7/2

NO REFUSAL
NO WEEPING OR STANDING WATER
GROUNDWATER= BELOW ELEV. 111.1'
DATE: JUNE 05, 2023 F.B. 727A, PG. 66
BY: PATRICK ARNOW, SOIL EVALUATOR
INSPECTOR: NONE

EXISTING CONDITIONS BASIN PROPERTIES:

EXISTING CONDITIONS BASIN 1 (E.C.B.-1)

TOTAL BASIN AREA = 47,763 S.F. (1.096 ACRES)
HYDRAULIC LENGTH = N/A
CHANGE IN ELEVATION = N/A
BASIN SLOPE = N/A (Tc MANUALLY SET TO 5 MINUTES)

GROUND COVER	Cn	AREA (ACRES)	PRODUCT
IMPERVIOUS AREA = 45,280 S.F. (1.039 ACRES)	98	1.039	101.822
LANDSCAPE AREA (GOOD COND.) = 2,483 S.F. (0.057 ACRES)	30	0.057	1.710
		SUM 1.096	SUM 103.532

WEIGHTED CURVE NUMBER (C_N) = (103.532/1.096) = 94.5

USDA SOIL CLASSIFICATION

SOIL NUMBER	SOIL SERIES	HYDROLOGIC SOIL GROUP
253B	HINCKLEY LOAMY SAND (3 TO 8% SLOPES)	A
255B	WINDSOR LOAMY SAND (3 TO 8% SLOPES)	A
600	PITS, GRAVEL	-*
651	UDORTHENTS, SMOOTHED	A

*SOIL SERIES THAT HAVE NO HYDROLOGIC SOIL GROUP RATING WERE GIVEN A RATING OF "A" TO DETERMINE RUNOFF CURVE NUMBERS.

FOR METROWEST ENGINEERING, INC. DATE
ROBERT A. GEMMA, P.E. # 31967 (CIVIL)

GRAPHIC SCALE
1 inch = 20 ft.
(FEET) 0 10 20 40 80
(METERS) 0 5 10 20 30

FIGURE TWO

EXISTING CONDITIONS WATERSHED DELINEATION PLAN
#171 PELHAM STREET
IN
METHUEN, MASS.

PREPARED FOR:
SCRUBADUB AUTO WASH CENTERS
172 WORCESTER STREET
NATICK, MA 01760

PROPERTY OF:
DONNA & THOMAS SWERCHESKY, ET AL., TRUSTEES
SWERCHESKY FAMILY REVOCABLE LIVING TRUST
171 PELHAM STREET
METHUEN, MA 01844

ENGINEERS & SURVEYORS:
MWE
METROWEST ENGINEERING, INC.
75 FRANKLIN STREET
FRAMINGHAM, MA 01702
TELE.: (508)626-0063
EMAIL: INFO@MWENGINEERING.COM

SHEET 1 OF 1		DATE: JULY 27, 2023
CALC'D BY: RAG	FIELD BK: 761	CAD FILE: SCRUB_EC_HYDRO.DWG
DRAFTER: CJC	PROJECT: MET_PEL	DWG FILE:

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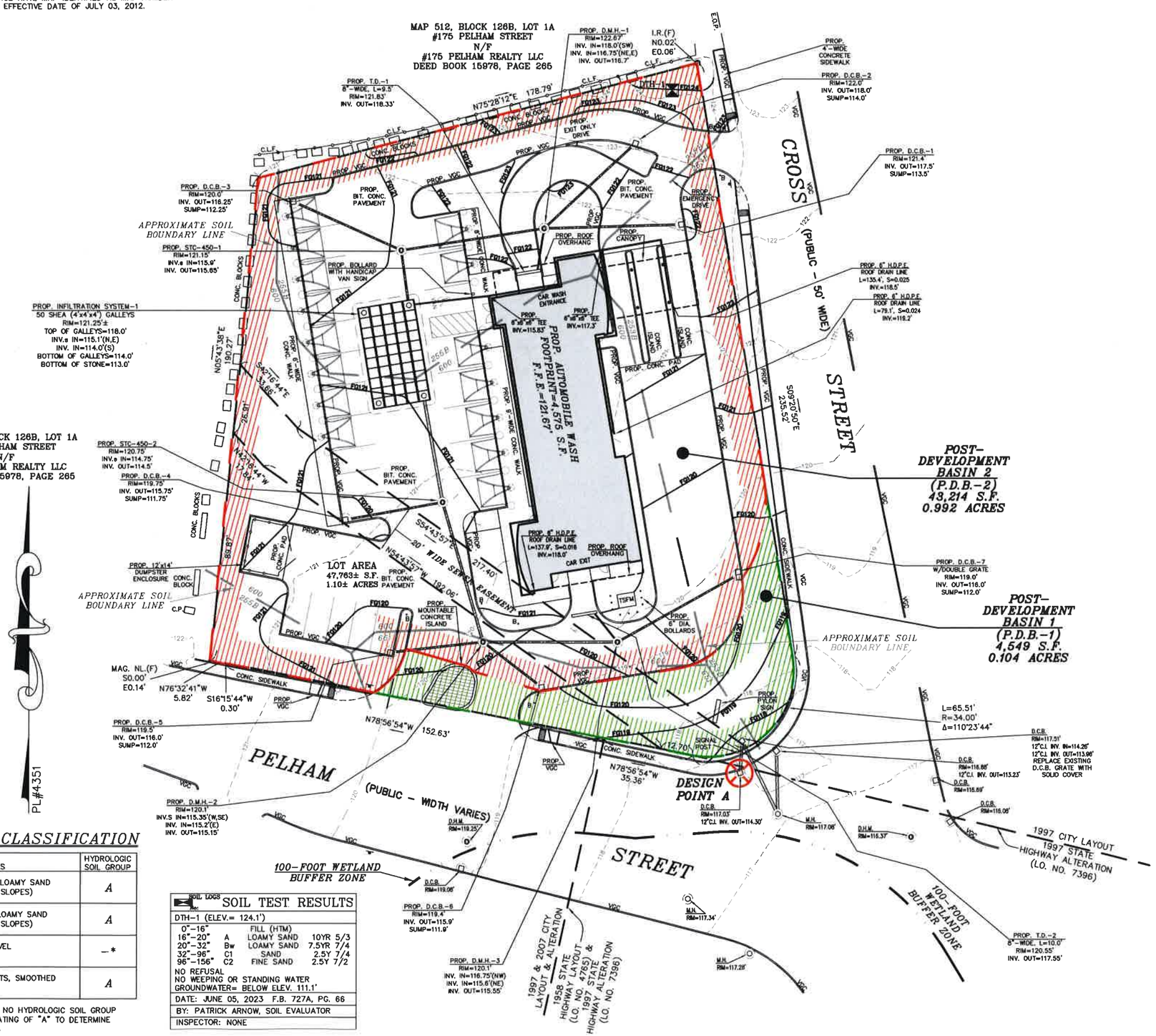

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SOIL NUMBER	SOIL SERIES	HYDROLOGIC SOIL GROUP
253B	HINCKLEY LOAMY SAND (3 TO 8% SLOPES)	A
255B	WINDSOR LOAMY SAND (3 TO 8% SLOPES)	A
600	PITS, GRAVEL	–*
651	UDORTHENTS, SMOOTHED	A

*SOIL SERIES THAT HAVE NO HYDROLOGIC SOIL GROUP RATING WERE GIVEN A RATING OF "A" TO DETERMINE RUNOFF CURVE NUMBERS.

SOIL LOGS

SOIL TEST RESULTS

DTH-1 (ELEV.= 124.1')

0"-16"		FILL (HTM)	
16"-20"	A	LOAMY SAND	10YR 5/3
20"-32"	Bw	LOAMY SAND	7.5YR 7/4
32"-96"	C1	SAND	2.5Y 7/4
96"-156"	C2	FINE SAND	2.5Y 7/2

NO REFUSAL
NO WEEPING OR STANDING WATER
GROUNDWATER= BELOW ELEV. 111.1'

DATE: JUNE 05, 2023 F.B. 727A, PG. 66
BY: PATRICK ARNOW, SOIL EVALUATOR
INSPECTOR: NONE

POST-DEVELOPMENT BASIN PROPERTIES:

POST-DEVELOPMENT BASIN 1 (P.D.B.-1)

TOTAL BASIN AREA = 4,549 S.F. (0.104 ACRES)
HYDRAULIC LENGTH = N/A
CHANGE IN ELEVATION = N/A
BASIN SLOPE = N/A (Tc MANUALLY SET TO 5 MINUTES)

GROUND COVER	Cn	AREA (ACRES)	PRODUCT
IMPERVIOUS AREA = 879 S.F. (0.020 ACRES)	98	0.020	1.960
LAWN AREA (GOOD COND.) = 3,670 S.F. (0.084 ACRES)	39	0.084	3.276
		SUM 0.104	SUM 5.236

WEIGHTED CURVE NUMBER (C_N) = (5.236/0.104) = 50.3

POST-DEVELOPMENT BASIN 2 (P.D.B.-2)

TOTAL BASIN AREA = 43,214 S.F. (0.992 ACRES)
HYDRAULIC LENGTH = N/A
CHANGE IN ELEVATION = N/A
BASIN SLOPE = N/A (Tc MANUALLY SET TO 5 MINUTES)

GROUND COVER	Cn	AREA (ACRES)	PRODUCT
IMPERVIOUS AREA = 31,809 S.F. (0.730 ACRES)	98	0.730	71.540
GRAVEL AREA = 160 S.F. (0.004 ACRES)	76	0.004	0.304
LAWN AREA (GOOD COND.) = 11,245 S.F. (0.258 ACRES)	39	0.258	10.062
		SUM 0.992	SUM 81.906

WEIGHTED CURVE NUMBER (C_N) = (81.906/0.992) = 82.6

REVISIONS:

NO.	DATE	DESCRIPTION	BY
1	11/9/23	SHIFT BUILDING, REVISED DRIVE AND ADDED CROSS STREET EXIT	CJC

FOR METROWEST ENGINEERING, INC. *DATE*
ROBERT A. GEMMA, P.E. # 31967 (CIVIL)

GRAPHIC SCALE
1 inch = 20 ft.
20 0 10 20 40 60 (FEET)
0 4 8 16 24 (METERS)

FIGURE THREE

POST-DEVELOPMENT WATERSHED DELINEATION PLAN
#171 PELHAM STREET
IN
METHUEN, MASS.

PREPARED FOR:
SCRUBADUB AUTO WASH CENTERS
172 WORCESTER STREET
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FRAMINGHAM, MA 01702
TELE.: (508)626-0063
EMAIL: INFO@MWENGINEERING.COM

SHEET 1 OF 1	DATE: JULY 27, 2023
CALC'D BY: RAG / FIELD BK: 751	CAD FILE: SCRUB_PD_HYDRO_R1.DWG
DRAFTER: CJC / PROJECT: MET_PEL	DWG FILE:

Post-Development Basin 1 (P.D.B.-1)

Basin area = 4,549 square feet
Impervious area = 879 square feet; curve number = 98.0
Lawn area (good condition) = 3,670 square feet, curve number = 39.0
Hydrologic soil group A
Weighted Curve Number = 50.3
Basin slope = N/A
Hydraulic length = N/A
Time of concentration = 5.0 minutes (Manually Set)

Post-Development Basin 2 (P.D.B.-2)

Basin area = 43,214 square feet
Impervious area = 31,809 square feet; curve number = 98.0
Gravel area = 160 square feet, curve number = 76.0
Lawn area (good condition) = 11,245 square feet, curve number = 39.0
Hydrologic soil group A
Weighted Curve Number = 82.6
Basin slope = N/A
Hydraulic length = N/A
Time of concentration = 5.0 minutes (Manually Set)

Drainage System

Subsurface Infiltration System 1

System configuration:	50, 4 ft.-long by 4 ft.-wide by 4 ft.-high Shea Precast Concrete Leaching Galleys
Bottom Area	1,163 square feet
Total Storage Volume Available:	3,225 cubic feet or 24,125 gallons
Exfiltration Rate:	8.27 inches per hour
Bottom Exfiltration Capacity:	0.22 C.F.S.

Model Results

The model results for Design Point A are shown in Tables One and Two below:

Table One: Comparison of Pre and Post-Development Peak Runoff Rates Leaving the Project Site at Design Point A

Drainage Basin	2-year storm	10-year storm	25-year storm	100-year storm
E.C.B.-1	2.75 CFS	4.20 CFS	5.45 CFS	7.82 CFS
P.D.B.-1 + Infilt. Sys.-1 Overflow	0.00 CFS	0.46 CFS	3.31 CFS	6.00 CFS
Difference	-2.75 CFS	-3.74 CFS	-2.14 CFS	-1.82 CFS
Difference	(-100%)	(-89%)	(-39%)	(-23%)

Table Two: Comparison of Pre and Post-Development Runoff Volumes Leaving the Project Site at Design Point A

Drainage Basin	2-year storm	10-year storm	25-year storm	100-year storm
E.C.B.-1	9,675 CF	15,170 CF	19,969 CF	29,239 CF
P.D.B.-1 + Infilt. Sys.-1 Overflow	48 CF	356 CF	2,382 CF	7,197 CF
Difference	-9,627 CF	-14,814 CF	-17,587 CF	-22,042 CF
Difference	(-99%)	(-98%)	(-88%)	(-75%)

Conclusion

The results provided in Tables One and Two demonstrate that the project, with the stormwater controls in place, will result in a substantial decrease in both peak runoff rates and total runoff volume discharged from the project site. Post-development peak runoff rates and volumes will not impact off-site flooding.

Runoff from the proposed parking lot, driveway, and from the roof of the proposed car wash building will be collected and recharged. The stormwater management system as designed is consistent with MADEP Stormwater Management Policy and accepted design practices.

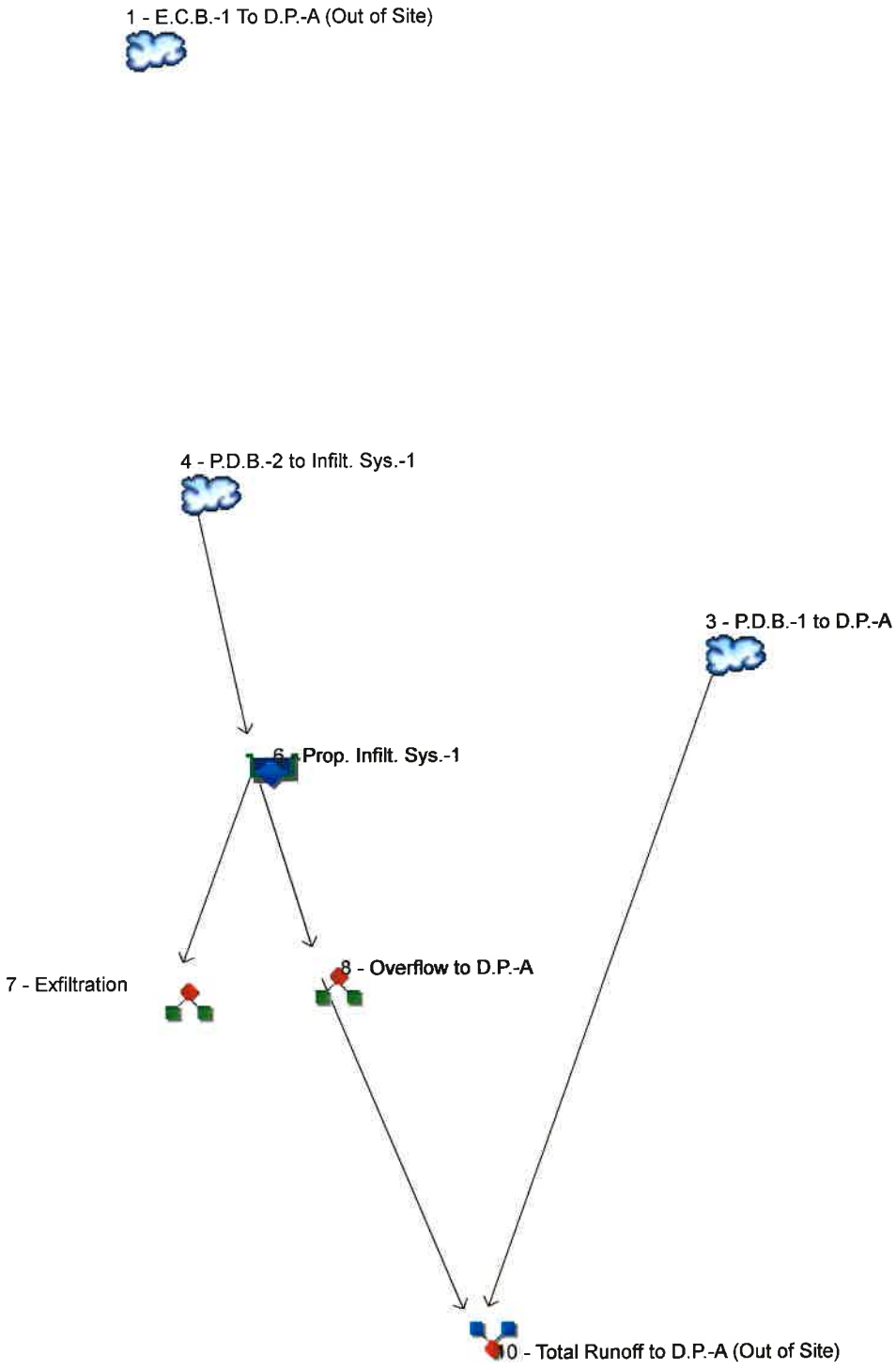
Hydraflow Table of Contents

Scrub, 171 Pelham Street, Methuen_R1.gpw

Hydraflow Hydrographs by Intelisolve v9.22

Tuesday, Nov 21, 2023

Watershed Model Schematic



2-Year Storm, Pre and Post-Development

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	2.753	3	726	9,675	----	------	------	E.C.B.-1 To D.P.-A (Out of Site)
3	SCS Runoff	0.003	3	747	48	----	------	------	P.D.B.-1 to D.P.-A
4	SCS Runoff	1.602	3	726	5,336	----	------	------	P.D.B.-2 to Infilt. Sys.-1
6	Reservoir	0.329	3	753	5,335	4	116.04	1,635	Prop. Infilt. Sys.-1
7	Diversion1	0.329	3	753	5,335	6	------	------	Exfiltration
8	Diversion2	0.000	3	687	0	6	------	------	Overflow to D.P.-A
10	Combine	0.003	3	747	48	3, 8,	------	------	Total Runoff to D.P.-A (Out of Site)

Hydrograph Report

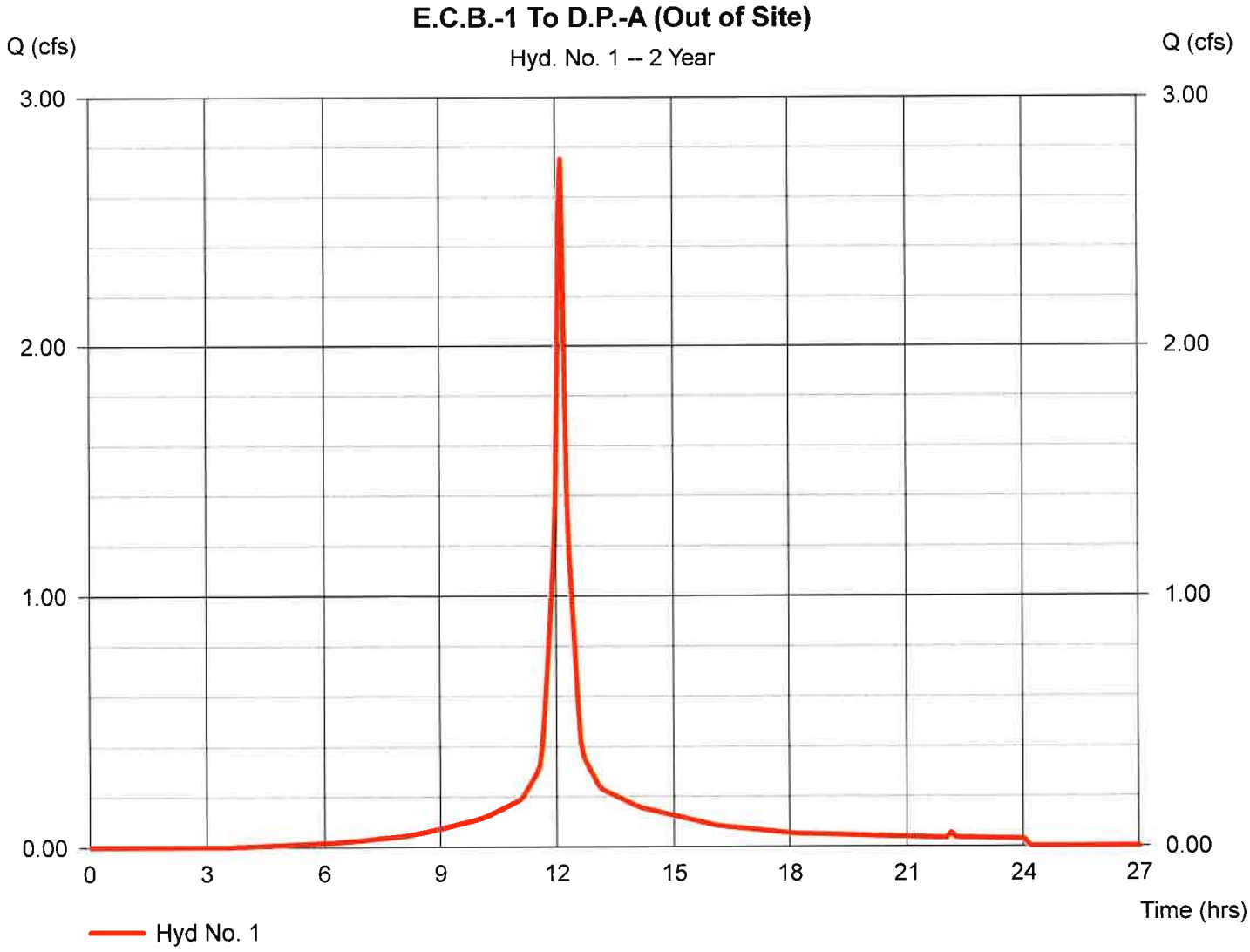
Hydraflow Hydrographs by Intelisolve v9.22

Tuesday, Nov 21, 2023

Hyd. No. 1

E.C.B.-1 To D.P.-A (Out of Site)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.753 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 9,675 cuft
Drainage area	= 1.096 ac	Curve number	= 94.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

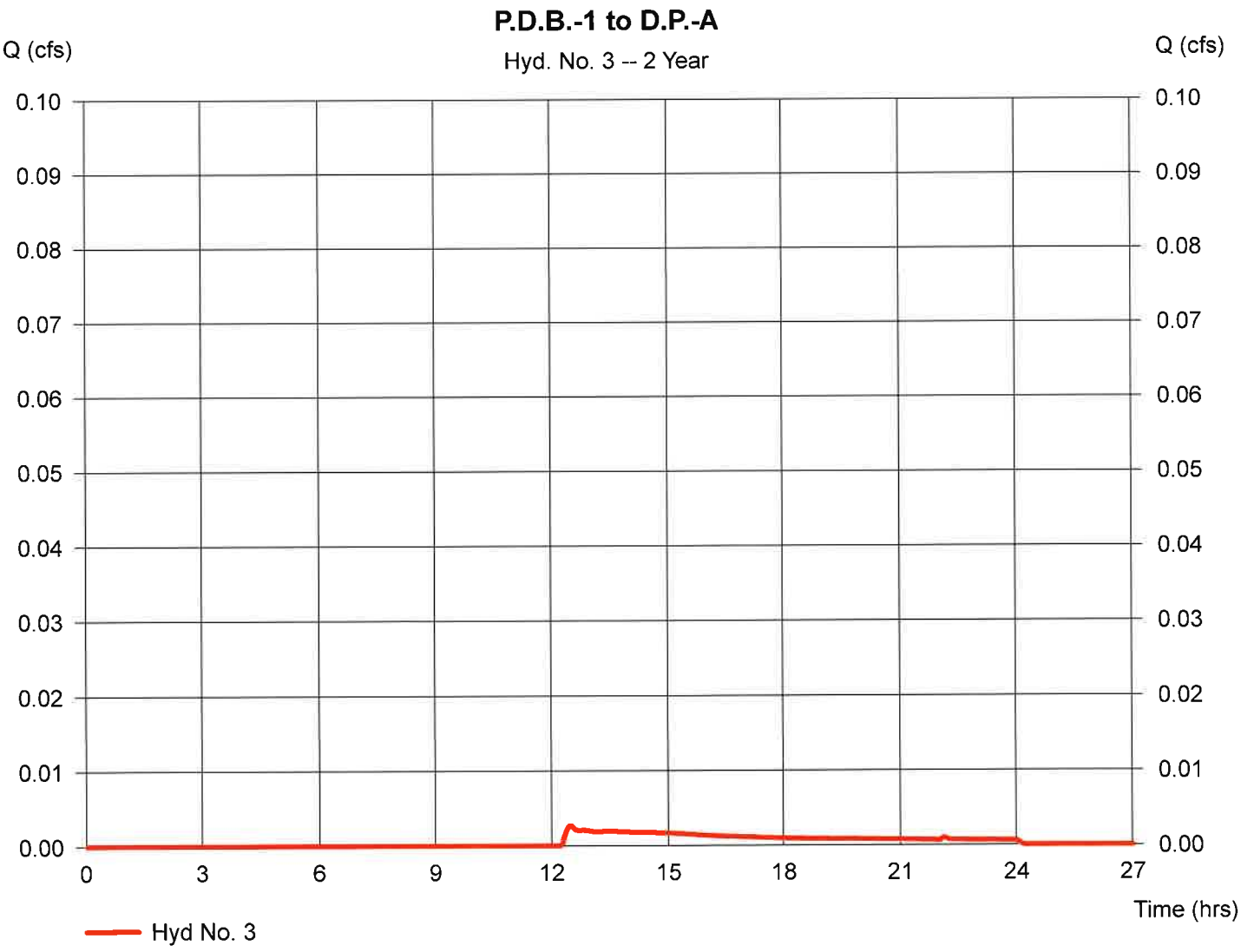


Hydrograph Report

Hyd. No. 3

P.D.B.-1 to D.P.-A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.003 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.45 hrs
Time interval	= 3 min	Hyd. volume	= 48 cuft
Drainage area	= 0.104 ac	Curve number	= 50.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

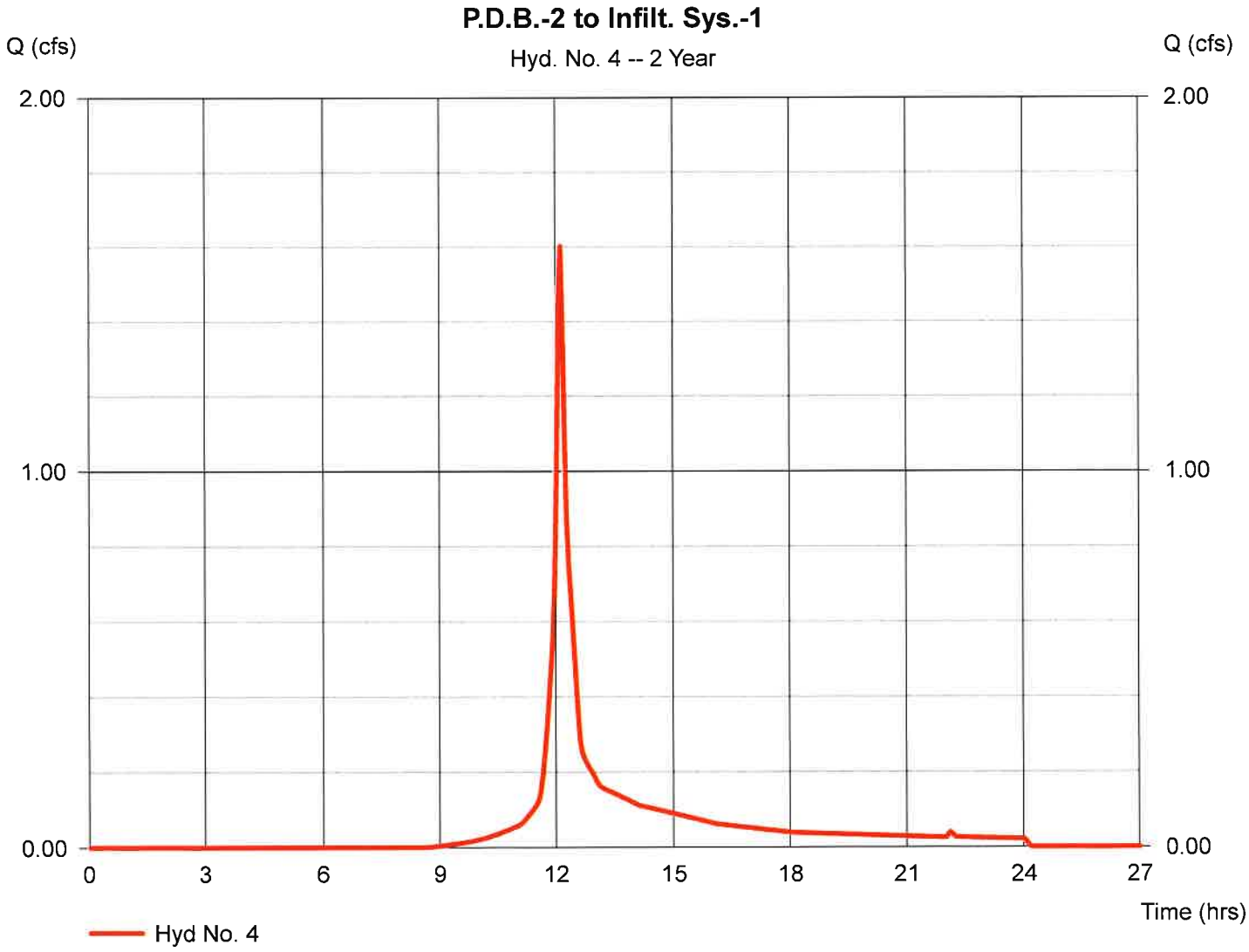


Hydrograph Report

Hyd. No. 4

P.D.B.-2 to Infilt. Sys.-1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.602 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 5,336 cuft
Drainage area	= 0.992 ac	Curve number	= 82.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



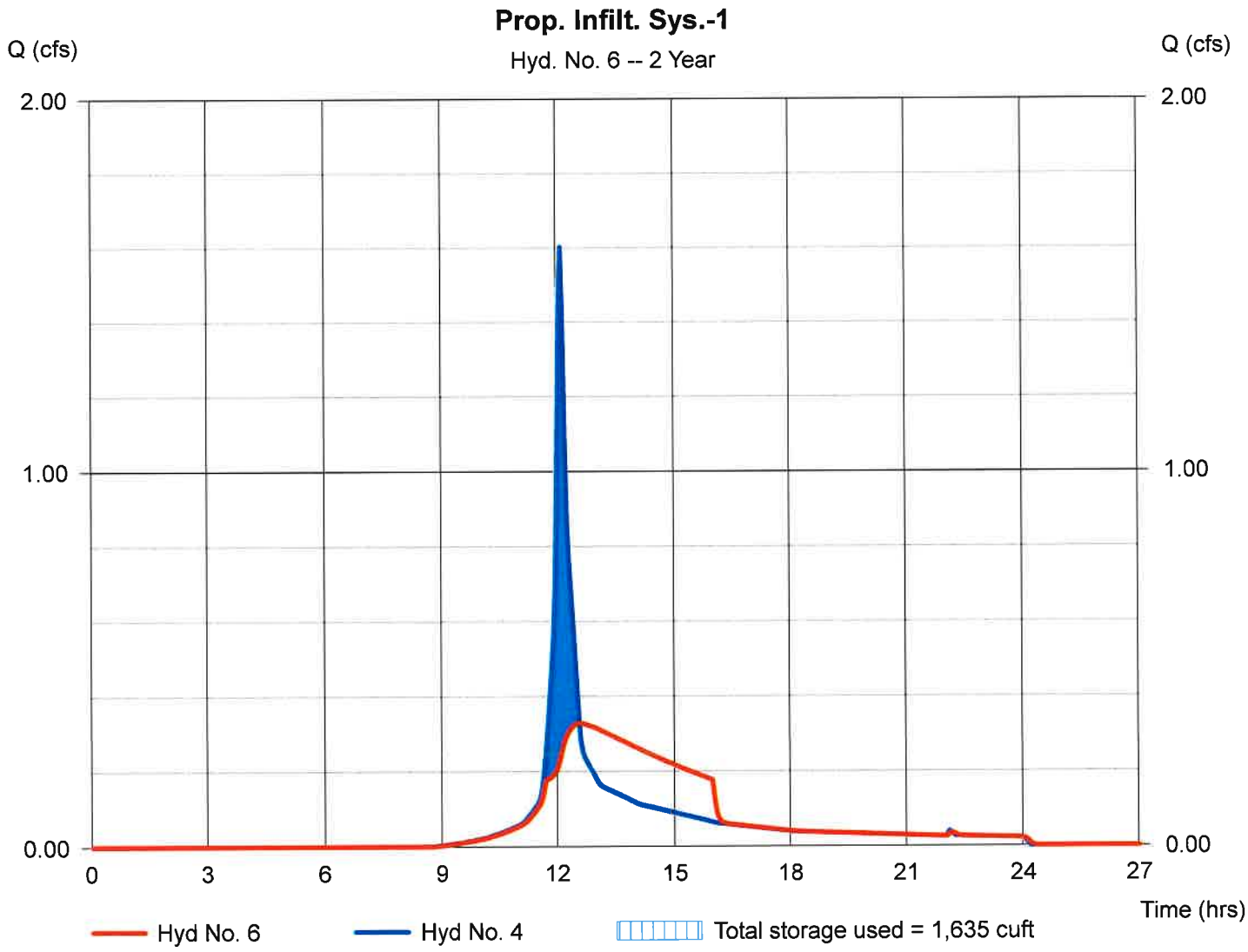
Hydrograph Report

Hyd. No. 6

Prop. Infilt. Sys.-1

Hydrograph type	= Reservoir	Peak discharge	= 0.329 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 5,335 cuft
Inflow hyd. No.	= 4 - P.D.B.-2 to Infilt. Sys.-1	Max. Elevation	= 116.04 ft
Reservoir name	= 50 Shea 4'x4'x4' Galleys	Max. Storage	= 1,635 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.22 — Tuesday, Nov 21, 2023

Pond No. 4 - 50 Shea 4'x4'x4' Galleys

Pond Data

UG Chambers - Invert elev. = 114.00 ft, Rise x Span = 4.00 x 4.00 ft, Barrel Len = 4.00 ft, No. Barrels = 50, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 114.00 ft, Width = 4.50 ft, Height = 5.75 ft, Voids = 1.25%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	114.00	n/a	0	0
0.58	114.58	n/a	461	461
1.15	115.15	n/a	461	922
1.73	115.73	n/a	461	1,382
2.30	116.30	n/a	461	1,843
2.88	116.88	n/a	461	2,304
3.45	117.45	n/a	461	2,765
4.03	118.03	n/a	441	3,206
4.60	118.60	n/a	6	3,212
5.18	119.18	n/a	6	3,219
5.75	119.75	n/a	6	3,225

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	10.00	0.00	0.00
Crest El. (ft)	= 119.40	119.50	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 8.270 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

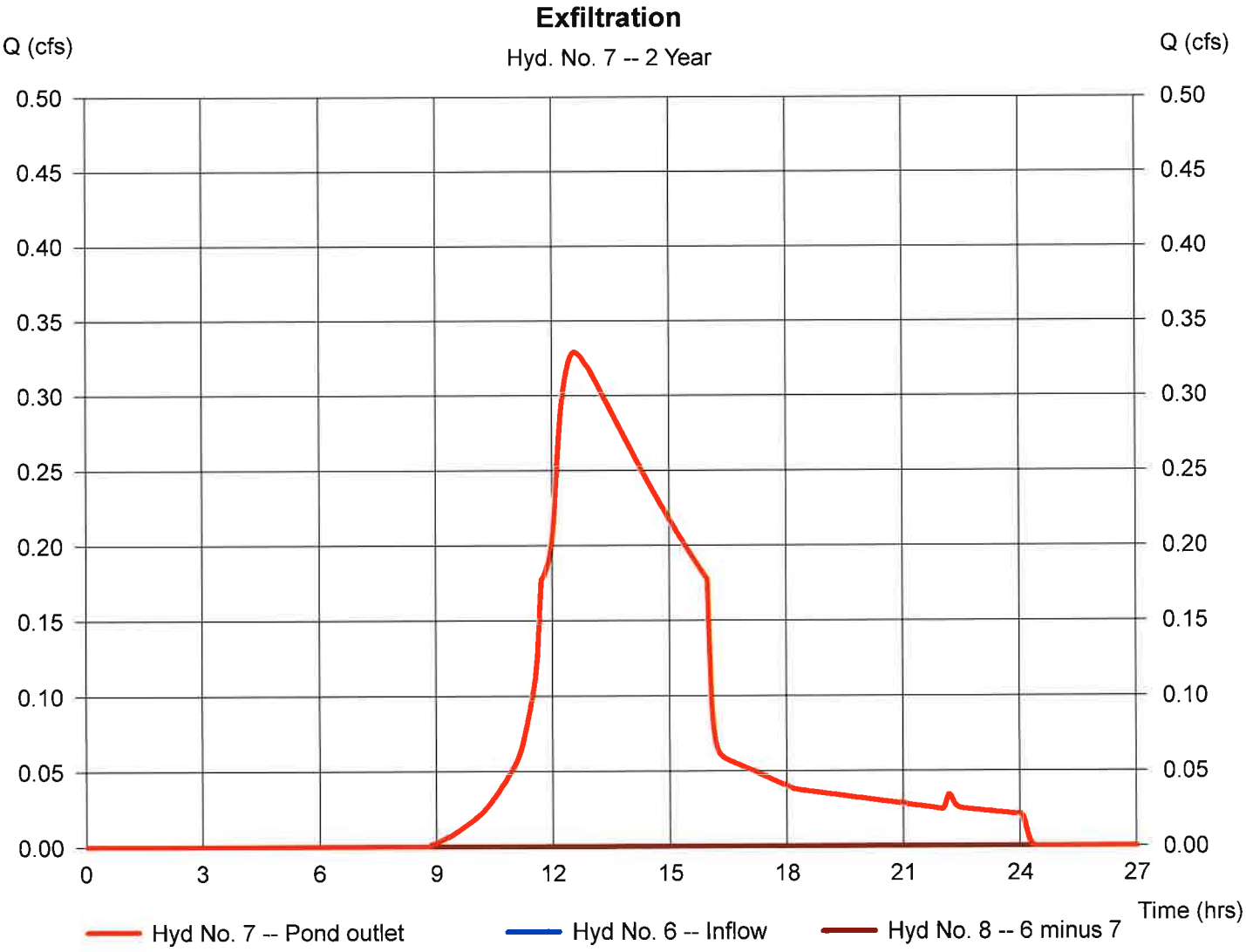
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	114.00	---	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.58	461	114.58	---	---	---	---	0.00	0.00	---	---	0.216	---	0.216
1.15	922	115.15	---	---	---	---	0.00	0.00	---	---	0.260	---	0.260
1.73	1,382	115.73	---	---	---	---	0.00	0.00	---	---	0.304	---	0.304
2.30	1,843	116.30	---	---	---	---	0.00	0.00	---	---	0.348	---	0.348
2.88	2,304	116.88	---	---	---	---	0.00	0.00	---	---	0.392	---	0.392
3.45	2,765	117.45	---	---	---	---	0.00	0.00	---	---	0.436	---	0.436
4.03	3,206	118.03	---	---	---	---	0.00	0.00	---	---	0.480	---	0.480
4.60	3,212	118.60	---	---	---	---	0.00	0.00	---	---	0.525	---	0.525
5.18	3,219	119.18	---	---	---	---	0.00	0.00	---	---	0.569	---	0.569
5.75	3,225	119.75	---	---	---	---	4.31	3.25	---	---	0.613	---	8.169

Hydrograph Report

Hyd. No. 7

Exfiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.329 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 5,335 cuft
Inflow hydrograph	= 6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	= 8
Diversion method	= Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	= Exfiltration

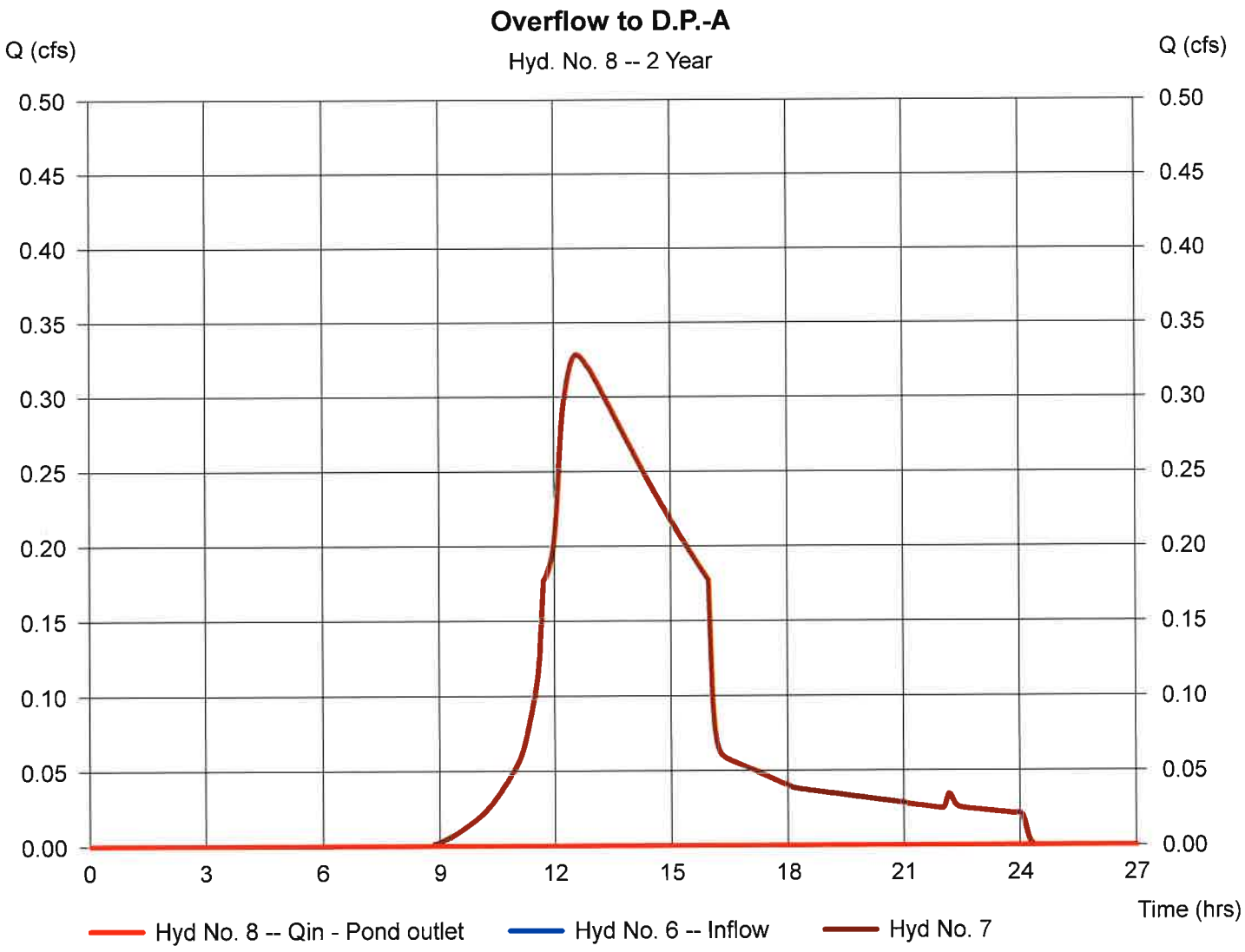


Hydrograph Report

Hyd. No. 8

Overflow to D.P.-A

Hydrograph type	=	Diversion2	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.45 hrs
Time interval	=	3 min	Hyd. volume	=	0 cuft
Inflow hydrograph	=	6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	=	7
Diversion method	=	Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	=	Exfiltration

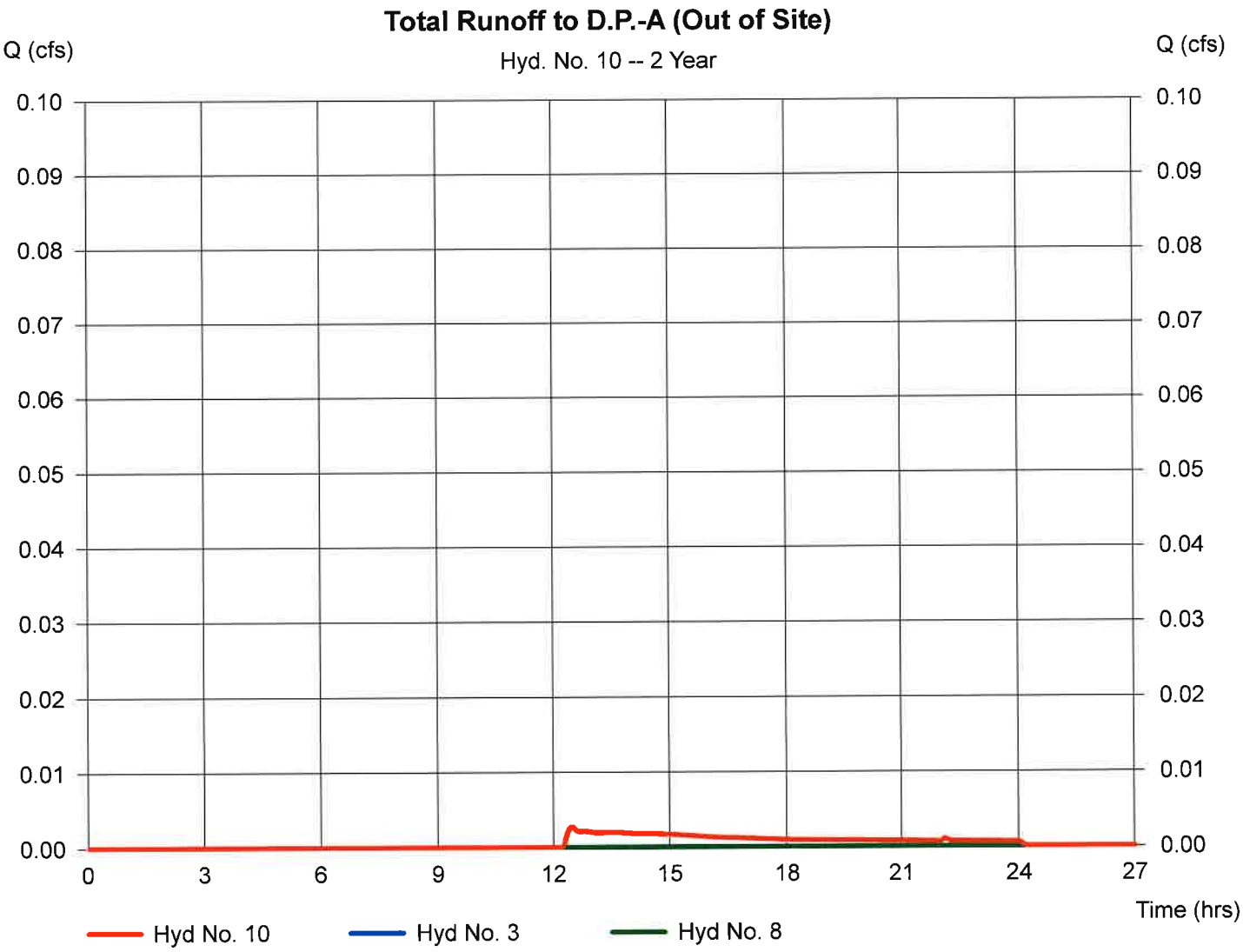


Hydrograph Report

Hyd. No. 10

Total Runoff to D.P.-A (Out of Site)

Hydrograph type	= Combine	Peak discharge	= 0.003 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.45 hrs
Time interval	= 3 min	Hyd. volume	= 48 cuft
Inflow hyds.	= 3, 8	Contrib. drain. area	= 0.104 ac



10-Year Storm, Pre and Post-Development

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

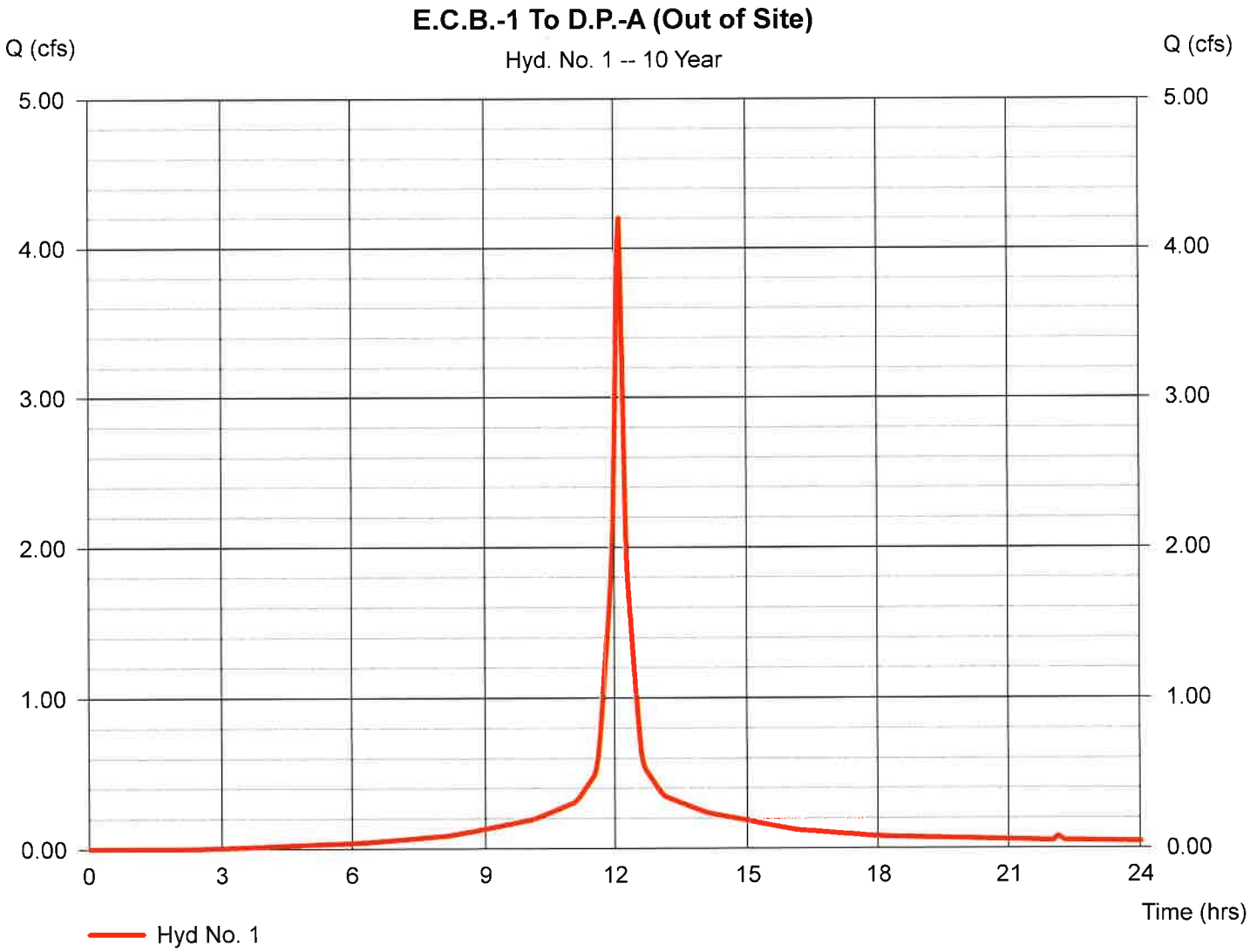
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	4.203	3	726	15,170	----	------	------	E.C.B.-1 To D.P.-A (Out of Site)
3	SCS Runoff	0.036	3	729	208	----	------	------	P.D.B.-1 to D.P.-A
4	SCS Runoff	2.900	3	726	9,679	----	------	------	P.D.B.-2 to Infilt. Sys.-1
6	Reservoir	1.030	3	747	9,679	4	119.47	3,222	Prop. Infilt. Sys.-1
7	Diversion1	0.591	3	747	9,531	6	------	------	Exfiltration
8	Diversion2	0.439	3	747	148	6	------	------	Overflow to D.P.-A
10	Combine	0.462	3	747	356	3, 8,	------	------	Total Runoff to D.P.-A (Out of Site)

Hydrograph Report

Hyd. No. 1

E.C.B.-1 To D.P.-A (Out of Site)

Hydrograph type	= SCS Runoff	Peak discharge	= 4.203 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 15,170 cuft
Drainage area	= 1.096 ac	Curve number	= 94.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

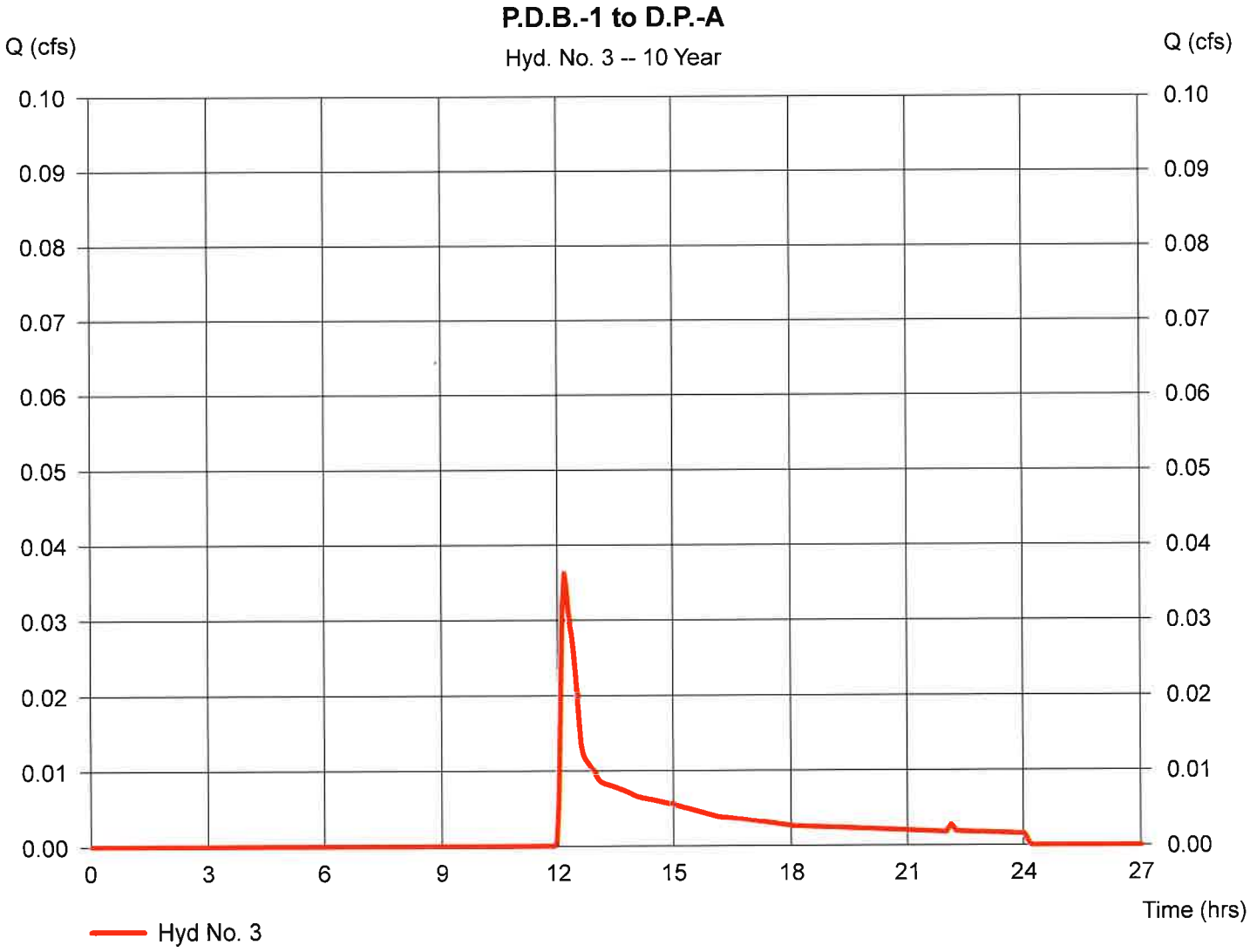


Hydrograph Report

Hyd. No. 3

P.D.B.-1 to D.P.-A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.036 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 208 cuft
Drainage area	= 0.104 ac	Curve number	= 50.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

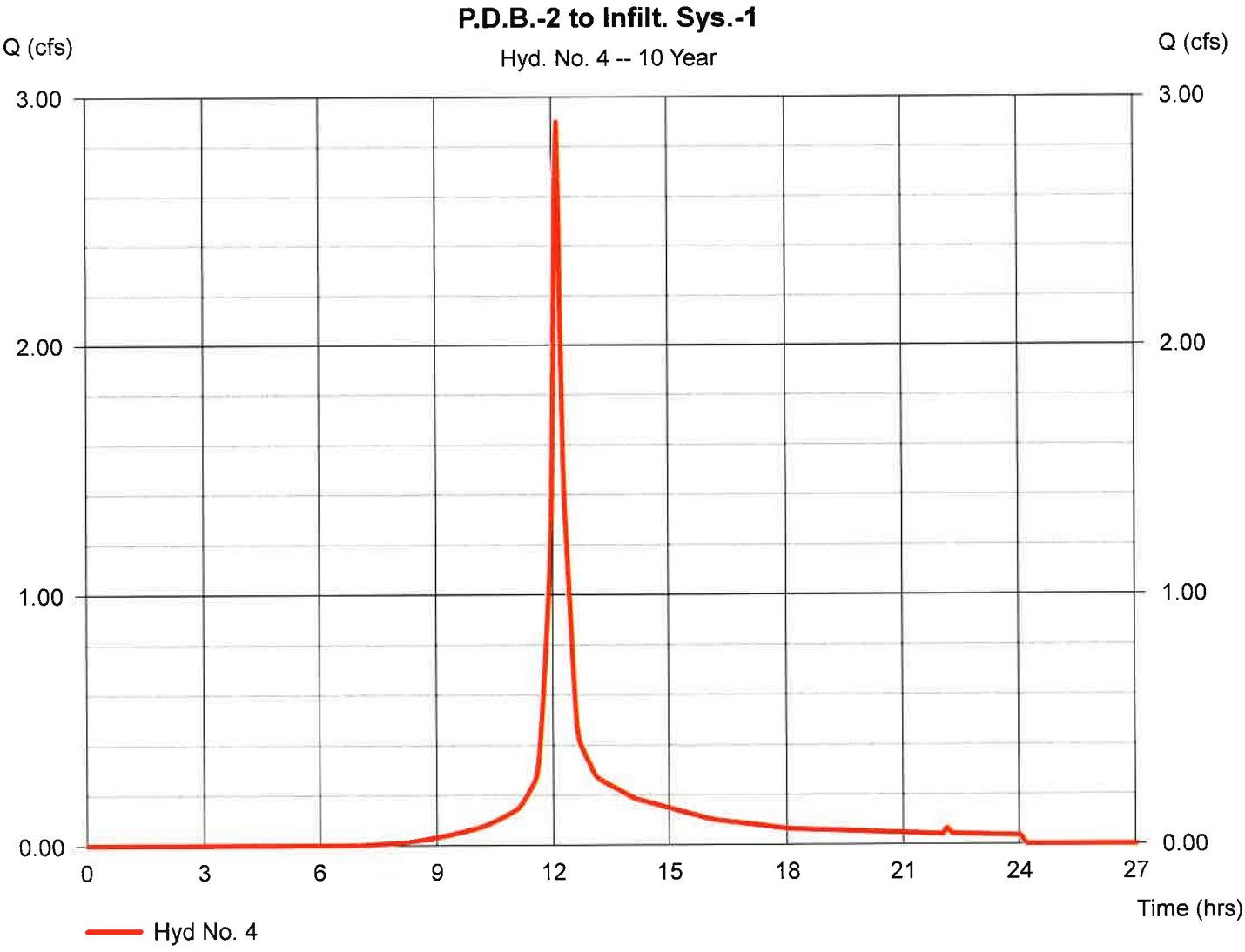


Hydrograph Report

Hyd. No. 4

P.D.B.-2 to Infilt. Sys.-1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.900 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 9,679 cuft
Drainage area	= 0.992 ac	Curve number	= 82.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

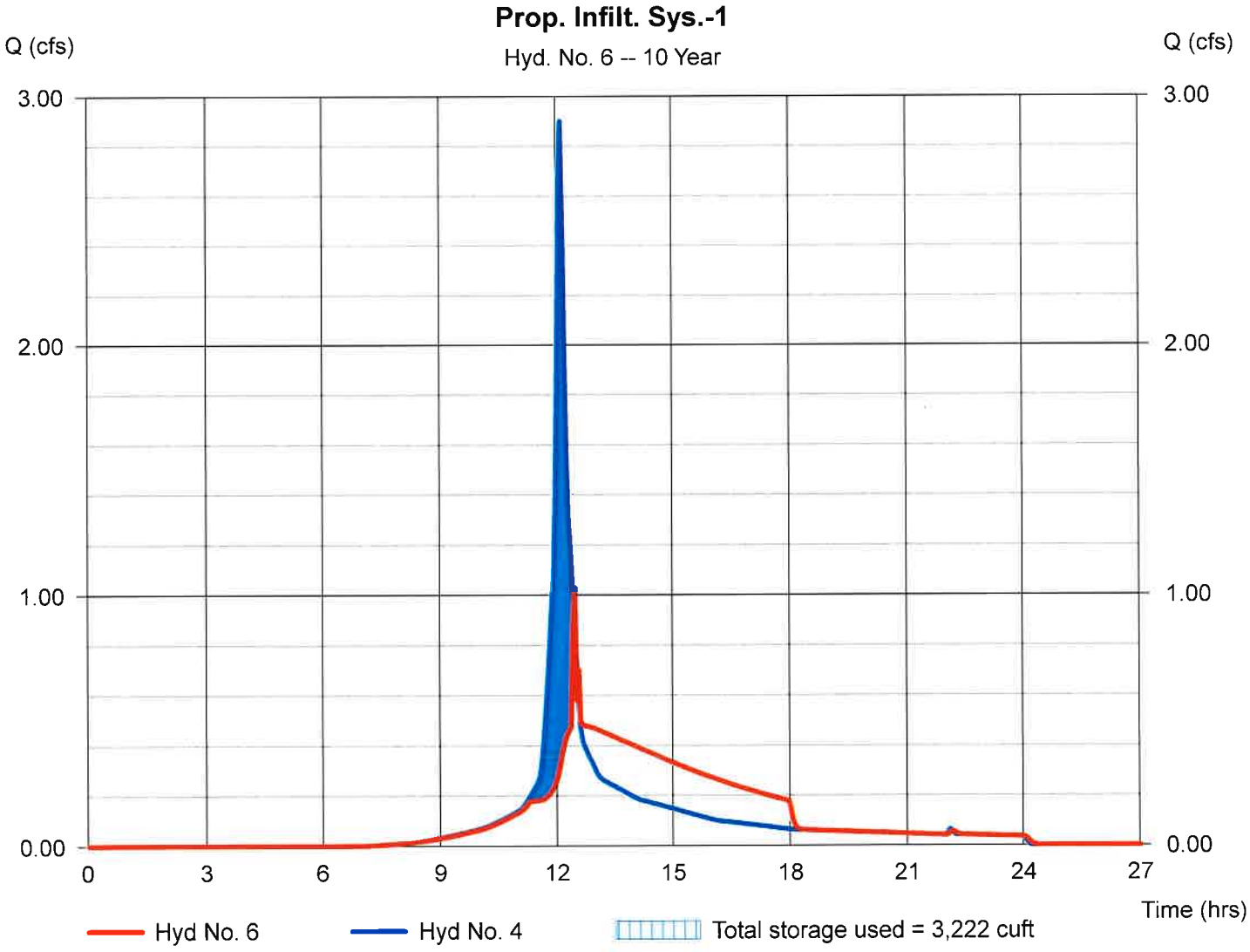
Tuesday, Nov 21, 2023

Hyd. No. 6

Prop. Infilt. Sys.-1

Hydrograph type	= Reservoir	Peak discharge	= 1.030 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.45 hrs
Time interval	= 3 min	Hyd. volume	= 9,679 cuft
Inflow hyd. No.	= 4 - P.D.B.-2 to Infilt. Sys.-1	Max. Elevation	= 119.47 ft
Reservoir name	= 50 Shea 4'x4'x4' Galleys	Max. Storage	= 3,222 cuft

Storage Indication method used. Outflow includes exfiltration.

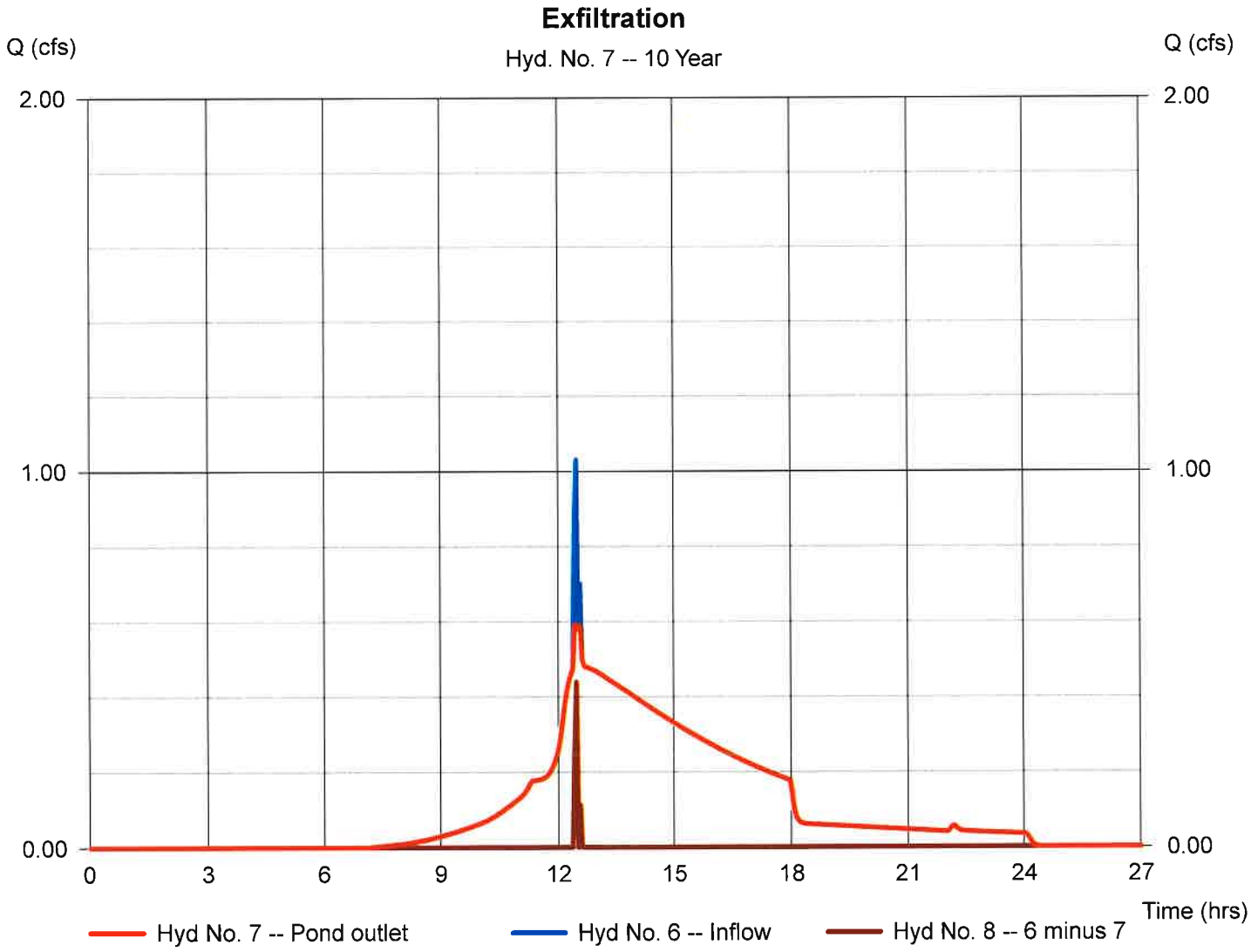


Hydrograph Report

Hyd. No. 7

Exfiltration

Hydrograph type	=	Diversion1	Peak discharge	=	0.591 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.45 hrs
Time interval	=	3 min	Hyd. volume	=	9,531 cuft
Inflow hydrograph	=	6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	=	8
Diversion method	=	Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	=	Exfiltration

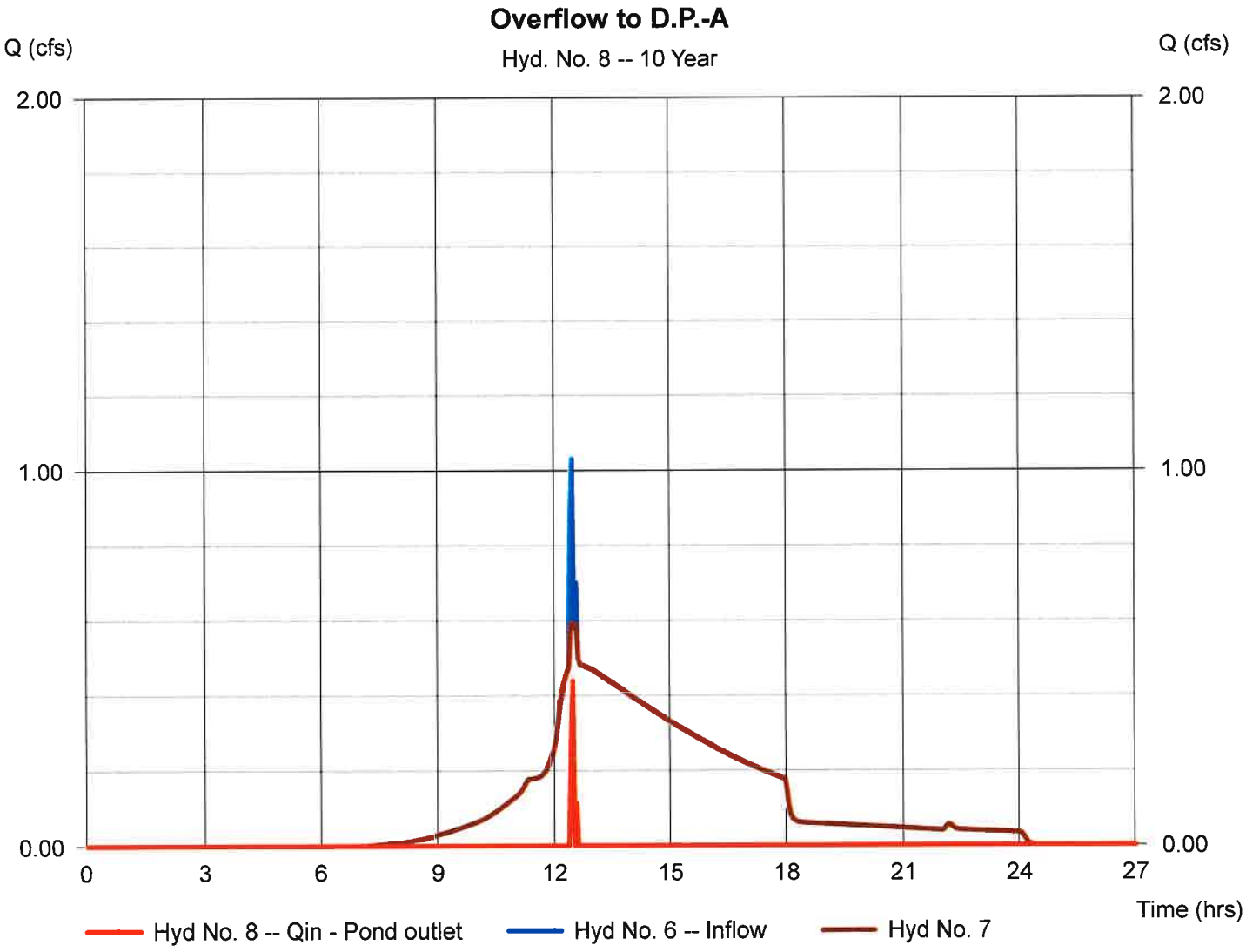


Hydrograph Report

Hyd. No. 8

Overflow to D.P.-A

Hydrograph type	= Diversion2	Peak discharge	= 0.439 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.45 hrs
Time interval	= 3 min	Hyd. volume	= 148 cuft
Inflow hydrograph	= 6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	= 7
Diversion method	= Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	= Exfiltration

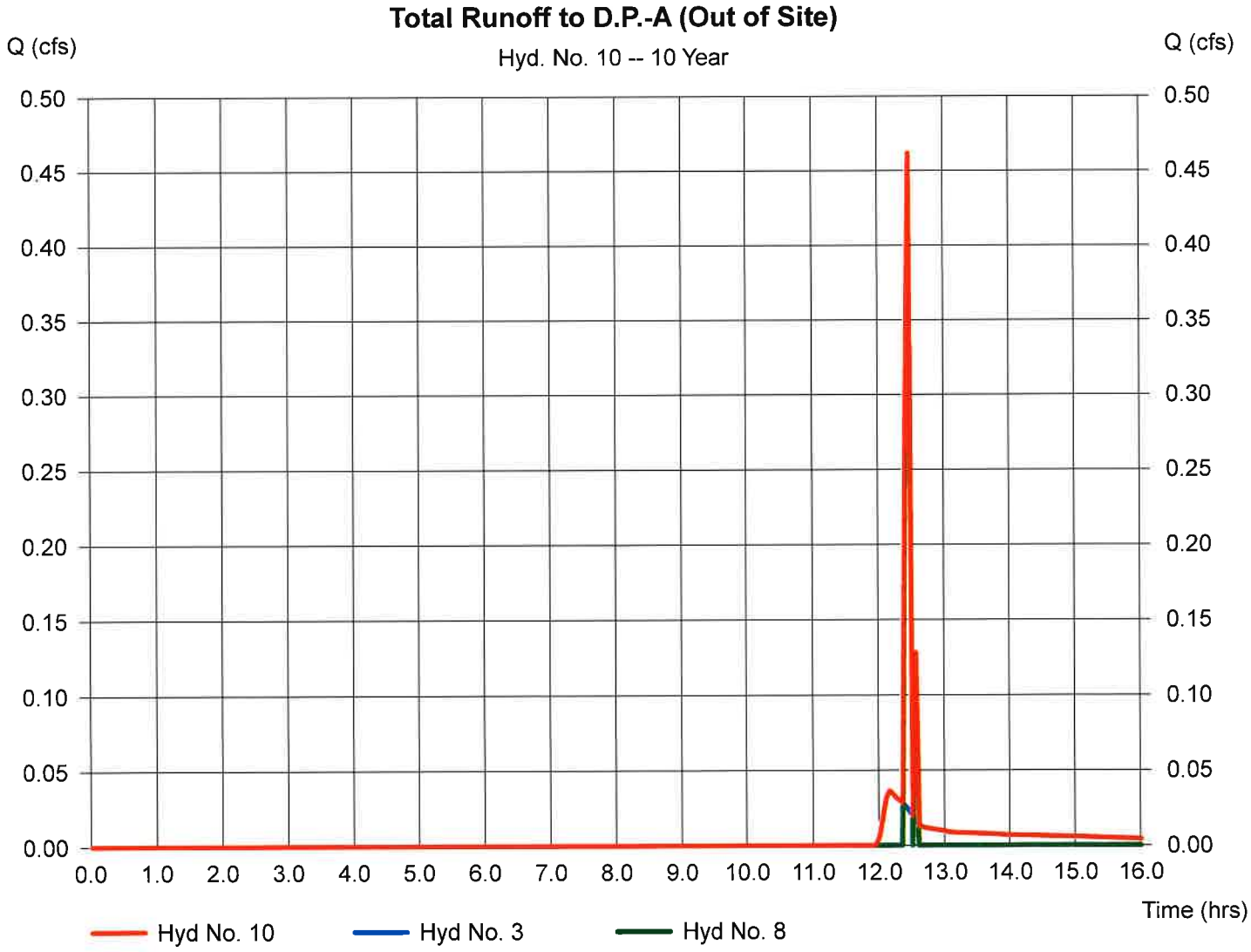


Hydrograph Report

Hyd. No. 10

Total Runoff to D.P.-A (Out of Site)

Hydrograph type	= Combine	Peak discharge	= 0.462 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.45 hrs
Time interval	= 3 min	Hyd. volume	= 356 cuft
Inflow hyds.	= 3, 8	Contrib. drain. area	= 0.104 ac



25-Year Storm, Pre and Post-Development

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.446	3	726	19,969	----	------	------	E.C.B.-1 To D.P.-A (Out of Site)
3	SCS Runoff	0.098	3	726	412	----	------	------	P.D.B.-1 to D.P.-A
4	SCS Runoff	4.055	3	726	13,671	----	------	------	P.D.B.-2 to Infilt. Sys.-1
6	Reservoir	3.818	3	729	13,671	4	119.62	3,224	Prop. Infilt. Sys.-1
7	Diversion1	0.603	3	729	11,701	6	------	------	Exfiltration
8	Diversion2	3.215	3	729	1,970	6	------	------	Overflow to D.P.-A
10	Combine	3.311	3	729	2,382	3, 8,	------	------	Total Runoff to D.P.-A (Out of Site)

Hydrograph Report

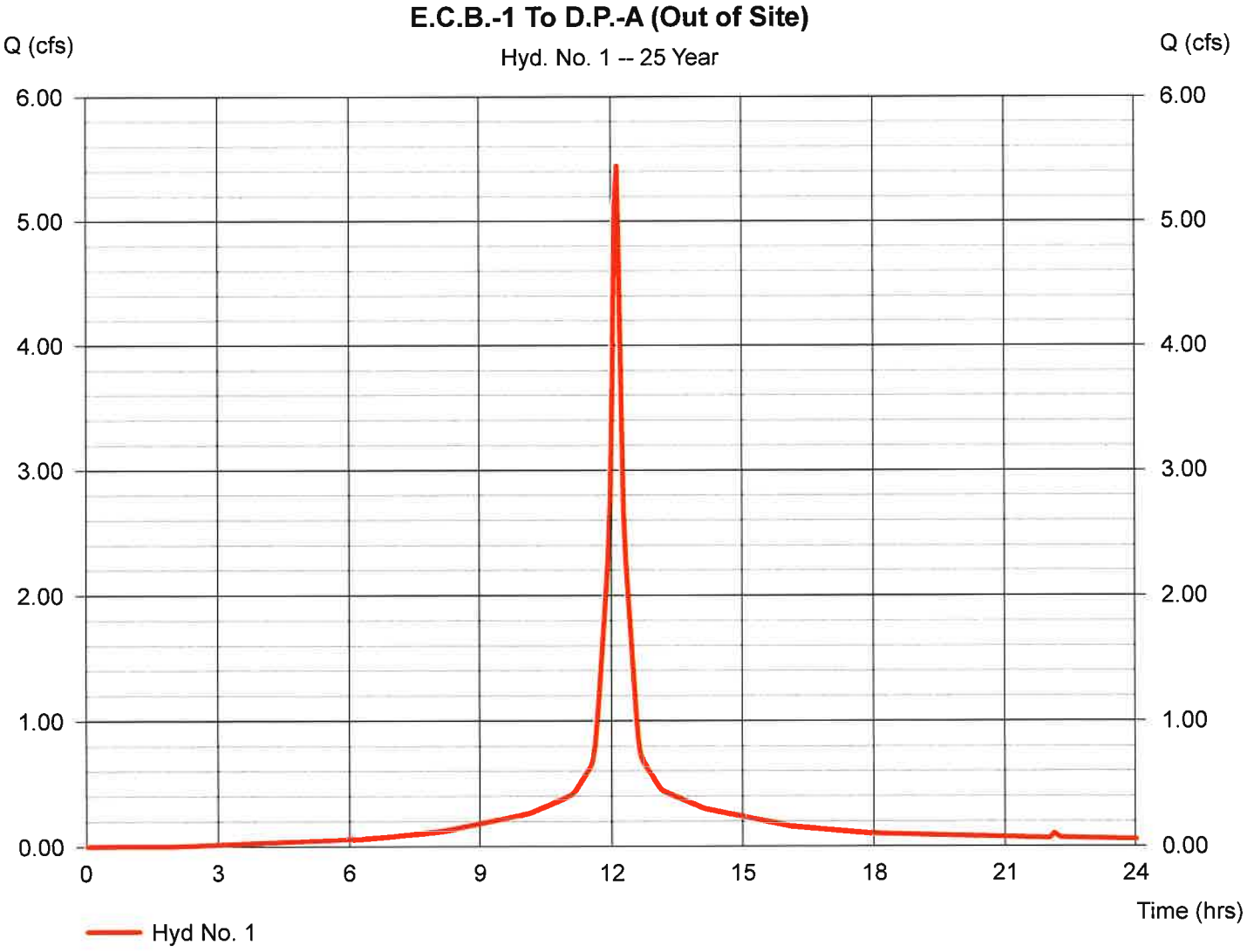
Hydraflow Hydrographs by Intelisolve v9.22

Tuesday, Nov 21, 2023

Hyd. No. 1

E.C.B.-1 To D.P.-A (Out of Site)

Hydrograph type	= SCS Runoff	Peak discharge	= 5.446 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 19,969 cuft
Drainage area	= 1.096 ac	Curve number	= 94.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

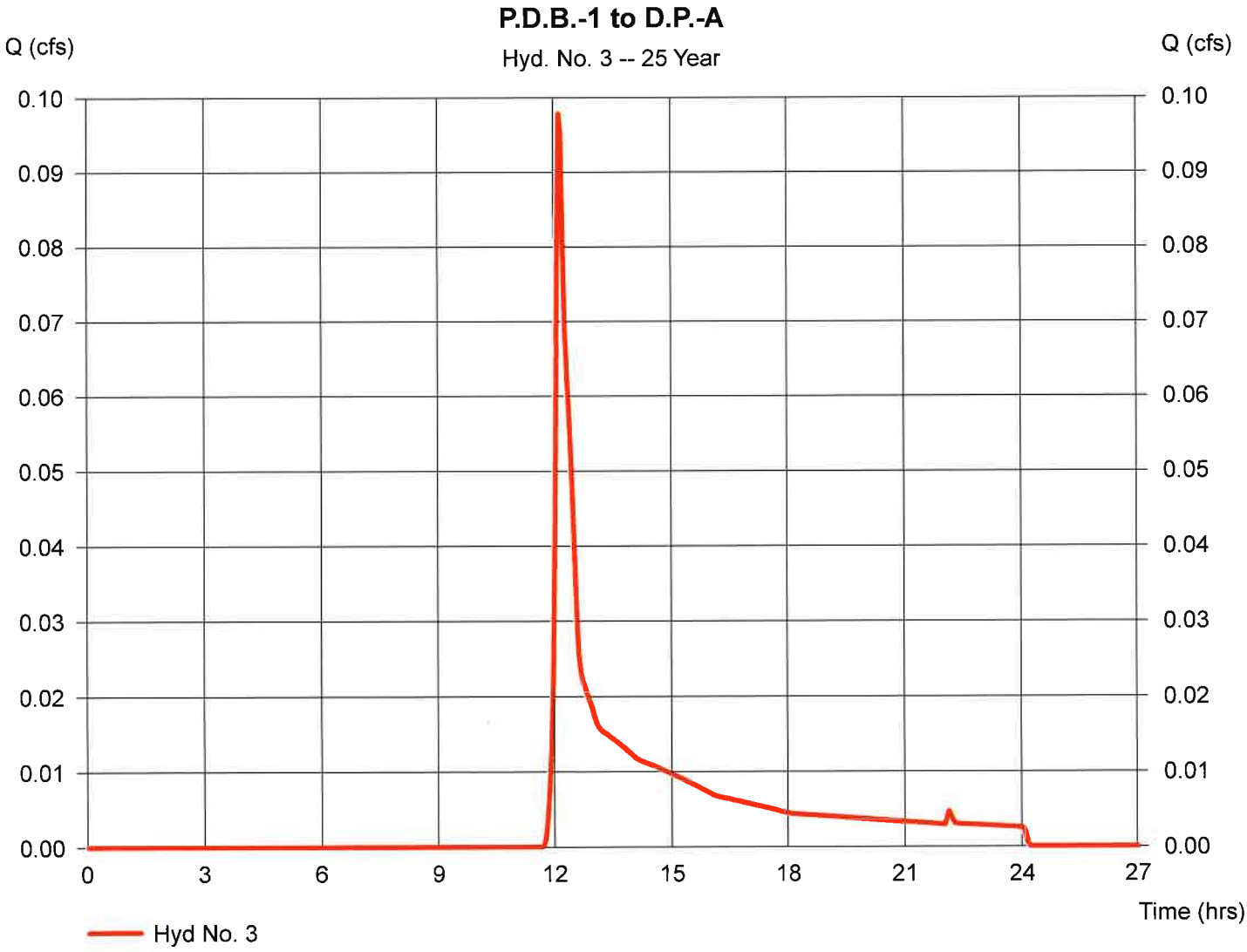
Hydraflow Hydrographs by Intelisolve v9.22

Tuesday, Nov 21, 2023

Hyd. No. 3

P.D.B.-1 to D.P.-A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.098 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 412 cuft
Drainage area	= 0.104 ac	Curve number	= 50.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



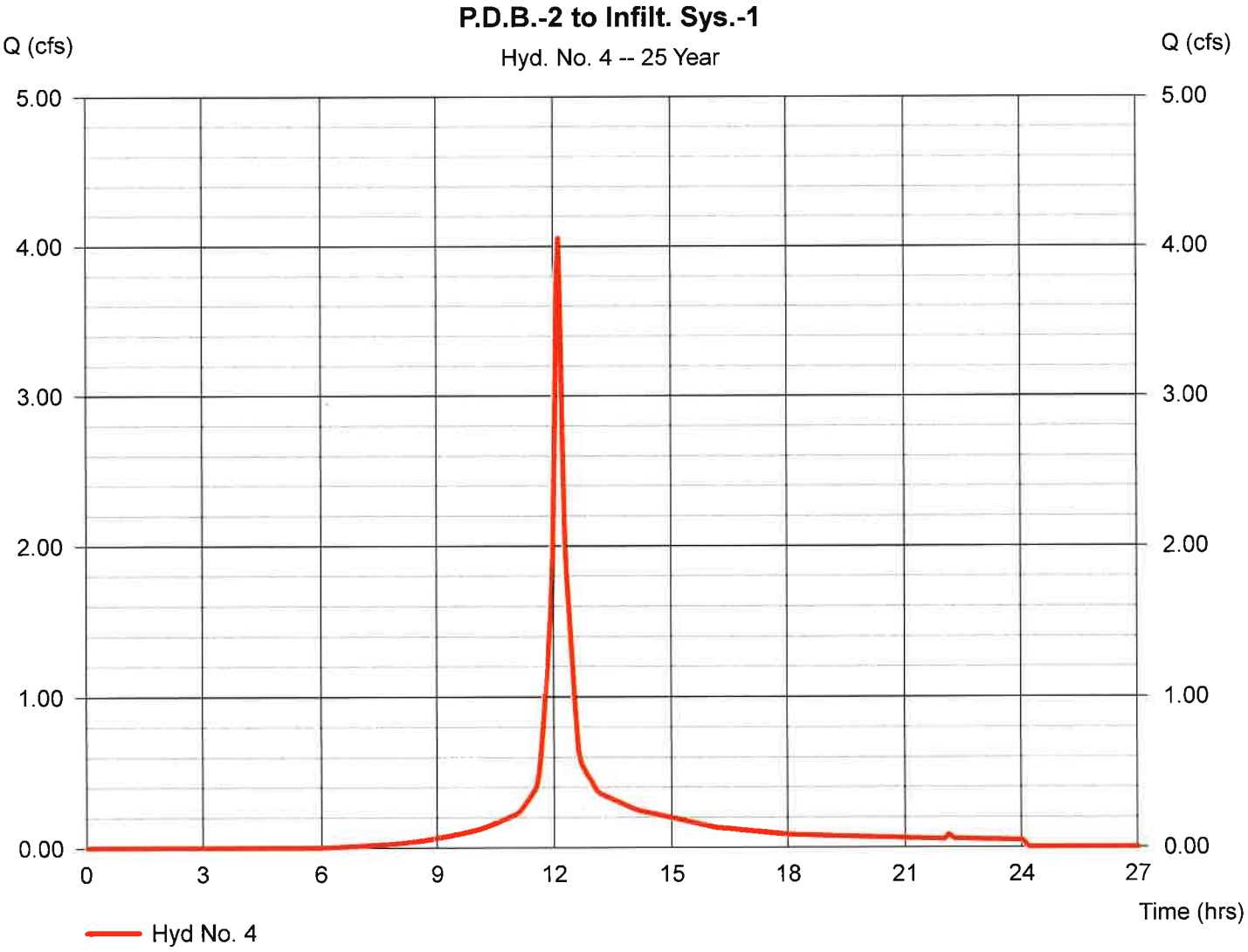
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Tuesday, Nov 21, 2023

Hyd. No. 4

P.D.B.-2 to Infilt. Sys.-1

Hydrograph type	= SCS Runoff	Peak discharge	= 4.055 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 13,671 cuft
Drainage area	= 0.992 ac	Curve number	= 82.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

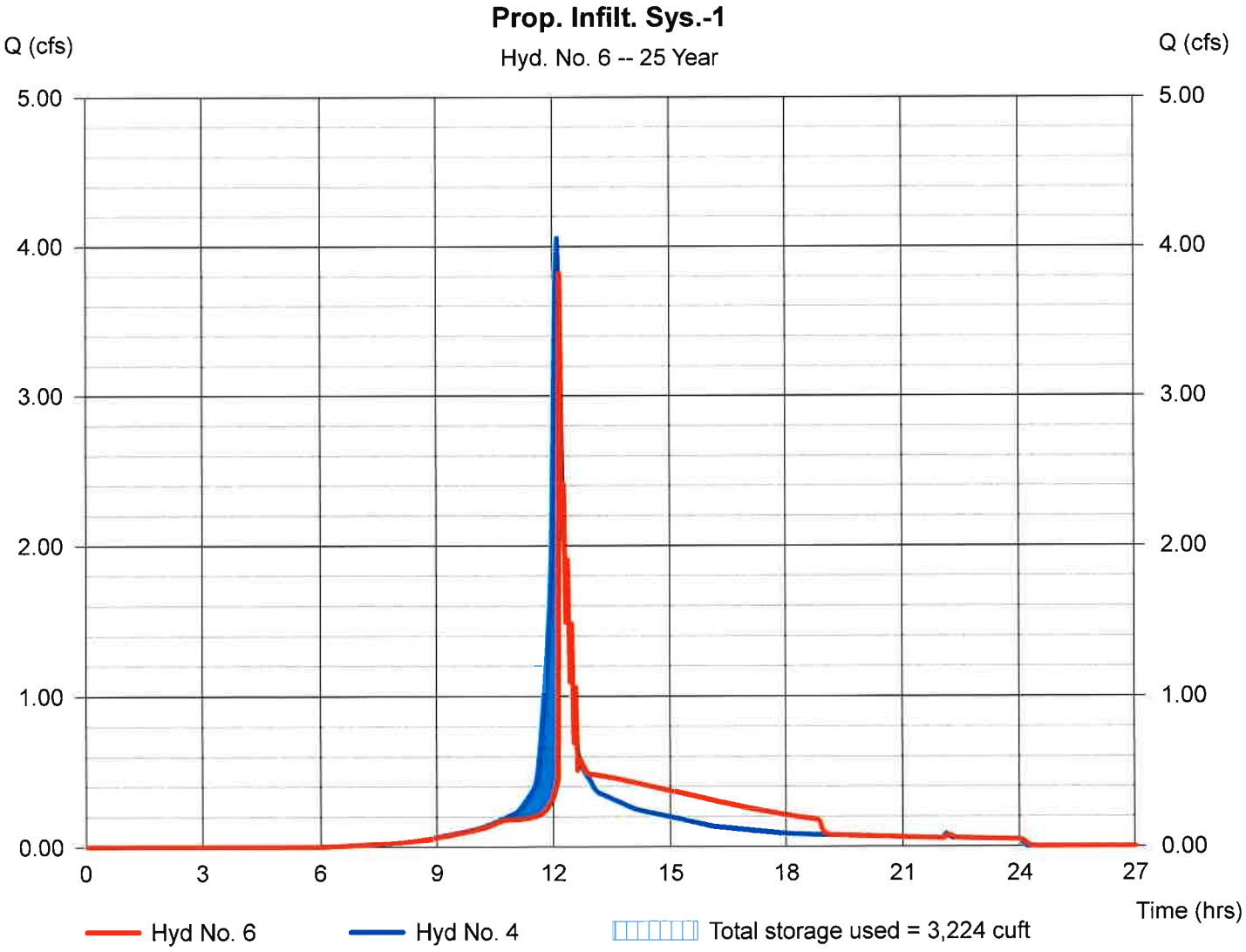
Tuesday, Nov 21, 2023

Hyd. No. 6

Prop. Infilt. Sys.-1

Hydrograph type	= Reservoir	Peak discharge	= 3.818 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 13,671 cuft
Inflow hyd. No.	= 4 - P.D.B.-2 to Infilt. Sys.-1	Max. Elevation	= 119.62 ft
Reservoir name	= 50 Shea 4'x4'x4' Galleys	Max. Storage	= 3,224 cuft

Storage Indication method used. Outflow includes exfiltration.

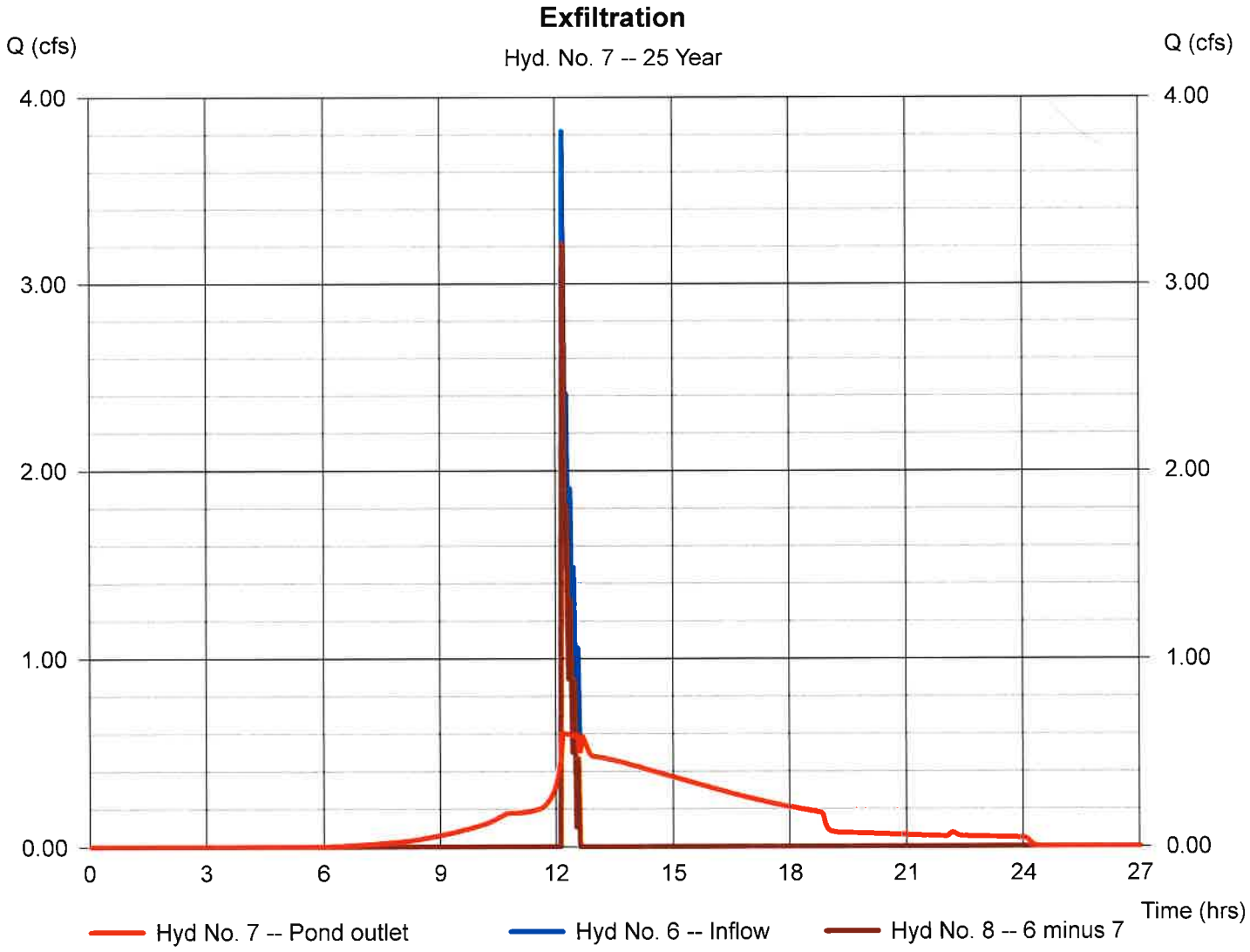


Hydrograph Report

Hyd. No. 7

Exfiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.603 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 11,701 cuft
Inflow hydrograph	= 6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	= 8
Diversion method	= Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	= Exfiltration

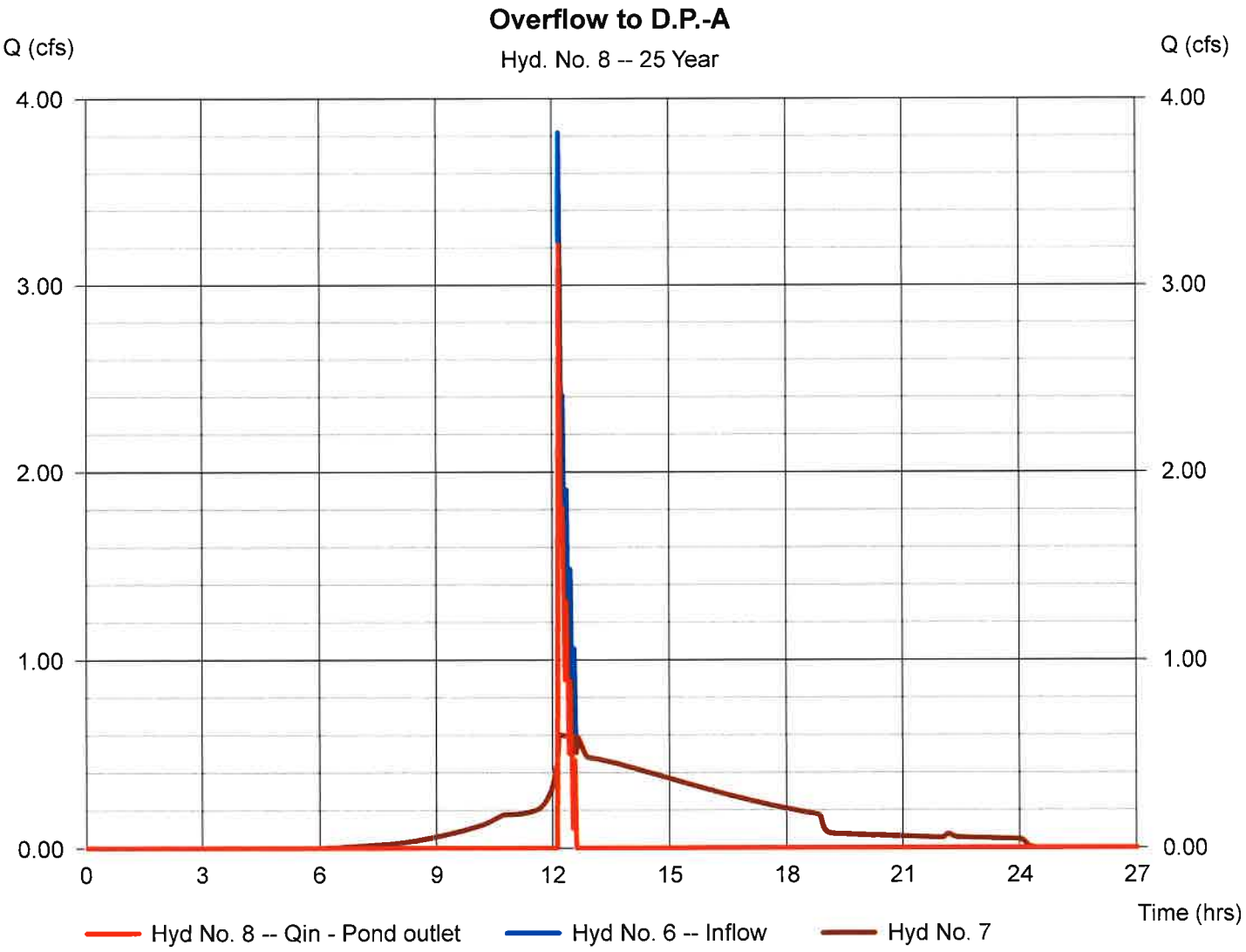


Hydrograph Report

Hyd. No. 8

Overflow to D.P.-A

Hydrograph type	= Diversion2	Peak discharge	= 3.215 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 1,970 cuft
Inflow hydrograph	= 6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	= 7
Diversion method	= Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	= Exfiltration

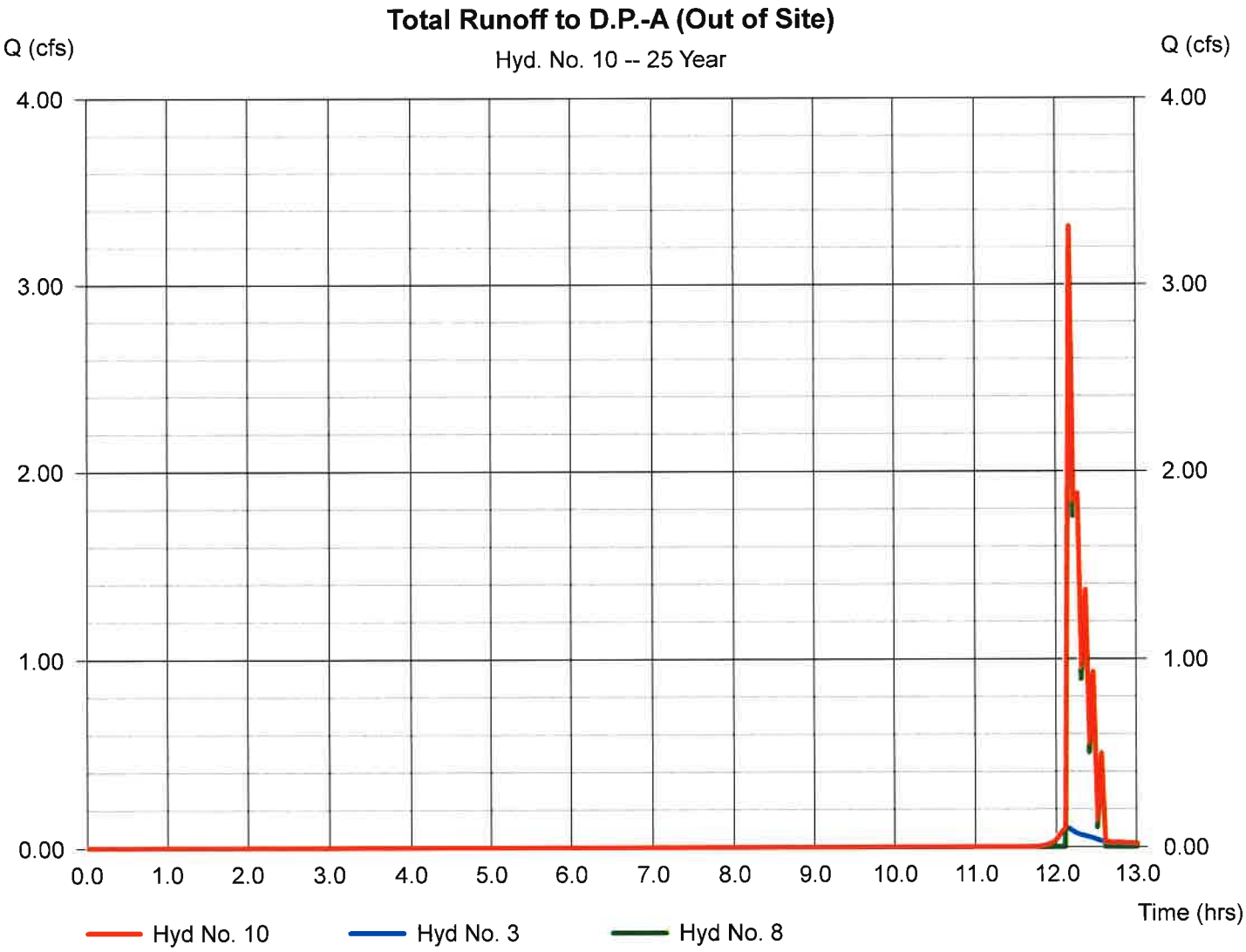


Hydrograph Report

Hyd. No. 10

Total Runoff to D.P.-A (Out of Site)

Hydrograph type	= Combine	Peak discharge	= 3.311 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 2,382 cuft
Inflow hyds.	= 3, 8	Contrib. drain. area	= 0.104 ac



100-Year Storm, Pre and Post-Development

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	7.817	3	726	29,239	----	------	------	E.C.B.-1 To D.P.-A (Out of Site)
3	SCS Runoff	0.259	3	726	918	----	------	------	P.D.B.-1 to D.P.-A
4	SCS Runoff	6.287	3	726	21,632	----	------	------	P.D.B.-2 to Infilt. Sys.-1
6	Reservoir	6.391	3	723	21,632	4	119.70	3,225	Prop. Infilt. Sys.-1
7	Diversion1	0.609	3	723	15,353	6	------	------	Exfiltration
8	Diversion2	5.782	3	723	6,279	6	------	------	Overflow to D.P.-A
10	Combine	6.003	3	723	7,197	3, 8,	------	------	Total Runoff to D.P.-A (Out of Site)

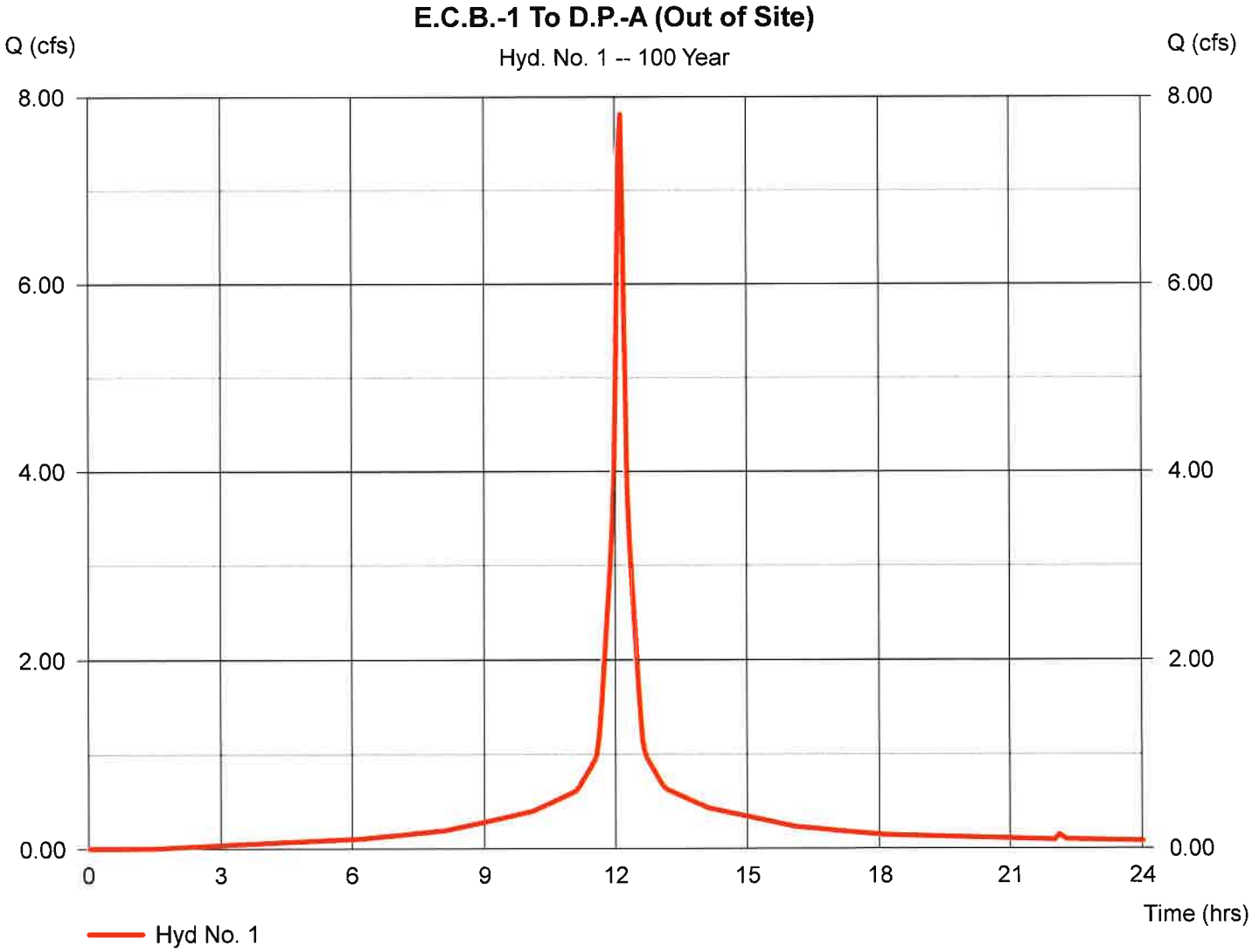
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Tuesday, Nov 21, 2023

Hyd. No. 1

E.C.B.-1 To D.P.-A (Out of Site)

Hydrograph type	= SCS Runoff	Peak discharge	= 7.817 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 29,239 cuft
Drainage area	= 1.096 ac	Curve number	= 94.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

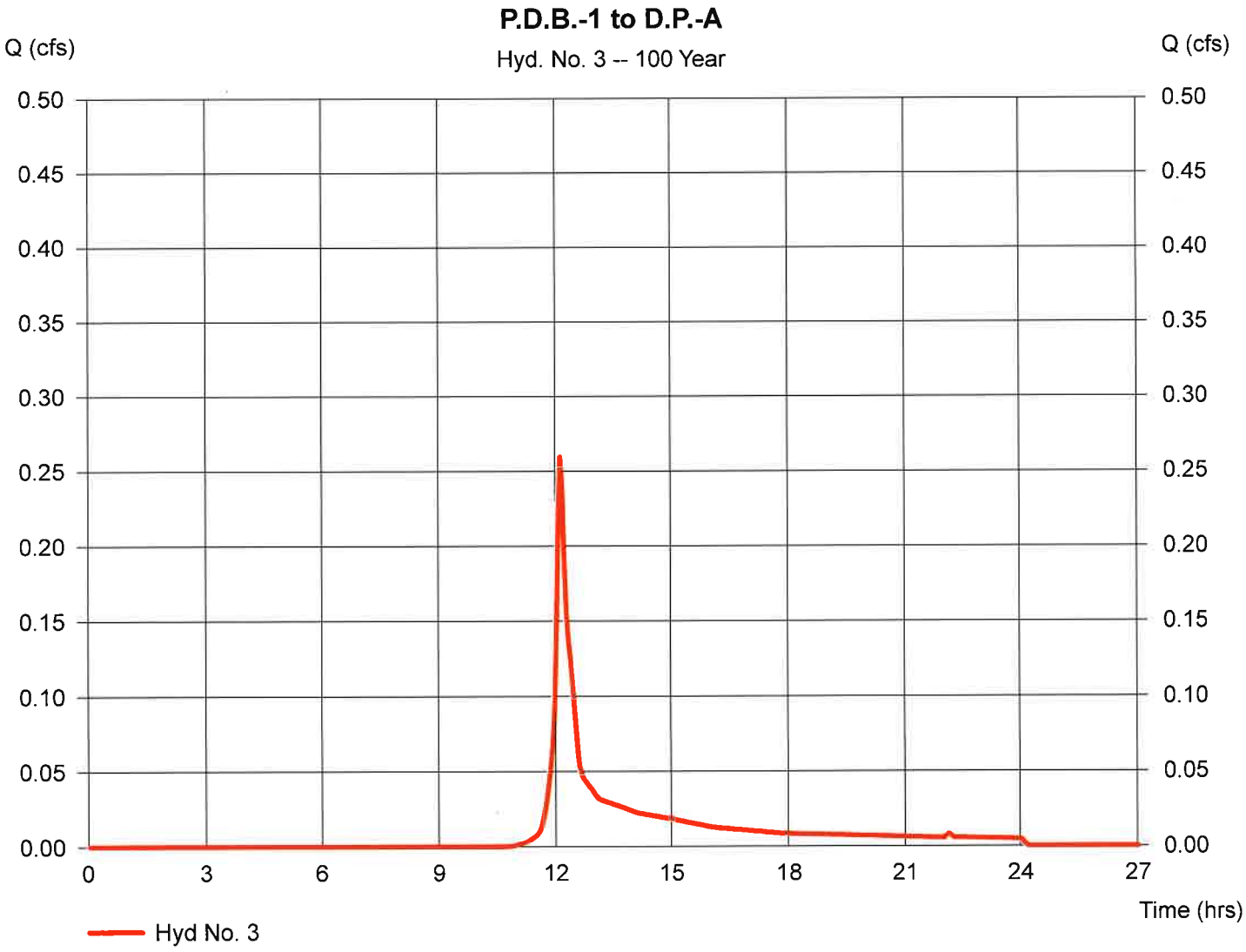


Hydrograph Report

Hyd. No. 3

P.D.B.-1 to D.P.-A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.259 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 918 cuft
Drainage area	= 0.104 ac	Curve number	= 50.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

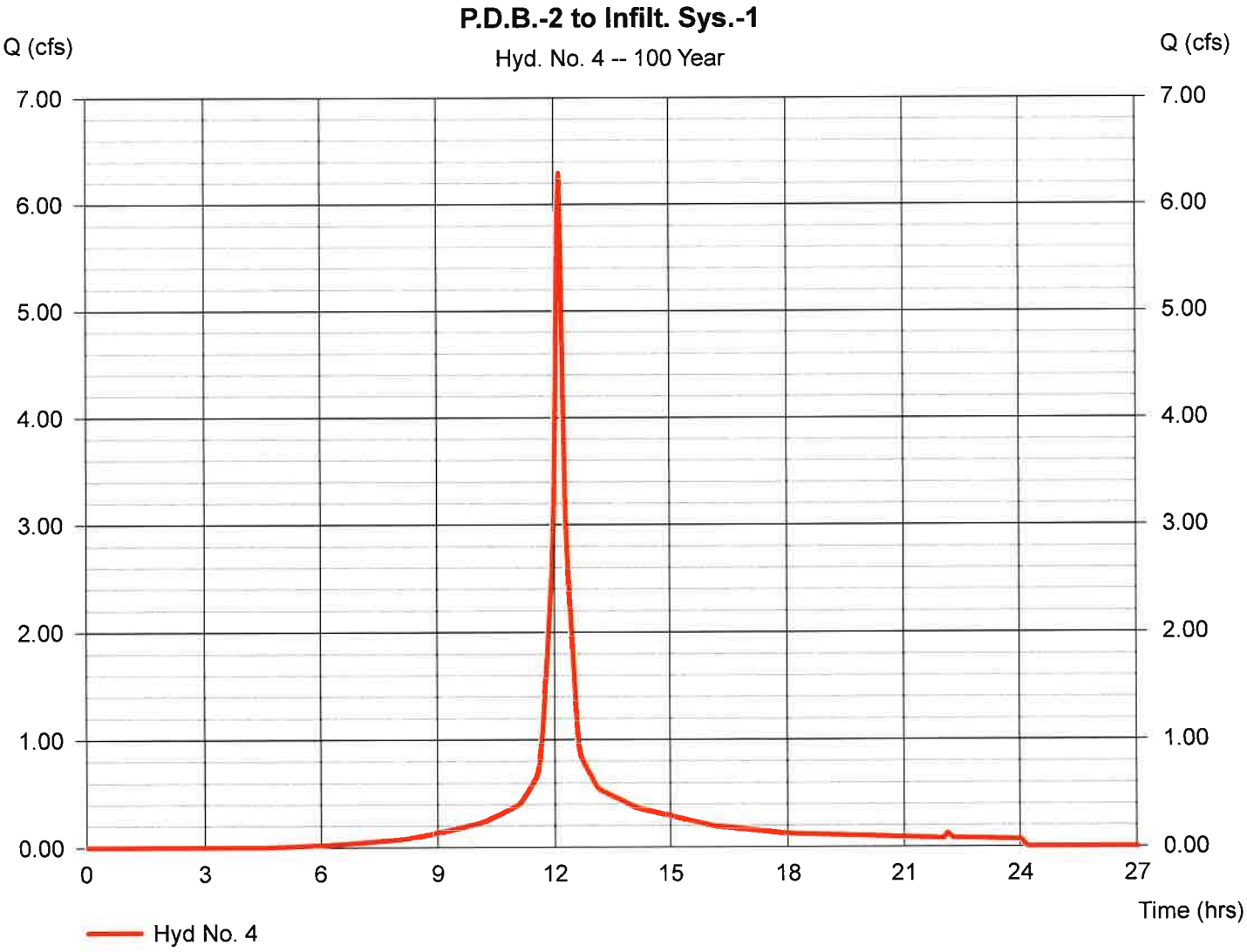


Hydrograph Report

Hyd. No. 4

P.D.B.-2 to Infilt. Sys.-1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.287 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 21,632 cuft
Drainage area	= 0.992 ac	Curve number	= 82.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

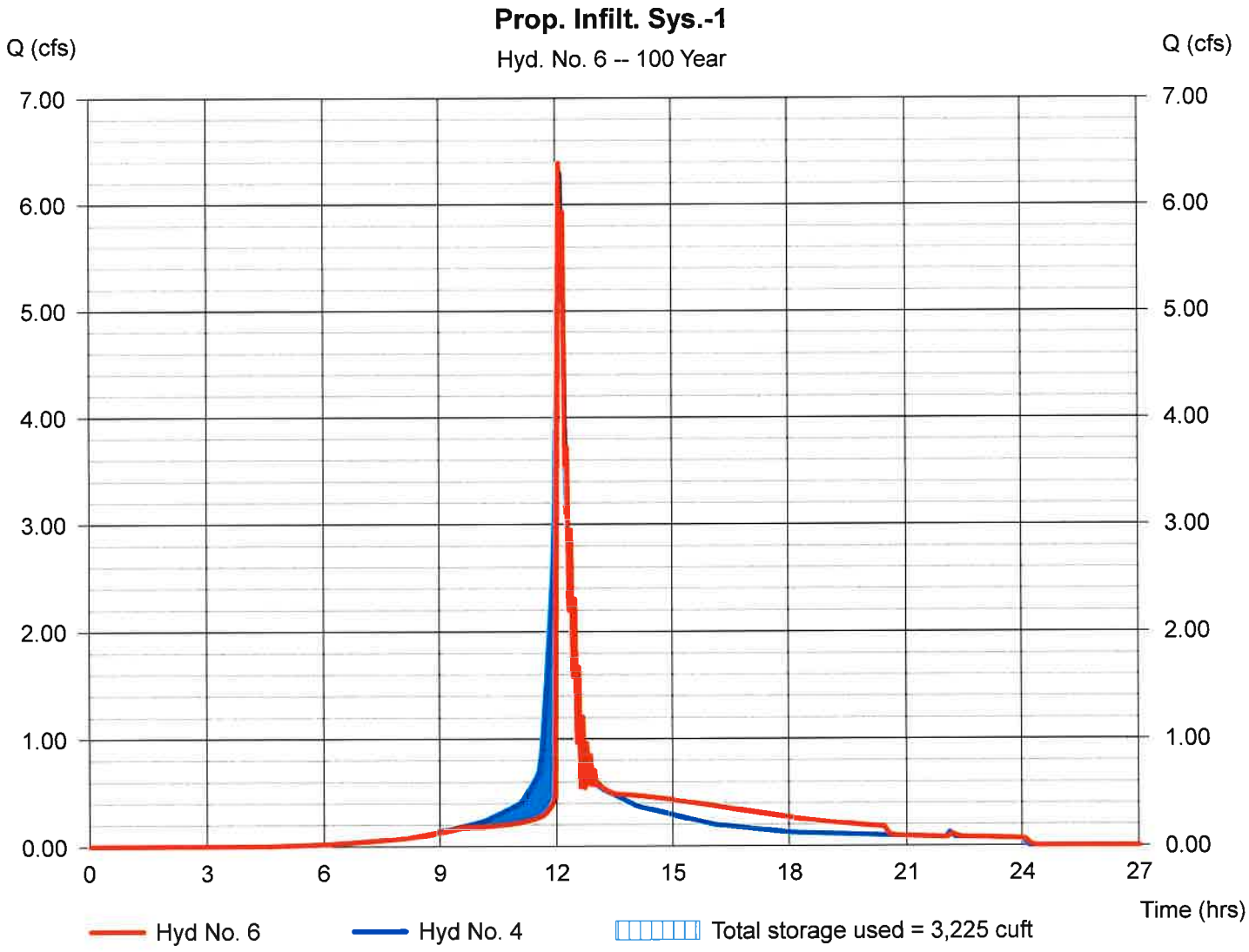
Tuesday, Nov 21, 2023

Hyd. No. 6

Prop. Infilt. Sys.-1

Hydrograph type	= Reservoir	Peak discharge	= 6.391 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.05 hrs
Time interval	= 3 min	Hyd. volume	= 21,632 cuft
Inflow hyd. No.	= 4 - P.D.B.-2 to Infilt. Sys.-1	Max. Elevation	= 119.70 ft
Reservoir name	= 50 Shea 4'x4'x4' Galleys	Max. Storage	= 3,225 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

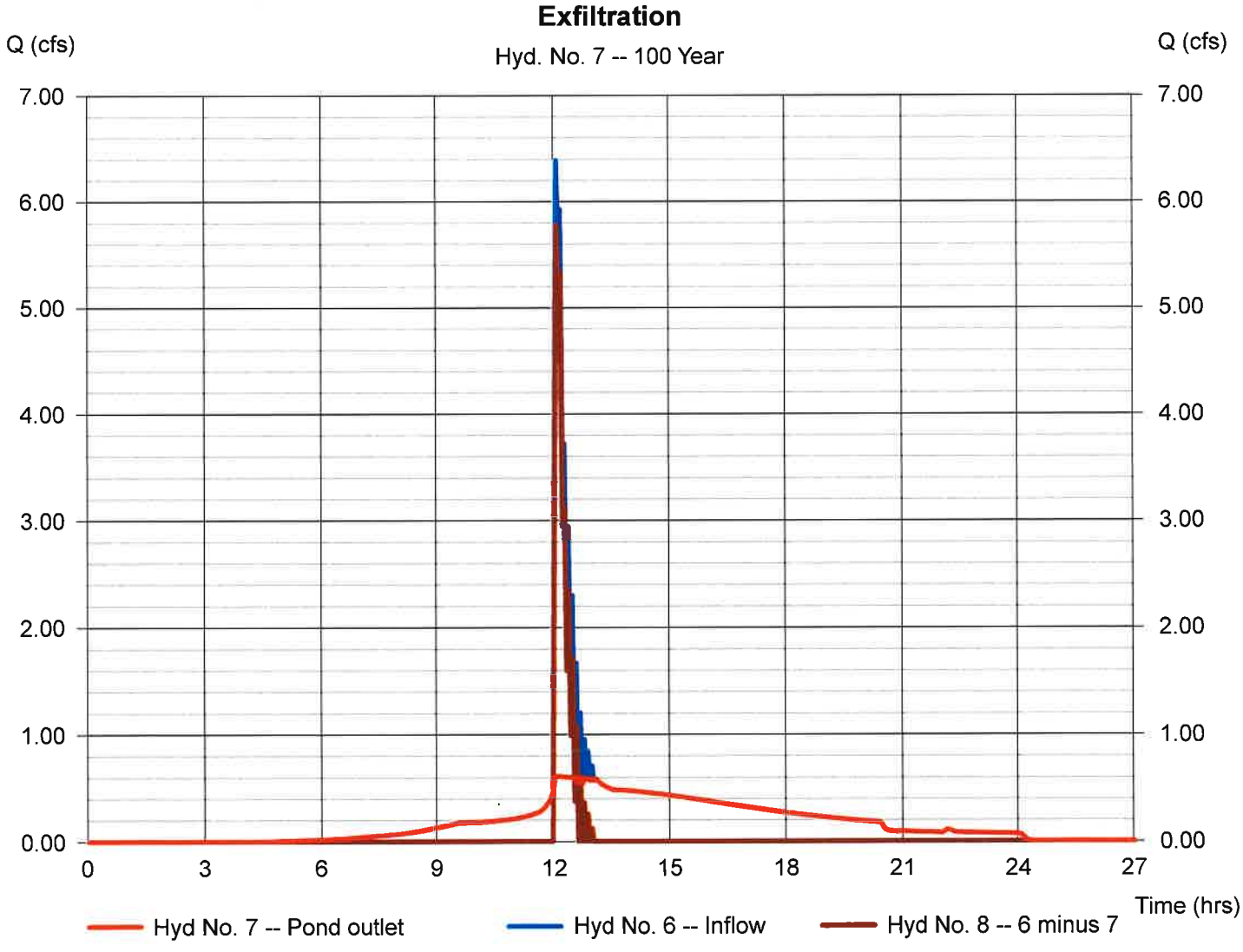
Hydraflow Hydrographs by Intelisolve v9.22

Tuesday, Nov 21, 2023

Hyd. No. 7

Exfiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.609 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.05 hrs
Time interval	= 3 min	Hyd. volume	= 15,353 cuft
Inflow hydrograph	= 6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	= 8
Diversion method	= Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	= Exfiltration



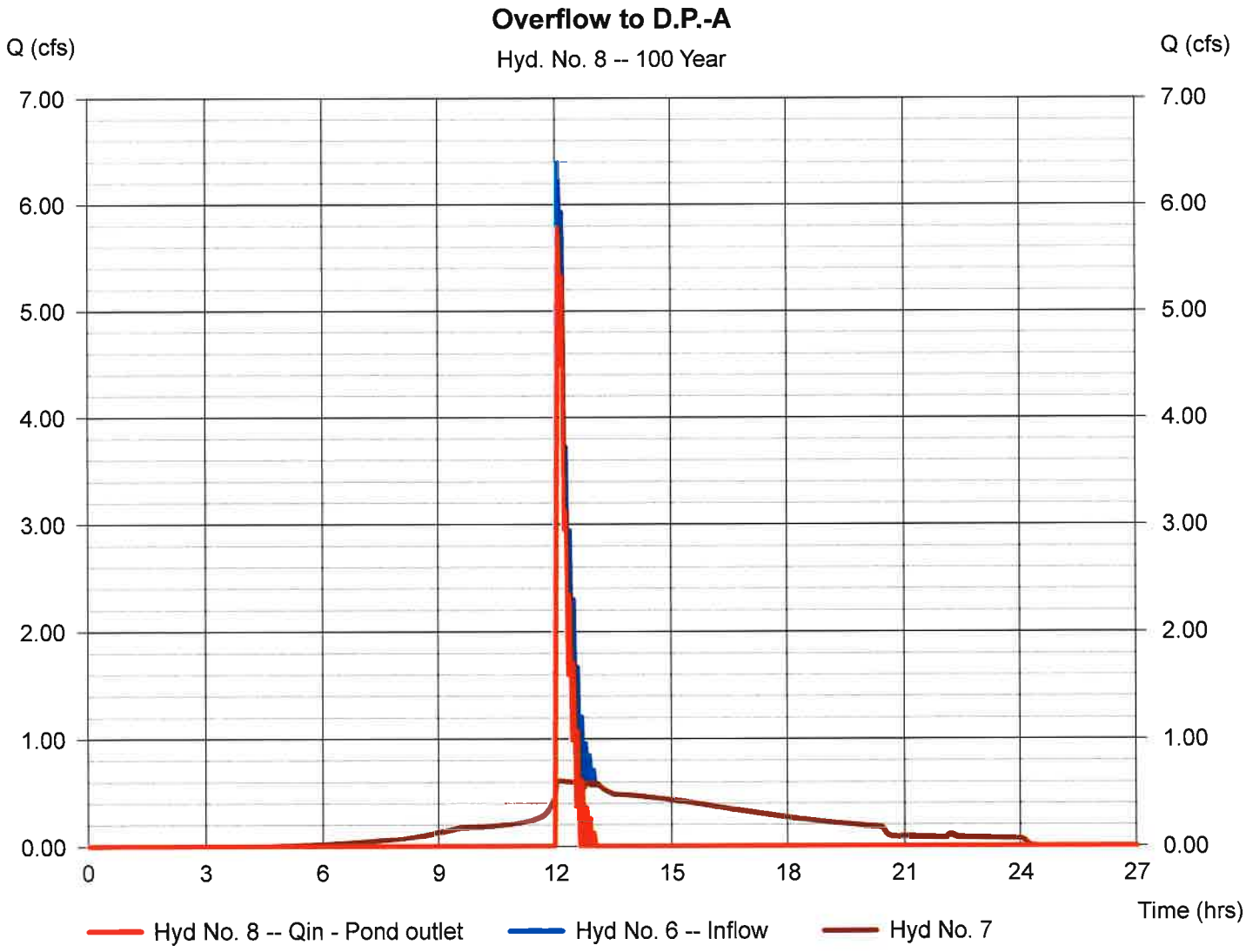
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Tuesday, Nov 21, 2023

Hyd. No. 8

Overflow to D.P.-A

Hydrograph type	= Diversion2	Peak discharge	= 5.782 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.05 hrs
Time interval	= 3 min	Hyd. volume	= 6,279 cuft
Inflow hydrograph	= 6 - Prop. Infilt. Sys.-1	2nd diverted hyd.	= 7
Diversion method	= Pond - 50 Shea 4'x4'x4' Galleys	Pond structure	= Exfiltration

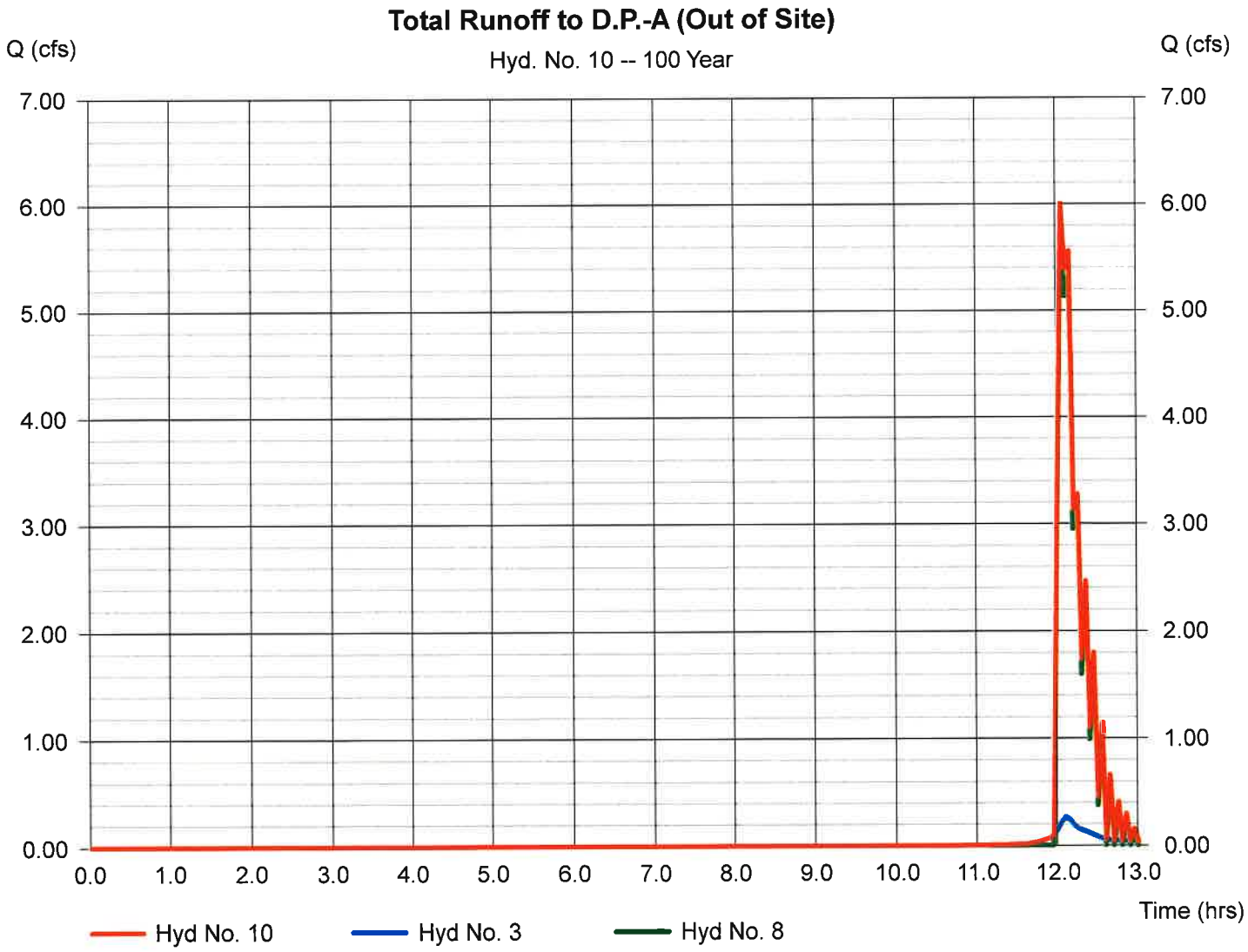


Hydrograph Report

Hyd. No. 10

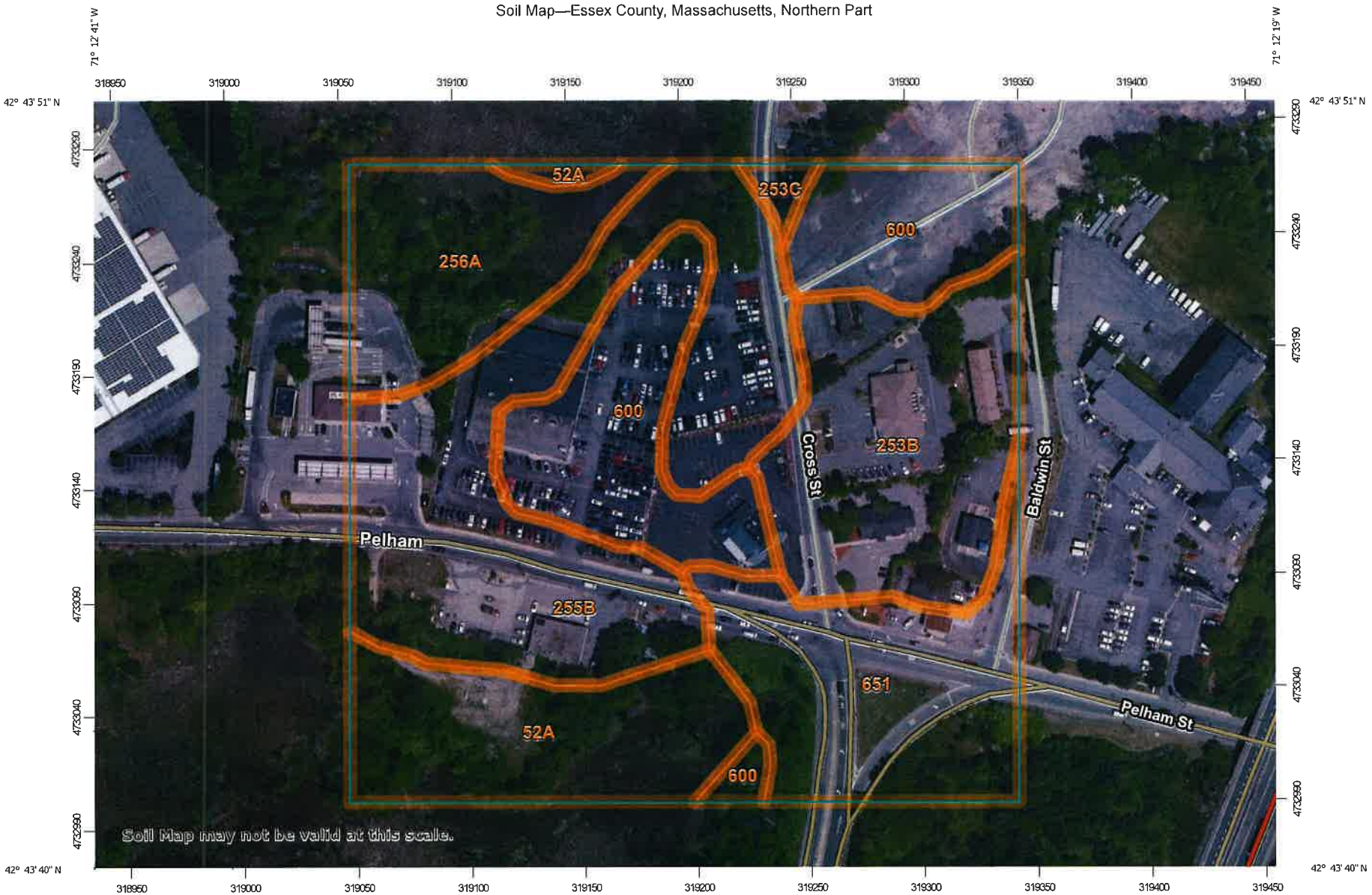
Total Runoff to D.P.-A (Out of Site)

Hydrograph type	= Combine	Peak discharge	= 6.003 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.05 hrs
Time interval	= 3 min	Hyd. volume	= 7,197 cuft
Inflow hyds.	= 3, 8	Contrib. drain. area	= 0.104 ac



Appendix B:
NRCS Soil Survey

Soil Map—Essex County, Massachusetts, Northern Part



Map Scale: 1:2,380 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Essex County, Massachusetts, Northern Part
Survey Area Data: Version 18, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
52A	Freetown muck, 0 to 1 percent slopes	2.6	12.6%
253B	Hinckley loamy sand, 3 to 8 percent slopes	3.4	16.6%
253C	Hinckley loamy sand, 8 to 15 percent slopes	0.1	0.7%
255B	Windsor loamy sand, 3 to 8 percent slopes	5.5	26.9%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	2.2	10.7%
600	Pits, gravel	3.7	18.1%
651	Udorthents, smoothed	3.0	14.4%
Totals for Area of Interest		**20.6**	**100.0%**

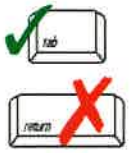
CHAPTER 2: CHECKLIST FOR STORMWATER REPORT

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

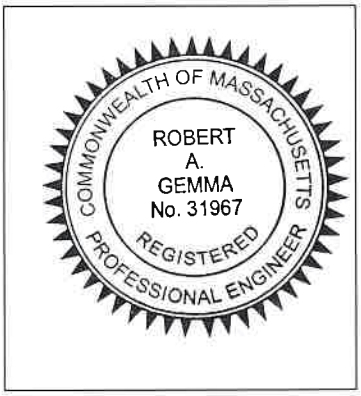
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



11/21/23

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☒ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☒ Other (describe): Subsurface Infiltration System

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

☒ The ½" or (1") Water Quality Volume or

☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☒ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☒ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☒ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

CHAPTER 3: LID MEASURES

Chapter 3:

The proposed redevelopment project will be utilizing various low impact development (LID) approaches to minimize environmental impacts and these LID measures include stormwater management aspects of the project. Stormwater from the project will be managed by one primary technique:

1. Stormwater runoff will be stored and recharged by a subsurface infiltration system

LID measures:

Design of the project has utilized Low Impact Development (LID) techniques to the maximum extent practicable. The following LID approaches have been employed in the design of this project:

Proposed Infiltration System 1

Proposed Infiltration System-1 consists of 50 Shea precast concrete leaching galleys surrounded by two-feet of stone. The infiltration system will collect and infiltrate stormwater runoff from the roof of the building, paved driveway and parking lot. Proposed Infiltration System-1 is located underneath the parking lot, approximately 35-feet west of the proposed car wash facility. Runoff rates and volumes leaving the project site will be significantly reduced for all storm events.

CHAPTER 4: STORMWATER MANAGEMENT STANDARDS 1 & 2

Chapter 4:

Standard 1: No New Untreated Discharges

- No New Untreated Discharges will occur in the post-development condition.
- All discharges off site will be treated using both structural and non-structural Best Management Practices (Stormceptor® Units, deep sump catch basins, etc.) to remove TSS and other pollutants.
- Runoff from proposed impervious areas will be collected and recharged using a subsurface infiltration system, thereby decreasing discharge to the municipal storm sewer system in comparison to pre-development conditions.
- Supporting calculations specified in Volume 3 are attached with the Hydrologic Analysis, Chapter 1.

Standard 2: Peak Rate Attenuation

- The Hydrologic Analysis provided in Chapter 1 demonstrates that no off-site flooding will occur in post-development state during the 100-year 24-hour storm.
- The Hydrologic Analysis provided in Chapter 1, Tables One and Two, demonstrate that the peak runoff rates and total runoff volumes will be reduced in the post-development state up to the 100-year 24-hour storm event.

Table One: Comparison of Pre and Post-Development Peak Runoff Rates Leaving the Project Site at Design Point A

Drainage Basin	2-year storm	10-year storm	25-year storm	100-year storm
E.C.B.-1	2.75 CFS	4.20 CFS	5.45 CFS	7.82 CFS
P.D.B.-1 + Infilt. Sys.-1 Overflow	0.00 CFS	0.46 CFS	3.31 CFS	6.00 CFS
Difference	-2.75 CFS	-3.74 CFS	-2.14 CFS	-1.82 CFS
Difference	(-100%)	(-89%)	(-39%)	(-23%)

Table Two: Comparison of Pre and Post-Development Runoff Volumes Leaving the Project Site at Design Point A

Drainage Basin	2-year storm	10-year storm	25-year storm	100-year storm
E.C.B.-1	9,675 CF	15,170 CF	19,969 CF	29,239 CF
P.D.B.-1 + Infilt. Sys.-1 Overflow	48 CF	356 CF	2,382 CF	7,197 CF
Difference	-9,627 CF	-14,814 CF	-17,587 CF	-22,042 CF
Difference	(-99%)	(-98%)	(-88%)	(-75%)

CHAPTER 5: STORMWATER MANAGEMENT STANDARD 3

Chapter 5:

Standard 3: Recharge

- **The required recharge volume calculations:**
  The required Recharge Volume is based on additional impervious area added to the site. Sandy textures with a NRCS Hydrologic Group rating of A and a Target Depth Factor (F) of 0.60-inch were used. Below is the calculation for the required recharge volume for the entire site:

  Required Recharge Volume
  Rv = (F) x (New Impervious Area)
  Rv = (0.60 inch /12) x (0 square feet)
  Rv = 0 cubic feet.

- The sizing of the infiltration BMP's is based on a "Static Method."
- Runoff from the proposed parking area, drive aisles and roof surfaces on the site are being collected and discharged into the infiltration BMP.

Subsurface Infiltration System 1

System configuration:	50, 4 ft.-long by 4 ft.-wide by 4 ft.-high Shea Precast Concrete Leaching Galleys
Bottom Area	1,163 square feet
Total Storage Volume Available:	3,225 cubic feet or 24,125 gallons
Exfiltration Rate:	8.27 inches per hour
Bottom Exfiltration Capacity:	0.22 C.F.S.

Recharge Volumes from Hydrologic Analysis, Chapter 1.

Proposed Infiltration System 1

2-Year Recharge Volume = 5,335 cubic feet
10-Year Recharge Volume = 9,531 cubic feet
25-Year Recharge Volume = 11,701 cubic feet
100-Year Recharge Volume = 15,353 cubic feet

- A more detailed analysis of the storage and infiltration capacities for the proposed infiltration system can be found in the Hydrologic Analysis, Chapter 1.
- Below are the calculations showing that the Infiltration BMP will drain within 72 hours based on a modified required recharge volume using the total proposed impervious area.

Subsurface Infiltration System 1 (Based on Rv)*

$$Time_{drawdown} = \frac{(Rv^*)}{(K) \times (\text{Bottom Area})}$$

$$Time_{drawdown} = \frac{(1{,}560 \text{ cubic feet})}{(8.27 \text{ inches/hour})(1 \text{ foot}/ 12 \text{ inches}) \times (1{,}163 \text{ square feet})}$$

$Time_{drawdown}$ = **1.9 hours < 72 hours**

Subsurface Infiltration System 1 (Based on Full System)

$$Time_{drawdown} = \frac{(Rv^*)}{(K) \times (\text{Bottom Area})}$$

$$Time_{drawdown} = \frac{(3{,}225 \text{ cubic feet})}{(8.27 \text{ inches/hour})(1 \text{ foot}/ 12 \text{ inches}) \times (1{,}163 \text{ square feet})}$$

$Time_{drawdown}$ = **4.0 hours < 72 hours**

CHAPTER 6: LONG-TERM POLLUTION PREVENTION PLAN STORMWATER MANAGEMENT STANDARDS 4-6

Chapter 6:

Long-Term Pollution Prevention Plan:

- The Operation and Maintenance Plan from Chapter 9 address all necessary aspects of the Long-Term Pollution Prevention Plan

Standard 4: Water Quality

- Approximately **93%** TSS Removal will be achieved prior to discharging to an infiltration BMP.
- Stormwater runoff to be treated for Water Quality is based on one-inch of runoff due to the post-development condition involving runoff from land use with higher potential pollutant loads and soil infiltration rates greater than 2.4 in/hr.
    - Requirement for Entire Site
      Amount of Runoff to be treated = (1.0 inch) x (impervious area)
      = (1.0 inch)/(1/12) x (32,688 square feet)
      = **2,724 cubic feet**
- Below is TSS Removal calculations for one sub basin on the post-development site:

TSS Treatment Basin 1 (P.D.B.-2)

Driveway Sweeping - **5% (BMP1)**
Deep Sump Catch Basin – **25% (BMP2)**
Stormceptor – **50% (BMP3)**
Infiltration System 1 – **80% (BMP4)**

Driveway & Parking Lot Sweeping:
Average Annual Load (1.00) * BMP1 Removal Rate (0.05) = **0.05**
(0.95 of the TSS load remains)

Deep Sump Catch Basin:
Average Annual Load (0.95) * BMP2 Removal Rate (0.25) = **0.24**
(0.71 of the TSS load remains)

Stormceptor 450:
TSS load remaining (0.71) * BMP3 Removal Rate (0.50) = **0.36**
(0.35 of the TSS load remains)

Infiltration System 1:
TSS load remaining (0.35) * BMP4 Removal Rate (0.80) = **0.28**
(0.07 of the TSS load remains)

Final TSS Removal Rate: 1.00 – 0.07= 0.93 **(93% TSS Removal)**

Chapter 6: (continued)

- Post-development TSS Removal was determined to be **93%**.
- Pretreatment TSS Removal was determined to be **65%** with an assumed TSS removal rate of 50% for the Stormceptor proprietary treatment device satisfying the 44% pretreatment requirement.

Standard 5: Land Use with Higher Potential Pollutant Loads

- The project does include land uses with Higher Potential Pollutant Loads as defined under section 310 CMR 22.20C(2)(m), commercial outdoor washing of vehicles and commercial car washes.
- The property is not located within Zone A of a Surface Water Protection Area or an Outstanding Resource Waters.
- The proposed parking lot and driveway will feature a Stormceptor 450 within the treatment train reducing the risk of stormwater runoff with moderate to higher concentrations of oil and grease from discharging into the infiltration system.
- The project does meet 50% reduction of the average annual load of Total Phosphorus (TP) required from Methuen Stormwater Performance Standard for Redevelopment Sites Section 9(D)(1).
- Total phosphorus loads were calculated based on pre- and post-development conditions as shown below.

Phosphorus Removal Calculations

Total Phosphorus (TP) leaving the site will be reduced in the post-development condition by approximately 1.81 pounds per year as demonstrated in the following calculations.

Baseline Phosphorus Load
Total Site Area = 1.04 acres
Phosphorus Load Export Rate (PLER) = 1.78 lbs./acre year

Baseline Phosphorous Load = 1.04 acres x 1.78 lbs./acre year = 1.85 lbs./year

Proposed Phosphorus Load
Total site area not flowing to infiltration system = 0.02 acres
Phosphorous Load Export Rate (PLER) = 1.78 lbs./acre year

Proposed Phosphorus Load = 0.02 acres x 1.78 lbs./acre year = 0.04 lbs./year
Proposed Phosphorus Load Reduction = 1.81 lbs./year (98% Reduction)

Standard 6: Critical Areas

- The project site is not located within a critical area as defined in MADEP Stormwater Handbook.

CHAPTER 7: STORMWATER MANAGEMENT STANDARD 7

Chapter 7:

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project will result in a reduction in impervious area and, therefore, is considered redevelopment only.
- An approximate 12,592 square feet or 28% reduction of impervious surface will be removed from the project site resulting in a total proposed impervious area of 32,688 square feet.
- The project is compliant with Stormwater Management Policy to the maximum extent practicable.
- All proposed activities will be located within previously developed land.
- The proposed project removes impervious areas and increases the natural buffer around the perimeter of the project site.

CHAPTER 8: CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN STORMWATER MANAGEMENT STANDARD 8

Chapter 8:

Standard 8: Construction Period Prevention Pollution and Erosion and Sedimentation Control Plan

- The project is not required to file for coverage under the NPDES general construction permit as the project will not disturb an acre or more of land.
- See Erosion Control and Sedimental Control Plan in the Proposed Site Plan Set for further details.
- A Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the project and is attached below.

STORMWATER POLLUTION PREVENTION PLAN

for

Proposed Site Redevelopment
171 Pelham Street
Methuen, MA 01844

Prepared for: **Scrub-A-Dub Auto Wash Centers**
172 Worcester Street
Natick, MA 01760

Prepared by: **MetroWest Engineering, Inc.**
75 Franklin Street
Framingham, MA 01702
(508) 626-0063

Original: August, 2023
Revised: November, 2023

Table of Contents

A. Project Name and Location

Name:	Proposed Site Redevelopment
Street:	171 Pelham Street, Methuen, Massachusetts 01844
Landmark:	The project site has frontage along Cross Street and Pelham Street, approximately 60-feet northwest from the intersection of Cross Street and Pelham Street.
Latitude:	42° - 43' – 46" N
Longitude:	71° - 12' – 30" W

B. Property Owners

Donna & Thomas Swerchesky, Et al., Trustees
Swerchesky Family Revocable Living Trust
171 Pelham Street
Methuen, MA 01844

C. Project Engineer

MetroWest Engineering, Inc.
75 Franklin Street
Framingham, MA 01702
(508)-626-0063
Attn: Robert A. Gemma

D. Environmental Consultant

MetroWest Engineering, Inc.
75 Franklin Street
Framingham, MA 01702
(508)-626-0063
Attn: Robert A. Gemma

E. General Contractor

Dixon Inc.
361 West Main Street
Northborough, MA 01532
(508)-393-4411

F. CERTIFICATION OF STORMWATER POLLUTION PREVENTION PLAN

Project: Proposed Site Redevelopment at 171 Pelham Street, Methuen, MA 01844

This certification must be completed by an authorized signatory of each operator (generally the owner and the General Contractor) before the effective date of the Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Date: _____

G. CONTRACTOR/SUB-CONTRACTOR CERTIFICATION

Project: Proposed Site Redevelopment at 171 Pelham Street, Methuen, MA 01844

This Certification is to be completed by the General Contractor and each Sub-Contractor involved in any on-site activities related to the construction.

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Date: _____

H. SUB-CONTRACTOR NAMES AND ADDRESSES

The following list includes all subcontractors working on the project site at any time. The general contractor and all subcontractors must sign the certification included in Section G., page 3.

Subcontractor:

Subcontractor:

Subcontractor:

Subcontractor:

Subcontractor:

I. Project Description

The scope of work for this project is comprised of demolishing the existing restaurant and parking lot followed by the construction of a car wash facility, parking lot with vacuum stalls, water reclamation system, stormwater management system, supporting utilities, hardscape and landscaped areas.

The proposed car wash facility has a footprint of approximately 4,575 square feet and will be located in the center of the lot. Traffic will enter the property from the Pelham Street curb cut and be directed right, along the front of the building, to Point of Sale (P.O.S.) stations covered by a roof canopy. Once sale transactions have been completed, traffic is directed to the car wash entrance located on the north side of the facility. A 13-foot-wide escape lane is also provided between the car wash entrance and the parking area for vehicles to bypass the car wash tunnel entrance in case of an emergency. Traffic will exit the car wash facility on the south side of the building. Cars can either turn left to exit the site on to Pelham Street or turn right towards a paved parking area. The paved parking area will contain 15 vacuum stalls for interior car cleaning. All traffic that enters the parking area will be directed to either the right turn only exit going westbound on Pelham Street or the exit driveway on Cross Street.

The proposed car wash facility will feature an underground water reclamation system that will collect, filter and recycle wastewater from the car wash process. The recycling system will reduce water consumption from the city water system and wastewater discharge into the city sewer system.

J. Total Site Area and Disturbed Area

Total site area is 1.10±-acres
Existing impervious area is approximately 1.04-acres
Proposed impervious area is approximately 0.72-acres
Total site reduction in impervious area is approximately 0.32-acres
Total area to be disturbed is approximately 1.10-acres (includes building, driveway, parking lot and stormwater management system; infiltration system).

K. Surrounding Developments

The project has frontage along Cross Street to the east and Pelham Street to the south. The site is also bounded by a commercial car dealership along the northern and western property lines.

L. Soil Description

According to the Natural Resources Conservation Service (NRCS) Soil Survey, soils on and around the site belong to the Hinckley Loamy Sand (253B), Windsor Loamy Sand (255B), Pits, Gravel (600) and Udorthents, Smoothed (651) soil series. The soil series, except the Pits, Gravel soil series, have a defined hydrologic soil group rating of "A". For this project, Pits,

Gravel soil series was given a hydrologic soil group of "A" to perform the hydrologic analysis.

An onsite soil evaluation program consisting of one deep test hole, DTH-1, was performed by MetroWest Engineering on June 5, 2023. DTH-1 was excavated approximately seven-feet north of the existing parking lot in the northeast corner of the property. DTH-1 contained fill, A and B soil horizons to an approximate depth of 2.5-feet below ground surface. C horizons consisted of sand to a depth of 13-feet below ground surface. No redoximorphic features were observed in DTH-1.

M. Runoff Coefficient

The pre-construction average or composite curve number, based on S.C.S TR-55 Methodology, is 94.5.

N. Site Map and Plans

Complete project site plans are attached to this SWPPP.

O. Receiving Water

No direct discharge will occur into any nearby bodies of water.

P. Extent of Wetland Resource Areas

The project site contains nor abuts any Wetland Resource Areas.

Q. Sequence of Major Activities

1. The project is scheduled to begin February 2024.
2. Demolition of the existing building to begin March 2024
3. Construction of the new facility & site work will begin in June 2024.
4. All construction & site work will be completed by March 2025.

R. Construction Sequence

1. **Erosion Control**
   An erosion control barrier consisting of either Filter Mitt mulch tubes, hay bales and/or silt fence will be placed at the limit of work around the majority of the parcel as needed and in any sensitive areas.

2. **Site Access**
   Site access, for construction equipment, will be made from an existing driveway. An erosion control barrier or chain-linked fence to the work area shall be removed at the start of each workday and replaced at the end of each workday. The erosion control barriers will be in place during periods of inclement weather and when so directed by

the Environmental Consultant. The barriers will remain in place during all non-work periods until the site has been deemed to be stable by the Environmental Consultant.

3. **Construction Staging**
   A construction staging area will be established on the site in the northern and western portions of the property. All construction materials, supplies, trailers and offices, portable toilets, and equipment shall be stored within the limits of the staging area. Construction fence and/or erosion control barriers shall demarcate the limits of the staging area.

4. **Site Work**
   Site work, including excavation for the car wash facility, stormwater drainage system, utilities and finish grading may commence only when the site is stable from erosion and all required control measures are in place and functional. Site work during wet periods should be avoided if possible and limited to only those areas that will not have adverse impacts on wetland resource areas or abutting properties.

5. **Additional Detail**
   N/A

S. Pollution Prevention Measures

1. Before, during and after construction, functional erosion and sedimentation controls shall be implemented to prevent the silting of abutting, down-gradient properties and roads. Siltation controls shall be properly maintained and are not to be removed until so approved by the Environmental Consultant. Other controls shall be added as warranted during construction to protect the environmentally sensitive areas. Sufficient extra materials (e.g. siltation fencing and other control materials) shall be stored on site for emergencies.

2. Casting of excavated materials shall be stored away from any sensitive land areas.

3. Any stockpiling of loose materials shall be properly stabilized to prevent erosion and siltation. Preventive controls such as silt fencing, filter mitt mulch tubes, hay bales or jute covering shall be implemented to prevent such an occurrence. Any stockpiling of soil, sand or similar materials within a wetland buffer zone or resource area requires approval from the Conservation Commission or its Administrator and be enclosed within a line of entrenched and staked erosion control socks or silt fence.

4. There shall be no flooding, ponding, or flood related damage caused by the project or surface run-off emanating from the project on lands of an abutter, nearby or down-gradient properties.

5. All surface discharge shall meet the water quality standards for the Mass. Division of Water Pollution Control for Class "B" Water.

6. Proper landscaping of embankments and run-off areas (that is, the use of grass, vegetation, shrubbery, and crushed stone) shall be implemented before the project is completed.

7. Finish grades shall be no steeper than a slope of 2 horizontal to 1 vertical.

8. There shall be no contaminant migration caused by the project to nearby and down-gradient properties, nearby aquifers, wetlands and nearby wells.

9. The use of salt and sand on paved surfaces shall be kept to an absolute minimum during the winter months.

10. The applicant shall make sufficient provisions to control any unexpected drainage and erosion conditions that may rise during construction that may create damage to abutting properties and wetland areas. Said control measures are to be implemented at once and the Environmental Consultant shall be notified in writing.

11. During construction flood prevention, erosion, and sedimentation controls shall be in place before the natural ground cover is disturbed. Said controls shall be in place prior to other construction work and shall be monitored and approved by the Environmental Consultant before other work is commenced. They shall be properly maintained and are not to be removed until so approved by the Environmental Consultant.

12. The applicant shall designate a person or persons to inspect and supervise the drainage and erosion controls for the project and the Environmental Consultant shall be notified as to the means to contact said individual or individuals on a 24-hour basis on all working and non-working days of the project. Said means of contact shall include the telephone number of said designated person or persons.

13. There shall be periodic inspection of the fabric fencing and other controls by the applicant's designee to assure their continued effectiveness.

14. The Conservation Commission and the Department of Public Works conditions of approval shall be included as part of the contracts and subcontracts and shall be posted in the supervisory office on-site.

15. Any changes in the construction plans must be submitted in writing in advance for approval by the Project Engineer.

16. Upon completion of this project, the Project Engineer shall certify that the work completed conforms to the plans as submitted. Certification must include registered engineer's stamp. In addition, an as-built plan shall be submitted to the Conservation Commission and Department of Public Works for approval prior to the issuance of a Certificate of Compliance.

17. Upon completion of the project, the permanent functional erosion, sedimentation, and flood control measures that are installed according to the presented plans and specifications submitted and revised shall be maintained in perpetuity.

18. Upon completion of the project, the contractor shall clean all deep sump catch basins to remove any silt and sediment.

T. Other Control Measures

Off-site Vehicle Tracking. A stabilized construction entrance will be provided to help reduce vehicle tracking of sediments. The paved streets adjacent to the site shall be swept or scraped weekly, or as needed, to remove any excess mud, dirt, or rock tracked from the construction area. A source of fresh water for washing sediment from trucks, especially during periods of wet weather, may be provided in order to minimize the amount of street sweeping and scraping required. Any wash water resulting from this operation will be directed into a sediment trap.

Waste Materials. All trash and construction debris from the site will be hauled to an approved landfill. No construction waste material will be buried on the site. All personnel will receive instructions regarding the correct procedure for waste disposal. Notices describing these practices will be posted in the construction office. The site superintendent will be responsible for seeing that these procedures are followed. Employee waste and other loose materials will be collected so as to prevent the release of floatables during runoff events.

Hazardous Waste. No hazardous waste is expected to be generated or encountered in this project. In the event that hazardous waste is encountered, all hazardous waste materials will be disposed of in the manner specified by local or state regulation or by the manufacturer. The site superintendent will be responsible for seeing that these practices are followed.

Sanitary Waste. Portable sanitary units will be provided for use by all workers throughout the life of the project. A licensed sanitary waste management contractor will regularly collect all sanitary waste from the portable units.

U. Maintenance

To maintain the erosion and sediment controls, the following procedures will be performed:

- **Sediment Capture Devices:** Sediment will be removed from the upstream or upslope side of the filter fabric fences, straw bale barriers, siltation basins, diversion trenches, or other devices, when the depth of accumulated sediment reaches about one-third the height of the structure or device.

- **Storm Sewer Inlets:** Silt sacks shall be placed in catch basins inlets. Any sediment in the storm sewer inlets will be removed and disposed of properly.

- **Temporary Controls:** All temporary controls will be maintained until final site stabilization and landscaping is complete, and the Environmental Consultant approves removal.

Sediment that is removed from structural barriers; either will be hauled off the site and disposed of properly or will be used as backfill. Sediment temporarily stockpiled on site will be placed in such areas and in such manner as to minimize erosion of sediments back into the local drainage system. Berms, filter fabric fencing, straw bale barriers, and polyethylene or polypropylene covers are measures that may be utilized in minimizing erosion of stockpiled sediment.

V. Inspection Procedures

Inspections will be conducted by the responsible person(s) at least once every 7 calendar days and within 24-hrs after each storm event producing 0.5 inch of rainfall or greater. Areas that have been reseeded will be inspected regularly after seed germination to ensure complete coverage of exposed areas.

The contractor will designate a qualified person or persons to perform the following inspections:

- **Stabilization Measures:** Disturbed areas and other areas used for storage of materials that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system. After a portion of the site is finally stabilized, inspections will be conducted at least once every month throughout the life of the project. Form 1 shows the inspection form to be used for stabilization measures.

- **Structural Controls:** Filter fabric fences, straw bale barriers, and all other erosion and sediment control measures identified in the plan will be inspected regularly for proper positioning, anchoring, and effectiveness in trapping sediments. Sediment will be removed from the upstream or upslope side of the filter fabric. Form 2 shows the inspection form to be used for structural controls.

- **Discharge Points:** Discharge points or locations will be inspected to determine whether erosion control measures are effective in preventing significant amounts of pollutants from entering receiving waters.

- **Construction Entrances:** Locations where vehicles enter or exit the site will be inspected for evidence of off-site sediment tracking.

Form 1 - **INSPECTION REPORT FORM FOR STABILIZATION MEASURES**

INSPECTOR: _____ DATE: _____

Days since last rainfall: _____ Amount of Last Rainfall: _____inches

Area	Date last disturbed	Date of next Disturbance	Stabilized?	Stabilized With	Condition

Stabilization Required:

_____
_____
_____
_____
_____
_____
_____
_____

To be performed by:_____ **On or Before:**_____

Form 2 - **INSPECTION FORM FOR STRUCTURAL CONTROLS**

INSPECTOR: _____ DATE: _____

Days since last rainfall: _____ Amount of Last Rainfall: _____inches

Location of Control	In place?	Condition	Sediment Depth	Washed out or overtopped?

Maintenance Required:

_____
_____
_____
_____
_____
_____
_____
_____

To be performed by:_____ **On or Before:** _____

W. Revisions to the SWPPP

Based on the results of the inspection, the site description and control measures of this pollution prevention plan will be revised as appropriate, but in no case later than 7 calendar days following the inspection. Form 3 shows the form to be used to record necessary changes to the SWPPP.

X. Inspection Report Summary

A report summarizing the scope of each inspection, name(s) and qualifications of personnel making the inspection, date(s) of the inspection, major observations relating to the implementation of the SWPPP, and actions taken to revise the plan will be completed and retained as part of the SWPPP for at least 3 years from the date that the site is finally stabilized. Form 4 shows the form to be used for certification of the inspection report. The report will be signed by one of the following persons:

Owner of the property.

A duly authorized representative of the property owner.

Y. Non-Storm-Water Discharges

It is expected that the following non-storm-water discharges will occur at the site during the construction period:

- **Dewatering discharges:** Water pumped from the construction area during dewatering operations (this may or may not be storm water).
- **Pressure test water:** Water used to pressure-test the potable water system.
- **Disinfectant water:** Water used to disinfect the potable water system.

Dewatering discharges will be done in such a manner as to avoid erosion problems and will pass through a portable sediment tank or temporary siltation basin. No direct discharge to surface waters or wetlands will be permitted.

Form 3 - **REPORT FORM FOR CHANGES IN POLLUTION PREVENTION PLAN**

INSPECTOR:_____ DATE: _____

SUMMARY OF REQUIRED CHANGES:

_____
_____
_____
_____
_____
_____
_____
_____
_____

REASON(S) FOR CHANGES:

_____
_____
_____
_____
_____
_____
_____
_____
_____

INSPECTOR'S SIGNATURE: _____

DATE:_____

Form 4 - **INSPECTION CERTIFICATION FORM**

Project: Proposed Site Redevelopment for 171 Pelham Street, Methuen, MA 01844

This certification must be completed after each inspection to signify that the inspection has been properly completed and the site has been found to be in compliance with the Storm Water Pollution Prevention Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Date: _____

Z. Significant-Materials Inventory

Significant materials expected to be found at the construction site include:

- Lime (trucked onto the site for soil stabilization purposes)
- Concrete mix (trucked onto the site for construction)
- Steel reinforcing bars and related materials
- Lumber
- Diesel and Gasoline fuel and lubricating oils
- Pre-cast concrete structures
- Ductile iron pipe
- Steel pipe
- Paints
- Fertilizers
- Plastic and p.v.c. pipe
- Earth materials, stone and aggregate
- Asphalt
- Cements and adhesives
- Waterproofing tar
- Block, brick and masonry materials
- Fiberglass and foam insulation
- Propane fuel for space heaters
- Acetylene fuel for welding

This list of significant materials may be reduced or expanded once a contractor has been chosen and the materials to be used have been specified. If fewer or additional materials are required, the SWPPP will be amended to reflect these changes.

AA. Spill Prevention and Response Procedures

Spill prevention and response include good housekeeping as well as specific practices for certain products and established procedures for responding to spills.

Good Housekeeping

The following good housekeeping practices will be followed onsite during the construction project.

- **Minimize materials:** An effort will be made to store only enough material required to do the job.

- **Storage:** All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible,

the materials will be covered with polyethylene or polypropylene sheeting to protect them from the elements.

- **Labeling:** Products will be kept in their original containers with the original manufacturer's label affixed to each container.

- **Mixing:** Substances will not be mixed with one another unless this is recommended by the manufacturer.

- **Disposal:** Whenever possible, all of a product's contents will be used prior to disposal of the container. The manufacturer's recommendations for proper use and disposal will be followed.

- **Inspections:** The site superintendent will inspect the site daily to ensure proper use and disposal of materials onsite.

- **Spoil materials:** Any excavated earth that will not be used for fill material and all demolished pavements will be hauled off site immediately and will be disposed of properly.

Product-Specific Practices

- **Petroleum Products.** All on-site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. If petroleum products are present at the site, they will be stored in tightly sealed containers that are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

- **Concrete Trucks.** Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water at the site.

- **Paints.** All containers will be tightly sealed and stored when not required for use. Excess paint will not be poured into the storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

- **Fertilizers.** Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. The fertilizer will be stored in a covered area, and any partially used bags will be transferred to a sealable plastic bin to avoid spills. No fertilizers are to be applied within the wetland buffer zone or resources areas.

Spill Control and Response Practices

A spill prevention and response team will be designated by the owner or the site superintendent. In addition, the following practices will be followed for spill cleanup:

- **Information:** Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and location of the information and cleanup supplies.

- **Equipment:** Materials and equipment necessary for spill cleanup will be present on the site at all times. Equipment and materials will include but not be limited to brooms, shovels, rags, gloves, goggles, absorbent materials (sand, sawdust, etc.) and plastic or metal trash containers specifically designed for this purpose. The materials and equipment necessary for spill cleanup will be dependent upon the nature and quantity of the material stored on site.

- **Response:** All spills will be cleaned up immediately upon discovery.

- **Safety:** The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.

- **Reporting:** Spills of toxic of hazardous material (if present on site) will be reported to the appropriate state or local government agency, regardless of the spills size.

- **Record Keeping:** The spill prevention plan will be modified to include measures to prevent this type of spill from recurring as well as improved methods for cleaning up any future spills. A description of each spill, what caused it, and the cleanup measures used will be kept with the plan.

BB. Plan Location and Public Access

The SWPPP is not submitted to the EPA for review unless requested. The SWPPP must be available at the construction site from the date of project initiation to the date of final stabilization. The SWPPP and all reports required by the permit must be retained for at least 3 years front he date on which the site is finally stabilized.

Despite the fact that the SWPPP and associated reports are not necessarily required to be submitted with the Notice of Intent, these documents are considered to be reports according to section 308(b) of the Clean Water Act and therefore are available to the public. The permittee, however, may claim certain parts of the SWPPP as confidential according to regulations in 40 CFR part 2. These regulations state that records that contain trade secrets may be claimed as confidential.

The SWPPP shall also be at the offices of the Environmental Consultant, MetroWest Engineering, Inc (75 Franklin Street, Framingham, MA 01702).

APPENDIX A: PERMIT REQUIREMENTS

NPDES FORM 3510-9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460
NOTICE OF INTENT (NOI) FOR THE 2022 NPDES CONSTRUCTION PERMIT

FORM Approved OMB No. 2040-0305

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

Permit Information

NPDES ID: MAR1004S0

State/Territory to which your project/site is discharging: MA

Is your project/site located on federally recognized Indian Country lands? No

Are you requesting coverage under this NOI as a *"Federal Operator"* or a *"Federal Facility"* as defined in Appendix A (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-a-definitions.pdf)?

No

Have stormwater discharges from your current construction site been covered previously under an NPDES permit? No

Will you use polymers, flocculants, or other treatment chemicals at your construction site? No

Has a Stormwater Pollution Prevention Plan (SWPPP) been prepared in advance of filling this NOI, as required? Yes

Are you able to demonstrate that you meet one of the criteria listed in Appendix D (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-d-endangered-species-protection.pdf) with respect to protection of threatened or endangered species listed under the Endangered Species Act (ESA) and federally designated critical habitat?

Yes

Have you completed the screening process in Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf) relating to the protection of historic properties?

Yes

Indicating "Yes" below, I confirm that I understand that CGP only authorized the allowable stormwater discharges in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), during an Inspection, etc. If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must be covered under another NPDES permit.

Yes

Operator Information

Operator Information

Operator Name: Scrubadub Auto Wash Centers

Operator Mailing Address:

Address Line 1: 172 Worcester Street

Address Line 2:

City: Natick

ZIP/Postal Code: 01760

State: MA

County or Similar Division: Middlesex

Country: US

Operator Point of Contact Information

First Name Middle Initial Last Name: Danny Paisner

Title: President

Email: ccantin@mwengineering.com

NOI Preparer Information

☑ **This NOI is being prepared by someone other than the certifier.**

First Name **Middle Initial** **Last Name:** Christopher Cantin

Organization: MetroWest Engineering, Inc.

Phone: 508-626-0063 **Ext.:** 101

Email: ccantin@mwengineering.com

Project/Site Information

Project/Site Name: Scrubadub - Pelham, Methuen

Project/Site Address

Address Line 1: 171 Pelham Street

Address Line 2:

City: Methuen

ZIP/Postal Code: 01844

State: MA

County or Similar Division: Essex

Latitude/Longitude: 42.729244°N, 71.208244°W

Latitude/Longitude Data Source: Map

Horizontal Reference Datum: WGS 84

Project Start Date: 10/23/2023 **Project End Date:** 10/28/2024 **Estimated Area to be Disturbed:** 1.25

Types of Construction Sites:

- Commercial

Will there be demolition of any structure built or renovated before January 1, 1980? Yes

➔ **Do any of the structures being demolished have at least 10,000 square feet of floor space?** No

Will you be discharging dewatering water from your site? No

Was the pre-development land use used for agriculture? No

Are there other operators that are covered under this permit for the same project site? No

Have earth-disturbing activities commenced on your project/site? No

Is your project/site located on federally recognized Indian Country lands? No

Is your project/site located on a property of religious or cultural significance to an Indian tribe? No

Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? Yes

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? No

Are any of the waters of the U.S. to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? See Resources, Tools and Templates (https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates)

No

001: Subsurface Infiltration System

Latitude/Longitude:

Tier Designation: N/A

Is this receiving water impaired (on the CWA 303(d) list)? No

Has a TMDL been completed for this receiving waterbody? No

Stormwater Pollution Prevention Plan (SWPPP)

Will all required personnel, including those conducting inspections at your site, meet the training requirements in Part 6 of this permit? Yes

First Name Middle Initial Last Name: Christopher Cantin

Title: Project Engineer

Phone: 508-626-0063 **Ext.:** 101

Email: ccantin@mwengineering.com

Endangered Species Protection Worksheet: Criterion A

Determine ESA Eligibility Criterion

Are your discharges and discharge-related activities already addressed in another operator's valid certification of eligibility for your "action area" under the current 2022 CGP?

No

Has consultation between you, a Federal Agency, and the USFWS and/or the NMFS under section 7 of the Endangered Species Act (ESA) concluded?

Yes

Are your construction activities the subject of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat?

No

You must determine whether species listed as either threatened or endangered, or their critical habitat(s) are located in your site's action area (i.e., all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action, including areas beyond the footprint of the site that are likely to be affected by stormwater discharges, discharge-related activities, and authorized non-stormwater discharges).

Determine your Action Area

You must consider the following in determining the action area for your site, and **confirm that all the following are true**:

- **In determining my "action area", I have considered that discharges of pollutants into downstream areas can expand the action area well beyond the footprint of my site and the discharge point(s). I have taken into account the controls I will be implementing to minimize pollutants and the receiving waterbody characteristics (e.g., perennial, intermittent, ephemeral) in determining the extent of physical, chemical, and/or biotic effects of the discharges. I confirm that all receiving waterbodies that could receive pollutants from my site are included in my action area.**

  True

- **In determining my "action area", I have considered that discharge-related activities must also be accounted for in determining my action area. I understand that discharge-related activities are any activities that cause, contribute to, or result in stormwater and authorized non-stormwater point source discharges, and measures such as the siting, construction timing, and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged. I understand that any new or modified stormwater controls that will have noise or other similar effects, and any disturbances associated with construction of controls, are part of my action area.**

  True

Determine is ESA-listed species and/or critical habitat are in your site action area.

critical habitat lists from both federal agencies.

National Marine Fisheries Service (NMFS)

For NMFS species and designated critical habitat information, use the following webpage:

- https://www.epa.gov/npdes/construction-general-permit-cgp-threatened-and-endangered-species-eligibility (https://www.epa.gov/npdes/construction-general-permit-cgp-threatened-and-endangered-species-eligibility)

I have checked the webpage listed above and confirmed that:

- There are no NMFS-protected species and/or designated critical habitat in my action area.
- There are NMFS-protected species and/or designated critical habitat in my action area.

U.S. Fish and Wildlife Service (USFWS)

For USFWS species and critical habitat information, use the following webpage:

- https://www.epa.gov/npdes/construction-general-permit-cgp-threatened-and-endangered-species-eligibility (https://www.epa.gov/npdes/construction-general-permit-cgp-threatened-and-endangered-species-eligibility)

I have checked the webpage listed above and confirmed that:

- There are no FWS-protected species and/or designated critical habitat in my action area.
- There are FWS-protected species and/or designated critical habitat in my action area.

You are eligible under **Criterion A**.

Identify the USFWS information sources used (Note: state resources are not acceptable):

No ESAs or critical habitats are located within the project area.

Identify the NMFS information sources used (Note: state resources are not acceptable):

No ESAs or critical habitats are located within the project area.

You must attach:

- Aerial image(s) of the site.
- A printout of the species' list(s) showing no ESA-listed species or designated critical habitat in my action area.

Name	Uploaded Date	Size
Ariel.jpg (attachment/1719062)	08/11/2023	24.98 KB
IPaC_ Explore Location resources.pdf (attachment/1719051)	08/11/2023	652.07 KB
ipac.jpg (attachment/1719050)	08/11/2023	52.34 KB

Have you attached aerial image(s) of the site? Yes

Have you attached a printout of the species' list(s) showing no ESA-listed species or designated critical habitat in my action area? Yes

Have you provided documentation in your SWPPP supporting your eligibility under Criterion A? Yes

Historic Preservation

Are you installing any stormwater controls as described in Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf) that require subsurface earth disturbances? (Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf), Step 1)

Yes

- **Have prior surveys or evaluations conducted on the site already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E (https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-e-historic-properties.pdf), Step 2):**

  Yes

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Signing an electronic document on behalf of another person is subject to criminal, civil, administrative, or other lawful action.

Certified By: Christopher J. Cantin

Certifier Title: Project Engineer

Certifier Email: ccantin@mwengineering.com

Certified On: 08/11/2023 12:15 PM ET

IPaC **U.S. Fish & Wildlife Service**

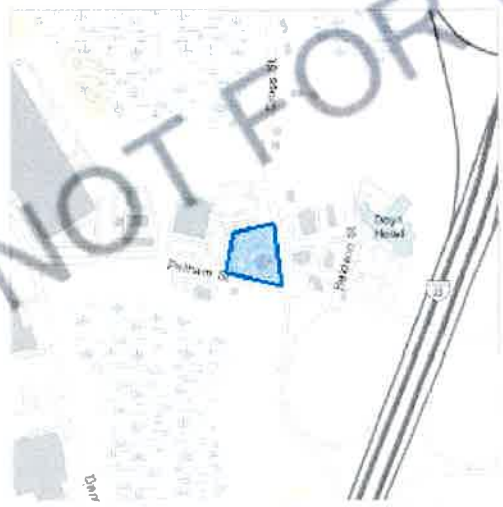
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Essex County, Massachusetts



Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300

Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found **No critical habitat has been designated for this species.** https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list,click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted

Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

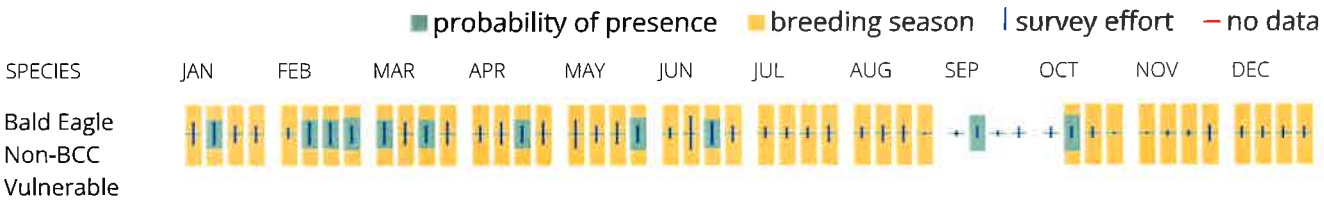
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project

intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-

measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Blue-winged Warbler Vermivora pinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

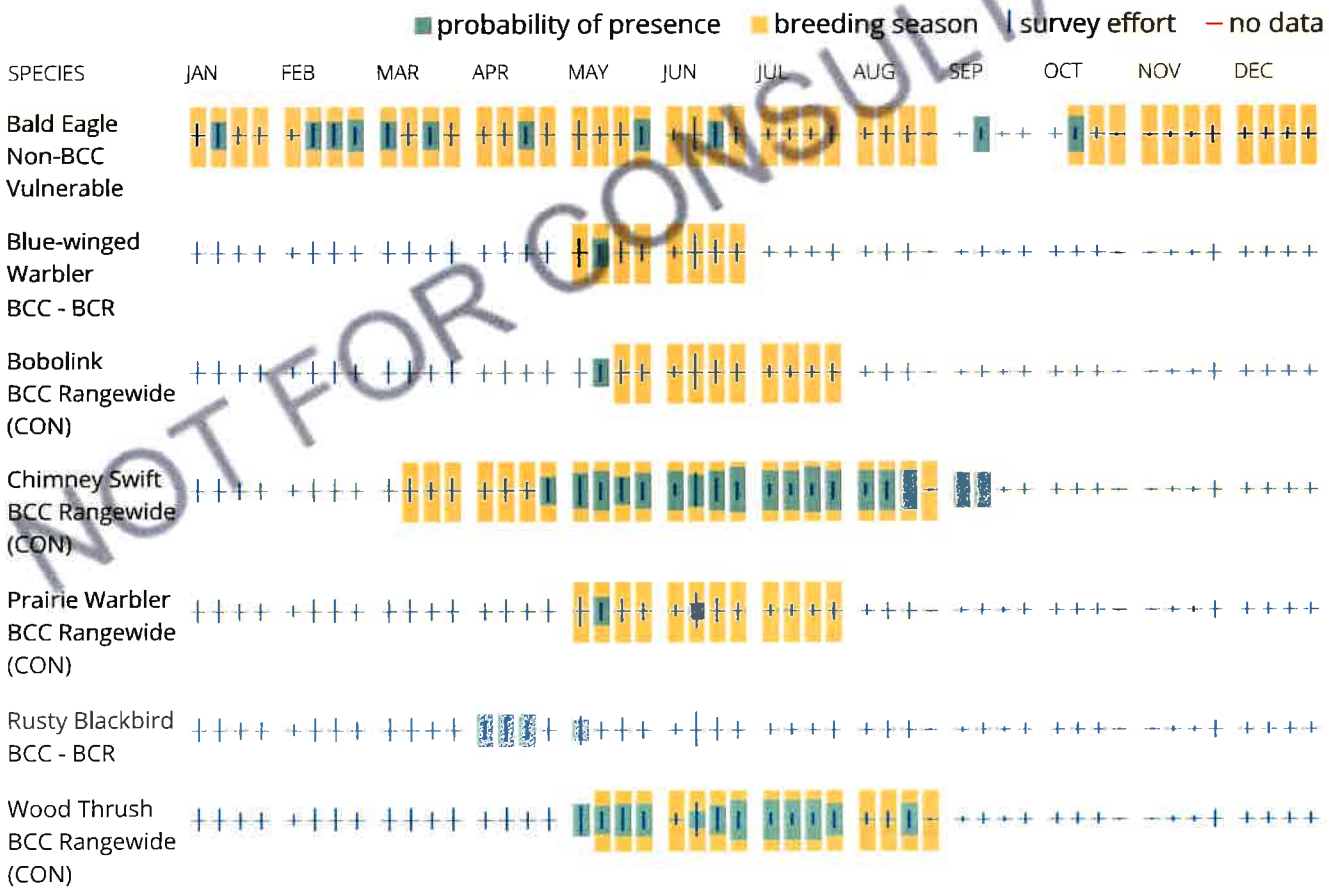
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX B: EMERGENCY & INSPECTION INFORMATION
Emergency Contact Sheet

Form 1. Emergency Contact Numbers

City of Methuen Fire Department	
Emergency	911
Business	(978) 983-8940
City of Methuen Police Department	
Emergency	911
Business	(978) 983-8698
Massachusetts Department of Environmental Protection	
Northeast Regional Office	(978) 694-3200
City of Methuen Conservation Commission	(978) 983-8650
City of Methuen Inspections Division	(978) 983-8625
City of Methuen Engineering Division	(978) 983-8550
National Response Center	1-800-424-8802
US EPA	1-888-372-7341

CHAPTER 9: OPERATION AND MAINTENANCE PLAN STORMWATER MANAGEMENT STANDARD 9

Chapter 9:

Standard 9: Operation and Maintenance Plan

- An Operation and Maintenance Plan has been developed for this project and is attached below.

Stormwater Operation and Maintenance Plan:
Proposed Site Redevelopment
171 Pelham Street, Methuen MA

Prepared for: ***Scrub-A-Dub Auto Wash Centers***
172 Worcester Street
Natick, MA 01760

Prepared by: ***MetroWest Engineering, Inc.***
75 Franklin Street
Framingham, MA 01702
(508) 626-0063

August, 2023

Table of Contents

Stormwater Operation and Maintenance Plan
Scrub-A-Dub, 171 Pelham Street, Methuen MA
Prepared By: MetroWest Engineering Inc.

Introduction

The purpose of this Stormwater Operation and Maintenance Plan is to inform and instill long-term maintenance practices to maintain the property located at 171 Pelham Street in Methuen, Massachusetts.

Existing Conditions

The subject property, shown as Methuen Assessors' Map 512, Block 126B, Lot 1, contains approximately 47,763 square feet (1.1-acres) of land, and is located at the corner of Cross Street and Pelham Street. The property is bounded by Cross Street to the east, Pelham Street to the south and Dan O'Brien Car Dealership along the northern and western boundary lines. The site is presently improved with a one-story restaurant & pub building, paved parking lot, freestanding sign, outdoor dining area and supporting utilities. The project site is not located within any jurisdictional wetland resource areas or buffer zones.

Site Redevelopment

The scope of work for this project is comprised of demolishing the existing restaurant and parking lot followed by the construction of a car wash facility, parking lot with vacuum stalls, water reclamation system, stormwater management system, supporting utilities, hardscape and landscaped areas.

Drainage Approach

The property presently has no stormwater controls in place to manage stormwater runoff rates, volumes, or stormwater quality leaving the property. Stormwater runoff leaving the site flows towards a municipal storm sewer catch basin located in the southeastern corner of the property. A new stormwater management system has been designed for this project to collect and treat stormwater runoff, reduce runoff rates and volumes for all design storms compared to the existing conditions and promote groundwater recharge through the use of a subsurface infiltration system, a Low Impact Development (LID) technique. The proposed stormwater management system consists of roof gutters, downspouts, trench drains, deep-sump catch basins, drainage pipes, manholes, proprietary treatment devices and a subsurface infiltration system. The system has been designed in compliance with MADEP Stormwater Management Standards.

Subsurface Infiltration System

The proposed infiltration system is located underneath the parking lot, approximately 35-feet west of the proposed car wash facility. The infiltration system consists of 50 Shea precast concrete leaching galleys that will be surrounded by two-feet of double-washed stone.

Stormwater runoff is collected from the roof of the car wash building, paved driveway and parking lot through the use of roof gutters, downspouts, trench drains and deep-sump catch basins. Runoff will then be routed through a series of drainage pipes, manholes and proprietary devices (Stormceptor) prior to discharging into the infiltration system. The proposed infiltration system is designed to reduce peak runoff rates and volumes leaving the project site for all storm events. The location, purpose and durability of the infiltration system offers numerous benefits to the project. No disturbance to the natural vegetation will be required, as the infiltration system's location is within a previously disturbed area and located underneath the proposed parking lot.

For optimal performance, the stormwater management system will require periodic inspection and maintenance.

Maintenance Requirements

The project's stormwater collection and treatment system is designed to collect and treat stormwater so that all discharges from the system are in compliance with all local, state and federal environmental regulations. Periodic routine inspection and maintenance of the system is critical if the system is to continue to meet required performance standards.

Responsible Party

The property owner **shall** be responsible for all maintenance and repair activities throughout the site relating to the grounds, pavement surface, stormwater collection system and infiltration system. Contact information for the owner/responsible party is listed below:

Owner/Responsible Party
Scrubadub Auto Wash Centers
172 Worcester Street
Natick, MA 01760

If ownership of the subject property changes, the new owner shall become the responsible party. This Operation and Maintenance Plan shall run with the land.

The owner/responsible party shall be responsible for the implementation of this Operation and Maintenance Plan and the proper training of employees to ensure compliance with all daily and long-term aspects of the plan.

Required Maintenance

Grounds

All slopes shall be inspected weekly and any exposed areas or other locations susceptible to erosion shall be stabilized with mulch, sod, seed, stone or other suitable measures. All litter and trash shall be picked up and removed from all paved, landscaped and wooded areas on a regular basis. All grass clippings, leaves, brush and other natural materials will be transported to an

approved composting facility. No clippings or leaves will be deposited in wooded areas or on abutting properties.

Fertilizers and pesticides shall be applied in accordance with manufacturer's instructions and all applicable local and state regulations. They shall be applied sparingly by trained personnel.

BMP1 - Parking Area

The driveway and parking areas shall be vacuum swept monthly. All sediment removed shall be disposed of in accordance with DEP policy and requirements for the disposal of road sediments.

During winter months the use of de-icing compounds shall be kept to a minimum.

Untreated sand shall be used to the minimum extent necessary to provide tire traction. During extreme events sand treated with a non-sodium de-icer may be used.

BMP 2 - Catch Basins

All catch basins shall include a deep sump and an MDC type oil/water separation hood. Catch basin sumps shall be cleaned twice per year, once in the spring and again in the fall. Catch basins may be cleaned with either clamshell bucket or by vacuum truck. Pipe inlets, outlets and MDC hoods shall be inspected at the time of the sump cleaning and shall be immediately repaired as necessary. All sediment removed shall be disposed of in accordance with DEP policy and requirements for the disposal of road sediments.

BMP 3 - Stormceptor Model 450 Treatment Systems

The Stormceptor Model 450 systems shall be cleaned twice per year. A vacuum truck shall remove sediment and oil from the sump and dispose of the sediment in accordance with the current standards and requirements of MADEP. Refer to the attached maintenance procedures provided by Rinker Industries.

BMP 4 – Subsurface Infiltration System

The subsurface infiltration systems shall be inspected twice per year to evaluate sediment accumulation and once per year during a storm event. Routine inspection for sediment accumulation shall consist of the inspection of each chamber where an inspection port is located. Any sediment that has entered the system at the inlet locations shall be removed and disposed of in accordance with MADEP policy.

The systems shall also be observed at least once per year during a major storm event. A major storm event shall be defined for this Operation and Maintenance Plan as one in which the 24-hour rainfall volume exceeds one-inch. The inspection shall include the removal of an inspection port cover to measure the water depth inside the systems. The inspection should take place after at least one-inch of rainfall has fallen and prior to the end of storm. Following the inspection, the precipitation volume, based upon the nearest reporting weather station, should be recorded in the inspection logbook.

Snow Removal

Snow shall be removed from all drain inlets immediately after a snow event to prevent the accumulation of ice in parking areas. De-icing material shall consist of sand mixed with a non-sodium based de-icing agent.

Storage and Use of Chemicals

Chemical storage on the site shall be limited and all chemicals stored on site shall be done in accordance with the manufacturer's recommendations and all applicable local and state regulations.

Hazardous Waste

All hazardous waste materials shall be stored and disposed of in accordance with all applicable local and state regulations. In the event of an accident or spill involving and/or other hazardous materials the facilities manager shall contact a hazardous waste removal contractor and immediately notify local and state regulatory agencies.

There shall be no illicit discharges into the stormwater management system.

Waste Storage and Handling

All waste material shall be stored in a covered metal dumpster provided by a solid waste management company licensed in the City of Methuen and the Commonwealth of Massachusetts. The dumpster shall be emptied on a regular basis or when full. Loose trash around the site and near the dumpster shall be picked up on a weekly basis.

Recommended Personnel

A commercial contractor should be engaged to perform the periodic cleaning and inspections required for the drainage systems. A landscape contractor may perform gutter cleaning.

A professional engineer with expertise in drainage systems, hydrology or similar sciences should perform an annual inspection of the infiltration system and should evaluate the drainage system during a major storm event.

Record Keeping

A logbook or other record should be maintained for all inspection, cleaning and maintenance activities. The logs or records should be provided to the drainage professional engaged to perform the annual inspection of the drainage system and infiltration system. An annual report should be prepared by the drainage professional to summarize inspection and maintenance activities, review the performance of the infiltration system, and provide recommendations for

repair or remedial measures required to maintain the performance of the system. The annual report should be submitted to the property owner and operator and kept on site.

Emergency Contacts

In the event of a major drainage system failure, a release of dangerous materials or other unforeseen accident, the following organizations may be contacted:

City of Methuen Inspections Division
(978) 983-8625

City of Methuen Economic & Community Development
(978) 983-8560

City of Methuen Fire Department
(978) 983-8940

City of Methuen Engineering Department
(978) 983-8550

MetroWest Engineering, Inc. (Design Engineer)
(508) 626-0063

Form 1 - *INSPECTION REPORT FORM FOR STABILIZATION MEASURES*

INSPECTOR: _____ DATE: _____

Days since last rainfall: _____ Amount of Last Rainfall: _____inches

Area	Date last disturbed	Date of next Disturbance	Stabilized?	Stabilized With	Condition

Comments and Stabilization Required:

_____
_____
_____
_____
_____
_____
_____
_____

To be performed by:_____ **On or Before:** _____

Form 2 - *INSPECTION FORM FOR DRAIN CATCH BASIN (D.C.B.)*
Ongoing Maintenance

STRUCTURE NUMBER: _____
INSPECTOR: _____
DATE: _____
Days since last rainfall: _____ Amount of Last Rainfall: _____inches

Structure Number	Rim Elev.	Sediment Depth	Condition	Date and Description of Cleaning

Comments and Maintenance Required:

_____
_____
_____
_____
_____
_____
_____
_____

To be performed by:_____ **On or Before:** _____

Form 3 - *INSPECTION FORM FOR STORMCEPTOR INLET UNIT*
StormCeptor STC-450 Ongoing Maintenance

STRUCTURE NUMBER: _____
INSPECTOR: _____
DATE: _____
Days since last rainfall: _____
Amount of Last Rainfall: _____inches

Structure Number	Rim Elev.	Sediment Depth	Condition	Date and Description of Cleaning

Comments and Maintenance Required:

_____
_____
_____
_____
_____
_____
_____
_____

To be performed by:_____ **On or Before:** _____

Form 4 - *INSPECTION FORM FOR INFILTRATION SYSTEM 1*

Ongoing Maintenance

STRUCTURE NUMBER: _____
INSPECTOR: _____
DATE: _____
Days since last rainfall: _____
Amount of Last Rainfall: _____inches

Rim Location	Rim Elev.	Sediment Depth	Condition	Date and Description of Cleaning

Comments and Maintenance Required:

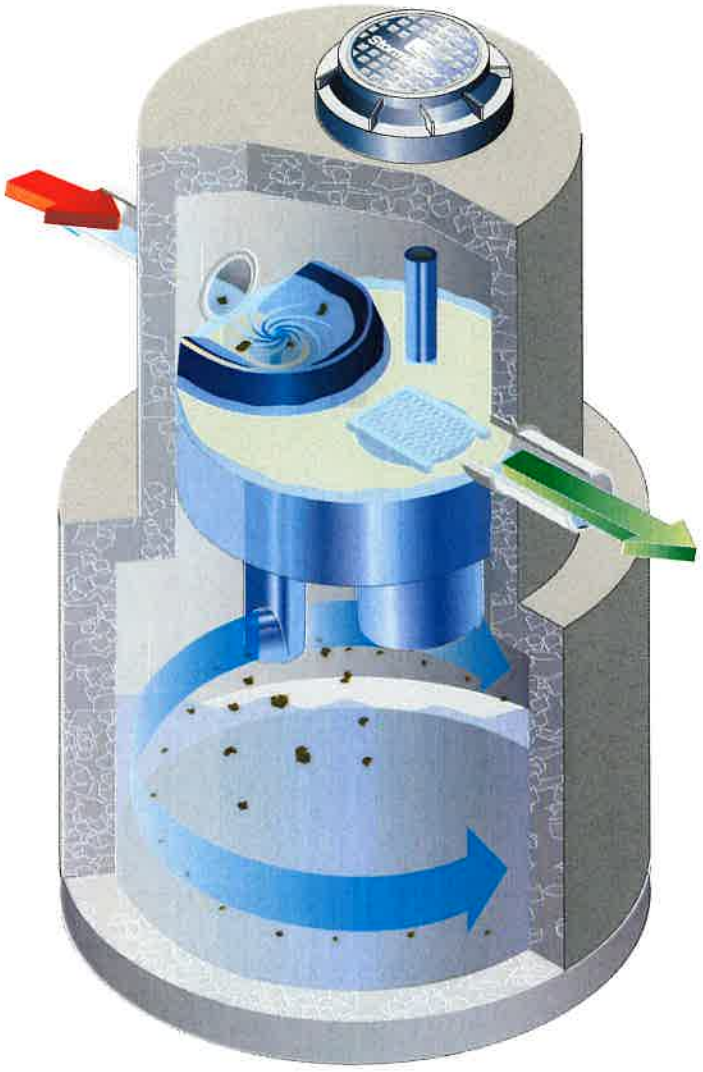
_____
_____
_____
_____
_____
_____
_____
_____

To be performed by:_____ **On or Before:** _____

APPENDIX A: STORMCEPTOR OWNER'S MANUAL

Stormceptor®

Owner's Manual



Stormceptor is protected by one or more of the following patents:

Canadian Patent No. 2,137,942
Canadian Patent No. 2,175,277
Canadian Patent No. 2,180,305
Canadian Patent No. 2,180,338
Canadian Patent No. 2,206,338
Canadian Patent No. 2,327,768
U.S. Patent No. 5,753,115
U.S. Patent No. 5,849,181
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690
U.S. Patent No. 7,582,216
U.S. Patent No. 7,666,303
Australia Patent No. 693.164
Australia Patent No. 707,133
Australia Patent No. 729,096
Australia Patent No. 779,401
Australia Patent No. 2008,279,378
Australia Patent No. 2008,288,900
Indonesia Patent No. 0007058
Japan Patent No. 3581233
Japan Patent No. 9-11476
Korean Patent No. 0519212
Malaysia Patent No. 118987
New Zealand Patent No. 314,646
New Zealand Patent No. 583,008
New Zealand Patent No. 583,583
South African Patent No. 2010/00682
South African Patent No. 2010/01796
Other Patents Pending

Table of Contents

Congratulations!

Your selection of a Stormceptor® means that you have chosen the most recognized and efficient stormwater oil/sediment separator available for protecting the environment. Stormceptor is a pollution control device often referred to as a "Hydrodynamic Separator (HDS)" or an "Oil Grit Separator (OGS)", engineered to remove and retain pollutants from stormwater runoff to protect our lakes, rivers and streams from the harmful effects of non-point source pollution.

1 – Stormceptor Overview

Stormceptor is a patented stormwater quality structure most often utilized as a treatment component of the underground storm drain network for stormwater pollution prevention. Stormceptor is designed to remove sediment, total suspended solids (TSS), other pollutants attached to sediment, hydrocarbons and free oil from stormwater runoff. Collectively the Stormceptor provides spill protection and prevents non-point source pollution from entering downstream waterways.

Key benefits of Stormceptor include:

- Removes sediment, suspended solids, debris, nutrients, heavy metals, and hydrocarbons (oil and grease) from runoff and snowmelt.
- Will not scour or re-suspend trapped pollutants.
- Provides sediment and oil storage.
- Provides spill control for accidents, commercial and industrial developments.
- Easy to inspect and maintain (vacuum truck).
- "STORMCEPTOR" is *clearly* marked on the access cover (excluding inlet designs).
- Relatively small footprint.
- 3rd Party tested and independently verified.
- Dedicated team of experts available to provide support.

Model Types:

- STC (Standard)
- STF (Fiberglass)
- EOS (Extended Oil Storage)
- OSR (Oil and Sand Removal)
- MAX (Custom designed unit, specific to site)

Configuration Types:

- Inlet unit (accommodates inlet flow entry, and multi-pipe entry)
- In-Line (accommodates multi-pipe entry)
- Submerged Unit (accommodates the site's tailwater conditions)
- Series Unit (combines treatment in two systems)

Please Maintain Your Stormceptor

To ensure long-term environmental protection through continued performance as originally designed for your site, **Stormceptor must be maintained**, as any stormwater treatment practice does. The need for maintenance is determined through inspection of the Stormceptor. Procedures for inspection are provided within this document. Maintenance of the Stormceptor is performed from the surface via vacuum truck.

If you require information about Stormceptor, or assistance in finding resources to facilitate inspections or maintenance of your Stormceptor please call your local Stormceptor Licensee or Imbrium® Systems.

2 – Stormceptor Operation & Components

Stormceptor is a flexibly designed underground stormwater quality treatment device that is unparalleled in its effectiveness for pollutant capture and retention using patented flow separation technology.

Stormceptor creates a non-turbulent treatment environment below the insert platform within the system. The insert diverts water into the lower chamber, allowing free oils and debris to rise, and sediment to settle under relatively low velocity conditions. These pollutants are trapped and stored below the insert and protected from large runoff events for later removal during the maintenance procedure.

With thousands of units operating worldwide, Stormceptor delivers reliable protection every day, in every storm. The patented Stormceptor design prohibits the scour and release of captured pollutants, ensuring superior water quality treatment and protection during even the most extreme storm events. Stormceptor's proven performance is backed by the longest record of lab and field verification in the industry.

Stormceptor Schematic and Component Functions

Below are schematics of two common Stormceptor configurations with key components identified and their functions briefly described.

Figure 1.

Inline Stormceptor

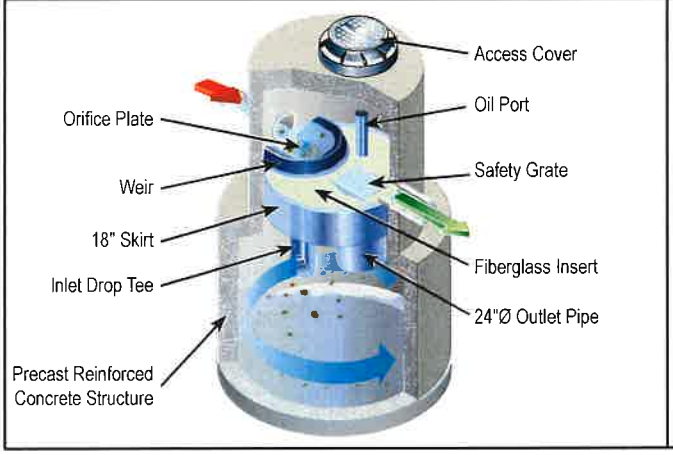
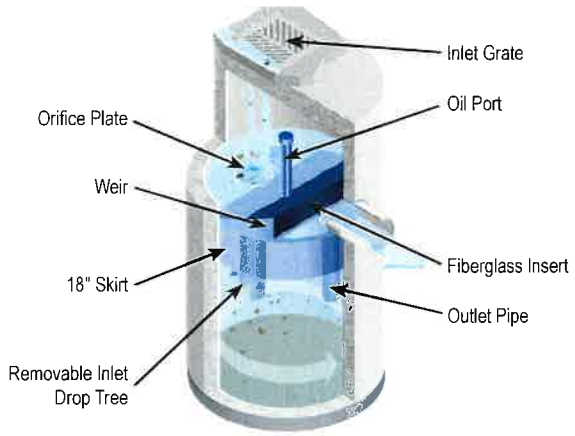


Figure 2.

Inlet Stormceptor



- **Manhole access cover** – provides access to the subsurface components
- **Precast reinforced concrete structure** – provides the vessel's watertight structural support
- **Fiberglass insert** – separates vessel into upper and lower chambers
- **Weir** – directs incoming stormwater and oil spills into the lower chamber
- **Orifice plate** – prevents scour of accumulated pollutants
- **Inlet drop tee** – conveys stormwater into the lower chamber
- **Fiberglass skirt** – provides double-wall containment of hydrocarbons
- **Outlet riser pipe** – conveys treated water to the upper chamber; primary vacuum line access port for sediment removal
- **Oil inspection port** – primary access for measuring oil depth and oil removal
- **Safety grate** – safety measure to cover riser pipe in the event of manned entry into vessel

3 – Stormceptor Identification

Stormceptor is available in both precast concrete and fiberglass vessels, with precast concrete often being the dominant material of construction.

In the Stormceptor, a patented, engineered fiberglass insert separates the structure into an upper chamber and lower chamber. The lower chamber will remain full of water, as this is where the pollutants are sequestered for later removal. Multiple Stormceptor model (STC, OSR, EOS, MAX and STF) configurations exist, each to be inspected and maintained in a similar fashion.

Each unit is easily identifiable as a Stormceptor by the trade name "Stormceptor" embossed on each access cover at the surface. To determine the location of "inlet" Stormceptor units with horizontal catch basin inlet, look down into the grate as the Stormceptor insert will be visible. The name "Stormceptor" is not embossed on inlet models due to the variability of inlet grates used/ approved across North America.

Once the location of the Stormceptor is determined, the model number may be identified by comparing the measured depth from the fiberglass insert level at the outlet pipe's invert (water level) to the bottom of the tank using **Table 1**.

In addition, starting in 1996 a metal serial number tag containing the model number has been affixed to the inside of the unit, on the fiberglass insert. If the unit does not have a serial number, or if there is any uncertainty regarding the size of the unit using depth measurements, please contact your local Stormceptor Representative for assistance.

Sizes/Models

Typical general dimensions and capacities of the standard precast STC, EOS & OSR Stormceptor models in both USA and Canada/International (excluding South East Asia and Australia) are provided in **Tables 1 and 2**. Typical rim to invert measurements are provided later in this document. The total depth for cleaning will be the sum of the depth from outlet pipe invert (generally the water level) to rim (grade) and the depth from outlet pipe invert to the precast bottom of the unit. Note that depths and capacities may vary slightly between regions.

Table 1A. (US) Stormceptor Dimensions – Insert to Base of Structure

STC Model	Insert to Base (in.)
450	60
900	55
1200	71
1800	105
2400	94
3600	134
4800	128
6000	150
7200	134
11000*	128
13000*	150
16000*	134

EOS Model	Insert to Base (in.)
4-175	60
9-365	55
12-590	71
18-1000	105
24-1400	94
36-1700	134
48-2000	128
60-2500	150
72-3400	134
110-5000*	128
130-6000*	150
160-7800*	134

OSR Model	Insert to Base (in.)
65	60
140	55
250	94
390	128
560	134
780*	128
1125*	134

Typical STF m (in.)
1.5 (60)
1.5 (61)
1.8 (73)
2.9 (115)
2.3 (89)
3.2 (127)
2.9 (113)
3.5 (138)
3.3 (128)

Notes:

1. *Depth Below Pipe Inlet Invert to the Bottom of Base Slab can vary slightly by manufacturing facility, and can be modified to accommodate specific site designs, pollutant loads or site conditions. Contact your local representative for assistance.*

**Consist of two chamber structures in series.*

Table 1B. (CA & Int'l) Stormceptor Dimensions – Insert to Base of Structure

STC Model	Insert to Base (m)
300	1.5
750	1.5
1000	1.8
1500	2.8
2000	2.8
3000	3.7
4000	3.4
5000	4.0
6000	3.7
9000*	3.4
11000*	4.0
14000*	3.7

EOS Model	Insert to Base (m)
300	1.5
750	1.5
1000	1.8
2000	2.8
3000	3.7
4000	3.4
5000	4.0
6000	3.7
9000*	3.4
10000*	4.0
14000*	3.7

OSR Model	Insert to Base (m)
300	1.7
750	1.6
2000	2.6
4000	3.6
6000	3.7
9000*	3.6
14000*	3.7

Typical STF m (in.)
1.5 (60)
1.5 (61)
1.8 (73)
2.9 (115)
2.3 (89)
3.2 (127)
2.9 (113)
3.5 (138)
3.3 (128)

Notes:

1. *Depth Below Pipe Inlet Invert to the Bottom of Base Slab can vary slightly by manufacturing facility, and can be modified to accommodate specific site designs, pollutant loads or site conditions. Contact your local representative for assistance.*

**Consist of two chamber structures in series.*

Table 2A. (US) Storage Capacities

STC Model	Hydrocarbon Storage Capacity gal	Sediment Capacity ft^3	**EOS Model**	Hydrocarbon Storage Capacity gal	**OSR Model**	Hydrocarbon Storage Capacity gal	Sediment Capacity ft^3
450	86	46	**4-175**	175	**065**	115	46
900	251	89	**9-365**	365	**140**	233	58
1200	251	127	**12-590**	591			
1800	251	207	**18-1000**	1198			
2400	840	205	**24-1400**	1457	**250**	792	156
3600	840	373	**36-1700**	1773			
4800	909	543	**48-2000**	2005	**390**	1233	465
6000	909	687	**60-2500**	2514			
7200	1059	839	**72-3400**	3418	**560**	1384	690
11000*	2797	1089	**110-5000***	5023	**780***	2430	930
13000*	2797	1374	**130-6000***	6041			
16000*	3055	1677	**160-7800***	7850	**1125***	2689	1378

Notes:

1. *Hydrocarbon & Sediment capacities can be modified to accommodate specific site design requirements, contact your local representative for assistance.*

**Consist of two chamber structures in series.*

Table 2B. (CA & Int'l) Storage Capacities

STC Model	Hydrocarbon Storage Capacity L	Sediment Capacity L	EOS Model	Hydrocarbon Storage Capacity L	OSR Model	Hydrocarbon Storage Capacity L	Sediment Capacity L
300	300	1450	**300**	662	**300**	300	1500
750	915	3000	**750**	1380	**750**	900	3000
1000	915	3800	**1000**	2235			
1500	915	6205					
2000	2890	7700	**2000**	5515	**2000**	2790	7700
3000	2890	11965	**3000**	6710			
4000	3360	16490	**4000**	7585	**4000**	4700	22200
5000	3360	20940	**5000**	9515			
6000	3930	26945	**6000**	12940	**6000**	5200	26900
9000*	10555	32980	**9000***	19010	**9000***	9300	33000
11000*	10555	37415	**10000***	22865			
14000*	11700	53890	**14000***	29715	**14000***	10500	53900

Notes:

1. *Hydrocarbon & Sediment capacities can be modified to accommodate specific site design requirements, contact your local representative for assistance.*

**Consist of two chamber structures in series.*

4 – Stormceptor Inspection & Maintenance

Regular inspection and maintenance is a proven, cost-effective way to maximize water resource protection for all stormwater pollution control practices, and is required to insure proper functioning of the Stormceptor. Both inspection and maintenance of the Stormceptor is easily performed from the surface. Stormceptor's patented technology has no moving parts, simplifying the inspection and maintenance process.

Please refer to the following information and guidelines before conducting inspection and maintenance activities.

When is inspection needed?

- Post-construction inspection is required prior to putting the Stormceptor into service.
- Routine inspections are recommended during the first year of operation to accurately assess the sediment accumulation.
- Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
- Inspections should also be performed immediately after oil, fuel, or other chemical spills.

When is maintenance cleaning needed?

- For optimum performance, the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, which is approximately 15% of the unit's total storage capacity (see **Table 2**). The frequency should be adjusted based on historical inspection results due to variable site pollutant loading.

- Sediment removal is easier when removed on a regular basis at or prior to the recommended maintenance sediment depths, as sediment build-up can compact making removal more difficult.
- The unit should be cleaned out immediately after an oil, fuel or chemical spill.

What conditions can compromise Stormceptor performance?

- If construction sediment and debris is not removed prior to activating the Stormceptor unit, maintenance frequency may be reduced.
- If the system is not maintained regularly and fills with sediment and debris beyond the capacity as indicated in **Table 2**, pollutant removal efficiency may be reduced.
- If an oil spill(s) exceeds the oil capacity of the system, subsequent spills may not be captured.
- If debris clogs the inlet of the system, removal efficiency of sediment and hydrocarbons may be reduced.
- If a downstream blockage occurs, a backwater condition may occur for the Stormceptor and removal efficiency of sediment and hydrocarbons may be reduced.

What training is required?

The Stormceptor is to be inspected and maintained by professional vacuum cleaning service providers with experience in the maintenance of underground tanks, sewers and catch basins. For typical inspection and maintenance activities, no specific supplemental training is required for the Stormceptor. Information provided within this Manual (provided to the site owner) contains sufficient guidance to maintain the system properly.

In unusual circumstances, such as if a damaged component needs replacement or some other condition requires manned entry into the vessel, confined space entry procedures must be followed. Only professional maintenance service providers trained in these procedures should enter the vessel. Service provider companies typically have personnel who are trained and certified in confined space entry procedures according to local, state, and federal standards.

What equipment is typically required for inspection?

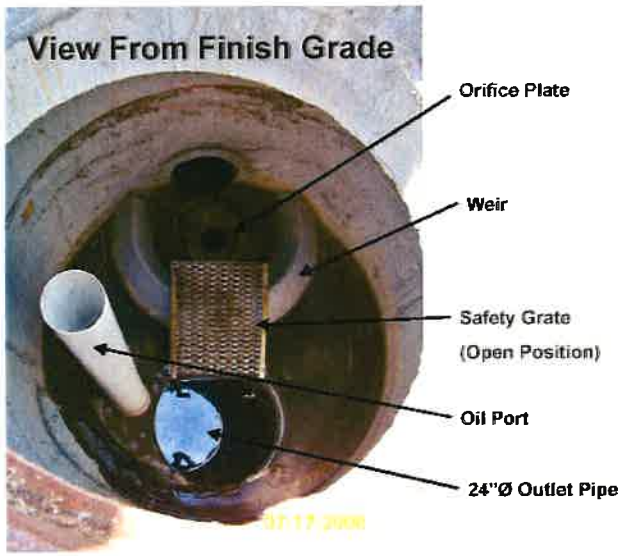
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones and caution tape
- Hard hat, safety shoes, safety glasses, and chemical-resistant gloves

Recommended Stormceptor Inspection Procedure:

- Stormceptor is to be inspected from grade through a standard surface manhole access cover.
- Sediment and oil depth inspections are performed with a sediment probe and oil dipstick.
- Oil depth is measured through the oil inspection port, either a 4-inch (100 mm) or 6-inch (150 mm) diameter port.
- Sediment depth can be measured through the oil inspection port or the 24-inch (610 mm) diameter outlet riser pipe.
- Inspections also involve a visual inspection of the internal components of the system.

Figure 3.

Figure 4.



What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required

Recommended Stormceptor Maintenance Procedure

Maintenance of Stormceptor is performed using a vacuum truck.

No entry into the unit is required for maintenance. ***DO NOT ENTER THE STORMCEPTOR CHAMBER*** unless you have the proper personal safety equipment, have been trained and are qualified to enter a confined space, as identified by local Occupational Safety and Health Regulations (e.g. 29 CFR 1910.146 or Canada Occupational Safety and Health Regulations – SOR/86-304). Without the proper equipment, training and permit, entry into confined spaces can result in serious bodily harm and potentially death. Consult local, provincial, and/or state regulations to determine the requirements for confined space entry. Be aware, and take precaution that the Stormceptor fiberglass insert may be slippery. In addition, be aware that some units do not have a safety grate to cover the outlet riser pipe that leads to the submerged, lower chamber.

- Ideally maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor is to be maintained through a standard surface manhole access cover.
- Insert the oil dipstick into the oil inspection port. If oil is present, pump off the oil layer into separate containment using a small pump and tubing.
- Maintenance cleaning of accumulated sediment is performed with a vacuum truck.
    - For 6-ft (1800 mm) diameter models and larger, the vacuum hose is inserted into the lower chamber via the 24-inch (610 mm) outlet riser pipe.
    - For 4-ft (1200 mm) diameter model, the removable drop tee is lifted out, and the vacuum hose is inserted into the lower chamber via the 12-inch (305 mm) drop tee hole.

Figure 5.

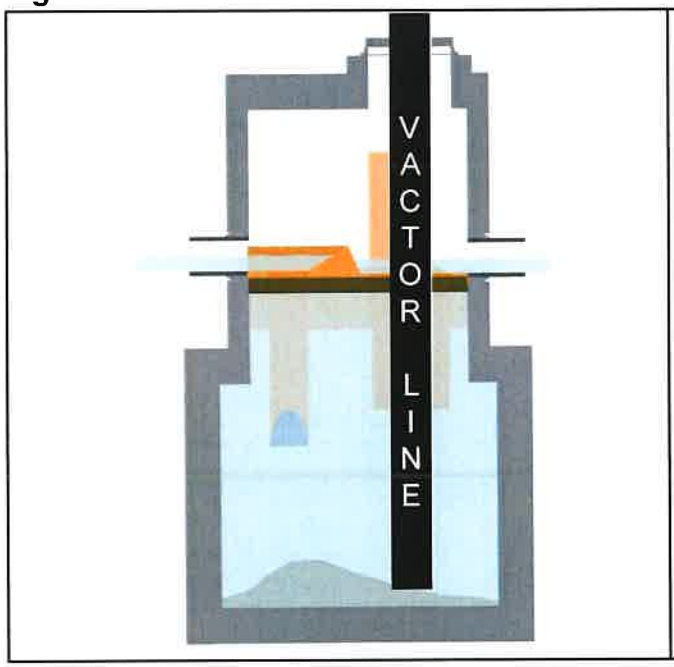


Figure 6.

- Using the vacuum hose, decant the water from the lower chamber into a separate containment tank or to the sanitary sewer, if permitted by the local regulating authority.
- Remove the sediment sludge from the bottom of the unit using the vacuum hose. For large Stormceptor units, a flexible hose is often connected to the primary vacuum line for ease of movement in the lower chamber.
- Units that have not been maintained regularly, have surpassed the maximum recommended sediment capacity, or contain damaged components may require manned entry by trained personnel using safe and proper confined space entry procedures.

Figure 7.

Figure 8.

A maintenance worker stationed at the above ground surface uses a vacuum hose to evacuate water, sediment, and debris from the system.

What is required for proper disposal?

The requirements for the disposal of material removed from Stormceptor units are similar to that of any other stormwater treatment Best Management Practices (BMP). Local guidelines should be consulted prior to disposal of the separator contents. In most areas the sediment, once dewatered, can be disposed of in a sanitary landfill. It is not anticipated that the sediment would be classified as hazardous waste. This could be site and pollutant dependent. In some cases, approval from the disposal facility operator/agency may be required.

What about oil spills?

Stormceptor is often implemented in areas where there is high potential for oil, fuel or other hydrocarbon or chemical spills. Stormceptor units should be cleaned immediately after a spill occurs by a licensed liquid waste hauler. You should also notify the appropriate regulatory agencies as required in the event of a spill.

What if I see an oil rainbow or sheen at the Stormceptor outlet?

With a steady influx of water with high concentrations of oil, a sheen may be noticeable at the Stormceptor outlet. This may occur because a hydrocarbon rainbow or sheen can be seen at

very small oil concentrations (< 10 ppm). Stormceptor is effective at removing 95% of free oil, and the appearance of a sheen at the outlet with high influent oil concentrations does not mean that the unit is not working to this level of removal. In addition, if the influent oil is emulsified, the Stormceptor will not be able to remove it. The Stormceptor is designed for free oil removal and not emulsified or dissolved oil conditions.

What factors affect the costs involved with inspection/maintenance?

The Vacuum Service Industry for stormwater drainage and sewer systems is a well-established sector of the service industry that cleans underground tanks, sewers and catch basins. Costs to clean Stormceptor units will vary. Inspection and maintenance costs are most often based on unit size, the number of units on a site, sediment/oil/hazardous material loads, transportation distances, tipping fees, disposal requirements and other local regulations.

What factors predict maintenance frequency?

Maintenance frequency will vary with the amount of pollution on your site (number of hydrocarbon spills, amount of sediment, site activity and use, etc.). It is recommended that the frequency of maintenance be increased or reduced based on local conditions. If the sediment load is high from an unstable site or sediment loads transported from upstream catchments, maintenance may be required semi-annually. Conversely once a site has stabilized, maintenance may be required less frequently (for example: two to seven year, site and situation dependent). Maintenance should be performed immediately after an oil spill or once the sediment depth in Stormceptor reaches the value specified in **Table 3** based on the unit size.

Table 3A. (US) Recommended Sediment Depths Indicating Maintenance

STC Model	Maintenance Sediment depth (in)	EOS Model	Maintenance Sediment depth (in)	Oil Storage Depth (in)	OSR Model	Maintenance Sediment depth (in)
450	8	**4-175**	9	24	**065**	8
900	8	**9-365**	9	24	**140**	8
1200	10	**12-590**	11	39		
1800	15					
2400	12	**24-1400**	14	68	**250**	12
3600	17	**36-1700**	19	79		
4800	15	**48-2000**	16	68	**390**	17
6000	18	**60-2500**	20	79		
7200	15	**72-3400**	17	79	**560**	17
11000*	17	**110-5000***	16	68	**780***	17
13000*	20	**130-6000***	20	79		
16000*	17	**160-7800***	17	79	**1125***	17

Note:

1. *The values above are for typical standard units.*

**Per structure.*

Table 3B. (CA & Int'l) Recommended Sediment Depths Indicating Maintenance

STC Model	Maintenance Sediment depth (mm)	EOS Model	Maintenance Sediment depth (mm)	Oil Storage Depth (mm)	OSR Model	Maintenance Sediment depth (mm)
300	225	**300**	225	610	**300**	200
750	230	**750**	230	610	**750**	200
1000	275	**1000**	275	990		
1500	400					
2000	350	**2000**	350	1727	**2000**	300
3000	475	**3000**	475	2006		
4000	400	**4000**	400	1727	**4000**	375
5000	500	**5000**	500	2006		
6000	425	**6000**	425	2006	**6000**	375
9000*	400	**9000***	400	1727	**9000***	425
11000*	500	**10000***	500	2006		
14000*	425	**14000***	425	2006	**14000***	425

Note:

1. *The values above are for typical standard units.*

**Per structure.*

Replacement parts

Since there are no moving parts during operation in a Stormceptor, broken, damaged, or worn parts are not typically encountered. Therefore, inspection and maintenance activities are generally focused on pollutant removal. However, if replacements parts are necessary, they may be purchased by contacting your local Stormceptor Representative, or Imbrium Systems.

The benefits of regular inspection and maintenance are many – from ensuring maximum operation efficiency, to keeping maintenance costs low, to the continued protection of natural waterways – and provide the key to Stormceptor's long and effective service life.

Stormceptor Inspection and Maintenance Log

Stormceptor Model No: _____

Allowable Sediment Depth: _____

Serial Number: _____

Installation Date: _____

Location Description of Unit: _____

Other Comments: _____

Contact Information

Questions regarding the Stormceptor can be addressed by contacting your area Stormceptor Licensee, Imbrium Systems, or visit our website at www.stormceptor.com.

Stormceptor Licensees:

CANADA

Lafarge Canada Inc.	
www.lafargepipe.com	
403-292-9502 / 1-888-422-4022	Calgary, AB
780-468-5910	Edmonton, AB
204-958-6348	Winnipeg, MB, NW. ON, SK
Langley Concrete Group	
www.langleyconcretegroup.com	
604-502-5236	BC
Hanson Pipe & Precast Inc.	
www.hansonpipeandprecast.com	
519-622-7574 / 1-888-888-3222	ON
Lécuyer et Fils Ltée.	
www.lecuyerbeton.com	
450-454-3928 / 1-800-561-0970	QC
Strescon Limited	
www.strescon.com	
902-494-7400	NS, NF
506-633-8877	NB, PE

UNITED STATES

Rinker Materials
www.rinkerstormceptor.com
1-800-909-7763

AUSTRALIA & SOUTHEAST ASIA, including New Zealand & Japan

Humes Water Solutions
www.humes.com.au
+61 7 3364 2894

Imbrium Systems Inc. & Imbrium Systems LLC

Canada	1-416-960-9900 / 1-800-565-4801
United States	1-301-279-8827 / 1-888-279-8826
International	+1-416-960-9900 / +1-301-279-8827
Email	info@imbriumsystems.com

www.imbriumsystems.com
www.stormceptor.com

CHAPTER 10: STORMWATER MANAGEMENT STANDARD 10

Chapter 10:

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes the required measures to prevent illicit discharges.
- All Catch basins and drain inlets shall be labeled with signage to prohibit the release of any illicit substance into the drainage system.
- No washing of vehicles shall be permitted outside of the car wash facility.
- All operations and managers of the facility will be provided with training and education concerning the danger of illicit discharges into the drainage system.

Illicit Discharge Certification

I have read Standard 10 of the Massachusetts Stormwater Management Policy regarding Illicit Discharges. I have also studied the Proposed Site Plans and Stormwater Operation and Maintenance Plan, and I am aware of the components of the Stormwater Management System at the proposed Scrub-A-Dub located at 171 Pelham Street in Methuen, Massachusetts. I hereby certify that there will be no illicit discharges, as defined by the Policy, from the site through any part of the Stormwater Management System.

Signature

Daniel Palmer President 8/11/23

Name and Title Date