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STORMWATER MANAGEMENT PLAN

For

**Land of Nod Property
Windham, Maine**

Prepared For:
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39 Belanger Road
Windham, Maine 04062

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Project No. 16236

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STORMWATER MANAGEMENT PLAN
Land of Nod Property
Windham, Maine

I. Introduction

This Stormwater Management Plan has been prepared to address the potential impacts associated with this project due to the proposed modification in stormwater runoff characteristics and land cover changes. The stormwater management controls that are outlined in this plan have been designed to best suit the proposed development and to comply with applicable regulatory requirements.

II. Existing Conditions

Total area of the parcel is shown as 65.67 acres on property currently owned by Leonard Sanborn and Chris Wilson. The total area of the parcel proceeding conveyance of areas to abutters totals 62.55 acres. The site is identified as Lots 29 on the Town of Windham Tax Map 7 accessing of Land of Nod Road nearly opposite of Morgan Drive and zoned Farm (F) District.

The stormwater runoff on the existing site breaks into two directions heading to the rear of the site and to the front of the site but eventually discharges into the Colley Wright Brook which is a tributary of the Presumpscot River. Colley Wright Brook is not defined by the Maine Department of Environmental Protection (MDEP) Chapter 502 Rules as an Urban Impaired Stream Watershed.

Slopes on the site are generally flat to moderate, with a majority of slopes ranging from 0.5% to 25%. The runoff traveling toward the front of the site is routed northwesterly via drainage ditch along Land of Nod Road and combines with a small meandering stream in the far corner of the site traveling westerly before discharging to Colley Wright Brook. The runoff traveling toward the rear of the site is routed southwesterly through forested areas and continues westerly, eventually discharging to Colley Wright Brook.

The development area of the site is located in Zone C, identified as an area of minimal flooding, per the FEMA Flood Insurance Rate Map for the Town of Westbrook, Community Panel 230189 0030 B.

III. Soils

Soil characteristics were obtained from a class C medium high intensity soil survey performed by Sebago Technics. The Hydrologic Groups (HSG) of the soils is classified by Technical Release TR-55 of the Soil Conservation Service as follows:

Soil Map Symbol	Soil Name	Slope (%)	HSG
DeB	Deerfield – Loamy Fine Sand	3-8	A
EmB	Elmwood – Fine Sandy Loam	0-8	B
GP	Gravel Pits		
HiB	Hinckley - Loamy Sand	3-8	A
PbB	Paxton - Fine Sandy Loam	3-8	C
Sd	Saugatuck - Loamy Sand		A/D
Sn	Scantic – Silt Loam	0-3	D
Sz	Swanton – Fine Sandy Loam		C/D
Wa	Walpole – Fine Sandy Loam		A/D
WmB	Windsor – Loamy sand	0-8	A

Hydrologic Soil Group boundaries are delineated on the Watershed Map. A copy of the medium high intensity soil survey map follows.

IV. Proposed Site Improvements

The project proposes to develop a private roadway to provide future access to 28 new subdivided lots for single family homes. Two existing homes are to remain, totaling 30 single family homes. The proposed site will consist of two dead end roadway sections; Sanborn Lane and Maysens Way. Sanborn Lane begins at Land of Nod Road and finishes with a cul de sac. Maysens Way connects to the proposed Sanborn Lane and finishes with a hammerhead turnaround.

The runoff from the proposed development will maintain the same flow directions as the existing conditions prior to discharging into the Colley Wright Brook.

The planned development will result in the creation of 2.75 acres of impervious area and 1.96 acres of pervious area, totaling 4.71 acres of developed area. The construction of the project will alter 2,200 square feet of wetland near the connection at Land of Nod Road, which is below the 14,999 square-foot overall disturbance limit requiring a Tier 1 NRPA permit.

V. Pre-Development Watershed Model

The pre-development watershed model consists of six (6) subcatchments with stormwater discharge to four (4) study points, as shown in the HydroCAD model.

Three (3) subcatchments drain to Study Point 1, designated SP1, which is representative of the northwest corner of the site near Land of Nod road and contributes to a small existing stream. Existing land areas modeled as being directed toward SP1 include 1.01S, 1.03S, and 1.04S. These subcatchments include the existing structures and driveways onsite to remain,

and large areas of woodland and field. There are also several wetland areas, all of which are tributary to the wetland represented by Study Point 1, which ultimately drains to Colley Wright Brook.

One (1) subcatchment drains to Study Point 2, designated SP2, which is representative of the outlet located in the north westerly edge of the site. This outlet conveys stormwater in a westerly direction, which ultimately drains to Colley Wright Brook. Existing land areas modeled as being directed toward SP2 includes subcatchment 1.02S and is entirely wooded.

One (1) subcatchment drains to Study Point 3, designated SP3, which is representative of the outlet located in the south westerly edge of the site. This outlet conveys stormwater in a westerly direction, which ultimately drains to Colley Wright Brook. Existing land areas modeled as being directed toward SP3 includes subcatchment 1.05S. This subcatchment includes large areas of woodland and field. There are also several wetland areas, all of which are tributary to the wetland represented by Study Point 3, which ultimately drains to Colley Wright Brook.

One (1) subcatchment drains to Study Point 4, designated SP4, which is representative of the outlet located in the eastern corner of the site. This outlet conveys stormwater in a south easterly direction. Existing land areas modeled as being directed toward SP4 includes subcatchment 1.06S. This subcatchment includes large areas of woodland and field. There are also several wetland areas, all of which are tributary to the wetland represented by Study Point 4.

VI. Post-Development Watershed Model

The post-development watershed model consists of ten (10) subcatchments with stormwater discharging to four (4) study points, as shown in the HydroCAD model. Modeling reflects on-site ground cover changes to include proposed landscaping and impervious areas associated with the roadway areas. Existing drainage patterns will be generally maintained with the proposed stormwater design. Four (4) total post-development sub-catchments will include improvements from the proposed construction and will receive treatment.

Seven (7) subcatchments drain to Study Point 1, designated as SP1, which is representative of the northwest corner of the site near Land of Nod road and contributes to a small existing stream. Stormwater runoff directed toward SP1 includes flow over land area within subcatchments 10.1S, 10.3S, 10.4S, 11.1S, 11.2S, 11.3S, and 11.4S. Stormwater from subcatchments 11.2S and 11.4S will be treated by Underdrained Soil Filter 1 and 2, respectively. Stormwater from subcatchments 11.1S and 11.3S will be treated by Meadow and Wooded Buffers, respectively.

One (1) subcatchment drains to Study Point 2, designated SP2, which is representative of the outlet located in the north westerly edge of the site. Existing subcatchment 10.2S will

remain the same as predevelopment subcatchment 1.02S, as the area will remain undeveloped.

One (1) subcatchment drains to Study Point 3, designated SP3, which is representative of the outlet located in the south westerly edge of the site. This outlet conveys stormwater in a westerly direction, which ultimately drains to Colley Wright Brook. Existing land areas modeled as being directed toward SP3 includes subcatchment 10.5S. This subcatchment reflects the predevelopment subcatchment 1.05S but has a net reduction in area due to the proposed development.

One (1) subcatchment drains to Study Point 4, designated SP4, which is representative of the outlet located in the eastern corner of the site. This outlet conveys stormwater in a south easterly direction. Existing land areas modeled as being directed toward SP4 includes subcatchment 10.6S. This subcatchment reflects the predevelopment subcatchment 1.05S but has a net reduction in area due to the proposed development.

The Best Management Practices have been designed and sized in accordance with DEP BMP standards contained within Chapter 500 and the BMP Manual. Sizing calculations can be found in Appendix 2.

VII. Stormwater Management

Basic Standard - Chapter 500, Section 4(B)

Since the project will disturb more than one (1) acre of land area, MDEP Basic Standards apply, requiring that grading or other construction activities on the site do not impede or otherwise alter drainage ways to have an unreasonable adverse impact. We have avoided adverse impacts by providing an Erosion & Sedimentation Control Plan, and an Inspection, Maintenance and Housekeeping Plan (Appendix 4) to be implemented during construction and post-construction stabilization of the site. These construction requirements have been developed following Best Management Practice guidelines.

General Standard - Chapter 500, Section 4(C)

Since the project will create more than one (1) acre of impervious surface, MDEP General Standards apply, which require a project's stormwater management system to include treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. The General Standards require treatment of no less than 95% of the site's created impervious area and no less than 80% of the site's created developed area (landscaped area and impervious area combined). To mitigate the changes in hydrologic patterns due to the development of this project, two (2) underdrained soil filters, a meadow buffer and a wooded buffer have been implemented into the stormwater management infrastructure.

BMP sizing and treatment calculations are provided as Appendix 2.

Flooding Standard - Chapter 500, Section 4(F)

Since the planned project will create more than three (3) acres of impervious surface, MDEP Flooding Standards must be met. The Flooding Standard requires a project's stormwater management system detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2, 10 and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project. As such, a runoff evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations. Runoff curve numbers were determined for each of the watersheds by measuring the area of each hydrologic soil group within each type of land cover. The type of land cover was determined based on survey data, field reconnaissance and aerial photography. Times of concentration were determined from site topographic maps in accordance with SCS procedures.

The 24-hour rainfall values utilized in the hydrologic model were obtained from Appendix H of MDEP's Chapter 500: Stormwater Management (effective date August 2015). Rainfall values for Cumberland County (SE) are listed in the table below.

Storm Frequency Precipitation (in./24 hr) Cumberland County (SE)	
2-year	3.1
10-year	4.6
25-year	5.8

The following table presents the results of the stormwater runoff calculations at the analysis points for the pre-development and post-developed conditions.

Stormwater Runoff Summary Table			
Analysis Point	Storm Event	Pre-Development (cfs)	Post-Development (cfs)
SP-1	2-year	5.22	5.55
	10-year	22.71	19.01
	25-year	43.00	34.11
SP-2	2-year	0	0
	10-year	0	0
	25-year	0.01	0.01
SP-3	2-year	1.23	1.23
	10-year	6.95	6.94
	25-year	14.12	14.10
SP-4	2-year	0.24	0.23
	10-year	1.34	1.31
	25-year	2.65	2.60

The HydroCAD Data output sheets from this analysis are appended to this report (Appendix 3) along with pre-development and post-development watershed maps (Appendix 1). The model predicts that the peak runoff rates in the post-development condition are maintained at pre-development levels with implementation of the stormwater management system.

VIII. Summary

The proposed development has been designed to manage stormwater runoff through Best Management Practices approved by MDEP. Stormwater BMP's provide treatment to 91.4% (95% required) of impervious areas, and 98.8% (80% required) of the total developed area. Due to the natural topography of the site and the type of development, the 95% of impervious target cannot be met. However, 98.8% of the proposed development is treated by the proposed BMP's as compensation.

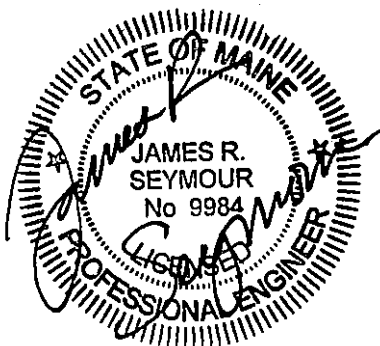
Runoff discharging from the site will be at or below pre-development conditions for the 2, 10, and 25-year storm events at all study points, with the exception of the 2-year storm at subcatchment 1.02S/10.2S. The post development subcatchment 10.2S discharges to a proposed culvert at the proposed Sanborn Lane that is sized to disable stormwater from overtopping the road, which results in a slightly higher stormwater flow rate during the 2-year storm. This minimal increase is approximately a 6.3% increase in the 2-year storm, and for the benefit of safety (eliminating flooding/overtopping on driveways or the public road in the immediate vicinity) in the larger storm events, is a necessary trade-off in the smaller rain events. Additionally, erosion and sedimentation controls along with associated maintenance and housekeeping procedures have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

Sincerely,



James R. Seymour, P.E.
Project Manager

JRS



Appendix 1

Watershed Plans and Stormwater Treatment Plans

ATTACHED SEPARATELY

Appendix 2

Stormwater Quality Calculations

Table 1: MDEP GENERAL STANDARD CALCULATIONS: Land of Nod, Windham, Maine

AREA ID	WATERSHED SIZE (S.F.)	EXISTING IMPERVIOUS AREA (S.F.)	NEW IMPERVIOUS AREA (S.F.)	EXISTING LANDSCAPED AREA (S.F.)	NEW LANDSCAPED AREA (S.F.)	NEW DEVELOPED AREA (S.F.)	UNDEVELOPED AREAS (S.F.)	TREATMENT PROVIDED?	NEW IMPERVIOUS AREA TREATED* (S.F.)	NEW LANDSCAPED AREA TREATED* (S.F.)	NEW DEVELOPED AREA TREATED* (S.F.)	TREATMENT BMP
10.1S**	695,930	21,530	1,500	416,430	2,150	3,650	254,320	NO	0	0	0	NONE
10.2S**	43,490	0	0	0	0	0	43,490	NO	0	0	0	NONE
10.3S**	988,770	44,470	2,800	833,230	1,650	4,450	106,620	NO	0	0	0	NONE
10.4S**	313,540	4,460	0	264,270	2,410	2,410	42,400	NO	0	0	0	NONE
10.5S**	1,328,600	0	1,280	316,650	3,130	4,410	1,007,540	NO	0	0	0	NONE
10.6S**	157,640	0	0	3,070	0	0	154,570	NO	0	0	0	NONE
11.1S	53,730	0	8,710	11,620	33,400	42,110	0	YES	8,710	45,020	53,730	MB
11.2S	106,550	0	17,410	0	89,140	106,550	0	YES	17,410	89,140	106,550	UDSF-1
11.3S	69,130	0	24,890	0	39,240	64,130	5,000	YES	24,890	39,240	64,130	WB
11.4S	39,190	0	8,400	0	30,790	39,190	0	YES	8,400	30,790	39,190	UDSF-2
SUM	3,796,570	70,460	64,990	1,845,270	201,910	266,900	1,613,940	-	59,410	204,190	263,600	-

Designations: SSF= Subsurface Sand Filter

*TOTAL NEW IMPERVIOUS AREA (Ac.)	1.49	*TOTAL NEW DEVELOPED AREA (Ac.)	6.13
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (Ac.)	1.36	TOTAL DEV. AREA RECEIVING TREATMENT (Ac.)	6.05
% OF IMPERVIOUS AREA RECEIVING TREATMENT	91.4%	% OF DEV. AREA RECEIVING TREATMENT	98.8%

*INCLUDES EXISTING IMPERVIOUS AND DEVELOPED AREAS THAT ARE CURRENTLY RECEIVING TREATMENT

**INCLUDES EXISTING IMPERVIOUS AND DEVELOPED AREAS THAT ARE NOT CURRENTLY RECEIVING TREATMENT AND WILL NOT RECEIVE TREATMENT IN POST DEVELOPMENT

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JOB 16236
 SHEET NO. 1 OF 1
 CALCULATED BY BAW DATE 2/4/2019
 CHECKED BY BJB
 FILE NAME 16236 WQC PRINT DATE 2/4/2019
 MDEP Site Location of Development Submission

Note: Buffers are sized in accordance with Chapter 5 of the Maine Department of Environmental Protection BMPs Technical Design Manual, latest revision.

Meadow Buffer 1 (MB-1)						
Type of Buffer :		Buffer with Stone Bermed Level Spreader				
Existing Cover :		Meadow				
Soils :		Hinckley (HSG-A)				
Buffer Slope :		4.0%				
Buffer Length :		80	feet			
Tributary Area						
Impervious :		8,710	sf			
Landscaped :		45,020	sf			
Per Table 5-5 of Manual for Soil Group A:						
Berm Length per acre of impervious :		60	ft			
Berm Length per acre of landscaped :		20	ft			
Required Level Spreader Berm Length :				32.7	ft	
Provided Level Spreader Berm Length :				50.0	ft	

Wooded Buffer 1 (WB-1)						
Type of Buffer :		Buffer with Stone Bermed Level Spreader				
Existing Cover :		Forested				
Soils :		Windsor (HSG-A)				
Buffer Slope :		2.0%				
Buffer Length :		55	feet			
Tributary Area						
Impervious :		25,000.0	sf			
Landscaped :		44,300.0	sf			
Per Table 5-5 of Manual for Soil Group A:						
Berm Length per acre of impervious :		75	ft			
Berm Length per acre of landscaped :		25	ft			
Required Level Spreader Berm Length :				68.5	ft	
Provided Level Spreader Berm Length :				80.0	ft	

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CHECKED BY	BJB		
FILE NAME	16236 WQC	PRINT DATE	2/4/2019

Note: Underdrained Soil Filters are sized in accordance with Chapter 7.1 of the Maine Department of Environmental Protection BMPs Technical Design Manual, latest revision

Treatment Calculations for Proposed Underdrained Soil Filter #1 (UDSF-1)							
WQV Calculation							
(WQV = Water Quality Volume)							
Total Impervious Area =	17,400.0	sf					
Total Landscaped Area=	89,140.0	sf					
WQV Required= 1" x Impervious Area + 0.4"x Landscape Area =	4,421.3	cf					
WQV Provided =	7,500.0	cf @ 1.5' depth					
Filterbed Area Calculation							
Filterbed Area Required = 0.05 x Impervious + 0.02 x Landscape =	2652.8	sf					
Filterbed Area Provided=	2,700.0	sf					
Pre-treatment Sediment Forebay Volume Calculation							
Sand Application Rate=	50.0	cf/acre/year					
Total Impervious Area=	17,400.0	sf					
Tributary to UDSF #2							
Required Pre-treatment Volume=	20.0	cf					
Provided Pre-treatment Volume=	300.0	cf					

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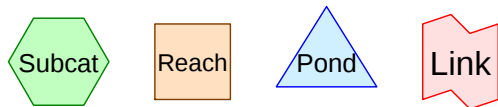
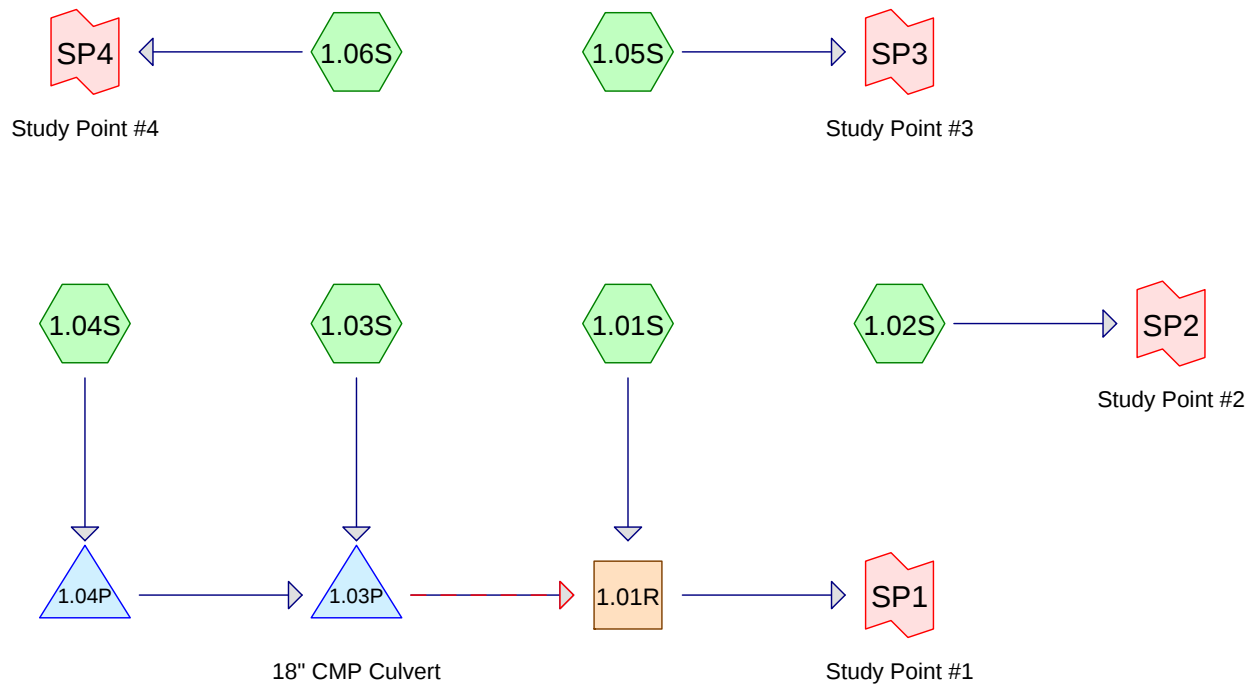
Note: Underdrained Soil Filters are sized in accordance with Chapter 7.1 of the Maine Department of Environmental Protection BMPs Technical Design Manual, latest revision

Treatment Calculations for Proposed Underdrained Soil Filter #2 (UDSF-2)							
WQV Calculation							
(WQV = Water Quality Volume)							
Total Impervious Area =		8,400.0	sf				
Total Landscaped Area=		30,800.0	sf				
WQV Required= 1" x Impervious Area + 0.4"x Landscape Area =		1,726.7	cf				
WQV Provided =		1,500.0	cf @ 1.5' depth				
Filterbed Area Calculation							
Filterbed Area Required = 0.05 x Impervious + 0.02 x Landscape =		1036.0	sf				
Filterbed Area Provided=		1,100.0	sf				
Pre-treatment Sediment Forebay Volume Calculation							
Sand Application Rate=		50.0	cf/acre/year				
Total Impervious Area=		8,400.0	sf				
Tributary to UDSF #2							
Required Pre-treatment Volume=		9.6	cf				
Provided Pre-treatment Volume=		200.0	cf				

Appendix 3

HydroCAD Output Pre-Development and Post-Development Models

PREDEVELOPMENT



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1.01S: Runoff Area=607,190 sf 2.45% Impervious Runoff Depth=0.06"
 Flow Length=770' Tc=24.1 min CN=47 Runoff=0.11 cfs 0.068 af

Subcatchment1.02S: Runoff Area=43,490 sf 0.00% Impervious Runoff Depth=0.00"
 Flow Length=340' Tc=33.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment1.03S: Runoff Area=1,333,160 sf 3.02% Impervious Runoff Depth=0.51"
 Flow Length=2,080' Tc=34.6 min CN=64 Runoff=7.33 cfs 1.309 af

Subcatchment1.04S: Runoff Area=321,610 sf 0.81% Impervious Runoff Depth=0.09"
 Flow Length=900' Tc=39.0 min CN=49 Runoff=0.09 cfs 0.056 af

Subcatchment1.05S: Runoff Area=1,330,210 sf 1.68% Impervious Runoff Depth=0.22"
 Flow Length=1,720' Tc=81.1 min CN=55 Runoff=1.23 cfs 0.565 af

Subcatchment1.06S: Runoff Area=161,170 sf 0.00% Impervious Runoff Depth=0.25"
 Flow Length=960' Tc=44.8 min CN=56 Runoff=0.24 cfs 0.077 af

Reach 1.01R: Avg. Flow Depth=0.38' Max Vel=0.65 fps Inflow=6.66 cfs 1.433 af
 n=0.070 L=700.0' S=0.0072 ' Capacity=43.26 cfs Outflow=5.22 cfs 1.433 af

Pond 1.03P: 18" CMP Culvert Peak Elev=225.23' Storage=4,846 cf Inflow=7.34 cfs 1.365 af
 Primary=5.81 cfs 1.354 af Secondary=0.85 cfs 0.010 af Outflow=6.66 cfs 1.364 af

Pond 1.04P: Inflow=0.09 cfs 0.056 af
 Primary=0.09 cfs 0.056 af

Link SP1: Study Point #1 Inflow=5.22 cfs 1.433 af
 Primary=5.22 cfs 1.433 af

Link SP2: Study Point #2 Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af

Link SP3: Study Point #3 Inflow=1.23 cfs 0.565 af
 Primary=1.23 cfs 0.565 af

Link SP4: Study Point #4 Inflow=0.24 cfs 0.077 af
 Primary=0.24 cfs 0.077 af

Total Runoff Area = 87.163 ac Runoff Volume = 2.075 af Average Runoff Depth = 0.29"
97.89% Pervious = 85.323 ac 2.11% Impervious = 1.840 ac

Summary for Subcatchment 1.01S:

Runoff = 0.11 cfs @ 15.29 hrs, Volume= 0.068 af, Depth= 0.06"

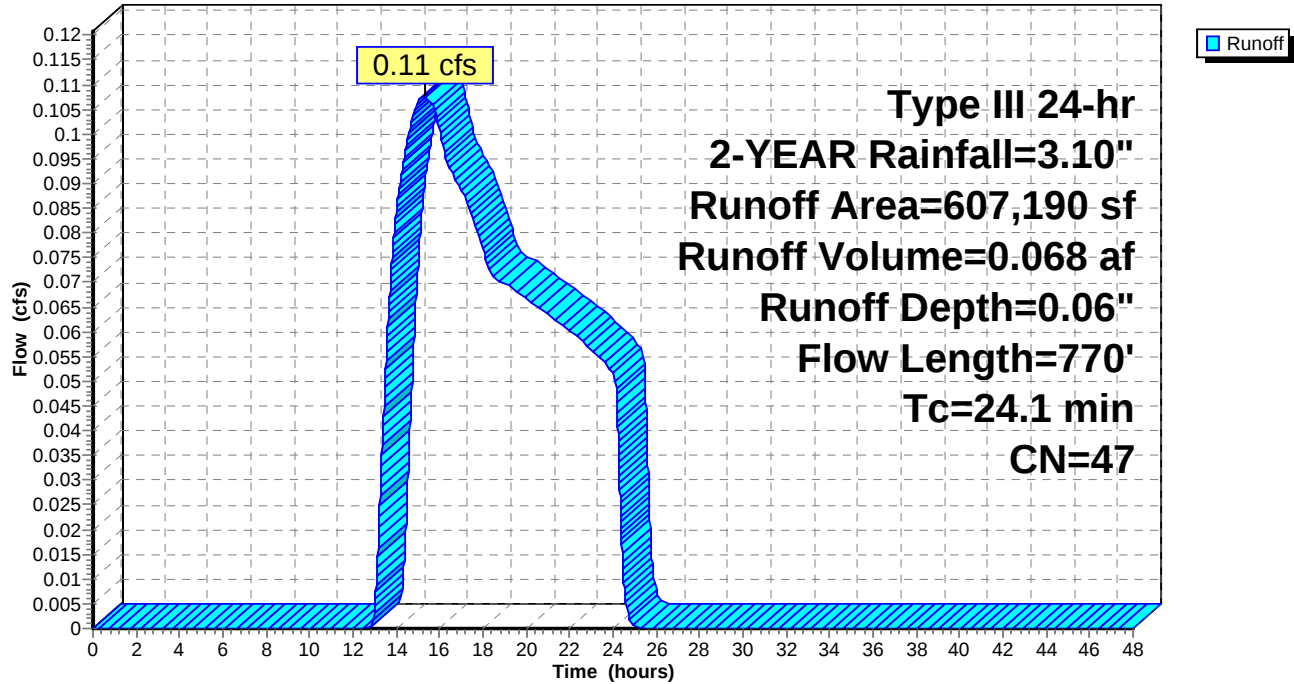
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
145,160	80	>75% Grass cover, Good, HSG D
188,830	39	>75% Grass cover, Good, HSG A
8,630	98	Paved roads w/curbs & sewers, HSG D
3,640	98	Paved roads w/curbs & sewers, HSG A
13,130	77	Woods, Good, HSG D
245,210	30	Woods, Good, HSG A
2,590	98	Unconnected roofs, HSG A
607,190	47	Weighted Average
592,330		97.55% Pervious Area
14,860		2.45% Impervious Area
2,590		17.43% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	150	0.0200	0.12		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.0	620	0.0300	2.60		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
24.1	770	Total			

Subcatchment 1.01S:

Hydrograph



Summary for Subcatchment 1.02S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

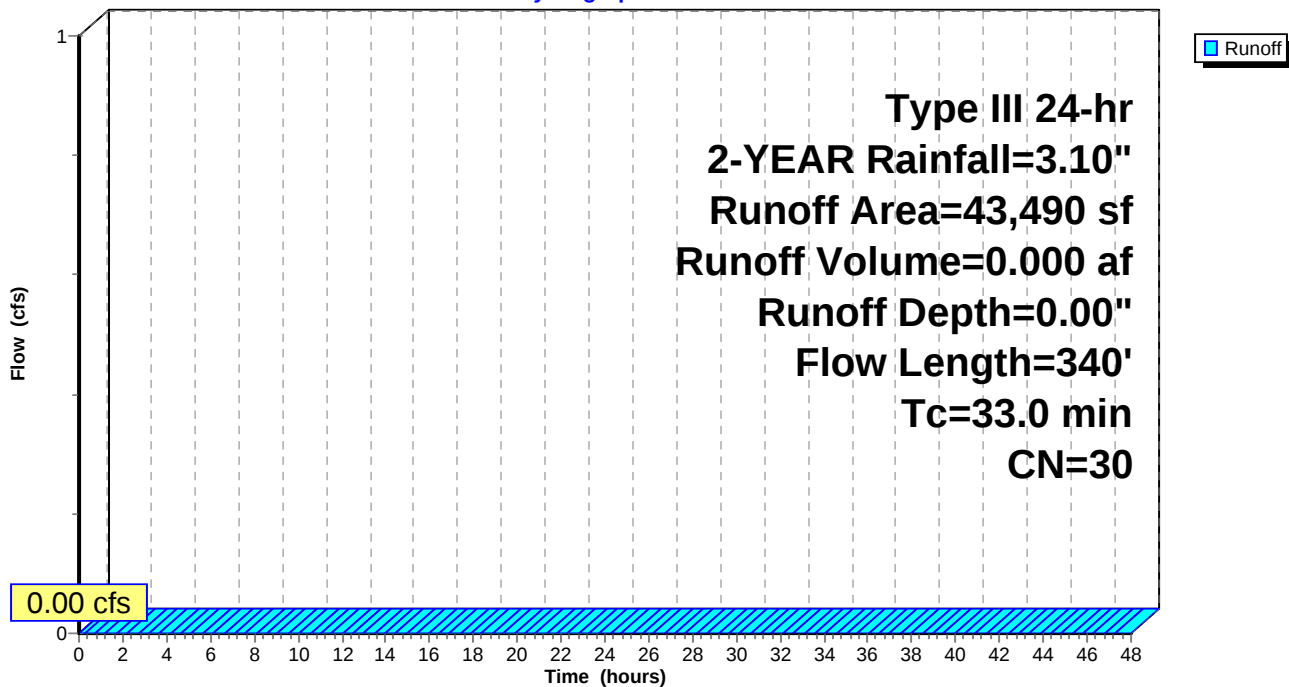
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
43,490	30	Woods, Good, HSG A
43,490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	150	0.0230	0.09		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
4.5	190	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
33.0	340	Total			

Subcatchment 1.02S:

Hydrograph



Summary for Subcatchment 1.03S:

Runoff = 7.33 cfs @ 12.61 hrs, Volume= 1.309 af, Depth= 0.51"

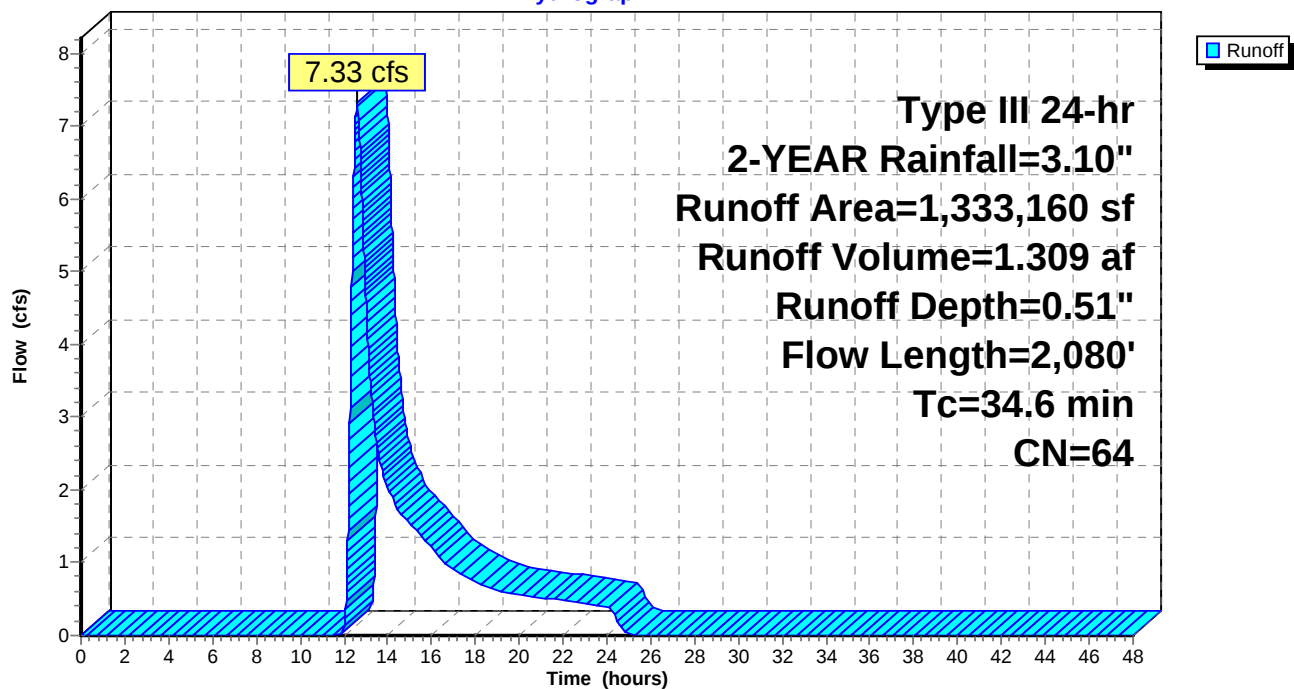
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
206,040	39	>75% Grass cover, Good, HSG A
760,280	74	>75% Grass cover, Good, HSG C
80,490	80	>75% Grass cover, Good, HSG D
7,220	98	Paved roads w/curbs & sewers, HSG D
2,890	98	Paved roads w/curbs & sewers, HSG A
21,480	98	Paved roads w/curbs & sewers, HSG C
174,360	30	Woods, Good, HSG A
62,980	70	Woods, Good, HSG C
2,270	76	Gravel roads, HSG A
6,480	89	Gravel roads, HSG C
6,400	98	Unconnected roofs, HSG C
2,270	98	Unconnected roofs, HSG A
1,333,160	64	Weighted Average
1,292,900		96.98% Pervious Area
40,260		3.02% Impervious Area
8,670		21.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0300	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
17.5	1,930	0.0150	1.84		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
34.6	2,080	Total			

Subcatchment 1.03S:

Hydrograph



Summary for Subcatchment 1.04S:

Runoff = 0.09 cfs @ 14.95 hrs, Volume= 0.056 af, Depth= 0.09"

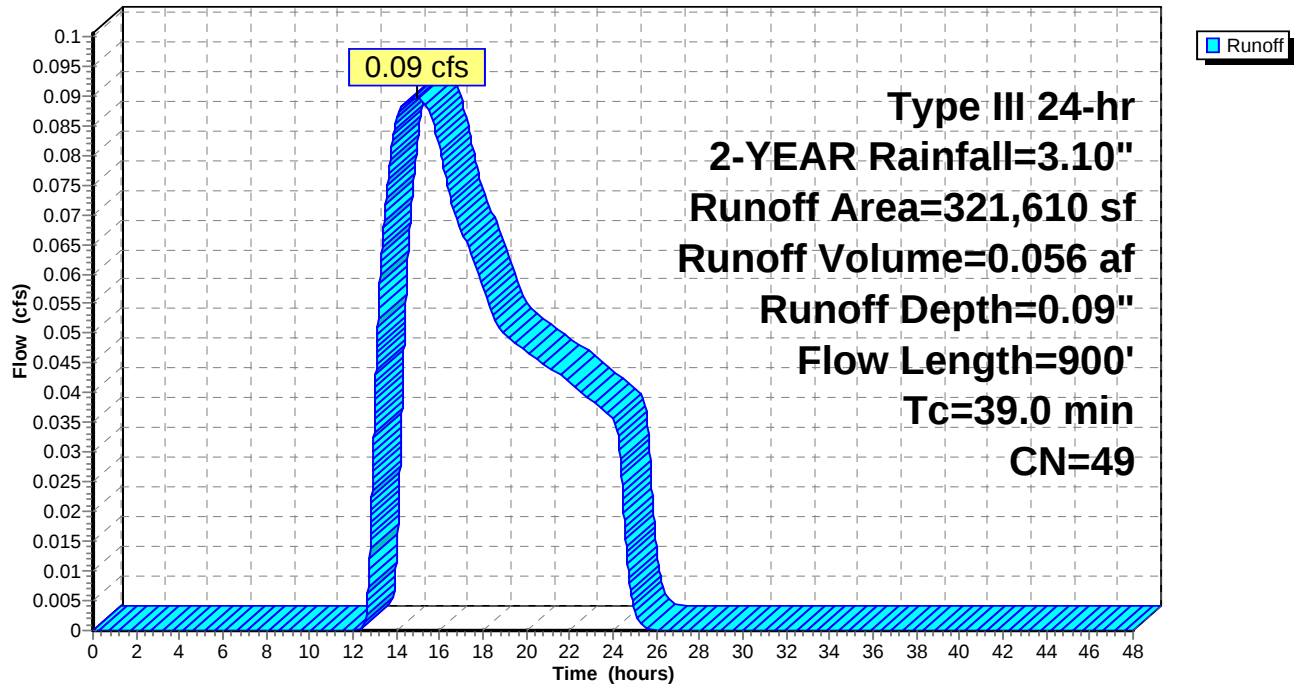
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
72,020	39	>75% Grass cover, Good, HSG A
55,490	74	>75% Grass cover, Good, HSG C
118,860	30	Woods, Good, HSG A
2,480	55	Woods, Good, HSG B
68,300	70	Woods, Good, HSG C
1,840	76	Gravel roads, HSG A
2,620	98	Unconnected roofs, HSG D
321,610	49	Weighted Average
318,990		99.19% Pervious Area
2,620		0.81% Impervious Area
2,620		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	130	0.0800	1.41		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
14.6	620	0.0050	0.71		Shallow Concentrated Flow, C-D Nearly Bare & Untilled Kv= 10.0 fps
39.0	900	Total			

Subcatchment 1.04S:

Hydrograph



Summary for Subcatchment 1.05S:

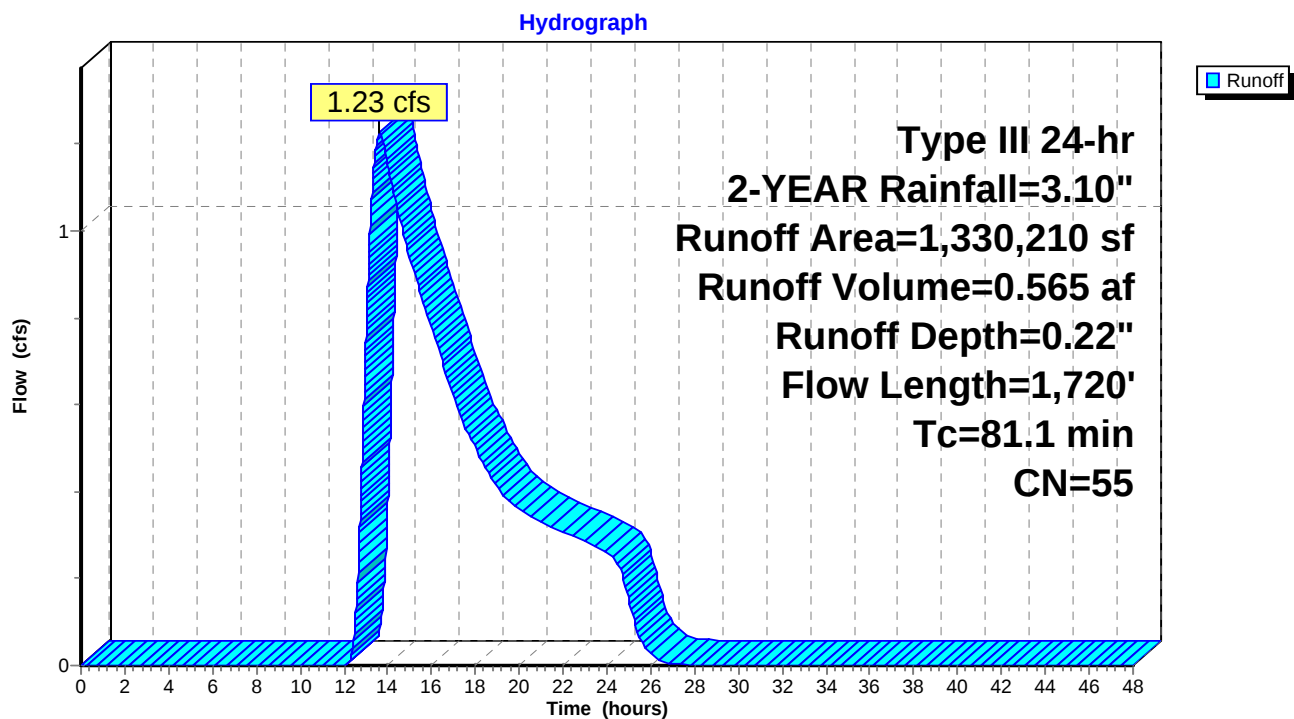
Runoff = 1.23 cfs @ 13.61 hrs, Volume= 0.565 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
23,430	39	>75% Grass cover, Good, HSG A
135,940	74	>75% Grass cover, Good, HSG C
411,320	30	Woods, Good, HSG A
448,710	70	Woods, Good, HSG C
288,410	55	Woods, Good, HSG B
22,400	98	Water Surface, HSG C
1,330,210	55	Weighted Average
1,307,810		98.32% Pervious Area
22,400		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
1.9	170	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
46.7	1,400	0.0100	0.50		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
81.1	1,720	Total			

Subcatchment 1.05S:



Summary for Subcatchment 1.06S:

Runoff = 0.24 cfs @ 12.90 hrs, Volume= 0.077 af, Depth= 0.25"

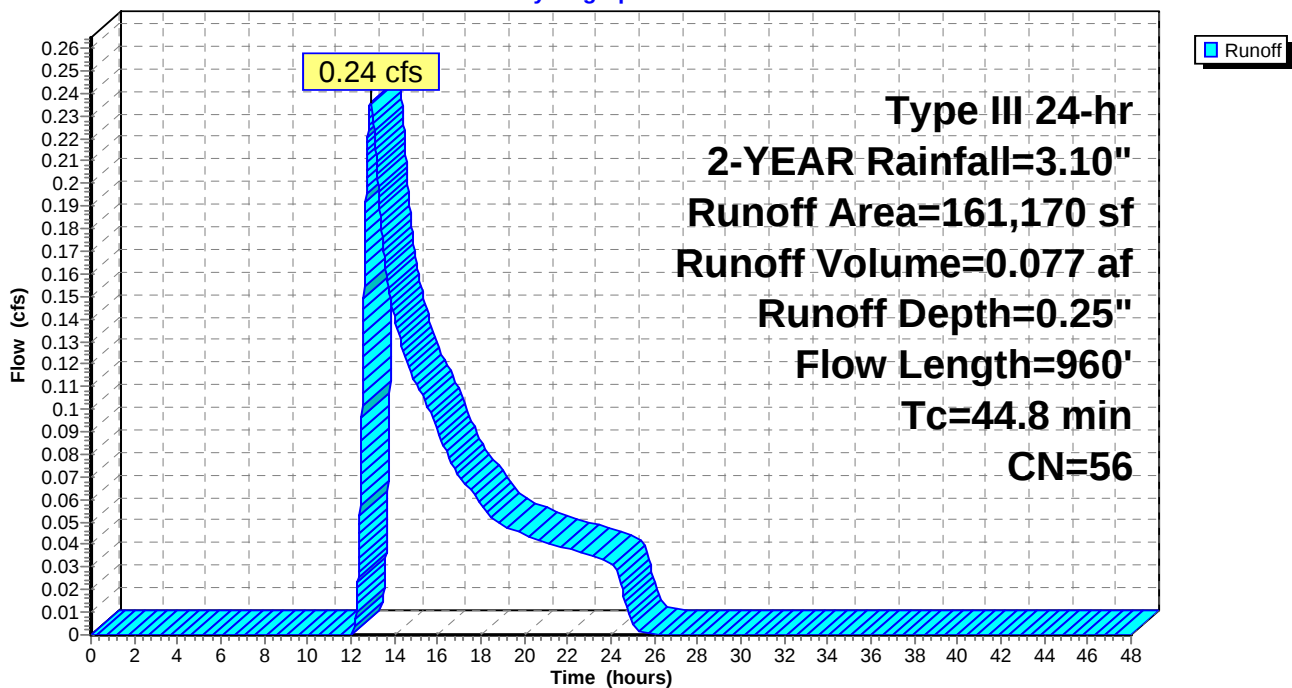
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
20,190	30	Woods, Good, HSG A
41,030	70	Woods, Good, HSG C
99,950	55	Woods, Good, HSG B
161,170	56	Weighted Average
161,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	150	0.0300	0.10		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
19.1	810	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
44.8	960	Total			

Subcatchment 1.06S:

Hydrograph



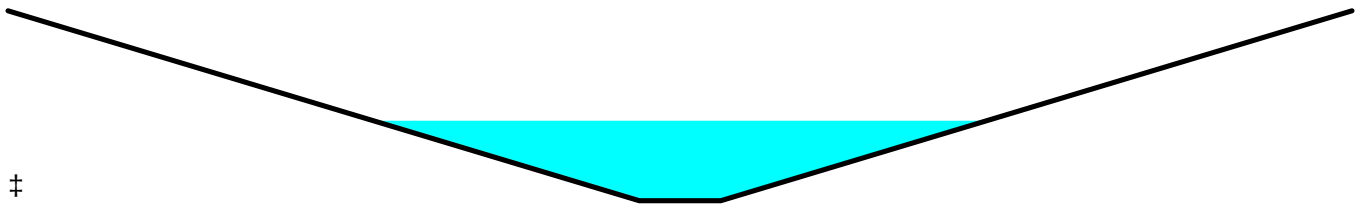
Summary for Reach 1.01R:

Inflow Area = 51.927 ac, 2.55% Impervious, Inflow Depth = 0.33" for 2-YEAR event
 Inflow = 6.66 cfs @ 12.75 hrs, Volume= 1.433 af
 Outflow = 5.22 cfs @ 13.07 hrs, Volume= 1.433 af, Atten= 22%, Lag= 19.6 min

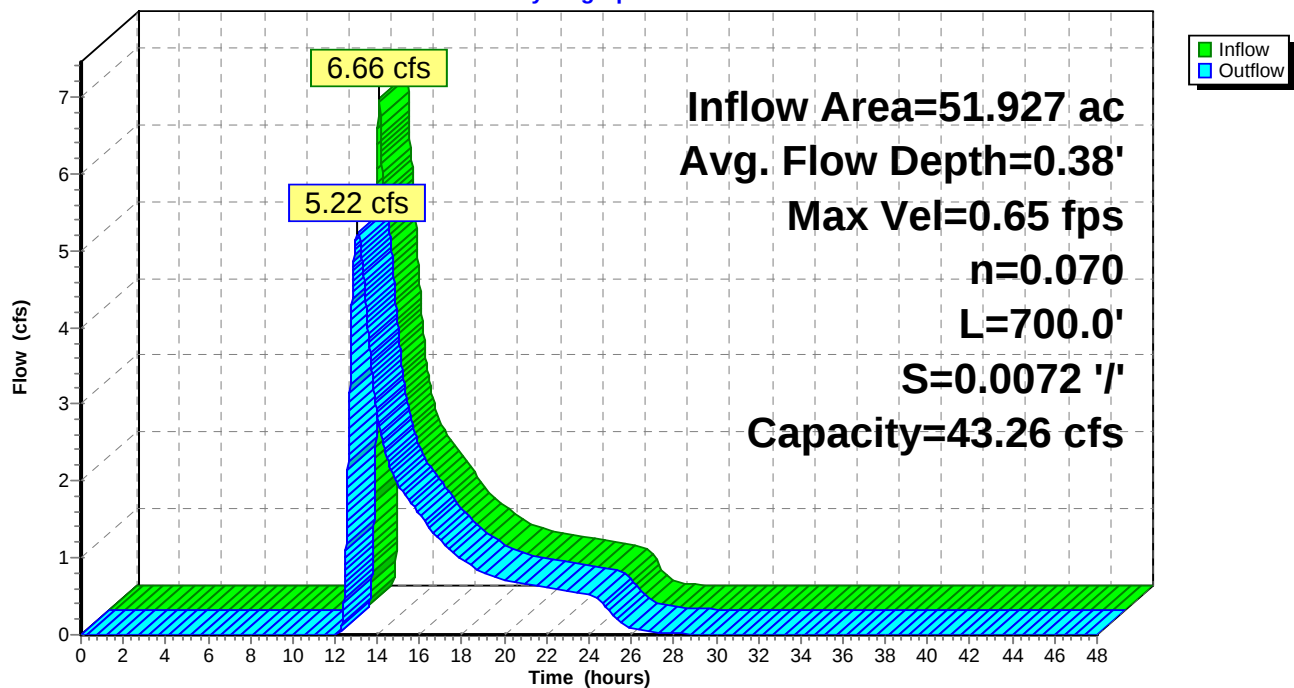
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.65 fps, Min. Travel Time= 18.1 min
 Avg. Velocity = 0.21 fps, Avg. Travel Time= 54.9 min

Peak Storage= 5,657 cf @ 13.07 hrs
 Average Depth at Peak Storage= 0.38'
 Bank-Full Depth= 0.90' Flow Area= 39.3 sf, Capacity= 43.26 cfs

5.00' x 0.90' deep channel, n= 0.070 Sluggish weedy reaches w/pools
 Side Slope Z-value= 43.0 '/' Top Width= 82.40'
 Length= 700.0' Slope= 0.0072 '/'
 Inlet Invert= 222.30', Outlet Invert= 217.26'

**Reach 1.01R:**

Hydrograph



Stage-Area-Storage for Reach 1.01R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
222.30	0.0	0	222.83	14.7	10,310
222.31	0.1	38	222.84	15.2	10,667
222.32	0.1	82	222.85	15.8	11,030
222.33	0.2	133	222.86	16.3	11,400
222.34	0.3	189	222.87	16.8	11,775
222.35	0.4	251	222.88	17.4	12,156
222.36	0.5	319	222.89	17.9	12,543
222.37	0.6	393	222.90	18.5	12,937
222.38	0.7	473	222.91	19.1	13,336
222.39	0.8	559	222.92	19.6	13,741
222.40	0.9	651	222.93	20.2	14,152
222.41	1.1	750	222.94	20.8	14,569
222.42	1.2	854	222.95	21.4	14,993
222.43	1.4	964	222.96	22.0	15,422
222.44	1.5	1,081	222.97	22.7	15,857
222.45	1.7	1,203	222.98	23.3	16,299
222.46	1.9	1,331	222.99	23.9	16,746
222.47	2.1	1,465	223.00	24.6	17,199
222.48	2.3	1,605	223.01	25.2	17,659
222.49	2.5	1,752	223.02	25.9	18,124
222.50	2.7	1,904	223.03	26.6	18,596
222.51	2.9	2,063	223.04	27.2	19,073
222.52	3.2	2,227	223.05	27.9	19,557
222.53	3.4	2,398	223.06	28.6	20,046
222.54	3.7	2,574	223.07	29.3	20,542
222.55	3.9	2,757	223.08	30.1	21,043
222.56	4.2	2,945	223.09	30.8	21,551
222.57	4.5	3,139	223.10	31.5	22,064
222.58	4.8	3,340	223.11	32.3	22,584
222.59	5.1	3,547	223.12	33.0	23,109
222.60	5.4	3,760	223.13	33.8	23,641
222.61	5.7	3,978	223.14	34.5	24,179
222.62	6.0	4,203	223.15	35.3	24,723
222.63	6.3	4,433	223.16	36.1	25,273
222.64	6.7	4,670	223.17	36.9	25,828
222.65	7.0	4,912	223.18	37.7	26,390
222.66	7.4	5,161	223.19	38.5	26,957
222.67	7.7	5,416	223.20	39.3	27,531
222.68	8.1	5,677			
222.69	8.5	5,944			
222.70	8.9	6,217			
222.71	9.3	6,495			
222.72	9.7	6,780			
222.73	10.1	7,071			
222.74	10.5	7,368			
222.75	11.0	7,670			
222.76	11.4	7,979			
222.77	11.8	8,295			
222.78	12.3	8,616			
222.79	12.8	8,943			
222.80	13.3	9,276			
222.81	13.7	9,615			
222.82	14.2	9,959			

Summary for Pond 1.03P: 18" CMP Culvert

Inflow Area = 37.988 ac, 2.59% Impervious, Inflow Depth = 0.43" for 2-YEAR event
 Inflow = 7.34 cfs @ 12.61 hrs, Volume= 1.365 af
 Outflow = 6.66 cfs @ 12.75 hrs, Volume= 1.364 af, Atten= 9%, Lag= 8.5 min
 Primary = 5.81 cfs @ 12.75 hrs, Volume= 1.354 af
 Secondary = 0.85 cfs @ 12.75 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 225.23' @ 12.75 hrs Surf.Area= 5,012 sf Storage= 4,846 cf
 Flood Elev= 149.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 17.7 min calculated for 1.364 af (100% of inflow)
 Center-of-Mass det. time= 17.7 min (953.1 - 935.5)

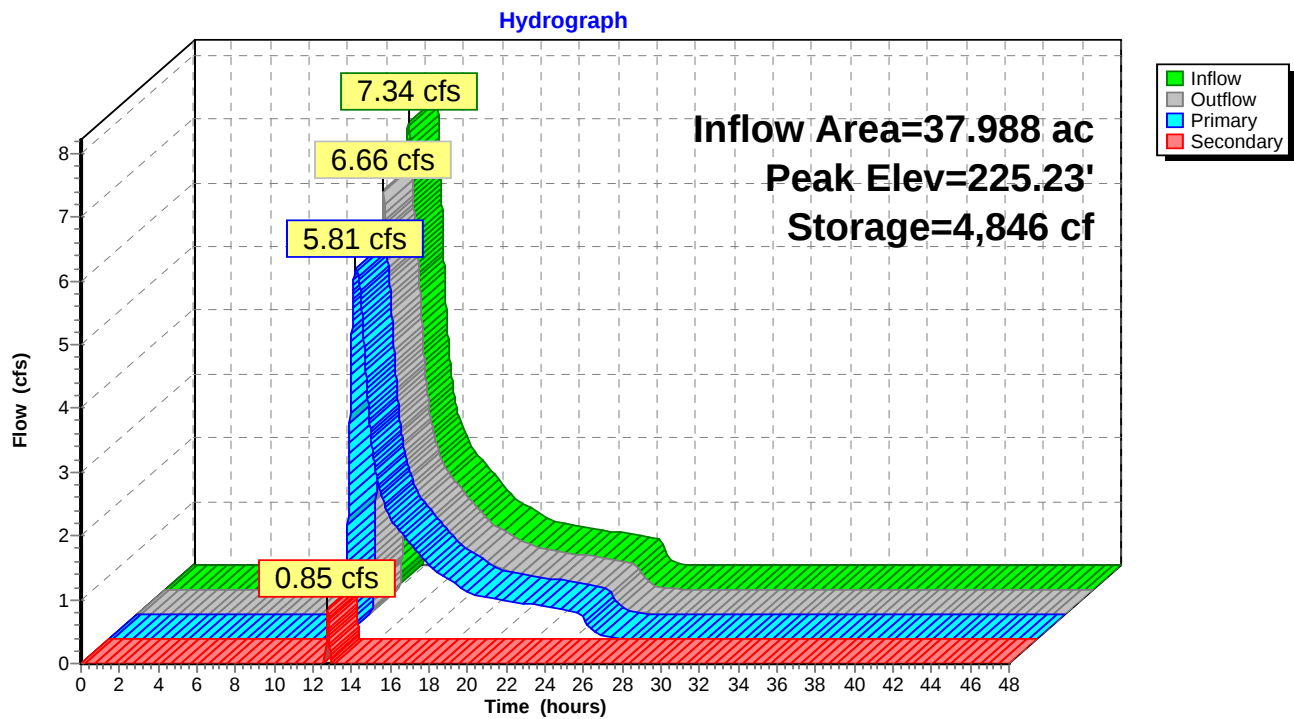
Volume	Invert	Avail.Storage	Storage Description
#1	223.50'	6,375 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.50	1,000	0	0
224.00	2,300	825	825
225.00	3,700	3,000	3,825
225.50	6,500	2,550	6,375

Device	Routing	Invert	Outlet Devices
#1	Primary	223.50'	18.0" Round Culvert L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 223.50' / 223.50' S= 0.0000 '/ Cc= 0.900 n= 0.010, Flow Area= 1.77 sf
#2	Secondary	225.20'	50.0' long x 20.0' breadth Overflow at Driveway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.81 cfs @ 12.75 hrs HW=225.23' TW=222.63' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 5.81 cfs @ 3.57 fps)

Secondary OutFlow Max=0.85 cfs @ 12.75 hrs HW=225.23' TW=222.63' (Dynamic Tailwater)
 ↑**2=Overflow at Driveway** (Weir Controls 0.85 cfs @ 0.50 fps)

Pond 1.03P: 18" CMP Culvert

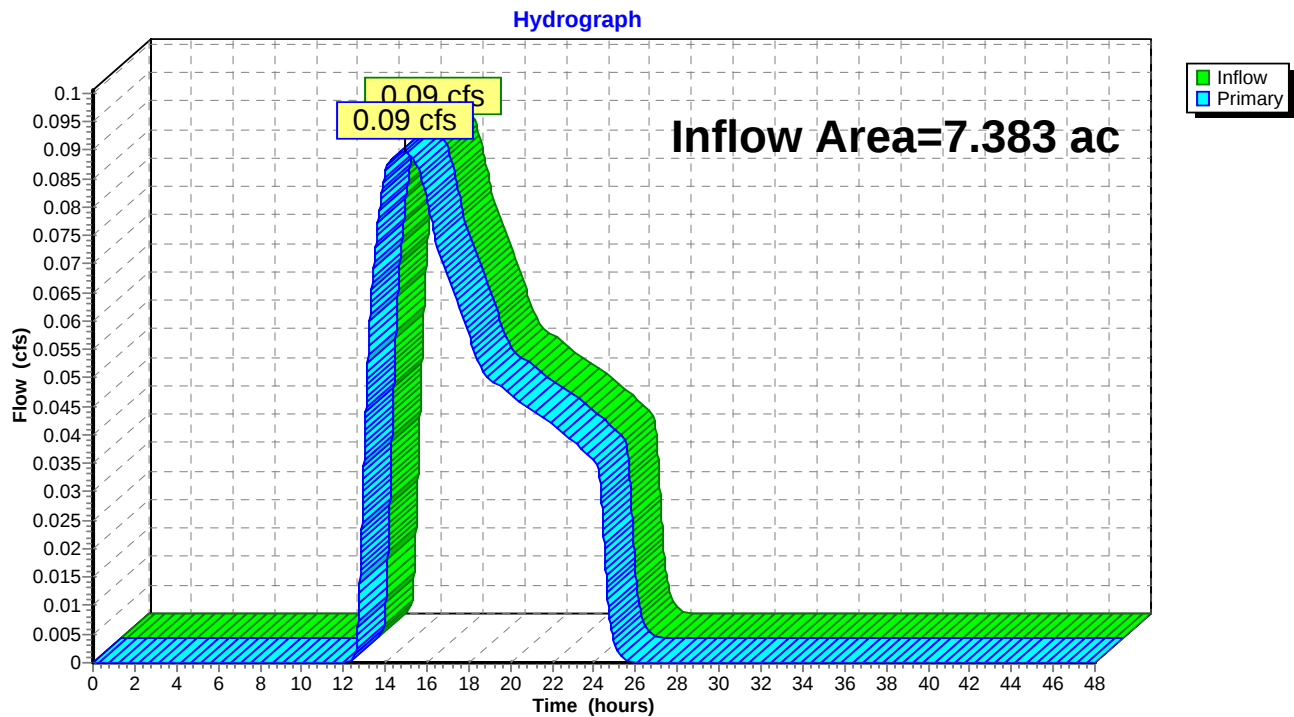
Stage-Area-Storage for Pond 1.03P: 18" CMP Culvert

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
223.50	1,000	0	224.56	3,084	2,333
223.52	1,052	21	224.58	3,112	2,394
223.54	1,104	42	224.60	3,140	2,457
223.56	1,156	65	224.62	3,168	2,520
223.58	1,208	88	224.64	3,196	2,584
223.60	1,260	113	224.66	3,224	2,648
223.62	1,312	139	224.68	3,252	2,713
223.64	1,364	165	224.70	3,280	2,778
223.66	1,416	193	224.72	3,308	2,844
223.68	1,468	222	224.74	3,336	2,910
223.70	1,520	252	224.76	3,364	2,977
223.72	1,572	283	224.78	3,392	3,045
223.74	1,624	315	224.80	3,420	3,113
223.76	1,676	348	224.82	3,448	3,182
223.78	1,728	382	224.84	3,476	3,251
223.80	1,780	417	224.86	3,504	3,321
223.82	1,832	453	224.88	3,532	3,391
223.84	1,884	490	224.90	3,560	3,462
223.86	1,936	528	224.92	3,588	3,533
223.88	1,988	568	224.94	3,616	3,606
223.90	2,040	608	224.96	3,644	3,678
223.92	2,092	649	224.98	3,672	3,751
223.94	2,144	692	225.00	3,700	3,825
223.96	2,196	735	225.02	3,812	3,900
223.98	2,248	780	225.04	3,924	3,977
224.00	2,300	825	225.06	4,036	4,057
224.02	2,328	871	225.08	4,148	4,139
224.04	2,356	918	225.10	4,260	4,223
224.06	2,384	966	225.12	4,372	4,309
224.08	2,412	1,013	225.14	4,484	4,398
224.10	2,440	1,062	225.16	4,596	4,489
224.12	2,468	1,111	225.18	4,708	4,582
224.14	2,496	1,161	225.20	4,820	4,677
224.16	2,524	1,211	225.22	4,932	4,775
224.18	2,552	1,262	225.24	5,044	4,874
224.20	2,580	1,313	225.26	5,156	4,976
224.22	2,608	1,365	225.28	5,268	5,081
224.24	2,636	1,417	225.30	5,380	5,187
224.26	2,664	1,470	225.32	5,492	5,296
224.28	2,692	1,524	225.34	5,604	5,407
224.30	2,720	1,578	225.36	5,716	5,520
224.32	2,748	1,633	225.38	5,828	5,635
224.34	2,776	1,688	225.40	5,940	5,753
224.36	2,804	1,744	225.42	6,052	5,873
224.38	2,832	1,800	225.44	6,164	5,995
224.40	2,860	1,857	225.46	6,276	6,119
224.42	2,888	1,914	225.48	6,388	6,246
224.44	2,916	1,973	225.50	6,500	6,375
224.46	2,944	2,031			
224.48	2,972	2,090			
224.50	3,000	2,150			
224.52	3,028	2,210			
224.54	3,056	2,271			

Summary for Pond 1.04P:

Inflow Area = 7.383 ac, 0.81% Impervious, Inflow Depth = 0.09" for 2-YEAR event
Inflow = 0.09 cfs @ 14.95 hrs, Volume= 0.056 af
Primary = 0.09 cfs @ 14.95 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

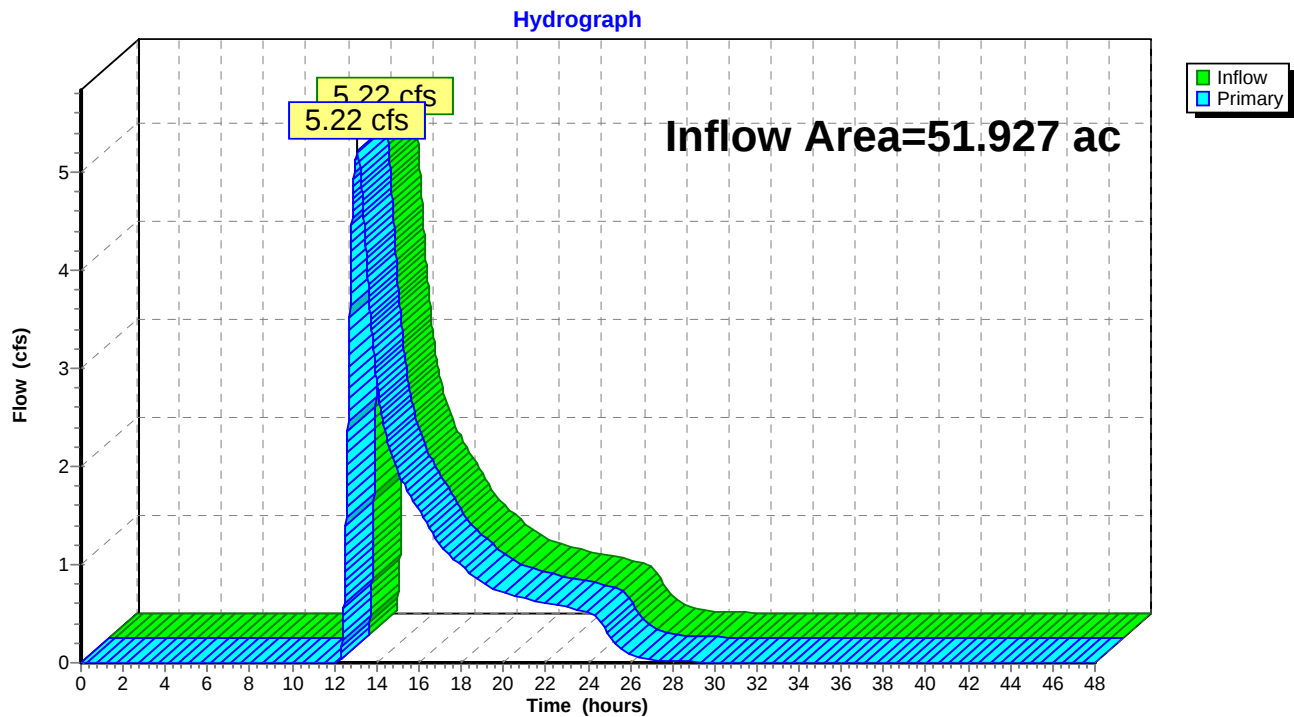
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 1.04P:

Summary for Link SP1: Study Point #1

Inflow Area = 51.927 ac, 2.55% Impervious, Inflow Depth = 0.33" for 2-YEAR event
Inflow = 5.22 cfs @ 13.07 hrs, Volume= 1.433 af
Primary = 5.22 cfs @ 13.07 hrs, Volume= 1.433 af, Atten= 0%, Lag= 0.0 min

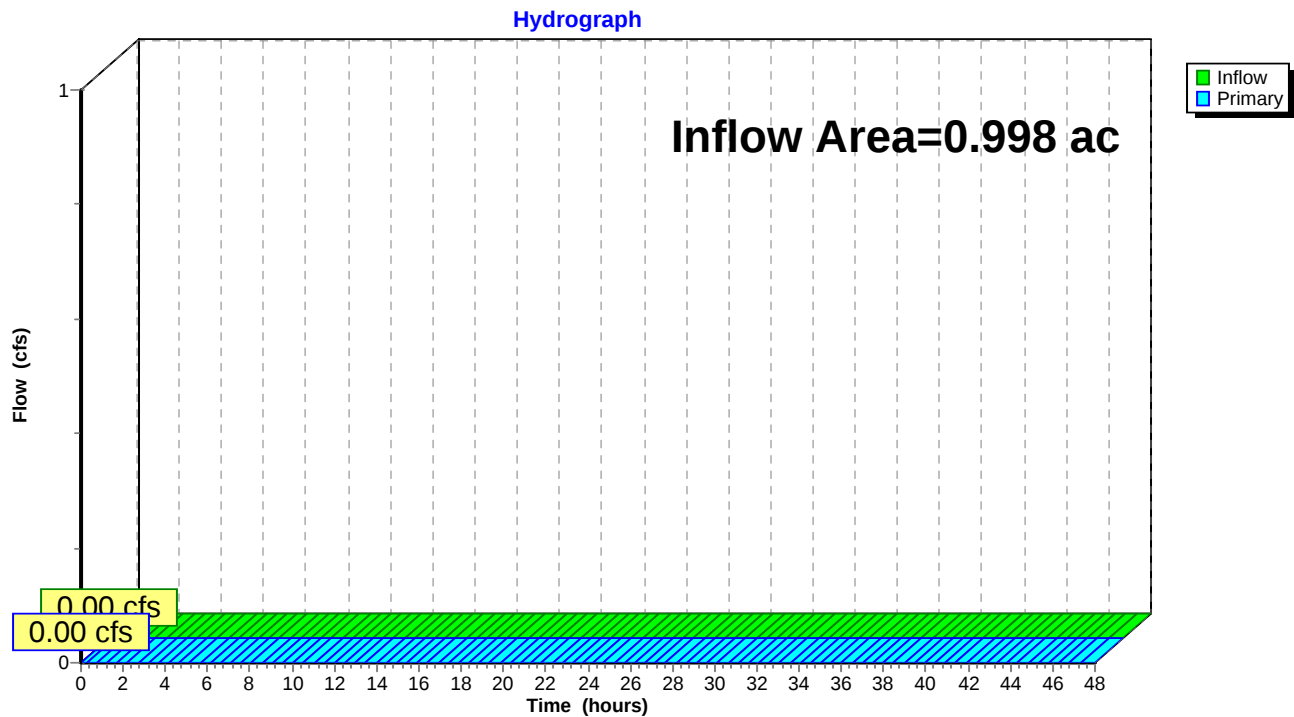
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP1: Study Point #1

Summary for Link SP2: Study Point #2

Inflow Area = 0.998 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

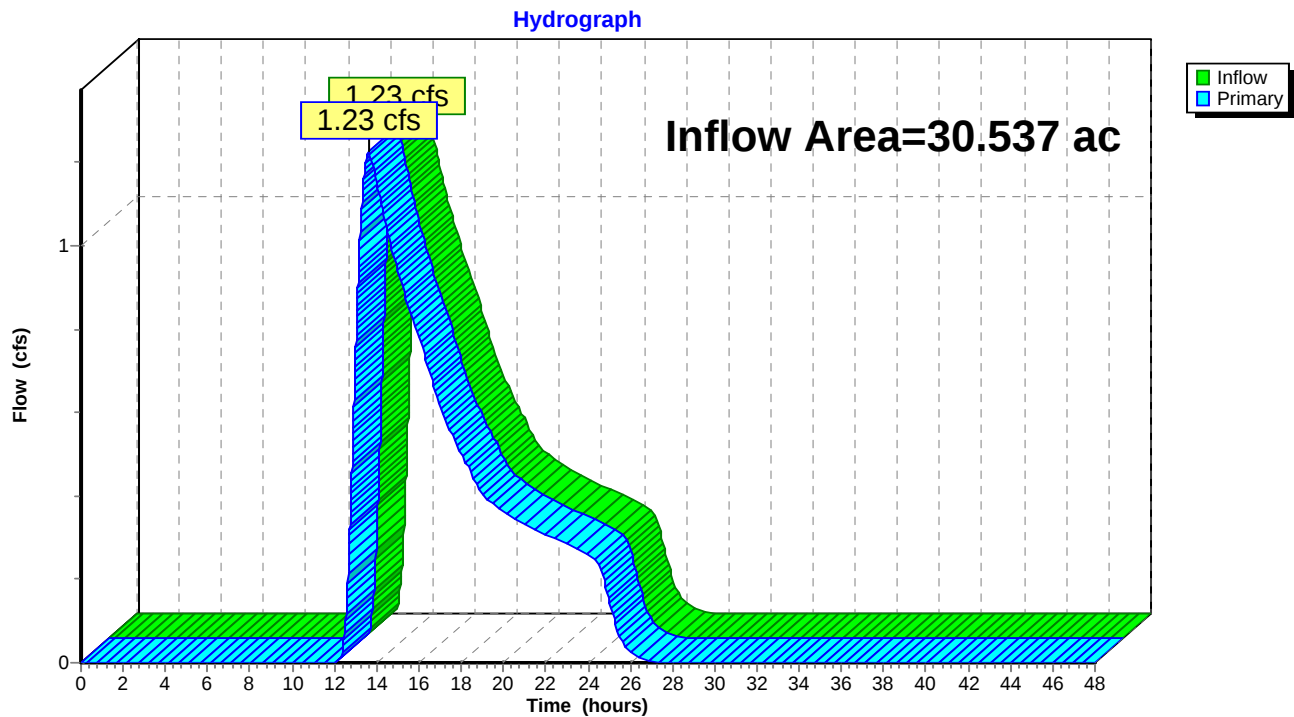
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP2: Study Point #2

Summary for Link SP3: Study Point #3

Inflow Area = 30.537 ac, 1.68% Impervious, Inflow Depth = 0.22" for 2-YEAR event
Inflow = 1.23 cfs @ 13.61 hrs, Volume= 0.565 af
Primary = 1.23 cfs @ 13.61 hrs, Volume= 0.565 af, Atten= 0%, Lag= 0.0 min

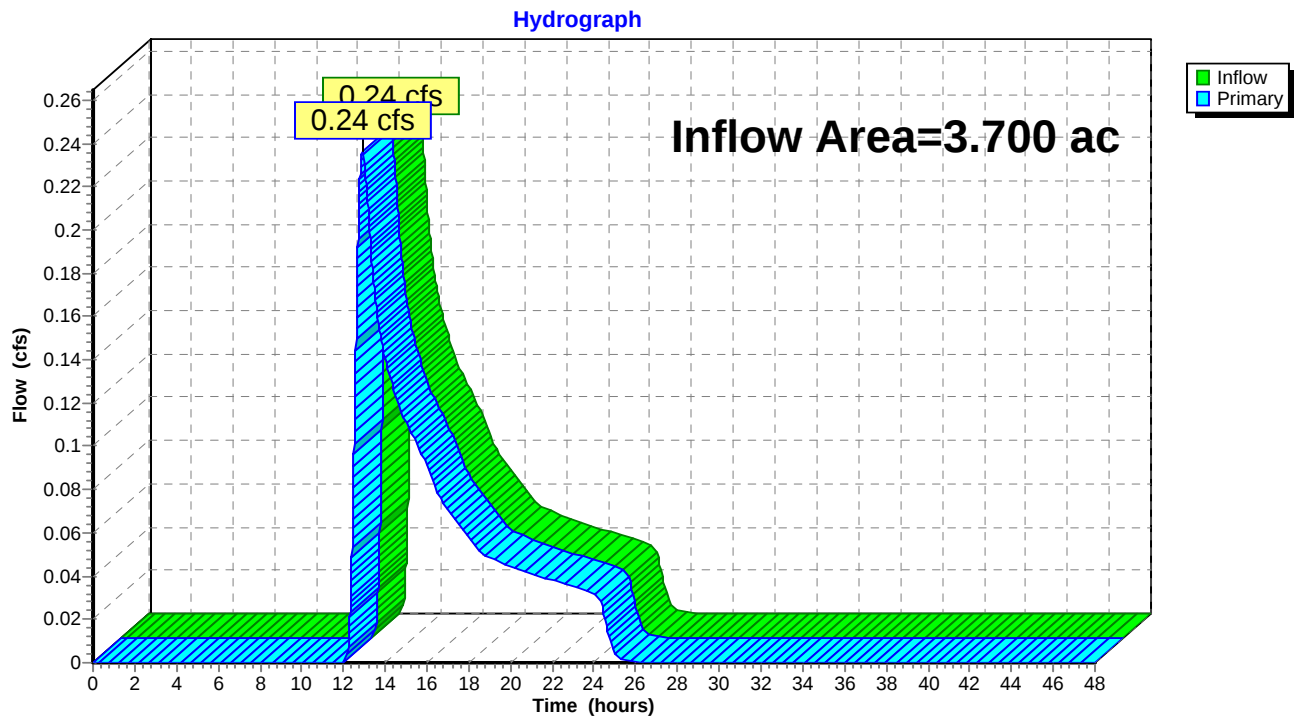
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP3: Study Point #3

Summary for Link SP4: Study Point #4

Inflow Area = 3.700 ac, 0.00% Impervious, Inflow Depth = 0.25" for 2-YEAR event
Inflow = 0.24 cfs @ 12.90 hrs, Volume= 0.077 af
Primary = 0.24 cfs @ 12.90 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP4: Study Point #4

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1.01S:	Runoff Area=607,190 sf 2.45% Impervious Runoff Depth=0.40" Flow Length=770' Tc=24.1 min CN=47 Runoff=2.02 cfs 0.469 af
Subcatchment1.02S:	Runoff Area=43,490 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=340' Tc=33.0 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment1.03S:	Runoff Area=1,333,160 sf 3.02% Impervious Runoff Depth=1.33" Flow Length=2,080' Tc=34.6 min CN=64 Runoff=23.21 cfs 3.384 af
Subcatchment1.04S:	Runoff Area=321,610 sf 0.81% Impervious Runoff Depth=0.49" Flow Length=900' Tc=39.0 min CN=49 Runoff=1.23 cfs 0.302 af
Subcatchment1.05S:	Runoff Area=1,330,210 sf 1.68% Impervious Runoff Depth=0.79" Flow Length=1,720' Tc=81.1 min CN=55 Runoff=6.95 cfs 2.005 af
Subcatchment1.06S:	Runoff Area=161,170 sf 0.00% Impervious Runoff Depth=0.84" Flow Length=960' Tc=44.8 min CN=56 Runoff=1.34 cfs 0.260 af
Reach 1.01R:	Avg. Flow Depth=0.70' Max Vel=0.94 fps Inflow=26.14 cfs 4.155 af n=0.070 L=700.0' S=0.0072 ' /' Capacity=43.26 cfs Outflow=22.71 cfs 4.155 af
Pond 1.03P: 18" CMP Culvert	Peak Elev=225.46' Storage=6,102 cf Inflow=24.15 cfs 3.686 af Primary=6.60 cfs 2.720 af Secondary=17.52 cfs 0.966 af Outflow=24.12 cfs 3.686 af
Pond 1.04P:	Inflow=1.23 cfs 0.302 af Primary=1.23 cfs 0.302 af
Link SP1: Study Point #1	Inflow=22.71 cfs 4.155 af Primary=22.71 cfs 4.155 af
Link SP2: Study Point #2	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
Link SP3: Study Point #3	Inflow=6.95 cfs 2.005 af Primary=6.95 cfs 2.005 af
Link SP4: Study Point #4	Inflow=1.34 cfs 0.260 af Primary=1.34 cfs 0.260 af

Total Runoff Area = 87.163 ac Runoff Volume = 6.420 af Average Runoff Depth = 0.88"
97.89% Pervious = 85.323 ac 2.11% Impervious = 1.840 ac

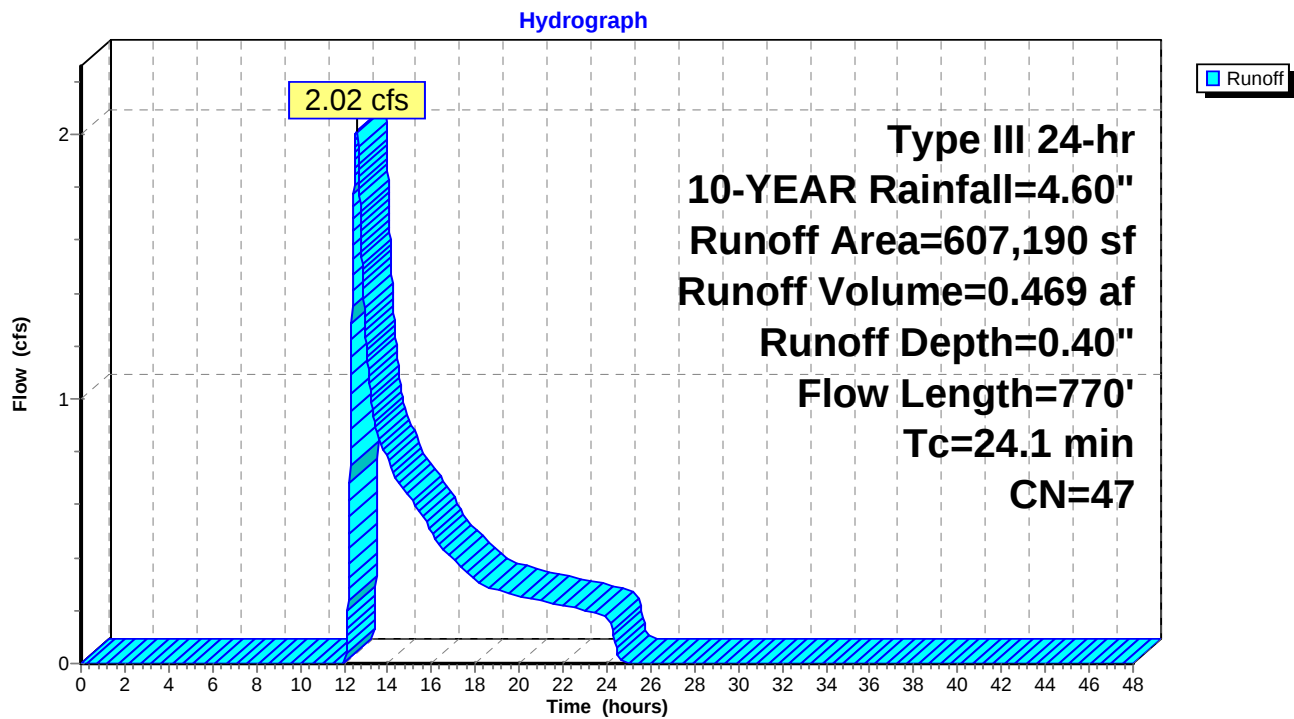
Summary for Subcatchment 1.01S:

Runoff = 2.02 cfs @ 12.57 hrs, Volume= 0.469 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
145,160	80	>75% Grass cover, Good, HSG D
188,830	39	>75% Grass cover, Good, HSG A
8,630	98	Paved roads w/curbs & sewers, HSG D
3,640	98	Paved roads w/curbs & sewers, HSG A
13,130	77	Woods, Good, HSG D
245,210	30	Woods, Good, HSG A
2,590	98	Unconnected roofs, HSG A
607,190	47	Weighted Average
592,330		97.55% Pervious Area
14,860		2.45% Impervious Area
2,590		17.43% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	150	0.0200	0.12		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.0	620	0.0300	2.60		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
24.1	770	Total			

Subcatchment 1.01S:

Summary for Subcatchment 1.02S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

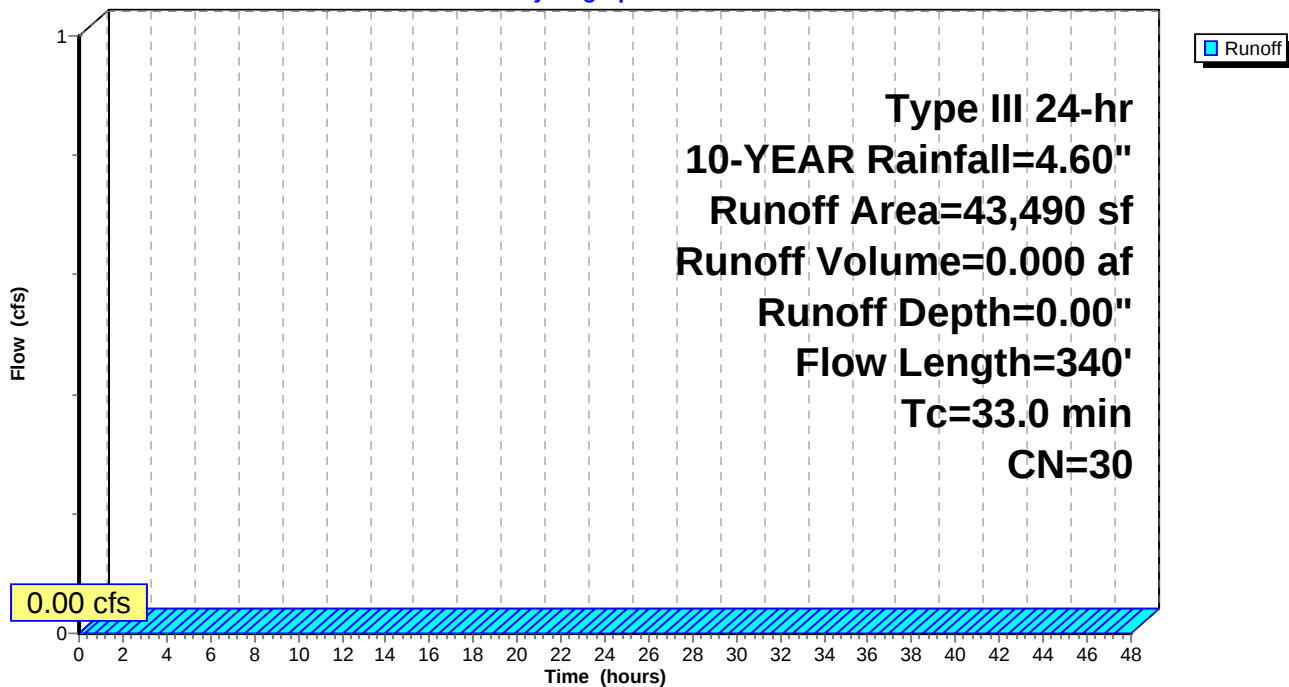
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
43,490	30	Woods, Good, HSG A
43,490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	150	0.0230	0.09		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
4.5	190	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
33.0	340	Total			

Subcatchment 1.02S:

Hydrograph



Summary for Subcatchment 1.03S:

Runoff = 23.21 cfs @ 12.53 hrs, Volume= 3.384 af, Depth= 1.33"

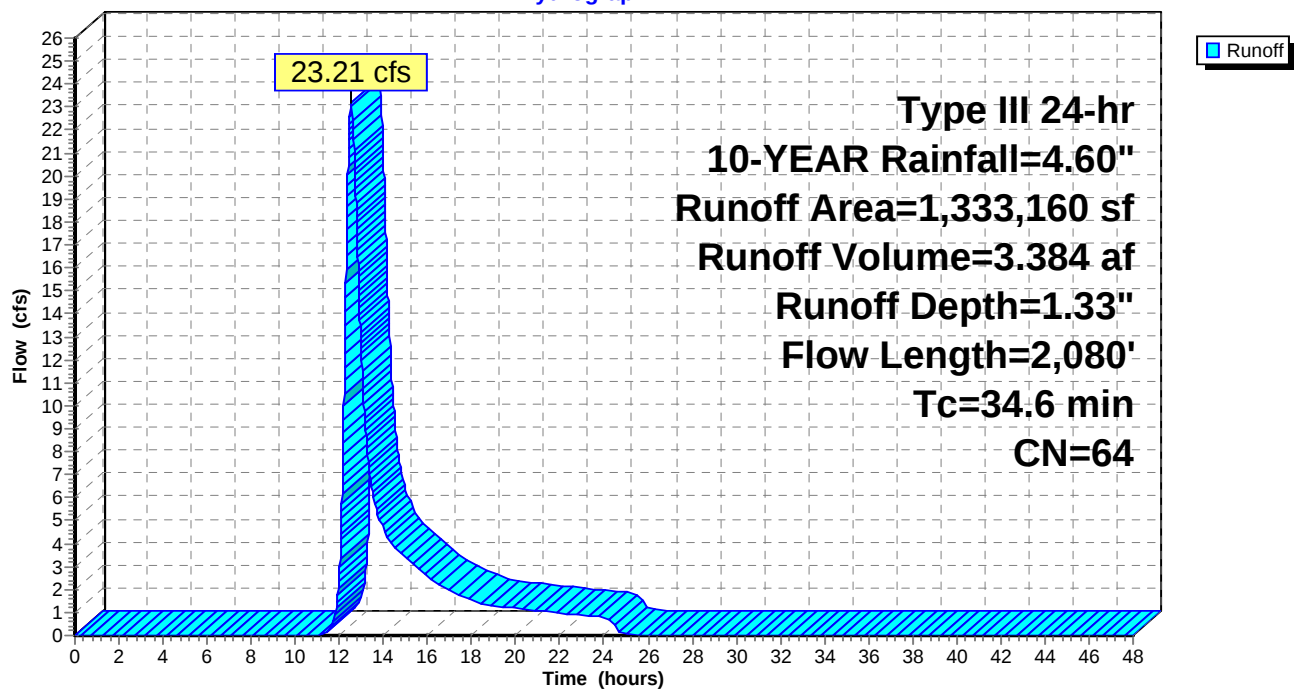
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
206,040	39	>75% Grass cover, Good, HSG A
760,280	74	>75% Grass cover, Good, HSG C
80,490	80	>75% Grass cover, Good, HSG D
7,220	98	Paved roads w/curbs & sewers, HSG D
2,890	98	Paved roads w/curbs & sewers, HSG A
21,480	98	Paved roads w/curbs & sewers, HSG C
174,360	30	Woods, Good, HSG A
62,980	70	Woods, Good, HSG C
2,270	76	Gravel roads, HSG A
6,480	89	Gravel roads, HSG C
6,400	98	Unconnected roofs, HSG C
2,270	98	Unconnected roofs, HSG A
1,333,160	64	Weighted Average
1,292,900		96.98% Pervious Area
40,260		3.02% Impervious Area
8,670		21.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0300	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
17.5	1,930	0.0150	1.84		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
34.6	2,080	Total			

Subcatchment 1.03S:

Hydrograph



Summary for Subcatchment 1.04S:

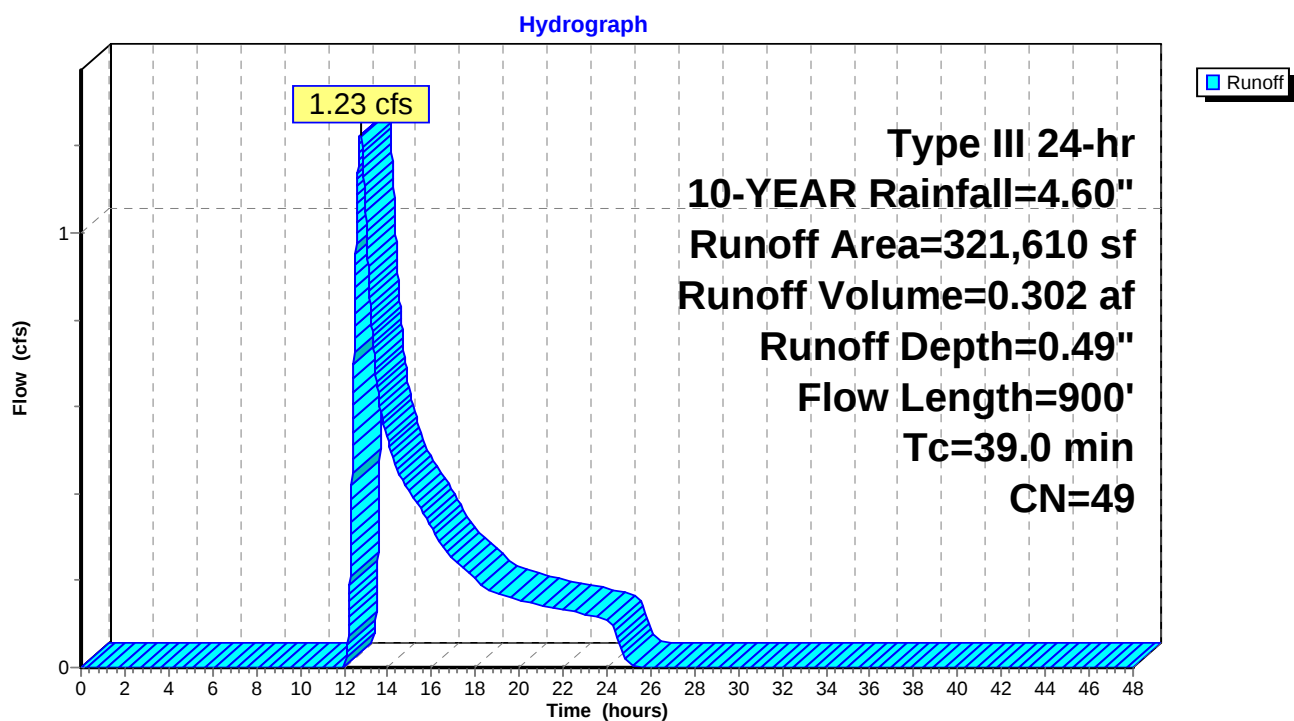
Runoff = 1.23 cfs @ 12.74 hrs, Volume= 0.302 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
72,020	39	>75% Grass cover, Good, HSG A
55,490	74	>75% Grass cover, Good, HSG C
118,860	30	Woods, Good, HSG A
2,480	55	Woods, Good, HSG B
68,300	70	Woods, Good, HSG C
1,840	76	Gravel roads, HSG A
2,620	98	Unconnected roofs, HSG D
321,610	49	Weighted Average
318,990		99.19% Pervious Area
2,620		0.81% Impervious Area
2,620		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	130	0.0800	1.41		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
14.6	620	0.0050	0.71		Shallow Concentrated Flow, C-D Nearly Bare & Untilled Kv= 10.0 fps
39.0	900	Total			

Subcatchment 1.04S:



Summary for Subcatchment 1.05S:

Runoff = 6.95 cfs @ 13.25 hrs, Volume= 2.005 af, Depth= 0.79"

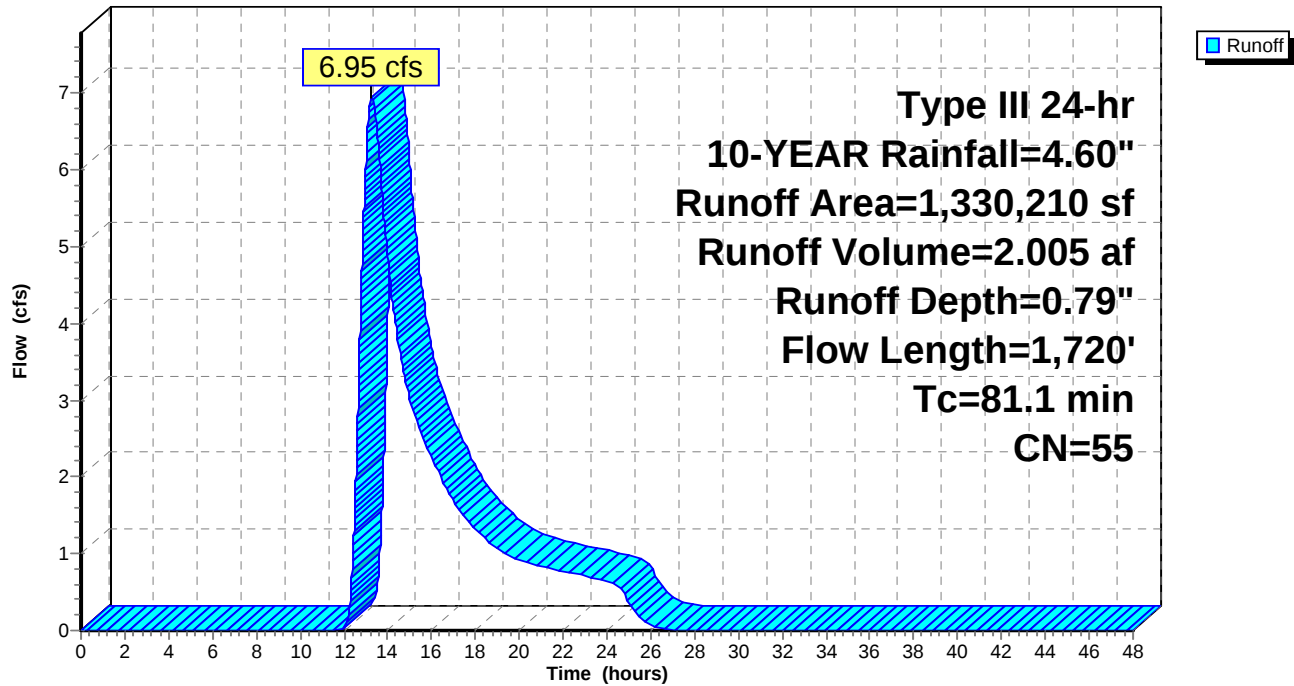
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
23,430	39	>75% Grass cover, Good, HSG A
135,940	74	>75% Grass cover, Good, HSG C
411,320	30	Woods, Good, HSG A
448,710	70	Woods, Good, HSG C
288,410	55	Woods, Good, HSG B
22,400	98	Water Surface, HSG C
1,330,210	55	Weighted Average
1,307,810		98.32% Pervious Area
22,400		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
1.9	170	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
46.7	1,400	0.0100	0.50		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
81.1	1,720	Total			

Subcatchment 1.05S:

Hydrograph



Summary for Subcatchment 1.06S:

Runoff = 1.34 cfs @ 12.74 hrs, Volume= 0.260 af, Depth= 0.84"

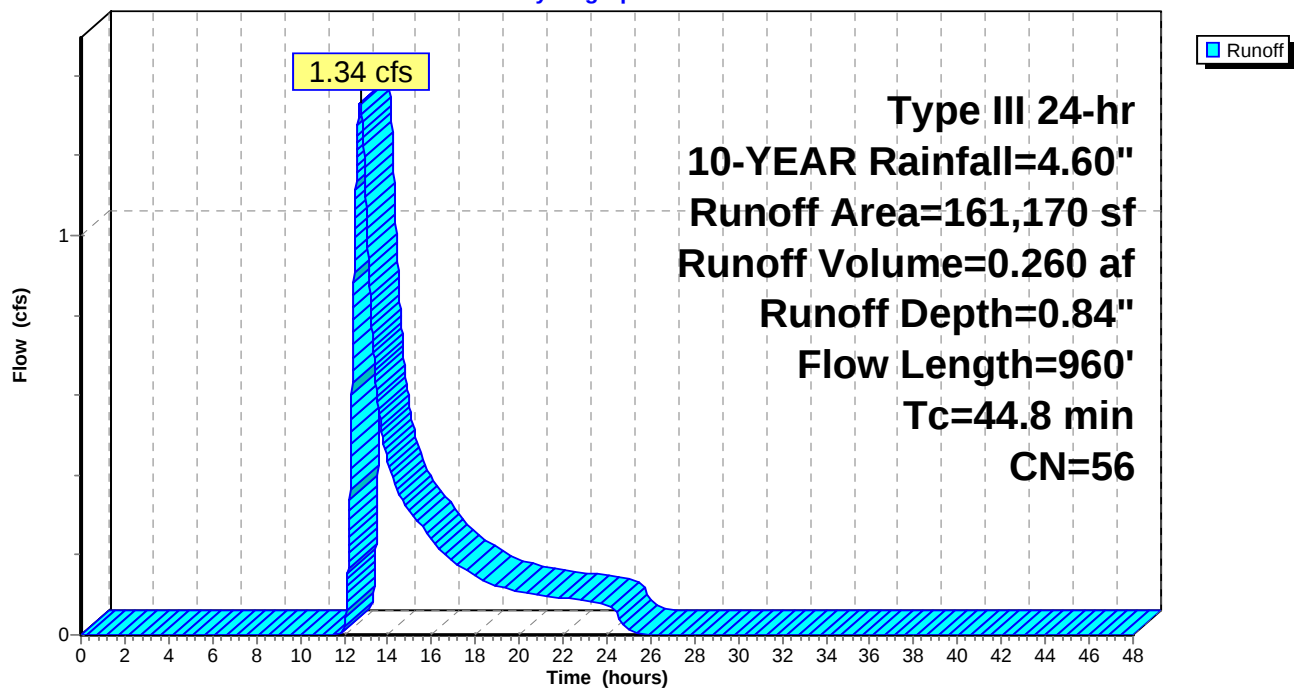
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
20,190	30	Woods, Good, HSG A
41,030	70	Woods, Good, HSG C
99,950	55	Woods, Good, HSG B
161,170	56	Weighted Average
161,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	150	0.0300	0.10		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
19.1	810	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
44.8	960	Total			

Subcatchment 1.06S:

Hydrograph



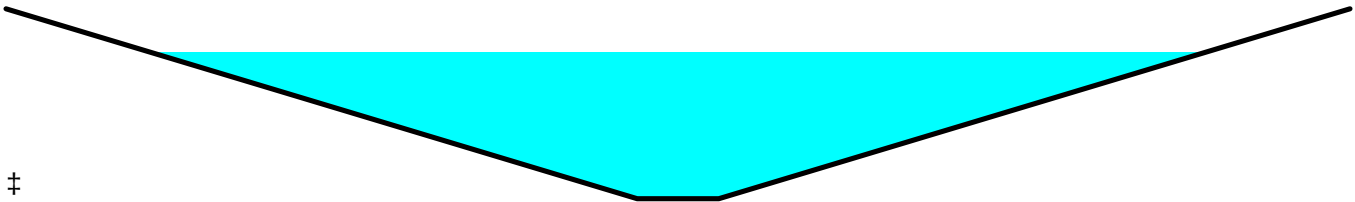
Summary for Reach 1.01R:

Inflow Area = 51.927 ac, 2.55% Impervious, Inflow Depth = 0.96" for 10-YEAR event
 Inflow = 26.14 cfs @ 12.56 hrs, Volume= 4.155 af
 Outflow = 22.71 cfs @ 12.74 hrs, Volume= 4.155 af, Atten= 13%, Lag= 10.4 min

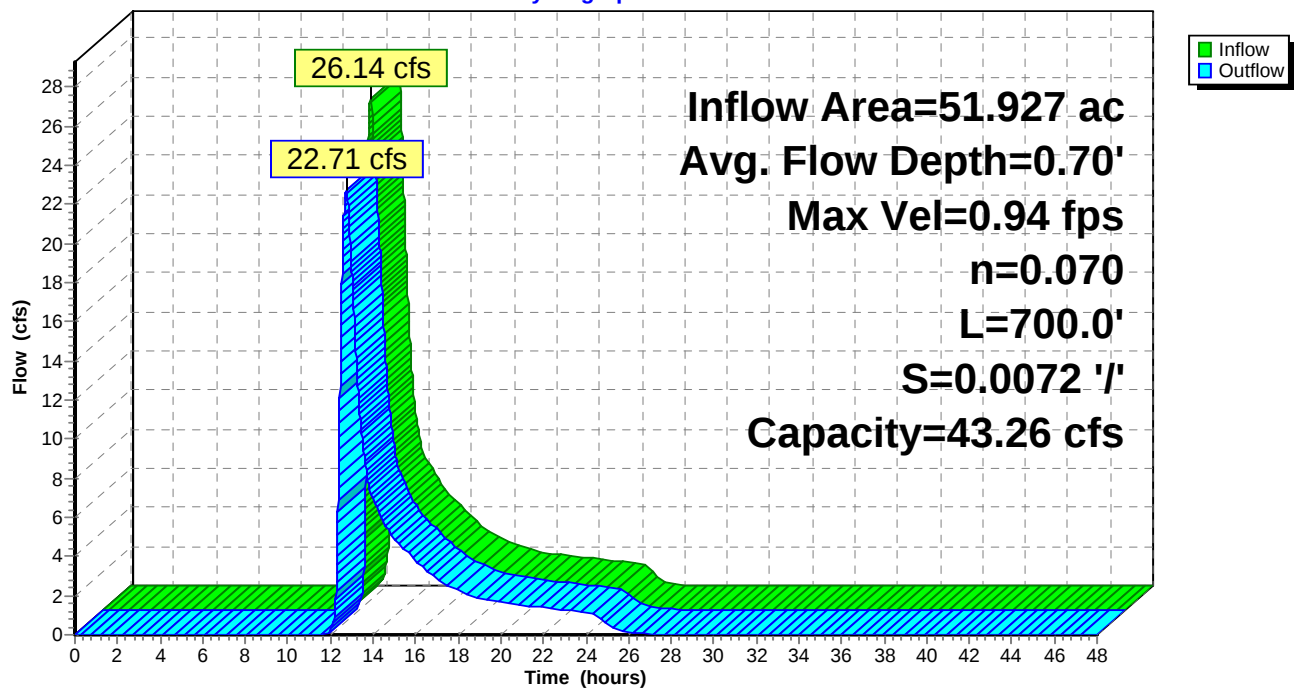
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.94 fps, Min. Travel Time= 12.5 min
 Avg. Velocity = 0.26 fps, Avg. Travel Time= 45.3 min

Peak Storage= 16,987 cf @ 12.74 hrs
 Average Depth at Peak Storage= 0.70'
 Bank-Full Depth= 0.90' Flow Area= 39.3 sf, Capacity= 43.26 cfs

5.00' x 0.90' deep channel, n= 0.070 Sluggish weedy reaches w/pools
 Side Slope Z-value= 43.0 '/' Top Width= 82.40'
 Length= 700.0' Slope= 0.0072 '/'
 Inlet Invert= 222.30', Outlet Invert= 217.26'

**Reach 1.01R:**

Hydrograph



Stage-Area-Storage for Reach 1.01R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
222.30	0.0	0	222.83	14.7	10,310
222.31	0.1	38	222.84	15.2	10,667
222.32	0.1	82	222.85	15.8	11,030
222.33	0.2	133	222.86	16.3	11,400
222.34	0.3	189	222.87	16.8	11,775
222.35	0.4	251	222.88	17.4	12,156
222.36	0.5	319	222.89	17.9	12,543
222.37	0.6	393	222.90	18.5	12,937
222.38	0.7	473	222.91	19.1	13,336
222.39	0.8	559	222.92	19.6	13,741
222.40	0.9	651	222.93	20.2	14,152
222.41	1.1	750	222.94	20.8	14,569
222.42	1.2	854	222.95	21.4	14,993
222.43	1.4	964	222.96	22.0	15,422
222.44	1.5	1,081	222.97	22.7	15,857
222.45	1.7	1,203	222.98	23.3	16,299
222.46	1.9	1,331	222.99	23.9	16,746
222.47	2.1	1,465	223.00	24.6	17,199
222.48	2.3	1,605	223.01	25.2	17,659
222.49	2.5	1,752	223.02	25.9	18,124
222.50	2.7	1,904	223.03	26.6	18,596
222.51	2.9	2,063	223.04	27.2	19,073
222.52	3.2	2,227	223.05	27.9	19,557
222.53	3.4	2,398	223.06	28.6	20,046
222.54	3.7	2,574	223.07	29.3	20,542
222.55	3.9	2,757	223.08	30.1	21,043
222.56	4.2	2,945	223.09	30.8	21,551
222.57	4.5	3,139	223.10	31.5	22,064
222.58	4.8	3,340	223.11	32.3	22,584
222.59	5.1	3,547	223.12	33.0	23,109
222.60	5.4	3,760	223.13	33.8	23,641
222.61	5.7	3,978	223.14	34.5	24,179
222.62	6.0	4,203	223.15	35.3	24,723
222.63	6.3	4,433	223.16	36.1	25,273
222.64	6.7	4,670	223.17	36.9	25,828
222.65	7.0	4,912	223.18	37.7	26,390
222.66	7.4	5,161	223.19	38.5	26,957
222.67	7.7	5,416	223.20	39.3	27,531
222.68	8.1	5,677			
222.69	8.5	5,944			
222.70	8.9	6,217			
222.71	9.3	6,495			
222.72	9.7	6,780			
222.73	10.1	7,071			
222.74	10.5	7,368			
222.75	11.0	7,670			
222.76	11.4	7,979			
222.77	11.8	8,295			
222.78	12.3	8,616			
222.79	12.8	8,943			
222.80	13.3	9,276			
222.81	13.7	9,615			
222.82	14.2	9,959			

Summary for Pond 1.03P: 18" CMP Culvert

Inflow Area = 37.988 ac, 2.59% Impervious, Inflow Depth = 1.16" for 10-YEAR event
 Inflow = 24.15 cfs @ 12.54 hrs, Volume= 3.686 af
 Outflow = 24.12 cfs @ 12.56 hrs, Volume= 3.686 af, Atten= 0%, Lag= 1.5 min
 Primary = 6.60 cfs @ 12.56 hrs, Volume= 2.720 af
 Secondary = 17.52 cfs @ 12.56 hrs, Volume= 0.966 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 225.46' @ 12.56 hrs Surf.Area= 6,261 sf Storage= 6,102 cf
 Flood Elev= 149.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 11.6 min calculated for 3.686 af (100% of inflow)
 Center-of-Mass det. time= 11.5 min (912.8 - 901.2)

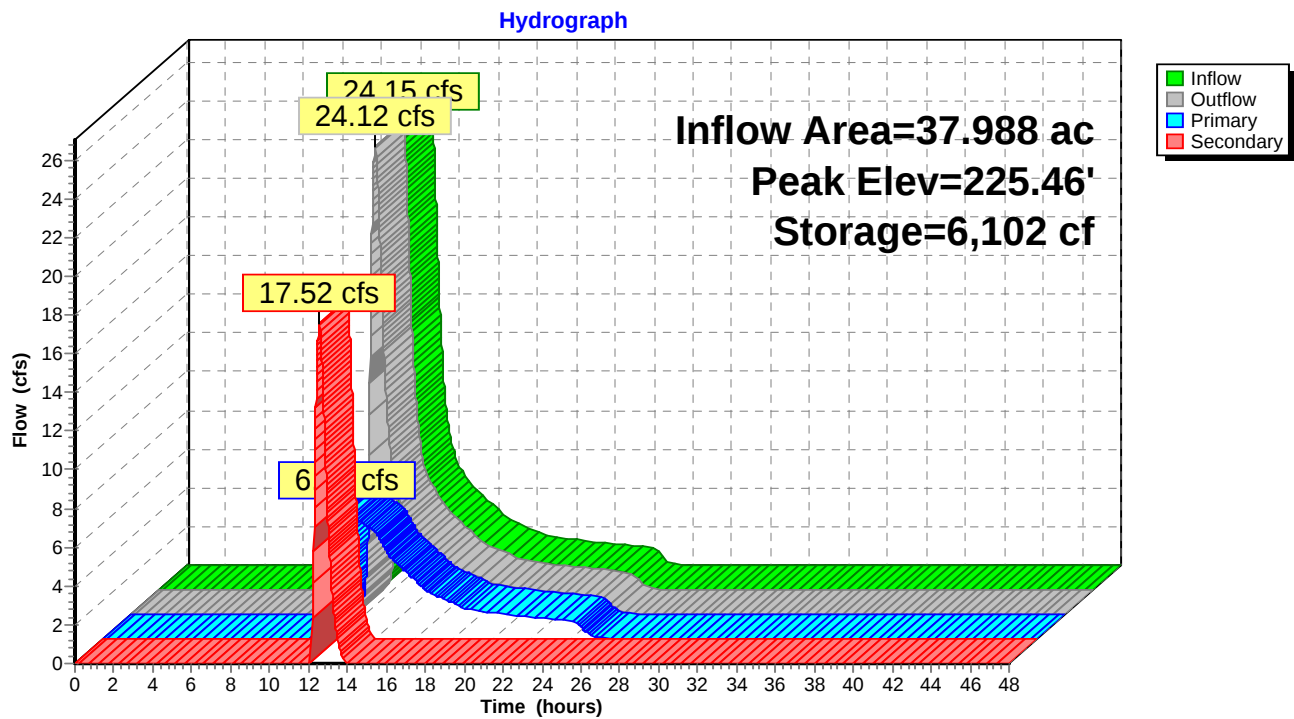
Volume	Invert	Avail.Storage	Storage Description
#1	223.50'	6,375 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.50	1,000	0	0
224.00	2,300	825	825
225.00	3,700	3,000	3,825
225.50	6,500	2,550	6,375

Device	Routing	Invert	Outlet Devices
#1	Primary	223.50'	18.0" Round Culvert L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 223.50' / 223.50' S= 0.0000 ' /' Cc= 0.900 n= 0.010, Flow Area= 1.77 sf
#2	Secondary	225.20'	50.0' long x 20.0' breadth Overflow at Driveway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.60 cfs @ 12.56 hrs HW=225.46' TW=222.95' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 6.60 cfs @ 3.76 fps)

Secondary OutFlow Max=17.52 cfs @ 12.56 hrs HW=225.46' TW=222.95' (Dynamic Tailwater)
 ↑ **2=Overflow at Driveway** (Weir Controls 17.52 cfs @ 1.36 fps)

Pond 1.03P: 18" CMP Culvert

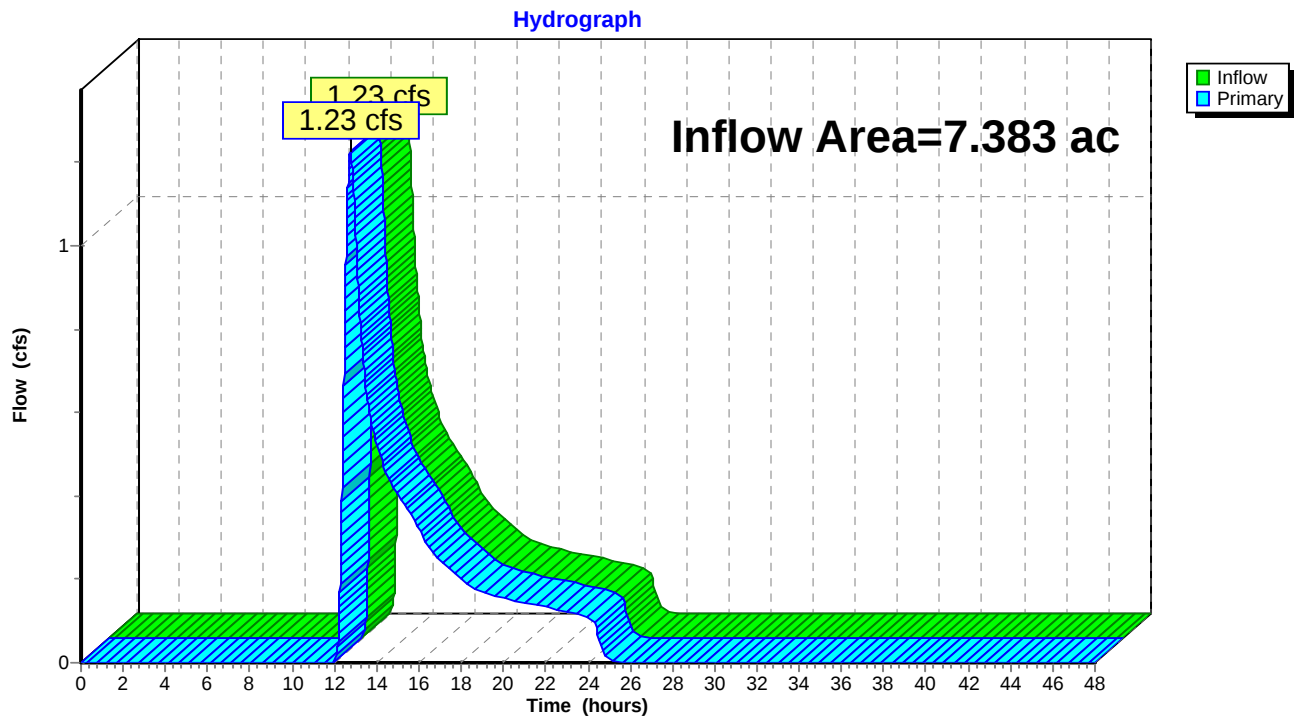
Stage-Area-Storage for Pond 1.03P: 18" CMP Culvert

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
223.50	1,000	0	224.56	3,084	2,333
223.52	1,052	21	224.58	3,112	2,394
223.54	1,104	42	224.60	3,140	2,457
223.56	1,156	65	224.62	3,168	2,520
223.58	1,208	88	224.64	3,196	2,584
223.60	1,260	113	224.66	3,224	2,648
223.62	1,312	139	224.68	3,252	2,713
223.64	1,364	165	224.70	3,280	2,778
223.66	1,416	193	224.72	3,308	2,844
223.68	1,468	222	224.74	3,336	2,910
223.70	1,520	252	224.76	3,364	2,977
223.72	1,572	283	224.78	3,392	3,045
223.74	1,624	315	224.80	3,420	3,113
223.76	1,676	348	224.82	3,448	3,182
223.78	1,728	382	224.84	3,476	3,251
223.80	1,780	417	224.86	3,504	3,321
223.82	1,832	453	224.88	3,532	3,391
223.84	1,884	490	224.90	3,560	3,462
223.86	1,936	528	224.92	3,588	3,533
223.88	1,988	568	224.94	3,616	3,606
223.90	2,040	608	224.96	3,644	3,678
223.92	2,092	649	224.98	3,672	3,751
223.94	2,144	692	225.00	3,700	3,825
223.96	2,196	735	225.02	3,812	3,900
223.98	2,248	780	225.04	3,924	3,977
224.00	2,300	825	225.06	4,036	4,057
224.02	2,328	871	225.08	4,148	4,139
224.04	2,356	918	225.10	4,260	4,223
224.06	2,384	966	225.12	4,372	4,309
224.08	2,412	1,013	225.14	4,484	4,398
224.10	2,440	1,062	225.16	4,596	4,489
224.12	2,468	1,111	225.18	4,708	4,582
224.14	2,496	1,161	225.20	4,820	4,677
224.16	2,524	1,211	225.22	4,932	4,775
224.18	2,552	1,262	225.24	5,044	4,874
224.20	2,580	1,313	225.26	5,156	4,976
224.22	2,608	1,365	225.28	5,268	5,081
224.24	2,636	1,417	225.30	5,380	5,187
224.26	2,664	1,470	225.32	5,492	5,296
224.28	2,692	1,524	225.34	5,604	5,407
224.30	2,720	1,578	225.36	5,716	5,520
224.32	2,748	1,633	225.38	5,828	5,635
224.34	2,776	1,688	225.40	5,940	5,753
224.36	2,804	1,744	225.42	6,052	5,873
224.38	2,832	1,800	225.44	6,164	5,995
224.40	2,860	1,857	225.46	6,276	6,119
224.42	2,888	1,914	225.48	6,388	6,246
224.44	2,916	1,973	225.50	6,500	6,375
224.46	2,944	2,031			
224.48	2,972	2,090			
224.50	3,000	2,150			
224.52	3,028	2,210			
224.54	3,056	2,271			

Summary for Pond 1.04P:

Inflow Area = 7.383 ac, 0.81% Impervious, Inflow Depth = 0.49" for 10-YEAR event
Inflow = 1.23 cfs @ 12.74 hrs, Volume= 0.302 af
Primary = 1.23 cfs @ 12.74 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min

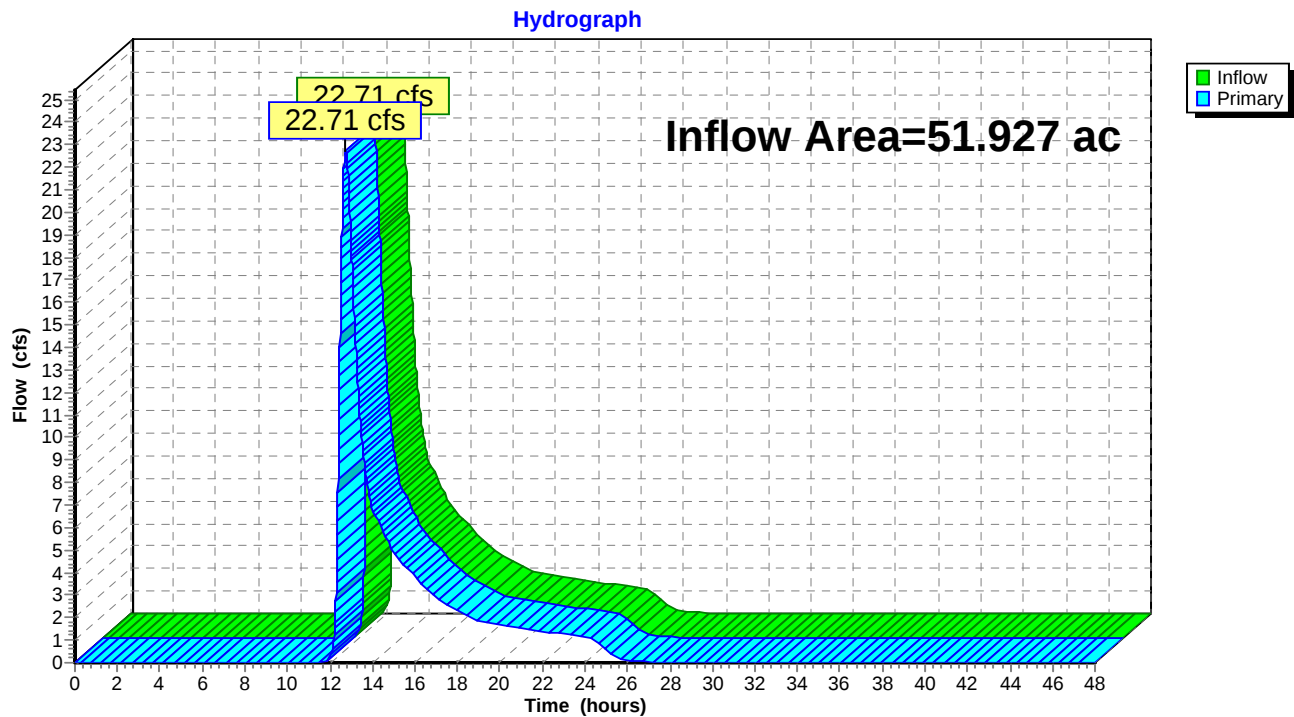
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 1.04P:

Summary for Link SP1: Study Point #1

Inflow Area = 51.927 ac, 2.55% Impervious, Inflow Depth = 0.96" for 10-YEAR event
Inflow = 22.71 cfs @ 12.74 hrs, Volume= 4.155 af
Primary = 22.71 cfs @ 12.74 hrs, Volume= 4.155 af, Atten= 0%, Lag= 0.0 min

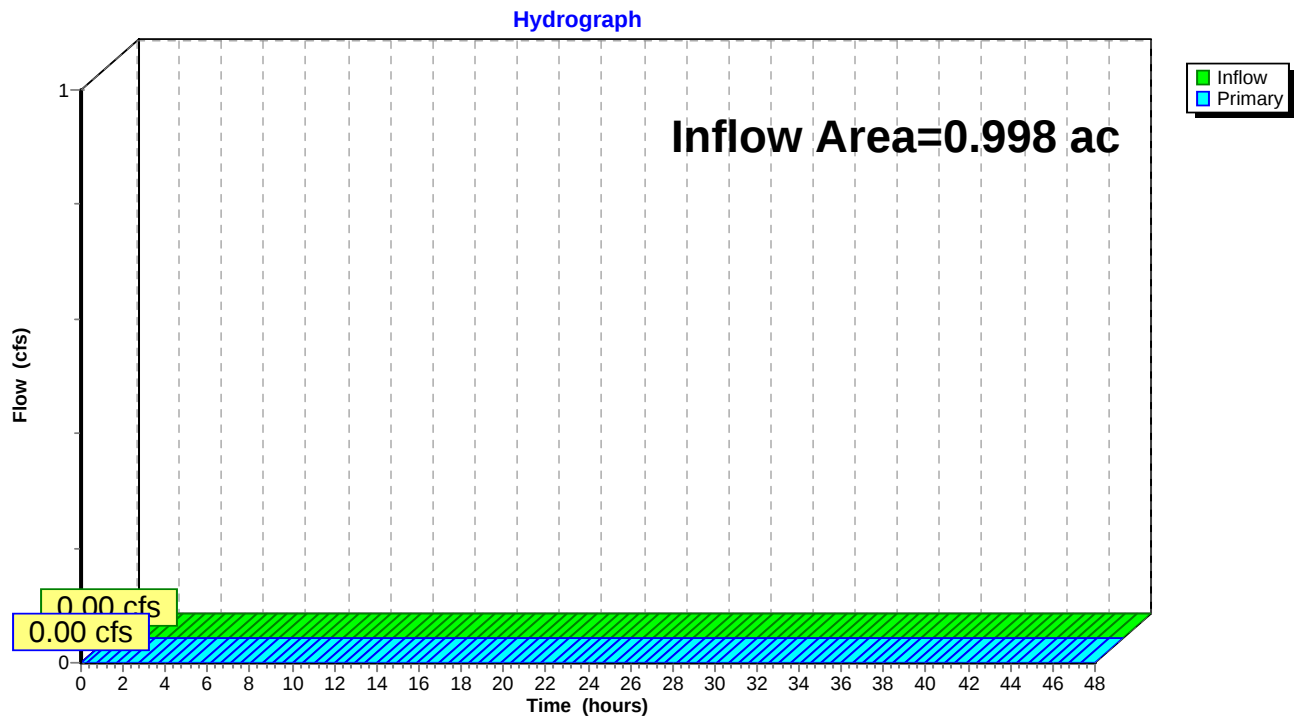
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP1: Study Point #1

Summary for Link SP2: Study Point #2

Inflow Area = 0.998 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

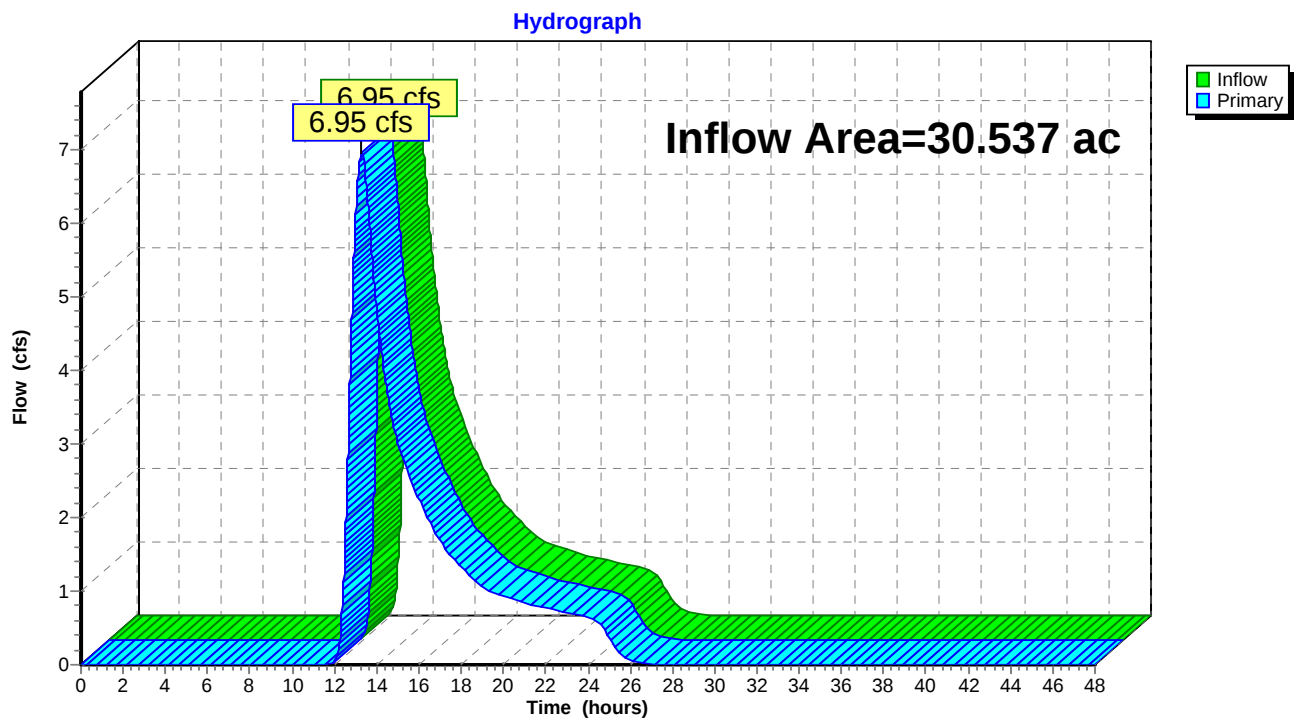
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP2: Study Point #2

Summary for Link SP3: Study Point #3

Inflow Area = 30.537 ac, 1.68% Impervious, Inflow Depth = 0.79" for 10-YEAR event
Inflow = 6.95 cfs @ 13.25 hrs, Volume= 2.005 af
Primary = 6.95 cfs @ 13.25 hrs, Volume= 2.005 af, Atten= 0%, Lag= 0.0 min

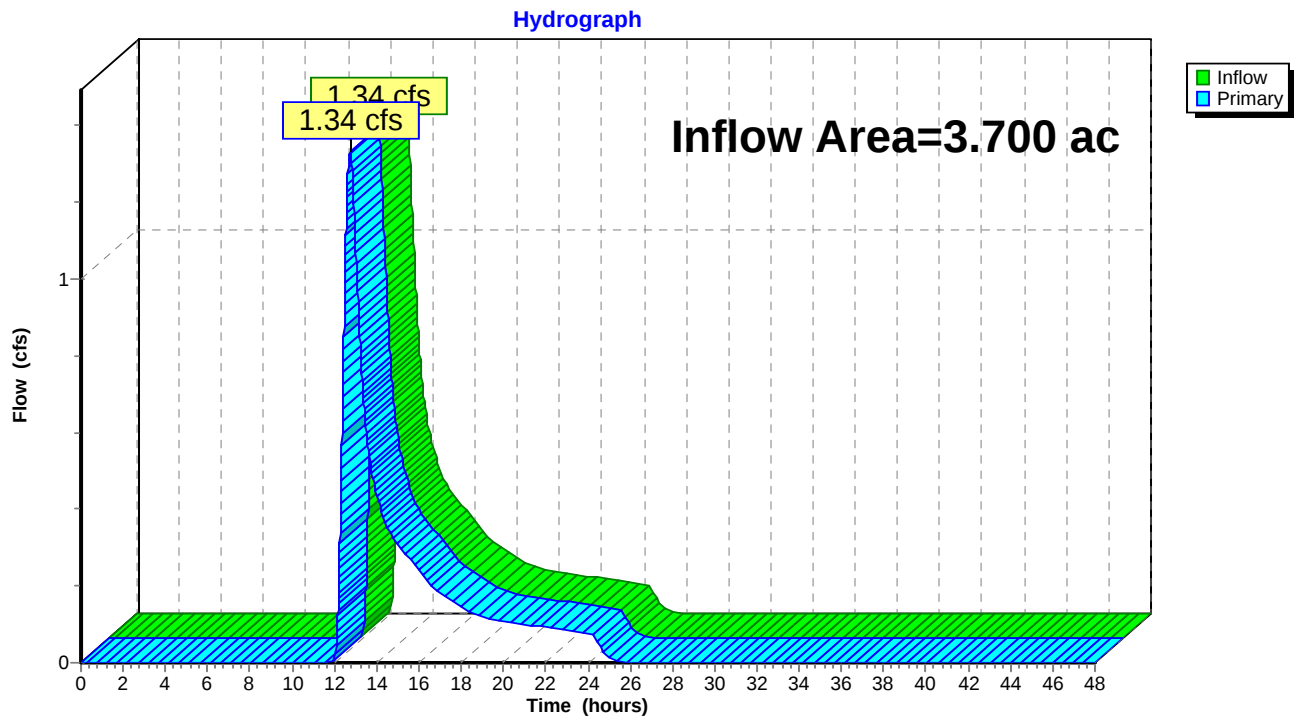
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP3: Study Point #3

Summary for Link SP4: Study Point #4

Inflow Area = 3.700 ac, 0.00% Impervious, Inflow Depth = 0.84" for 10-YEAR event
Inflow = 1.34 cfs @ 12.74 hrs, Volume= 0.260 af
Primary = 1.34 cfs @ 12.74 hrs, Volume= 0.260 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP4: Study Point #4

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1.01S: Runoff Area=607,190 sf 2.45% Impervious Runoff Depth=0.85"
 Flow Length=770' Tc=24.1 min CN=47 Runoff=5.97 cfs 0.985 af

Subcatchment1.02S: Runoff Area=43,490 sf 0.00% Impervious Runoff Depth=0.05"
 Flow Length=340' Tc=33.0 min CN=30 Runoff=0.01 cfs 0.004 af

Subcatchment1.03S: Runoff Area=1,333,160 sf 3.02% Impervious Runoff Depth=2.12"
 Flow Length=2,080' Tc=34.6 min CN=64 Runoff=38.91 cfs 5.412 af

Subcatchment1.04S: Runoff Area=321,610 sf 0.81% Impervious Runoff Depth=0.98"
 Flow Length=900' Tc=39.0 min CN=49 Runoff=3.21 cfs 0.602 af

Subcatchment1.05S: Runoff Area=1,330,210 sf 1.68% Impervious Runoff Depth=1.40"
 Flow Length=1,720' Tc=81.1 min CN=55 Runoff=14.12 cfs 3.573 af

Subcatchment1.06S: Runoff Area=161,170 sf 0.00% Impervious Runoff Depth=1.48"
 Flow Length=960' Tc=44.8 min CN=56 Runoff=2.65 cfs 0.456 af

Reach 1.01R: Avg. Flow Depth=0.90' Max Vel=1.10 fps Inflow=47.64 cfs 6.998 af
 n=0.070 L=700.0' S=0.0072 ' /' Capacity=43.26 cfs Outflow=43.00 cfs 6.998 af

Pond 1.03P: 18" CMP Culvert Peak Elev=225.60' Storage=6,375 cf Inflow=41.73 cfs 6.014 af
 Primary=7.29 cfs 3.666 af Secondary=34.51 cfs 2.348 af Outflow=41.80 cfs 6.014 af

Pond 1.04P: Inflow=3.21 cfs 0.602 af
 Primary=3.21 cfs 0.602 af

Link SP1: Study Point #1 Inflow=43.00 cfs 6.998 af
 Primary=43.00 cfs 6.998 af

Link SP2: Study Point #2 Inflow=0.01 cfs 0.004 af
 Primary=0.01 cfs 0.004 af

Link SP3: Study Point #3 Inflow=14.12 cfs 3.573 af
 Primary=14.12 cfs 3.573 af

Link SP4: Study Point #4 Inflow=2.65 cfs 0.456 af
 Primary=2.65 cfs 0.456 af

Total Runoff Area = 87.163 ac Runoff Volume = 11.033 af Average Runoff Depth = 1.52"
97.89% Pervious = 85.323 ac 2.11% Impervious = 1.840 ac

Summary for Subcatchment 1.01S:

Runoff = 5.97 cfs @ 12.45 hrs, Volume= 0.985 af, Depth= 0.85"

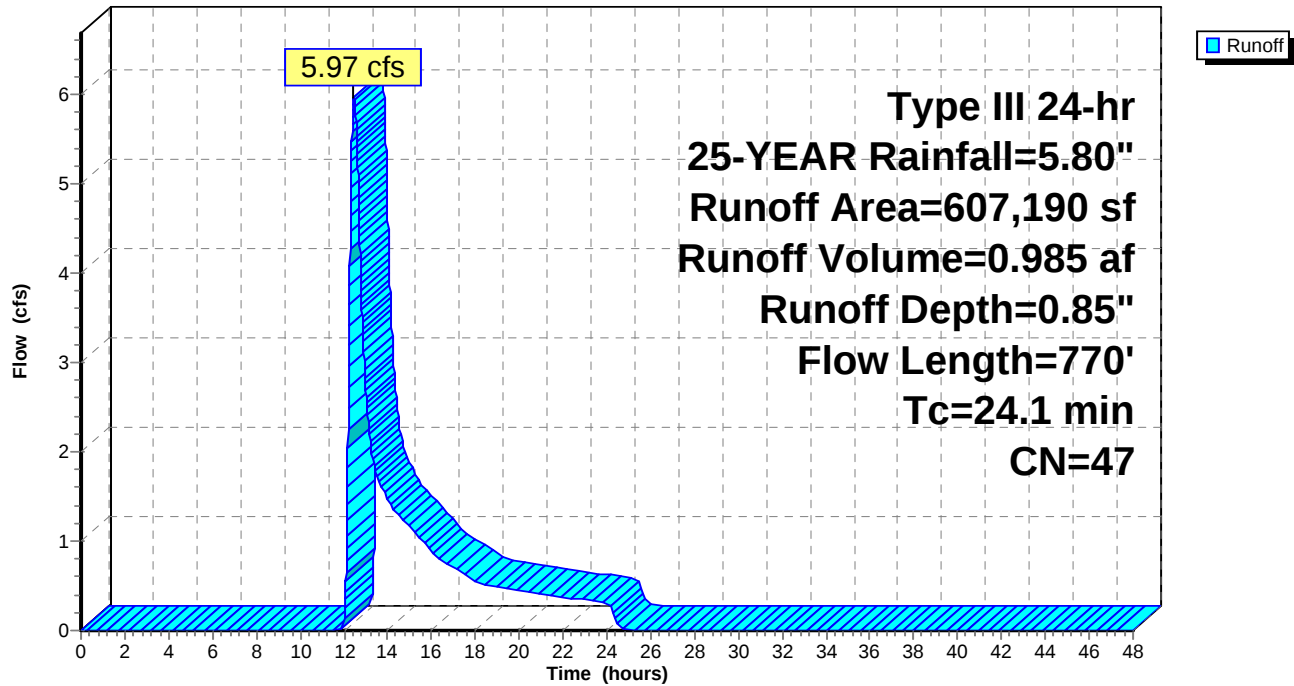
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
145,160	80	>75% Grass cover, Good, HSG D
188,830	39	>75% Grass cover, Good, HSG A
8,630	98	Paved roads w/curbs & sewers, HSG D
3,640	98	Paved roads w/curbs & sewers, HSG A
13,130	77	Woods, Good, HSG D
245,210	30	Woods, Good, HSG A
2,590	98	Unconnected roofs, HSG A
607,190	47	Weighted Average
592,330		97.55% Pervious Area
14,860		2.45% Impervious Area
2,590		17.43% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1	150	0.0200	0.12		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.0	620	0.0300	2.60		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
24.1	770	Total			

Subcatchment 1.01S:

Hydrograph



Summary for Subcatchment 1.02S:

Runoff = 0.01 cfs @ 17.20 hrs, Volume= 0.004 af, Depth= 0.05"

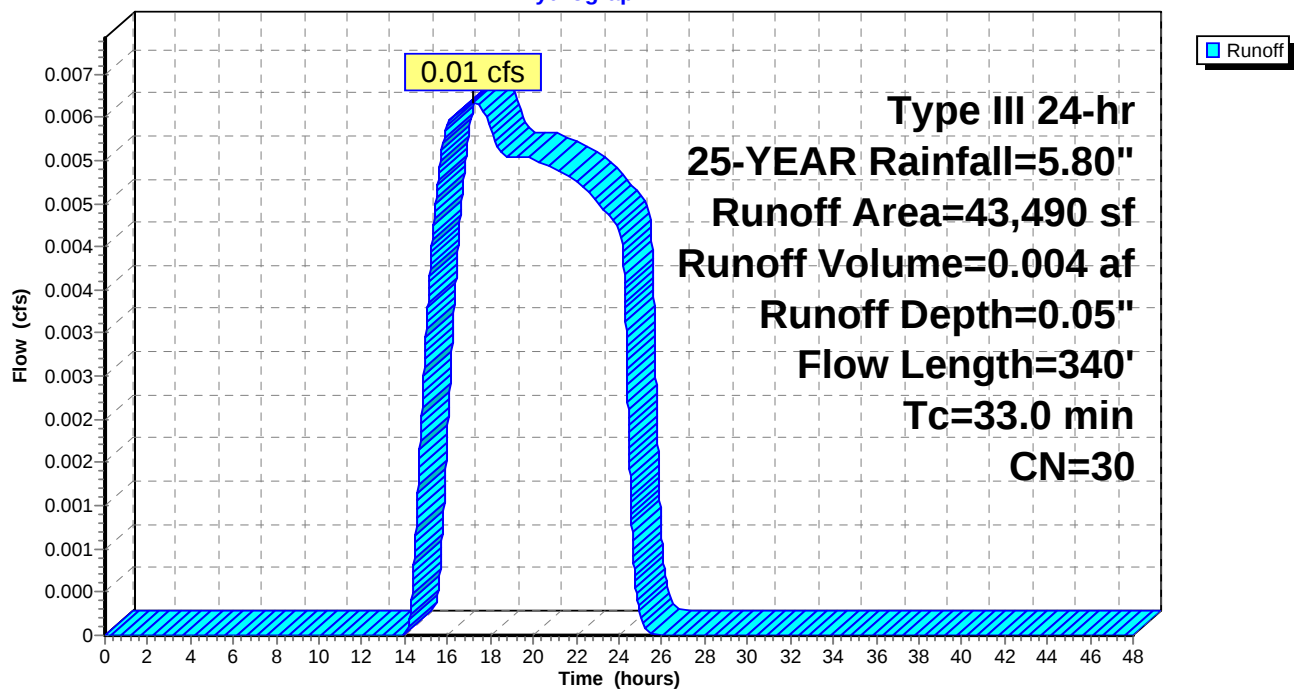
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
43,490	30	Woods, Good, HSG A
43,490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	150	0.0230	0.09		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
4.5	190	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
33.0	340	Total			

Subcatchment 1.02S:

Hydrograph



Summary for Subcatchment 1.03S:

Runoff = 38.91 cfs @ 12.50 hrs, Volume= 5.412 af, Depth= 2.12"

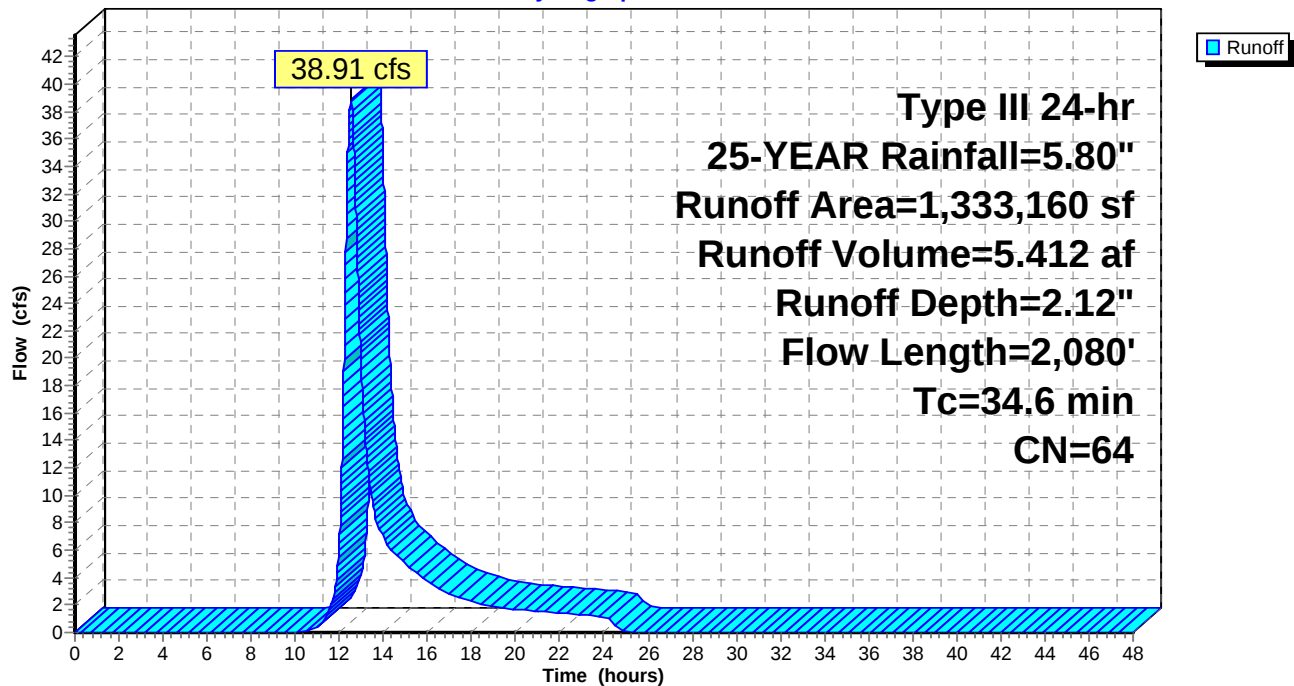
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
206,040	39	>75% Grass cover, Good, HSG A
760,280	74	>75% Grass cover, Good, HSG C
80,490	80	>75% Grass cover, Good, HSG D
7,220	98	Paved roads w/curbs & sewers, HSG D
2,890	98	Paved roads w/curbs & sewers, HSG A
21,480	98	Paved roads w/curbs & sewers, HSG C
174,360	30	Woods, Good, HSG A
62,980	70	Woods, Good, HSG C
2,270	76	Gravel roads, HSG A
6,480	89	Gravel roads, HSG C
6,400	98	Unconnected roofs, HSG C
2,270	98	Unconnected roofs, HSG A
1,333,160	64	Weighted Average
1,292,900		96.98% Pervious Area
40,260		3.02% Impervious Area
8,670		21.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0300	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
17.5	1,930	0.0150	1.84		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
34.6	2,080	Total			

Subcatchment 1.03S:

Hydrograph



Summary for Subcatchment 1.04S:

Runoff = 3.21 cfs @ 12.66 hrs, Volume= 0.602 af, Depth= 0.98"

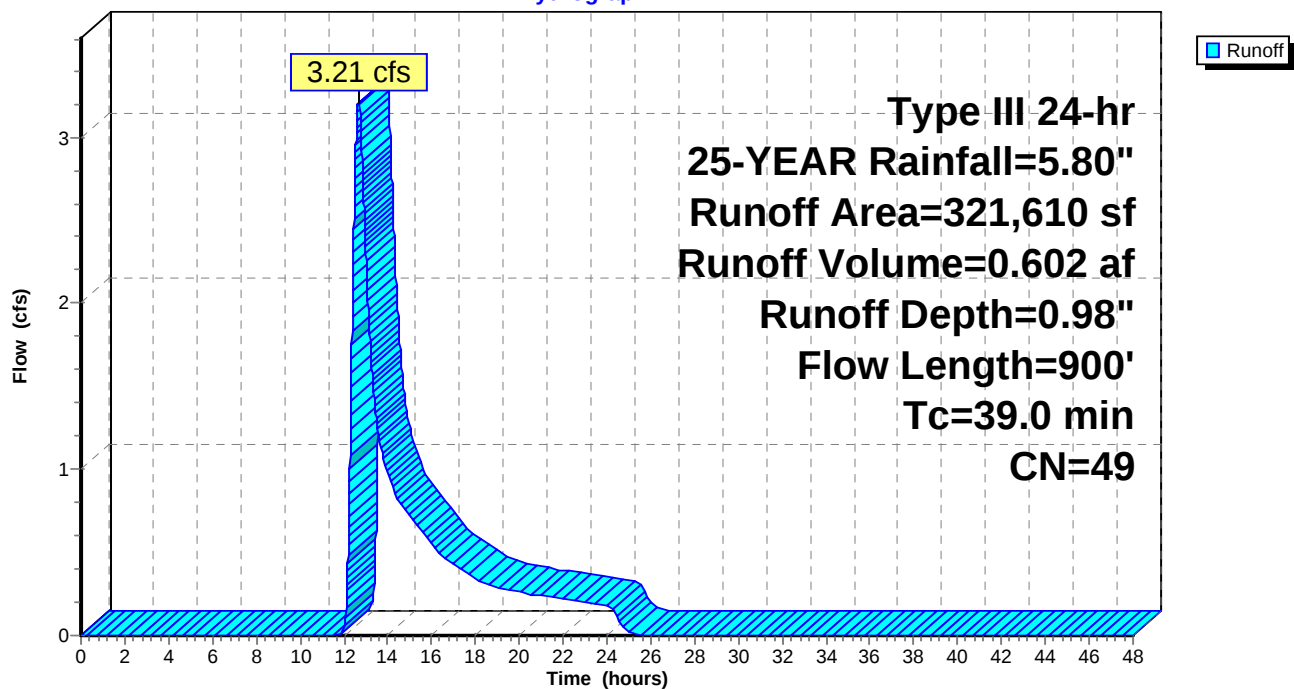
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
72,020	39	>75% Grass cover, Good, HSG A
55,490	74	>75% Grass cover, Good, HSG C
118,860	30	Woods, Good, HSG A
2,480	55	Woods, Good, HSG B
68,300	70	Woods, Good, HSG C
1,840	76	Gravel roads, HSG A
2,620	98	Unconnected roofs, HSG D
321,610	49	Weighted Average
318,990		99.19% Pervious Area
2,620		0.81% Impervious Area
2,620		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	130	0.0800	1.41		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
14.6	620	0.0050	0.71		Shallow Concentrated Flow, C-D Nearly Bare & Untilled Kv= 10.0 fps
39.0	900	Total			

Subcatchment 1.04S:

Hydrograph



Summary for Subcatchment 1.05S:

Runoff = 14.12 cfs @ 13.24 hrs, Volume= 3.573 af, Depth= 1.40"

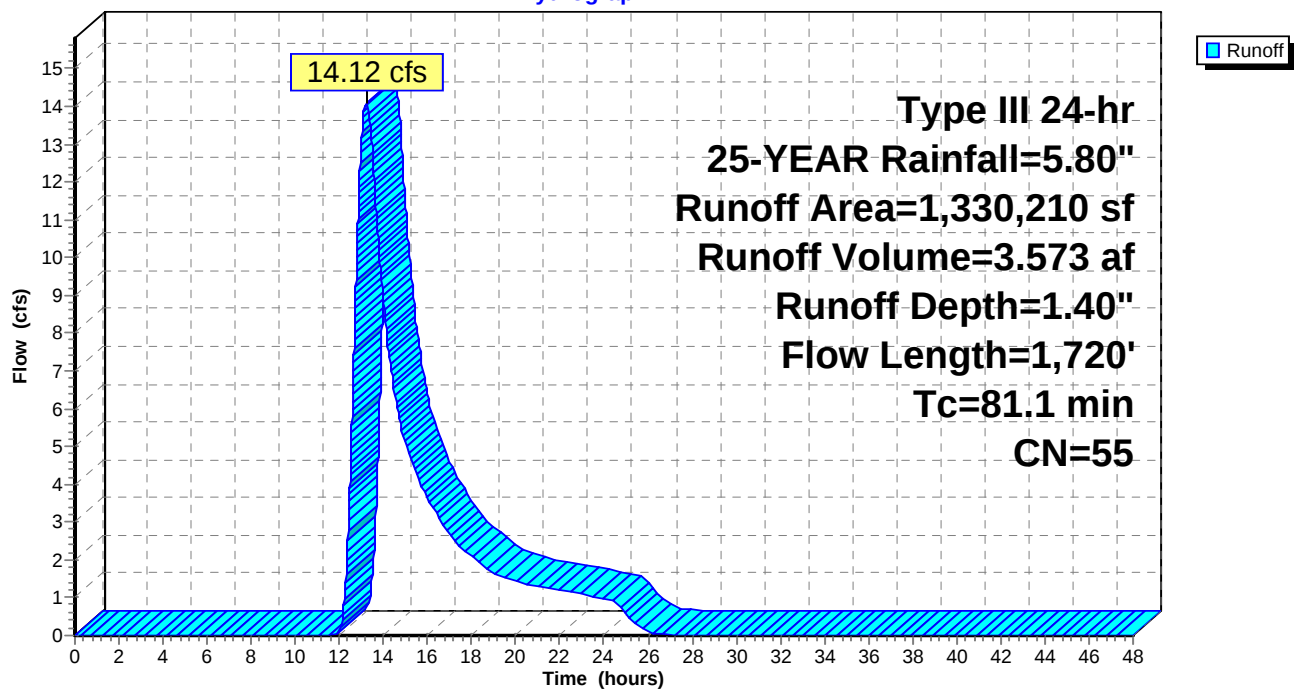
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
23,430	39	>75% Grass cover, Good, HSG A
135,940	74	>75% Grass cover, Good, HSG C
411,320	30	Woods, Good, HSG A
448,710	70	Woods, Good, HSG C
288,410	55	Woods, Good, HSG B
22,400	98	Water Surface, HSG C
1,330,210	55	Weighted Average
1,307,810		98.32% Pervious Area
22,400		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
1.9	170	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
46.7	1,400	0.0100	0.50		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
81.1	1,720	Total			

Subcatchment 1.05S:

Hydrograph



Summary for Subcatchment 1.06S:

Runoff = 2.65 cfs @ 12.69 hrs, Volume= 0.456 af, Depth= 1.48"

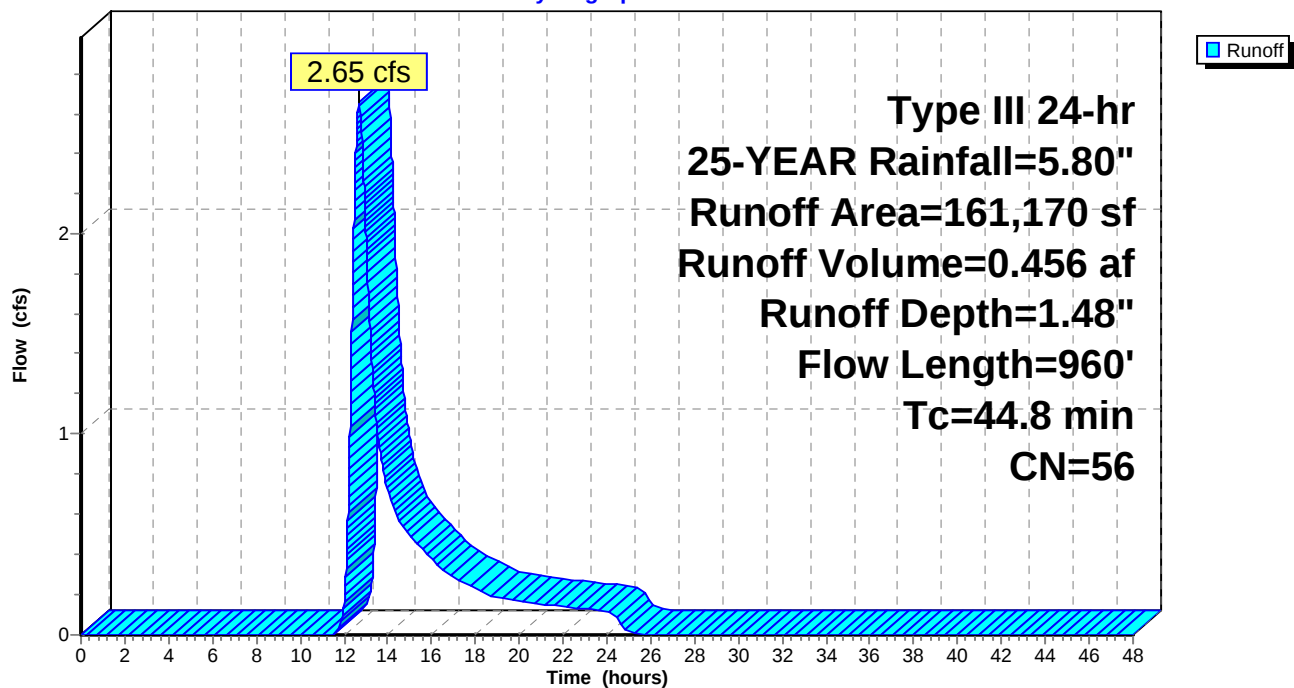
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
20,190	30	Woods, Good, HSG A
41,030	70	Woods, Good, HSG C
99,950	55	Woods, Good, HSG B
161,170	56	Weighted Average
161,170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	150	0.0300	0.10		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
19.1	810	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
44.8	960	Total			

Subcatchment 1.06S:

Hydrograph



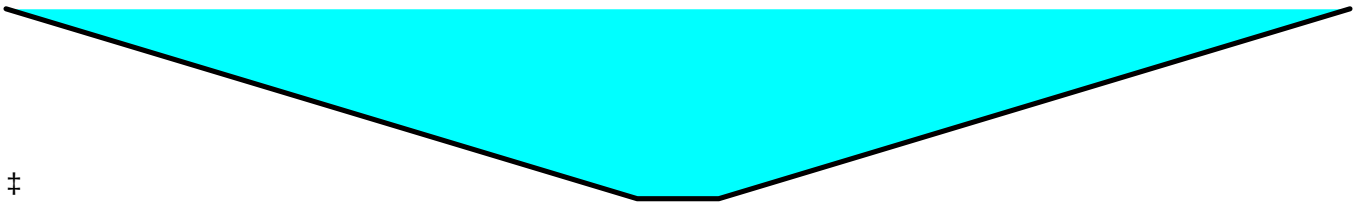
Summary for Reach 1.01R:

Inflow Area = 51.927 ac, 2.55% Impervious, Inflow Depth = 1.62" for 25-YEAR event
 Inflow = 47.64 cfs @ 12.51 hrs, Volume= 6.998 af
 Outflow = 43.00 cfs @ 12.66 hrs, Volume= 6.998 af, Atten= 10%, Lag= 9.1 min

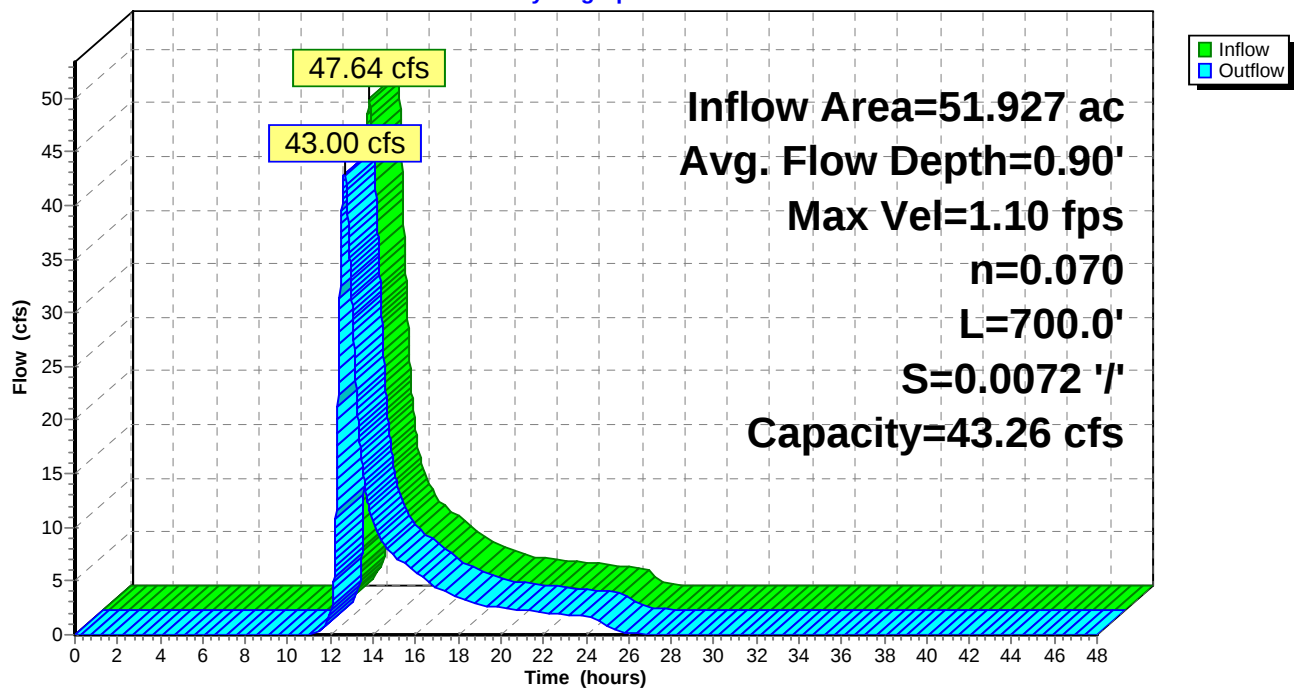
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.10 fps, Min. Travel Time= 10.6 min
 Avg. Velocity = 0.28 fps, Avg. Travel Time= 41.0 min

Peak Storage= 27,404 cf @ 12.66 hrs
 Average Depth at Peak Storage= 0.90'
 Bank-Full Depth= 0.90' Flow Area= 39.3 sf, Capacity= 43.26 cfs

5.00' x 0.90' deep channel, n= 0.070 Sluggish weedy reaches w/pools
 Side Slope Z-value= 43.0 '/' Top Width= 82.40'
 Length= 700.0' Slope= 0.0072 '/'
 Inlet Invert= 222.30', Outlet Invert= 217.26'

**Reach 1.01R:**

Hydrograph



Stage-Area-Storage for Reach 1.01R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
222.30	0.0	0	222.83	14.7	10,310
222.31	0.1	38	222.84	15.2	10,667
222.32	0.1	82	222.85	15.8	11,030
222.33	0.2	133	222.86	16.3	11,400
222.34	0.3	189	222.87	16.8	11,775
222.35	0.4	251	222.88	17.4	12,156
222.36	0.5	319	222.89	17.9	12,543
222.37	0.6	393	222.90	18.5	12,937
222.38	0.7	473	222.91	19.1	13,336
222.39	0.8	559	222.92	19.6	13,741
222.40	0.9	651	222.93	20.2	14,152
222.41	1.1	750	222.94	20.8	14,569
222.42	1.2	854	222.95	21.4	14,993
222.43	1.4	964	222.96	22.0	15,422
222.44	1.5	1,081	222.97	22.7	15,857
222.45	1.7	1,203	222.98	23.3	16,299
222.46	1.9	1,331	222.99	23.9	16,746
222.47	2.1	1,465	223.00	24.6	17,199
222.48	2.3	1,605	223.01	25.2	17,659
222.49	2.5	1,752	223.02	25.9	18,124
222.50	2.7	1,904	223.03	26.6	18,596
222.51	2.9	2,063	223.04	27.2	19,073
222.52	3.2	2,227	223.05	27.9	19,557
222.53	3.4	2,398	223.06	28.6	20,046
222.54	3.7	2,574	223.07	29.3	20,542
222.55	3.9	2,757	223.08	30.1	21,043
222.56	4.2	2,945	223.09	30.8	21,551
222.57	4.5	3,139	223.10	31.5	22,064
222.58	4.8	3,340	223.11	32.3	22,584
222.59	5.1	3,547	223.12	33.0	23,109
222.60	5.4	3,760	223.13	33.8	23,641
222.61	5.7	3,978	223.14	34.5	24,179
222.62	6.0	4,203	223.15	35.3	24,723
222.63	6.3	4,433	223.16	36.1	25,273
222.64	6.7	4,670	223.17	36.9	25,828
222.65	7.0	4,912	223.18	37.7	26,390
222.66	7.4	5,161	223.19	38.5	26,957
222.67	7.7	5,416	223.20	39.3	27,531
222.68	8.1	5,677			
222.69	8.5	5,944			
222.70	8.9	6,217			
222.71	9.3	6,495			
222.72	9.7	6,780			
222.73	10.1	7,071			
222.74	10.5	7,368			
222.75	11.0	7,670			
222.76	11.4	7,979			
222.77	11.8	8,295			
222.78	12.3	8,616			
222.79	12.8	8,943			
222.80	13.3	9,276			
222.81	13.7	9,615			
222.82	14.2	9,959			

Summary for Pond 1.03P: 18" CMP Culvert

Inflow Area = 37.988 ac, 2.59% Impervious, Inflow Depth = 1.90" for 25-YEAR event
 Inflow = 41.73 cfs @ 12.53 hrs, Volume= 6.014 af
 Outflow = 41.80 cfs @ 12.53 hrs, Volume= 6.014 af, Atten= 0%, Lag= 0.2 min
 Primary = 7.29 cfs @ 12.53 hrs, Volume= 3.666 af
 Secondary = 34.51 cfs @ 12.53 hrs, Volume= 2.348 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 225.60' @ 12.53 hrs Surf.Area= 6,500 sf Storage= 6,375 cf
 Flood Elev= 149.50' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 9.1 min calculated for 6.012 af (100% of inflow)
 Center-of-Mass det. time= 9.2 min (895.4 - 886.3)

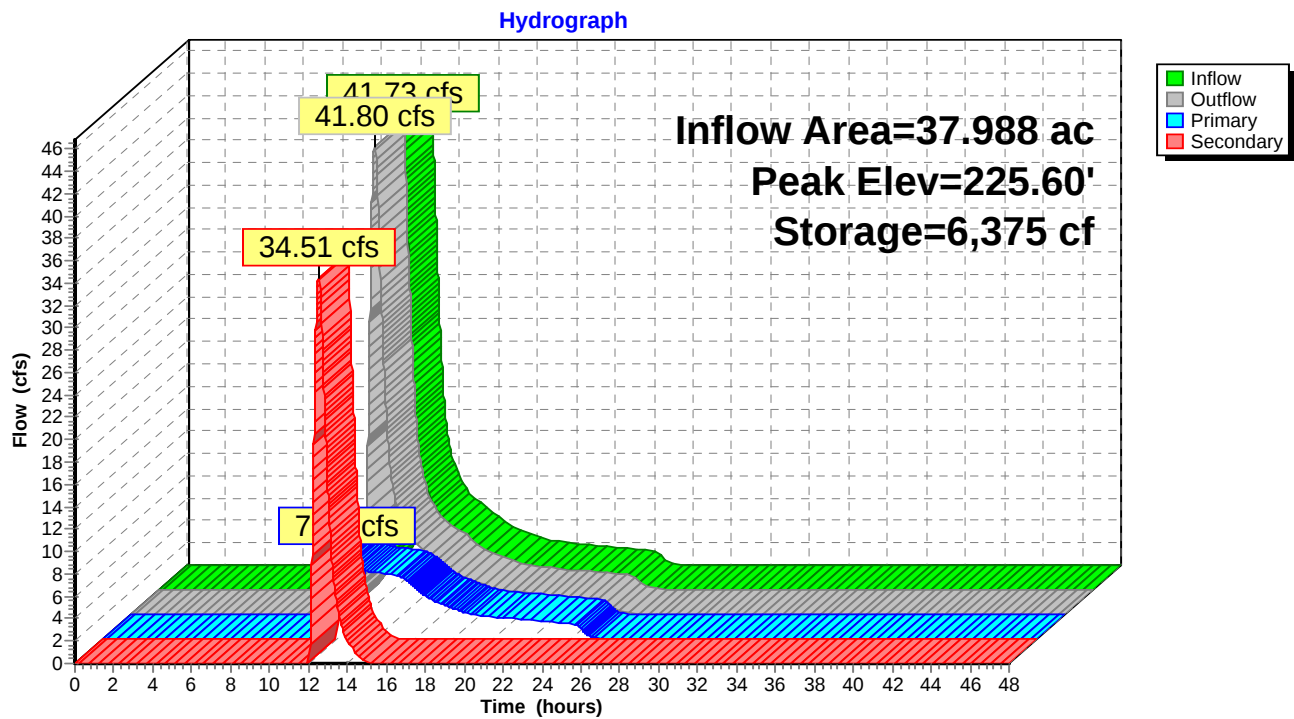
Volume	Invert	Avail.Storage	Storage Description
#1	223.50'	6,375 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.50	1,000	0	0
224.00	2,300	825	825
225.00	3,700	3,000	3,825
225.50	6,500	2,550	6,375

Device	Routing	Invert	Outlet Devices
#1	Primary	223.50'	18.0" Round Culvert L= 35.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 223.50' / 223.50' S= 0.0000 ' /' Cc= 0.900 n= 0.010, Flow Area= 1.77 sf
#2	Secondary	225.20'	50.0' long x 20.0' breadth Overflow at Driveway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.29 cfs @ 12.53 hrs HW=225.60' TW=223.16' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 7.29 cfs @ 4.13 fps)

Secondary OutFlow Max=34.49 cfs @ 12.53 hrs HW=225.60' TW=223.16' (Dynamic Tailwater)
 ↑ **2=Overflow at Driveway** (Weir Controls 34.49 cfs @ 1.71 fps)

Pond 1.03P: 18" CMP Culvert

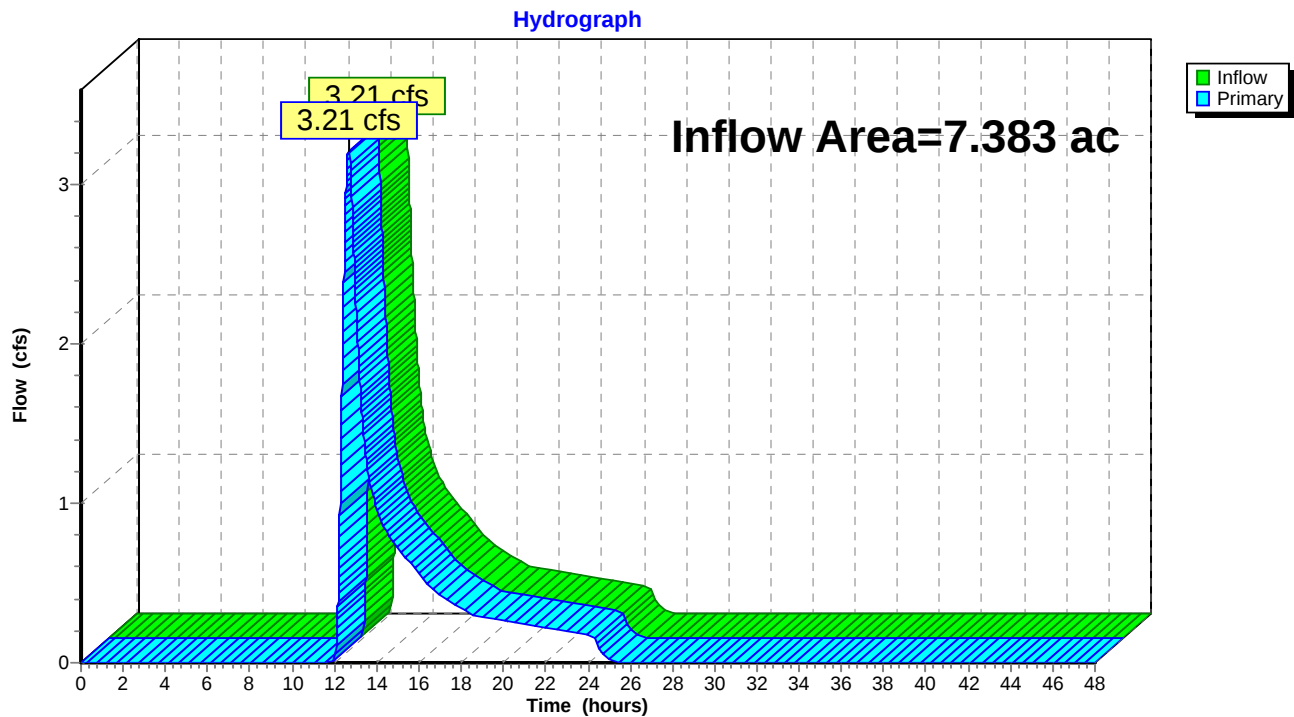
Stage-Area-Storage for Pond 1.03P: 18" CMP Culvert

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
223.50	1,000	0
223.55	1,130	53
223.60	1,260	113
223.65	1,390	179
223.70	1,520	252
223.75	1,650	331
223.80	1,780	417
223.85	1,910	509
223.90	2,040	608
223.95	2,170	713
224.00	2,300	825
224.05	2,370	942
224.10	2,440	1,062
224.15	2,510	1,186
224.20	2,580	1,313
224.25	2,650	1,444
224.30	2,720	1,578
224.35	2,790	1,716
224.40	2,860	1,857
224.45	2,930	2,002
224.50	3,000	2,150
224.55	3,070	2,302
224.60	3,140	2,457
224.65	3,210	2,616
224.70	3,280	2,778
224.75	3,350	2,944
224.80	3,420	3,113
224.85	3,490	3,286
224.90	3,560	3,462
224.95	3,630	3,642
225.00	3,700	3,825
225.05	3,980	4,017
225.10	4,260	4,223
225.15	4,540	4,443
225.20	4,820	4,677
225.25	5,100	4,925
225.30	5,380	5,187
225.35	5,660	5,463
225.40	5,940	5,753
225.45	6,220	6,057
225.50	6,500	6,375
225.55	6,500	6,375
225.60	6,500	6,375

Summary for Pond 1.04P:

Inflow Area = 7.383 ac, 0.81% Impervious, Inflow Depth = 0.98" for 25-YEAR event
Inflow = 3.21 cfs @ 12.66 hrs, Volume= 0.602 af
Primary = 3.21 cfs @ 12.66 hrs, Volume= 0.602 af, Atten= 0%, Lag= 0.0 min

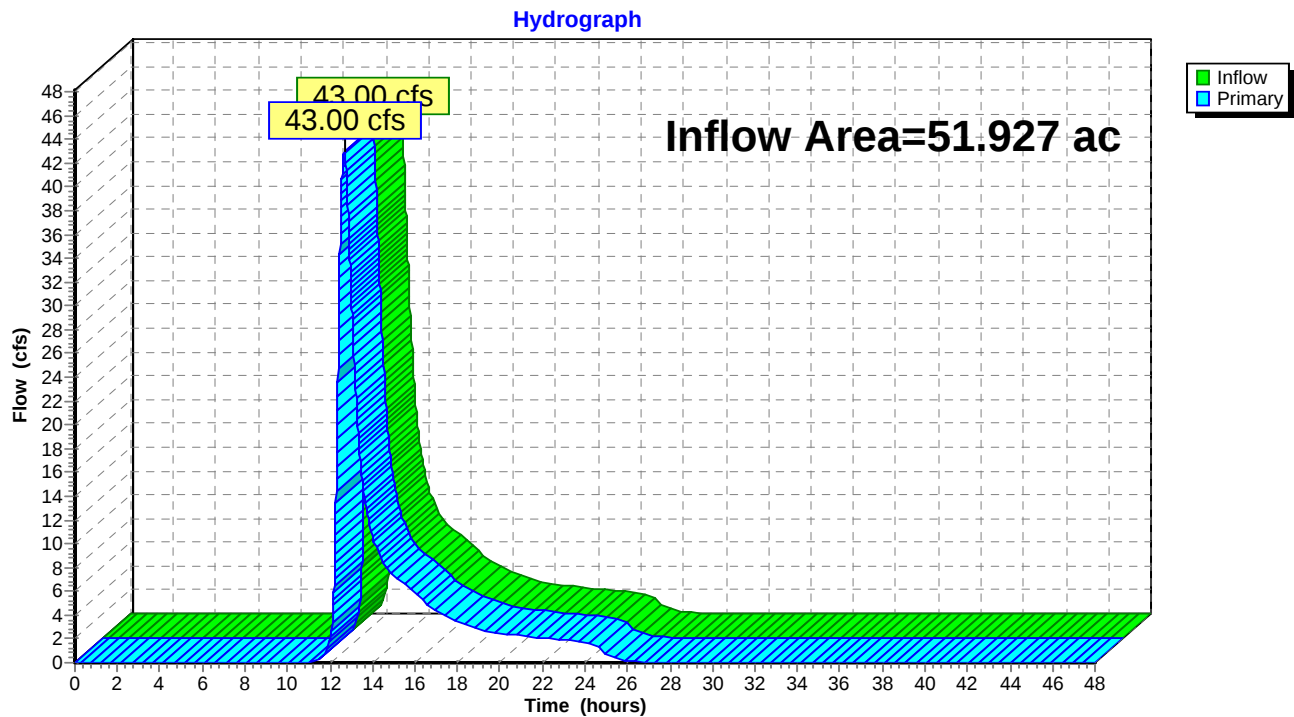
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 1.04P:

Summary for Link SP1: Study Point #1

Inflow Area = 51.927 ac, 2.55% Impervious, Inflow Depth = 1.62" for 25-YEAR event
Inflow = 43.00 cfs @ 12.66 hrs, Volume= 6.998 af
Primary = 43.00 cfs @ 12.66 hrs, Volume= 6.998 af, Atten= 0%, Lag= 0.0 min

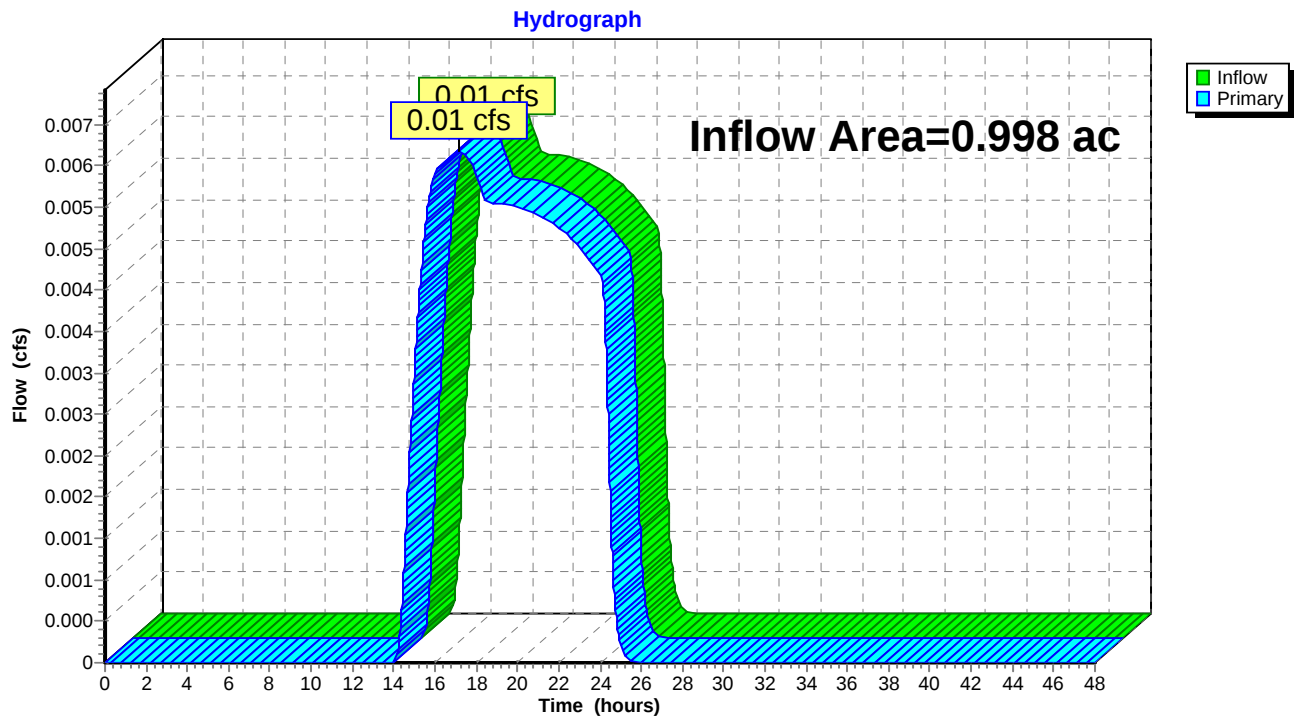
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP1: Study Point #1

Summary for Link SP2: Study Point #2

Inflow Area = 0.998 ac, 0.00% Impervious, Inflow Depth = 0.05" for 25-YEAR event
Inflow = 0.01 cfs @ 17.20 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 17.20 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

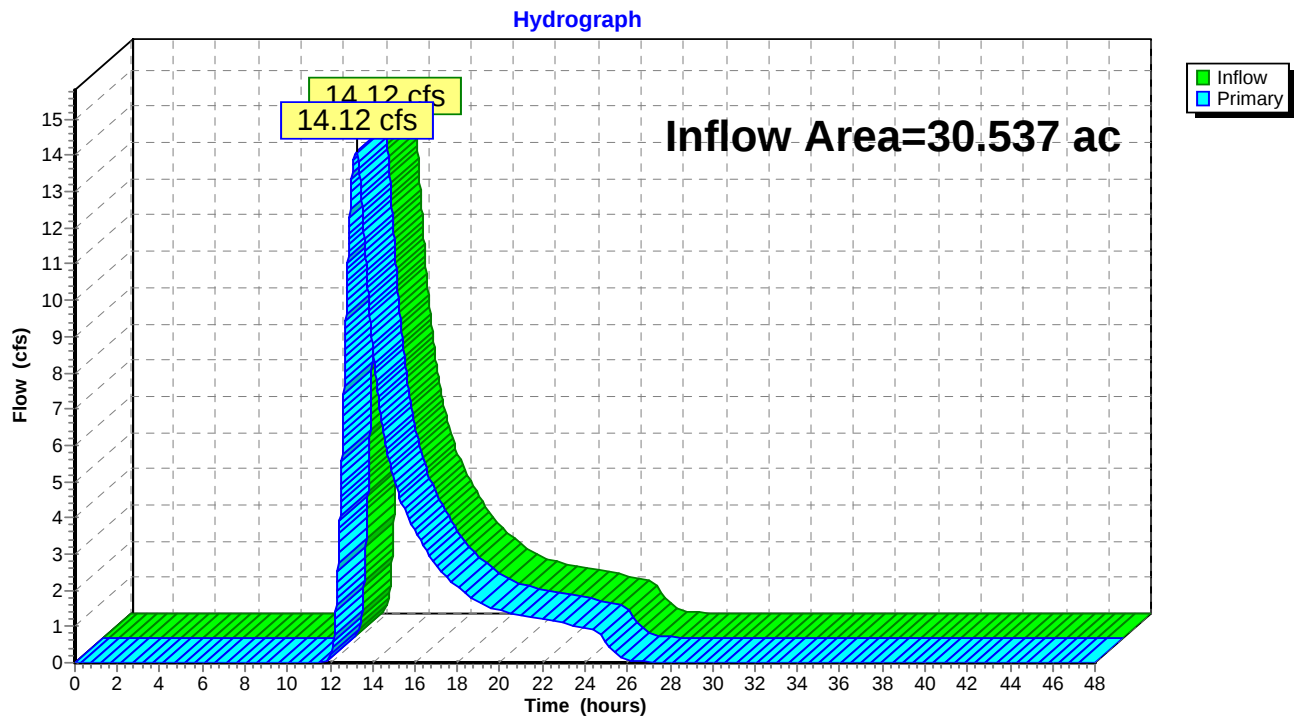
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP2: Study Point #2

Summary for Link SP3: Study Point #3

Inflow Area = 30.537 ac, 1.68% Impervious, Inflow Depth = 1.40" for 25-YEAR event
Inflow = 14.12 cfs @ 13.24 hrs, Volume= 3.573 af
Primary = 14.12 cfs @ 13.24 hrs, Volume= 3.573 af, Atten= 0%, Lag= 0.0 min

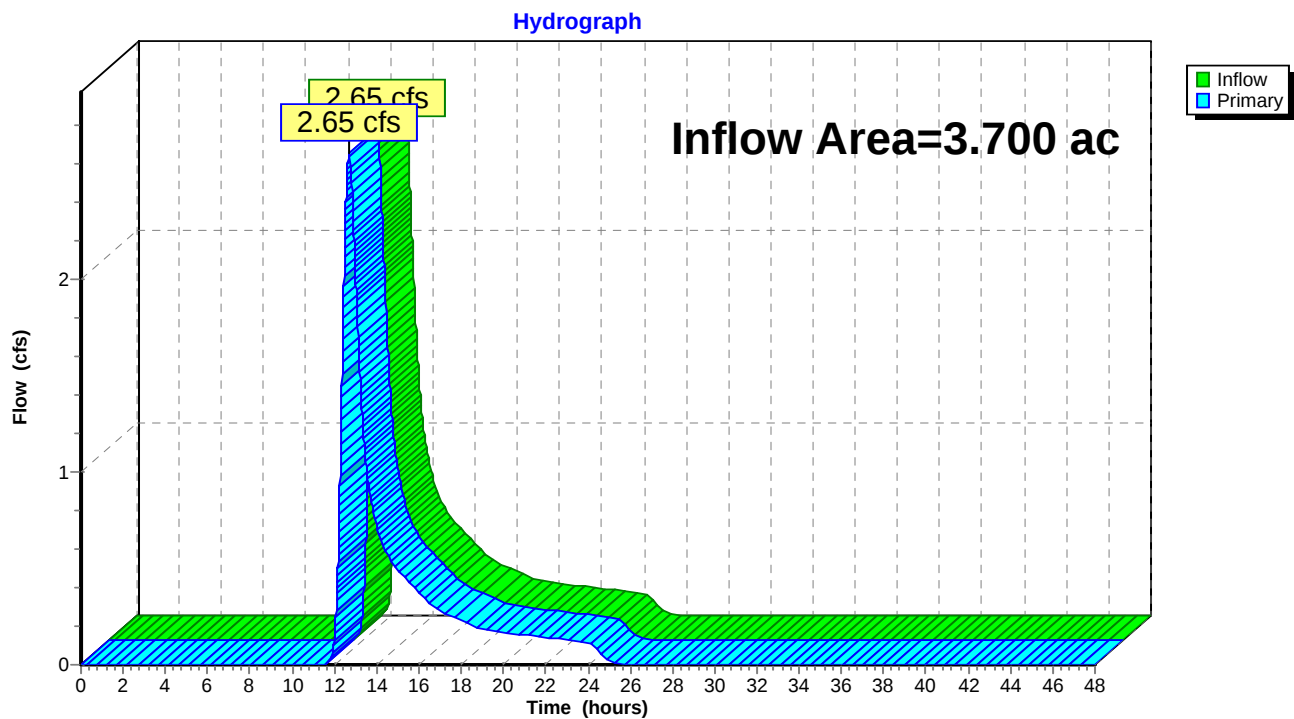
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP3: Study Point #3

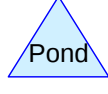
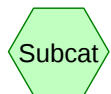
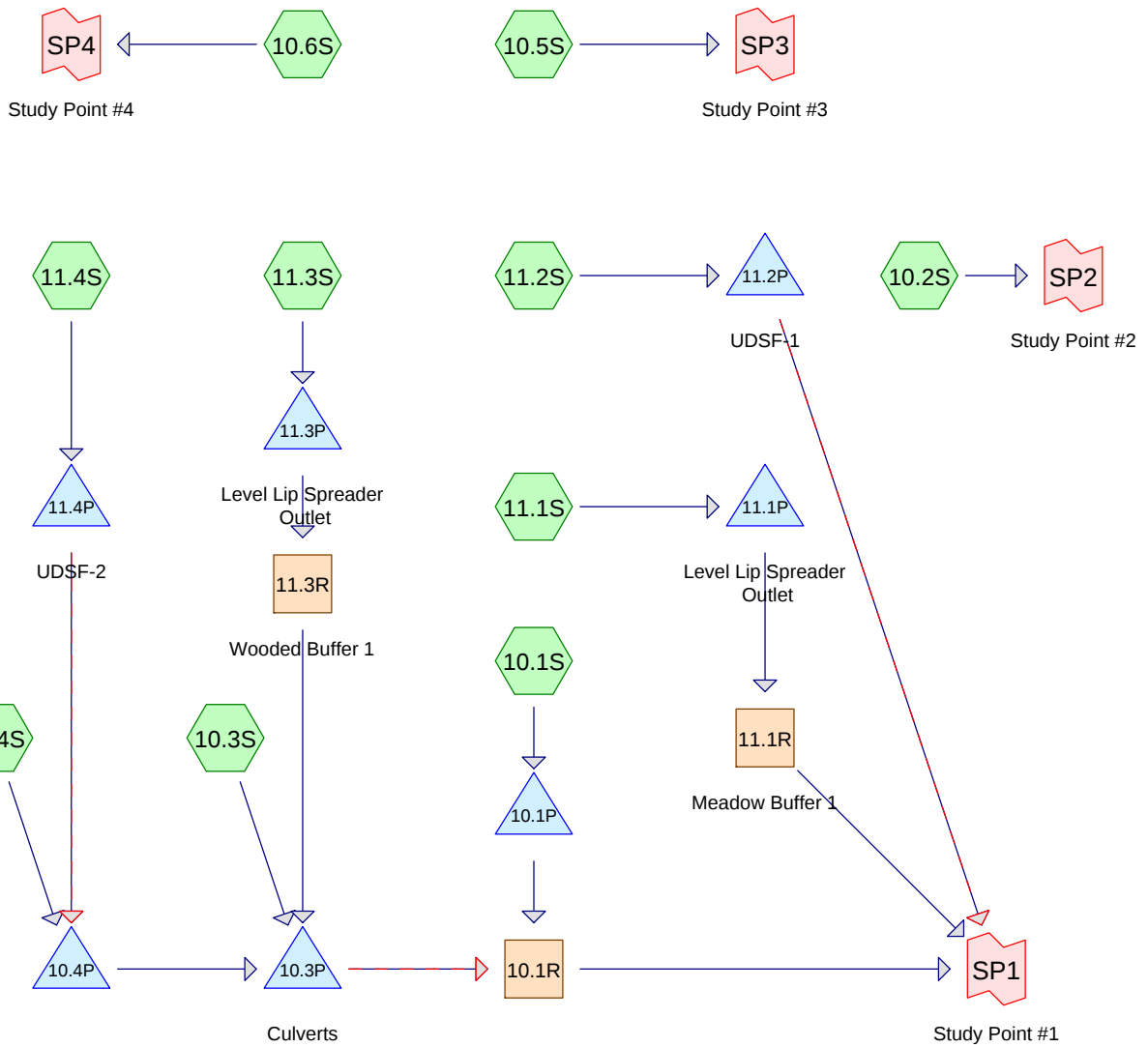
Summary for Link SP4: Study Point #4

Inflow Area = 3.700 ac, 0.00% Impervious, Inflow Depth = 1.48" for 25-YEAR event
Inflow = 2.65 cfs @ 12.69 hrs, Volume= 0.456 af
Primary = 2.65 cfs @ 12.69 hrs, Volume= 0.456 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP4: Study Point #4

POSTDEVELOPMENT



16236 POST-DEV

Prepared by Microsoft

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Type III 24-hr 2-YEAR Rainfall=3.10"

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Page 2

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

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

Subcatchment10.1S: Runoff Area=695,930 sf 3.31% Impervious Runoff Depth=0.07"
Flow Length=710' Tc=32.5 min UI Adjusted CN=48 Runoff=0.16 cfs 0.099 af

Subcatchment10.2S: Runoff Area=43,490 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=340' Tc=33.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment10.3S: Runoff Area=988,770 sf 3.61% Impervious Runoff Depth=0.77"
Flow Length=1,830' Tc=32.3 min CN=70 Runoff=9.93 cfs 1.458 af

Subcatchment10.4S: Runoff Area=313,540 sf 0.84% Impervious Runoff Depth=0.11"
Flow Length=900' Tc=39.0 min CN=50 Runoff=0.11 cfs 0.065 af

Subcatchment10.5S: Runoff Area=1,328,600 sf 1.78% Impervious Runoff Depth=0.22"
Flow Length=1,720' Tc=81.1 min CN=55 Runoff=1.23 cfs 0.565 af

Subcatchment10.6S: Runoff Area=157,640 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=960' Tc=44.8 min CN=56 Runoff=0.23 cfs 0.075 af

Subcatchment11.1S: Runoff Area=53,730 sf 16.21% Impervious Runoff Depth=0.59"
Flow Length=325' Tc=17.0 min CN=66 Runoff=0.48 cfs 0.061 af

Subcatchment11.2S: Runoff Area=106,550 sf 16.34% Impervious Runoff Depth=0.25"
Flow Length=575' Tc=37.0 min CN=56 Runoff=0.17 cfs 0.051 af

Subcatchment11.3S: Runoff Area=69,130 sf 36.00% Impervious Runoff Depth=0.37"
Flow Length=600' Tc=37.2 min CN=60 Runoff=0.22 cfs 0.049 af

Subcatchment11.4S: Runoff Area=39,190 sf 21.43% Impervious Runoff Depth=0.72"
Flow Length=450' Tc=35.8 min CN=69 Runoff=0.34 cfs 0.054 af

Reach 10.1R: Avg. Flow Depth=0.39' Max Vel=0.66 fps Inflow=6.23 cfs 1.686 af
n=0.070 L=700.0' S=0.0072 ' /' Capacity=43.26 cfs Outflow=5.51 cfs 1.686 af

Reach 11.1R: Meadow Buffer 1 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.240 L=80.0' S=0.0400 ' /' Capacity=94.49 cfs Outflow=0.00 cfs 0.000 af

Reach 11.3R: Wooded Buffer 1 Avg. Flow Depth=0.00' Max Vel=0.13 fps Inflow=0.04 cfs 0.016 af
n=0.240 L=55.0' S=0.2000 ' /' Capacity=289.74 cfs Outflow=0.04 cfs 0.016 af

Pond 10.1P: Inflow=0.16 cfs 0.099 af
Primary=0.16 cfs 0.099 af

Pond 10.3P: Culverts Peak Elev=225.82' Storage=12,818 cf Inflow=9.98 cfs 1.588 af
Primary=6.22 cfs 1.588 af Secondary=0.00 cfs 0.000 af Outflow=6.22 cfs 1.588 af

Pond 10.4P: Inflow=0.17 cfs 0.114 af
Primary=0.17 cfs 0.114 af

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Type III 24-hr 2-YEAR Rainfall=3.10"

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Pond 11.1P: Level Lip Spreader Outlet Peak Elev=229.10' Storage=2,656 cf Inflow=0.48 cfs 0.061 af
Outflow=0.00 cfs 0.000 af

Pond 11.2P: UDSF-1 Peak Elev=230.92' Storage=613 cf Inflow=0.17 cfs 0.051 af
Primary=0.07 cfs 0.044 af Secondary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.044 af

Pond 11.3P: Level Lip Spreader Outlet Peak Elev=234.00' Storage=1,450 cf Inflow=0.22 cfs 0.049 af
Outflow=0.04 cfs 0.016 af

Pond 11.4P: UDSF-2 Peak Elev=239.36' Storage=985 cf Inflow=0.34 cfs 0.054 af
Primary=0.06 cfs 0.049 af Secondary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.049 af

Link SP1: Study Point #1 Inflow=5.55 cfs 1.731 af
Primary=5.55 cfs 1.731 af

Link SP2: Study Point #2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link SP3: Study Point #3 Inflow=1.23 cfs 0.565 af
Primary=1.23 cfs 0.565 af

Link SP4: Study Point #4 Inflow=0.23 cfs 0.075 af
Primary=0.23 cfs 0.075 af

Total Runoff Area = 87.157 ac Runoff Volume = 2.476 af Average Runoff Depth = 0.34"
96.19% Pervious = 83.840 ac 3.81% Impervious = 3.317 ac

Summary for Subcatchment 10.1S:

Runoff = 0.16 cfs @ 15.13 hrs, Volume= 0.099 af, Depth= 0.07"

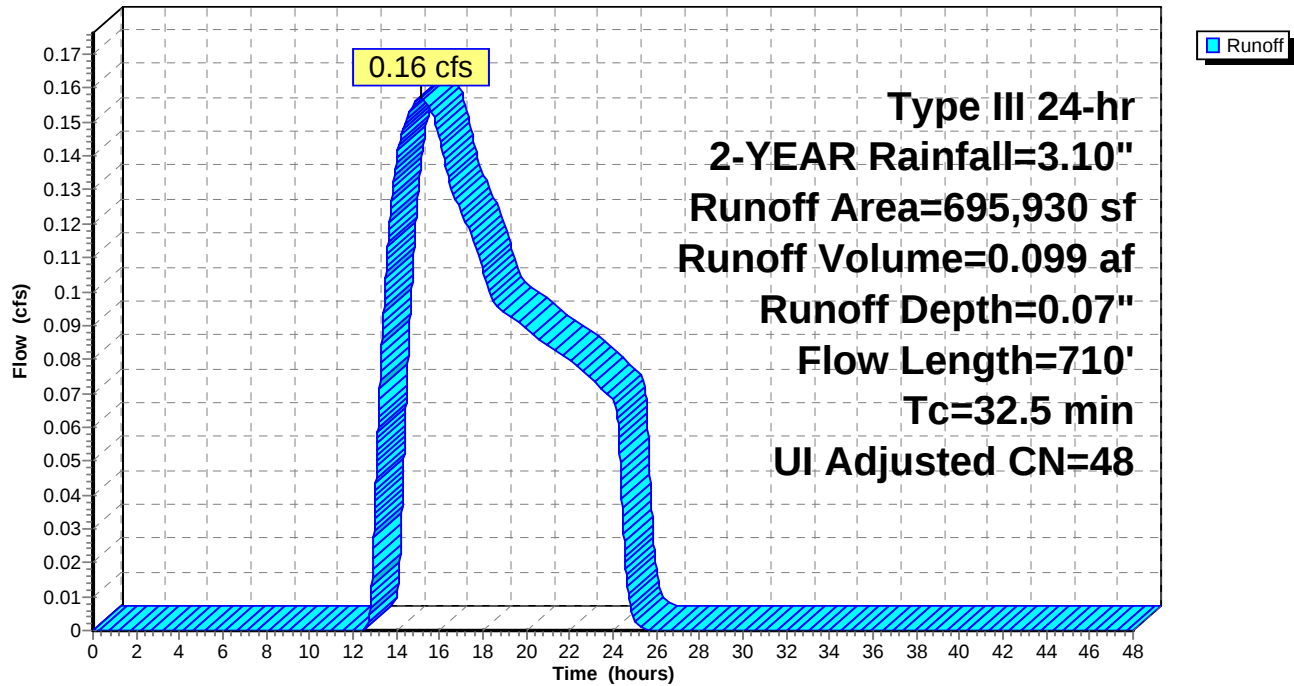
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Adj	Description
161,180	80		>75% Grass cover, Good, HSG D
10,800	74		>75% Grass cover, Good, HSG C
246,600	39		>75% Grass cover, Good, HSG A
11,660	98		Paved roads w/curbs & sewers, HSG D
1,510	98		Paved roads w/curbs & sewers, HSG C
6,150	98		Paved roads w/curbs & sewers, HSG A
13,130	77		Woods, Good, HSG D
241,170	30		Woods, Good, HSG A
3,730	98		Unconnected roofs, HSG A
695,930	49	48	Weighted Average, UI Adjusted
672,880			96.69% Pervious Area
23,050			3.31% Impervious Area
3,730			16.18% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	150	0.0080	0.09		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
3.6	560	0.0300	2.60		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
32.5	710	Total			

Subcatchment 10.1S:

Hydrograph



Summary for Subcatchment 10.2S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

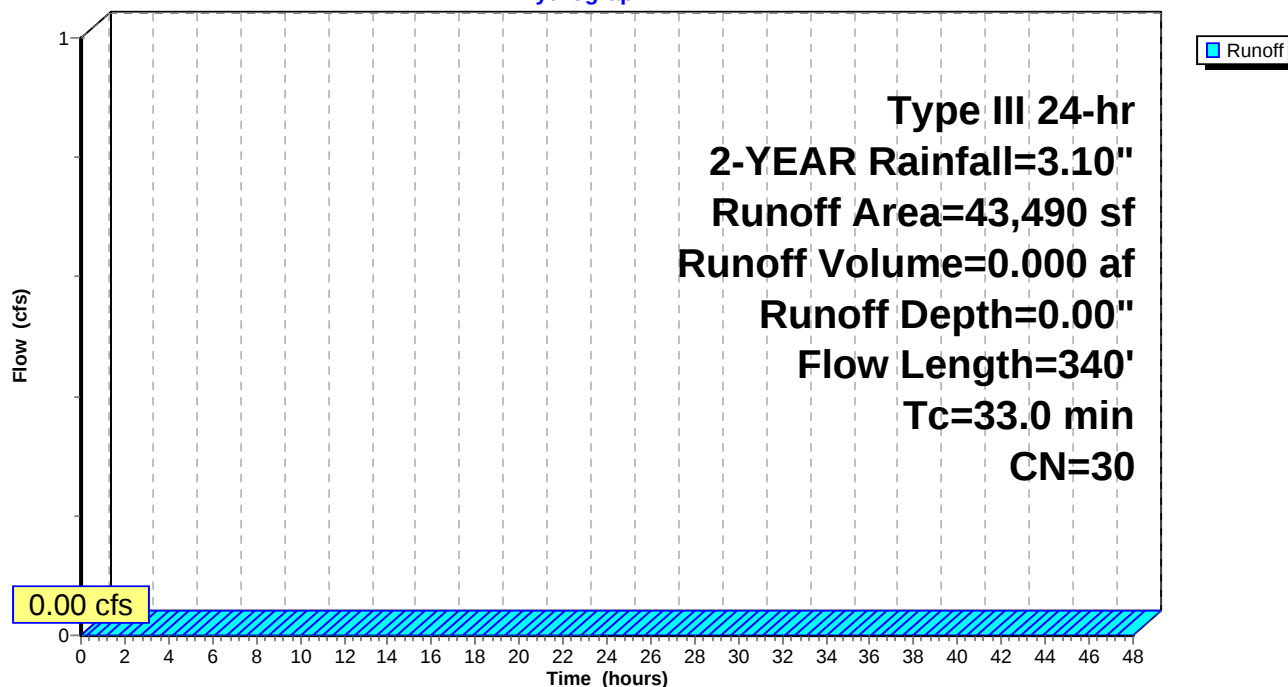
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
43,490	30	Woods, Good, HSG A
43,490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	150	0.0230	0.09		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
4.5	190	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
33.0	340	Total			

Subcatchment 10.2S:

Hydrograph



Summary for Subcatchment 10.3S:

Runoff = 9.93 cfs @ 12.52 hrs, Volume= 1.458 af, Depth= 0.77"

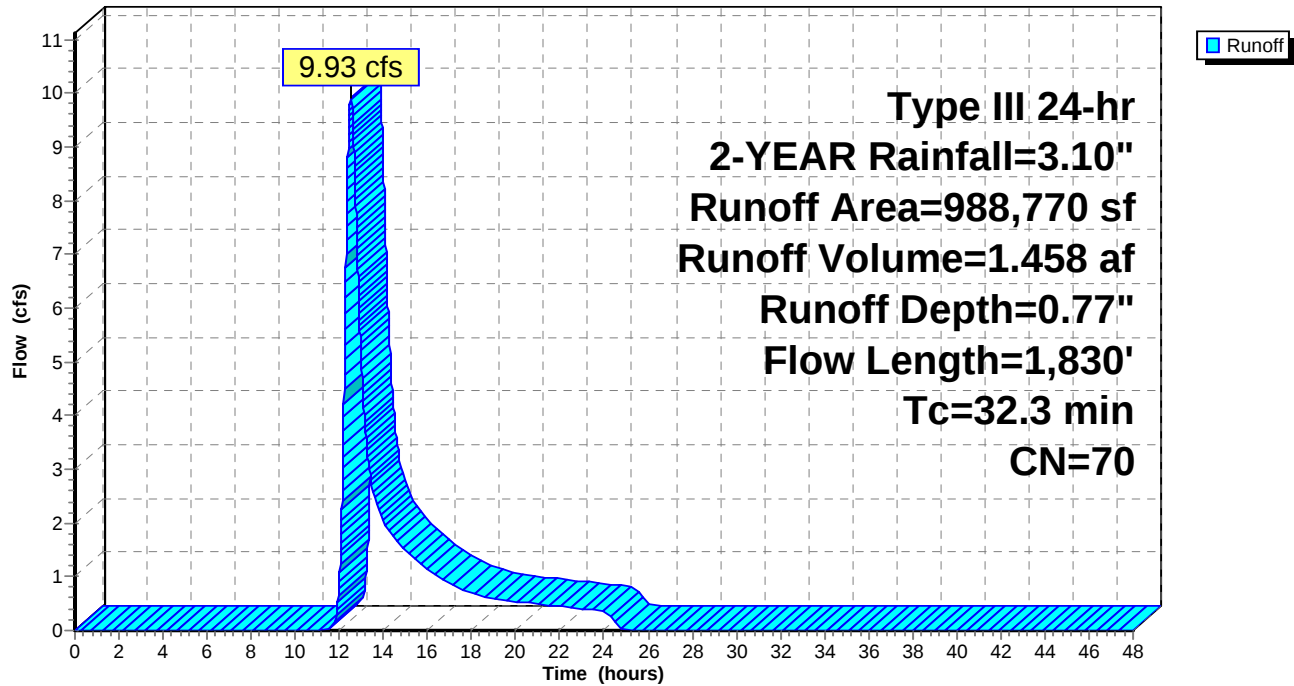
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
48,440	39	>75% Grass cover, Good, HSG A
608,410	74	>75% Grass cover, Good, HSG C
63,390	80	>75% Grass cover, Good, HSG D
22,940	98	Paved roads w/curbs & sewers, HSG C
5,250	98	Paved roads w/curbs & sewers, HSG D
57,590	30	Woods, Good, HSG A
51,830	70	Woods, Good, HSG C
2,270	76	Gravel roads, HSG A
6,480	89	Gravel roads, HSG C
6,400	98	Unconnected roofs, HSG C
1,130	98	Unconnected roofs, HSG A
29,880	39	>75% Grass cover, Good, HSG A
84,760	74	>75% Grass cover, Good, HSG C
988,770	70	Weighted Average
953,050		96.39% Pervious Area
35,720		3.61% Impervious Area
7,530		21.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0300	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
15.2	1,680	0.0150	1.84		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
32.3	1,830	Total			

Subcatchment 10.3S:

Hydrograph



Summary for Subcatchment 10.4S:

Runoff = 0.11 cfs @ 14.17 hrs, Volume= 0.065 af, Depth= 0.11"

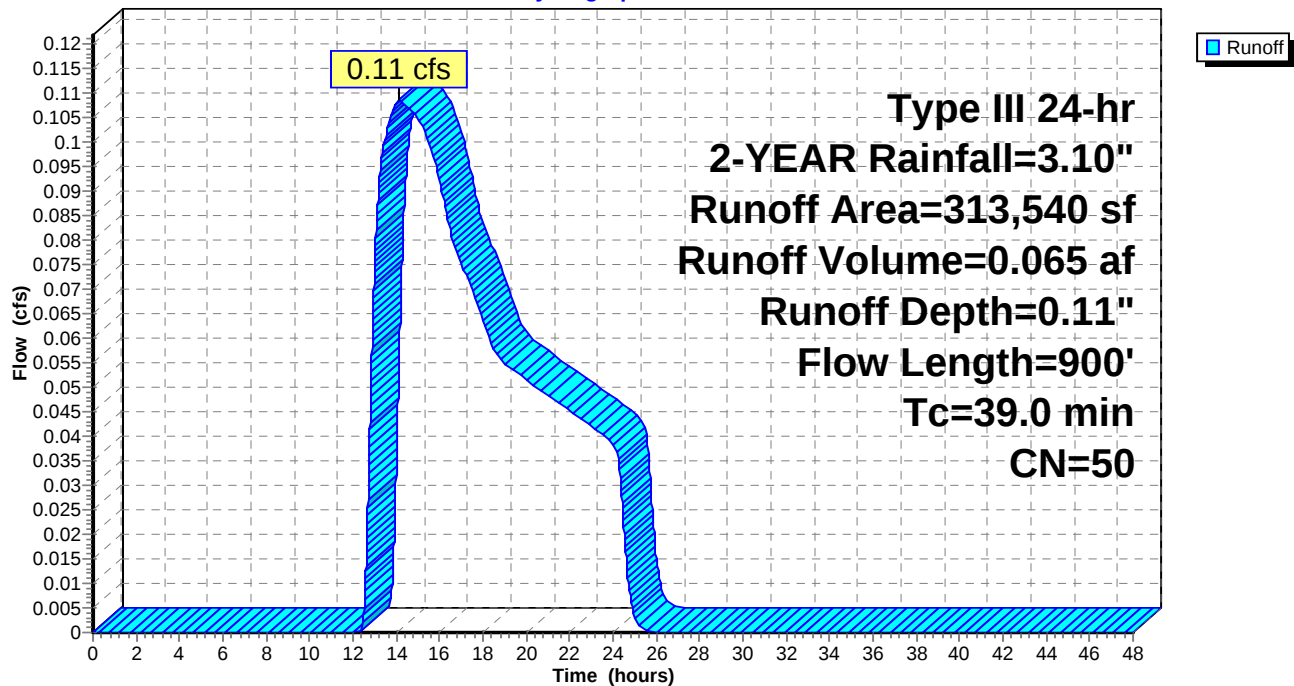
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
71,700	39	>75% Grass cover, Good, HSG A
55,490	74	>75% Grass cover, Good, HSG C
87,930	30	Woods, Good, HSG A
56,360	70	Woods, Good, HSG C
1,840	76	Gravel roads, HSG A
2,620	98	Unconnected roofs, HSG D
30,180	39	>75% Grass cover, Good, HSG A
7,420	74	>75% Grass cover, Good, HSG C
313,540	50	Weighted Average
310,920		99.16% Pervious Area
2,620		0.84% Impervious Area
2,620		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	130	0.0800	1.41		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
14.6	620	0.0050	0.71		Shallow Concentrated Flow, C-D Nearly Bare & Untilled Kv= 10.0 fps
39.0	900	Total			

Subcatchment 10.4S:

Hydrograph



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Type III 24-hr 2-YEAR Rainfall=3.10"

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Summary for Subcatchment 10.5S:

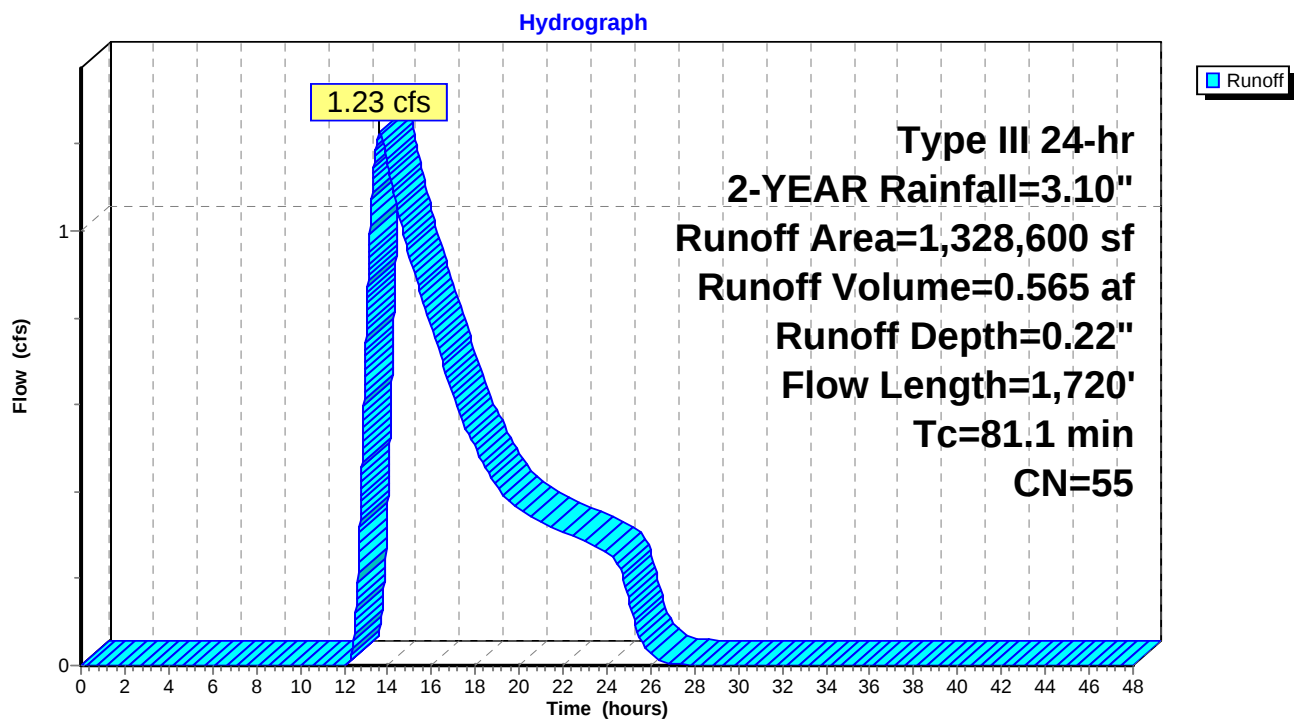
Runoff = 1.23 cfs @ 13.61 hrs, Volume= 0.565 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
19,420	39	>75% Grass cover, Good, HSG A
135,940	74	>75% Grass cover, Good, HSG C
1,280	98	Paved roads w/curbs & sewers, HSG A
351,500	30	Woods, Good, HSG A
446,380	70	Woods, Good, HSG C
187,260	55	Woods, Good, HSG B
22,400	98	Water Surface, HSG C
90,200	39	>75% Grass cover, Good, HSG A
71,900	61	>75% Grass cover, Good, HSG B
2,320	74	>75% Grass cover, Good, HSG C
1,328,600	55	Weighted Average
1,304,920		98.22% Pervious Area
23,680		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
1.9	170	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
46.7	1,400	0.0100	0.50		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
81.1	1,720	Total			

Subcatchment 10.5S:



Summary for Subcatchment 10.6S:

Runoff = 0.23 cfs @ 12.90 hrs, Volume= 0.075 af, Depth= 0.25"

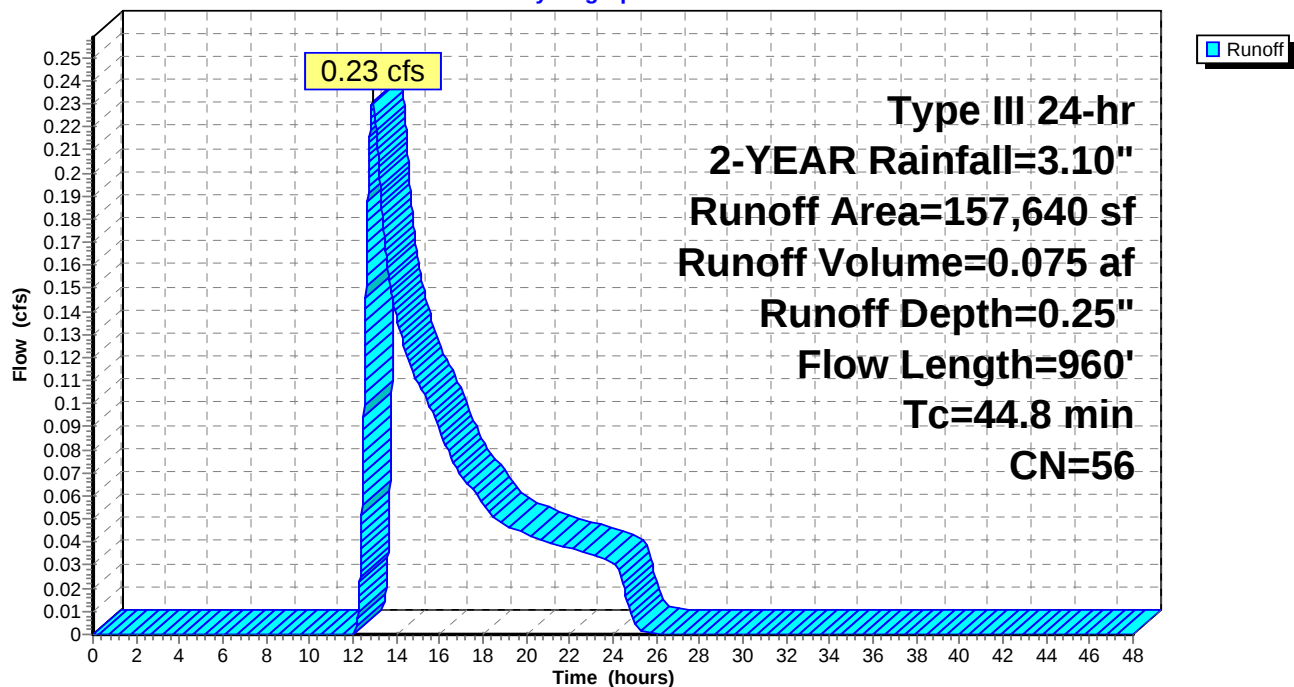
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
20,190	30	Woods, Good, HSG A
40,980	70	Woods, Good, HSG C
93,400	55	Woods, Good, HSG B
3,070	61	>75% Grass cover, Good, HSG B
157,640	56	Weighted Average
157,640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	150	0.0300	0.10		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
19.1	810	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
44.8	960	Total			

Subcatchment 10.6S:

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Type III 24-hr 2-YEAR Rainfall=3.10"

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Summary for Subcatchment 11.1S:

Runoff = 0.48 cfs @ 12.29 hrs, Volume= 0.061 af, Depth= 0.59"

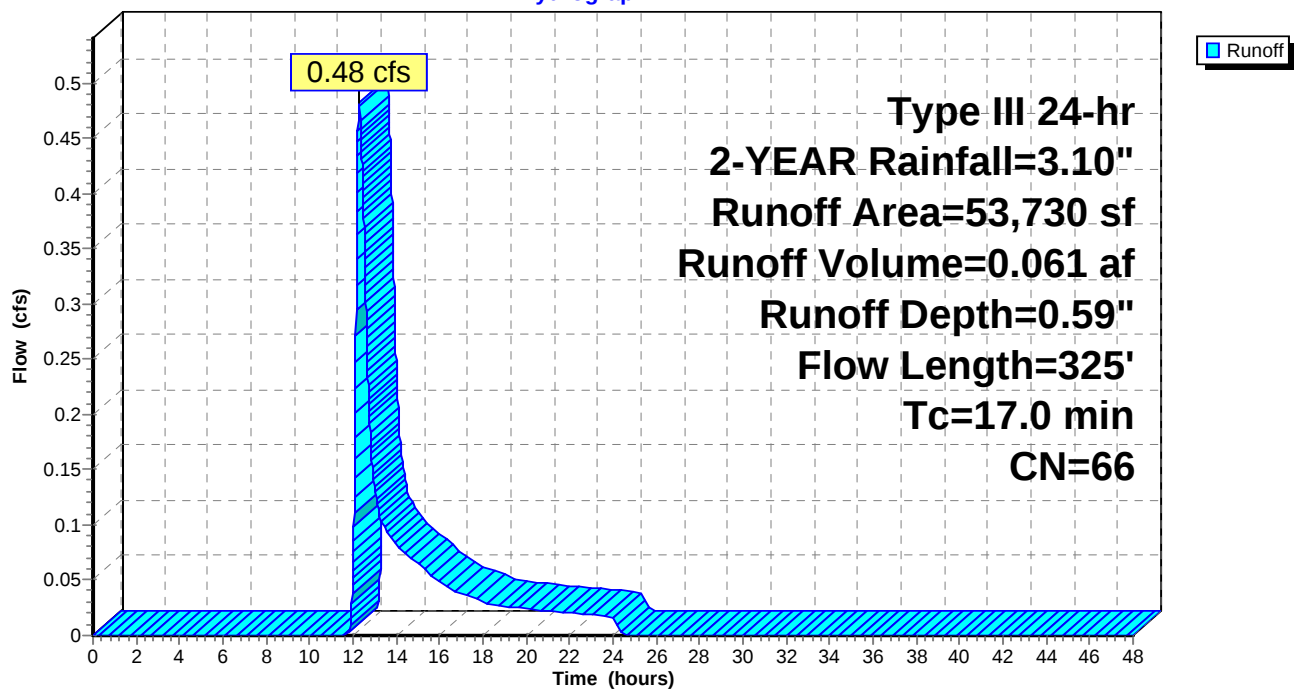
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
8,170	74	>75% Grass cover, Good, HSG C
1,660	98	Paved roads w/curbs & sewers, HSG A
7,050	98	Paved roads w/curbs & sewers, HSG C
18,310	39	>75% Grass cover, Good, HSG A
18,540	74	>75% Grass cover, Good, HSG C
53,730	66	Weighted Average
45,020		83.79% Pervious Area
8,710		16.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	150	0.0350	0.16		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
0.8	130	0.0350	2.81		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.2	45	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
17.0	325	Total			

Subcatchment 11.1S:

Hydrograph



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Type III 24-hr 2-YEAR Rainfall=3.10"

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Summary for Subcatchment 11.2S:

Runoff = 0.17 cfs @ 12.79 hrs, Volume= 0.051 af, Depth= 0.25"

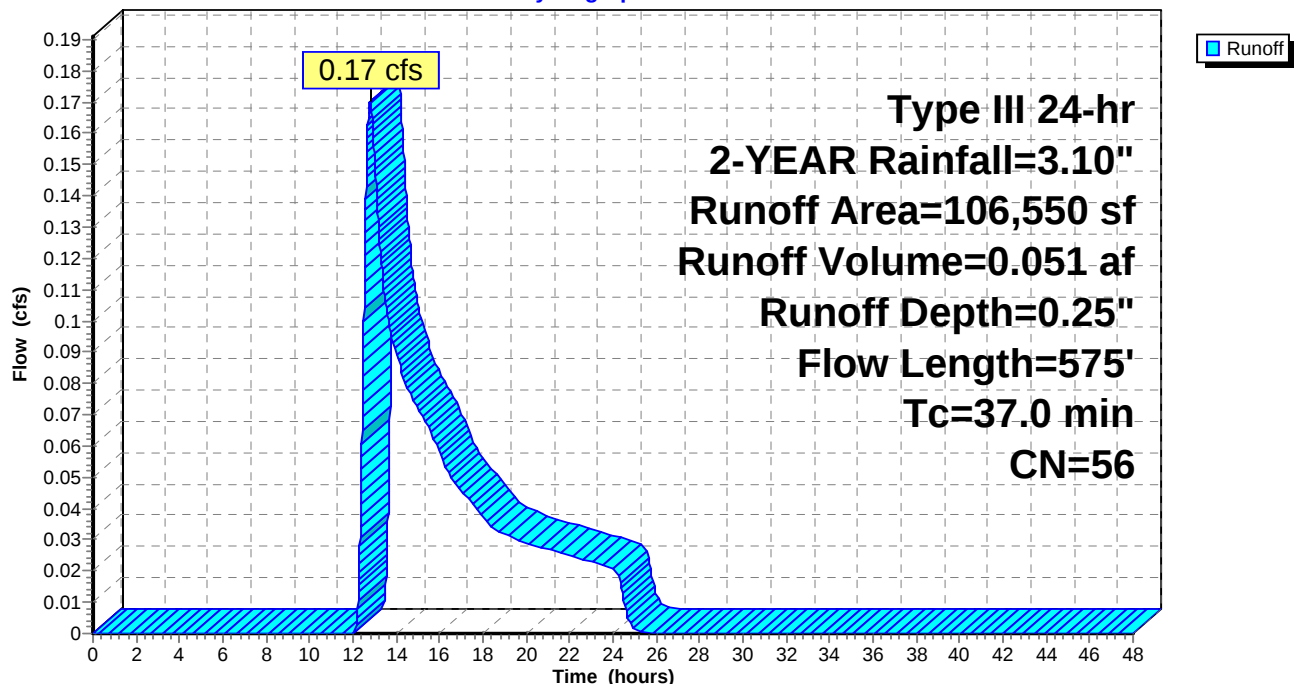
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
68,240	39	>75% Grass cover, Good, HSG A
8,130	98	Paved roads w/curbs & sewers, HSG A
9,280	98	Paved roads w/curbs & sewers, HSG C
20,900	74	>75% Grass cover, Good, HSG C
106,550	56	Weighted Average
89,140		83.66% Pervious Area
17,410		16.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.3	390	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.2	35	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
37.0	575	Total			

Subcatchment 11.2S:

Hydrograph



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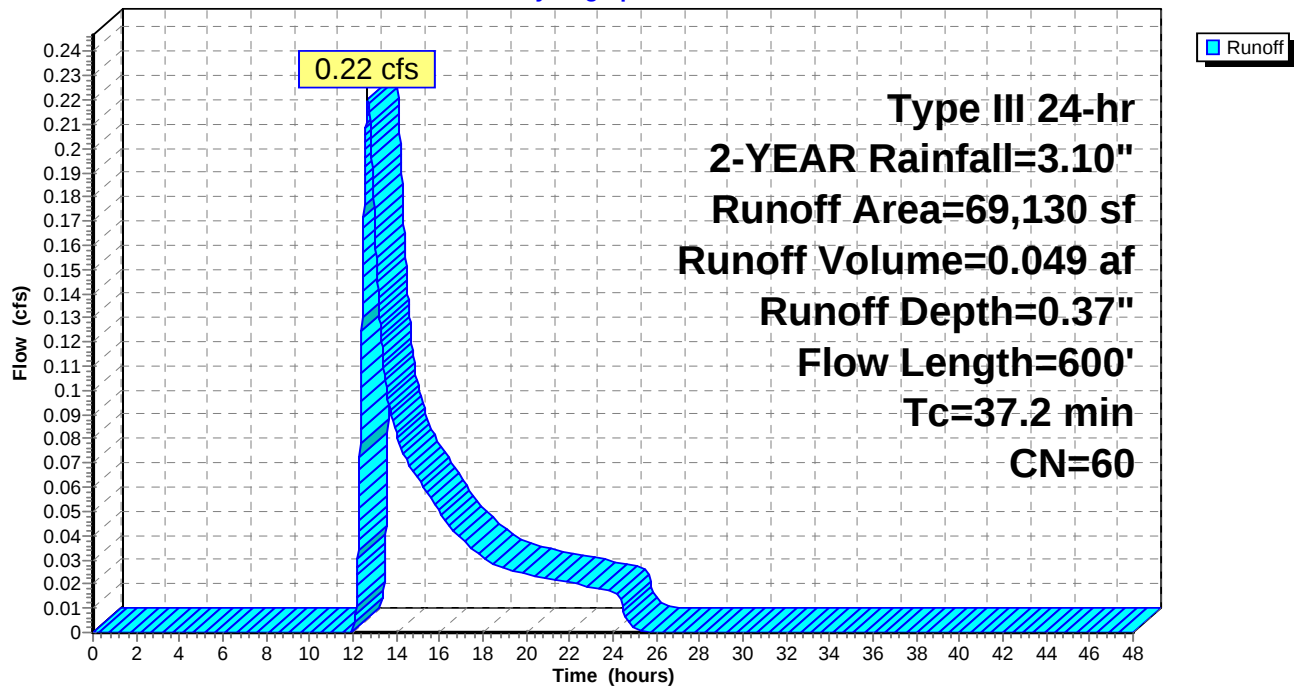
Summary for Subcatchment 11.3S:

Runoff = 0.22 cfs @ 12.69 hrs, Volume= 0.049 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
23,650	98	Paved roads w/curbs & sewers, HSG A
1,240	98	Paved roads w/curbs & sewers, HSG C
37,000	39	>75% Grass cover, Good, HSG A
2,240	61	>75% Grass cover, Good, HSG B
5,000	30	Woods, Good, HSG A
69,130	60	Weighted Average
44,240		64.00% Pervious Area
24,890		36.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.4	400	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.3	50	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
37.2	600	Total			

Subcatchment 11.3S:**Hydrograph**

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Type III 24-hr 2-YEAR Rainfall=3.10"

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Summary for Subcatchment 11.4S:

Runoff = 0.34 cfs @ 12.57 hrs, Volume= 0.054 af, Depth= 0.72"

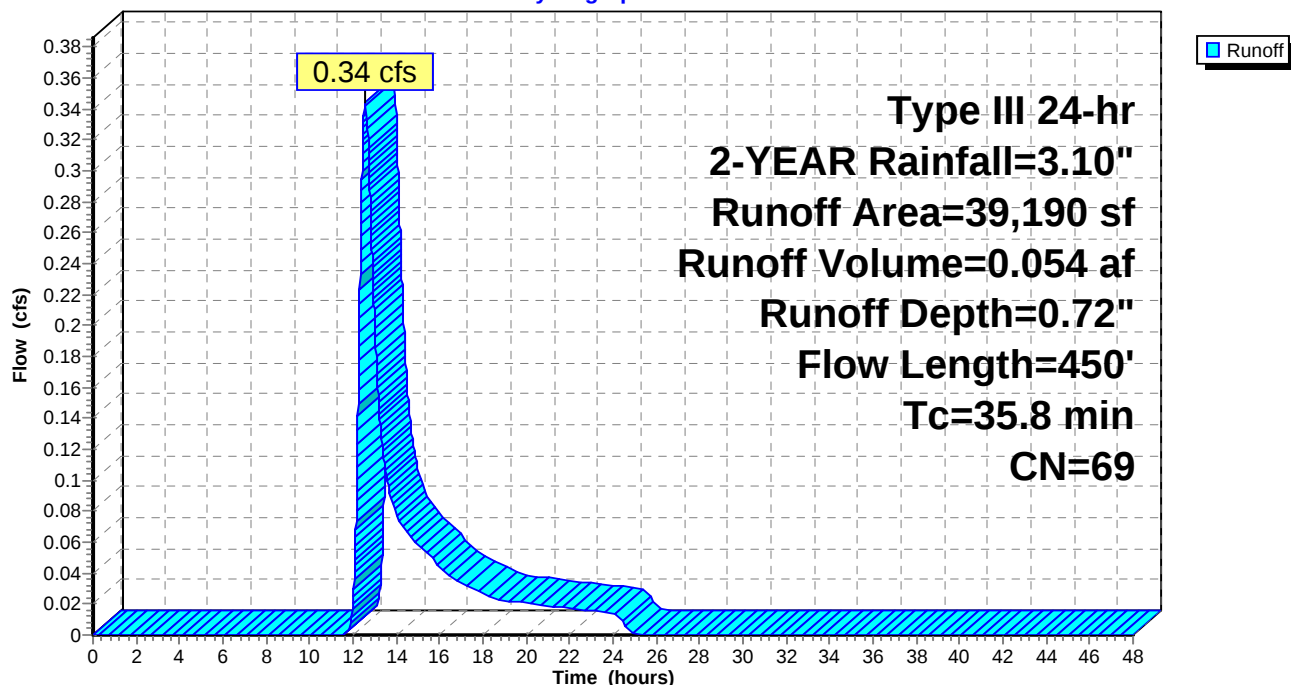
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
3,190	74	>75% Grass cover, Good, HSG C
7,160	61	>75% Grass cover, Good, HSG B
8,400	98	Paved roads w/curbs & sewers, HSG B
2,720	39	>75% Grass cover, Good, HSG A
16,380	61	>75% Grass cover, Good, HSG B
1,340	74	>75% Grass cover, Good, HSG C
39,190	69	Weighted Average
30,790		78.57% Pervious Area
8,400		21.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
3.3	300	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
35.8	450	Total			

Subcatchment 11.4S:

Hydrograph



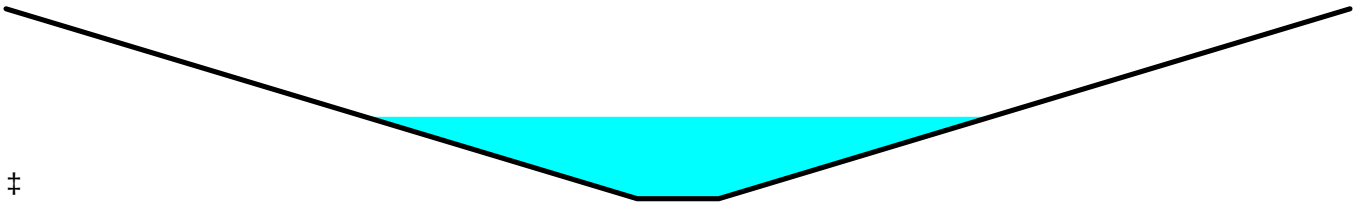
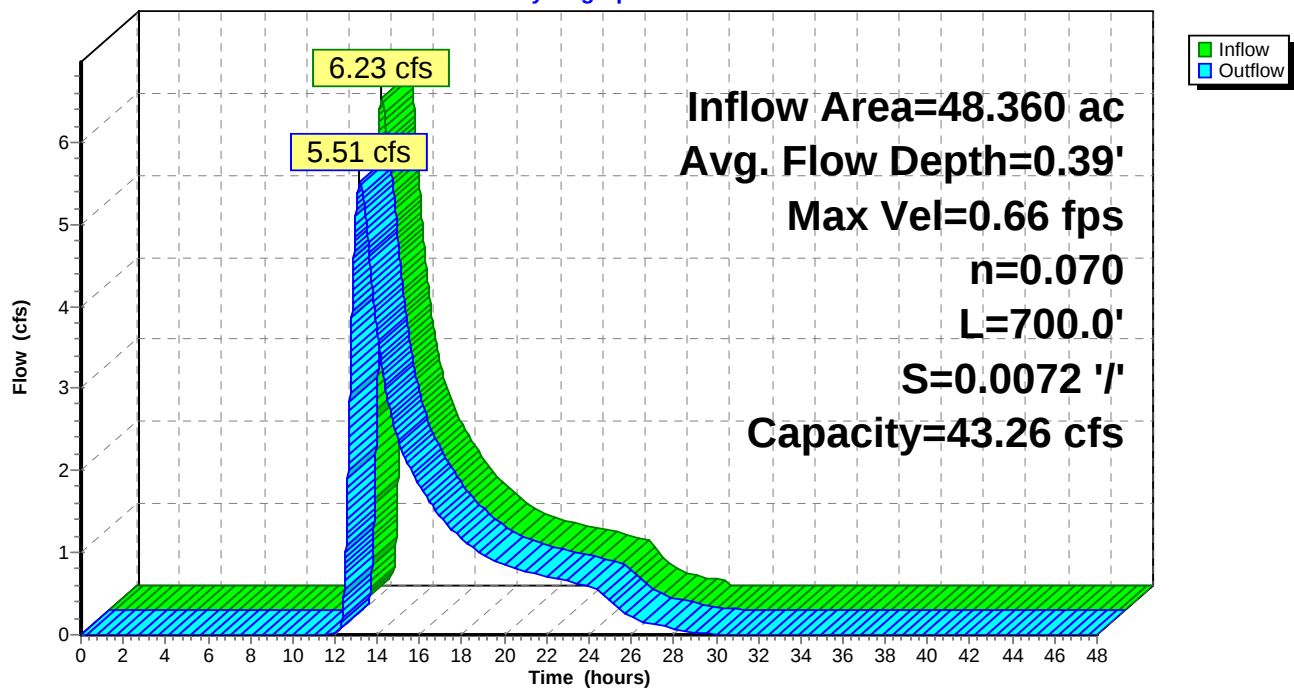
Summary for Reach 10.1R:

Inflow Area = 48.360 ac, 4.49% Impervious, Inflow Depth = 0.42" for 2-YEAR event
 Inflow = 6.23 cfs @ 12.89 hrs, Volume= 1.686 af
 Outflow = 5.51 cfs @ 13.18 hrs, Volume= 1.686 af, Atten= 12%, Lag= 17.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.66 fps, Min. Travel Time= 17.8 min
 Avg. Velocity = 0.23 fps, Avg. Travel Time= 51.7 min

Peak Storage= 5,892 cf @ 13.18 hrs
 Average Depth at Peak Storage= 0.39'
 Bank-Full Depth= 0.90' Flow Area= 39.3 sf, Capacity= 43.26 cfs

5.00' x 0.90' deep channel, n= 0.070 Sluggish weedy reaches w/pools
 Side Slope Z-value= 43.0 '/' Top Width= 82.40'
 Length= 700.0' Slope= 0.0072 '/'
 Inlet Invert= 222.30', Outlet Invert= 217.26'

**Reach 10.1R:****Hydrograph**

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Type III 24-hr 2-YEAR Rainfall=3.10"

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Stage-Area-Storage for Reach 10.1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
222.30	0.0	0	222.83	14.7	10,310
222.31	0.1	38	222.84	15.2	10,667
222.32	0.1	82	222.85	15.8	11,030
222.33	0.2	133	222.86	16.3	11,400
222.34	0.3	189	222.87	16.8	11,775
222.35	0.4	251	222.88	17.4	12,156
222.36	0.5	319	222.89	17.9	12,543
222.37	0.6	393	222.90	18.5	12,937
222.38	0.7	473	222.91	19.1	13,336
222.39	0.8	559	222.92	19.6	13,741
222.40	0.9	651	222.93	20.2	14,152
222.41	1.1	750	222.94	20.8	14,569
222.42	1.2	854	222.95	21.4	14,993
222.43	1.4	964	222.96	22.0	15,422
222.44	1.5	1,081	222.97	22.7	15,857
222.45	1.7	1,203	222.98	23.3	16,299
222.46	1.9	1,331	222.99	23.9	16,746
222.47	2.1	1,465	223.00	24.6	17,199
222.48	2.3	1,605	223.01	25.2	17,659
222.49	2.5	1,752	223.02	25.9	18,124
222.50	2.7	1,904	223.03	26.6	18,596
222.51	2.9	2,063	223.04	27.2	19,073
222.52	3.2	2,227	223.05	27.9	19,557
222.53	3.4	2,398	223.06	28.6	20,046
222.54	3.7	2,574	223.07	29.3	20,542
222.55	3.9	2,757	223.08	30.1	21,043
222.56	4.2	2,945	223.09	30.8	21,551
222.57	4.5	3,139	223.10	31.5	22,064
222.58	4.8	3,340	223.11	32.3	22,584
222.59	5.1	3,547	223.12	33.0	23,109
222.60	5.4	3,760	223.13	33.8	23,641
222.61	5.7	3,978	223.14	34.5	24,179
222.62	6.0	4,203	223.15	35.3	24,723
222.63	6.3	4,433	223.16	36.1	25,273
222.64	6.7	4,670	223.17	36.9	25,828
222.65	7.0	4,912	223.18	37.7	26,390
222.66	7.4	5,161	223.19	38.5	26,957
222.67	7.7	5,416	223.20	39.3	27,531
222.68	8.1	5,677			
222.69	8.5	5,944			
222.70	8.9	6,217			
222.71	9.3	6,495			
222.72	9.7	6,780			
222.73	10.1	7,071			
222.74	10.5	7,368			
222.75	11.0	7,670			
222.76	11.4	7,979			
222.77	11.8	8,295			
222.78	12.3	8,616			
222.79	12.8	8,943			
222.80	13.3	9,276			
222.81	13.7	9,615			
222.82	14.2	9,959			

Summary for Reach 11.1R: Meadow Buffer 1

Inflow Area = 1.233 ac, 16.21% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

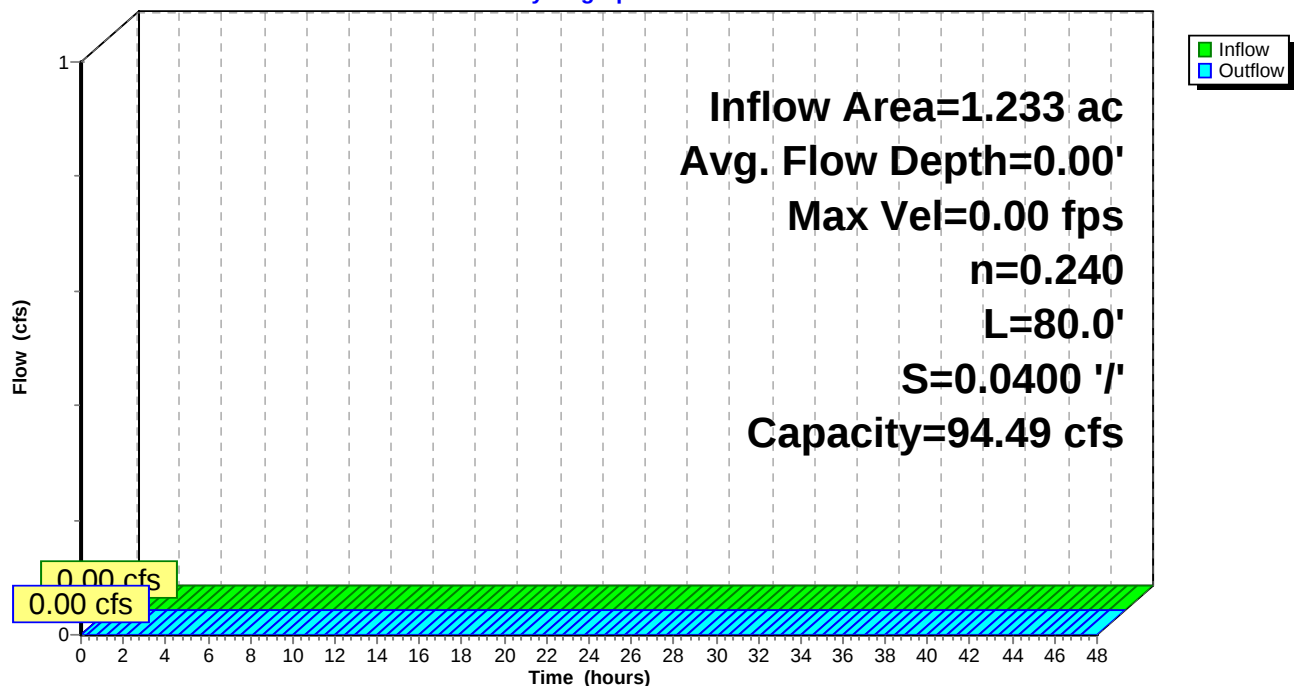
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 94.49 cfs

50.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
Side Slope Z-value= 50.0 ' / ' Top Width= 150.00'
Length= 80.0' Slope= 0.0400 ' / '
Inlet Invert= 229.00', Outlet Invert= 225.80'

**Reach 11.1R: Meadow Buffer 1**

Hydrograph



Stage-Area-Storage for Reach 11.1R: Meadow Buffer 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
229.00	0.0	0	229.53	40.5	3,244
229.01	0.5	40	229.54	41.6	3,326
229.02	1.0	82	229.55	42.6	3,410
229.03	1.5	124	229.56	43.7	3,494
229.04	2.1	166	229.57	44.7	3,580
229.05	2.6	210	229.58	45.8	3,666
229.06	3.2	254	229.59	46.9	3,752
229.07	3.7	300	229.60	48.0	3,840
229.08	4.3	346	229.61	49.1	3,928
229.09	4.9	392	229.62	50.2	4,018
229.10	5.5	440	229.63	51.3	4,108
229.11	6.1	488	229.64	52.5	4,198
229.12	6.7	538	229.65	53.6	4,290
229.13	7.3	588	229.66	54.8	4,382
229.14	8.0	638	229.67	55.9	4,476
229.15	8.6	690	229.68	57.1	4,570
229.16	9.3	742	229.69	58.3	4,664
229.17	9.9	796	229.70	59.5	4,760
229.18	10.6	850	229.71	60.7	4,856
229.19	11.3	904	229.72	61.9	4,954
229.20	12.0	960	229.73	63.1	5,052
229.21	12.7	1,016	229.74	64.4	5,150
229.22	13.4	1,074	229.75	65.6	5,250
229.23	14.1	1,132	229.76	66.9	5,350
229.24	14.9	1,190	229.77	68.1	5,452
229.25	15.6	1,250	229.78	69.4	5,554
229.26	16.4	1,310	229.79	70.7	5,656
229.27	17.1	1,372	229.80	72.0	5,760
229.28	17.9	1,434	229.81	73.3	5,864
229.29	18.7	1,496	229.82	74.6	5,970
229.30	19.5	1,560	229.83	75.9	6,076
229.31	20.3	1,624	229.84	77.3	6,182
229.32	21.1	1,690	229.85	78.6	6,290
229.33	21.9	1,756	229.86	80.0	6,398
229.34	22.8	1,822	229.87	81.3	6,508
229.35	23.6	1,890	229.88	82.7	6,618
229.36	24.5	1,958	229.89	84.1	6,728
229.37	25.3	2,028	229.90	85.5	6,840
229.38	26.2	2,098	229.91	86.9	6,952
229.39	27.1	2,168	229.92	88.3	7,066
229.40	28.0	2,240	229.93	89.7	7,180
229.41	28.9	2,312	229.94	91.2	7,294
229.42	29.8	2,386	229.95	92.6	7,410
229.43	30.7	2,460	229.96	94.1	7,526
229.44	31.7	2,534	229.97	95.5	7,644
229.45	32.6	2,610	229.98	97.0	7,762
229.46	33.6	2,686	229.99	98.5	7,880
229.47	34.5	2,764	230.00	100.0	8,000
229.48	35.5	2,842			
229.49	36.5	2,920			
229.50	37.5	3,000			
229.51	38.5	3,080			
229.52	39.5	3,162			

Summary for Reach 11.3R: Wooded Buffer 1

Inflow Area = 1.587 ac, 36.00% Impervious, Inflow Depth = 0.12" for 2-YEAR event
 Inflow = 0.04 cfs @ 17.00 hrs, Volume= 0.016 af
 Outflow = 0.04 cfs @ 17.27 hrs, Volume= 0.016 af, Atten= 3%, Lag= 16.3 min

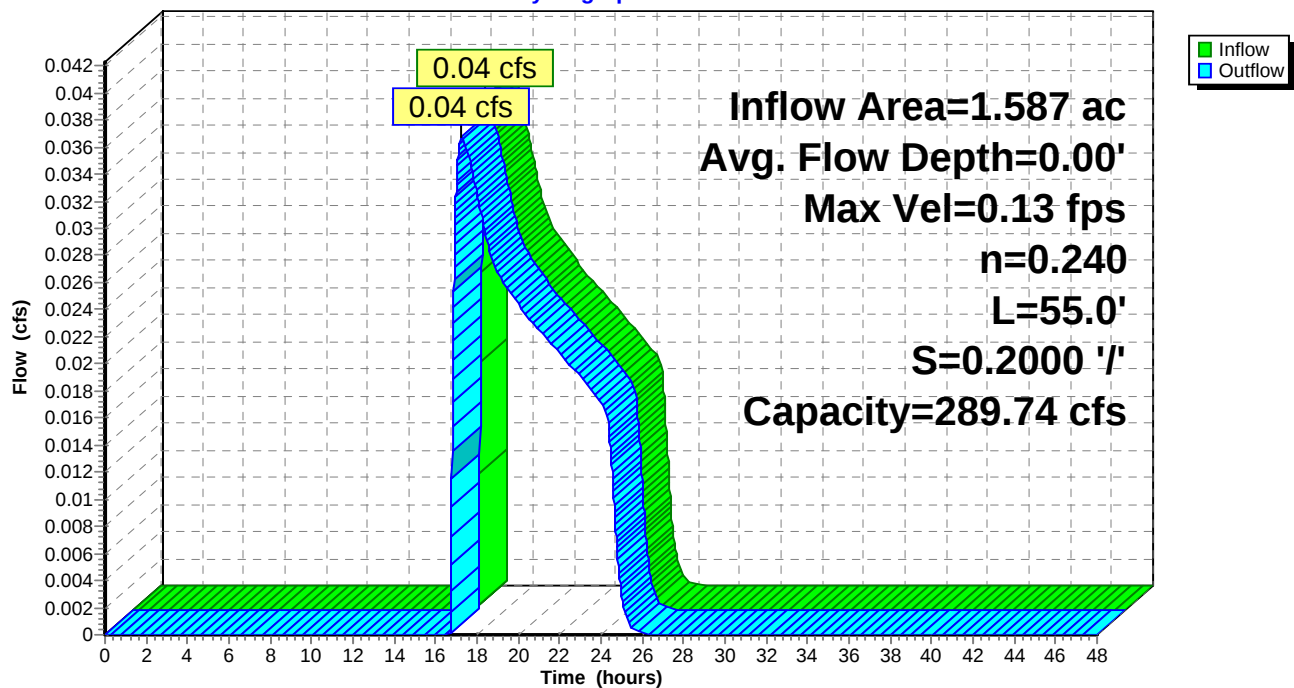
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.13 fps, Min. Travel Time= 7.2 min
 Avg. Velocity = 0.13 fps, Avg. Travel Time= 7.2 min

Peak Storage= 16 cf @ 17.27 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 130.0 sf, Capacity= 289.74 cfs

80.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
 Side Slope Z-value= 50.0 ' ' Top Width= 180.00'
 Length= 55.0' Slope= 0.2000 ' '
 Inlet Invert= 234.00', Outlet Invert= 223.00'

**Reach 11.3R: Wooded Buffer 1**

Hydrograph



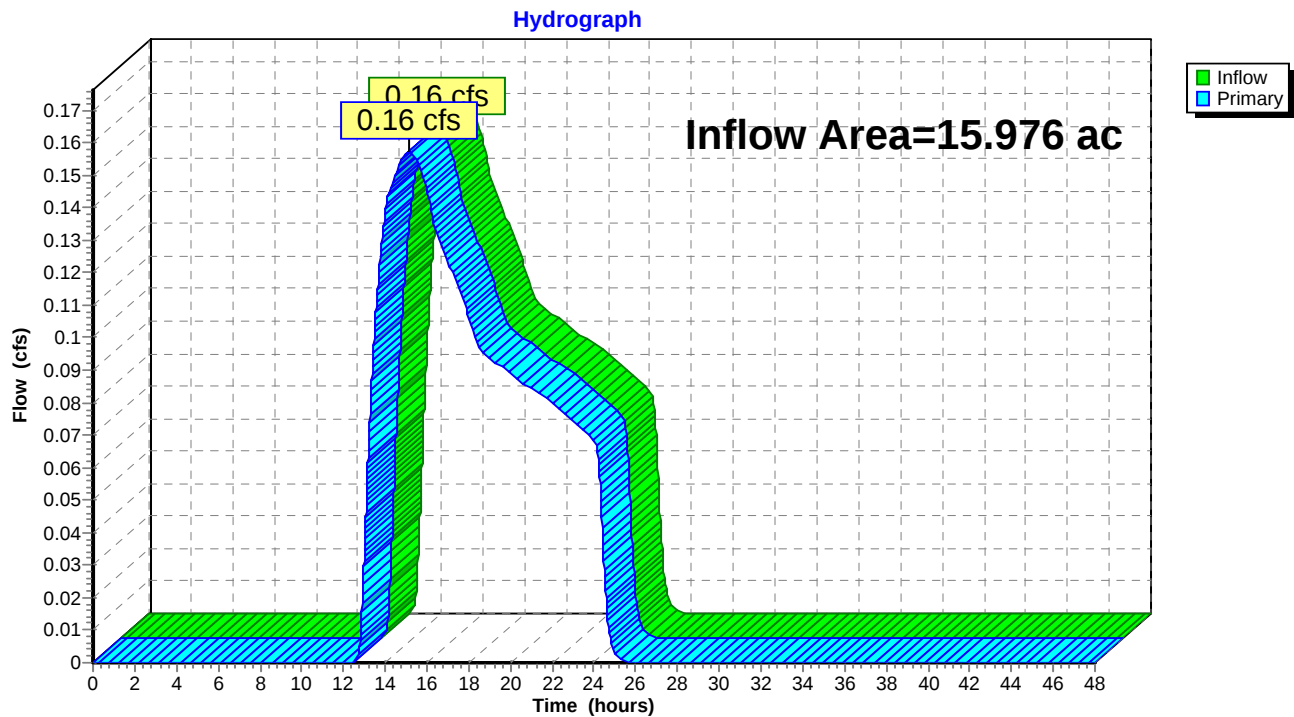
Stage-Area-Storage for Reach 11.3R: Wooded Buffer 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
234.00	0.0	0	234.53	56.4	3,104
234.01	0.8	44	234.54	57.8	3,178
234.02	1.6	89	234.55	59.1	3,252
234.03	2.4	134	234.56	60.5	3,326
234.04	3.3	180	234.57	61.8	3,401
234.05	4.1	227	234.58	63.2	3,477
234.06	5.0	274	234.59	64.6	3,553
234.07	5.8	321	234.60	66.0	3,630
234.08	6.7	370	234.61	67.4	3,707
234.09	7.6	418	234.62	68.8	3,785
234.10	8.5	468	234.63	70.2	3,863
234.11	9.4	517	234.64	71.7	3,942
234.12	10.3	568	234.65	73.1	4,022
234.13	11.2	618	234.66	74.6	4,102
234.14	12.2	670	234.67	76.0	4,182
234.15	13.1	722	234.68	77.5	4,264
234.16	14.1	774	234.69	79.0	4,345
234.17	15.0	827	234.70	80.5	4,428
234.18	16.0	881	234.71	82.0	4,510
234.19	17.0	935	234.72	83.5	4,594
234.20	18.0	990	234.73	85.0	4,677
234.21	19.0	1,045	234.74	86.6	4,762
234.22	20.0	1,101	234.75	88.1	4,847
234.23	21.0	1,157	234.76	89.7	4,932
234.24	22.1	1,214	234.77	91.2	5,018
234.25	23.1	1,272	234.78	92.8	5,105
234.26	24.2	1,330	234.79	94.4	5,192
234.27	25.2	1,388	234.80	96.0	5,280
234.28	26.3	1,448	234.81	97.6	5,368
234.29	27.4	1,507	234.82	99.2	5,457
234.30	28.5	1,568	234.83	100.8	5,546
234.31	29.6	1,628	234.84	102.5	5,636
234.32	30.7	1,690	234.85	104.1	5,727
234.33	31.8	1,751	234.86	105.8	5,818
234.34	33.0	1,814	234.87	107.4	5,909
234.35	34.1	1,877	234.88	109.1	6,002
234.36	35.3	1,940	234.89	110.8	6,094
234.37	36.4	2,004	234.90	112.5	6,188
234.38	37.6	2,069	234.91	114.2	6,281
234.39	38.8	2,134	234.92	115.9	6,376
234.40	40.0	2,200	234.93	117.6	6,470
234.41	41.2	2,266	234.94	119.4	6,566
234.42	42.4	2,333	234.95	121.1	6,662
234.43	43.6	2,400	234.96	122.9	6,758
234.44	44.9	2,468	234.97	124.6	6,855
234.45	46.1	2,537	234.98	126.4	6,953
234.46	47.4	2,606	234.99	128.2	7,051
234.47	48.6	2,675	235.00	130.0	7,150
234.48	49.9	2,746			
234.49	51.2	2,816			
234.50	52.5	2,888			
234.51	53.8	2,959			
234.52	55.1	3,032			

Summary for Pond 10.1P:

Inflow Area = 15.976 ac, 3.31% Impervious, Inflow Depth = 0.07" for 2-YEAR event
Inflow = 0.16 cfs @ 15.13 hrs, Volume= 0.099 af
Primary = 0.16 cfs @ 15.13 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 10.1P:

Summary for Pond 10.3P: Culverts

Inflow Area = 32.384 ac, 5.08% Impervious, Inflow Depth = 0.59" for 2-YEAR event
 Inflow = 9.98 cfs @ 12.52 hrs, Volume= 1.588 af
 Outflow = 6.22 cfs @ 12.88 hrs, Volume= 1.588 af, Atten= 38%, Lag= 21.6 min
 Primary = 6.22 cfs @ 12.88 hrs, Volume= 1.588 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 225.82' @ 12.88 hrs Surf.Area= 18,320 sf Storage= 12,818 cf
 Flood Elev= 227.00' Surf.Area= 37,000 sf Storage= 44,500 cf

Plug-Flow detention time= 50.5 min calculated for 1.587 af (100% of inflow)
 Center-of-Mass det. time= 50.5 min (967.7 - 917.2)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	127,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
225.00	13,000	0	0
226.00	19,500	16,250	16,250
227.00	37,000	28,250	44,500
228.00	61,500	49,250	93,750
228.50	74,500	34,000	127,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.90'	30.0" Round 30" PIPE L= 45.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 224.90' / 224.80' S= 0.0022 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	224.90'	30.0" Round 30" PIPE L= 45.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 224.90' / 224.80' S= 0.0022 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	227.17'	50.0' long x 20.0' breadth Overflow at Driveway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.22 cfs @ 12.88 hrs HW=225.82' TW=222.66' (Dynamic Tailwater)

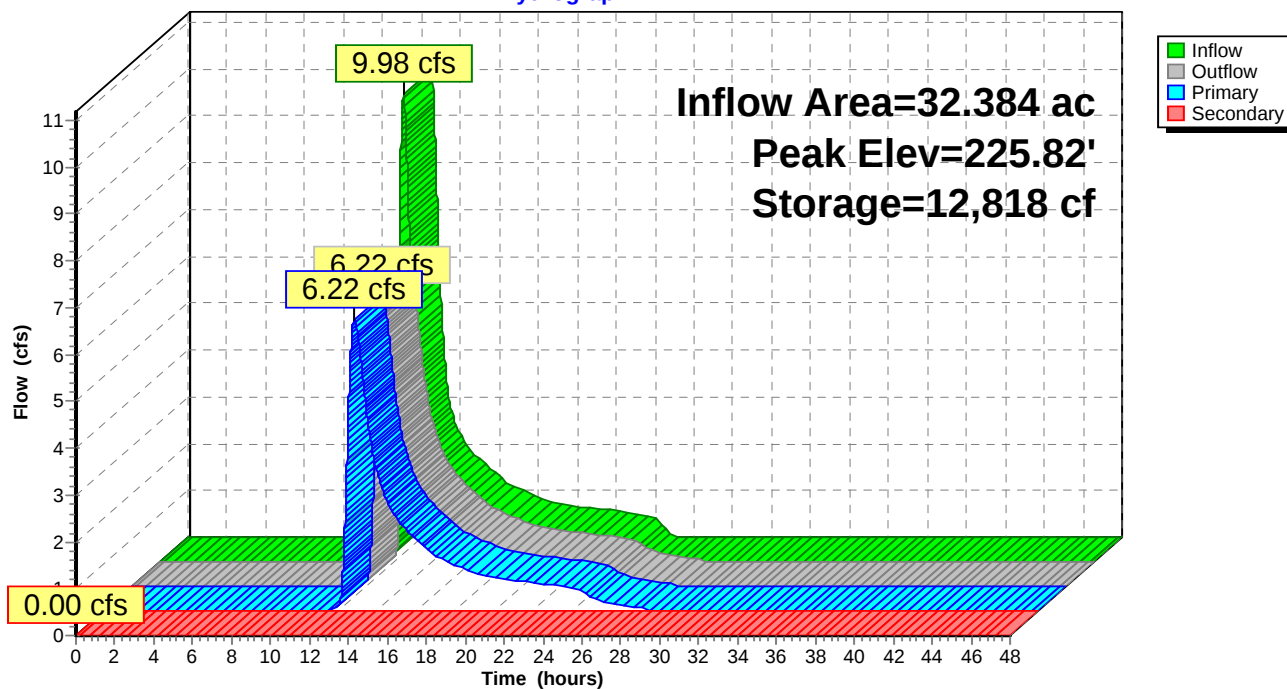
↑ **1=30" PIPE** (Barrel Controls 3.11 cfs @ 2.83 fps)
 ↓ **2=30" PIPE** (Barrel Controls 3.11 cfs @ 2.83 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' TW=222.30' (Dynamic Tailwater)

↑ **3=Overflow at Driveway** (Controls 0.00 cfs)

Pond 10.3P: Culverts

Hydrograph



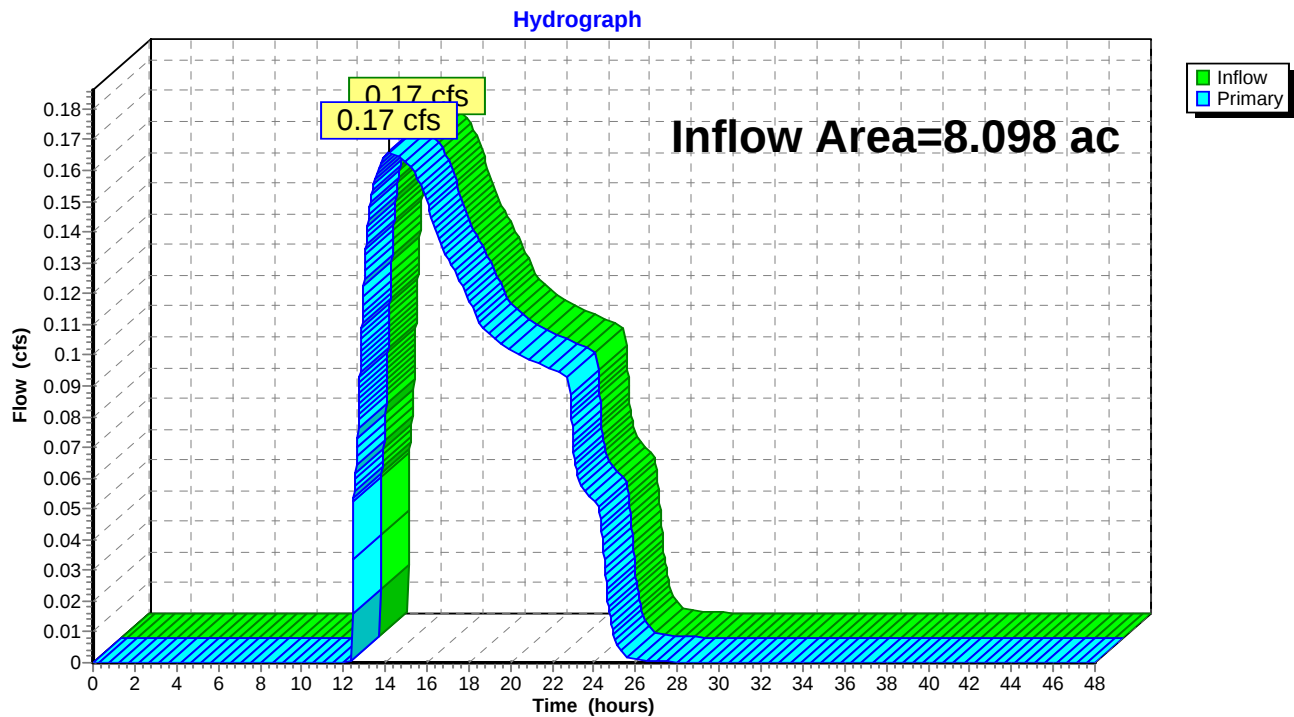
Stage-Area-Storage for Pond 10.3P: Culverts

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
225.00	13,000	0	227.65	52,925	73,726
225.05	13,325	658	227.70	54,150	76,402
225.10	13,650	1,332	227.75	55,375	79,141
225.15	13,975	2,023	227.80	56,600	81,940
225.20	14,300	2,730	227.85	57,825	84,801
225.25	14,625	3,453	227.90	59,050	87,723
225.30	14,950	4,193	227.95	60,275	90,706
225.35	15,275	4,948	228.00	61,500	93,750
225.40	15,600	5,720	228.05	62,800	96,858
225.45	15,925	6,508	228.10	64,100	100,030
225.50	16,250	7,313	228.15	65,400	103,268
225.55	16,575	8,133	228.20	66,700	106,570
225.60	16,900	8,970	228.25	68,000	109,938
225.65	17,225	9,823	228.30	69,300	113,370
225.70	17,550	10,692	228.35	70,600	116,867
225.75	17,875	11,578	228.40	71,900	120,430
225.80	18,200	12,480	228.45	73,200	124,057
225.85	18,525	13,398	228.50	74,500	127,750
225.90	18,850	14,333			
225.95	19,175	15,283			
226.00	19,500	16,250			
226.05	20,375	17,247			
226.10	21,250	18,287			
226.15	22,125	19,372			
226.20	23,000	20,500			
226.25	23,875	21,672			
226.30	24,750	22,888			
226.35	25,625	24,147			
226.40	26,500	25,450			
226.45	27,375	26,797			
226.50	28,250	28,188			
226.55	29,125	29,622			
226.60	30,000	31,100			
226.65	30,875	32,622			
226.70	31,750	34,187			
226.75	32,625	35,797			
226.80	33,500	37,450			
226.85	34,375	39,147			
226.90	35,250	40,888			
226.95	36,125	42,672			
227.00	37,000	44,500			
227.05	38,225	46,381			
227.10	39,450	48,322			
227.15	40,675	50,326			
227.20	41,900	52,390			
227.25	43,125	54,516			
227.30	44,350	56,703			
227.35	45,575	58,951			
227.40	46,800	61,260			
227.45	48,025	63,631			
227.50	49,250	66,063			
227.55	50,475	68,556			
227.60	51,700	71,110			

Summary for Pond 10.4P:

Inflow Area = 8.098 ac, 3.12% Impervious, Inflow Depth = 0.17" for 2-YEAR event
Inflow = 0.17 cfs @ 14.17 hrs, Volume= 0.114 af
Primary = 0.17 cfs @ 14.17 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 10.4P:

Summary for Pond 11.1P: Level Lip Spreader Outlet

Inflow Area = 1.233 ac, 16.21% Impervious, Inflow Depth = 0.59" for 2-YEAR event
 Inflow = 0.48 cfs @ 12.29 hrs, Volume= 0.061 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 229.10' @ 24.98 hrs Surf.Area= 1,556 sf Storage= 2,656 cf
 Flood Elev= 230.50' Surf.Area= 2,100 sf Storage= 4,480 cf

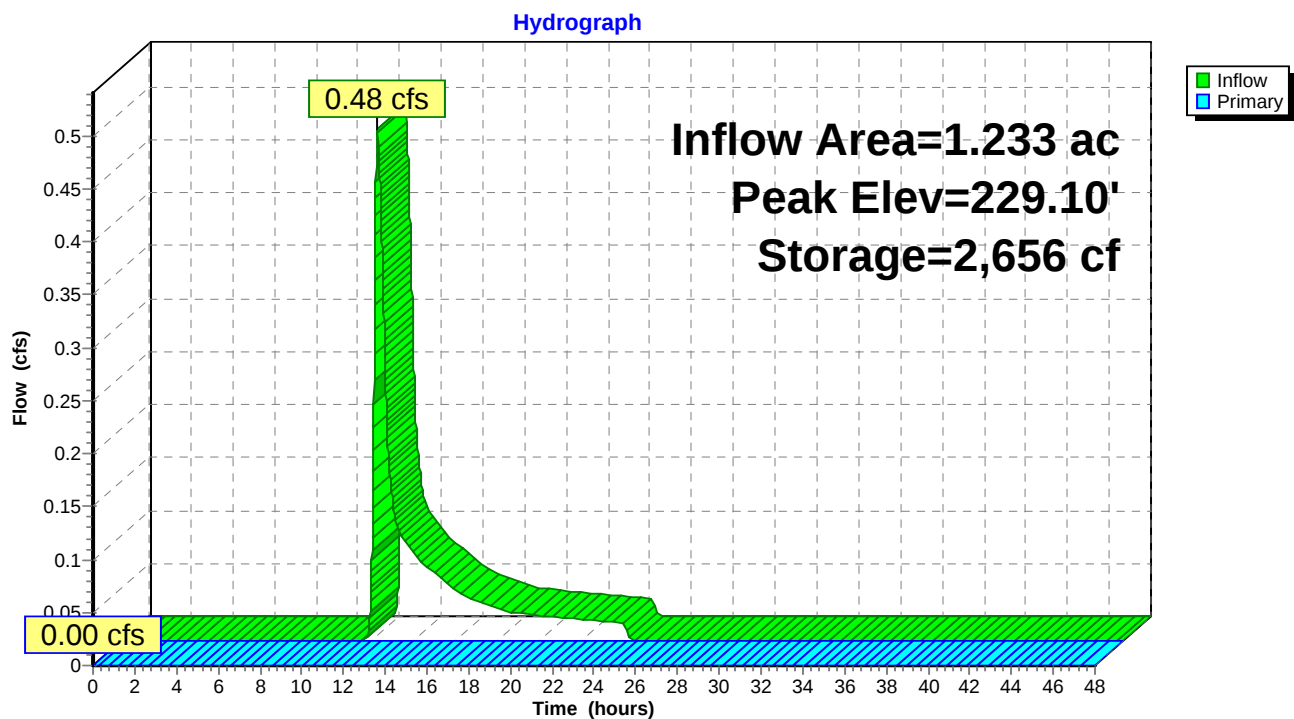
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	226.50'	4,480 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
226.50	500	0	0
227.00	700	300	300
228.00	1,100	900	1,200
229.00	1,500	1,300	2,500
230.10	2,100	1,980	4,480

Device	Routing	Invert	Outlet Devices
#1	Primary	230.00'	50.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=226.50' TW=229.00' (Dynamic Tailwater)
 ↑**1=Level Spreader** (Controls 0.00 cfs)

Pond 11.1P: Level Lip Spreader Outlet

Stage-Area-Storage for Pond 11.1P: Level Lip Spreader Outlet

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
226.50	500	0	229.15	1,582	2,731
226.55	520	26	229.20	1,609	2,811
226.60	540	52	229.25	1,636	2,892
226.65	560	80	229.30	1,664	2,975
226.70	580	108	229.35	1,691	3,058
226.75	600	138	229.40	1,718	3,144
226.80	620	168	229.45	1,745	3,230
226.85	640	199	229.50	1,773	3,318
226.90	660	232	229.55	1,800	3,408
226.95	680	265	229.60	1,827	3,498
227.00	700	300	229.65	1,855	3,590
227.05	720	336	229.70	1,882	3,684
227.10	740	372	229.75	1,909	3,778
227.15	760	410	229.80	1,936	3,875
227.20	780	448	229.85	1,964	3,972
227.25	800	488	229.90	1,991	4,071
227.30	820	528	229.95	2,018	4,171
227.35	840	569	230.00	2,045	4,273
227.40	860	612	230.05	2,073	4,376
227.45	880	655	230.10	2,100	4,480
227.50	900	700	230.15	2,100	4,480
227.55	920	746	230.20	2,100	4,480
227.60	940	792	230.25	2,100	4,480
227.65	960	840	230.30	2,100	4,480
227.70	980	888	230.35	2,100	4,480
227.75	1,000	938	230.40	2,100	4,480
227.80	1,020	988	230.45	2,100	4,480
227.85	1,040	1,039	230.50	2,100	4,480
227.90	1,060	1,092			
227.95	1,080	1,145			
228.00	1,100	1,200			
228.05	1,120	1,256			
228.10	1,140	1,312			
228.15	1,160	1,370			
228.20	1,180	1,428			
228.25	1,200	1,488			
228.30	1,220	1,548			
228.35	1,240	1,609			
228.40	1,260	1,672			
228.45	1,280	1,735			
228.50	1,300	1,800			
228.55	1,320	1,866			
228.60	1,340	1,932			
228.65	1,360	2,000			
228.70	1,380	2,068			
228.75	1,400	2,138			
228.80	1,420	2,208			
228.85	1,440	2,279			
228.90	1,460	2,352			
228.95	1,480	2,425			
229.00	1,500	2,500			
229.05	1,527	2,576			
229.10	1,555	2,653			

Summary for Pond 11.2P: UDSF-1

Inflow Area = 2.446 ac, 16.34% Impervious, Inflow Depth = 0.25" for 2-YEAR event
 Inflow = 0.17 cfs @ 12.79 hrs, Volume= 0.051 af
 Outflow = 0.07 cfs @ 15.24 hrs, Volume= 0.044 af, Atten= 59%, Lag= 147.5 min
 Primary = 0.07 cfs @ 15.24 hrs, Volume= 0.044 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 230.92' @ 15.24 hrs Surf.Area= 2,700 sf Storage= 613 cf
 Flood Elev= 234.50' Surf.Area= 4,420 sf Storage= 7,628 cf

Plug-Flow detention time= 162.0 min calculated for 0.044 af (87% of inflow)
 Center-of-Mass det. time= 106.2 min (1,088.5 - 982.3)

Volume	Invert	Avail.Storage	Storage Description
#1	230.16'	7,628 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet) Cum.Store (cubic-feet)
230.16	2,700	0.0	0 0
230.17	2,700	30.0	8 8
232.49	2,700	30.0	1,879 1,887
232.50	2,700	100.0	27 1,914
233.00	3,260	100.0	1,490 3,404
234.10	4,420	100.0	4,224 7,628

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	12.0" Round Outfall L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.50' / 230.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	230.34'	4.0" Round UD Header L= 170.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.34' / 230.34' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#3	Device 2	230.16'	2.400 in/hr Filtration over Surface area
#4	Primary	233.50'	1.5" x 1.5" Horiz. Grate X 7.00 columns X 7 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	234.00'	12.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.07 cfs @ 15.24 hrs HW=230.92' TW=0.00' (Dynamic Tailwater)

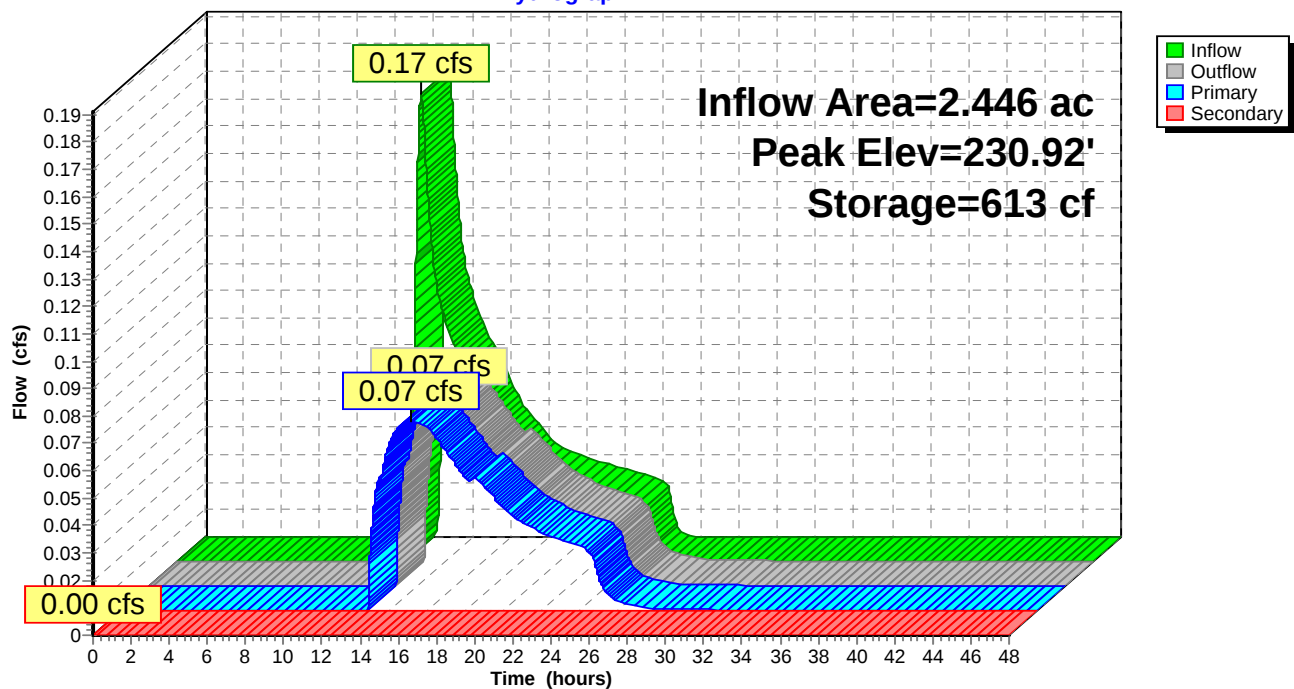
- 1=Outfall (Passes 0.07 cfs of 0.54 cfs potential flow)
- 2=UD Header (Barrel Controls 0.07 cfs @ 0.79 fps)
- 3=Filtration (Passes 0.07 cfs of 0.15 cfs potential flow)
- 4=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=230.16' TW=0.00' (Dynamic Tailwater)

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

Pond 11.2P: UDSF-1

Hydrograph



16236 POST-DEV

Prepared by Microsoft

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Type III 24-hr 2-YEAR Rainfall=3.10"

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Stage-Area-Storage for Pond 11.2P: UDSF-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
230.16	2,700	0	232.81	3,047	2,805
230.21	2,700	41	232.86	3,103	2,959
230.26	2,700	81	232.91	3,159	3,115
230.31	2,700	122	232.96	3,215	3,275
230.36	2,700	162	233.01	3,271	3,437
230.41	2,700	203	233.06	3,323	3,602
230.46	2,700	243	233.11	3,376	3,769
230.51	2,700	283	233.16	3,429	3,939
230.56	2,700	324	233.21	3,481	4,112
230.61	2,700	364	233.26	3,534	4,288
230.66	2,700	405	233.31	3,587	4,466
230.71	2,700	446	233.36	3,640	4,646
230.76	2,700	486	233.41	3,692	4,830
230.81	2,700	527	233.46	3,745	5,015
230.86	2,700	567	233.51	3,798	5,204
230.91	2,700	608	233.56	3,851	5,395
230.96	2,700	648	233.61	3,903	5,589
231.01	2,700	688	233.66	3,956	5,786
231.06	2,700	729	233.71	4,009	5,985
231.11	2,700	769	233.76	4,061	6,186
231.16	2,700	810	233.81	4,114	6,391
231.21	2,700	851	233.86	4,167	6,598
231.26	2,700	891	233.91	4,220	6,808
231.31	2,700	932	233.96	4,272	7,020
231.36	2,700	972	234.01	4,325	7,235
231.41	2,700	1,013	234.06	4,378	7,452
231.46	2,700	1,053	234.11	4,420	7,628
231.51	2,700	1,093	234.16	4,420	7,628
231.56	2,700	1,134	234.21	4,420	7,628
231.61	2,700	1,174	234.26	4,420	7,628
231.66	2,700	1,215	234.31	4,420	7,628
231.71	2,700	1,256	234.36	4,420	7,628
231.76	2,700	1,296	234.41	4,420	7,628
231.81	2,700	1,337	234.46	4,420	7,628
231.86	2,700	1,377			
231.91	2,700	1,418			
231.96	2,700	1,458			
232.01	2,700	1,498			
232.06	2,700	1,539			
232.11	2,700	1,579			
232.16	2,700	1,620			
232.21	2,700	1,661			
232.26	2,700	1,701			
232.31	2,700	1,742			
232.36	2,700	1,782			
232.41	2,700	1,823			
232.46	2,700	1,863			
232.51	2,711	1,941			
232.56	2,767	2,078			
232.61	2,823	2,218			
232.66	2,879	2,361			
232.71	2,935	2,506			
232.76	2,991	2,654			

Summary for Pond 11.3P: Level Lip Spreader Outlet

Inflow Area = 1.587 ac, 36.00% Impervious, Inflow Depth = 0.37" for 2-YEAR event
 Inflow = 0.22 cfs @ 12.69 hrs, Volume= 0.049 af
 Outflow = 0.04 cfs @ 17.00 hrs, Volume= 0.016 af, Atten= 83%, Lag= 258.3 min
 Primary = 0.04 cfs @ 17.00 hrs, Volume= 0.016 af

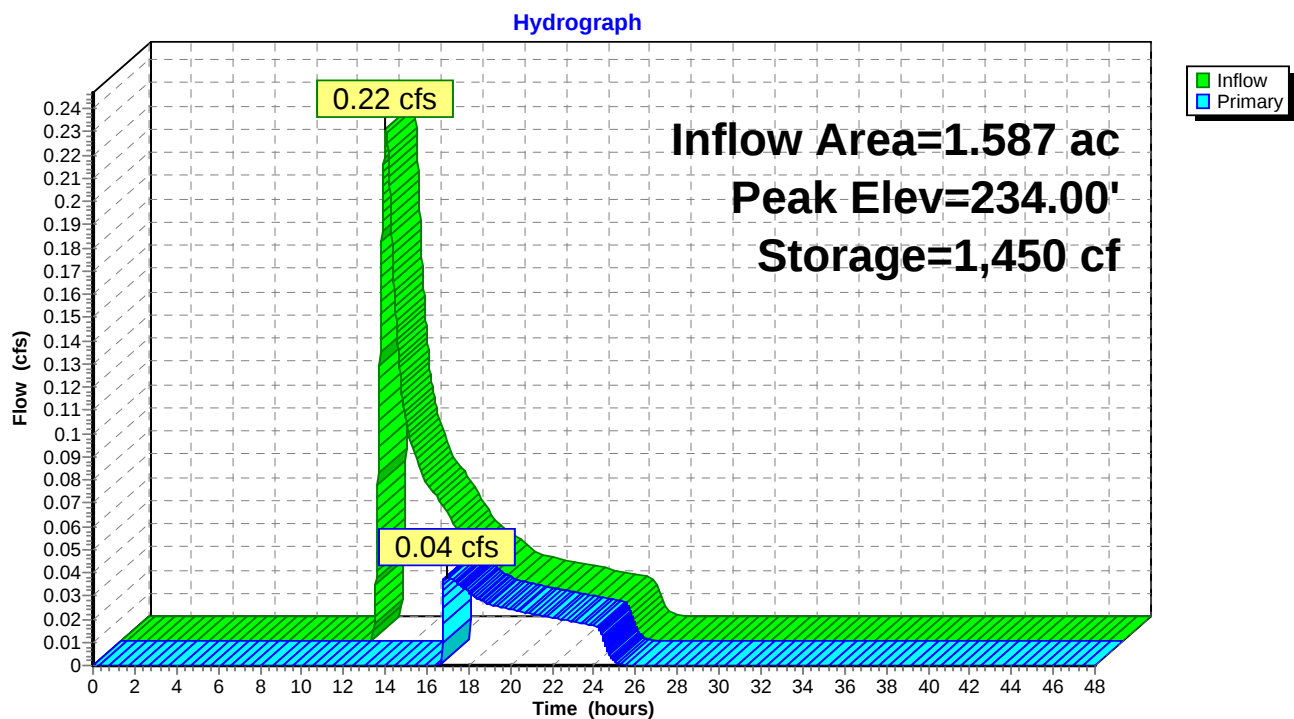
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 234.00' @ 17.22 hrs Surf.Area= 1,439 sf Storage= 1,450 cf
 Flood Elev= 234.50' Surf.Area= 1,500 sf Storage= 1,590 cf

Plug-Flow detention time= 437.6 min calculated for 0.016 af (32% of inflow)
 Center-of-Mass det. time= 254.5 min (1,208.3 - 953.9)

Volume	Invert	Avail.Storage	Storage Description
#1	232.50'	1,590 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
232.50	500	0	0
233.00	800	325	325
234.10	1,500	1,265	1,590

Device	Routing	Invert	Outlet Devices
#1	Primary	234.00'	80.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.04 cfs @ 17.00 hrs HW=234.00' TW=234.00' (Dynamic Tailwater)
 ↑**1=Level Spreader** (Weir Controls 0.04 cfs @ 0.11 fps)

Pond 11.3P: Level Lip Spreader Outlet

Stage-Area-Storage for Pond 11.3P: Level Lip Spreader Outlet

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
232.50	500	0	233.56	1,156	873
232.52	512	10	233.58	1,169	896
232.54	524	20	233.60	1,182	920
232.56	536	31	233.62	1,195	943
232.58	548	42	233.64	1,207	967
232.60	560	53	233.66	1,220	992
232.62	572	64	233.68	1,233	1,016
232.64	584	76	233.70	1,245	1,041
232.66	596	88	233.72	1,258	1,066
232.68	608	100	233.74	1,271	1,091
232.70	620	112	233.76	1,284	1,117
232.72	632	125	233.78	1,296	1,143
232.74	644	137	233.80	1,309	1,169
232.76	656	150	233.82	1,322	1,195
232.78	668	164	233.84	1,335	1,222
232.80	680	177	233.86	1,347	1,248
232.82	692	191	233.88	1,360	1,275
232.84	704	205	233.90	1,373	1,303
232.86	716	219	233.92	1,385	1,330
232.88	728	233	233.94	1,398	1,358
232.90	740	248	233.96	1,411	1,386
232.92	752	263	233.98	1,424	1,415
232.94	764	278	234.00	1,436	1,443
232.96	776	293	234.02	1,449	1,472
232.98	788	309	234.04	1,462	1,501
233.00	800	325	234.06	1,475	1,531
233.02	813	341	234.08	1,487	1,560
233.04	825	358	234.10	1,500	1,590
233.06	838	374	234.12	1,500	1,590
233.08	851	391	234.14	1,500	1,590
233.10	864	408	234.16	1,500	1,590
233.12	876	426	234.18	1,500	1,590
233.14	889	443	234.20	1,500	1,590
233.16	902	461	234.22	1,500	1,590
233.18	915	479	234.24	1,500	1,590
233.20	927	498	234.26	1,500	1,590
233.22	940	516	234.28	1,500	1,590
233.24	953	535	234.30	1,500	1,590
233.26	965	555	234.32	1,500	1,590
233.28	978	574	234.34	1,500	1,590
233.30	991	594	234.36	1,500	1,590
233.32	1,004	614	234.38	1,500	1,590
233.34	1,016	634	234.40	1,500	1,590
233.36	1,029	654	234.42	1,500	1,590
233.38	1,042	675	234.44	1,500	1,590
233.40	1,055	696	234.46	1,500	1,590
233.42	1,067	717	234.48	1,500	1,590
233.44	1,080	739	234.50	1,500	1,590
233.46	1,093	760			
233.48	1,105	782			
233.50	1,118	805			
233.52	1,131	827			
233.54	1,144	850			

Summary for Pond 11.4P: UDSF-2

Inflow Area = 0.900 ac, 21.43% Impervious, Inflow Depth = 0.72" for 2-YEAR event
 Inflow = 0.34 cfs @ 12.57 hrs, Volume= 0.054 af
 Outflow = 0.06 cfs @ 15.02 hrs, Volume= 0.049 af, Atten= 83%, Lag= 146.7 min
 Primary = 0.06 cfs @ 15.02 hrs, Volume= 0.049 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 239.36' @ 15.02 hrs Surf.Area= 1,043 sf Storage= 985 cf

Flood Elev= 241.00' Surf.Area= 1,500 sf Storage= 2,568 cf

Plug-Flow detention time= 213.4 min calculated for 0.049 af (90% of inflow)

Center-of-Mass det. time= 166.5 min (1,076.0 - 909.6)

Volume	Invert	Avail.Storage	Storage Description
#1	236.66'	2,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
236.66	900	0.0	0	0
236.67	900	30.0	3	3
238.99	900	30.0	626	629
239.00	900	100.0	9	638
239.50	1,100	100.0	500	1,138
240.60	1,500	100.0	1,430	2,568

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	12.0" Round Outfall L= 225.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 237.50' / 237.00' S= 0.0022 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	236.83'	4.0" Round UD Header L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 236.83' / 236.83' S= 0.0000 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#3	Device 2	236.66'	2.400 in/hr Filtration over Surface area
#4	Primary	240.30'	1.5" x 1.5" Horiz. Grate X 7.00 columns X 7 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	240.50'	12.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.06 cfs @ 15.02 hrs HW=239.36' TW=0.00' (Dynamic Tailwater)

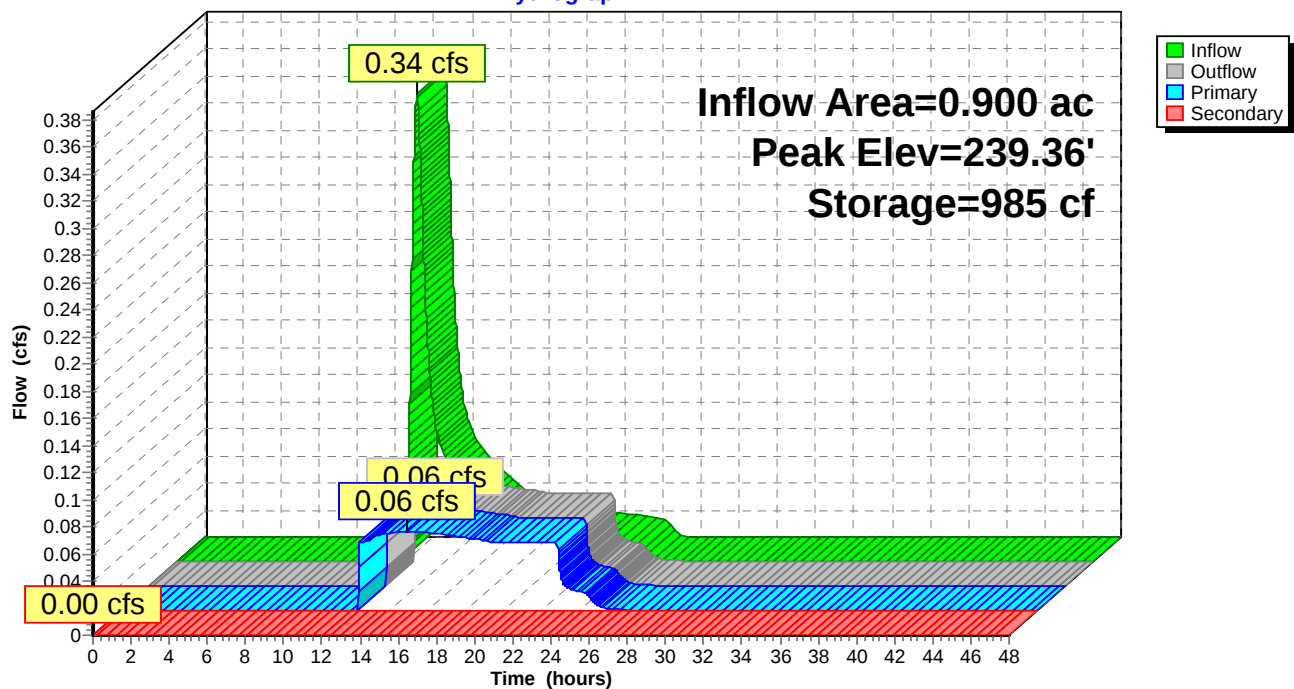
- 1=Outfall (Passes 0.06 cfs of 2.45 cfs potential flow)
- 2=UD Header (Passes 0.06 cfs of 0.35 cfs potential flow)
- 3=Filtration (Exfiltration Controls 0.06 cfs)
- 4=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=236.66' TW=0.00' (Dynamic Tailwater)

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

Pond 11.4P: UDSF-2

Hydrograph



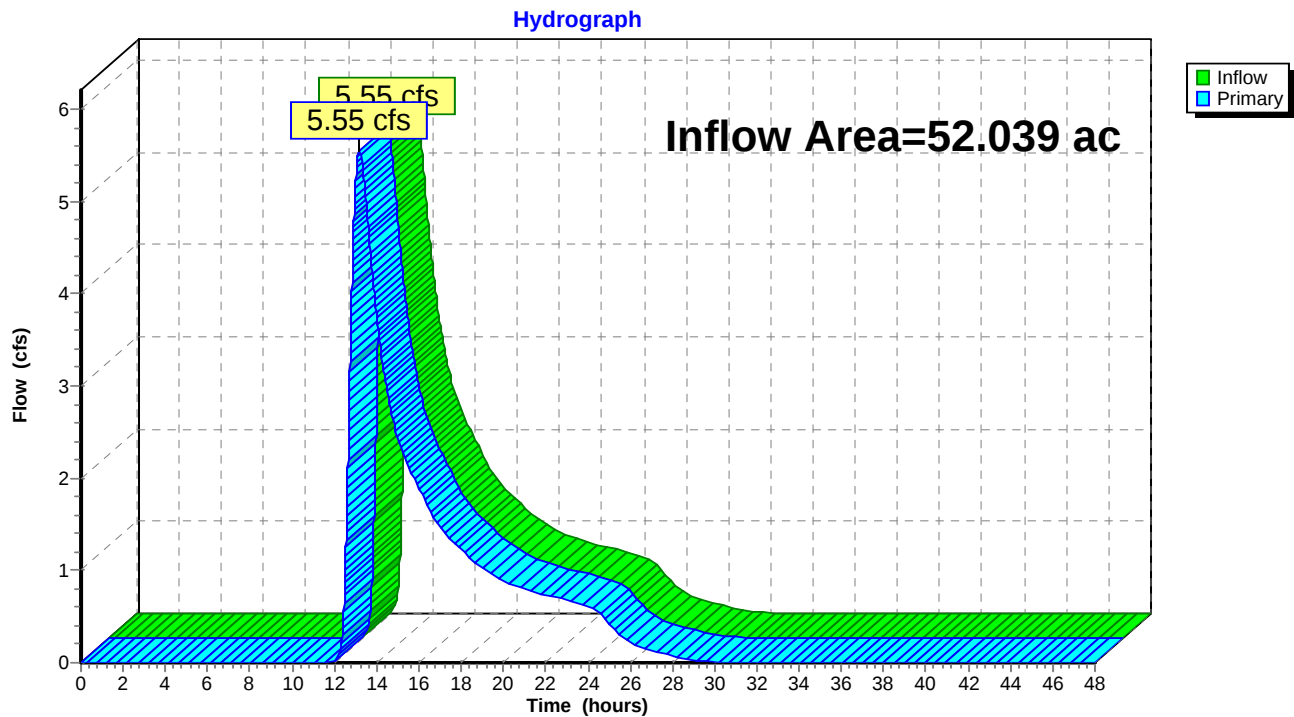
Stage-Area-Storage for Pond 11.4P: UDSF-2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
236.66	900	0	239.31	1,024	936
236.71	900	14	239.36	1,044	988
236.76	900	27	239.41	1,064	1,041
236.81	900	41	239.46	1,084	1,094
236.86	900	54	239.51	1,104	1,149
236.91	900	68	239.56	1,122	1,205
236.96	900	81	239.61	1,140	1,261
237.01	900	94	239.66	1,158	1,319
237.06	900	108	239.71	1,176	1,377
237.11	900	121	239.76	1,195	1,436
237.16	900	135	239.81	1,213	1,497
237.21	900	149	239.86	1,231	1,558
237.26	900	162	239.91	1,249	1,620
237.31	900	176	239.96	1,267	1,683
237.36	900	189	240.01	1,285	1,746
237.41	900	203	240.06	1,304	1,811
237.46	900	216	240.11	1,322	1,877
237.51	900	229	240.16	1,340	1,943
237.56	900	243	240.21	1,358	2,011
237.61	900	256	240.26	1,376	2,079
237.66	900	270	240.31	1,395	2,148
237.71	900	284	240.36	1,413	2,219
237.76	900	297	240.41	1,431	2,290
237.81	900	311	240.46	1,449	2,362
237.86	900	324	240.51	1,467	2,435
237.91	900	338	240.56	1,485	2,508
237.96	900	351	240.61	1,500	2,568
238.01	900	364	240.66	1,500	2,568
238.06	900	378	240.71	1,500	2,568
238.11	900	391	240.76	1,500	2,568
238.16	900	405	240.81	1,500	2,568
238.21	900	419	240.86	1,500	2,568
238.26	900	432	240.91	1,500	2,568
238.31	900	446	240.96	1,500	2,568
238.36	900	459			
238.41	900	473			
238.46	900	486			
238.51	900	499			
238.56	900	513			
238.61	900	526			
238.66	900	540			
238.71	900	554			
238.76	900	567			
238.81	900	581			
238.86	900	594			
238.91	900	608			
238.96	900	621			
239.01	904	647			
239.06	924	693			
239.11	944	740			
239.16	964	787			
239.21	984	836			
239.26	1,004	886			

Summary for Link SP1: Study Point #1

Inflow Area = 52.039 ac, 5.33% Impervious, Inflow Depth = 0.40" for 2-YEAR event
Inflow = 5.55 cfs @ 13.18 hrs, Volume= 1.731 af
Primary = 5.55 cfs @ 13.18 hrs, Volume= 1.731 af, Atten= 0%, Lag= 0.0 min

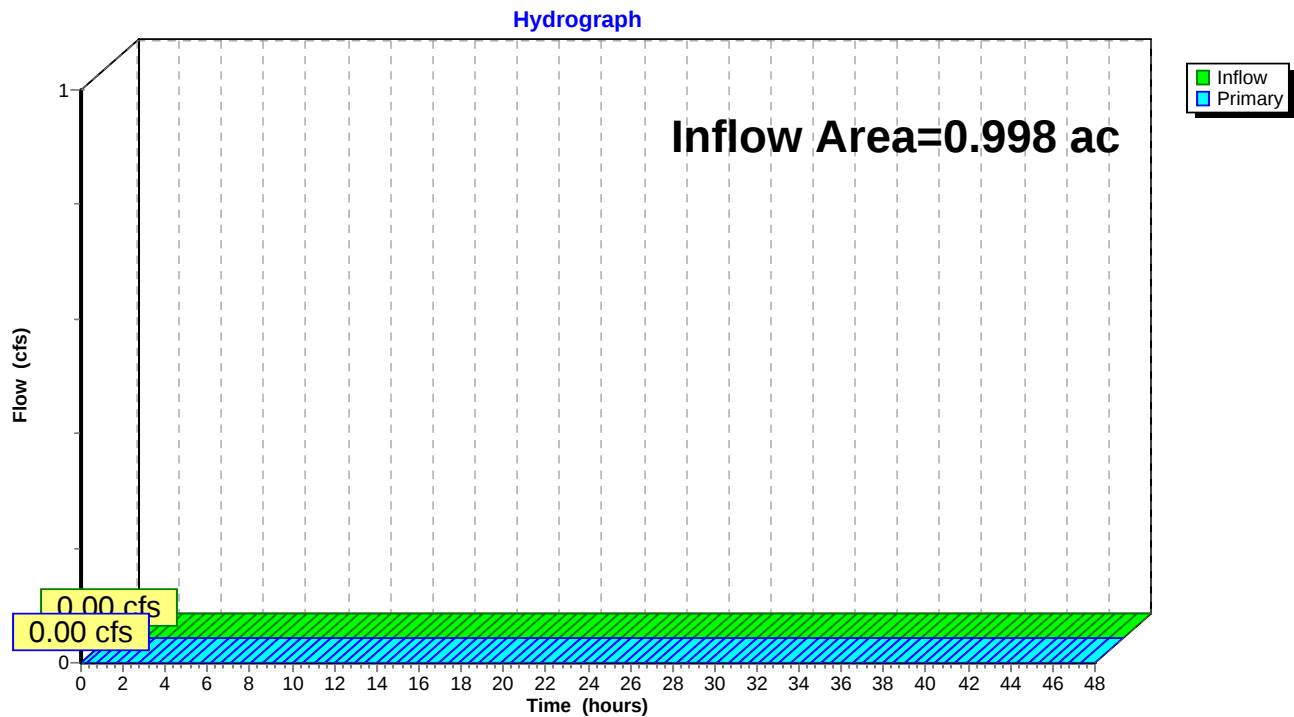
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP1: Study Point #1

Summary for Link SP2: Study Point #2

Inflow Area = 0.998 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

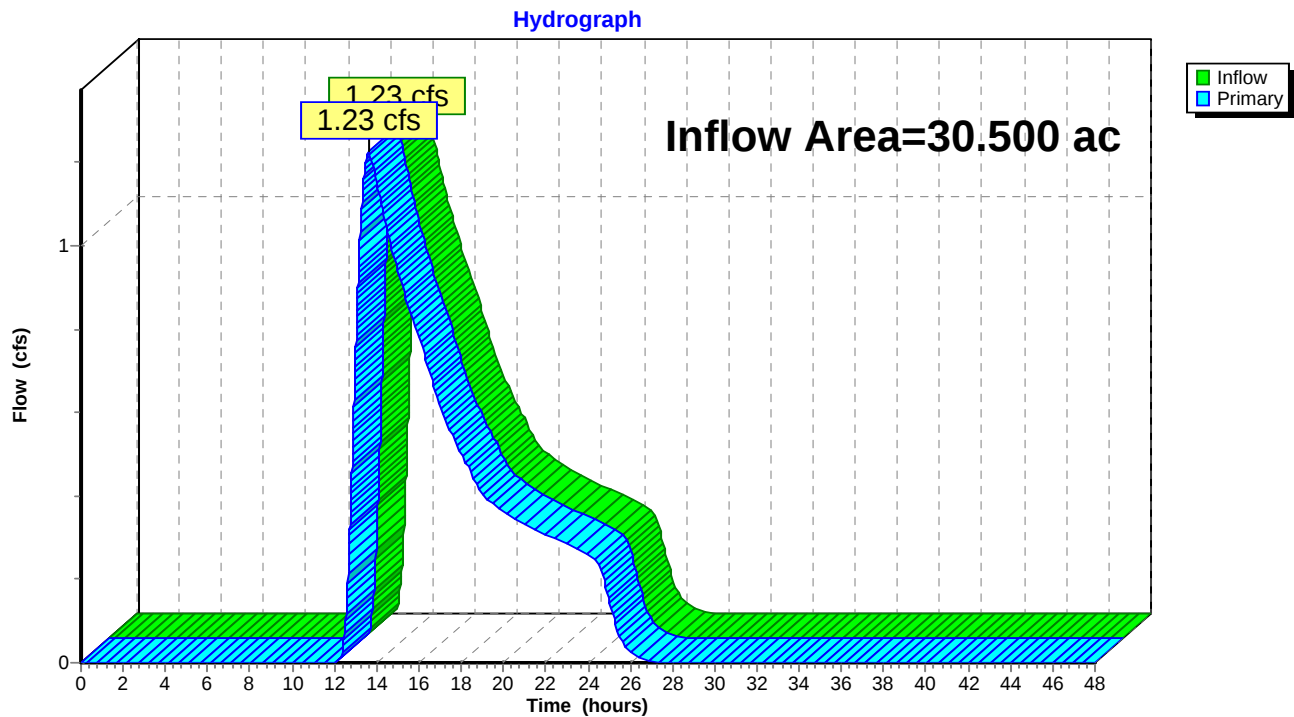
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP2: Study Point #2

Summary for Link SP3: Study Point #3

Inflow Area = 30.500 ac, 1.78% Impervious, Inflow Depth = 0.22" for 2-YEAR event
Inflow = 1.23 cfs @ 13.61 hrs, Volume= 0.565 af
Primary = 1.23 cfs @ 13.61 hrs, Volume= 0.565 af, Atten= 0%, Lag= 0.0 min

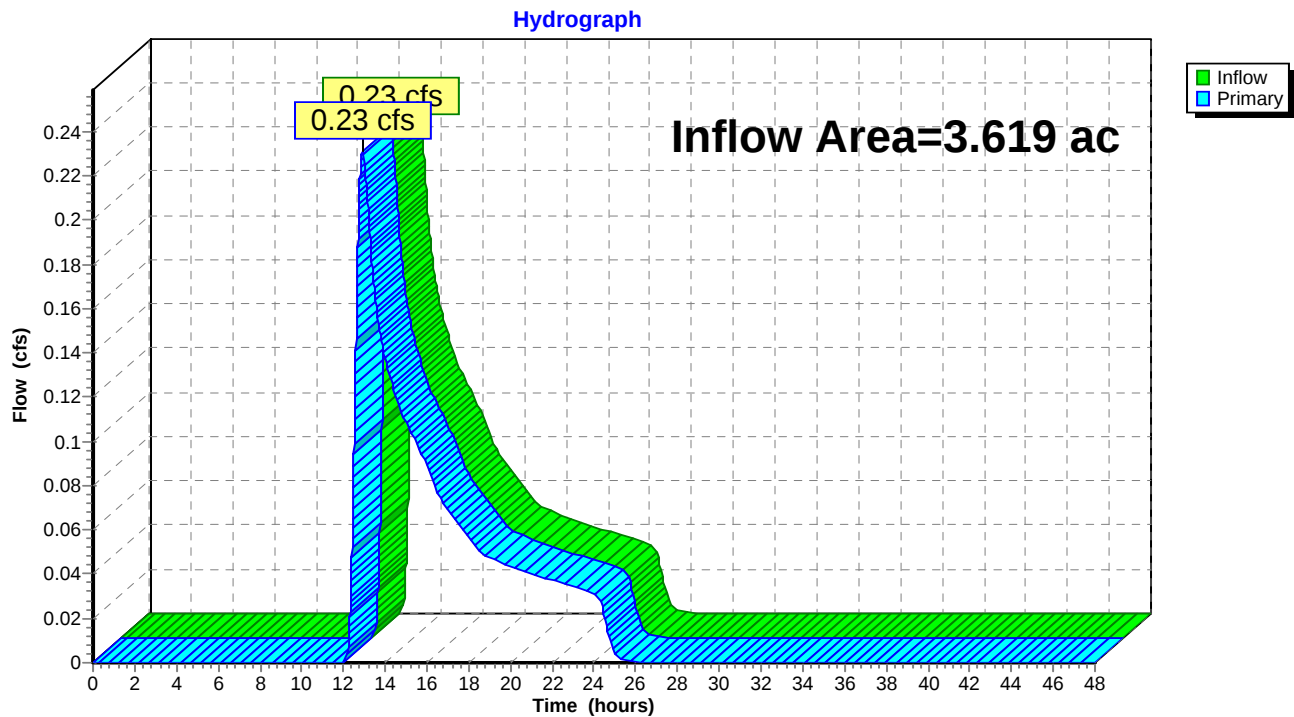
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP3: Study Point #3

Summary for Link SP4: Study Point #4

Inflow Area = 3.619 ac, 0.00% Impervious, Inflow Depth = 0.25" for 2-YEAR event
Inflow = 0.23 cfs @ 12.90 hrs, Volume= 0.075 af
Primary = 0.23 cfs @ 12.90 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP4: Study Point #4

16236 POST-DEV

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Type III 24-hr 10-YEAR Rainfall=4.60"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

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

Subcatchment10.1S: Runoff Area=695,930 sf 3.31% Impervious Runoff Depth=0.45"
Flow Length=710' Tc=32.5 min UI Adjusted CN=48 Runoff=2.46 cfs 0.594 af

Subcatchment10.2S: Runoff Area=43,490 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=340' Tc=33.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment10.3S: Runoff Area=988,770 sf 3.61% Impervious Runoff Depth=1.74"
Flow Length=1,830' Tc=32.3 min CN=70 Runoff=24.62 cfs 3.301 af

Subcatchment10.4S: Runoff Area=313,540 sf 0.84% Impervious Runoff Depth=0.54"
Flow Length=900' Tc=39.0 min CN=50 Runoff=1.39 cfs 0.322 af

Subcatchment10.5S: Runoff Area=1,328,600 sf 1.78% Impervious Runoff Depth=0.79"
Flow Length=1,720' Tc=81.1 min CN=55 Runoff=6.94 cfs 2.003 af

Subcatchment10.6S: Runoff Area=157,640 sf 0.00% Impervious Runoff Depth=0.84"
Flow Length=960' Tc=44.8 min CN=56 Runoff=1.31 cfs 0.254 af

Subcatchment11.1S: Runoff Area=53,730 sf 16.21% Impervious Runoff Depth=1.46"
Flow Length=325' Tc=17.0 min CN=66 Runoff=1.42 cfs 0.150 af

Subcatchment11.2S: Runoff Area=106,550 sf 16.34% Impervious Runoff Depth=0.84"
Flow Length=575' Tc=37.0 min CN=56 Runoff=0.98 cfs 0.172 af

Subcatchment11.3S: Runoff Area=69,130 sf 36.00% Impervious Runoff Depth=1.07"
Flow Length=600' Tc=37.2 min CN=60 Runoff=0.89 cfs 0.142 af

Subcatchment11.4S: Runoff Area=39,190 sf 21.43% Impervious Runoff Depth=1.67"
Flow Length=450' Tc=35.8 min CN=69 Runoff=0.89 cfs 0.125 af

Reach 10.1R: Avg. Flow Depth=0.65' Max Vel=0.89 fps Inflow=20.27 cfs 4.446 af
n=0.070 L=700.0' S=0.0072 ' /' Capacity=43.26 cfs Outflow=18.86 cfs 4.446 af

Reach 11.1R: Meadow Buffer 1 Avg. Flow Depth=0.02' Max Vel=0.11 fps Inflow=0.15 cfs 0.052 af
n=0.240 L=80.0' S=0.0400 ' /' Capacity=94.49 cfs Outflow=0.13 cfs 0.052 af

Reach 11.3R: Wooded Buffer 1 Avg. Flow Depth=0.03' Max Vel=0.27 fps Inflow=0.75 cfs 0.109 af
n=0.240 L=55.0' S=0.2000 ' /' Capacity=289.74 cfs Outflow=0.66 cfs 0.109 af

Pond 10.1P: Inflow=2.46 cfs 0.594 af
Primary=2.46 cfs 0.594 af

Pond 10.3P: Culverts Peak Elev=226.53' Storage=29,129 cf Inflow=25.64 cfs 3.851 af
Primary=17.95 cfs 3.851 af Secondary=0.00 cfs 0.000 af Outflow=17.95 cfs 3.851 af

Pond 10.4P: Inflow=1.51 cfs 0.442 af
Primary=1.51 cfs 0.442 af

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Type III 24-hr 10-YEAR Rainfall=4.60"

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Pond 11.1P: Level Lip Spreader Outlet Peak Elev=230.01' Storage=4,296 cf Inflow=1.42 cfs 0.150 af
Outflow=0.15 cfs 0.052 af

Pond 11.2P: UDSF-1 Peak Elev=232.87' Storage=3,003 cf Inflow=0.98 cfs 0.172 af
Primary=0.17 cfs 0.165 af Secondary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.165 af

Pond 11.3P: Level Lip Spreader Outlet Peak Elev=234.03' Storage=1,493 cf Inflow=0.89 cfs 0.142 af
Outflow=0.75 cfs 0.109 af

Pond 11.4P: UDSF-2 Peak Elev=240.33' Storage=2,171 cf Inflow=0.89 cfs 0.125 af
Primary=0.42 cfs 0.120 af Secondary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.120 af

Link SP1: Study Point #1 Inflow=19.01 cfs 4.663 af
Primary=19.01 cfs 4.663 af

Link SP2: Study Point #2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link SP3: Study Point #3 Inflow=6.94 cfs 2.003 af
Primary=6.94 cfs 2.003 af

Link SP4: Study Point #4 Inflow=1.31 cfs 0.254 af
Primary=1.31 cfs 0.254 af

Total Runoff Area = 87.157 ac Runoff Volume = 7.063 af Average Runoff Depth = 0.97"
96.19% Pervious = 83.840 ac 3.81% Impervious = 3.317 ac

Summary for Subcatchment 10.1S:

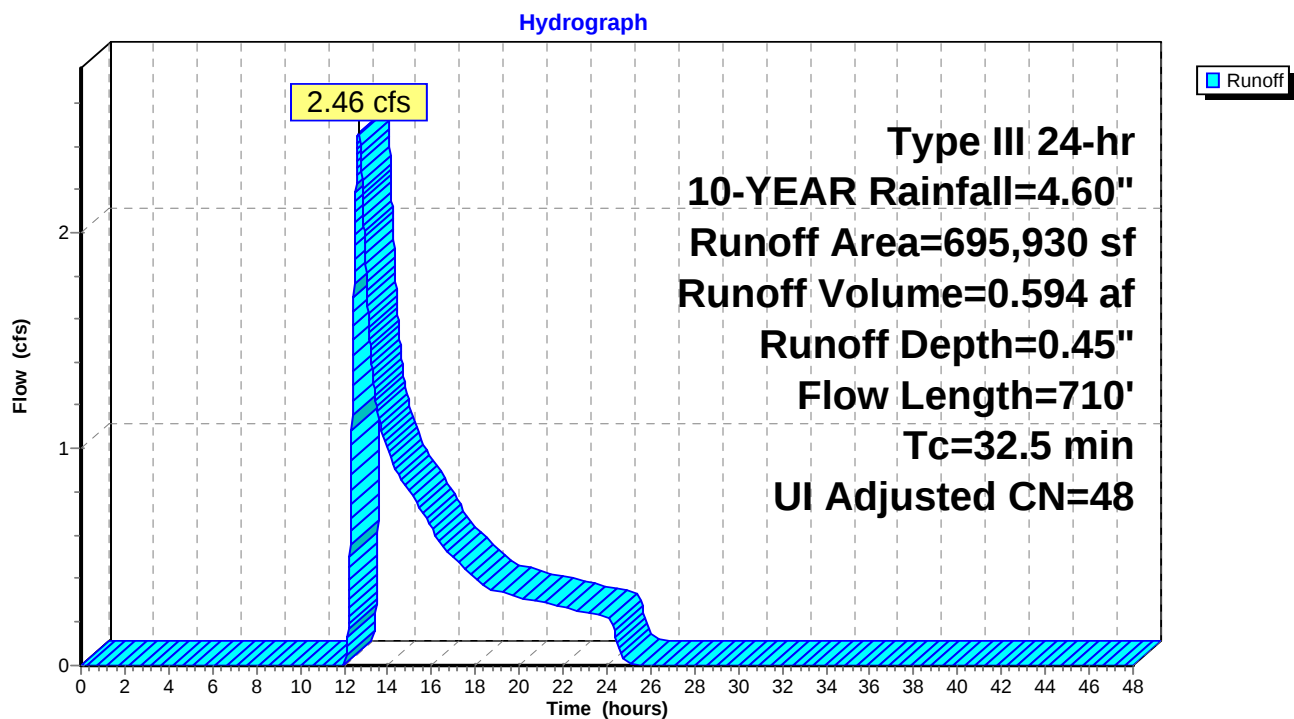
Runoff = 2.46 cfs @ 12.67 hrs, Volume= 0.594 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Adj	Description
161,180	80		>75% Grass cover, Good, HSG D
10,800	74		>75% Grass cover, Good, HSG C
246,600	39		>75% Grass cover, Good, HSG A
11,660	98		Paved roads w/curbs & sewers, HSG D
1,510	98		Paved roads w/curbs & sewers, HSG C
6,150	98		Paved roads w/curbs & sewers, HSG A
13,130	77		Woods, Good, HSG D
241,170	30		Woods, Good, HSG A
3,730	98		Unconnected roofs, HSG A
695,930	49	48	Weighted Average, UI Adjusted
672,880			96.69% Pervious Area
23,050			3.31% Impervious Area
3,730			16.18% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	150	0.0080	0.09		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
3.6	560	0.0300	2.60		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
32.5	710	Total			

Subcatchment 10.1S:



Summary for Subcatchment 10.2S:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

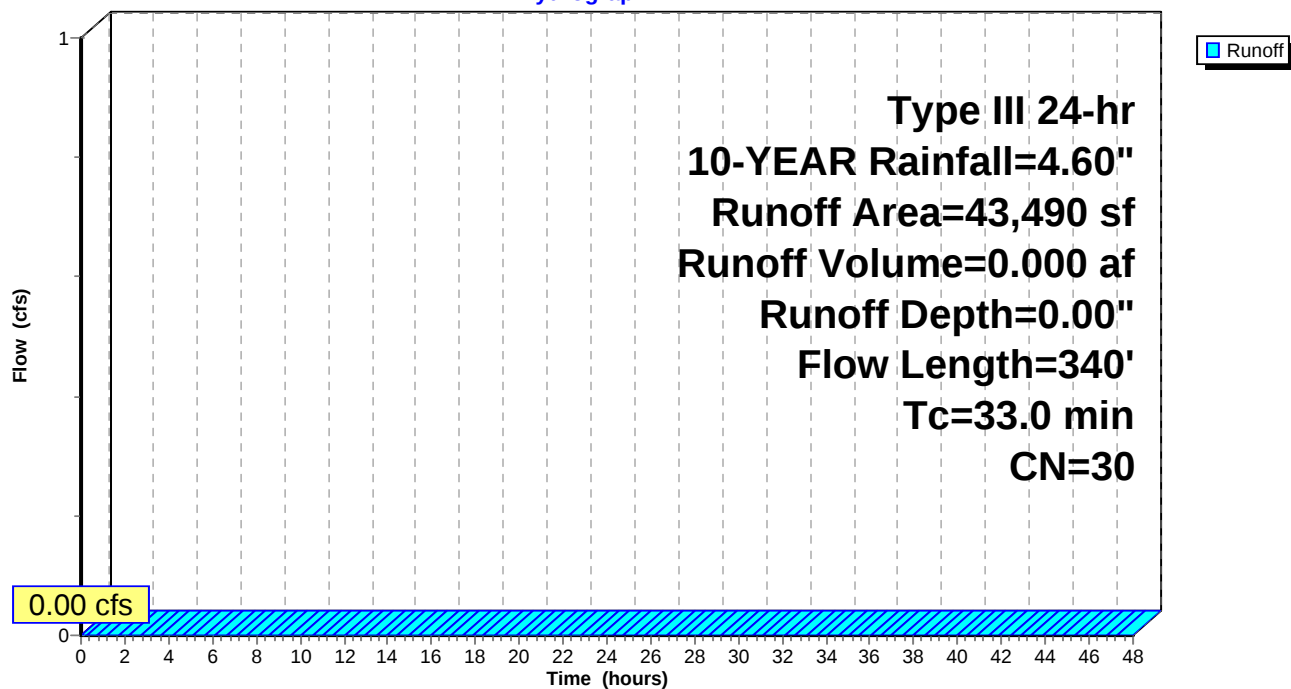
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
43,490	30	Woods, Good, HSG A
43,490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	150	0.0230	0.09		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
4.5	190	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
33.0	340	Total			

Subcatchment 10.2S:

Hydrograph



Summary for Subcatchment 10.3S:

Runoff = 24.62 cfs @ 12.46 hrs, Volume= 3.301 af, Depth= 1.74"

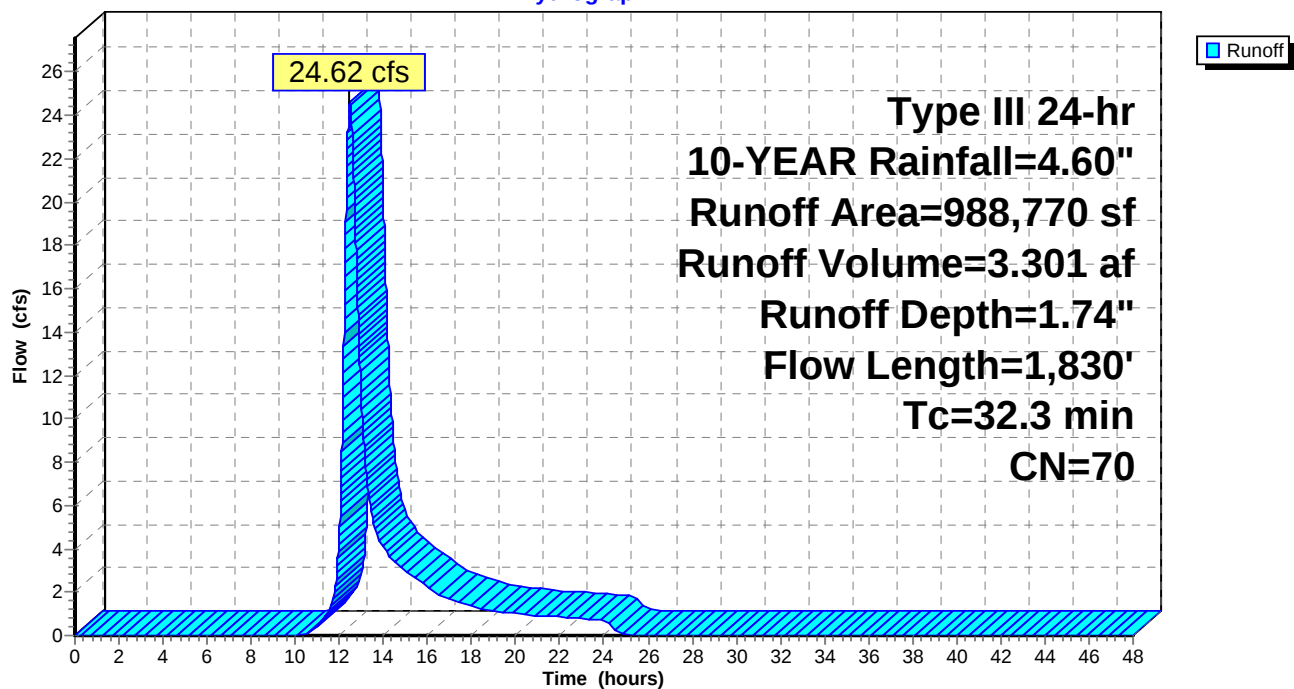
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
48,440	39	>75% Grass cover, Good, HSG A
608,410	74	>75% Grass cover, Good, HSG C
63,390	80	>75% Grass cover, Good, HSG D
22,940	98	Paved roads w/curbs & sewers, HSG C
5,250	98	Paved roads w/curbs & sewers, HSG D
57,590	30	Woods, Good, HSG A
51,830	70	Woods, Good, HSG C
2,270	76	Gravel roads, HSG A
6,480	89	Gravel roads, HSG C
6,400	98	Unconnected roofs, HSG C
1,130	98	Unconnected roofs, HSG A
29,880	39	>75% Grass cover, Good, HSG A
84,760	74	>75% Grass cover, Good, HSG C
988,770	70	Weighted Average
953,050		96.39% Pervious Area
35,720		3.61% Impervious Area
7,530		21.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0300	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
15.2	1,680	0.0150	1.84		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
32.3	1,830	Total			

Subcatchment 10.3S:

Hydrograph



Summary for Subcatchment 10.4S:

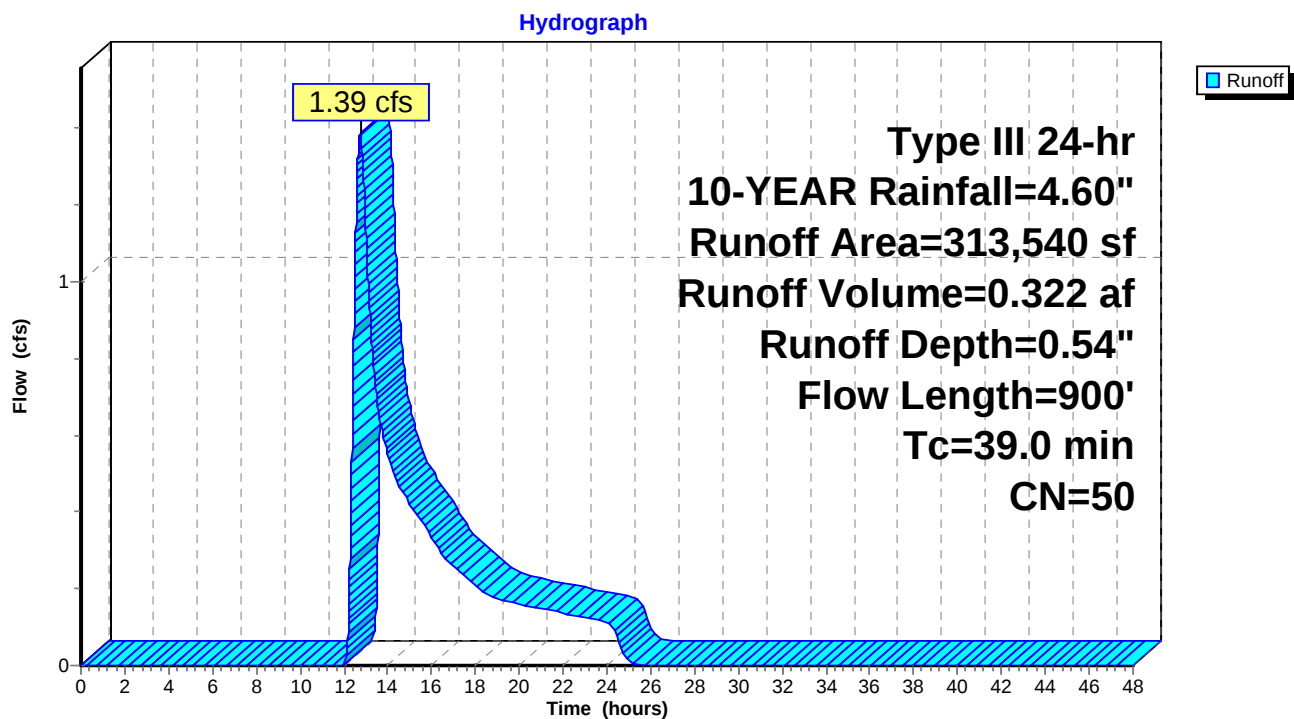
Runoff = 1.39 cfs @ 12.73 hrs, Volume= 0.322 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
71,700	39	>75% Grass cover, Good, HSG A
55,490	74	>75% Grass cover, Good, HSG C
87,930	30	Woods, Good, HSG A
56,360	70	Woods, Good, HSG C
1,840	76	Gravel roads, HSG A
2,620	98	Unconnected roofs, HSG D
30,180	39	>75% Grass cover, Good, HSG A
7,420	74	>75% Grass cover, Good, HSG C
313,540	50	Weighted Average
310,920		99.16% Pervious Area
2,620		0.84% Impervious Area
2,620		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	130	0.0800	1.41		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
14.6	620	0.0050	0.71		Shallow Concentrated Flow, C-D Nearly Bare & Untilled Kv= 10.0 fps
39.0	900	Total			

Subcatchment 10.4S:



Summary for Subcatchment 10.5S:

Runoff = 6.94 cfs @ 13.25 hrs, Volume= 2.003 af, Depth= 0.79"

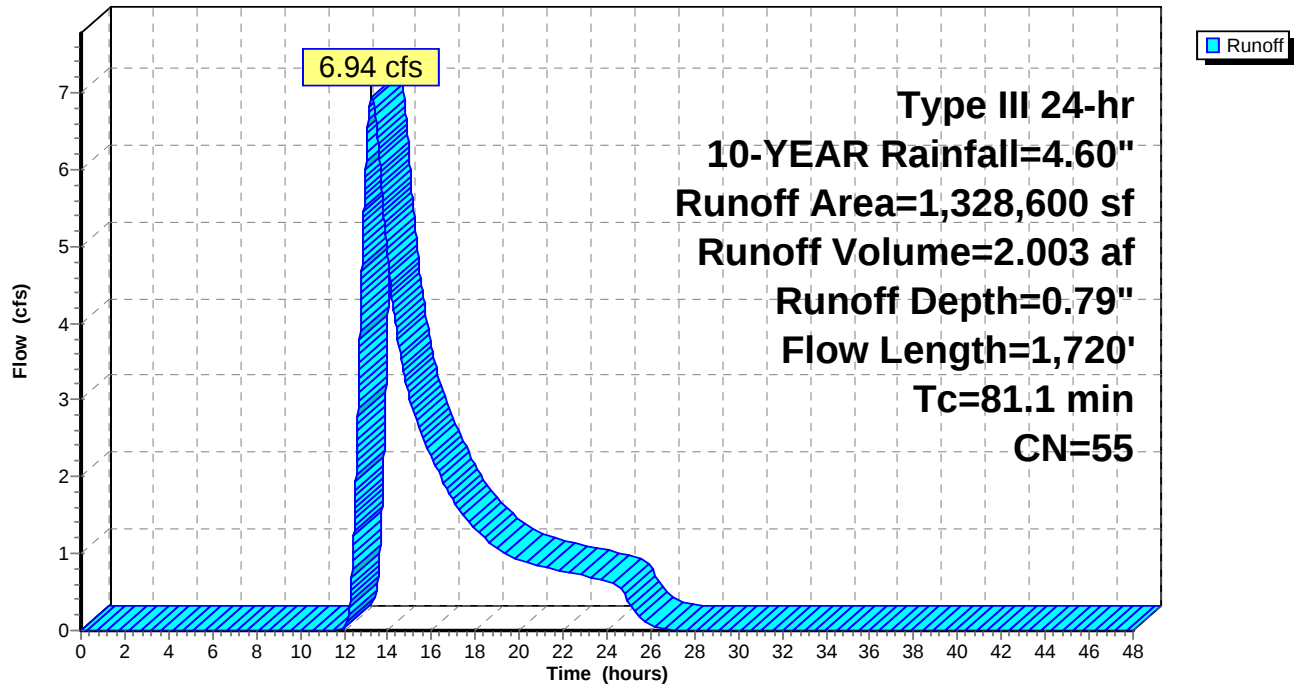
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
19,420	39	>75% Grass cover, Good, HSG A
135,940	74	>75% Grass cover, Good, HSG C
1,280	98	Paved roads w/curbs & sewers, HSG A
351,500	30	Woods, Good, HSG A
446,380	70	Woods, Good, HSG C
187,260	55	Woods, Good, HSG B
22,400	98	Water Surface, HSG C
90,200	39	>75% Grass cover, Good, HSG A
71,900	61	>75% Grass cover, Good, HSG B
2,320	74	>75% Grass cover, Good, HSG C
1,328,600	55	Weighted Average
1,304,920		98.22% Pervious Area
23,680		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
1.9	170	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
46.7	1,400	0.0100	0.50		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
81.1	1,720	Total			

Subcatchment 10.5S:

Hydrograph



Summary for Subcatchment 10.6S:

Runoff = 1.31 cfs @ 12.74 hrs, Volume= 0.254 af, Depth= 0.84"

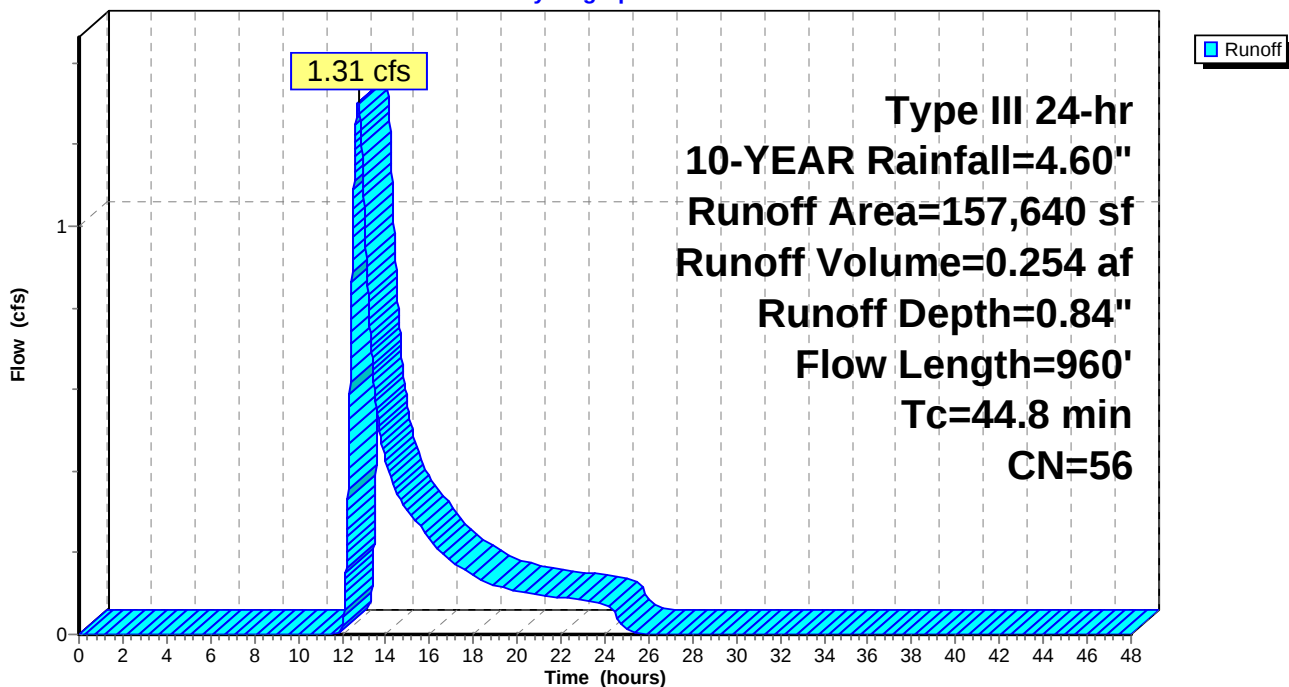
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
20,190	30	Woods, Good, HSG A
40,980	70	Woods, Good, HSG C
93,400	55	Woods, Good, HSG B
3,070	61	>75% Grass cover, Good, HSG B
157,640	56	Weighted Average
157,640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	150	0.0300	0.10		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
19.1	810	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
44.8	960	Total			

Subcatchment 10.6S:

Hydrograph



Summary for Subcatchment 11.1S:

Runoff = 1.42 cfs @ 12.26 hrs, Volume= 0.150 af, Depth= 1.46"

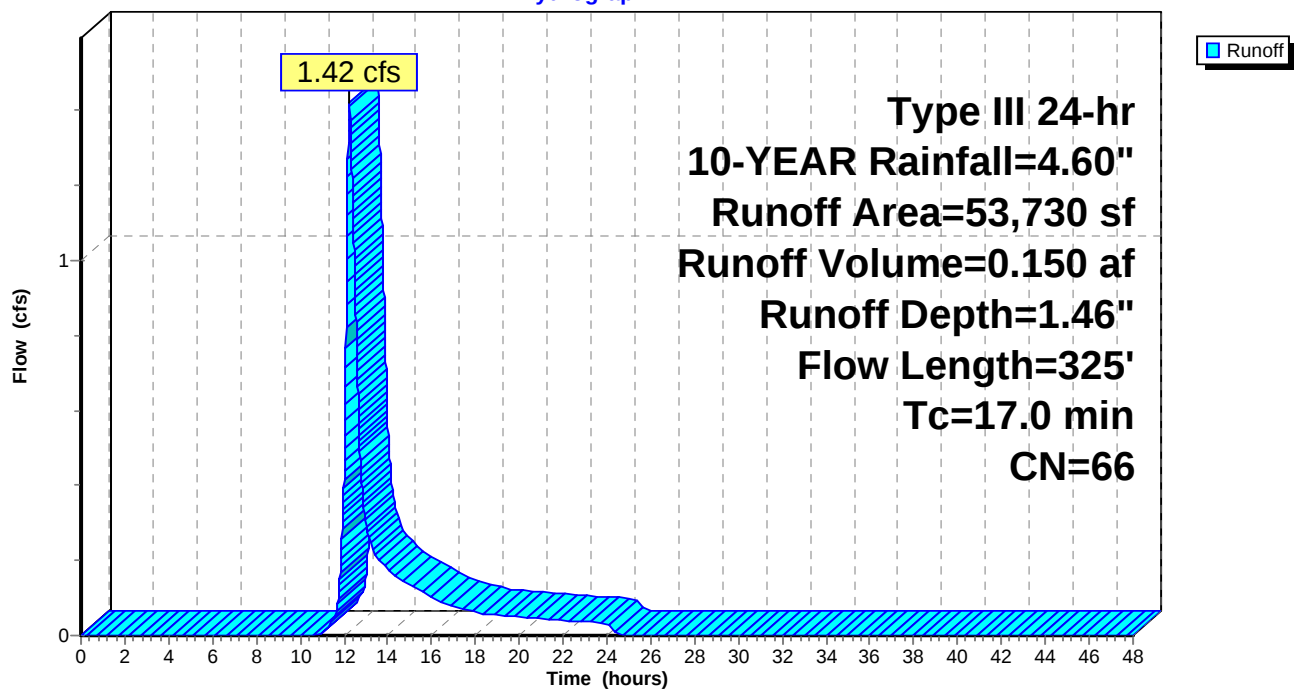
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
8,170	74	>75% Grass cover, Good, HSG C
1,660	98	Paved roads w/curbs & sewers, HSG A
7,050	98	Paved roads w/curbs & sewers, HSG C
18,310	39	>75% Grass cover, Good, HSG A
18,540	74	>75% Grass cover, Good, HSG C
53,730	66	Weighted Average
45,020		83.79% Pervious Area
8,710		16.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	150	0.0350	0.16		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
0.8	130	0.0350	2.81		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.2	45	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
17.0	325	Total			

Subcatchment 11.1S:

Hydrograph



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Type III 24-hr 10-YEAR Rainfall=4.60"

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Summary for Subcatchment 11.2S:

Runoff = 0.98 cfs @ 12.62 hrs, Volume= 0.172 af, Depth= 0.84"

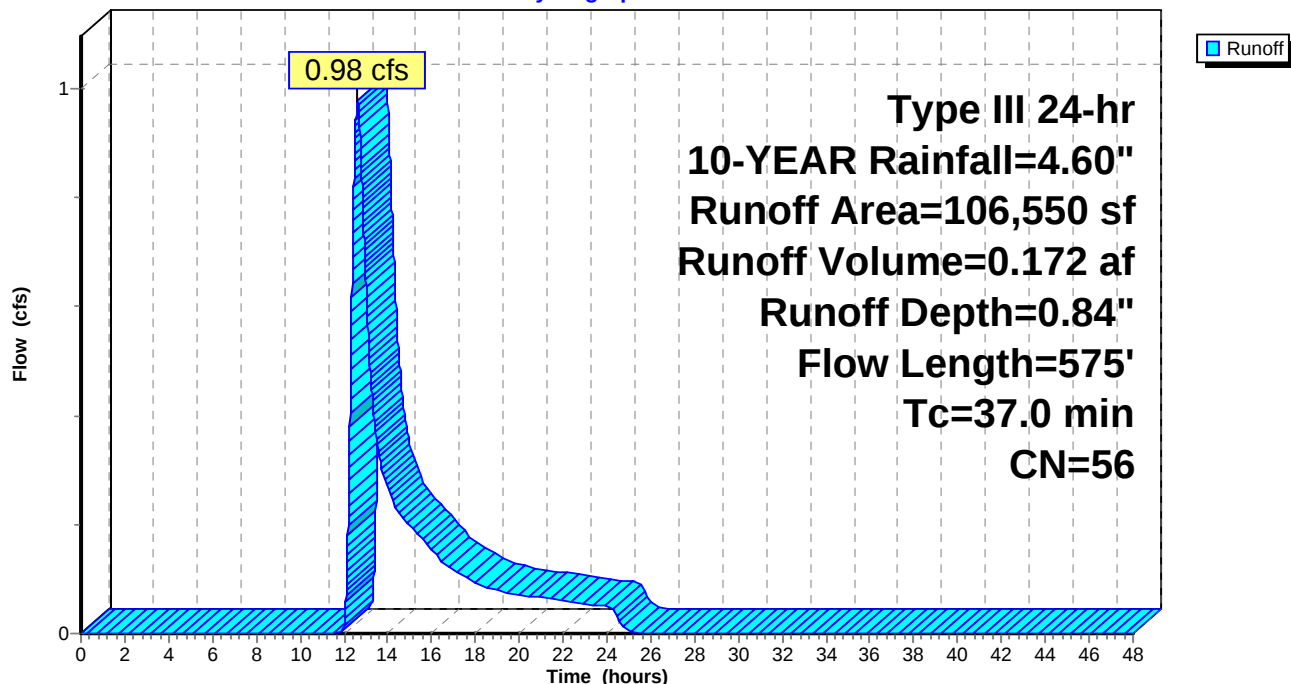
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
68,240	39	>75% Grass cover, Good, HSG A
8,130	98	Paved roads w/curbs & sewers, HSG A
9,280	98	Paved roads w/curbs & sewers, HSG C
20,900	74	>75% Grass cover, Good, HSG C
106,550	56	Weighted Average
89,140		83.66% Pervious Area
17,410		16.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.3	390	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.2	35	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
37.0	575	Total			

Subcatchment 11.2S:

Hydrograph



Summary for Subcatchment 11.3S:

Runoff = 0.89 cfs @ 12.60 hrs, Volume= 0.142 af, Depth= 1.07"

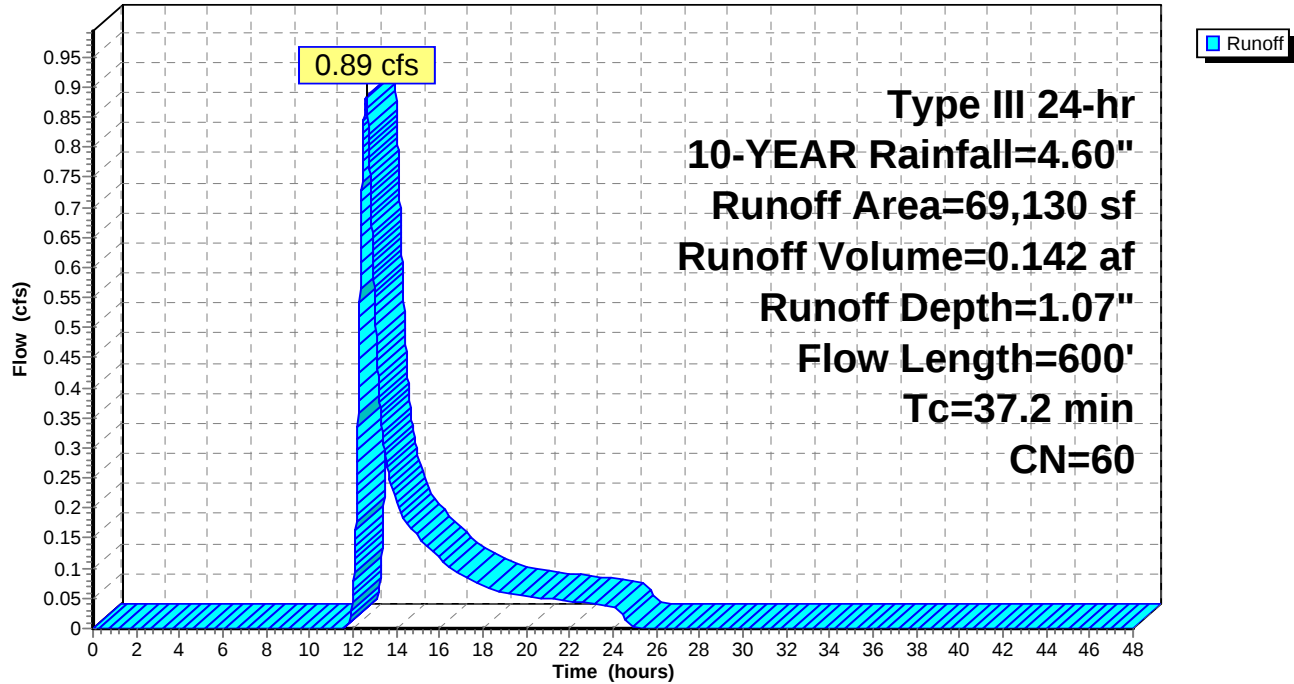
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
23,650	98	Paved roads w/curbs & sewers, HSG A
1,240	98	Paved roads w/curbs & sewers, HSG C
37,000	39	>75% Grass cover, Good, HSG A
2,240	61	>75% Grass cover, Good, HSG B
5,000	30	Woods, Good, HSG A
69,130	60	Weighted Average
44,240		64.00% Pervious Area
24,890		36.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.4	400	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.3	50	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
37.2	600	Total			

Subcatchment 11.3S:

Hydrograph



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Type III 24-hr 10-YEAR Rainfall=4.60"

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Summary for Subcatchment 11.4S:

Runoff = 0.89 cfs @ 12.53 hrs, Volume= 0.125 af, Depth= 1.67"

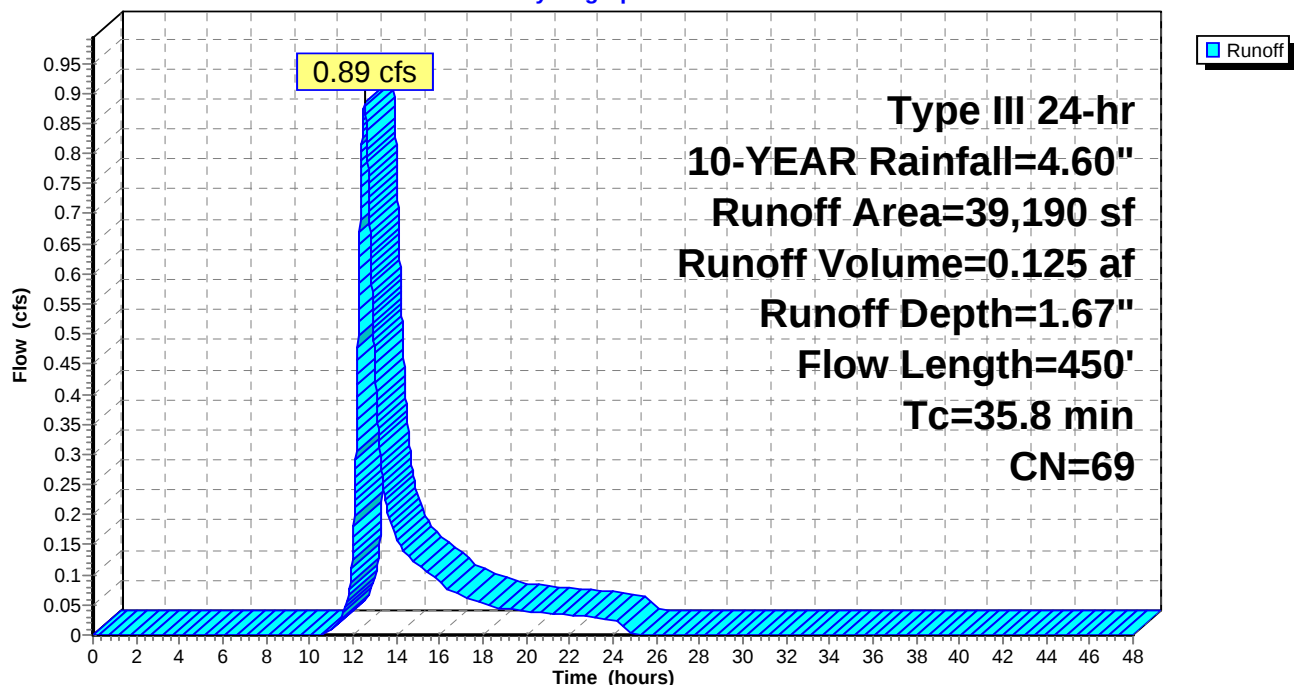
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=4.60"

Area (sf)	CN	Description
3,190	74	>75% Grass cover, Good, HSG C
7,160	61	>75% Grass cover, Good, HSG B
8,400	98	Paved roads w/curbs & sewers, HSG B
2,720	39	>75% Grass cover, Good, HSG A
16,380	61	>75% Grass cover, Good, HSG B
1,340	74	>75% Grass cover, Good, HSG C
39,190	69	Weighted Average
30,790		78.57% Pervious Area
8,400		21.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
3.3	300	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
35.8	450	Total			

Subcatchment 11.4S:

Hydrograph



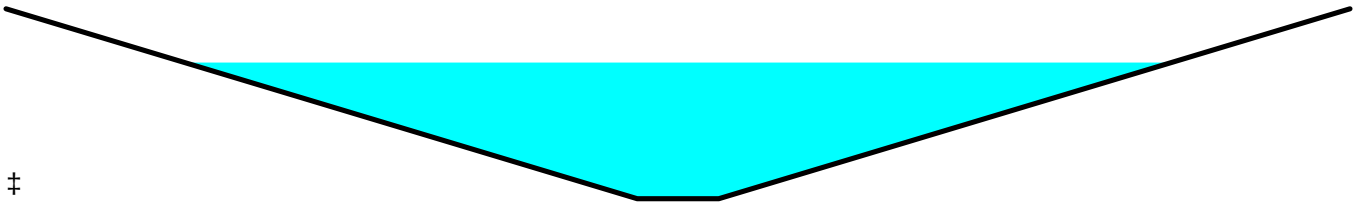
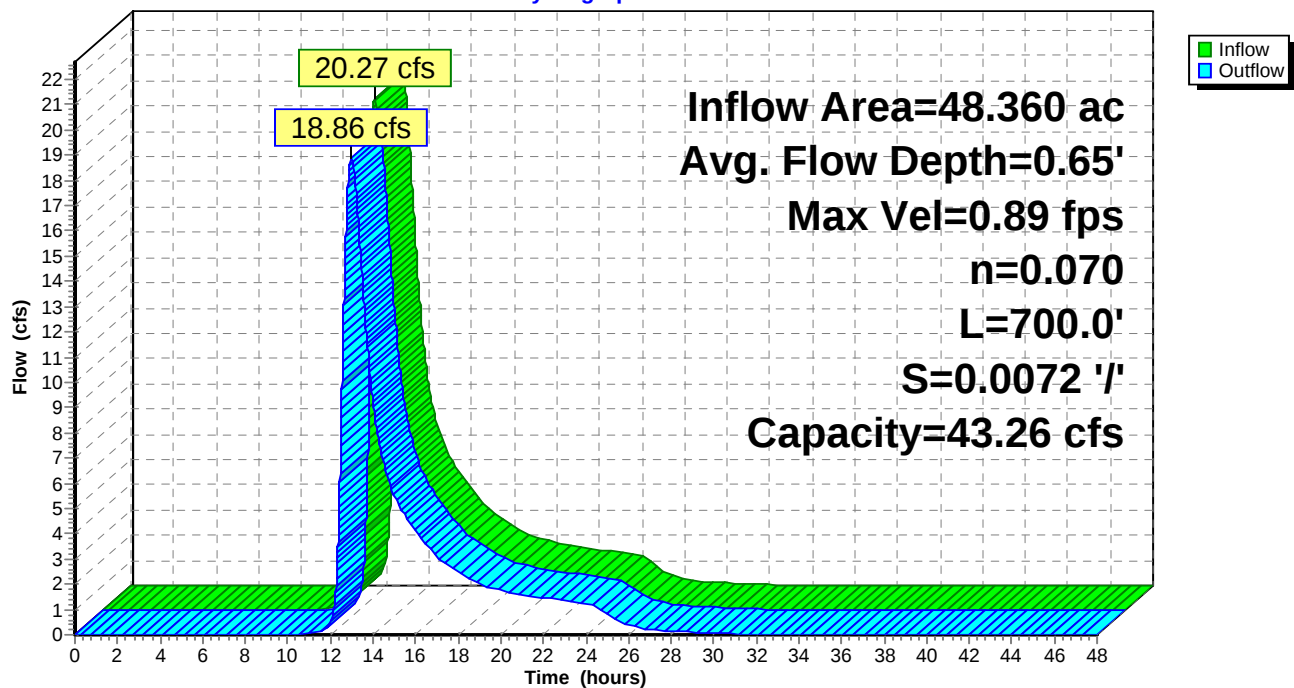
Summary for Reach 10.1R:

Inflow Area = 48.360 ac, 4.49% Impervious, Inflow Depth = 1.10" for 10-YEAR event
 Inflow = 20.27 cfs @ 12.77 hrs, Volume= 4.446 af
 Outflow = 18.86 cfs @ 12.98 hrs, Volume= 4.446 af, Atten= 7%, Lag= 12.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.89 fps, Min. Travel Time= 13.1 min
 Avg. Velocity = 0.28 fps, Avg. Travel Time= 42.0 min

Peak Storage= 14,782 cf @ 12.98 hrs
 Average Depth at Peak Storage= 0.65'
 Bank-Full Depth= 0.90' Flow Area= 39.3 sf, Capacity= 43.26 cfs

5.00' x 0.90' deep channel, n= 0.070 Sluggish weedy reaches w/pools
 Side Slope Z-value= 43.0 '/' Top Width= 82.40'
 Length= 700.0' Slope= 0.0072 '/'
 Inlet Invert= 222.30', Outlet Invert= 217.26'

**Reach 10.1R:****Hydrograph**

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Type III 24-hr 10-YEAR Rainfall=4.60"

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Stage-Area-Storage for Reach 10.1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
222.30	0.0	0	222.83	14.7	10,310
222.31	0.1	38	222.84	15.2	10,667
222.32	0.1	82	222.85	15.8	11,030
222.33	0.2	133	222.86	16.3	11,400
222.34	0.3	189	222.87	16.8	11,775
222.35	0.4	251	222.88	17.4	12,156
222.36	0.5	319	222.89	17.9	12,543
222.37	0.6	393	222.90	18.5	12,937
222.38	0.7	473	222.91	19.1	13,336
222.39	0.8	559	222.92	19.6	13,741
222.40	0.9	651	222.93	20.2	14,152
222.41	1.1	750	222.94	20.8	14,569
222.42	1.2	854	222.95	21.4	14,993
222.43	1.4	964	222.96	22.0	15,422
222.44	1.5	1,081	222.97	22.7	15,857
222.45	1.7	1,203	222.98	23.3	16,299
222.46	1.9	1,331	222.99	23.9	16,746
222.47	2.1	1,465	223.00	24.6	17,199
222.48	2.3	1,605	223.01	25.2	17,659
222.49	2.5	1,752	223.02	25.9	18,124
222.50	2.7	1,904	223.03	26.6	18,596
222.51	2.9	2,063	223.04	27.2	19,073
222.52	3.2	2,227	223.05	27.9	19,557
222.53	3.4	2,398	223.06	28.6	20,046
222.54	3.7	2,574	223.07	29.3	20,542
222.55	3.9	2,757	223.08	30.1	21,043
222.56	4.2	2,945	223.09	30.8	21,551
222.57	4.5	3,139	223.10	31.5	22,064
222.58	4.8	3,340	223.11	32.3	22,584
222.59	5.1	3,547	223.12	33.0	23,109
222.60	5.4	3,760	223.13	33.8	23,641
222.61	5.7	3,978	223.14	34.5	24,179
222.62	6.0	4,203	223.15	35.3	24,723
222.63	6.3	4,433	223.16	36.1	25,273
222.64	6.7	4,670	223.17	36.9	25,828
222.65	7.0	4,912	223.18	37.7	26,390
222.66	7.4	5,161	223.19	38.5	26,957
222.67	7.7	5,416	223.20	39.3	27,531
222.68	8.1	5,677			
222.69	8.5	5,944			
222.70	8.9	6,217			
222.71	9.3	6,495			
222.72	9.7	6,780			
222.73	10.1	7,071			
222.74	10.5	7,368			
222.75	11.0	7,670			
222.76	11.4	7,979			
222.77	11.8	8,295			
222.78	12.3	8,616			
222.79	12.8	8,943			
222.80	13.3	9,276			
222.81	13.7	9,615			
222.82	14.2	9,959			

Summary for Reach 11.1R: Meadow Buffer 1

Inflow Area = 1.233 ac, 16.21% Impervious, Inflow Depth = 0.51" for 10-YEAR event
 Inflow = 0.15 cfs @ 14.64 hrs, Volume= 0.052 af
 Outflow = 0.13 cfs @ 15.07 hrs, Volume= 0.052 af, Atten= 9%, Lag= 25.9 min

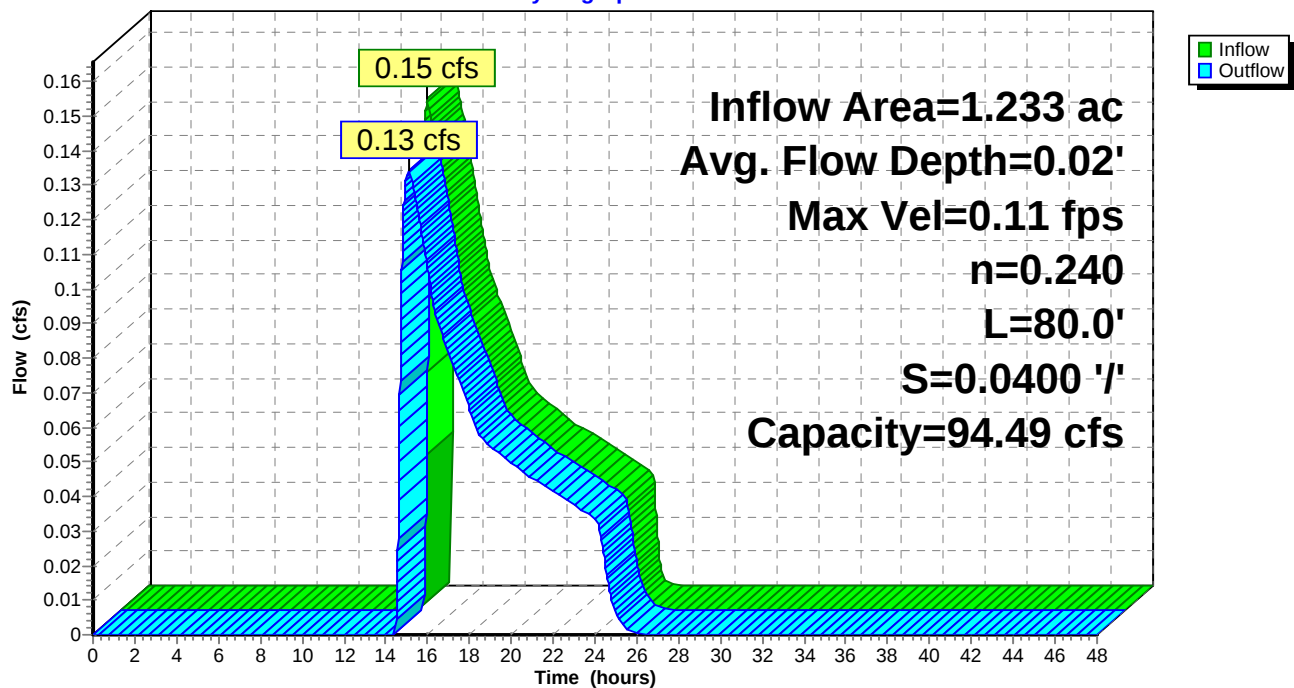
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.11 fps, Min. Travel Time= 12.6 min
 Avg. Velocity= 0.07 fps, Avg. Travel Time= 18.4 min

Peak Storage= 102 cf @ 15.07 hrs
 Average Depth at Peak Storage= 0.02'
 Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 94.49 cfs

50.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
 Side Slope Z-value= 50.0 '/' Top Width= 150.00'
 Length= 80.0' Slope= 0.0400 '/'
 Inlet Invert= 229.00', Outlet Invert= 225.80'

**Reach 11.1R: Meadow Buffer 1**

Hydrograph



Stage-Area-Storage for Reach 11.1R: Meadow Buffer 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
229.00	0.0	0	229.53	40.5	3,244
229.01	0.5	40	229.54	41.6	3,326
229.02	1.0	82	229.55	42.6	3,410
229.03	1.5	124	229.56	43.7	3,494
229.04	2.1	166	229.57	44.7	3,580
229.05	2.6	210	229.58	45.8	3,666
229.06	3.2	254	229.59	46.9	3,752
229.07	3.7	300	229.60	48.0	3,840
229.08	4.3	346	229.61	49.1	3,928
229.09	4.9	392	229.62	50.2	4,018
229.10	5.5	440	229.63	51.3	4,108
229.11	6.1	488	229.64	52.5	4,198
229.12	6.7	538	229.65	53.6	4,290
229.13	7.3	588	229.66	54.8	4,382
229.14	8.0	638	229.67	55.9	4,476
229.15	8.6	690	229.68	57.1	4,570
229.16	9.3	742	229.69	58.3	4,664
229.17	9.9	796	229.70	59.5	4,760
229.18	10.6	850	229.71	60.7	4,856
229.19	11.3	904	229.72	61.9	4,954
229.20	12.0	960	229.73	63.1	5,052
229.21	12.7	1,016	229.74	64.4	5,150
229.22	13.4	1,074	229.75	65.6	5,250
229.23	14.1	1,132	229.76	66.9	5,350
229.24	14.9	1,190	229.77	68.1	5,452
229.25	15.6	1,250	229.78	69.4	5,554
229.26	16.4	1,310	229.79	70.7	5,656
229.27	17.1	1,372	229.80	72.0	5,760
229.28	17.9	1,434	229.81	73.3	5,864
229.29	18.7	1,496	229.82	74.6	5,970
229.30	19.5	1,560	229.83	75.9	6,076
229.31	20.3	1,624	229.84	77.3	6,182
229.32	21.1	1,690	229.85	78.6	6,290
229.33	21.9	1,756	229.86	80.0	6,398
229.34	22.8	1,822	229.87	81.3	6,508
229.35	23.6	1,890	229.88	82.7	6,618
229.36	24.5	1,958	229.89	84.1	6,728
229.37	25.3	2,028	229.90	85.5	6,840
229.38	26.2	2,098	229.91	86.9	6,952
229.39	27.1	2,168	229.92	88.3	7,066
229.40	28.0	2,240	229.93	89.7	7,180
229.41	28.9	2,312	229.94	91.2	7,294
229.42	29.8	2,386	229.95	92.6	7,410
229.43	30.7	2,460	229.96	94.1	7,526
229.44	31.7	2,534	229.97	95.5	7,644
229.45	32.6	2,610	229.98	97.0	7,762
229.46	33.6	2,686	229.99	98.5	7,880
229.47	34.5	2,764	230.00	100.0	8,000
229.48	35.5	2,842			
229.49	36.5	2,920			
229.50	37.5	3,000			
229.51	38.5	3,080			
229.52	39.5	3,162			

Summary for Reach 11.3R: Wooded Buffer 1

Inflow Area = 1.587 ac, 36.00% Impervious, Inflow Depth = 0.82" for 10-YEAR event
 Inflow = 0.75 cfs @ 12.75 hrs, Volume= 0.109 af
 Outflow = 0.66 cfs @ 12.88 hrs, Volume= 0.109 af, Atten= 13%, Lag= 7.8 min

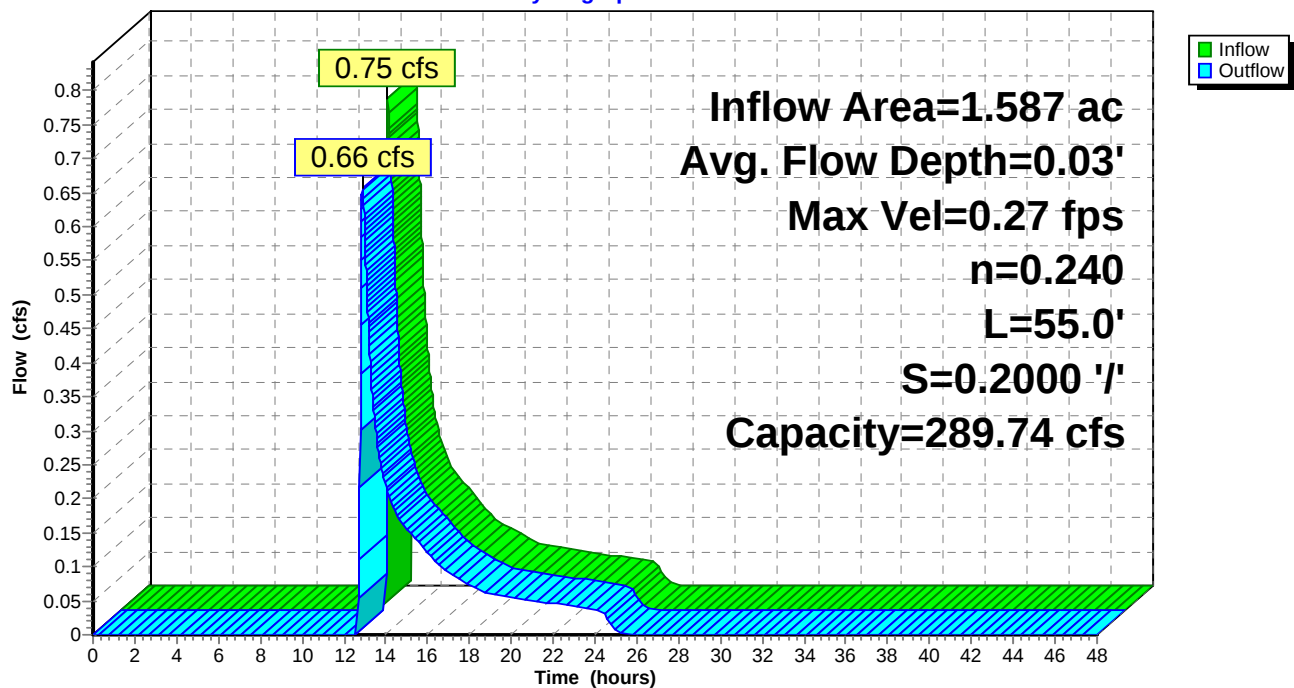
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.27 fps, Min. Travel Time= 3.4 min
 Avg. Velocity= 0.14 fps, Avg. Travel Time= 6.5 min

Peak Storage= 136 cf @ 12.88 hrs
 Average Depth at Peak Storage= 0.03'
 Bank-Full Depth= 1.00' Flow Area= 130.0 sf, Capacity= 289.74 cfs

80.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
 Side Slope Z-value= 50.0 '/' Top Width= 180.00'
 Length= 55.0' Slope= 0.2000 '/'
 Inlet Invert= 234.00', Outlet Invert= 223.00'

**Reach 11.3R: Wooded Buffer 1**

Hydrograph



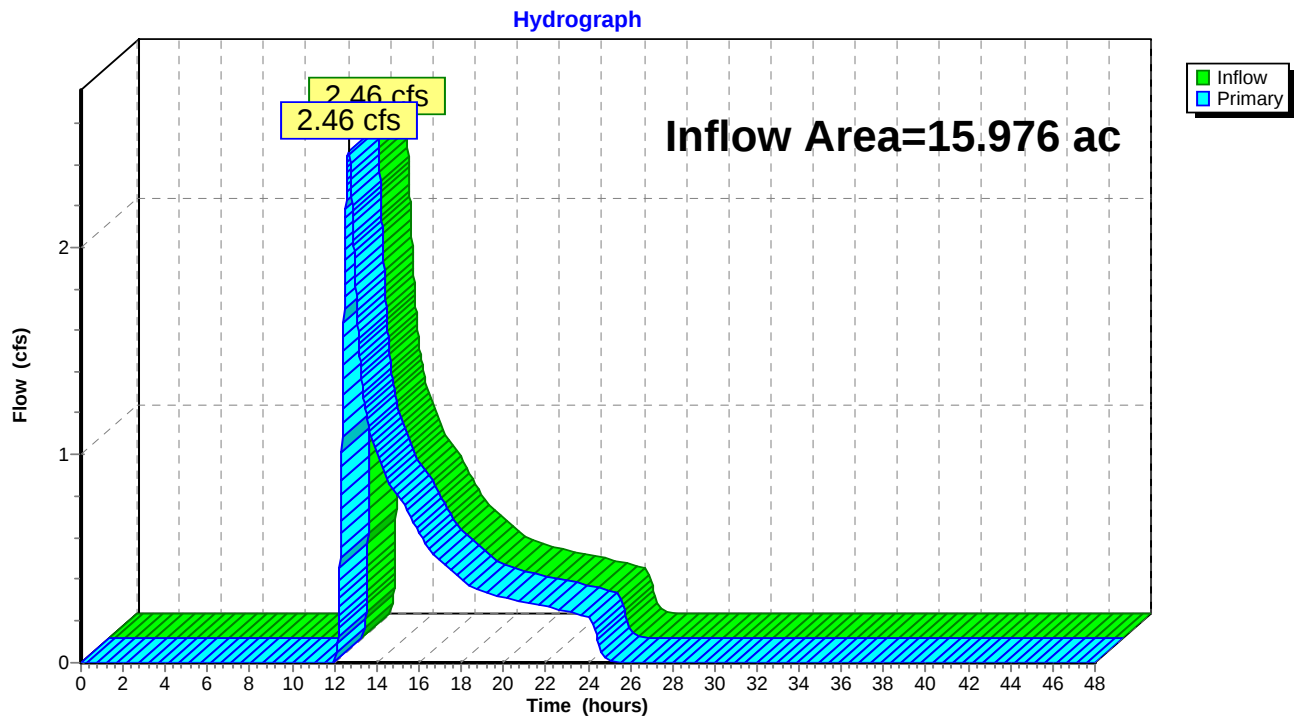
Stage-Area-Storage for Reach 11.3R: Wooded Buffer 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
234.00	0.0	0	234.53	56.4	3,104
234.01	0.8	44	234.54	57.8	3,178
234.02	1.6	89	234.55	59.1	3,252
234.03	2.4	134	234.56	60.5	3,326
234.04	3.3	180	234.57	61.8	3,401
234.05	4.1	227	234.58	63.2	3,477
234.06	5.0	274	234.59	64.6	3,553
234.07	5.8	321	234.60	66.0	3,630
234.08	6.7	370	234.61	67.4	3,707
234.09	7.6	418	234.62	68.8	3,785
234.10	8.5	468	234.63	70.2	3,863
234.11	9.4	517	234.64	71.7	3,942
234.12	10.3	568	234.65	73.1	4,022
234.13	11.2	618	234.66	74.6	4,102
234.14	12.2	670	234.67	76.0	4,182
234.15	13.1	722	234.68	77.5	4,264
234.16	14.1	774	234.69	79.0	4,345
234.17	15.0	827	234.70	80.5	4,428
234.18	16.0	881	234.71	82.0	4,510
234.19	17.0	935	234.72	83.5	4,594
234.20	18.0	990	234.73	85.0	4,677
234.21	19.0	1,045	234.74	86.6	4,762
234.22	20.0	1,101	234.75	88.1	4,847
234.23	21.0	1,157	234.76	89.7	4,932
234.24	22.1	1,214	234.77	91.2	5,018
234.25	23.1	1,272	234.78	92.8	5,105
234.26	24.2	1,330	234.79	94.4	5,192
234.27	25.2	1,388	234.80	96.0	5,280
234.28	26.3	1,448	234.81	97.6	5,368
234.29	27.4	1,507	234.82	99.2	5,457
234.30	28.5	1,568	234.83	100.8	5,546
234.31	29.6	1,628	234.84	102.5	5,636
234.32	30.7	1,690	234.85	104.1	5,727
234.33	31.8	1,751	234.86	105.8	5,818
234.34	33.0	1,814	234.87	107.4	5,909
234.35	34.1	1,877	234.88	109.1	6,002
234.36	35.3	1,940	234.89	110.8	6,094
234.37	36.4	2,004	234.90	112.5	6,188
234.38	37.6	2,069	234.91	114.2	6,281
234.39	38.8	2,134	234.92	115.9	6,376
234.40	40.0	2,200	234.93	117.6	6,470
234.41	41.2	2,266	234.94	119.4	6,566
234.42	42.4	2,333	234.95	121.1	6,662
234.43	43.6	2,400	234.96	122.9	6,758
234.44	44.9	2,468	234.97	124.6	6,855
234.45	46.1	2,537	234.98	126.4	6,953
234.46	47.4	2,606	234.99	128.2	7,051
234.47	48.6	2,675	235.00	130.0	7,150
234.48	49.9	2,746			
234.49	51.2	2,816			
234.50	52.5	2,888			
234.51	53.8	2,959			
234.52	55.1	3,032			

Summary for Pond 10.1P:

Inflow Area = 15.976 ac, 3.31% Impervious, Inflow Depth = 0.45" for 10-YEAR event
Inflow = 2.46 cfs @ 12.67 hrs, Volume= 0.594 af
Primary = 2.46 cfs @ 12.67 hrs, Volume= 0.594 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 10.1P:

Summary for Pond 10.3P: Culverts

Inflow Area = 32.384 ac, 5.08% Impervious, Inflow Depth = 1.43" for 10-YEAR event
 Inflow = 25.64 cfs @ 12.49 hrs, Volume= 3.851 af
 Outflow = 17.95 cfs @ 12.80 hrs, Volume= 3.851 af, Atten= 30%, Lag= 18.9 min
 Primary = 17.95 cfs @ 12.80 hrs, Volume= 3.851 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 226.53' @ 12.80 hrs Surf.Area= 28,827 sf Storage= 29,129 cf
 Flood Elev= 227.00' Surf.Area= 37,000 sf Storage= 44,500 cf

Plug-Flow detention time= 38.8 min calculated for 3.851 af (100% of inflow)
 Center-of-Mass det. time= 38.8 min (933.2 - 894.4)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	127,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
225.00	13,000	0	0
226.00	19,500	16,250	16,250
227.00	37,000	28,250	44,500
228.00	61,500	49,250	93,750
228.50	74,500	34,000	127,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.90'	30.0" Round 30" PIPE L= 45.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 224.90' / 224.80' S= 0.0022 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	224.90'	30.0" Round 30" PIPE L= 45.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 224.90' / 224.80' S= 0.0022 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	227.17'	50.0' long x 20.0' breadth Overflow at Driveway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=17.95 cfs @ 12.80 hrs HW=226.53' TW=222.93' (Dynamic Tailwater)

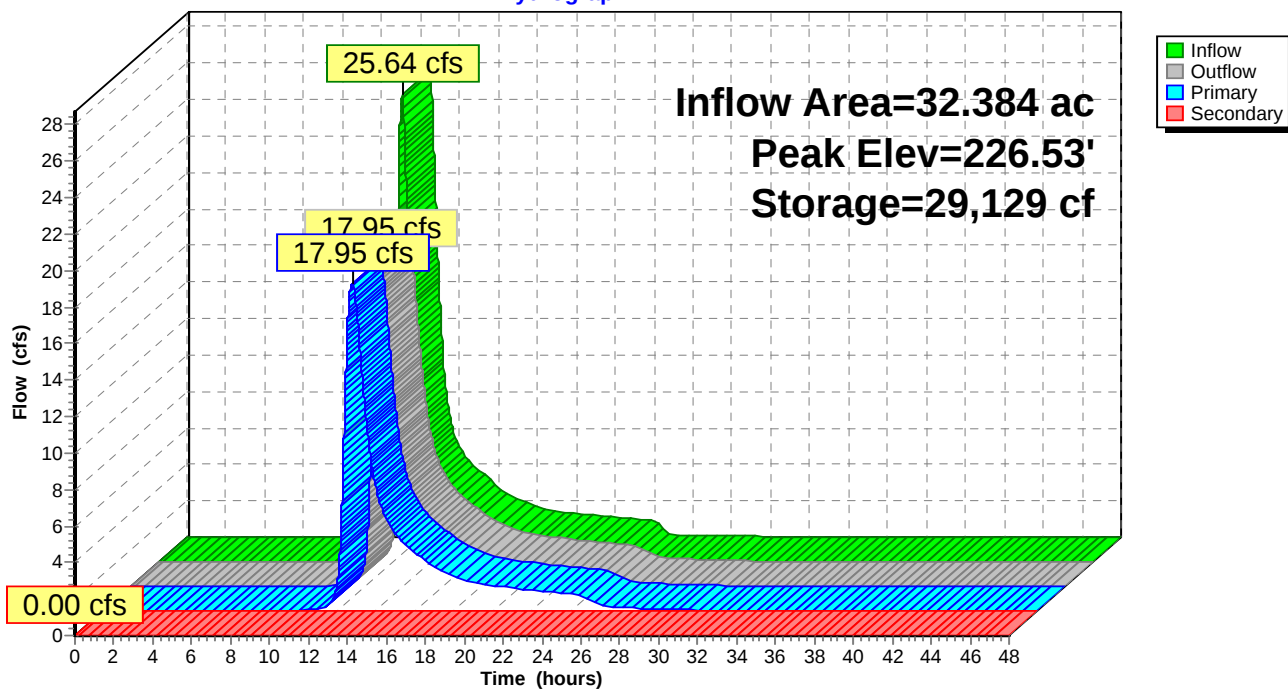
↑ **1=30" PIPE** (Barrel Controls 8.97 cfs @ 3.75 fps)
 ↓ **2=30" PIPE** (Barrel Controls 8.97 cfs @ 3.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' TW=222.30' (Dynamic Tailwater)

↑ **3=Overflow at Driveway** (Controls 0.00 cfs)

Pond 10.3P: Culverts

Hydrograph



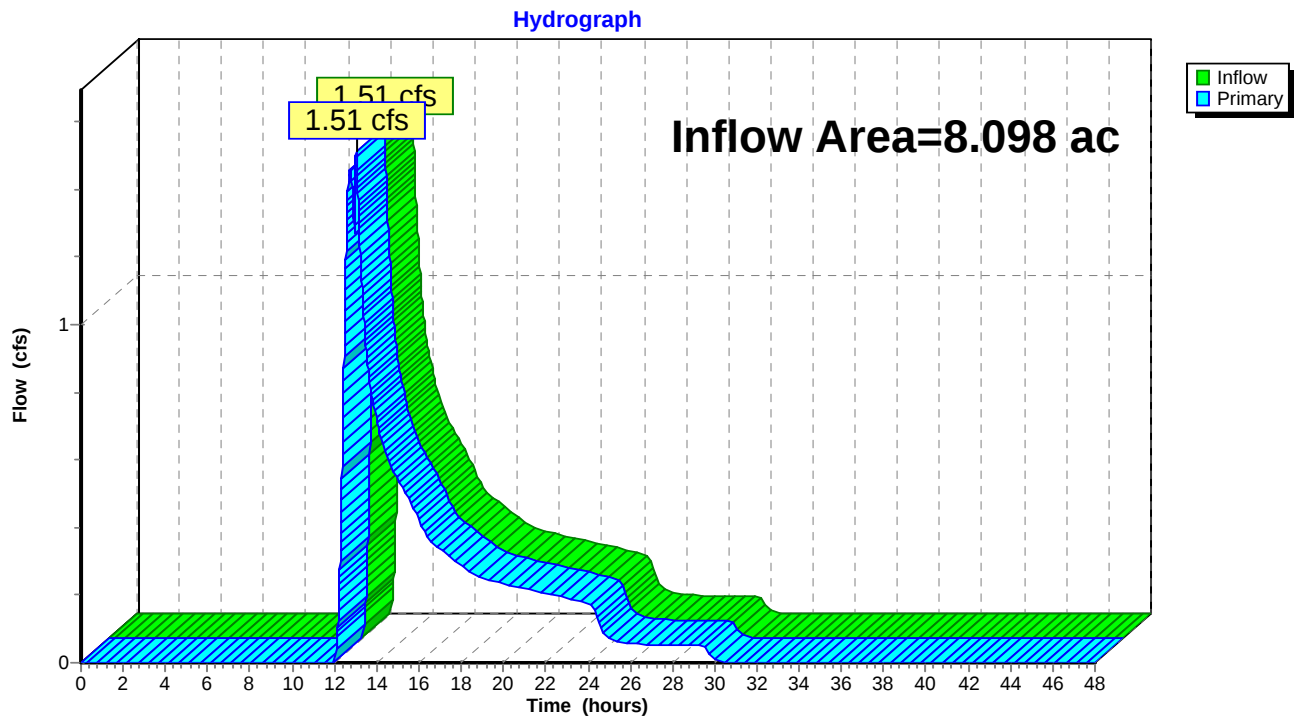
Stage-Area-Storage for Pond 10.3P: Culverts

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
225.00	13,000	0	227.65	52,925	73,726
225.05	13,325	658	227.70	54,150	76,402
225.10	13,650	1,332	227.75	55,375	79,141
225.15	13,975	2,023	227.80	56,600	81,940
225.20	14,300	2,730	227.85	57,825	84,801
225.25	14,625	3,453	227.90	59,050	87,723
225.30	14,950	4,193	227.95	60,275	90,706
225.35	15,275	4,948	228.00	61,500	93,750
225.40	15,600	5,720	228.05	62,800	96,858
225.45	15,925	6,508	228.10	64,100	100,030
225.50	16,250	7,313	228.15	65,400	103,268
225.55	16,575	8,133	228.20	66,700	106,570
225.60	16,900	8,970	228.25	68,000	109,938
225.65	17,225	9,823	228.30	69,300	113,370
225.70	17,550	10,692	228.35	70,600	116,867
225.75	17,875	11,578	228.40	71,900	120,430
225.80	18,200	12,480	228.45	73,200	124,057
225.85	18,525	13,398	228.50	74,500	127,750
225.90	18,850	14,333			
225.95	19,175	15,283			
226.00	19,500	16,250			
226.05	20,375	17,247			
226.10	21,250	18,287			
226.15	22,125	19,372			
226.20	23,000	20,500			
226.25	23,875	21,672			
226.30	24,750	22,888			
226.35	25,625	24,147			
226.40	26,500	25,450			
226.45	27,375	26,797			
226.50	28,250	28,188			
226.55	29,125	29,622			
226.60	30,000	31,100			
226.65	30,875	32,622			
226.70	31,750	34,187			
226.75	32,625	35,797			
226.80	33,500	37,450			
226.85	34,375	39,147			
226.90	35,250	40,888			
226.95	36,125	42,672			
227.00	37,000	44,500			
227.05	38,225	46,381			
227.10	39,450	48,322			
227.15	40,675	50,326			
227.20	41,900	52,390			
227.25	43,125	54,516			
227.30	44,350	56,703			
227.35	45,575	58,951			
227.40	46,800	61,260			
227.45	48,025	63,631			
227.50	49,250	66,063			
227.55	50,475	68,556			
227.60	51,700	71,110			

Summary for Pond 10.4P:

Inflow Area = 8.098 ac, 3.12% Impervious, Inflow Depth = 0.65" for 10-YEAR event
Inflow = 1.51 cfs @ 13.02 hrs, Volume= 0.442 af
Primary = 1.51 cfs @ 13.02 hrs, Volume= 0.442 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 10.4P:

Summary for Pond 11.1P: Level Lip Spreader Outlet

Inflow Area = 1.233 ac, 16.21% Impervious, Inflow Depth = 1.46" for 10-YEAR event
 Inflow = 1.42 cfs @ 12.26 hrs, Volume= 0.150 af
 Outflow = 0.15 cfs @ 14.64 hrs, Volume= 0.052 af, Atten= 90%, Lag= 142.9 min
 Primary = 0.15 cfs @ 14.64 hrs, Volume= 0.052 af

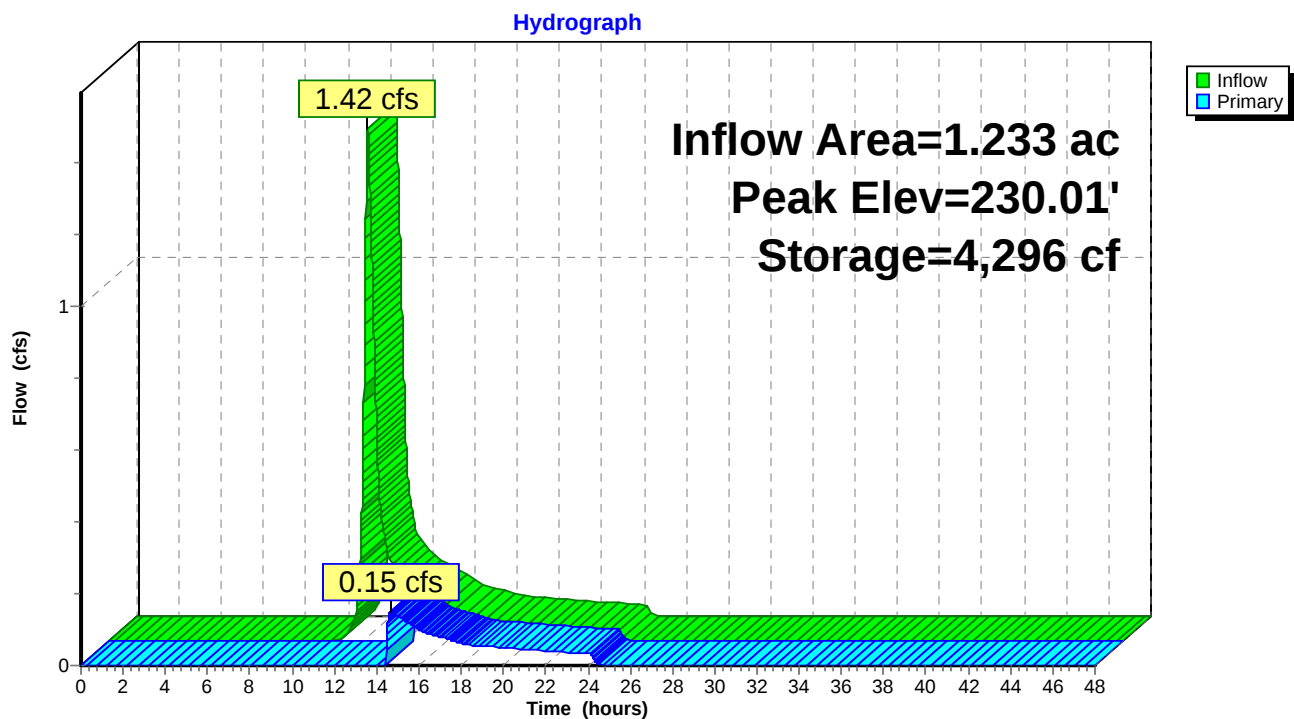
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 230.01' @ 14.64 hrs Surf.Area= 2,052 sf Storage= 4,296 cf
 Flood Elev= 230.50' Surf.Area= 2,100 sf Storage= 4,480 cf

Plug-Flow detention time= 357.4 min calculated for 0.052 af (35% of inflow)
 Center-of-Mass det. time= 216.1 min (1,089.7 - 873.5)

Volume	Invert	Avail.Storage	Storage Description
#1	226.50'	4,480 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
226.50	500	0	0
227.00	700	300	300
228.00	1,100	900	1,200
229.00	1,500	1,300	2,500
230.10	2,100	1,980	4,480

Device	Routing	Invert	Outlet Devices
#1	Primary	230.00'	50.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.15 cfs @ 14.64 hrs HW=230.01' TW=229.01' (Dynamic Tailwater)
 ↑ **1=Level Spreader** (Weir Controls 0.15 cfs @ 0.26 fps)

Pond 11.1P: Level Lip Spreader Outlet

Stage-Area-Storage for Pond 11.1P: Level Lip Spreader Outlet

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
226.50	500	0	229.15	1,582	2,731
226.55	520	26	229.20	1,609	2,811
226.60	540	52	229.25	1,636	2,892
226.65	560	80	229.30	1,664	2,975
226.70	580	108	229.35	1,691	3,058
226.75	600	138	229.40	1,718	3,144
226.80	620	168	229.45	1,745	3,230
226.85	640	199	229.50	1,773	3,318
226.90	660	232	229.55	1,800	3,408
226.95	680	265	229.60	1,827	3,498
227.00	700	300	229.65	1,855	3,590
227.05	720	336	229.70	1,882	3,684
227.10	740	372	229.75	1,909	3,778
227.15	760	410	229.80	1,936	3,875
227.20	780	448	229.85	1,964	3,972
227.25	800	488	229.90	1,991	4,071
227.30	820	528	229.95	2,018	4,171
227.35	840	569	230.00	2,045	4,273
227.40	860	612	230.05	2,073	4,376
227.45	880	655	230.10	2,100	4,480
227.50	900	700	230.15	2,100	4,480
227.55	920	746	230.20	2,100	4,480
227.60	940	792	230.25	2,100	4,480
227.65	960	840	230.30	2,100	4,480
227.70	980	888	230.35	2,100	4,480
227.75	1,000	938	230.40	2,100	4,480
227.80	1,020	988	230.45	2,100	4,480
227.85	1,040	1,039	230.50	2,100	4,480
227.90	1,060	1,092			
227.95	1,080	1,145			
228.00	1,100	1,200			
228.05	1,120	1,256			
228.10	1,140	1,312			
228.15	1,160	1,370			
228.20	1,180	1,428			
228.25	1,200	1,488			
228.30	1,220	1,548			
228.35	1,240	1,609			
228.40	1,260	1,672			
228.45	1,280	1,735			
228.50	1,300	1,800			
228.55	1,320	1,866			
228.60	1,340	1,932			
228.65	1,360	2,000			
228.70	1,380	2,068			
228.75	1,400	2,138			
228.80	1,420	2,208			
228.85	1,440	2,279			
228.90	1,460	2,352			
228.95	1,480	2,425			
229.00	1,500	2,500			
229.05	1,527	2,576			
229.10	1,555	2,653			

Summary for Pond 11.2P: UDSF-1

Inflow Area = 2.446 ac, 16.34% Impervious, Inflow Depth = 0.84" for 10-YEAR event
 Inflow = 0.98 cfs @ 12.62 hrs, Volume= 0.172 af
 Outflow = 0.17 cfs @ 15.58 hrs, Volume= 0.165 af, Atten= 82%, Lag= 177.4 min
 Primary = 0.17 cfs @ 15.58 hrs, Volume= 0.165 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 232.87' @ 15.58 hrs Surf.Area= 3,119 sf Storage= 3,003 cf
 Flood Elev= 234.50' Surf.Area= 4,420 sf Storage= 7,628 cf

Plug-Flow detention time= 218.5 min calculated for 0.165 af (96% of inflow)
 Center-of-Mass det. time= 199.2 min (1,124.8 - 925.6)

Volume	Invert	Avail.Storage	Storage Description
#1	230.16'	7,628 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet) Cum.Store (cubic-feet)
230.16	2,700	0.0	0 0
230.17	2,700	30.0	8 8
232.49	2,700	30.0	1,879 1,887
232.50	2,700	100.0	27 1,914
233.00	3,260	100.0	1,490 3,404
234.10	4,420	100.0	4,224 7,628

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	12.0" Round Outfall L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.50' / 230.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	230.34'	4.0" Round UD Header L= 170.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.34' / 230.34' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#3	Device 2	230.16'	2.400 in/hr Filtration over Surface area
#4	Primary	233.50'	1.5" x 1.5" Horiz. Grate X 7.00 columns X 7 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	234.00'	12.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

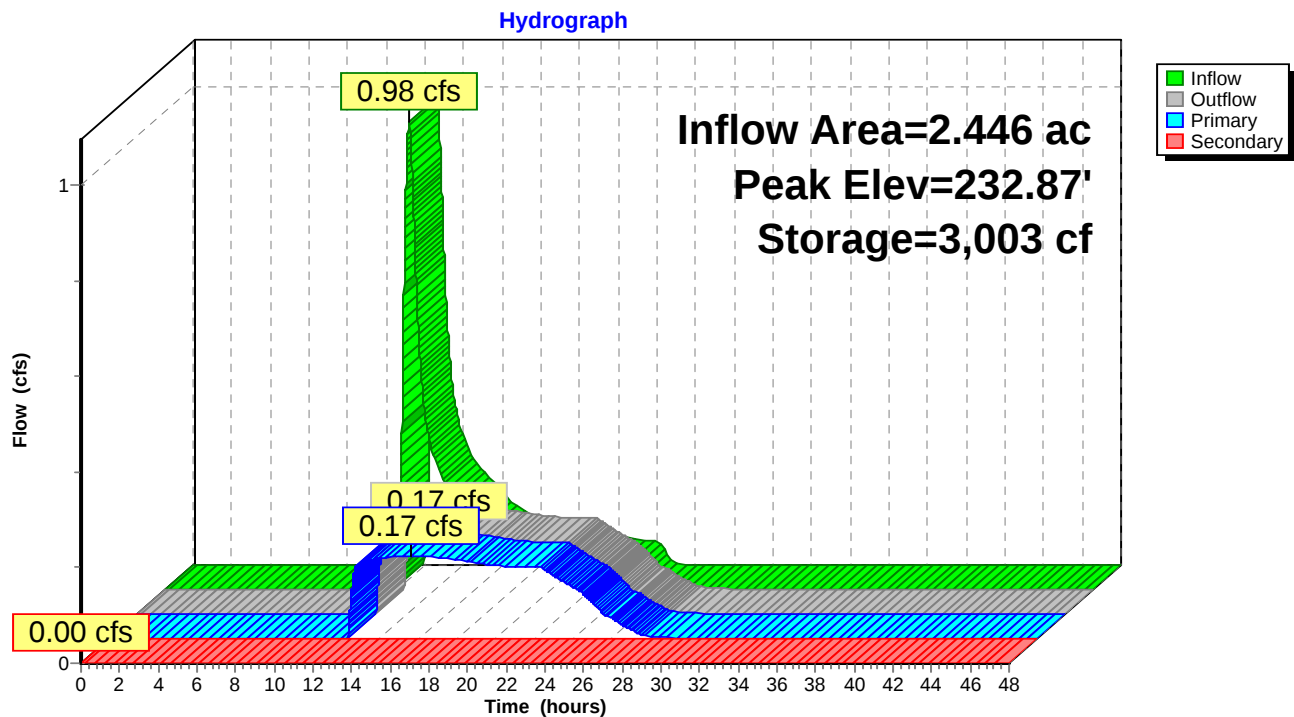
Primary OutFlow Max=0.17 cfs @ 15.58 hrs HW=232.87' TW=0.00' (Dynamic Tailwater)

- 1=Outfall (Passes 0.17 cfs of 4.09 cfs potential flow)
- 2=UD Header (Passes 0.17 cfs of 0.21 cfs potential flow)
- 3=Filtration (Exfiltration Controls 0.17 cfs)
- 4=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=230.16' TW=0.00' (Dynamic Tailwater)

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

Pond 11.2P: UDSF-1



Stage-Area-Storage for Pond 11.2P: UDSF-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
230.16	2,700	0	232.81	3,047	2,805
230.21	2,700	41	232.86	3,103	2,959
230.26	2,700	81	232.91	3,159	3,115
230.31	2,700	122	232.96	3,215	3,275
230.36	2,700	162	233.01	3,271	3,437
230.41	2,700	203	233.06	3,323	3,602
230.46	2,700	243	233.11	3,376	3,769
230.51	2,700	283	233.16	3,429	3,939
230.56	2,700	324	233.21	3,481	4,112
230.61	2,700	364	233.26	3,534	4,288
230.66	2,700	405	233.31	3,587	4,466
230.71	2,700	446	233.36	3,640	4,646
230.76	2,700	486	233.41	3,692	4,830
230.81	2,700	527	233.46	3,745	5,015
230.86	2,700	567	233.51	3,798	5,204
230.91	2,700	608	233.56	3,851	5,395
230.96	2,700	648	233.61	3,903	5,589
231.01	2,700	688	233.66	3,956	5,786
231.06	2,700	729	233.71	4,009	5,985
231.11	2,700	769	233.76	4,061	6,186
231.16	2,700	810	233.81	4,114	6,391
231.21	2,700	851	233.86	4,167	6,598
231.26	2,700	891	233.91	4,220	6,808
231.31	2,700	932	233.96	4,272	7,020
231.36	2,700	972	234.01	4,325	7,235
231.41	2,700	1,013	234.06	4,378	7,452
231.46	2,700	1,053	234.11	4,420	7,628
231.51	2,700	1,093	234.16	4,420	7,628
231.56	2,700	1,134	234.21	4,420	7,628
231.61	2,700	1,174	234.26	4,420	7,628
231.66	2,700	1,215	234.31	4,420	7,628
231.71	2,700	1,256	234.36	4,420	7,628
231.76	2,700	1,296	234.41	4,420	7,628
231.81	2,700	1,337	234.46	4,420	7,628
231.86	2,700	1,377			
231.91	2,700	1,418			
231.96	2,700	1,458			
232.01	2,700	1,498			
232.06	2,700	1,539			
232.11	2,700	1,579			
232.16	2,700	1,620			
232.21	2,700	1,661			
232.26	2,700	1,701			
232.31	2,700	1,742			
232.36	2,700	1,782			
232.41	2,700	1,823			
232.46	2,700	1,863			
232.51	2,711	1,941			
232.56	2,767	2,078			
232.61	2,823	2,218			
232.66	2,879	2,361			
232.71	2,935	2,506			
232.76	2,991	2,654			

Summary for Pond 11.3P: Level Lip Spreader Outlet

Inflow Area = 1.587 ac, 36.00% Impervious, Inflow Depth = 1.07" for 10-YEAR event
 Inflow = 0.89 cfs @ 12.60 hrs, Volume= 0.142 af
 Outflow = 0.75 cfs @ 12.75 hrs, Volume= 0.109 af, Atten= 15%, Lag= 9.2 min
 Primary = 0.75 cfs @ 12.75 hrs, Volume= 0.109 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 234.03' @ 12.88 hrs Surf.Area= 1,458 sf Storage= 1,493 cf
 Flood Elev= 234.50' Surf.Area= 1,500 sf Storage= 1,590 cf

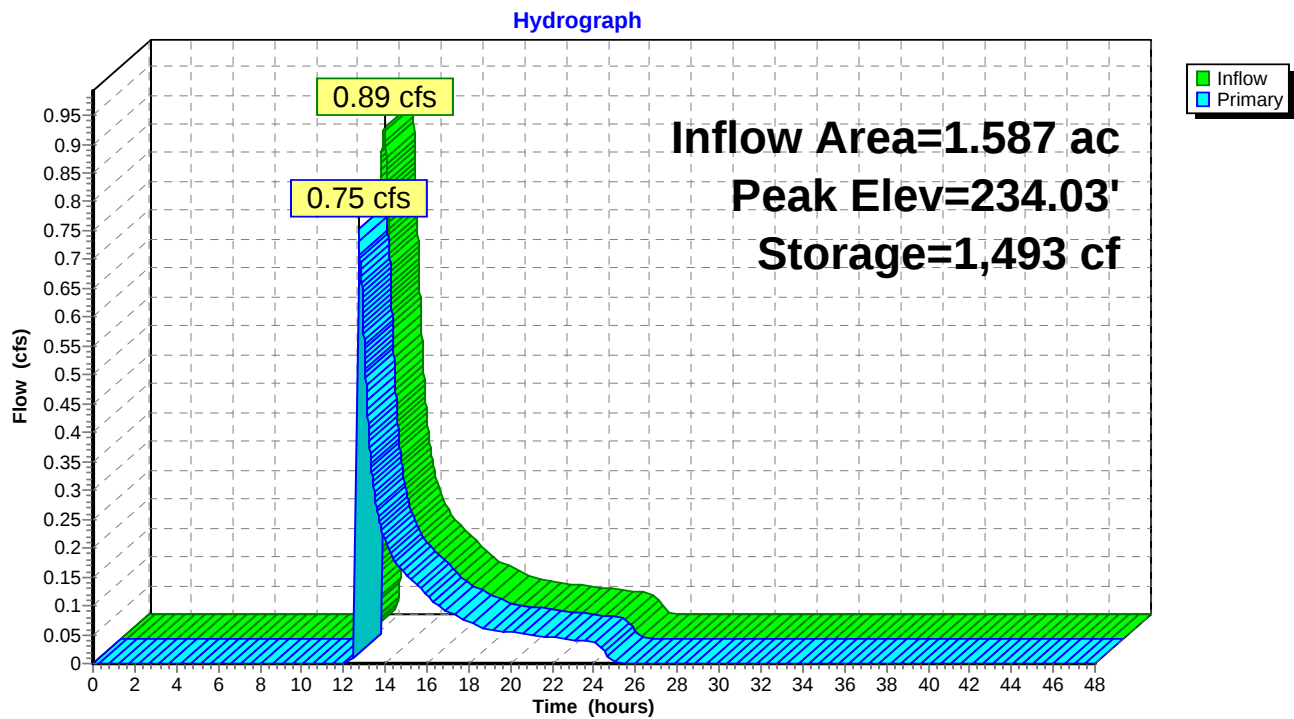
Plug-Flow detention time= 144.4 min calculated for 0.109 af (77% of inflow)
 Center-of-Mass det. time= 51.7 min (962.6 - 910.9)

Volume	Invert	Avail.Storage	Storage Description
#1	232.50'	1,590 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
232.50	500	0	0
233.00	800	325	325
234.10	1,500	1,265	1,590

Device	Routing	Invert	Outlet Devices
#1	Primary	234.00'	80.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.68 cfs @ 12.75 hrs HW=234.03' TW=234.01' (Dynamic Tailwater)
 ↑**1=Level Spreader** (Weir Controls 0.68 cfs @ 0.33 fps)

Pond 11.3P: Level Lip Spreader Outlet

Stage-Area-Storage for Pond 11.3P: Level Lip Spreader Outlet

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
232.50	500	0	233.56	1,156	873
232.52	512	10	233.58	1,169	896
232.54	524	20	233.60	1,182	920
232.56	536	31	233.62	1,195	943
232.58	548	42	233.64	1,207	967
232.60	560	53	233.66	1,220	992
232.62	572	64	233.68	1,233	1,016
232.64	584	76	233.70	1,245	1,041
232.66	596	88	233.72	1,258	1,066
232.68	608	100	233.74	1,271	1,091
232.70	620	112	233.76	1,284	1,117
232.72	632	125	233.78	1,296	1,143
232.74	644	137	233.80	1,309	1,169
232.76	656	150	233.82	1,322	1,195
232.78	668	164	233.84	1,335	1,222
232.80	680	177	233.86	1,347	1,248
232.82	692	191	233.88	1,360	1,275
232.84	704	205	233.90	1,373	1,303
232.86	716	219	233.92	1,385	1,330
232.88	728	233	233.94	1,398	1,358
232.90	740	248	233.96	1,411	1,386
232.92	752	263	233.98	1,424	1,415
232.94	764	278	234.00	1,436	1,443
232.96	776	293	234.02	1,449	1,472
232.98	788	309	234.04	1,462	1,501
233.00	800	325	234.06	1,475	1,531
233.02	813	341	234.08	1,487	1,560
233.04	825	358	234.10	1,500	1,590
233.06	838	374	234.12	1,500	1,590
233.08	851	391	234.14	1,500	1,590
233.10	864	408	234.16	1,500	1,590
233.12	876	426	234.18	1,500	1,590
233.14	889	443	234.20	1,500	1,590
233.16	902	461	234.22	1,500	1,590
233.18	915	479	234.24	1,500	1,590
233.20	927	498	234.26	1,500	1,590
233.22	940	516	234.28	1,500	1,590
233.24	953	535	234.30	1,500	1,590
233.26	965	555	234.32	1,500	1,590
233.28	978	574	234.34	1,500	1,590
233.30	991	594	234.36	1,500	1,590
233.32	1,004	614	234.38	1,500	1,590
233.34	1,016	634	234.40	1,500	1,590
233.36	1,029	654	234.42	1,500	1,590
233.38	1,042	675	234.44	1,500	1,590
233.40	1,055	696	234.46	1,500	1,590
233.42	1,067	717	234.48	1,500	1,590
233.44	1,080	739	234.50	1,500	1,590
233.46	1,093	760			
233.48	1,105	782			
233.50	1,118	805			
233.52	1,131	827			
233.54	1,144	850			

Summary for Pond 11.4P: UDSF-2

Inflow Area = 0.900 ac, 21.43% Impervious, Inflow Depth = 1.67" for 10-YEAR event
 Inflow = 0.89 cfs @ 12.53 hrs, Volume= 0.125 af
 Outflow = 0.42 cfs @ 13.04 hrs, Volume= 0.120 af, Atten= 53%, Lag= 30.8 min
 Primary = 0.42 cfs @ 13.04 hrs, Volume= 0.120 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 240.33' @ 13.04 hrs Surf.Area= 1,400 sf Storage= 2,171 cf
 Flood Elev= 241.00' Surf.Area= 1,500 sf Storage= 2,568 cf

Plug-Flow detention time= 287.6 min calculated for 0.120 af (96% of inflow)
 Center-of-Mass det. time= 265.1 min (1,147.7 - 882.6)

Volume	Invert	Avail.Storage	Storage Description
#1	236.66'	2,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet) Cum.Store (cubic-feet)
236.66	900	0.0	0 0
236.67	900	30.0	3 3
238.99	900	30.0	626 629
239.00	900	100.0	9 638
239.50	1,100	100.0	500 1,138
240.60	1,500	100.0	1,430 2,568

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	12.0" Round Outfall L= 225.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 237.50' / 237.00' S= 0.0022 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	236.83'	4.0" Round UD Header L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 236.83' / 236.83' S= 0.0000 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#3	Device 2	236.66'	2.400 in/hr Filtration over Surface area
#4	Primary	240.30'	1.5" x 1.5" Horiz. Grate X 7.00 columns X 7 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	240.50'	12.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.42 cfs @ 13.04 hrs HW=240.33' TW=0.00' (Dynamic Tailwater)

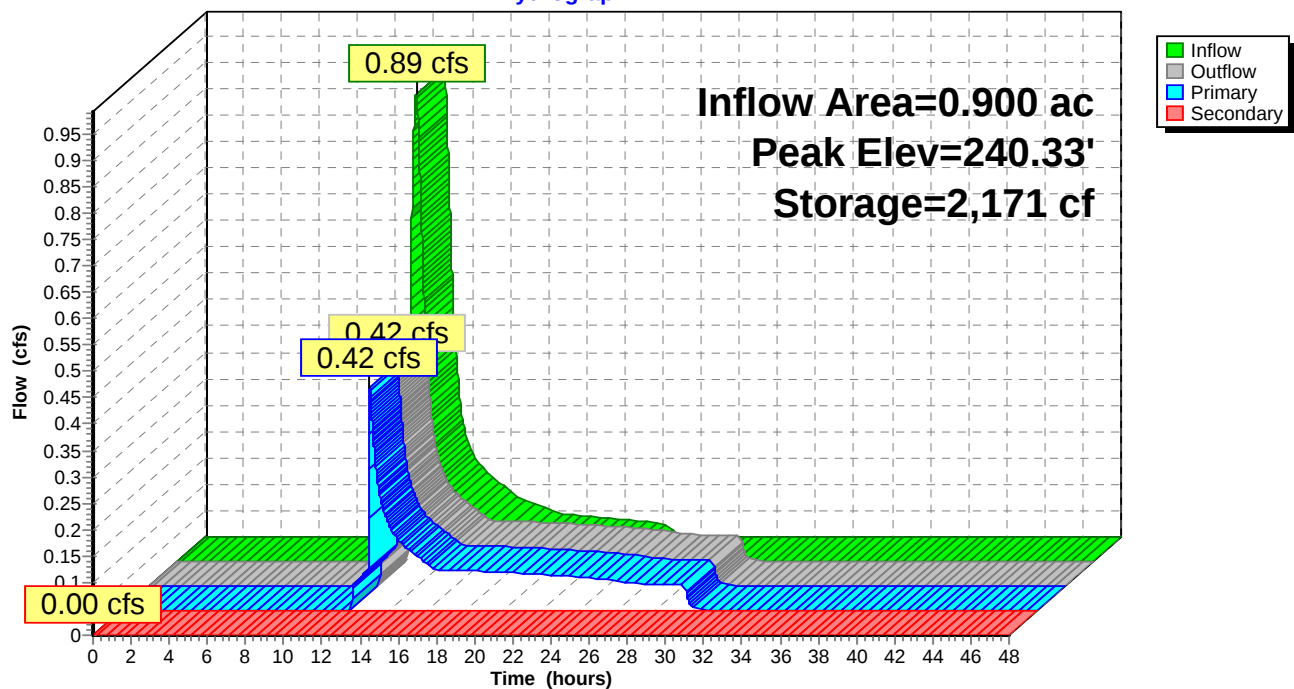
- 1=Outfall (Passes 0.08 cfs of 3.21 cfs potential flow)
- 2=UD Header (Passes 0.08 cfs of 0.43 cfs potential flow)
- 3=Filtration (Exfiltration Controls 0.08 cfs)
- 4=Grate (Weir Controls 0.34 cfs @ 0.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=236.66' TW=0.00' (Dynamic Tailwater)

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

Pond 11.4P: UDSF-2

Hydrograph



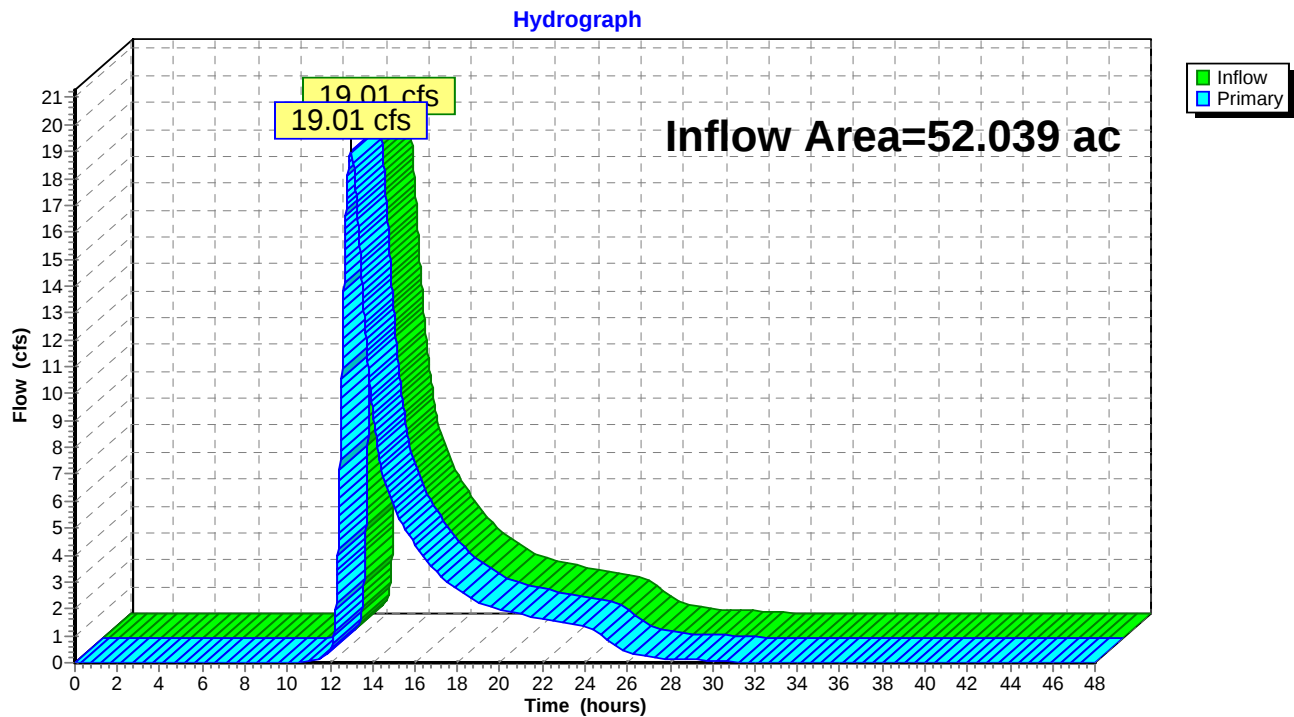
Stage-Area-Storage for Pond 11.4P: UDSF-2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
236.66	900	0	239.31	1,024	936
236.71	900	14	239.36	1,044	988
236.76	900	27	239.41	1,064	1,041
236.81	900	41	239.46	1,084	1,094
236.86	900	54	239.51	1,104	1,149
236.91	900	68	239.56	1,122	1,205
236.96	900	81	239.61	1,140	1,261
237.01	900	94	239.66	1,158	1,319
237.06	900	108	239.71	1,176	1,377
237.11	900	121	239.76	1,195	1,436
237.16	900	135	239.81	1,213	1,497
237.21	900	149	239.86	1,231	1,558
237.26	900	162	239.91	1,249	1,620
237.31	900	176	239.96	1,267	1,683
237.36	900	189	240.01	1,285	1,746
237.41	900	203	240.06	1,304	1,811
237.46	900	216	240.11	1,322	1,877
237.51	900	229	240.16	1,340	1,943
237.56	900	243	240.21	1,358	2,011
237.61	900	256	240.26	1,376	2,079
237.66	900	270	240.31	1,395	2,148
237.71	900	284	240.36	1,413	2,219
237.76	900	297	240.41	1,431	2,290
237.81	900	311	240.46	1,449	2,362
237.86	900	324	240.51	1,467	2,435
237.91	900	338	240.56	1,485	2,508
237.96	900	351	240.61	1,500	2,568
238.01	900	364	240.66	1,500	2,568
238.06	900	378	240.71	1,500	2,568
238.11	900	391	240.76	1,500	2,568
238.16	900	405	240.81	1,500	2,568
238.21	900	419	240.86	1,500	2,568
238.26	900	432	240.91	1,500	2,568
238.31	900	446	240.96	1,500	2,568
238.36	900	459			
238.41	900	473			
238.46	900	486			
238.51	900	499			
238.56	900	513			
238.61	900	526			
238.66	900	540			
238.71	900	554			
238.76	900	567			
238.81	900	581			
238.86	900	594			
238.91	900	608			
238.96	900	621			
239.01	904	647			
239.06	924	693			
239.11	944	740			
239.16	964	787			
239.21	984	836			
239.26	1,004	886			

Summary for Link SP1: Study Point #1

Inflow Area = 52.039 ac, 5.33% Impervious, Inflow Depth = 1.08" for 10-YEAR event
Inflow = 19.01 cfs @ 12.98 hrs, Volume= 4.663 af
Primary = 19.01 cfs @ 12.98 hrs, Volume= 4.663 af, Atten= 0%, Lag= 0.0 min

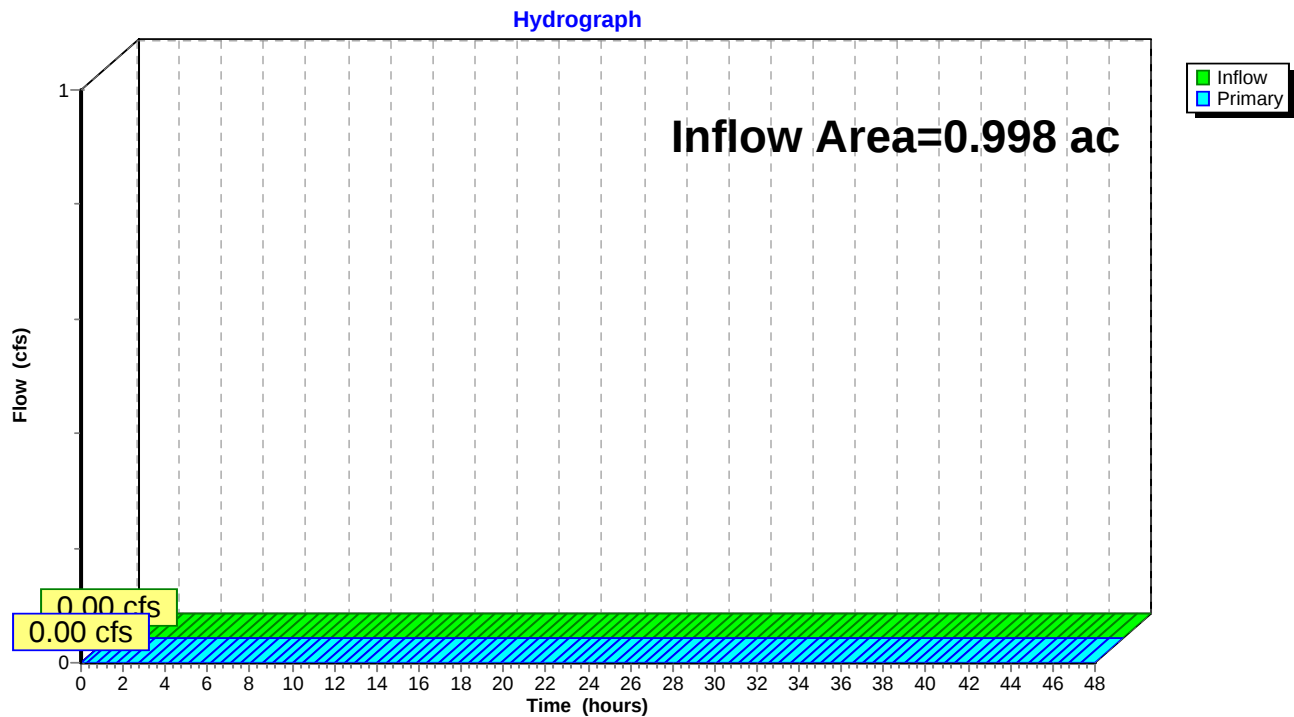
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP1: Study Point #1

Summary for Link SP2: Study Point #2

Inflow Area = 0.998 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

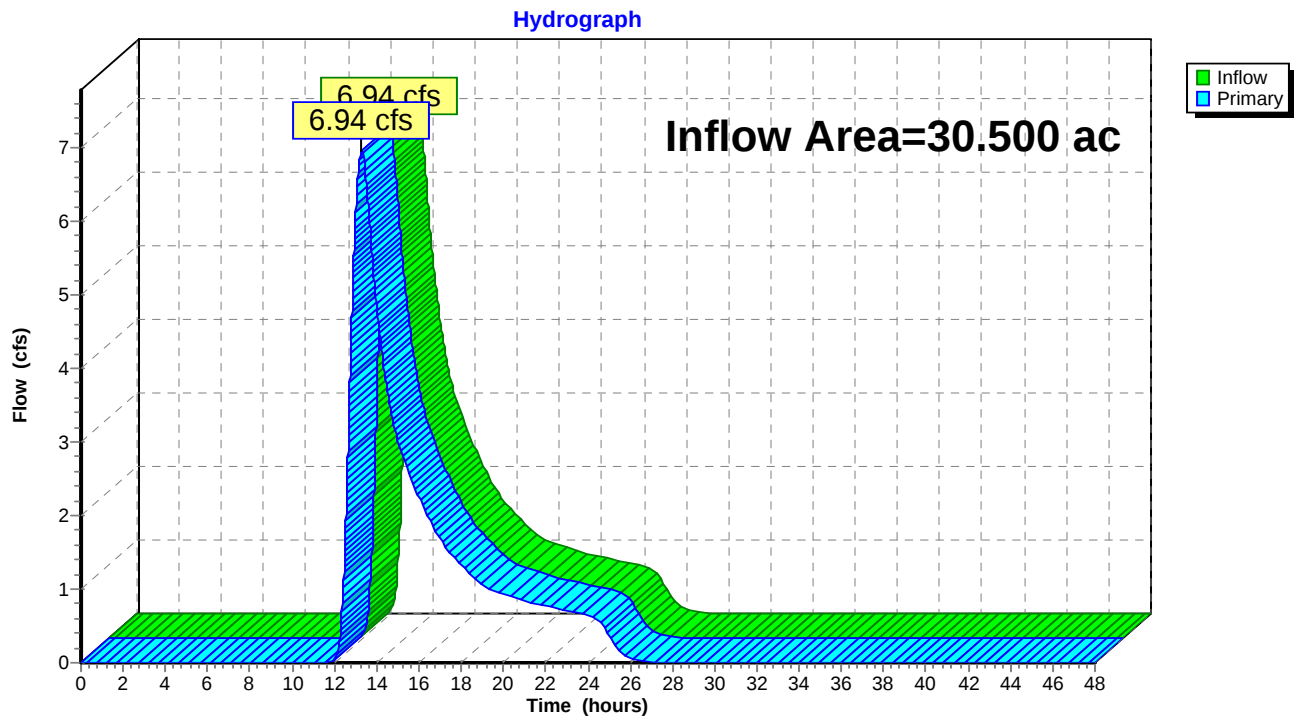
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP2: Study Point #2

Summary for Link SP3: Study Point #3

Inflow Area = 30.500 ac, 1.78% Impervious, Inflow Depth = 0.79" for 10-YEAR event
Inflow = 6.94 cfs @ 13.25 hrs, Volume= 2.003 af
Primary = 6.94 cfs @ 13.25 hrs, Volume= 2.003 af, Atten= 0%, Lag= 0.0 min

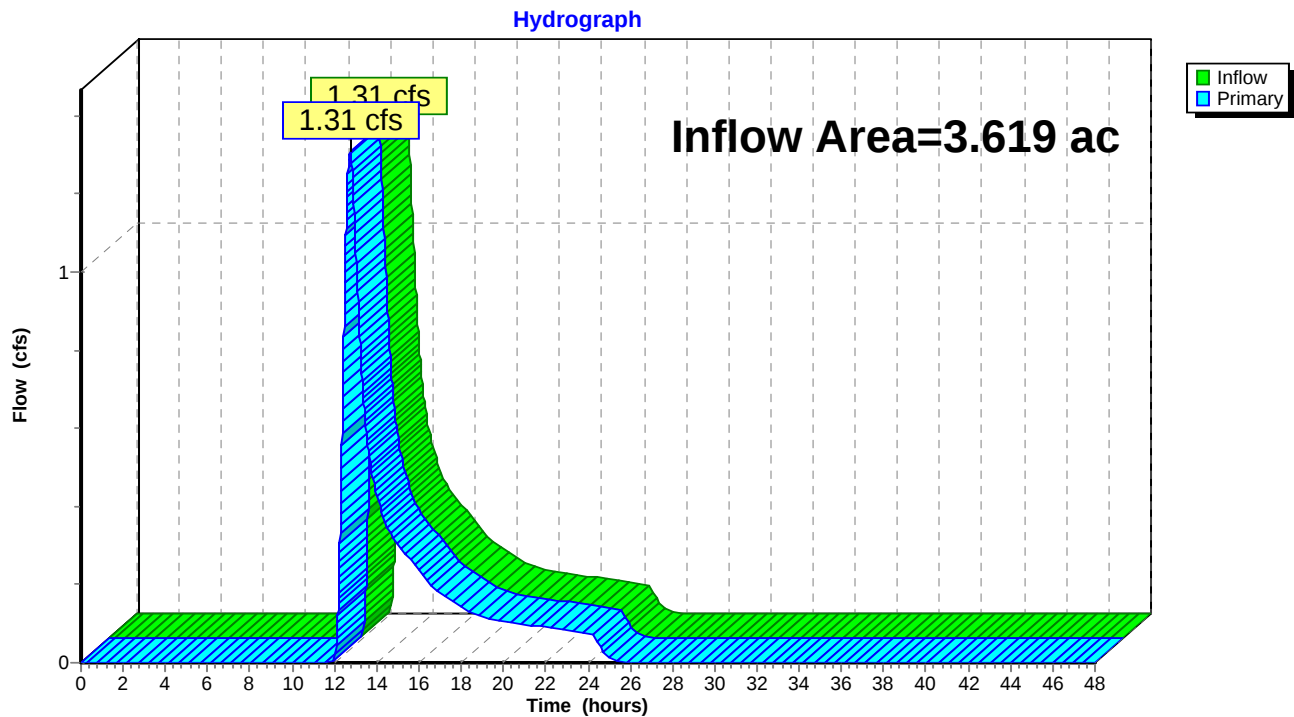
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP3: Study Point #3

Summary for Link SP4: Study Point #4

Inflow Area = 3.619 ac, 0.00% Impervious, Inflow Depth = 0.84" for 10-YEAR event
Inflow = 1.31 cfs @ 12.74 hrs, Volume= 0.254 af
Primary = 1.31 cfs @ 12.74 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP4: Study Point #4

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Type III 24-hr 25-YEAR Rainfall=5.80"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment10.1S: Runoff Area=695,930 sf 3.31% Impervious Runoff Depth=0.91"
 Flow Length=710' Tc=32.5 min UI Adjusted CN=48 Runoff=6.83 cfs 1.215 af

Subcatchment10.2S: Runoff Area=43,490 sf 0.00% Impervious Runoff Depth=0.05"
 Flow Length=340' Tc=33.0 min CN=30 Runoff=0.01 cfs 0.004 af

Subcatchment10.3S: Runoff Area=988,770 sf 3.61% Impervious Runoff Depth=2.65"
 Flow Length=1,830' Tc=32.3 min CN=70 Runoff=38.19 cfs 5.008 af

Subcatchment10.4S: Runoff Area=313,540 sf 0.84% Impervious Runoff Depth=1.05"
 Flow Length=900' Tc=39.0 min CN=50 Runoff=3.45 cfs 0.628 af

Subcatchment10.5S: Runoff Area=1,328,600 sf 1.78% Impervious Runoff Depth=1.40"
 Flow Length=1,720' Tc=81.1 min CN=55 Runoff=14.10 cfs 3.569 af

Subcatchment10.6S: Runoff Area=157,640 sf 0.00% Impervious Runoff Depth=1.48"
 Flow Length=960' Tc=44.8 min CN=56 Runoff=2.60 cfs 0.446 af

Subcatchment11.1S: Runoff Area=53,730 sf 16.21% Impervious Runoff Depth=2.29"
 Flow Length=325' Tc=17.0 min CN=66 Runoff=2.32 cfs 0.236 af

Subcatchment11.2S: Runoff Area=106,550 sf 16.34% Impervious Runoff Depth=1.48"
 Flow Length=575' Tc=37.0 min CN=56 Runoff=1.94 cfs 0.302 af

Subcatchment11.3S: Runoff Area=69,130 sf 36.00% Impervious Runoff Depth=1.79"
 Flow Length=600' Tc=37.2 min CN=60 Runoff=1.59 cfs 0.237 af

Subcatchment11.4S: Runoff Area=39,190 sf 21.43% Impervious Runoff Depth=2.56"
 Flow Length=450' Tc=35.8 min CN=69 Runoff=1.39 cfs 0.192 af

Reach 10.1R: Avg. Flow Depth=0.81' Max Vel=1.03 fps Inflow=35.12 cfs 7.241 af
 n=0.070 L=700.0' S=0.0072 ' /' Capacity=43.26 cfs Outflow=33.32 cfs 7.241 af

Reach 11.1R: Meadow Buffer 1 Avg. Flow Depth=0.07' Max Vel=0.20 fps Inflow=1.08 cfs 0.138 af
 n=0.240 L=80.0' S=0.0400 ' /' Capacity=94.49 cfs Outflow=0.75 cfs 0.138 af

Reach 11.3R: Wooded Buffer 1 Avg. Flow Depth=0.05' Max Vel=0.37 fps Inflow=1.57 cfs 0.204 af
 n=0.240 L=55.0' S=0.2000 ' /' Capacity=289.74 cfs Outflow=1.56 cfs 0.204 af

Pond 10.1P: Inflow=6.83 cfs 1.215 af
 Primary=6.83 cfs 1.215 af

Pond 10.3P: Culverts Peak Elev=227.08' Storage=47,617 cf Inflow=41.79 cfs 6.026 af
 Primary=29.32 cfs 6.026 af Secondary=0.00 cfs 0.000 af Outflow=29.32 cfs 6.026 af

Pond 10.4P: Inflow=4.65 cfs 0.814 af
 Primary=4.65 cfs 0.814 af

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Type III 24-hr 25-YEAR Rainfall=5.80"

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Pond 11.1P: Level Lip Spreader Outlet Peak Elev=230.04' Storage=4,361 cf Inflow=2.32 cfs 0.236 af
Outflow=1.08 cfs 0.138 af

Pond 11.2P: UDSF-1 Peak Elev=233.53' Storage=5,272 cf Inflow=1.94 cfs 0.302 af
Primary=0.59 cfs 0.295 af Secondary=0.00 cfs 0.000 af Outflow=0.59 cfs 0.295 af

Pond 11.3P: Level Lip Spreader Outlet Peak Elev=234.06' Storage=1,530 cf Inflow=1.59 cfs 0.237 af
Outflow=1.57 cfs 0.204 af

Pond 11.4P: UDSF-2 Peak Elev=240.39' Storage=2,266 cf Inflow=1.39 cfs 0.192 af
Primary=1.21 cfs 0.187 af Secondary=0.00 cfs 0.000 af Outflow=1.21 cfs 0.187 af

Link SP1: Study Point #1 Inflow=34.11 cfs 7.674 af
Primary=34.11 cfs 7.674 af

Link SP2: Study Point #2 Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af

Link SP3: Study Point #3 Inflow=14.10 cfs 3.569 af
Primary=14.10 cfs 3.569 af

Link SP4: Study Point #4 Inflow=2.60 cfs 0.446 af
Primary=2.60 cfs 0.446 af

Total Runoff Area = 87.157 ac Runoff Volume = 11.836 af Average Runoff Depth = 1.63"
96.19% Pervious = 83.840 ac 3.81% Impervious = 3.317 ac

Summary for Subcatchment 10.1S:

Runoff = 6.83 cfs @ 12.57 hrs, Volume= 1.215 af, Depth= 0.91"

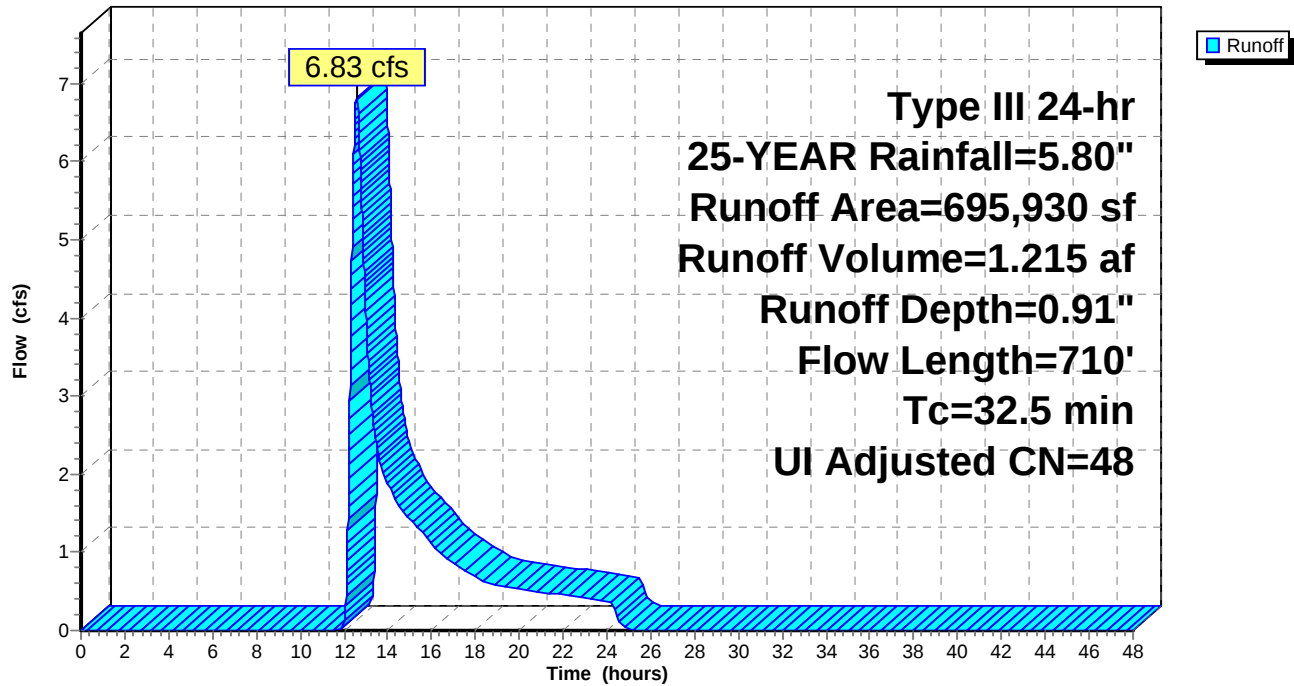
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Adj	Description
161,180	80		>75% Grass cover, Good, HSG D
10,800	74		>75% Grass cover, Good, HSG C
246,600	39		>75% Grass cover, Good, HSG A
11,660	98		Paved roads w/curbs & sewers, HSG D
1,510	98		Paved roads w/curbs & sewers, HSG C
6,150	98		Paved roads w/curbs & sewers, HSG A
13,130	77		Woods, Good, HSG D
241,170	30		Woods, Good, HSG A
3,730	98		Unconnected roofs, HSG A
695,930	49	48	Weighted Average, UI Adjusted
672,880			96.69% Pervious Area
23,050			3.31% Impervious Area
3,730			16.18% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	150	0.0080	0.09		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
3.6	560	0.0300	2.60		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
32.5	710	Total			

Subcatchment 10.1S:

Hydrograph



Summary for Subcatchment 10.2S:

Runoff = 0.01 cfs @ 17.20 hrs, Volume= 0.004 af, Depth= 0.05"

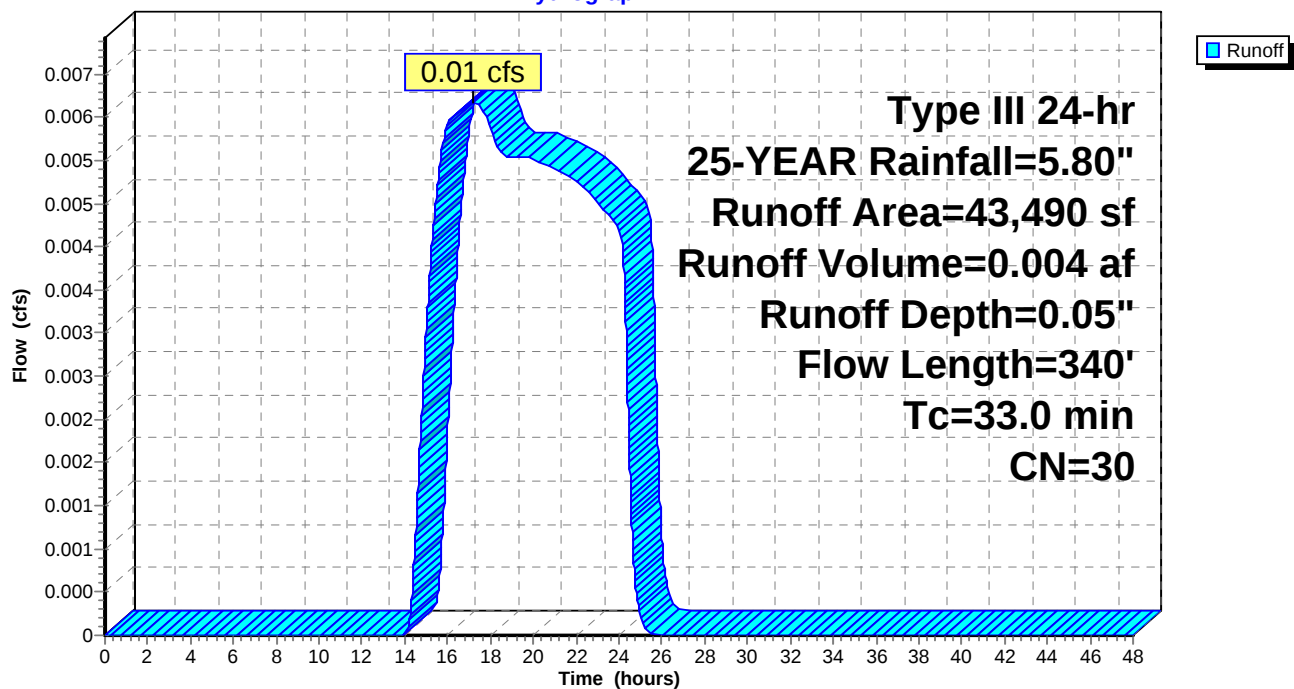
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
43,490	30	Woods, Good, HSG A
43,490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	150	0.0230	0.09		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
4.5	190	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
33.0	340	Total			

Subcatchment 10.2S:

Hydrograph



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Type III 24-hr 25-YEAR Rainfall=5.80"

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Summary for Subcatchment 10.3S:

Runoff = 38.19 cfs @ 12.46 hrs, Volume= 5.008 af, Depth= 2.65"

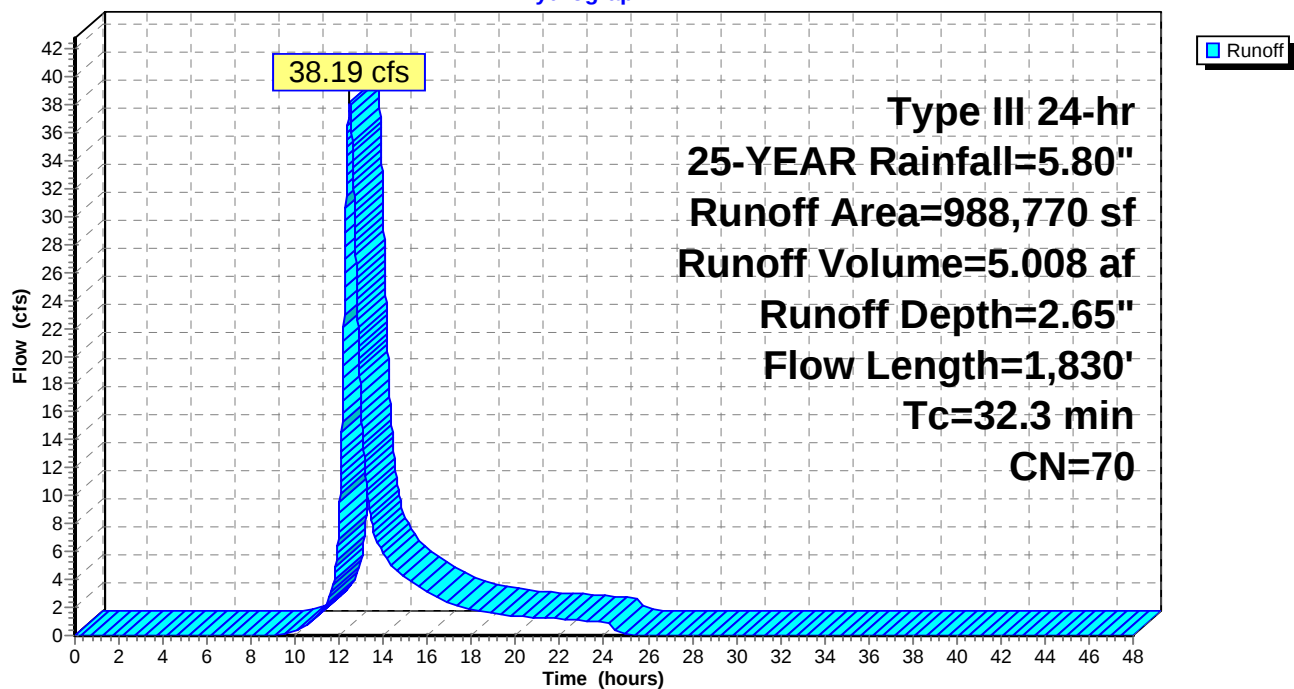
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
48,440	39	>75% Grass cover, Good, HSG A
608,410	74	>75% Grass cover, Good, HSG C
63,390	80	>75% Grass cover, Good, HSG D
22,940	98	Paved roads w/curbs & sewers, HSG C
5,250	98	Paved roads w/curbs & sewers, HSG D
57,590	30	Woods, Good, HSG A
51,830	70	Woods, Good, HSG C
2,270	76	Gravel roads, HSG A
6,480	89	Gravel roads, HSG C
6,400	98	Unconnected roofs, HSG C
1,130	98	Unconnected roofs, HSG A
29,880	39	>75% Grass cover, Good, HSG A
84,760	74	>75% Grass cover, Good, HSG C
988,770	70	Weighted Average
953,050		96.39% Pervious Area
35,720		3.61% Impervious Area
7,530		21.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0300	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
15.2	1,680	0.0150	1.84		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
32.3	1,830	Total			

Subcatchment 10.3S:

Hydrograph



Summary for Subcatchment 10.4S:

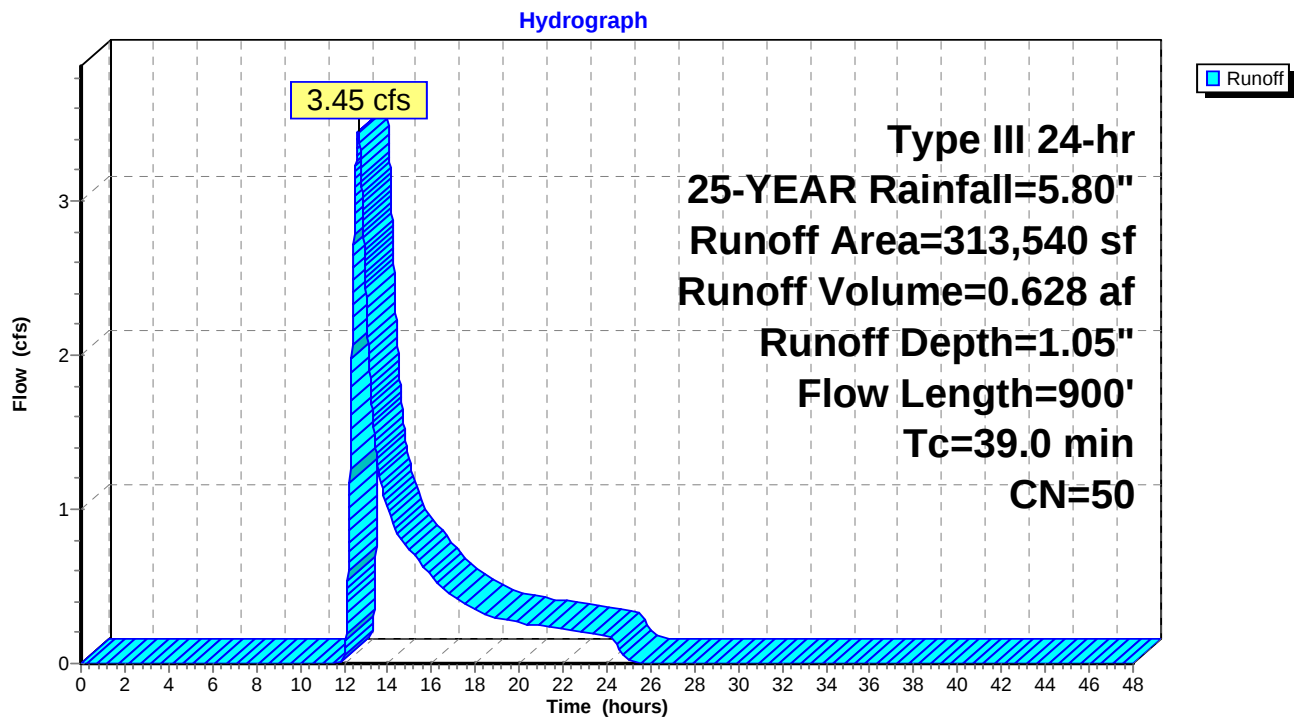
Runoff = 3.45 cfs @ 12.65 hrs, Volume= 0.628 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
71,700	39	>75% Grass cover, Good, HSG A
55,490	74	>75% Grass cover, Good, HSG C
87,930	30	Woods, Good, HSG A
56,360	70	Woods, Good, HSG C
1,840	76	Gravel roads, HSG A
2,620	98	Unconnected roofs, HSG D
30,180	39	>75% Grass cover, Good, HSG A
7,420	74	>75% Grass cover, Good, HSG C
313,540	50	Weighted Average
310,920		99.16% Pervious Area
2,620		0.84% Impervious Area
2,620		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	150	0.0400	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	130	0.0800	1.41		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
14.6	620	0.0050	0.71		Shallow Concentrated Flow, C-D Nearly Bare & Untilled Kv= 10.0 fps
39.0	900	Total			

Subcatchment 10.4S:



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Type III 24-hr 25-YEAR Rainfall=5.80"

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Summary for Subcatchment 10.5S:

Runoff = 14.10 cfs @ 13.24 hrs, Volume= 3.569 af, Depth= 1.40"

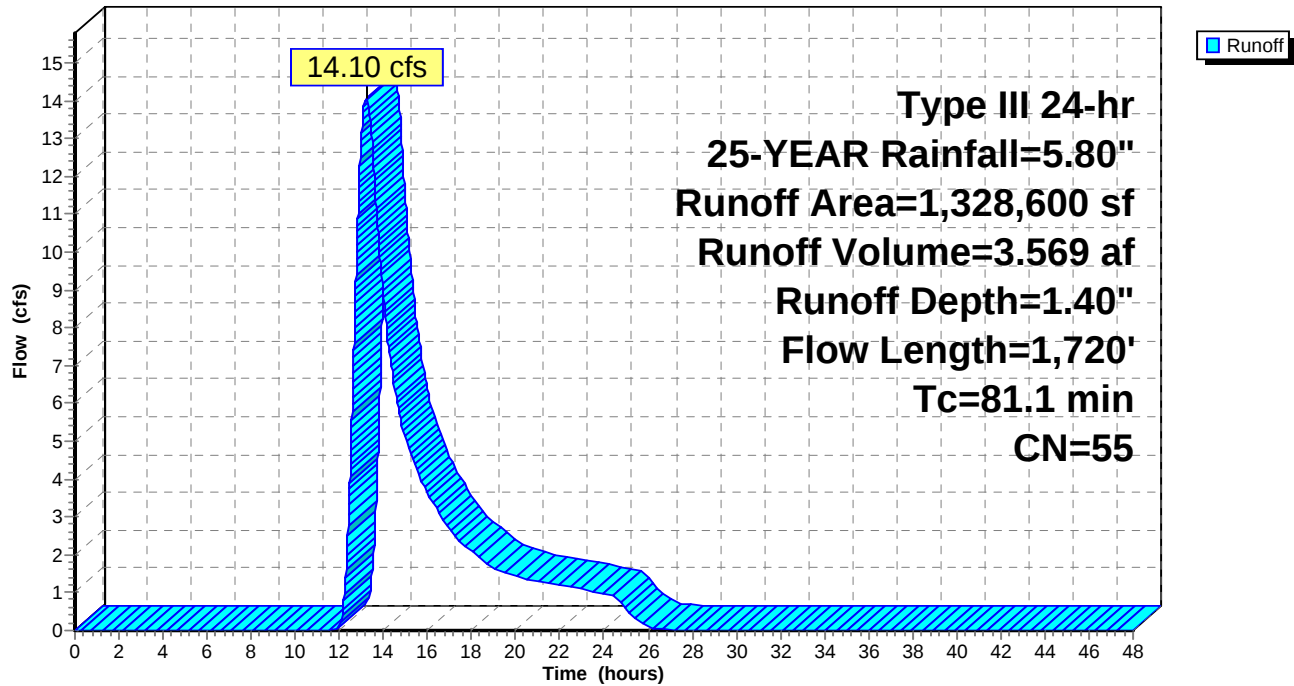
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
19,420	39	>75% Grass cover, Good, HSG A
135,940	74	>75% Grass cover, Good, HSG C
1,280	98	Paved roads w/curbs & sewers, HSG A
351,500	30	Woods, Good, HSG A
446,380	70	Woods, Good, HSG C
187,260	55	Woods, Good, HSG B
22,400	98	Water Surface, HSG C
90,200	39	>75% Grass cover, Good, HSG A
71,900	61	>75% Grass cover, Good, HSG B
2,320	74	>75% Grass cover, Good, HSG C
1,328,600	55	Weighted Average
1,304,920		98.22% Pervious Area
23,680		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
1.9	170	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
46.7	1,400	0.0100	0.50		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
81.1	1,720	Total			

Subcatchment 10.5S:

Hydrograph



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Type III 24-hr 25-YEAR Rainfall=5.80"

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Summary for Subcatchment 10.6S:

Runoff = 2.60 cfs @ 12.69 hrs, Volume= 0.446 af, Depth= 1.48"

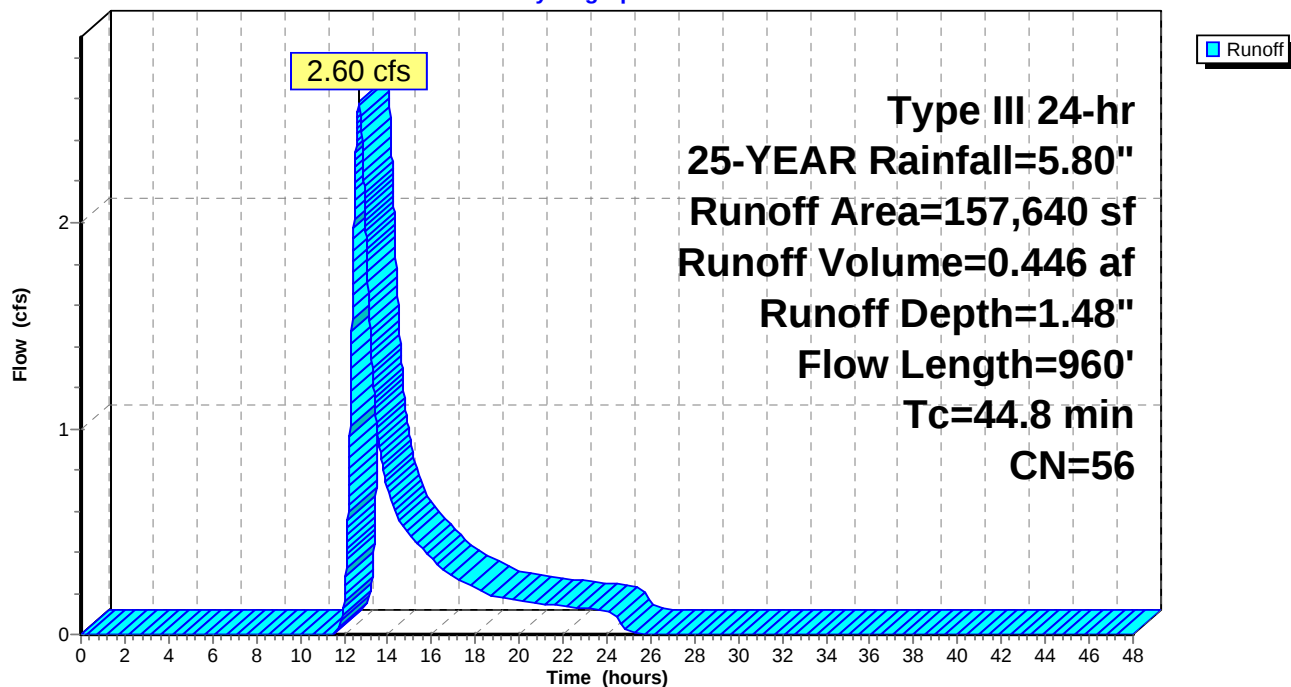
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
20,190	30	Woods, Good, HSG A
40,980	70	Woods, Good, HSG C
93,400	55	Woods, Good, HSG B
3,070	61	>75% Grass cover, Good, HSG B
157,640	56	Weighted Average
157,640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	150	0.0300	0.10		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
19.1	810	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
44.8	960	Total			

Subcatchment 10.6S:

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Type III 24-hr 25-YEAR Rainfall=5.80"

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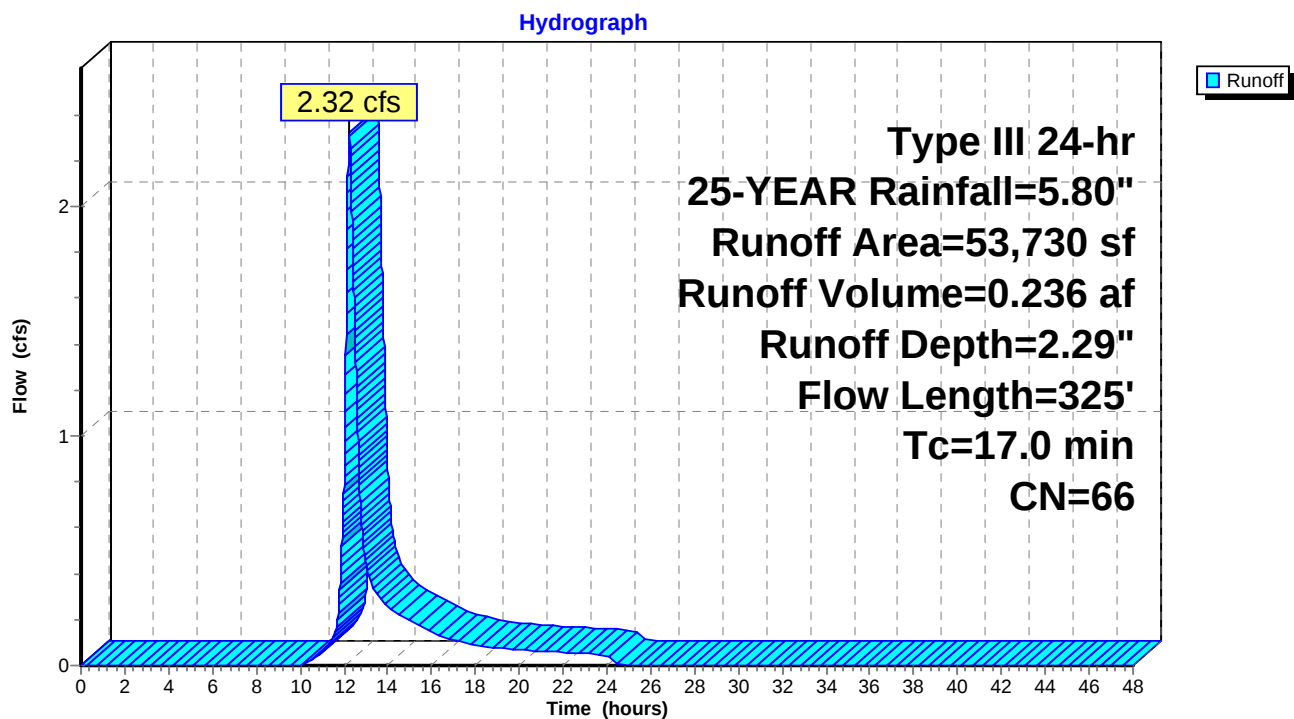
Summary for Subcatchment 11.1S:

Runoff = 2.32 cfs @ 12.24 hrs, Volume= 0.236 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
8,170	74	>75% Grass cover, Good, HSG C
1,660	98	Paved roads w/curbs & sewers, HSG A
7,050	98	Paved roads w/curbs & sewers, HSG C
18,310	39	>75% Grass cover, Good, HSG A
18,540	74	>75% Grass cover, Good, HSG C
53,730	66	Weighted Average
45,020		83.79% Pervious Area
8,710		16.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	150	0.0350	0.16		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
0.8	130	0.0350	2.81		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.2	45	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
17.0	325	Total			

Subcatchment 11.1S:

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Type III 24-hr 25-YEAR Rainfall=5.80"

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Summary for Subcatchment 11.2S:

Runoff = 1.94 cfs @ 12.58 hrs, Volume= 0.302 af, Depth= 1.48"

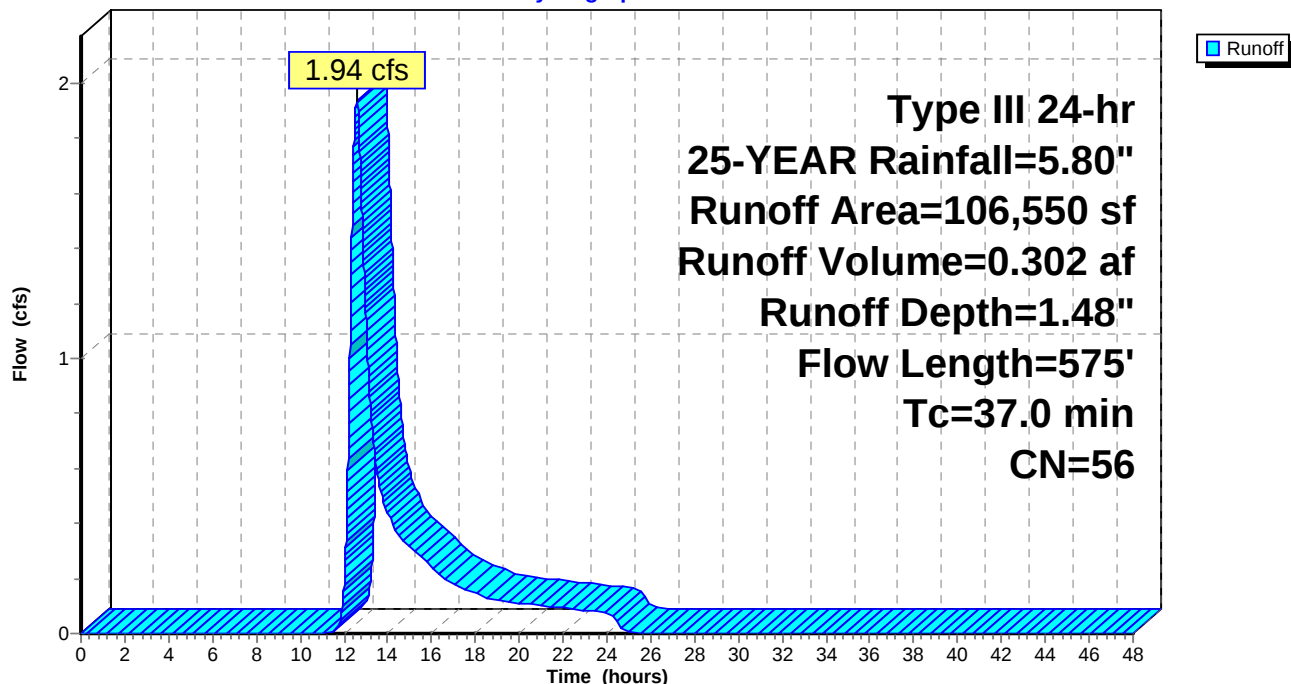
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
68,240	39	>75% Grass cover, Good, HSG A
8,130	98	Paved roads w/curbs & sewers, HSG A
9,280	98	Paved roads w/curbs & sewers, HSG C
20,900	74	>75% Grass cover, Good, HSG C
106,550	56	Weighted Average
89,140		83.66% Pervious Area
17,410		16.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.3	390	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.2	35	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
37.0	575	Total			

Subcatchment 11.2S:

Hydrograph



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Type III 24-hr 25-YEAR Rainfall=5.80"

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Summary for Subcatchment 11.3S:

Runoff = 1.59 cfs @ 12.56 hrs, Volume= 0.237 af, Depth= 1.79"

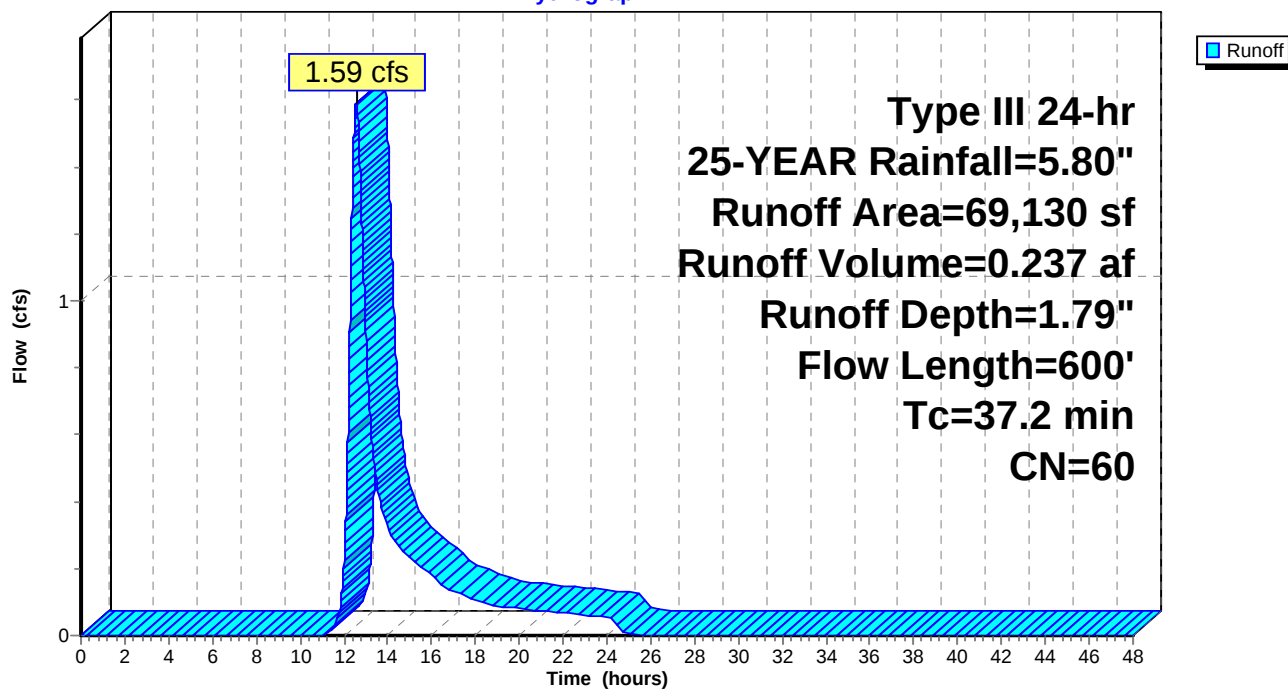
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
23,650	98	Paved roads w/curbs & sewers, HSG A
1,240	98	Paved roads w/curbs & sewers, HSG C
37,000	39	>75% Grass cover, Good, HSG A
2,240	61	>75% Grass cover, Good, HSG B
5,000	30	Woods, Good, HSG A
69,130	60	Weighted Average
44,240		64.00% Pervious Area
24,890		36.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
4.4	400	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.3	50	0.0050	3.21	2.52	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
37.2	600	Total			

Subcatchment 11.3S:

Hydrograph



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Type III 24-hr 25-YEAR Rainfall=5.80"

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Summary for Subcatchment 11.4S:

Runoff = 1.39 cfs @ 12.53 hrs, Volume= 0.192 af, Depth= 2.56"

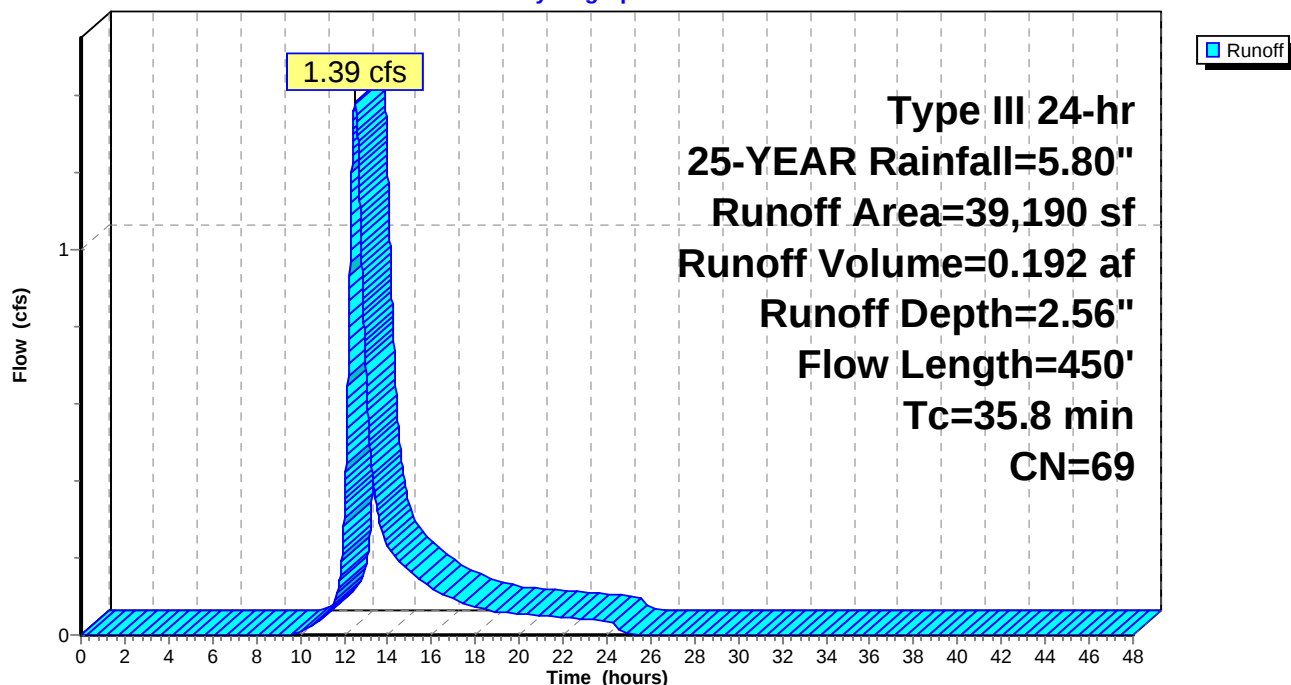
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=5.80"

Area (sf)	CN	Description
3,190	74	>75% Grass cover, Good, HSG C
7,160	61	>75% Grass cover, Good, HSG B
8,400	98	Paved roads w/curbs & sewers, HSG B
2,720	39	>75% Grass cover, Good, HSG A
16,380	61	>75% Grass cover, Good, HSG B
1,340	74	>75% Grass cover, Good, HSG C
39,190	69	Weighted Average
30,790		78.57% Pervious Area
8,400		21.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	150	0.0060	0.08		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10"
3.3	300	0.0100	1.50		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
35.8	450	Total			

Subcatchment 11.4S:

Hydrograph



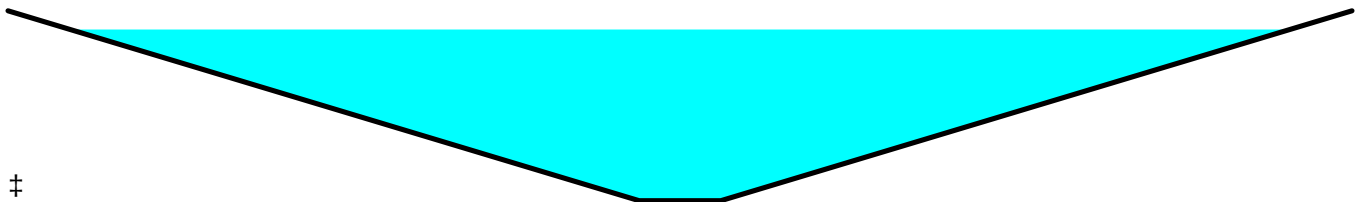
Summary for Reach 10.1R:

Inflow Area = 48.360 ac, 4.49% Impervious, Inflow Depth = 1.80" for 25-YEAR event
 Inflow = 35.12 cfs @ 12.75 hrs, Volume= 7.241 af
 Outflow = 33.32 cfs @ 12.92 hrs, Volume= 7.241 af, Atten= 5%, Lag= 10.3 min

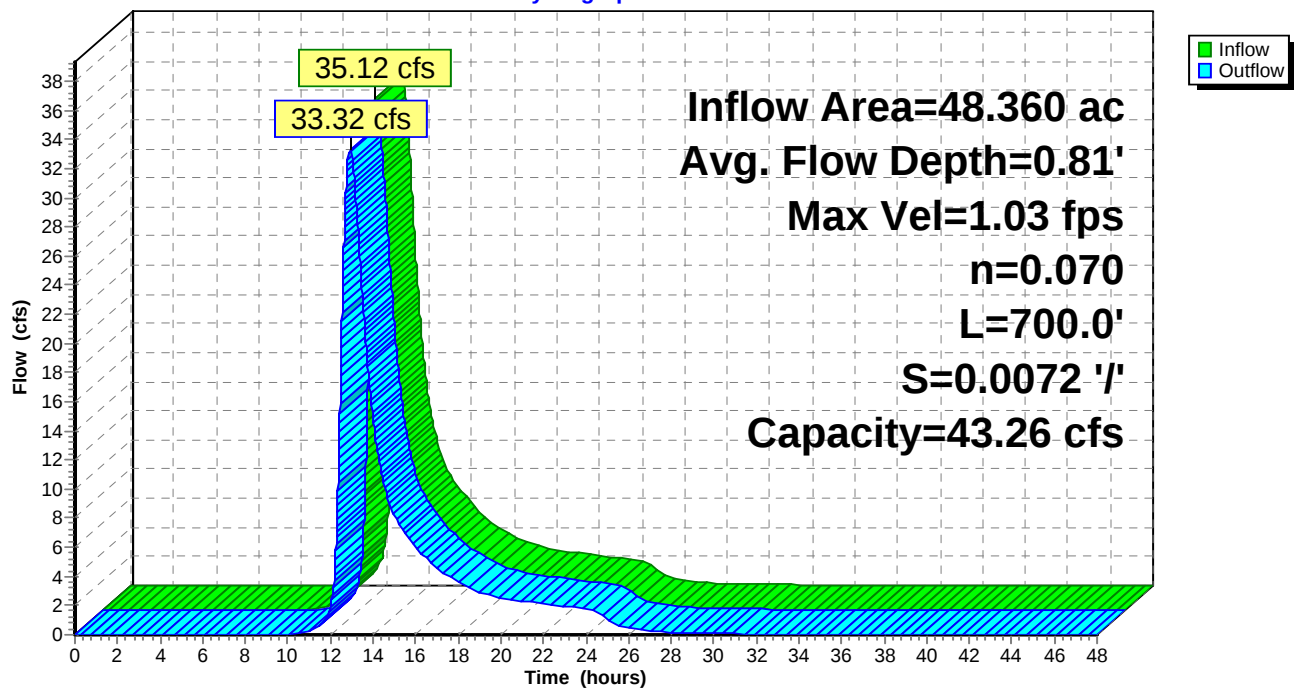
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.03 fps, Min. Travel Time= 11.3 min
 Avg. Velocity = 0.31 fps, Avg. Travel Time= 37.9 min

Peak Storage= 22,641 cf @ 12.92 hrs
 Average Depth at Peak Storage= 0.81'
 Bank-Full Depth= 0.90' Flow Area= 39.3 sf, Capacity= 43.26 cfs

5.00' x 0.90' deep channel, n= 0.070 Sluggish weedy reaches w/pools
 Side Slope Z-value= 43.0 '/' Top Width= 82.40'
 Length= 700.0' Slope= 0.0072 '/'
 Inlet Invert= 222.30', Outlet Invert= 217.26'

**Reach 10.1R:**

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Type III 24-hr 25-YEAR Rainfall=5.80"

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Stage-Area-Storage for Reach 10.1R:

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
222.30	0.0	0	222.83	14.7	10,310
222.31	0.1	38	222.84	15.2	10,667
222.32	0.1	82	222.85	15.8	11,030
222.33	0.2	133	222.86	16.3	11,400
222.34	0.3	189	222.87	16.8	11,775
222.35	0.4	251	222.88	17.4	12,156
222.36	0.5	319	222.89	17.9	12,543
222.37	0.6	393	222.90	18.5	12,937
222.38	0.7	473	222.91	19.1	13,336
222.39	0.8	559	222.92	19.6	13,741
222.40	0.9	651	222.93	20.2	14,152
222.41	1.1	750	222.94	20.8	14,569
222.42	1.2	854	222.95	21.4	14,993
222.43	1.4	964	222.96	22.0	15,422
222.44	1.5	1,081	222.97	22.7	15,857
222.45	1.7	1,203	222.98	23.3	16,299
222.46	1.9	1,331	222.99	23.9	16,746
222.47	2.1	1,465	223.00	24.6	17,199
222.48	2.3	1,605	223.01	25.2	17,659
222.49	2.5	1,752	223.02	25.9	18,124
222.50	2.7	1,904	223.03	26.6	18,596
222.51	2.9	2,063	223.04	27.2	19,073
222.52	3.2	2,227	223.05	27.9	19,557
222.53	3.4	2,398	223.06	28.6	20,046
222.54	3.7	2,574	223.07	29.3	20,542
222.55	3.9	2,757	223.08	30.1	21,043
222.56	4.2	2,945	223.09	30.8	21,551
222.57	4.5	3,139	223.10	31.5	22,064
222.58	4.8	3,340	223.11	32.3	22,584
222.59	5.1	3,547	223.12	33.0	23,109
222.60	5.4	3,760	223.13	33.8	23,641
222.61	5.7	3,978	223.14	34.5	24,179
222.62	6.0	4,203	223.15	35.3	24,723
222.63	6.3	4,433	223.16	36.1	25,273
222.64	6.7	4,670	223.17	36.9	25,828
222.65	7.0	4,912	223.18	37.7	26,390
222.66	7.4	5,161	223.19	38.5	26,957
222.67	7.7	5,416	223.20	39.3	27,531
222.68	8.1	5,677			
222.69	8.5	5,944			
222.70	8.9	6,217			
222.71	9.3	6,495			
222.72	9.7	6,780			
222.73	10.1	7,071			
222.74	10.5	7,368			
222.75	11.0	7,670			
222.76	11.4	7,979			
222.77	11.8	8,295			
222.78	12.3	8,616			
222.79	12.8	8,943			
222.80	13.3	9,276			
222.81	13.7	9,615			
222.82	14.2	9,959			

Summary for Reach 11.1R: Meadow Buffer 1

Inflow Area = 1.233 ac, 16.21% Impervious, Inflow Depth = 1.34" for 25-YEAR event
 Inflow = 1.08 cfs @ 12.61 hrs, Volume= 0.138 af
 Outflow = 0.75 cfs @ 12.74 hrs, Volume= 0.138 af, Atten= 31%, Lag= 8.0 min

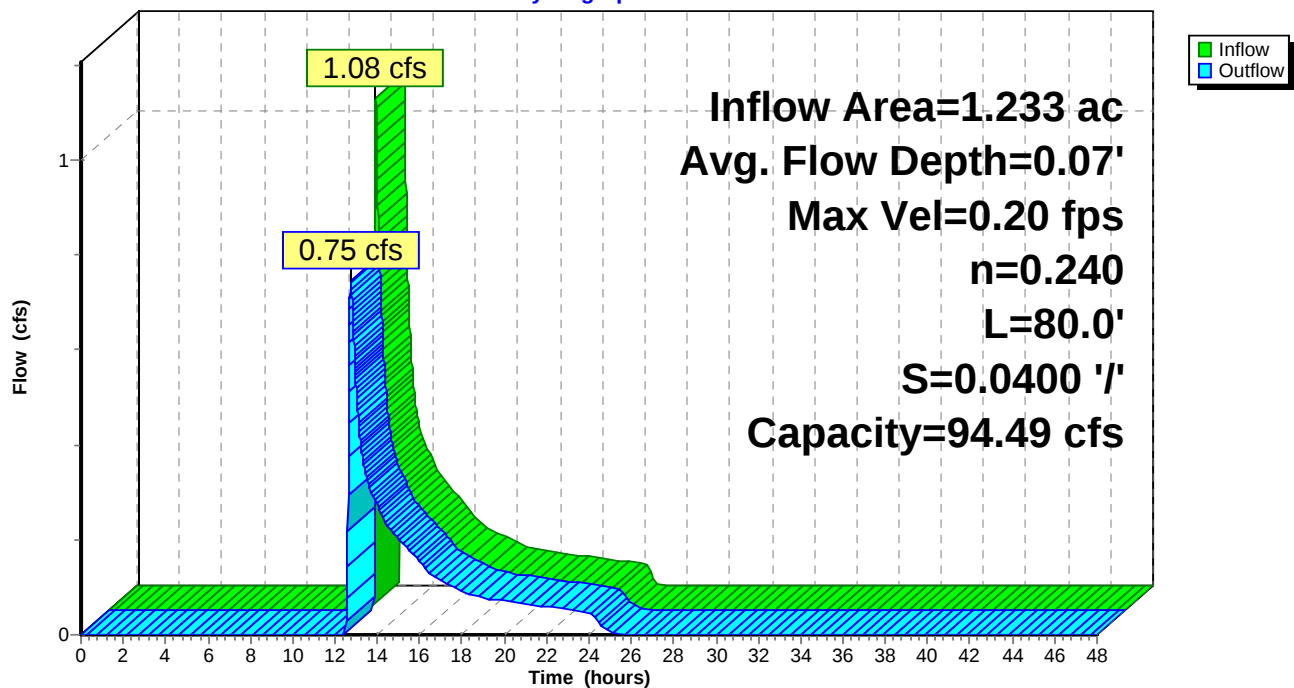
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.20 fps, Min. Travel Time= 6.6 min
 Avg. Velocity= 0.09 fps, Avg. Travel Time= 14.7 min

Peak Storage= 298 cf @ 12.74 hrs
 Average Depth at Peak Storage= 0.07'
 Bank-Full Depth= 1.00' Flow Area= 100.0 sf, Capacity= 94.49 cfs

50.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
 Side Slope Z-value= 50.0 ' ' Top Width= 150.00'
 Length= 80.0' Slope= 0.0400 ' '
 Inlet Invert= 229.00', Outlet Invert= 225.80'

**Reach 11.1R: Meadow Buffer 1**

Hydrograph



Stage-Area-Storage for Reach 11.1R: Meadow Buffer 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
229.00	0.0	0	229.53	40.5	3,244
229.01	0.5	40	229.54	41.6	3,326
229.02	1.0	82	229.55	42.6	3,410
229.03	1.5	124	229.56	43.7	3,494
229.04	2.1	166	229.57	44.7	3,580
229.05	2.6	210	229.58	45.8	3,666
229.06	3.2	254	229.59	46.9	3,752
229.07	3.7	300	229.60	48.0	3,840
229.08	4.3	346	229.61	49.1	3,928
229.09	4.9	392	229.62	50.2	4,018
229.10	5.5	440	229.63	51.3	4,108
229.11	6.1	488	229.64	52.5	4,198
229.12	6.7	538	229.65	53.6	4,290
229.13	7.3	588	229.66	54.8	4,382
229.14	8.0	638	229.67	55.9	4,476
229.15	8.6	690	229.68	57.1	4,570
229.16	9.3	742	229.69	58.3	4,664
229.17	9.9	796	229.70	59.5	4,760
229.18	10.6	850	229.71	60.7	4,856
229.19	11.3	904	229.72	61.9	4,954
229.20	12.0	960	229.73	63.1	5,052
229.21	12.7	1,016	229.74	64.4	5,150
229.22	13.4	1,074	229.75	65.6	5,250
229.23	14.1	1,132	229.76	66.9	5,350
229.24	14.9	1,190	229.77	68.1	5,452
229.25	15.6	1,250	229.78	69.4	5,554
229.26	16.4	1,310	229.79	70.7	5,656
229.27	17.1	1,372	229.80	72.0	5,760
229.28	17.9	1,434	229.81	73.3	5,864
229.29	18.7	1,496	229.82	74.6	5,970
229.30	19.5	1,560	229.83	75.9	6,076
229.31	20.3	1,624	229.84	77.3	6,182
229.32	21.1	1,690	229.85	78.6	6,290
229.33	21.9	1,756	229.86	80.0	6,398
229.34	22.8	1,822	229.87	81.3	6,508
229.35	23.6	1,890	229.88	82.7	6,618
229.36	24.5	1,958	229.89	84.1	6,728
229.37	25.3	2,028	229.90	85.5	6,840
229.38	26.2	2,098	229.91	86.9	6,952
229.39	27.1	2,168	229.92	88.3	7,066
229.40	28.0	2,240	229.93	89.7	7,180
229.41	28.9	2,312	229.94	91.2	7,294
229.42	29.8	2,386	229.95	92.6	7,410
229.43	30.7	2,460	229.96	94.1	7,526
229.44	31.7	2,534	229.97	95.5	7,644
229.45	32.6	2,610	229.98	97.0	7,762
229.46	33.6	2,686	229.99	98.5	7,880
229.47	34.5	2,764	230.00	100.0	8,000
229.48	35.5	2,842			
229.49	36.5	2,920			
229.50	37.5	3,000			
229.51	38.5	3,080			
229.52	39.5	3,162			

Summary for Reach 11.3R: Wooded Buffer 1

Inflow Area = 1.587 ac, 36.00% Impervious, Inflow Depth = 1.54" for 25-YEAR event
 Inflow = 1.57 cfs @ 12.60 hrs, Volume= 0.204 af
 Outflow = 1.56 cfs @ 12.63 hrs, Volume= 0.204 af, Atten= 1%, Lag= 1.7 min

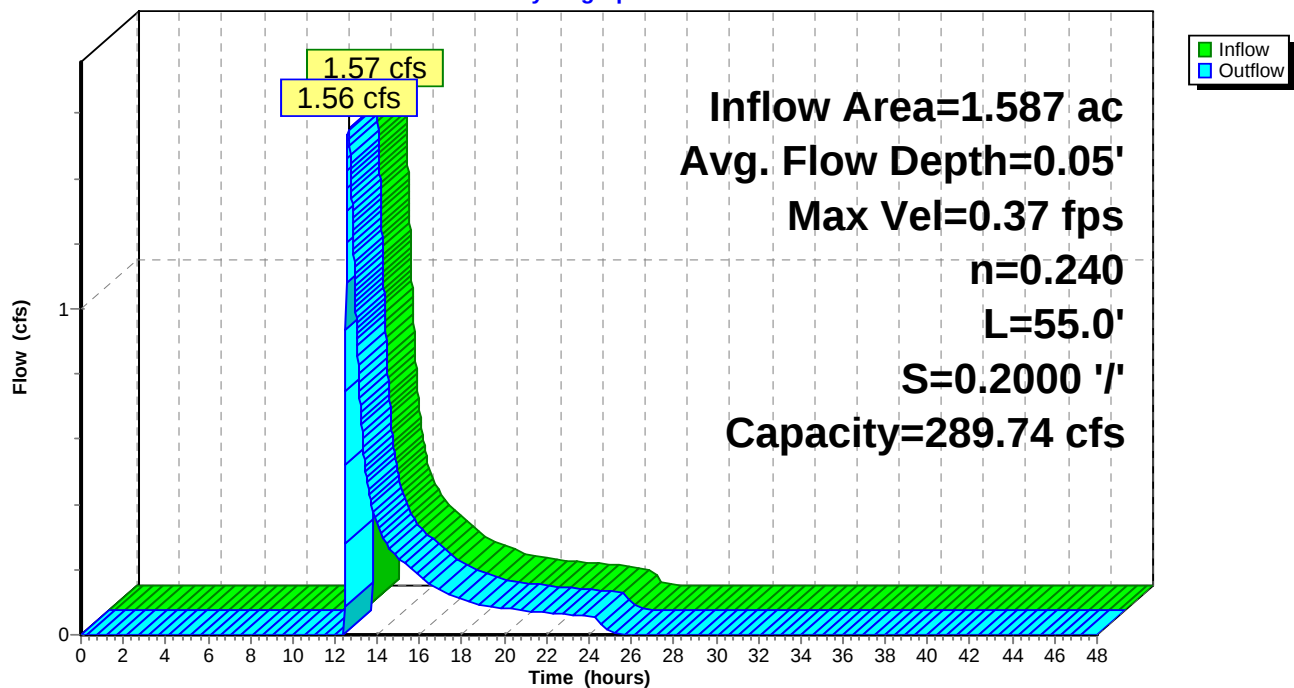
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.37 fps, Min. Travel Time= 2.5 min
 Avg. Velocity= 0.15 fps, Avg. Travel Time= 5.9 min

Peak Storage= 230 cf @ 12.63 hrs
 Average Depth at Peak Storage= 0.05'
 Bank-Full Depth= 1.00' Flow Area= 130.0 sf, Capacity= 289.74 cfs

80.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
 Side Slope Z-value= 50.0 ' ' Top Width= 180.00'
 Length= 55.0' Slope= 0.2000 ' '
 Inlet Invert= 234.00', Outlet Invert= 223.00'

**Reach 11.3R: Wooded Buffer 1**

Hydrograph



16236 POST-DEV

Prepared by Microsoft

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Type III 24-hr 25-YEAR Rainfall=5.80"

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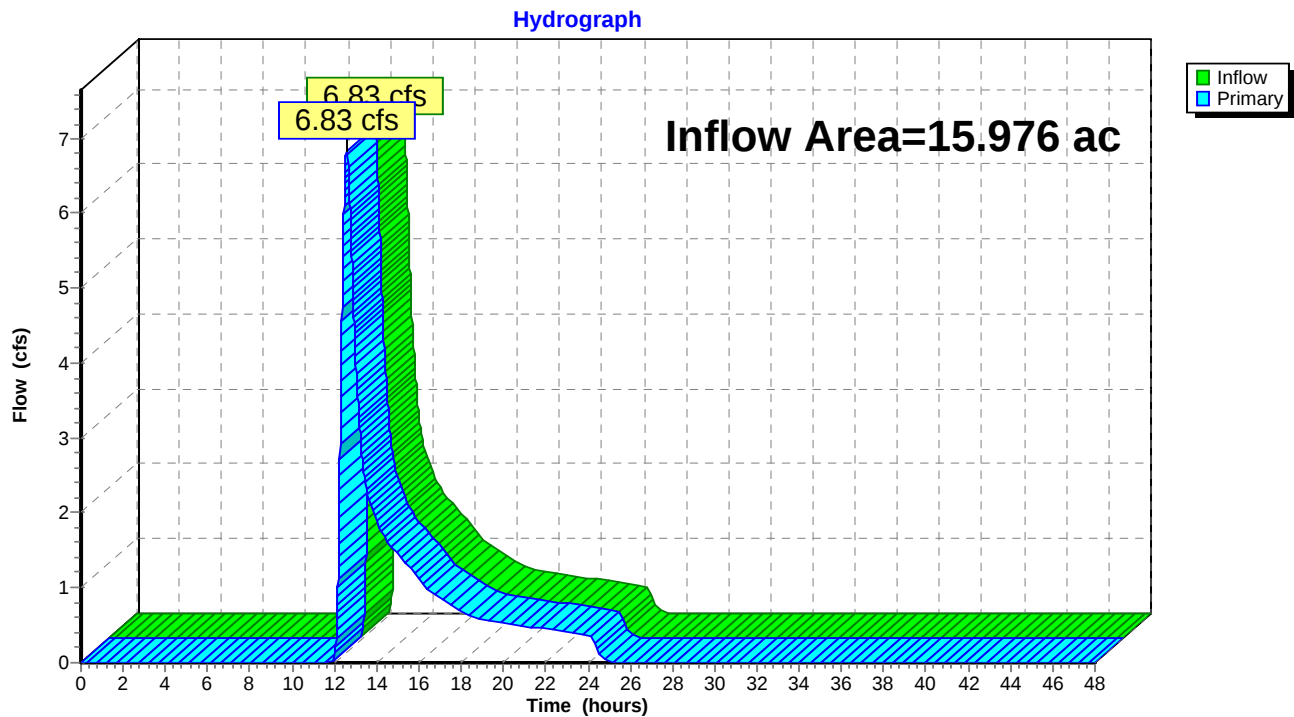
Stage-Area-Storage for Reach 11.3R: Wooded Buffer 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
234.00	0.0	0	234.53	56.4	3,104
234.01	0.8	44	234.54	57.8	3,178
234.02	1.6	89	234.55	59.1	3,252
234.03	2.4	134	234.56	60.5	3,326
234.04	3.3	180	234.57	61.8	3,401
234.05	4.1	227	234.58	63.2	3,477
234.06	5.0	274	234.59	64.6	3,553
234.07	5.8	321	234.60	66.0	3,630
234.08	6.7	370	234.61	67.4	3,707
234.09	7.6	418	234.62	68.8	3,785
234.10	8.5	468	234.63	70.2	3,863
234.11	9.4	517	234.64	71.7	3,942
234.12	10.3	568	234.65	73.1	4,022
234.13	11.2	618	234.66	74.6	4,102
234.14	12.2	670	234.67	76.0	4,182
234.15	13.1	722	234.68	77.5	4,264
234.16	14.1	774	234.69	79.0	4,345
234.17	15.0	827	234.70	80.5	4,428
234.18	16.0	881	234.71	82.0	4,510
234.19	17.0	935	234.72	83.5	4,594
234.20	18.0	990	234.73	85.0	4,677
234.21	19.0	1,045	234.74	86.6	4,762
234.22	20.0	1,101	234.75	88.1	4,847
234.23	21.0	1,157	234.76	89.7	4,932
234.24	22.1	1,214	234.77	91.2	5,018
234.25	23.1	1,272	234.78	92.8	5,105
234.26	24.2	1,330	234.79	94.4	5,192
234.27	25.2	1,388	234.80	96.0	5,280
234.28	26.3	1,448	234.81	97.6	5,368
234.29	27.4	1,507	234.82	99.2	5,457
234.30	28.5	1,568	234.83	100.8	5,546
234.31	29.6	1,628	234.84	102.5	5,636
234.32	30.7	1,690	234.85	104.1	5,727
234.33	31.8	1,751	234.86	105.8	5,818
234.34	33.0	1,814	234.87	107.4	5,909
234.35	34.1	1,877	234.88	109.1	6,002
234.36	35.3	1,940	234.89	110.8	6,094
234.37	36.4	2,004	234.90	112.5	6,188
234.38	37.6	2,069	234.91	114.2	6,281
234.39	38.8	2,134	234.92	115.9	6,376
234.40	40.0	2,200	234.93	117.6	6,470
234.41	41.2	2,266	234.94	119.4	6,566
234.42	42.4	2,333	234.95	121.1	6,662
234.43	43.6	2,400	234.96	122.9	6,758
234.44	44.9	2,468	234.97	124.6	6,855
234.45	46.1	2,537	234.98	126.4	6,953
234.46	47.4	2,606	234.99	128.2	7,051
234.47	48.6	2,675	235.00	130.0	7,150
234.48	49.9	2,746			
234.49	51.2	2,816			
234.50	52.5	2,888			
234.51	53.8	2,959			
234.52	55.1	3,032			

Summary for Pond 10.1P:

Inflow Area = 15.976 ac, 3.31% Impervious, Inflow Depth = 0.91" for 25-YEAR event
Inflow = 6.83 cfs @ 12.57 hrs, Volume= 1.215 af
Primary = 6.83 cfs @ 12.57 hrs, Volume= 1.215 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 10.1P:

Summary for Pond 10.3P: Culverts

Inflow Area = 32.384 ac, 5.08% Impervious, Inflow Depth = 2.23" for 25-YEAR event
 Inflow = 41.79 cfs @ 12.52 hrs, Volume= 6.026 af
 Outflow = 29.32 cfs @ 12.81 hrs, Volume= 6.026 af, Atten= 30%, Lag= 17.3 min
 Primary = 29.32 cfs @ 12.81 hrs, Volume= 6.026 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 227.08' @ 12.81 hrs Surf.Area= 39,010 sf Storage= 47,617 cf
 Flood Elev= 227.00' Surf.Area= 37,000 sf Storage= 44,500 cf

Plug-Flow detention time= 35.1 min calculated for 6.025 af (100% of inflow)
 Center-of-Mass det. time= 35.1 min (914.5 - 879.4)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	127,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
225.00	13,000	0	0
226.00	19,500	16,250	16,250
227.00	37,000	28,250	44,500
228.00	61,500	49,250	93,750
228.50	74,500	34,000	127,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.90'	30.0" Round 30" PIPE L= 45.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 224.90' / 224.80' S= 0.0022 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Primary	224.90'	30.0" Round 30" PIPE L= 45.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 224.90' / 224.80' S= 0.0022 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Secondary	227.17'	50.0' long x 20.0' breadth Overflow at Driveway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.31 cfs @ 12.81 hrs HW=227.08' TW=223.10' (Dynamic Tailwater)

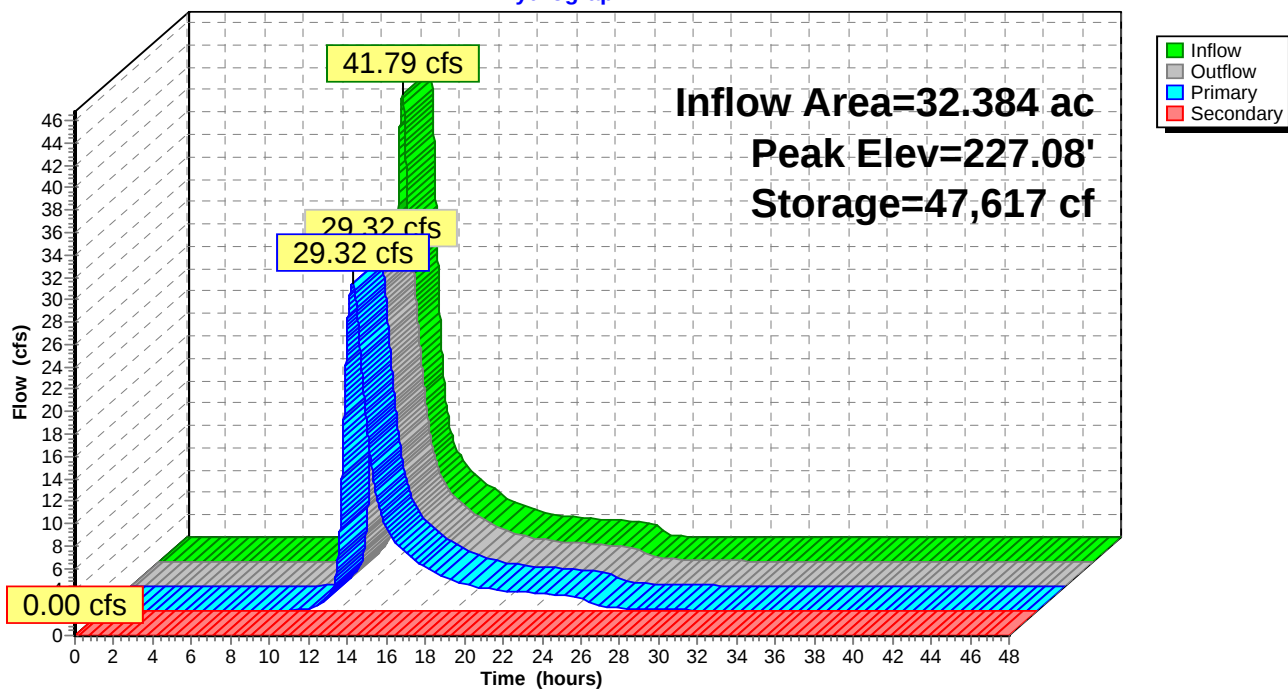
↑ **1=30" PIPE** (Barrel Controls 14.66 cfs @ 4.30 fps)
 ↓ **2=30" PIPE** (Barrel Controls 14.66 cfs @ 4.30 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' TW=222.30' (Dynamic Tailwater)

↑ **3=Overflow at Driveway** (Controls 0.00 cfs)

Pond 10.3P: Culverts

Hydrograph



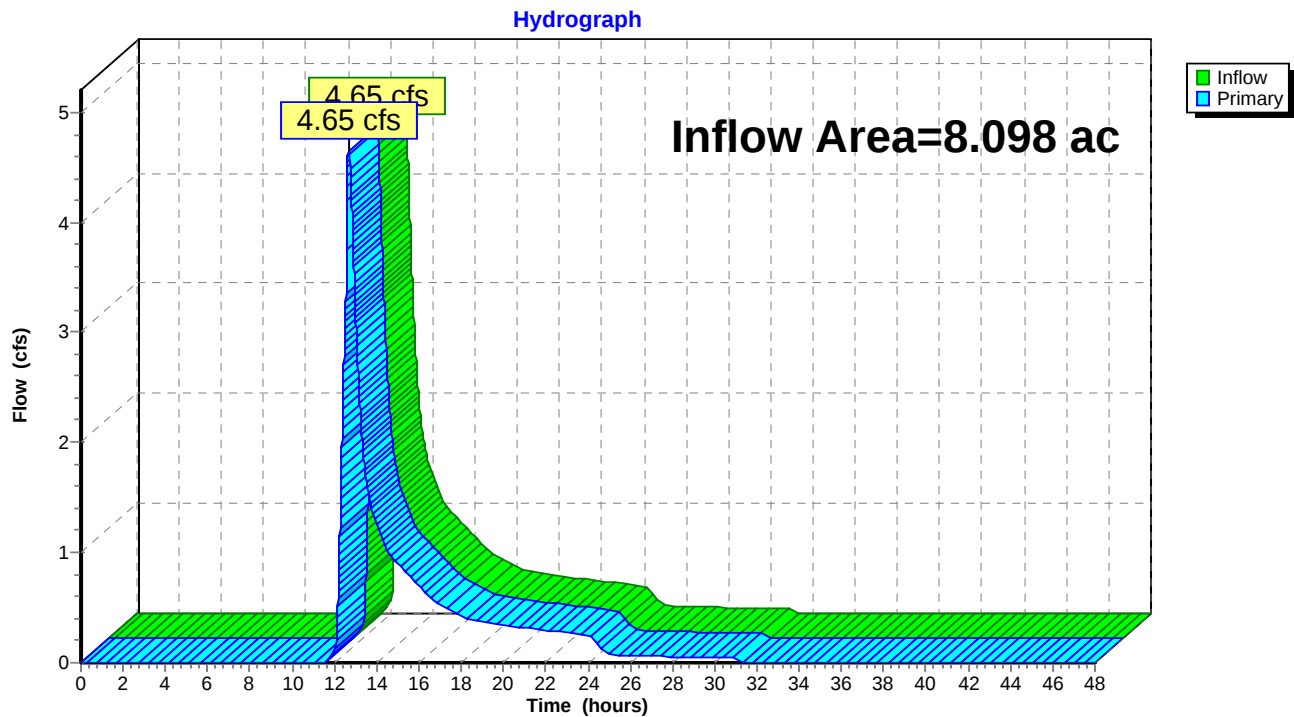
Stage-Area-Storage for Pond 10.3P: Culverts

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
225.00	13,000	0	227.65	52,925	73,726
225.05	13,325	658	227.70	54,150	76,402
225.10	13,650	1,332	227.75	55,375	79,141
225.15	13,975	2,023	227.80	56,600	81,940
225.20	14,300	2,730	227.85	57,825	84,801
225.25	14,625	3,453	227.90	59,050	87,723
225.30	14,950	4,193	227.95	60,275	90,706
225.35	15,275	4,948	228.00	61,500	93,750
225.40	15,600	5,720	228.05	62,800	96,858
225.45	15,925	6,508	228.10	64,100	100,030
225.50	16,250	7,313	228.15	65,400	103,268
225.55	16,575	8,133	228.20	66,700	106,570
225.60	16,900	8,970	228.25	68,000	109,938
225.65	17,225	9,823	228.30	69,300	113,370
225.70	17,550	10,692	228.35	70,600	116,867
225.75	17,875	11,578	228.40	71,900	120,430
225.80	18,200	12,480	228.45	73,200	124,057
225.85	18,525	13,398	228.50	74,500	127,750
225.90	18,850	14,333			
225.95	19,175	15,283			
226.00	19,500	16,250			
226.05	20,375	17,247			
226.10	21,250	18,287			
226.15	22,125	19,372			
226.20	23,000	20,500			
226.25	23,875	21,672			
226.30	24,750	22,888			
226.35	25,625	24,147			
226.40	26,500	25,450			
226.45	27,375	26,797			
226.50	28,250	28,188			
226.55	29,125	29,622			
226.60	30,000	31,100			
226.65	30,875	32,622			
226.70	31,750	34,187			
226.75	32,625	35,797			
226.80	33,500	37,450			
226.85	34,375	39,147			
226.90	35,250	40,888			
226.95	36,125	42,672			
227.00	37,000	44,500			
227.05	38,225	46,381			
227.10	39,450	48,322			
227.15	40,675	50,326			
227.20	41,900	52,390			
227.25	43,125	54,516			
227.30	44,350	56,703			
227.35	45,575	58,951			
227.40	46,800	61,260			
227.45	48,025	63,631			
227.50	49,250	66,063			
227.55	50,475	68,556			
227.60	51,700	71,110			

Summary for Pond 10.4P:

Inflow Area = 8.098 ac, 3.12% Impervious, Inflow Depth = 1.21" for 25-YEAR event
Inflow = 4.65 cfs @ 12.67 hrs, Volume= 0.814 af
Primary = 4.65 cfs @ 12.67 hrs, Volume= 0.814 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 10.4P:

Summary for Pond 11.1P: Level Lip Spreader Outlet

Inflow Area = 1.233 ac, 16.21% Impervious, Inflow Depth = 2.29" for 25-YEAR event
 Inflow = 2.32 cfs @ 12.24 hrs, Volume= 0.236 af
 Outflow = 1.08 cfs @ 12.61 hrs, Volume= 0.138 af, Atten= 54%, Lag= 22.0 min
 Primary = 1.08 cfs @ 12.61 hrs, Volume= 0.138 af

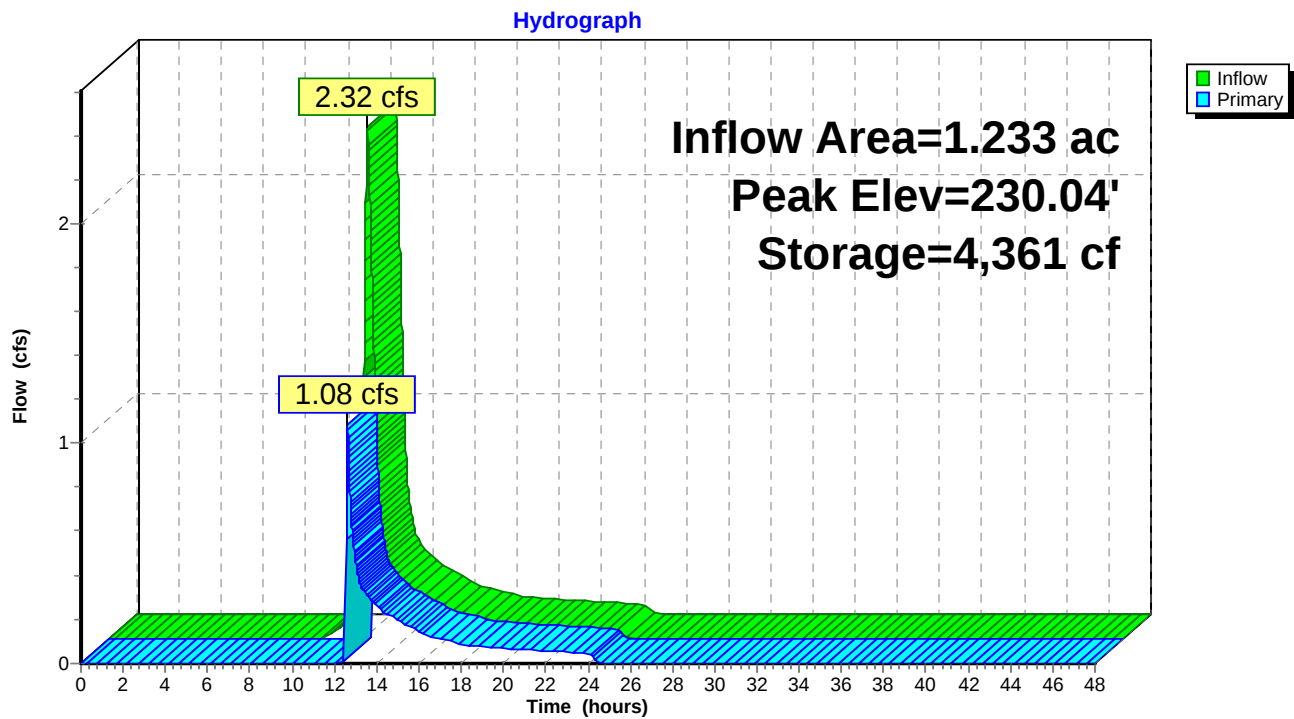
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 230.04' @ 12.61 hrs Surf.Area= 2,069 sf Storage= 4,361 cf
 Flood Elev= 230.50' Surf.Area= 2,100 sf Storage= 4,480 cf

Plug-Flow detention time= 213.2 min calculated for 0.138 af (58% of inflow)
 Center-of-Mass det. time= 95.4 min (955.2 - 859.8)

Volume	Invert	Avail.Storage	Storage Description
#1	226.50'	4,480 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
226.50	500	0	0
227.00	700	300	300
228.00	1,100	900	1,200
229.00	1,500	1,300	2,500
230.10	2,100	1,980	4,480

Device	Routing	Invert	Outlet Devices
#1	Primary	230.00'	50.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.08 cfs @ 12.61 hrs HW=230.04' TW=229.03' (Dynamic Tailwater)
 ↑ **1=Level Spreader** (Weir Controls 1.08 cfs @ 0.50 fps)

Pond 11.1P: Level Lip Spreader Outlet

Stage-Area-Storage for Pond 11.1P: Level Lip Spreader Outlet

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
226.50	500	0	229.15	1,582	2,731
226.55	520	26	229.20	1,609	2,811
226.60	540	52	229.25	1,636	2,892
226.65	560	80	229.30	1,664	2,975
226.70	580	108	229.35	1,691	3,058
226.75	600	138	229.40	1,718	3,144
226.80	620	168	229.45	1,745	3,230
226.85	640	199	229.50	1,773	3,318
226.90	660	232	229.55	1,800	3,408
226.95	680	265	229.60	1,827	3,498
227.00	700	300	229.65	1,855	3,590
227.05	720	336	229.70	1,882	3,684
227.10	740	372	229.75	1,909	3,778
227.15	760	410	229.80	1,936	3,875
227.20	780	448	229.85	1,964	3,972
227.25	800	488	229.90	1,991	4,071
227.30	820	528	229.95	2,018	4,171
227.35	840	569	230.00	2,045	4,273
227.40	860	612	230.05	2,073	4,376
227.45	880	655	230.10	2,100	4,480
227.50	900	700	230.15	2,100	4,480
227.55	920	746	230.20	2,100	4,480
227.60	940	792	230.25	2,100	4,480
227.65	960	840	230.30	2,100	4,480
227.70	980	888	230.35	2,100	4,480
227.75	1,000	938	230.40	2,100	4,480
227.80	1,020	988	230.45	2,100	4,480
227.85	1,040	1,039	230.50	2,100	4,480
227.90	1,060	1,092			
227.95	1,080	1,145			
228.00	1,100	1,200			
228.05	1,120	1,256			
228.10	1,140	1,312			
228.15	1,160	1,370			
228.20	1,180	1,428			
228.25	1,200	1,488			
228.30	1,220	1,548			
228.35	1,240	1,609			
228.40	1,260	1,672			
228.45	1,280	1,735			
228.50	1,300	1,800			
228.55	1,320	1,866			
228.60	1,340	1,932			
228.65	1,360	2,000			
228.70	1,380	2,068			
228.75	1,400	2,138			
228.80	1,420	2,208			
228.85	1,440	2,279			
228.90	1,460	2,352			
228.95	1,480	2,425			
229.00	1,500	2,500			
229.05	1,527	2,576			
229.10	1,555	2,653			

Summary for Pond 11.2P: UDSF-1

Inflow Area = 2.446 ac, 16.34% Impervious, Inflow Depth = 1.48" for 25-YEAR event
 Inflow = 1.94 cfs @ 12.58 hrs, Volume= 0.302 af
 Outflow = 0.59 cfs @ 13.51 hrs, Volume= 0.295 af, Atten= 70%, Lag= 55.9 min
 Primary = 0.59 cfs @ 13.51 hrs, Volume= 0.295 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 233.53' @ 13.51 hrs Surf.Area= 3,817 sf Storage= 5,272 cf
 Flood Elev= 234.50' Surf.Area= 4,420 sf Storage= 7,628 cf

Plug-Flow detention time= 279.9 min calculated for 0.295 af (98% of inflow)
 Center-of-Mass det. time= 268.2 min (1,173.5 - 905.3)

Volume	Invert	Avail.Storage	Storage Description
#1	230.16'	7,628 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet) Cum.Store (cubic-feet)
230.16	2,700	0.0	0 0
230.17	2,700	30.0	8 8
232.49	2,700	30.0	1,879 1,887
232.50	2,700	100.0	27 1,914
233.00	3,260	100.0	1,490 3,404
234.10	4,420	100.0	4,224 7,628

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	12.0" Round Outfall L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.50' / 230.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	230.34'	4.0" Round UD Header L= 170.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.34' / 230.34' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#3	Device 2	230.16'	2.400 in/hr Filtration over Surface area
#4	Primary	233.50'	1.5" x 1.5" Horiz. Grate X 7.00 columns X 7 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	234.00'	12.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.59 cfs @ 13.51 hrs HW=233.53' TW=0.00' (Dynamic Tailwater)

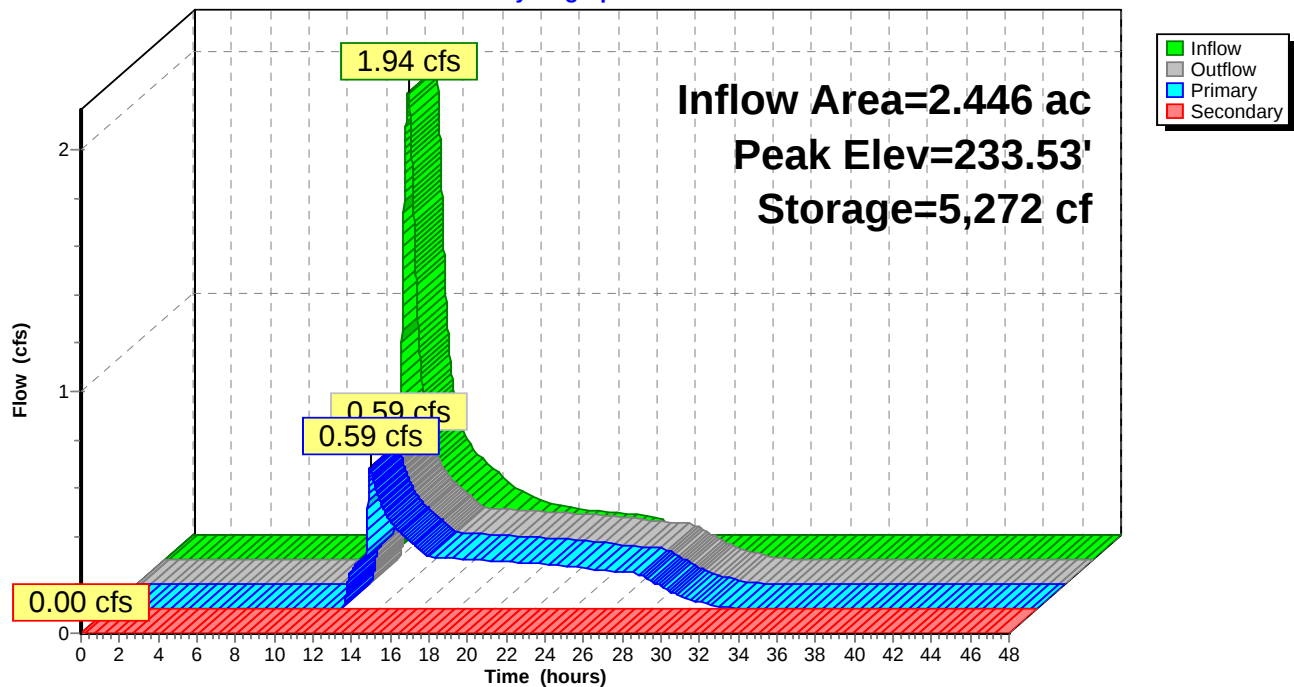
- 1=Outfall (Passes 0.21 cfs of 4.75 cfs potential flow)
- 2=UD Header (Passes 0.21 cfs of 0.24 cfs potential flow)
- 3=Filtration (Exfiltration Controls 0.21 cfs)
- 4=Grate (Weir Controls 0.37 cfs @ 0.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=230.16' TW=0.00' (Dynamic Tailwater)

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

Pond 11.2P: UDSF-1

Hydrograph



Stage-Area-Storage for Pond 11.2P: UDSF-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
230.16	2,700	0	232.81	3,047	2,805
230.21	2,700	41	232.86	3,103	2,959
230.26	2,700	81	232.91	3,159	3,115
230.31	2,700	122	232.96	3,215	3,275
230.36	2,700	162	233.01	3,271	3,437
230.41	2,700	203	233.06	3,323	3,602
230.46	2,700	243	233.11	3,376	3,769
230.51	2,700	283	233.16	3,429	3,939
230.56	2,700	324	233.21	3,481	4,112
230.61	2,700	364	233.26	3,534	4,288
230.66	2,700	405	233.31	3,587	4,466
230.71	2,700	446	233.36	3,640	4,646
230.76	2,700	486	233.41	3,692	4,830
230.81	2,700	527	233.46	3,745	5,015
230.86	2,700	567	233.51	3,798	5,204
230.91	2,700	608	233.56	3,851	5,395
230.96	2,700	648	233.61	3,903	5,589
231.01	2,700	688	233.66	3,956	5,786
231.06	2,700	729	233.71	4,009	5,985
231.11	2,700	769	233.76	4,061	6,186
231.16	2,700	810	233.81	4,114	6,391
231.21	2,700	851	233.86	4,167	6,598
231.26	2,700	891	233.91	4,220	6,808
231.31	2,700	932	233.96	4,272	7,020
231.36	2,700	972	234.01	4,325	7,235
231.41	2,700	1,013	234.06	4,378	7,452
231.46	2,700	1,053	234.11	4,420	7,628
231.51	2,700	1,093	234.16	4,420	7,628
231.56	2,700	1,134	234.21	4,420	7,628
231.61	2,700	1,174	234.26	4,420	7,628
231.66	2,700	1,215	234.31	4,420	7,628
231.71	2,700	1,256	234.36	4,420	7,628
231.76	2,700	1,296	234.41	4,420	7,628
231.81	2,700	1,337	234.46	4,420	7,628
231.86	2,700	1,377			
231.91	2,700	1,418			
231.96	2,700	1,458			
232.01	2,700	1,498			
232.06	2,700	1,539			
232.11	2,700	1,579			
232.16	2,700	1,620			
232.21	2,700	1,661			
232.26	2,700	1,701			
232.31	2,700	1,742			
232.36	2,700	1,782			
232.41	2,700	1,823			
232.46	2,700	1,863			
232.51	2,711	1,941			
232.56	2,767	2,078			
232.61	2,823	2,218			
232.66	2,879	2,361			
232.71	2,935	2,506			
232.76	2,991	2,654			

Summary for Pond 11.3P: Level Lip Spreader Outlet

Inflow Area = 1.587 ac, 36.00% Impervious, Inflow Depth = 1.79" for 25-YEAR event
 Inflow = 1.59 cfs @ 12.56 hrs, Volume= 0.237 af
 Outflow = 1.57 cfs @ 12.60 hrs, Volume= 0.204 af, Atten= 1%, Lag= 2.4 min
 Primary = 1.57 cfs @ 12.60 hrs, Volume= 0.204 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 234.06' @ 12.63 hrs Surf.Area= 1,474 sf Storage= 1,530 cf
 Flood Elev= 234.50' Surf.Area= 1,500 sf Storage= 1,590 cf

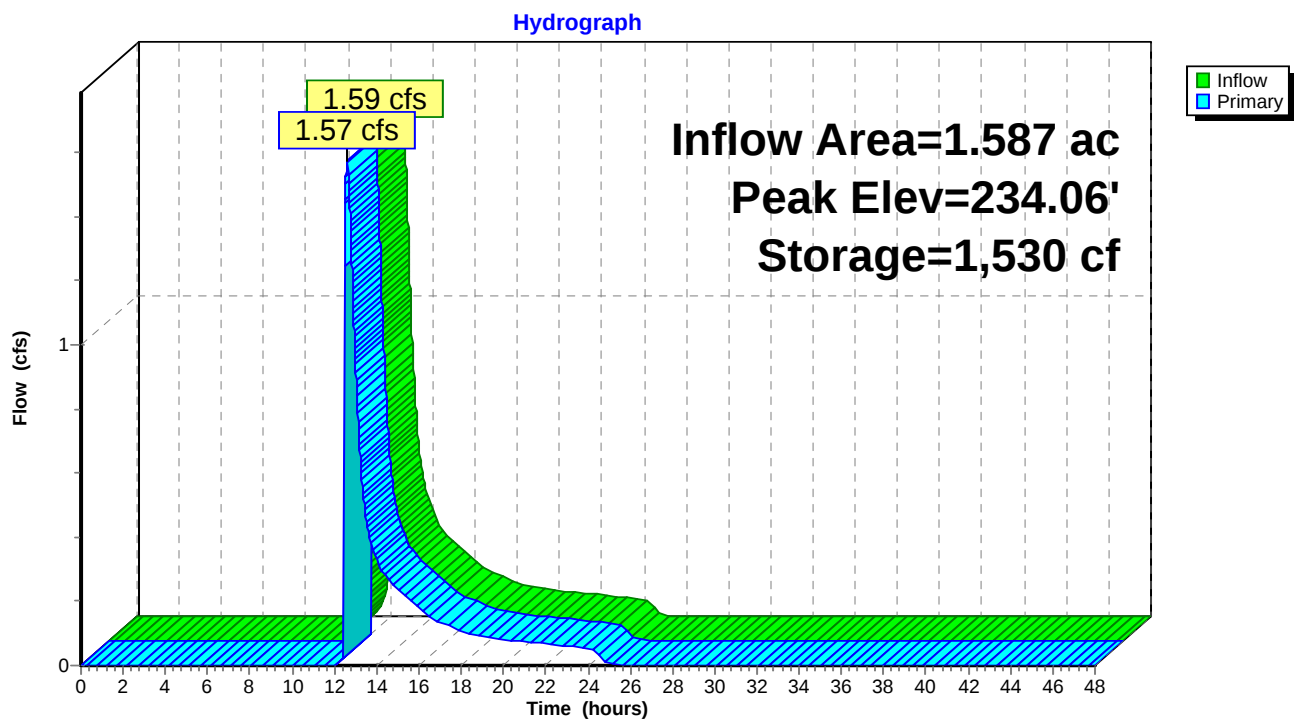
Plug-Flow detention time= 91.2 min calculated for 0.204 af (86% of inflow)
 Center-of-Mass det. time= 27.6 min (921.6 - 894.0)

Volume	Invert	Avail.Storage	Storage Description
#1	232.50'	1,590 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
232.50	500	0	0
233.00	800	325	325
234.10	1,500	1,265	1,590

Device	Routing	Invert	Outlet Devices
#1	Primary	234.00'	80.0' long x 3.0' breadth Level Spreader Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.55 cfs @ 12.60 hrs HW=234.06' TW=234.05' (Dynamic Tailwater)
 ↑**1=Level Spreader** (Weir Controls 1.55 cfs @ 0.33 fps)

Pond 11.3P: Level Lip Spreader Outlet

Stage-Area-Storage for Pond 11.3P: Level Lip Spreader Outlet

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
232.50	500	0	233.56	1,156	873
232.52	512	10	233.58	1,169	896
232.54	524	20	233.60	1,182	920
232.56	536	31	233.62	1,195	943
232.58	548	42	233.64	1,207	967
232.60	560	53	233.66	1,220	992
232.62	572	64	233.68	1,233	1,016
232.64	584	76	233.70	1,245	1,041
232.66	596	88	233.72	1,258	1,066
232.68	608	100	233.74	1,271	1,091
232.70	620	112	233.76	1,284	1,117
232.72	632	125	233.78	1,296	1,143
232.74	644	137	233.80	1,309	1,169
232.76	656	150	233.82	1,322	1,195
232.78	668	164	233.84	1,335	1,222
232.80	680	177	233.86	1,347	1,248
232.82	692	191	233.88	1,360	1,275
232.84	704	205	233.90	1,373	1,303
232.86	716	219	233.92	1,385	1,330
232.88	728	233	233.94	1,398	1,358
232.90	740	248	233.96	1,411	1,386
232.92	752	263	233.98	1,424	1,415
232.94	764	278	234.00	1,436	1,443
232.96	776	293	234.02	1,449	1,472
232.98	788	309	234.04	1,462	1,501
233.00	800	325	234.06	1,475	1,531
233.02	813	341	234.08	1,487	1,560
233.04	825	358	234.10	1,500	1,590
233.06	838	374	234.12	1,500	1,590
233.08	851	391	234.14	1,500	1,590
233.10	864	408	234.16	1,500	1,590
233.12	876	426	234.18	1,500	1,590
233.14	889	443	234.20	1,500	1,590
233.16	902	461	234.22	1,500	1,590
233.18	915	479	234.24	1,500	1,590
233.20	927	498	234.26	1,500	1,590
233.22	940	516	234.28	1,500	1,590
233.24	953	535	234.30	1,500	1,590
233.26	965	555	234.32	1,500	1,590
233.28	978	574	234.34	1,500	1,590
233.30	991	594	234.36	1,500	1,590
233.32	1,004	614	234.38	1,500	1,590
233.34	1,016	634	234.40	1,500	1,590
233.36	1,029	654	234.42	1,500	1,590
233.38	1,042	675	234.44	1,500	1,590
233.40	1,055	696	234.46	1,500	1,590
233.42	1,067	717	234.48	1,500	1,590
233.44	1,080	739	234.50	1,500	1,590
233.46	1,093	760			
233.48	1,105	782			
233.50	1,118	805			
233.52	1,131	827			
233.54	1,144	850			

Summary for Pond 11.4P: UDSF-2

Inflow Area = 0.900 ac, 21.43% Impervious, Inflow Depth = 2.56" for 25-YEAR event
 Inflow = 1.39 cfs @ 12.53 hrs, Volume= 0.192 af
 Outflow = 1.21 cfs @ 12.69 hrs, Volume= 0.187 af, Atten= 13%, Lag= 9.8 min
 Primary = 1.21 cfs @ 12.69 hrs, Volume= 0.187 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 240.39' @ 12.69 hrs Surf.Area= 1,425 sf Storage= 2,266 cf
 Flood Elev= 241.00' Surf.Area= 1,500 sf Storage= 2,568 cf

Plug-Flow detention time= 214.3 min calculated for 0.187 af (97% of inflow)
 Center-of-Mass det. time= 198.8 min (1,068.8 - 870.0)

Volume	Invert	Avail.Storage	Storage Description
#1	236.66'	2,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet) Cum.Store (cubic-feet)
236.66	900	0.0	0 0
236.67	900	30.0	3 3
238.99	900	30.0	626 629
239.00	900	100.0	9 638
239.50	1,100	100.0	500 1,138
240.60	1,500	100.0	1,430 2,568

Device	Routing	Invert	Outlet Devices
#1	Primary	237.50'	12.0" Round Outfall L= 225.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 237.50' / 237.00' S= 0.0022 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	236.83'	4.0" Round UD Header L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 236.83' / 236.83' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#3	Device 2	236.66'	2.400 in/hr Filtration over Surface area
#4	Primary	240.30'	1.5" x 1.5" Horiz. Grate X 7.00 columns X 7 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	240.50'	12.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.21 cfs @ 12.69 hrs HW=240.39' TW=0.00' (Dynamic Tailwater)

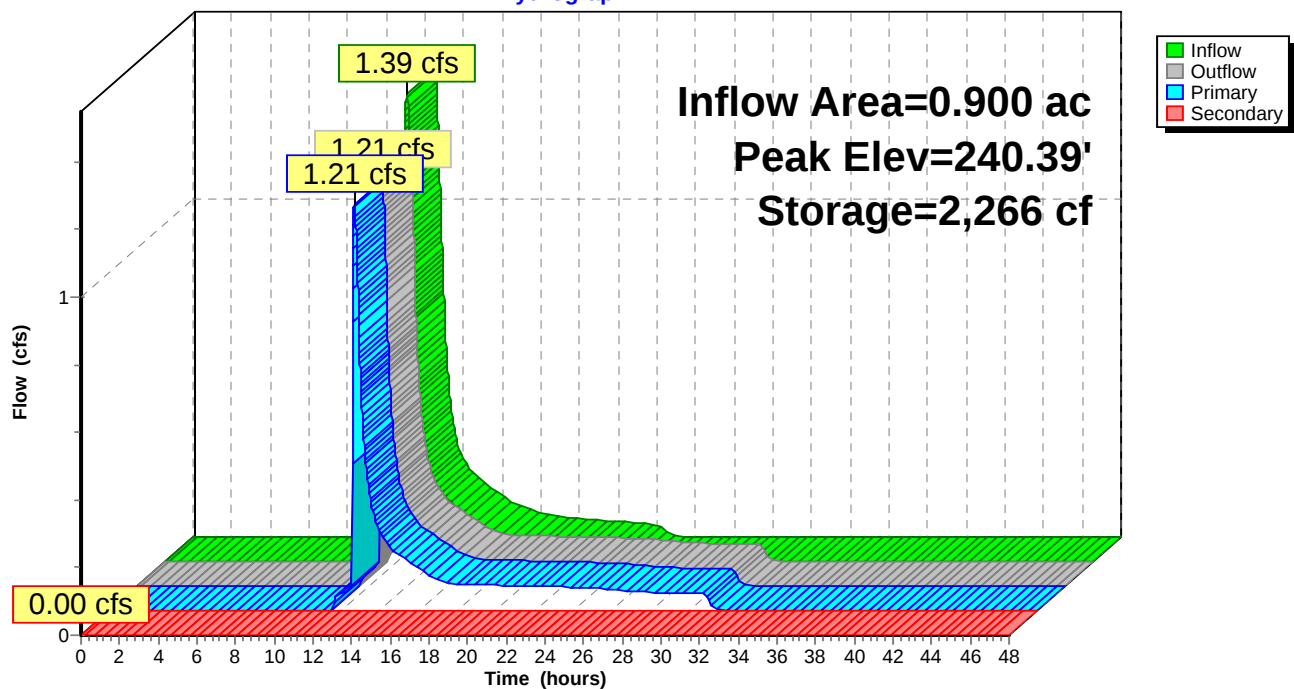
- 1=Outfall (Passes 0.08 cfs of 3.26 cfs potential flow)
- 2=UD Header (Passes 0.08 cfs of 0.43 cfs potential flow)
- 3=Filtration (Exfiltration Controls 0.08 cfs)
- 4=Grate (Orifice Controls 1.13 cfs @ 1.47 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=236.66' TW=0.00' (Dynamic Tailwater)

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

Pond 11.4P: UDSF-2

Hydrograph



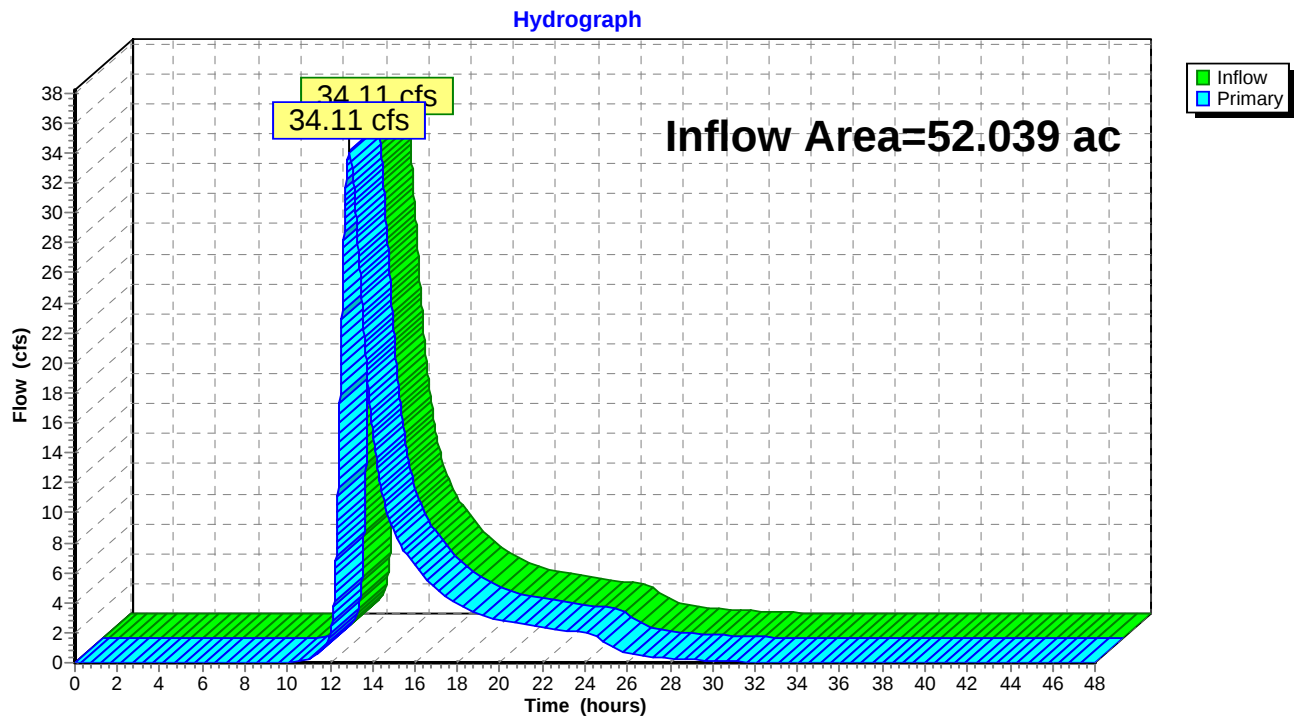
Stage-Area-Storage for Pond 11.4P: UDSF-2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
236.66	900	0	239.31	1,024	936
236.71	900	14	239.36	1,044	988
236.76	900	27	239.41	1,064	1,041
236.81	900	41	239.46	1,084	1,094
236.86	900	54	239.51	1,104	1,149
236.91	900	68	239.56	1,122	1,205
236.96	900	81	239.61	1,140	1,261
237.01	900	94	239.66	1,158	1,319
237.06	900	108	239.71	1,176	1,377
237.11	900	121	239.76	1,195	1,436
237.16	900	135	239.81	1,213	1,497
237.21	900	149	239.86	1,231	1,558
237.26	900	162	239.91	1,249	1,620
237.31	900	176	239.96	1,267	1,683
237.36	900	189	240.01	1,285	1,746
237.41	900	203	240.06	1,304	1,811
237.46	900	216	240.11	1,322	1,877
237.51	900	229	240.16	1,340	1,943
237.56	900	243	240.21	1,358	2,011
237.61	900	256	240.26	1,376	2,079
237.66	900	270	240.31	1,395	2,148
237.71	900	284	240.36	1,413	2,219
237.76	900	297	240.41	1,431	2,290
237.81	900	311	240.46	1,449	2,362
237.86	900	324	240.51	1,467	2,435
237.91	900	338	240.56	1,485	2,508
237.96	900	351	240.61	1,500	2,568
238.01	900	364	240.66	1,500	2,568
238.06	900	378	240.71	1,500	2,568
238.11	900	391	240.76	1,500	2,568
238.16	900	405	240.81	1,500	2,568
238.21	900	419	240.86	1,500	2,568
238.26	900	432	240.91	1,500	2,568
238.31	900	446	240.96	1,500	2,568
238.36	900	459			
238.41	900	473			
238.46	900	486			
238.51	900	499			
238.56	900	513			
238.61	900	526			
238.66	900	540			
238.71	900	554			
238.76	900	567			
238.81	900	581			
238.86	900	594			
238.91	900	608			
238.96	900	621			
239.01	904	647			
239.06	924	693			
239.11	944	740			
239.16	964	787			
239.21	984	836			
239.26	1,004	886			

Summary for Link SP1: Study Point #1

Inflow Area = 52.039 ac, 5.33% Impervious, Inflow Depth = 1.77" for 25-YEAR event
Inflow = 34.11 cfs @ 12.91 hrs, Volume= 7.674 af
Primary = 34.11 cfs @ 12.91 hrs, Volume= 7.674 af, Atten= 0%, Lag= 0.0 min

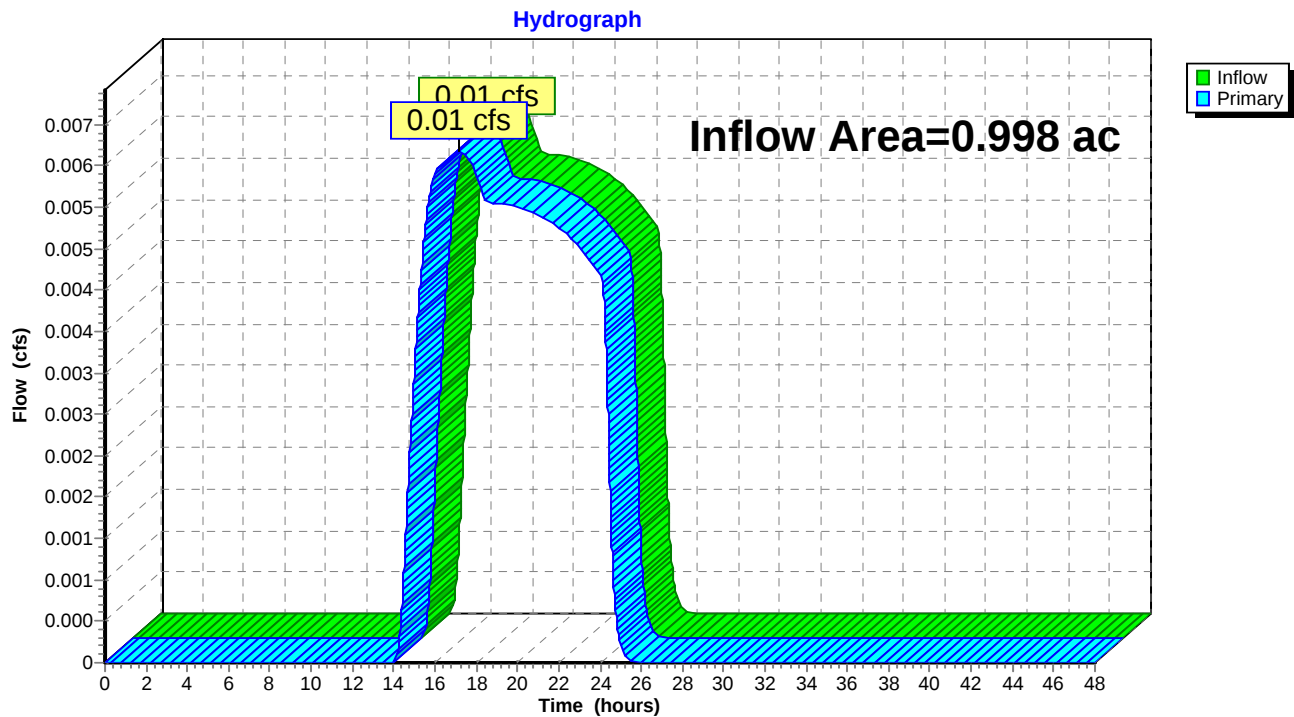
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP1: Study Point #1

Summary for Link SP2: Study Point #2

Inflow Area = 0.998 ac, 0.00% Impervious, Inflow Depth = 0.05" for 25-YEAR event
Inflow = 0.01 cfs @ 17.20 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 17.20 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

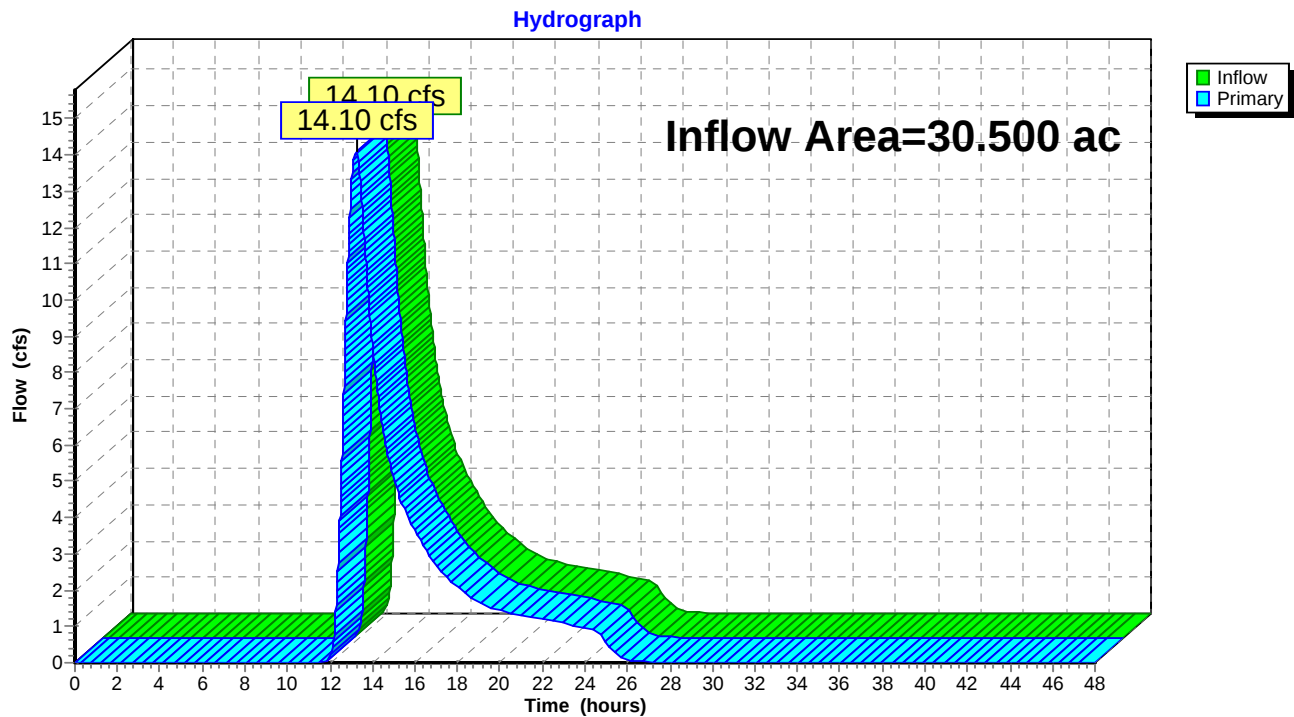
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP2: Study Point #2

Summary for Link SP3: Study Point #3

Inflow Area = 30.500 ac, 1.78% Impervious, Inflow Depth = 1.40" for 25-YEAR event
Inflow = 14.10 cfs @ 13.24 hrs, Volume= 3.569 af
Primary = 14.10 cfs @ 13.24 hrs, Volume= 3.569 af, Atten= 0%, Lag= 0.0 min

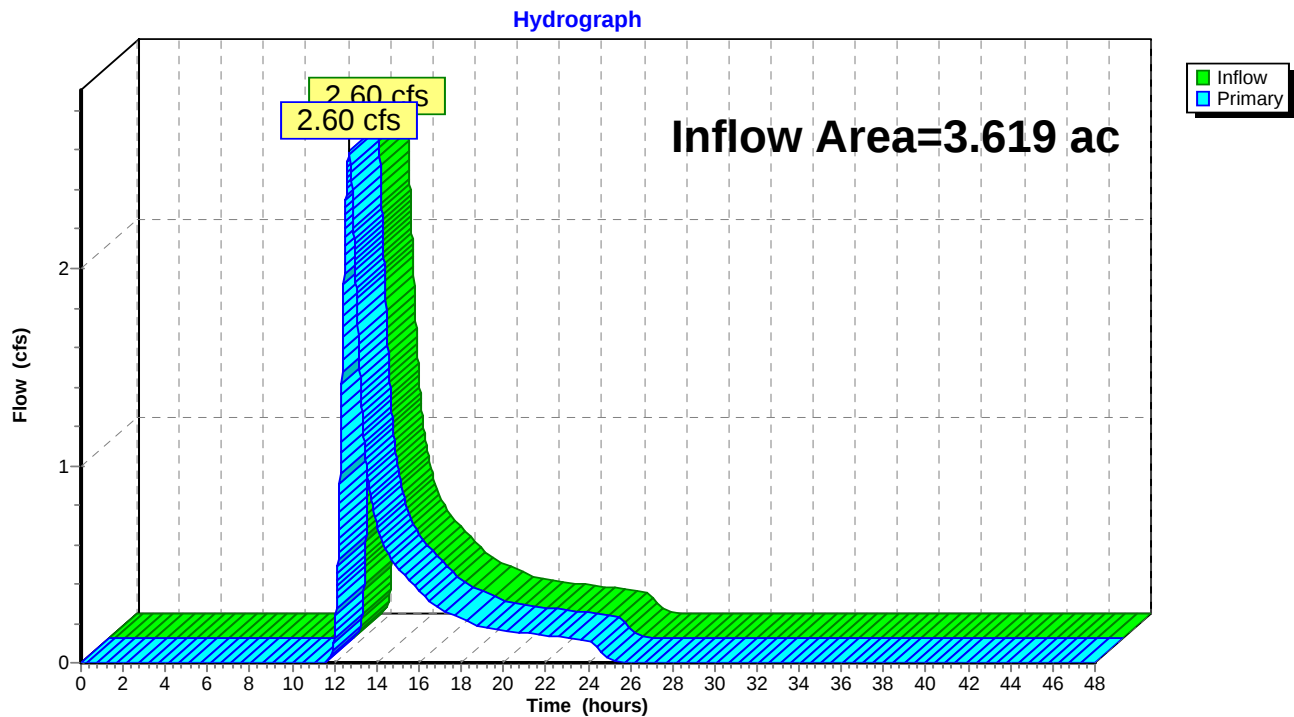
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP3: Study Point #3

Summary for Link SP4: Study Point #4

Inflow Area = 3.619 ac, 0.00% Impervious, Inflow Depth = 1.48" for 25-YEAR event
Inflow = 2.60 cfs @ 12.69 hrs, Volume= 0.446 af
Primary = 2.60 cfs @ 12.69 hrs, Volume= 0.446 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link SP4: Study Point #4

Appendix 4

Inspection, Maintenance and Housekeeping Plan

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

LAND OF NOD PROPERTY WINDHAM, MAINE

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation control measures as well as stormwater management facilities for the project. This plan also outlines several housekeeping requirements that shall be followed during and after construction. These procedures shall be followed in order to ensure the intended function of the designed measures and to prevent unreasonably adverse impacts to the surrounding environment.

The procedures outlined in this Inspection, Maintenance, and Housekeeping Plan are provided as an overview of the anticipated practices to be used on this site by the contractor during construction and by the owner after construction. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP).

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section and the erosion and sedimentation control plan for the project. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once per week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.
2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).
3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. Correction action shall be performed in general conformance with the Maine Construction General Permit and Maine DEP Chapter 500 Stormwater standards. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

A. Filter Berms:

- Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
- If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
- Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
- Filter berms shall be reshaped as needed.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

B. Stone Check Dams:

- Inspect the center of the dam to make sure it is lower than the edges. Erosion caused by high flows around the edges of the dam must be corrected.
- Sediment accumulation shall be removed prior to reaching half of the original design height.
- Areas beneath stone check dams must be seeded and mulched upon removal.

C. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

D. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

E. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with

the collected soil material. The entrance should then be reconstructed.

- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

F. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

G. Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

- A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation. A Spill, Prevention, Control and Countermeasures Plan is created for the project and is to be kept onsite at all times.
- B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
- C. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.
- D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

- E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

Post-Construction

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in all applicable permits, shall conduct the inspections.
2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction.
 - A. Vegetated Areas:
 - Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
 - Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
 - B. Ditches, Swales and Other Open Channels:
 - Inspect ditches, swales, level spreaders and other open stormwater channels in the spring, in the late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
 - Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
 - Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
 - If the ditch has a riprap lining, replace riprap in areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.
 - C. Winter Sanding:
 - Clear accumulations of winter sand along access road at least once a year, preferably in the spring.

- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

D. Culverts:

- Inspect culverts in the spring, in the late fall, and after heavy rains to remove any obstructions to flow.
- Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
- Inspect and repair any erosion damage at the culvert's inlet and outlet.

E. Underdrained Soil Filters:

- During the first year, the basin shall be inspected semi-annually and following major storm events.
- Debris and sediment buildup shall be removed from the forebay and basin as needed. Mowing of a grassed basin can occur semiannually to a height no less than 6 inches. Any bare area or erosion rills shall be repaired with new filter media or sandy loam then seeded and mulched. Maintaining good grass cover will minimize clogging with fine sediments and if ponding exceeds 48 hours, the top of the filter bed must be rototilled to reestablish the soil's filtration capacity.
- The soil filter should be inspected after every major storm in the first year to be sure it is functioning properly. Thereafter, the filter should be inspected at least once every six months to ensure that it is draining within 48 hours following a one inch storm or greater. Following storms that fill the system and overflow is observed, the soil filter should drain in no less than 36 to 60 hours. If the system drains too fast, an orifice may need to be added on the underdrain outlet or, if already present, may need to be modified.
- Soil Filter Replacement: The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. Removed sediments should be disposed of in an acceptable manner.
- Sediment Removal: Sediment and plant debris should be removed from the pretreatment structure at least annually.
- Mowing: If mowing is desired, only handheld string trimmers or push-mowers are allowed on the filter (no tractor) and the grass bed should be mowed no more than 2 times per growing season to maintain grass heights of no less than 6 inches.
- Fertilization: Fertilization of the underdrained filter area should be avoided unless absolutely necessary to establish vegetation.
- Harvesting and Weeding: Harvesting and pruning of excessive growth will need to be done occasionally. Weeding to control unwanted or invasive plants may also be necessary.

F. Level Spreader:

- The level spreader pool should be inspected after rainfall events for sediment accumulation and debris that may reduce its capacity. Sediment and debris

buildup should be removed once the volume of the pool has been reduced by 25%. The level berm must be constructed so that flows slowly seep across the berm as sheet flow to the receiving downstream drainage way. Repair or reconstruction of the berm is required when flow from the spreader becomes channelized.

G. Wooded & Meadow Buffer Areas:

- Remove dead wood and debris with minimal disturbance. Monitor for bypass and channelization; repair as it is occurring and remove sediment build-up to assure sheet flow conditions. Replant trees and bushes if needed. Perform monitoring on a semi-annual basis.

3. Documentation:

- A. A log summarizing the inspections and any corrective action taken must be maintained. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 2 of this Inspection, Maintenance, and Housekeeping Plan.

4. Maine DEP Recertification: A certification of the following shall be submitted to the MDEP within three months of the expiration of each five-year interval from the date of issuance of MDEP permits.

- A. Identification and repair of erosion problems. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
- B. Inspection and repair of stormwater control system. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.
- C. The Inspection, Maintenance, and Housekeeping Plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the MDEP, and the maintenance log is being maintained.

5. Duration of Maintenance: Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of

responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

Attachments

Attachment 1 – Stormwater Inspection and Maintenance Log Form

ATTACHMENT 1 – STORMWATER INSPECTION AND MAINTENANCE LOG

LAND OF NOD PROPERTY WINDHAM, MAINE

This log is intended to accompany the Inspection, Maintenance, and Housekeeping Plan for the proposed Institute for Local Food Systems Innovation. The following items shall be checked, cleaned and maintained on a regular basis as specified in the Maintenance Plan and as described in the table below. This log shall be kept on file for a minimum of five (5) years and shall be available for review by the municipality. Qualified personnel familiar with drainage systems and soils shall perform all inspections. Attached is a copy of the construction and post-construction maintenance logs.

	INSPECTOR NAME	DATE PERFORMED	SUGGESTED INTERVAL
Vegetated Areas			
Inspect all slopes and embankments			Annually
Replant bare areas or areas with sparse growth			Annually
Paved Surfaces			
Clear accumulated winter sand			Annually
Remove sediment along edges and in pockets			Annually
Ditches & Swales			
Remove any obstructions and accumulated sediments and debris			Monthly
Repair any erosion of ditch lining			Annually
Mow vegetated ditches			Annually
Remove woody vegetation growing through riprap			Annually
Repair any slumping side slopes			Annually
Replace riprap where stones have dislodged			Annually
Level Spreader			
Remove sediment			Monthly
Check for evidence of channelized flow over berm			Monthly
Erosion (side slopes, embankment)			Monthly
Mowed			Semi-Annually
Wooded & Meadow Buffers			
Remove dead tree limbs			Annually
Check for evidence of channelized flow through wooded buffer area			Annually
*See Deed Restrictions on Forested Buffers & Meadow Buffers in Attachments E & F of Stormwater Management Report			

Underdrained Soil Filters				
	Remove sediment & debris			Monthly
				Monthly (during growing season)
	Remove weeds			
	Erosion (side slopes, embankment)			Monthly
	Inspection after major storm to verify proper function			Bi-Annually