



**STORMWATER
ADDENDUM #1
For
Upper Union Solar Project
0 Upper Union Street
Franklin, Massachusetts**

Prepared for:

**VS Union Solar Smart, LLC
24941 Dana Point Harbor
Dana Point, California 92629**

Prepared by:

**Atlantic Design Engineers, Inc.
P.O. Box 1051
Sandwich, Massachusetts 02563**



November 10, 2023
ADE Project No. 3328.00

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1.0 SUMMARY

This Addendum #1 to the original stormwater report dated 6/19/23 addresses the stormwater/drainage-related comments from the BETA Group, Inc review letters dated 8/3/23 and 8/18/23, the Massachusetts Department of Environmental Protection (MassDEP) review letter dated 10/20/23, and the Town Engineer review letter dated 8/7/23.

The following is a summary of the revisions incorporated into this Stormwater Report Addendum #1:

- Provide soil evaluation test pit logs completed by Zenith Consulting Engineers LLC on 10/11/23.
- Revised Water Quality, Recharge, TSS Removal, and Stormwater Basin/Infiltration Trench Drawn calculations.
- Revised CN values and Tc calculations provided within the revised Pre and Post Development HydroCAD Calculations
- Revised Pre and Post-development watershed plans
- Provide Pre and Post-development volume and revised Pre and Post-development runoff rate comparison table
- Revised Post-Construction Long Term Stormwater O&M Plan as follows:
 - Provide owner's signature line;
 - Indicated stormwater system owner following construction;
 - Indicated party or parties responsible for maintenance;
 - Provided BMP location map;
 - Indicated catch basin should be inspected four times per year;
 - Indicated regular inspection and maintenance of drip edges;
 - Provided owner's signature line on illicit discharge compliance statement;
- Provide Best Management Practices (BMP) Location Map

2.0 PRE & POST-DEVELOPMENT RUNOFF RATE AND VOLUME COMPARISON TABLE

<i>Design Point #DP 1 – Offsite West</i>				
<i>Storm Event</i>	<i>Pre-Development</i>		<i>Post-Development</i>	
	<i>Runoff Rate</i>	<i>Volume</i>	<i>Runoff Rate</i>	<i>Volume</i>
2-year	0.98 cfs	3,622 cf	0.97 cfs	3,603 cf
10-year	2.22 cfs	7,899 cf	2.02 cfs	7,365 cf
25-year	3.30 cfs	11,691 cf	2.91 cfs	10,609 cf
100-year	5.63 cfs	20,101 cf	4.77 cfs	17,670 cf

<i>Design Point # DP 2 – Offsite North</i>				
<i>Storm Event</i>	<i>Pre-Development</i>		<i>Post-Development</i>	
	<i>Runoff Rate</i>	<i>Volume</i>	<i>Runoff Rate</i>	<i>Volume</i>
2-year	1.24 cfs	4,502 cf	0.37 cfs	1,248 cf
10-year	2.97 cfs	10,173 cf	0.78 cfs	2,591 cf
25-year	4.49 cfs	15,275 cf	1.13 cfs	3,758 cf
100-year	7.82 cfs	26,711 cf	1.87 cfs	6,307 cf

<i>Design Point # DP 3 – Offsite West Wetland</i>				
<i>Storm Event</i>	<i>Pre-Development</i>		<i>Post-Development</i>	
	<i>Runoff Rate</i>	<i>Volume</i>	<i>Runoff Rate</i>	<i>Volume</i>
2-year	1.38 cfs	4,048 cf	1.18 cfs	4,019 cf
10-year	2.84 cfs	8,275 cf	2.41 cfs	8,092 cf
25-year	4.06 cfs	11,921 cf	3.43 cfs	11,582 cf
100-year	6.63 cfs	19, 854 cf	5.57 cfs	19,144 cf

<i>Design Point # DP 4 – Offsite East Wetland</i>				
<i>Storm Event</i>	<i>Pre-Development</i>		<i>Post-Development</i>	
	<i>Runoff Rate</i>	<i>Volume</i>	<i>Runoff Rate</i>	<i>Volume</i>
2-year	0.98 cfs	3,176 cf	0.78 cfs	3,130 cf
10-year	2.22 cfs	6,927 cf	1.75 cfs	6,713 cf
25-year	3.29 cfs	10,253 cf	2.58 cfs	9,866 cf
100-year	5.60 cfs	17,628 cf	4.35 cfs	16,824 cf

Design Point # DP 5 – Offsite Northwest				
Storm Event	Pre-Development		Post-Development	
	<i>Runoff Rate</i>	<i>Volume</i>	<i>Runoff Rate</i>	<i>Volume</i>
2-year	0.00 cfs	0 cf	0.00 cfs	5 cf
10-year	0.02 cfs	694 cf	0.01 cfs	310 cf
25-year	0.14 cfs	2,311 cf	0.11 cfs	827 cf
100-year	1.34 cfs	7,871 cf	0.72 cfs	2,445 cf

Design Point # DP 6 – Offsite East				
Storm Event	Pre-Development		Post-Development	
	<i>Runoff Rate</i>	<i>Volume</i>	<i>Runoff Rate</i>	<i>Volume</i>
2-year	0.02 cfs	548 cf	0.13 cfs	566 cf
10-year	0.40 cfs	2,860 cf	0.41 cfs	1,484 cf
25-year	1.09 cfs	5,586 cf	0.68 cfs	3,361 cf
100-year	2.99 cfs	12,875 cf	1.28 cfs	4,411 cf

APPENDIX A

Soil Evaluation Test Pit Logs

**On-Site Review
Form 11 & 12
Franklin, Massachusetts**

Site Address/Parcel ID 0 Upper Union Street Owner Name VS Union Solar Smart, LLC

New Construction ☒ Upgrade ☐ Repair ☐

Soil Survey Available? Yes ☒ No ☐ Source NRCS Web Soil Survey Soil Map Unit 312B

Soil Name Woodbridge Fine Sandy Loam Parent Material Coarse Loamy Lodgement Till Landform Ground Moraines

Land Use Lawn Slope (%) 0-8 Surface Stones None Vegetation Grass

Current Water Resource Conditions (USGS): Date: 10/11/2023 Range: Normal

Deep Hole Number TP-1 Date 10/11/2023 Time 8:00 am Weather Cloudy 55°

Distance From: Open Water Body 400'+ Drainage Way 100'+ Wetlands 100'+

Property Line 10'+ Drinking Water Well 100'+ Other None

Unsuitable Material Present? Yes ☐ No ☒ If Yes: Disturbed Soil ☐ Fill Material ☐ Bedrock ☐

Groundwater Observed? Yes ☐ No ☒ If Yes: Depth to Weeping None Depth to Standing None

Estimated Depth to High Groundwater Mottles @74"

SOIL LOG					
Depth (in)	Soil Horizon/ Layer	Soil Texture	Soil Color (Munsell)	Mottles	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0-8	O/A	Sandy Loam	10YR 3/2		
8-34	B	Sandy Loam	10YR 5/6		
34-108	C	Loamy Sand	2.5Y 5/2	74"	

Soil Survey Available? Yes ☒ No ☐ Source NRCS Web Soil Survey Soil Map Unit 310B

Soil Name Woodbridge Fine Sandy Loam Parent Material Coarse Loamy Lodgement Till Landform Ground Moraines

Land Use Lawn Slope (%) 3-8 Surface Stones None Vegetation Grass

Current Water Resource Conditions (USGS): Date: 10/11/2023 Range: Normal

Deep Hole Number TP-2 Date 10/11/2023 Time 8:00 am Weather Cloudy 55°

Distance From: Open Water Body 400'+ Drainage Way 100'+ Wetlands 100'+

Property Line 10'+ Drinking Water Well 100'+ Other None

Unsuitable Material Present? Yes ☐ No ☒ If Yes: Disturbed Soil ☐ Fill Material ☐ Bedrock ☐

Groundwater Observed? Yes ☐ No ☒ If Yes: Depth to Weeping None Depth to Standing None

Estimated Depth to High Groundwater Mottles @ 70"

SOIL LOG					
Depth (in)	Soil Horizon/ Layer	Soil Texture	Soil Color (Munsell)	Mottles	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0-8	O/A	Sandy Loam	10YR 3/2		
8-32	B	Sandy Loam	10YR 5/6		
32-94	C	Loamy Sand	2.5Y 5/2	70"	Refusal

**On-Site Review
Form 11 & 12**

Deep Hole Number **TP-3** Date 10/11/2023 Time 8:00 am Weather Cloudy 55°
 Distance From: Open Water Body 400'+ Drainage Way 100'+ Wetlands 100'+
 Property Line 10'+ Drinking Water Well 100'+ Other None
 Unsuitable Material Present? Yes ☐ No ☒ If Yes: Disturbed Soil ☐ Fill Material ☐ Bedrock ☐
 Groundwater Observed? Yes ☐ No ☒ If Yes: Depth to Weeping None Depth to Standing None
 Estimated Depth to High Groundwater Mottles @60"

SOIL LOG					
Depth (in)	Soil Horizon/ Layer	Soil Texture	Soil Color (Munsell)	Mottles	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0-12	O/A	Sandy Loam	10YR 3/2		
12-38	B	Sandy Loam	10YR 5/6		
38-56	C1	Loamy Sand	2.5Y 5/2		
56-74	C2d	Sandy Loam	2.5Y 5/3	60"	
74-122	C3	Medium Coarse Sand	2.5Y 5/4		

Deep Hole Number **TP-4** Date 10/11/2023 Time 8:00 am Weather Cloudy 45°
 Distance From: Open Water Body 400'+ Drainage Way 100'+ Wetlands 100'+
 Property Line 10'+ Drinking Water Well 100'+ Other None
 Unsuitable Material Present? Yes ☐ No ☒ If Yes: Disturbed Soil ☐ Fill Material ☐ Bedrock ☐
 Groundwater Observed? Yes ☐ No ☒ If Yes: Depth to Weeping None Depth to Standing None
 Estimated Depth to High Groundwater Mottles @50"

SOIL LOG					
Depth (in)	Soil Horizon/ Layer	Soil Texture	Soil Color (Munsell)	Mottles	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0-10	O/A	Sandy Loam	10YR 3/2		
10-32	B	Sandy Loam	10YR 5/8		
32-76	C	Loamy Sand	2.5Y 5/6	50"	

Deep Hole Number **TP-5** Date 10/11/2023 Time 8:00 am Weather Cloudy 45°
 Distance From: Open Water Body 400'+ Drainage Way 100'+ Wetlands 100'+
 Property Line 10'+ Drinking Water Well 100'+ Other None
 Unsuitable Material Present? Yes ☐ No ☒ If Yes: Disturbed Soil ☐ Fill Material ☐ Bedrock ☐
 Groundwater Observed? Yes ☐ No ☒ If Yes: Depth to Weeping None Depth to Standing None
 Estimated Depth to High Groundwater Mottles @40"

SOIL LOG					
Depth (in)	Soil Horizon/ Layer	Soil Texture	Soil Color (Munsell)	Mottles	Other (Structure, Stones, Boulders, Consistency, % Gravel)
0-8	O/A	Sandy Loam	10YR 3/2		
8-34	B	Sandy Loam	10YR 5/8		
34-84	C	Loamy Sand	2.5Y 5/6	40"	Refusal

On-Site Review**Form 11 & 12**Witnessed By: No witnessPerformed By: Nyles Zager SE2781 Exp. 6/30/2025Signature  Date 10-17-23**3 Main St Lakeville, MA Tel# 508-947-4208**

PERCOLATION TEST	
Date: 10/11/2023	Time: 9:04 am
Deep Hole Number	NONE
Depth of Perc.	
Start Pre-Soak	
End Pre-Soak	
Time at 12"	
Time at 9"	
Time at 6"	
Time (9"-6")	
Rate (Min./Inch)	

APPENDIX B
Miscellaneous Calculations

Drawdown Calculations

Design Engineer: Atlantic Design Engineers, Inc.
 Project Name: Upper Union Solar Project
 Location: 0 Upper Union Street, Franklin, MA

Job No.: 3328.00
 Calc'd By: BJR
 Date: 11/10/2023

$$\text{Time Drawdown (Tdd)} = Rv / [(K)(A)]$$

Rv = Storage Volume
 K = Saturated Hydraulic Conductivity
 A = Bottom Area of Basin

Rv calculated in HydroCAD based on 100yr design storm

Proposed Stormwater Basin 2P	Infiltration Rate	2.41	in/hr	
	Bottom Area =	4,039		sq ft
	Storage Volume (Rv)=	15,057		
	Time to Drawdown (Tdd)=	15,057 / [(2.41 / 12) (4,039)]		
	Time to Drawdown (Tdd)=	19		hrs <72 hrs - Requirement Met
Proposed Stormwater Basin 6P	Infiltration Rate	2.41	in/hr	
	Bottom Area =	1,593		sq ft
	Storage Volume (Rv)=	16,011		
	Time to Drawdown (Tdd)=	16,011 / [(2.41 / 12) (1,593)]		
	Time to Drawdown (Tdd)=	50		hrs <72 hrs - Requirement Met
Proposed Infiltration Trench	Infiltration Rate	2.41	in/hr	
	Bottom Area =	140		sq ft
	Storage Volume (Rv)=	56		
	Time to Drawdown (Tdd)=	56 / [(2.41 / 12) (140)]		
	Time to Drawdown (Tdd)=	2		hrs <72 hrs - Requirement Met

Required Recharge Volume

Design Engineer:	Atlantic Design Engineers, Inc	Job No.:	3328.00
Project Name:	Upper Union Solar Project	Calc'd By:	BJR
Location:	0 Upper Union Street, Franklin, MA	Original Date:	6/19/2023
		Revised Date:	11/10/2023

The groundwater recharge volume is required for the proposed asphalt **impervious area**.

$R_v = (F) (A_{imp})$
Rv = Required Recharge Volume
Aimp= Impervious Area on site
F = Target Depth Factor: 0.25 inch for C soils

Required Recharge

Total New Impervious Area =	1,137 sf	
Required Recharge Volume (Rv)=	1,137 *0.25** (1/12)=	24 cf

Recharge Volume Provided		
Cultec C-100HD Subsurface System	(2) Cultec C-100HD Chambers w/ Stone (See HydroCAD Calcs)	153 cf
Proposed Volume Provided in Sub-Surface Systems=		153 cf

Total Required Recharge Volume on Site=	24 cf
--	--------------

Proposed Recharge Volume Provided in Subsurface System=	153 cf
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153 > 24

Standard is Met

Required Recharge Volume

Design Engineer:	Atlantic Design Engineers, Inc	Job No.:	3328.00
Project Name:	Upper Union Solar Project	Calc'd By:	BJR
Location:	0 Upper Union Street, Franklin, MA	Original Date:	6/19/2023
		Revision Date:	11/10/2023

The groundwater recharge volume is required for the proposed equipment pad **impervious area**.

$R_v = (F) (A_{imp})$
Rv = Required Recharge Volume
Aimp= Impervious Area on site
F = Target Depth Factor: 0.6 inch for A soils

Infiltration Trench (140 SF x 1'D @ 40% Voids)

Total New Impervious Area =	640 sf	
Required Recharge Volume (Rv)=	$640 * 0.6'' * (1/12) =$	32 cf

Recharge Volume Provided

Infiltration Trench	$140 \text{ SF} * 1 \text{ FT} * (40\%) =$	56 cf
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Proposed Volume Provided in Infiltration Trench=	56 cf
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Total Required Recharge Volume on Site=	32 cf
--	--------------

Proposed Recharge Volume Provided in Infiltration Trench=	56 cf
--	--------------

56 > 32

Standard is Met

TSS REMOVAL CALCULATION SHEET

Design Engineer: Atlantic Design Engineers, Inc Job No.: 3328.00
Project Name: Upper Union Solar Project Calc'd By: BR
Location: 0 Upper Union Street, Franklin, MA Date: 11/10/2023

Paved Driveway Section (80% Treatment Requirement)

BMP	Removal Rate	Starting TSS Load	TSS Removed	Remaining Load
Deep Sump Catch Basins	25%	100.0%	25%	75.0%
Subsurface Infiltration (Cultec HD-100)	80%	75.0%	60%	15.0%
Total Removed			85%	

Water Quality Calculation Sheet*

Design Engineer: Atlantic Design Engineers, Inc
 Project Name: Upper Union Solar Project
 Location: 0 Upper Union Street, Franklin, MA

Job No.: 3328.00
 Calc'd By: BJR
 Original Date: 6/19/2023
 Revision Date: 11/10/2023

The required water quality treatment volume is calculated as follows:

$$V_{wq} = (D_{wq}) * (A_{imp})$$

Vwq =Required Water Quality Volume
 Dwq =Water Quality Depth * 1"
 Aimp=Area of Impervious

Subcatchment Area: 1S

Total Impervious Area for the Subcatchment=	1,137	sf		
Water Quality Volume Required (Vwq)=	1,137		* 1" * (1/12)=	95 cf
Volume Provided via Cultec 100HD=			(4 CHAMBER) Cultec C-100HD Chambers w/ Stone (See HydroCAD Calcs)	153 cf

Volume Required=	94.8	<	153	Water Quality Volume is met
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Subcatchment Area: 6A

Total Impervious Area for the Subcatchment=	640	sf		
Water Quality Volume Required (Vwq)=	640		* 1" * (1/12)=	53 cf
Volume Provided via Infiltration Trench=			140 SF*1"*(40%)	56 cf

Volume Required=	53.3	<	56	Water Quality Volume is met
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Total Impervious Area on the Site=	1,777	sf
Total Volume Quality Required=	148	cf
Total Volume Provided=	209	cf

* The purpose of these calculations is to show compliance with the Town of Franklin Stormwater Management Bylaw Chapter 153, specifically Section 153-16.B.(1).(a)

APPENDIX C

Revised Pre and Post Development HydroCAD Calculations



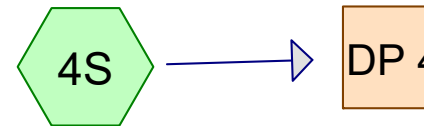
Towards Offsite West



Towards Offsite North



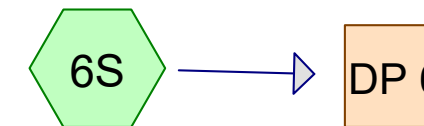
Towards West Wetland



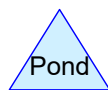
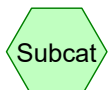
Towards East Wetland



Towards Offsite
Northwest



Towards Offsite East



Routing Diagram for 3328.00-PRE REV1

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3328.00-PRE REV1

Prepared by {enter your company name here}

Printed 11/16/2023

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
36,001	74	>75% Grass cover, Good, HSG C (1S, 2S)
45,039	77	Brush, Poor, HSG C (3S, 4S)
2,000	96	Gravel surface, HSG C (3S, 4S)
3,337	98	Roofs, HSG C (1S, 2S)
91,346	30	Woods, Good, HSG A (5S, 6S)
135,937	70	Woods, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S)
313,660	60	TOTAL AREA

3328.00-PRE REV1

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
91,346	HSG A	5S, 6S
0	HSG B	
222,314	HSG C	1S, 2S, 3S, 4S, 5S, 6S
0	HSG D	
0	Other	
313,660		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	36,001	0	0	36,001	>75% Grass cover, Good	
0	0	45,039	0	0	45,039	Brush, Poor	
0	0	2,000	0	0	2,000	Gravel surface	
0	0	3,337	0	0	3,337	Roofs	
91,346	0	135,937	0	0	227,283	Woods, Good	
91,346	0	222,314	0	0	313,660	TOTAL AREA	

3328.00-PRE REV1

NRCC 24-hr C 2-Year Rainfall=3.22"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=43,659 sf 4.43% Impervious Runoff Depth=1.00"
Flow Length=329' Tc=11.4 min CN=73 Runoff=0.98 cfs 3,622 cf

Subcatchment2S: Runoff Area=60,694 sf 2.31% Impervious Runoff Depth=0.89"
Flow Length=325' Tc=10.3 min CN=71 Runoff=1.24 cfs 4,502 cf

Subcatchment3S: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth=1.23"
Flow Length=182' Tc=9.1 min CN=77 Runoff=1.23 cfs 4,048 cf

Subcatchment4S: Runoff Area=38,286 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=122' Tc=8.2 min CN=73 Runoff=0.98 cfs 3,176 cf

Subcatchment5S: Runoff Area=72,775 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=357' Tc=15.1 min CN=37 Runoff=0.00 cfs 0 cf

Subcatchment6S: Runoff Area=58,624 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=427' Tc=15.7 min CN=49 Runoff=0.02 cfs 548 cf

Reach DP 1: Towards Offsite West Inflow=0.98 cfs 3,622 cf
Outflow=0.98 cfs 3,622 cf

Reach DP 2: Towards Offsite North Inflow=1.24 cfs 4,502 cf
Outflow=1.24 cfs 4,502 cf

Reach DP 3: Towards West Wetland Inflow=1.23 cfs 4,048 cf
Outflow=1.23 cfs 4,048 cf

Reach DP 4: Towards East Wetland Inflow=0.98 cfs 3,176 cf
Outflow=0.98 cfs 3,176 cf

Reach DP 5: Towards Offsite Northwest Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Reach DP 6: Towards Offsite East Inflow=0.02 cfs 548 cf
Outflow=0.02 cfs 548 cf

Total Runoff Area = 313,660 sf Runoff Volume = 15,898 cf Average Runoff Depth = 0.61"
98.94% Pervious = 310,323 sf 1.06% Impervious = 3,337 sf

Summary for Subcatchment 1S:

Runoff = 0.98 cfs @ 12.20 hrs, Volume= 3,622 cf, Depth= 1.00"

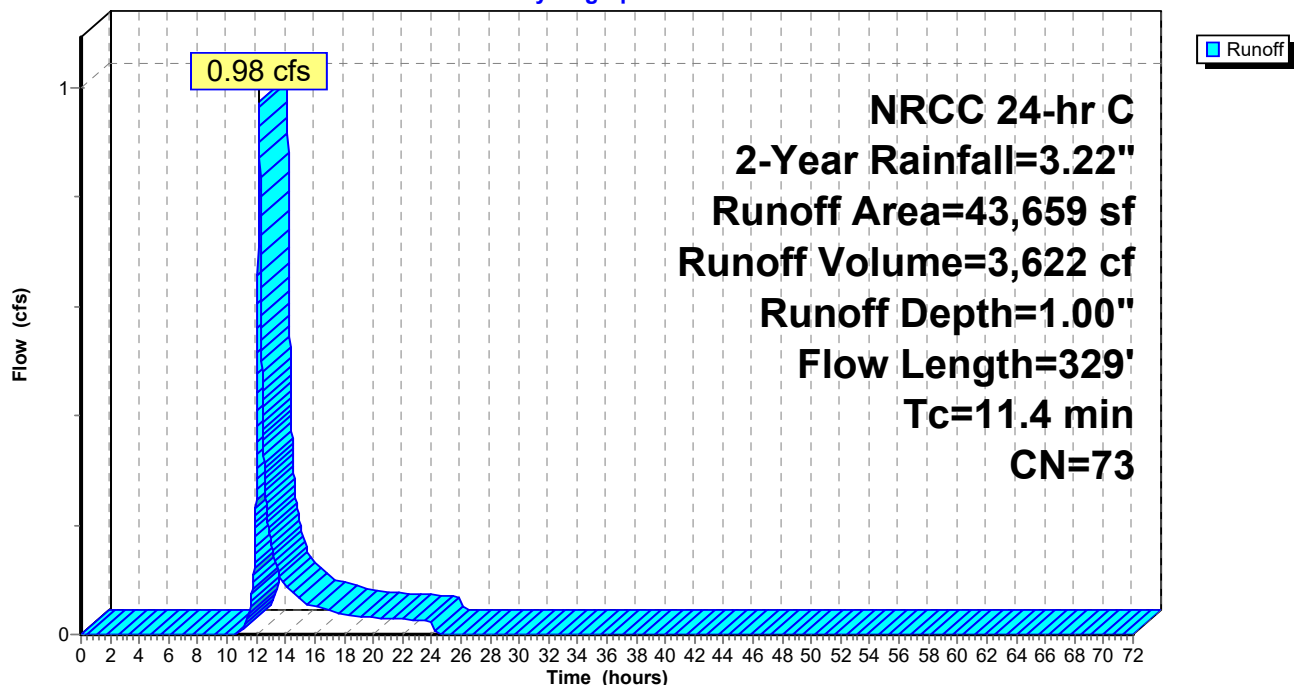
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
18,229	70	Woods, Good, HSG C
1,932	98	Roofs, HSG C
23,498	74	>75% Grass cover, Good, HSG C
43,659	73	Weighted Average
41,727		95.57% Pervious Area
1,932		4.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0280	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.3	22	0.0320	1.25		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	257	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	329	Total			

Subcatchment 1S:

Hydrograph



Summary for Subcatchment 2S:

Runoff = 1.24 cfs @ 12.19 hrs, Volume= 4,502 cf, Depth= 0.89"

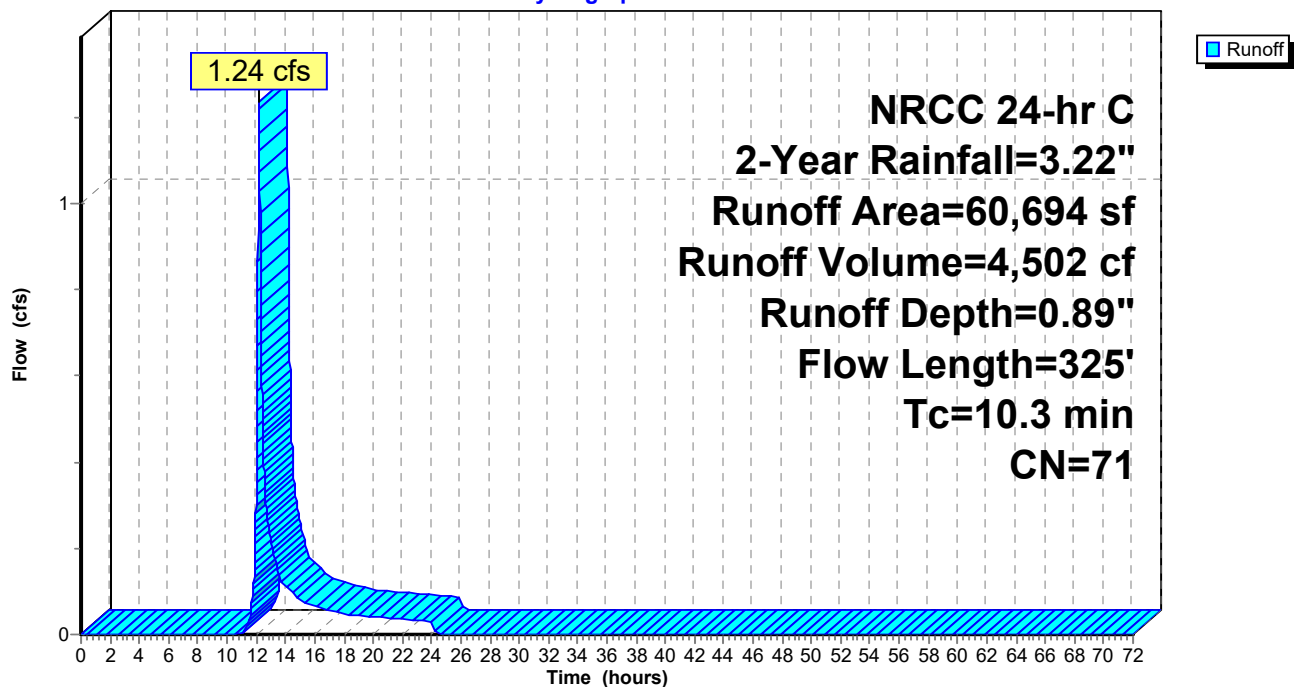
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
12,503	74	>75% Grass cover, Good, HSG C
1,405	98	Roofs, HSG C
46,786	70	Woods, Good, HSG C
60,694	71	Weighted Average
59,289		97.69% Pervious Area
1,405		2.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.5	262	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.3	325	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 1.23 cfs @ 12.17 hrs, Volume= 4,048 cf, Depth= 1.23"

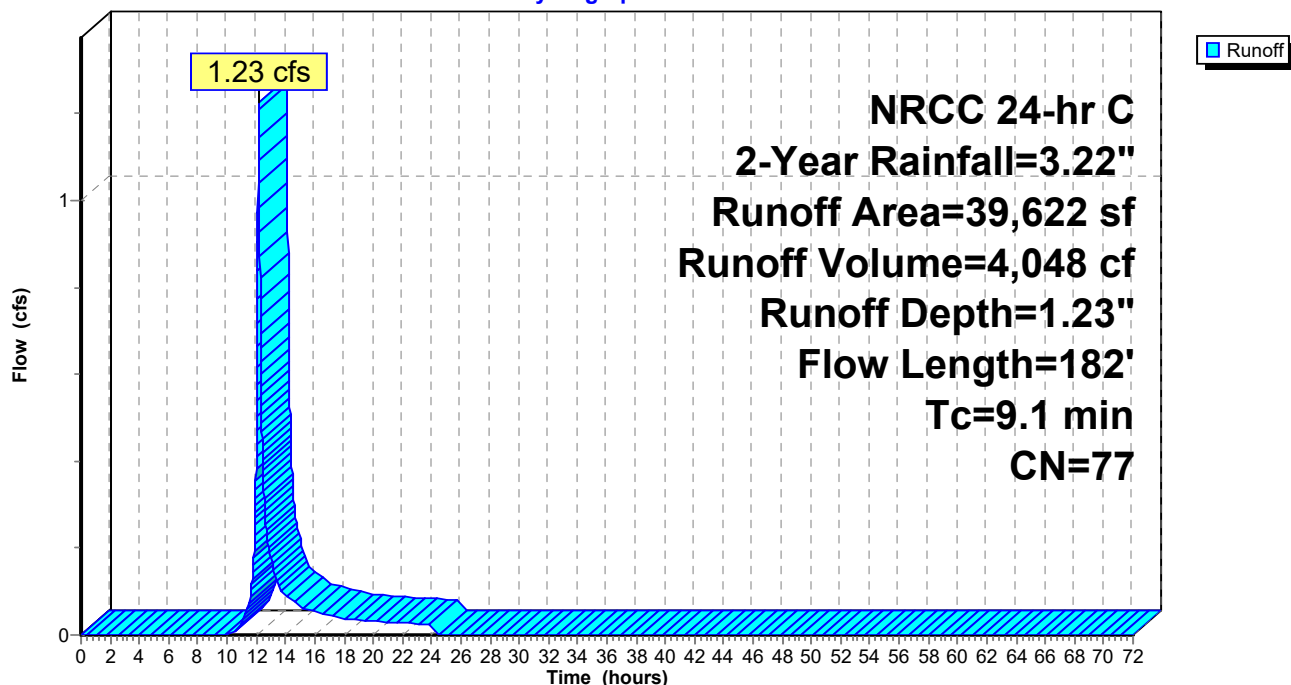
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
6,096	70	Woods, Good, HSG C
1,627	96	Gravel surface, HSG C
31,899	77	Brush, Poor, HSG C
39,622	77	Weighted Average
39,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0548	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.9	102	0.0768	1.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.1	182	Total			

Subcatchment 3S:

Hydrograph



Summary for Subcatchment 4S:

Runoff = 0.98 cfs @ 12.16 hrs, Volume= 3,176 cf, Depth= 1.00"

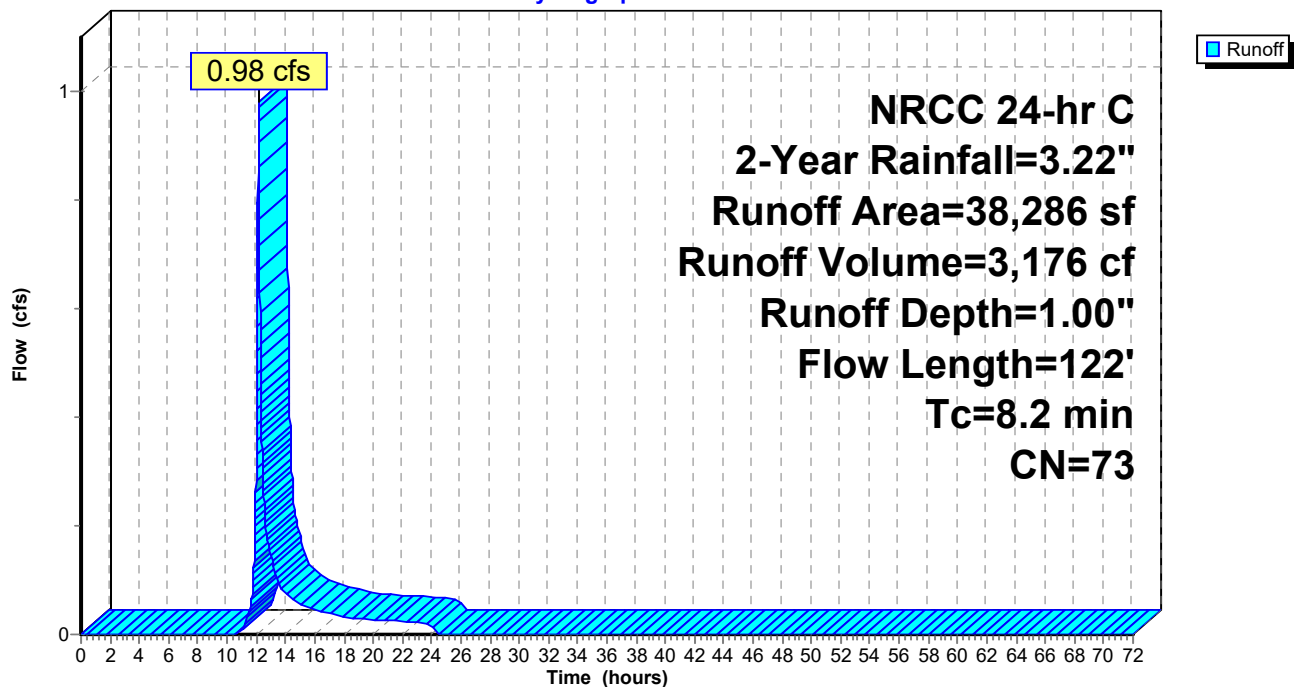
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
13,140	77	Brush, Poor, HSG C
17,055	70	Woods, Good, HSG C
373	96	Gravel surface, HSG C
7,718	70	Woods, Good, HSG C
38,286	73	Weighted Average
38,286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0640	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.7	72	0.1350	1.84		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	122	Total			

Subcatchment 4S:

Hydrograph



Summary for Subcatchment 5S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

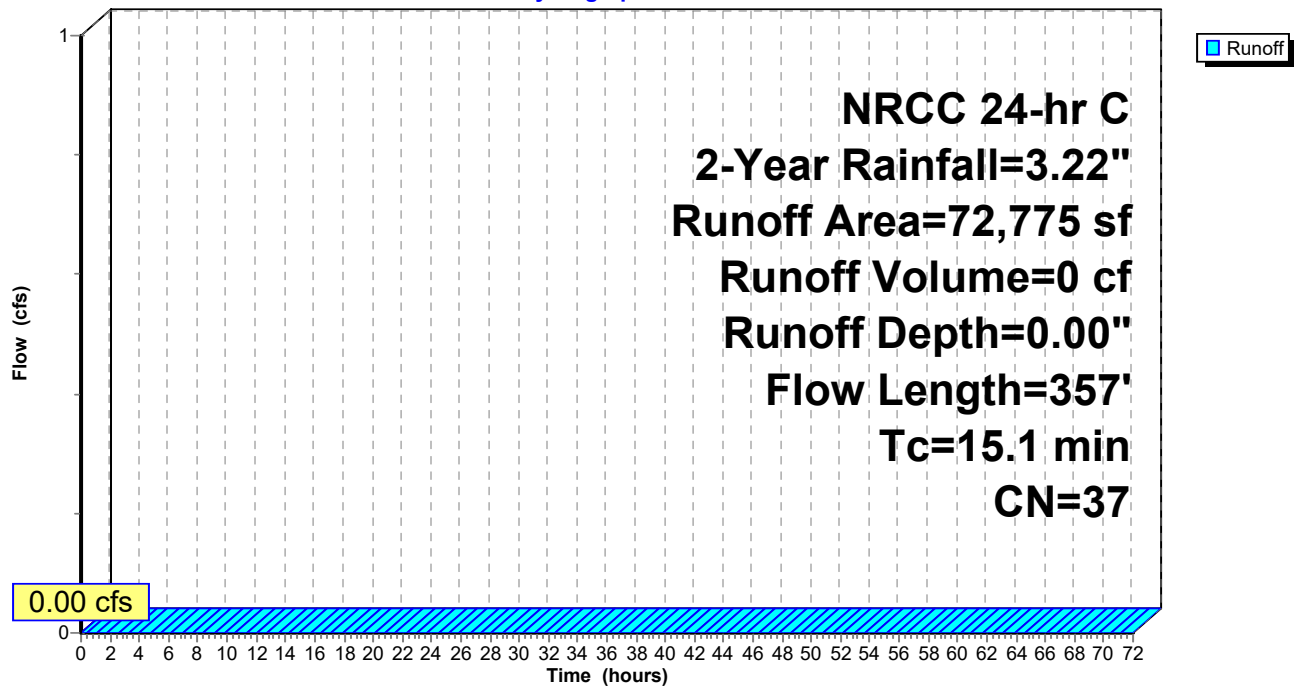
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
9,331	70	Woods, Good, HSG C
60,443	30	Woods, Good, HSG A
3,001	70	Woods, Good, HSG C
72,775	37	Weighted Average
72,775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.2	307	0.1050	1.62		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.1	357	Total			

Subcatchment 5S:

Hydrograph



Summary for Subcatchment 6S:

Runoff = 0.02 cfs @ 13.21 hrs, Volume= 548 cf, Depth= 0.11"

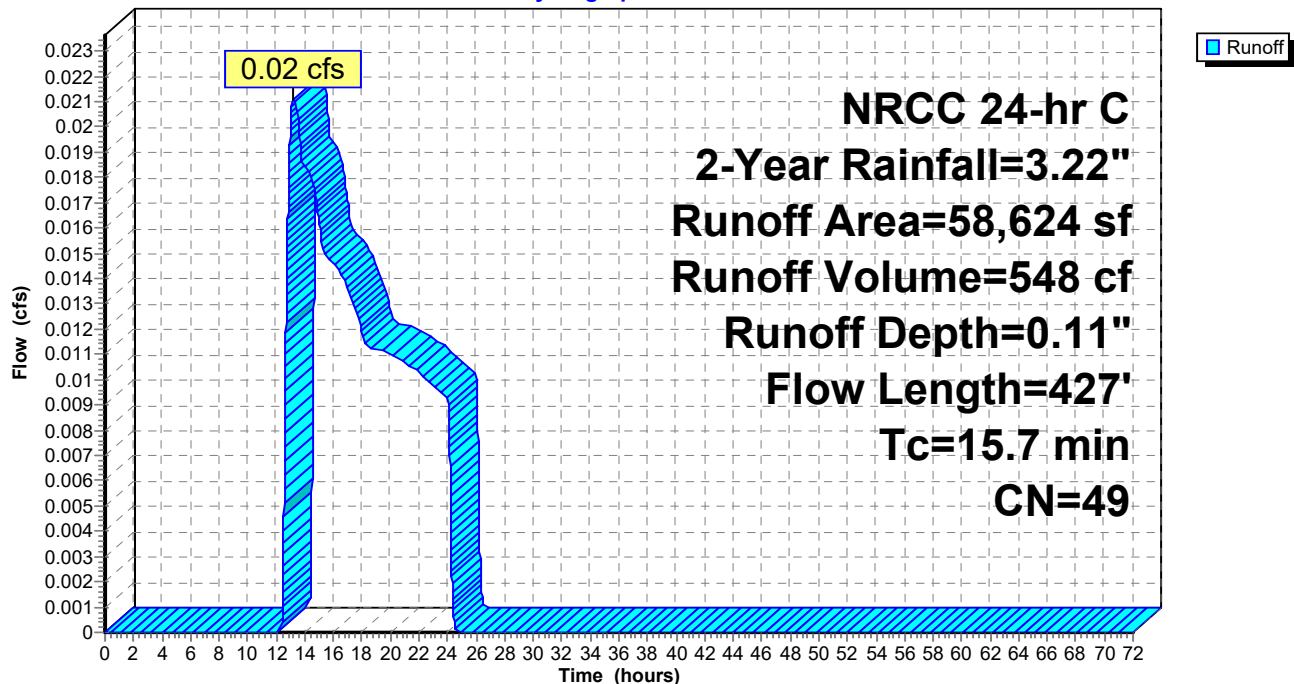
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
30,903	30	Woods, Good, HSG A
27,721	70	Woods, Good, HSG C
58,624	49	Weighted Average
58,624		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.8	377	0.1120	1.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.7	427	Total			

Subcatchment 6S:

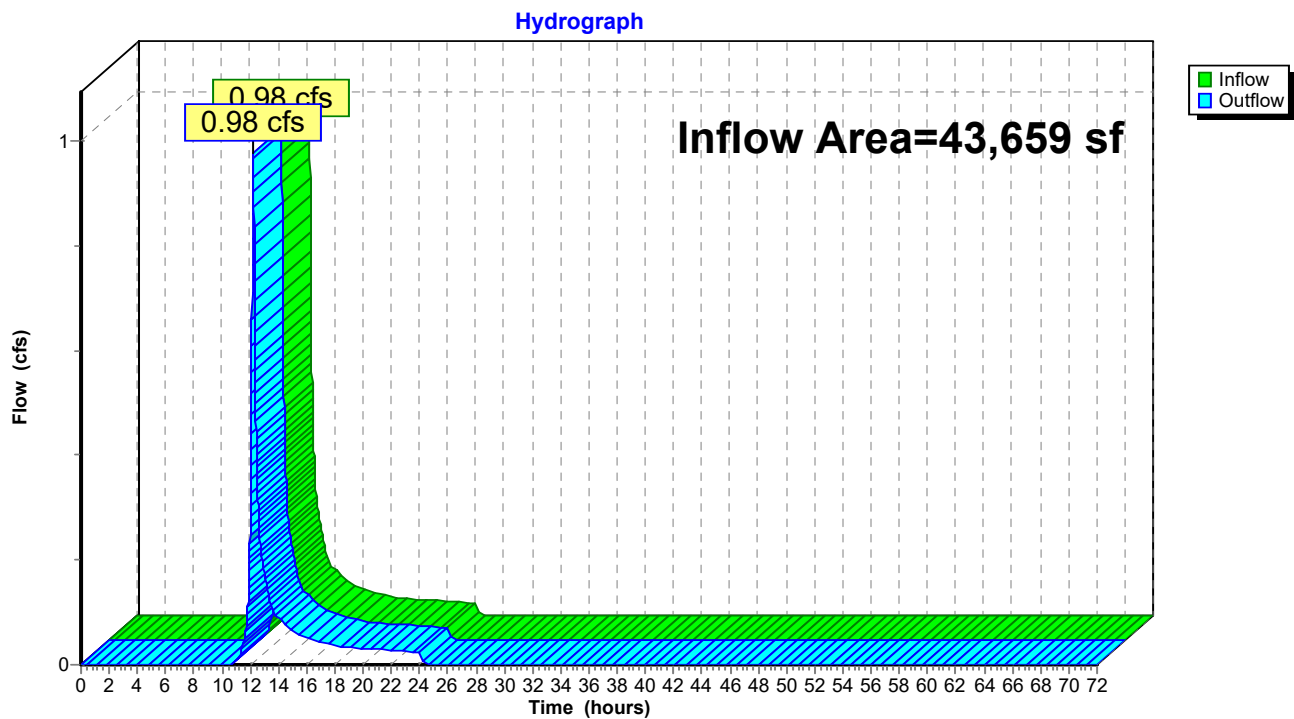
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 43,659 sf, 4.43% Impervious, Inflow Depth = 1.00" for 2-Year event
Inflow = 0.98 cfs @ 12.20 hrs, Volume= 3,622 cf
Outflow = 0.98 cfs @ 12.20 hrs, Volume= 3,622 cf, Atten= 0%, Lag= 0.0 min

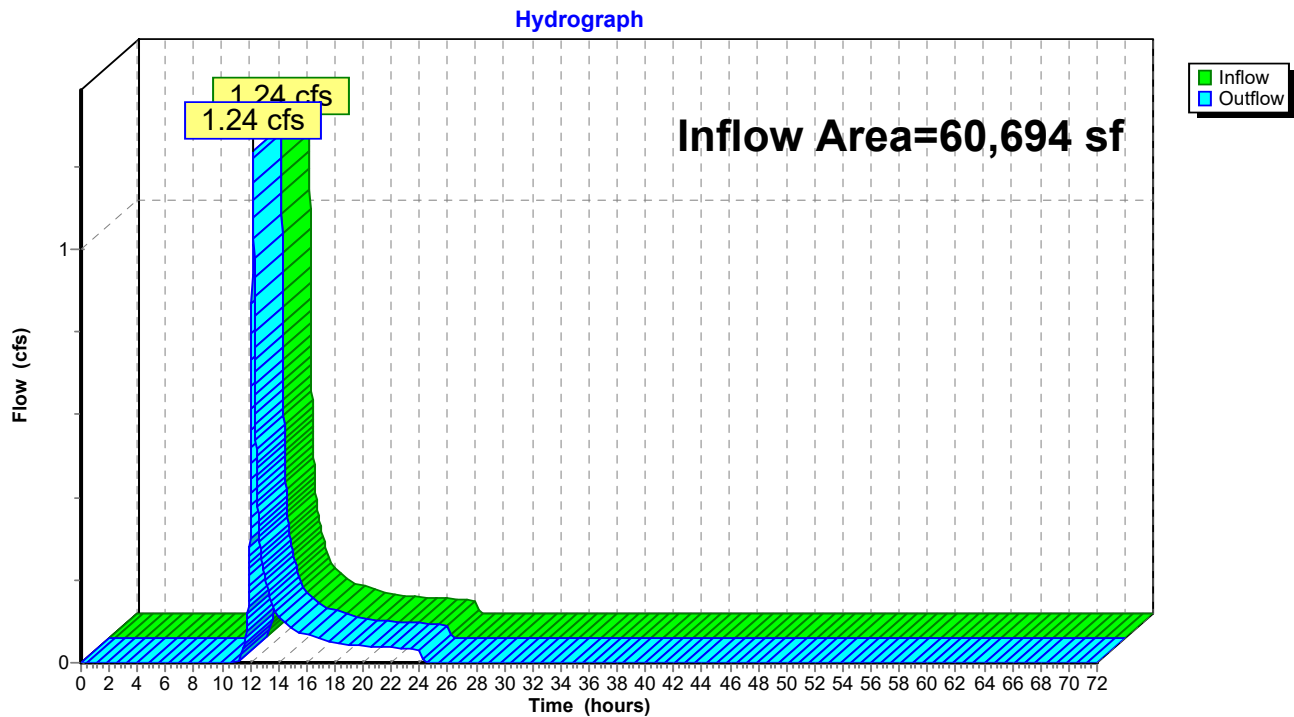
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 60,694 sf, 2.31% Impervious, Inflow Depth = 0.89" for 2-Year event
Inflow = 1.24 cfs @ 12.19 hrs, Volume= 4,502 cf
Outflow = 1.24 cfs @ 12.19 hrs, Volume= 4,502 cf, Atten= 0%, Lag= 0.0 min

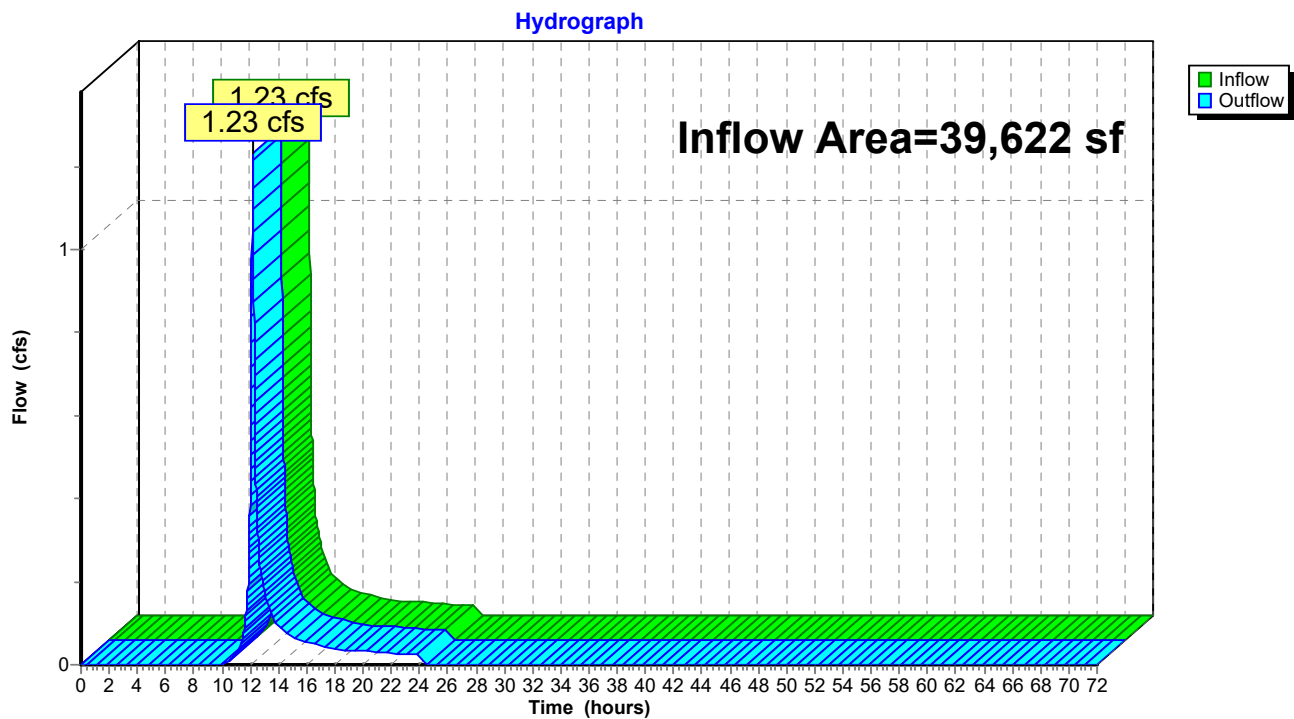
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 39,622 sf, 0.00% Impervious, Inflow Depth = 1.23" for 2-Year event
Inflow = 1.23 cfs @ 12.17 hrs, Volume= 4,048 cf
Outflow = 1.23 cfs @ 12.17 hrs, Volume= 4,048 cf, Atten= 0%, Lag= 0.0 min

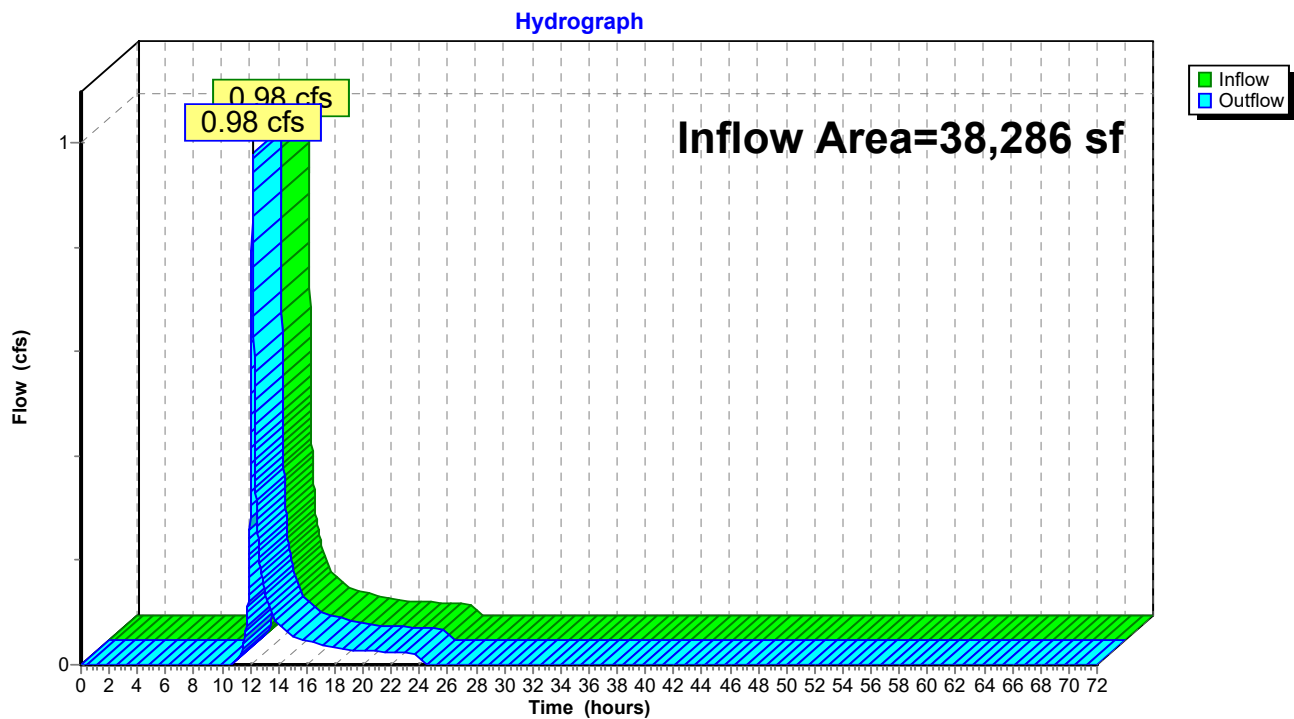
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 38,286 sf, 0.00% Impervious, Inflow Depth = 1.00" for 2-Year event
Inflow = 0.98 cfs @ 12.16 hrs, Volume= 3,176 cf
Outflow = 0.98 cfs @ 12.16 hrs, Volume= 3,176 cf, Atten= 0%, Lag= 0.0 min

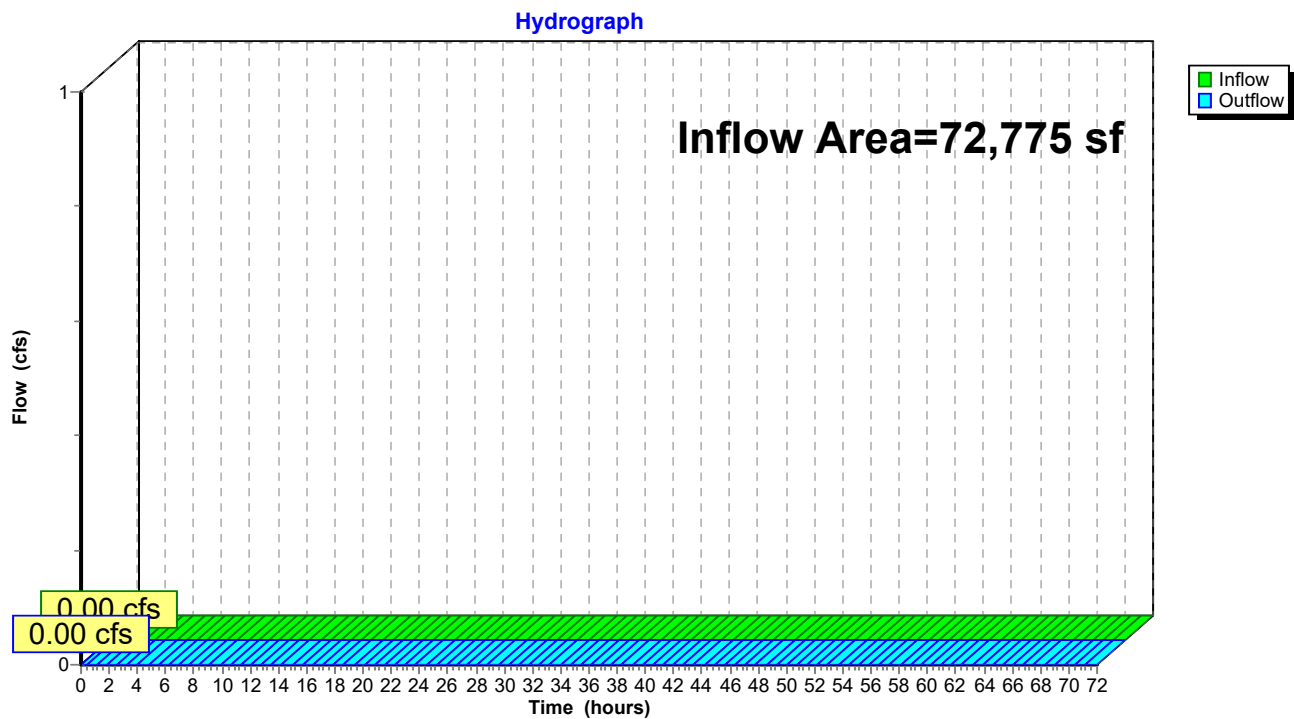
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 72,775 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

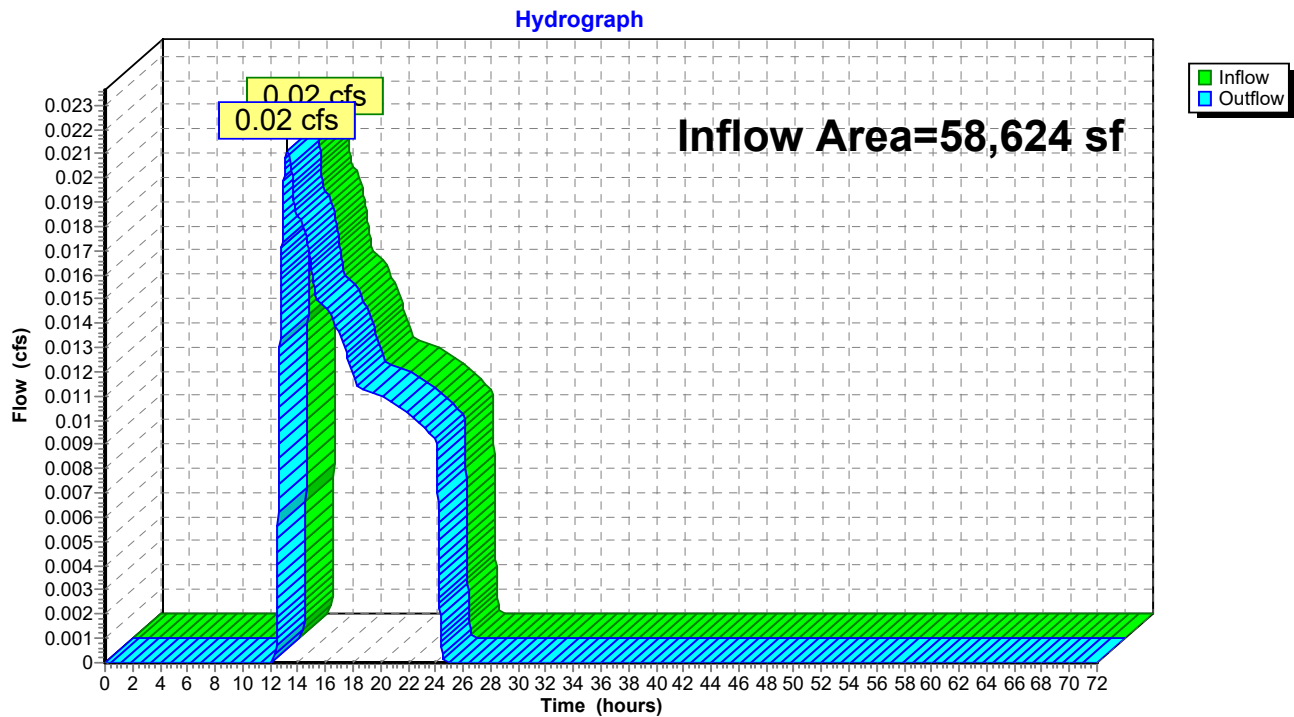
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest

Summary for Reach DP 6: Towards Offsite East

Inflow Area = 58,624 sf, 0.00% Impervious, Inflow Depth = 0.11" for 2-Year event
Inflow = 0.02 cfs @ 13.21 hrs, Volume= 548 cf
Outflow = 0.02 cfs @ 13.21 hrs, Volume= 548 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East

3328.00-PRE REV1**NRCC 24-hr C 10-Year Rainfall=4.86"**

Prepared by {enter your company name here}

Printed 11/16/2023

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=43,659 sf 4.43% Impervious Runoff Depth=2.17"
Flow Length=329' Tc=11.4 min CN=73 Runoff=2.22 cfs 7,899 cf

Subcatchment2S: Runoff Area=60,694 sf 2.31% Impervious Runoff Depth=2.01"
Flow Length=325' Tc=10.3 min CN=71 Runoff=2.97 cfs 10,173 cf

Subcatchment3S: Runoff Area=39,622 sf 0.00% Impervious Runoff Depth=2.51"
Flow Length=182' Tc=9.1 min CN=77 Runoff=2.55 cfs 8,275 cf

Subcatchment4S: Runoff Area=38,286 sf 0.00% Impervious Runoff Depth=2.17"
Flow Length=122' Tc=8.2 min CN=73 Runoff=2.22 cfs 6,927 cf

Subcatchment5S: Runoff Area=72,775 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=357' Tc=15.1 min CN=37 Runoff=0.02 cfs 694 cf

Subcatchment6S: Runoff Area=58,624 sf 0.00% Impervious Runoff Depth=0.59"
Flow Length=427' Tc=15.7 min CN=49 Runoff=0.40 cfs 2,860 cf

Reach DP 1: Towards Offsite West Inflow=2.22 cfs 7,899 cf
Outflow=2.22 cfs 7,899 cf

Reach DP 2: Towards Offsite North Inflow=2.97 cfs 10,173 cf
Outflow=2.97 cfs 10,173 cf

Reach DP 3: Towards West Wetland Inflow=2.55 cfs 8,275 cf
Outflow=2.55 cfs 8,275 cf

Reach DP 4: Towards East Wetland Inflow=2.22 cfs 6,927 cf
Outflow=2.22 cfs 6,927 cf

Reach DP 5: Towards Offsite Northwest Inflow=0.02 cfs 694 cf
Outflow=0.02 cfs 694 cf

Reach DP 6: Towards Offsite East Inflow=0.40 cfs 2,860 cf
Outflow=0.40 cfs 2,860 cf

Total Runoff Area = 313,660 sf Runoff Volume = 36,829 cf Average Runoff Depth = 1.41"
98.94% Pervious = 310,323 sf 1.06% Impervious = 3,337 sf

Summary for Subcatchment 1S:

Runoff = 2.22 cfs @ 12.19 hrs, Volume= 7,899 cf, Depth= 2.17"

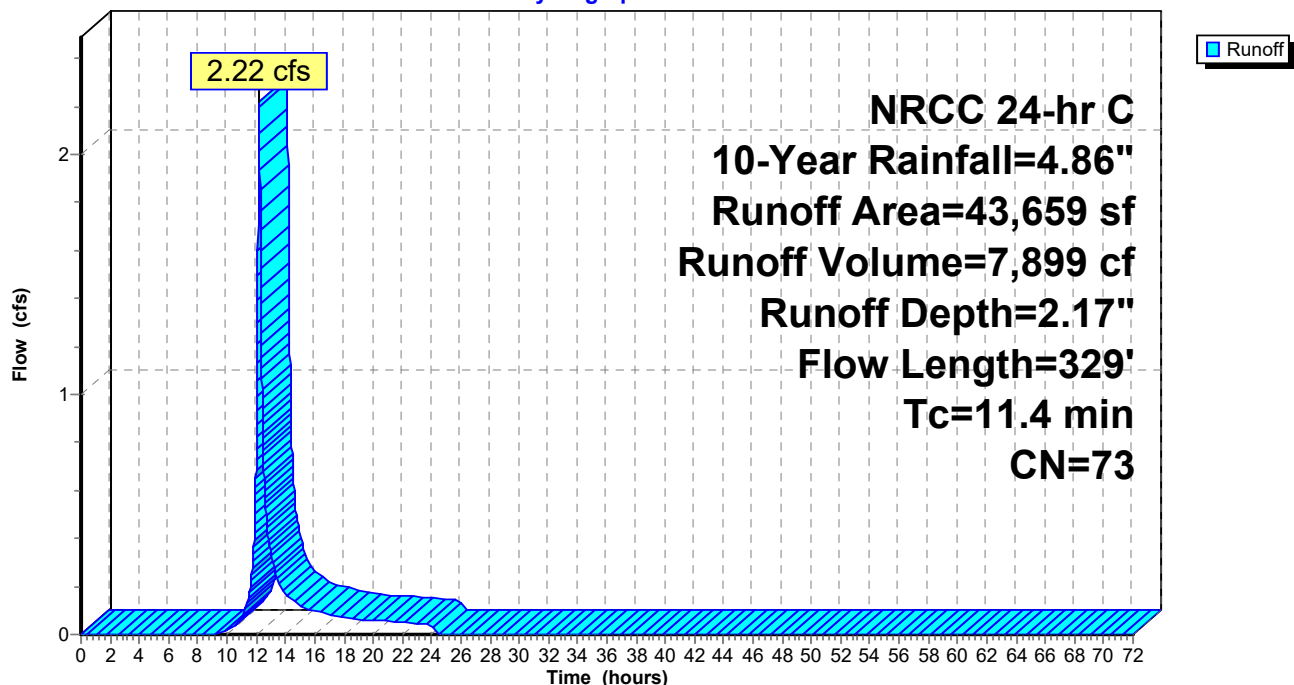
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
18,229	70	Woods, Good, HSG C
1,932	98	Roofs, HSG C
23,498	74	>75% Grass cover, Good, HSG C
43,659	73	Weighted Average
41,727		95.57% Pervious Area
1,932		4.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0280	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.3	22	0.0320	1.25		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	257	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	329	Total			

Subcatchment 1S:

Hydrograph



Summary for Subcatchment 2S:

Runoff = 2.97 cfs @ 12.18 hrs, Volume= 10,173 cf, Depth= 2.01"

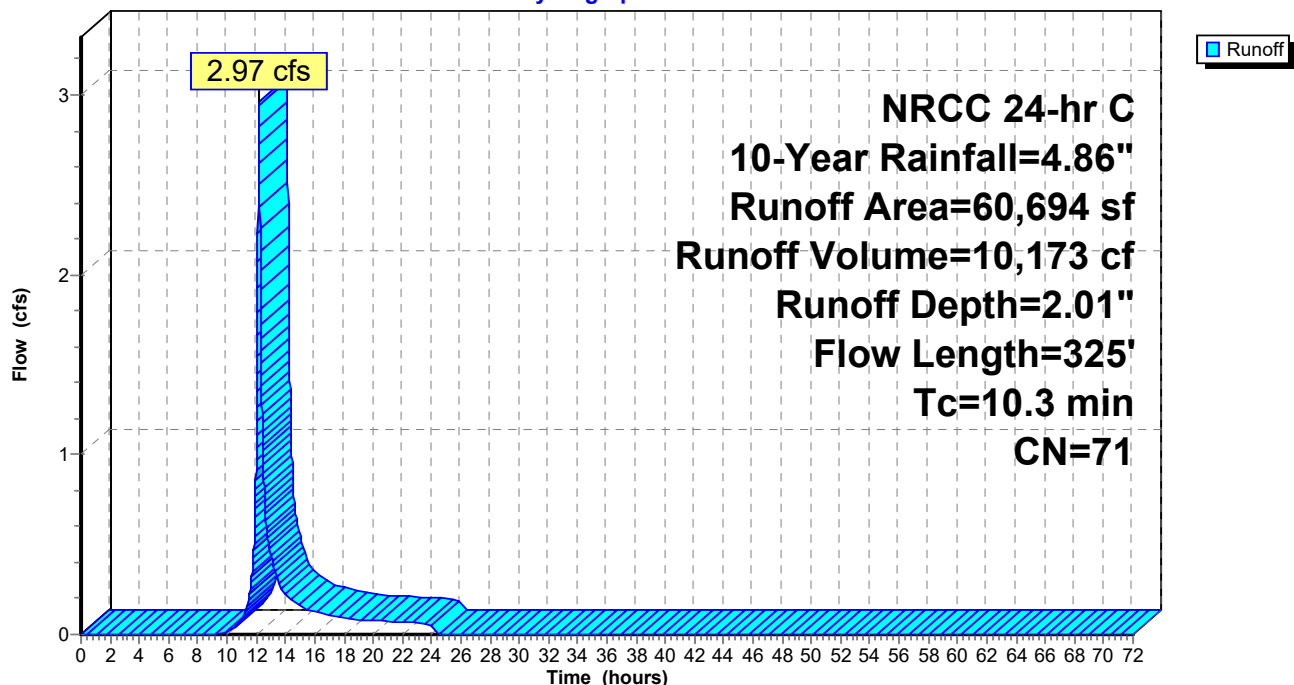
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
12,503	74	>75% Grass cover, Good, HSG C
1,405	98	Roofs, HSG C
46,786	70	Woods, Good, HSG C
60,694	71	Weighted Average
59,289		97.69% Pervious Area
1,405		2.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.5	262	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.3	325	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 2.55 cfs @ 12.16 hrs, Volume= 8,275 cf, Depth= 2.51"

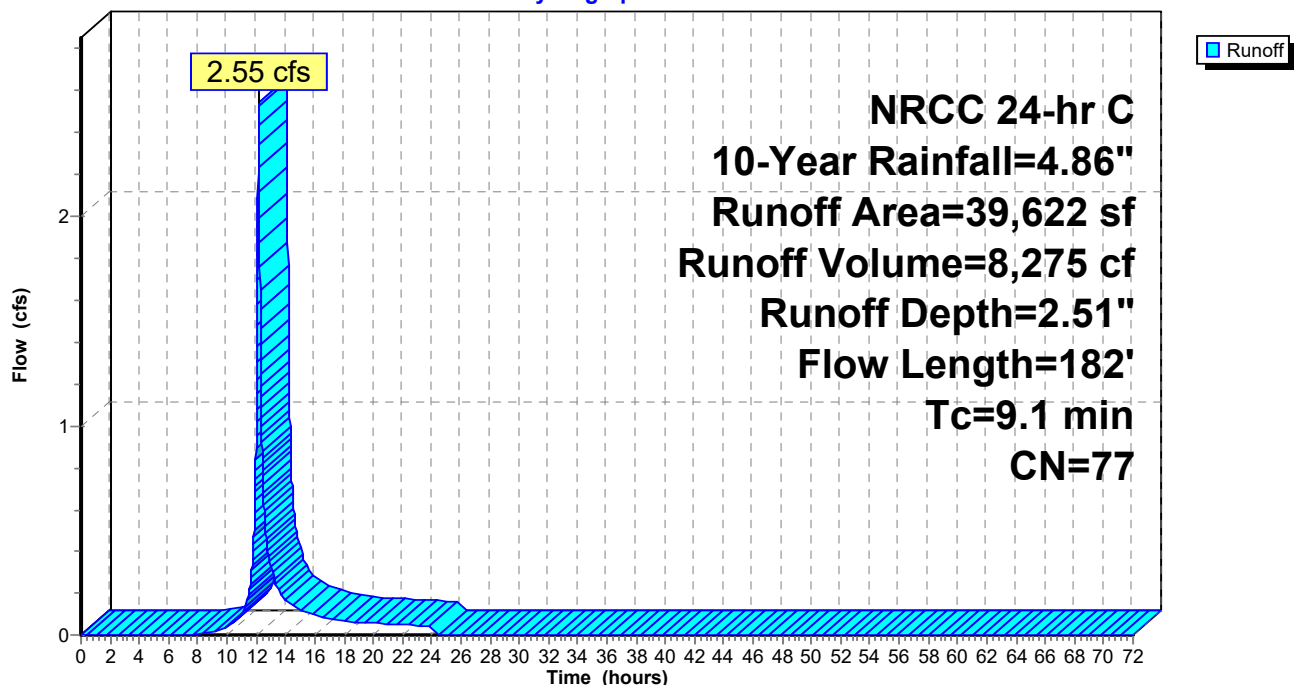
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
6,096	70	Woods, Good, HSG C
1,627	96	Gravel surface, HSG C
31,899	77	Brush, Poor, HSG C
39,622	77	Weighted Average
39,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0548	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.9	102	0.0768	1.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.1	182	Total			

Subcatchment 3S:

Hydrograph



Summary for Subcatchment 4S:

Runoff = 2.22 cfs @ 12.16 hrs, Volume= 6,927 cf, Depth= 2.17"

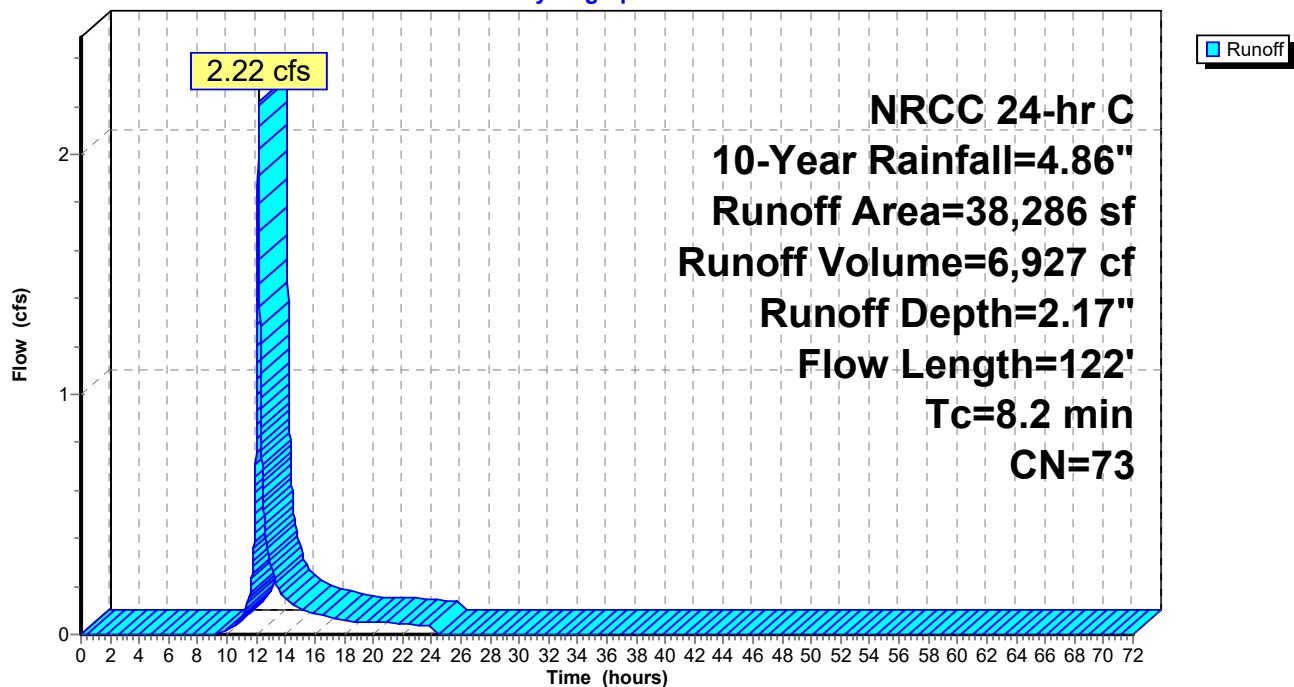
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
13,140	77	Brush, Poor, HSG C
17,055	70	Woods, Good, HSG C
373	96	Gravel surface, HSG C
7,718	70	Woods, Good, HSG C
38,286	73	Weighted Average
38,286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0640	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.7	72	0.1350	1.84		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	122	Total			

Subcatchment 4S:

Hydrograph



Summary for Subcatchment 5S:

Runoff = 0.02 cfs @ 14.51 hrs, Volume= 694 cf, Depth= 0.11"

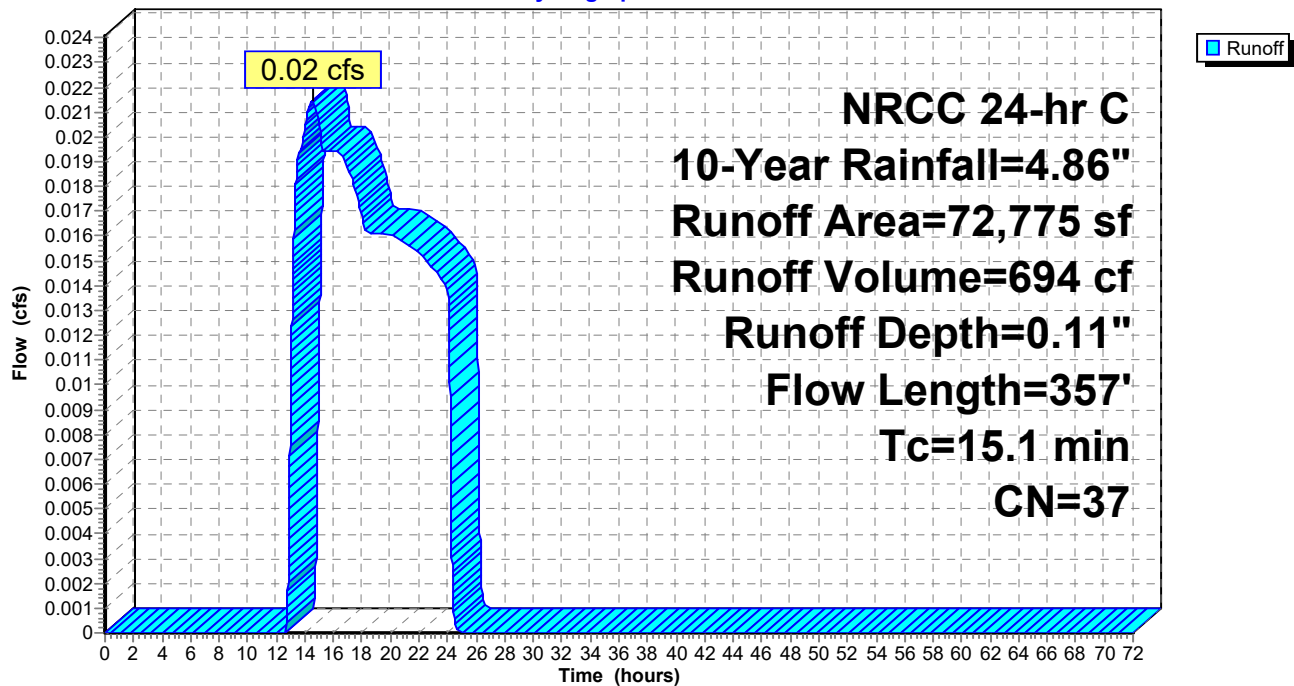
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
9,331	70	Woods, Good, HSG C
60,443	30	Woods, Good, HSG A
3,001	70	Woods, Good, HSG C
72,775	37	Weighted Average
72,775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.2	307	0.1050	1.62		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.1	357	Total			

Subcatchment 5S:

Hydrograph



Summary for Subcatchment 6S:

Runoff = 0.40 cfs @ 12.30 hrs, Volume= 2,860 cf, Depth= 0.59"

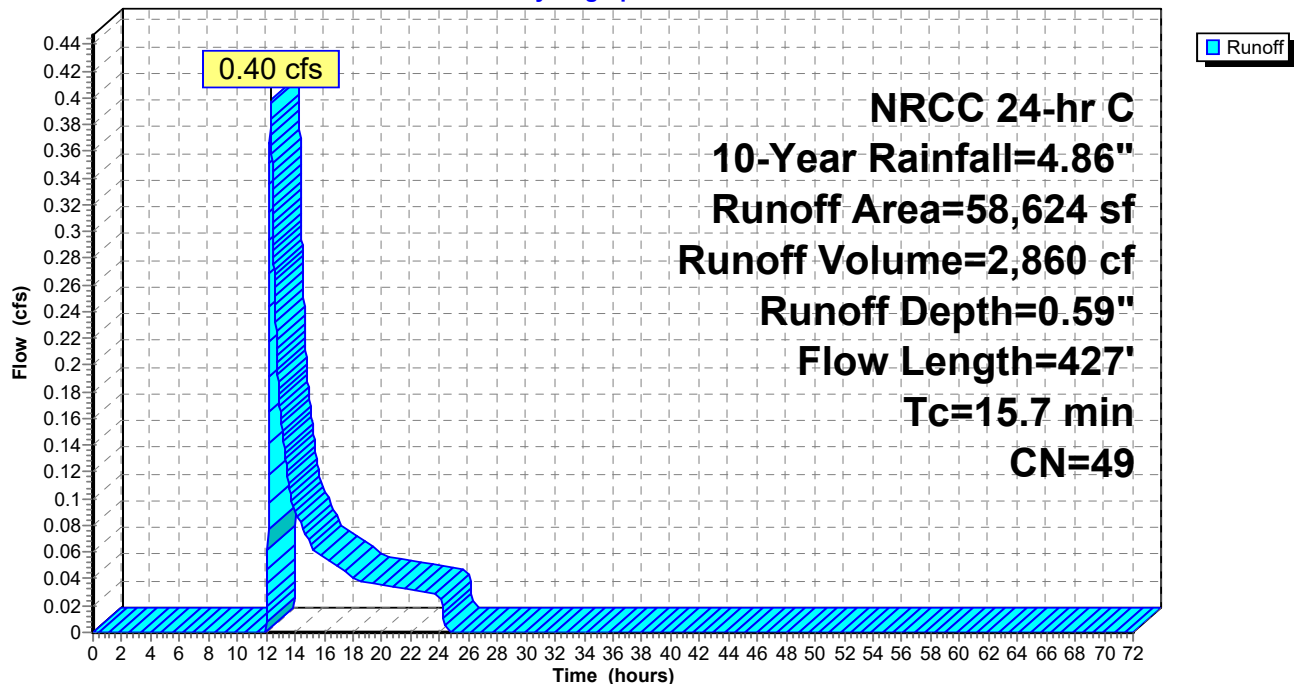
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
30,903	30	Woods, Good, HSG A
27,721	70	Woods, Good, HSG C
58,624	49	Weighted Average
58,624		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.8	377	0.1120	1.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.7	427	Total			

Subcatchment 6S:

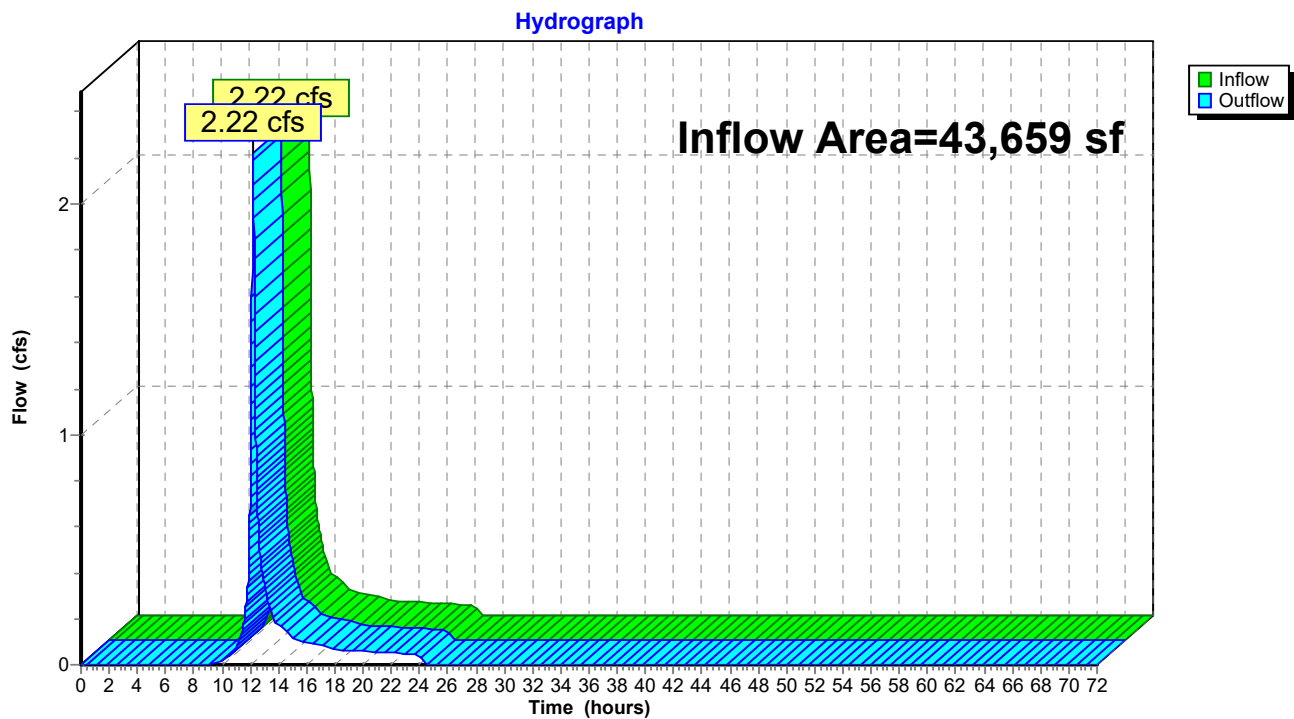
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 43,659 sf, 4.43% Impervious, Inflow Depth = 2.17" for 10-Year event
Inflow = 2.22 cfs @ 12.19 hrs, Volume= 7,899 cf
Outflow = 2.22 cfs @ 12.19 hrs, Volume= 7,899 cf, Atten= 0%, Lag= 0.0 min

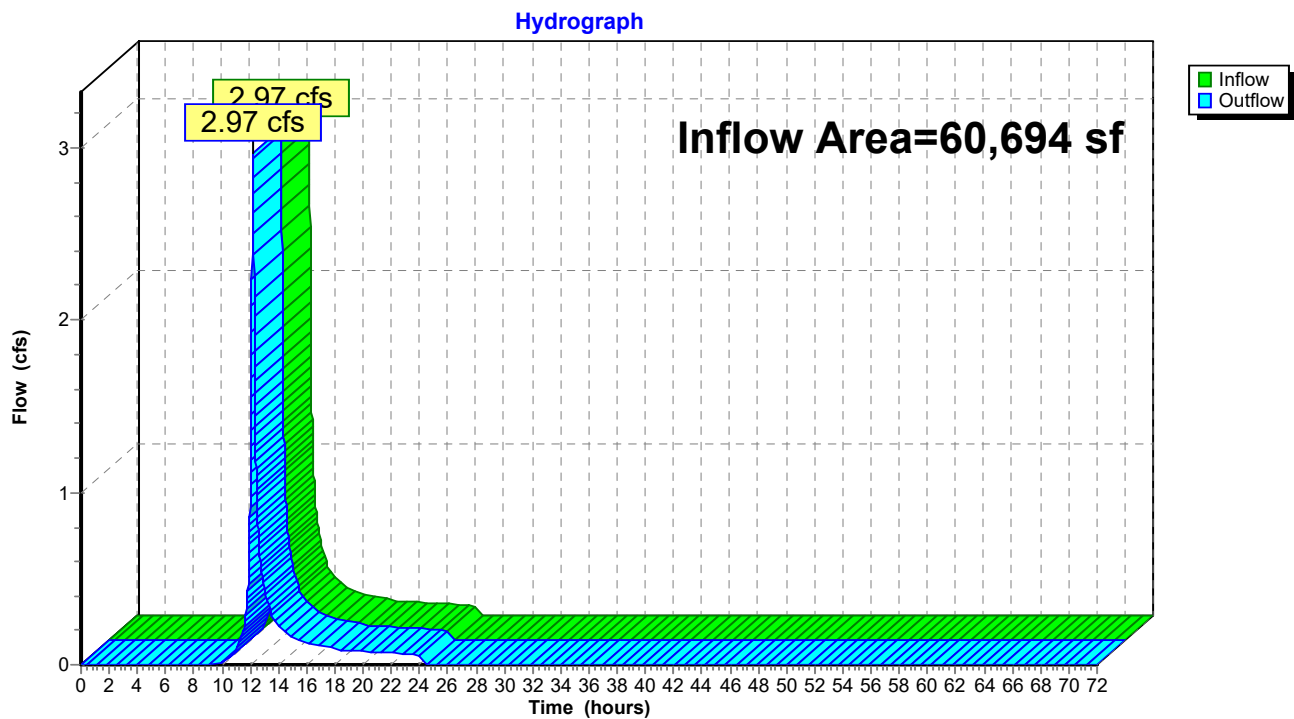
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 60,694 sf, 2.31% Impervious, Inflow Depth = 2.01" for 10-Year event
Inflow = 2.97 cfs @ 12.18 hrs, Volume= 10,173 cf
Outflow = 2.97 cfs @ 12.18 hrs, Volume= 10,173 cf, Atten= 0%, Lag= 0.0 min

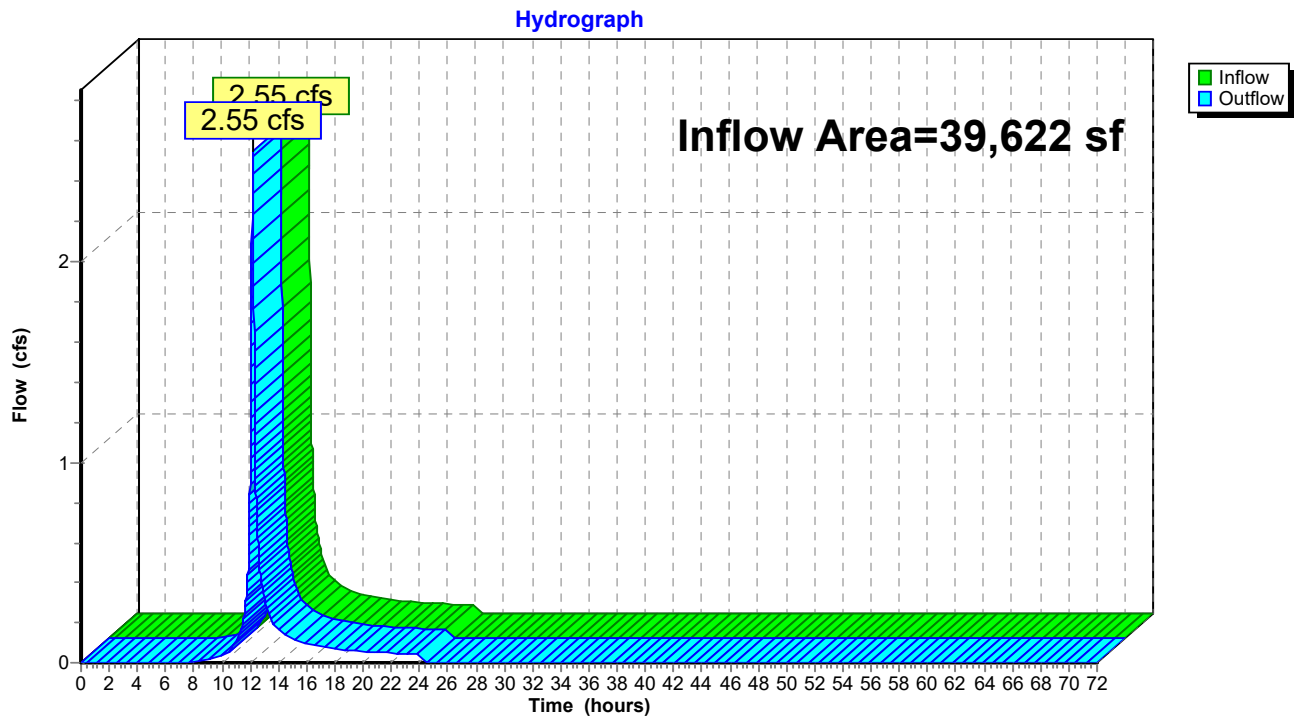
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 39,622 sf, 0.00% Impervious, Inflow Depth = 2.51" for 10-Year event
Inflow = 2.55 cfs @ 12.16 hrs, Volume= 8,275 cf
Outflow = 2.55 cfs @ 12.16 hrs, Volume= 8,275 cf, Atten= 0%, Lag= 0.0 min

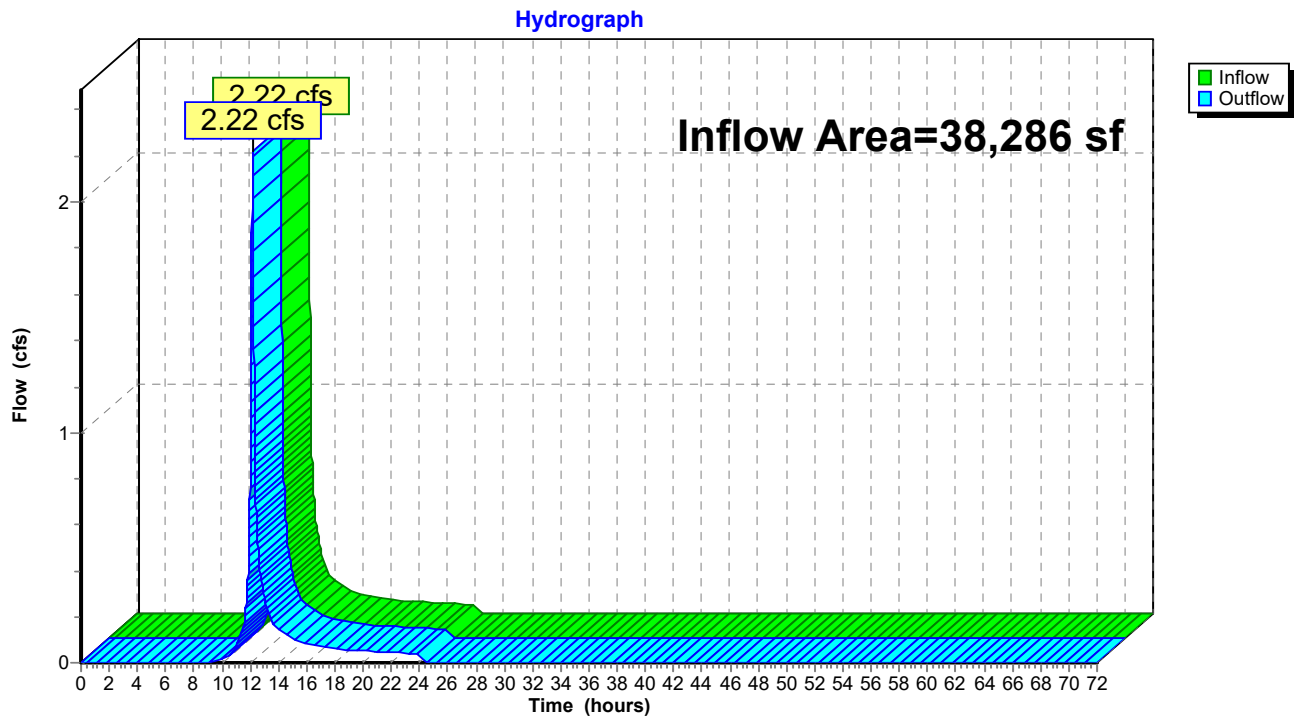
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 38,286 sf, 0.00% Impervious, Inflow Depth = 2.17" for 10-Year event
Inflow = 2.22 cfs @ 12.16 hrs, Volume= 6,927 cf
Outflow = 2.22 cfs @ 12.16 hrs, Volume= 6,927 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

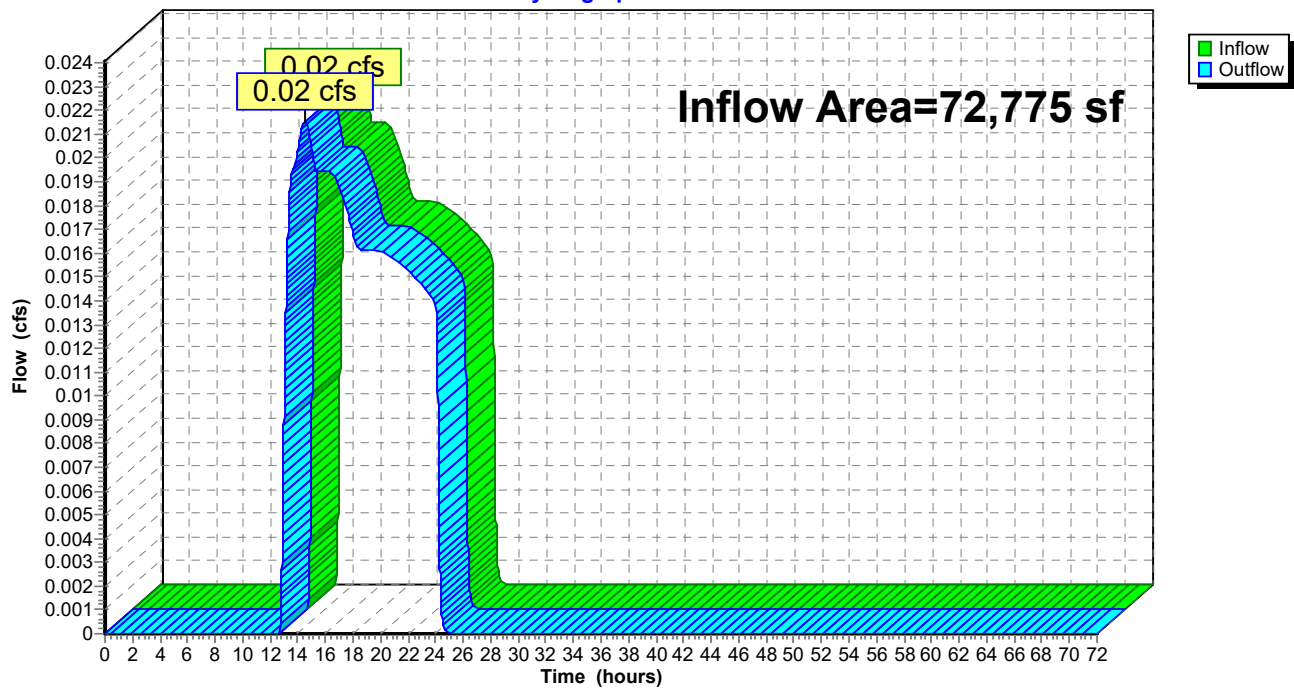
Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 72,775 sf, 0.00% Impervious, Inflow Depth = 0.11" for 10-Year event
Inflow = 0.02 cfs @ 14.51 hrs, Volume= 694 cf
Outflow = 0.02 cfs @ 14.51 hrs, Volume= 694 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest

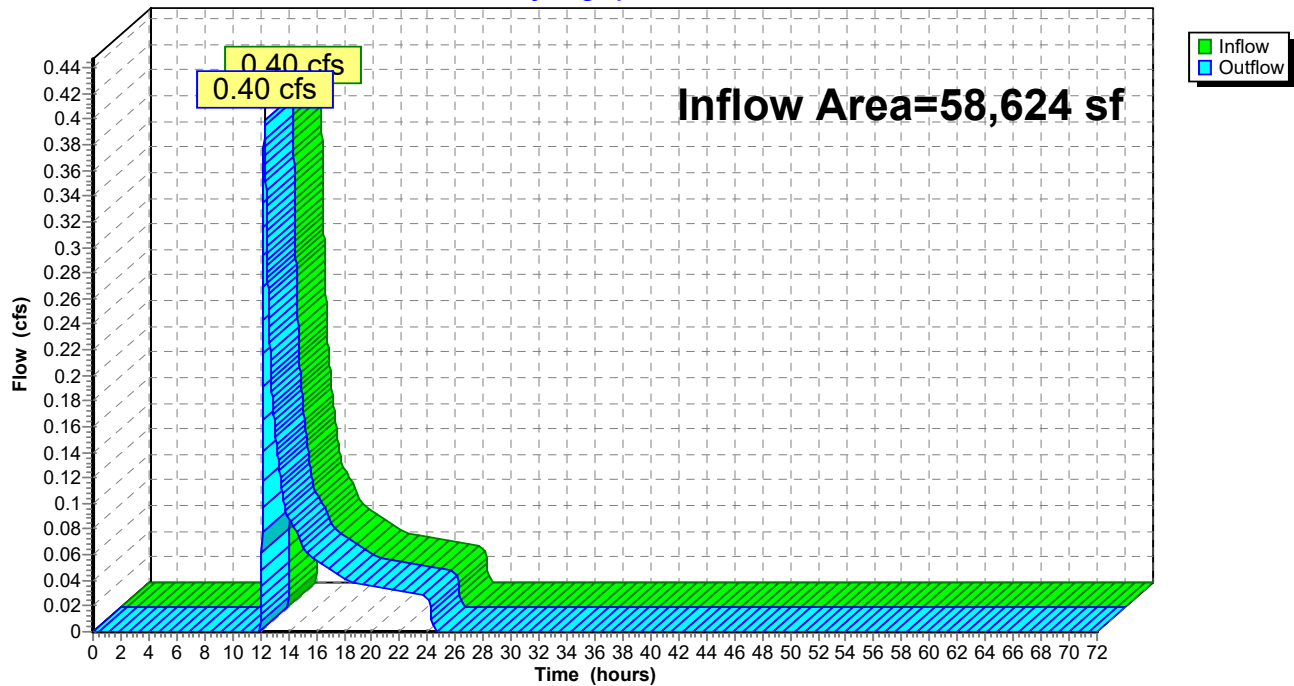
Hydrograph



Summary for Reach DP 6: Towards Offsite East

Inflow Area = 58,624 sf, 0.00% Impervious, Inflow Depth = 0.59" for 10-Year event
Inflow = 0.40 cfs @ 12.30 hrs, Volume= 2,860 cf
Outflow = 0.40 cfs @ 12.30 hrs, Volume= 2,860 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East**Hydrograph**

3328.00-PRE REV1

NRCC 24-hr C 25-Year Rainfall=6.15"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S:	Runoff Area=43,659 sf 4.43% Impervious Runoff Depth=3.21" Flow Length=329' Tc=11.4 min CN=73 Runoff=3.30 cfs 11,691 cf
Subcatchment2S:	Runoff Area=60,694 sf 2.31% Impervious Runoff Depth=3.02" Flow Length=325' Tc=10.3 min CN=71 Runoff=4.49 cfs 15,275 cf
Subcatchment3S:	Runoff Area=39,622 sf 0.00% Impervious Runoff Depth=3.61" Flow Length=182' Tc=9.1 min CN=77 Runoff=3.66 cfs 11,921 cf
Subcatchment4S:	Runoff Area=38,286 sf 0.00% Impervious Runoff Depth=3.21" Flow Length=122' Tc=8.2 min CN=73 Runoff=3.29 cfs 10,253 cf
Subcatchment5S:	Runoff Area=72,775 sf 0.00% Impervious Runoff Depth=0.38" Flow Length=357' Tc=15.1 min CN=37 Runoff=0.14 cfs 2,311 cf
Subcatchment6S:	Runoff Area=58,624 sf 0.00% Impervious Runoff Depth=1.14" Flow Length=427' Tc=15.7 min CN=49 Runoff=1.09 cfs 5,586 cf
Reach DP 1: Towards Offsite West	Inflow=3.30 cfs 11,691 cf Outflow=3.30 cfs 11,691 cf
Reach DP 2: Towards Offsite North	Inflow=4.49 cfs 15,275 cf Outflow=4.49 cfs 15,275 cf
Reach DP 3: Towards West Wetland	Inflow=3.66 cfs 11,921 cf Outflow=3.66 cfs 11,921 cf
Reach DP 4: Towards East Wetland	Inflow=3.29 cfs 10,253 cf Outflow=3.29 cfs 10,253 cf
Reach DP 5: Towards Offsite Northwest	Inflow=0.14 cfs 2,311 cf Outflow=0.14 cfs 2,311 cf
Reach DP 6: Towards Offsite East	Inflow=1.09 cfs 5,586 cf Outflow=1.09 cfs 5,586 cf

Total Runoff Area = 313,660 sf Runoff Volume = 57,036 cf Average Runoff Depth = 2.18"
98.94% Pervious = 310,323 sf 1.06% Impervious = 3,337 sf

Summary for Subcatchment 1S:

Runoff = 3.30 cfs @ 12.19 hrs, Volume= 11,691 cf, Depth= 3.21"

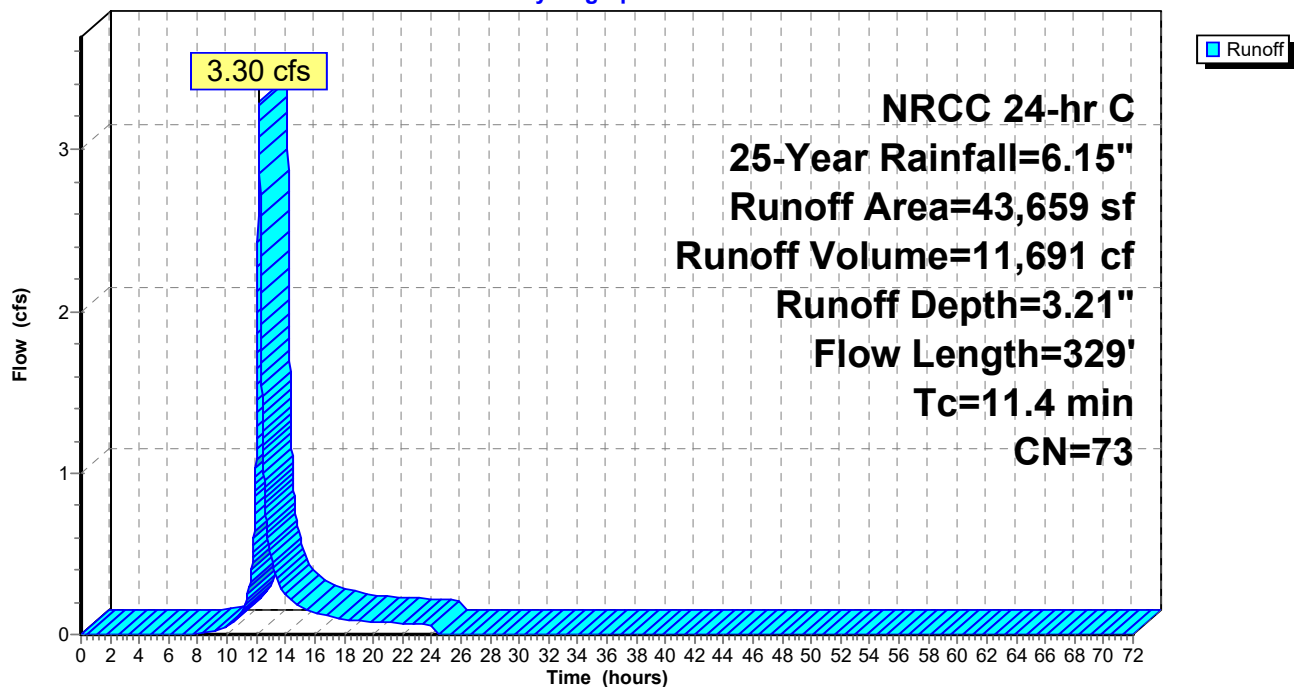
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
18,229	70	Woods, Good, HSG C
1,932	98	Roofs, HSG C
23,498	74	>75% Grass cover, Good, HSG C
43,659	73	Weighted Average
41,727		95.57% Pervious Area
1,932		4.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0280	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.3	22	0.0320	1.25		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	257	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	329	Total			

Subcatchment 1S:

Hydrograph



Summary for Subcatchment 2S:

Runoff = 4.49 cfs @ 12.18 hrs, Volume= 15,275 cf, Depth= 3.02"

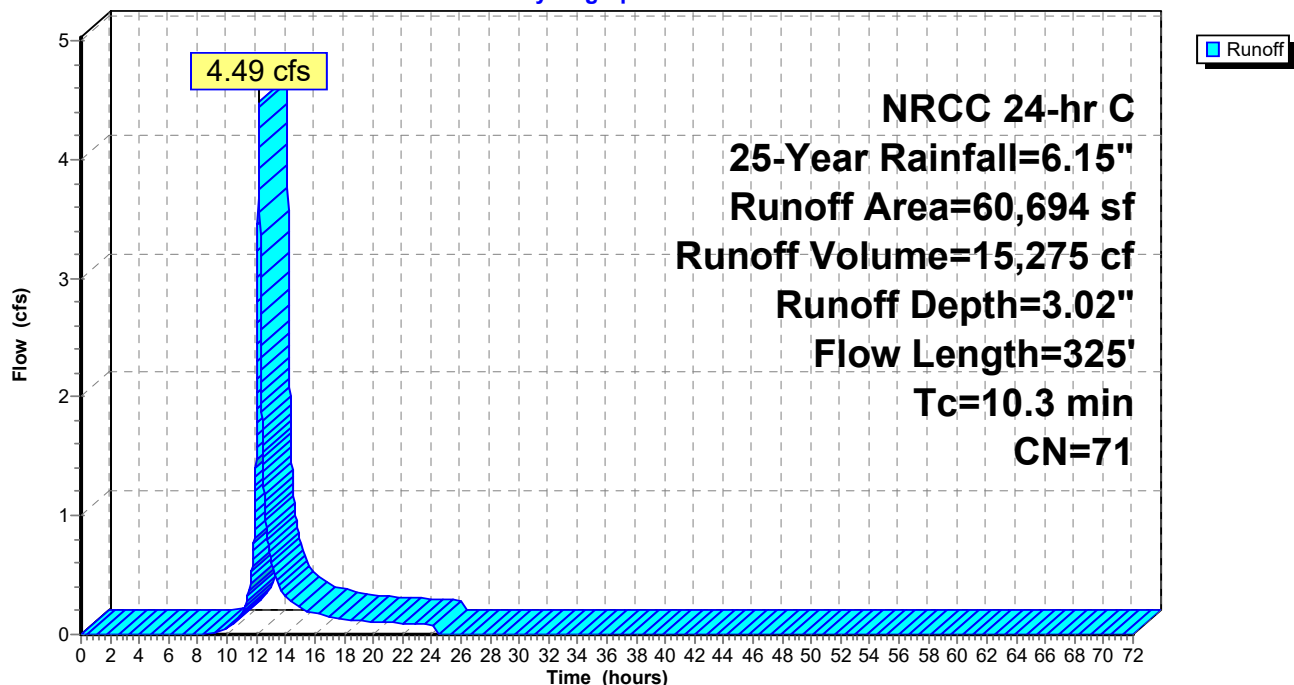
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
12,503	74	>75% Grass cover, Good, HSG C
1,405	98	Roofs, HSG C
46,786	70	Woods, Good, HSG C
60,694	71	Weighted Average
59,289		97.69% Pervious Area
1,405		2.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.5	262	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.3	325	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 3.66 cfs @ 12.16 hrs, Volume= 11,921 cf, Depth= 3.61"

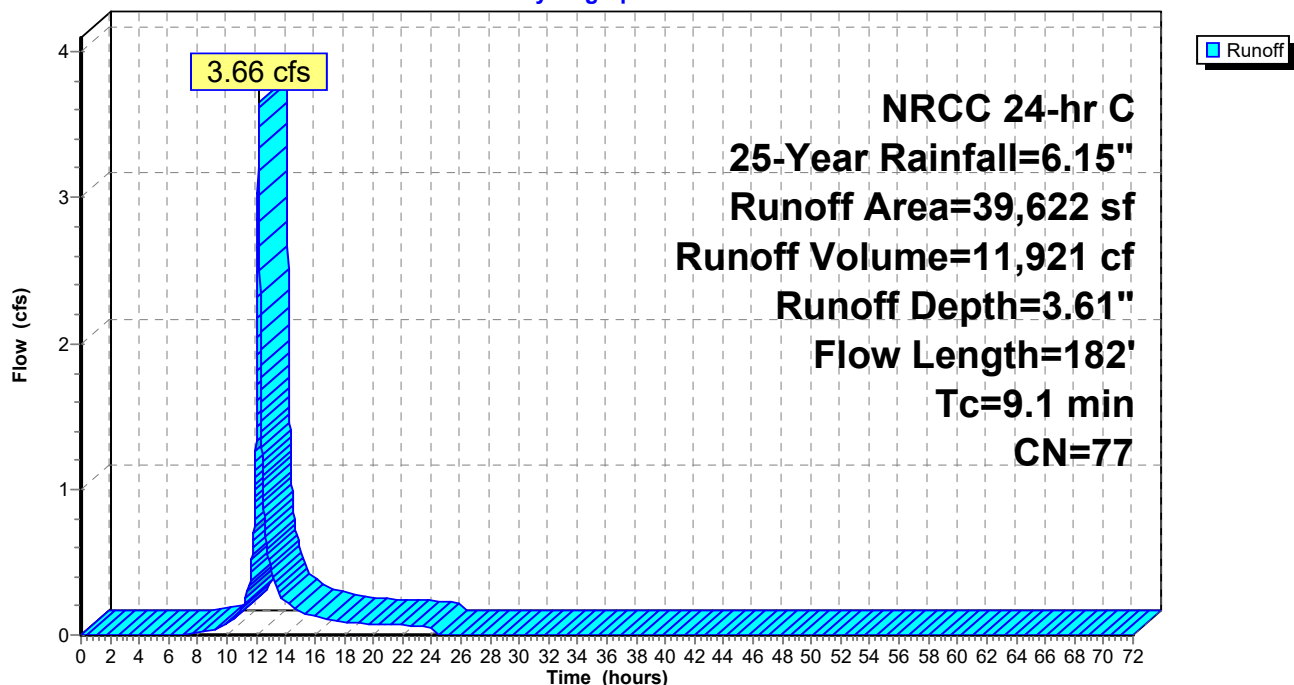
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
6,096	70	Woods, Good, HSG C
1,627	96	Gravel surface, HSG C
31,899	77	Brush, Poor, HSG C
39,622	77	Weighted Average
39,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0548	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.9	102	0.0768	1.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.1	182	Total			

Subcatchment 3S:

Hydrograph



Summary for Subcatchment 4S:

Runoff = 3.29 cfs @ 12.16 hrs, Volume= 10,253 cf, Depth= 3.21"

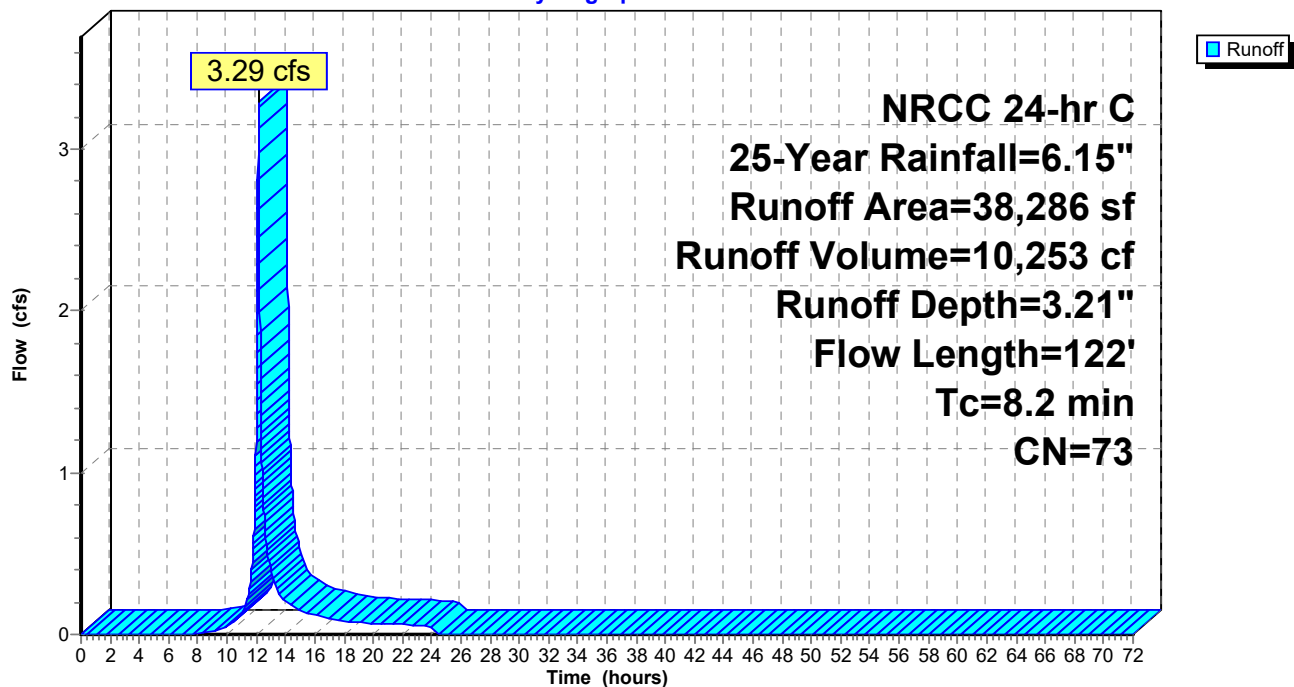
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
13,140	77	Brush, Poor, HSG C
17,055	70	Woods, Good, HSG C
373	96	Gravel surface, HSG C
7,718	70	Woods, Good, HSG C
38,286	73	Weighted Average
38,286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0640	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.7	72	0.1350	1.84		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	122	Total			

Subcatchment 4S:

Hydrograph



Summary for Subcatchment 5S:

Runoff = 0.14 cfs @ 12.60 hrs, Volume= 2,311 cf, Depth= 0.38"

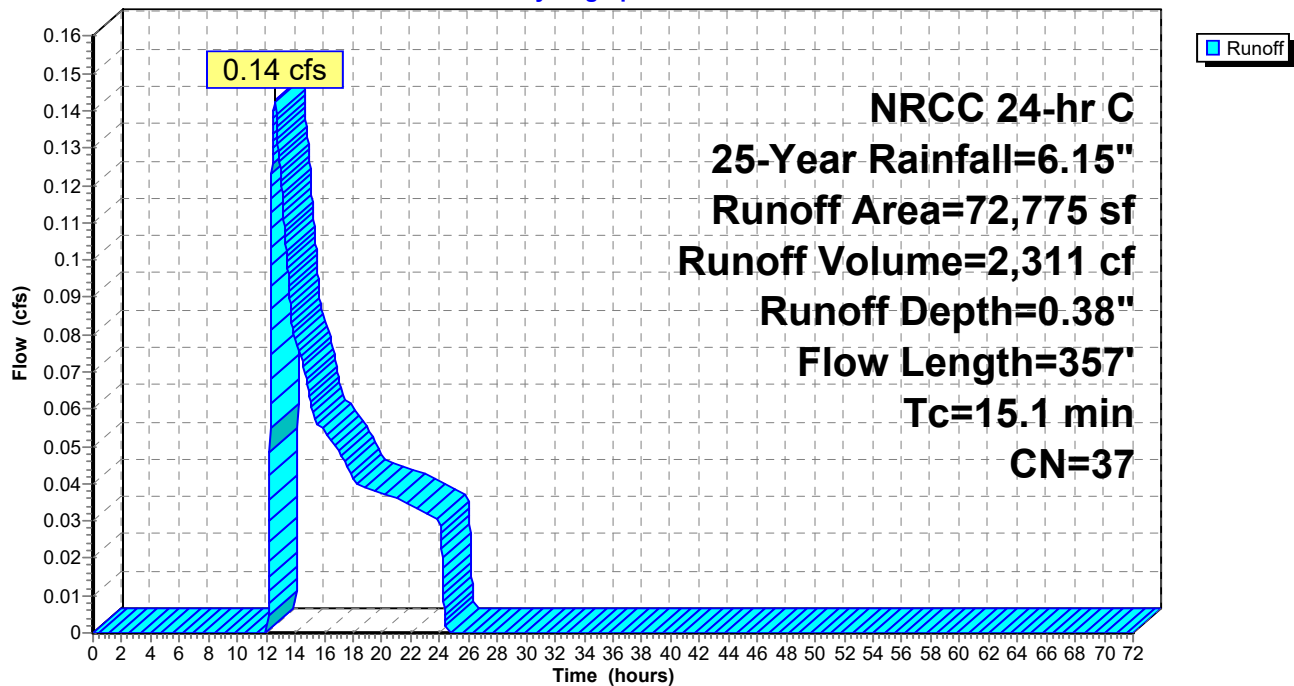
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
9,331	70	Woods, Good, HSG C
60,443	30	Woods, Good, HSG A
3,001	70	Woods, Good, HSG C
72,775	37	Weighted Average
72,775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.2	307	0.1050	1.62		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.1	357	Total			

Subcatchment 5S:

Hydrograph



Summary for Subcatchment 6S:

Runoff = 1.09 cfs @ 12.27 hrs, Volume= 5,586 cf, Depth= 1.14"

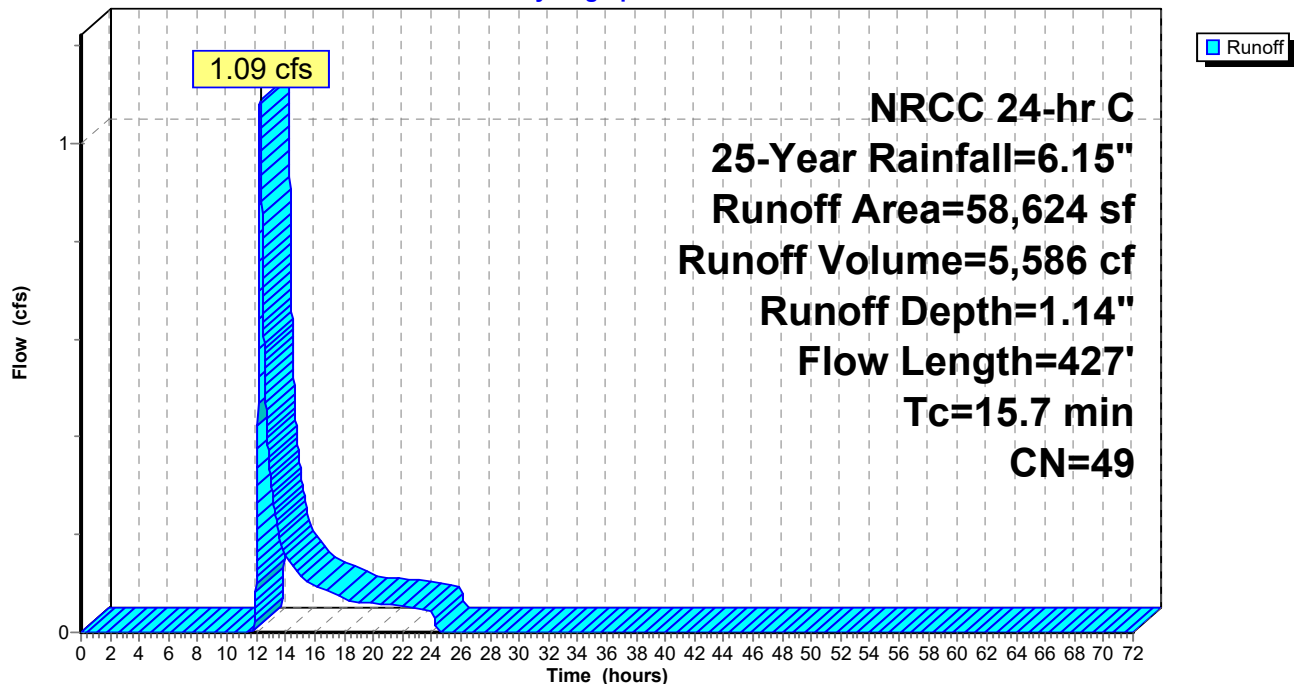
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
30,903	30	Woods, Good, HSG A
27,721	70	Woods, Good, HSG C
58,624	49	Weighted Average
58,624		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.8	377	0.1120	1.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.7	427	Total			

Subcatchment 6S:

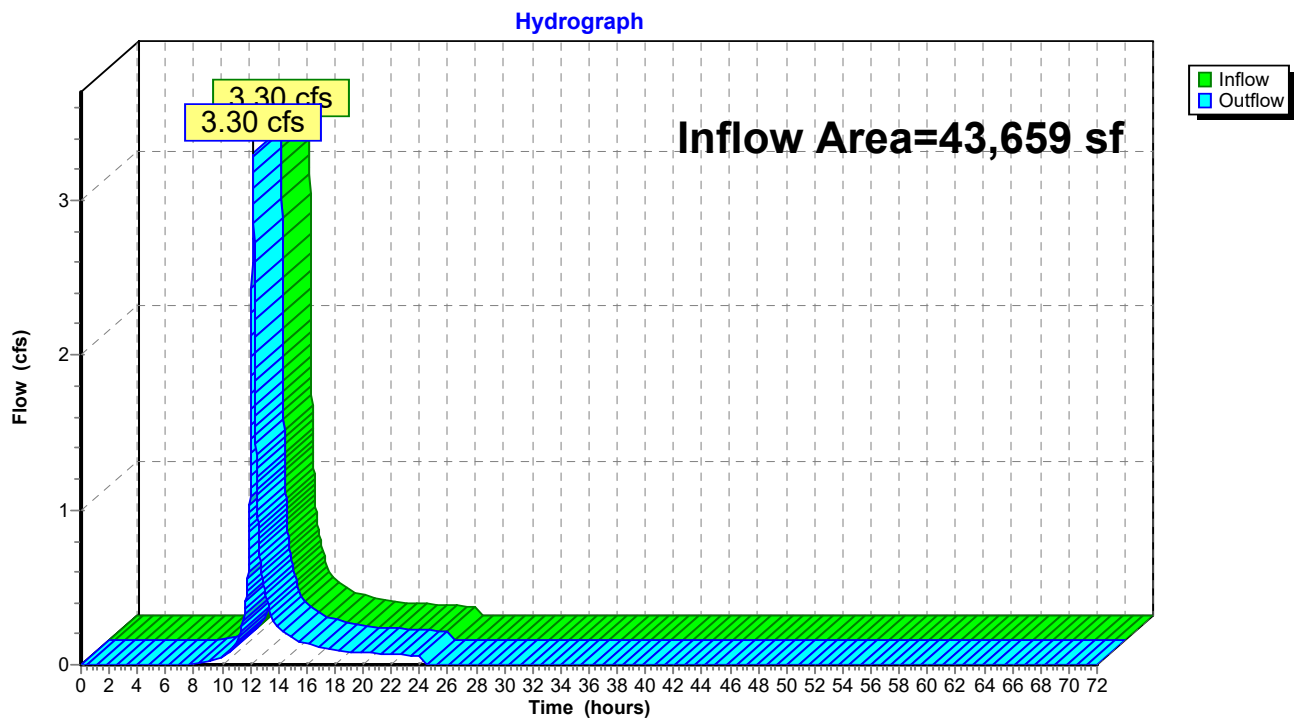
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 43,659 sf, 4.43% Impervious, Inflow Depth = 3.21" for 25-Year event
Inflow = 3.30 cfs @ 12.19 hrs, Volume= 11,691 cf
Outflow = 3.30 cfs @ 12.19 hrs, Volume= 11,691 cf, Atten= 0%, Lag= 0.0 min

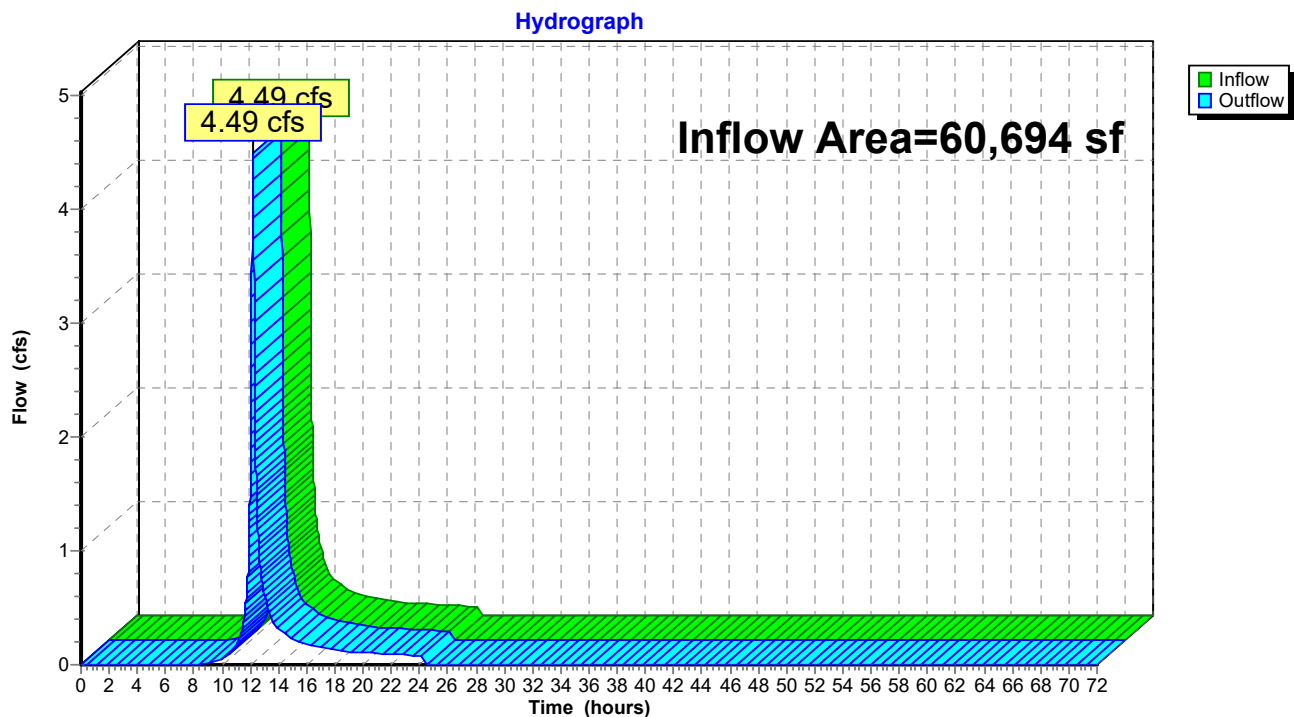
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 60,694 sf, 2.31% Impervious, Inflow Depth = 3.02" for 25-Year event
Inflow = 4.49 cfs @ 12.18 hrs, Volume= 15,275 cf
Outflow = 4.49 cfs @ 12.18 hrs, Volume= 15,275 cf, Atten= 0%, Lag= 0.0 min

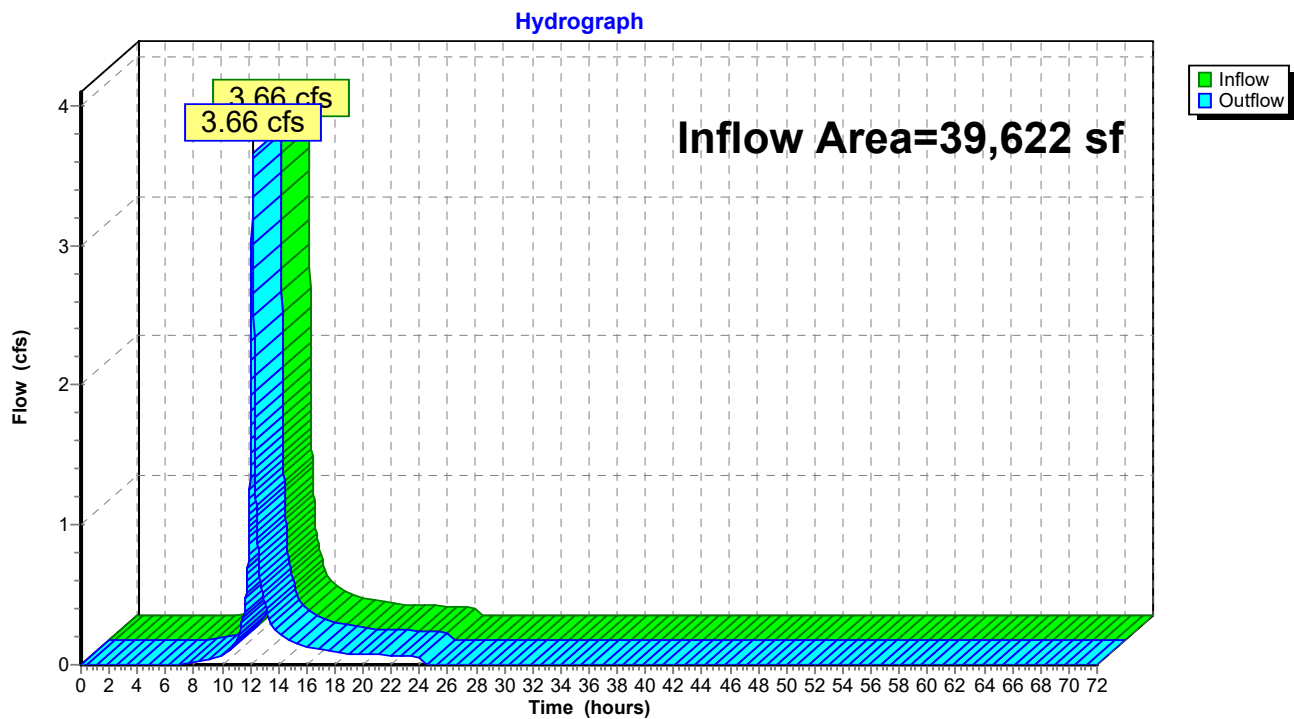
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 39,622 sf, 0.00% Impervious, Inflow Depth = 3.61" for 25-Year event
Inflow = 3.66 cfs @ 12.16 hrs, Volume= 11,921 cf
Outflow = 3.66 cfs @ 12.16 hrs, Volume= 11,921 cf, Atten= 0%, Lag= 0.0 min

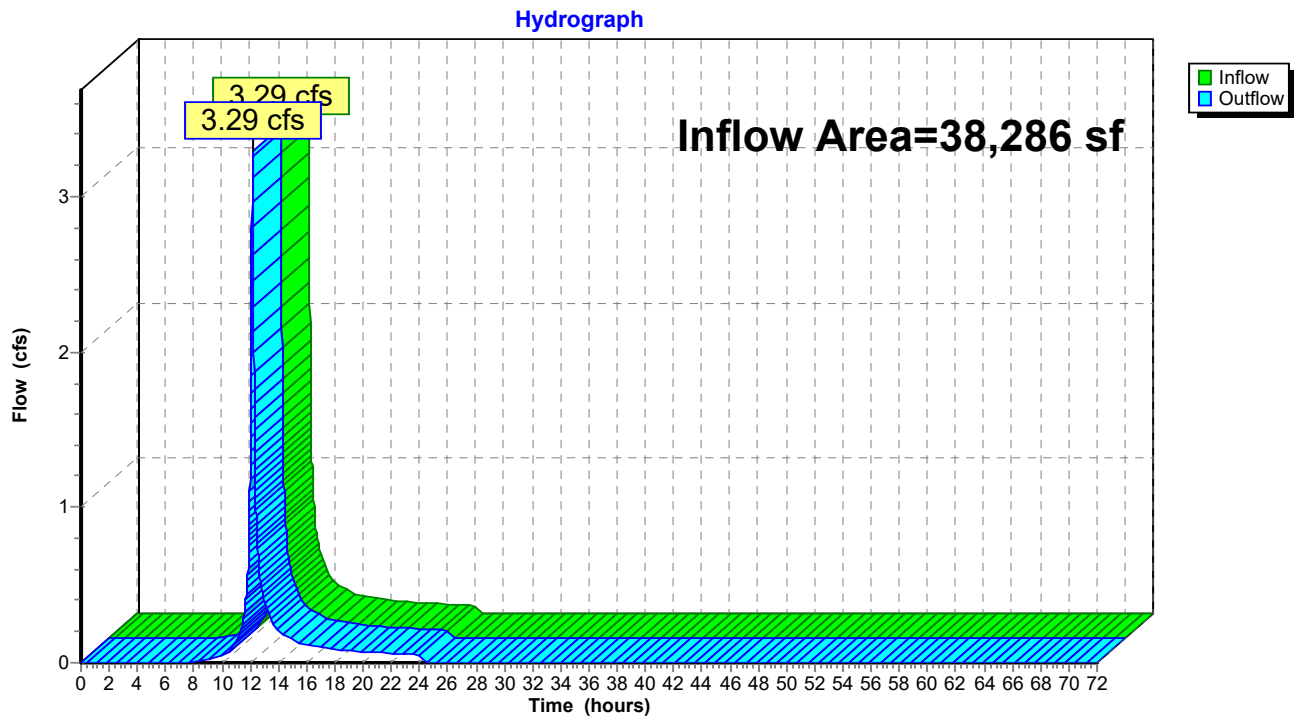
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 38,286 sf, 0.00% Impervious, Inflow Depth = 3.21" for 25-Year event
Inflow = 3.29 cfs @ 12.16 hrs, Volume= 10,253 cf
Outflow = 3.29 cfs @ 12.16 hrs, Volume= 10,253 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

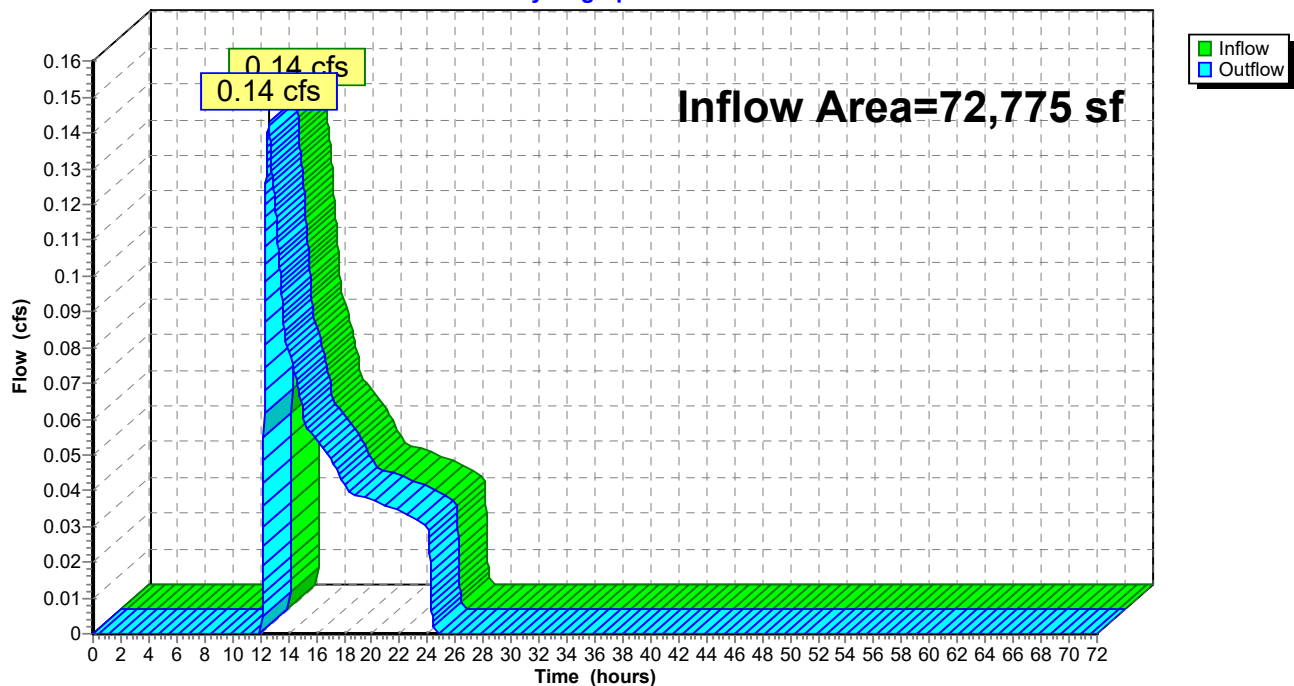
Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 72,775 sf, 0.00% Impervious, Inflow Depth = 0.38" for 25-Year event
Inflow = 0.14 cfs @ 12.60 hrs, Volume= 2,311 cf
Outflow = 0.14 cfs @ 12.60 hrs, Volume= 2,311 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest

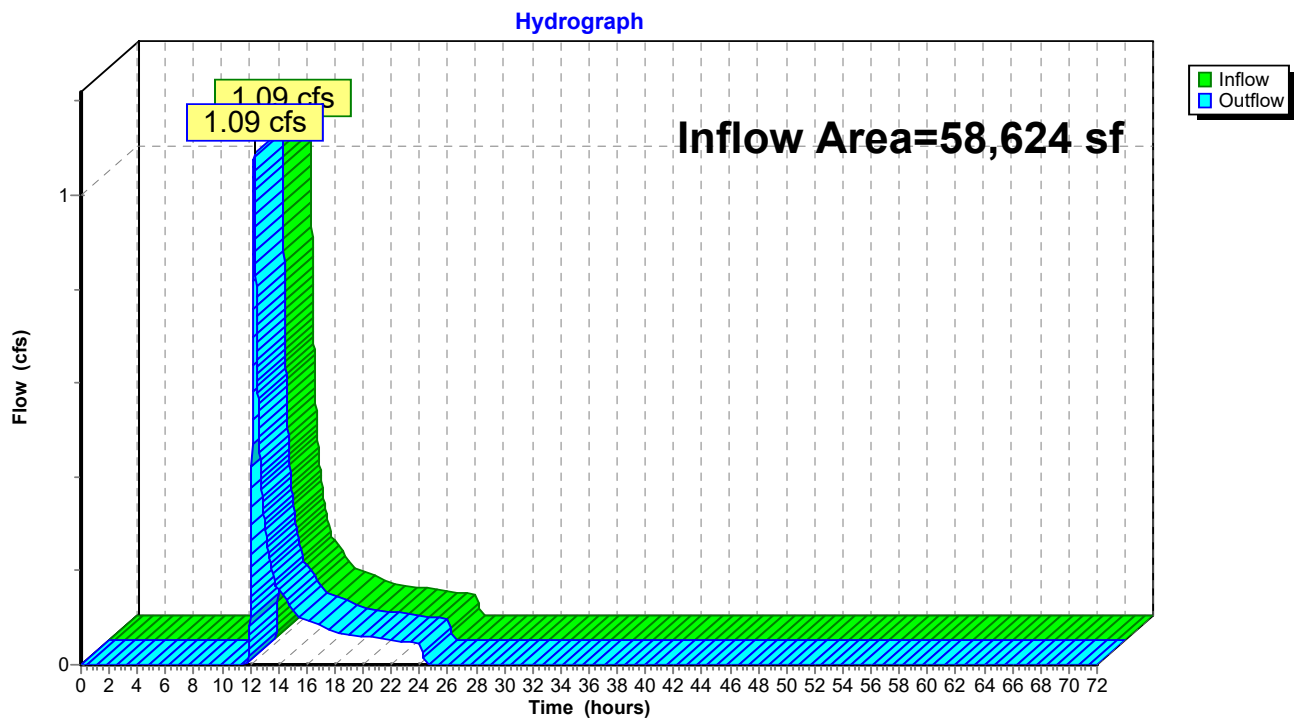
Hydrograph



Summary for Reach DP 6: Towards Offsite East

Inflow Area = 58,624 sf, 0.00% Impervious, Inflow Depth = 1.14" for 25-Year event
Inflow = 1.09 cfs @ 12.27 hrs, Volume= 5,586 cf
Outflow = 1.09 cfs @ 12.27 hrs, Volume= 5,586 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East

3328.00-PRE REV1

NRCC 24-hr C 100-Year Rainfall=8.80"

Prepared by {enter your company name here}

Printed 11/16/2023

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S:	Runoff Area=43,659 sf 4.43% Impervious Runoff Depth=5.53" Flow Length=329' Tc=11.4 min CN=73 Runoff=5.63 cfs 20,101 cf
Subcatchment2S:	Runoff Area=60,694 sf 2.31% Impervious Runoff Depth=5.28" Flow Length=325' Tc=10.3 min CN=71 Runoff=7.82 cfs 26,711 cf
Subcatchment3S:	Runoff Area=39,622 sf 0.00% Impervious Runoff Depth=6.01" Flow Length=182' Tc=9.1 min CN=77 Runoff=5.99 cfs 19,854 cf
Subcatchment4S:	Runoff Area=38,286 sf 0.00% Impervious Runoff Depth=5.53" Flow Length=122' Tc=8.2 min CN=73 Runoff=5.60 cfs 17,628 cf
Subcatchment5S:	Runoff Area=72,775 sf 0.00% Impervious Runoff Depth=1.30" Flow Length=357' Tc=15.1 min CN=37 Runoff=1.34 cfs 7,871 cf
Subcatchment6S:	Runoff Area=58,624 sf 0.00% Impervious Runoff Depth=2.64" Flow Length=427' Tc=15.7 min CN=49 Runoff=2.99 cfs 12,875 cf
Reach DP 1: Towards Offsite West	Inflow=5.63 cfs 20,101 cf Outflow=5.63 cfs 20,101 cf
Reach DP 2: Towards Offsite North	Inflow=7.82 cfs 26,711 cf Outflow=7.82 cfs 26,711 cf
Reach DP 3: Towards West Wetland	Inflow=5.99 cfs 19,854 cf Outflow=5.99 cfs 19,854 cf
Reach DP 4: Towards East Wetland	Inflow=5.60 cfs 17,628 cf Outflow=5.60 cfs 17,628 cf
Reach DP 5: Towards Offsite Northwest	Inflow=1.34 cfs 7,871 cf Outflow=1.34 cfs 7,871 cf
Reach DP 6: Towards Offsite East	Inflow=2.99 cfs 12,875 cf Outflow=2.99 cfs 12,875 cf

Total Runoff Area = 313,660 sf Runoff Volume = 105,040 cf Average Runoff Depth = 4.02"
98.94% Pervious = 310,323 sf 1.06% Impervious = 3,337 sf

Summary for Subcatchment 1S:

Runoff = 5.63 cfs @ 12.19 hrs, Volume= 20,101 cf, Depth= 5.53"

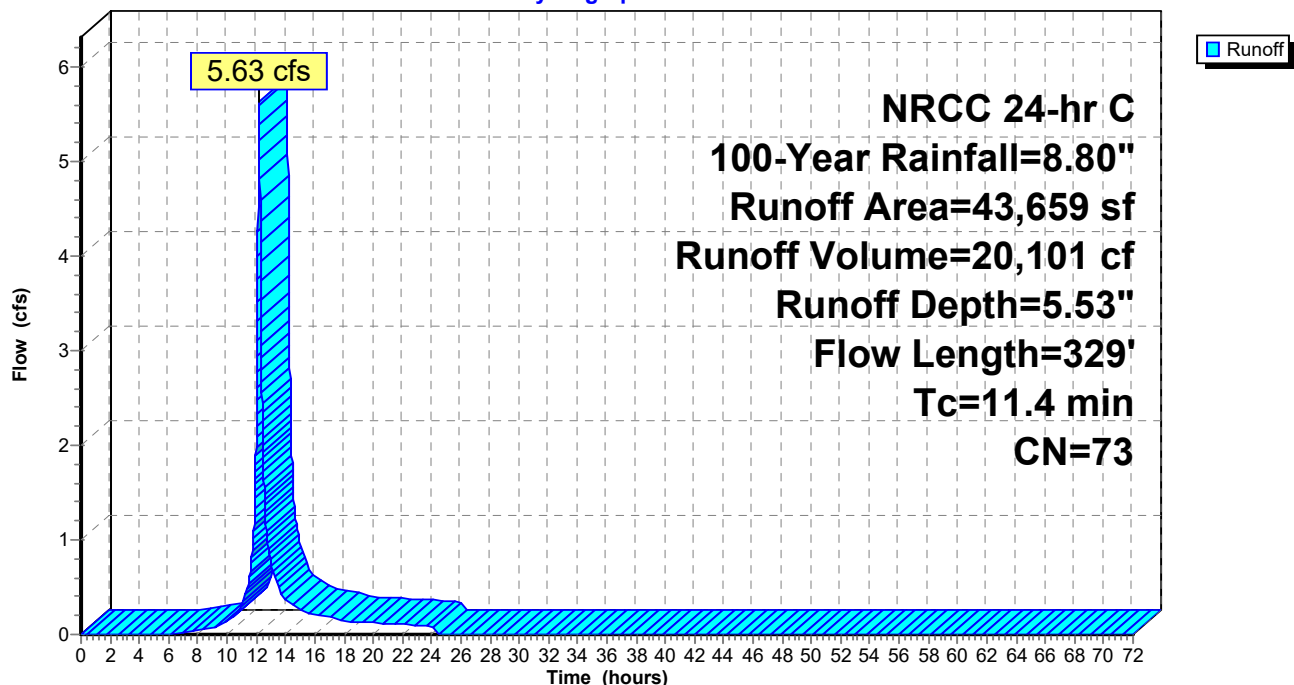
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
18,229	70	Woods, Good, HSG C
1,932	98	Roofs, HSG C
23,498	74	>75% Grass cover, Good, HSG C
43,659	73	Weighted Average
41,727		95.57% Pervious Area
1,932		4.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0280	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.3	22	0.0320	1.25		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	257	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	329	Total			

Subcatchment 1S:

Hydrograph



Summary for Subcatchment 2S:

Runoff = 7.82 cfs @ 12.18 hrs, Volume= 26,711 cf, Depth= 5.28"

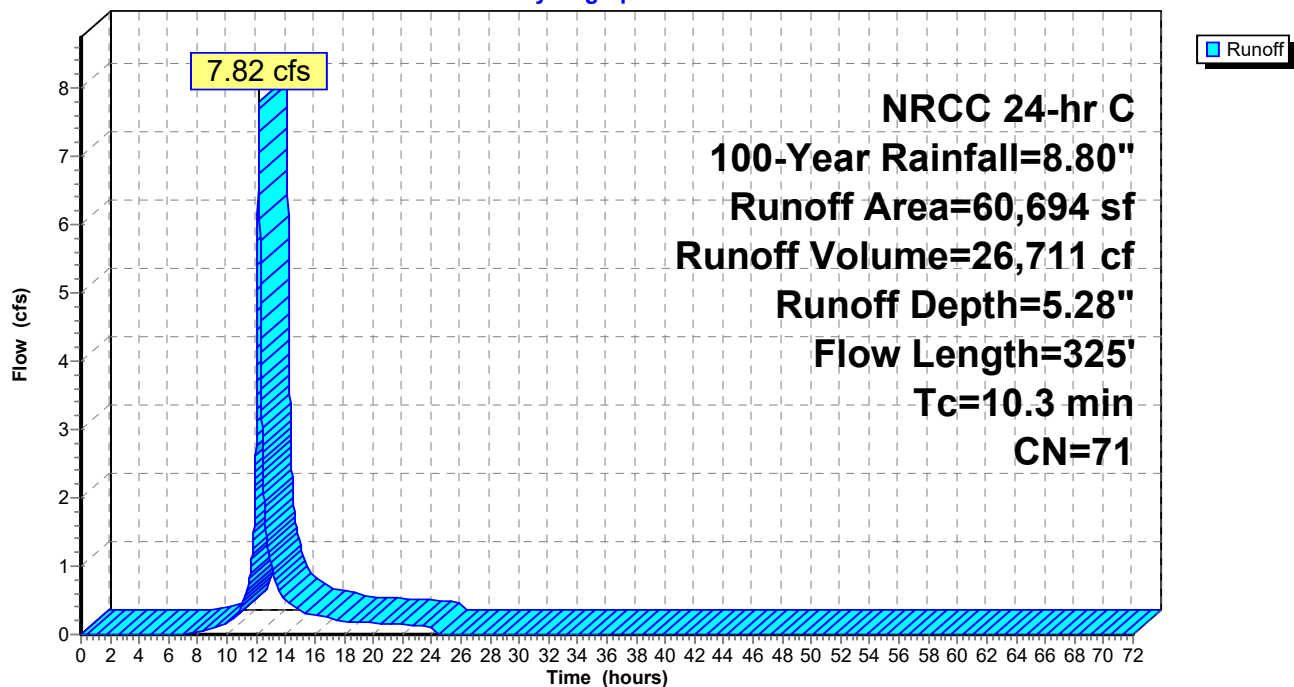
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
12,503	74	>75% Grass cover, Good, HSG C
1,405	98	Roofs, HSG C
46,786	70	Woods, Good, HSG C
60,694	71	Weighted Average
59,289		97.69% Pervious Area
1,405		2.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.5	262	0.0180	0.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.3	325	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 5.99 cfs @ 12.16 hrs, Volume= 19,854 cf, Depth= 6.01"

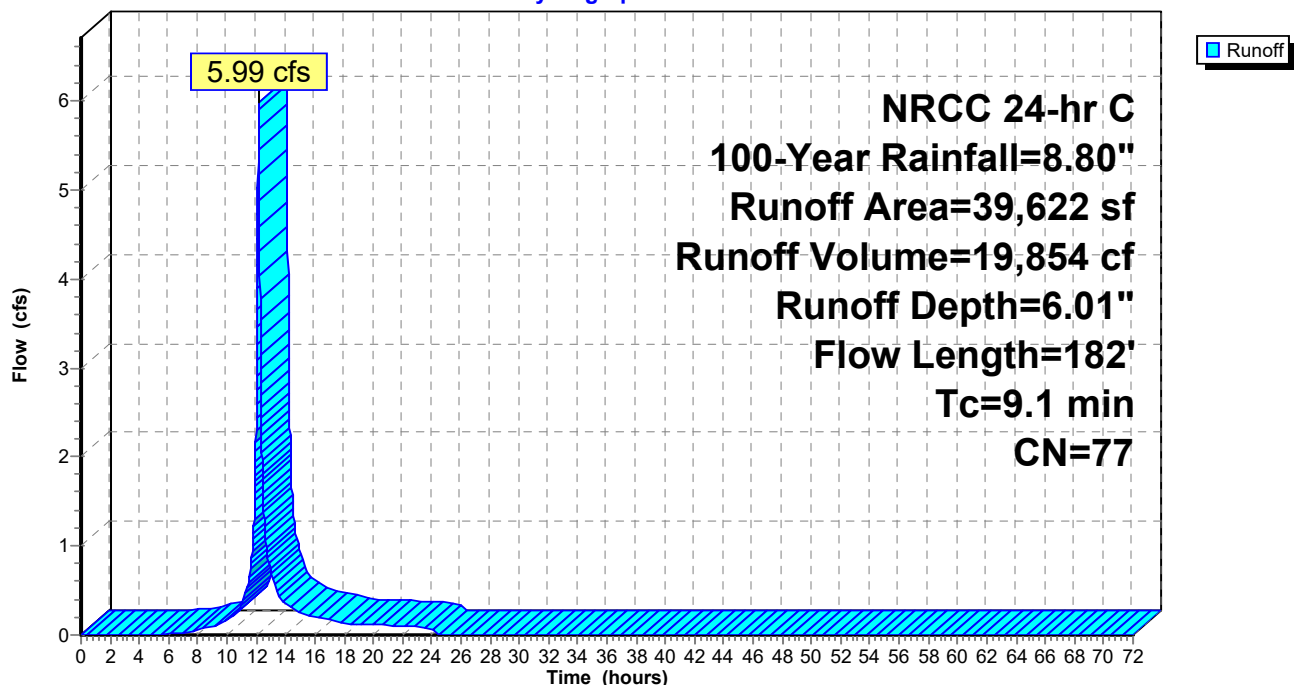
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
6,096	70	Woods, Good, HSG C
1,627	96	Gravel surface, HSG C
31,899	77	Brush, Poor, HSG C
39,622	77	Weighted Average
39,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0548	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.9	102	0.0768	1.94		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.1	182	Total			

Subcatchment 3S:

Hydrograph



Summary for Subcatchment 4S:

Runoff = 5.60 cfs @ 12.15 hrs, Volume= 17,628 cf, Depth= 5.53"

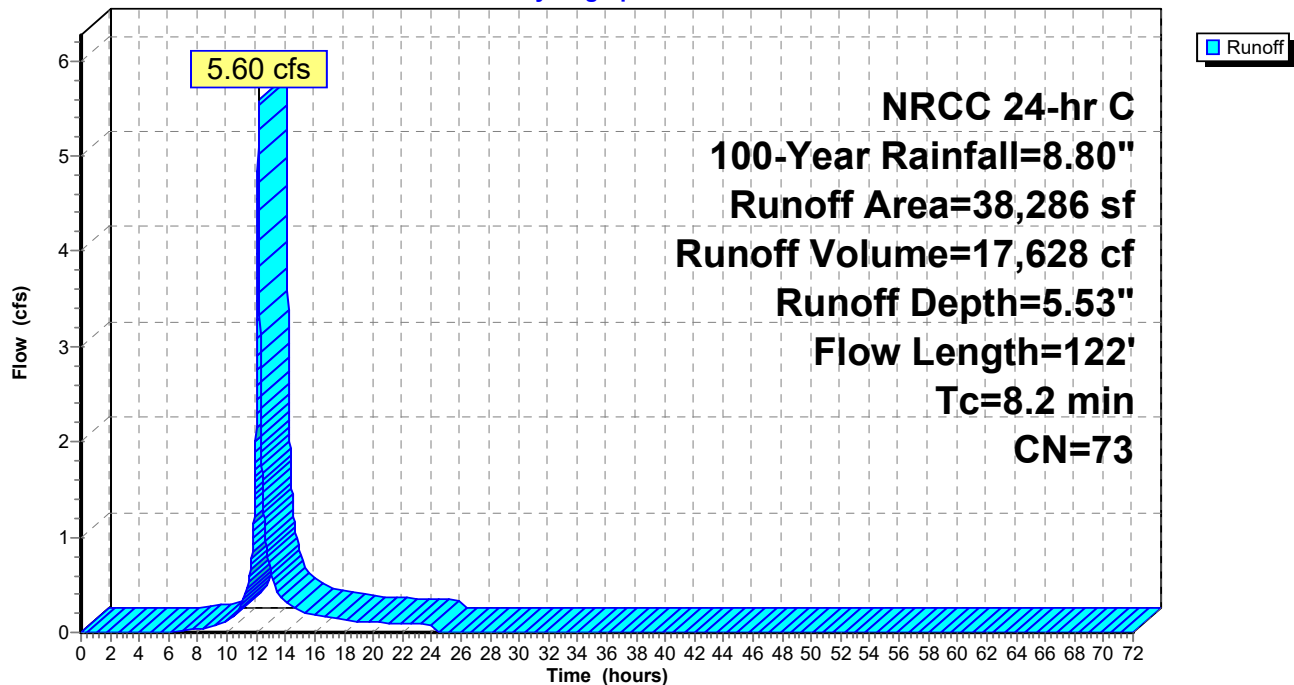
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
13,140	77	Brush, Poor, HSG C
17,055	70	Woods, Good, HSG C
373	96	Gravel surface, HSG C
7,718	70	Woods, Good, HSG C
38,286	73	Weighted Average
38,286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0640	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.7	72	0.1350	1.84		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	122	Total			

Subcatchment 4S:

Hydrograph



Summary for Subcatchment 5S:

Runoff = 1.34 cfs @ 12.28 hrs, Volume= 7,871 cf, Depth= 1.30"

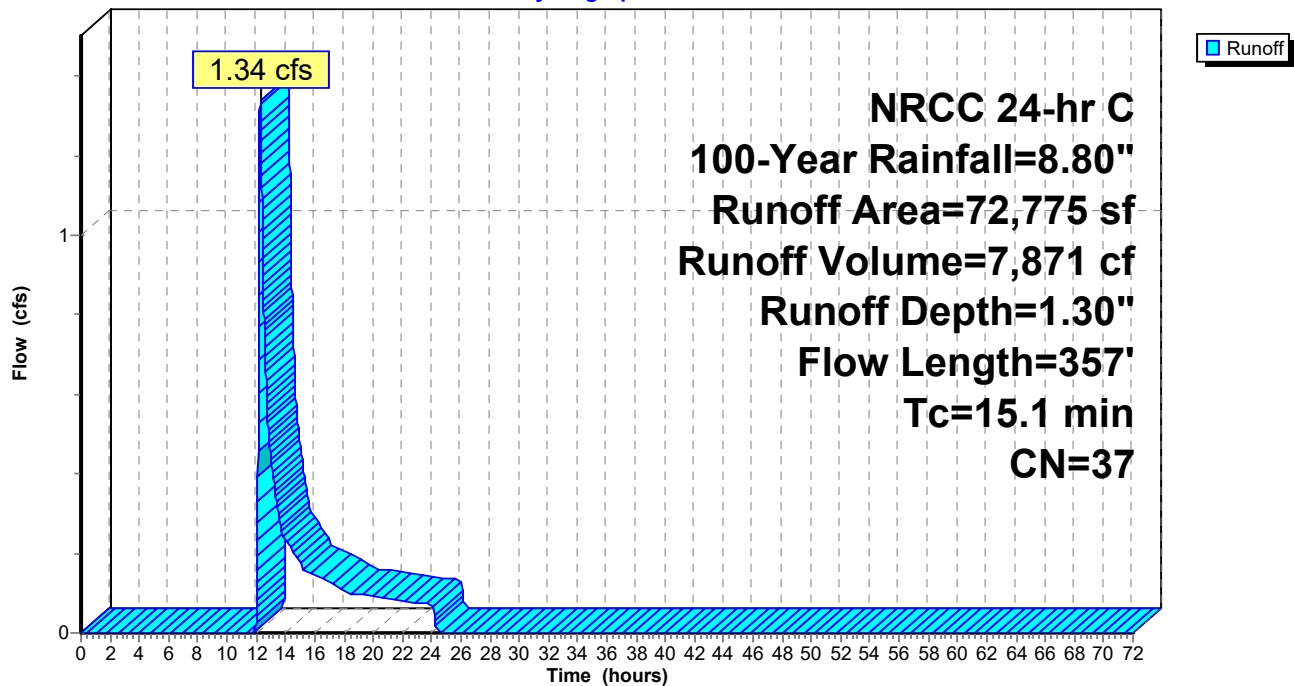
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
9,331	70	Woods, Good, HSG C
60,443	30	Woods, Good, HSG A
3,001	70	Woods, Good, HSG C
72,775	37	Weighted Average
72,775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.2	307	0.1050	1.62		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.1	357	Total			

Subcatchment 5S:

Hydrograph



Summary for Subcatchment 6S:

Runoff = 2.99 cfs @ 12.26 hrs, Volume= 12,875 cf, Depth= 2.64"

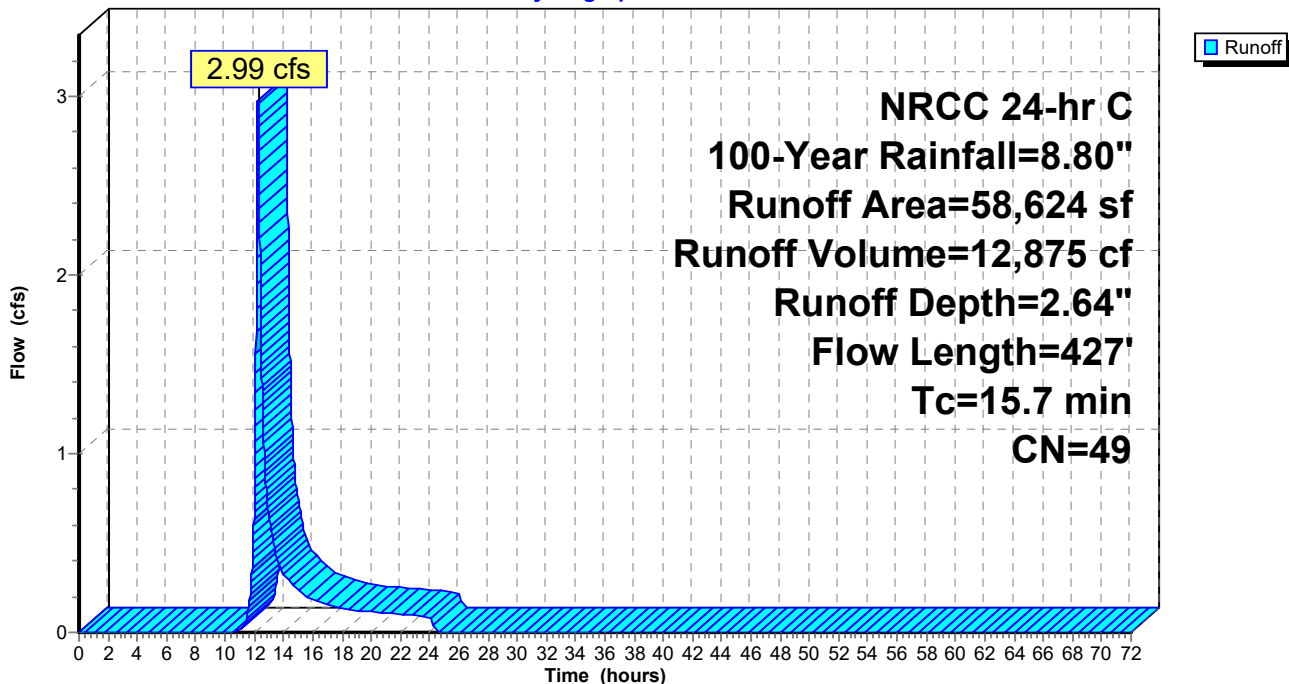
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
30,903	30	Woods, Good, HSG A
27,721	70	Woods, Good, HSG C
58,624	49	Weighted Average
58,624		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
3.8	377	0.1120	1.67		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.7	427	Total			

Subcatchment 6S:

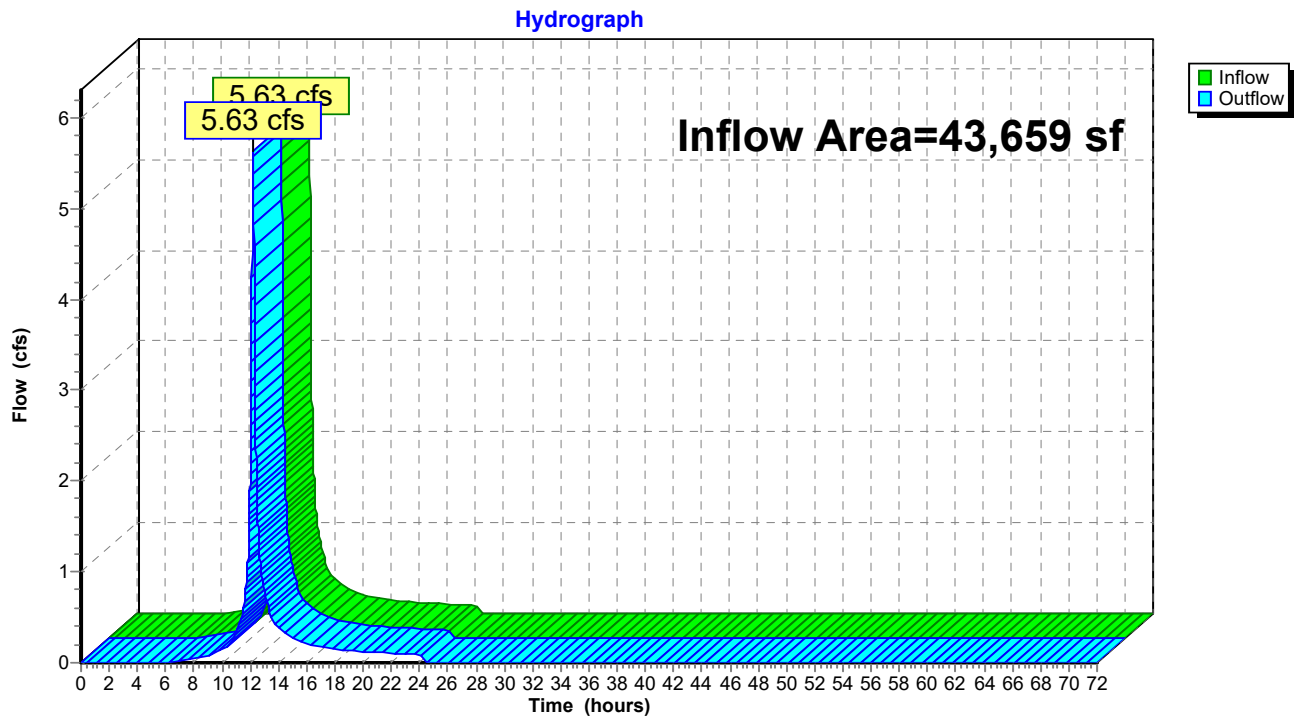
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 43,659 sf, 4.43% Impervious, Inflow Depth = 5.53" for 100-Year event
Inflow = 5.63 cfs @ 12.19 hrs, Volume= 20,101 cf
Outflow = 5.63 cfs @ 12.19 hrs, Volume= 20,101 cf, Atten= 0%, Lag= 0.0 min

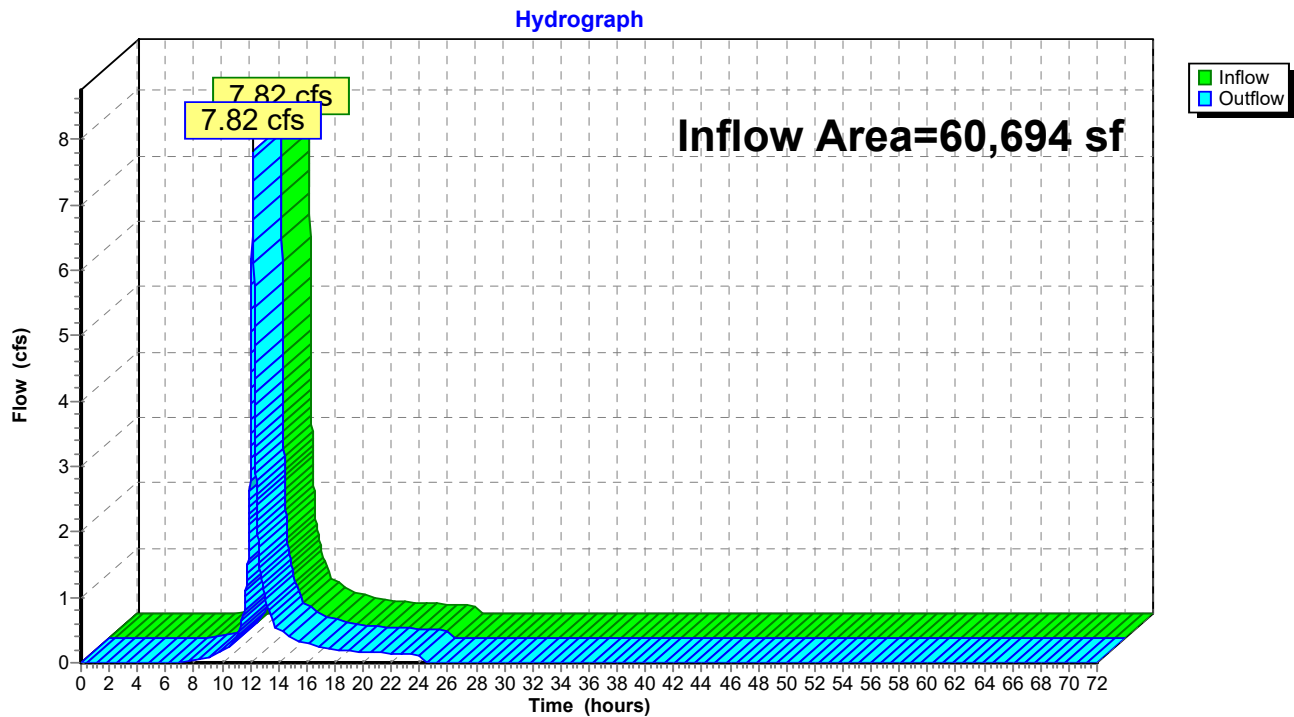
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 60,694 sf, 2.31% Impervious, Inflow Depth = 5.28" for 100-Year event
Inflow = 7.82 cfs @ 12.18 hrs, Volume= 26,711 cf
Outflow = 7.82 cfs @ 12.18 hrs, Volume= 26,711 cf, Atten= 0%, Lag= 0.0 min

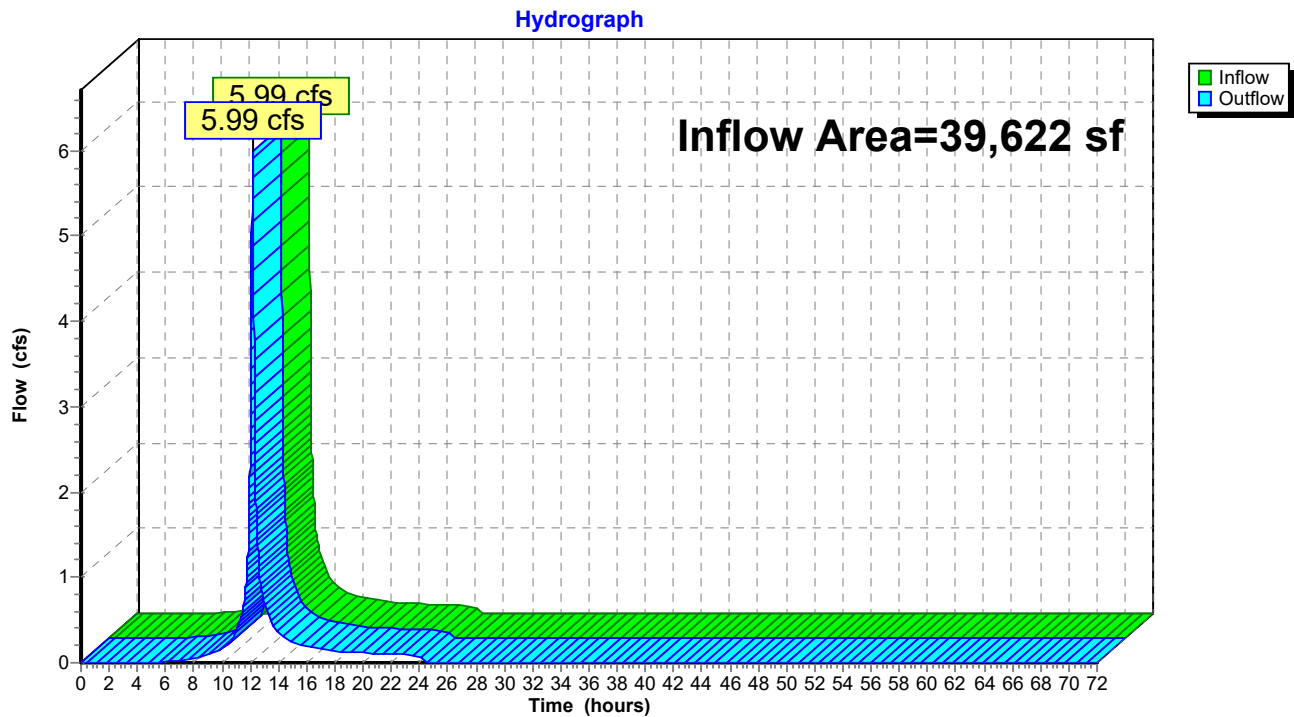
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 39,622 sf, 0.00% Impervious, Inflow Depth = 6.01" for 100-Year event
Inflow = 5.99 cfs @ 12.16 hrs, Volume= 19,854 cf
Outflow = 5.99 cfs @ 12.16 hrs, Volume= 19,854 cf, Atten= 0%, Lag= 0.0 min

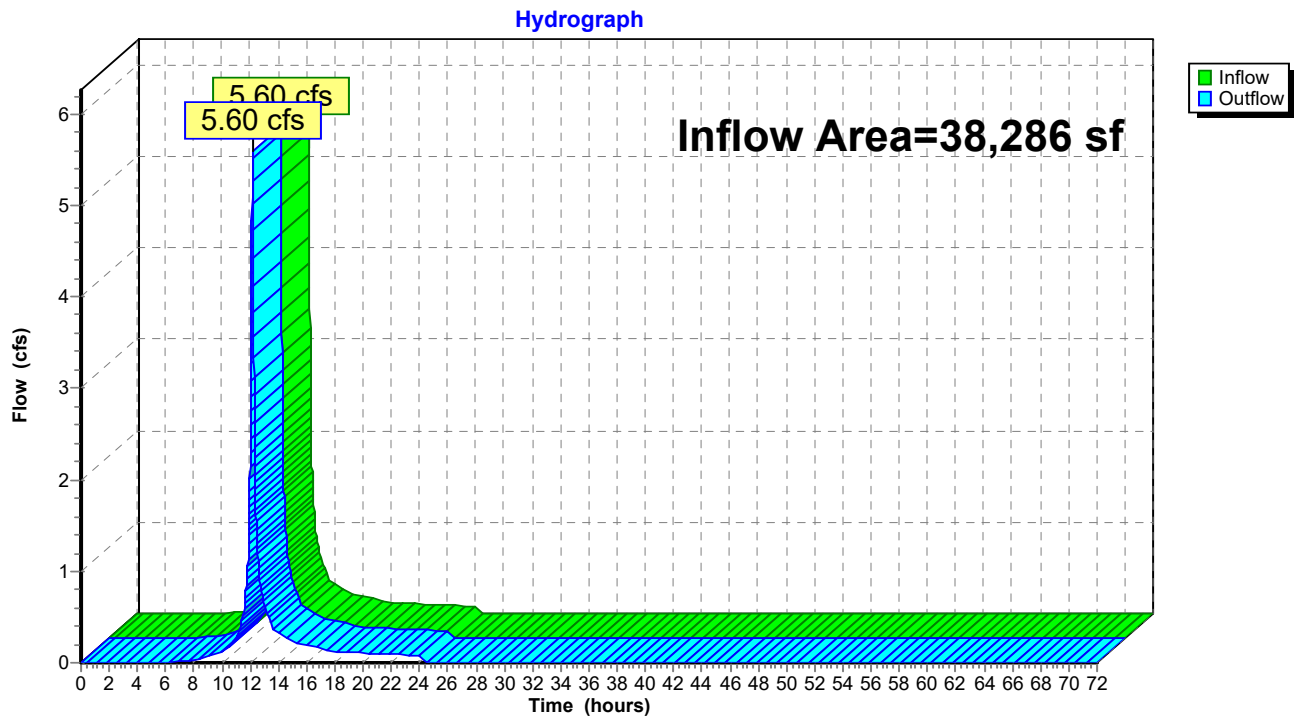
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 38,286 sf, 0.00% Impervious, Inflow Depth = 5.53" for 100-Year event
Inflow = 5.60 cfs @ 12.15 hrs, Volume= 17,628 cf
Outflow = 5.60 cfs @ 12.15 hrs, Volume= 17,628 cf, Atten= 0%, Lag= 0.0 min

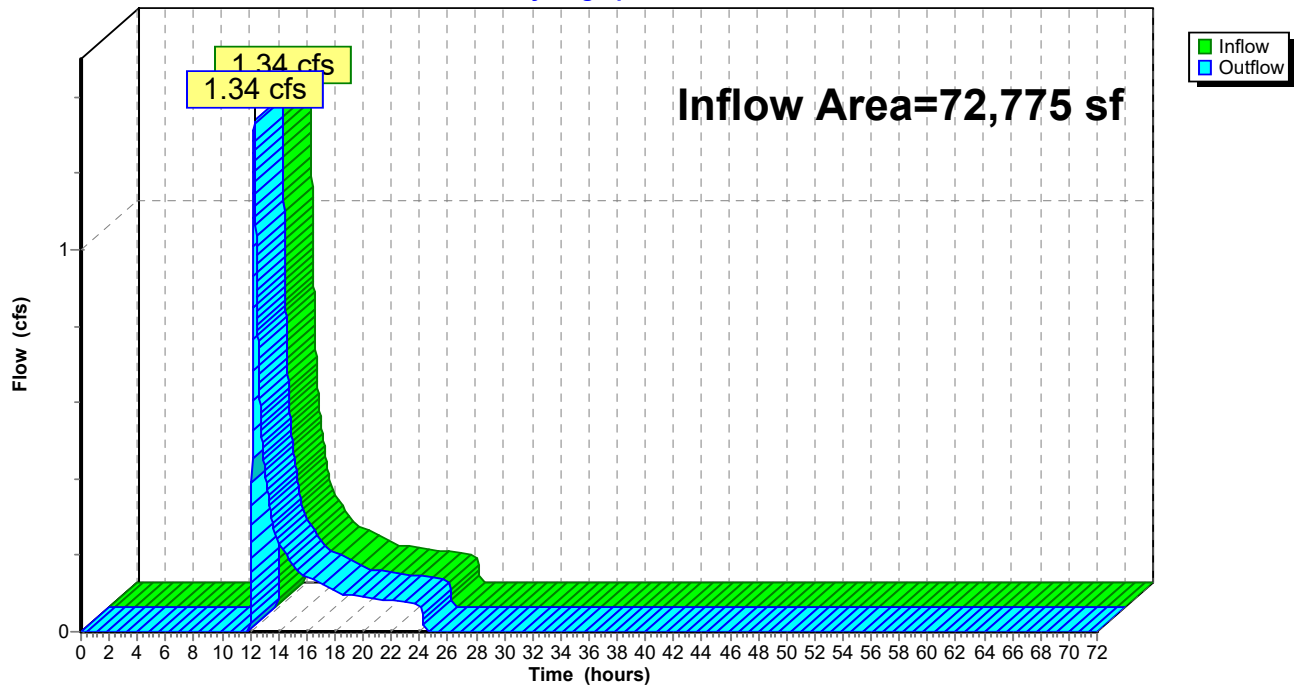
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 72,775 sf, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
Inflow = 1.34 cfs @ 12.28 hrs, Volume= 7,871 cf
Outflow = 1.34 cfs @ 12.28 hrs, Volume= 7,871 cf, Atten= 0%, Lag= 0.0 min

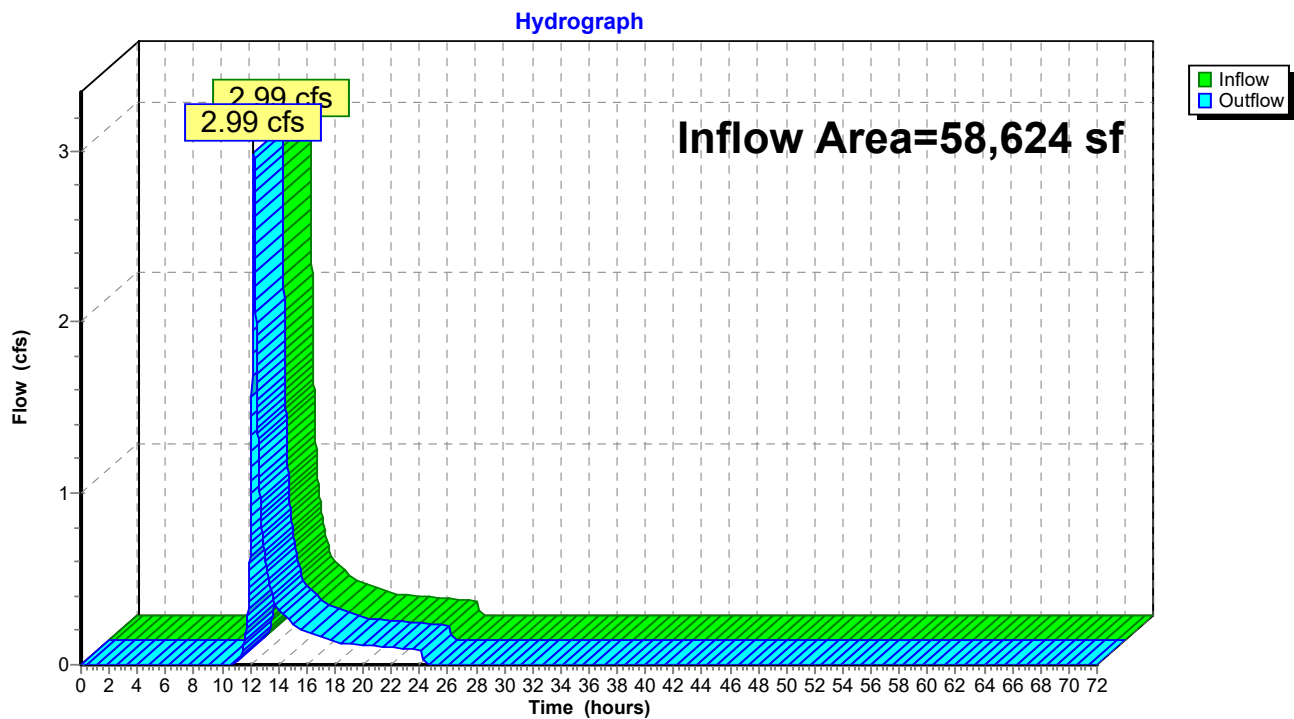
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

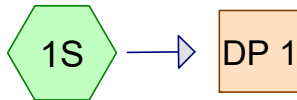
Reach DP 5: Towards Offsite Northwest**Hydrograph**

Summary for Reach DP 6: Towards Offsite East

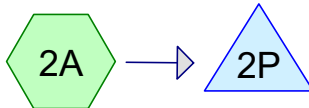
Inflow Area = 58,624 sf, 0.00% Impervious, Inflow Depth = 2.64" for 100-Year event
Inflow = 2.99 cfs @ 12.26 hrs, Volume= 12,875 cf
Outflow = 2.99 cfs @ 12.26 hrs, Volume= 12,875 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

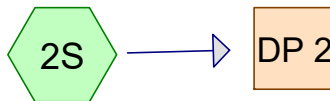
Reach DP 6: Towards Offsite East



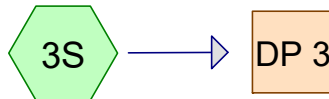
Towards Offsite West



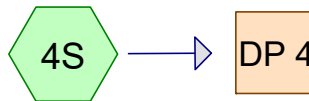
South West Basin



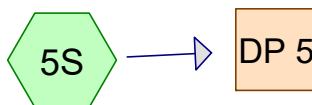
Towards Offsite North



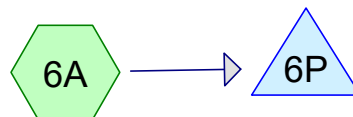
Towards West Wetland



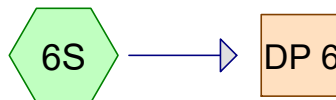
Towards East Wetland



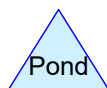
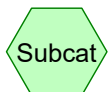
Towards Offsite
Northwest



North East Basin



Towards Offsite East



Routing Diagram for 3328.00-POST REV1

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
82,152	39	>75% Grass cover, Good, HSG A (5S, 6A, 6S)
80,895	74	>75% Grass cover, Good, HSG C (1S, 2A, 5S, 6A, 6S)
47,408	77	Brush, Poor, HSG C (2S, 3S, 4S)
3,251	96	Gravel surface, HSG A (6A)
22,853	96	Gravel surface, HSG C (1S, 2A, 2S, 3S, 4S, 6A)
1,137	98	Paved parking, HSG C (1S)
3,364	98	Roofs, HSG C (1S, 2A)
640	98	Unconnected pavement, HSG C (6A)
5,880	30	Woods, Good, HSG A (5S, 6A, 6S)
66,080	70	Woods, Good, HSG C (1S, 2A, 2S, 3S, 4S, 5S, 6A, 6S)
313,660	66	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
91,283	HSG A	5S, 6A, 6S
0	HSG B	
222,377	HSG C	1S, 2A, 2S, 3S, 4S, 5S, 6A, 6S
0	HSG D	
0	Other	
313,660		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
82,152	0	80,895	0	0	163,047	>75% Grass cover, Good	
0	0	47,408	0	0	47,408	Brush, Poor	
3,251	0	22,853	0	0	26,104	Gravel surface	
0	0	1,137	0	0	1,137	Paved parking	
0	0	3,364	0	0	3,364	Roofs	
0	0	640	0	0	640	Unconnected pavement	
5,880	0	66,080	0	0	71,960	Woods, Good	
91,283	0	222,377	0	0	313,660	TOTAL AREA	

3328.00-POST REV1*NRCC 24-hr C 2-Year Rainfall=3.22"*

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S:	Runoff Area=35,263 sf 9.29% Impervious Runoff Depth=1.23" Flow Length=303' Tc=12.2 min CN=77 Runoff=0.97 cfs 3,603 cf
Subcatchment2A:	Runoff Area=55,890 sf 2.19% Impervious Runoff Depth=1.23" Flow Length=240' Tc=6.4 min CN=77 Runoff=1.95 cfs 5,711 cf
Subcatchment2S:	Runoff Area=12,847 sf 0.00% Impervious Runoff Depth=1.17" Flow Length=225' Tc=9.7 min CN=76 Runoff=0.37 cfs 1,248 cf
Subcatchment3S:	Runoff Area=37,446 sf 0.00% Impervious Runoff Depth=1.29" Flow Length=191' Tc=10.0 min CN=78 Runoff=1.18 cfs 4,019 cf
Subcatchment4S:	Runoff Area=35,752 sf 0.00% Impervious Runoff Depth=1.05" Flow Length=151' Tc=13.8 min CN=74 Runoff=0.78 cfs 3,130 cf
Subcatchment5S:	Runoff Area=18,143 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=299' Tc=6.0 min CN=40 Runoff=0.00 cfs 5 cf
Subcatchment6A:	Runoff Area=106,367 sf 0.60% Impervious Runoff Depth=0.20" Flow Length=472' Tc=11.1 min CN=53 Runoff=0.12 cfs 1,798 cf
Subcatchment6S:	Runoff Area=11,952 sf 0.00% Impervious Runoff Depth=0.57" Flow Length=314' Tc=10.6 min CN=64 Runoff=0.13 cfs 566 cf
Reach DP 1: Towards Offsite West	Inflow=0.97 cfs 3,603 cf Outflow=0.97 cfs 3,603 cf
Reach DP 2: Towards Offsite North	Inflow=0.37 cfs 1,248 cf Outflow=0.37 cfs 1,248 cf
Reach DP 3: Towards West Wetland	Inflow=1.18 cfs 4,019 cf Outflow=1.18 cfs 4,019 cf
Reach DP 4: Towards East Wetland	Inflow=0.78 cfs 3,130 cf Outflow=0.78 cfs 3,130 cf
Reach DP 5: Towards Offsite Northwest	Inflow=0.00 cfs 5 cf Outflow=0.00 cfs 5 cf
Reach DP 6: Towards Offsite East	Inflow=0.13 cfs 566 cf Outflow=0.13 cfs 566 cf
Pond 2P: South West Basin	Peak Elev=455.41' Storage=1,742 cf Inflow=1.95 cfs 5,711 cf Outflow=0.25 cfs 5,711 cf
Pond 6P: North East Basin	Peak Elev=404.06' Storage=94 cf Inflow=0.12 cfs 1,798 cf Outflow=0.09 cfs 1,798 cf

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Total Runoff Area = 313,660 sf Runoff Volume = 20,081 cf Average Runoff Depth = 0.77"
98.36% Pervious = 308,519 sf 1.64% Impervious = 5,141 sf

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Summary for Subcatchment 1S:

Runoff = 0.97 cfs @ 12.21 hrs, Volume= 3,603 cf, Depth= 1.23"

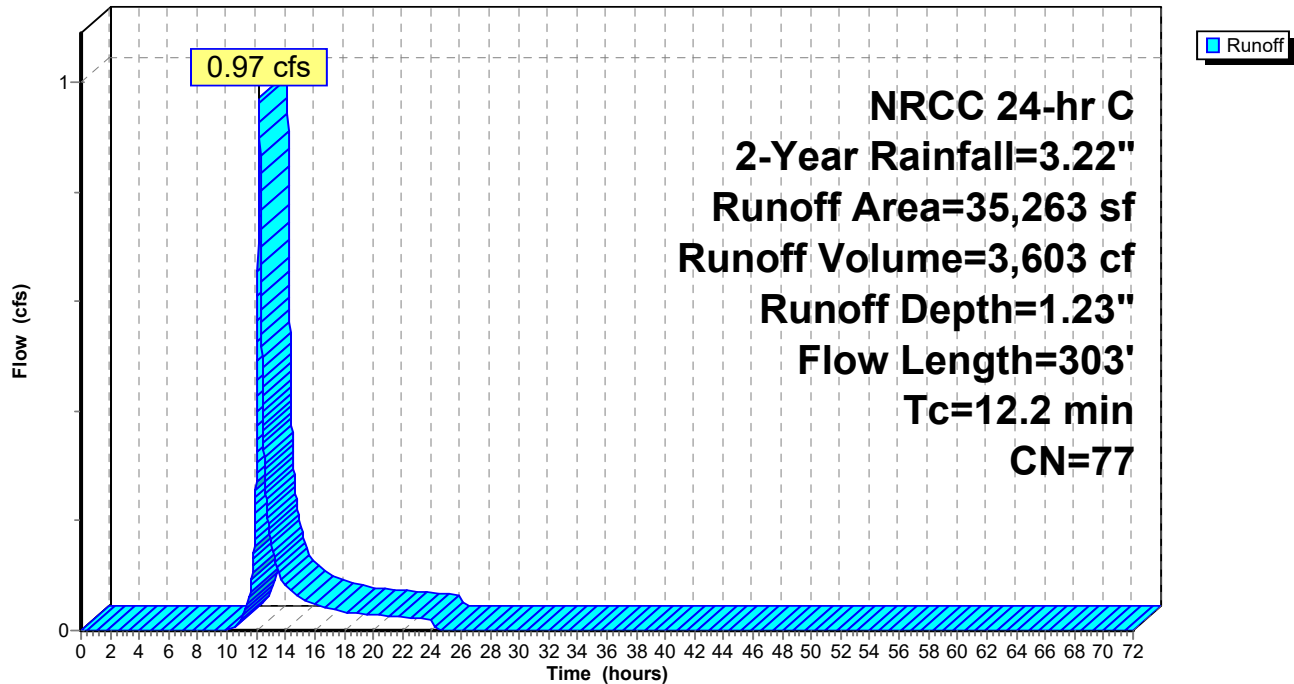
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
5,731	70	Woods, Good, HSG C
2,138	98	Roofs, HSG C
24,414	74	>75% Grass cover, Good, HSG C
1,843	96	Gravel surface, HSG C
1,137	98	Paved parking, HSG C
35,263	77	Weighted Average
31,988		90.71% Pervious Area
3,275		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.8	47	0.0213	1.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.9	123	0.0203	0.71		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	31	0.0484	3.54		Shallow Concentrated Flow, Gravel Road Unpaved Kv= 16.1 fps
4.0	52	0.0019	0.22		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
12.2	303	Total			

Subcatchment 1S:

Hydrograph



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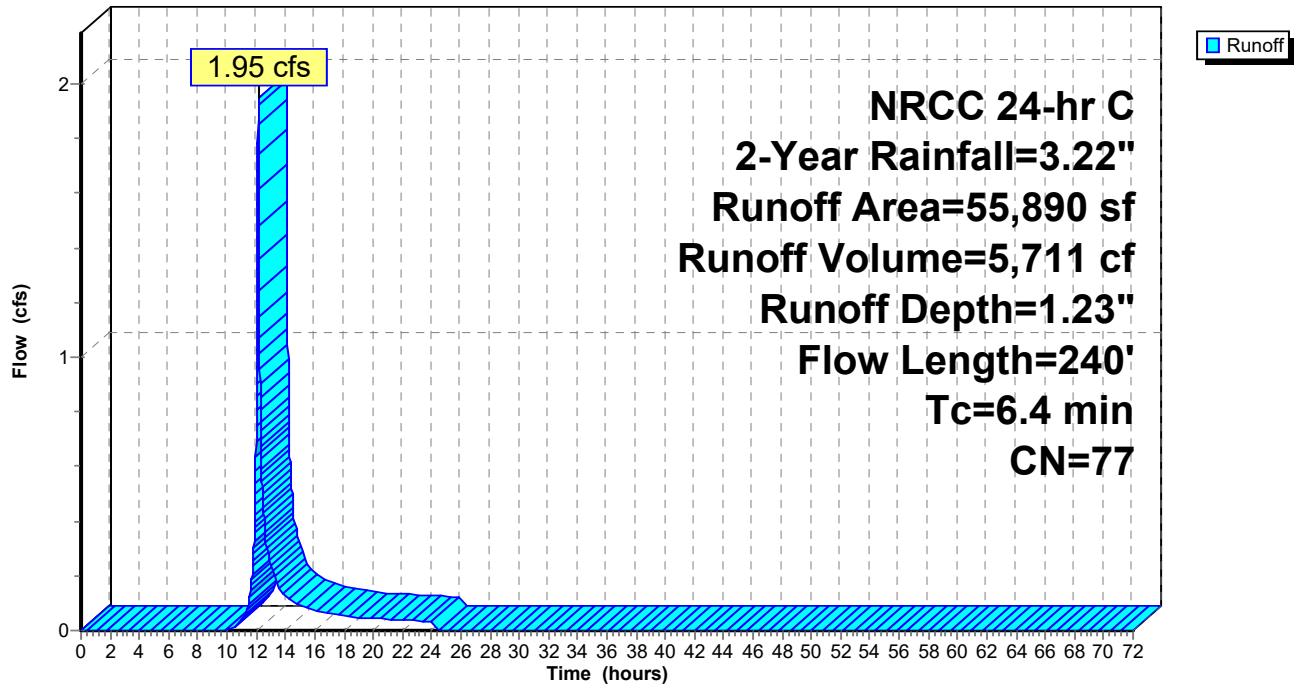
Summary for Subcatchment 2A:

Runoff = 1.95 cfs @ 12.14 hrs, Volume= 5,711 cf, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
30,811	74	>75% Grass cover, Good, HSG C
1,226	98	Roofs, HSG C
15,725	70	Woods, Good, HSG C
8,128	96	Gravel surface, HSG C
55,890	77	Weighted Average
54,664		97.81% Pervious Area
1,226		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	71	0.0366	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	28	0.0321	2.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.2	78	0.0256	1.12		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	240	Total			

Subcatchment 2A:**Hydrograph**

Summary for Subcatchment 2S:

Runoff = 0.37 cfs @ 12.17 hrs, Volume= 1,248 cf, Depth= 1.17"

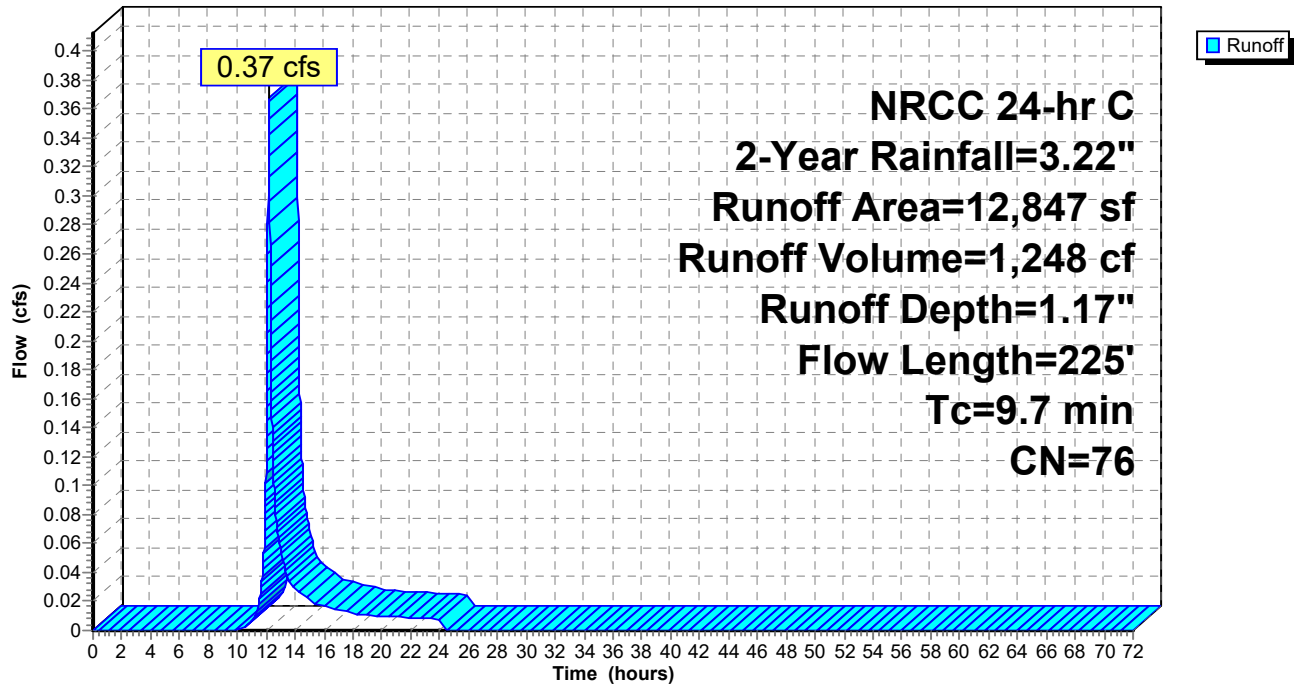
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
5,793	70	Woods, Good, HSG C
5,770	77	Brush, Poor, HSG C
1,284	96	Gravel surface, HSG C
12,847	76	Weighted Average
12,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0880	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.1	19	0.0256	2.58		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	10	0.0102	0.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	46	0.0176	0.66		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	59	0.0273	1.16		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0251	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	21	0.0239	1.08		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.7	225	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 1.18 cfs @ 12.18 hrs, Volume= 4,019 cf, Depth= 1.29"

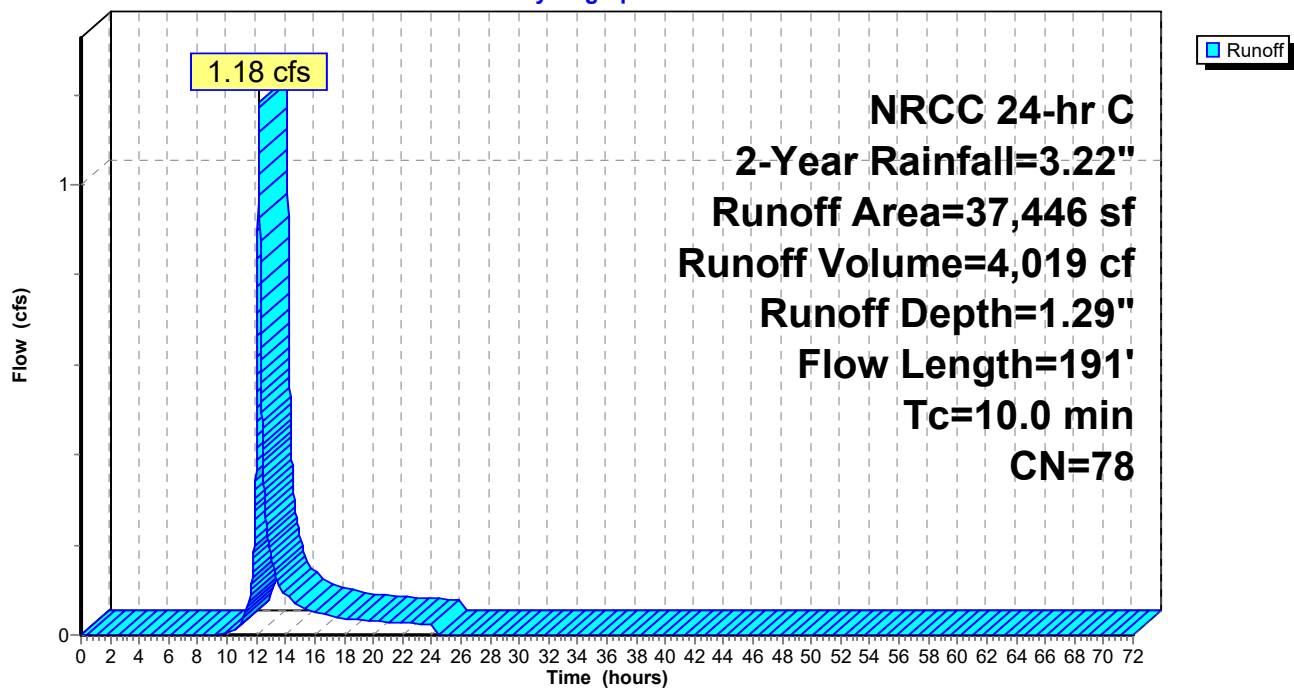
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
4,935	70	Woods, Good, HSG C
28,511	77	Brush, Poor, HSG C
4,000	96	Gravel surface, HSG C
37,446	78	Weighted Average
37,446		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0440	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.0	111	0.0731	1.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.0	191	Total			

Subcatchment 3S:

Hydrograph



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Summary for Subcatchment 4S:

Runoff = 0.78 cfs @ 12.22 hrs, Volume= 3,130 cf, Depth= 1.05"

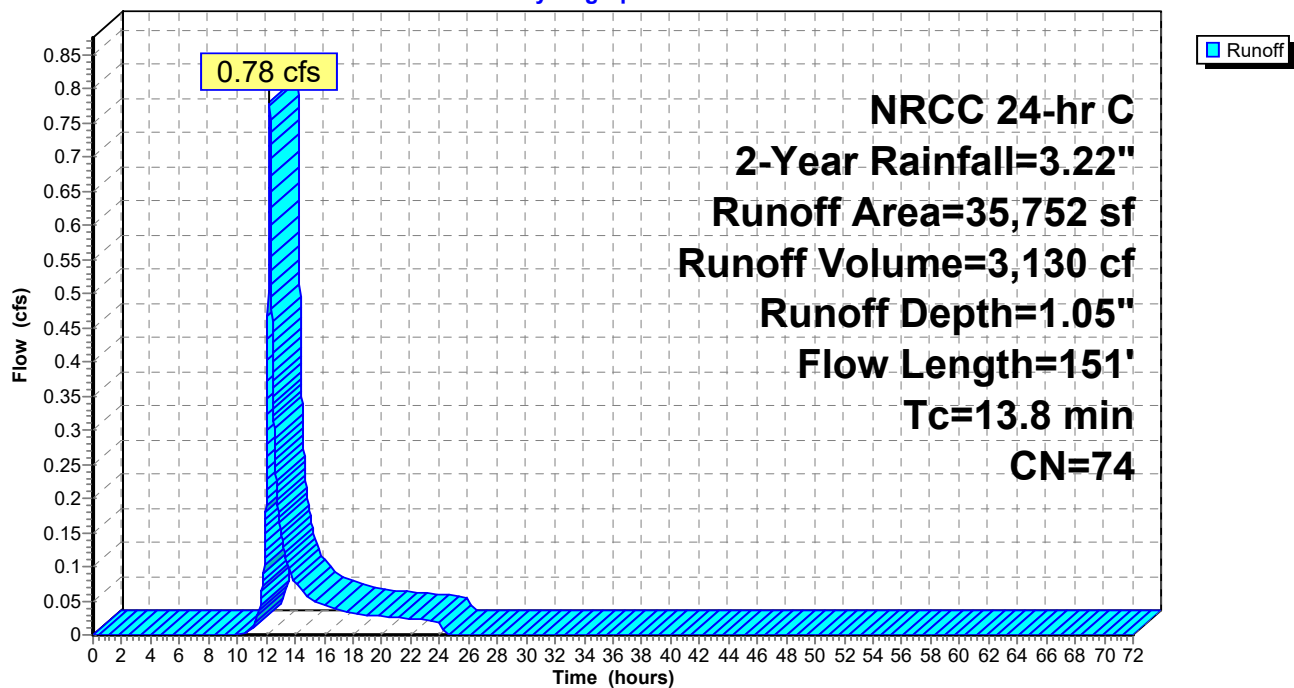
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
19,992	70	Woods, Good, HSG C
13,127	77	Brush, Poor, HSG C
2,633	96	Gravel surface, HSG C
35,752	74	Weighted Average
35,752		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	50	0.0160	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.8	101	0.0974	2.18		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	151	Total			

Subcatchment 4S:

Hydrograph



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Summary for Subcatchment 5S:

Runoff = 0.00 cfs @ 24.01 hrs, Volume= 5 cf, Depth= 0.00"

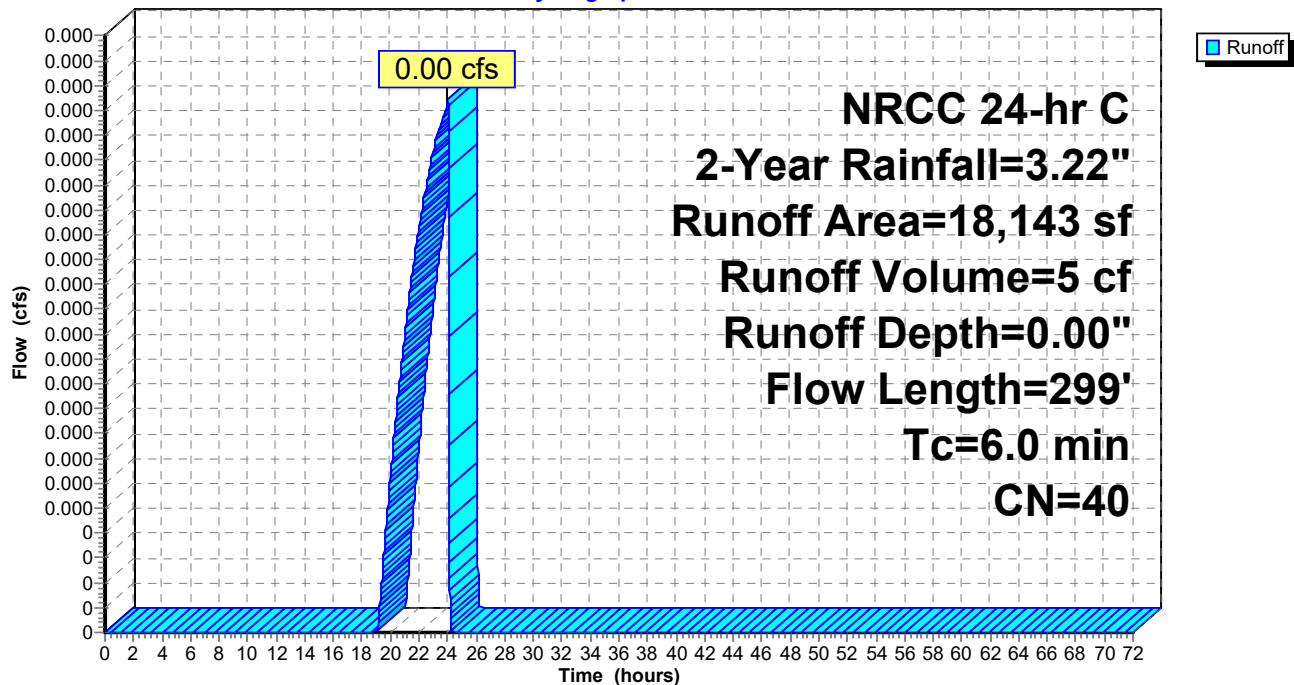
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
574	70	Woods, Good, HSG C
1,112	74	>75% Grass cover, Good, HSG C
4,232	30	Woods, Good, HSG A
12,225	39	>75% Grass cover, Good, HSG A
18,143	40	Weighted Average
18,143		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1040	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.9	193	0.0629	3.76		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	56	0.1470	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.2	299	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5S:

Hydrograph



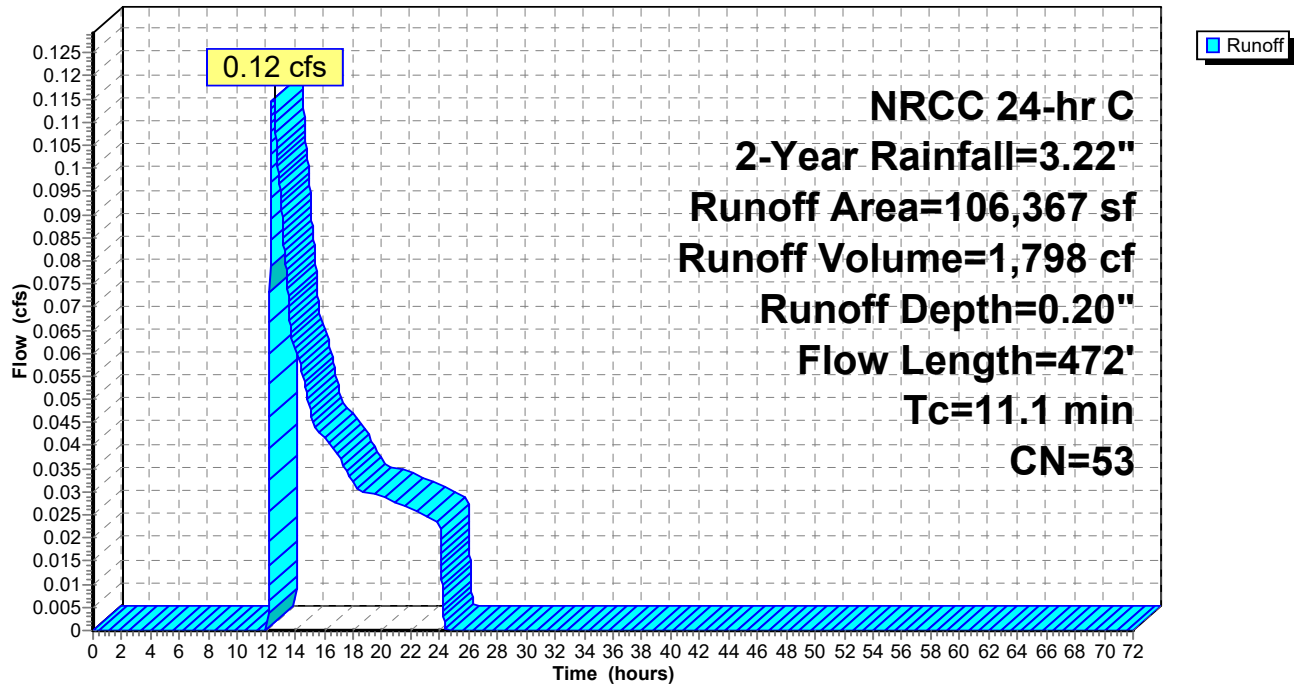
Summary for Subcatchment 6A:

Runoff = 0.12 cfs @ 12.57 hrs, Volume= 1,798 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
7,811	70	Woods, Good, HSG C
20,625	74	>75% Grass cover, Good, HSG C
4,965	96	Gravel surface, HSG C
640	98	Unconnected pavement, HSG C
746	30	Woods, Good, HSG A
68,329	39	>75% Grass cover, Good, HSG A
3,251	96	Gravel surface, HSG A
106,367	53	Weighted Average
105,727		99.40% Pervious Area
640		0.60% Impervious Area
640		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.44"
1.8	238	0.1042	2.26		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.4	184	0.0914	2.16	22.30	Trap/Vee/Rect Channel Flow, Bot.W=4.00' D=1.00' Z= 5.6 & 7.0 ' Top.W=16.60' n= 0.150 Sheet flow over Short Grass
11.1	472	Total			

Subcatchment 6A:**Hydrograph**

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Summary for Subcatchment 6S:

Runoff = 0.13 cfs @ 12.20 hrs, Volume= 566 cf, Depth= 0.57"

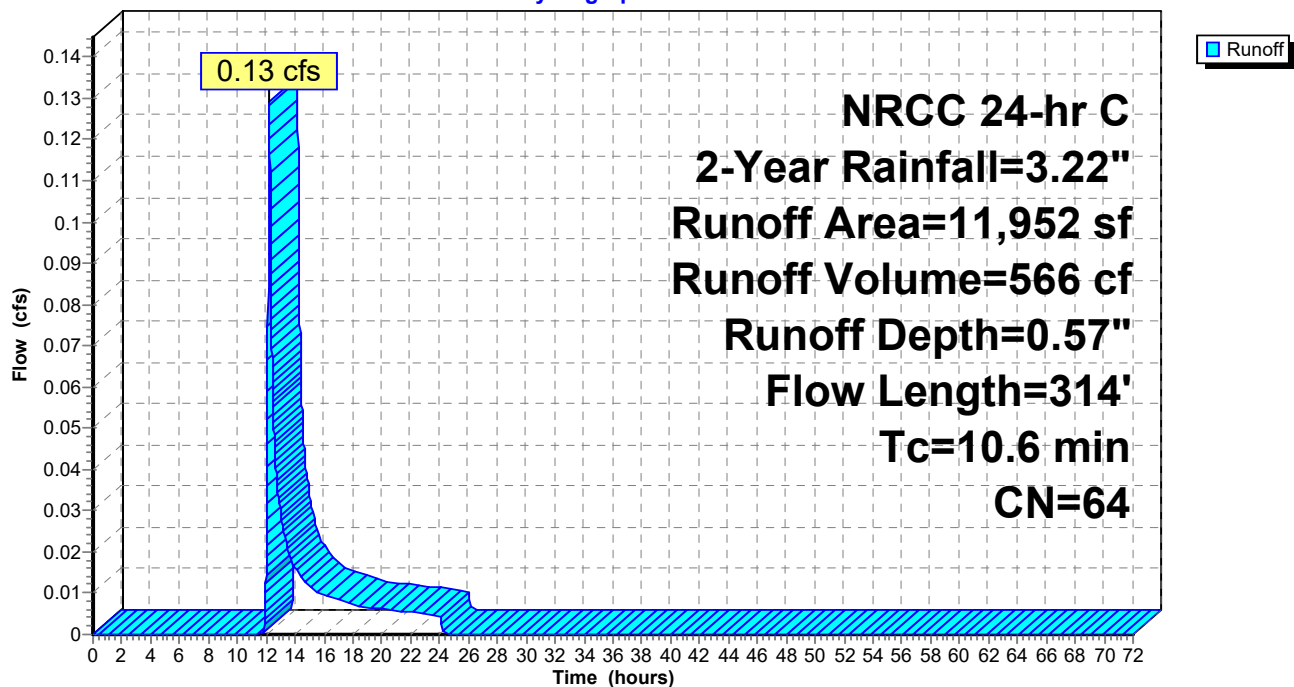
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.22"

Area (sf)	CN	Description
5,519	70	Woods, Good, HSG C
3,933	74	>75% Grass cover, Good, HSG C
902	30	Woods, Good, HSG A
1,598	39	>75% Grass cover, Good, HSG A
11,952	64	Weighted Average
11,952		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.9	150	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	114	0.1496	1.93		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.6	314	Total			

Subcatchment 6S:

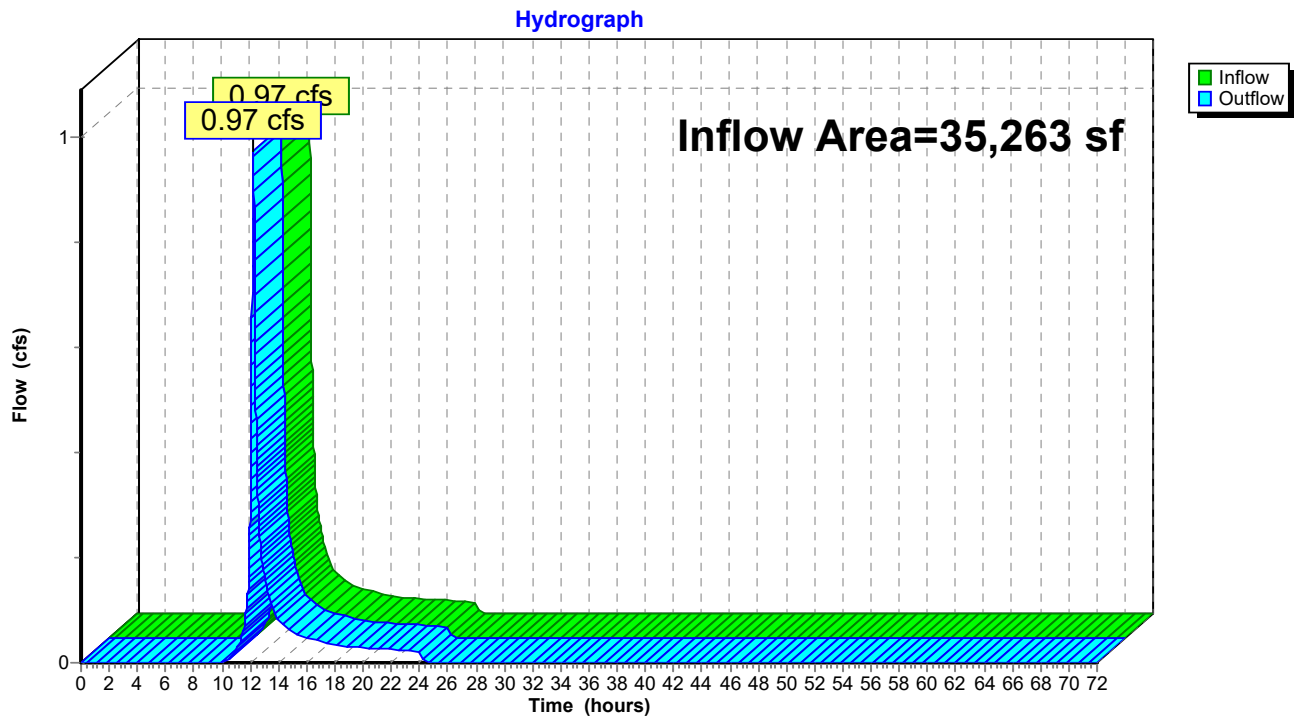
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 35,263 sf, 9.29% Impervious, Inflow Depth = 1.23" for 2-Year event
Inflow = 0.97 cfs @ 12.21 hrs, Volume= 3,603 cf
Outflow = 0.97 cfs @ 12.21 hrs, Volume= 3,603 cf, Atten= 0%, Lag= 0.0 min

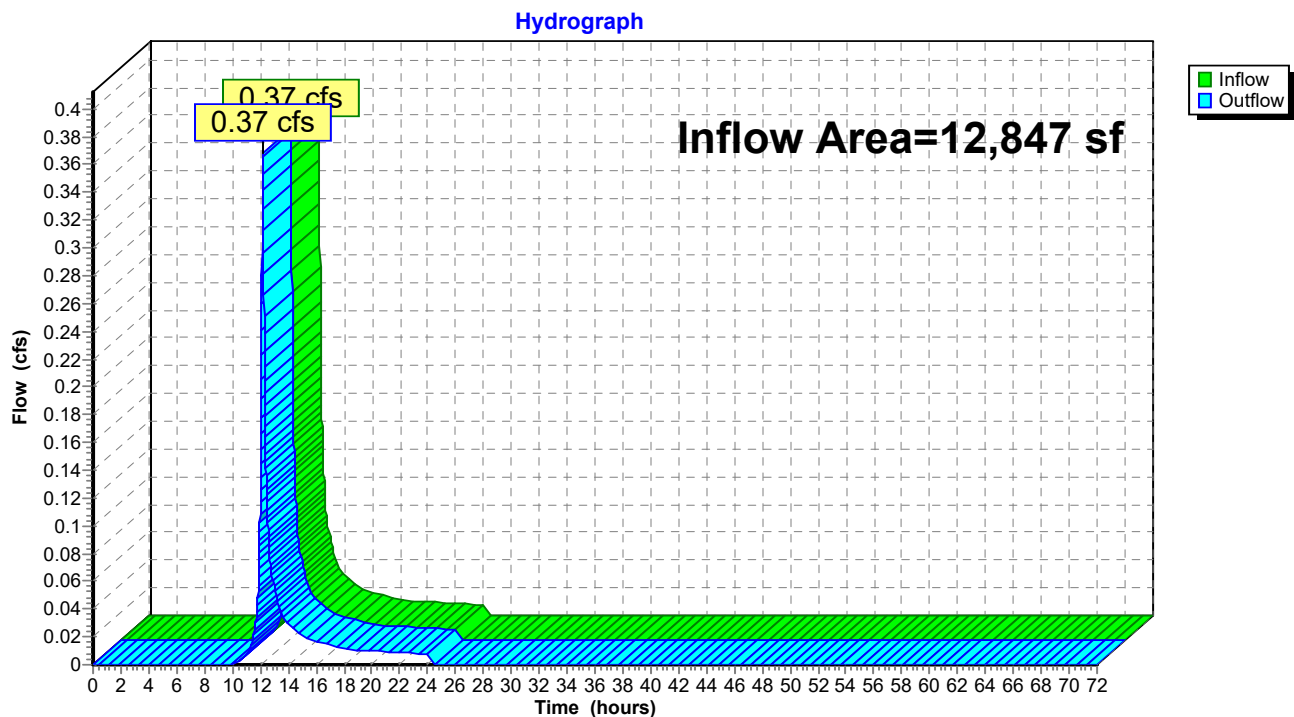
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 12,847 sf, 0.00% Impervious, Inflow Depth = 1.17" for 2-Year event
Inflow = 0.37 cfs @ 12.17 hrs, Volume= 1,248 cf
Outflow = 0.37 cfs @ 12.17 hrs, Volume= 1,248 cf, Atten= 0%, Lag= 0.0 min

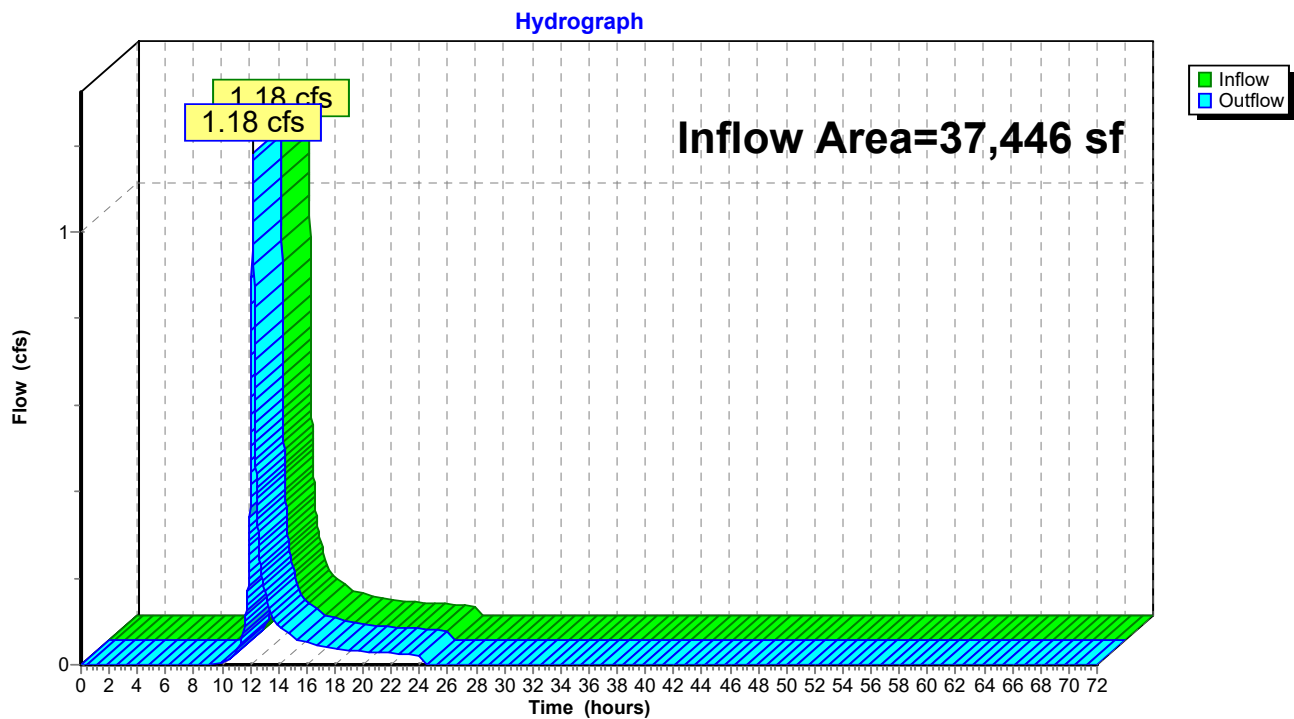
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 37,446 sf, 0.00% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 1.18 cfs @ 12.18 hrs, Volume= 4,019 cf
Outflow = 1.18 cfs @ 12.18 hrs, Volume= 4,019 cf, Atten= 0%, Lag= 0.0 min

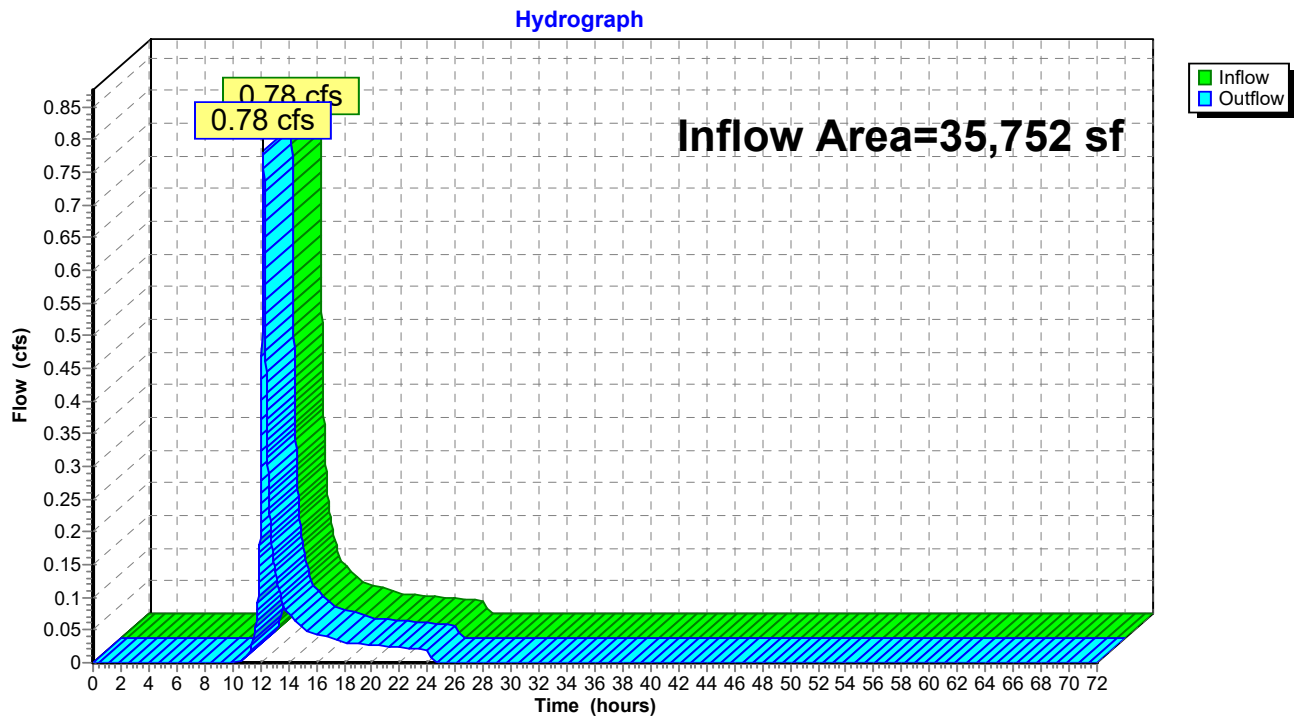
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 35,752 sf, 0.00% Impervious, Inflow Depth = 1.05" for 2-Year event
Inflow = 0.78 cfs @ 12.22 hrs, Volume= 3,130 cf
Outflow = 0.78 cfs @ 12.22 hrs, Volume= 3,130 cf, Atten= 0%, Lag= 0.0 min

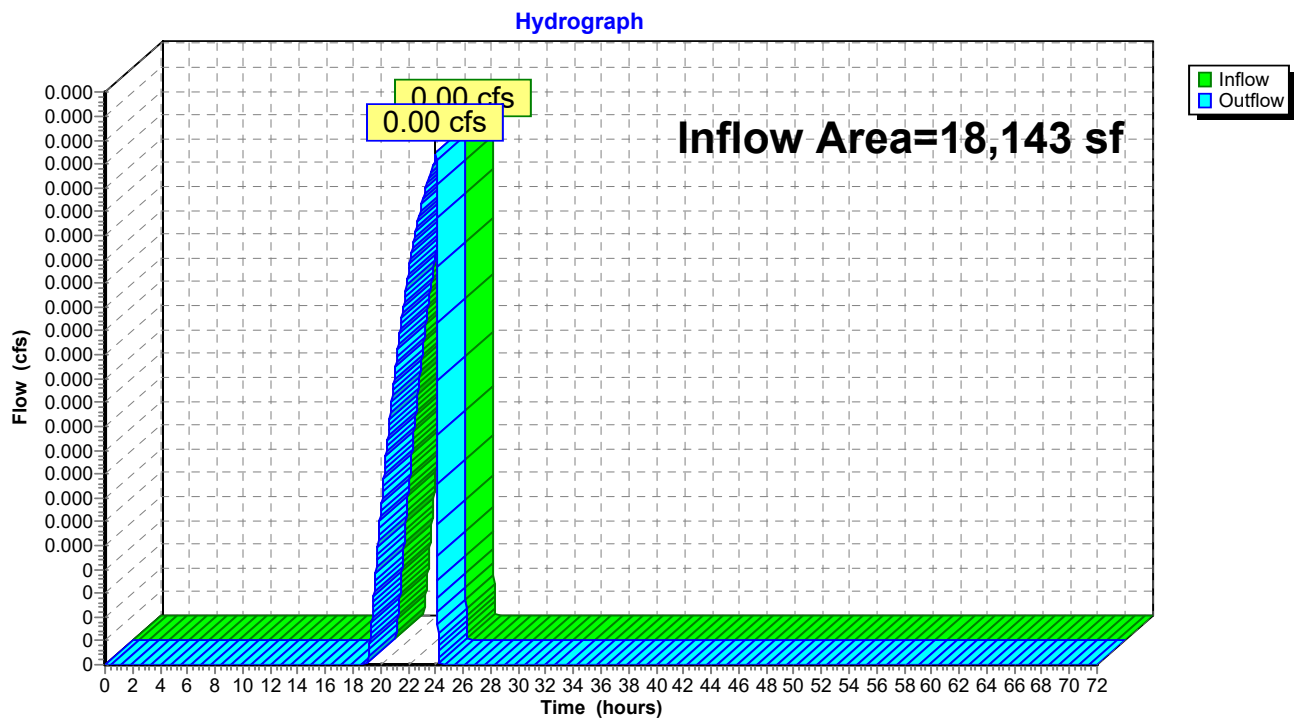
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 18,143 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.01 hrs, Volume= 5 cf
Outflow = 0.00 cfs @ 24.01 hrs, Volume= 5 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest

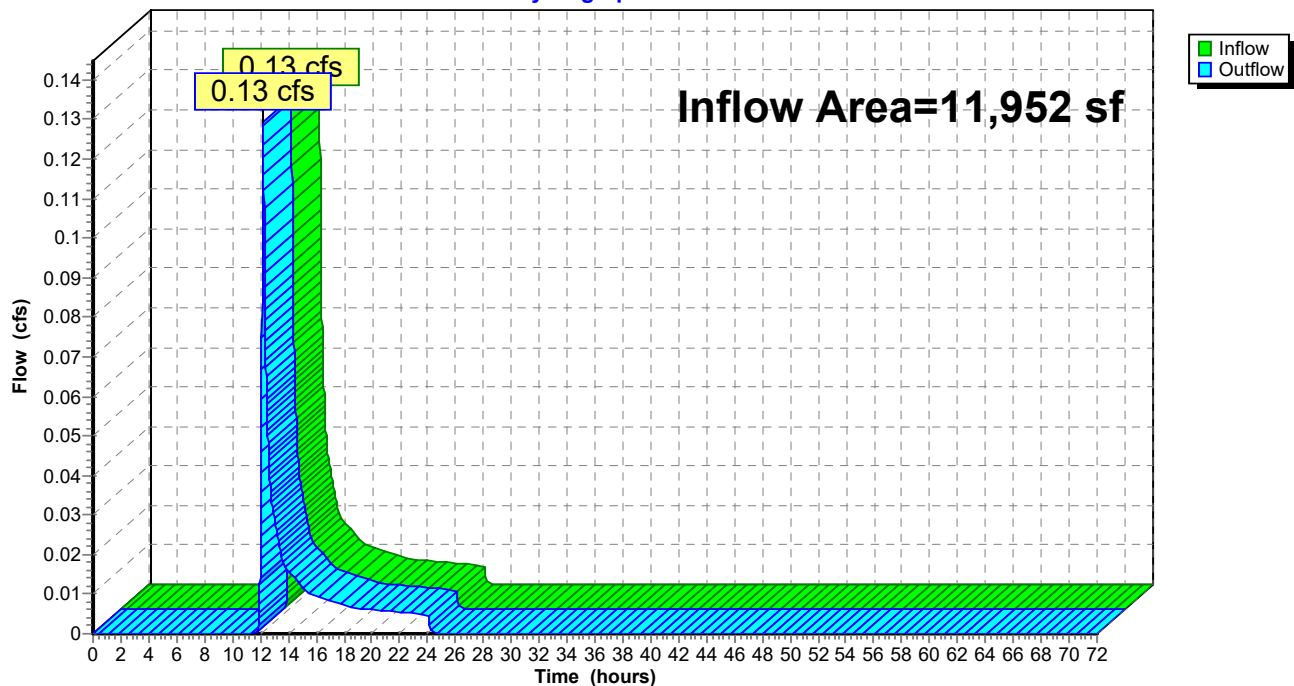
Summary for Reach DP 6: Towards Offsite East

Inflow Area = 11,952 sf, 0.00% Impervious, Inflow Depth = 0.57" for 2-Year event
Inflow = 0.13 cfs @ 12.20 hrs, Volume= 566 cf
Outflow = 0.13 cfs @ 12.20 hrs, Volume= 566 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East

Hydrograph



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NRCC 24-hr C 2-Year Rainfall=3.22"

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Summary for Pond 2P: South West Basin

Inflow Area = 55,890 sf, 2.19% Impervious, Inflow Depth = 1.23" for 2-Year event
 Inflow = 1.95 cfs @ 12.14 hrs, Volume= 5,711 cf
 Outflow = 0.25 cfs @ 12.98 hrs, Volume= 5,711 cf, Atten= 87%, Lag= 50.4 min
 Discarded = 0.25 cfs @ 12.98 hrs, Volume= 5,711 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 455.41' @ 12.98 hrs Surf.Area= 4,401 sf Storage= 1,742 cf

Plug-Flow detention time= 57.3 min calculated for 5,710 cf (100% of inflow)
 Center-of-Mass det. time= 57.3 min (921.7 - 864.4)

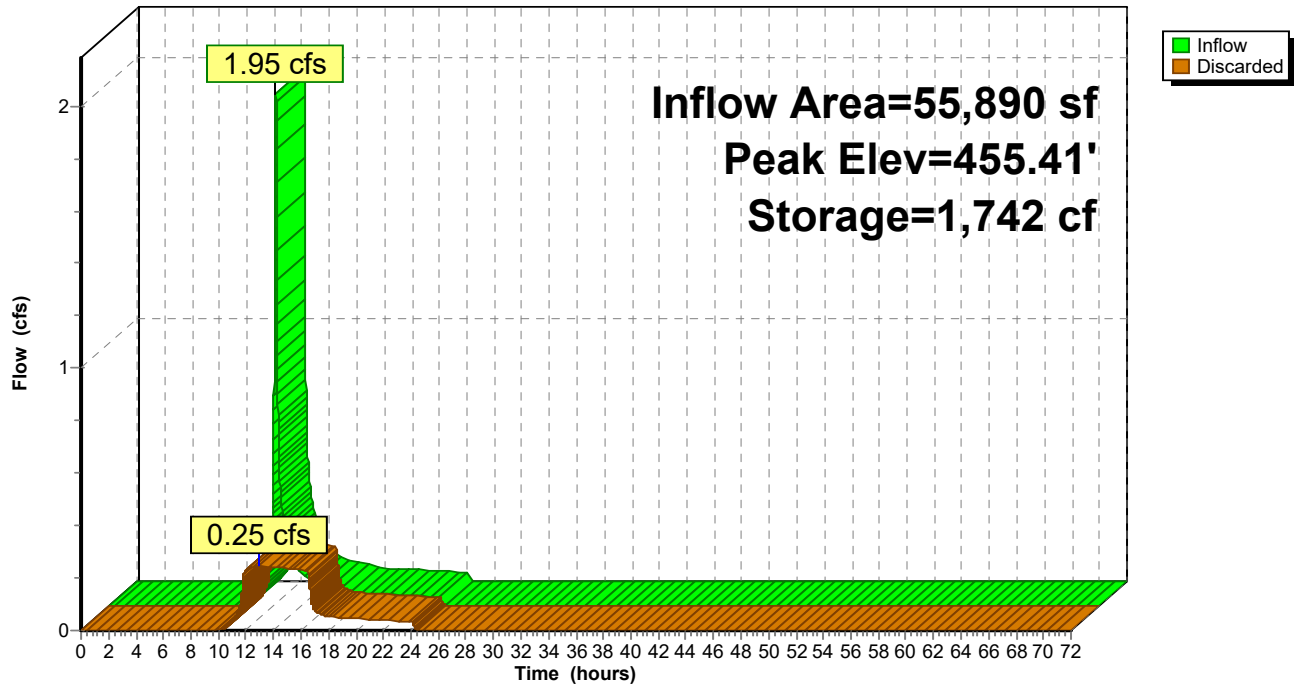
Volume	Invert	Avail.Storage	Storage Description	
#1	455.00'	16,306 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
455.00	4,039	0	0	4,039
456.00	4,943	4,483	4,483	4,974
457.00	5,904	5,416	9,900	5,969
458.00	6,922	6,406	16,306	7,026

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.25 cfs @ 12.98 hrs HW=455.41' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Pond 2P: South West Basin

Hydrograph



Summary for Pond 6P: North East Basin

Inflow Area = 106,367 sf, 0.60% Impervious, Inflow Depth = 0.20" for 2-Year event
 Inflow = 0.12 cfs @ 12.57 hrs, Volume= 1,798 cf
 Outflow = 0.09 cfs @ 13.07 hrs, Volume= 1,798 cf, Atten= 21%, Lag= 30.1 min
 Discarded = 0.09 cfs @ 13.07 hrs, Volume= 1,798 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 404.06' @ 13.07 hrs Surf.Area= 1,633 sf Storage= 94 cf

Plug-Flow detention time= 15.0 min calculated for 1,798 cf (100% of inflow)
 Center-of-Mass det. time= 15.0 min (1,014.6 - 999.6)

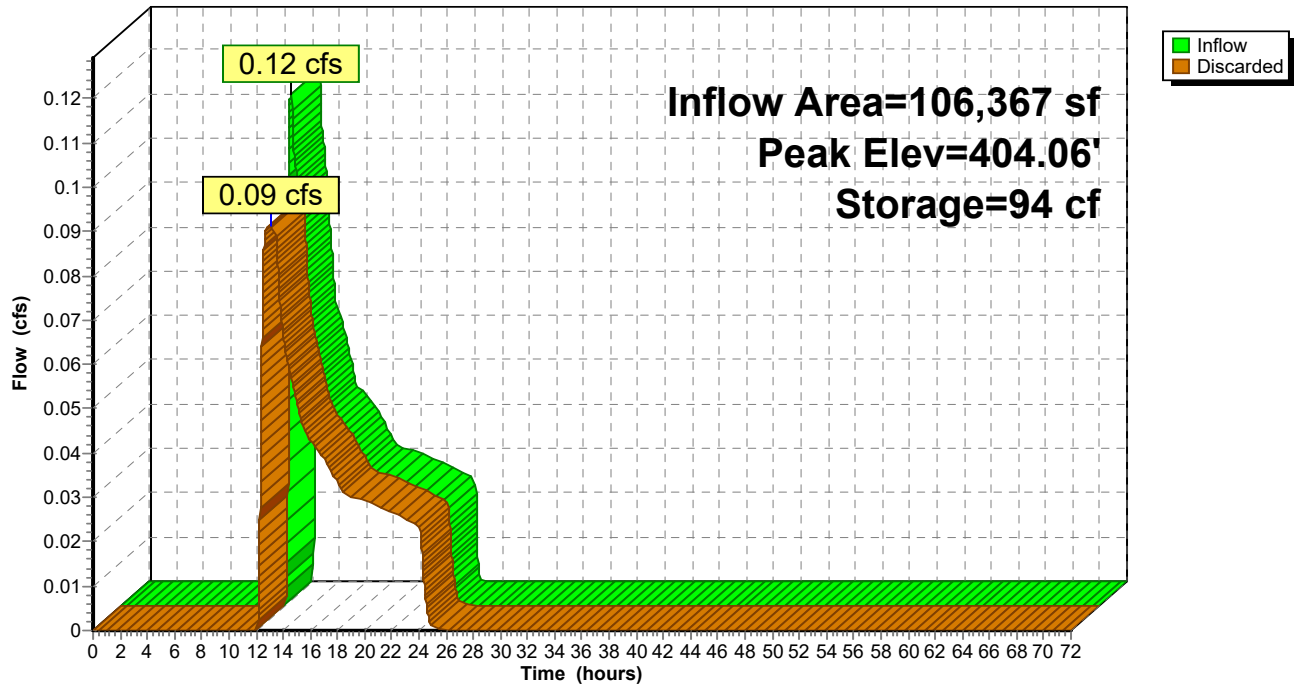
Volume	Invert	Avail.Storage	Storage Description		
#1	404.00'	18,479 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
404.00	1,593	178.0	0	0	1,593
405.00	2,352	203.0	1,960	1,960	2,375
406.00	3,120	229.0	2,727	4,687	3,294
407.00	3,995	256.0	3,548	8,236	4,364
408.00	5,102	285.0	4,537	12,773	5,641
409.00	6,333	315.0	5,706	18,479	7,105

Device	Routing	Invert	Outlet Devices
#1	Discarded	404.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.09 cfs @ 13.07 hrs HW=404.06' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.09 cfs)

Pond 6P: North East Basin

Hydrograph



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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S:	Runoff Area=35,263 sf 9.29% Impervious Runoff Depth=2.51" Flow Length=303' Tc=12.2 min CN=77 Runoff=2.02 cfs 7,365 cf
Subcatchment2A:	Runoff Area=55,890 sf 2.19% Impervious Runoff Depth=2.51" Flow Length=240' Tc=6.4 min CN=77 Runoff=4.02 cfs 11,673 cf
Subcatchment2S:	Runoff Area=12,847 sf 0.00% Impervious Runoff Depth=2.42" Flow Length=225' Tc=9.7 min CN=76 Runoff=0.78 cfs 2,591 cf
Subcatchment3S:	Runoff Area=37,446 sf 0.00% Impervious Runoff Depth=2.59" Flow Length=191' Tc=10.0 min CN=78 Runoff=2.41 cfs 8,092 cf
Subcatchment4S:	Runoff Area=35,752 sf 0.00% Impervious Runoff Depth=2.25" Flow Length=151' Tc=13.8 min CN=74 Runoff=1.75 cfs 6,713 cf
Subcatchment5S:	Runoff Area=18,143 sf 0.00% Impervious Runoff Depth=0.21" Flow Length=299' Tc=6.0 min CN=40 Runoff=0.01 cfs 310 cf
Subcatchment6A:	Runoff Area=106,367 sf 0.60% Impervious Runoff Depth=0.80" Flow Length=472' Tc=11.1 min CN=53 Runoff=1.51 cfs 7,063 cf
Subcatchment6S:	Runoff Area=11,952 sf 0.00% Impervious Runoff Depth=1.49" Flow Length=314' Tc=10.6 min CN=64 Runoff=0.41 cfs 1,484 cf
Reach DP 1: Towards Offsite West	Inflow=2.02 cfs 7,365 cf Outflow=2.02 cfs 7,365 cf
Reach DP 2: Towards Offsite North	Inflow=0.78 cfs 2,591 cf Outflow=0.78 cfs 2,591 cf
Reach DP 3: Towards West Wetland	Inflow=2.41 cfs 8,092 cf Outflow=2.41 cfs 8,092 cf
Reach DP 4: Towards East Wetland	Inflow=1.75 cfs 6,713 cf Outflow=1.75 cfs 6,713 cf
Reach DP 5: Towards Offsite Northwest	Inflow=0.01 cfs 310 cf Outflow=0.01 cfs 310 cf
Reach DP 6: Towards Offsite East	Inflow=0.41 cfs 1,484 cf Outflow=0.41 cfs 1,484 cf
Pond 2P: South West Basin	Peak Elev=456.08' Storage=4,901 cf Inflow=4.02 cfs 11,673 cf Outflow=0.28 cfs 11,673 cf
Pond 6P: North East Basin	Peak Elev=405.31' Storage=2,728 cf Inflow=1.51 cfs 7,063 cf Outflow=0.14 cfs 7,063 cf

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NRCC 24-hr C 10-Year Rainfall=4.86"

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Total Runoff Area = 313,660 sf Runoff Volume = 45,293 cf Average Runoff Depth = 1.73"
98.36% Pervious = 308,519 sf 1.64% Impervious = 5,141 sf

Summary for Subcatchment 1S:

Runoff = 2.02 cfs @ 12.20 hrs, Volume= 7,365 cf, Depth= 2.51"

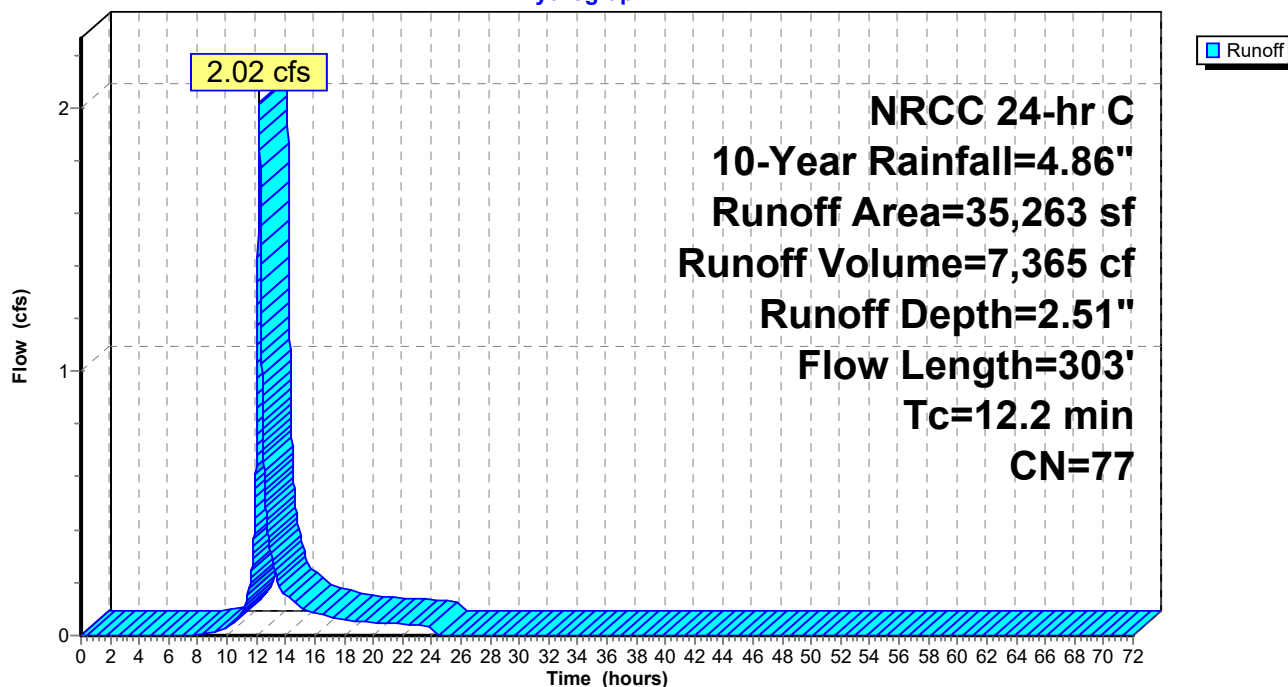
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
5,731	70	Woods, Good, HSG C
2,138	98	Roofs, HSG C
24,414	74	>75% Grass cover, Good, HSG C
1,843	96	Gravel surface, HSG C
1,137	98	Paved parking, HSG C
35,263	77	Weighted Average
31,988		90.71% Pervious Area
3,275		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.8	47	0.0213	1.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.9	123	0.0203	0.71		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	31	0.0484	3.54		Shallow Concentrated Flow, Gravel Road Unpaved Kv= 16.1 fps
4.0	52	0.0019	0.22		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
12.2	303	Total			

Subcatchment 1S:

Hydrograph



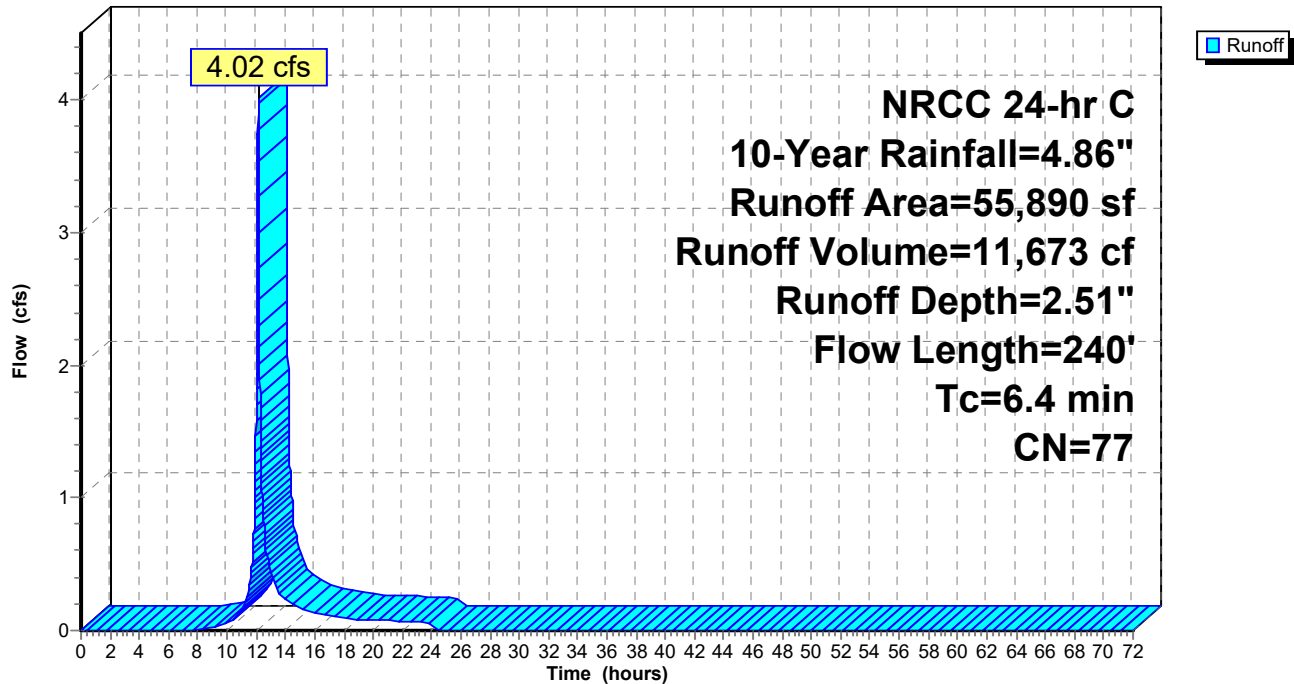
Summary for Subcatchment 2A:

Runoff = 4.02 cfs @ 12.14 hrs, Volume= 11,673 cf, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
30,811	74	>75% Grass cover, Good, HSG C
1,226	98	Roofs, HSG C
15,725	70	Woods, Good, HSG C
8,128	96	Gravel surface, HSG C
55,890	77	Weighted Average
54,664		97.81% Pervious Area
1,226		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	71	0.0366	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	28	0.0321	2.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.2	78	0.0256	1.12		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	240	Total			

Subcatchment 2A:**Hydrograph**

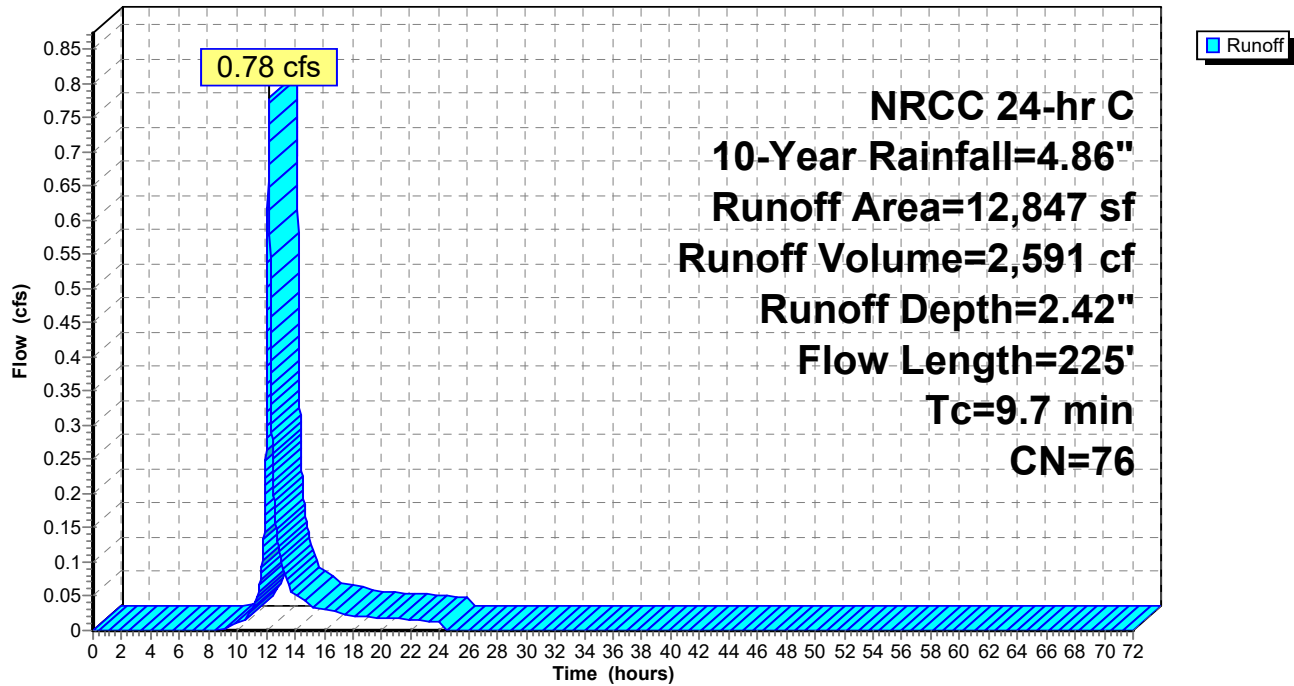
Summary for Subcatchment 2S:

Runoff = 0.78 cfs @ 12.17 hrs, Volume= 2,591 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
5,793	70	Woods, Good, HSG C
5,770	77	Brush, Poor, HSG C
1,284	96	Gravel surface, HSG C
12,847	76	Weighted Average
12,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0880	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.1	19	0.0256	2.58		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	10	0.0102	0.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	46	0.0176	0.66		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	59	0.0273	1.16		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0251	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	21	0.0239	1.08		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.7	225	Total			

Subcatchment 2S:**Hydrograph**

Summary for Subcatchment 3S:

Runoff = 2.41 cfs @ 12.17 hrs, Volume= 8,092 cf, Depth= 2.59"

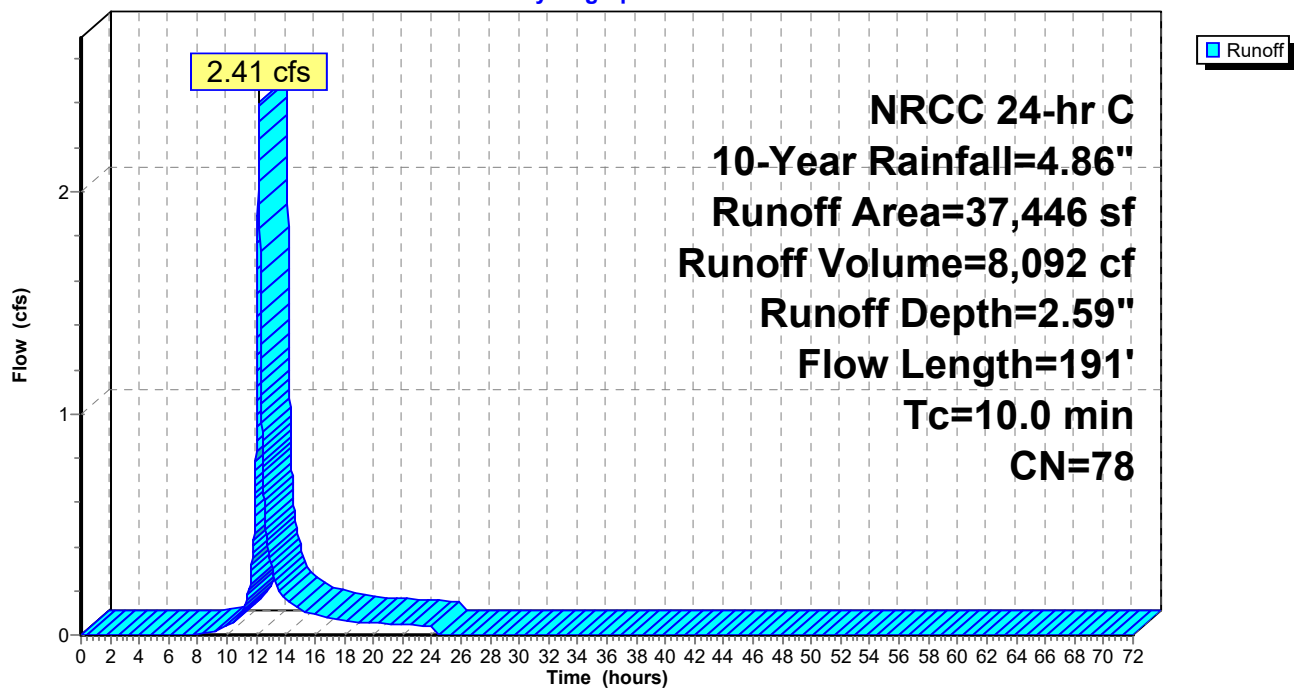
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
4,935	70	Woods, Good, HSG C
28,511	77	Brush, Poor, HSG C
4,000	96	Gravel surface, HSG C
37,446	78	Weighted Average
37,446		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0440	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.0	111	0.0731	1.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.0	191	Total			

Subcatchment 3S:

Hydrograph



Summary for Subcatchment 4S:

Runoff = 1.75 cfs @ 12.22 hrs, Volume= 6,713 cf, Depth= 2.25"

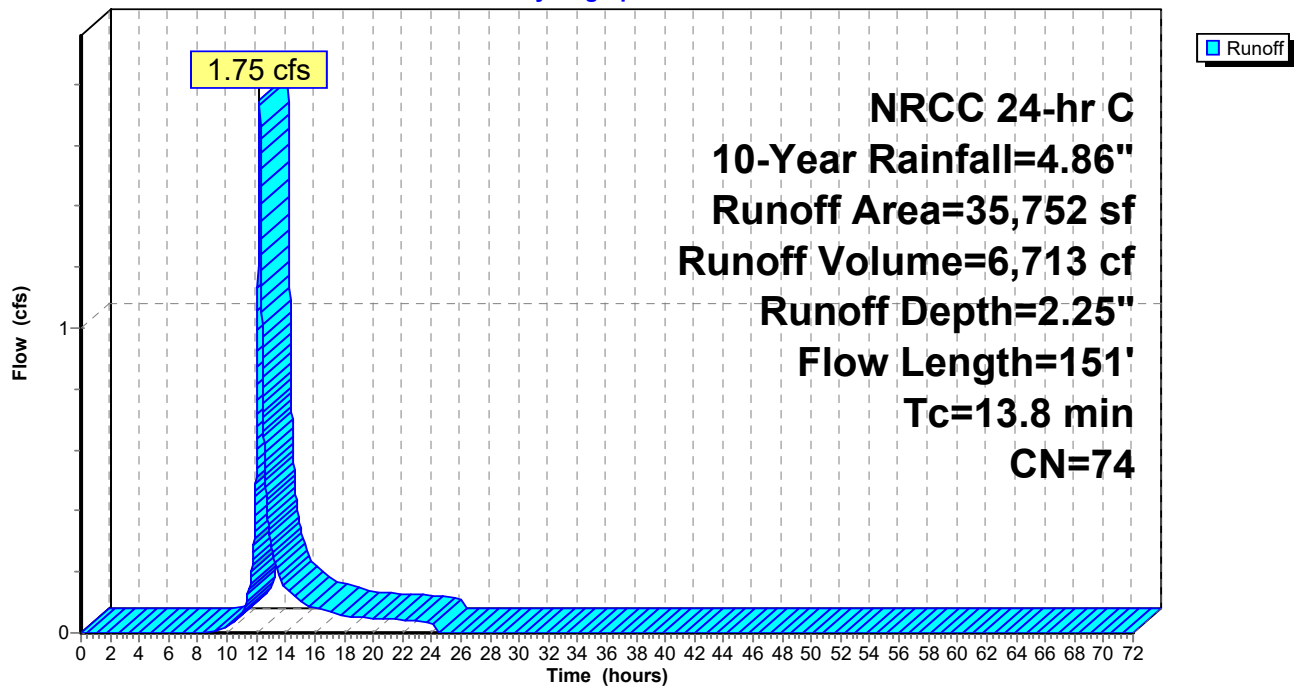
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
19,992	70	Woods, Good, HSG C
13,127	77	Brush, Poor, HSG C
2,633	96	Gravel surface, HSG C
35,752	74	Weighted Average
35,752		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	50	0.0160	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.8	101	0.0974	2.18		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	151	Total			

Subcatchment 4S:

Hydrograph



Summary for Subcatchment 5S:

Runoff = 0.01 cfs @ 12.94 hrs, Volume= 310 cf, Depth= 0.21"

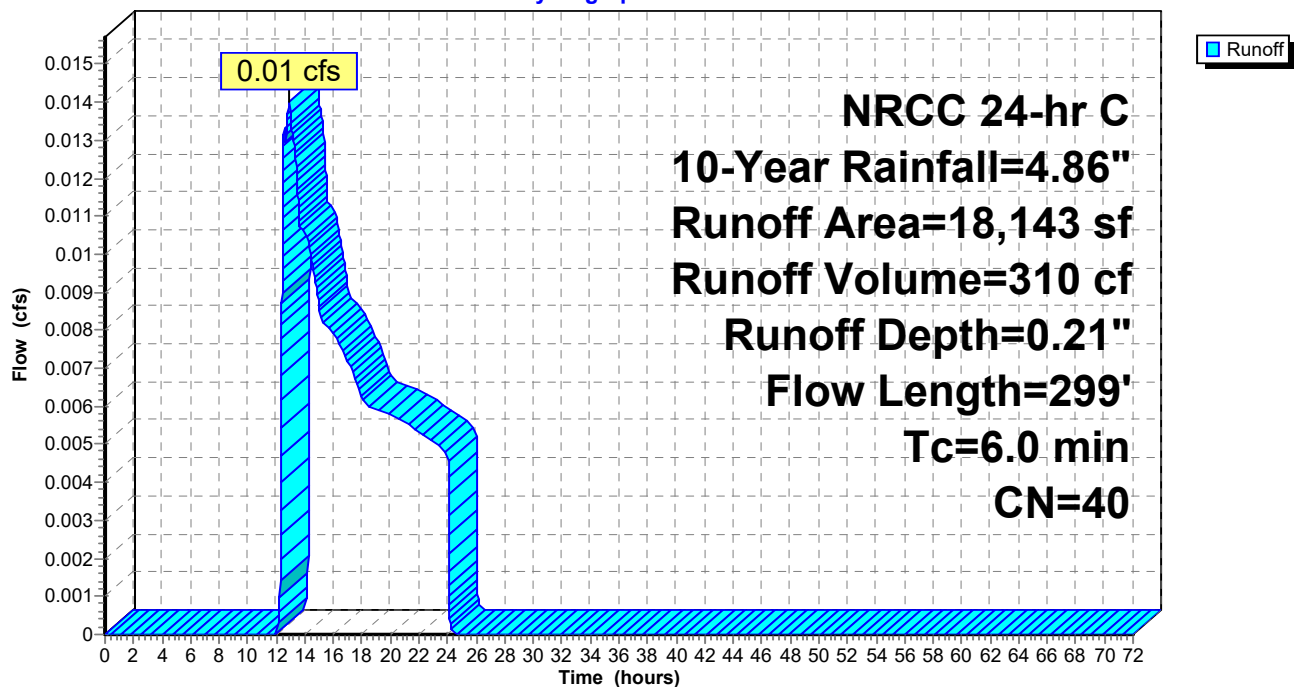
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
574	70	Woods, Good, HSG C
1,112	74	>75% Grass cover, Good, HSG C
4,232	30	Woods, Good, HSG A
12,225	39	>75% Grass cover, Good, HSG A
18,143	40	Weighted Average
18,143		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1040	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.9	193	0.0629	3.76		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	56	0.1470	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.2	299	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5S:

Hydrograph



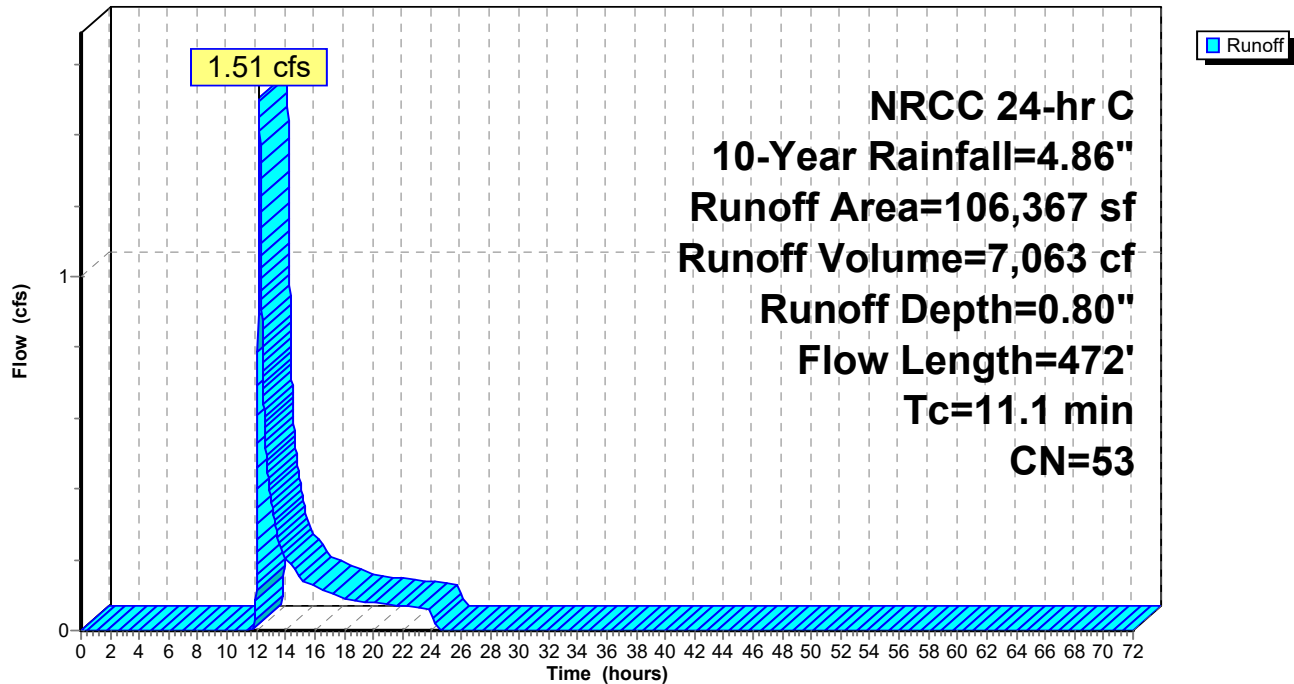
Summary for Subcatchment 6A:

Runoff = 1.51 cfs @ 12.21 hrs, Volume= 7,063 cf, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
7,811	70	Woods, Good, HSG C
20,625	74	>75% Grass cover, Good, HSG C
4,965	96	Gravel surface, HSG C
640	98	Unconnected pavement, HSG C
746	30	Woods, Good, HSG A
68,329	39	>75% Grass cover, Good, HSG A
3,251	96	Gravel surface, HSG A
106,367	53	Weighted Average
105,727		99.40% Pervious Area
640		0.60% Impervious Area
640		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.44"
1.8	238	0.1042	2.26		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.4	184	0.0914	2.16	22.30	Trap/Vee/Rect Channel Flow, Bot.W=4.00' D=1.00' Z= 5.6 & 7.0 ' Top.W=16.60' n= 0.150 Sheet flow over Short Grass
11.1	472	Total			

Subcatchment 6A:**Hydrograph**

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NRCC 24-hr C 10-Year Rainfall=4.86"

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Summary for Subcatchment 6S:

Runoff = 0.41 cfs @ 12.19 hrs, Volume= 1,484 cf, Depth= 1.49"

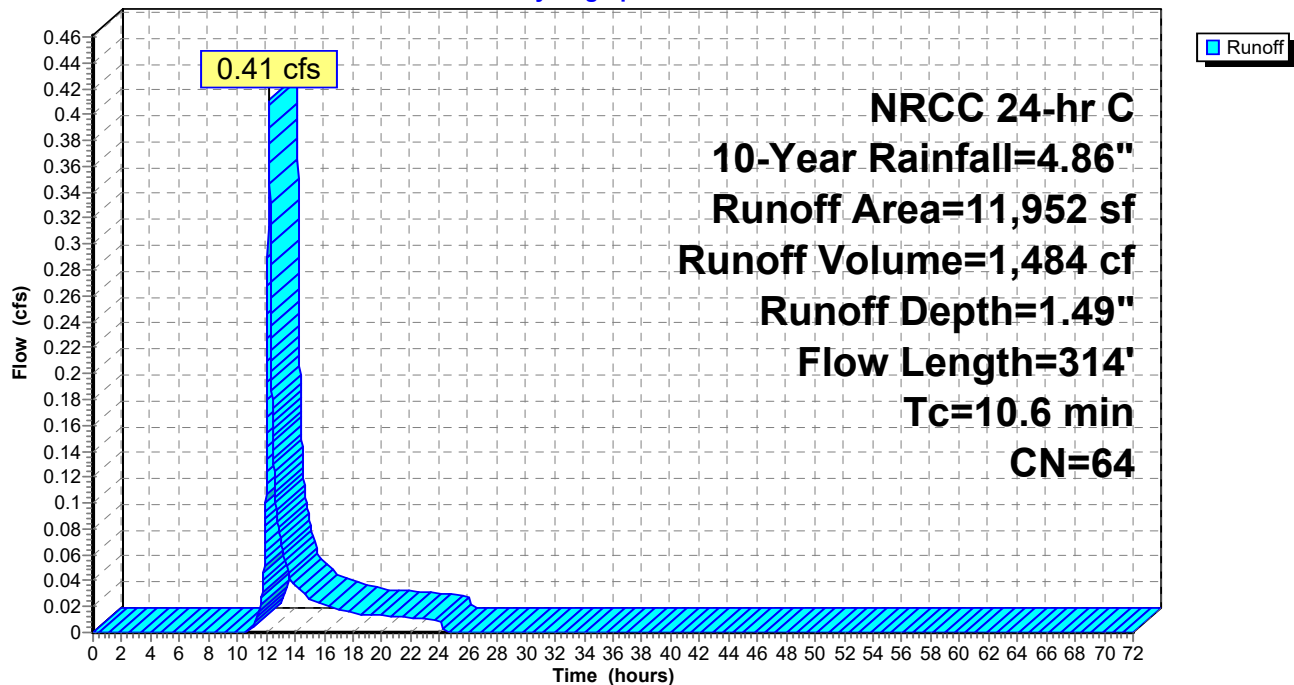
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.86"

Area (sf)	CN	Description
5,519	70	Woods, Good, HSG C
3,933	74	>75% Grass cover, Good, HSG C
902	30	Woods, Good, HSG A
1,598	39	>75% Grass cover, Good, HSG A
11,952	64	Weighted Average
11,952		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.9	150	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	114	0.1496	1.93		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.6	314	Total			

Subcatchment 6S:

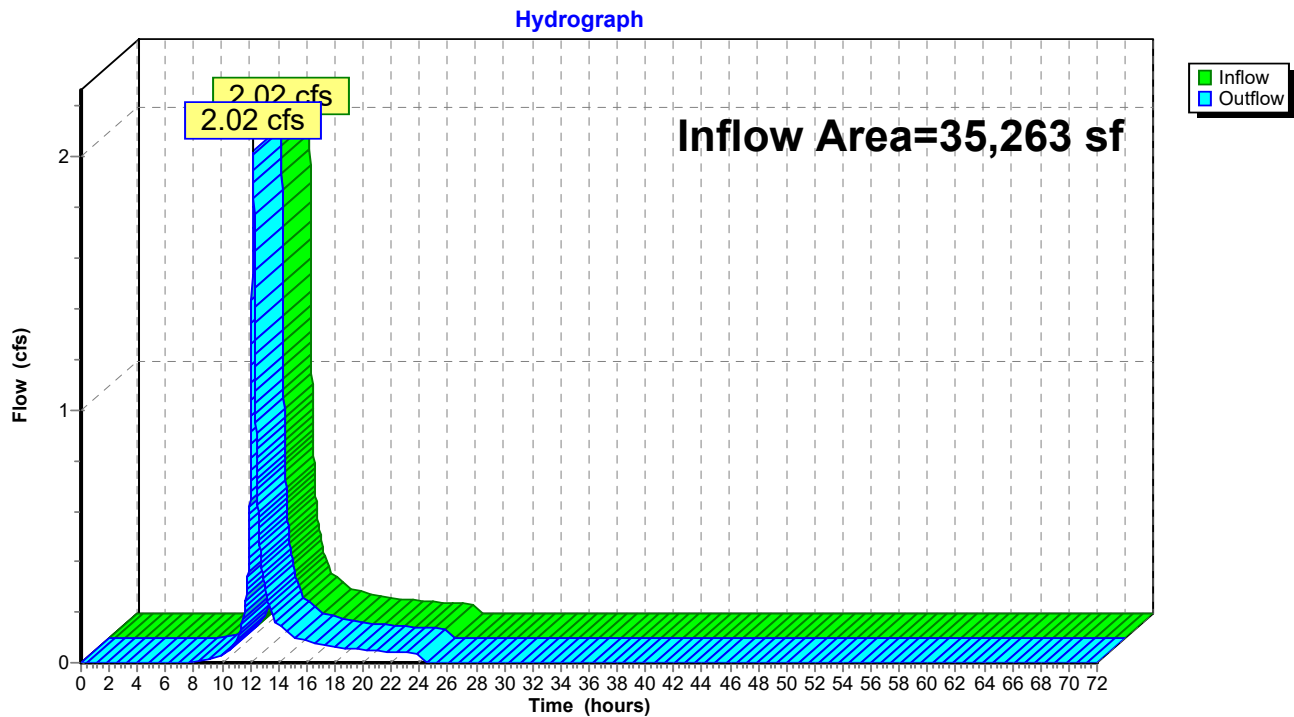
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 35,263 sf, 9.29% Impervious, Inflow Depth = 2.51" for 10-Year event
Inflow = 2.02 cfs @ 12.20 hrs, Volume= 7,365 cf
Outflow = 2.02 cfs @ 12.20 hrs, Volume= 7,365 cf, Atten= 0%, Lag= 0.0 min

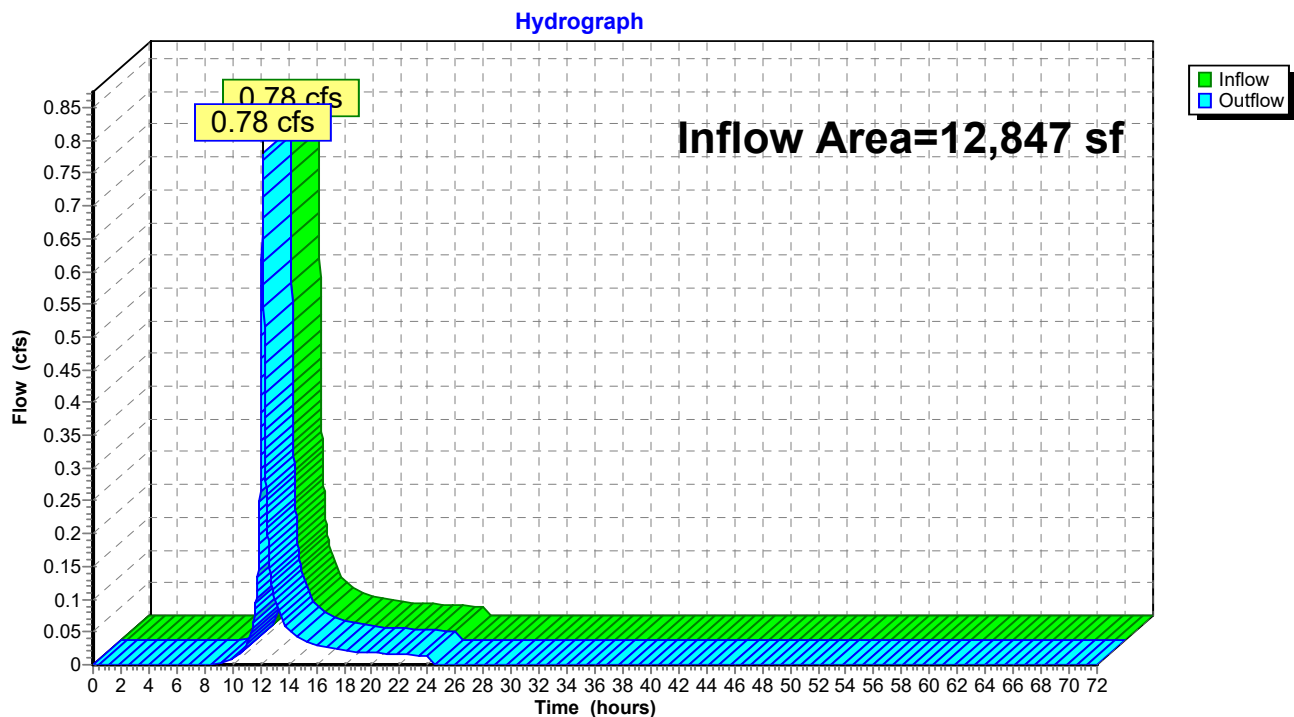
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 12,847 sf, 0.00% Impervious, Inflow Depth = 2.42" for 10-Year event
Inflow = 0.78 cfs @ 12.17 hrs, Volume= 2,591 cf
Outflow = 0.78 cfs @ 12.17 hrs, Volume= 2,591 cf, Atten= 0%, Lag= 0.0 min

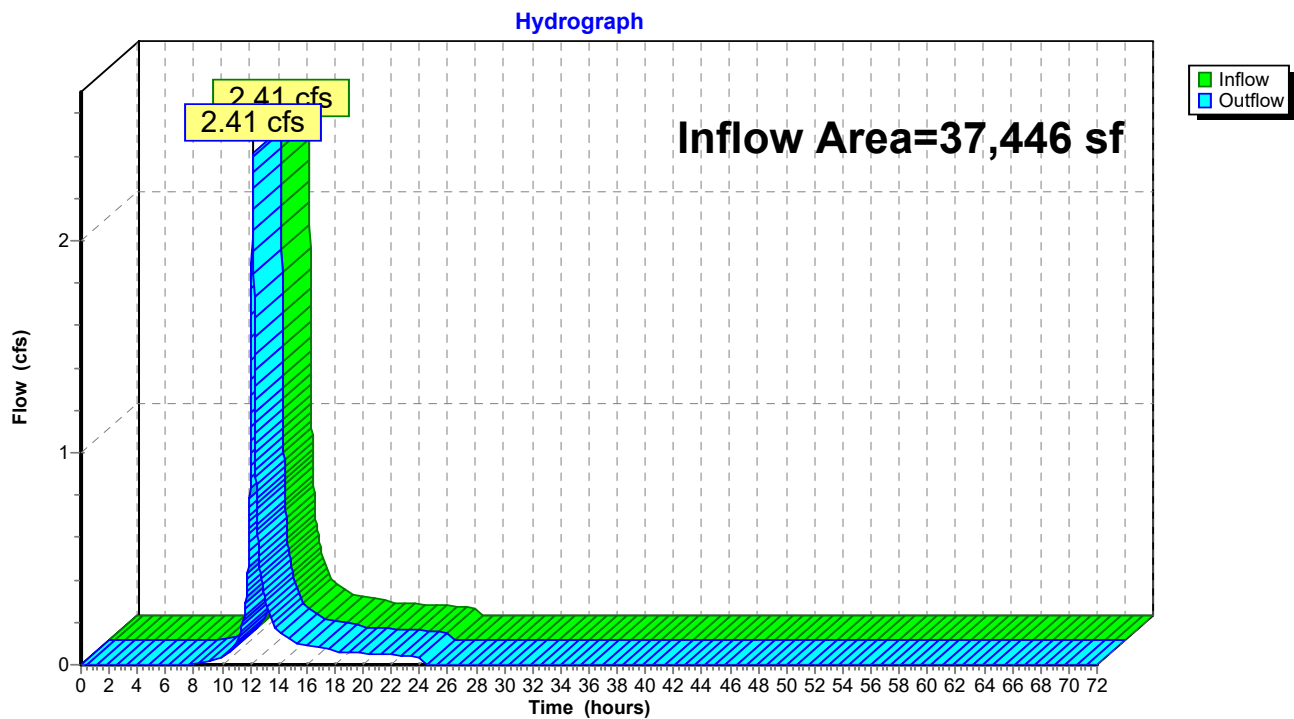
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 37,446 sf, 0.00% Impervious, Inflow Depth = 2.59" for 10-Year event
Inflow = 2.41 cfs @ 12.17 hrs, Volume= 8,092 cf
Outflow = 2.41 cfs @ 12.17 hrs, Volume= 8,092 cf, Atten= 0%, Lag= 0.0 min

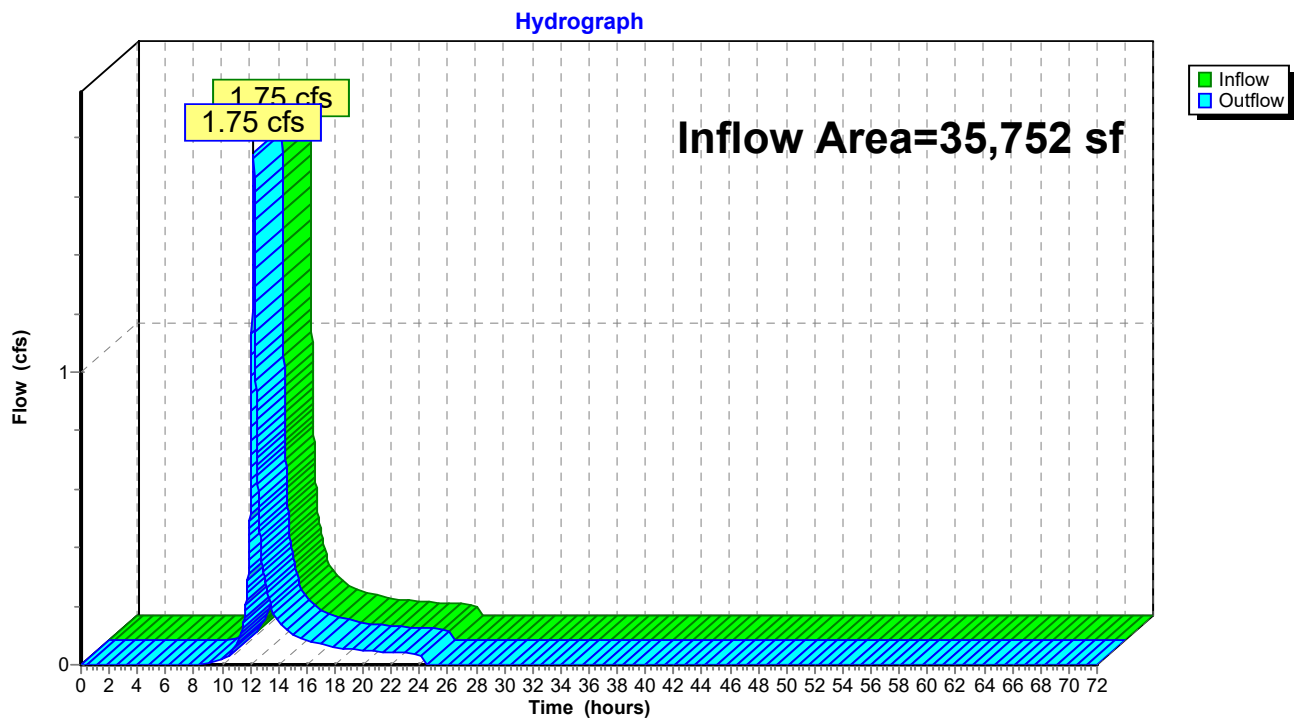
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 35,752 sf, 0.00% Impervious, Inflow Depth = 2.25" for 10-Year event
Inflow = 1.75 cfs @ 12.22 hrs, Volume= 6,713 cf
Outflow = 1.75 cfs @ 12.22 hrs, Volume= 6,713 cf, Atten= 0%, Lag= 0.0 min

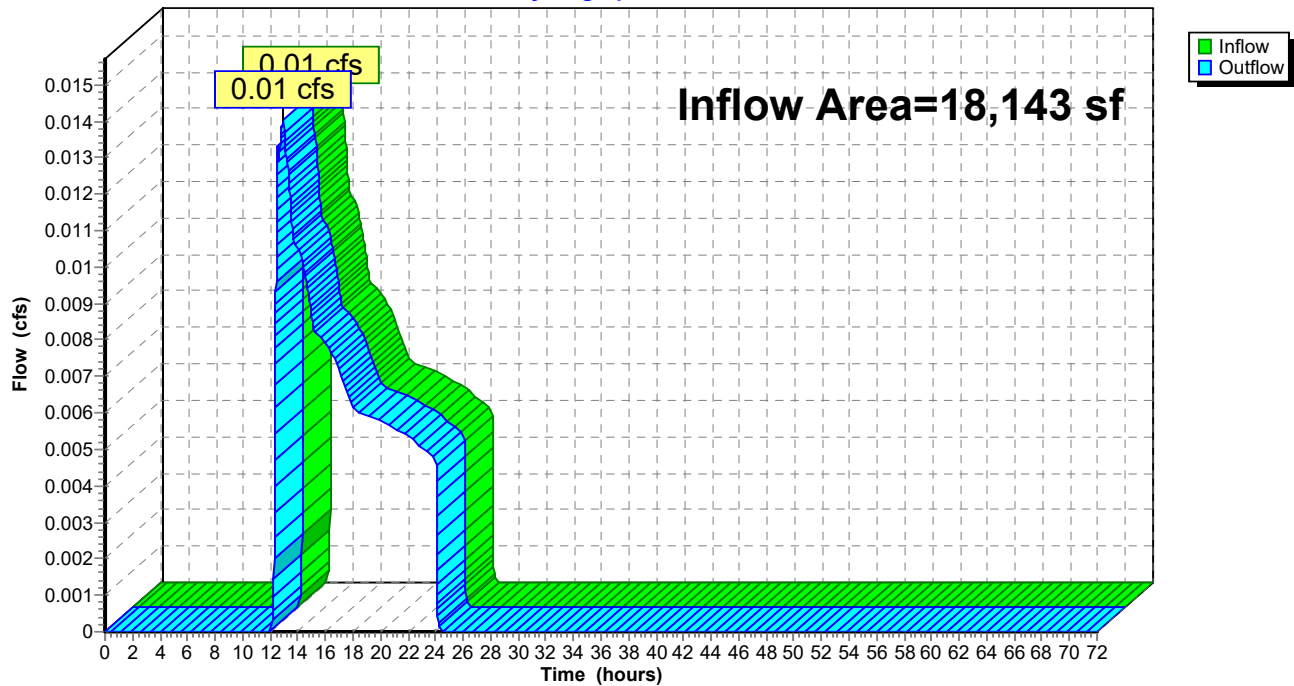
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 18,143 sf, 0.00% Impervious, Inflow Depth = 0.21" for 10-Year event
Inflow = 0.01 cfs @ 12.94 hrs, Volume= 310 cf
Outflow = 0.01 cfs @ 12.94 hrs, Volume= 310 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest**Hydrograph**

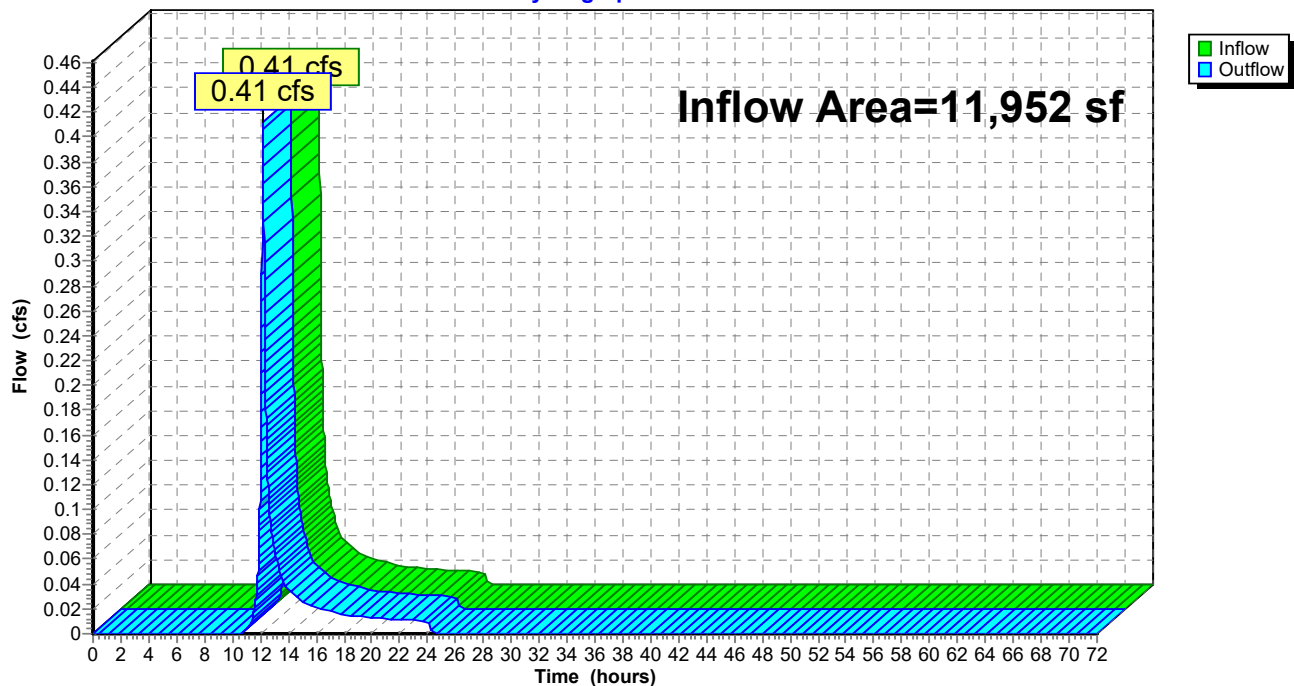
Summary for Reach DP 6: Towards Offsite East

Inflow Area = 11,952 sf, 0.00% Impervious, Inflow Depth = 1.49" for 10-Year event
Inflow = 0.41 cfs @ 12.19 hrs, Volume= 1,484 cf
Outflow = 0.41 cfs @ 12.19 hrs, Volume= 1,484 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East

Hydrograph



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Summary for Pond 2P: South West Basin

Inflow Area = 55,890 sf, 2.19% Impervious, Inflow Depth = 2.51" for 10-Year event
 Inflow = 4.02 cfs @ 12.14 hrs, Volume= 11,673 cf
 Outflow = 0.28 cfs @ 13.57 hrs, Volume= 11,673 cf, Atten= 93%, Lag= 85.7 min
 Discarded = 0.28 cfs @ 13.57 hrs, Volume= 11,673 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 456.08' @ 13.57 hrs Surf.Area= 5,020 sf Storage= 4,901 cf

Plug-Flow detention time= 168.2 min calculated for 11,671 cf (100% of inflow)
 Center-of-Mass det. time= 168.2 min (1,009.6 - 841.4)

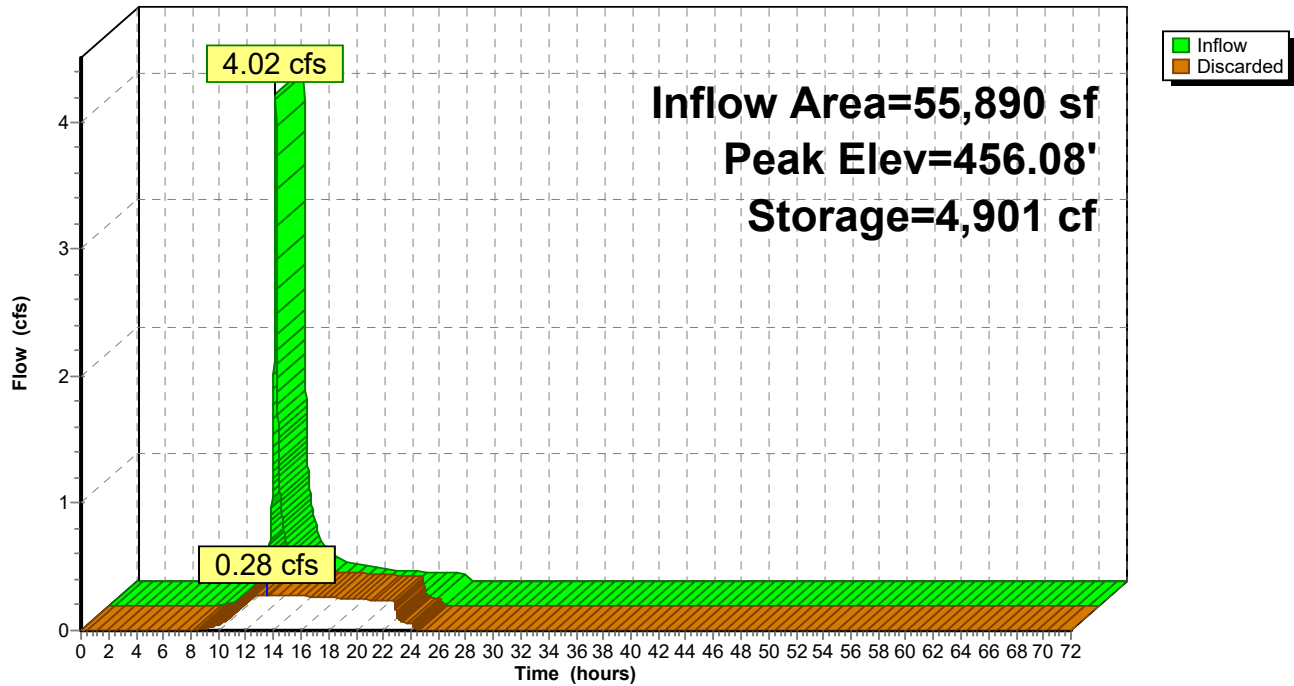
Volume	Invert	Avail.Storage	Storage Description	
#1	455.00'	16,306 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
455.00	4,039	0	0	4,039
456.00	4,943	4,483	4,483	4,974
457.00	5,904	5,416	9,900	5,969
458.00	6,922	6,406	16,306	7,026

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 13.57 hrs HW=456.08' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Pond 2P: South West Basin

Hydrograph



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Summary for Pond 6P: North East Basin

Inflow Area = 106,367 sf, 0.60% Impervious, Inflow Depth = 0.80" for 10-Year event
 Inflow = 1.51 cfs @ 12.21 hrs, Volume= 7,063 cf
 Outflow = 0.14 cfs @ 15.09 hrs, Volume= 7,063 cf, Atten= 90%, Lag= 172.9 min
 Discarded = 0.14 cfs @ 15.09 hrs, Volume= 7,063 cf

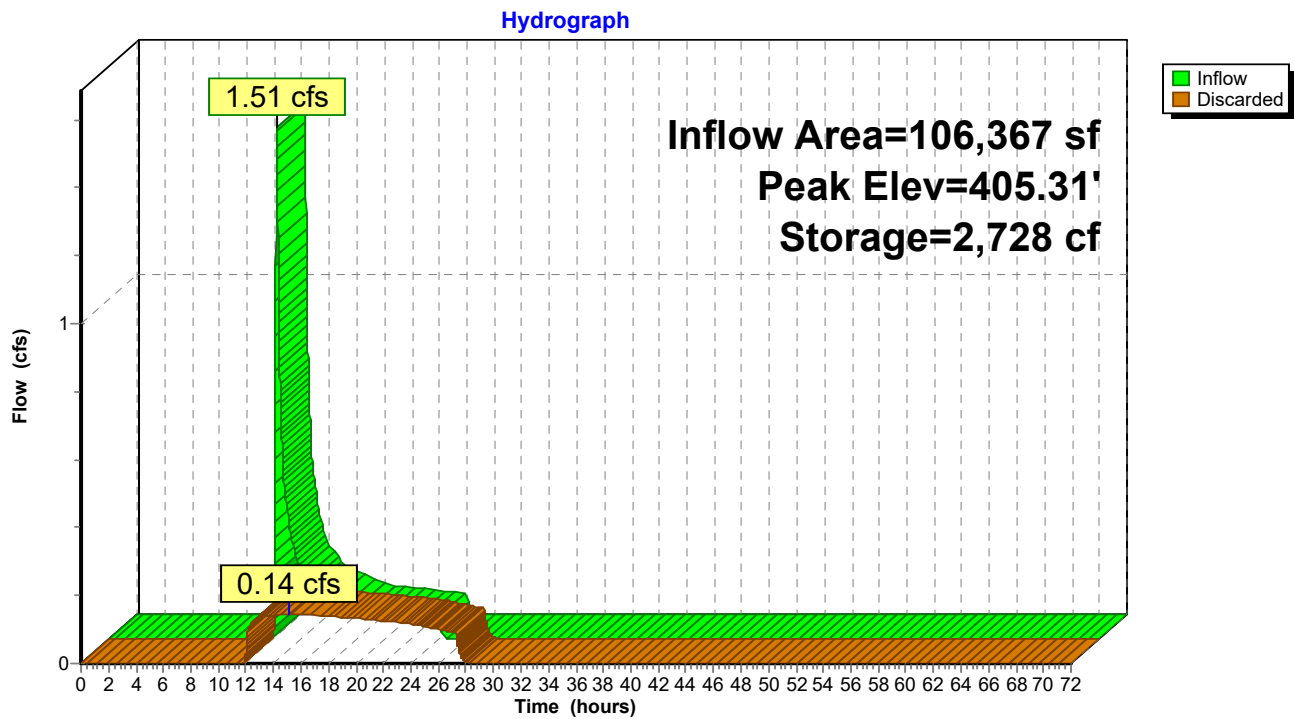
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 405.31' @ 15.09 hrs Surf.Area= 2,580 sf Storage= 2,728 cf

Plug-Flow detention time= 235.4 min calculated for 7,062 cf (100% of inflow)
 Center-of-Mass det. time= 235.4 min (1,160.8 - 925.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	404.00'	18,479 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
404.00	1,593	178.0	0	0	1,593
405.00	2,352	203.0	1,960	1,960	2,375
406.00	3,120	229.0	2,727	4,687	3,294
407.00	3,995	256.0	3,548	8,236	4,364
408.00	5,102	285.0	4,537	12,773	5,641
409.00	6,333	315.0	5,706	18,479	7,105

Device	Routing	Invert	Outlet Devices
#1	Discarded	404.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.14 cfs @ 15.09 hrs HW=405.31' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.14 cfs)

Pond 6P: North East Basin

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S:	Runoff Area=35,263 sf 9.29% Impervious Runoff Depth=3.61" Flow Length=303' Tc=12.2 min CN=77 Runoff=2.91 cfs 10,609 cf
Subcatchment2A:	Runoff Area=55,890 sf 2.19% Impervious Runoff Depth=3.61" Flow Length=240' Tc=6.4 min CN=77 Runoff=5.76 cfs 16,815 cf
Subcatchment2S:	Runoff Area=12,847 sf 0.00% Impervious Runoff Depth=3.51" Flow Length=225' Tc=9.7 min CN=76 Runoff=1.13 cfs 3,758 cf
Subcatchment3S:	Runoff Area=37,446 sf 0.00% Impervious Runoff Depth=3.71" Flow Length=191' Tc=10.0 min CN=78 Runoff=3.43 cfs 11,582 cf
Subcatchment4S:	Runoff Area=35,752 sf 0.00% Impervious Runoff Depth=3.31" Flow Length=151' Tc=13.8 min CN=74 Runoff=2.58 cfs 9,866 cf
Subcatchment5S:	Runoff Area=18,143 sf 0.00% Impervious Runoff Depth=0.55" Flow Length=299' Tc=6.0 min CN=40 Runoff=0.11 cfs 827 cf
Subcatchment6A:	Runoff Area=106,367 sf 0.60% Impervious Runoff Depth=1.45" Flow Length=472' Tc=11.1 min CN=53 Runoff=3.25 cfs 12,818 cf
Subcatchment6S:	Runoff Area=11,952 sf 0.00% Impervious Runoff Depth=2.37" Flow Length=314' Tc=10.6 min CN=64 Runoff=0.68 cfs 2,361 cf
Reach DP 1: Towards Offsite West	Inflow=2.91 cfs 10,609 cf Outflow=2.91 cfs 10,609 cf
Reach DP 2: Towards Offsite North	Inflow=1.13 cfs 3,758 cf Outflow=1.13 cfs 3,758 cf
Reach DP 3: Towards West Wetland	Inflow=3.43 cfs 11,582 cf Outflow=3.43 cfs 11,582 cf
Reach DP 4: Towards East Wetland	Inflow=2.58 cfs 9,866 cf Outflow=2.58 cfs 9,866 cf
Reach DP 5: Towards Offsite Northwest	Inflow=0.11 cfs 827 cf Outflow=0.11 cfs 827 cf
Reach DP 6: Towards Offsite East	Inflow=0.68 cfs 2,361 cf Outflow=0.68 cfs 2,361 cf
Pond 2P: South West Basin	Peak Elev=456.66' Storage=7,933 cf Inflow=5.76 cfs 16,815 cf Outflow=0.31 cfs 16,815 cf
Pond 6P: North East Basin	Peak Elev=406.48' Storage=6,286 cf Inflow=3.25 cfs 12,818 cf Outflow=0.20 cfs 12,818 cf

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Total Runoff Area = 313,660 sf Runoff Volume = 68,637 cf Average Runoff Depth = 2.63"
98.36% Pervious = 308,519 sf 1.64% Impervious = 5,141 sf

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Summary for Subcatchment 1S:

Runoff = 2.91 cfs @ 12.20 hrs, Volume= 10,609 cf, Depth= 3.61"

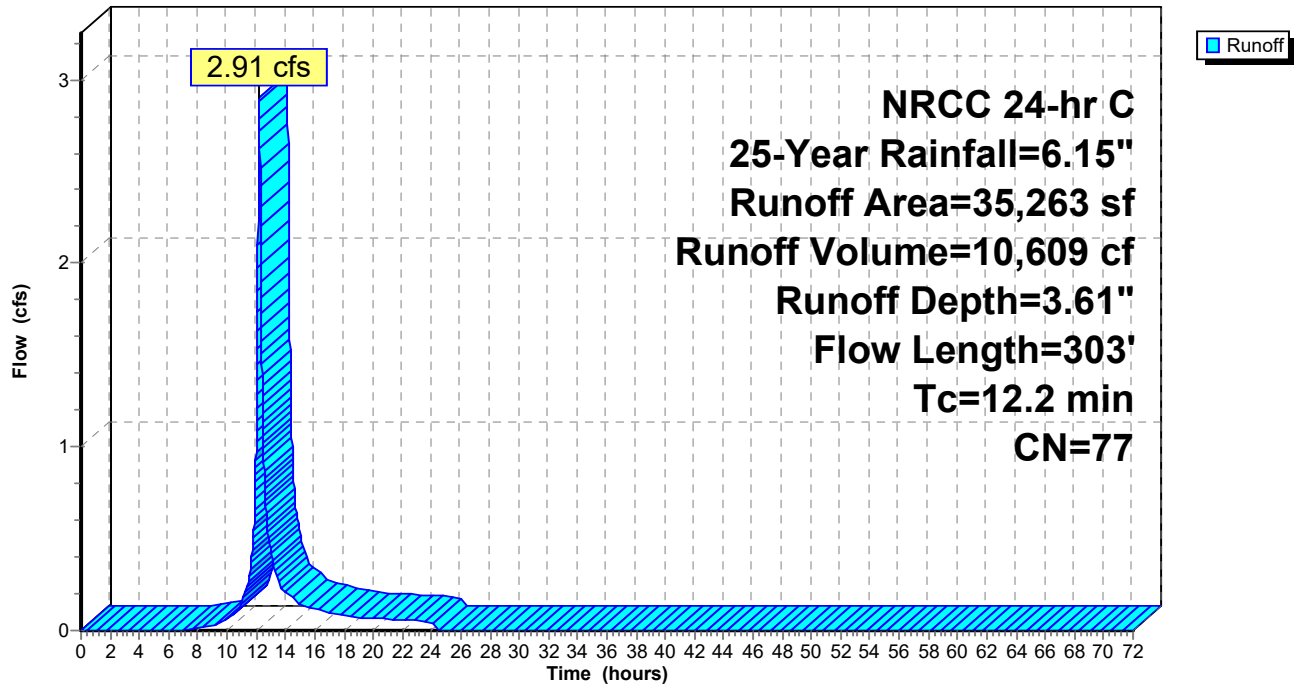
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
5,731	70	Woods, Good, HSG C
2,138	98	Roofs, HSG C
24,414	74	>75% Grass cover, Good, HSG C
1,843	96	Gravel surface, HSG C
1,137	98	Paved parking, HSG C
35,263	77	Weighted Average
31,988		90.71% Pervious Area
3,275		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.8	47	0.0213	1.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.9	123	0.0203	0.71		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	31	0.0484	3.54		Shallow Concentrated Flow, Gravel Road Unpaved Kv= 16.1 fps
4.0	52	0.0019	0.22		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
12.2	303	Total			

Subcatchment 1S:

Hydrograph



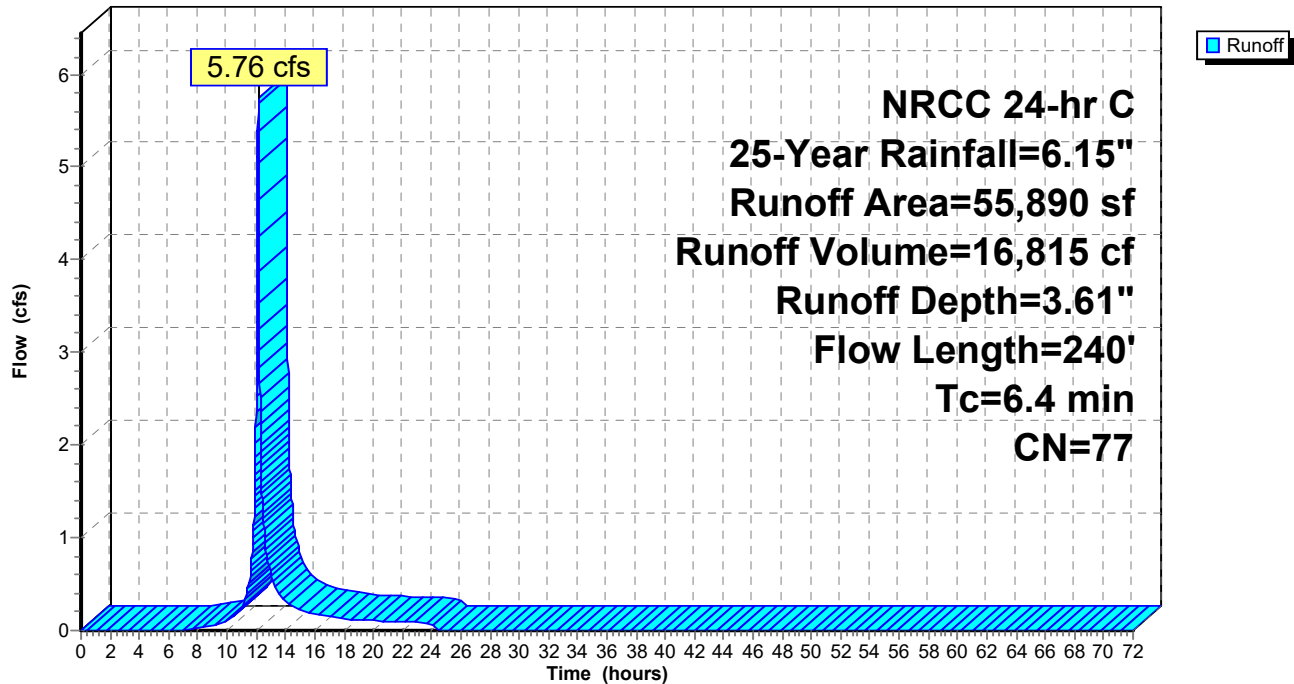
Summary for Subcatchment 2A:

Runoff = 5.76 cfs @ 12.14 hrs, Volume= 16,815 cf, Depth= 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
30,811	74	>75% Grass cover, Good, HSG C
1,226	98	Roofs, HSG C
15,725	70	Woods, Good, HSG C
8,128	96	Gravel surface, HSG C
55,890	77	Weighted Average
54,664		97.81% Pervious Area
1,226		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	71	0.0366	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	28	0.0321	2.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.2	78	0.0256	1.12		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	240	Total			

Subcatchment 2A:**Hydrograph**

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Summary for Subcatchment 2S:

Runoff = 1.13 cfs @ 12.17 hrs, Volume= 3,758 cf, Depth= 3.51"

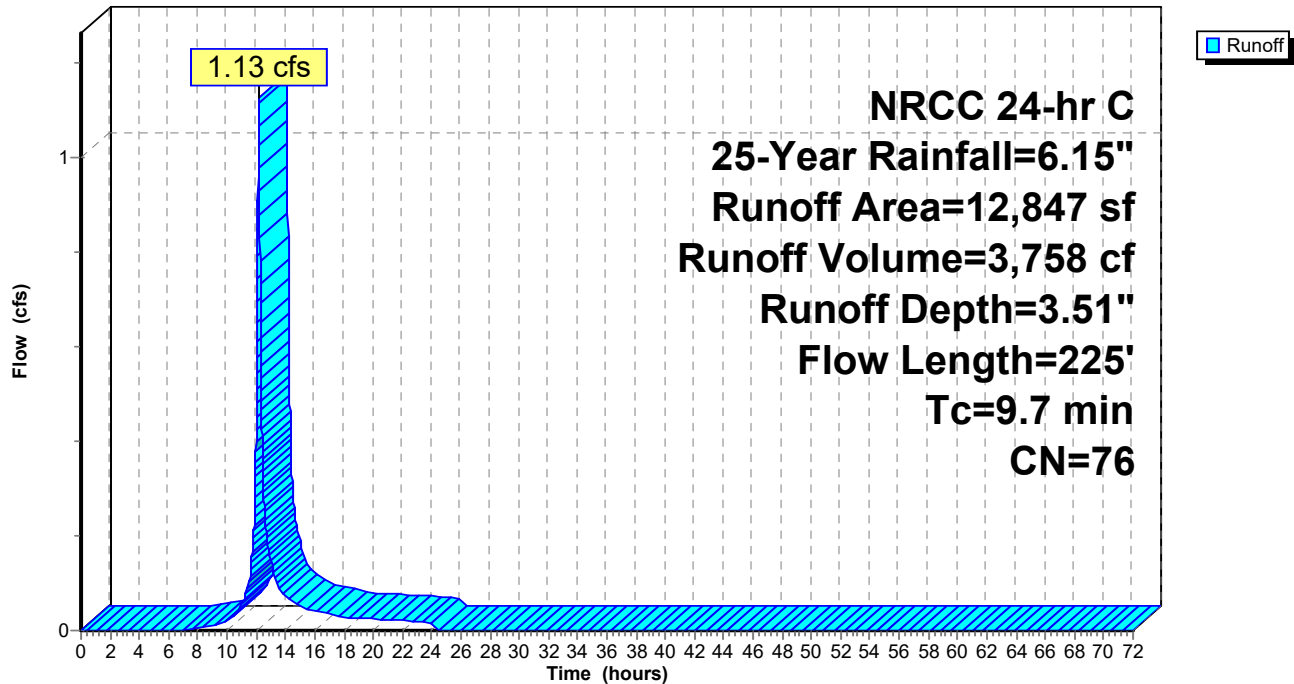
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
5,793	70	Woods, Good, HSG C
5,770	77	Brush, Poor, HSG C
1,284	96	Gravel surface, HSG C
12,847	76	Weighted Average
12,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0880	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.1	19	0.0256	2.58		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	10	0.0102	0.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	46	0.0176	0.66		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	59	0.0273	1.16		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0251	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	21	0.0239	1.08		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.7	225	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 3.43 cfs @ 12.17 hrs, Volume= 11,582 cf, Depth= 3.71"

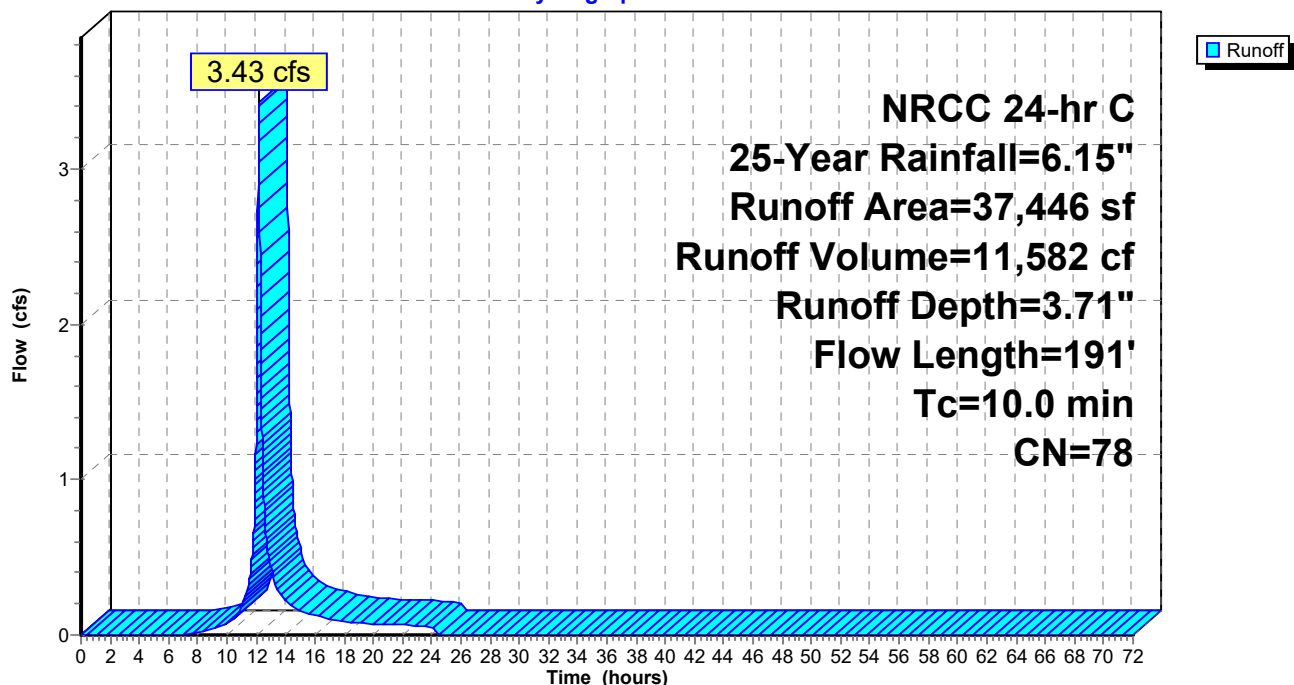
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
4,935	70	Woods, Good, HSG C
28,511	77	Brush, Poor, HSG C
4,000	96	Gravel surface, HSG C
37,446	78	Weighted Average
37,446		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0440	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.0	111	0.0731	1.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.0	191	Total			

Subcatchment 3S:

Hydrograph



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Summary for Subcatchment 4S:

Runoff = 2.58 cfs @ 12.22 hrs, Volume= 9,866 cf, Depth= 3.31"

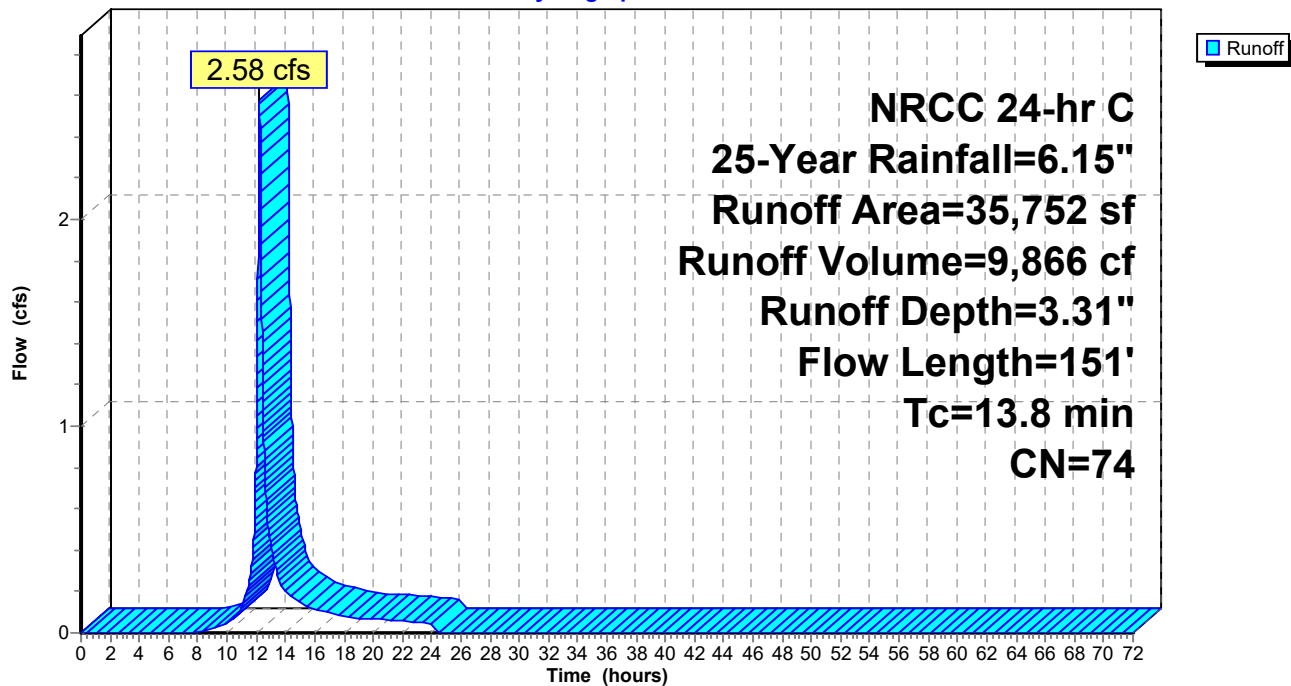
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
19,992	70	Woods, Good, HSG C
13,127	77	Brush, Poor, HSG C
2,633	96	Gravel surface, HSG C
35,752	74	Weighted Average
35,752		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	50	0.0160	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.8	101	0.0974	2.18		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	151	Total			

Subcatchment 4S:

Hydrograph



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Summary for Subcatchment 5S:

Runoff = 0.11 cfs @ 12.16 hrs, Volume= 827 cf, Depth= 0.55"

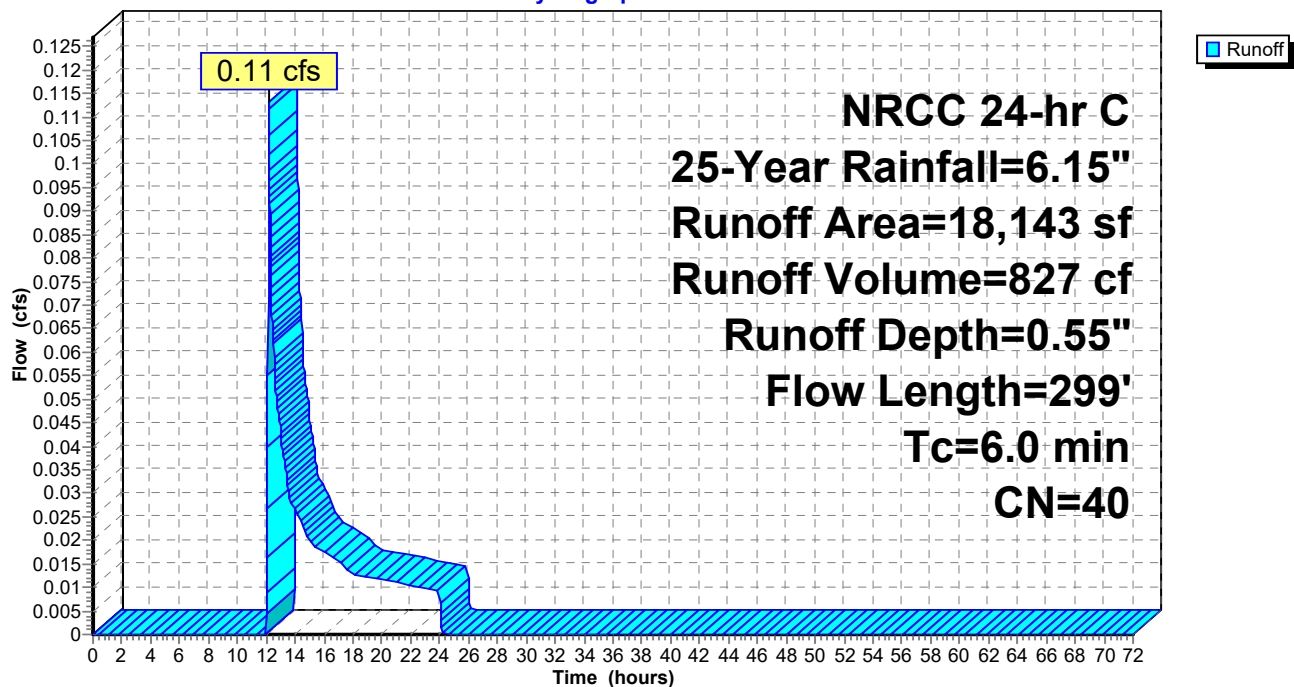
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
574	70	Woods, Good, HSG C
1,112	74	>75% Grass cover, Good, HSG C
4,232	30	Woods, Good, HSG A
12,225	39	>75% Grass cover, Good, HSG A
18,143	40	Weighted Average
18,143		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1040	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.9	193	0.0629	3.76		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	56	0.1470	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.2	299	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5S:

Hydrograph



Summary for Subcatchment 6A:

Runoff = 3.25 cfs @ 12.20 hrs, Volume= 12,818 cf, Depth= 1.45"

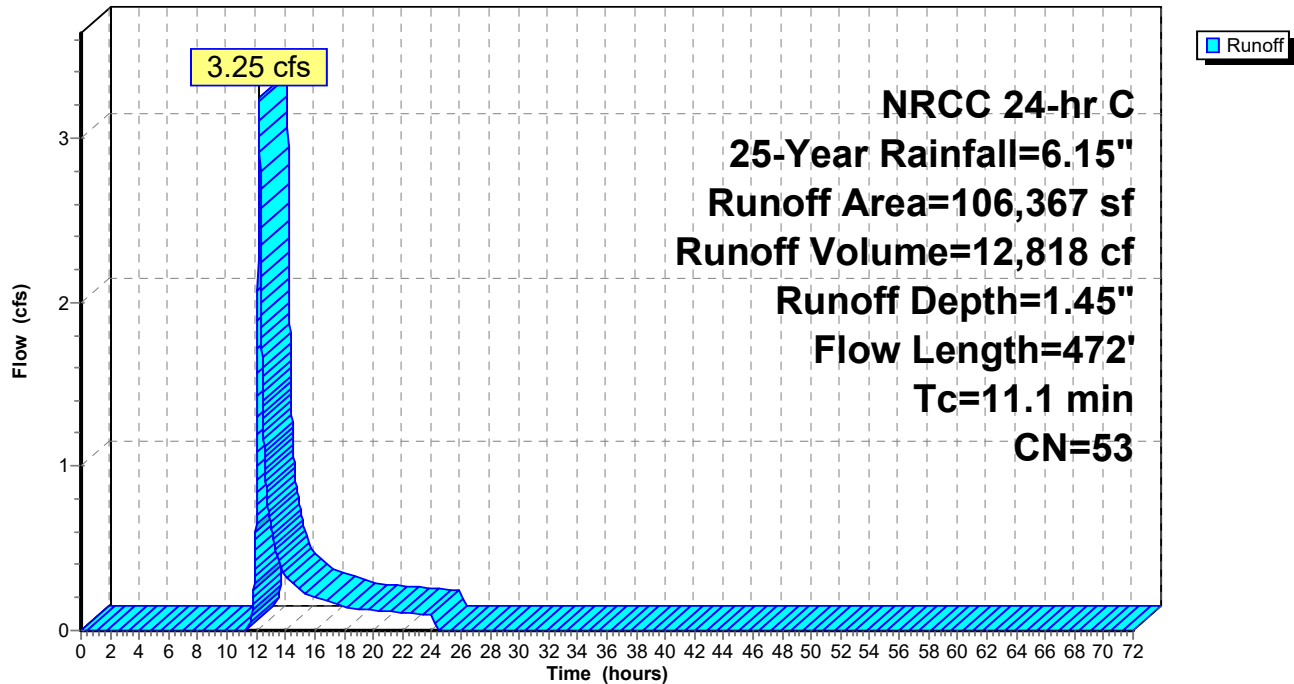
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
7,811	70	Woods, Good, HSG C
20,625	74	>75% Grass cover, Good, HSG C
4,965	96	Gravel surface, HSG C
640	98	Unconnected pavement, HSG C
746	30	Woods, Good, HSG A
68,329	39	>75% Grass cover, Good, HSG A
3,251	96	Gravel surface, HSG A
106,367	53	Weighted Average
105,727		99.40% Pervious Area
640		0.60% Impervious Area
640		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.44"
1.8	238	0.1042	2.26		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.4	184	0.0914	2.16	22.30	Trap/Vee/Rect Channel Flow, Bot.W=4.00' D=1.00' Z= 5.6 & 7.0 ' Top.W=16.60' n= 0.150 Sheet flow over Short Grass
11.1	472	Total			

Subcatchment 6A:

Hydrograph



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Summary for Subcatchment 6S:

Runoff = 0.68 cfs @ 12.19 hrs, Volume= 2,361 cf, Depth= 2.37"

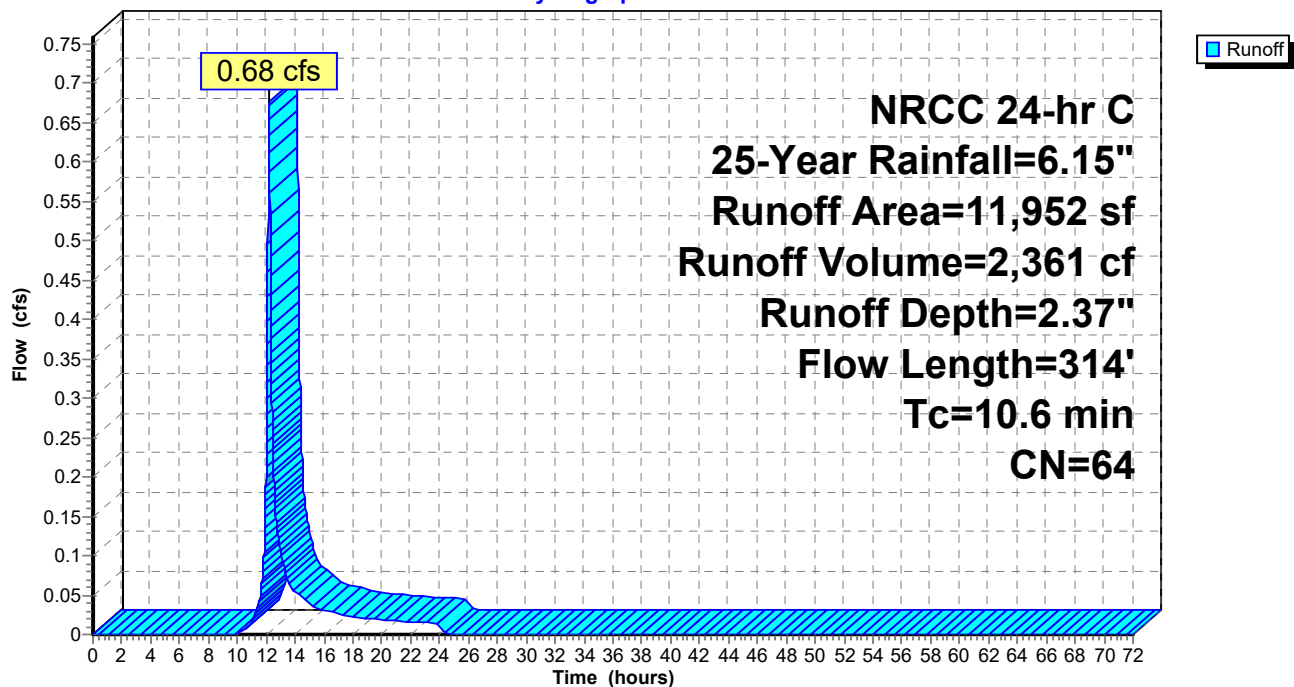
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.15"

Area (sf)	CN	Description
5,519	70	Woods, Good, HSG C
3,933	74	>75% Grass cover, Good, HSG C
902	30	Woods, Good, HSG A
1,598	39	>75% Grass cover, Good, HSG A
11,952	64	Weighted Average
11,952		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.9	150	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	114	0.1496	1.93		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.6	314	Total			

Subcatchment 6S:

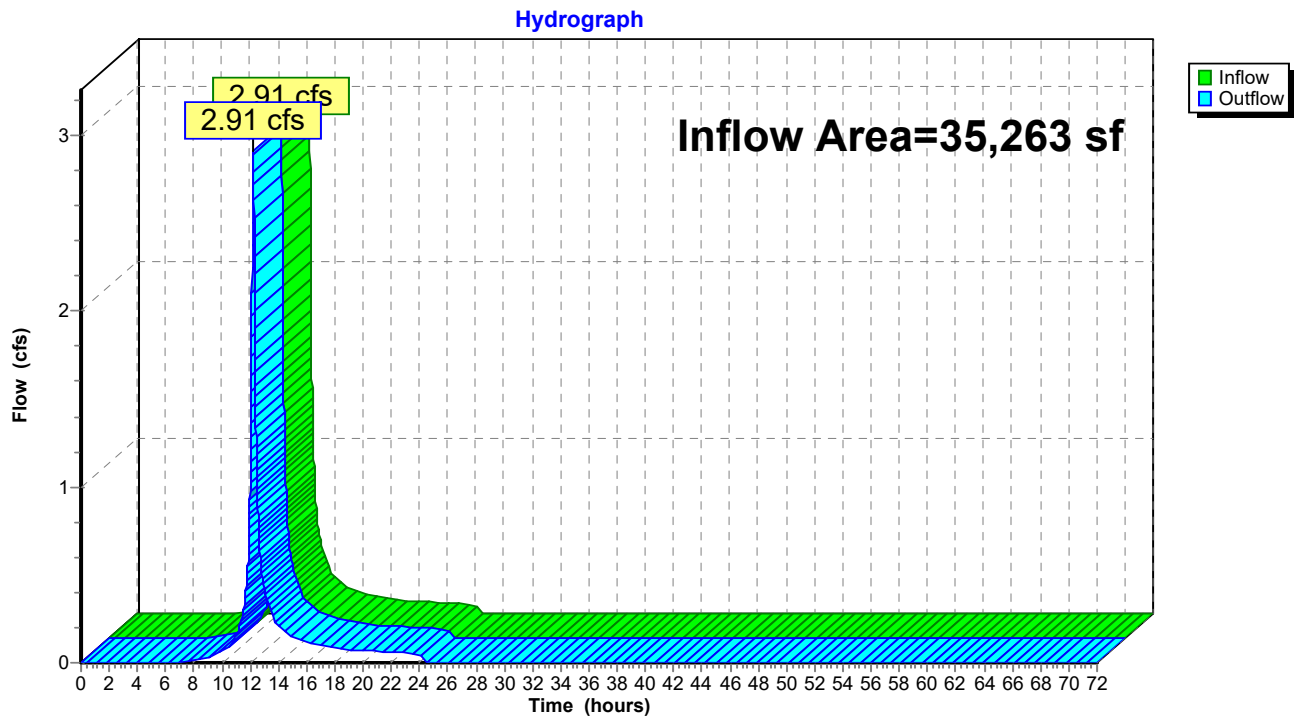
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 35,263 sf, 9.29% Impervious, Inflow Depth = 3.61" for 25-Year event
Inflow = 2.91 cfs @ 12.20 hrs, Volume= 10,609 cf
Outflow = 2.91 cfs @ 12.20 hrs, Volume= 10,609 cf, Atten= 0%, Lag= 0.0 min

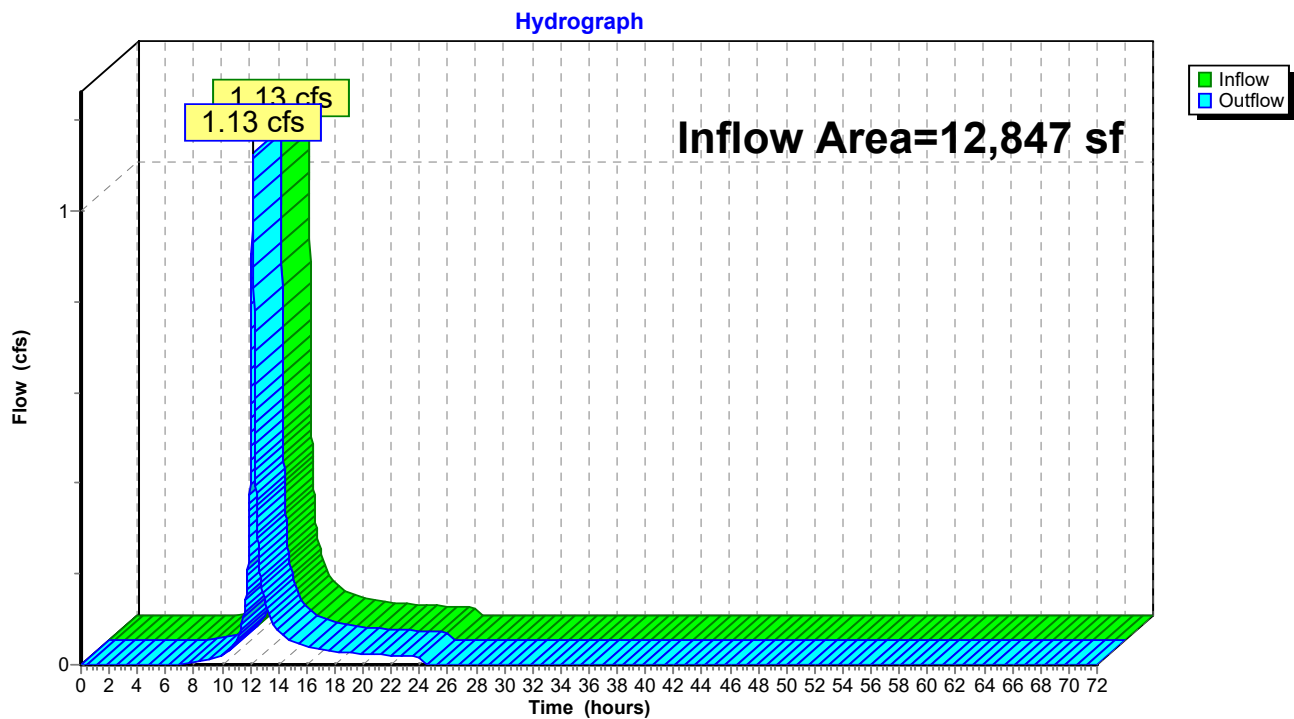
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 12,847 sf, 0.00% Impervious, Inflow Depth = 3.51" for 25-Year event
Inflow = 1.13 cfs @ 12.17 hrs, Volume= 3,758 cf
Outflow = 1.13 cfs @ 12.17 hrs, Volume= 3,758 cf, Atten= 0%, Lag= 0.0 min

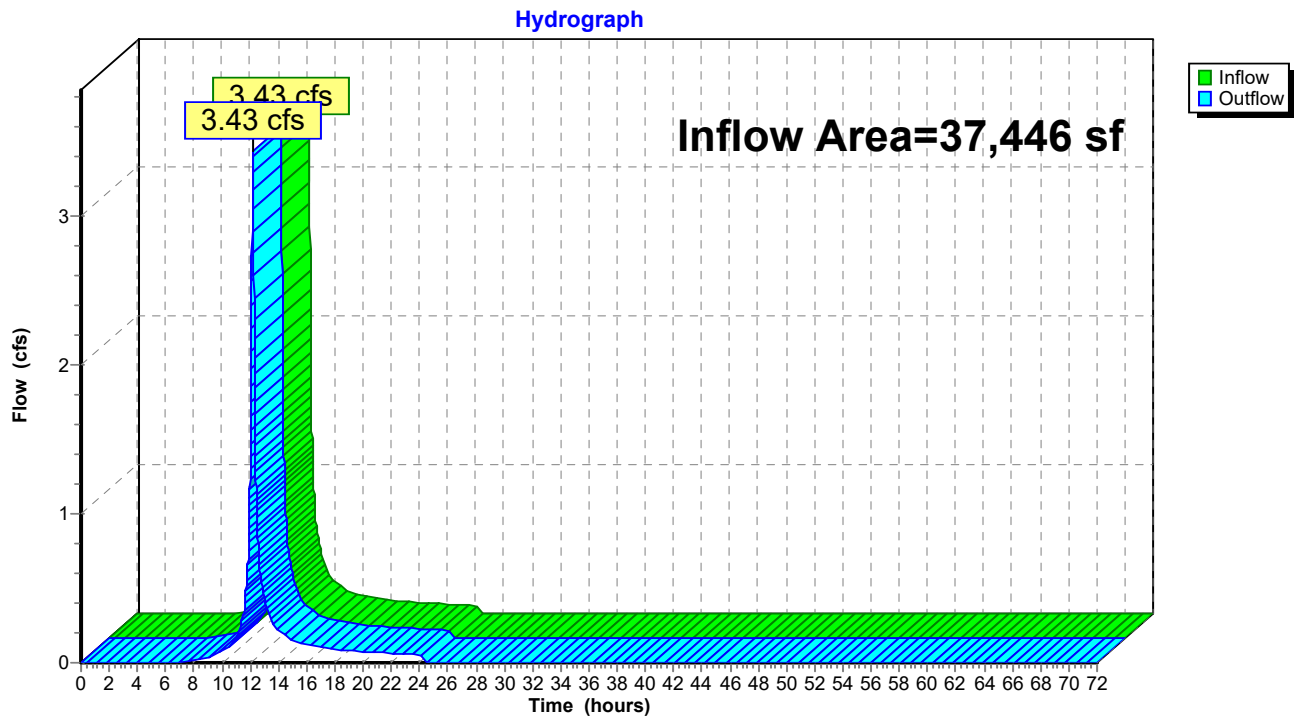
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 37,446 sf, 0.00% Impervious, Inflow Depth = 3.71" for 25-Year event
Inflow = 3.43 cfs @ 12.17 hrs, Volume= 11,582 cf
Outflow = 3.43 cfs @ 12.17 hrs, Volume= 11,582 cf, Atten= 0%, Lag= 0.0 min

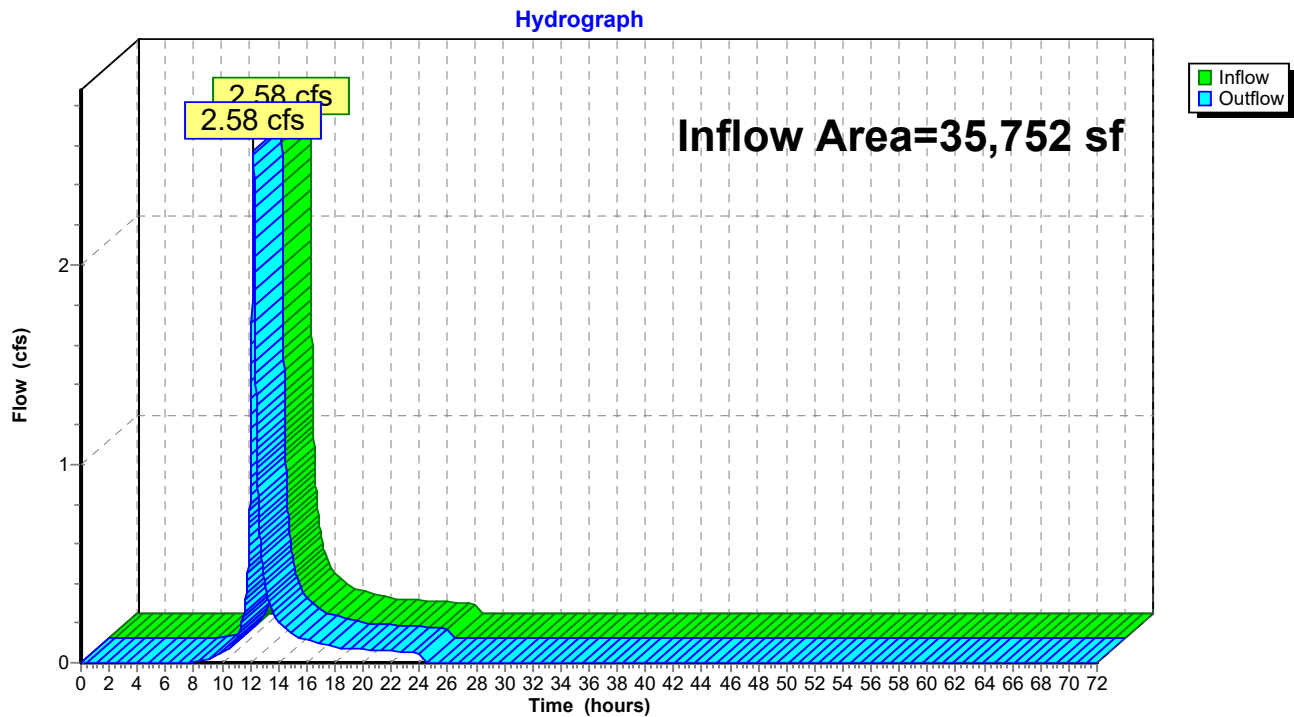
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 35,752 sf, 0.00% Impervious, Inflow Depth = 3.31" for 25-Year event
Inflow = 2.58 cfs @ 12.22 hrs, Volume= 9,866 cf
Outflow = 2.58 cfs @ 12.22 hrs, Volume= 9,866 cf, Atten= 0%, Lag= 0.0 min

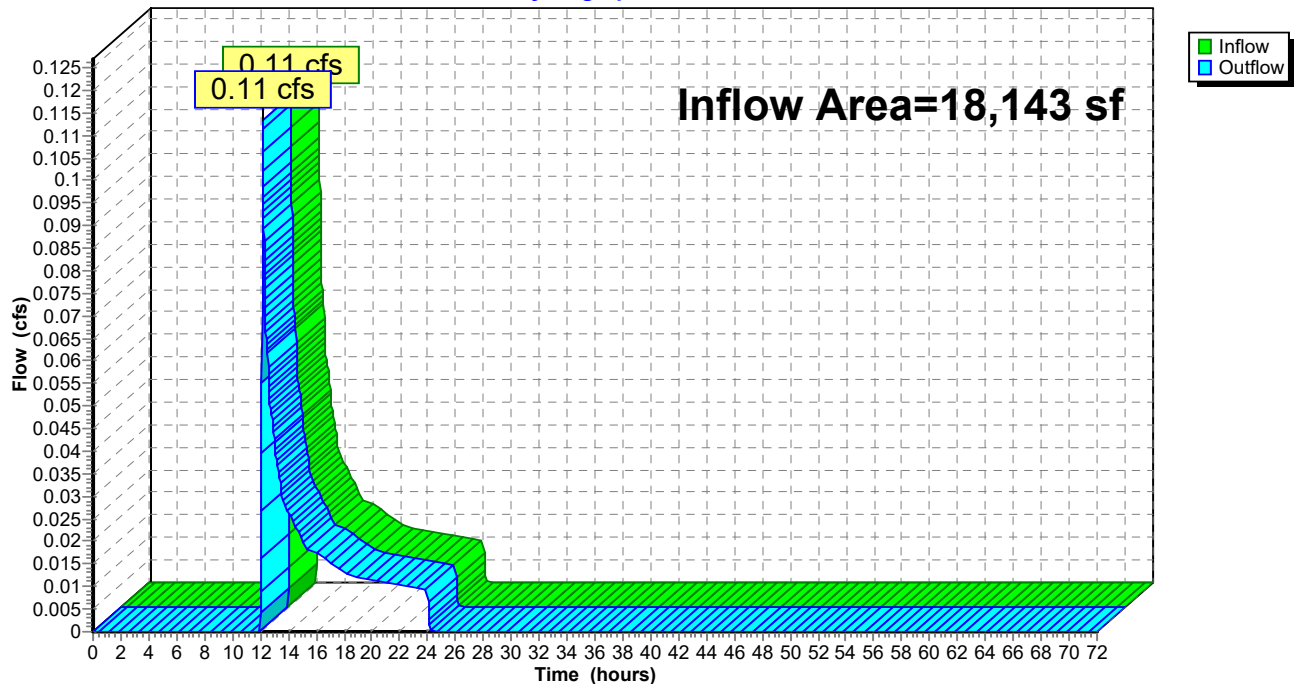
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 18,143 sf, 0.00% Impervious, Inflow Depth = 0.55" for 25-Year event
Inflow = 0.11 cfs @ 12.16 hrs, Volume= 827 cf
Outflow = 0.11 cfs @ 12.16 hrs, Volume= 827 cf, Atten= 0%, Lag= 0.0 min

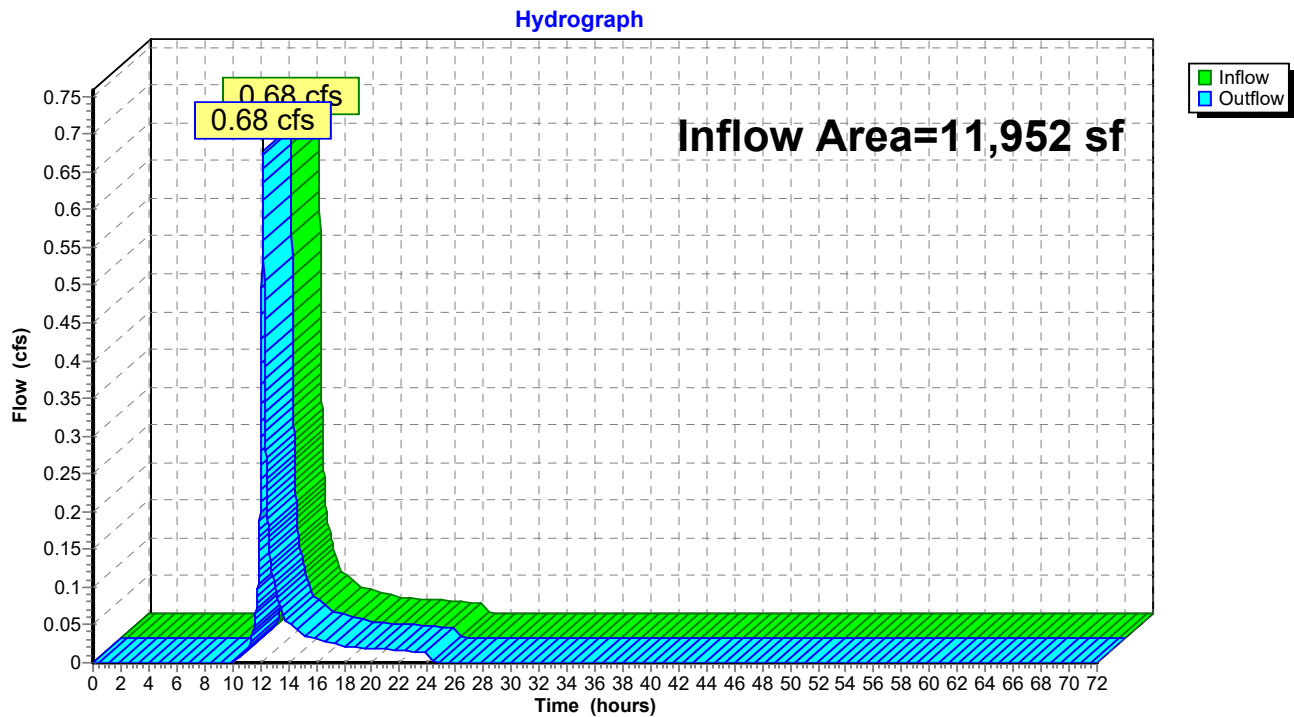
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest**Hydrograph**

Summary for Reach DP 6: Towards Offsite East

Inflow Area = 11,952 sf, 0.00% Impervious, Inflow Depth = 2.37" for 25-Year event
Inflow = 0.68 cfs @ 12.19 hrs, Volume= 2,361 cf
Outflow = 0.68 cfs @ 12.19 hrs, Volume= 2,361 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East

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NRCC 24-hr C 25-Year Rainfall=6.15"

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Summary for Pond 2P: South West Basin

Inflow Area = 55,890 sf, 2.19% Impervious, Inflow Depth = 3.61" for 25-Year event
 Inflow = 5.76 cfs @ 12.14 hrs, Volume= 16,815 cf
 Outflow = 0.31 cfs @ 14.08 hrs, Volume= 16,815 cf, Atten= 95%, Lag= 116.8 min
 Discarded = 0.31 cfs @ 14.08 hrs, Volume= 16,815 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 456.66' @ 14.08 hrs Surf.Area= 5,565 sf Storage= 7,933 cf

Plug-Flow detention time= 264.7 min calculated for 16,813 cf (100% of inflow)
 Center-of-Mass det. time= 264.7 min (1,094.6 - 829.9)

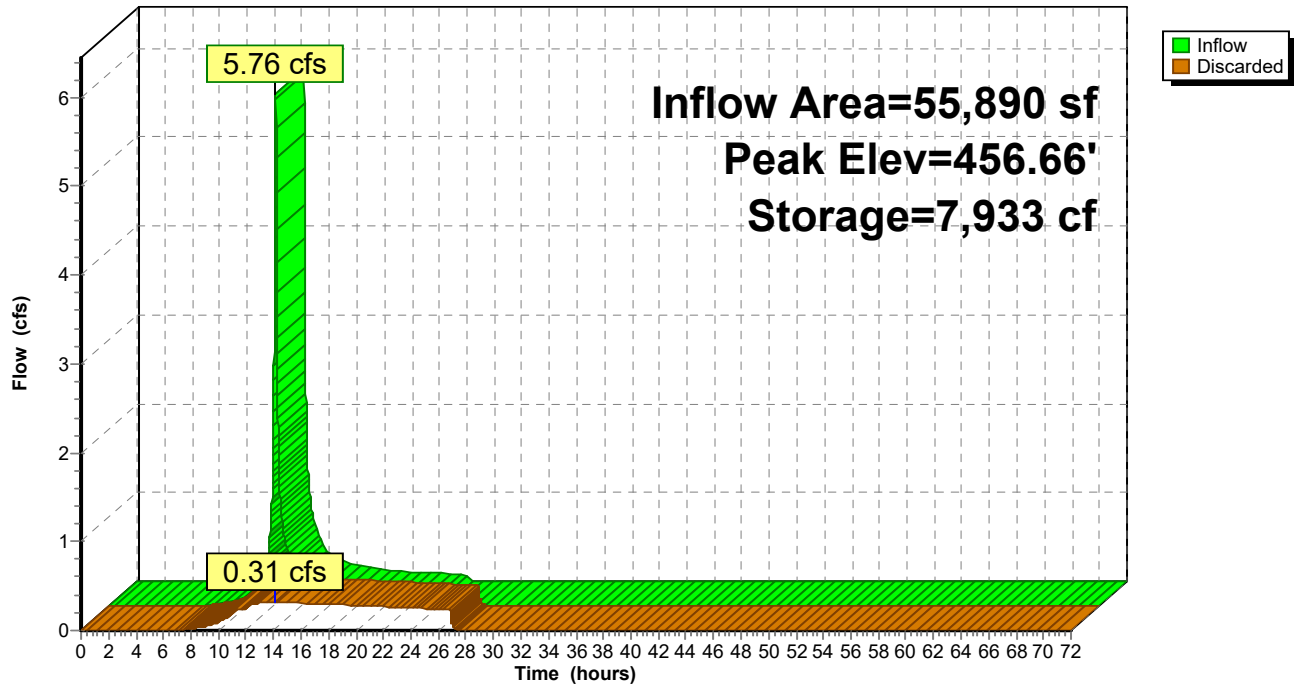
Volume	Invert	Avail.Storage	Storage Description	
#1	455.00'	16,306 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
455.00	4,039	0	0	4,039
456.00	4,943	4,483	4,483	4,974
457.00	5,904	5,416	9,900	5,969
458.00	6,922	6,406	16,306	7,026

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.31 cfs @ 14.08 hrs HW=456.66' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.31 cfs)

Pond 2P: South West Basin

Hydrograph



Summary for Pond 6P: North East Basin

Inflow Area = 106,367 sf, 0.60% Impervious, Inflow Depth = 1.45" for 25-Year event
 Inflow = 3.25 cfs @ 12.20 hrs, Volume= 12,818 cf
 Outflow = 0.20 cfs @ 16.17 hrs, Volume= 12,818 cf, Atten= 94%, Lag= 238.5 min
 Discarded = 0.20 cfs @ 16.17 hrs, Volume= 12,818 cf

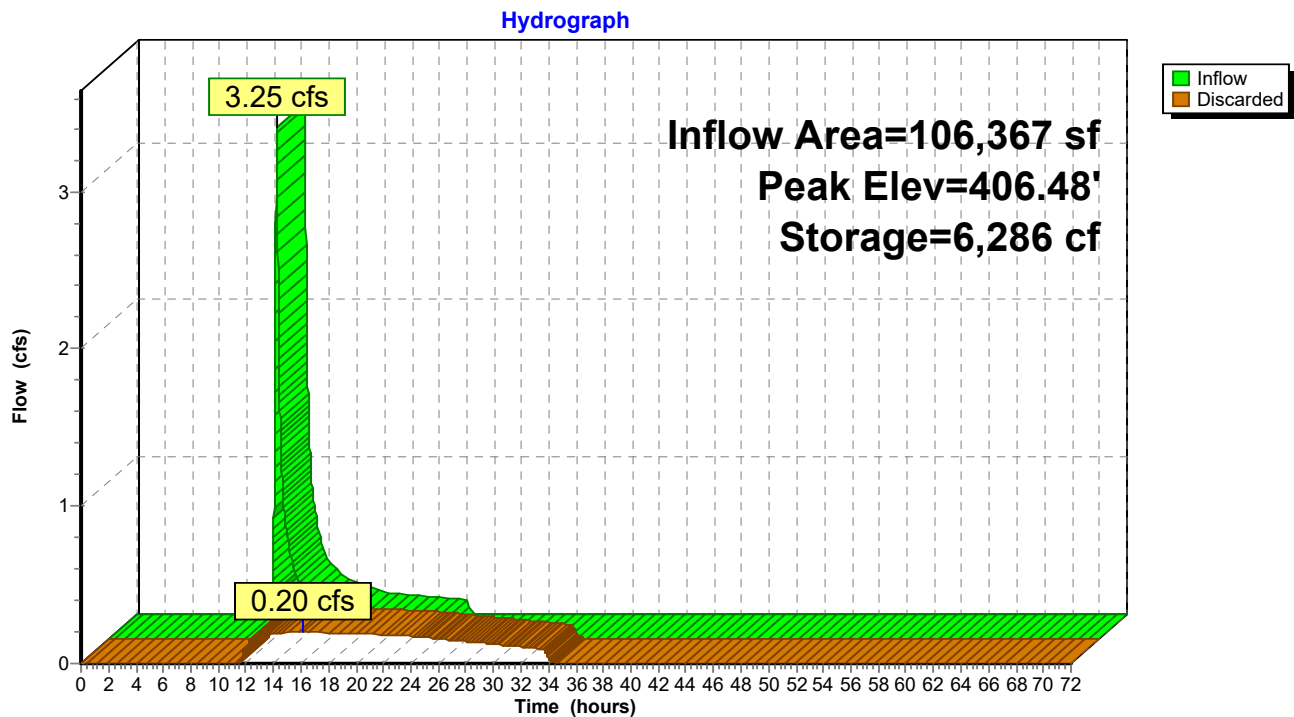
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 406.48' @ 16.17 hrs Surf.Area= 3,528 sf Storage= 6,286 cf

Plug-Flow detention time= 407.6 min calculated for 12,817 cf (100% of inflow)
 Center-of-Mass det. time= 407.6 min (1,308.6 - 901.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	404.00'	18,479 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
404.00	1,593	178.0	0	0	1,593
405.00	2,352	203.0	1,960	1,960	2,375
406.00	3,120	229.0	2,727	4,687	3,294
407.00	3,995	256.0	3,548	8,236	4,364
408.00	5,102	285.0	4,537	12,773	5,641
409.00	6,333	315.0	5,706	18,479	7,105

Device	Routing	Invert	Outlet Devices
#1	Discarded	404.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.20 cfs @ 16.17 hrs HW=406.48' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.20 cfs)

Pond 6P: North East Basin

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NRCC 24-hr C 100-Year Rainfall=8.80"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S:	Runoff Area=35,263 sf 9.29% Impervious Runoff Depth=6.01" Flow Length=303' Tc=12.2 min CN=77 Runoff=4.77 cfs 17,670 cf
Subcatchment2A:	Runoff Area=55,890 sf 2.19% Impervious Runoff Depth=6.01" Flow Length=240' Tc=6.4 min CN=77 Runoff=9.40 cfs 28,005 cf
Subcatchment2S:	Runoff Area=12,847 sf 0.00% Impervious Runoff Depth=5.89" Flow Length=225' Tc=9.7 min CN=76 Runoff=1.87 cfs 6,307 cf
Subcatchment3S:	Runoff Area=37,446 sf 0.00% Impervious Runoff Depth=6.13" Flow Length=191' Tc=10.0 min CN=78 Runoff=5.57 cfs 19,144 cf
Subcatchment4S:	Runoff Area=35,752 sf 0.00% Impervious Runoff Depth=5.65" Flow Length=151' Tc=13.8 min CN=74 Runoff=4.35 cfs 16,824 cf
Subcatchment5S:	Runoff Area=18,143 sf 0.00% Impervious Runoff Depth=1.62" Flow Length=299' Tc=6.0 min CN=40 Runoff=0.72 cfs 2,445 cf
Subcatchment6A:	Runoff Area=106,367 sf 0.60% Impervious Runoff Depth=3.11" Flow Length=472' Tc=11.1 min CN=53 Runoff=7.65 cfs 27,533 cf
Subcatchment6S:	Runoff Area=11,952 sf 0.00% Impervious Runoff Depth=4.43" Flow Length=314' Tc=10.6 min CN=64 Runoff=1.28 cfs 4,411 cf
Reach DP 1: Towards Offsite West	Inflow=4.77 cfs 17,670 cf Outflow=4.77 cfs 17,670 cf
Reach DP 2: Towards Offsite North	Inflow=1.87 cfs 6,307 cf Outflow=1.87 cfs 6,307 cf
Reach DP 3: Towards West Wetland	Inflow=5.57 cfs 19,144 cf Outflow=5.57 cfs 19,144 cf
Reach DP 4: Towards East Wetland	Inflow=4.35 cfs 16,824 cf Outflow=4.35 cfs 16,824 cf
Reach DP 5: Towards Offsite Northwest	Inflow=0.72 cfs 2,445 cf Outflow=0.72 cfs 2,445 cf
Reach DP 6: Towards Offsite East	Inflow=1.28 cfs 4,411 cf Outflow=1.28 cfs 4,411 cf
Pond 2P: South West Basin	Peak Elev=457.82' Storage=15,057 cf Inflow=9.40 cfs 28,005 cf Outflow=0.38 cfs 28,005 cf
Pond 6P: North East Basin	Peak Elev=408.59' Storage=16,011 cf Inflow=7.65 cfs 27,533 cf Outflow=0.32 cfs 27,533 cf

3328.00-POST REV1*NRCC 24-hr C 100-Year Rainfall=8.80"*

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Total Runoff Area = 313,660 sf Runoff Volume = 122,339 cf Average Runoff Depth = 4.68"
98.36% Pervious = 308,519 sf 1.64% Impervious = 5,141 sf

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Summary for Subcatchment 1S:

Runoff = 4.77 cfs @ 12.20 hrs, Volume= 17,670 cf, Depth= 6.01"

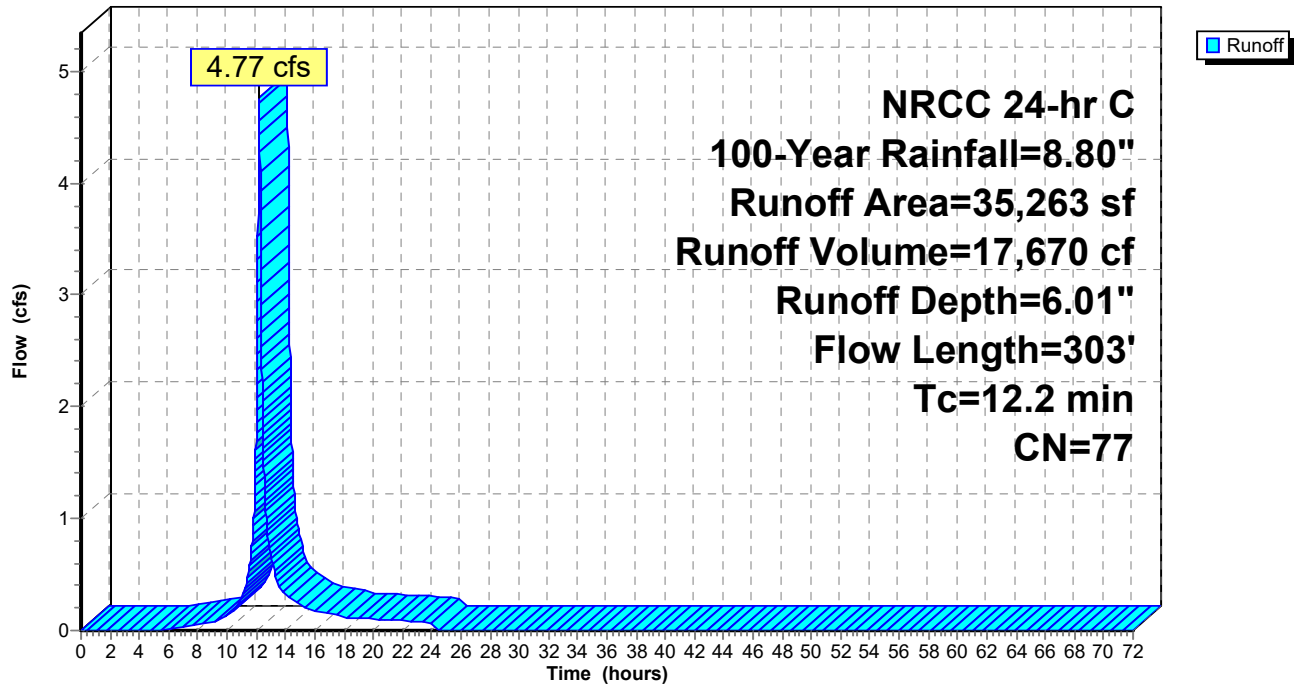
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
5,731	70	Woods, Good, HSG C
2,138	98	Roofs, HSG C
24,414	74	>75% Grass cover, Good, HSG C
1,843	96	Gravel surface, HSG C
1,137	98	Paved parking, HSG C
35,263	77	Weighted Average
31,988		90.71% Pervious Area
3,275		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.8	47	0.0213	1.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.9	123	0.0203	0.71		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	31	0.0484	3.54		Shallow Concentrated Flow, Gravel Road Unpaved Kv= 16.1 fps
4.0	52	0.0019	0.22		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
12.2	303	Total			

Subcatchment 1S:

Hydrograph



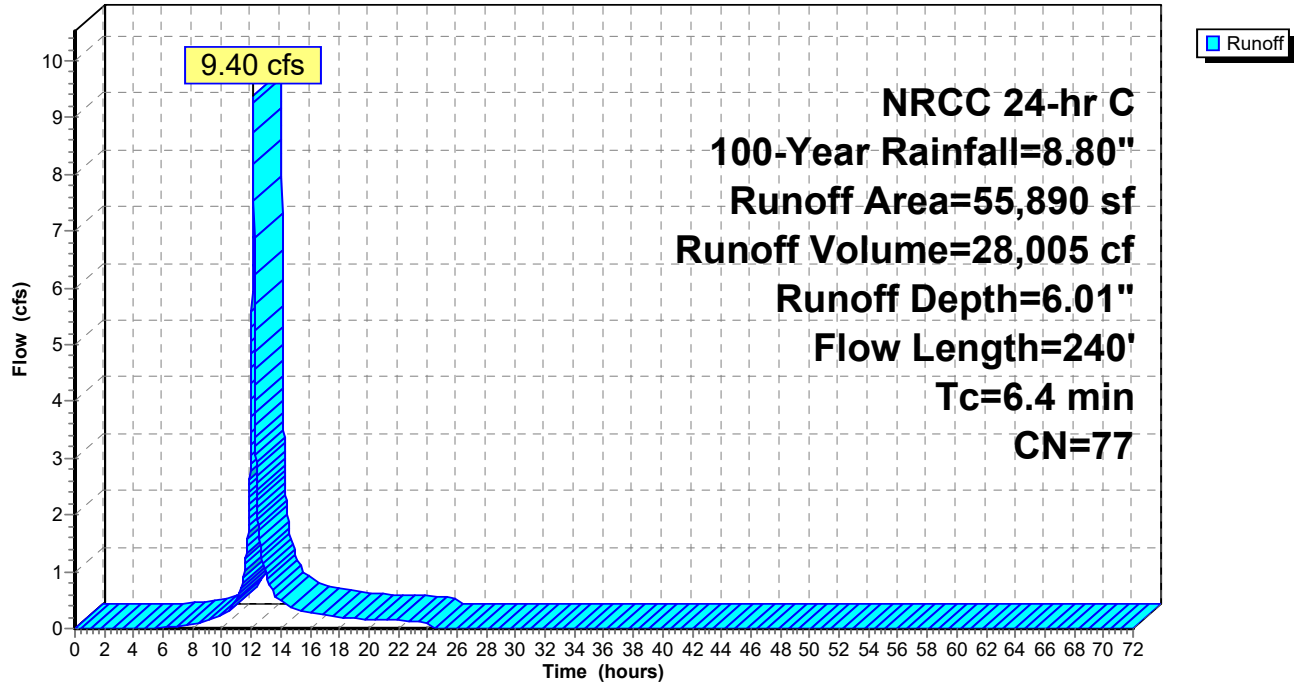
Summary for Subcatchment 2A:

Runoff = 9.40 cfs @ 12.14 hrs, Volume= 28,005 cf, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
30,811	74	>75% Grass cover, Good, HSG C
1,226	98	Roofs, HSG C
15,725	70	Woods, Good, HSG C
8,128	96	Gravel surface, HSG C
55,890	77	Weighted Average
54,664		97.81% Pervious Area
1,226		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0540	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.2	13	0.0310	1.23		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	71	0.0366	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	28	0.0321	2.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.2	78	0.0256	1.12		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
6.4	240	Total			

Subcatchment 2A:**Hydrograph**

Summary for Subcatchment 2S:

Runoff = 1.87 cfs @ 12.17 hrs, Volume= 6,307 cf, Depth= 5.89"

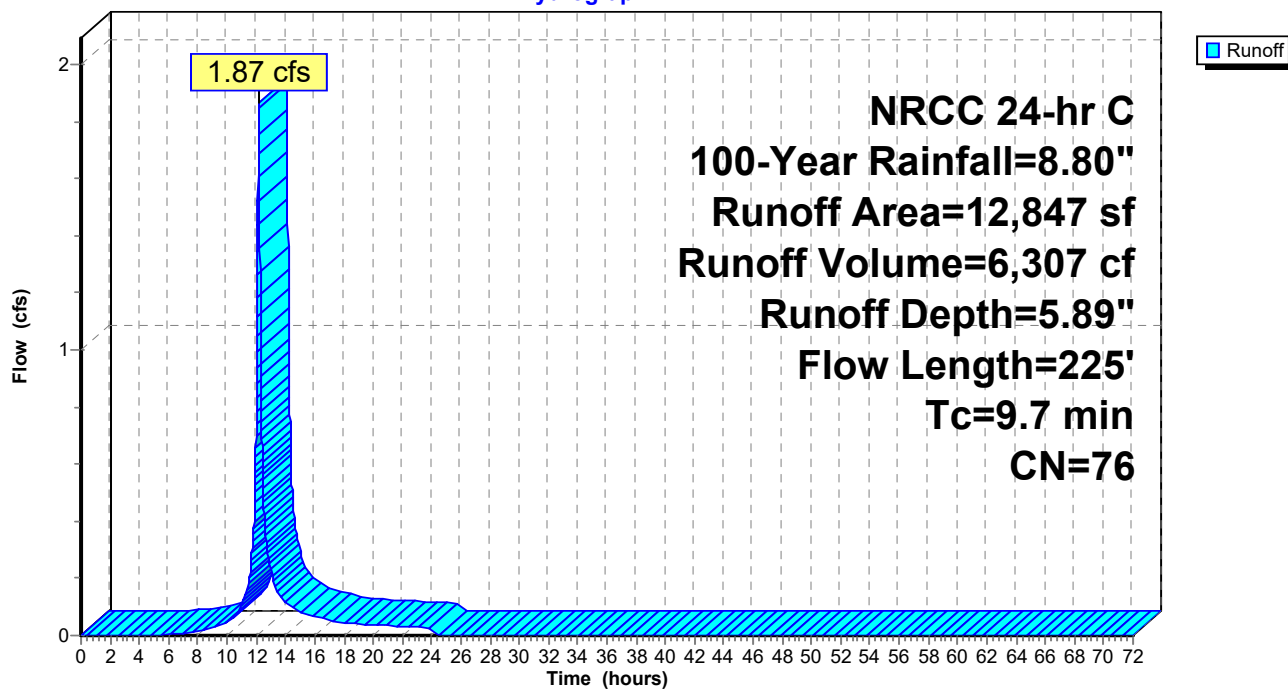
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
5,793	70	Woods, Good, HSG C
5,770	77	Brush, Poor, HSG C
1,284	96	Gravel surface, HSG C
12,847	76	Weighted Average
12,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0880	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.1	19	0.0256	2.58		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	10	0.0102	0.71		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.2	46	0.0176	0.66		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	59	0.0273	1.16		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0251	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	21	0.0239	1.08		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.7	225	Total			

Subcatchment 2S:

Hydrograph



Summary for Subcatchment 3S:

Runoff = 5.57 cfs @ 12.17 hrs, Volume= 19,144 cf, Depth= 6.13"

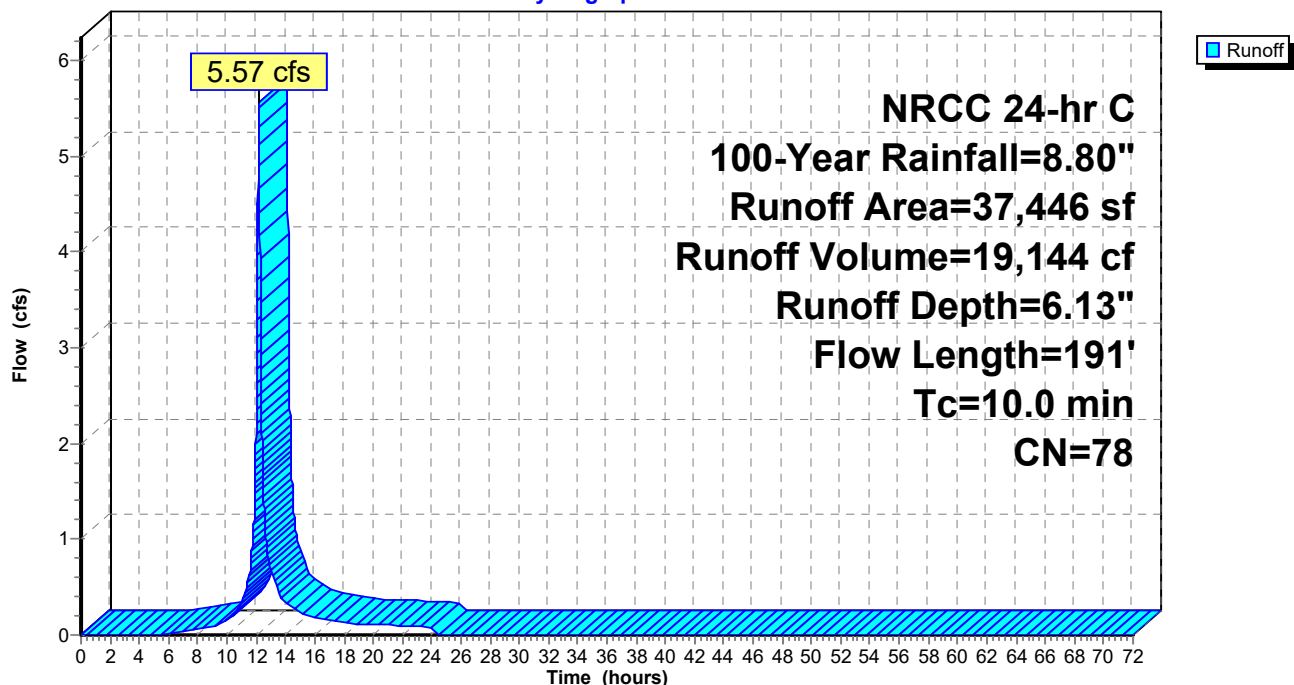
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
4,935	70	Woods, Good, HSG C
28,511	77	Brush, Poor, HSG C
4,000	96	Gravel surface, HSG C
37,446	78	Weighted Average
37,446		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0440	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.0	111	0.0731	1.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	19	0.0536	1.62		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.0	191	Total			

Subcatchment 3S:

Hydrograph



Summary for Subcatchment 4S:

Runoff = 4.35 cfs @ 12.22 hrs, Volume= 16,824 cf, Depth= 5.65"

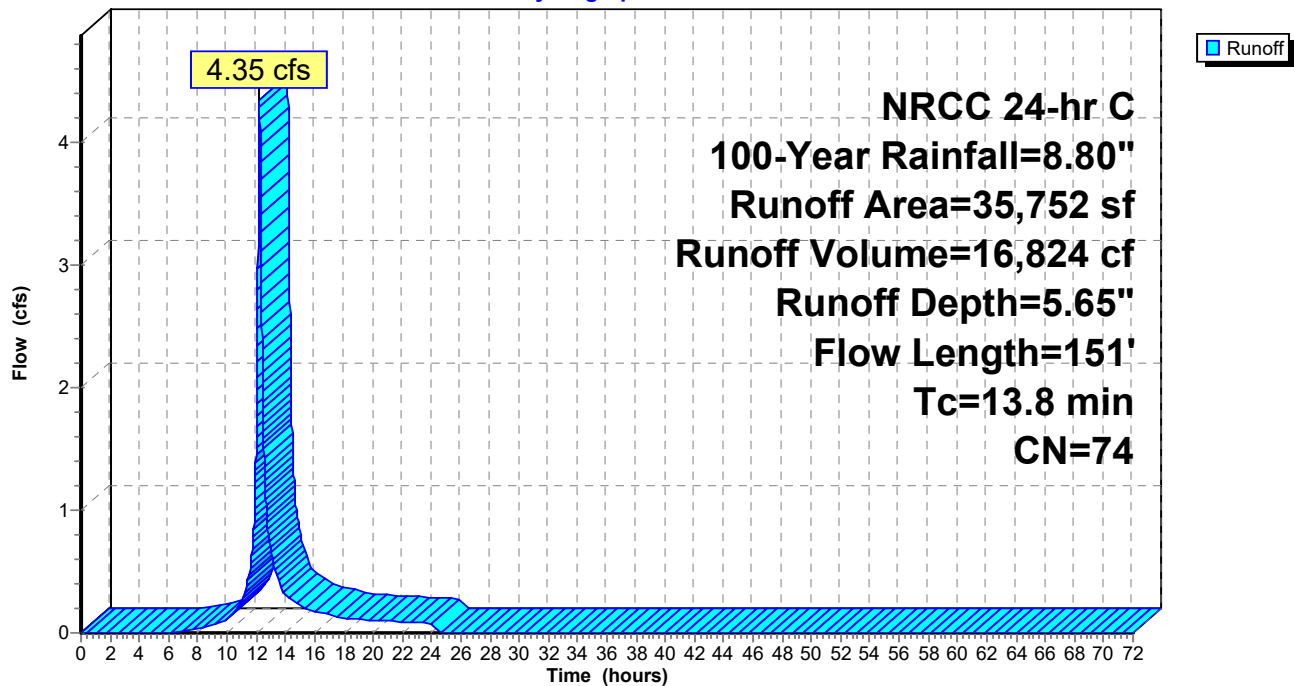
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
19,992	70	Woods, Good, HSG C
13,127	77	Brush, Poor, HSG C
2,633	96	Gravel surface, HSG C
35,752	74	Weighted Average
35,752		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	50	0.0160	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
0.8	101	0.0974	2.18		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
13.8	151	Total			

Subcatchment 4S:

Hydrograph



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NRCC 24-hr C 100-Year Rainfall=8.80"

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Summary for Subcatchment 5S:

Runoff = 0.72 cfs @ 12.14 hrs, Volume= 2,445 cf, Depth= 1.62"

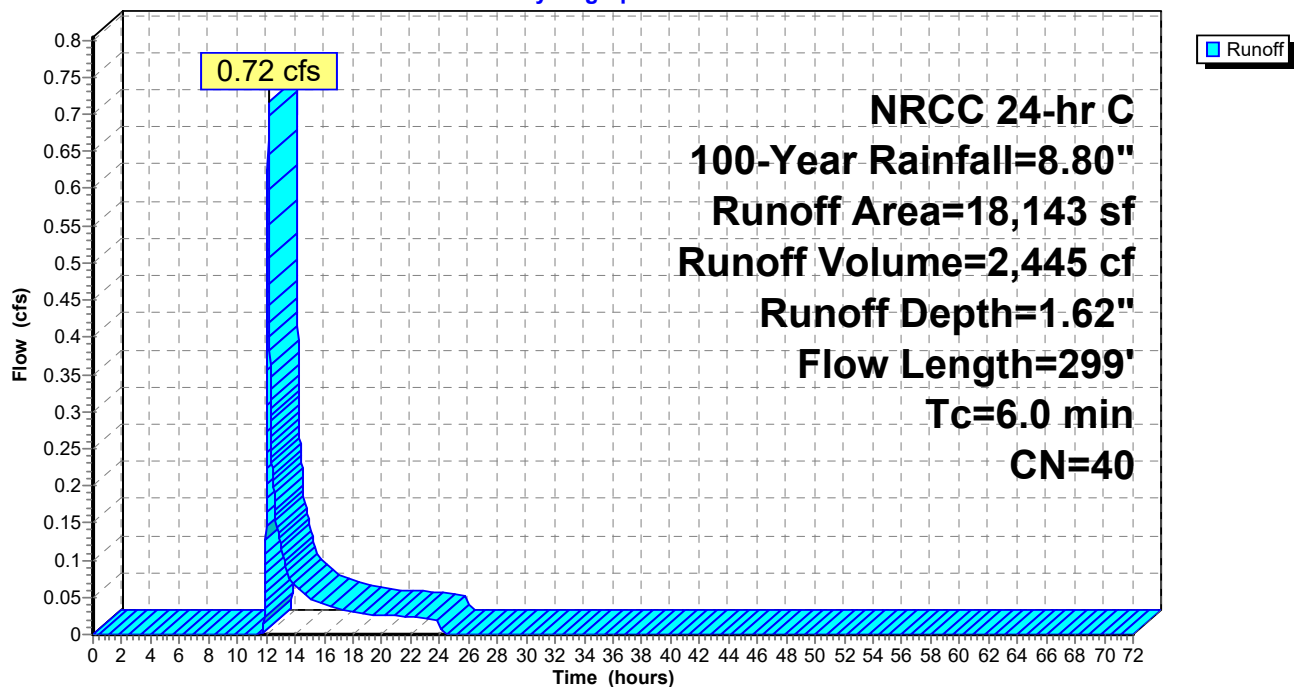
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
574	70	Woods, Good, HSG C
1,112	74	>75% Grass cover, Good, HSG C
4,232	30	Woods, Good, HSG A
12,225	39	>75% Grass cover, Good, HSG A
18,143	40	Weighted Average
18,143		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	50	0.1040	0.30		Sheet Flow, Grass: Short n= 0.150 P2= 3.44"
0.9	193	0.0629	3.76		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.5	56	0.1470	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.2	299	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5S:

Hydrograph



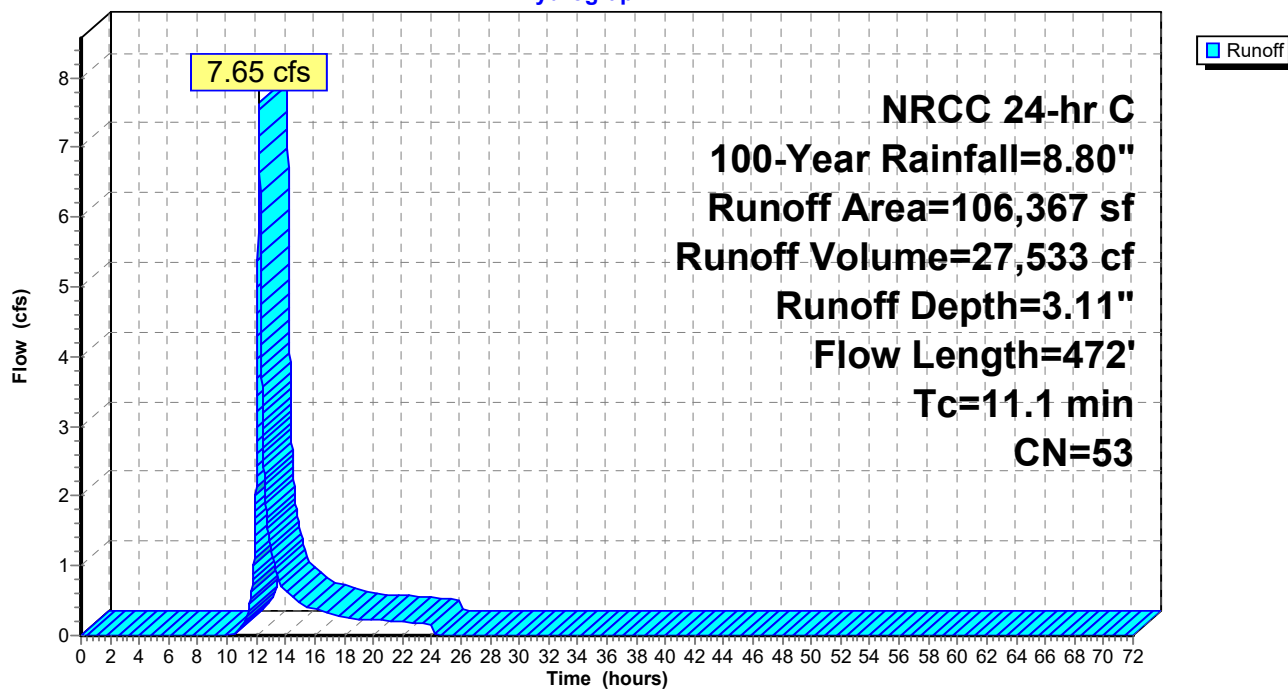
Summary for Subcatchment 6A:

Runoff = 7.65 cfs @ 12.19 hrs, Volume= 27,533 cf, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
7,811	70	Woods, Good, HSG C
20,625	74	>75% Grass cover, Good, HSG C
4,965	96	Gravel surface, HSG C
640	98	Unconnected pavement, HSG C
746	30	Woods, Good, HSG A
68,329	39	>75% Grass cover, Good, HSG A
3,251	96	Gravel surface, HSG A
106,367	53	Weighted Average
105,727		99.40% Pervious Area
640		0.60% Impervious Area
640		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.44"
1.8	238	0.1042	2.26		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.4	184	0.0914	2.16	22.30	Trap/Vee/Rect Channel Flow, Bot.W=4.00' D=1.00' Z= 5.6 & 7.0 ' Top.W=16.60' n= 0.150 Sheet flow over Short Grass
11.1	472	Total			

Subcatchment 6A:**Hydrograph**

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NRCC 24-hr C 100-Year Rainfall=8.80"

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Summary for Subcatchment 6S:

Runoff = 1.28 cfs @ 12.18 hrs, Volume= 4,411 cf, Depth= 4.43"

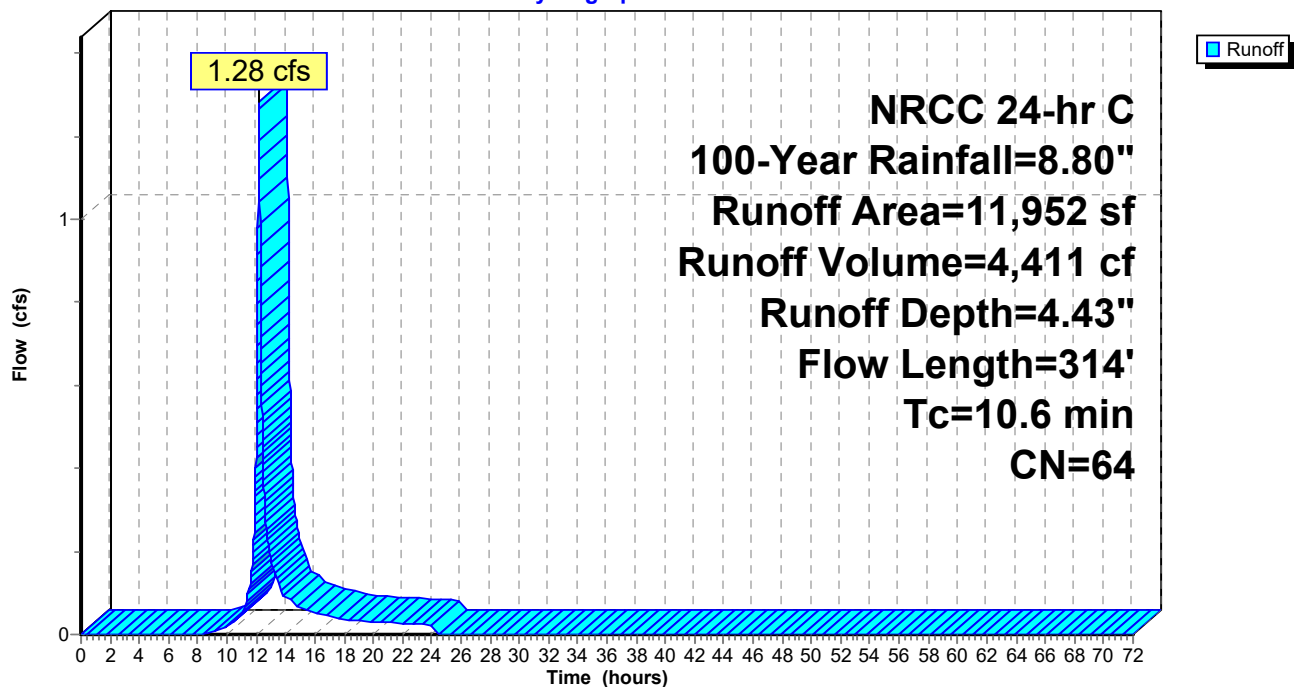
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.80"

Area (sf)	CN	Description
5,519	70	Woods, Good, HSG C
3,933	74	>75% Grass cover, Good, HSG C
902	30	Woods, Good, HSG A
1,598	39	>75% Grass cover, Good, HSG A
11,952	64	Weighted Average
11,952		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.44"
1.9	150	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.0	114	0.1496	1.93		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.6	314	Total			

Subcatchment 6S:

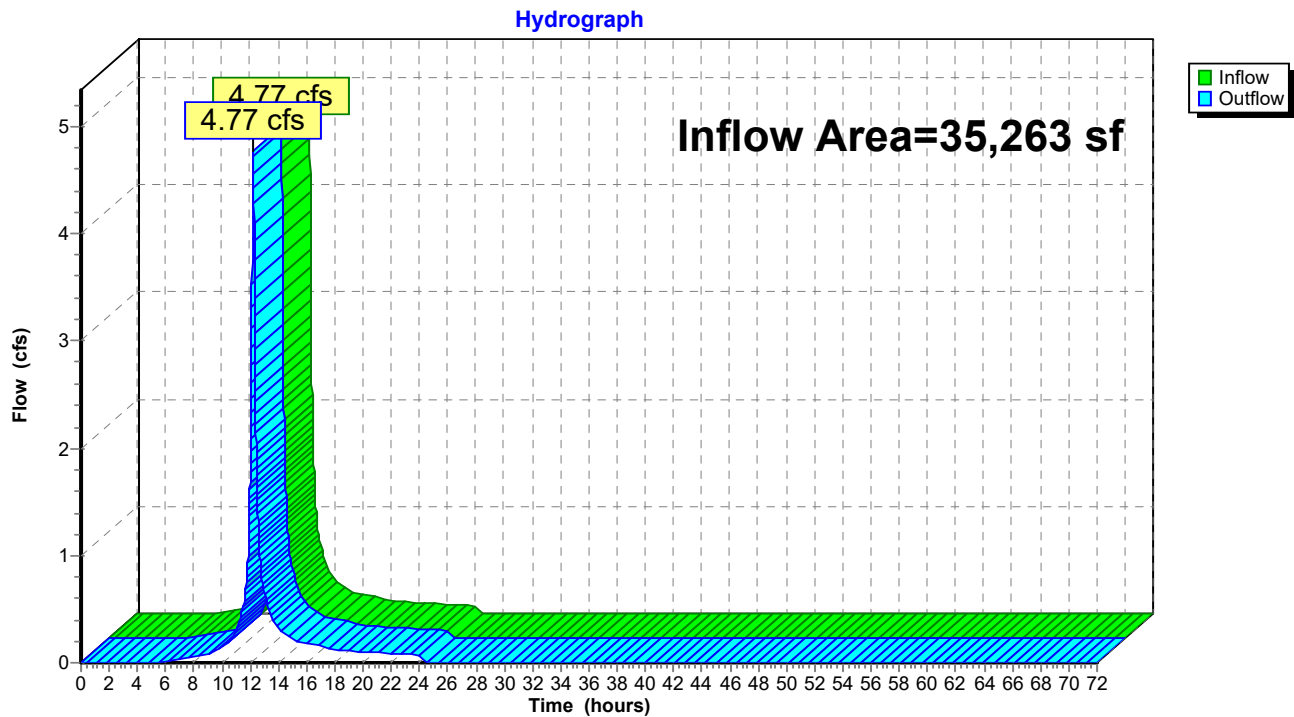
Hydrograph



Summary for Reach DP 1: Towards Offsite West

Inflow Area = 35,263 sf, 9.29% Impervious, Inflow Depth = 6.01" for 100-Year event
Inflow = 4.77 cfs @ 12.20 hrs, Volume= 17,670 cf
Outflow = 4.77 cfs @ 12.20 hrs, Volume= 17,670 cf, Atten= 0%, Lag= 0.0 min

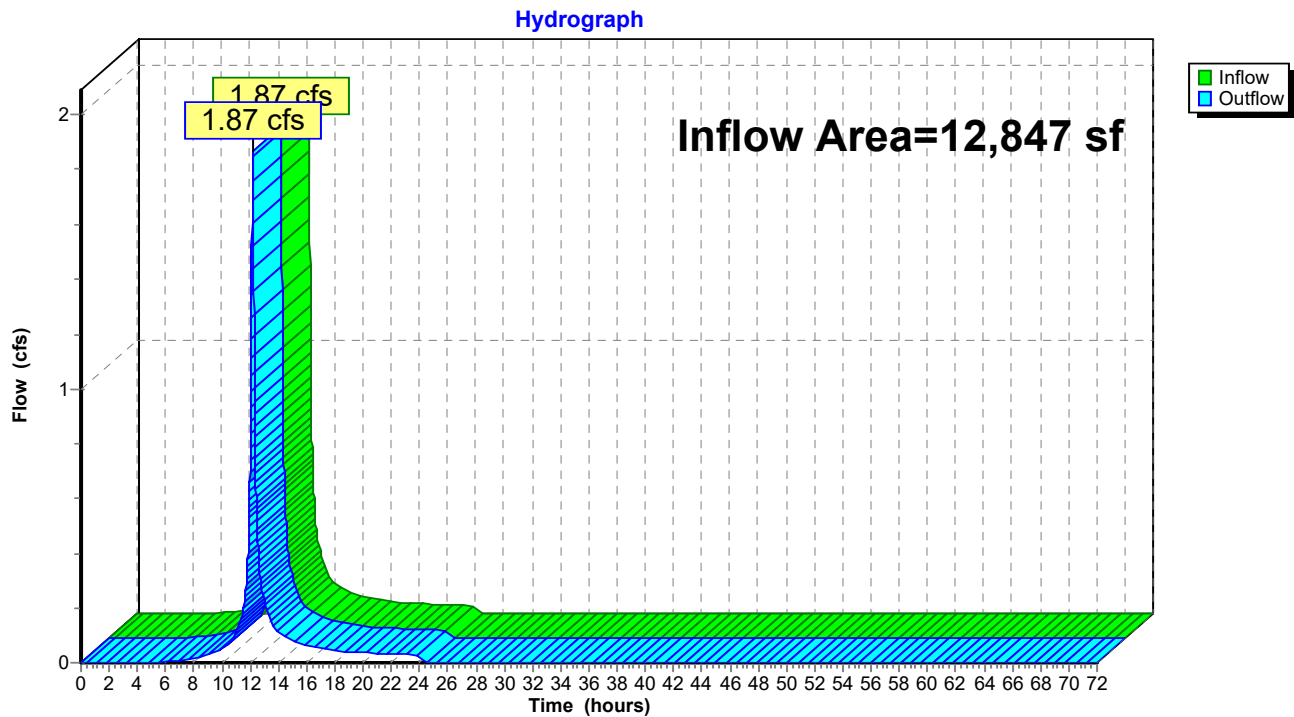
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1: Towards Offsite West

Summary for Reach DP 2: Towards Offsite North

Inflow Area = 12,847 sf, 0.00% Impervious, Inflow Depth = 5.89" for 100-Year event
Inflow = 1.87 cfs @ 12.17 hrs, Volume= 6,307 cf
Outflow = 1.87 cfs @ 12.17 hrs, Volume= 6,307 cf, Atten= 0%, Lag= 0.0 min

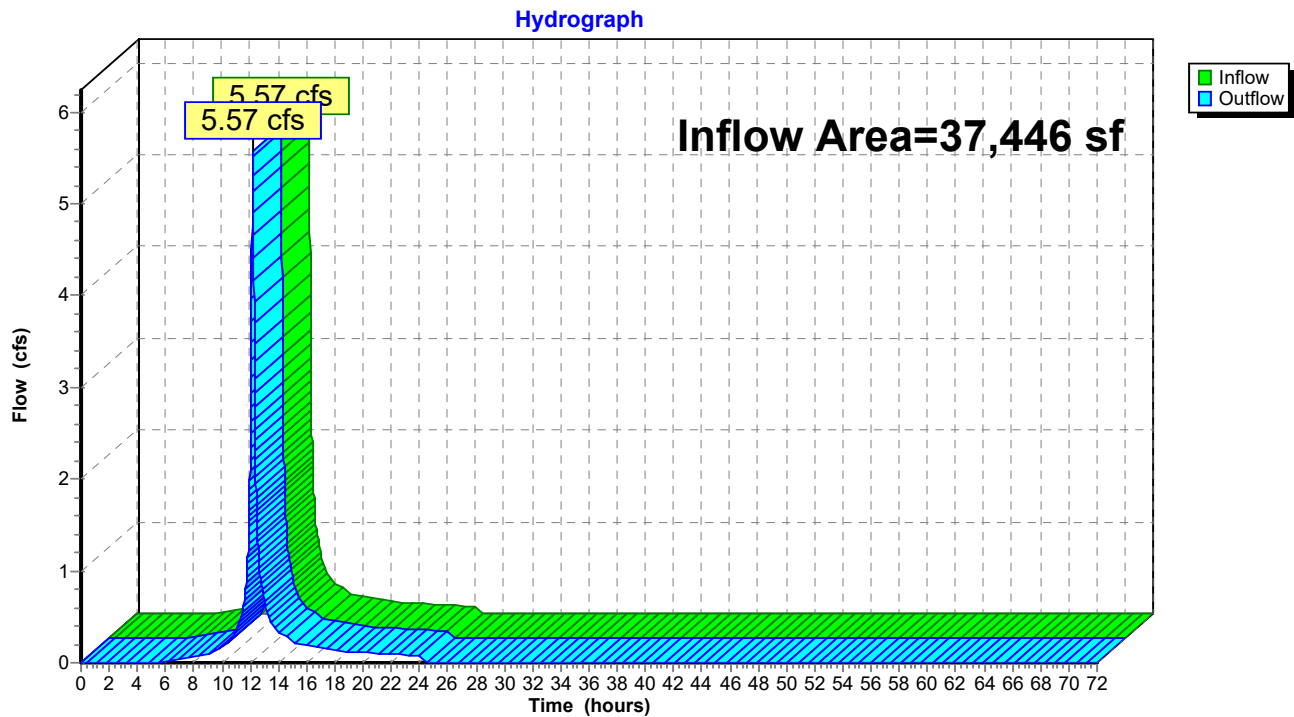
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2: Towards Offsite North

Summary for Reach DP 3: Towards West Wetland

Inflow Area = 37,446 sf, 0.00% Impervious, Inflow Depth = 6.13" for 100-Year event
Inflow = 5.57 cfs @ 12.17 hrs, Volume= 19,144 cf
Outflow = 5.57 cfs @ 12.17 hrs, Volume= 19,144 cf, Atten= 0%, Lag= 0.0 min

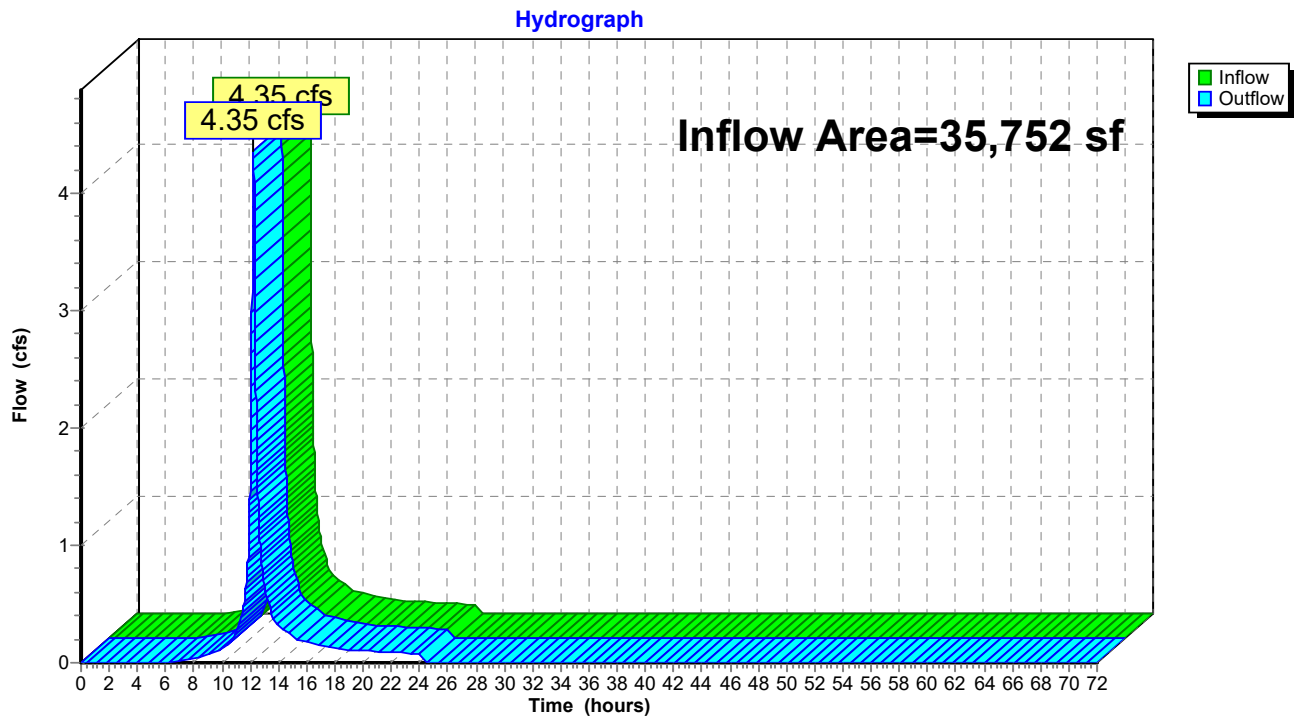
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3: Towards West Wetland

Summary for Reach DP 4: Towards East Wetland

Inflow Area = 35,752 sf, 0.00% Impervious, Inflow Depth = 5.65" for 100-Year event
Inflow = 4.35 cfs @ 12.22 hrs, Volume= 16,824 cf
Outflow = 4.35 cfs @ 12.22 hrs, Volume= 16,824 cf, Atten= 0%, Lag= 0.0 min

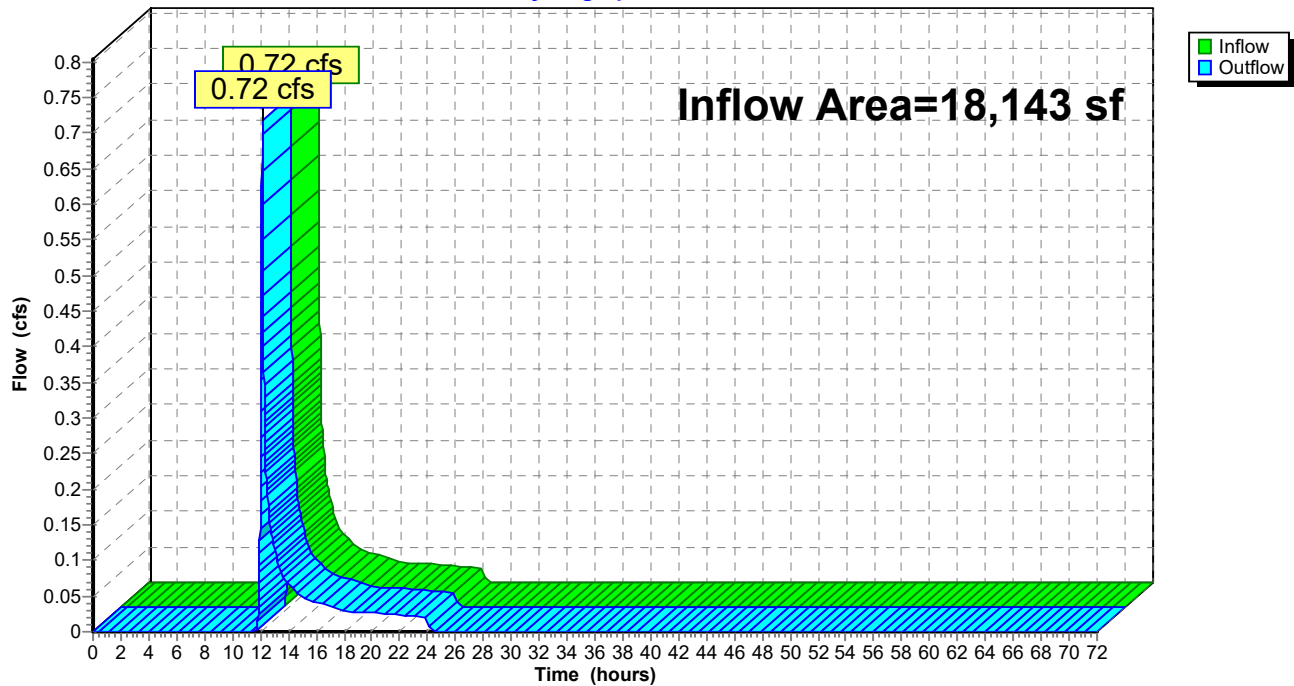
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 4: Towards East Wetland

Summary for Reach DP 5: Towards Offsite Northwest

Inflow Area = 18,143 sf, 0.00% Impervious, Inflow Depth = 1.62" for 100-Year event
Inflow = 0.72 cfs @ 12.14 hrs, Volume= 2,445 cf
Outflow = 0.72 cfs @ 12.14 hrs, Volume= 2,445 cf, Atten= 0%, Lag= 0.0 min

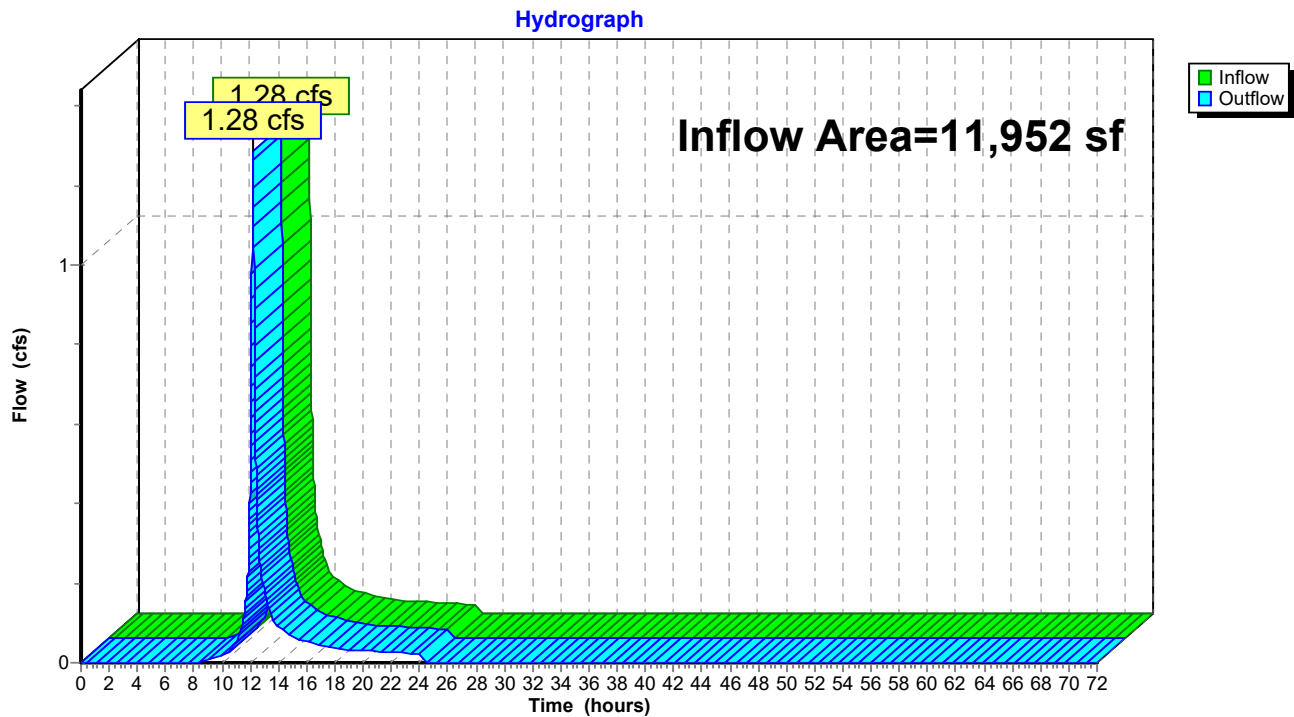
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 5: Towards Offsite Northwest**Hydrograph**

Summary for Reach DP 6: Towards Offsite East

Inflow Area = 11,952 sf, 0.00% Impervious, Inflow Depth = 4.43" for 100-Year event
Inflow = 1.28 cfs @ 12.18 hrs, Volume= 4,411 cf
Outflow = 1.28 cfs @ 12.18 hrs, Volume= 4,411 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 6: Towards Offsite East

3328.00-POST REV1

NRCC 24-hr C 100-Year Rainfall=8.80"

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Summary for Pond 2P: South West Basin

Inflow Area = 55,890 sf, 2.19% Impervious, Inflow Depth = 6.01" for 100-Year event
 Inflow = 9.40 cfs @ 12.14 hrs, Volume= 28,005 cf
 Outflow = 0.38 cfs @ 14.77 hrs, Volume= 28,005 cf, Atten= 96%, Lag= 157.9 min
 Discarded = 0.38 cfs @ 14.77 hrs, Volume= 28,005 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 457.82' @ 14.77 hrs Surf.Area= 6,730 sf Storage= 15,057 cf

Plug-Flow detention time= 430.8 min calculated for 28,001 cf (100% of inflow)
 Center-of-Mass det. time= 430.9 min (1,244.6 - 813.8)

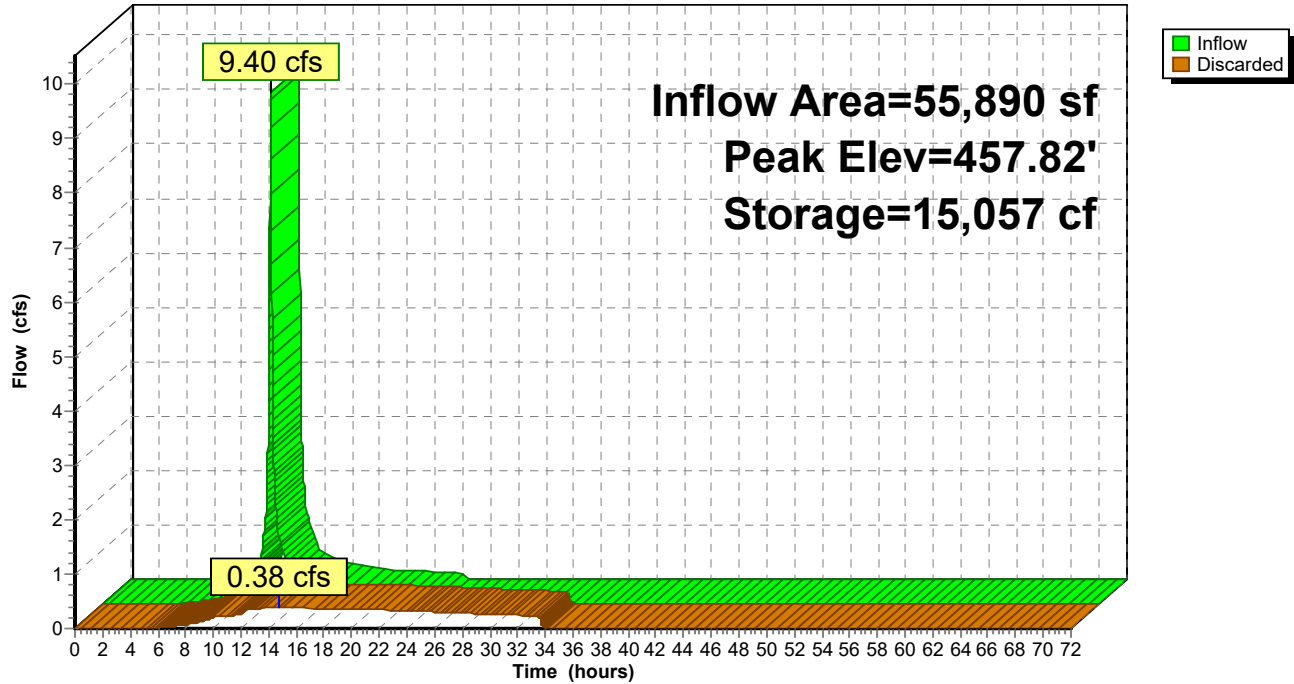
Volume	Invert	Avail.Storage	Storage Description	
#1	455.00'	16,306 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
455.00	4,039	0	0	4,039
456.00	4,943	4,483	4,483	4,974
457.00	5,904	5,416	9,900	5,969
458.00	6,922	6,406	16,306	7,026

Device	Routing	Invert	Outlet Devices
#1	Discarded	455.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.38 cfs @ 14.77 hrs HW=457.82' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.38 cfs)

Pond 2P: South West Basin

Hydrograph



3328.00-POST REV1

NRCC 24-hr C 100-Year Rainfall=8.80"

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Summary for Pond 6P: North East Basin

Inflow Area = 106,367 sf, 0.60% Impervious, Inflow Depth = 3.11" for 100-Year event
 Inflow = 7.65 cfs @ 12.19 hrs, Volume= 27,533 cf
 Outflow = 0.32 cfs @ 16.92 hrs, Volume= 27,533 cf, Atten= 96%, Lag= 283.7 min
 Discarded = 0.32 cfs @ 16.92 hrs, Volume= 27,533 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 408.59' @ 16.92 hrs Surf.Area= 5,817 sf Storage= 16,011 cf

Plug-Flow detention time= 640.4 min calculated for 27,529 cf (100% of inflow)
 Center-of-Mass det. time= 640.4 min (1,514.5 - 874.0)

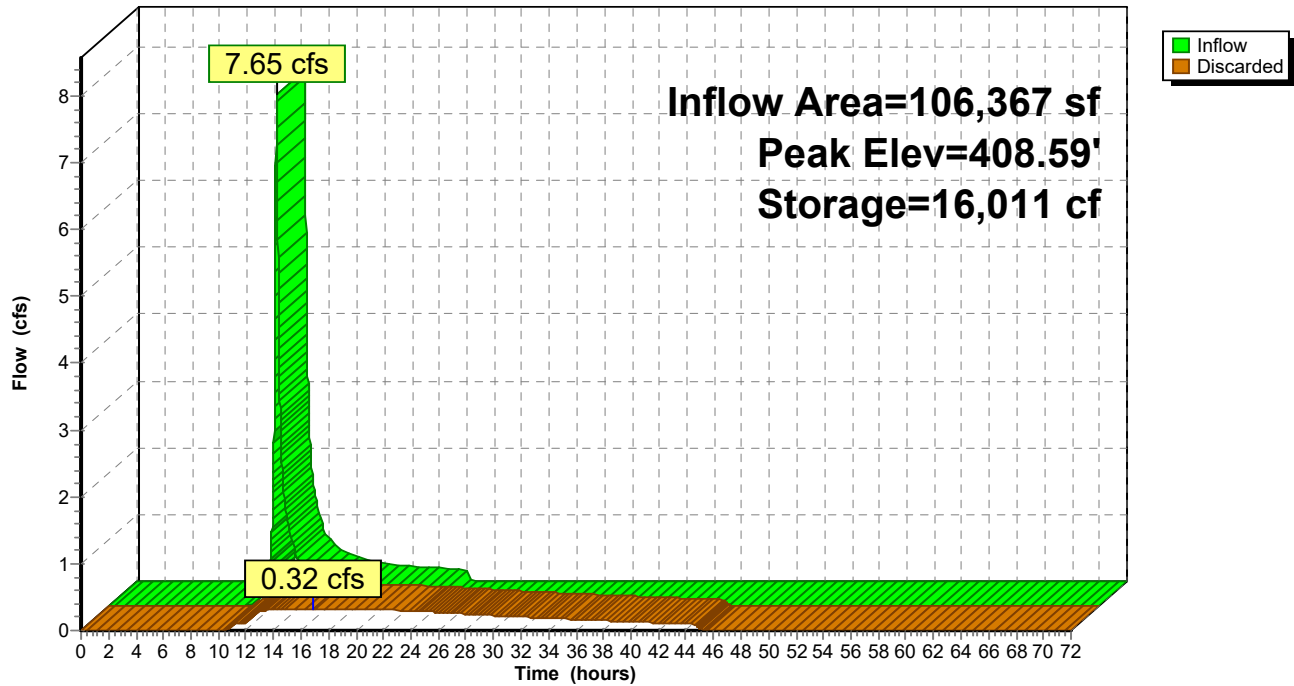
Volume	Invert	Avail.Storage	Storage Description		
#1	404.00'	18,479 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
404.00	1,593	178.0	0	0	1,593
405.00	2,352	203.0	1,960	1,960	2,375
406.00	3,120	229.0	2,727	4,687	3,294
407.00	3,995	256.0	3,548	8,236	4,364
408.00	5,102	285.0	4,537	12,773	5,641
409.00	6,333	315.0	5,706	18,479	7,105

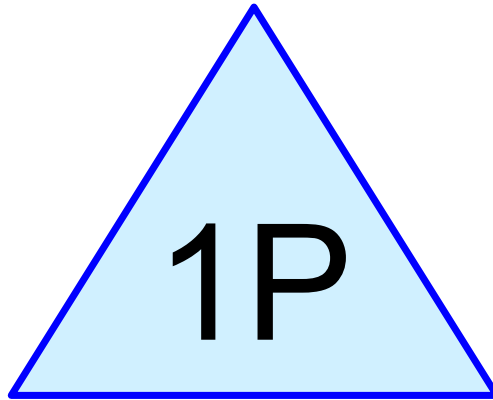
Device	Routing	Invert	Outlet Devices
#1	Discarded	404.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.32 cfs @ 16.92 hrs HW=408.59' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.32 cfs)

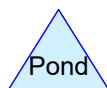
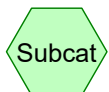
Pond 6P: North East Basin

Hydrograph





Cultec 100-HD



Routing Diagram for 3328.00 CULTEC

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3328.00 CULTEC*Rainfall not specified*

Prepared by {enter your company name here}

Printed 11/16/2023

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Page 2

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1P: Cultec 100-HD

Peak Elev=0.00' Storage=0 cf

3328.00 CULTEC

Prepared by {enter your company name here}

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Summary for Pond 1P: Cultec 100-HD

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	95 cf	8.25'W x 17.50'L x 2.04'H Field A 295 cf Overall - 58 cf Embedded = 237 cf x 40.0% Voids
#2A	0.50'	58 cf	Cultec C-100HD x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		153 cf	Total Available Storage

Storage Group A created with Chamber Wizard

3328.00 CULTEC

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Pond 1P: Cultec 100-HD - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf

Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap

Row Length Adjustment= +0.50' x 1.86 sf x 2 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

2 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

2 Rows x 36.0" Wide + 3.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.25' Base Width

6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

4 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 2 Rows = 57.7 cf Chamber Storage

294.8 cf Field - 57.7 cf Chambers = 237.1 cf Stone x 40.0% Voids = 94.8 cf Stone Storage

Chamber Storage + Stone Storage = 152.5 cf = 0.004 af

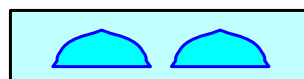
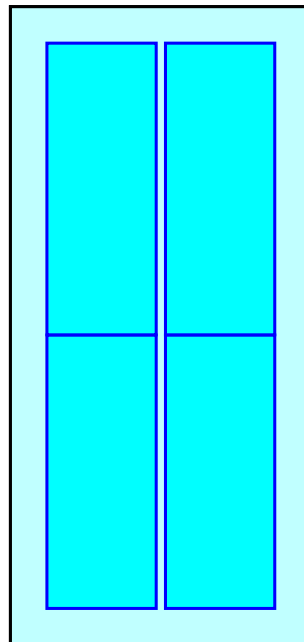
Overall Storage Efficiency = 51.7%

Overall System Size = 17.50' x 8.25' x 2.04'

4 Chambers

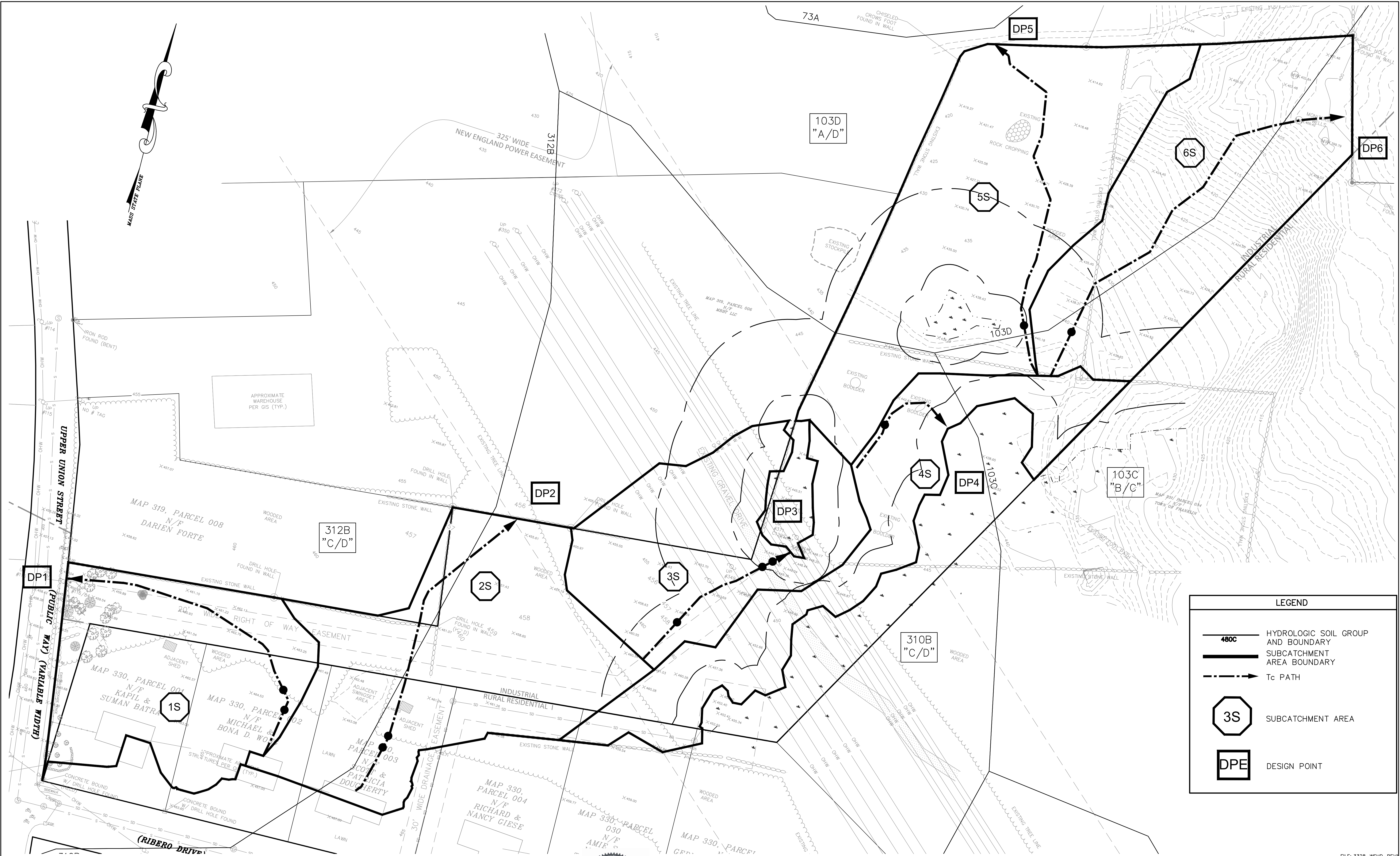
10.9 cy Field

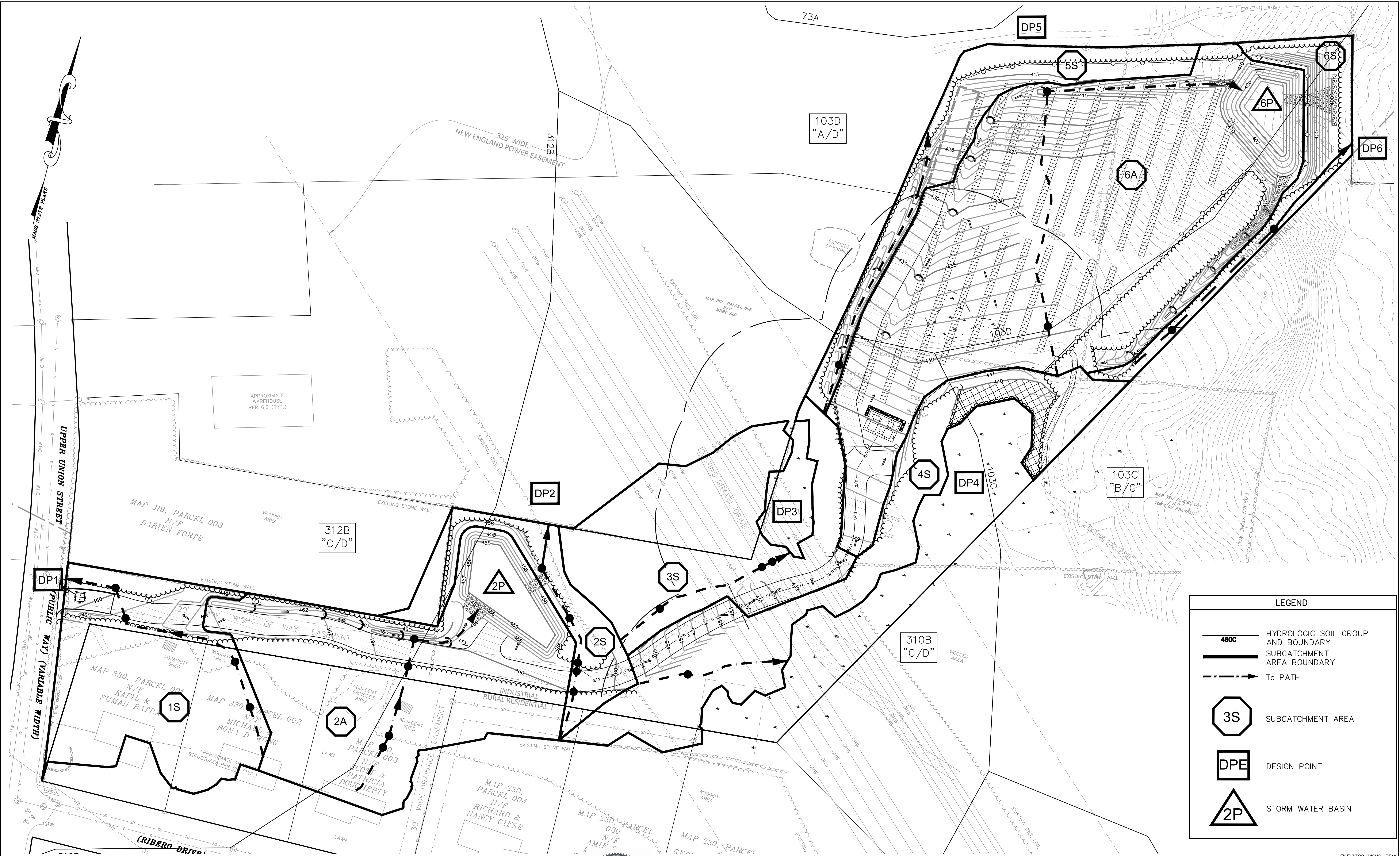
8.8 cy Stone



APPENDIX D

Revised Pre and Post Development Watershed Plans





LEGEND

480C

HYDROLOGIC SOIL GROUP AND BOUNDARY

SUBCATCHMENT AREA BOUNDARY

Tc PATH

3S

SUBCATCHMENT AREA

DPE

DESIGN POINT

2P

STORM WATER BASIN

Atlantic

DESIGN ENGINEERS, INC.

P.O. Box 1051, Sandwich, MA 02563

(508) 888 - 9282

Designed by :
Drawn by :
Checked by :
Survey chk. by :
Approved by :

SCALE

SCALE 1" = 40'

0

10

20

40

80

RICHARD J. TABAK

REGISTERED PROFESSIONAL ENGINEER

MA 000000000

MA 000000000

DATE

NO.	BY	DATE	REVISION
1	BJR	11/10/23	PEER REVIEW/TOWN COMMENTS

APPLICANT:
VS UNION SOLAR SMART, LLC
24941 DANA POINT HARBOR
DANA POINT, CA 92629

POST DEVELOPMENT WATERSHED PLAN
FOR
UPPER UNION SOLAR PROJECT
FRANKLIN, MA
JUNE 19, 2023

FILE: 3328-WSHD-REV1

Sheet	of
2	2
JOB NUMBER	3328.00

APPENDIX E
Revised O&M Plan

Upper Union Solar Project
At
0 Upper Union Street – Franklin, MA
Post-Construction Long Term Stormwater Operation & Maintenance Plan
Revised November 10, 2023
ADE Job #3328.00

A. GENERAL NOTES

1. Upon completion of construction, the operation and maintenance of all components of the stormwater management system will be the responsibility (financially and otherwise) of the system owner (responsible party):

System Owner
VS Union Solar Smart, LLC
24941 Dana Point Harbor
Dana Point, California 92629

Signature: *John T. Harrington*

Date 11.15.23

2. The responsible party shall file an inspection report with the Town of Franklin DPW following each site inspection as recommended in the Operation & Maintenance (O&M) Schedule. The inspection report shall identify the date of inspection, name, and contact number of responsible party, specific structures inspected, specific maintenance and/or repairs required and general observations. Any deficiencies noted in the inspection report shall be corrected to the Town of Franklin's DPW's satisfaction.
3. Disposal of accumulated sediment and hydrocarbons to be in accordance with the applicable local, state, and federal guidelines and regulations.
4. There shall be no illicit discharge of any waste or waste water into the stormwater management system. The maintenance of the facility shall be undertaken in such a manner as to prevent any discharge of waste or waste water into the stormwater management system. Any waste oil or other waste products generated during the maintenance shall be properly disposed of offsite.
5. The Town will be notified of changes in project ownership or assignment of operation and maintenance financial responsibility.



6. The maintenance schedule in this operation and maintenance (O&M) Plan will only be amended by mutual agreement of the Town and the responsible party. Amendments will be made in writing and signed by the responsible party.
7. There shall be regular inspection and maintenance of drip edges to mitigate creation of rills and gullies.
8. There shall be no illicit discharge of any waste or waste water into the stormwater management system. The maintenance of the facility shall be undertaken in such a manner as to prevent any discharge of waste or waste water into stormwater management system. Any waste products generated during maintenance shall be properly disposed of off-site.

System Owner
VS Union Solar Smart, LLC
24941 Dana Point Harbor
Dana Point, California 92629

Signature: *John T. Harrington*

Date: 11.15.23

B. STORMWATER SYSTEM/BMPS

Erosion control barriers:

Until the site is fully stabilized, erosion control barriers (sediment log, straw wattles, silt fence, etc.) should be inspected immediately after major storm events (2" or greater). Sediment deposits must be removed when the level of deposition reaches approximately one-half the height of the barrier. Repair/replace any sections of erosion control barriers that are damaged and install additional rows of barriers if needed.

Deep Sump Hooded Catch Basins:

Inspect after every major storm event (2" or greater) for the first few months after construction and at least four times per year thereafter. Inspect for clogged grates or pipes and excessive accumulation of sediment and trash. Remove accumulation of leaves or debris over grate inlets as needed throughout the year. Clean sumps when sediment reaches 24".

Sub-surface Infiltration System:

Inspect after every major storm event (2" or greater) for the first few months after construction to ensure proper stabilization and function. Thereafter, inspect at least twice per year during wet weather to ensure the system is draining properly. Check for accumulation of sediment and ponding water. If ponding water is visible inside the system for several days after a storm event, notify the engineer for possible remedial measures. Remove sediment as necessary during construction, while the system is dry, and at least every five years after construction.



Stone Check Dams:

Inspect after every major storm event (2" or greater) for the first few months after construction to ensure proper stabilization and function. Thereafter inspect twice per year at a minimum, for erosion, excessive accumulation of sediment, signs of failure, excessive weed/vegetation growth, and trash. Repair eroded spots immediately after inspection. Accumulated sediment shall be removed at least once a year or before it exceeds 0.5 ft. in depth, whichever occurs first.

Grassed swales:

Inspect after every major storm event (2" or greater) for the first few months after construction and at least twice per year thereafter. Repair eroded spots immediately after inspection. Additional inspections should be scheduled during the first few months to ensure that the vegetation in the channels is established adequately. Accumulated sediment shall be removed at least once a year or before it exceeds 0.5' in depth, whichever occurs first. Swales shall be mowed as needed. Clippings to be removed from swales, areas immediately up-gradient and properly disposed of.

Street Sweeping:

All paved areas should be swept two times per year, once during the late spring and once during the late fall seasons after construction.

Stone Infiltration Trench:

Inspect after every major storm event (2" or greater) for the first few months after construction and at least twice per year thereafter during wet weather to ensure the system is working properly. Check for accumulation of sediment, debris, weed growth and leaf litter and clean out as required, including replacement of top layer of stone.

Infiltration Basins:

Inspect after every major storm event (2" or greater) for the first few months after construction to ensure proper stabilization and function, thereafter inspect at least twice per year during wet weather to ensure the system is draining properly. Check for accumulation of sediment and ponding of water. If ponding water is visible inside the basin for several days after a storm event, notify the engineer for possible remedial measures. Remove sediment as necessary during construction, while the system is dry, and at least every 5 years after construction.

Rip-rap Aprons/Spillways/Level Spreaders:

Inspect after every major storm event (2" or greater) for the first few months after construction to ensure proper stabilization and function. Thereafter inspect twice per year at a minimum, for erosion, excessive accumulation of sediment, signs of failure, excessive weed/vegetation growth, and trash. Repair eroded spots immediately after inspection. Accumulated sediment shall be removed at least once a year or before it exceeds 0.5 ft. in depth, whichever occurs first.



Panel Drip Edges:

Inspect below panel drip edges, after every major storm event (2" or greater) for the first few months after construction and at least twice per year thereafter. Look for formation of eroded channels, rills and gulley's, particularly on newly constructed slopes. Repair and/or re-seed any areas that are eroded or not stabilized immediately after inspection.

C. ESTIMATED ANNUAL BUDGET

The estimated annual budget for the activities required in this Post-Construction Long Term Stormwater Operation and Maintenance Plan is \$2,000.00.

D. SAMPLE OPERATION AND MAINTENANCE LOG (Next Page)



SAMPLE OPERATION AND MAINTENANCE LOG

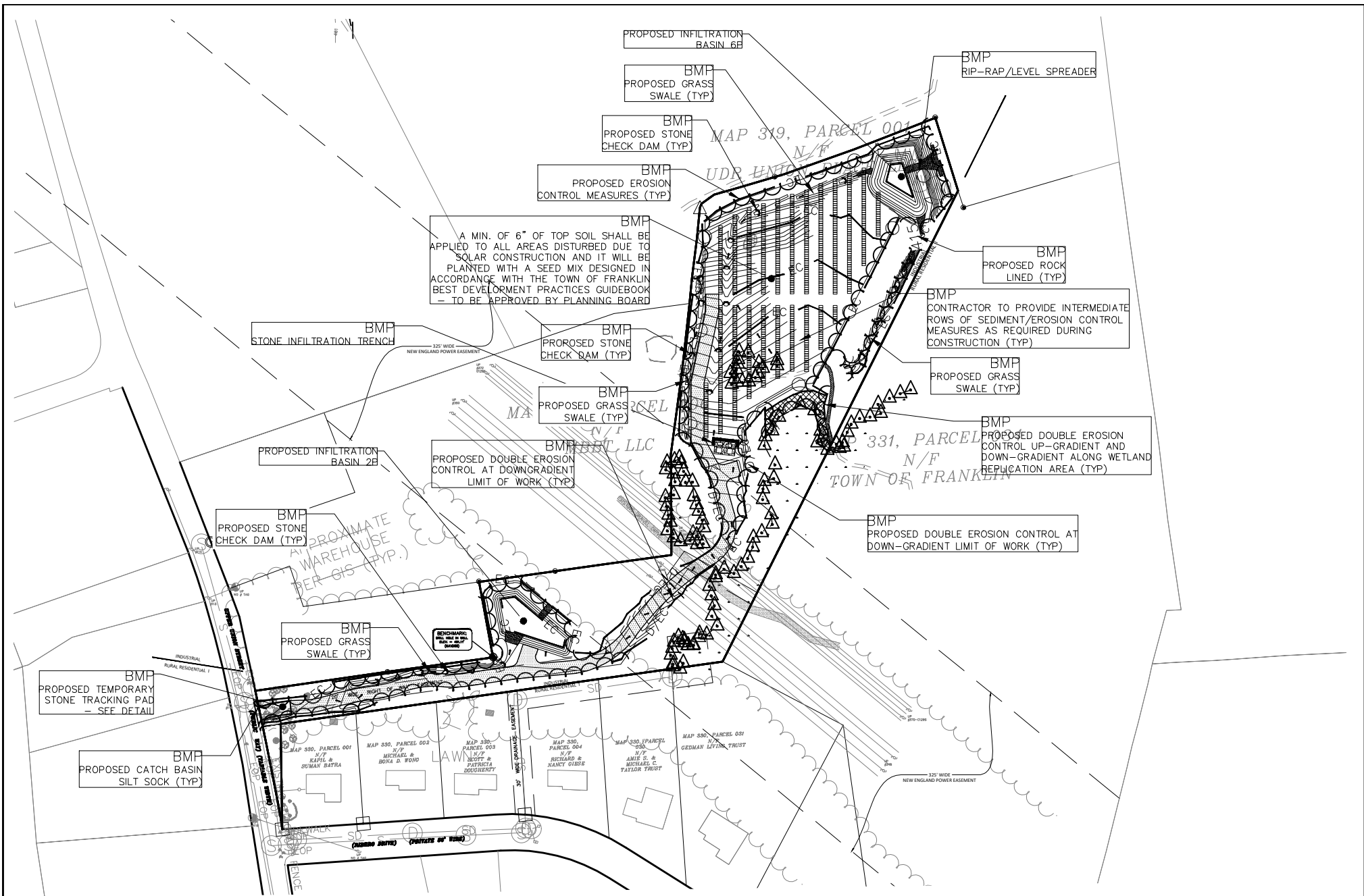
**UPPER UNION SOLAR PROJECT - FRANKLIN, MASSACHUSETTS
POST-CONSTRUCTION LONG TERM STORMWATER OPERATION &
MAINTENANCE PLAN**

Date: _____ Personnel Present: _____	
Inspectors Name: _____	
Inspectors Contact Information: _____	

Signature: _____	

O&M ITEM:	COMMENTS, CORRECTIVE ACTION NEEDED, AND NOTES:
Erosion Control Barriers	
Deep Sump Hooded Catch Basins	
Sub-Surface Infiltration System	
Grassed Swales	
Street Sweeping	
Stone Infiltration Trench	
Infiltration Basins	
Outlet Pipes and Flared End Sections/Headwalls	
Rip-rap Aprons/Spillways/Level Spreaders	
Stone Check Dams	

APPENDIX F
BMP Location Map



BMP Locations
Upper Union Solar Project
0 Upper Union Street, Franklin, MA
Scale: 1"=200'

