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STORM WATER DRAINAGE
CALCULATIONS

FOR

BLOCK 190, LOTS 1, 2.01, 2.03 & 2.09-2.12 (Expanded parking)
BLOCK 170, LOT 3.02 (Expanded church & parking)

CAVALRY BAPTIST CHURCH

TOWNSHIP OF LITTLE EGG HARBOR
OCEAN COUNTY, NEW JERSEY

PREPARED BY:

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NJPE No. 32883

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DRAINAGE AREA PLANS AS AN APPENDIX AT END OF REPORT

DESIGN METHODOLOGY:

GENERAL:

The storm water mitigation system is designed to the New Jersey Storm Water Regulations adopted in February, 2004 and as printed in the "Final Draft, December 2003 of the New Jersey Best Management Practices Manual" (BMP) as updated to January 2026 and includes more recent minor updates.

BACKGROUND:

Current conditions: Block 170, Lot 3.02 and Block 190, Lots 1, 2.01 & 2.03:

The site is a developed 3.866 Ac site with a 28,300 sf church, 1,974 sf chapel, (65) parking spaces and (2) bio retention swales and an infiltration basin. The site was subject of a CAFRA permit (1516-10-0017.1 CAF100001) to allow a building expansion and between Block 170 & 190 provide 174 parking spaces.

Current conditions: Block 190, Lots 2.09 through 2.12:

These four lots are wooded and considered forest area.

EXECUTIVE SUMMARY:

1. **Impacts of development:** See page **xx** discharge point tables listing pre and post runoff rates and volumes comparatively and page **xx** that demonstrates non-erosive discharge velocity for site discharge point post-developed runoff.
2. **Low impact development techniques:** as demonstrated on the development plans and the following, the site generates runoff that is largely overland flow into a bio-retention facility (motor vehicle surfaces into a forebay first) and then into an infiltration facility. See pages 4 & 5.
4. **Stormwater pollutant removal:** See page **xx** for the stormwater pollutant removal summary.
5. **Stormwater mathematical methodology:** As dictated by NJDEP BMP chap 5, the NOAA "C" distribution was utilized to generate runoff hydrographs and the water quality design storm (WQDS) is based upon the NJDEP WQDS 2 hour hydrograph with total runoff being 1.25 inches in depth. See page **x** for rainfall depths.
6. **Groundwater recharge:** See page **xx** for the groundwater recharge summary using the methodology of recharging at a minimum the difference between the two year future rainfall from pre and post-developed conditions.
7. **Landscaping:** Since this development proposes 1.5-foot-deep planting beds in the bio retention facility, the planting bed is proposed to be planted with grass seed and plants. See development plans for details.
8. **Maintenance of stormwater management measures:** There is a Stormwater Facilities Maintenance plan accompanying the Stormwater Management Calculations with the application for land development.
9. **Green infrastructure:** This proposal utilizes green infrastructure or small scale bio-retention and small scale infiltration facilities as defined in NJDEP BMP Chap. 9. See page **xx**.
12. **Soil testing:** NJDEP BMP Chap. 12 methodology has been adhered to. See development plans for results of soil testing and permeability testing results.
13. **Ground water mounding:** . See page **xx** for ground water mounding calculations and results. This project complies with NJDEP BMP Chap. 13 for the maximum height of a

ground water mound and its interaction with either the bio-retention bottom of planting bed or infiltration facility bottom elevations.

Proposed conditions: Block 170, Lot 3.02:

The proposal is to replace a portion of the existing building facing Railroad Dr. with a larger building addition, remove the existing chapel, add parking totaling (94) space, add (1) bio retention swale and enlarge one other existing one.

Proposed conditions: Block 190, Lots 2.01 & 2.03:

The proposal is to remove and replace the existing asphalt and gravel combination parking area with a new paved and curbed parking area plus add bio retention 70. The resulting parking area will accommodate (97) parking spaces.

Proposed conditions: Block 190, Lots 2.09 through 2.12:

These are new lots added to the previous CAFRA and township approval to satisfy the need for more parking. The proposal is to replace a portion of the existing forested area with (66) parking spaces, bio retention swale 80, basin 3 and a forest preservation area. The storm water mitigation system for the site west of Railroad Dr. (Lots 2.01, 2.03, 2.09 through 2.12) will act collectively.

GREEN INFRASTRUCTURE BMP's:

Specifically, the following Green Infrastructure (GI) management strategies have been employed:

1) ***GI small scale bioretention:***

The the site is proposing one Small Scale Bioretention swale that has less than a 2.5 Ac drainage area. Therefore, exfiltration during the routing is proposed. Pre-treatment in the form of forebay with the required volumes derived from the Hydorcad runoff volumes for the water quality design storm (WQDS) Preference was given to providing curb cuts in as many locations as possible to encourage overland flow into the bio-retention swales. As is permitted in the NJDEP BMP, the area of the bio-retention swale is not included in the post developed runoff into said bio-retention swale.

All drainage runoff from motor vehicle surface impervious areas enters a forebay shown on the plans as located within the bio retention areas. The sizing data is noted on the plans. Pursuant to to N.J.A.C. 7:8-1.2 Definitions, "Contributory drainage area" means the area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself".

2) ***GI small large infiltration basin:***

The proposal is to convey the discharge from the small scale bio-retention swale to the large scale infiltration basin that has a contributory drainage area of 2.5 Ac or less. Similarly as the bio-retention swale, the drainage area or area of the infiltration basin is not included in the post-developed runoff into the infiltration basin as is permitted by the NJDEP BMP. Pursuant to to N.J.A.C. 7:8-1.2 Definitions, "Contributory drainage area" means the area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself".

STORMWATER POLLUTANT REMOVAL STRATEGY:

The methods and measures used to remove pollutants from stormwater runoff work hand in hand with the measures to remove total suspended solids (TSS). In this case, the basin has been designed to recharge or retain the difference in the 2-year pre and post storm, which by definition qualifies as an infiltration basin.

STORMWATER RUNOFF RATE AND VOLUME CALCULATIONS:

As dictated by the NJDEP BMP, the rainfall shape is a NOAA 24 hour with a storm curve "C". The rainfall depths are as follows:

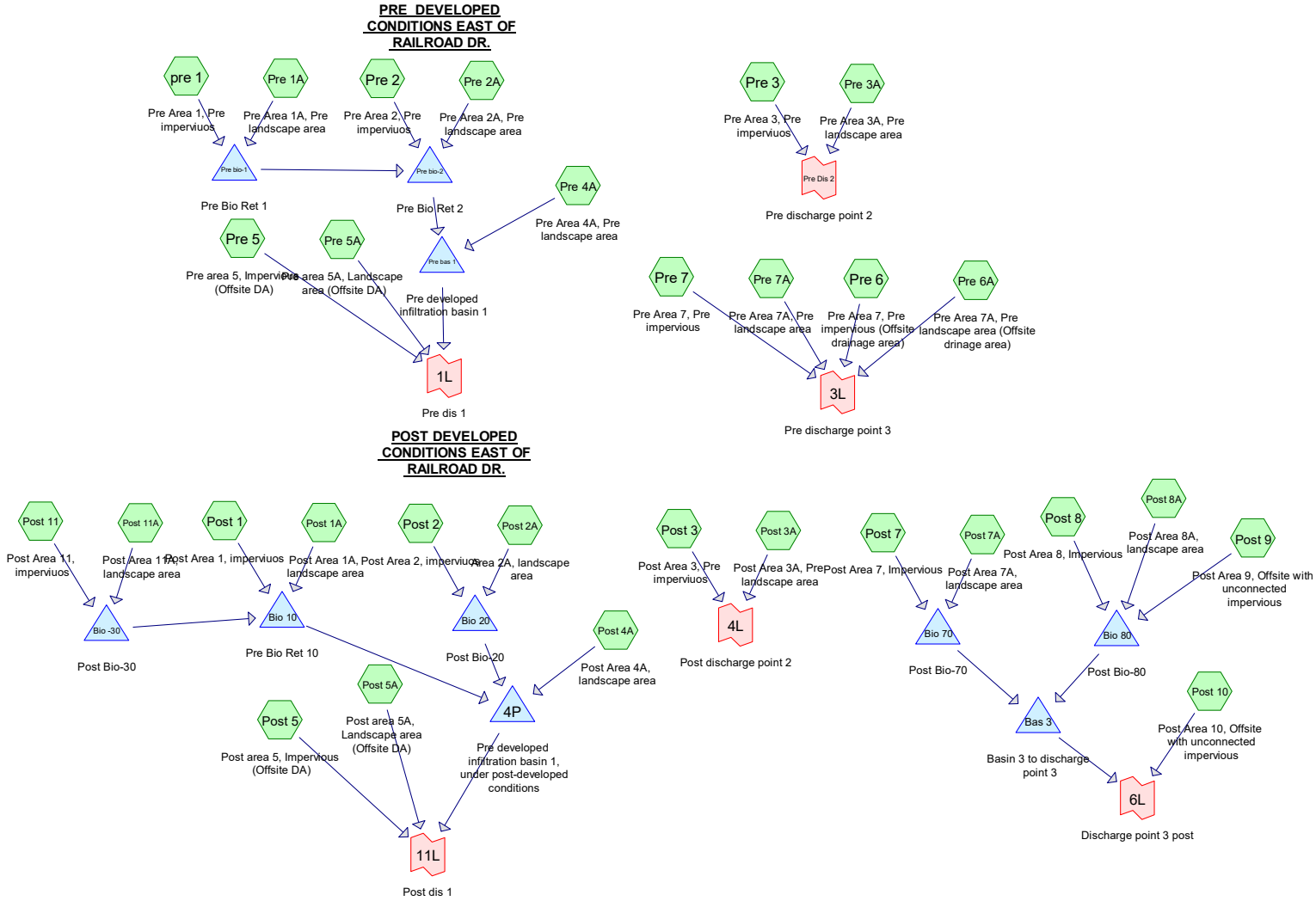
CUMBERLAND COUNTY	NRCS rainfall amounts from Table 5-1 in NJDEP BMP		
	2-Year	10- Year	100-Year
"rainfall" depths [inch]	2.69	5.09	8.76
"Current" rainfall factors	1.03	1.03	1.01
"Current" rainfall depths [inch]	2.77	5.24	8.85
"Future" rainfall factors (pg 17, chap 5) to "rainfall" depths	1.2	1.21	1.39
"Future" rainfall depths [inch]	3.23	6.16	12.18

The unit hydrograph is the Delmarva hydrograph with the "Storm Type" a NOAA 24-hour and a "Storm Curve" of "C" with the storm duration being 72-hour with a 24-hour rainfall in the front of the runoff hydrographs."

PATHWAY OF POSITIVE OUTFLOW:

The post developed runoff discharge points match the locations of the pre-developed discharge points.

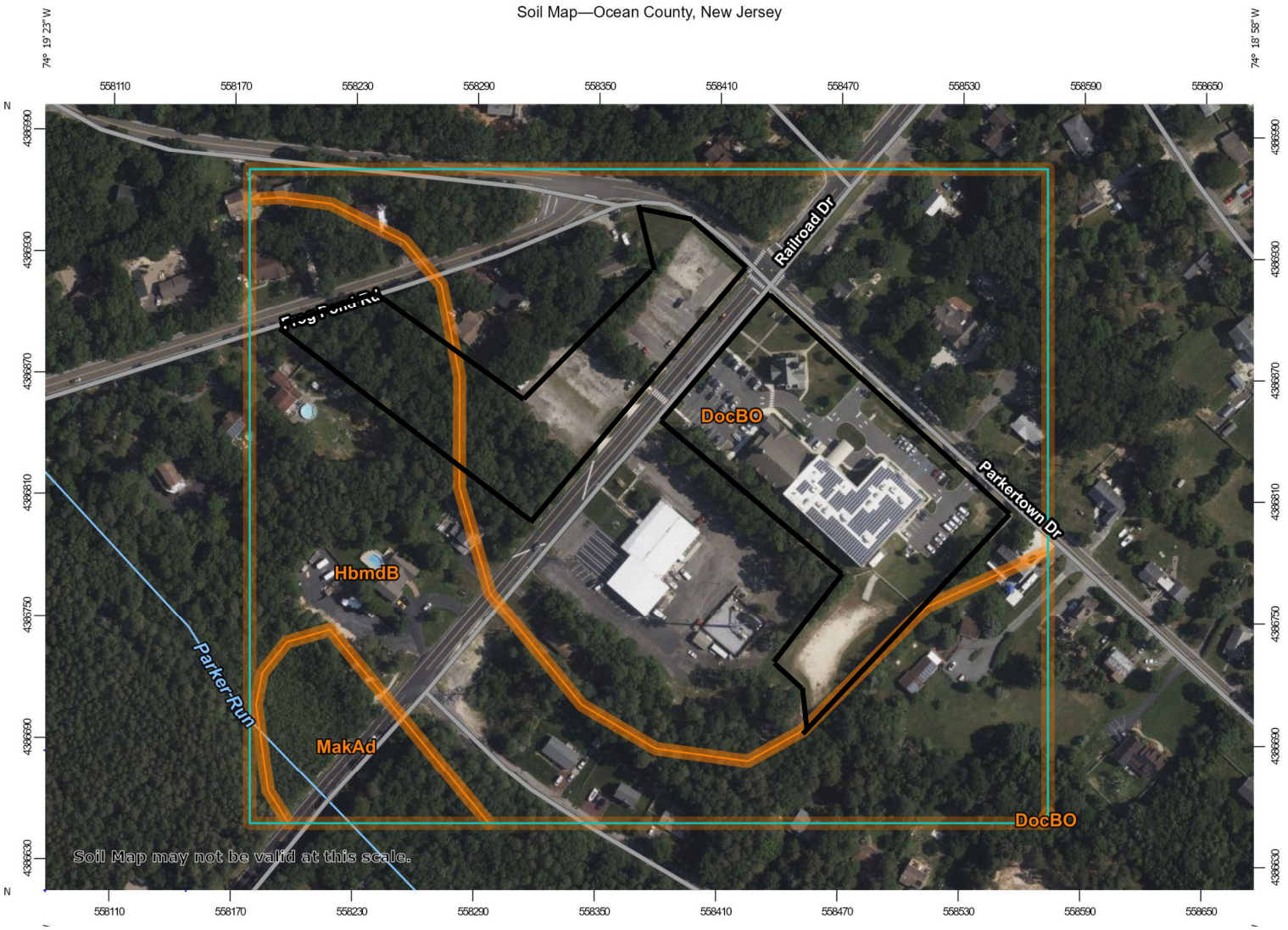
STORM WATER ROUTING DIAGRAM:



SOILS MAP:

Soil types from USDA Web Soil Survey

HbmdB	23%	USDA Hydrologic Soil Type B
DocBO	77%	USDA Hydrologic Soil Type A



Ocean County, New Jersey

DocBO—Downer loamy sand, 0 to 5 percent slopes, Northern Tidewater Area

Map Unit Setting

National map unit symbol: 2thw1
Landscape: Coastal plains
Elevation: 60 to 90 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 46 to 66 degrees F
Frost-free period: 190 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Downer and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Downer

Setting

Landscape: Coastal plains
Landform: Knolls, Low hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 10 inches: loamy sand
BE - 10 to 16 inches: loamy sand
Bt - 16 to 28 inches: sandy loam
C1 - 28 to 48 inches: loamy sand
C2 - 48 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 0.2 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F153DY160NJ - Well Drained Coarse-Loamy Upland
Hydric soil rating: No

Minor Components

Hammonton

Percent of map unit: 10 percent
Landscape: Coastal plains
Landform: Broad interstream divides, Flats
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Atsion

Percent of map unit: 5 percent
Landscape: Coastal plains
Landform: Depressions, Drainageways, Relict deflation flats, Flats
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F153DY120NJ - Sandy, Spodic Coastal Plain Swamp
Hydric soil rating: Yes

Evesboro

Percent of map unit: 5 percent
Landscape: Coastal plains
Landform: Fluviomarine terraces, Ancient dunes, Flats, Knolls
Landform position (three-dimensional): Riser, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Ecological site: F153DY170NJ - Sandy, Excessively Drained Upland
Hydric soil rating: No

Data Source Information

Soil Survey Area: Ocean County, New Jersey
Survey Area Data: Version 23, Aug 28, 2025

Ocean County, New Jersey

HbmdB—Hammonton loamy sand, 0 to 5 percent slopes, Northern Tidewater Area

Map Unit Setting

National map unit symbol: 2ztxw
Landscape: Coastal plains
Elevation: 0 to 70 feet
Mean annual precipitation: 41 to 49 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 190 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hammonton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hammonton

Setting

Landscape: Coastal plains
Landform: Drainageways on flats, Depressions on flats
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 5 inches: loamy sand
BE - 5 to 20 inches: sandy loam
Bt - 20 to 28 inches: sandy loam
BC - 28 to 47 inches: sandy loam
Cg - 47 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 20 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Minor Components

Klej

Percent of map unit: 5 percent
Landscape: Uplands
Landform: Shallow depressions on flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F153DY150NJ - Moist Sandy Upland
Hydric soil rating: No

Mullica

Percent of map unit: 5 percent
Landscape: Coastal plains
Landform: Flats, Drainageways, Depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F149AY090NJ - Coastal Plain Hardwood Swamp
Hydric soil rating: Yes

Atsion

Percent of map unit: 5 percent
Landscape: Coastal plains
Landform: Flats, Drainageways, Depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F153DY120NJ - Sandy, Spodic Coastal Plain Swamp
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Ocean County, New Jersey
Survey Area Data: Version 23, Aug 28, 2025

ANNUAL GROUND WATER RECHARGE ANALYSIS:

The criteria of retaining or recharging the difference between the 2-year pre and post runoff event is exceeded. Additionally, the pre and post 2-year discharge is zero in terms of basin discharge.

Discharge Point 1

Pre-Developed Areas:	2-year FUTURE runoff Vol. [cf]
Pre basin 1	0
Total Pre-Developed 2-year runoff:	**0**
Post-Developed Areas:	**2-year runoff Vol. [cf]**
Post basin 1	0
Total Post-Developed 2-year runoff:	**0**
Difference between pre & post 2-yr runoff	**0**
Small Scale Infiltration Structure:	**Infiltration Vol. [cf] (discarded)**
N/A	0
Total Infiltration Volume Available	**0**
Tot vol avail > 2-yr diff	

Discharge Point 2

Pre-Developed Areas:	2-year FUTURE runoff Vol. [cf]
Pre 6 & 7	18,139
Total Pre-Developed 2-year runoff:	**18,139**
Post-Developed Areas:	**2-year runoff Vol. [cf]**
Post area 7 & 7A	5,447
Post area 8 & 8A	15,175
Post area 10	5,157
Total Post-Developed 2-year runoff:	**25,779**
Difference between pre & post 2-yr runoff	**7,640**
Small Scale Infiltration Structure:	**Infiltration Vol. [cf] (discarded)**
Bio 70	5133
Bio 80	14067
Total Infiltration Volume Available	**19,200**
Tot vol avail > 2-yr diff	

DISCHARGE POINT PERFORMANCE SUMMARIES

DISCHARGE POINT 1

STORM FREQ. EVENT	RUNOFF RATES						RUNOFF VOLUMES	
	PRE-DEV TOTAL (cfs)	OFFSITE DA's (cfs)	ONSITE DA's (cfs)	PERMITTED POST: 100% OFFSITE + FACTORED ONSITE PRE DA RATE (cfs)	POST-DEV (cfs)	POST LESS THAN ALLOWED WITH OFFSITE?	PRE-DEV (cf)	POST-DEV (cf)
WATER QUALITY	2.20	2.20	0.00	2.20	2.20	yes	3,006	3,006
2-YR CURRENT	2.71	2.71	0.00	2.71	2.71	yes	9,259	9,259
2-YR FUTURE	3.21	3.21	0.00	3.21	3.21	yes	11,055	11,055
10-YR CURRENT	4.29	4.29	0.00	4.29	4.29	yes	14,991	14,991
10-YR FUTURE	5.06	5.06	0.00	5.06	5.06	yes	17,988	17,988
100-YR CURRENT	7.59	7.59	0.55	8.03	7.59	yes	43,918	42,081
100-YR FUTURE	9.15	9.15	2.10	10.83	9.15	yes	68,094	67,308

DISCHARGE POINT 2, into existing municipal system

STORM FREQ. EVENT	RUNOFF RATES						RUNOFF VOLUMES	
	PRE-DEV TOTAL (cfs)	OFFSITE DA's (cfs)	ONSITE DA's (cfs)	PERMITTED POST: 100% OFFSITE + FACTORED ONSITE PRE DA RATE (cfs)	POST-DEV (cfs)	POST LESS THAN ALLOWED WITH OFFSITE?	PRE-DEV (cf)	POST-DEV (cf)
WATER QUALITY	1.11	0.00	1.11	1.11	0.86	yes	1,419	1,079
2-YR CURRENT	1.38	0.00	1.38	0.69	1.07	no	4,378	3,327
2-YR FUTURE	1.63	0.00	1.63	0.82	1.27	no	5,285	4,002
10-YR CURRENT	2.18	0.00	2.18	1.64	1.69	no	7,426	5,551
10-YR FUTURE	2.58	0.00	2.58	1.94	2.00	no	9,088	6,726
100-YR CURRENT	4.09	0.00	4.09	3.27	3.11	yes	15,085	10,853
100-YR FUTURE	5.11	0.00	5.11	4.09	3.84	yes	19,088	13,549

DISCHARGE POINT 3

STORM FREQ. EVENT	RUNOFF RATES						RUNOFF VOLUMES		Basin 3 Portion of dis	
	PRE-DEV TOTAL (cfs)	OFFSITE DA's (cfs)	ONSITE DA's (cfs)	PERMITTED POST: 100% OFFSITE + FACTORED ONSITE PRE DA RATE (cfs)	POST-DEV (cfs)	POST LESS THAN ALLOWED WITH OFFSITE?	PRE-DEV (cf)	POST-DEV (cf)	Basin only POST-DEV (cfs)	Basin only post vol.[cf]
WATER QUALITY	2.74	1.14	1.60	2.74	0.39	yes	1,419	0	0.00	0
2-YR CURRENT	4.75	1.44	3.31	3.10	0.57	yes	4,378	0	0.00	0
2-YR FUTURE	5.90	1.70	4.20	3.80	0.73	yes	5,285	0	0.00	0
10-YR CURRENT	8.51	2.27	6.24	6.95	1.14	yes	7,426	6,153	0.00	0
10-YR FUTURE	10.45	2.69	7.76	8.51	1.49	yes	9,088	13,645	0.49	3,419
100-YR CURRENT	17.41	4.24	13.17	14.78	7.05	yes	15,085	44,237	4.58	25,585
100-YR FUTURE	22.05	5.29	16.76	18.70	12.22	yes	19,088	67,254	8.45	42,882

REMOVAL OF PHOSPHOROUS, NITROGEN & SUSPENDED SOLIDS (TSS):

The storm water management system has been designed to drain the parking lot area into bio retention swale prior to being conveyed to the infiltration basin. Most of the proposed building roof runoff will also flow into the bio-retention swales.

TSS & TN removal from NJDEPBMP Table 4-3 (Jan 2026)		post-developed conditions		post-developed cumulative removal rate
Discharge Point		bio-retention	infiltration basin *	
	TSS removal	80%	80%	**96%**
	Nitrogen removal	30%	30%	**51%**
	Phosporous removal	70%	60%	**88%**
Discharge Point Proposed Nutrient Input Reduction Measures:	* **For large scale infiltration basin, a waiver or variance from N.J.A.C. 7:8-5.3 is required.**			

DETAILED BASIN PERFORMANCE & MOUNDING:

SMALL SCALE BIO-RETENTION:

	Bio-Retention Swale			10 Results			Exist bio 1 from previous
STORM FREQ. EVENT	Basin INFLOW RATE (cfs)	Basin STAGE (ft)	PEAK Basin DEPTH (ft)	Basin Peak STORAGE (cf)	Primary Weir discharge rate (cfs)	Basin exfiltration rate (cfs)	DISCHARGE WEIR VELOCITY (fps)
1.25 inch in (2)	4,843	cf inflow					
hour water qual.	3.90	18.48	1.48	1,801	0.00	0.05	3.72
2 future	5.86	18.53	1.53	1,911	5.67	0.05	2.68
10 future	9.34	18.62	1.62	2,086	9.15	0.05	2.97
100 future	21.18	18.90	1.90	2,680	19.75	0.05	3.59

Basin Bottem Elev	=	17.00	feet	Area of bio-ret bottom =	672	sf
Number of discharge weirs	=	1	each	Weir is an "E" inlet w/culvert (existing)		
Width [ft] of each weir	=	10.00	feet			
Weir crest elevation [ft]	=	18.30	feet (dishcarge weir for extended routing above WQDS)			
Seaonal high water SHWT	=	11.1	feet as determined from test pit #		6	
Measured Perm Rate	=	6.6	in/hr. as determined from test pit #		6	
Peak 100- Yr Future stage elevation	=	18.90	feet	D1 =	5.90	feet
Depth "d" from bas bot to SHWT	=	5.90	feet	D2 =	7.80	feet
				Davg =	6.85	feet

TIME TO EMPTY 100-YR FUTURE MAX STORAGE:

o	Perm rate = 1/2 measured rate	**6.6** in/hour	**Ksafe =**	**0.000076 fps**
o	PERCOLATION AREA OF BASIN		**I = Davg/d =**	**1.16 ft**
	"K" WITH A FACTOR OF SAFETY OF 2.0 INLUDED		**A =**	**672 sf**
			=	**2,680 cf**
		Exfiltration	**Q =**	**0.05 cfs**
	TIME TO EMPTY BIO RET (100-yr future)		**=**	**14.5 hours**

FOREBAY SIZING: **10% OF WQDS INFLOW OR:** 4,843 **cf x 10% =** **484 cf min**

GROUND WATER MOUNDING: Measured Perm rate = **6.6** in/hr **"R" =** **3.3 in/hr**

"K_h" = **16.5 in/hr**

Duration of infiltration [hrs] = **WQDS** Discarded vol via exfiltration [cf] x 12 [in/ft] / Infiltration area [sf] **X** exfiltration rate [in/hr]

"t"[hr] = **4,843** cf x 12 in/ft / **672** sf x **3.3** in/hr = **26.2 hours**

Plnt bed thick=	**1.5** ft	and area:	12.0	feet wide X	56.0	feet long
△ h =	**3.46** ft		6.0	feet = 1/2 width **"y"**	28	feet 1/2 length **"x"**
SHWT El =	**11.1** ft		**Use**	**3.3 in/hour &**	**26.2 hours**	
Bio Bot El =	**17.0** ft		so, bottom of planting bed el=		**15.5** ft	
Max Mound =	**14.6** ft		**is below**	basin bottom surface	**1.5** ft	thick planting bed
Vert dist. SHWT to bio retention bottom =			**4.4** ft			

Input Values

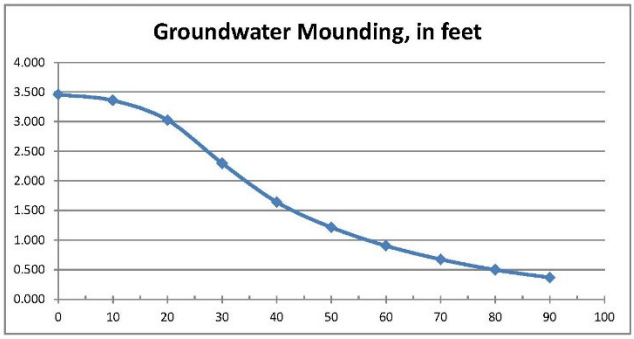
3.30	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
16.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
28.000	x	1/2 length of basin (x direction, in feet)
6.000	y	1/2 width of basin (y direction, in feet)
26.20	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.457	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.457	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.457	0
3.358	10
3.025	20
2.296	30
1.641	40
1.212	50
0.903	60
0.671	70
0.497	80
0.366	90

Re-Calculate Now

SEAONAL HIGH WATER TABLE



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

SMALL SCALE BIO-RETENTION:

	Bio-Retention Swale			20 Results	Expand exist bio		
STORM FREQ. EVENT	Basin INFLOW RATE (cfs)	Basin STAGE (ft)	PEAK Basin DEPTH (ft)	Basin Peak STORAGE (cf)	Primary Weir discharge rate (cfs)	Basin exfiltration rate (cfs)	DISCHARGE WEIR VELOCITY (fps)
1.25 inch in (2)	1,591	cf inflow					
hour water qual.	1.28	17.07	0.07	578	0.00	0.36	0.00
2 future	1.91	17.14	0.14	1,230	0.00	0.36	0.00
10 future	3.01	17.31	0.31	2,767	0.00	0.36	0.00
100 future	5.99	17.84	0.84	8,044	0.30	0.36	0.47

Basin Bottem Elev	=	17.00	feet	Area of bio-ret bottom =	8,420	sf
Number of discharge weirs	=	1	each	Weir is an "E" inlet w/culvert (existing)		
Width [ft] of each weir	=	10.00	feet			
Weir crest elevation [ft]	=	17.82	feet (dishcarge weir for extended routing above WQDS)			
Seaonal high water SHWT	=	11	feet as determined from test pit #		5	
Measured Perm Rate	=	3.7	in/hr. as determined from test pit #		5	
Peak 100- Yr Future stage elevation	=	17.84	feet	D1 =	6.00	feet
Depth "d" from bas bot to SHWT	=	6.00	feet	D2 =	6.84	feet
				Davg =	6.42	feet

TIME TO EMPTY 100-YR FUTURE MAX STORAGE:

- o Perm rate = 1/2 measured rate — **3.7** in/hour — **Ksafe =** **0.000043 fps**
- o PERCOLATION AREA OF BASIN — **I = Davg/d =** **1.07 ft**
- "K" WITH A FACTOR OF SAFETY OF 2.0 INLUDED — **A =** **8,420 sf**
- **=** **8,044 cf**

Exfiltration	Q =	0.36 cfs
TIME TO EMPTY BIO RET (100-yr future)	=	6.2 hours

FOREBAY SIZING: **10% OF WQDS INFLOW OR:** 1,591 **cf x 10% =** **159 cf min**

GROUND WATER MOUNDING: Measured Perm rate = **3.7** in/hr **"R" =** **1.85 in/hr**

"K_h" = **9.25 in/hr**

Duration of infiltration [hrs] = **WQDS** Discarded vol via exfiltration [cf] x 12 [in/ft] / Infiltration area [sf] **X** exfiltration rate [in/hr]

"t"[hr] = **1,591** cf x 12 in/ft / **8,420** sf x **1.85** in/hr = **1.2 hours**

Plnt bed thick=	1.5	ft and area:	43.4	feet wide X	194.0	feet long
△ h =	1.21	ft	21.7	feet = 1/2 width "y"	97	feet 1/2 length "x"
SHWT El =	11.0	ft	**Use**	**1.9 in/hour &**	**1.2 hours**	
Bio Bot El =	17.0	ft	so, bottom of planting bed el=		15.5	ft
Max Mound =	12.2	ft	**is below**	basin bottom surface	1.5	ft thick planting bed
Vert dist. SHWT to bio-retention bottom =			4.5	ft		

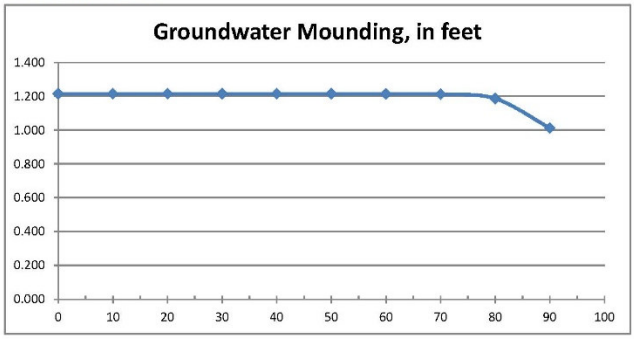
Input Values

1.85	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
9.25	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
97.000	x	1/2 length of basin (x direction, in feet)
21.700	y	1/2 width of basin (y direction, in feet)
1.20	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

11.214	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
1.214	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.214	0
1.214	10
1.214	20
1.214	30
1.214	40
1.214	50
1.214	60
1.212	70
1.186	80
1.012	90

Re-Calculate Now



SEAONAL HIGH WATER TABLE

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SMALL SCALE BIO-RETENTION:

	Bio-Retention Swale			30 Results			
STORM FREQ. EVENT	Basin INFLOW RATE (cfs)	Basin STAGE (ft)	PEAK Basin DEPTH (ft)	Basin Peak STORAGE (cf)	Primary Weir discharge rate (cfs)	Basin exfiltration rate (cfs)	DISCHARGE WEIR VELOCITY (fps)
1.25 inch in (2) hour water qual.	1,288 cf inflow						
	1.04	21.09	1.59	1,166	0.00	0.02	0.00
2 future	1.54	21.36	1.86	1,577	1.39	0.02	1.09
10 future	2.44	21.41	1.91	1,654	2.32	0.02	1.29
100 future	4.60	21.49	1.99	1,804	4.44	0.02	1.61

Basin Bottem Elev	=	19.50	feet	Area of bio-ret bottom =	207	sf
Number of discharge weirs	=	1	each	Weir is an "A" inlet riser w/culvert		
Width [ft] of each weir	=	6.00	feet			
Weir crest elevation [ft]	=	23.75	feet (dishcarge weir for extended routing above WQDS)			
Seaonal high water SHWT	=	13.7	feet as determined from test pit #		8	
Measured Perm Rate	=	6.6	in/hr. as determined from test pit #		8	
Peak 100- Yr Future stage elevation	=	21.49	feet	D1 =	5.80	feet
Depth "d" from bas bot to SHWT	=	5.80	feet	D2 =	7.79	feet
				Davg =	6.795	feet

TIME TO EMPTY 100-YR FUTURE MAX STORAGE:

- o Perm rate = 1/2 measured rate — **6.6** in/hour — **Ksafe =** **0.000076 fps**
- o PERCOLATION AREA OF BASIN — **I = Davg/d =** **1.17 ft**

"K" WITH A FACTOR OF SAFETY OF 2.0 INLUDED — **A =** **207 sf**

= **1,804 cf**

Exfiltration	**Q =**	**0.02 cfs**
TIME TO EMPTY BIO RET (100-yr future)	**=**	**31.7 hours**

FOREBAY SIZING: **10% OF WQDS INFLOW OR:** 1,288 **cf x 10% =** **129 cf min**

GROUND WATER MOUNDING: Measured Perm rate = **6.6** in/hr **"R" =** **3.3 in/hr**

"K_h" = **16.5 in/hr**

Duration of infiltration [hrs] = **WQDS** Discarded vol via exfiltration [cf] x 12 [in/ft] / Infiltration area [sf] **X** exfiltration rate [in/hr]

"t"[hr] = **1,288** cf x 12 in/ft / **207** sf x **3.3** in/hr = **22.6 hours**

Plnt bed thick=	**1.5** ft	and area:	4.5	feet wide X	46.0	feet long
△ h =	**1.3** ft		2.3	feet = 1/2 width **"y"**	23	feet 1/2 length **"x"**
SHWT El =	**13.7** ft		**Use**	**3.3 in/hour &**	**22.6 hours**	
Bio Bot El =	**19.5** ft		so, bottom of planting bed el=		**18.0** ft	
Max Mound =	**15.0** ft		**is below**	basin bottom surface		
Vert dist. SHWT bio bottom surface			**4.3** ft			

Input Values

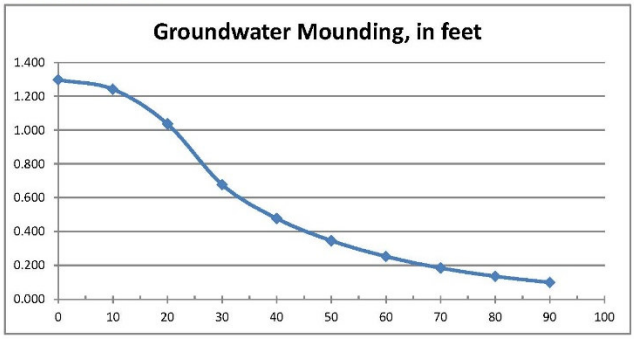
3.30	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
16.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
23.000	x	1/2 length of basin (x direction, in feet)
2.300	y	1/2 width of basin (y direction, in feet)
22.60	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

11.297	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
1.297	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.297	0
1.241	10
1.036	20
0.677	30
0.477	40
0.346	50
0.252	60
0.185	70
0.135	80
0.099	90

Re-Calculate Now

SEAONAL HIGH WATER TABLE



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SMALL SCALE BIO-RETENTION:

	Bio-Retention Swale			70 Results	Expand exist bio		
STORM FREQ. EVENT	Basin INFLOW RATE (cfs)	Basin STAGE (ft)	PEAK Basin DEPTH (ft)	Basin Peak STORAGE (cf)	Primary Weir discharge rate (cfs)	Basin exfiltration rate (cfs)	DISCHARGE WEIR VELOCITY (fps)
1.25 inch in (2)	1,452	cf inflow					
hour water qual.	1.17	23.31	0.31	747	0.00	0.18	0.00
2 future	1.74	23.60	0.60	1,566	0.00	0.18	0.00
10 future	2.75	24.02	1.02	3,086	0.00	0.18	0.00
100 future	5.69	24.94	1.94	7,629	1.26	0.18	0.99

Basin Bottem Elev = 23.00 feet — Area of bio-ret bottom = 2,094 sf
Number of discharge weirs = 1 each — Weir is an "E" inlet w/culvert (existing)
Width [ft] of each weir = 10.00 feet
Weir crest elevation [ft] = 24.85 feet (dishcarge weir for extended routing above WQDS)
Seaonal high water SHWT = 19.5 feet as determined from test pit # 10
Measured Perm Rate = 7.3 in/hr. as determined from test pit # 10
Peak 100- Yr Future stage elevation = 24.94 feet — D1 = 3.50 feet
Depth "d" from bas bot to SHWT = 3.50 feet — D2 = 5.44 feet
Davg = 4.47 feet

TIME TO EMPTY 100-YR FUTURE MAX STORAGE:

- Perm rate = 1/2 measured rate — **7.3** in/hour — **Ksafe =** **0.000084 fps**
- PERCOLATION AREA OF BASIN — **I = Davg/d =** **1.28 ft**
  "K" WITH A FACTOR OF SAFETY OF 2.0 INLUDED — **A =** **2,094 sf**
  = **7,629 cf**

Exfiltration Q = **0.18 cfs**

TIME TO EMPTY BIO RET (100-yr future) = **12.0 hours**

FOREBAY SIZING: **10% OF WQDS INFLOW OR:** 1,452 **cf x 10% =** **145 cf min**

GROUND WATER MOUNDING: Measured Perm rate = **7.3** in/hr **"R" =** **3.65 in/hr**

"K_h" = **18.25 in/hr**

Duration of infiltration [hrs] = **WQDS** Discarded vol via exfiltration [cf] x 12 [in/ft] / Infiltration area [sf] **X** exfiltration rate [in/hr]

"t"[hr] = **1,452** cf x 12 in/ft / **2,094** sf x **3.65** in/hr = **2.3 hours**

Plnt bed thick= **1.5** ft and area: 15.4 feet wide X 136.0 feet long

Δ h = **2.04** ft — 7.7 feet = 1/2 width **"y"** — 68 feet 1/2 length **"x"**

SHWT El = **19.5** ft — **Use 3.7 in/hour & 2.3 hours**

Bio Bot El = **23.0** ft — so, bottom of planting bed el= **21.5 ft**

Max Mound = **21.5** ft — **is below** basin bottom surface — **1.5** ft thick planting bed

Vert dist. SHWT to bio retention bottom = **3.5** ft

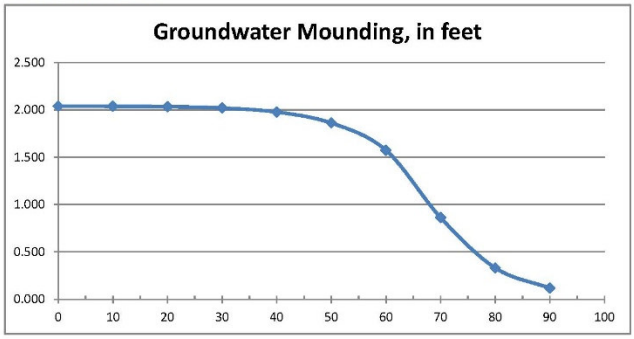
Input Values

3.65	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
18.25	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
68.000	x	1/2 length of basin (x direction, in feet)
7.700	y	1/2 width of basin (y direction, in feet)
2.30	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

12.038	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.038	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
2.038	0
2.037	10
2.033	20
2.019	30
1.976	40
1.860	50
1.572	60
0.861	70
0.329	80
0.117	90

Re-Calculate Now



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SMALL SCALE BIO-RETENTION:

	Bio-Retention Swale			80 Results	Exist bio 1 from previous		
STORM FREQ. EVENT	Basin INFLOW RATE (cfs)	Basin STAGE (ft)	PEAK Basin DEPTH (ft)	Basin Peak STORAGE (cf)	Primary Weir discharge rate (cfs)	Basin exfiltration rate (cfs)	DISCHARGE WEIR VELOCITY (fps)
1.25 inch in (2)	4,915	cf inflow					
hour water qual.	3.25	17.13	1.13	3,308	0.00	0.25	0.00
2 future	5.02	17.54	1.54	4,842	2.10	0.25	0.90
10 future	8.13	17.73	1.73	5,630	7.15	0.25	1.42
100 future	15.73	17.92	1.92	6,458	14.58	0.25	1.90

Basin Bottem Elev = 16.00 feet — Area of bio-ret bottom = 2,349 sf
Number of discharge weirs = 1 each — Weir is earthen weir
Width [ft] of each weir = 14.00 feet
Weir crest elevation [ft] = 17.40 feet (dishcarge weir for extended routing above WQDS)
Seaonal high water SHWT = 10 feet as determined from test pit # 13
Measured Perm Rate = 9.2 in/hr. as determined from test pit # 13
Peak 100- Yr Future stage elevation = 17.92 feet — D1 = 6.00 feet
Depth "d" from bas bot to SHWT = 6.00 feet — D2 = 7.92 feet
Davg = 6.96 feet

TIME TO EMPTY 100-YR FUTURE MAX STORAGE:

- Perm rate = 1/2 measured rate — **9.2** in/hour — **Ksafe =** **0.000106 fps**
- PERCOLATION AREA OF BASIN — **I = Davg/d =** **1.16 ft**

"K" WITH A FACTOR OF SAFETY OF 2.0 INLUDED — **A =** **2,349 sf**; **=** **6,458 cf**

Exfiltration Q = **0.25 cfs**

TIME TO EMPTY BIO RET (100-yr future) = **7.2 hours**

FOREBAY SIZING: **10% OF WQDS INFLOW OR:** 4,915 **cf x 10% =** **492 cf min**

GROUND WATER MOUNDING: Measured Perm rate = **9.2** in/hr **"R" =** **4.6 in/hr**

"K_h" = **23 in/hr**

Duration of infiltration [hrs] = **WQDS** Discarded vol via exfiltration [cf] x 12 [in/ft] / Infiltration area [sf] **X** exfiltration rate [in/hr]

"t"[hr] = **4,915** cf x 12 in/ft / **2,349** sf x **4.6** in/hr = **5.5 hours**

Plnt bed thick= **1.5** ft and area: 36.7 feet wide X 64.0 feet long

Δ h = **5.84** ft — 18.4 feet = 1/2 width **"y"** — 32 feet 1/2 length **"x"**

SHWT El = **10.0** ft — **Use 4.6 in/hour & 5.5 hours**

Bio Bot El = **16.0** ft — so, bottom of planting bed el= **14.5 ft**

Max Mound = **15.8** ft — **is below** basin bottom surface — **1.5** ft thick planting bed

Vert dist. SHWT to bio-retention bot = **4.5** ft

Input Values

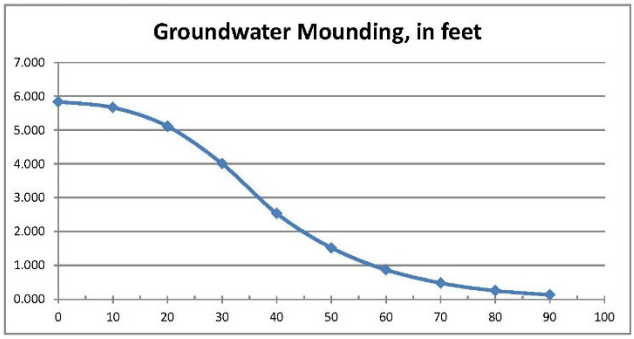
4.60	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
23.00	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
32.000	x	1/2 length of basin (x direction, in feet)
18.400	y	1/2 width of basin (y direction, in feet)
5.50	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.838	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.838	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.838	0
5.667	10
5.110	20
4.005	30
2.534	40
1.517	50
0.870	60
0.478	70
0.252	80
0.128	90

Re-Calculate Now

SEAONAL HIGH WATER TABLE



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STORM CONDUIT OUTLET PROTECTION CALCULATIONS:

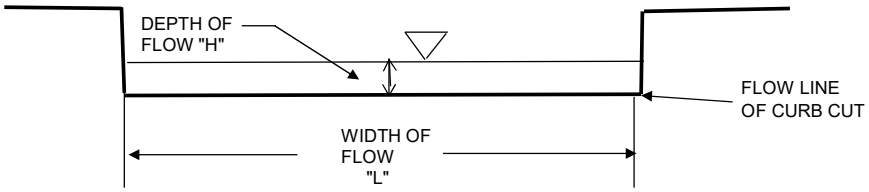
All of the inflow regime is by overland flow and not piped, so no rip rap aprons are necessary.

EMERGENCY OVERFLOW SPILLWAY DESIGN:

The proposed basin is situated such that it for storms greater than a 100-year event will still be directed to the same discharge point. .

CURB CUT STABILITY:

CURB CUT WEIR FLOW MODELED
MODELED AS A BROAD CRESTED WEIR *(LARGEST AREA)*



First determine if washout will occur due to intense short storm:

Largest single area contributing to any curb cut is **0.15** **Ac**

Therefore, the largest resulting flow is **0.15 Ac x 9 in/hour x 0.90 =**

Resulting high intensity flow = **1.22 cfs**

Second, determine runoff rate from a 10-year event

Area contributing to any curb cut again is **0.15 Ac**

Therefore, the largest resulting flow is **0.15 Ac x 5.5 in/hour x 0.90 =**

Resulting low intensity flow = **0.74 cfs**

$$Q = C_w L H^{1.5}$$

where:

Cw =	2.5	Broadcrested weir model
L =	3	ft (width of curb cut)
H =	flow depth	ft

DEPTH OF FLOW REQUIRED TO CARRY INTENSE STORM RUNOFF:

H = 0.30 [FT] WITH RESULTING VELOCITY OF FLOW, V = 1.36 [FPS]

DEPTH OF FLOW REQUIRED TO CARRY WATER QUALITY RUNOFF EVENT:

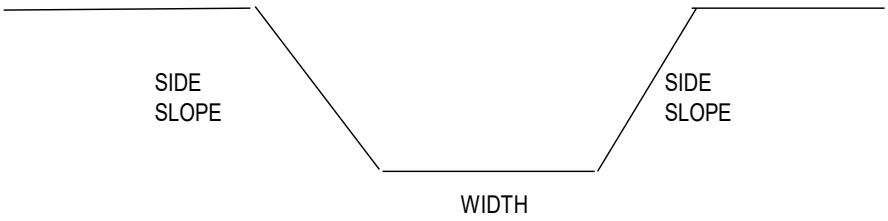
H = 0.21 [FT] WITH RESULTING VELOCITY OF FLOW, V = 0.10 [FPS]

The TR-55 manual defines sheet flow as shallow flow depths of approximately 0.1 feet. Therefore the above flow velocity and depth of flow over a curbcut weir qualify by definition as sheet flow conditions.

BASIN SIDE SLOPE STABILITY:

BASIN SIDE SLOPE STABILITY AT CURB CUTS

Model overland basin side slope flow as a constrained trapezoidal shaped swale that has an assumed 10' wide paved area contributing to it. Therefore, the flow necessary would be (190' x 10')/43560 x 0.90 x 9 in/hour or 0.35 cfs



SIDE SLOPE =	0.2	ft/ft
BOTTOM WIDTH =	10	ft

o Need to provide swale to handle 1.05 cfs for 100-year evnt

$$Q_{total} = \frac{(1.49\ A\ R^{.667})}{\text{"n" grass}}\ (S^{0.5})$$

where:

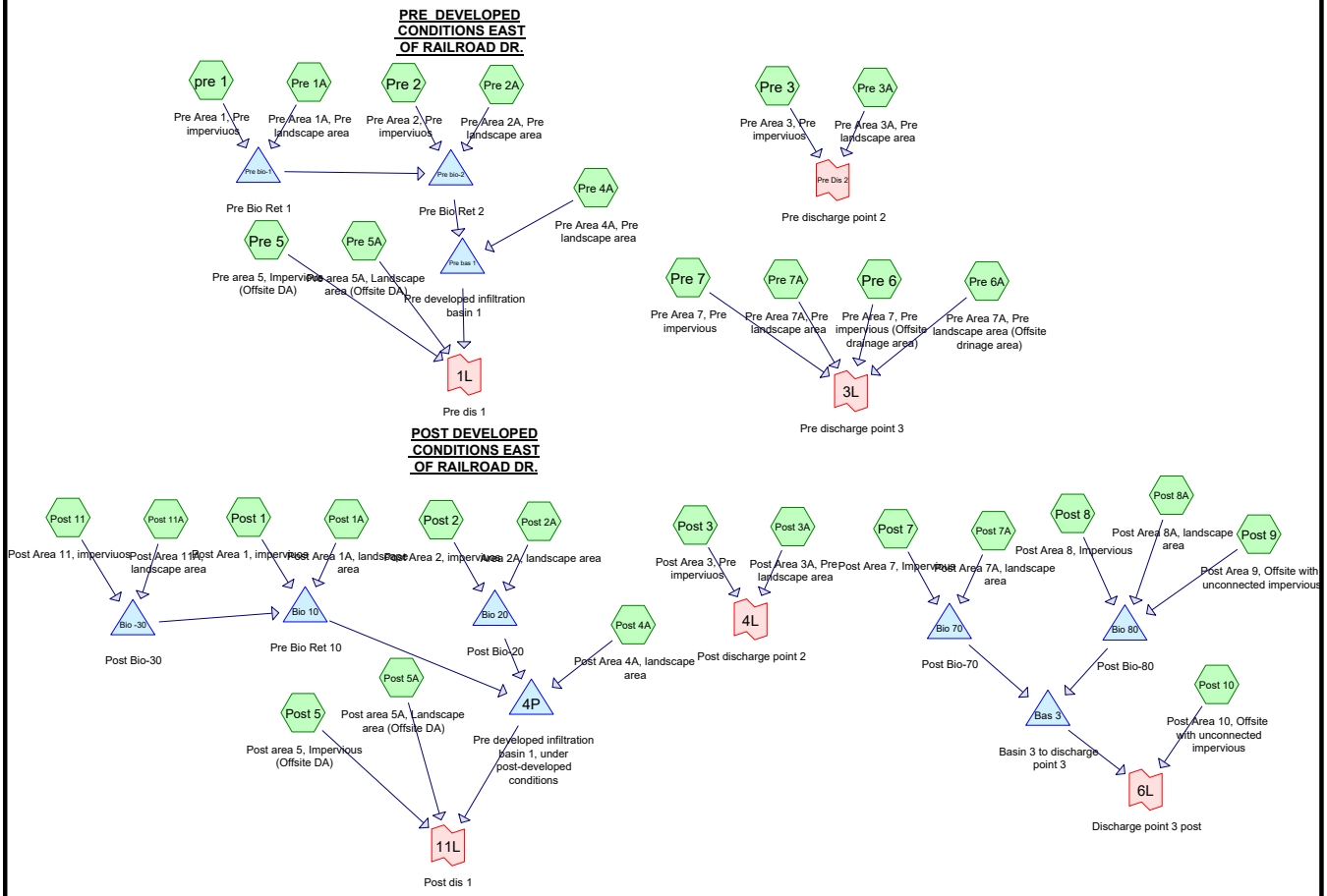
Depth of flow =	0.074	ft
A = area =	0.74	ft^2
W wet perm =	10.1	ft
R hyd radius =	0.07	ft
n Mannings n =	0.07	
S longi slope =	0.25	ft/ft

RESULTS: **Q = 1.37 cfs**

V = 1.86 fps

(stable for a grassed slope)

RUNOFF AND ROUTING HYDROCAD CALCULATIONS



Routing Diagram for BASIN TEMPLATE-02

Prepared by Schaeffer Nassar Scheidegg, Printed 6/2/2026

HydroCAD® 10.20-8a s/n 00732 © 2025 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "Basin-02.hcp"

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year current	NOAA 24-hr	C	Default	24.00	1	3.42	2
2	2-Year-Fut	NOAA 24-hr	C	Default	24.00	1	4.04	2
3	10-Year current	NOAA 24-hr	C	Default	24.00	1	5.38	2
4	10-Year-Fut	NOAA 24-hr	C	Default	24.00	1	6.34	2
5	100-Year current	NOAA 24-hr	C	Default	24.00	1	9.48	2
6	100-Year-Fut	NOAA 24-hr	C	Default	24.00	1	11.41	2
7	Water Quality	NJ DEP 2-hr		Default	2.00	1	1.25	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
279,631	39	>75% Grass cover, Good, HSG A (Post 10, Post 11A, Post 1A, Post 2A, Post 3A, Post 4A, Post 7A, Post 8A, Post 9, Pre 1A, Pre 2A, Pre 3A, Pre 4A, Pre 6A, Pre 7A)
9,854	61	>75% Grass cover, Good, HSG B (Post 10, Post 8A, Post 9)
3,720	98	Exist Parkertown Dr. (Pre 7)
117,345	98	Exist impervious (Post 2, pre 1, Pre 2, Pre 3, Pre 6)
6,316	98	Exist paving (Pre 7)
69,732	98	Exist paving & roof (Post 5, Pre 5)
3,720	98	Existing Parkertown Dr. (Post 7)
39,124	85	Existing gravel (Pre 7)
11,965	98	Portion of Frog Pond Road (Post 10, Post 9)
91,436	30	Woods, Good, HSG A (Post 5A, Post 8A, Post 9, Pre 5A, Pre 7A)
27,731	55	Woods, Good, HSG B (Post 10, Post 8A, Post 9)
12,409	98	house and driveways (Post 10, Post 9)
142,267	98	impervious (Post 1, Post 11, Post 3, Post 7, Post 8)
32,274	55	woods, good condition (Pre 7A)
847,524	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
371,067	HSG A	Post 10, Post 11A, Post 1A, Post 2A, Post 3A, Post 4A, Post 5A, Post 7A, Post 8A, Post 9, Pre 1A, Pre 2A, Pre 3A, Pre 4A, Pre 5A, Pre 6A, Pre 7A
37,585	HSG B	Post 10, Post 8A, Post 9
0	HSG C	
0	HSG D	
438,872	Other	Post 1, Post 10, Post 11, Post 2, Post 3, Post 5, Post 7, Post 8, Post 9, pre 1, Pre 2, Pre 3, Pre 5, Pre 6, Pre 7, Pre 7A
847,524		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	S N
279,631	9,854	0	0	0	289,485	>75% Grass cover, Good	
0	0	0	0	3,720	3,720	Exist Parkertown Dr.	
0	0	0	0	117,345	117,345	Exist impervious	
0	0	0	0	6,316	6,316	Exist paving	
0	0	0	0	69,732	69,732	Exist paving & roof	
0	0	0	0	3,720	3,720	Existing Parkertown Dr.	
0	0	0	0	39,124	39,124	Existing gravel	
0	0	0	0	11,965	11,965	Portion of Frog Pond Road	
91,436	27,731	0	0	0	119,167	Woods, Good	
0	0	0	0	12,409	12,409	house and driveways	
0	0	0	0	142,267	142,267	impervious	
0	0	0	0	32,274	32,274	woods, good condition	
371,067	**37,585**	**0**	**0**	**438,872**	**847,524**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	Bio -30	17.50	14.00	56.0	0.0625	0.013	0.0	15.0	0.0	
2	Bio -30	21.10	21.10	1.0	0.0000	0.013	0.0	3.0	0.0	
3	Bio 10	15.22	14.00	214.0	0.0057	0.013	0.0	18.0	0.0	
4	Bio 10	18.01	18.01	1.0	0.0000	0.013	0.0	3.0	0.0	
5	Bio 20	12.62	10.01	79.0	0.0330	0.013	0.0	15.0	0.0	
6	Bio 20	17.15	17.15	1.0	0.0000	0.013	0.0	3.0	0.0	
7	Bio 70	19.00	13.00	410.0	0.0146	0.010	0.0	15.0	0.0	
8	Bio 70	23.32	23.32	1.0	0.0000	0.013	0.0	3.0	0.0	
9	Bio 80	17.15	15.00	22.0	0.0977	0.010	0.0	6.0	0.0	
10	Pre bio-1	15.22	13.49	38.0	0.0455	0.013	0.0	15.0	0.0	
11	Pre bio-2	12.62	10.01	79.0	0.0330	0.013	0.0	15.0	0.0	

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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.90 cfs 14,917 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=1.06"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=0.57 cfs 4,034 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.30 cfs 3,967 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 3 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 8 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.61 cfs 4,902 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 9 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=1.07 cfs 3,323 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 4 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 17 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=330' Tc=3.9 min CN=98 Runoff=2.71 cfs 9,259 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 0 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.47 cfs 4,473 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 11 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.97 cfs 12,089 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=0.16"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.05 cfs 432 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=0.88"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=0.41 cfs 3,204 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.14 cfs 12,616 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 8 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.61 cfs 4,902 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 9 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=1.38 cfs 4,371 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 7 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 17 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=330' Tc=3.9 min CN=98 Runoff=2.71 cfs 9,259 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 0 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=3.19"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.44 cfs 4,371 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 7 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=2.20"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.31 cfs 9,013 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=0.15"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.08 cfs 866 cf

Pond 4P: Pre developed infiltration basin 1, Peak Elev=15.33' Storage=11,364 cf Inflow=4.88 cfs 11,364 cf
Outflow=0.00 cfs 0 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=13.99' Storage=3,090 cf Inflow=1.05 cfs 3,090 cf
Outflow=0.00 cfs 0 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.32' Storage=1,516 cf Inflow=1.30 cfs 3,970 cf
Discarded=0.02 cfs 2,600 cf Primary=0.77 cfs 1,370 cf Outflow=0.79 cfs 3,970 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.51' Storage=1,868 cf Inflow=5.06 cfs 16,295 cf
Discarded=0.05 cfs 4,947 cf Primary=4.88 cfs 11,348 cf Outflow=4.93 cfs 16,295 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.11' Storage=903 cf Inflow=1.61 cfs 4,911 cf
Discarded=0.36 cfs 4,911 cf Primary=0.00 cfs 0 cf Outflow=0.36 cfs 4,911 cf

Pond Bio 70: Post Bio-70 Peak Elev=23.49' Storage=1,247 cf Inflow=1.47 cfs 4,484 cf
Discarded=0.18 cfs 4,378 cf Primary=0.03 cfs 108 cf Outflow=0.21 cfs 4,486 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.48' Storage=4,601 cf Inflow=4.21 cfs 15,725 cf
Discarded=0.25 cfs 12,746 cf Primary=1.02 cfs 2,982 cf Outflow=1.27 cfs 15,727 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=15.55' Storage=14,528 cf Inflow=4.22 cfs 14,528 cf
Outflow=0.00 cfs 0 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=18.37' Storage=1,613 cf Inflow=4.14 cfs 12,624 cf
Outflow=3.12 cfs 11,831 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=18.01' Storage=3,175 cf Inflow=4.62 cfs 16,742 cf
Outflow=4.22 cfs 14,512 cf

Link 1L: Pre dis 1 Inflow=2.71 cfs 9,259 cf
Primary=2.71 cfs 9,259 cf

Link 3L: Pre discharge point 3 Inflow=4.75 cfs 14,257 cf
Primary=4.75 cfs 14,257 cf

Link 4L: Post discharge point 2 Inflow=1.07 cfs 3,327 cf
Primary=1.07 cfs 3,327 cf

Link 6L: Discharge point 3 post Inflow=0.57 cfs 4,034 cf
Primary=0.57 cfs 4,034 cf

Link 11L: Post dis 1 Inflow=2.71 cfs 9,259 cf
Primary=2.71 cfs 9,259 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=1.38 cfs 4,378 cf
Primary=1.38 cfs 4,378 cf

Total Runoff Area = 847,524 sf Runoff Volume = 106,096 cf Average Runoff Depth = 1.50"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

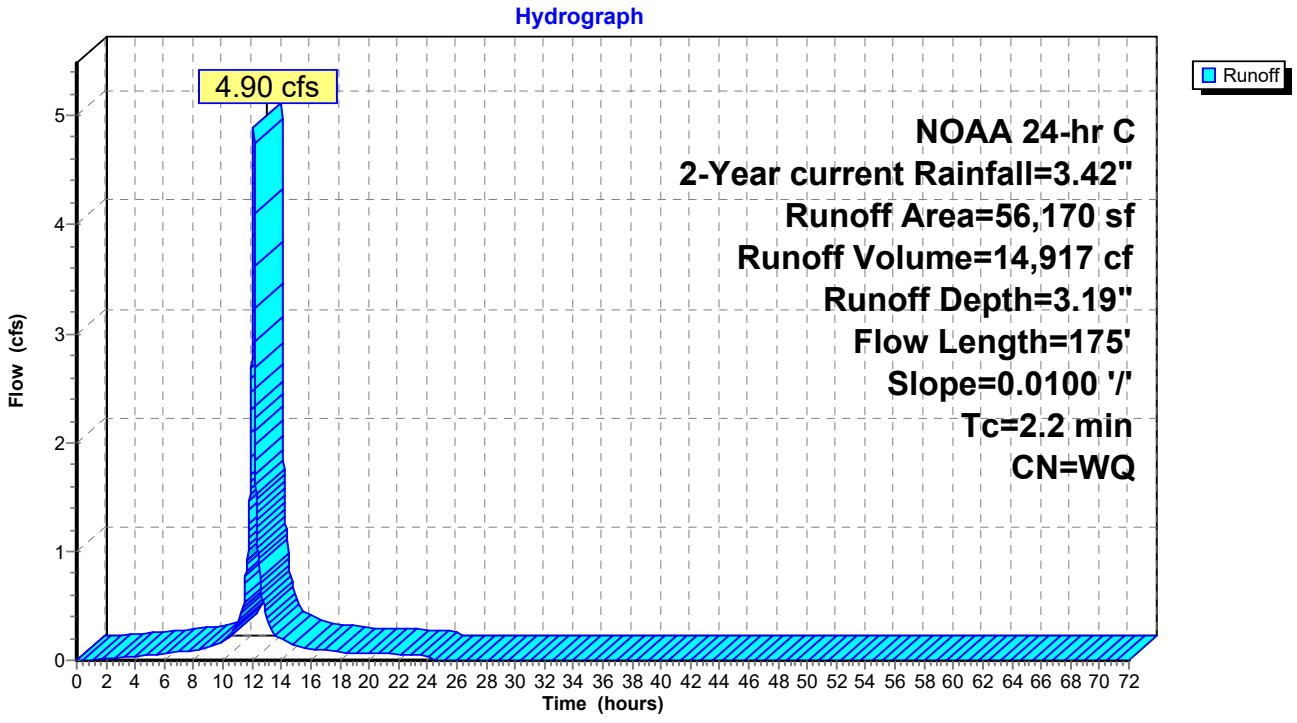
Runoff = 4.90 cfs @ 12.11 hrs, Volume= 14,917 cf, Depth= 3.19"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

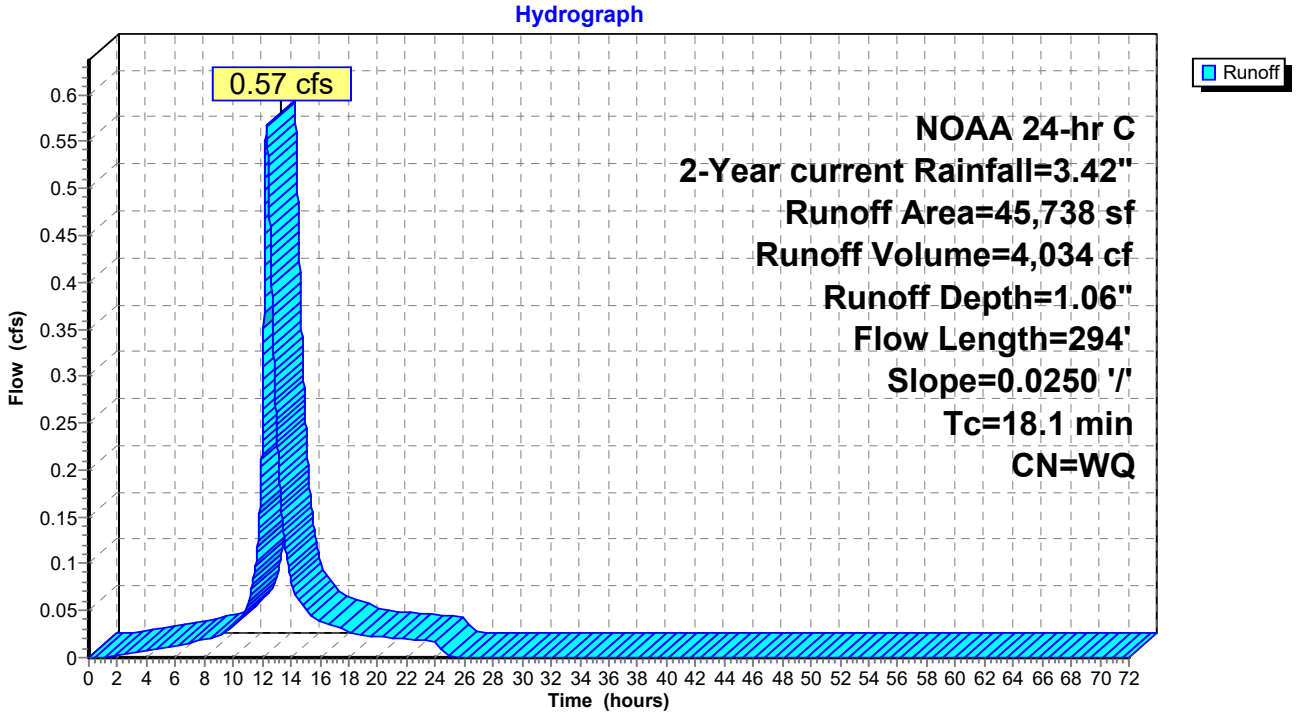
Runoff = 0.57 cfs @ 12.31 hrs, Volume= 4,034 cf, Depth= 1.06"
Routed to Link 6L : Discharge point 3 post

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

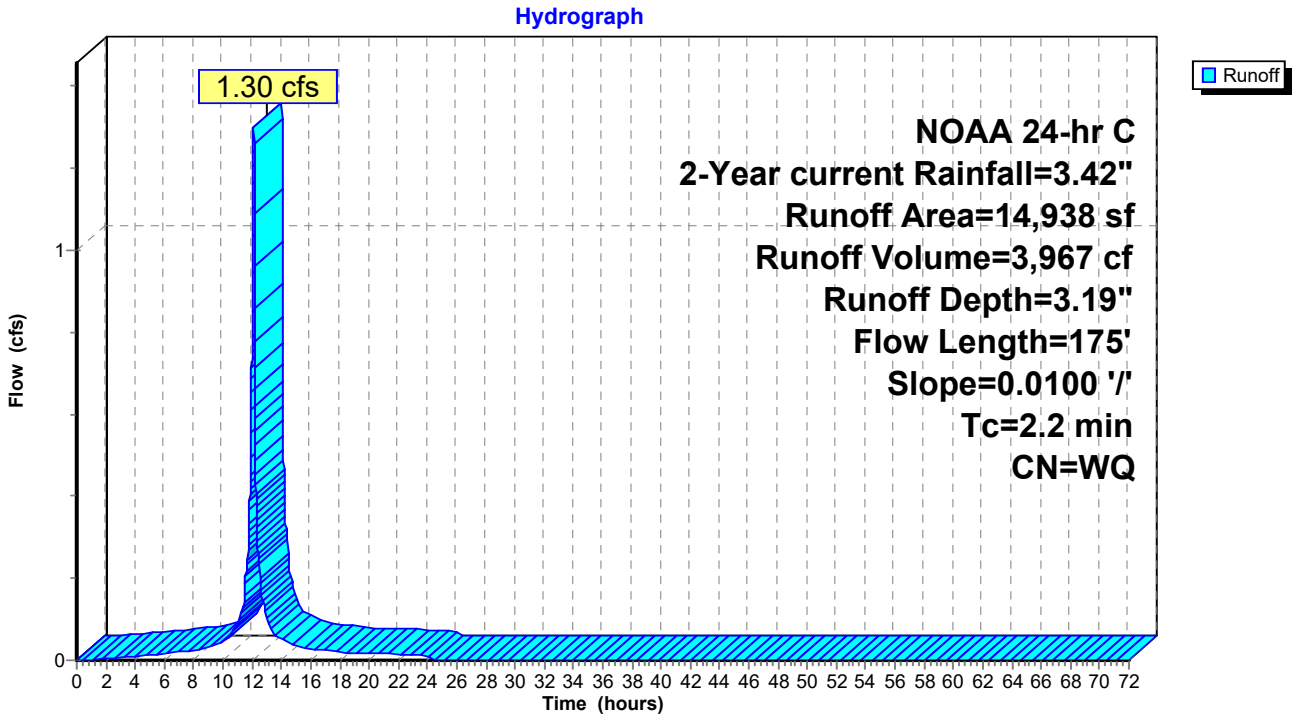
Runoff = 1.30 cfs @ 12.11 hrs, Volume= 3,967 cf, Depth= 3.19"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

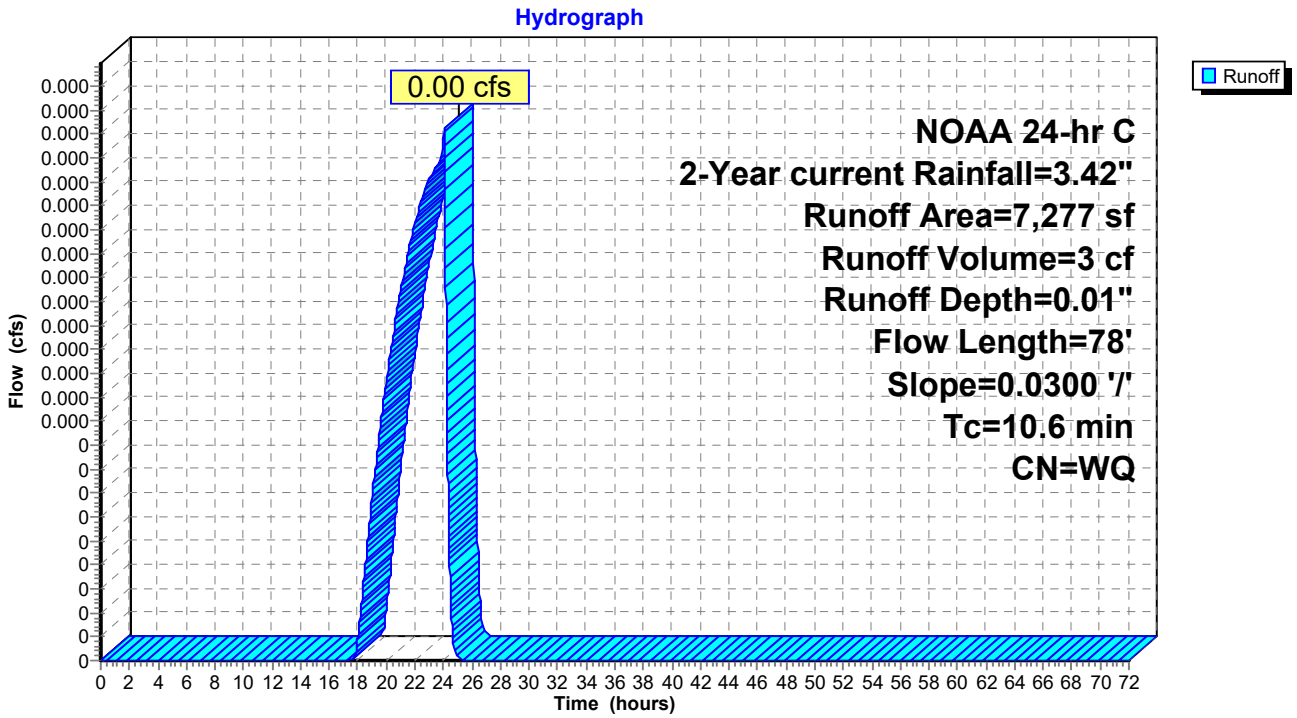
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 3 cf, Depth= 0.01"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

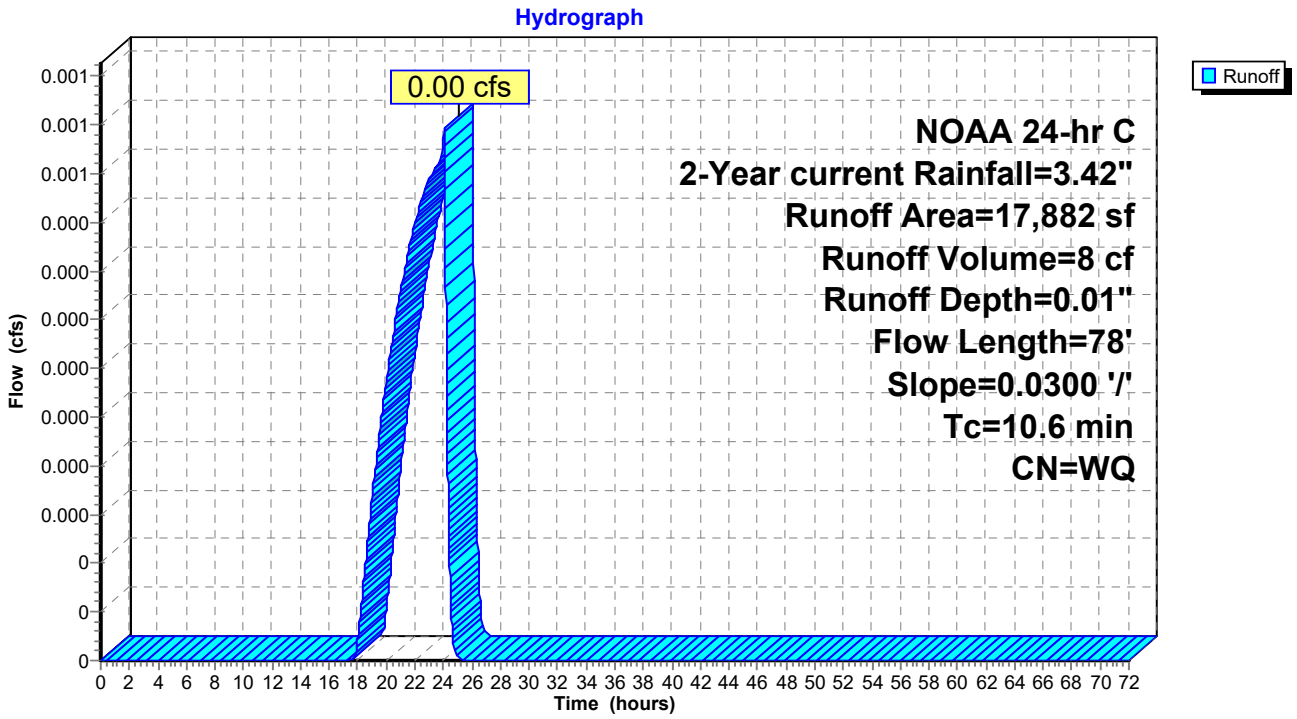
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 8 cf, Depth= 0.01"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

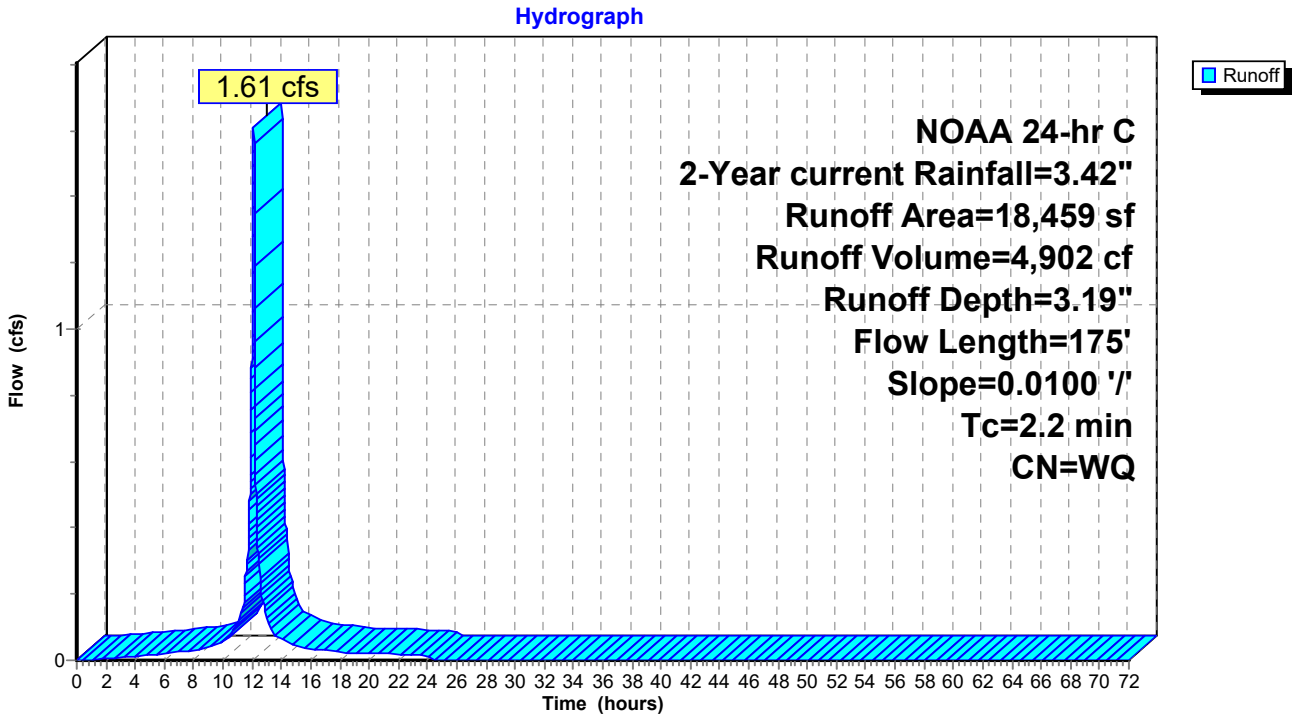
Runoff = 1.61 cfs @ 12.11 hrs, Volume= 4,902 cf, Depth= 3.19"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

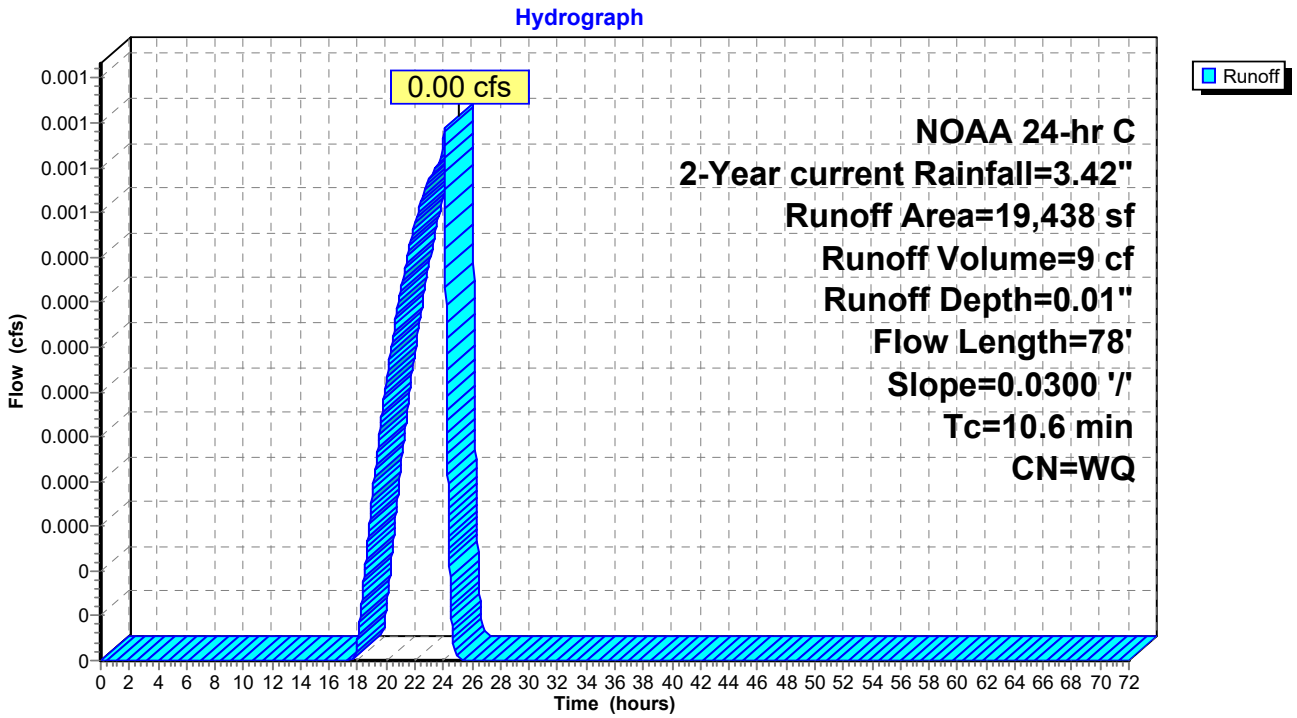
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 9 cf, Depth= 0.01"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

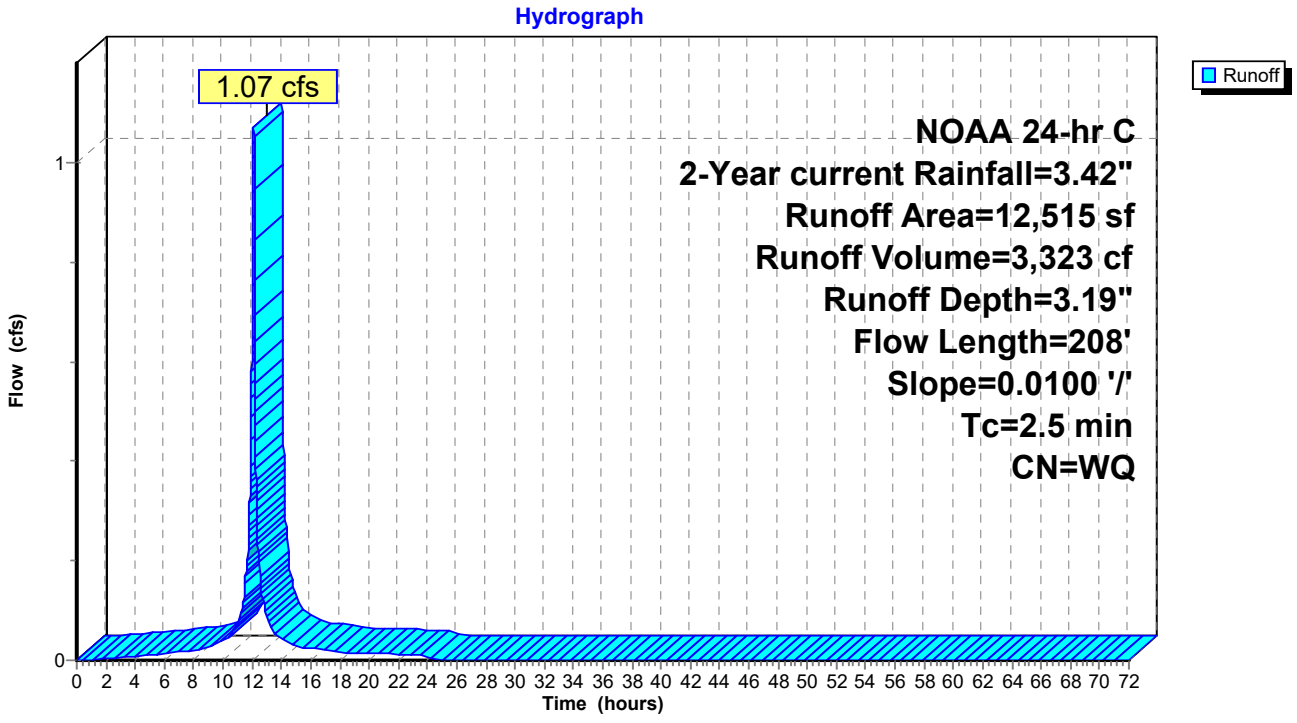
Runoff = 1.07 cfs @ 12.11 hrs, Volume= 3,323 cf, Depth= 3.19"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

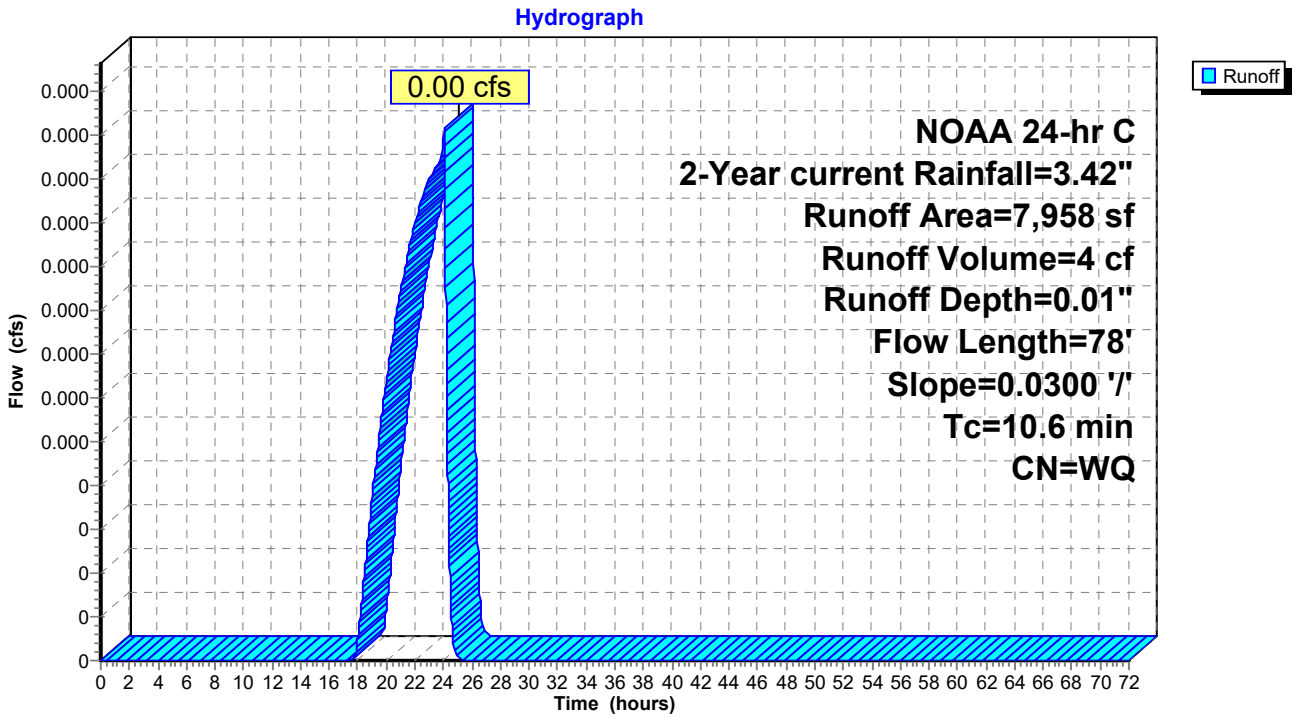
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 4 cf, Depth= 0.01"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

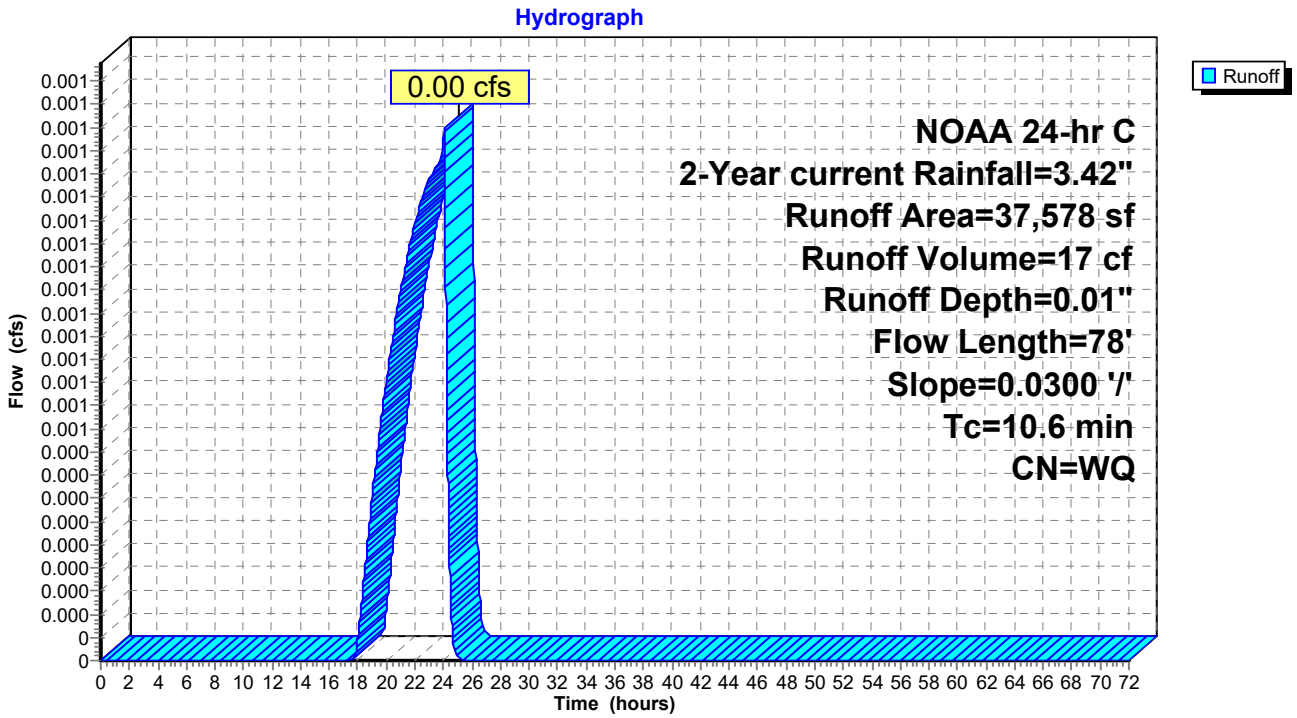
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 17 cf, Depth= 0.01"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

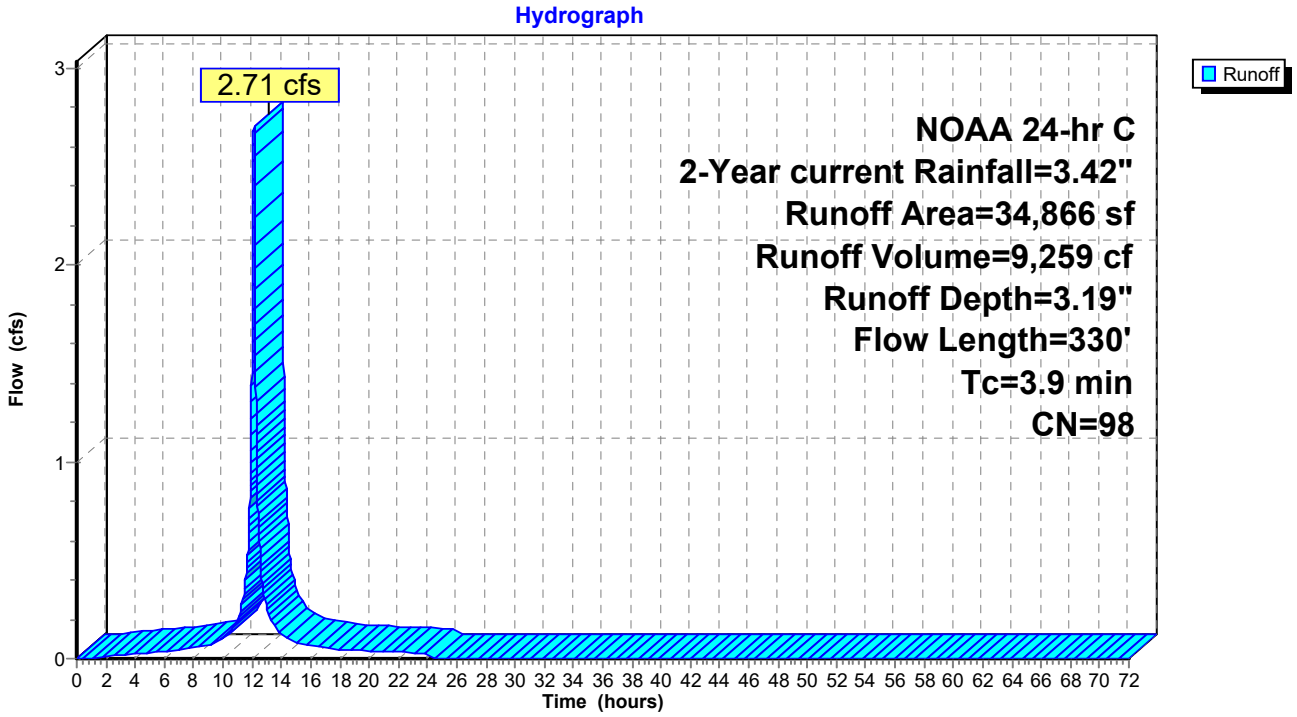
Runoff = 2.71 cfs @ 12.12 hrs, Volume= 9,259 cf, Depth= 3.19"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

[45] Hint: Runoff=Zero

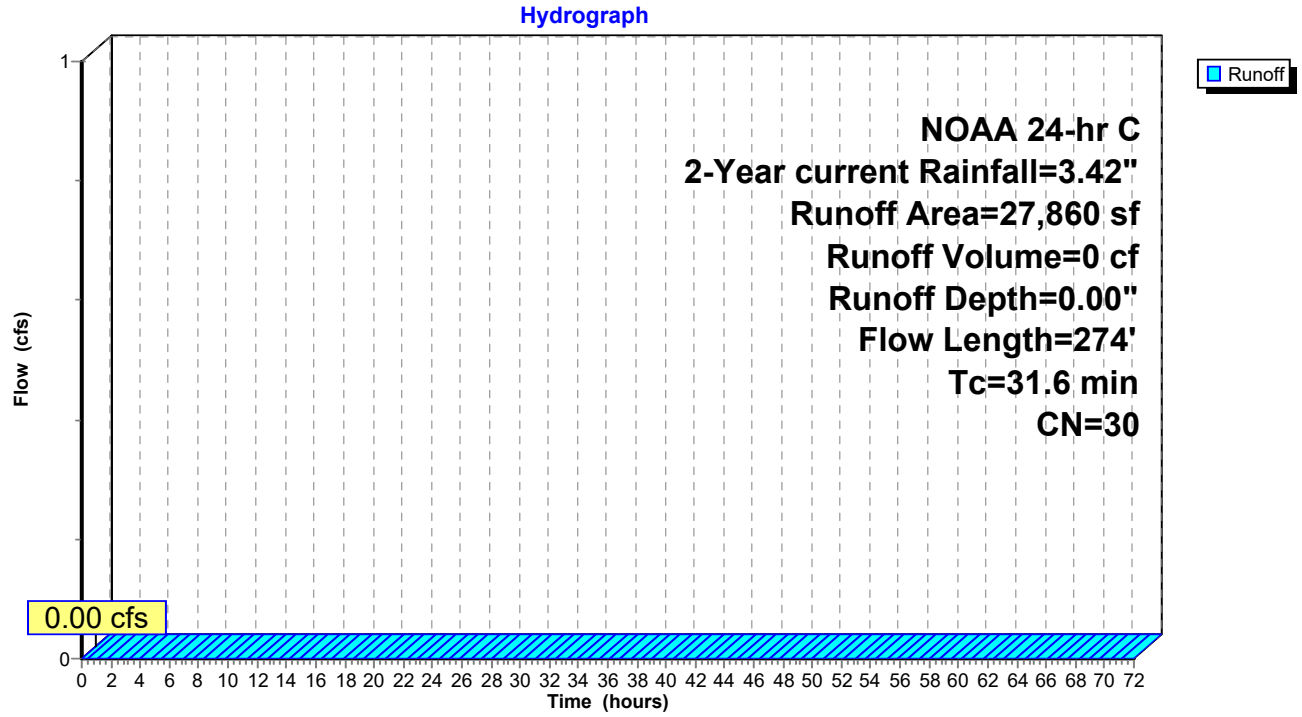
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

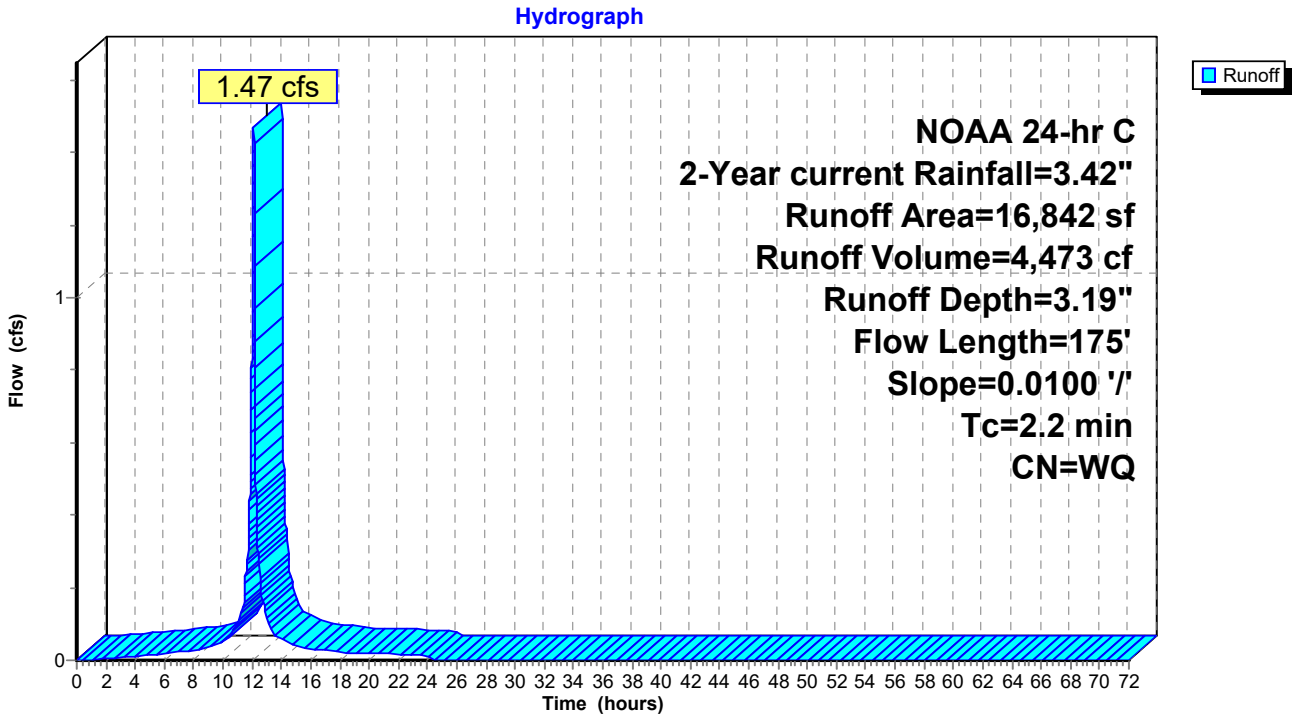
Runoff = 1.47 cfs @ 12.11 hrs, Volume= 4,473 cf, Depth= 3.19"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

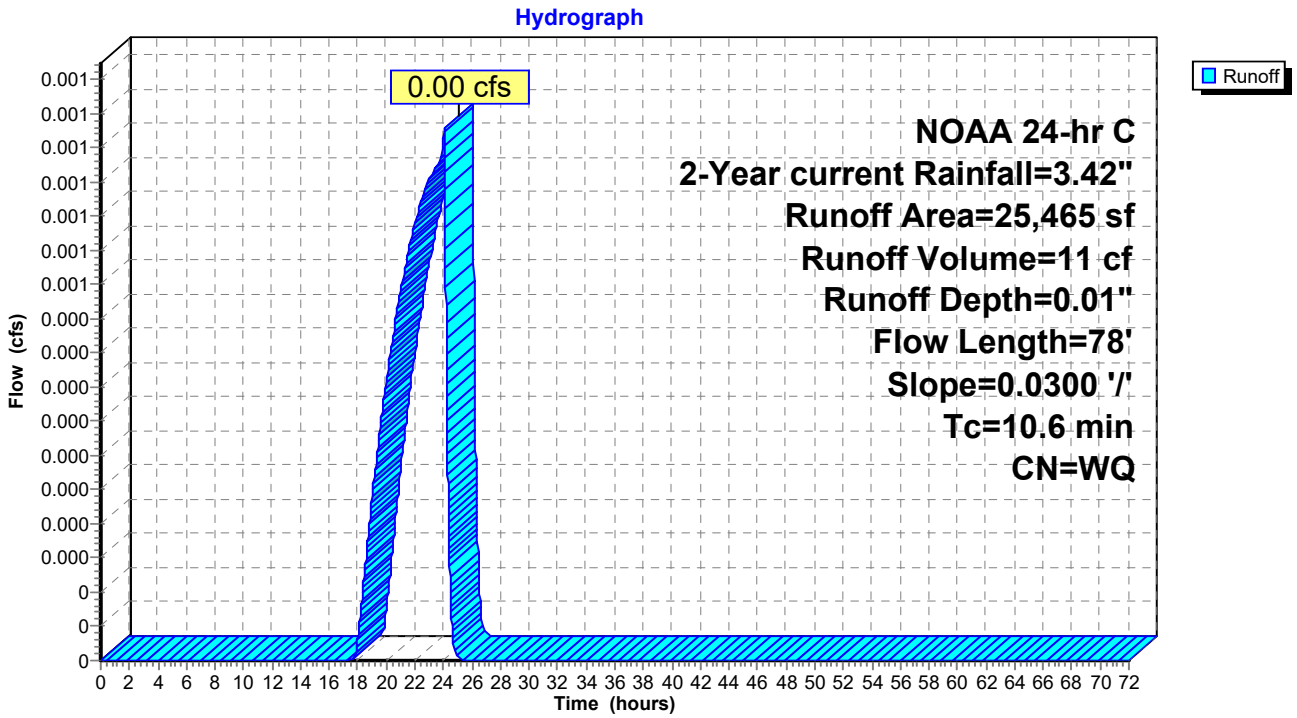
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 11 cf, Depth= 0.01"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

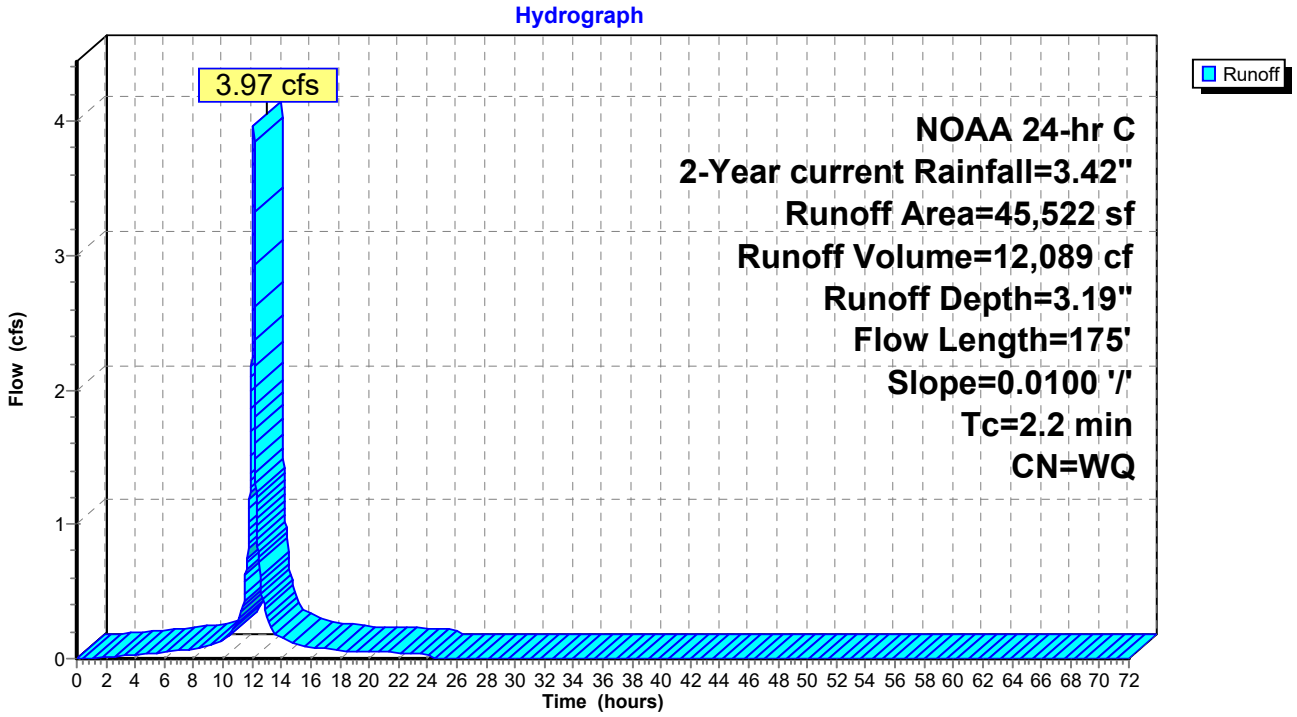
Runoff = 3.97 cfs @ 12.11 hrs, Volume= 12,089 cf, Depth= 3.19"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

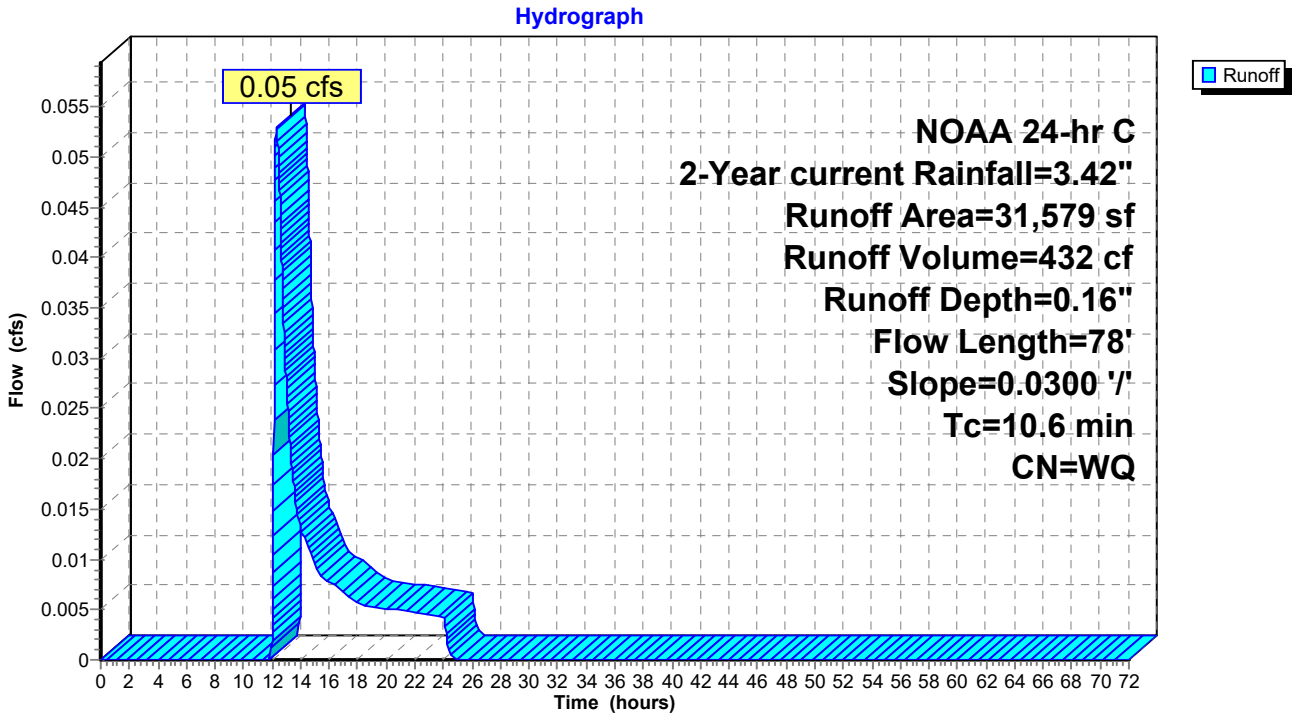
Runoff = 0.05 cfs @ 12.31 hrs, Volume= 432 cf, Depth= 0.16"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

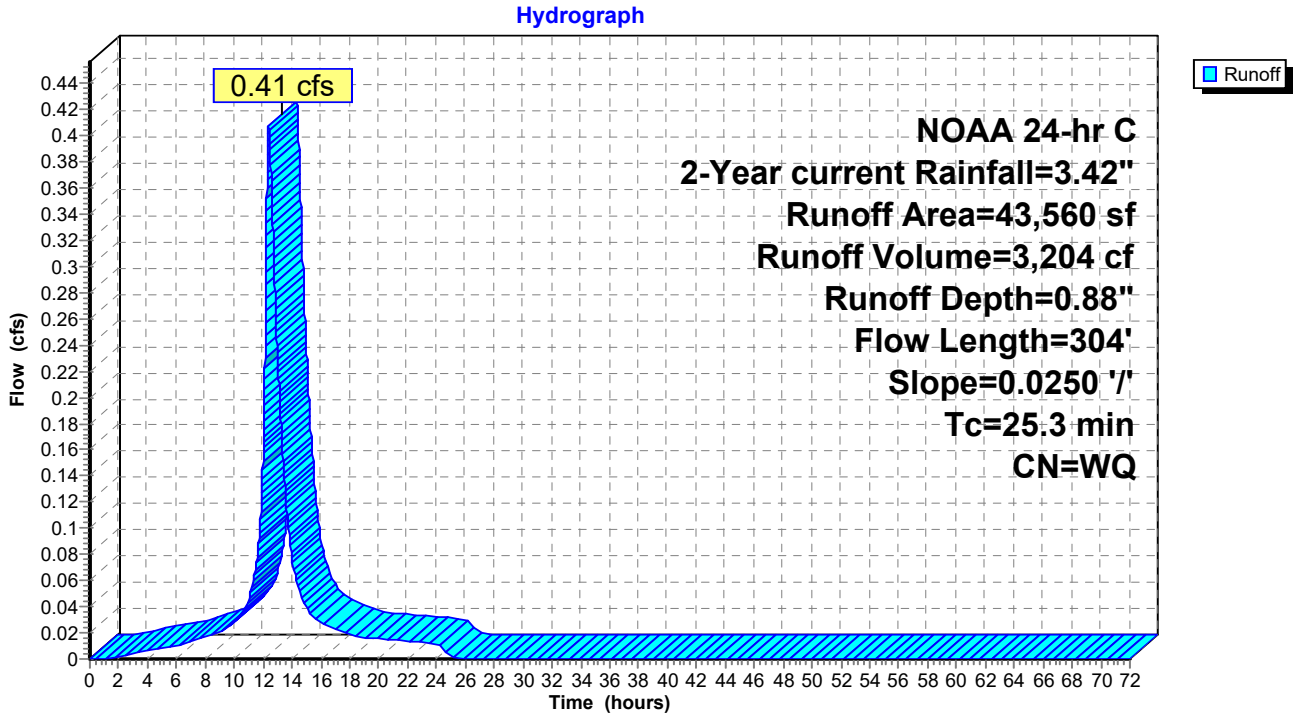
Runoff = 0.41 cfs @ 12.37 hrs, Volume= 3,204 cf, Depth= 0.88"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

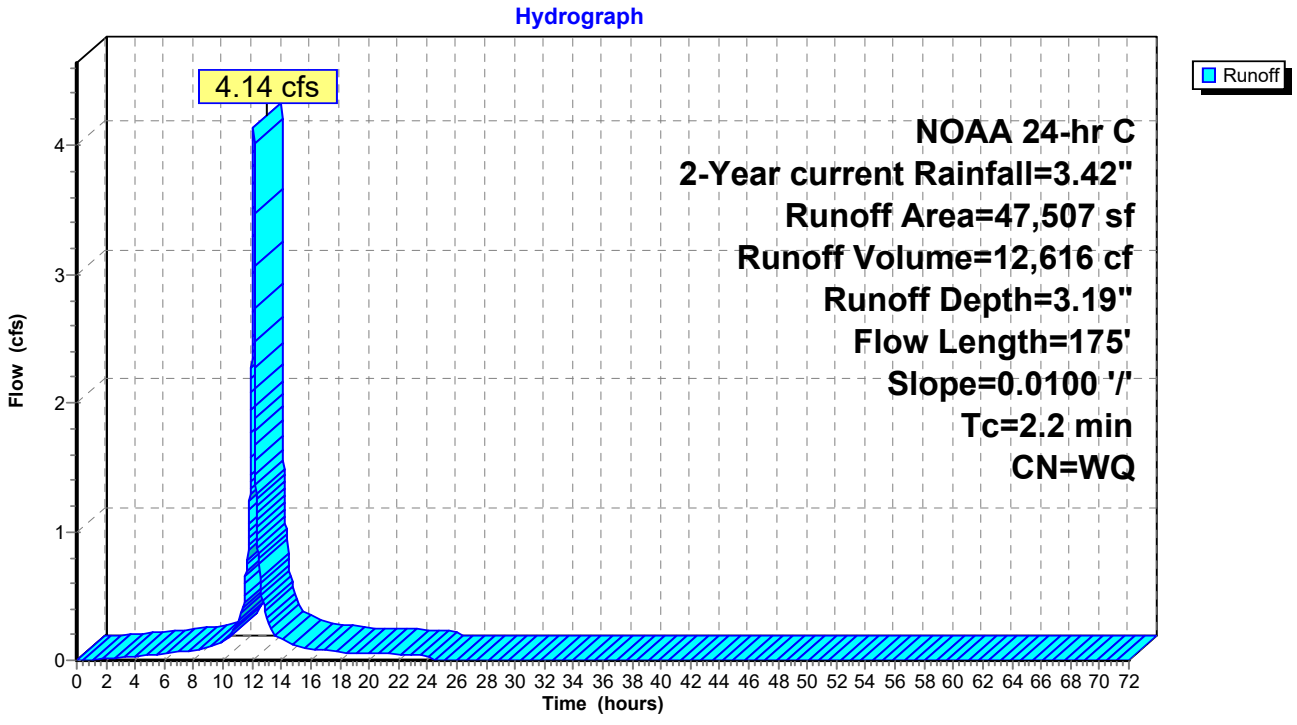
Runoff = 4.14 cfs @ 12.11 hrs, Volume= 12,616 cf, Depth= 3.19"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

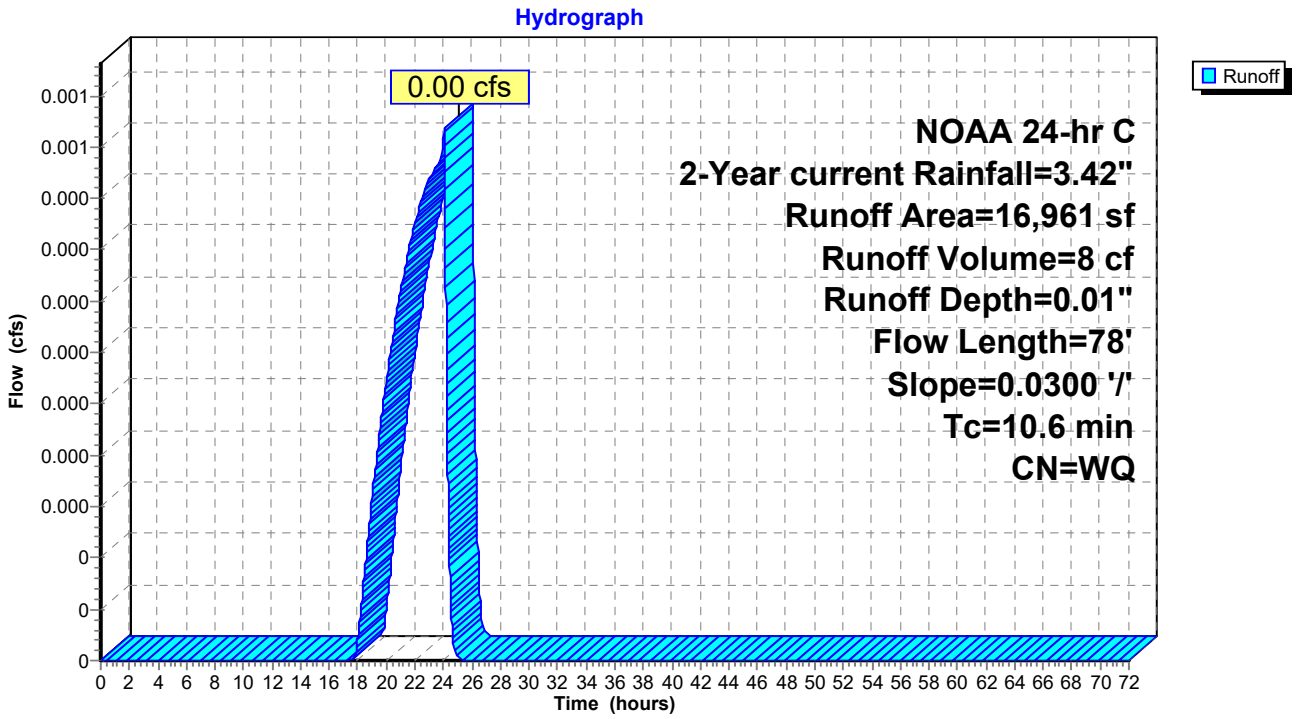
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 8 cf, Depth= 0.01"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

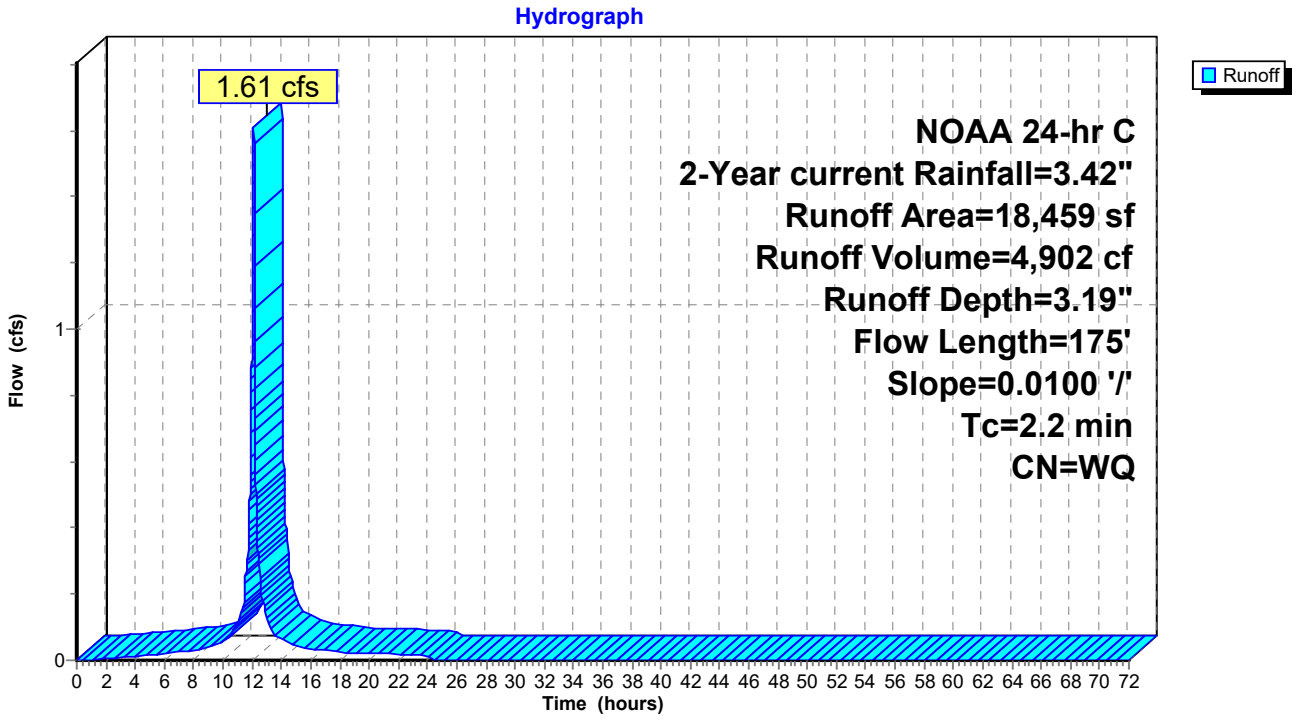
Runoff = 1.61 cfs @ 12.11 hrs, Volume= 4,902 cf, Depth= 3.19"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

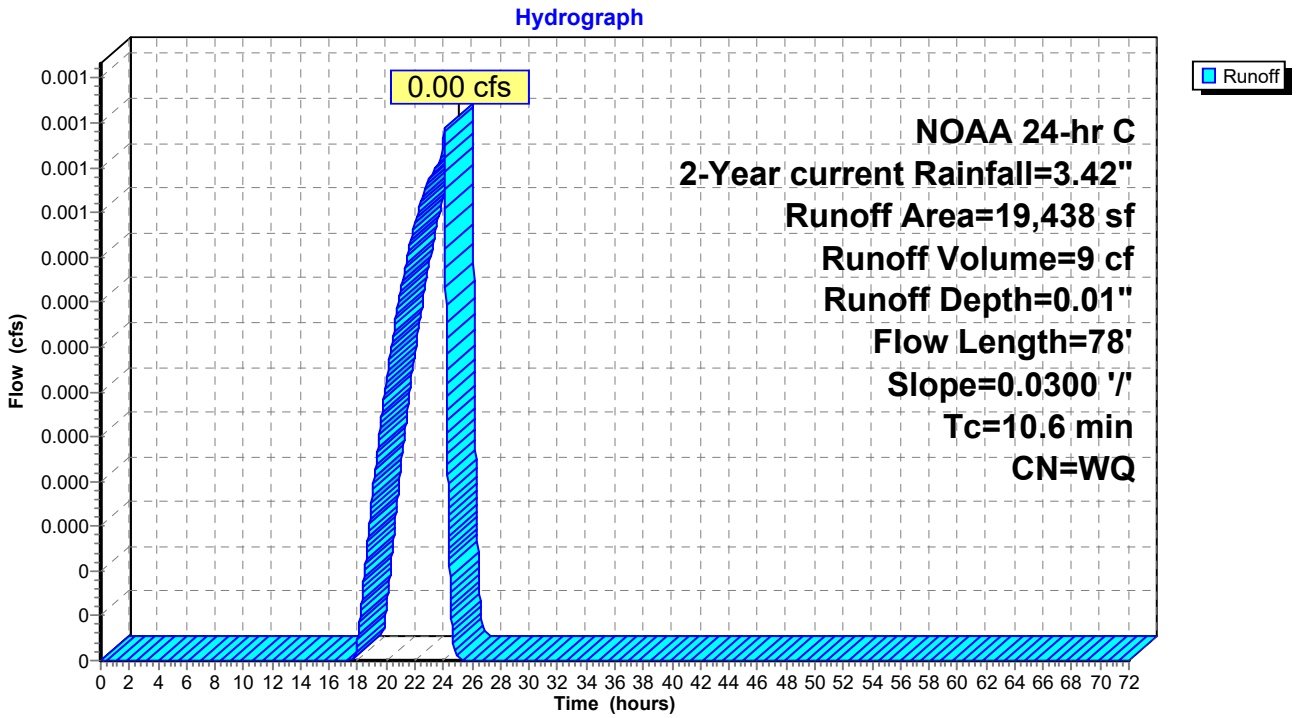
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 9 cf, Depth= 0.01"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

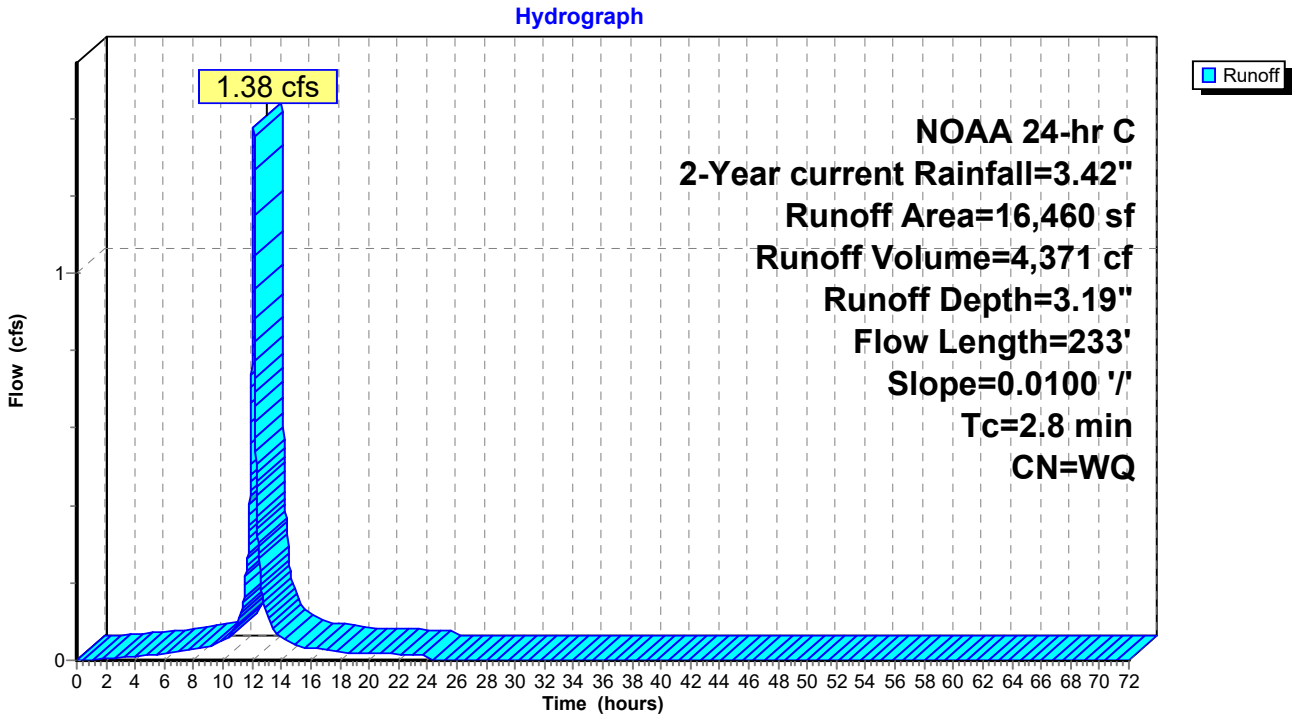
Runoff = 1.38 cfs @ 12.11 hrs, Volume= 4,371 cf, Depth= 3.19"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

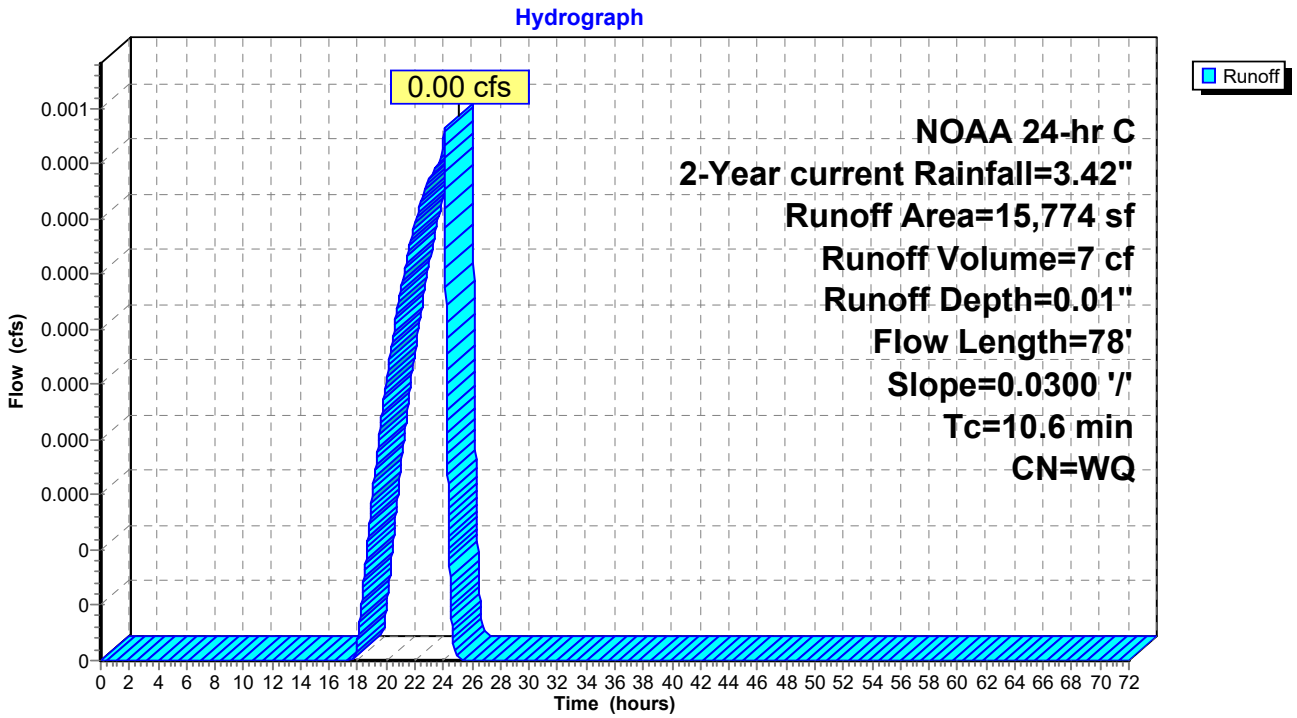
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 7 cf, Depth= 0.01"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

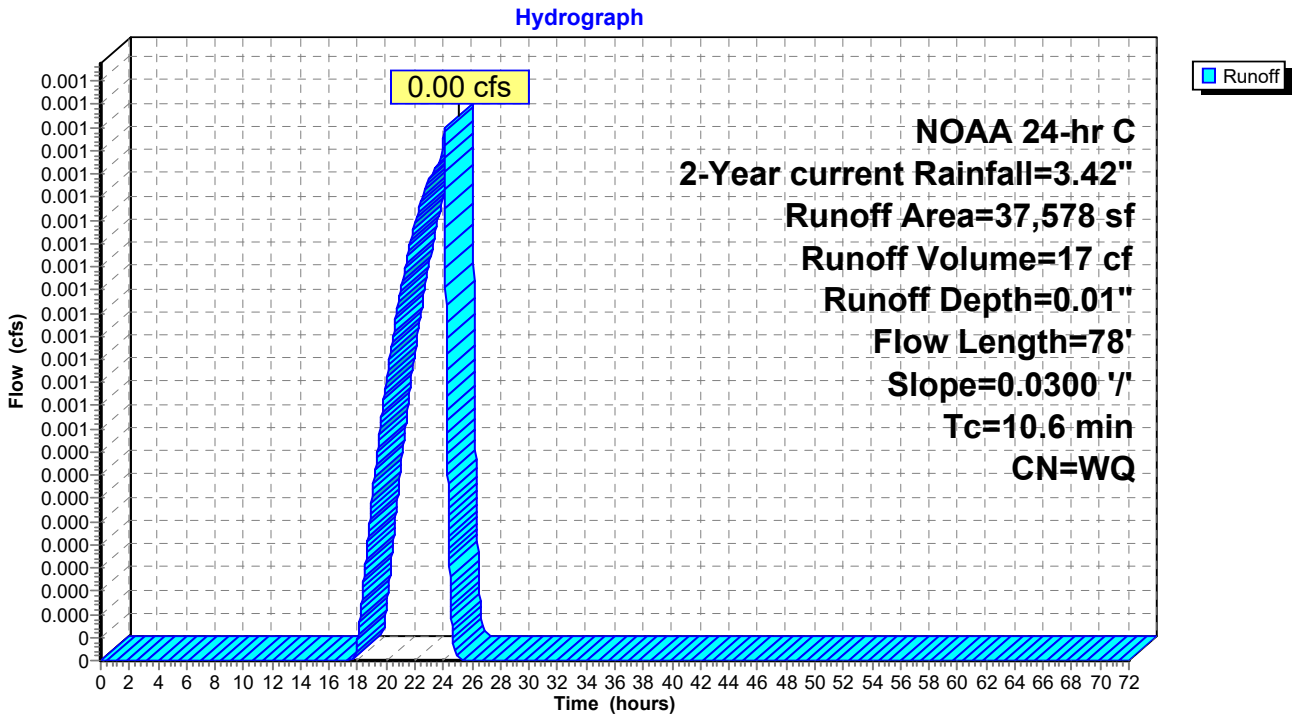
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 17 cf, Depth= 0.01"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

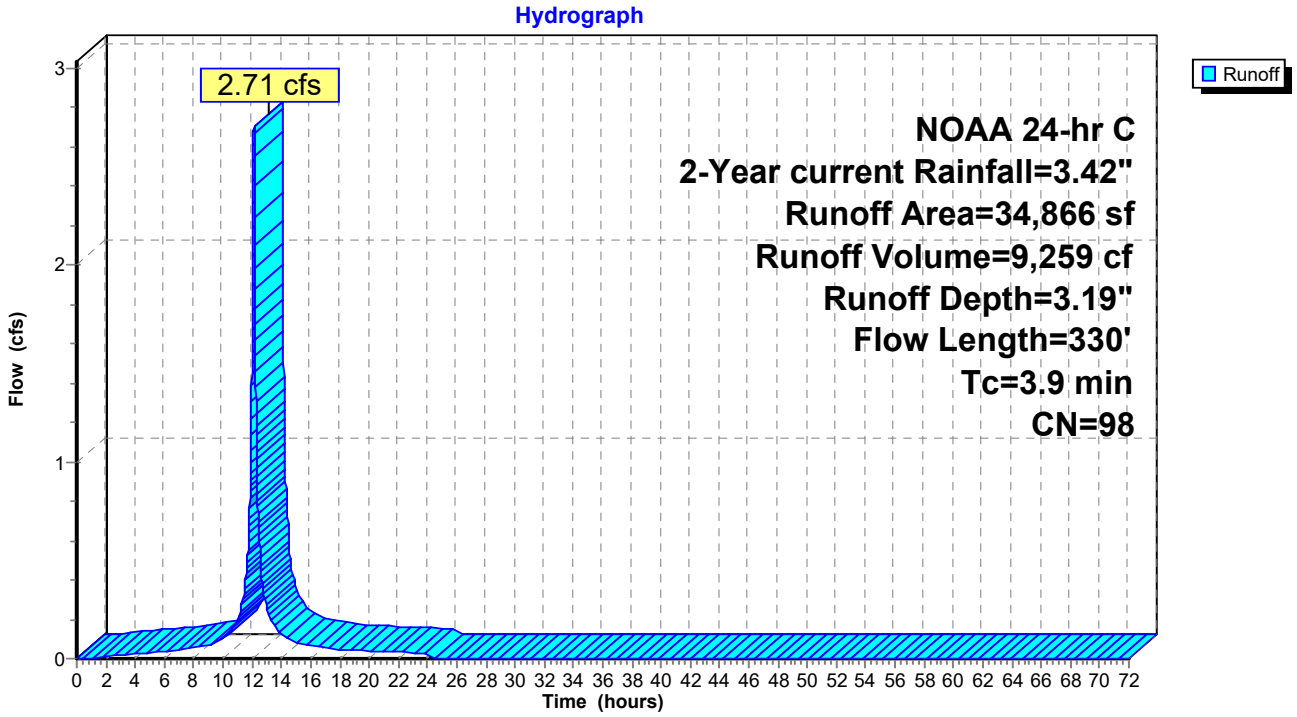
Runoff = 2.71 cfs @ 12.12 hrs, Volume= 9,259 cf, Depth= 3.19"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

[45] Hint: Runoff=Zero

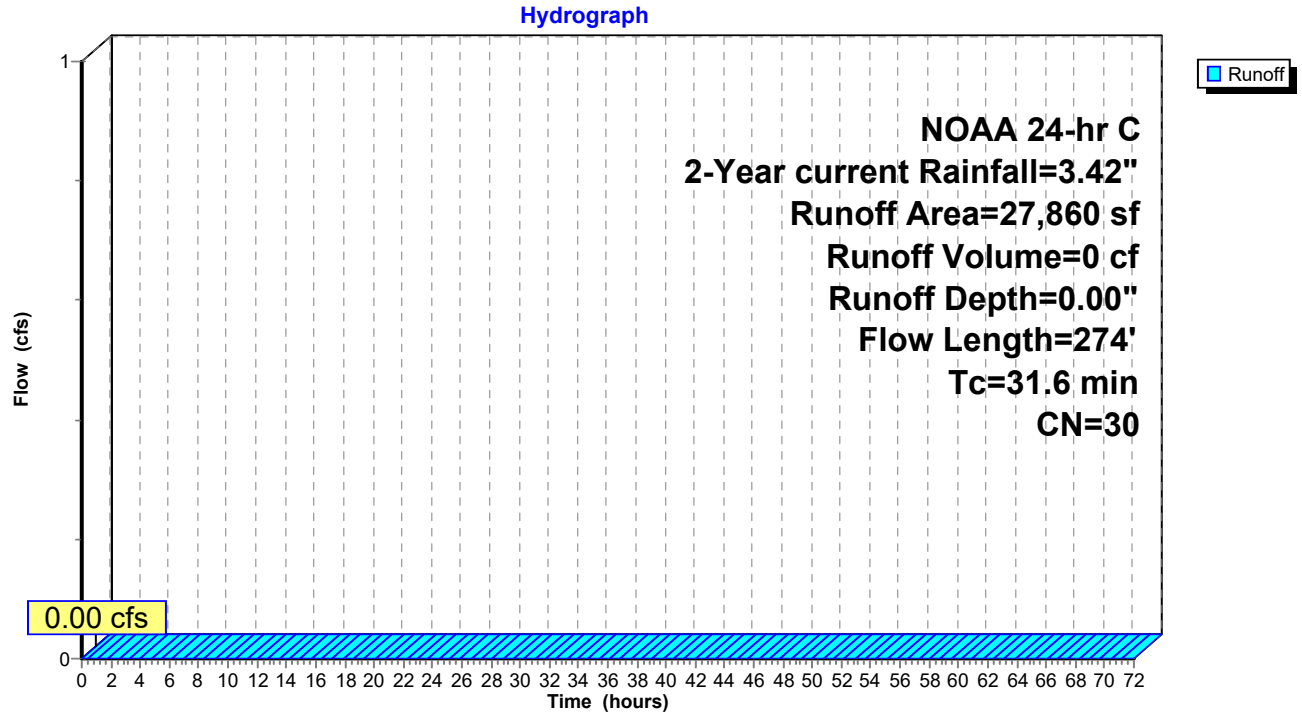
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

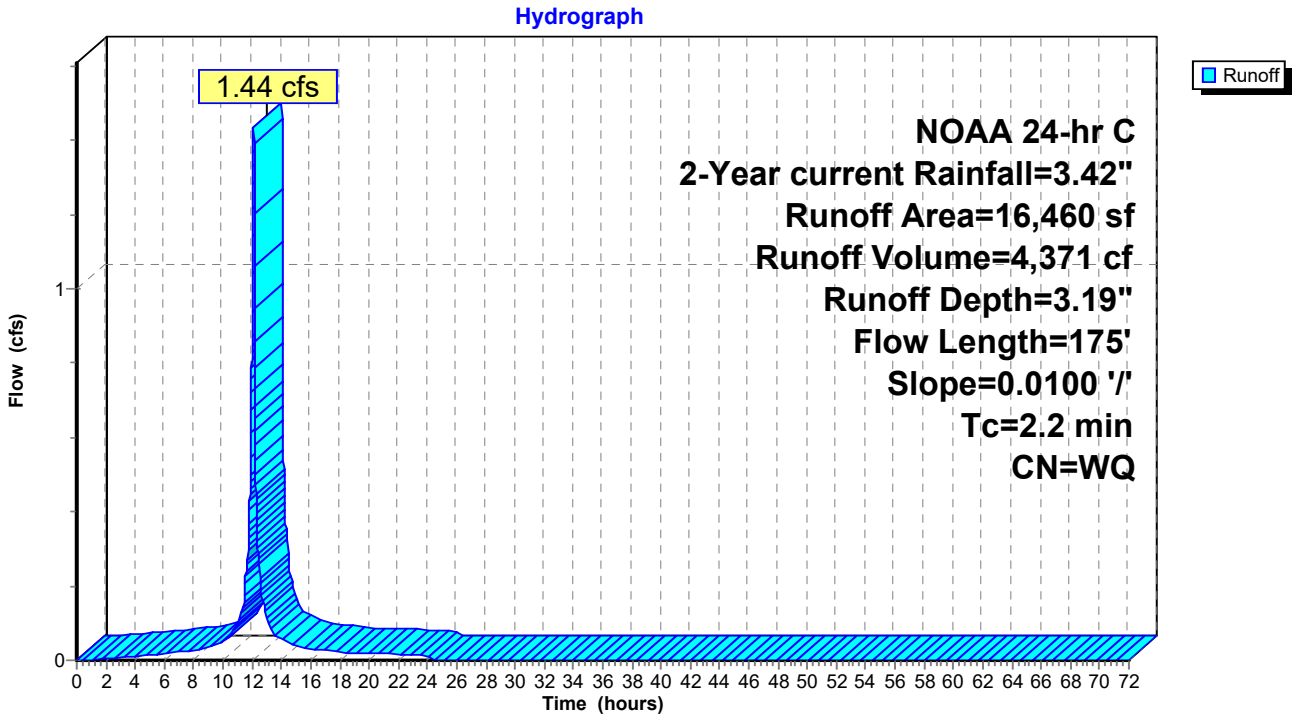
Runoff = 1.44 cfs @ 12.11 hrs, Volume= 4,371 cf, Depth= 3.19"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

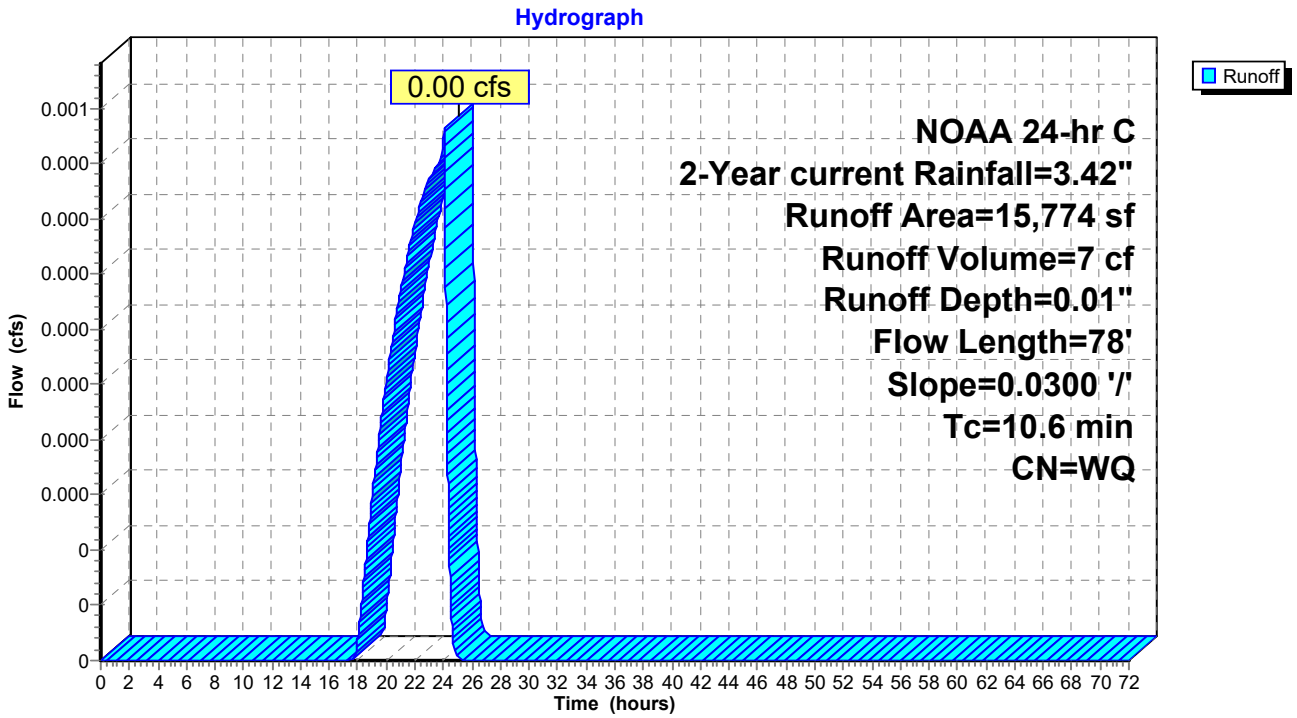
Runoff = 0.00 cfs @ 24.05 hrs, Volume= 7 cf, Depth= 0.01"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

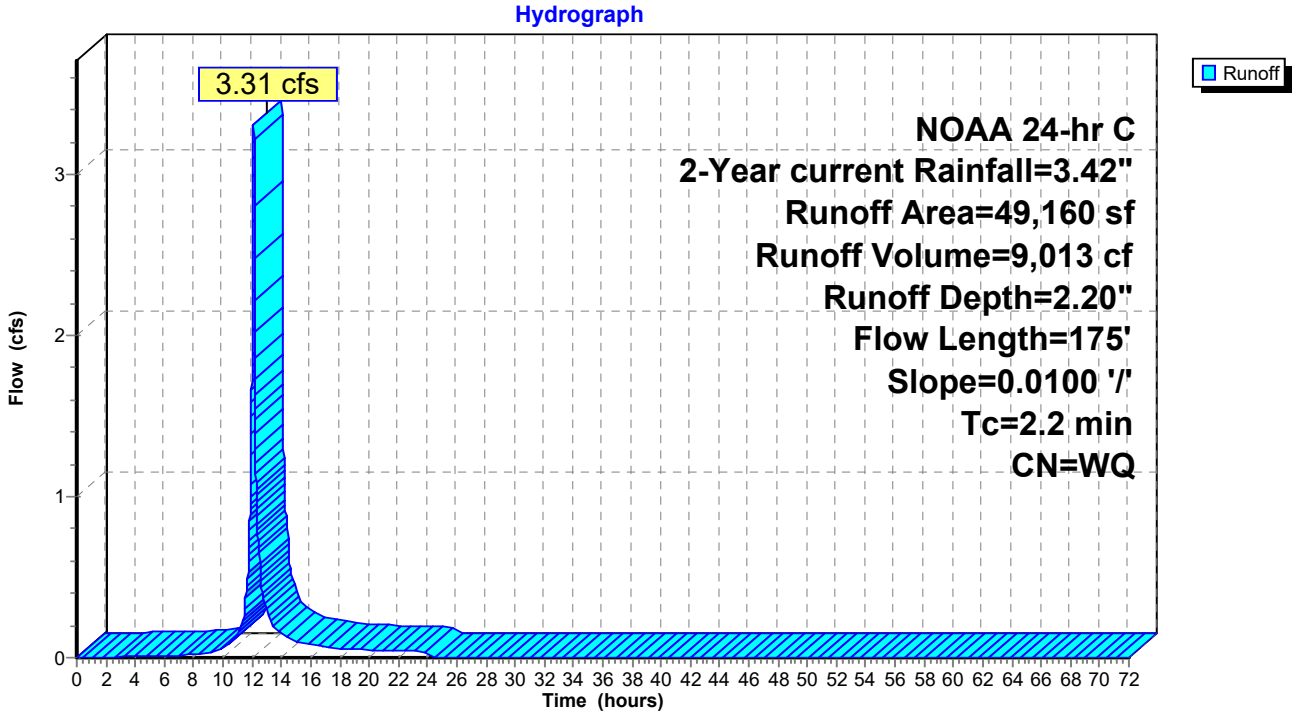
Runoff = 3.31 cfs @ 12.11 hrs, Volume= 9,013 cf, Depth= 2.20"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

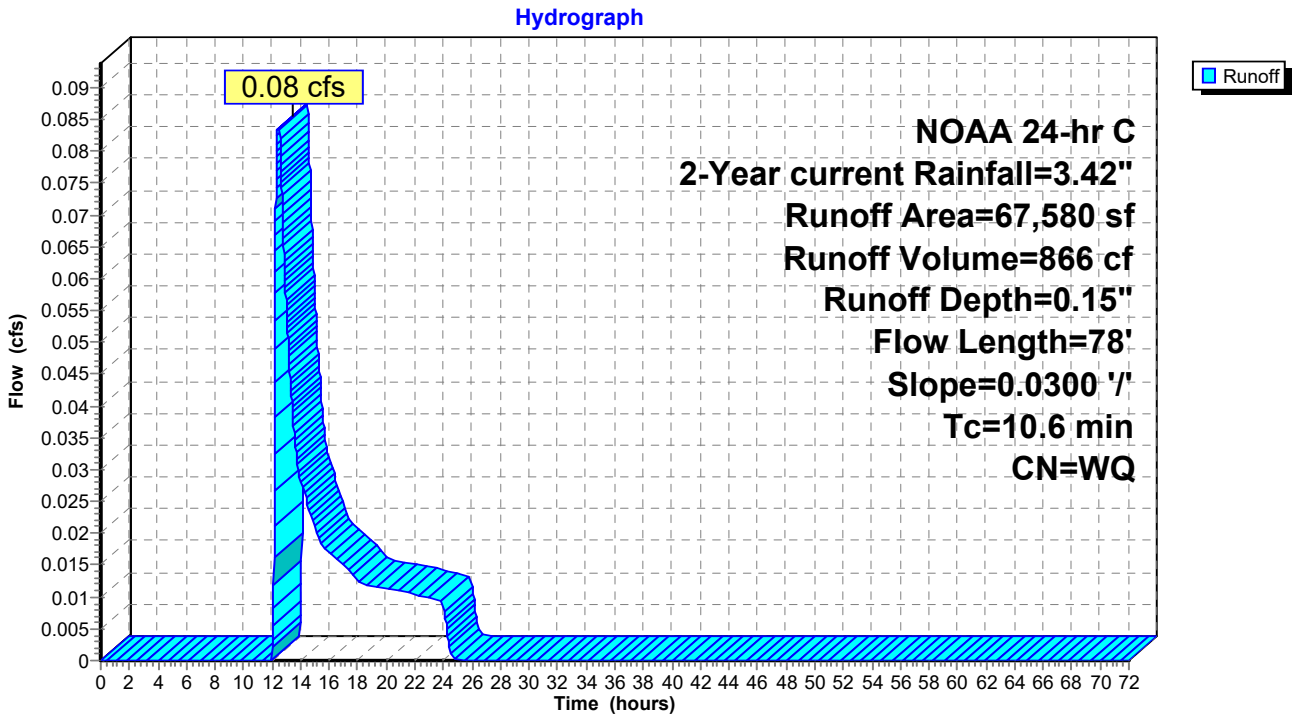
Runoff = 0.08 cfs @ 12.41 hrs, Volume= 866 cf, Depth= 0.15"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year current Rainfall=3.42"

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 0.79" for 2-Year current event
Inflow = 4.88 cfs @ 12.12 hrs, Volume= 11,364 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 15.33' @ 25.17 hrs Surf.Area= 14,316 sf Storage= 11,364 cf

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

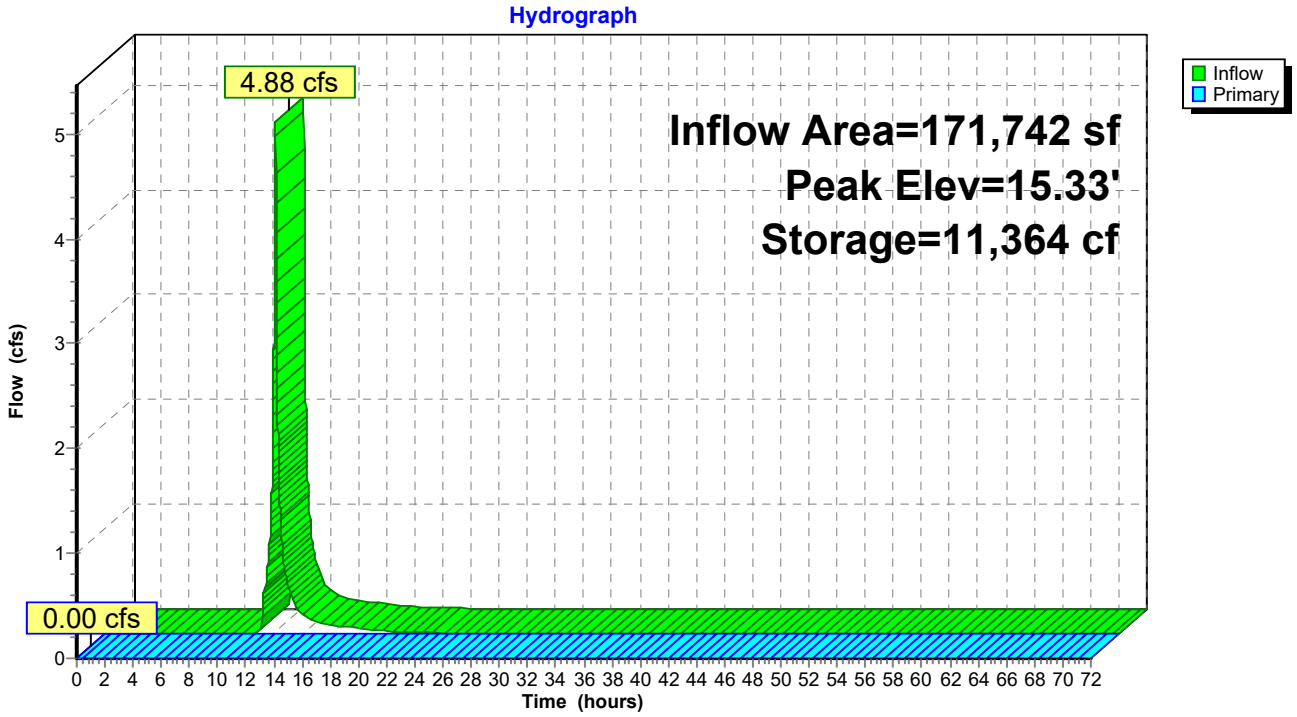
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 0.23" for 2-Year current event
Inflow = 1.05 cfs @ 12.39 hrs, Volume= 3,090 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 13.99' @ 15.83 hrs Surf.Area= 3,863 sf Storage= 3,090 cf

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

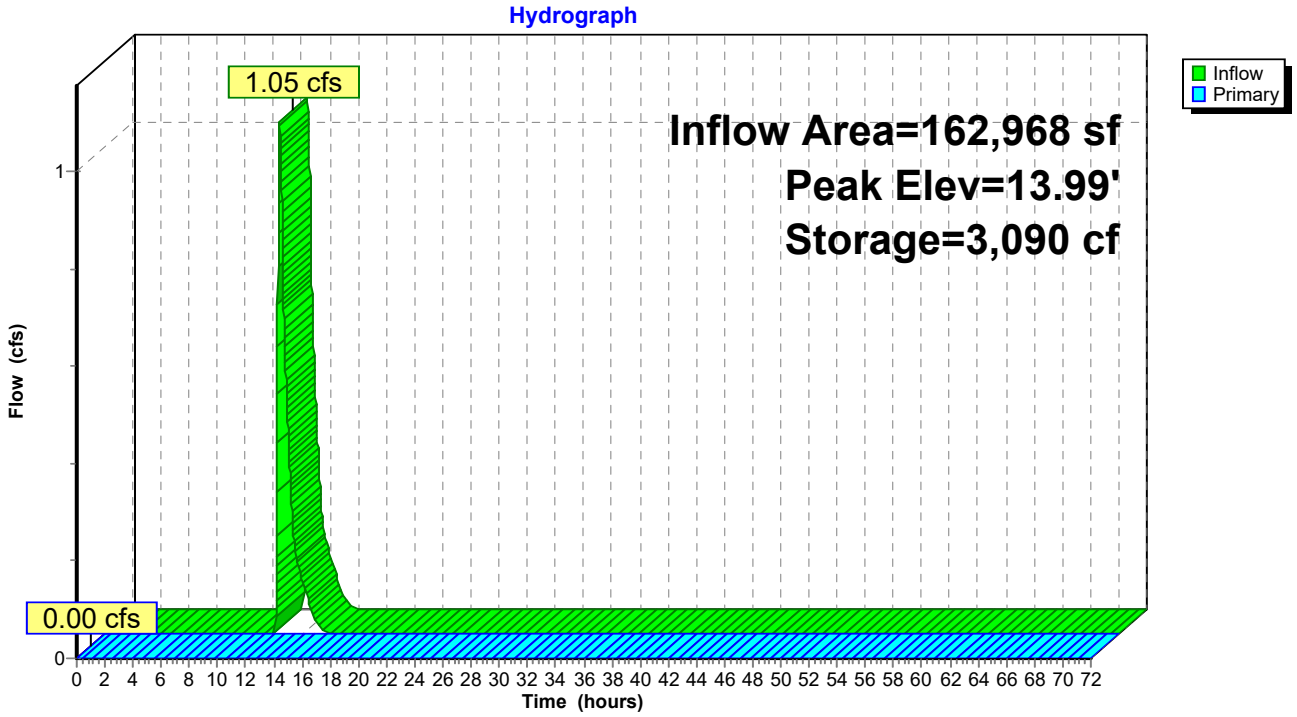
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=13.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 2.14" for 2-Year current event
Inflow = 1.30 cfs @ 12.11 hrs, Volume= 3,970 cf
Outflow = 0.79 cfs @ 12.16 hrs, Volume= 3,970 cf, Atten= 39%, Lag= 3.3 min
Discarded = 0.02 cfs @ 7.75 hrs, Volume= 2,600 cf
Primary = 0.77 cfs @ 12.16 hrs, Volume= 1,370 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.32' @ 12.16 hrs Surf.Area= 1,611 sf Storage= 1,516 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 390.2 min (1,144.6 - 754.4)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

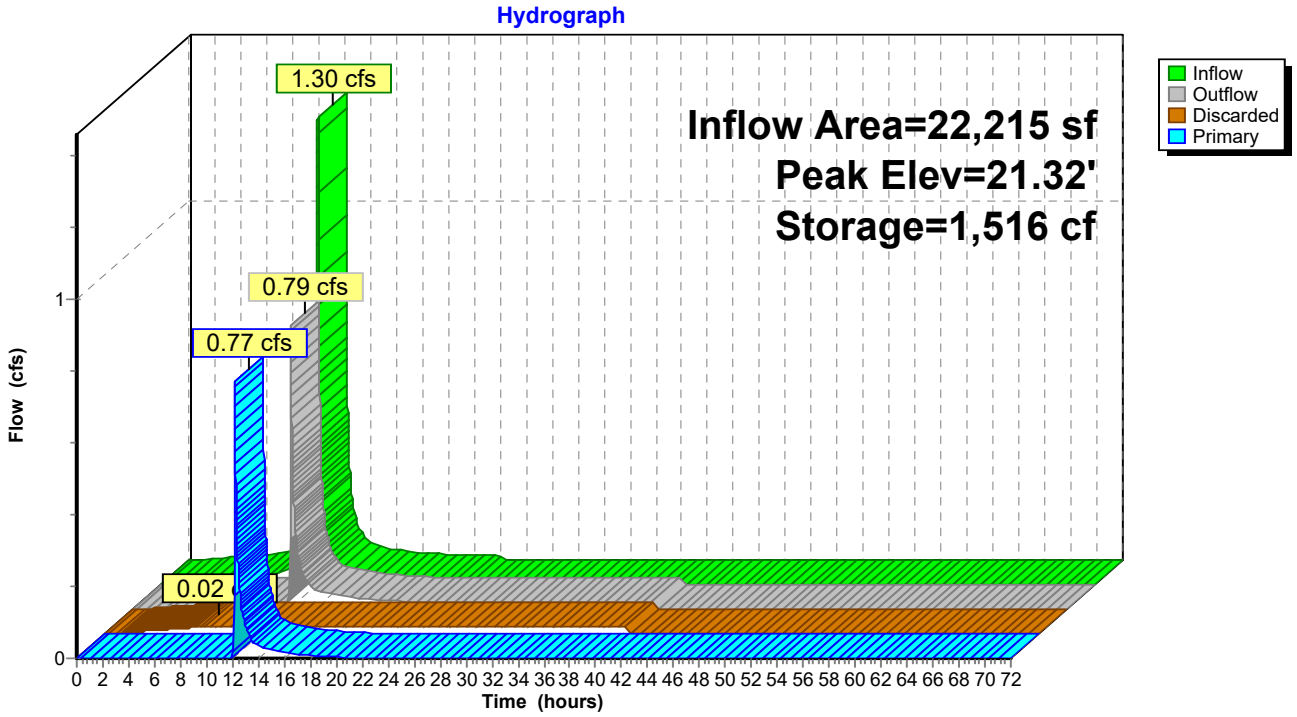
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 7.75 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.77 cfs @ 12.16 hrs HW=21.32' TW=18.49' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.77 cfs of 8.78 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 0.72 cfs @ 0.89 fps)
  └**4=Culvert** (Barrel Controls 0.05 cfs @ 1.47 fps)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 2.03" for 2-Year current event
Inflow = 5.06 cfs @ 12.11 hrs, Volume= 16,295 cf
Outflow = 4.93 cfs @ 12.12 hrs, Volume= 16,295 cf, Atten= 3%, Lag= 0.5 min
Discarded = 0.05 cfs @ 6.24 hrs, Volume= 4,947 cf
Primary = 4.88 cfs @ 12.12 hrs, Volume= 11,348 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.51' @ 12.12 hrs Surf.Area= 1,887 sf Storage= 1,868 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 87.8 min (846.1 - 758.3)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

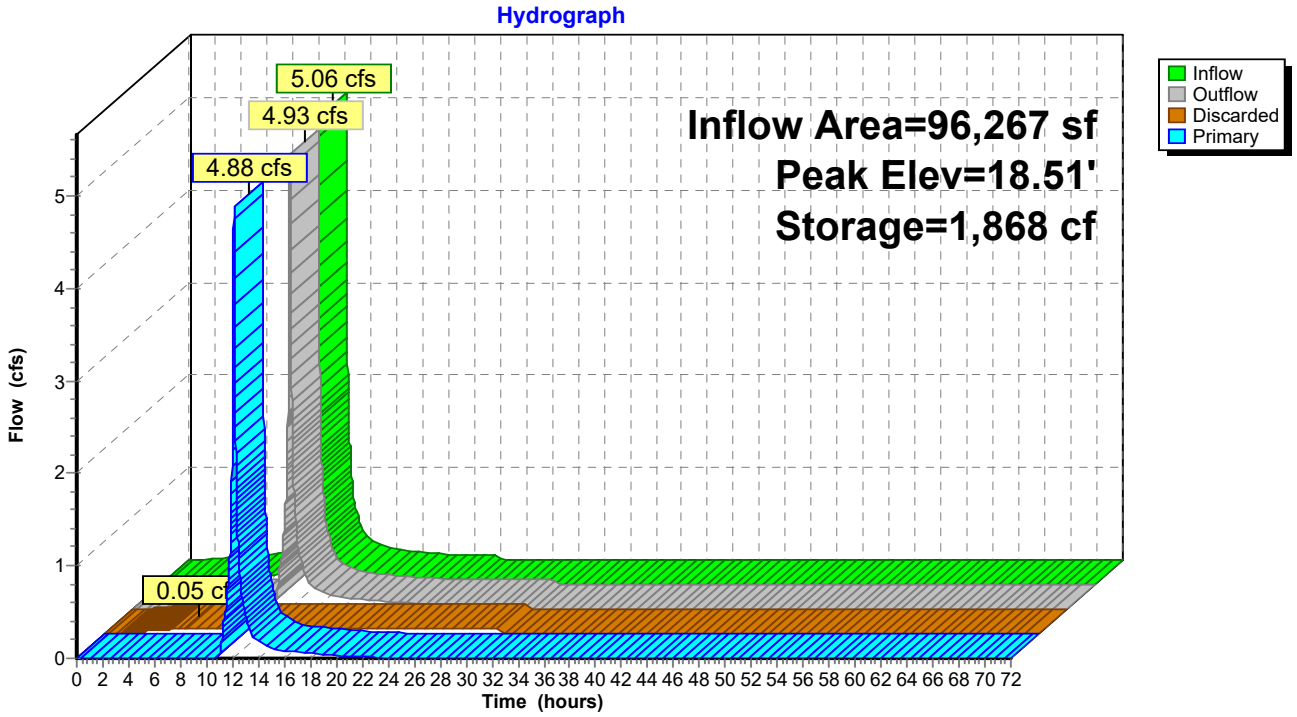
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 6.24 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=4.87 cfs @ 12.12 hrs HW=18.51' TW=14.79' (Dynamic Tailwater)
├**2=Culvert** (Passes 4.74 cfs of 20.77 cfs potential flow)
│ └**1=Orifice/Grate** (Weir Controls 4.74 cfs @ 1.50 fps)
└**3=Culvert** (Inlet Controls 0.13 cfs @ 2.60 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=526)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 1.55" for 2-Year current event
Inflow = 1.61 cfs @ 12.11 hrs, Volume= 4,911 cf
Outflow = 0.36 cfs @ 11.94 hrs, Volume= 4,911 cf, Atten= 78%, Lag= 0.0 min
Discarded = 0.36 cfs @ 11.94 hrs, Volume= 4,911 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.11' @ 12.35 hrs Surf.Area= 8,709 sf Storage= 903 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.4 min (766.3 - 754.9)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

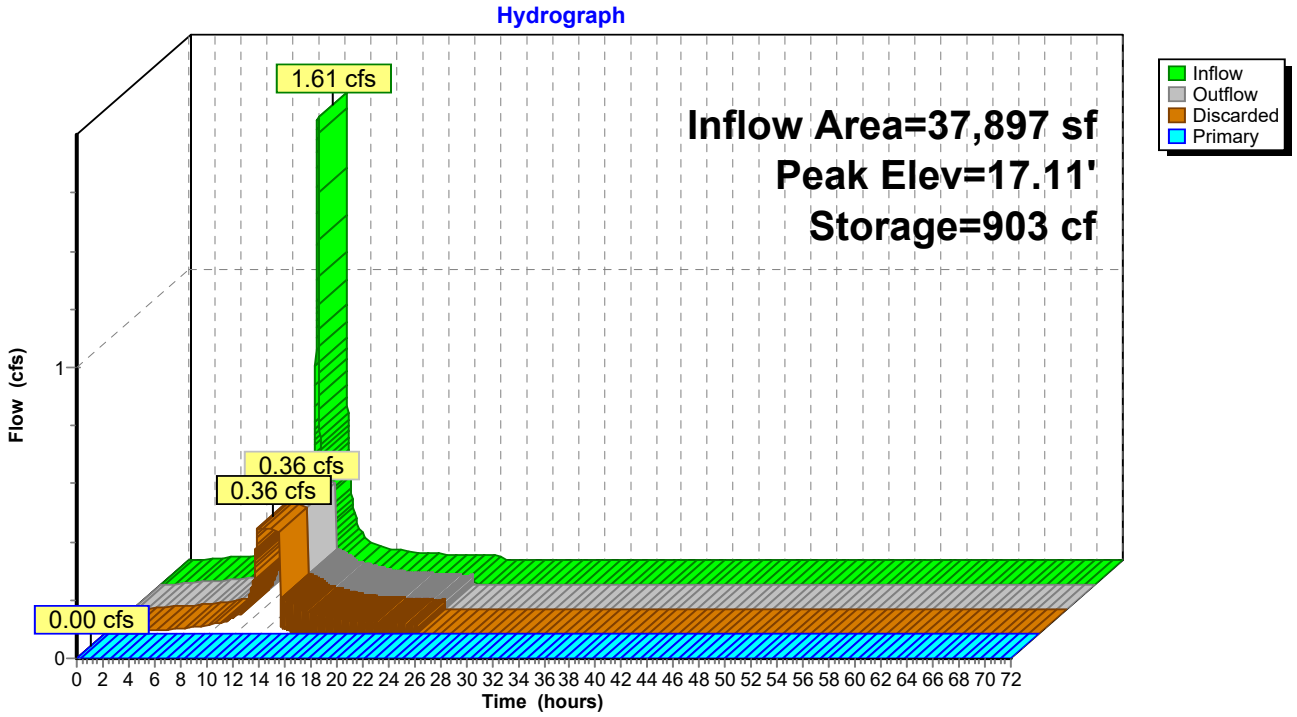
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 11.94 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.00' TW=14.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 9.33 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=429)

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 1.27" for 2-Year current event
Inflow = 1.47 cfs @ 12.11 hrs, Volume= 4,484 cf
Outflow = 0.21 cfs @ 12.56 hrs, Volume= 4,486 cf, Atten= 86%, Lag= 27.0 min
Discarded = 0.18 cfs @ 11.70 hrs, Volume= 4,378 cf
Primary = 0.03 cfs @ 12.56 hrs, Volume= 108 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 23.49' @ 12.56 hrs Surf.Area= 2,977 sf Storage= 1,247 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 37.1 min (792.5 - 755.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

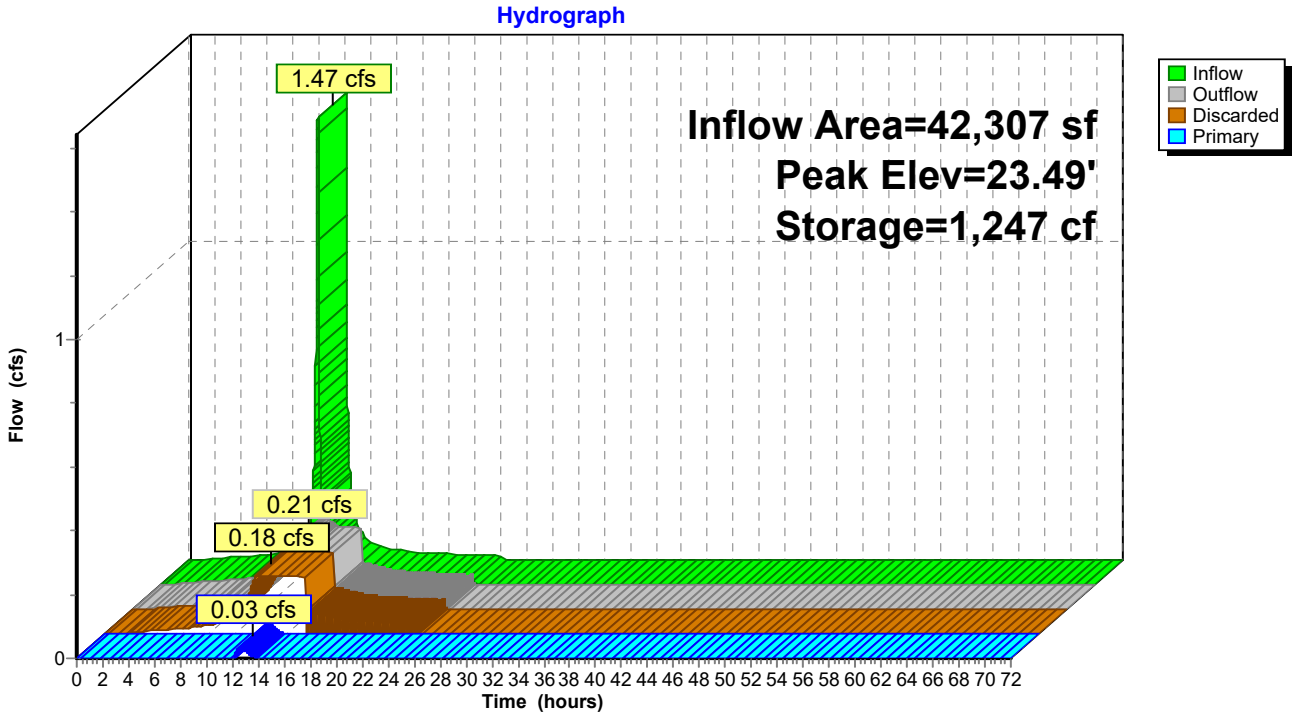
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 11.70 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.03 cfs @ 12.56 hrs HW=23.49' TW=13.40' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.03 cfs of 11.19 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Barrel Controls 0.03 cfs @ 1.21 fps)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=164)

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 1.56" for 2-Year current event
Inflow = 4.21 cfs @ 12.11 hrs, Volume= 15,725 cf
Outflow = 1.27 cfs @ 12.39 hrs, Volume= 15,727 cf, Atten= 70%, Lag= 17.0 min
Discarded = 0.25 cfs @ 11.05 hrs, Volume= 12,746 cf
Primary = 1.02 cfs @ 12.39 hrs, Volume= 2,982 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.48' @ 12.39 hrs Surf.Area= 3,930 sf Storage= 4,601 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 99.4 min (867.5 - 768.2)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

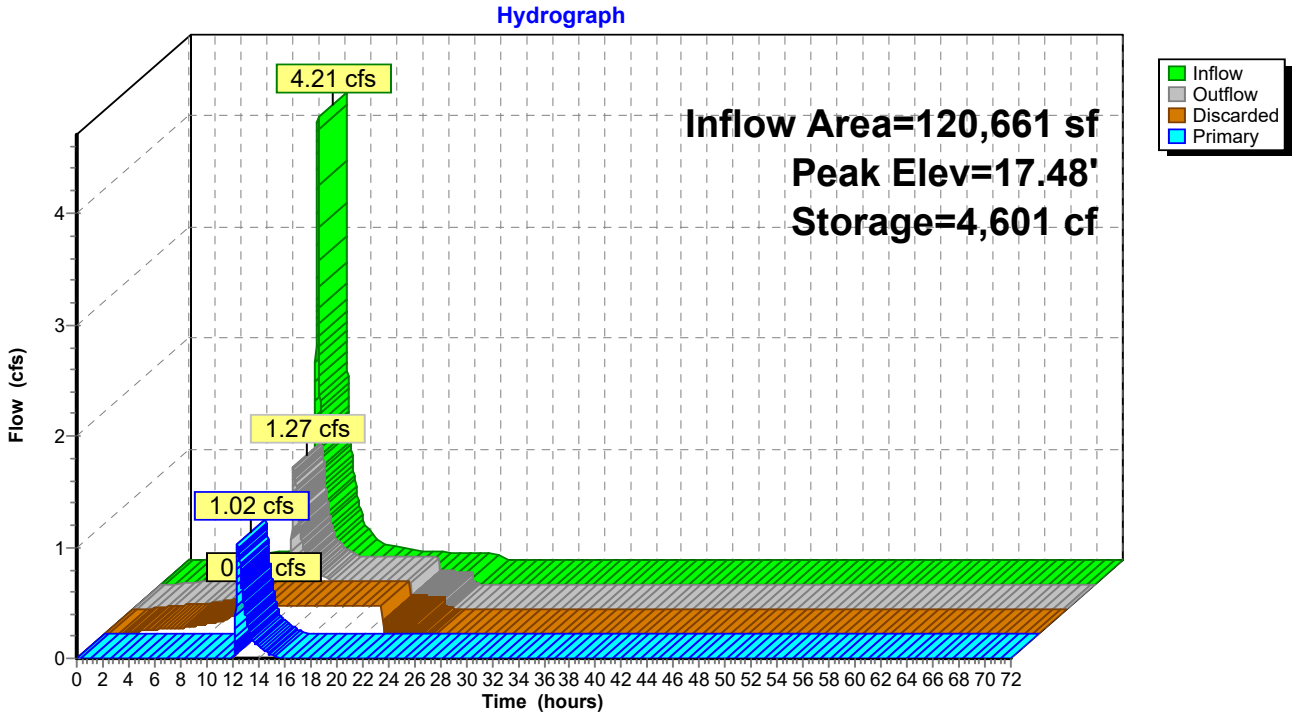
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 11.05 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=1.02 cfs @ 12.39 hrs HW=17.48' TW=13.19' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 0.78 cfs @ 0.68 fps)
└**2=Culvert** (Inlet Controls 0.24 cfs @ 1.73 fps)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 1.25" for 2-Year current event
Inflow = 4.22 cfs @ 12.15 hrs, Volume= 14,528 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 15.55' @ 52.59 hrs Surf.Area= 15,021 sf Storage= 14,528 cf

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

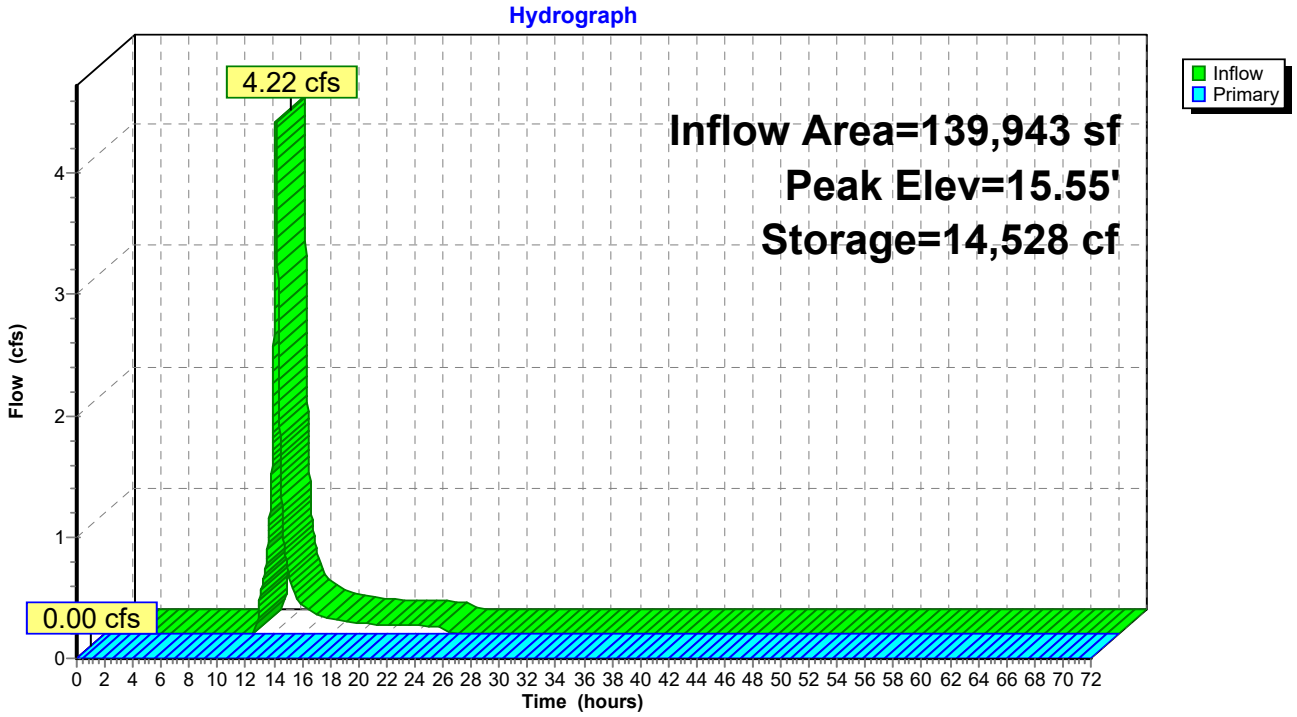
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 2.35" for 2-Year current event
Inflow = 4.14 cfs @ 12.11 hrs, Volume= 12,624 cf
Outflow = 3.12 cfs @ 12.14 hrs, Volume= 11,831 cf, Atten= 25%, Lag= 1.8 min
Primary = 3.12 cfs @ 12.14 hrs, Volume= 11,831 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.37' @ 12.14 hrs Surf.Area= 1,751 sf Storage= 1,613 cf

Plug-Flow detention time= 69.5 min calculated for 11,831 cf (94% of inflow)
Center-of-Mass det. time= 33.2 min (787.5 - 754.3)

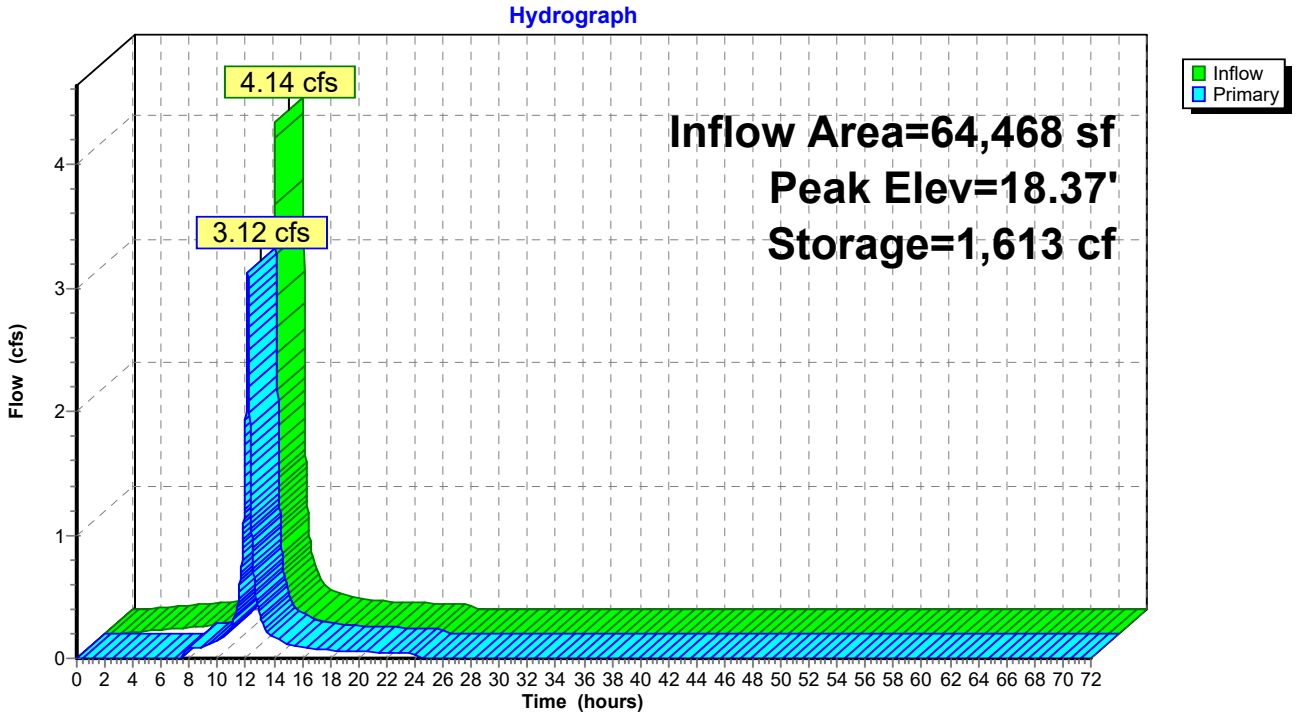
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.11 cfs @ 12.14 hrs HW=18.37' TW=18.01' (Dynamic Tailwater)
↑**2=Culvert** (Inlet Controls 3.11 cfs @ 2.53 fps)
↑**1=Orifice/Grate** (Passes 3.11 cfs of 18.24 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 1.96" for 2-Year current event
Inflow = 4.62 cfs @ 12.11 hrs, Volume= 16,742 cf
Outflow = 4.22 cfs @ 12.15 hrs, Volume= 14,512 cf, Atten= 9%, Lag= 2.0 min
Primary = 4.22 cfs @ 12.15 hrs, Volume= 14,512 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.01' @ 12.15 hrs Surf.Area= 5,236 sf Storage= 3,175 cf

Plug-Flow detention time= 106.4 min calculated for 14,512 cf (87% of inflow)
Center-of-Mass det. time= 44.5 min (822.4 - 777.9)

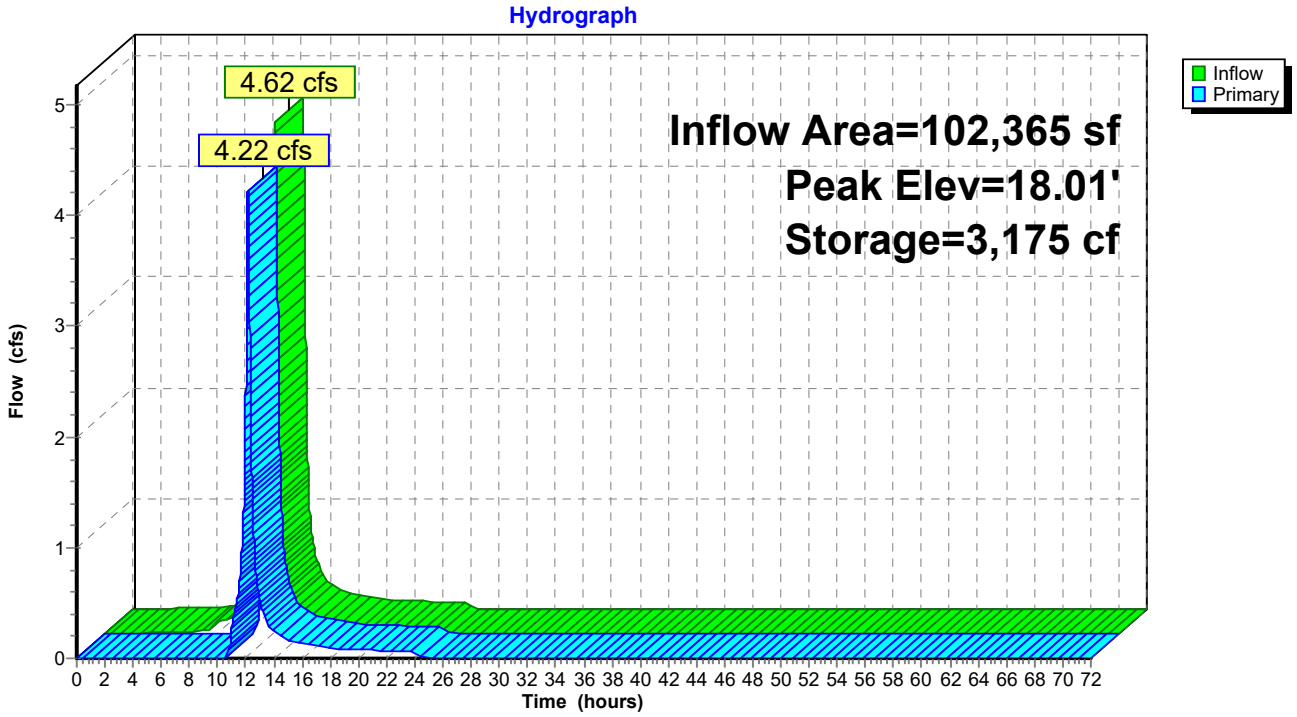
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.22 cfs @ 12.15 hrs HW=18.01' TW=14.84' (Dynamic Tailwater)
↑—**2=Culvert** (Passes 4.22 cfs of 9.29 cfs potential flow)
↑—**1=Orifice/Grate** (Weir Controls 4.22 cfs @ 1.44 fps)

Pond Pre bio-2: Pre Bio Ret 2

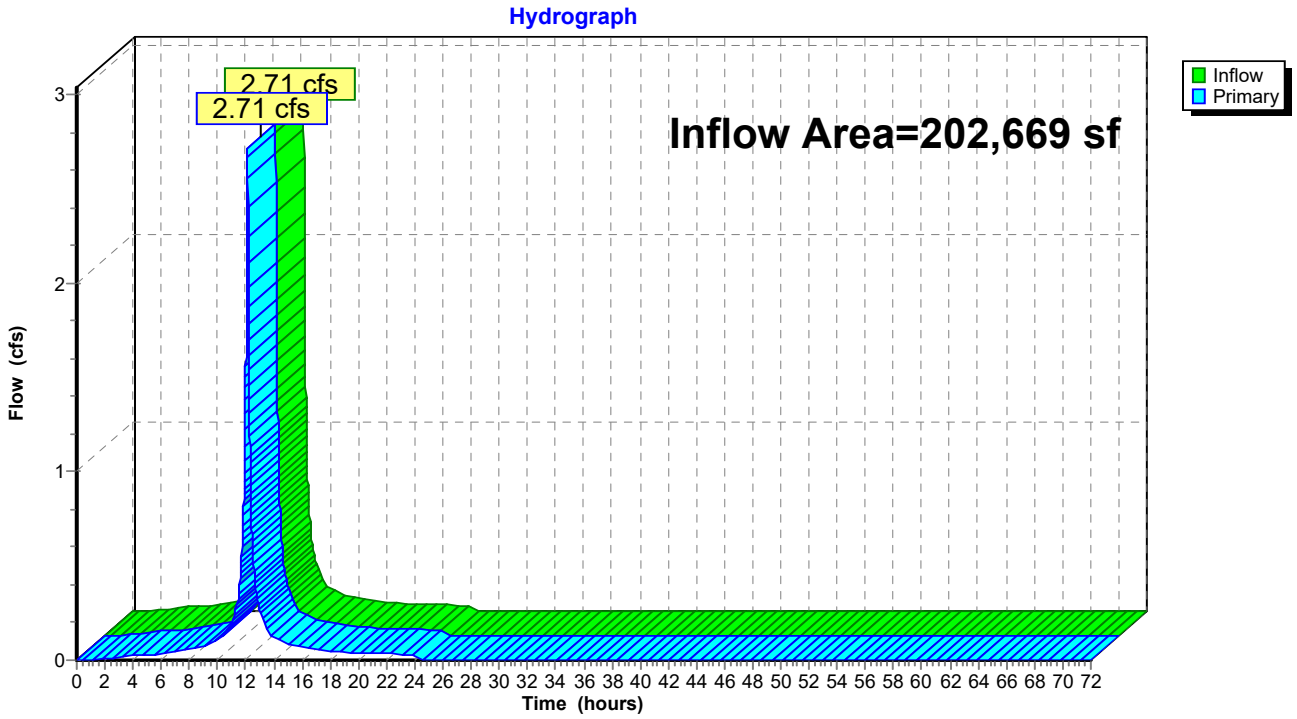


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 0.55" for 2-Year current event
Inflow = 2.71 cfs @ 12.12 hrs, Volume= 9,259 cf
Primary = 2.71 cfs @ 12.12 hrs, Volume= 9,259 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

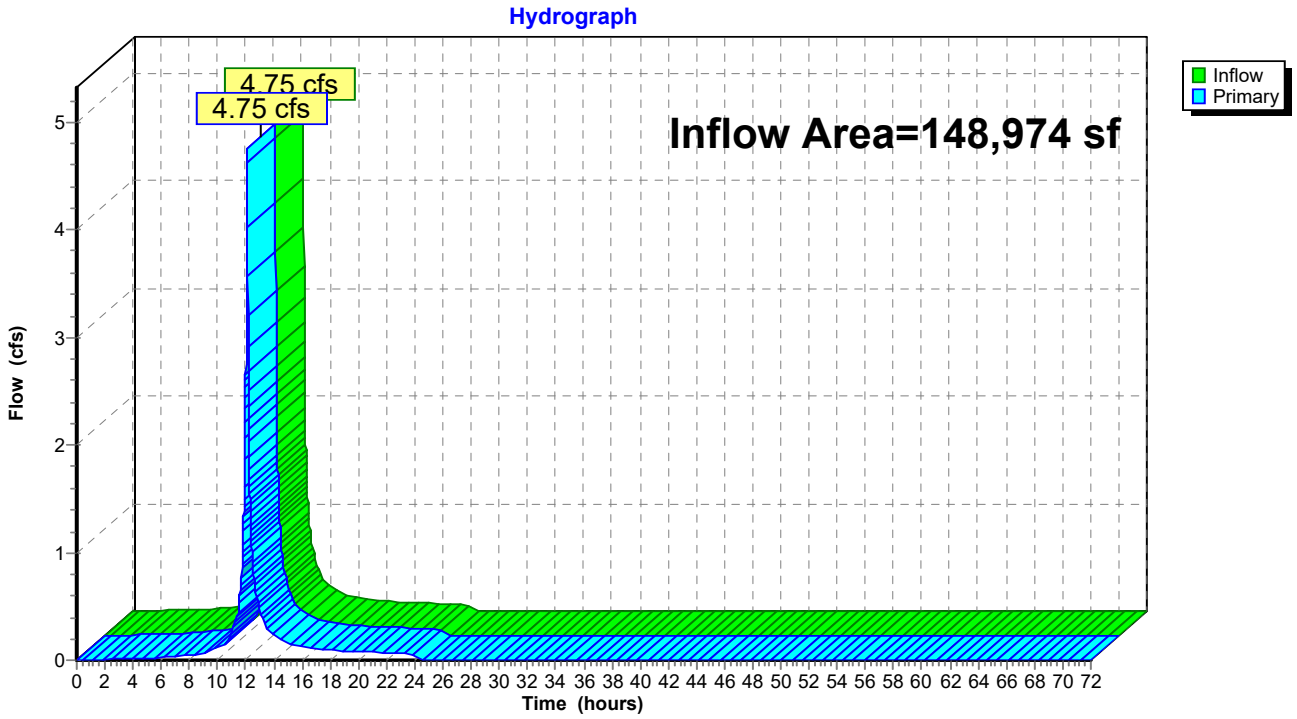


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 1.15" for 2-Year current event
Inflow = 4.75 cfs @ 12.11 hrs, Volume= 14,257 cf
Primary = 4.75 cfs @ 12.11 hrs, Volume= 14,257 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

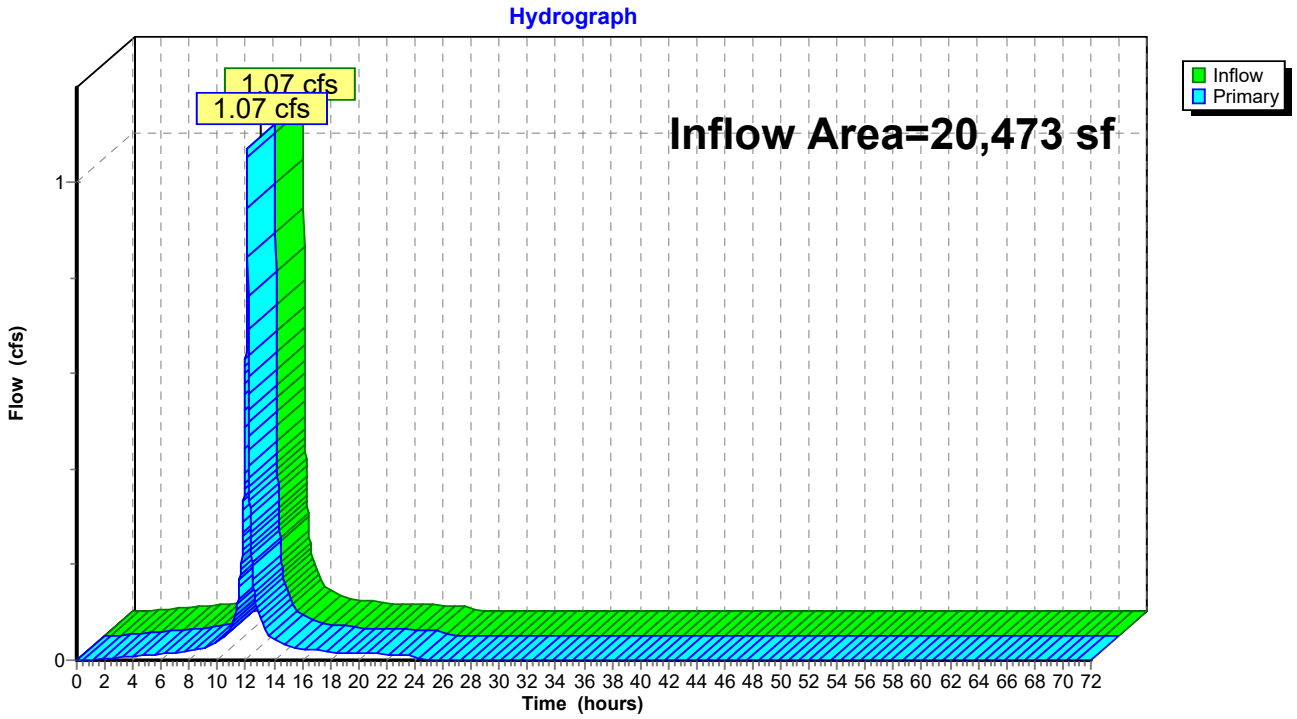


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 1.95" for 2-Year current event
Inflow = 1.07 cfs @ 12.11 hrs, Volume= 3,327 cf
Primary = 1.07 cfs @ 12.11 hrs, Volume= 3,327 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

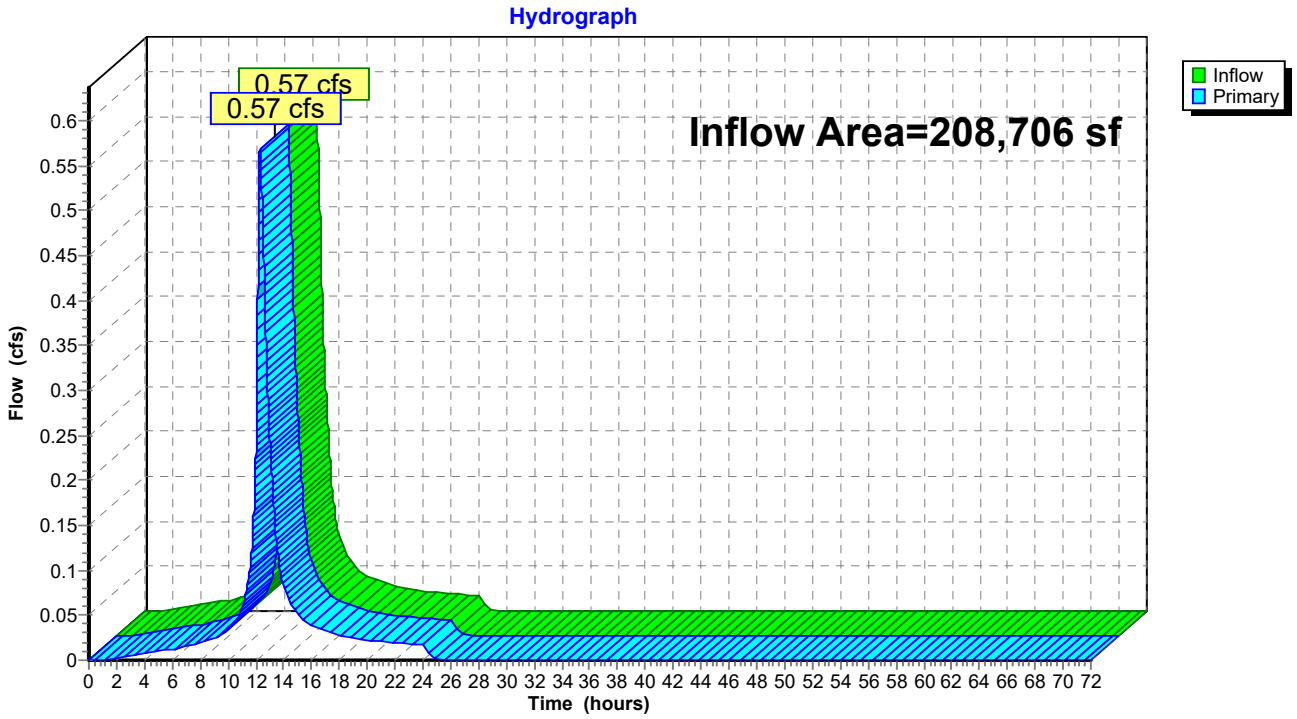


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 0.23" for 2-Year current event
Inflow = 0.57 cfs @ 12.31 hrs, Volume= 4,034 cf
Primary = 0.57 cfs @ 12.31 hrs, Volume= 4,034 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

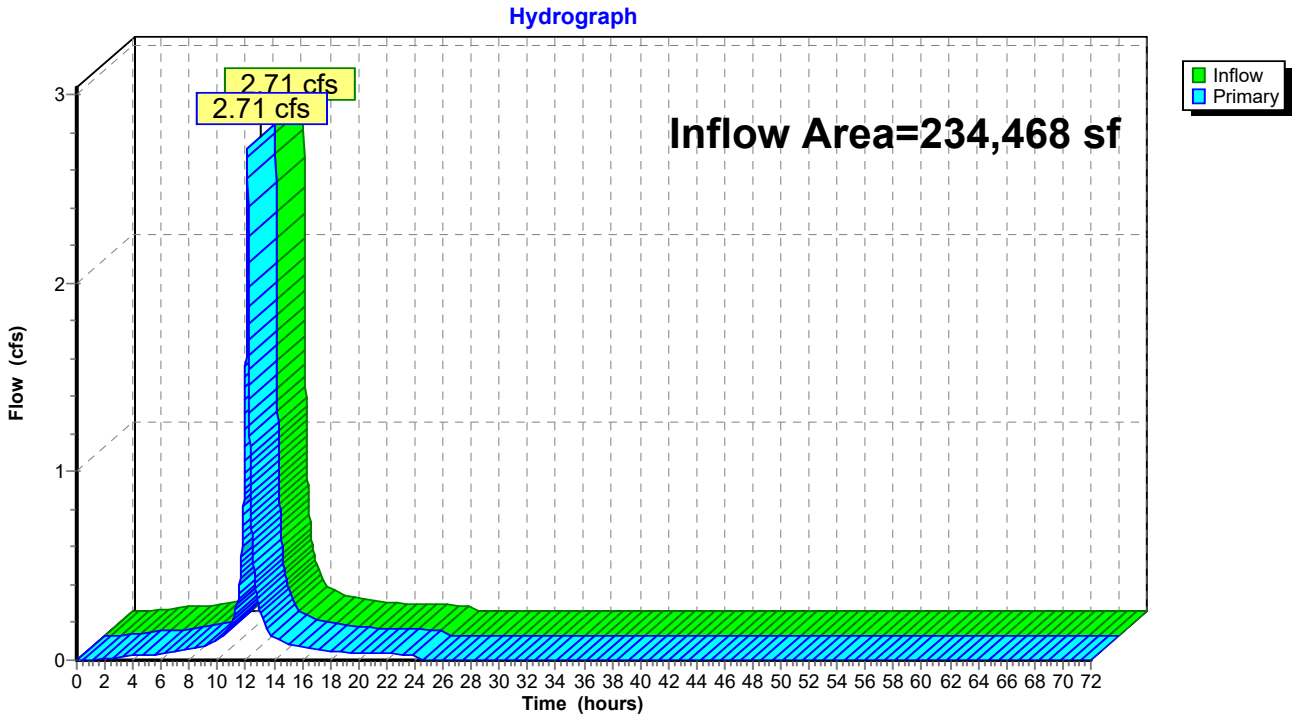


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 0.47" for 2-Year current event
Inflow = 2.71 cfs @ 12.12 hrs, Volume= 9,259 cf
Primary = 2.71 cfs @ 12.12 hrs, Volume= 9,259 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

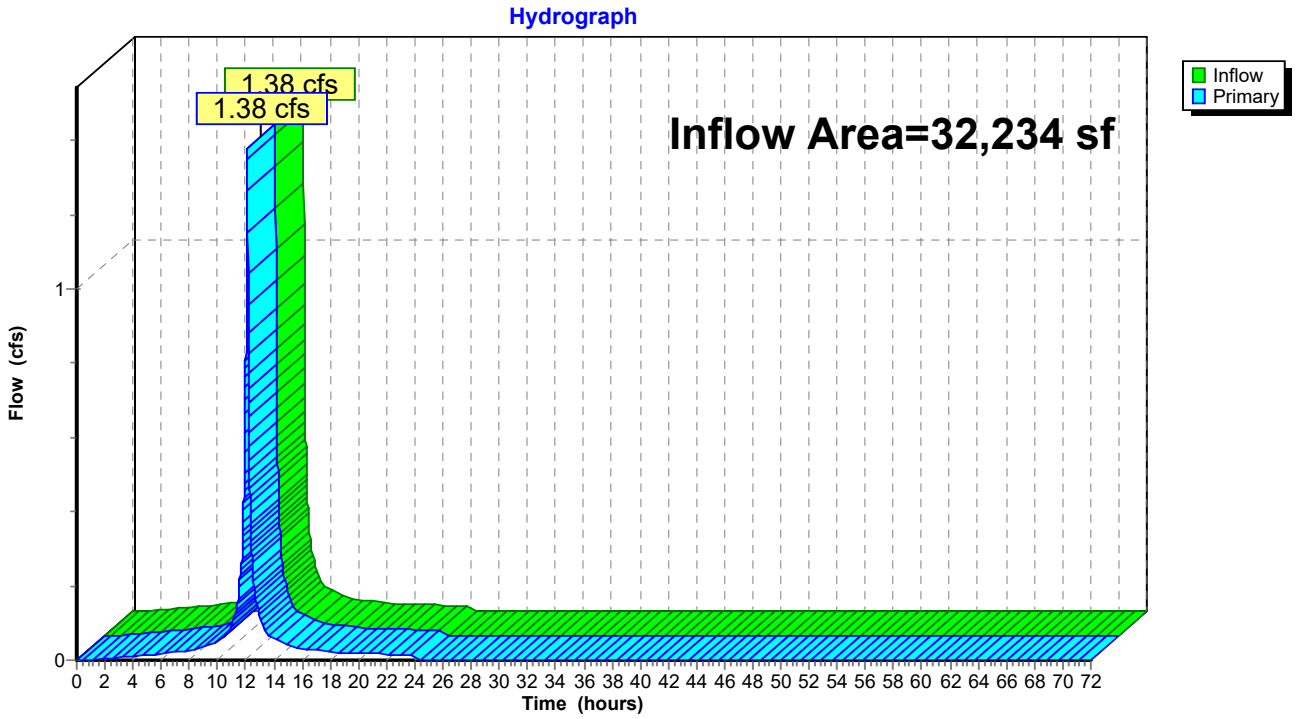


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 1.63" for 2-Year current event
Inflow = 1.38 cfs @ 12.11 hrs, Volume= 4,378 cf
Primary = 1.38 cfs @ 12.11 hrs, Volume= 4,378 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=5.80 cfs 17,811 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=1.35"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=0.73 cfs 5,157 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.54 cfs 4,737 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 30 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 75 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.91 cfs 5,853 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 81 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=1.27 cfs 3,968 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 33 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 157 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=330' Tc=3.9 min CN=98 Runoff=3.21 cfs 11,055 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 0 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.74 cfs 5,340 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 107 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.70 cfs 14,434 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.11 cfs 741 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=1.09"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=0.49 cfs 3,947 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.91 cfs 15,064 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 71 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.91 cfs 5,853 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 81 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=1.63 cfs 5,219 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 66 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 157 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=330' Tc=3.9 min CN=98 Runoff=3.21 cfs 11,055 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 0 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=3.81"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.70 cfs 5,219 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 66 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=2.76"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.12 cfs 11,312 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=0.27"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.20 cfs 1,542 cf

Pond 4P: Pre developed infiltration basin 1, Peak Elev=15.58' Storage=14,975 cf Inflow=6.89 cfs 14,975 cf
Outflow=0.00 cfs 0 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=14.52' Storage=5,370 cf Inflow=2.15 cfs 5,370 cf
Outflow=0.00 cfs 0 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.36' Storage=1,577 cf Inflow=1.54 cfs 4,767 cf
Discarded=0.02 cfs 2,709 cf Primary=1.39 cfs 2,058 cf Outflow=1.41 cfs 4,767 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.57' Storage=1,975 cf Inflow=7.13 cfs 19,944 cf
Discarded=0.05 cfs 5,127 cf Primary=6.89 cfs 14,818 cf Outflow=6.94 cfs 19,944 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.14' Storage=1,230 cf Inflow=1.91 cfs 5,934 cf
Discarded=0.36 cfs 5,938 cf Primary=0.00 cfs 0 cf Outflow=0.36 cfs 5,938 cf

Pond Bio 70: Post Bio-70 Peak Elev=23.60' Storage=1,566 cf Inflow=1.74 cfs 5,447 cf
Discarded=0.18 cfs 5,133 cf Primary=0.07 cfs 314 cf Outflow=0.25 cfs 5,448 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.54' Storage=4,842 cf Inflow=5.02 cfs 19,123 cf
Discarded=0.25 cfs 14,067 cf Primary=2.10 cfs 5,055 cf Outflow=2.35 cfs 19,123 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=15.79' Storage=18,204 cf Inflow=4.89 cfs 18,204 cf
Outflow=0.00 cfs 0 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=18.50' Storage=1,846 cf Inflow=4.91 cfs 15,135 cf
Outflow=3.56 cfs 14,342 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=18.04' Storage=3,281 cf Inflow=5.32 cfs 20,277 cf
Outflow=4.89 cfs 18,046 cf

Link 1L: Pre dis 1 Inflow=3.21 cfs 11,055 cf
Primary=3.21 cfs 11,055 cf

Link 3L: Pre discharge point 3 Inflow=5.90 cfs 18,139 cf
Primary=5.90 cfs 18,139 cf

Link 4L: Post discharge point 2 Inflow=1.27 cfs 4,002 cf
Primary=1.27 cfs 4,002 cf

Link 6L: Discharge point 3 post Inflow=0.73 cfs 5,157 cf
Primary=0.73 cfs 5,157 cf

Link 11L: Post dis 1 Inflow=3.21 cfs 11,055 cf
Primary=3.21 cfs 11,055 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=1.63 cfs 5,285 cf
Primary=1.63 cfs 5,285 cf

Total Runoff Area = 847,524 sf Runoff Volume = 129,234 cf Average Runoff Depth = 1.83"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

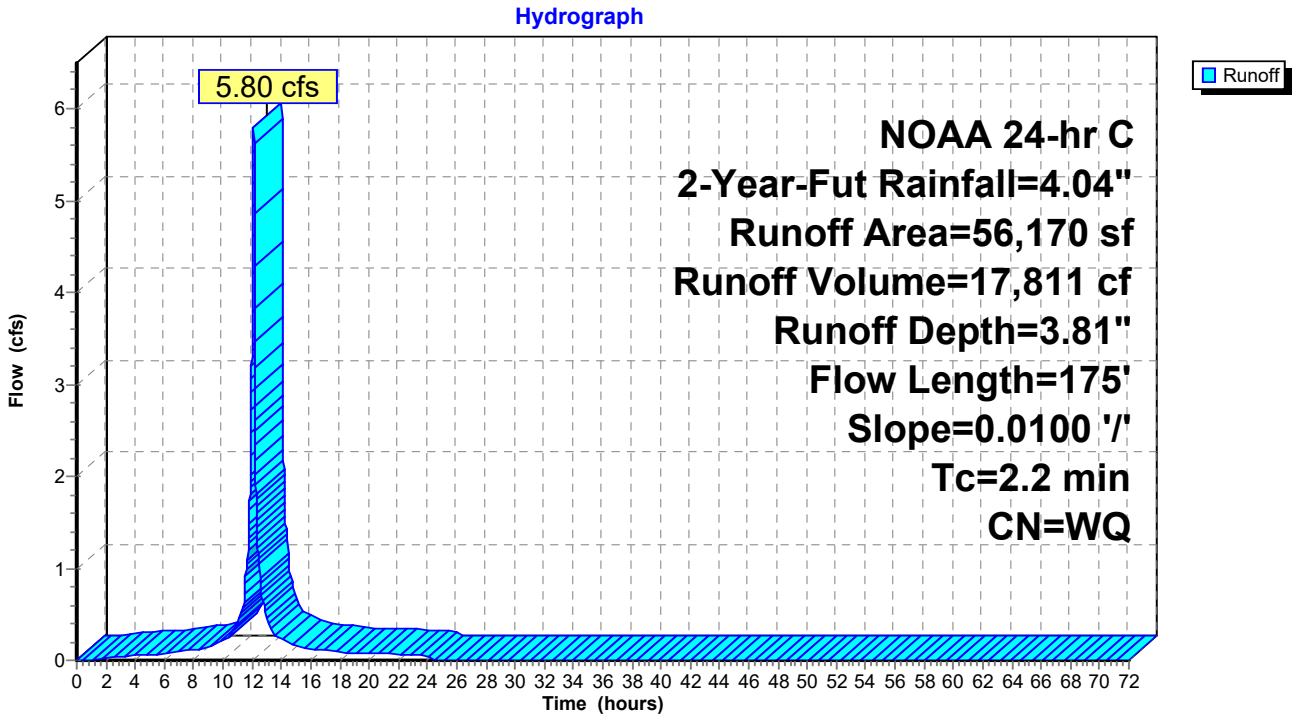
Runoff = 5.80 cfs @ 12.11 hrs, Volume= 17,811 cf, Depth= 3.81"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

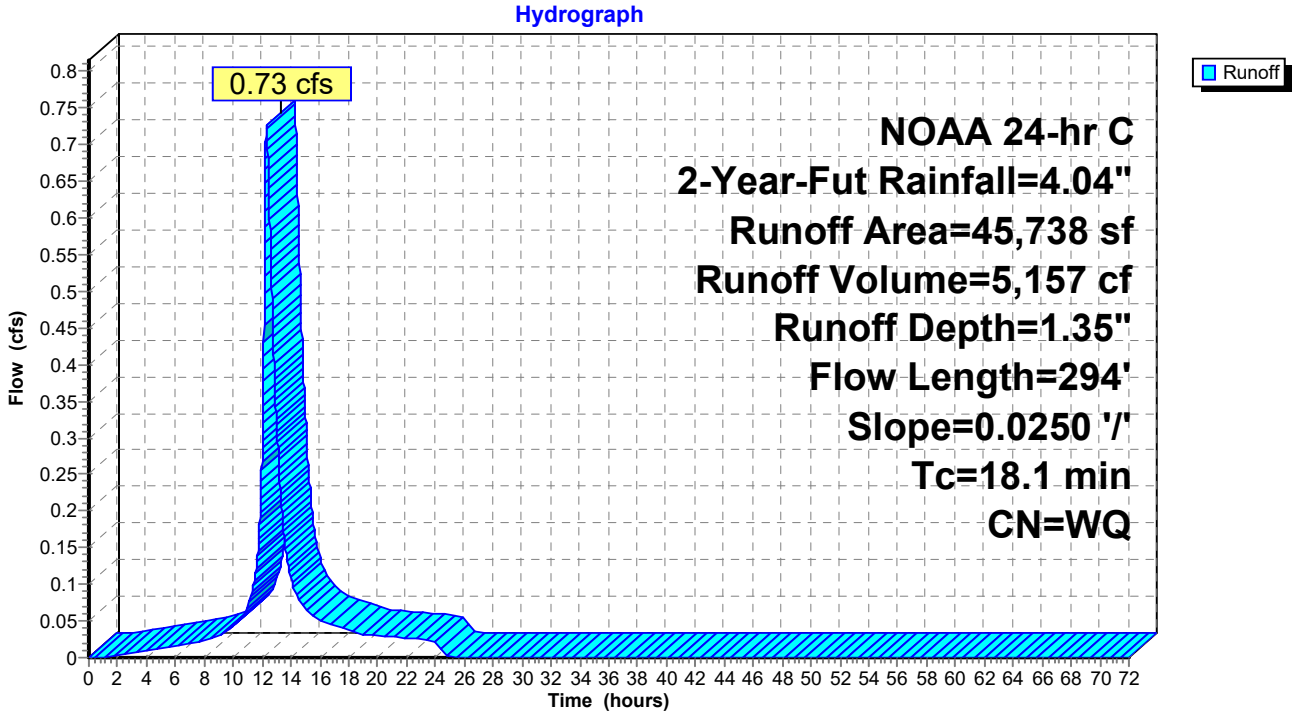
Runoff = 0.73 cfs @ 12.31 hrs, Volume= 5,157 cf, Depth= 1.35"
Routed to Link 6L : Discharge point 3 post

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

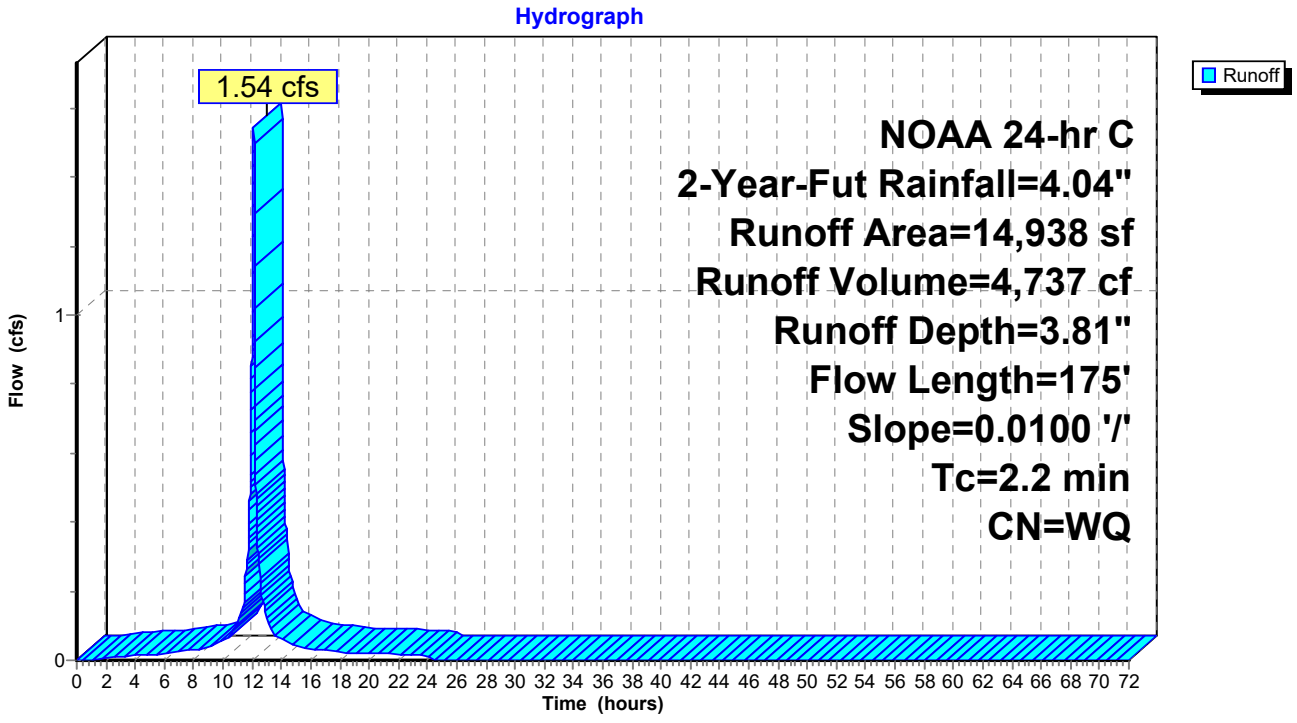
Runoff = 1.54 cfs @ 12.11 hrs, Volume= 4,737 cf, Depth= 3.81"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

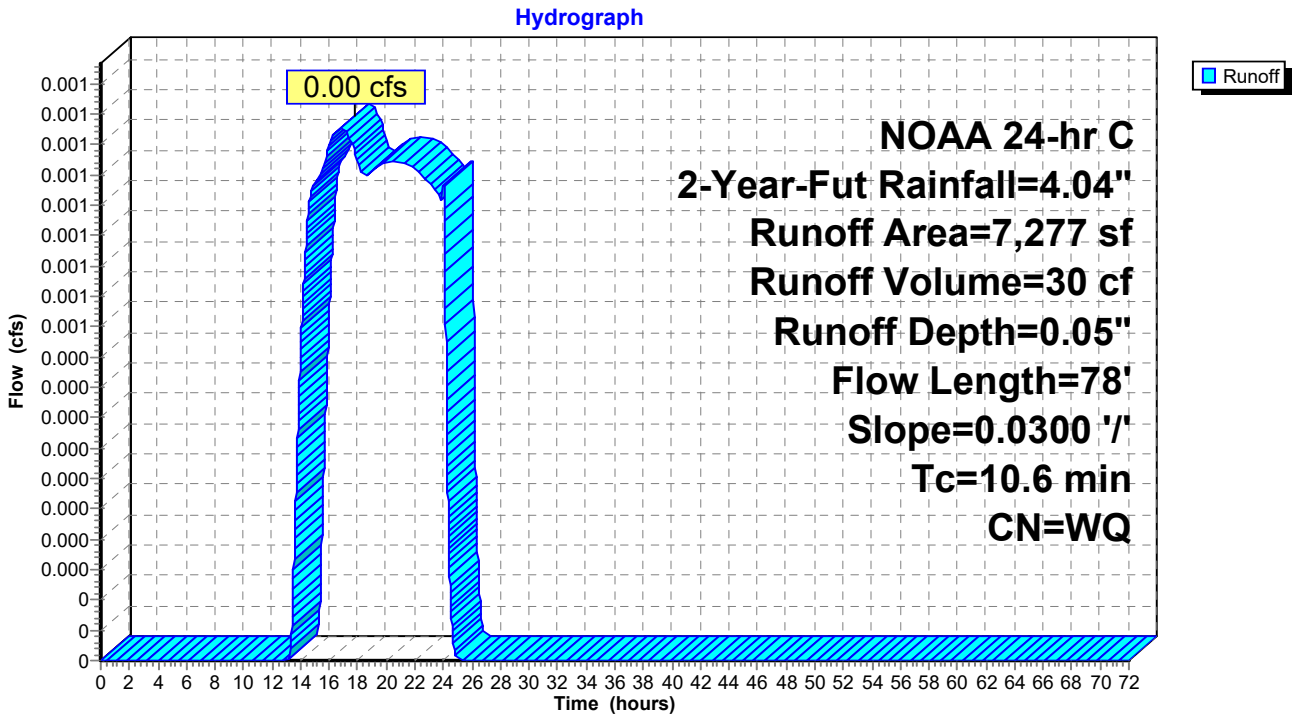
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 30 cf, Depth= 0.05"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

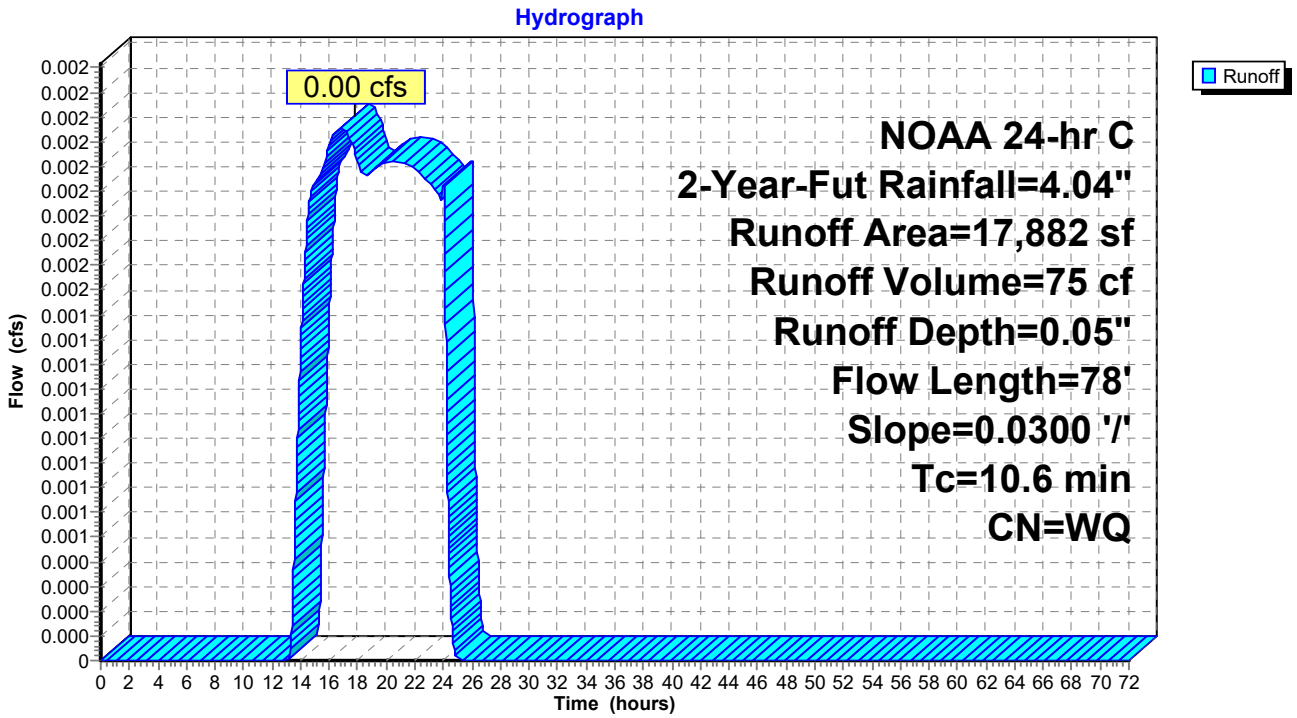
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 75 cf, Depth= 0.05"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

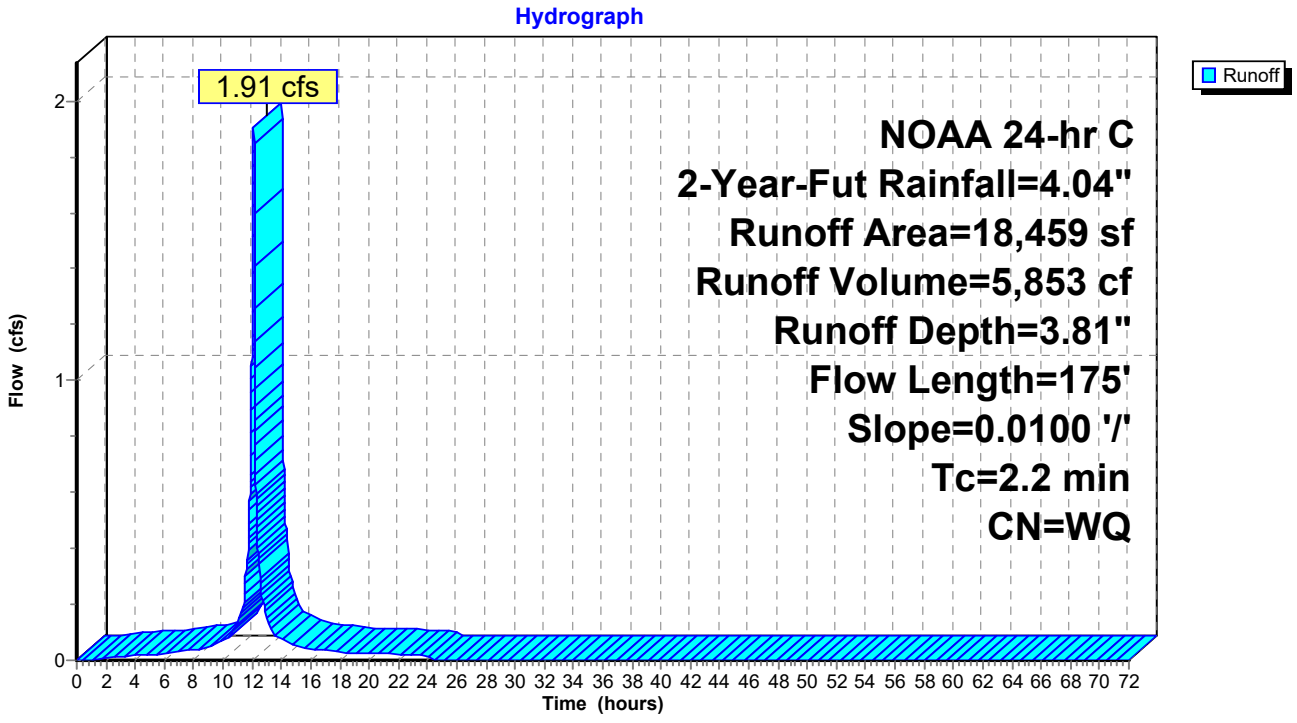
Runoff = 1.91 cfs @ 12.11 hrs, Volume= 5,853 cf, Depth= 3.81"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

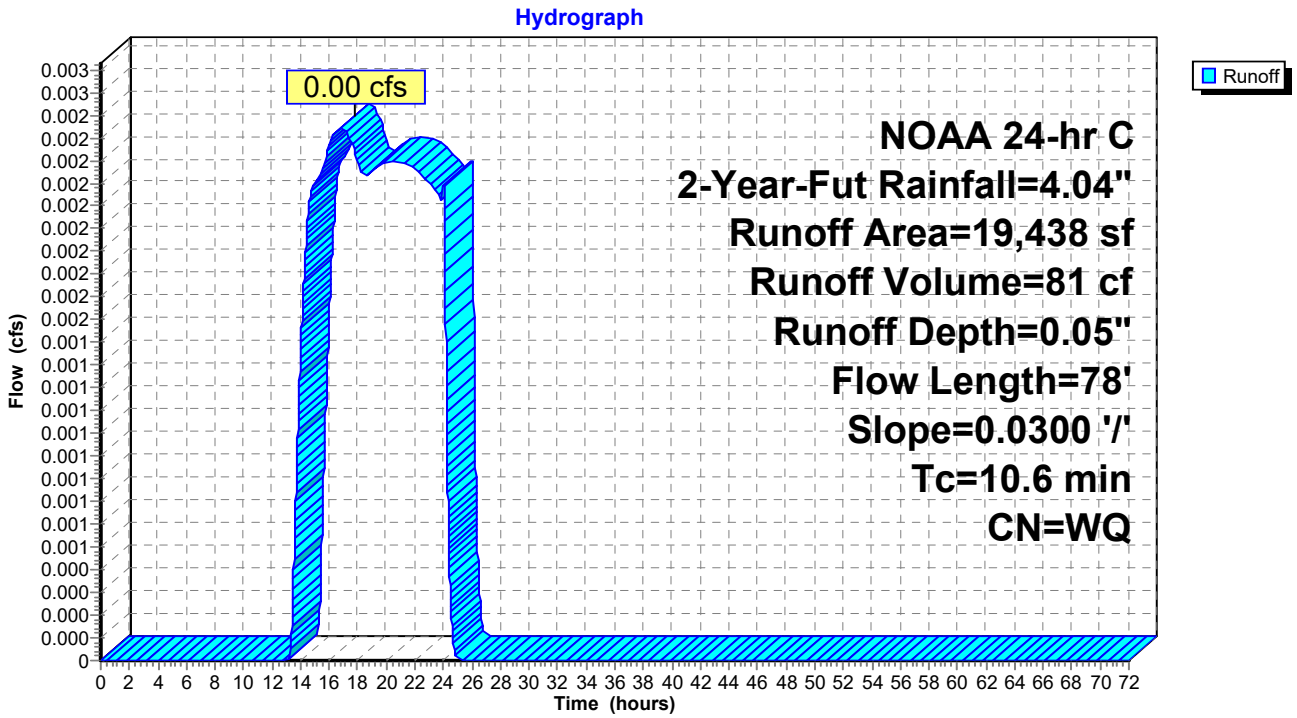
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 81 cf, Depth= 0.05"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

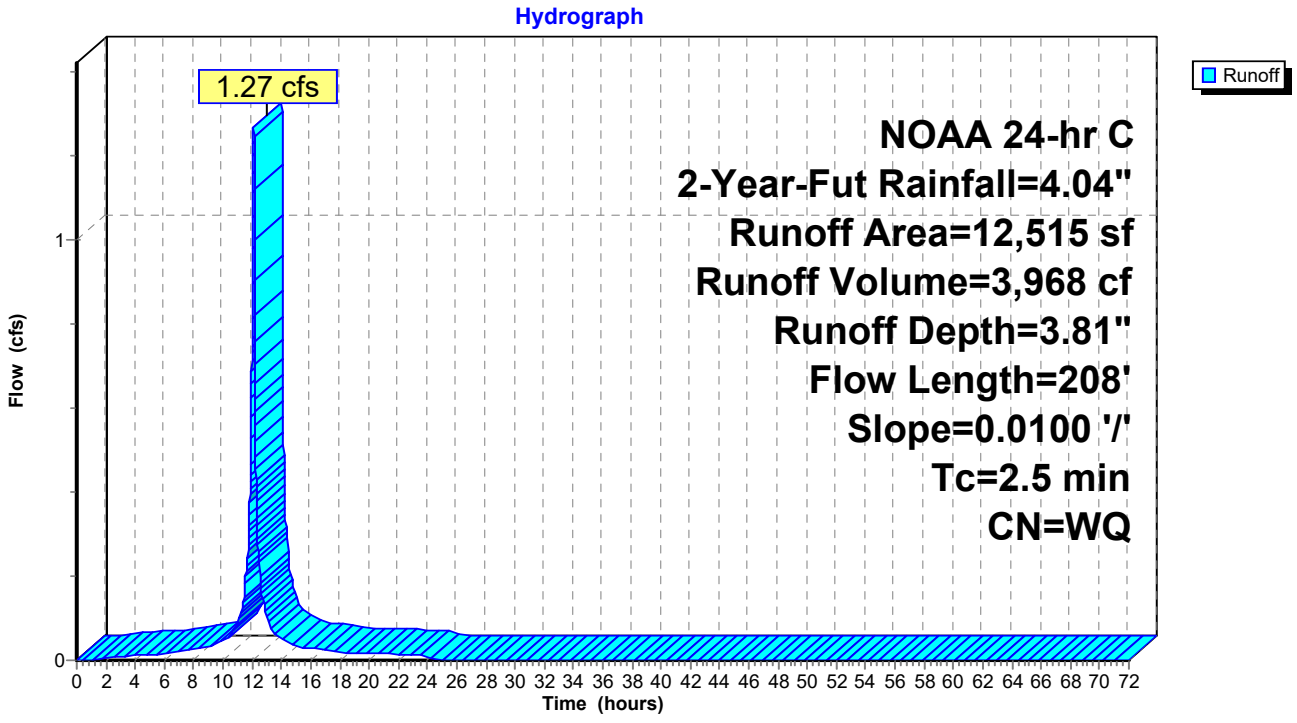
Runoff = 1.27 cfs @ 12.11 hrs, Volume= 3,968 cf, Depth= 3.81"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

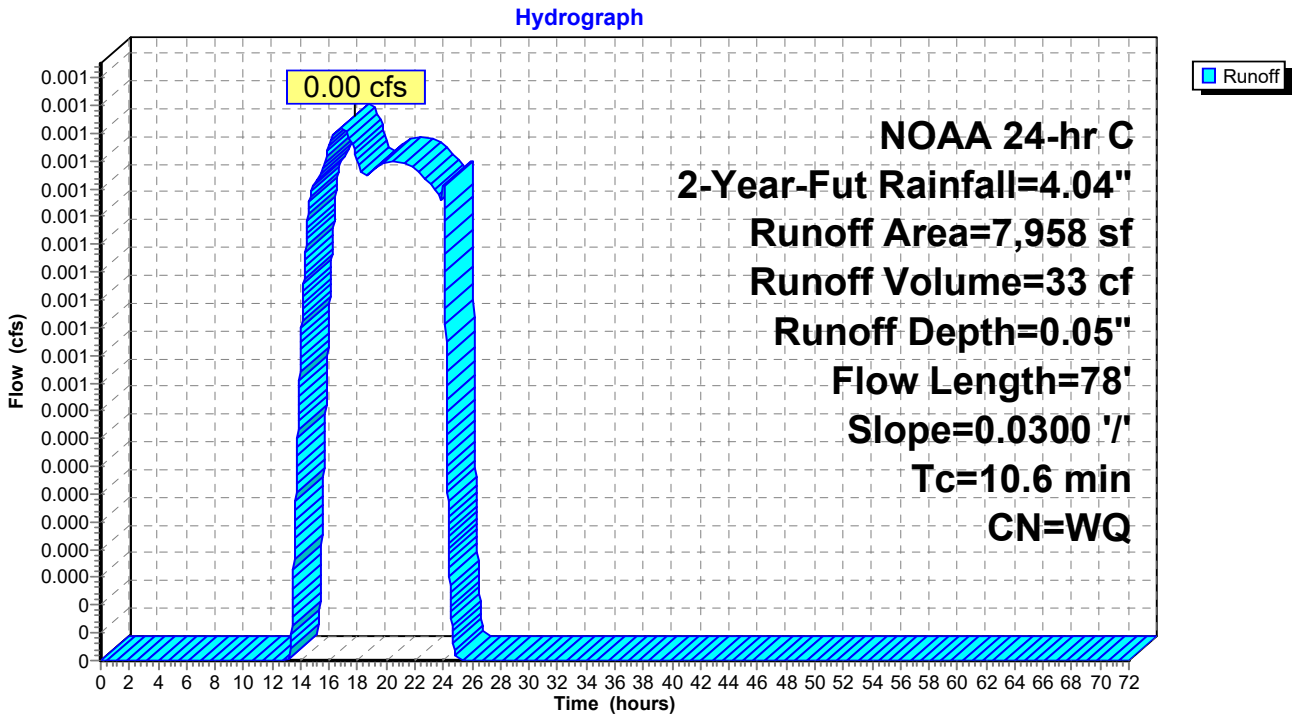
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 33 cf, Depth= 0.05"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

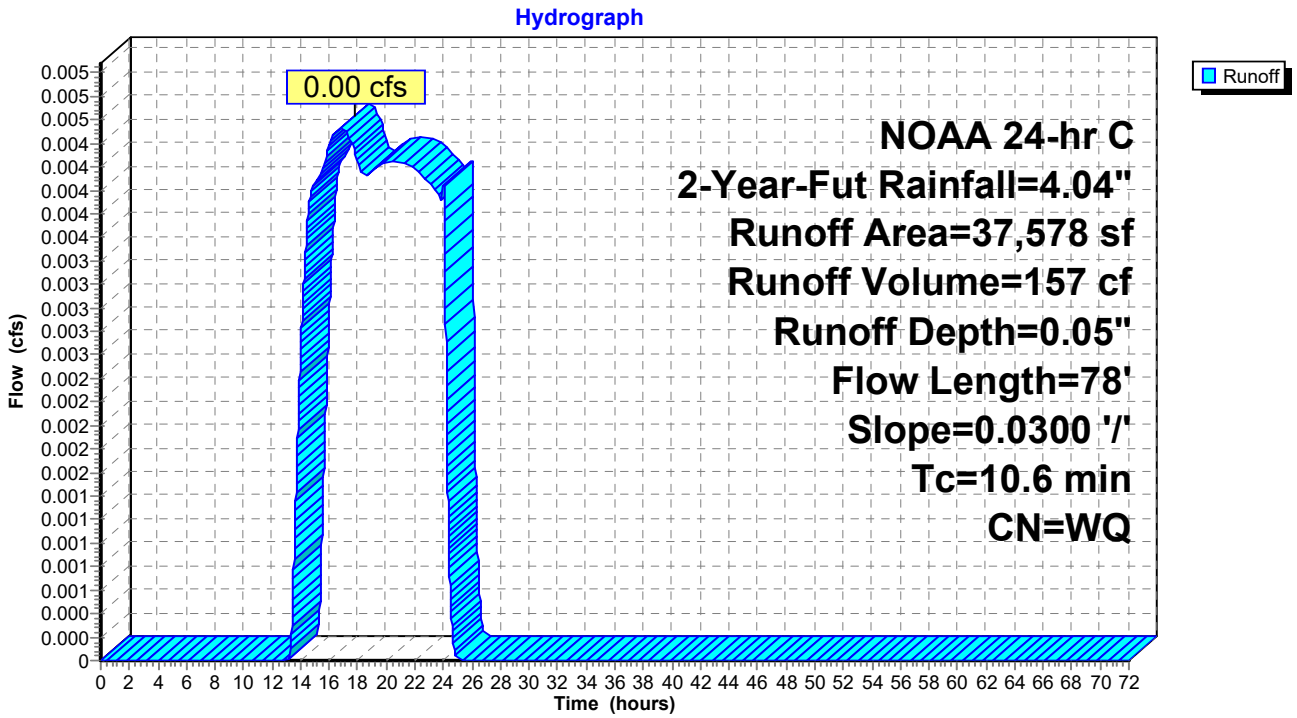
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 157 cf, Depth= 0.05"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

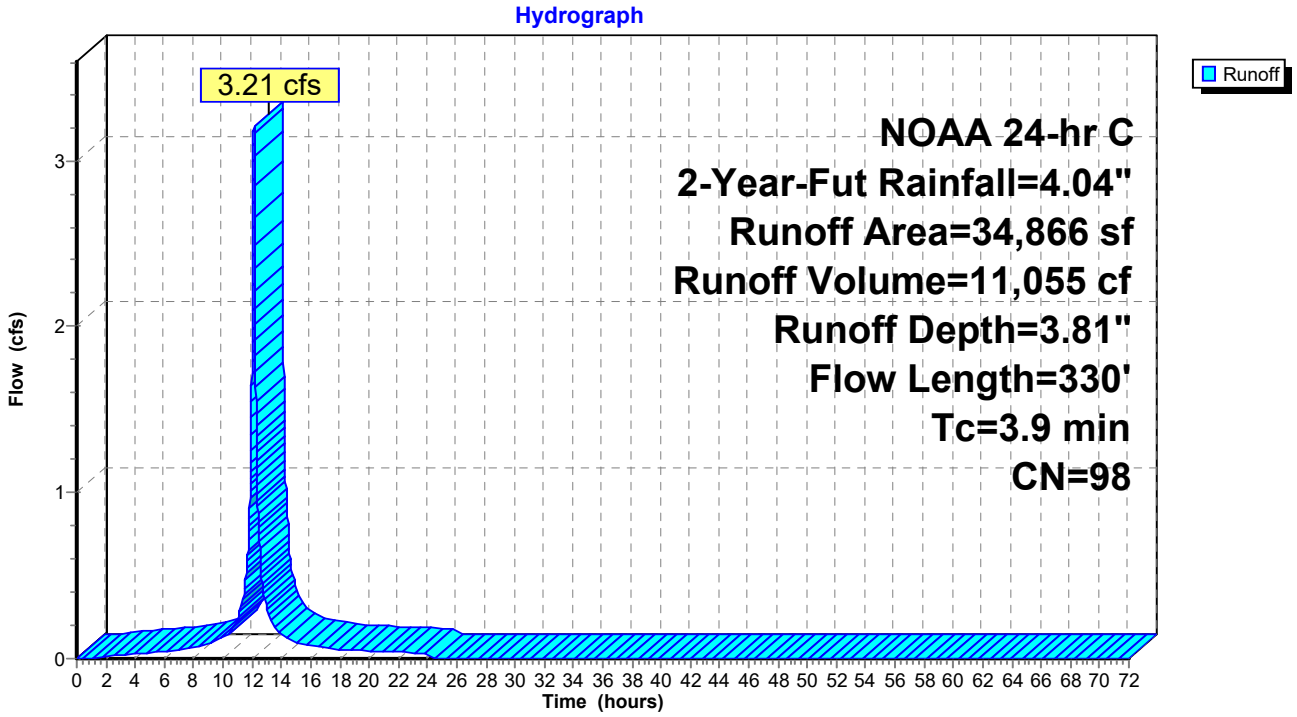
Runoff = 3.21 cfs @ 12.12 hrs, Volume= 11,055 cf, Depth= 3.81"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

[45] Hint: Runoff=Zero

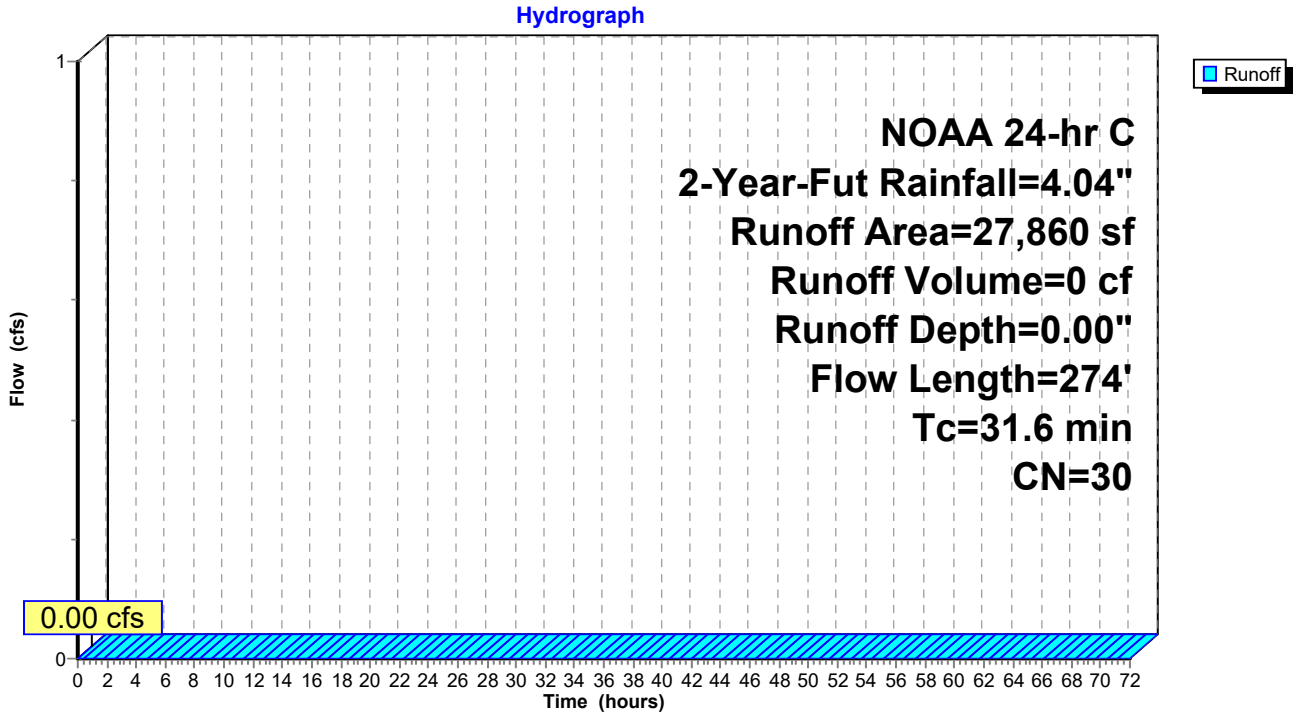
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

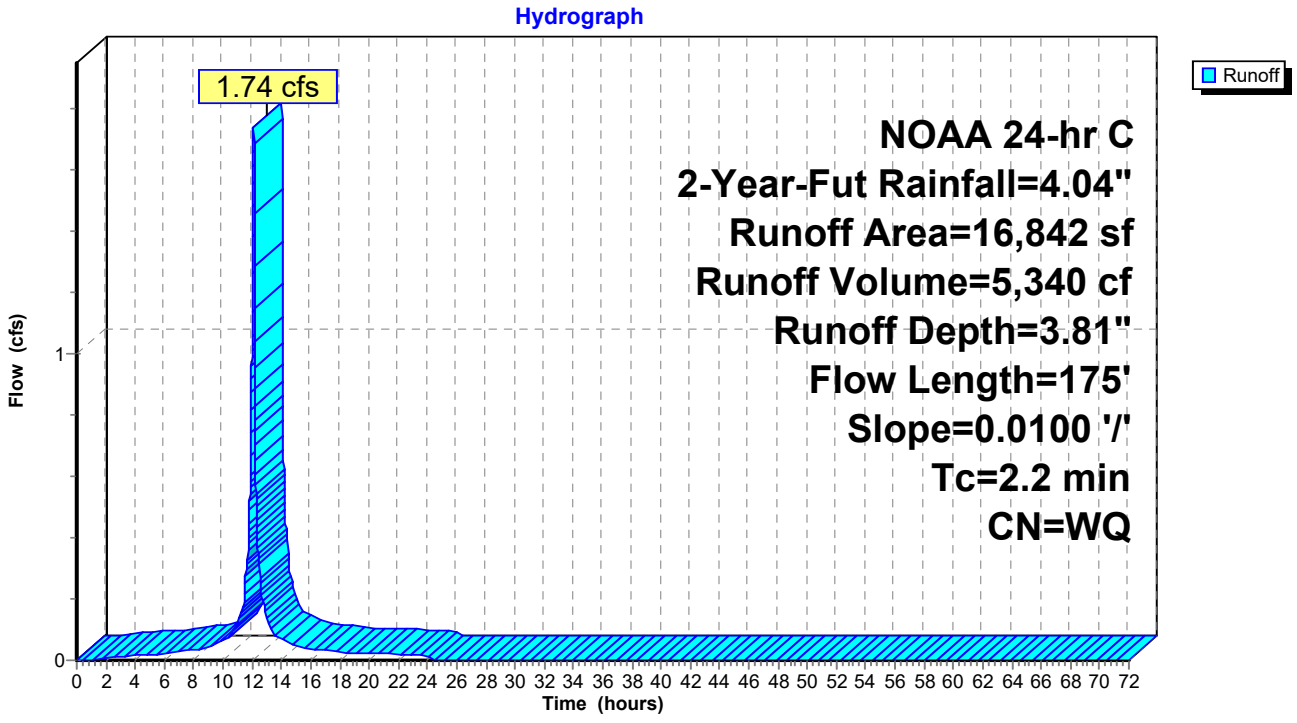
Runoff = 1.74 cfs @ 12.11 hrs, Volume= 5,340 cf, Depth= 3.81"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

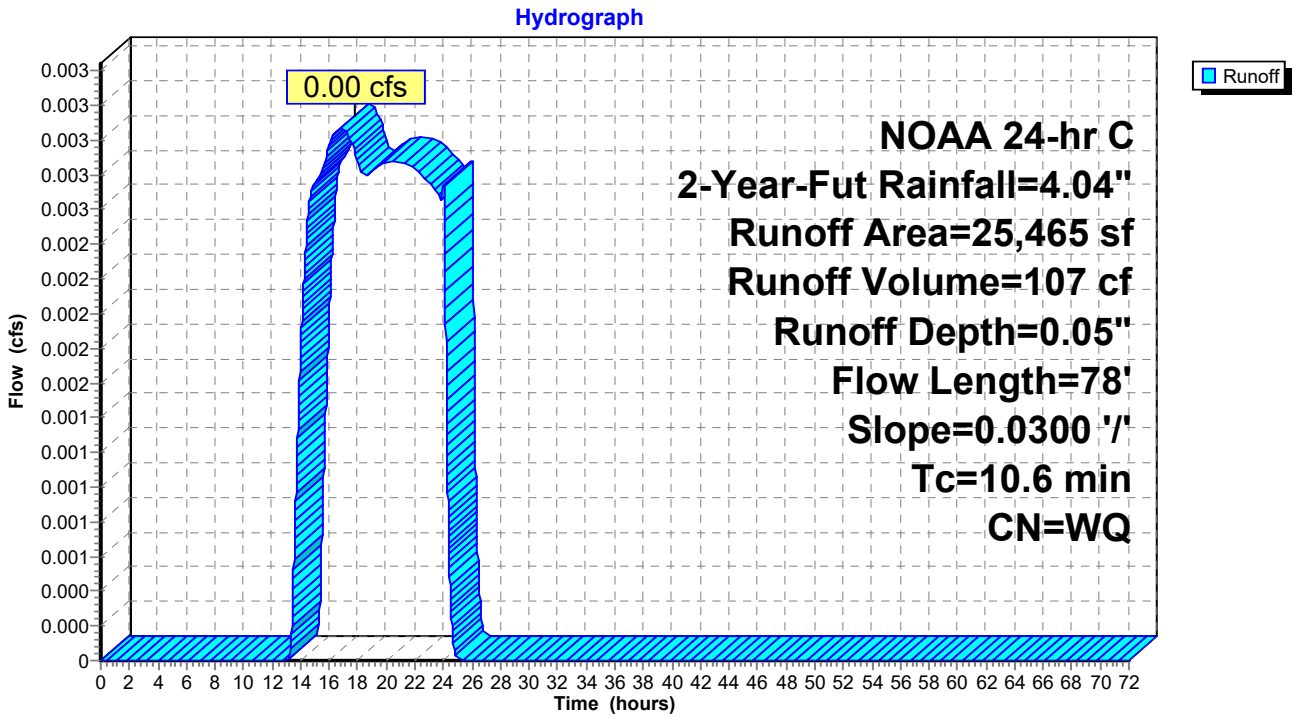
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 107 cf, Depth= 0.05"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

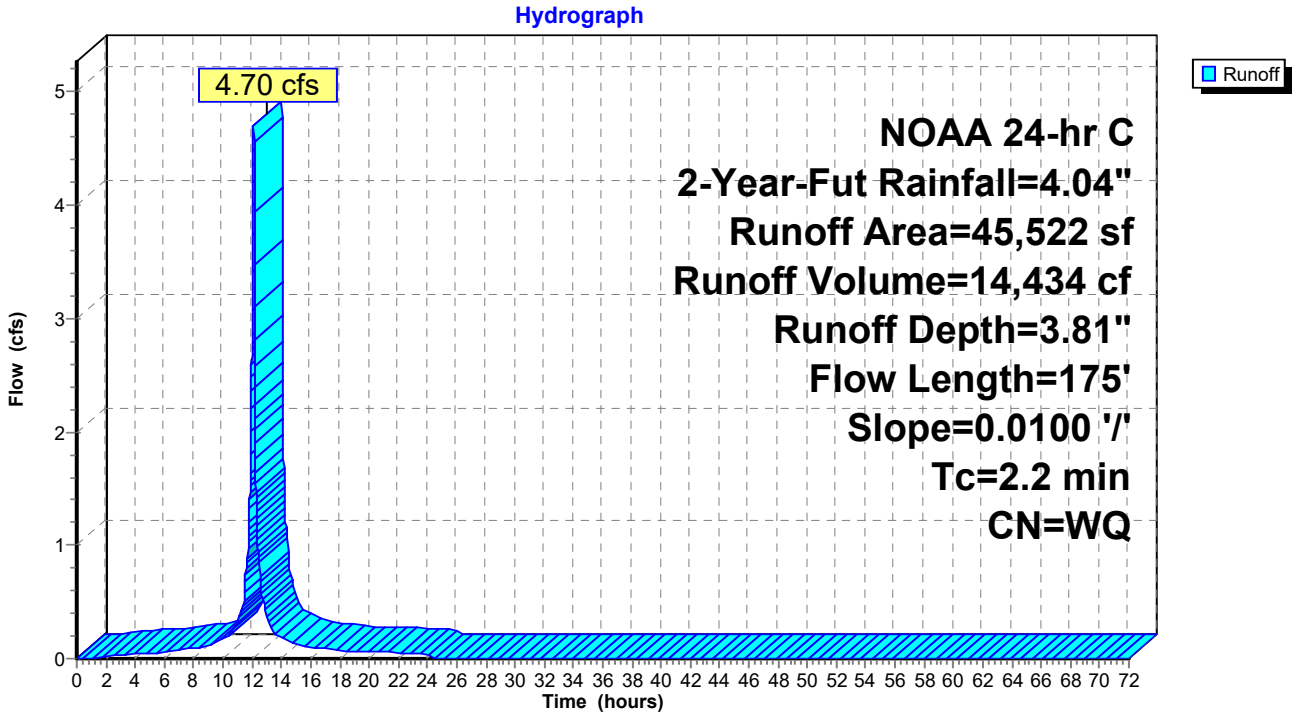
Runoff = 4.70 cfs @ 12.11 hrs, Volume= 14,434 cf, Depth= 3.81"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

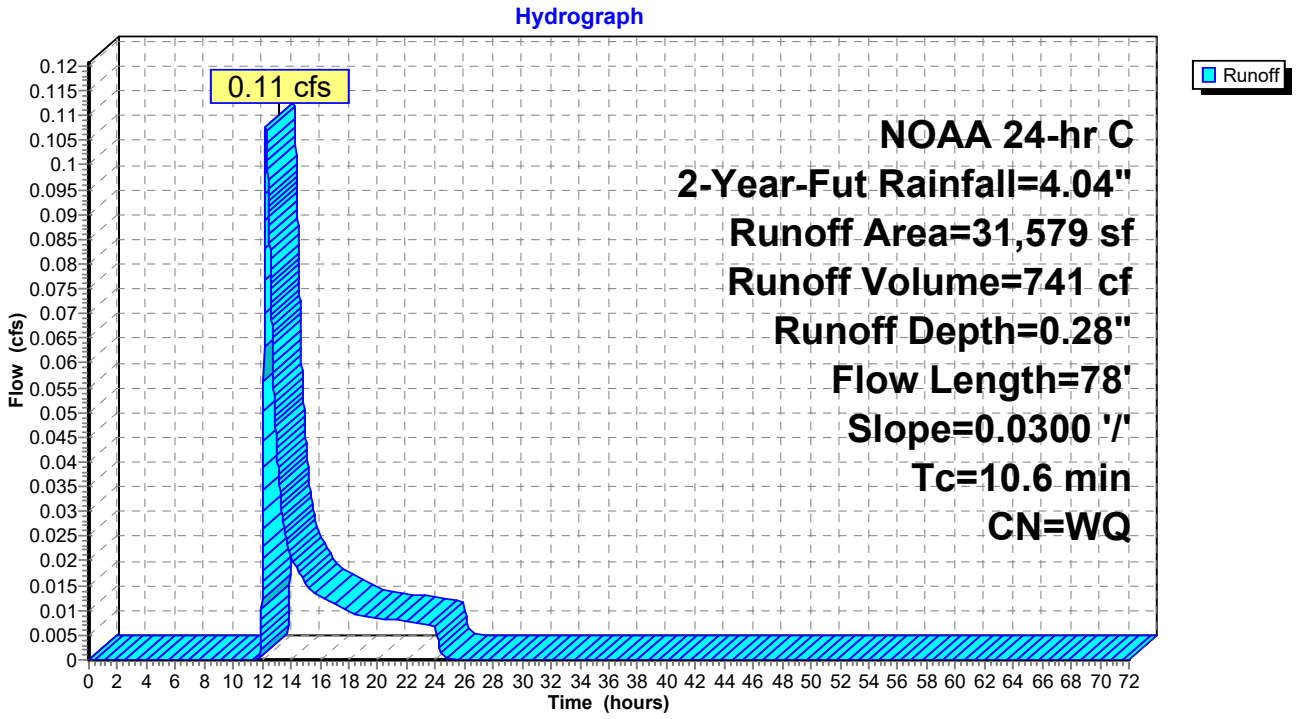
Runoff = 0.11 cfs @ 12.24 hrs, Volume= 741 cf, Depth= 0.28"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

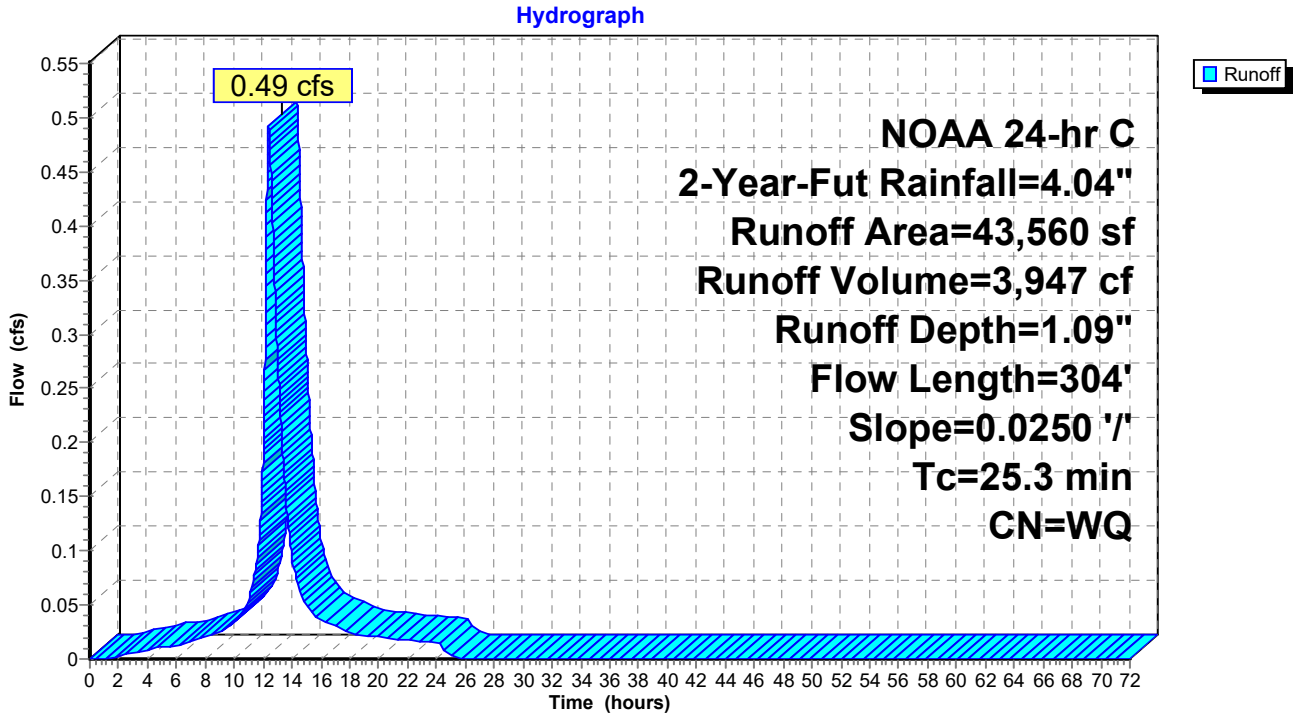
Runoff = 0.49 cfs @ 12.37 hrs, Volume= 3,947 cf, Depth= 1.09"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

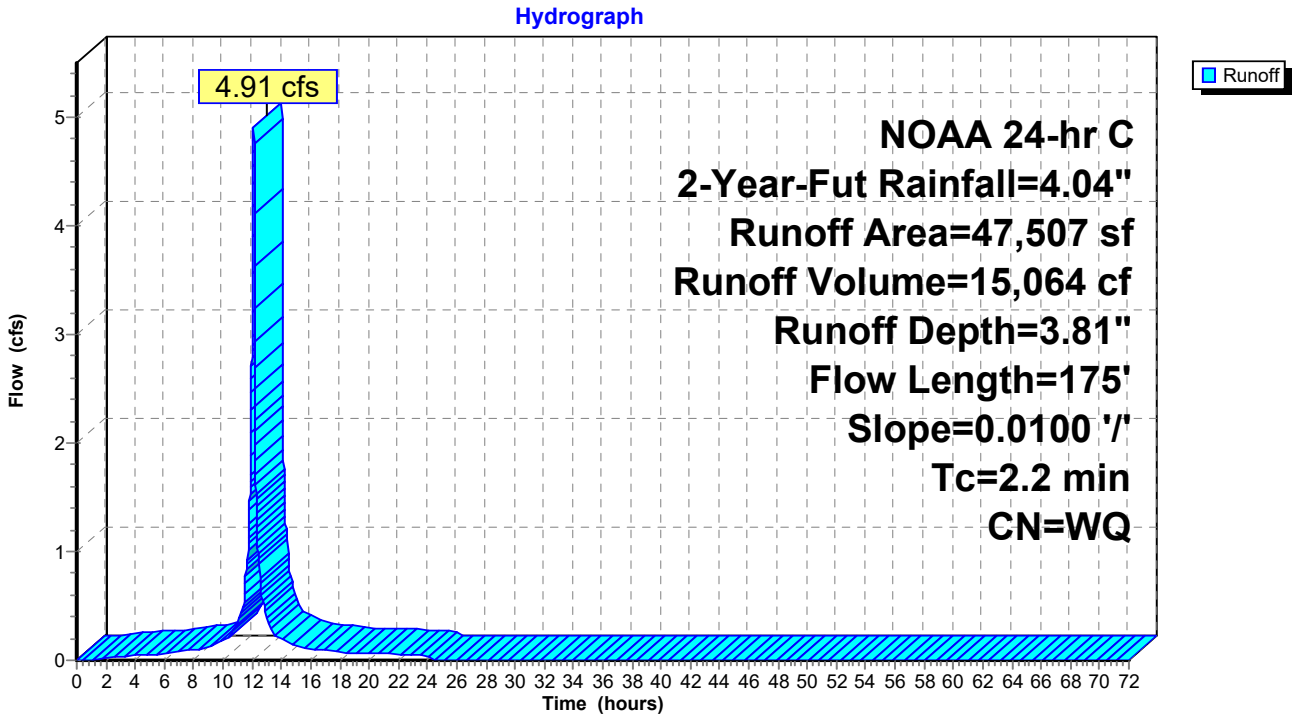
Runoff = 4.91 cfs @ 12.11 hrs, Volume= 15,064 cf, Depth= 3.81"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

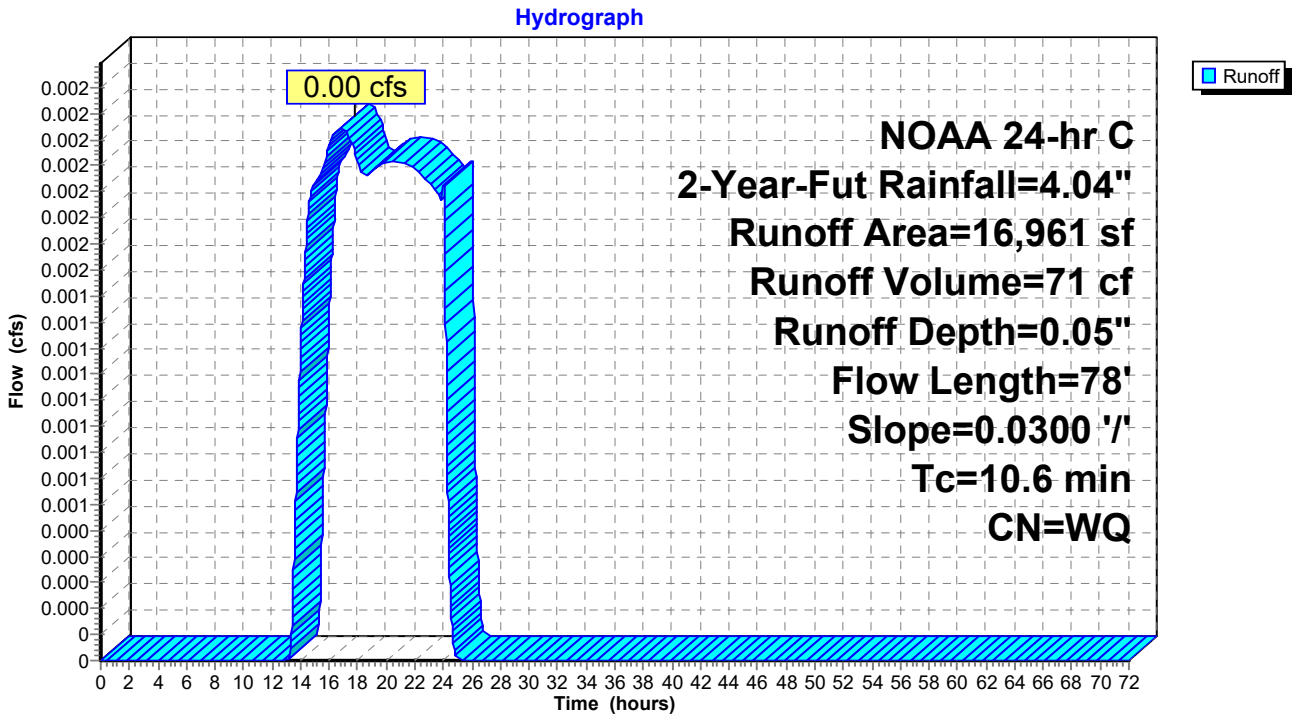
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 71 cf, Depth= 0.05"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

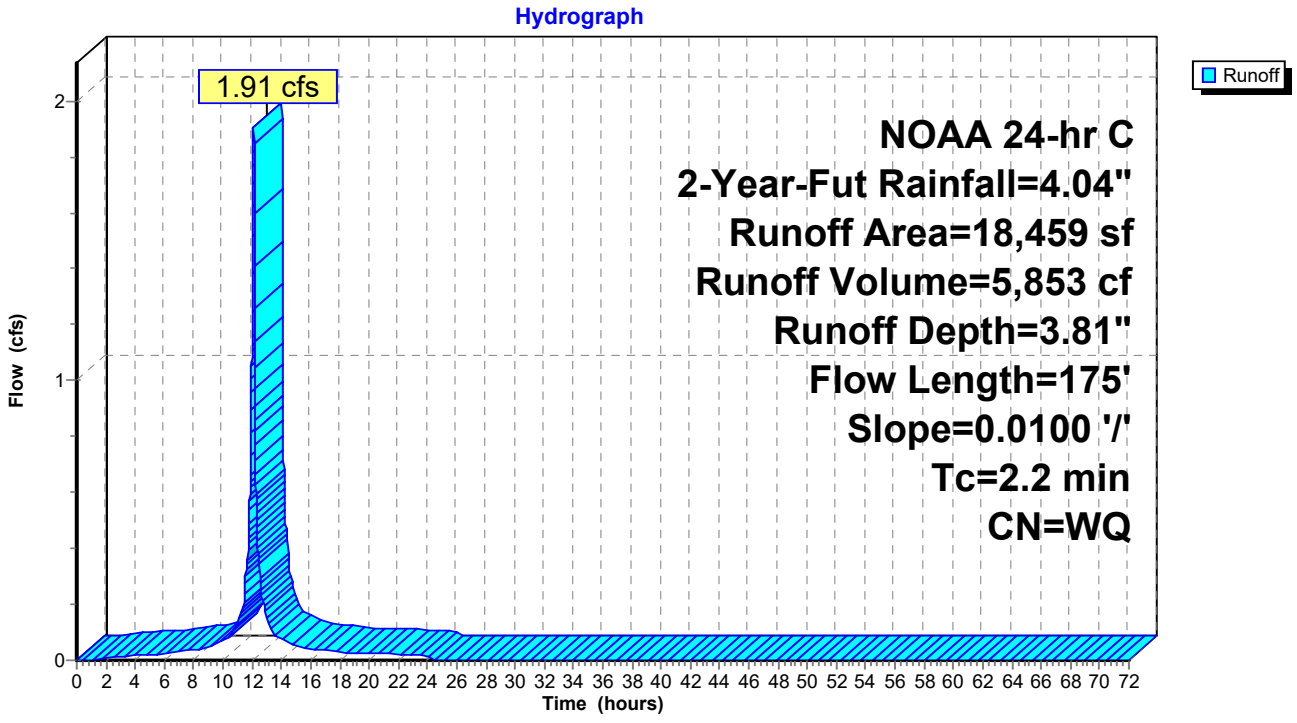
Runoff = 1.91 cfs @ 12.11 hrs, Volume= 5,853 cf, Depth= 3.81"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

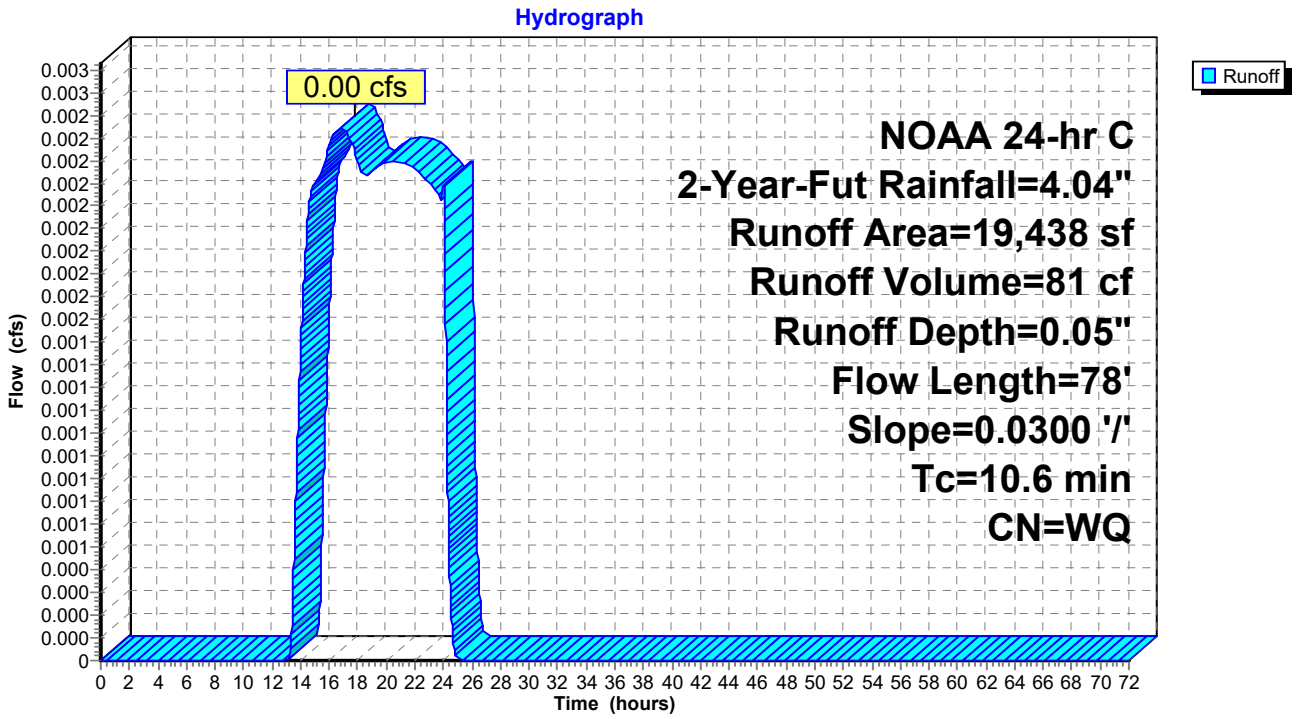
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 81 cf, Depth= 0.05"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

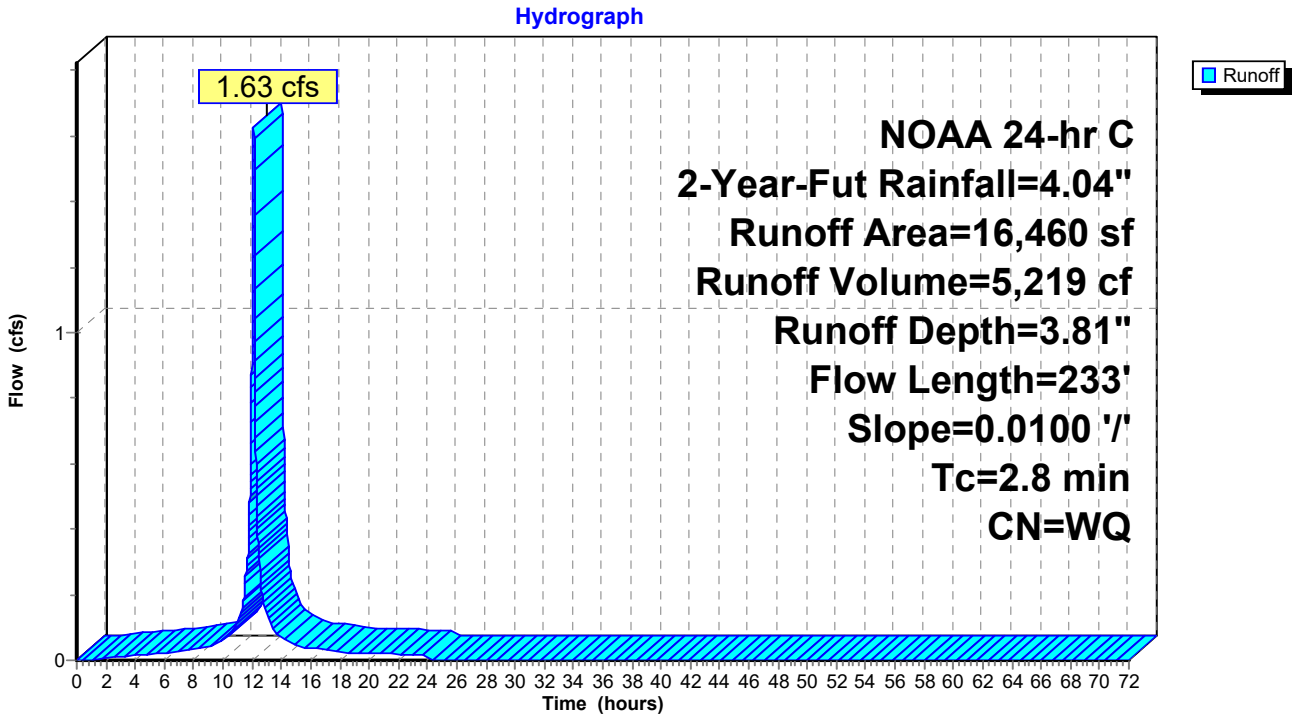
Runoff = 1.63 cfs @ 12.11 hrs, Volume= 5,219 cf, Depth= 3.81"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

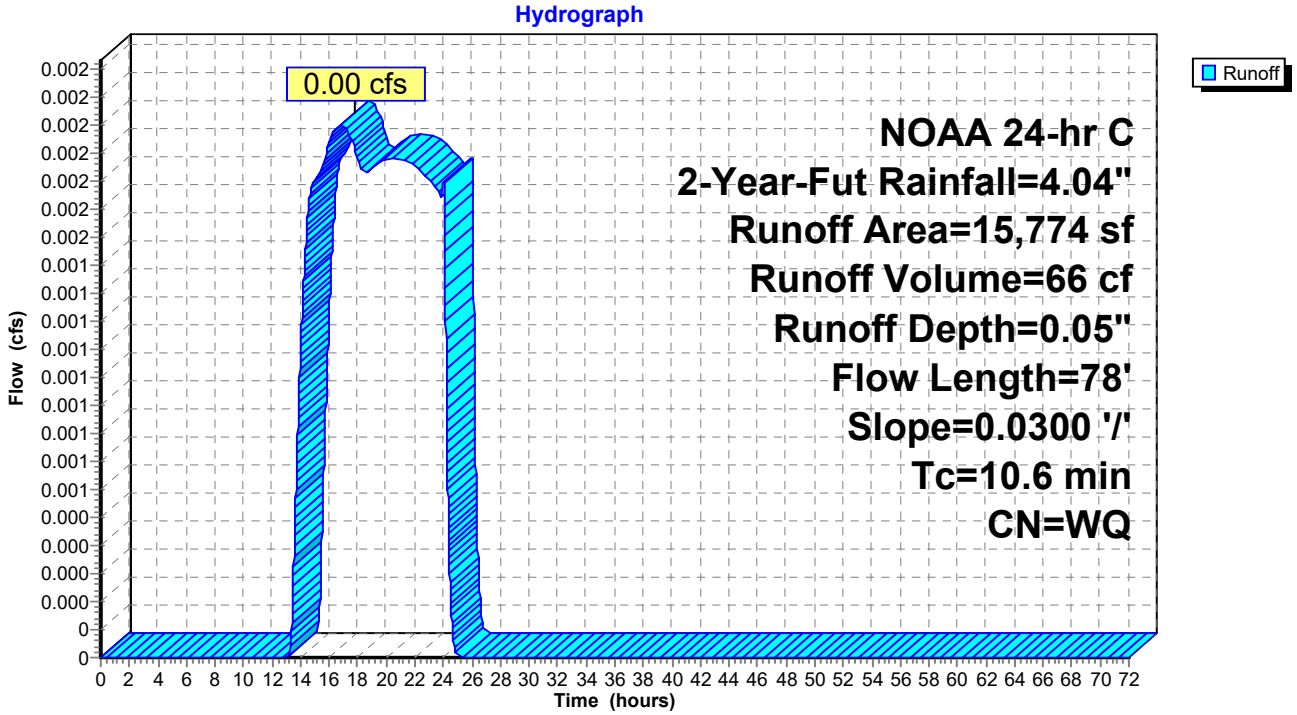
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 66 cf, Depth= 0.05"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

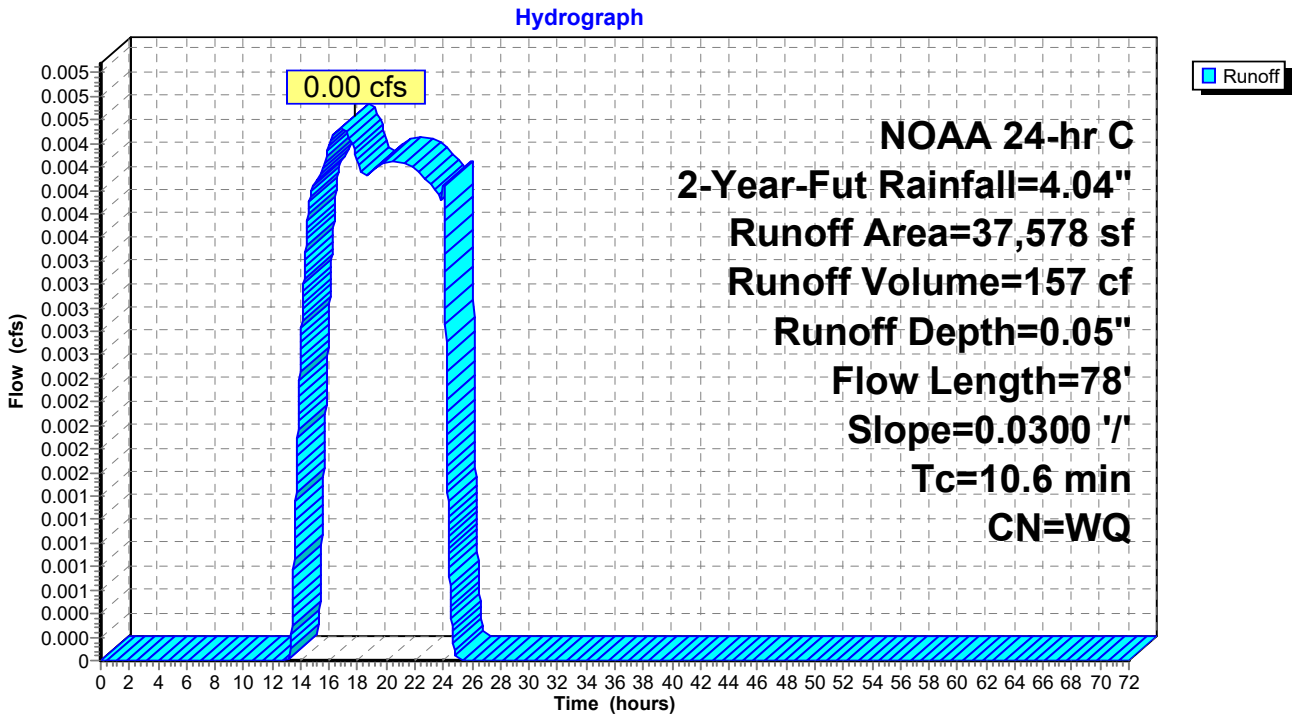
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 157 cf, Depth= 0.05"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

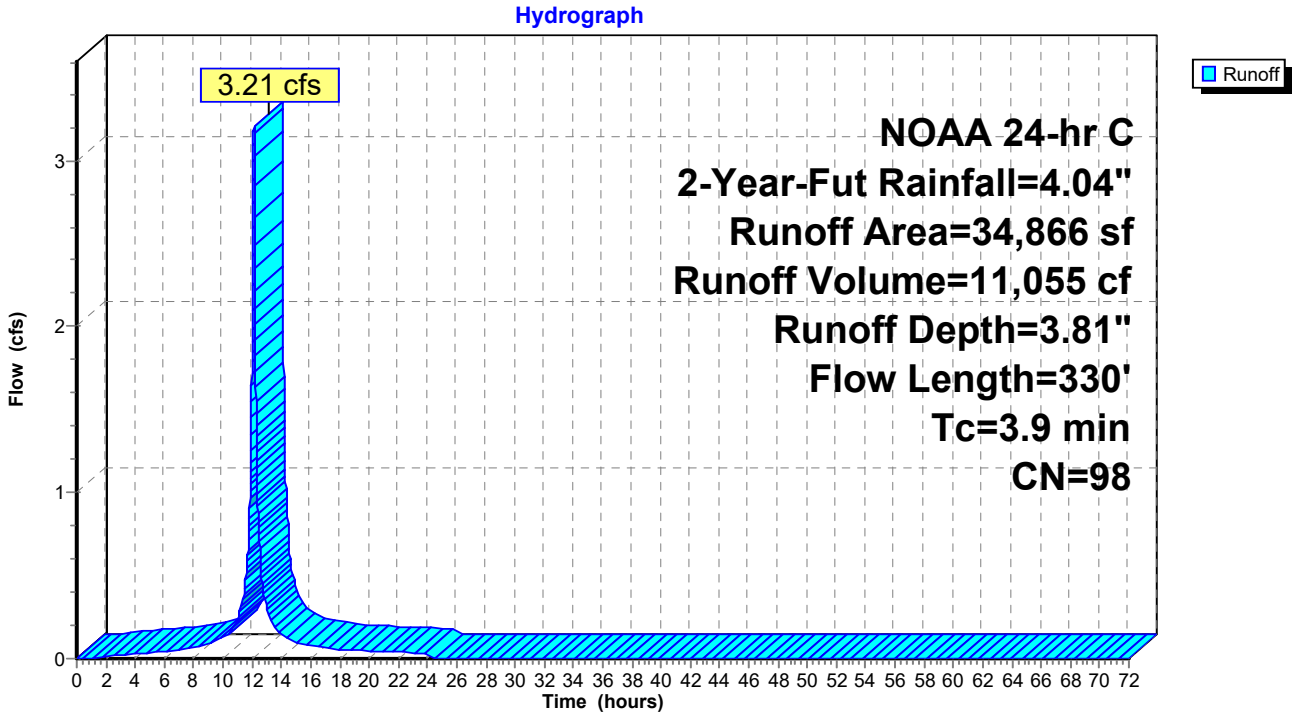
Runoff = 3.21 cfs @ 12.12 hrs, Volume= 11,055 cf, Depth= 3.81"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

[45] Hint: Runoff=Zero

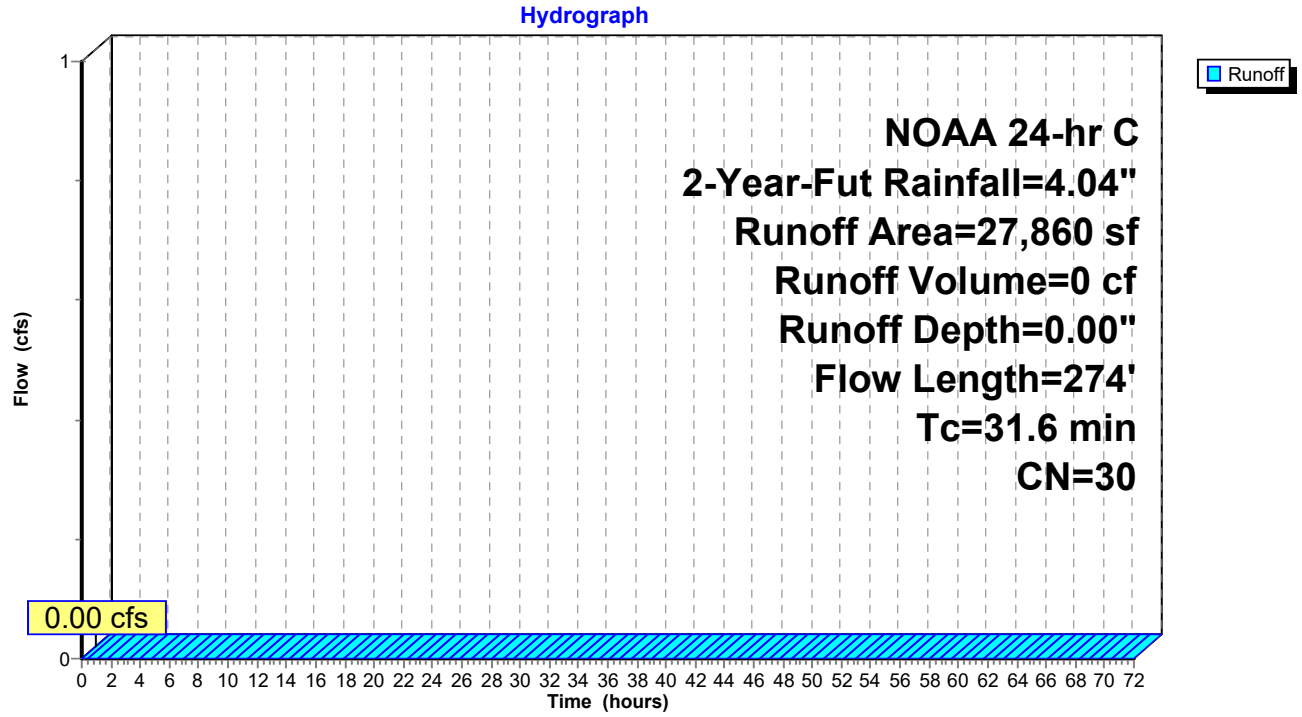
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

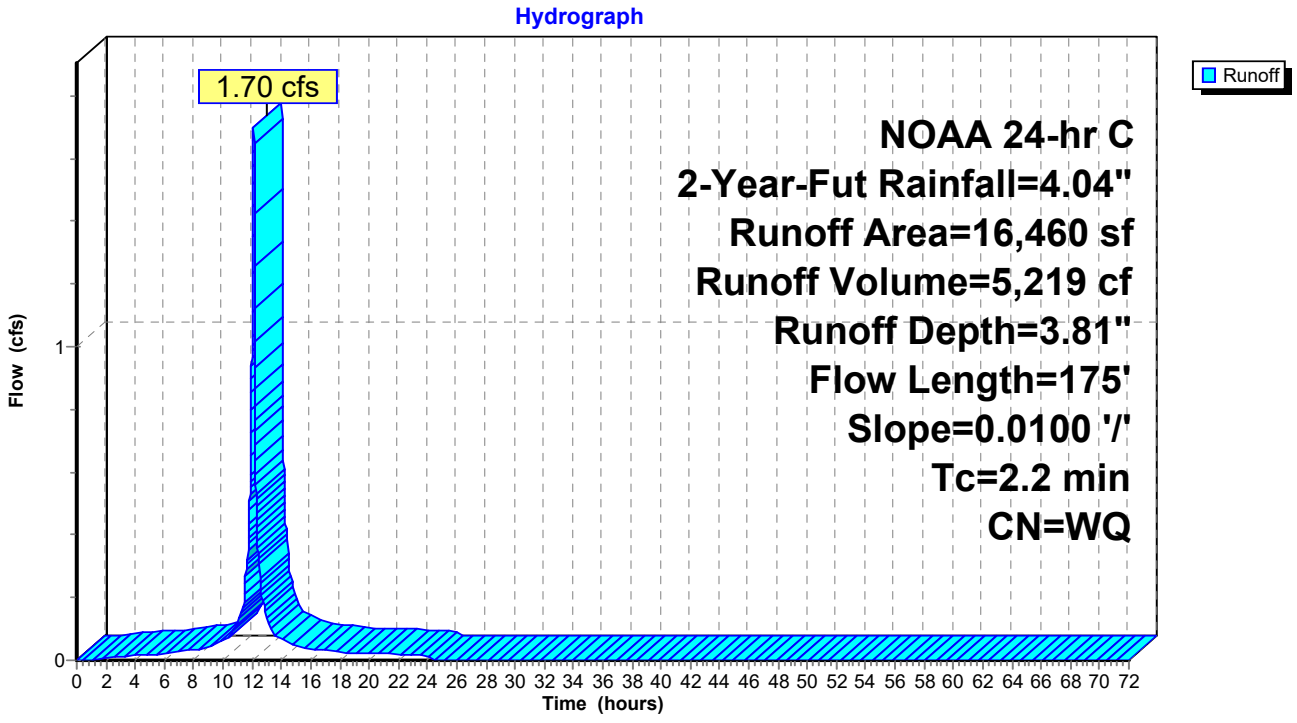
Runoff = 1.70 cfs @ 12.11 hrs, Volume= 5,219 cf, Depth= 3.81"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

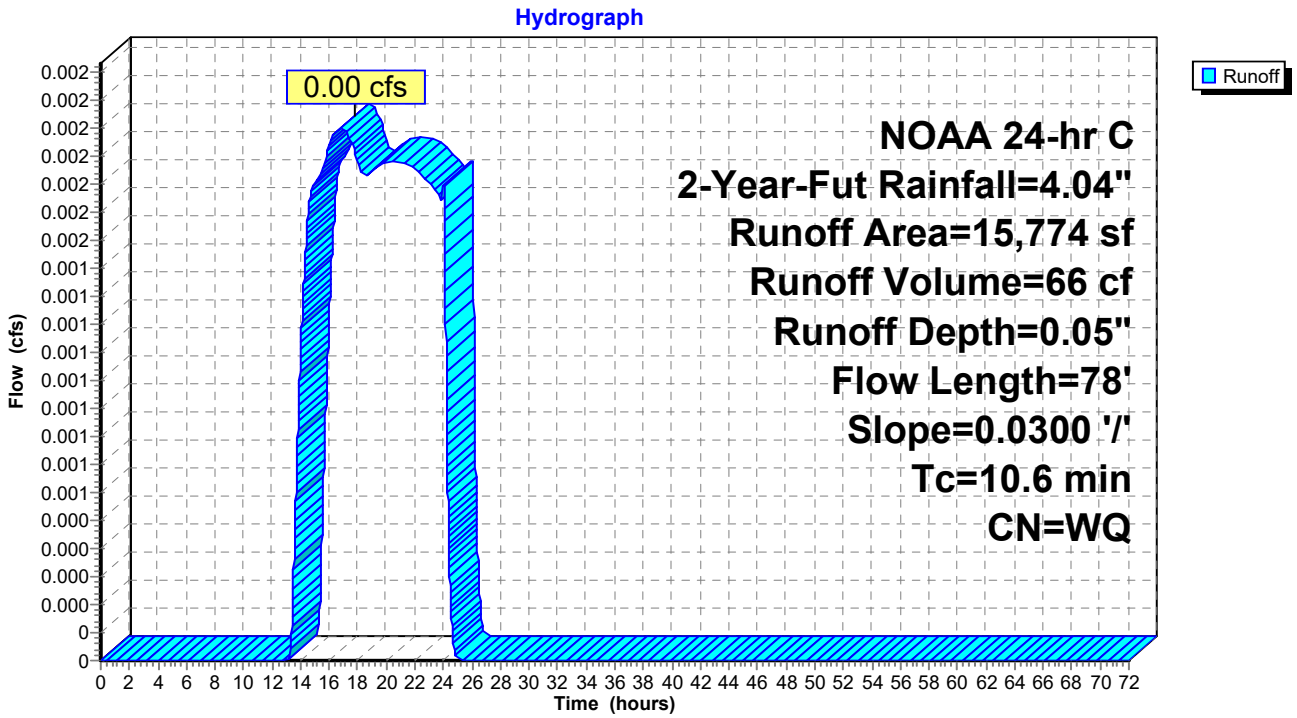
Runoff = 0.00 cfs @ 16.77 hrs, Volume= 66 cf, Depth= 0.05"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

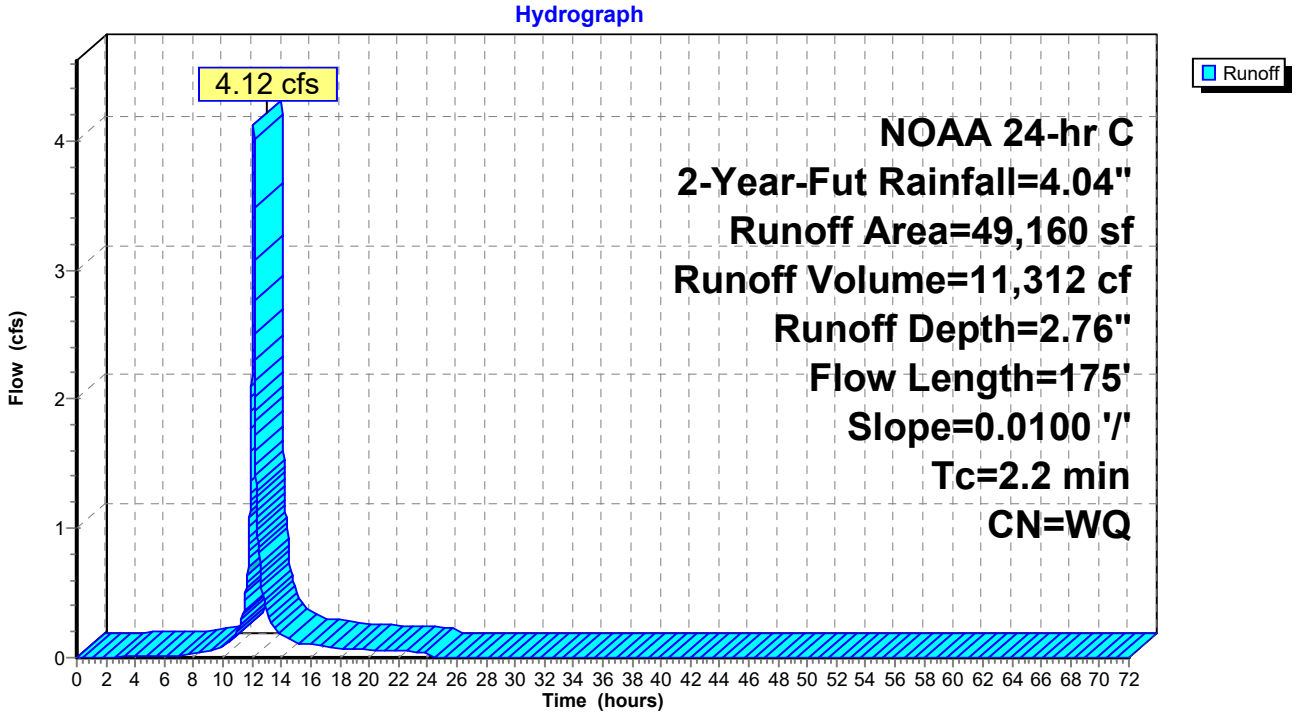
Runoff = 4.12 cfs @ 12.11 hrs, Volume= 11,312 cf, Depth= 2.76"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

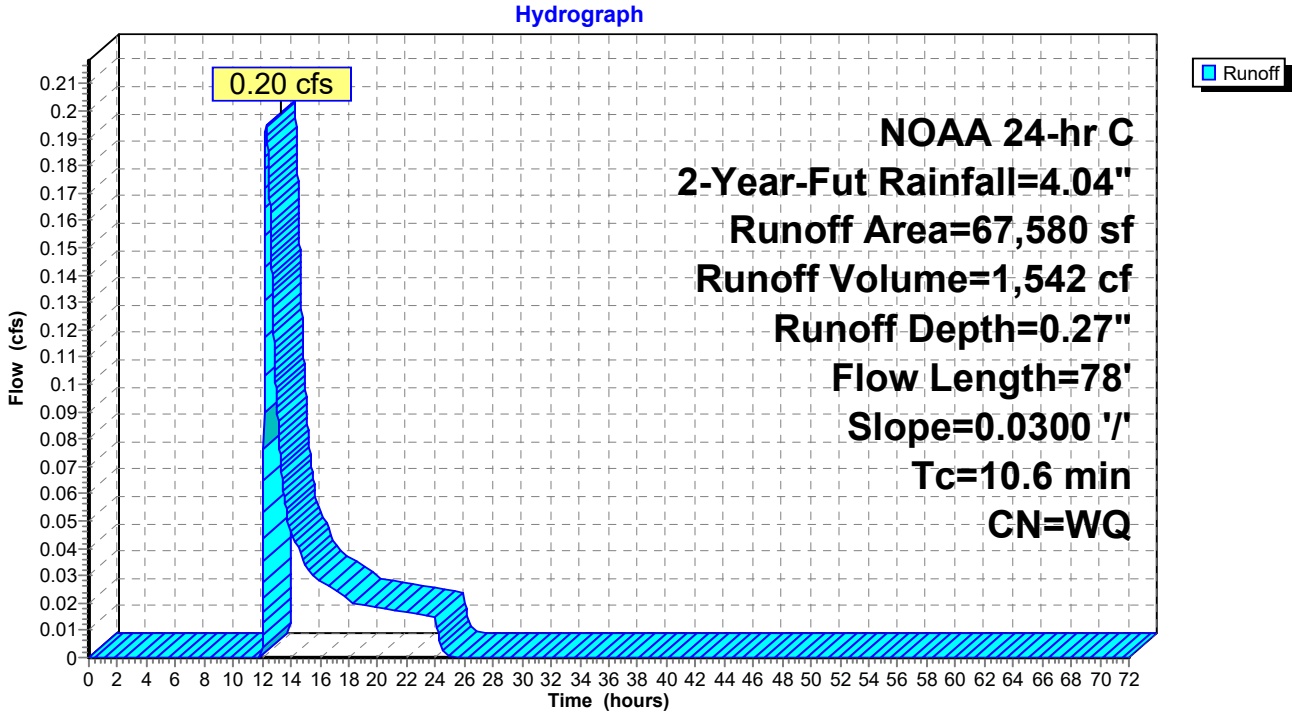
Runoff = 0.20 cfs @ 12.29 hrs, Volume= 1,542 cf, Depth= 0.27"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 2-Year-Fut Rainfall=4.04"

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 1.05" for 2-Year-Fut event
Inflow = 6.89 cfs @ 12.12 hrs, Volume= 14,975 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 15.58' @ 25.17 hrs Surf.Area= 15,118 sf Storage= 14,975 cf

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

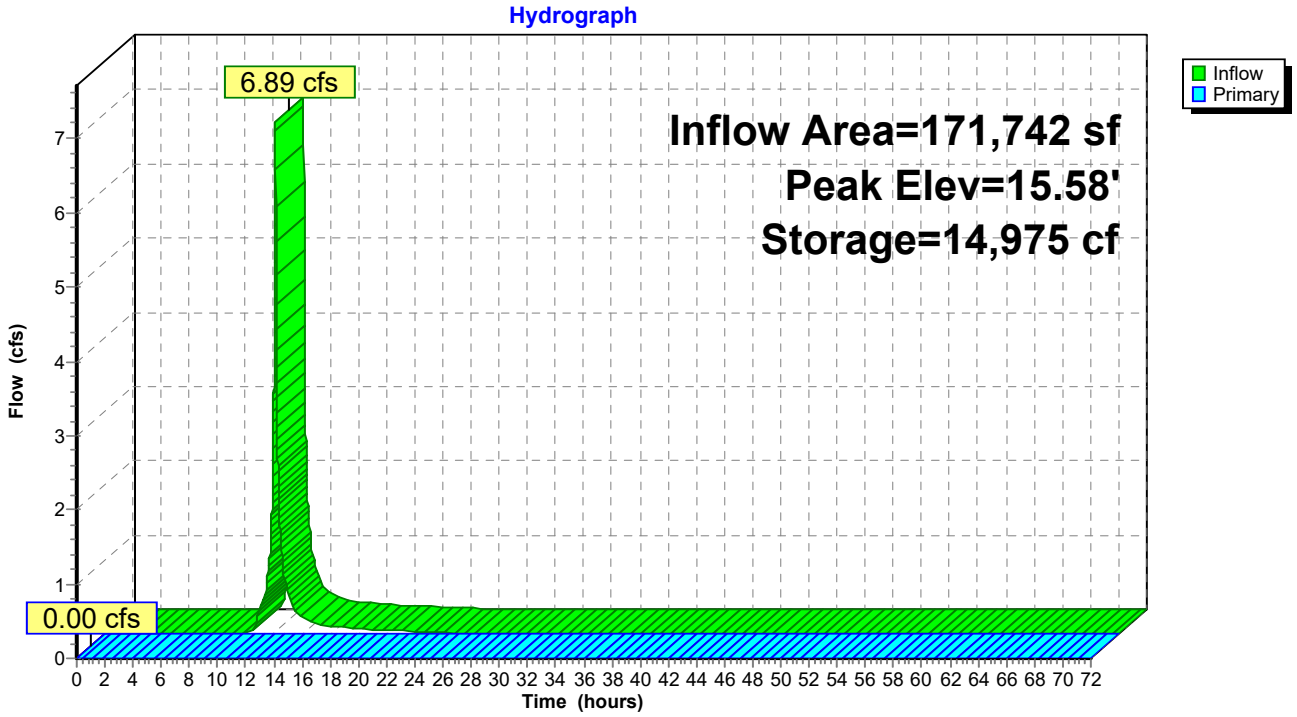
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 0.40" for 2-Year-Fut event
Inflow = 2.15 cfs @ 12.22 hrs, Volume= 5,370 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 14.52' @ 16.36 hrs Surf.Area= 4,658 sf Storage= 5,370 cf

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

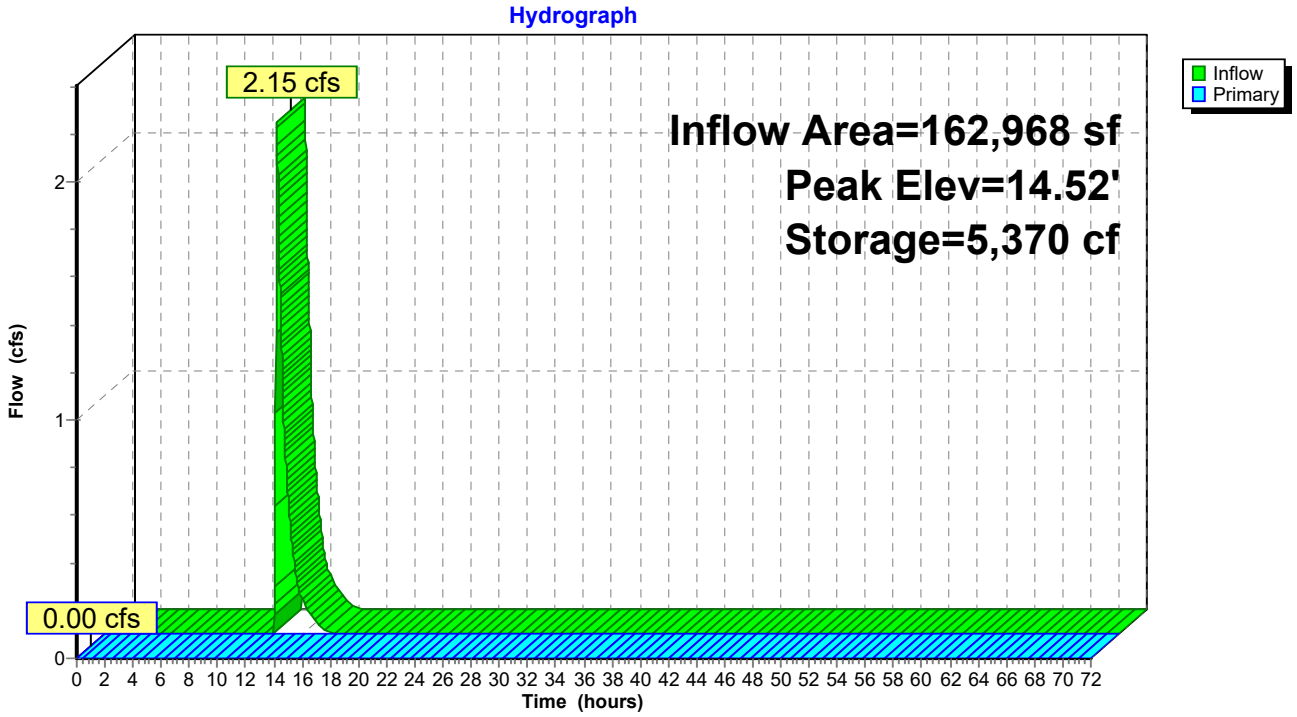
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=13.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 2.58" for 2-Year-Fut event
Inflow = 1.54 cfs @ 12.11 hrs, Volume= 4,767 cf
Outflow = 1.41 cfs @ 12.12 hrs, Volume= 4,767 cf, Atten= 8%, Lag= 1.0 min
Discarded = 0.02 cfs @ 6.92 hrs, Volume= 2,709 cf
Primary = 1.39 cfs @ 12.12 hrs, Volume= 2,058 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.36' @ 12.12 hrs Surf.Area= 1,647 sf Storage= 1,577 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 344.4 min (1,097.5 - 753.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

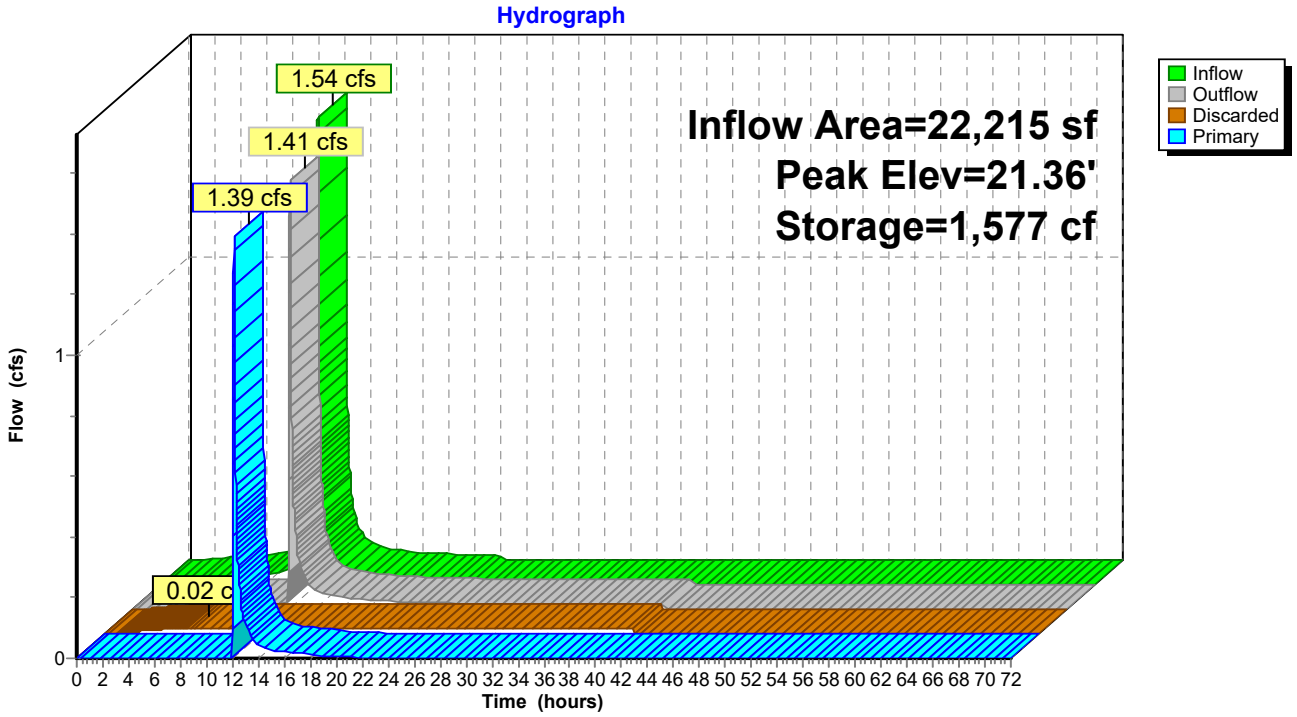
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 6.92 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.39 cfs @ 12.12 hrs HW=21.36' TW=18.57' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.39 cfs of 8.72 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 1.32 cfs @ 1.09 fps)
  └**4=Culvert** (Barrel Controls 0.07 cfs @ 1.59 fps)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 2.49" for 2-Year-Fut event
Inflow = 7.13 cfs @ 12.11 hrs, Volume= 19,944 cf
Outflow = 6.94 cfs @ 12.12 hrs, Volume= 19,944 cf, Atten= 3%, Lag= 0.6 min
Discarded = 0.05 cfs @ 4.84 hrs, Volume= 5,127 cf
Primary = 6.89 cfs @ 12.12 hrs, Volume= 14,818 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.57' @ 12.12 hrs Surf.Area= 1,941 sf Storage= 1,975 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 78.4 min (835.7 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

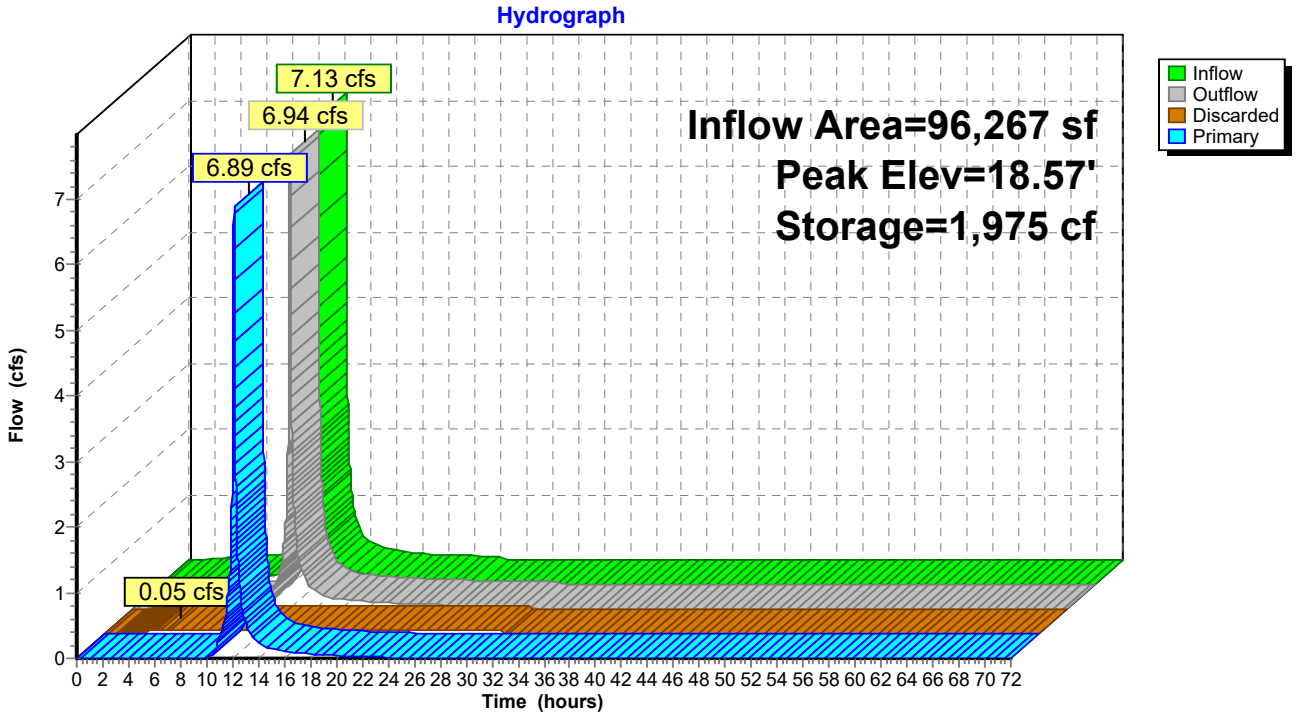
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 4.84 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=6.87 cfs @ 12.12 hrs HW=18.57' TW=14.93' (Dynamic Tailwater)
└**2=Culvert** (Passes 6.73 cfs of 20.96 cfs potential flow)
└**1=Orifice/Grate** (Weir Controls 6.73 cfs @ 1.69 fps)
└**3=Culvert** (Inlet Controls 0.14 cfs @ 2.79 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=509)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 1.88" for 2-Year-Fut event
Inflow = 1.91 cfs @ 12.11 hrs, Volume= 5,934 cf
Outflow = 0.36 cfs @ 11.89 hrs, Volume= 5,938 cf, Atten= 81%, Lag= 0.0 min
Discarded = 0.36 cfs @ 11.89 hrs, Volume= 5,938 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.14' @ 12.45 hrs Surf.Area= 8,811 sf Storage= 1,230 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.4 min (772.4 - 755.9)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

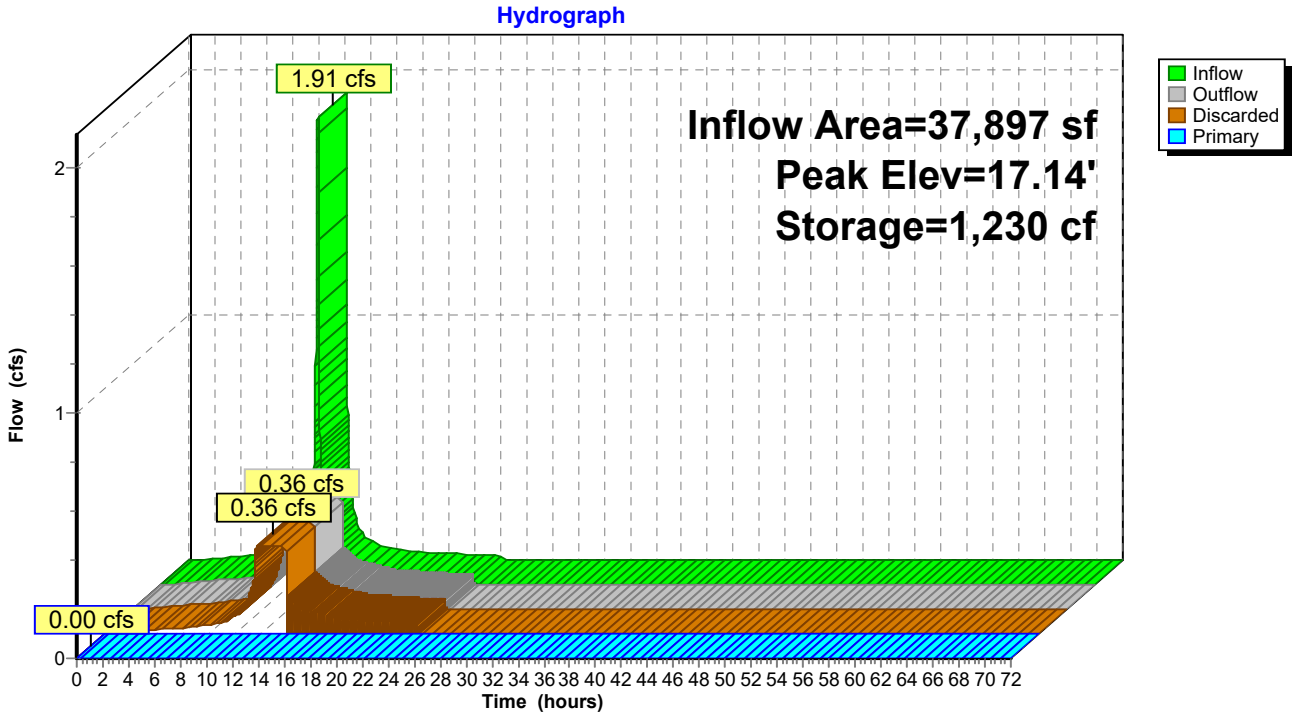
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 11.89 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.00' TW=14.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 9.33 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=406)

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 1.54" for 2-Year-Fut event
Inflow = 1.74 cfs @ 12.11 hrs, Volume= 5,447 cf
Outflow = 0.25 cfs @ 12.56 hrs, Volume= 5,448 cf, Atten= 86%, Lag= 27.2 min
Discarded = 0.18 cfs @ 11.63 hrs, Volume= 5,133 cf
Primary = 0.07 cfs @ 12.56 hrs, Volume= 314 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 23.60' @ 12.56 hrs Surf.Area= 3,163 sf Storage= 1,566 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 43.5 min (801.8 - 758.2)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

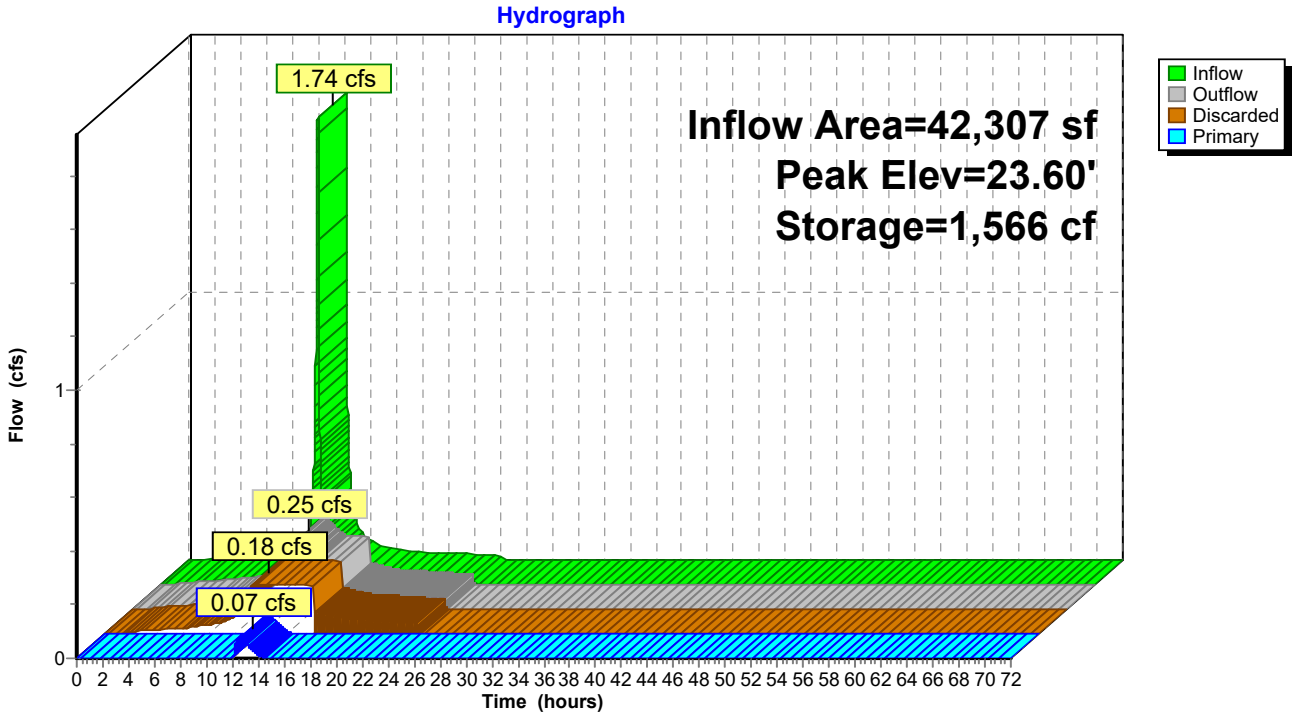
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 11.63 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.07 cfs @ 12.56 hrs HW=23.60' TW=13.84' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.07 cfs of 11.25 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Barrel Controls 0.07 cfs @ 1.55 fps)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=103)

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 1.90" for 2-Year-Fut event
Inflow = 5.02 cfs @ 12.11 hrs, Volume= 19,123 cf
Outflow = 2.35 cfs @ 12.22 hrs, Volume= 19,123 cf, Atten= 53%, Lag= 7.0 min
Discarded = 0.25 cfs @ 10.83 hrs, Volume= 14,067 cf
Primary = 2.10 cfs @ 12.22 hrs, Volume= 5,055 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.54' @ 12.22 hrs Surf.Area= 4,004 sf Storage= 4,842 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 92.8 min (861.0 - 768.2)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

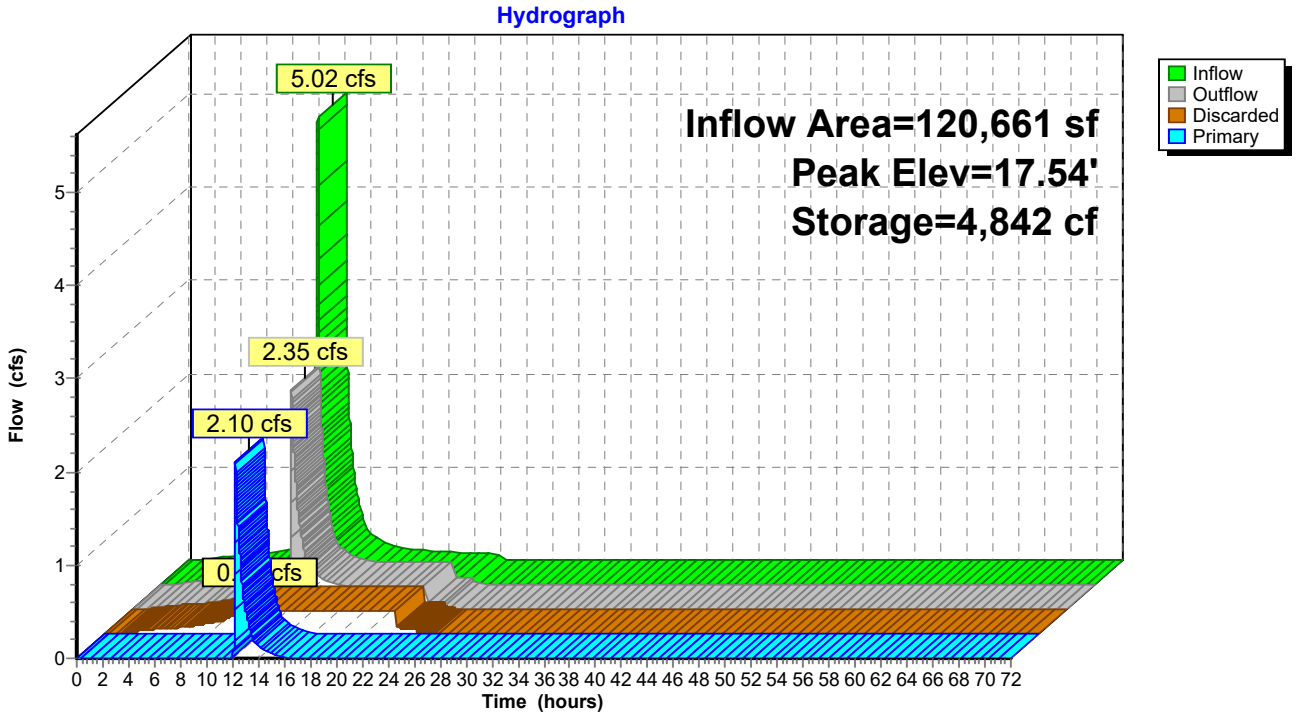
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 10.83 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=2.10 cfs @ 12.22 hrs HW=17.54' TW=13.23' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 1.79 cfs @ 0.90 fps)
└**2=Culvert** (Inlet Controls 0.31 cfs @ 1.88 fps)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 1.56" for 2-Year-Fut event
Inflow = 4.89 cfs @ 12.14 hrs, Volume= 18,204 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 15.79' @ 52.43 hrs Surf.Area= 15,801 sf Storage= 18,204 cf

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

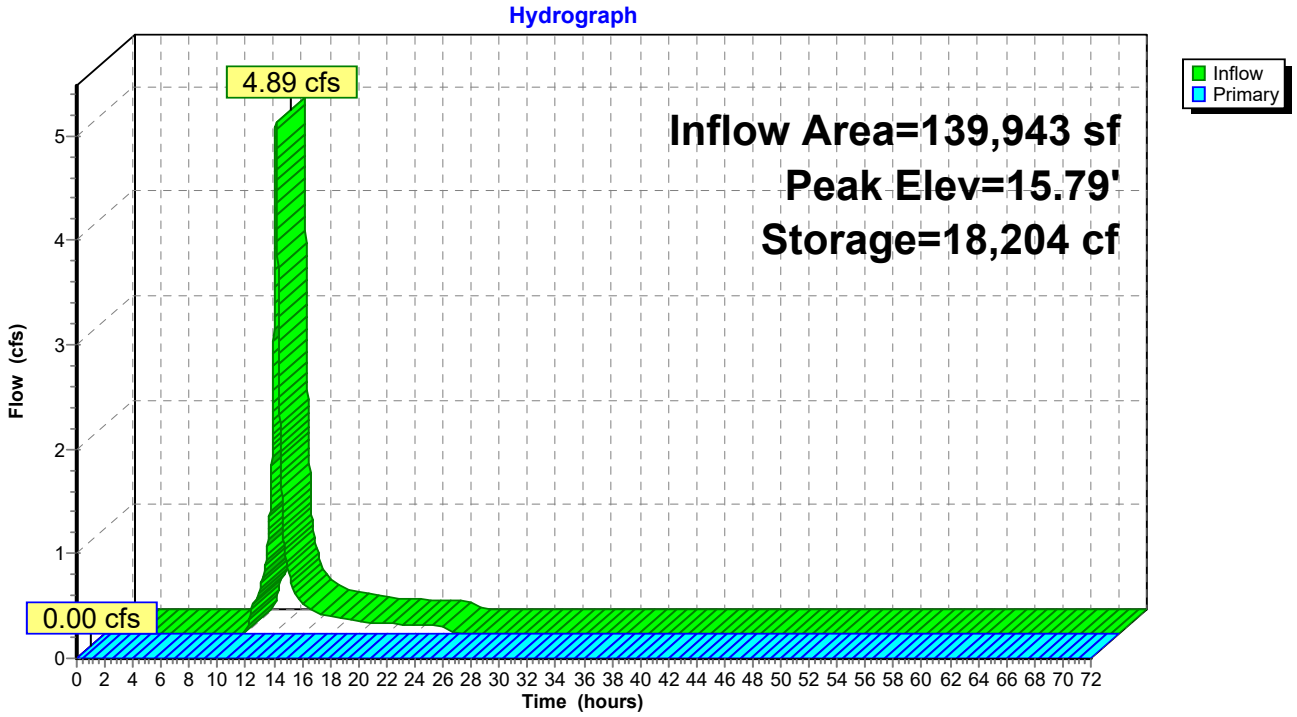
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 2.82" for 2-Year-Fut event
Inflow = 4.91 cfs @ 12.11 hrs, Volume= 15,135 cf
Outflow = 3.56 cfs @ 12.14 hrs, Volume= 14,342 cf, Atten= 28%, Lag= 2.1 min
Primary = 3.56 cfs @ 12.14 hrs, Volume= 14,342 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.50' @ 12.14 hrs Surf.Area= 1,876 sf Storage= 1,846 cf

Plug-Flow detention time= 61.6 min calculated for 14,342 cf (95% of inflow)
Center-of-Mass det. time= 30.2 min (782.6 - 752.4)

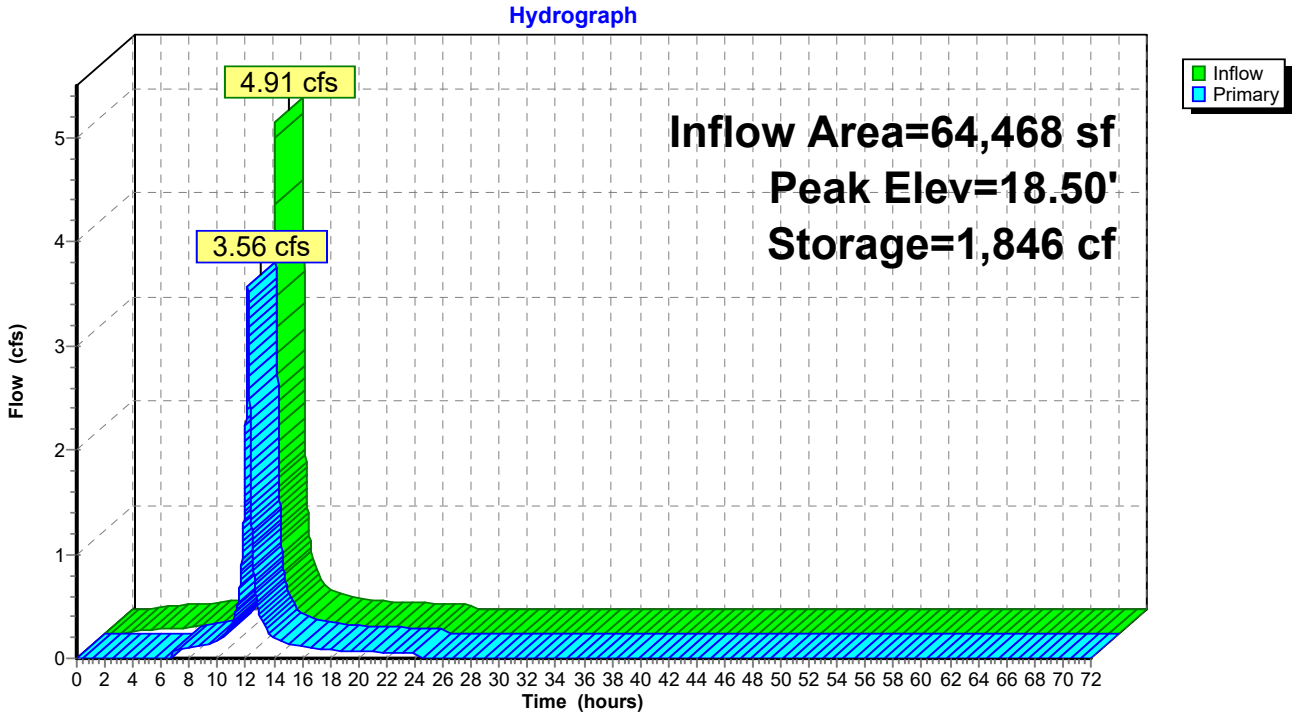
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.55 cfs @ 12.14 hrs HW=18.50' TW=18.03' (Dynamic Tailwater)
↑**2=Culvert** (Inlet Controls 3.55 cfs @ 2.89 fps)
↑**1=Orifice/Grate** (Passes 3.55 cfs of 25.44 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 2.38" for 2-Year-Fut event
Inflow = 5.32 cfs @ 12.11 hrs, Volume= 20,277 cf
Outflow = 4.89 cfs @ 12.14 hrs, Volume= 18,046 cf, Atten= 8%, Lag= 1.9 min
Primary = 4.89 cfs @ 12.14 hrs, Volume= 18,046 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.04' @ 12.14 hrs Surf.Area= 5,291 sf Storage= 3,281 cf

Plug-Flow detention time= 97.2 min calculated for 18,044 cf (89% of inflow)
Center-of-Mass det. time= 42.0 min (816.8 - 774.8)

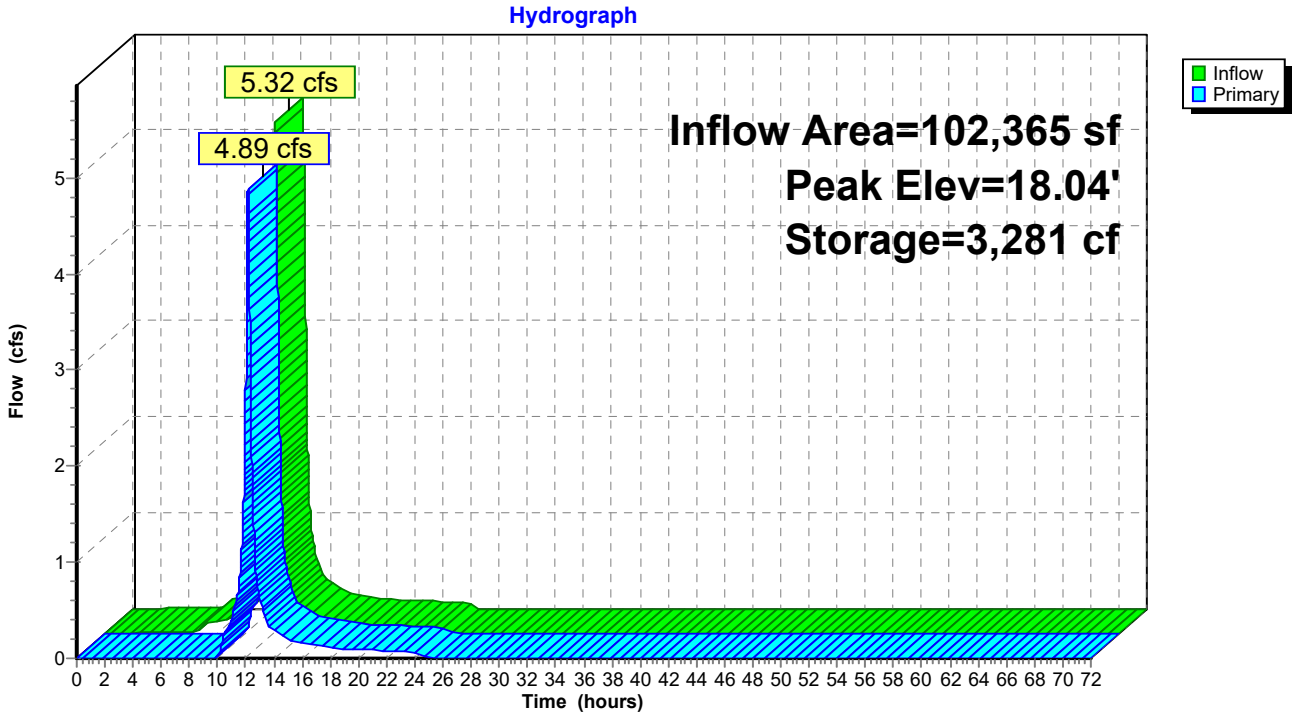
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.89 cfs @ 12.14 hrs HW=18.03' TW=14.97' (Dynamic Tailwater)
↑**2=Culvert** (Passes 4.89 cfs of 9.13 cfs potential flow)
↑**1=Orifice/Grate** (Weir Controls 4.89 cfs @ 1.52 fps)

Pond Pre bio-2: Pre Bio Ret 2

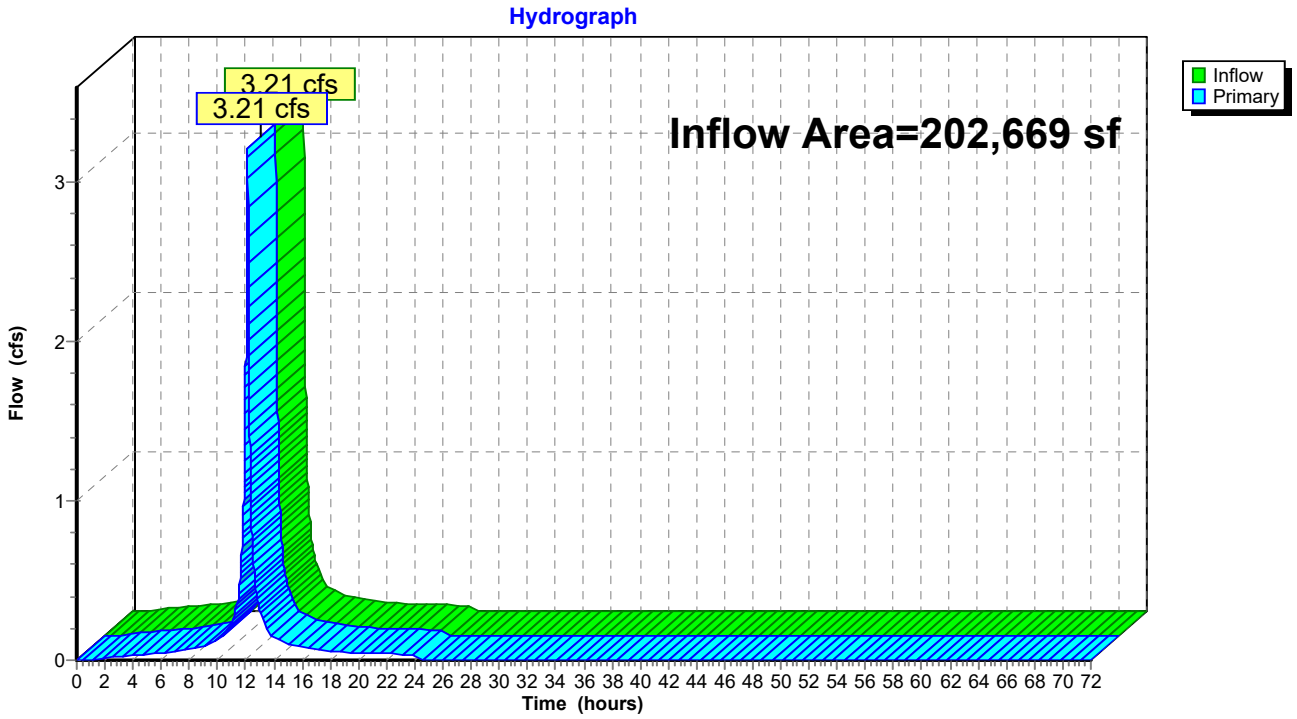


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 0.65" for 2-Year-Fut event
Inflow = 3.21 cfs @ 12.12 hrs, Volume= 11,055 cf
Primary = 3.21 cfs @ 12.12 hrs, Volume= 11,055 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

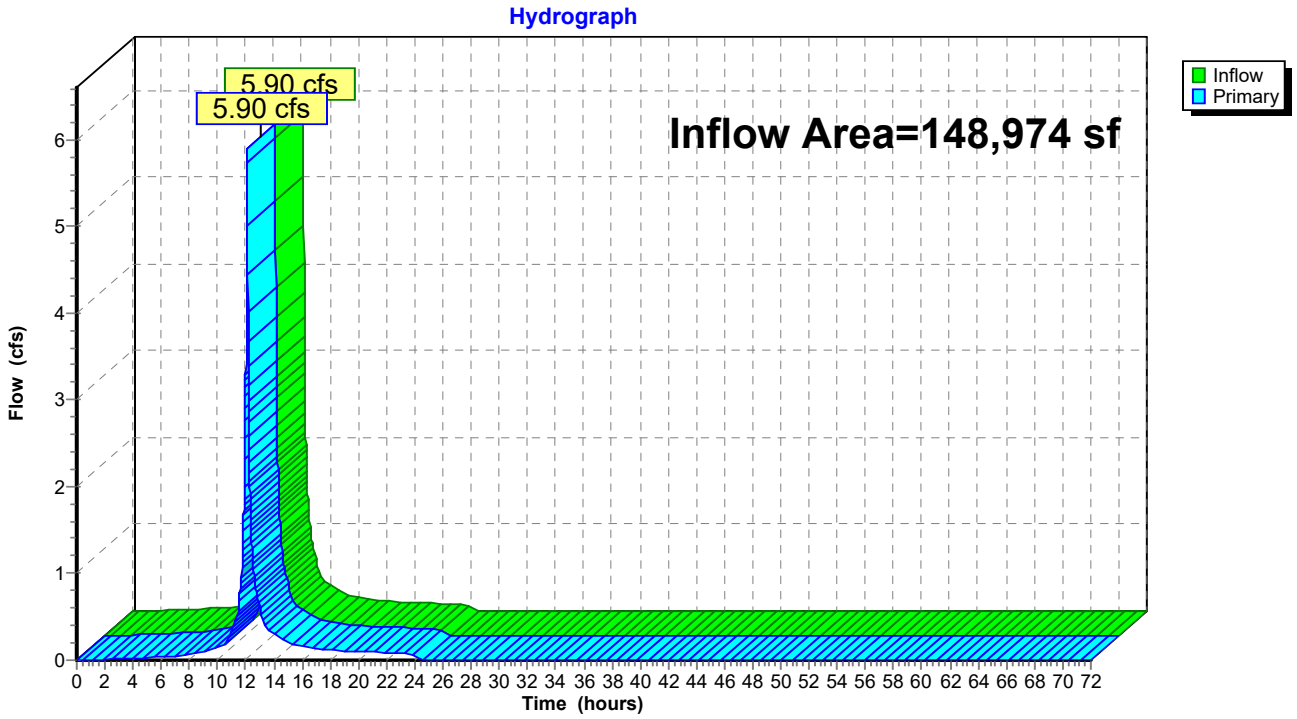


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 1.46" for 2-Year-Fut event
Inflow = 5.90 cfs @ 12.11 hrs, Volume= 18,139 cf
Primary = 5.90 cfs @ 12.11 hrs, Volume= 18,139 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

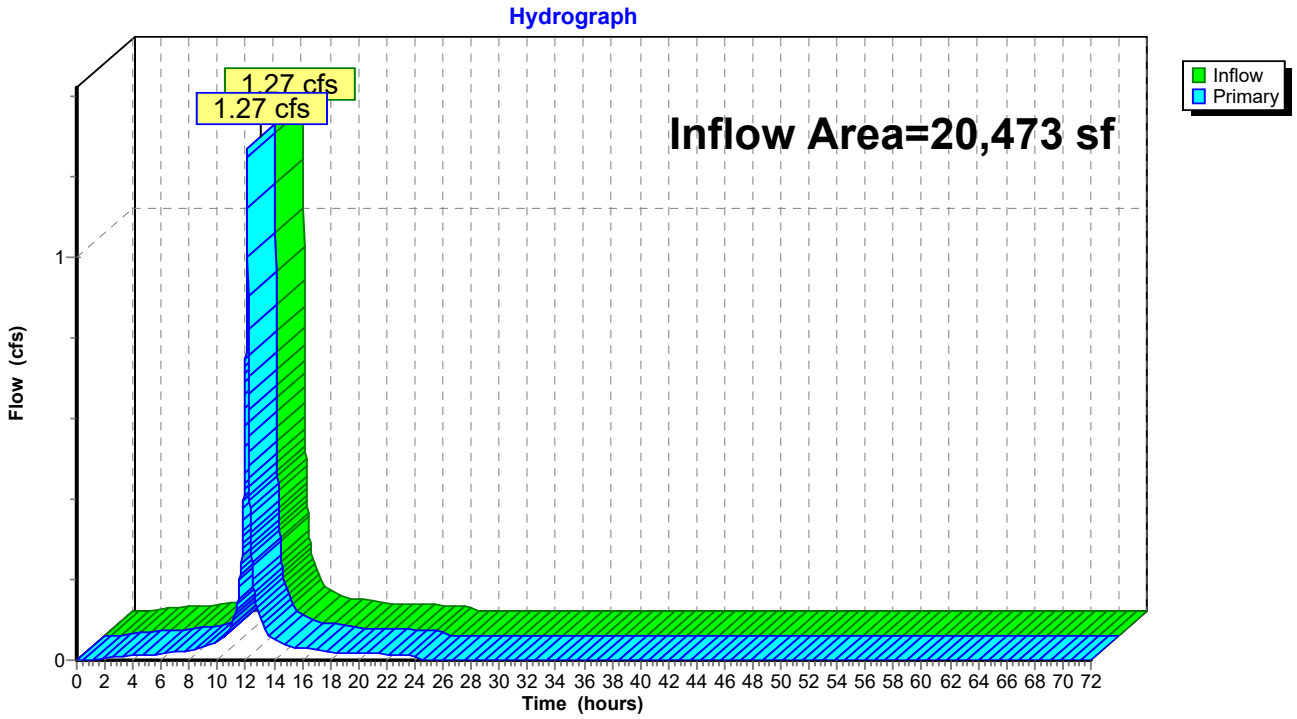


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 2.35" for 2-Year-Fut event
Inflow = 1.27 cfs @ 12.11 hrs, Volume= 4,002 cf
Primary = 1.27 cfs @ 12.11 hrs, Volume= 4,002 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

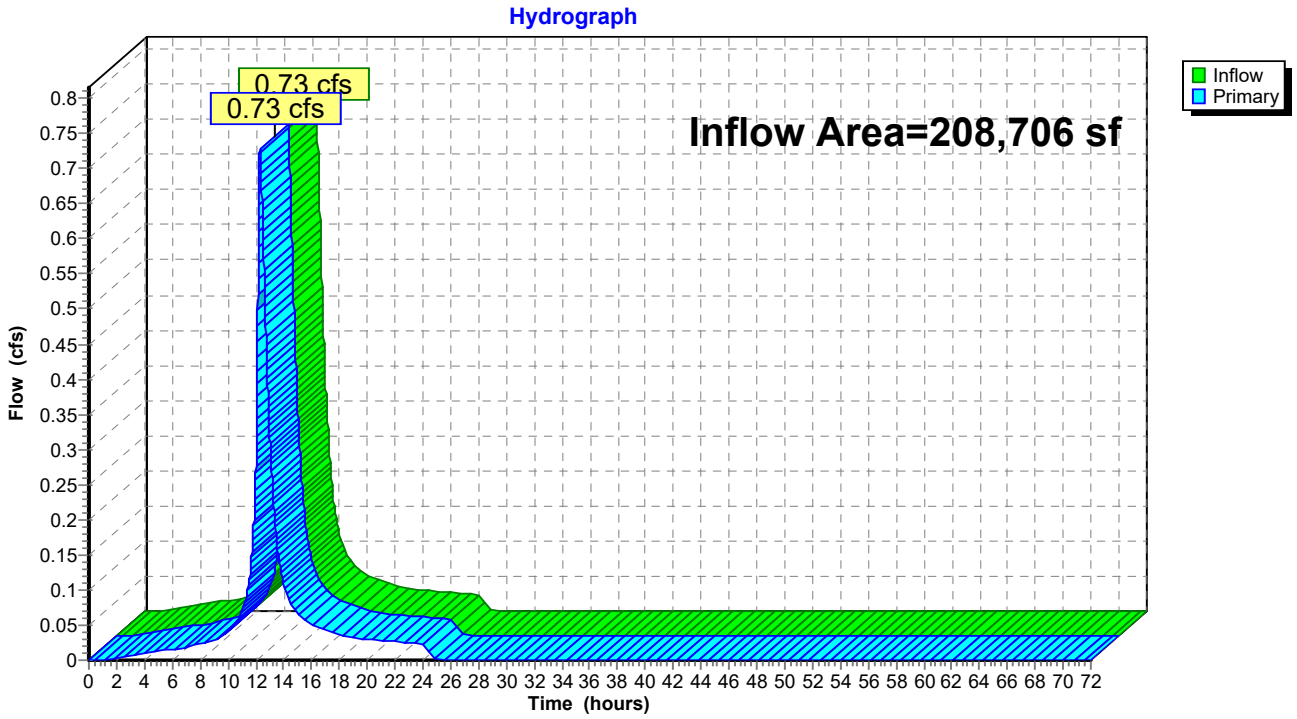


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 0.30" for 2-Year-Fut event
Inflow = 0.73 cfs @ 12.31 hrs, Volume= 5,157 cf
Primary = 0.73 cfs @ 12.31 hrs, Volume= 5,157 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

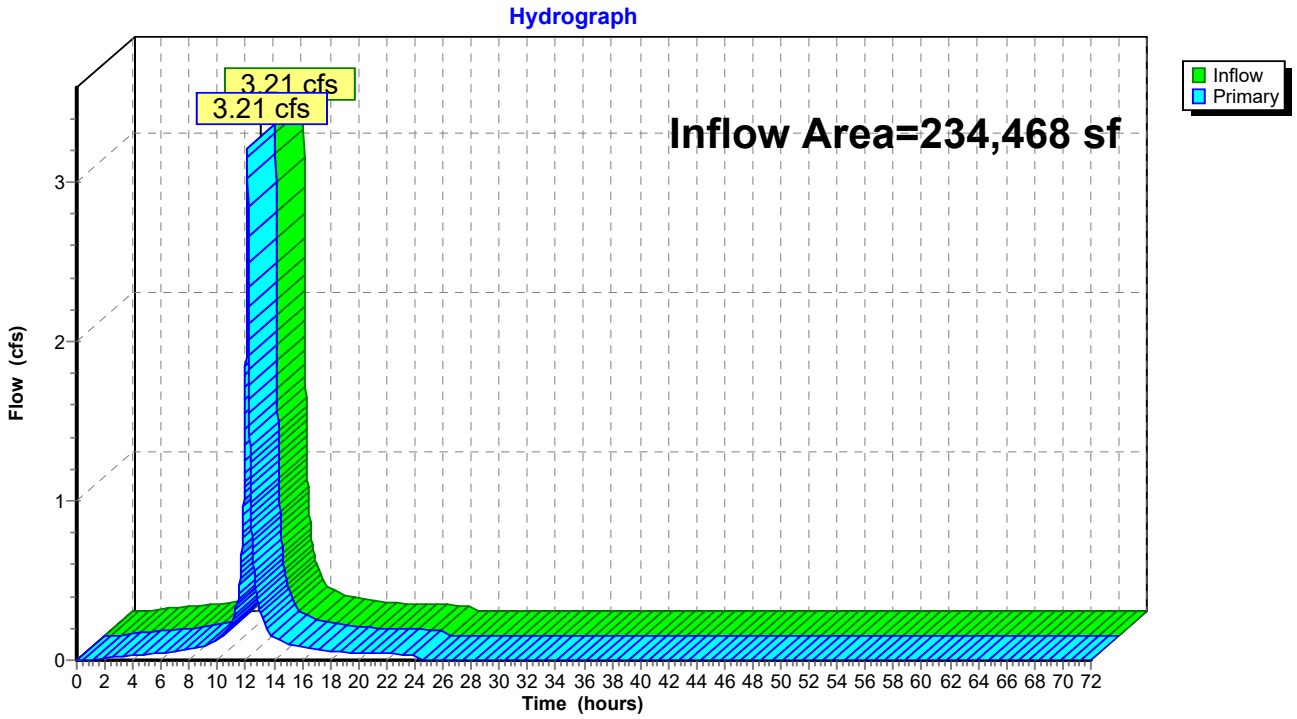


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 0.57" for 2-Year-Fut event
Inflow = 3.21 cfs @ 12.12 hrs, Volume= 11,055 cf
Primary = 3.21 cfs @ 12.12 hrs, Volume= 11,055 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

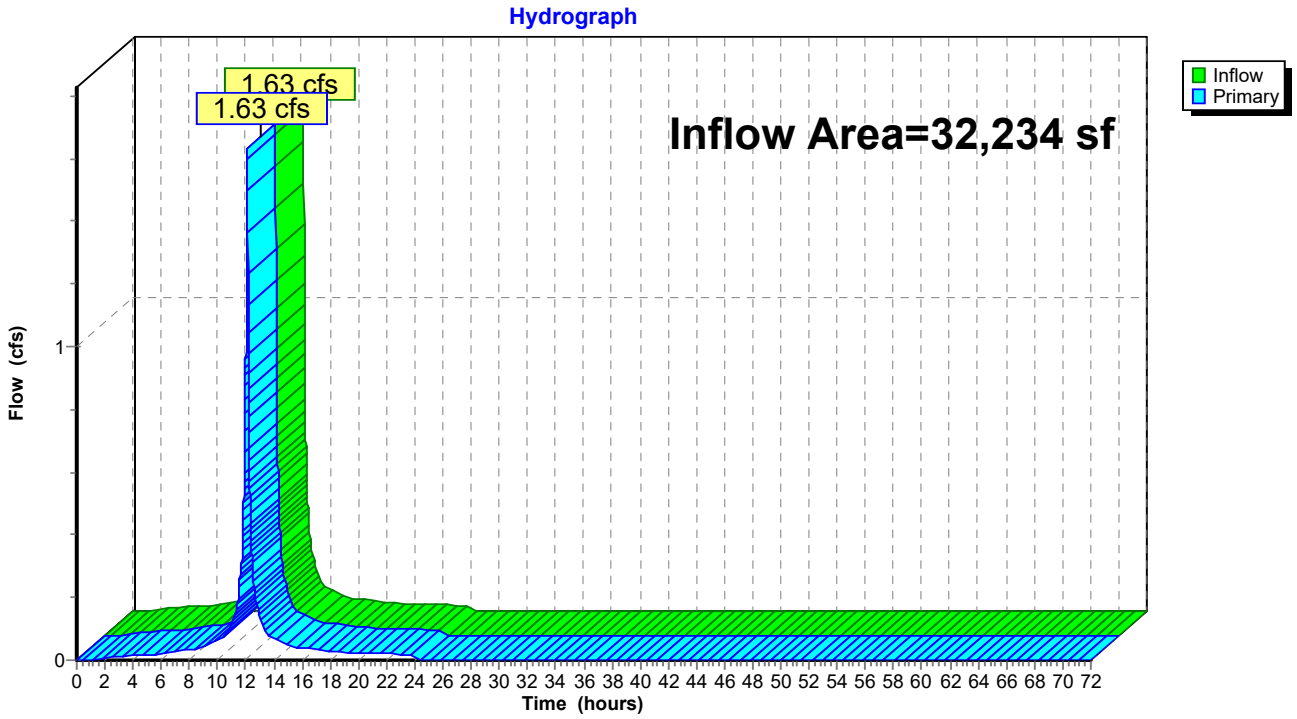


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 1.97" for 2-Year-Fut event
Inflow = 1.63 cfs @ 12.11 hrs, Volume= 5,285 cf
Primary = 1.63 cfs @ 12.11 hrs, Volume= 5,285 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=7.75 cfs 24,072 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=2.09"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=1.14 cfs 7,963 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.06 cfs 6,402 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.01 cfs 172 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.03 cfs 422 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.55 cfs 7,911 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.03 cfs 459 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=1.69 cfs 5,363 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.01 cfs 188 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.05 cfs 887 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=330' Tc=3.9 min CN=98 Runoff=4.29 cfs 14,942 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 49 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.33 cfs 7,218 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.04 cfs 601 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=6.28 cfs 19,509 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=0.65"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.27 cfs 1,702 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=1.60"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=0.69 cfs 5,811 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=6.56 cfs 20,359 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.02 cfs 401 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.55 cfs 7,911 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.03 cfs 459 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=2.18 cfs 7,054 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.02 cfs 373 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.05 cfs 887 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=330' Tc=3.9 min CN=98 Runoff=4.29 cfs 14,942 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 49 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=5.14"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.27 cfs 7,054 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.02 cfs 373 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=4.01"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=5.90 cfs 16,432 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=0.64"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.58 cfs 3,608 cf

Pond 4P: Pre developed infiltration basin 1, Peak Elev=16.13' Storage=23,760 cf Inflow=9.43 cfs 23,760 cf
Outflow=0.00 cfs 0 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=15.62' Storage=11,386 cf Inflow=5.59 cfs 11,386 cf
Outflow=0.00 cfs 0 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.39' Storage=1,625 cf Inflow=2.06 cfs 6,574 cf
Discarded=0.02 cfs 2,858 cf Primary=1.96 cfs 3,716 cf Outflow=1.98 cfs 6,574 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.63' Storage=2,099 cf Inflow=9.68 cfs 28,210 cf
Discarded=0.05 cfs 5,366 cf Primary=9.43 cfs 22,844 cf Outflow=9.48 cfs 28,210 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.24' Storage=2,066 cf Inflow=2.55 cfs 8,370 cf
Discarded=0.36 cfs 8,344 cf Primary=0.01 cfs 28 cf Outflow=0.37 cfs 8,372 cf

Pond Bio 70: Post Bio-70 Peak Elev=23.83' Storage=2,339 cf Inflow=2.33 cfs 7,819 cf
Discarded=0.18 cfs 6,750 cf Primary=0.13 cfs 1,071 cf Outflow=0.31 cfs 7,821 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.68' Storage=5,408 cf Inflow=6.82 cfs 27,021 cf
Discarded=0.25 cfs 16,706 cf Primary=5.51 cfs 10,316 cf Outflow=5.76 cfs 27,021 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=16.31' Storage=26,994 cf Inflow=6.24 cfs 26,994 cf
Outflow=0.00 cfs 0 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=18.78' Storage=2,420 cf Inflow=6.56 cfs 20,760 cf
Outflow=4.40 cfs 19,967 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=18.07' Storage=3,484 cf Inflow=6.73 cfs 28,337 cf
Outflow=6.24 cfs 26,107 cf

Link 1L: Pre dis 1 Inflow=4.29 cfs 14,991 cf
Primary=4.29 cfs 14,991 cf

Link 3L: Pre discharge point 3 Inflow=8.51 cfs 27,466 cf
Primary=8.51 cfs 27,466 cf

Link 4L: Post discharge point 2 Inflow=1.69 cfs 5,551 cf
Primary=1.69 cfs 5,551 cf

Link 6L: Discharge point 3 post Inflow=1.14 cfs 7,963 cf
Primary=1.14 cfs 7,963 cf

Link 11L: Post dis 1 Inflow=4.29 cfs 14,991 cf
Primary=4.29 cfs 14,991 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=2.18 cfs 7,426 cf
Primary=2.18 cfs 7,426 cf

Total Runoff Area = 847,524 sf Runoff Volume = 183,570 cf Average Runoff Depth = 2.60"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

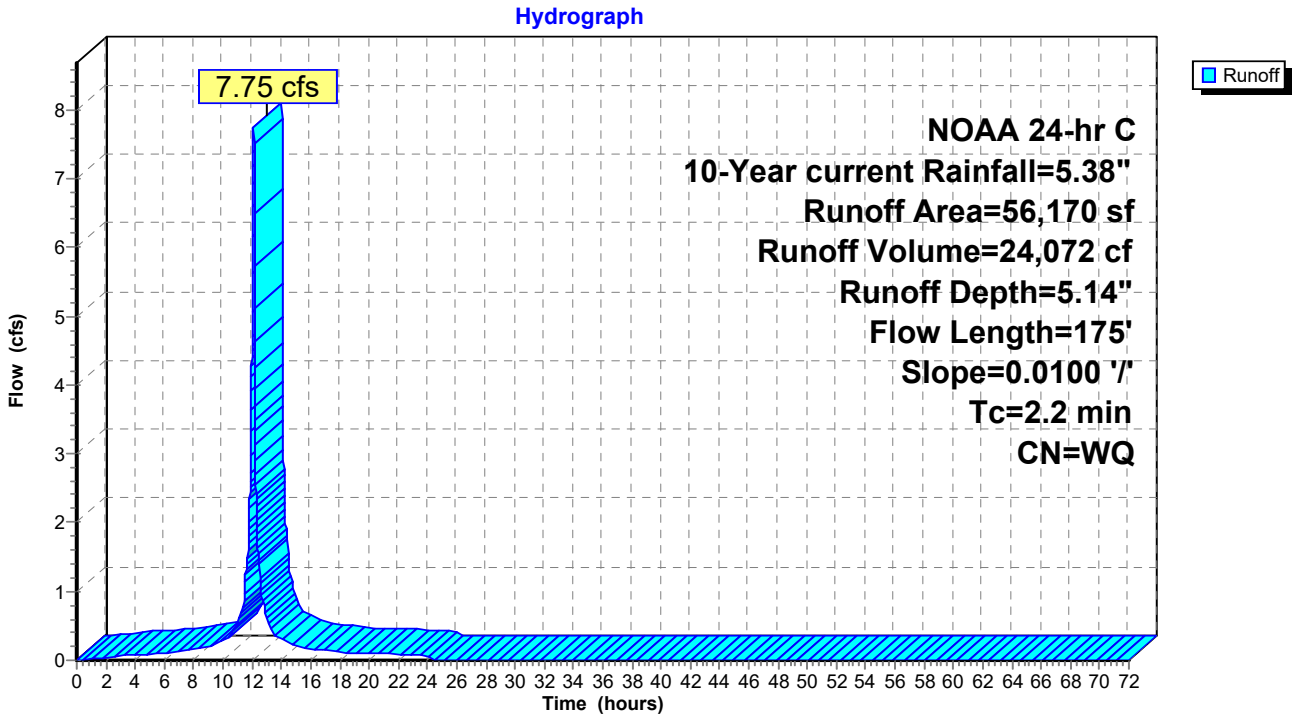
Runoff = 7.75 cfs @ 12.11 hrs, Volume= 24,072 cf, Depth= 5.14"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

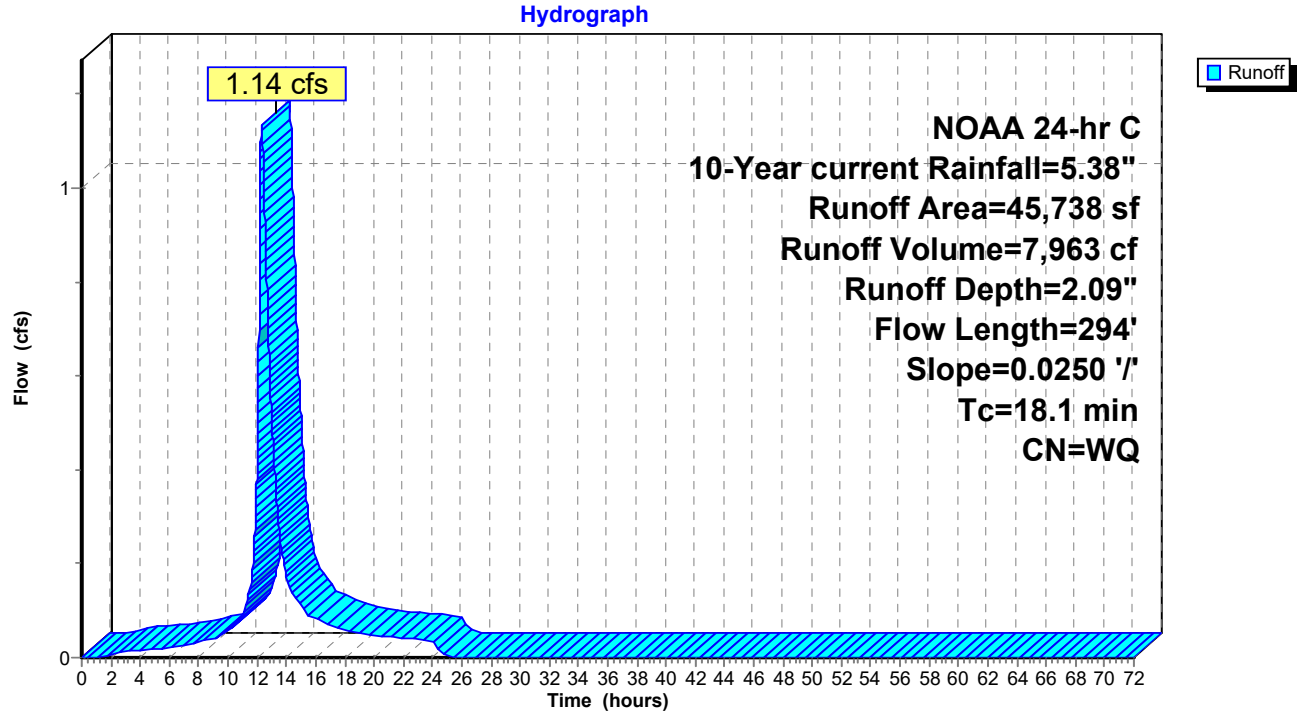
Runoff = 1.14 cfs @ 12.31 hrs, Volume= 7,963 cf, Depth= 2.09"
Routed to Link 6L : Discharge point 3 post

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

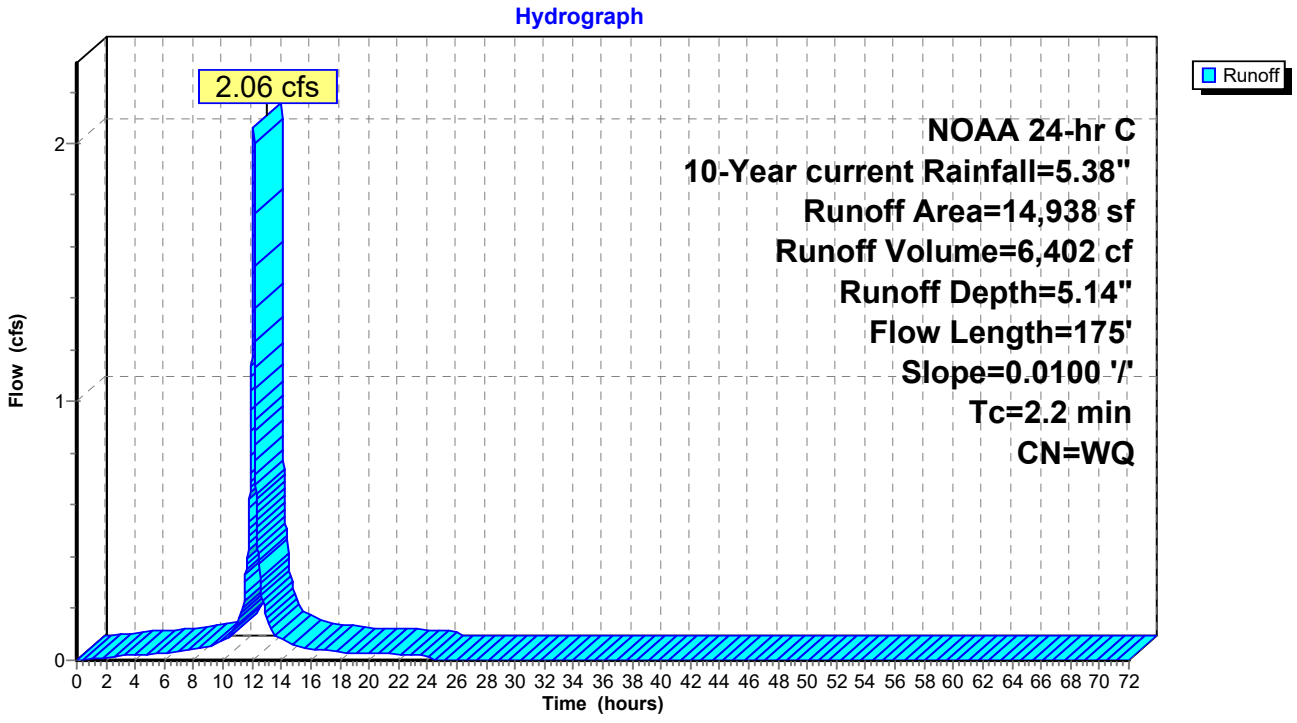
Runoff = 2.06 cfs @ 12.11 hrs, Volume= 6,402 cf, Depth= 5.14"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

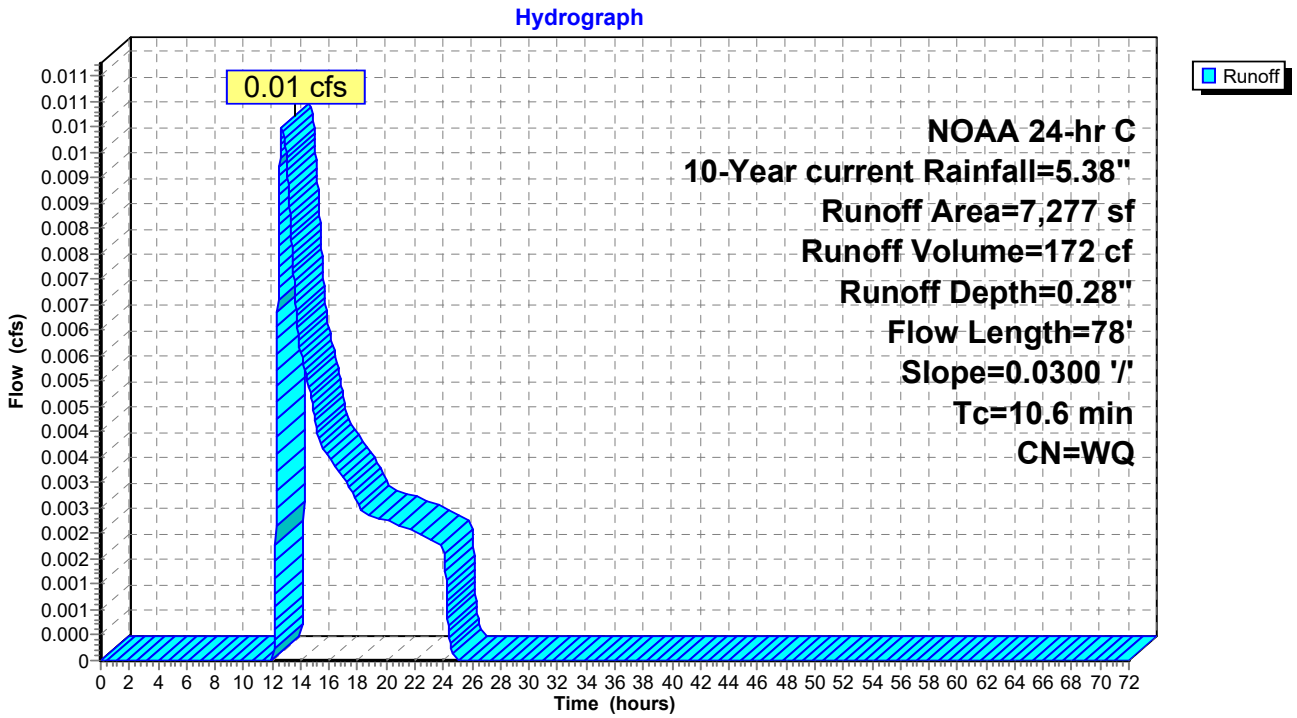
Runoff = 0.01 cfs @ 12.62 hrs, Volume= 172 cf, Depth= 0.28"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

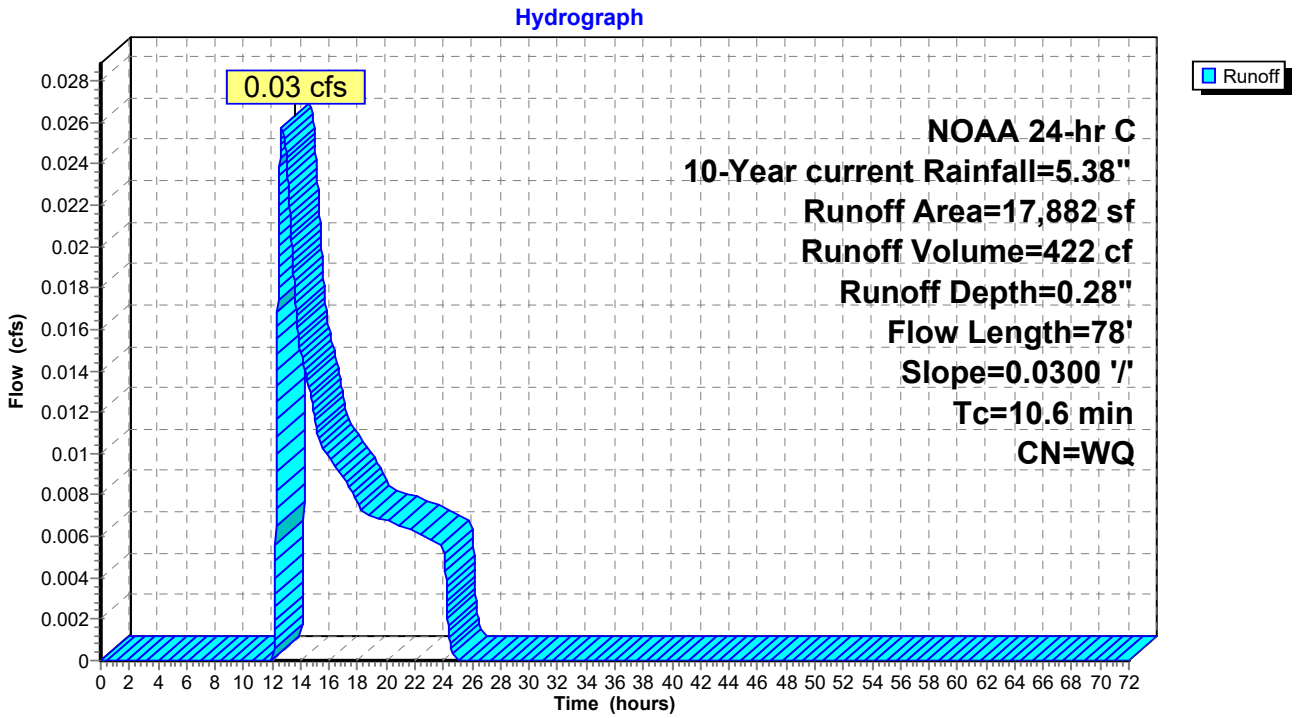
Runoff = 0.03 cfs @ 12.62 hrs, Volume= 422 cf, Depth= 0.28"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

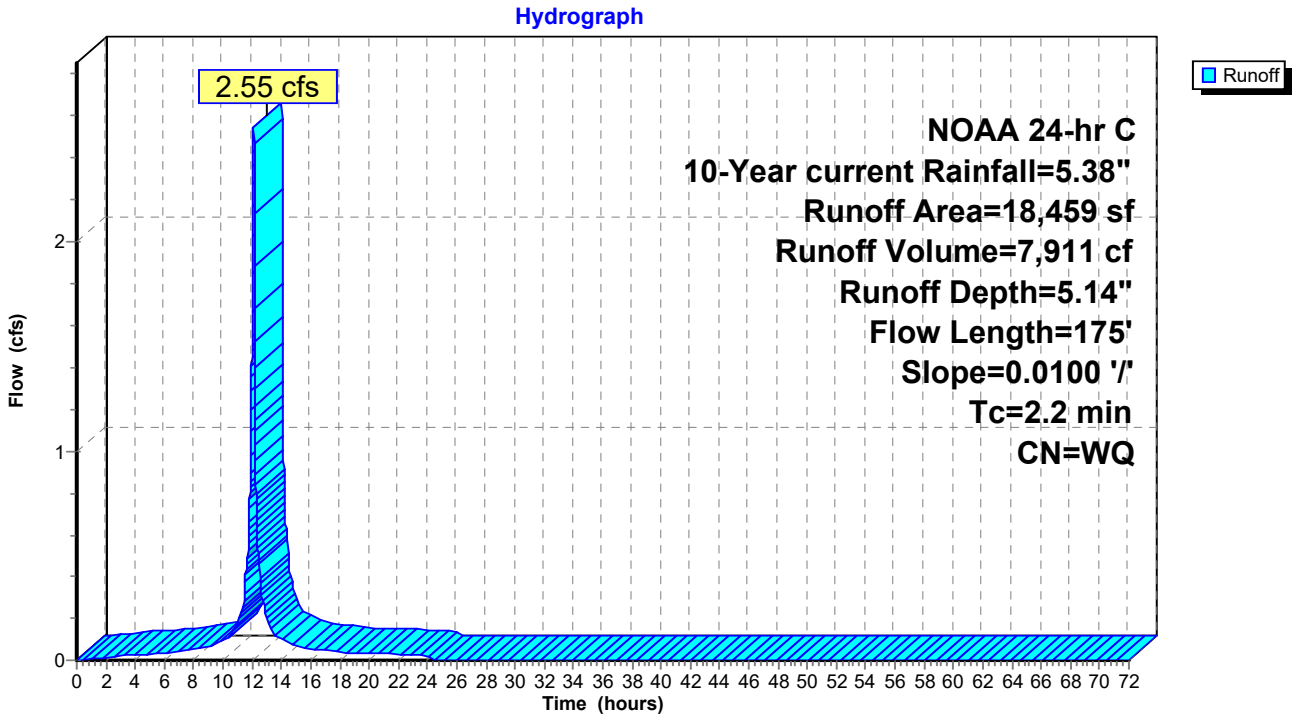
Runoff = 2.55 cfs @ 12.11 hrs, Volume= 7,911 cf, Depth= 5.14"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

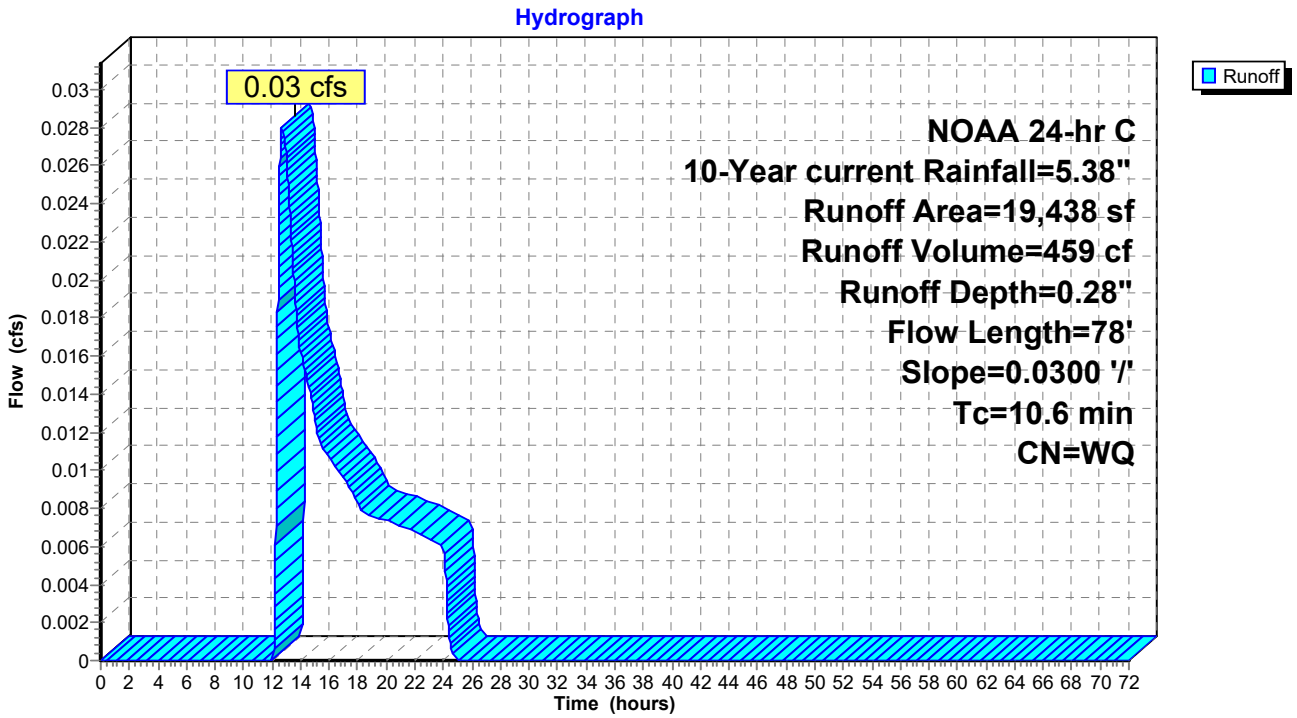
Runoff = 0.03 cfs @ 12.62 hrs, Volume= 459 cf, Depth= 0.28"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

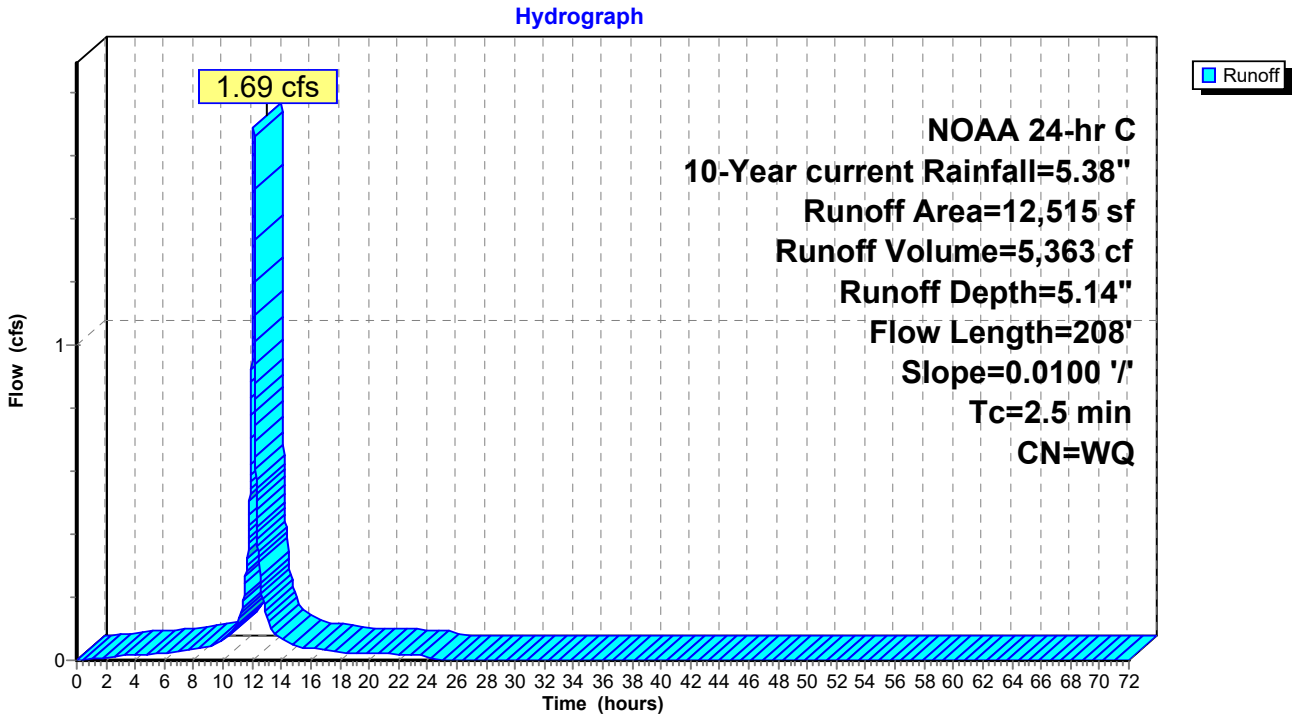
Runoff = 1.69 cfs @ 12.11 hrs, Volume= 5,363 cf, Depth= 5.14"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

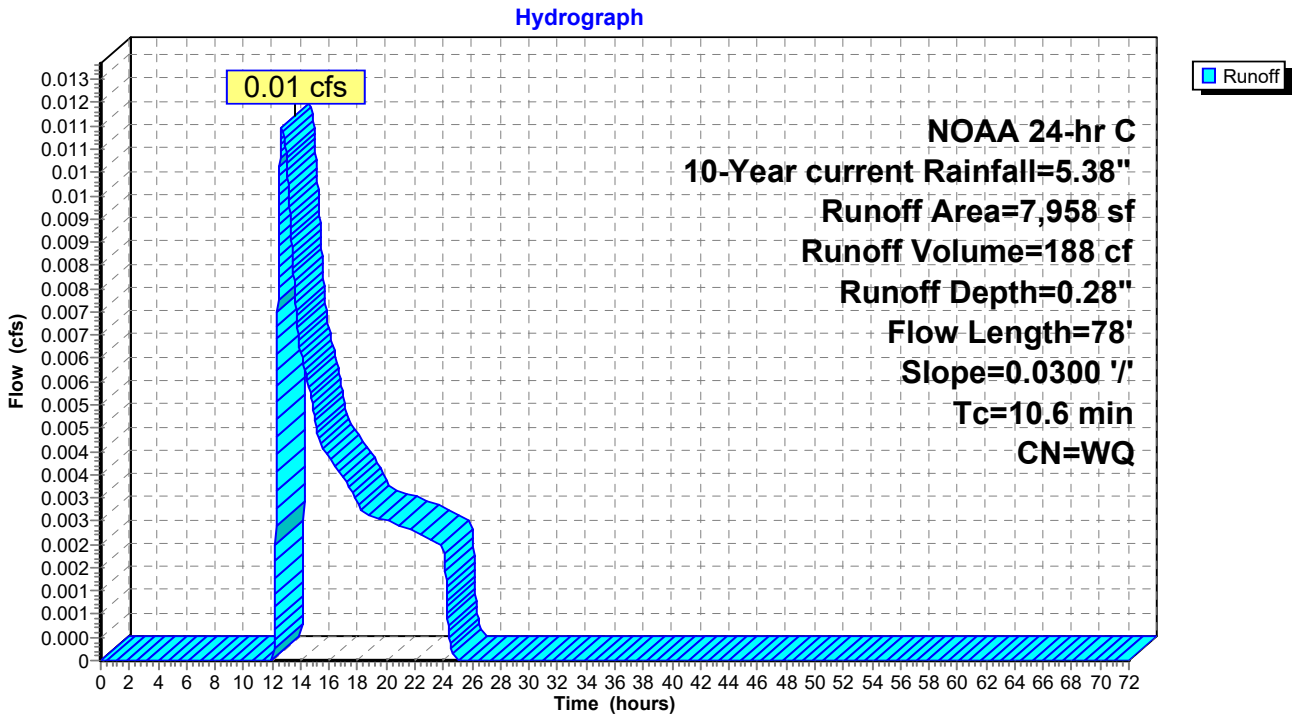
Runoff = 0.01 cfs @ 12.62 hrs, Volume= 188 cf, Depth= 0.28"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

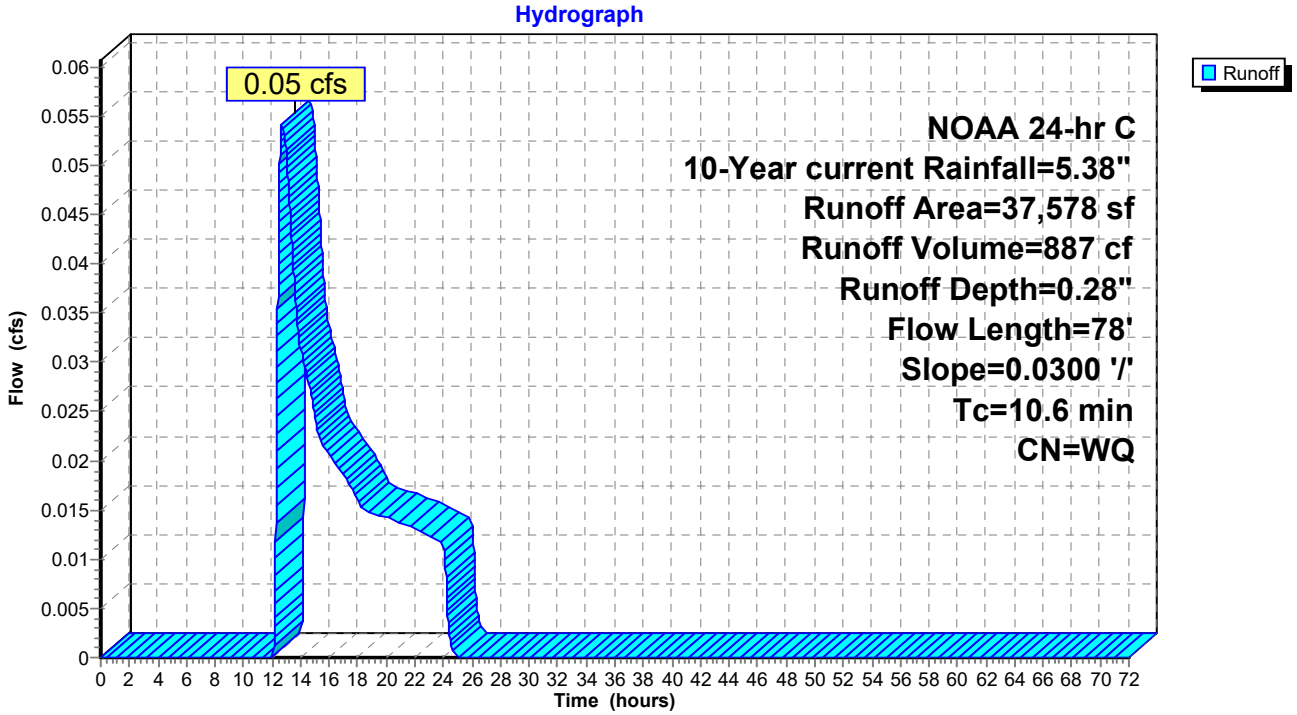
Runoff = 0.05 cfs @ 12.62 hrs, Volume= 887 cf, Depth= 0.28"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

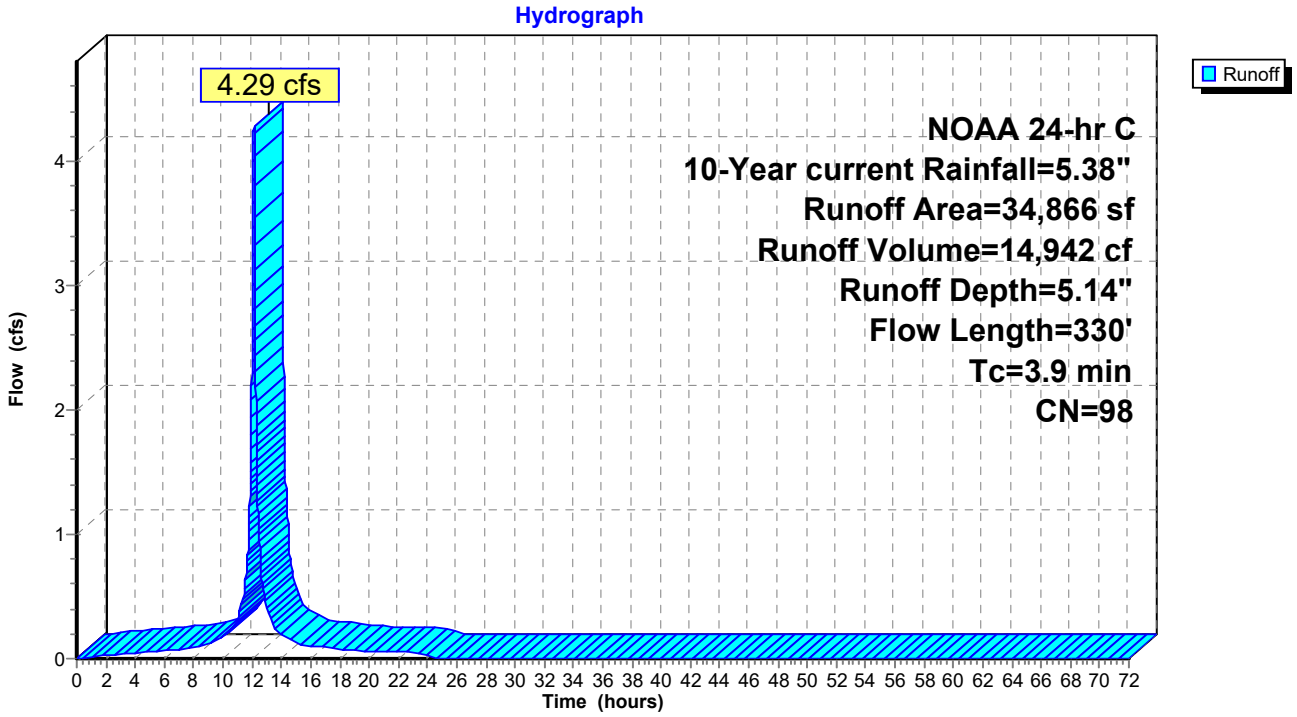
Runoff = 4.29 cfs @ 12.12 hrs, Volume= 14,942 cf, Depth= 5.14"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

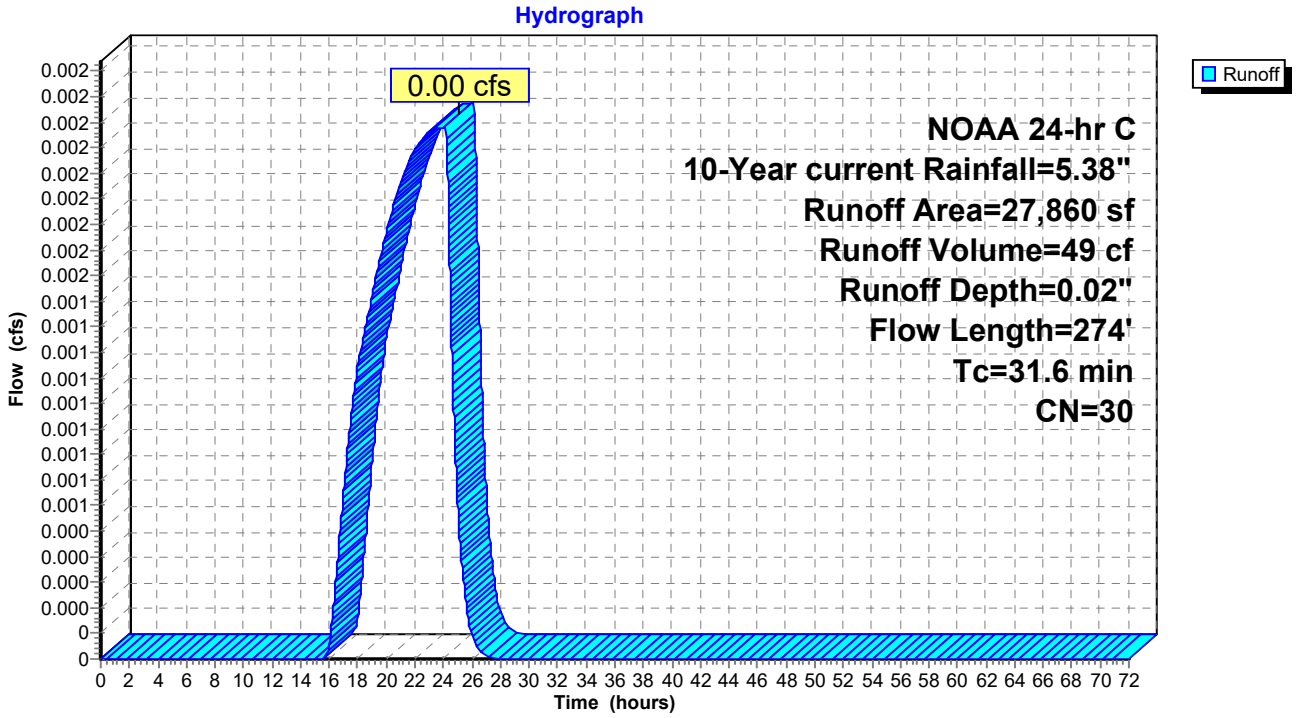
Runoff = 0.00 cfs @ 24.08 hrs, Volume= 49 cf, Depth= 0.02"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

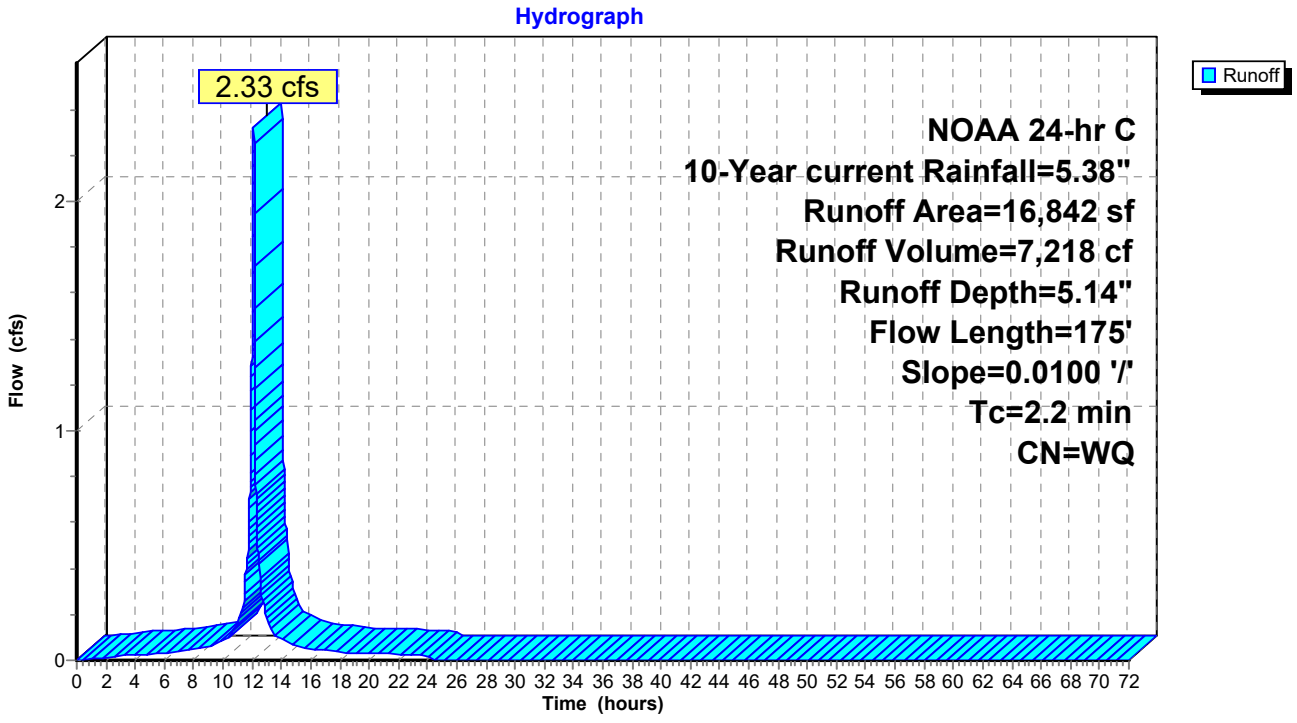
Runoff = 2.33 cfs @ 12.11 hrs, Volume= 7,218 cf, Depth= 5.14"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

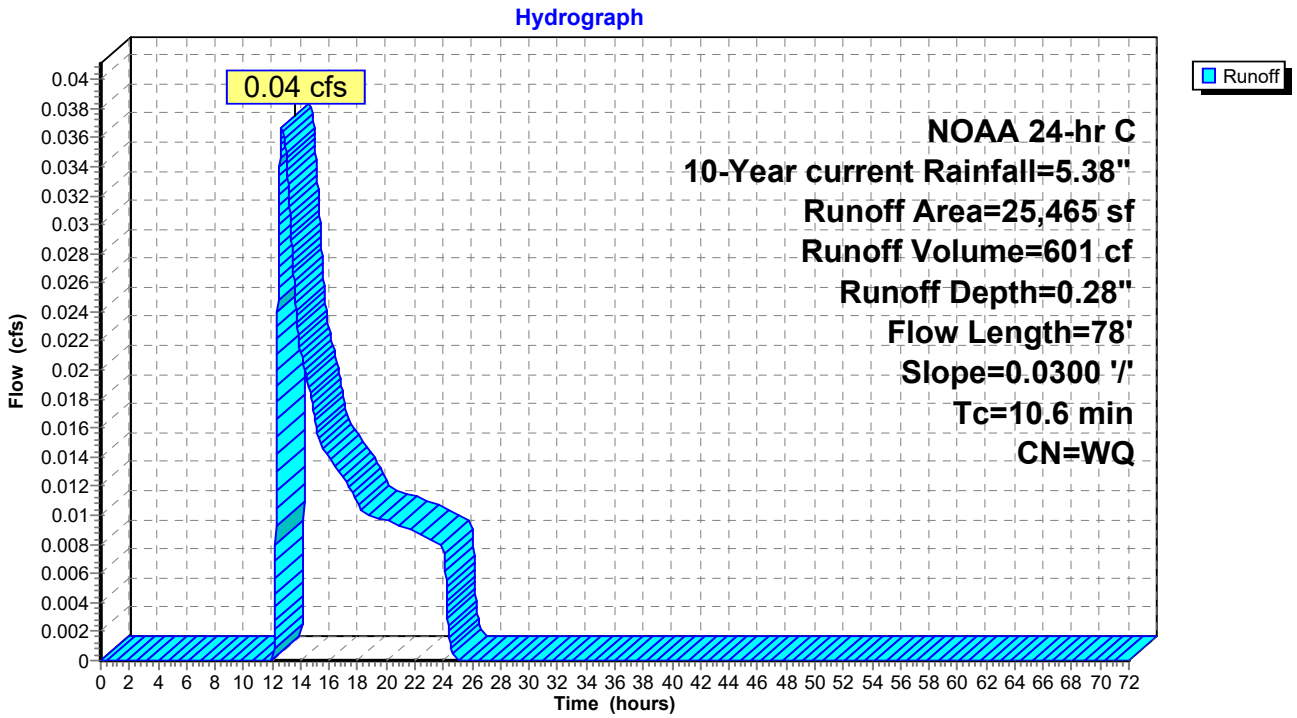
Runoff = 0.04 cfs @ 12.62 hrs, Volume= 601 cf, Depth= 0.28"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

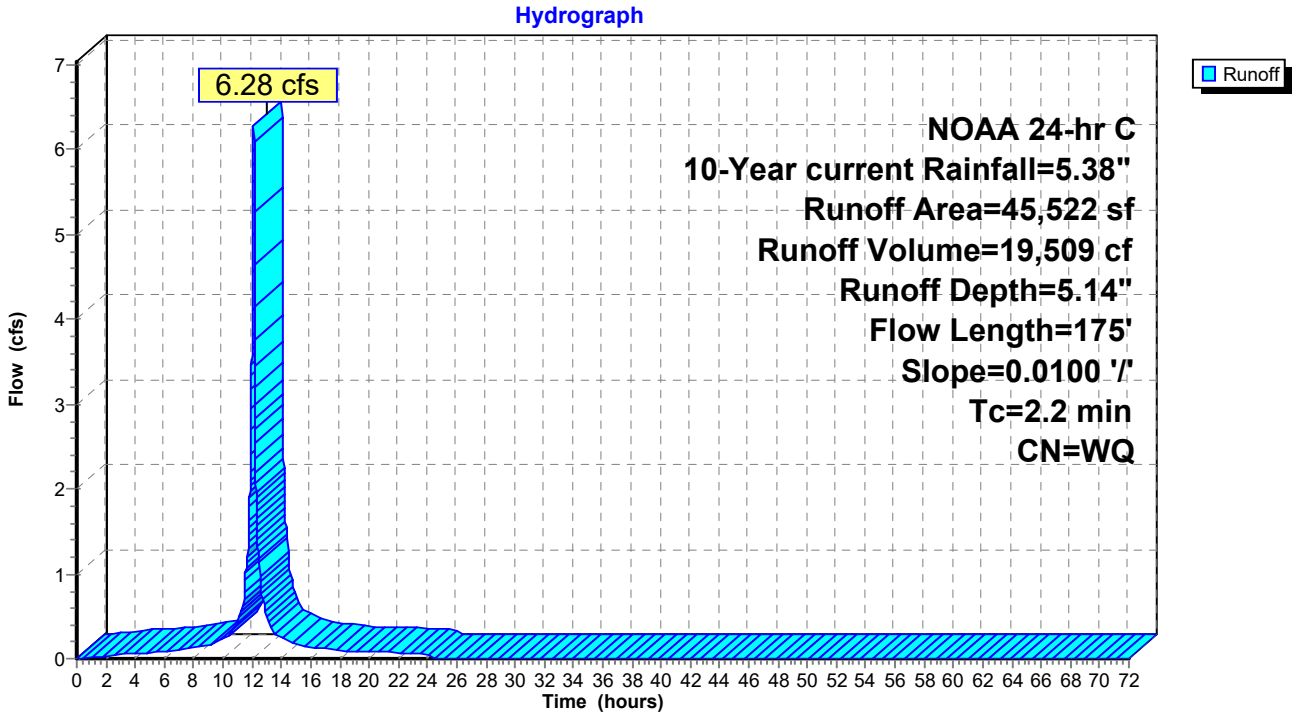
Runoff = 6.28 cfs @ 12.11 hrs, Volume= 19,509 cf, Depth= 5.14"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

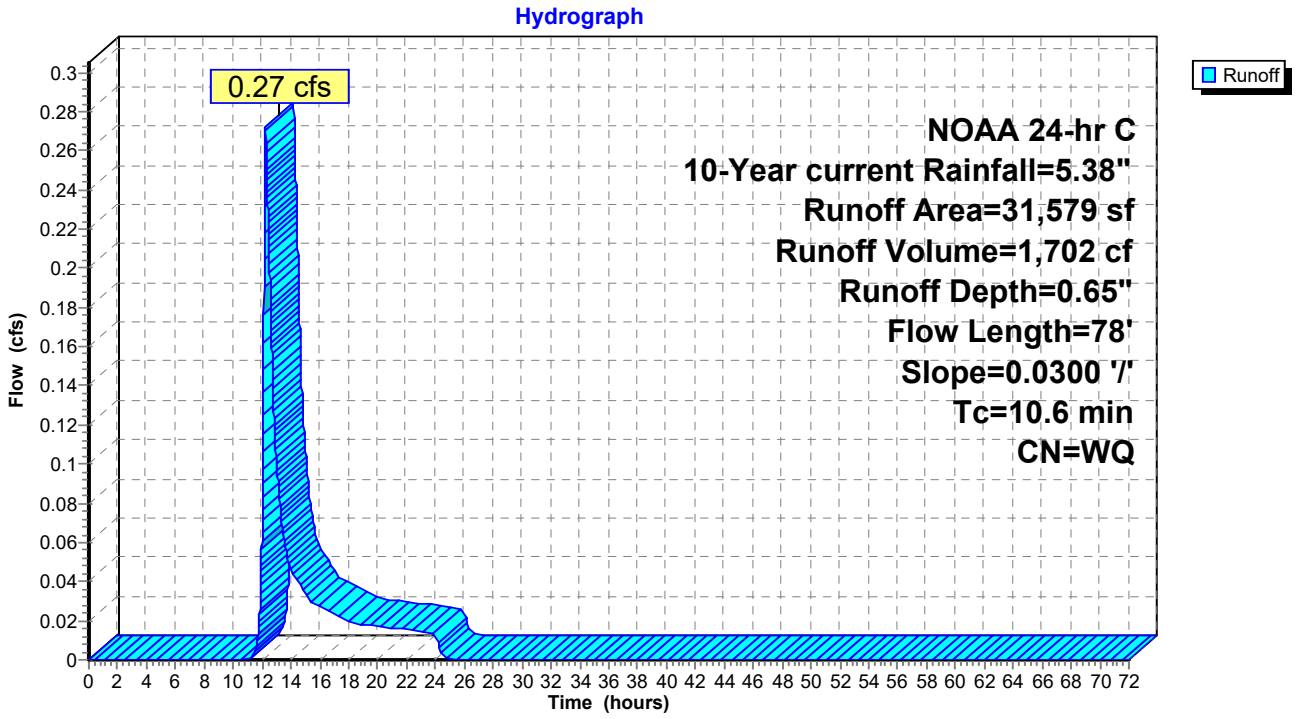
Runoff = 0.27 cfs @ 12.22 hrs, Volume= 1,702 cf, Depth= 0.65"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

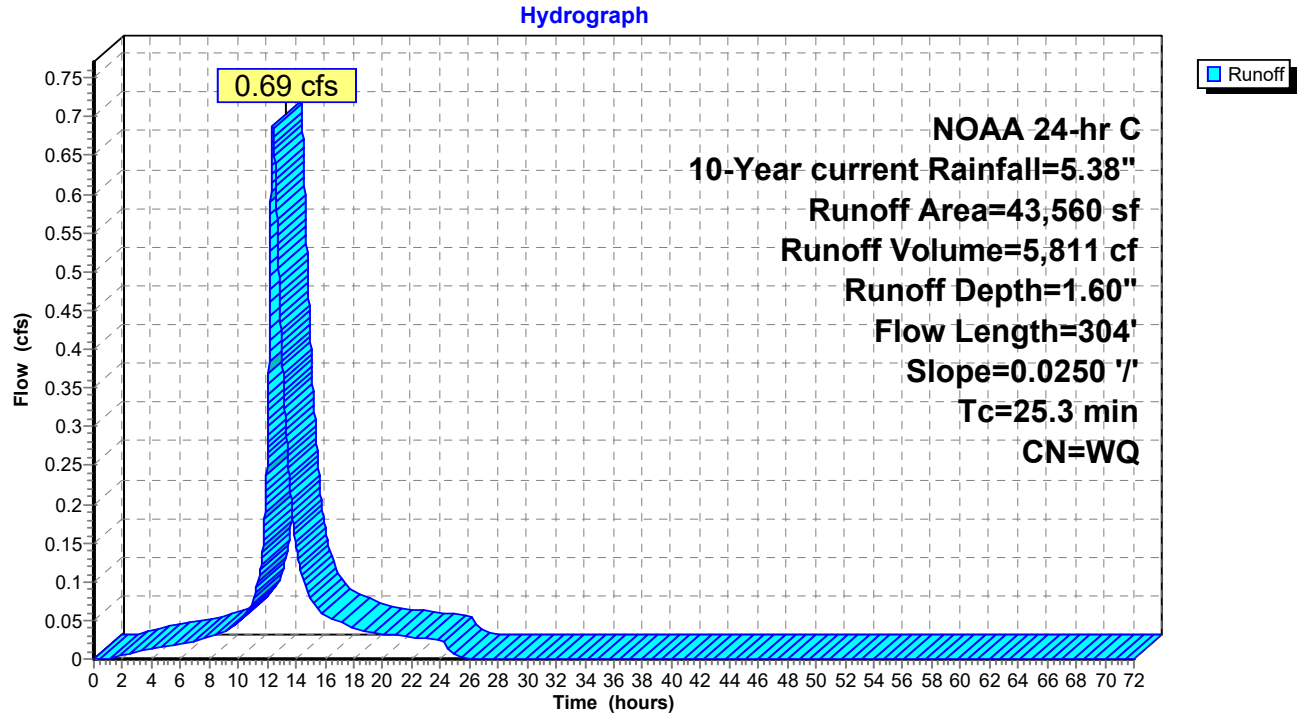
Runoff = 0.69 cfs @ 12.37 hrs, Volume= 5,811 cf, Depth= 1.60"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

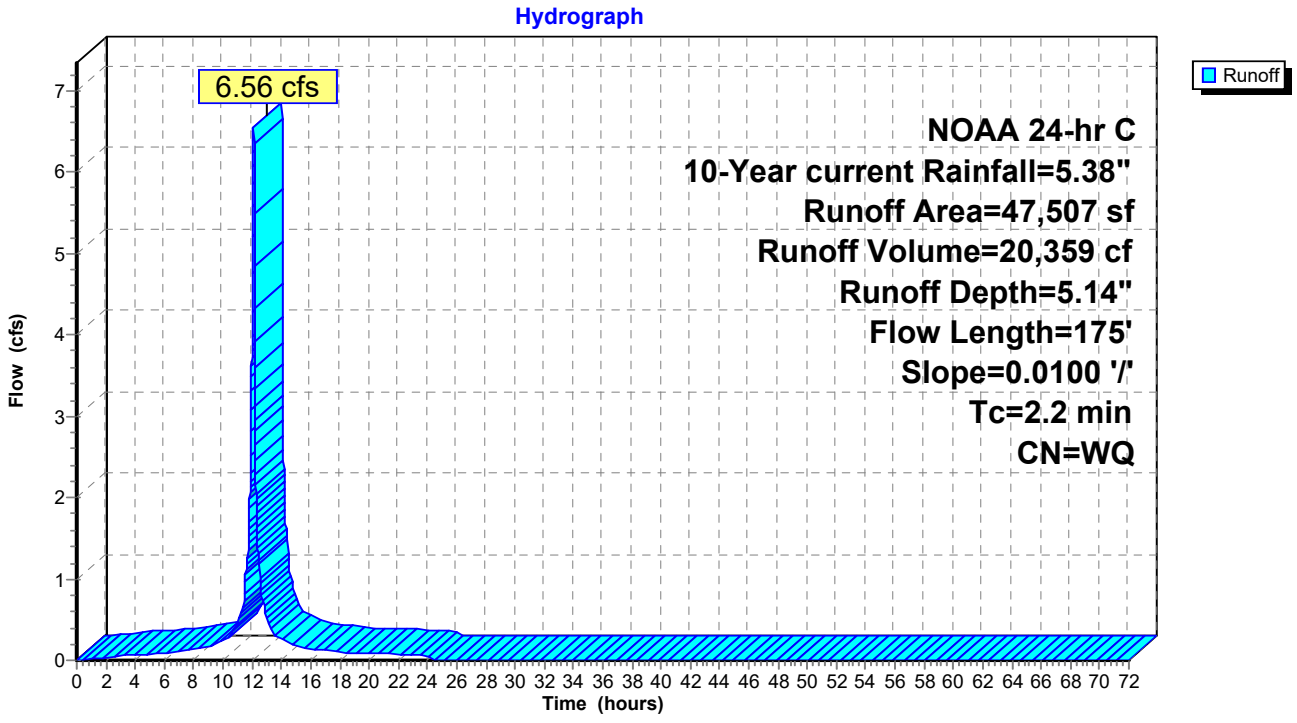
Runoff = 6.56 cfs @ 12.11 hrs, Volume= 20,359 cf, Depth= 5.14"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

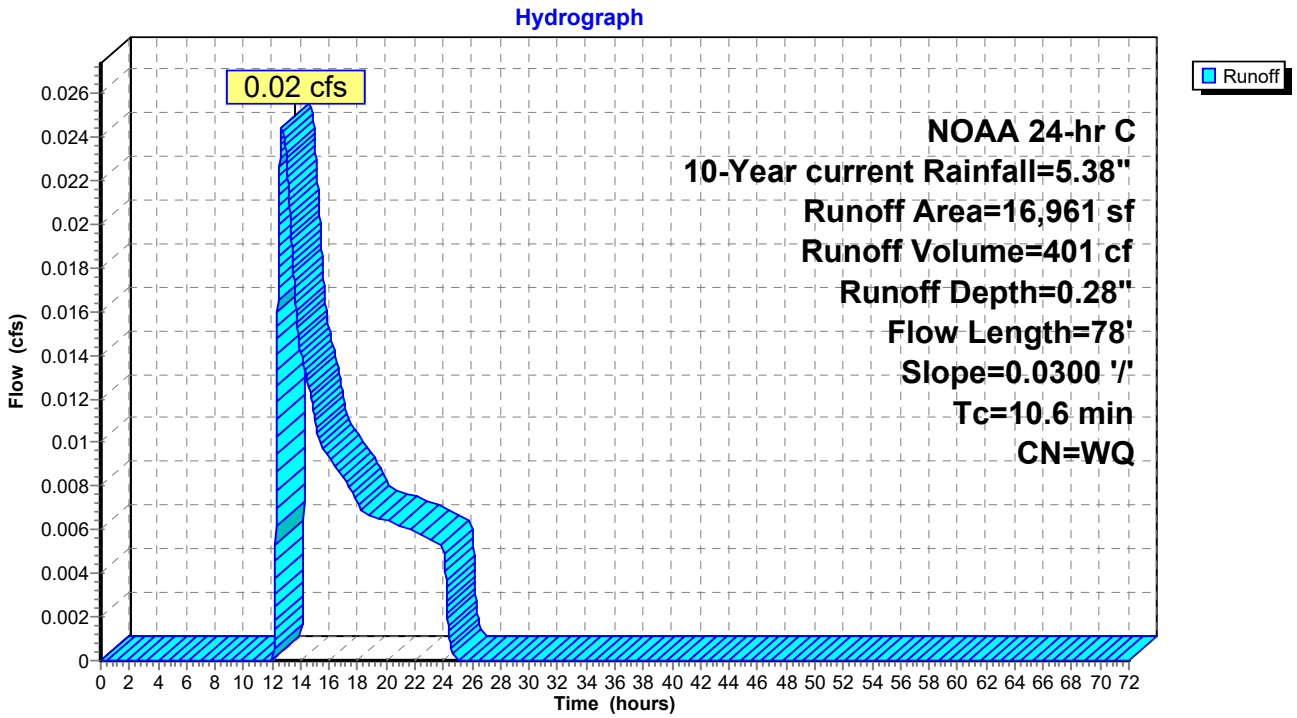
Runoff = 0.02 cfs @ 12.62 hrs, Volume= 401 cf, Depth= 0.28"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

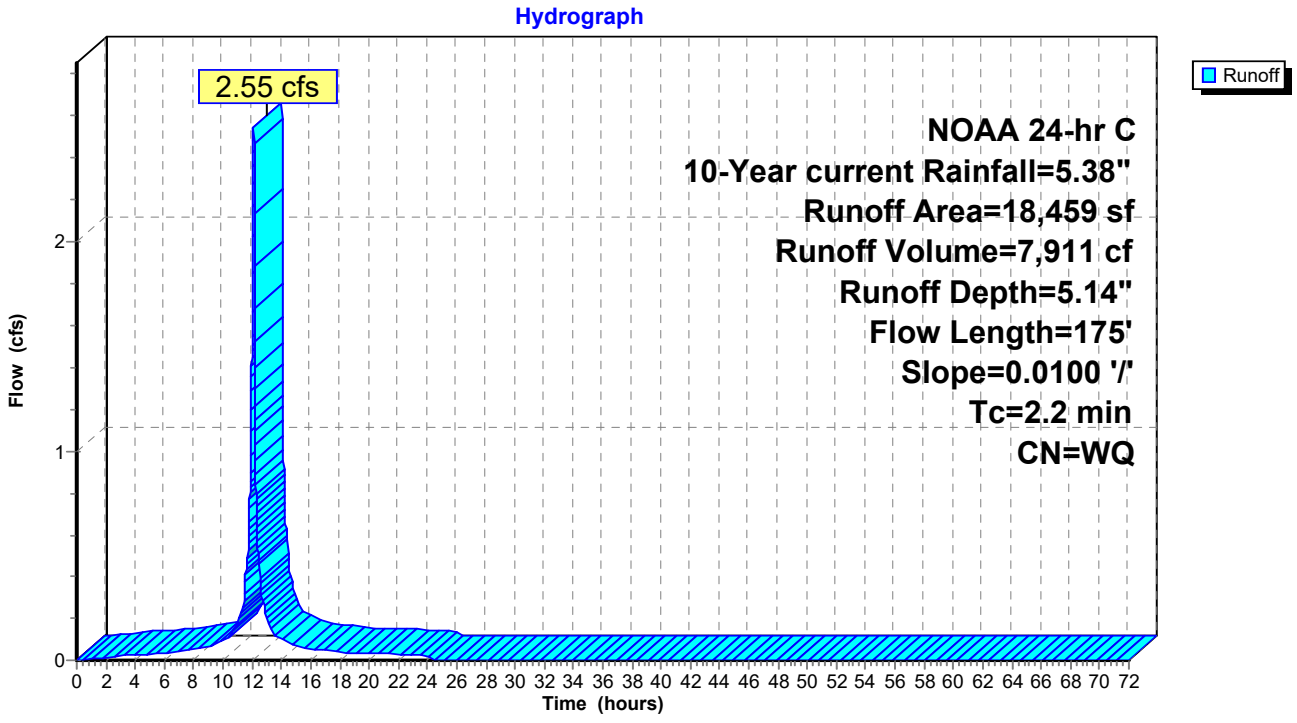
Runoff = 2.55 cfs @ 12.11 hrs, Volume= 7,911 cf, Depth= 5.14"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

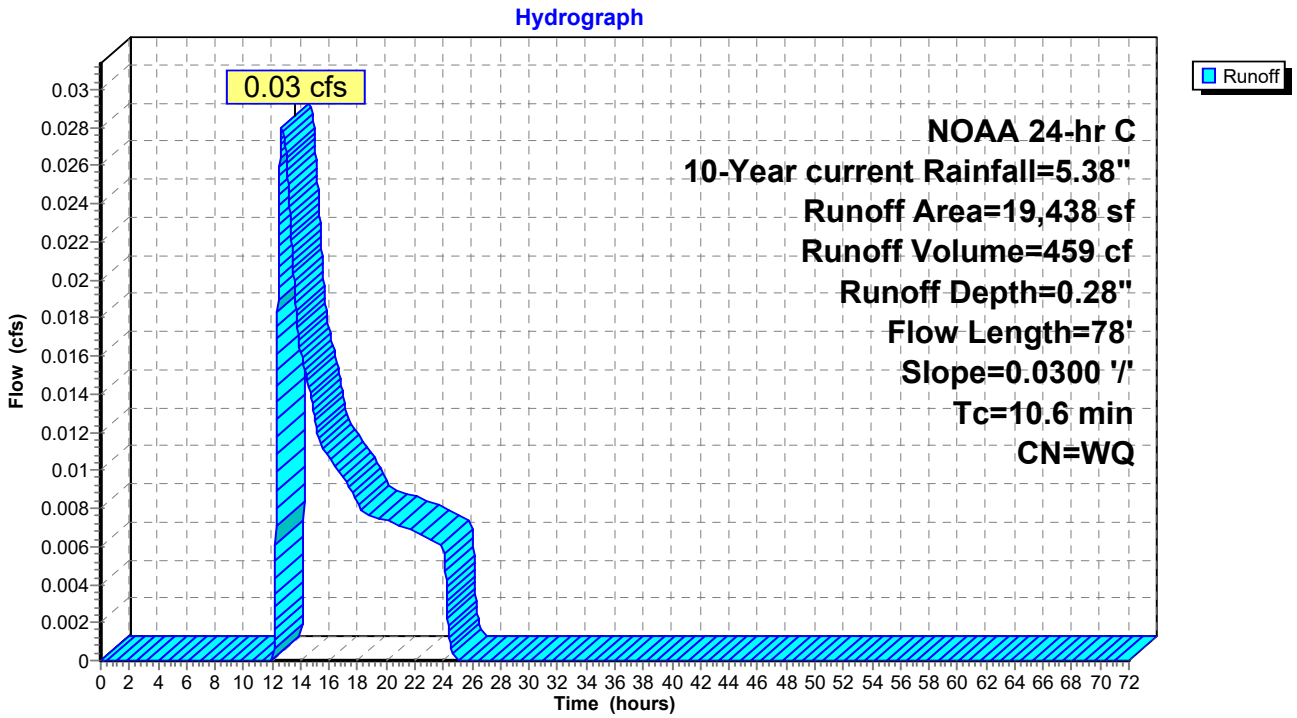
Runoff = 0.03 cfs @ 12.62 hrs, Volume= 459 cf, Depth= 0.28"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

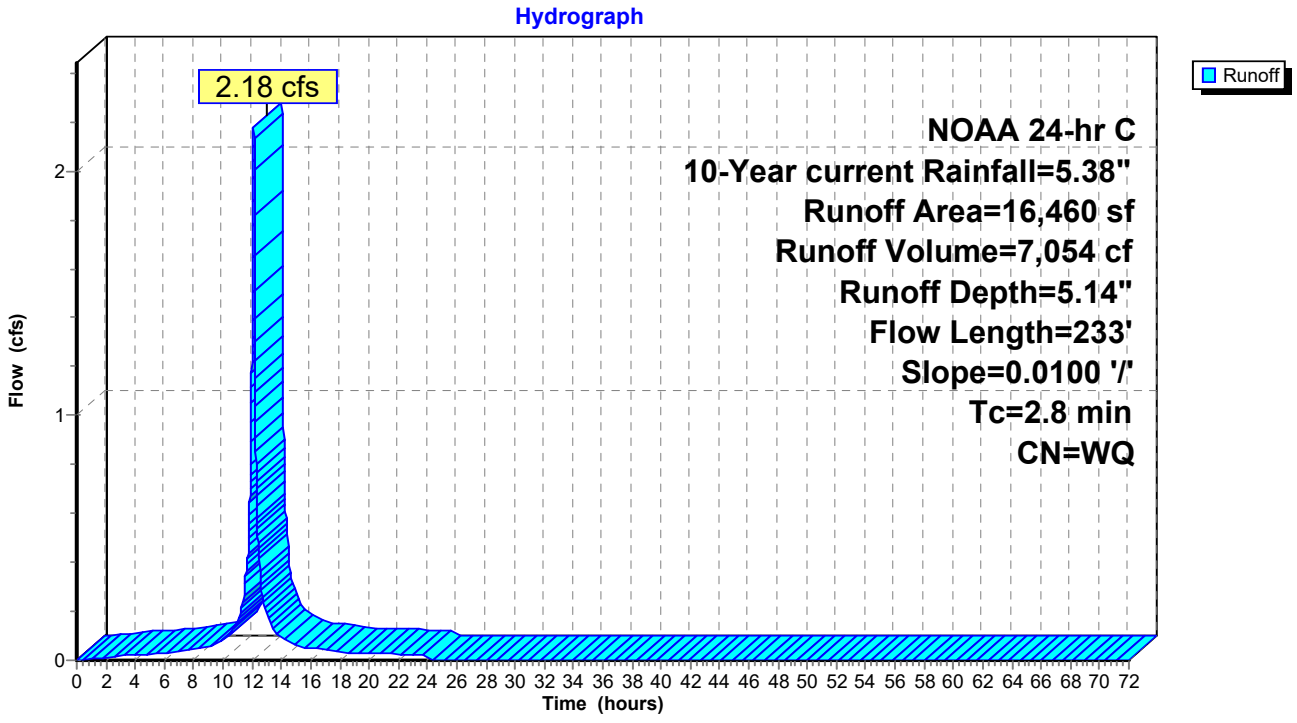
Runoff = 2.18 cfs @ 12.11 hrs, Volume= 7,054 cf, Depth= 5.14"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

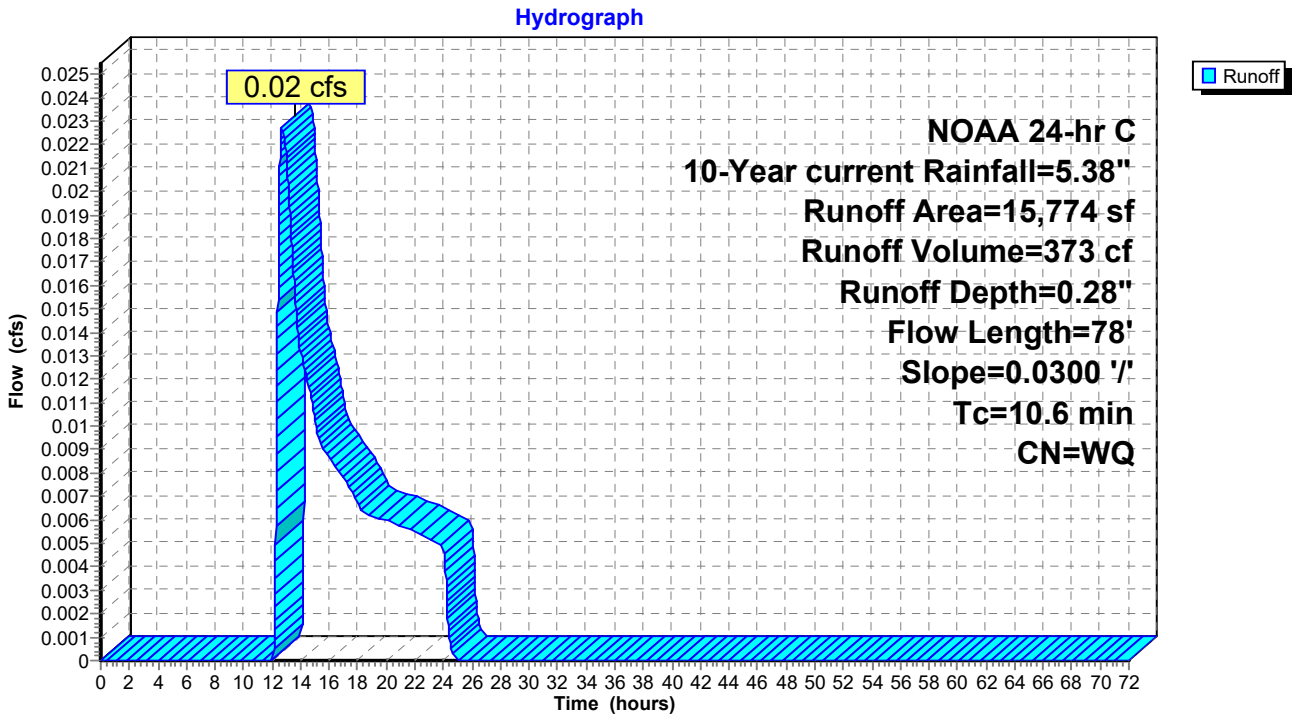
Runoff = 0.02 cfs @ 12.62 hrs, Volume= 373 cf, Depth= 0.28"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

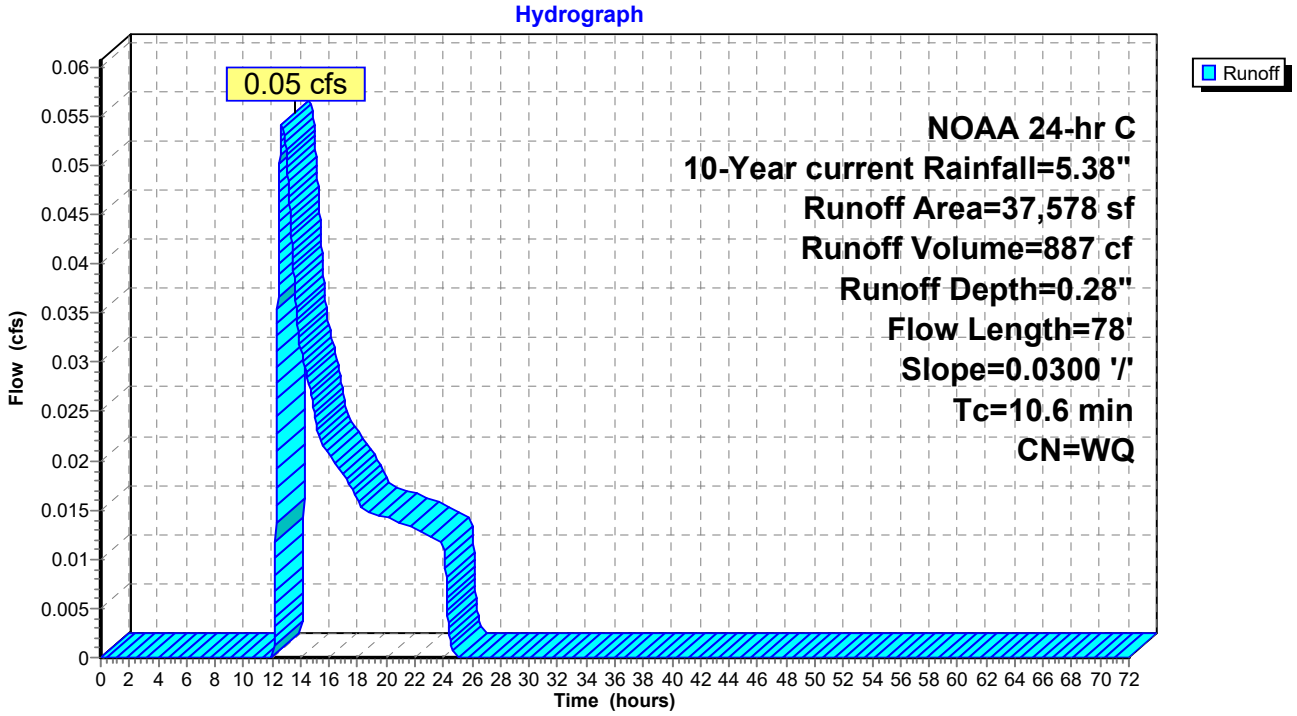
Runoff = 0.05 cfs @ 12.62 hrs, Volume= 887 cf, Depth= 0.28"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

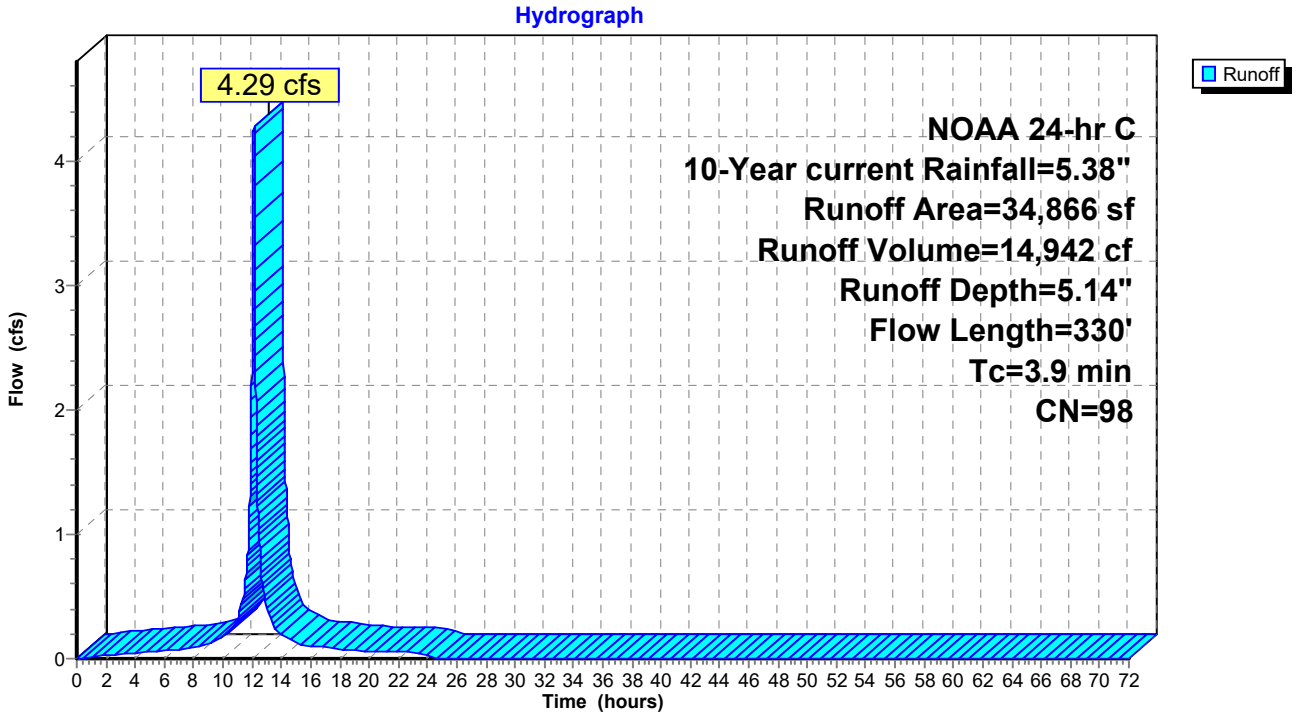
Runoff = 4.29 cfs @ 12.12 hrs, Volume= 14,942 cf, Depth= 5.14"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

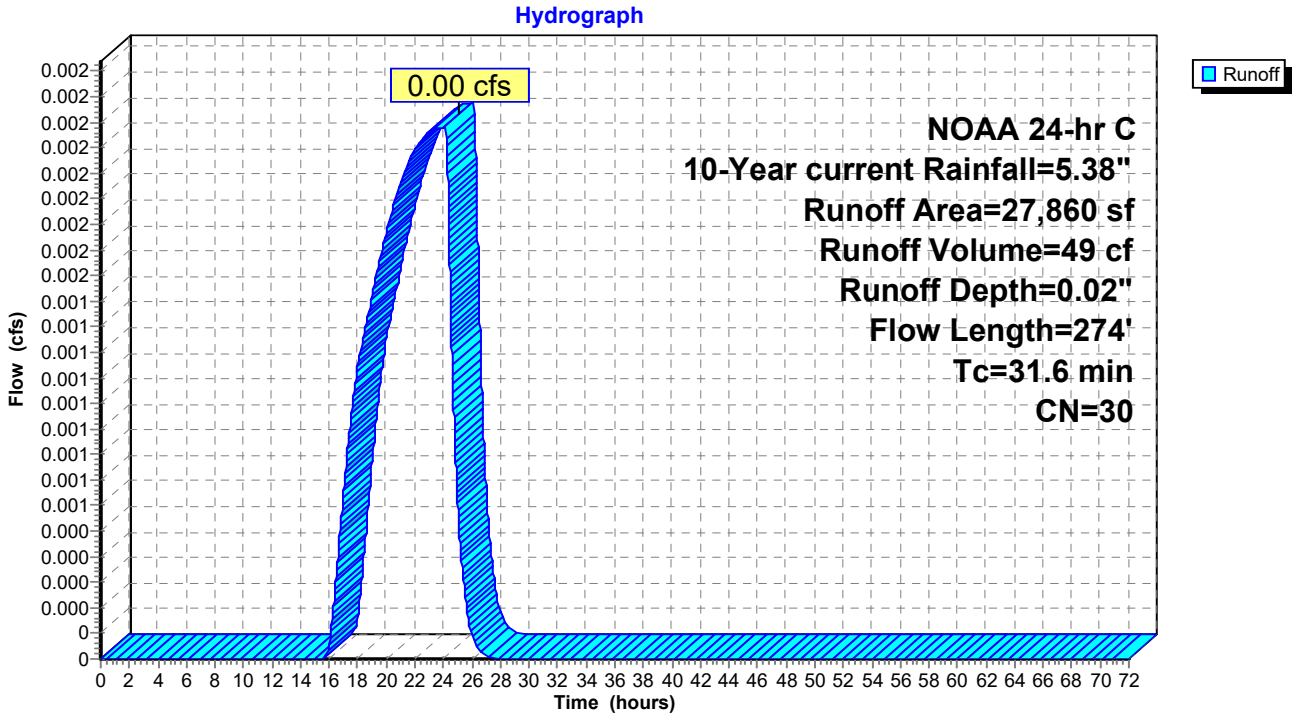
Runoff = 0.00 cfs @ 24.08 hrs, Volume= 49 cf, Depth= 0.02"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

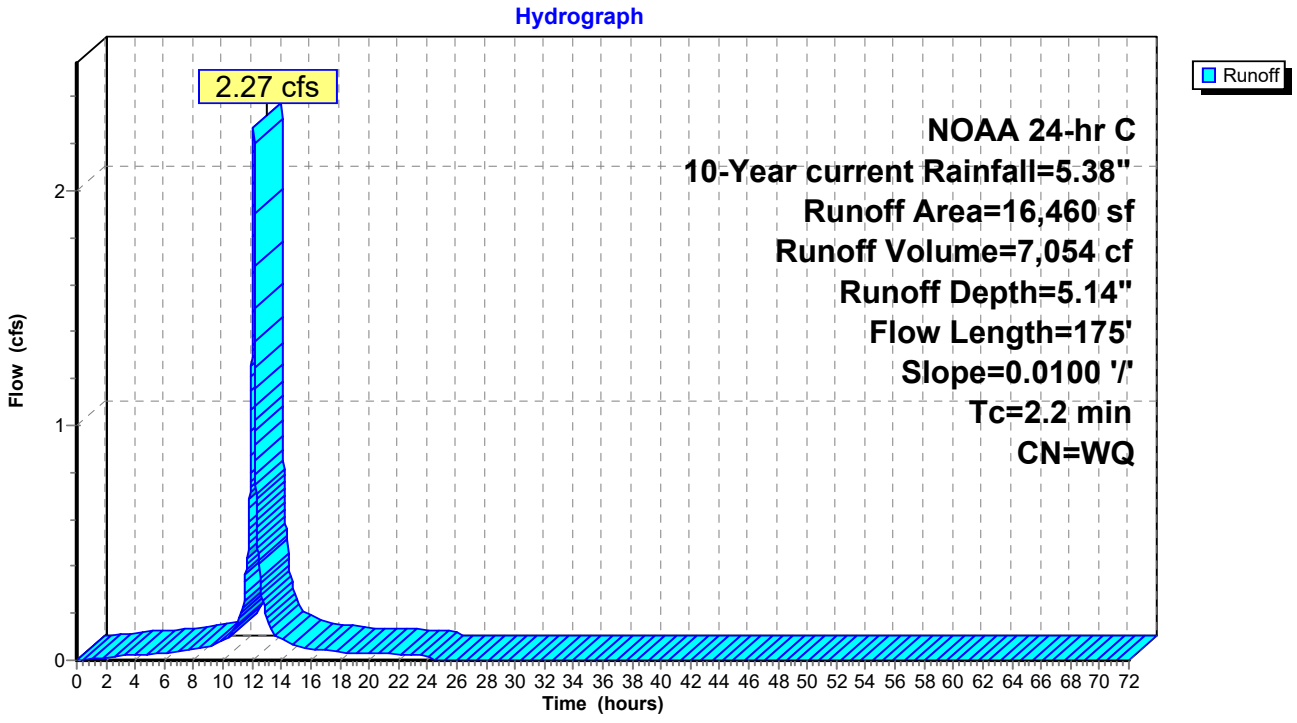
Runoff = 2.27 cfs @ 12.11 hrs, Volume= 7,054 cf, Depth= 5.14"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

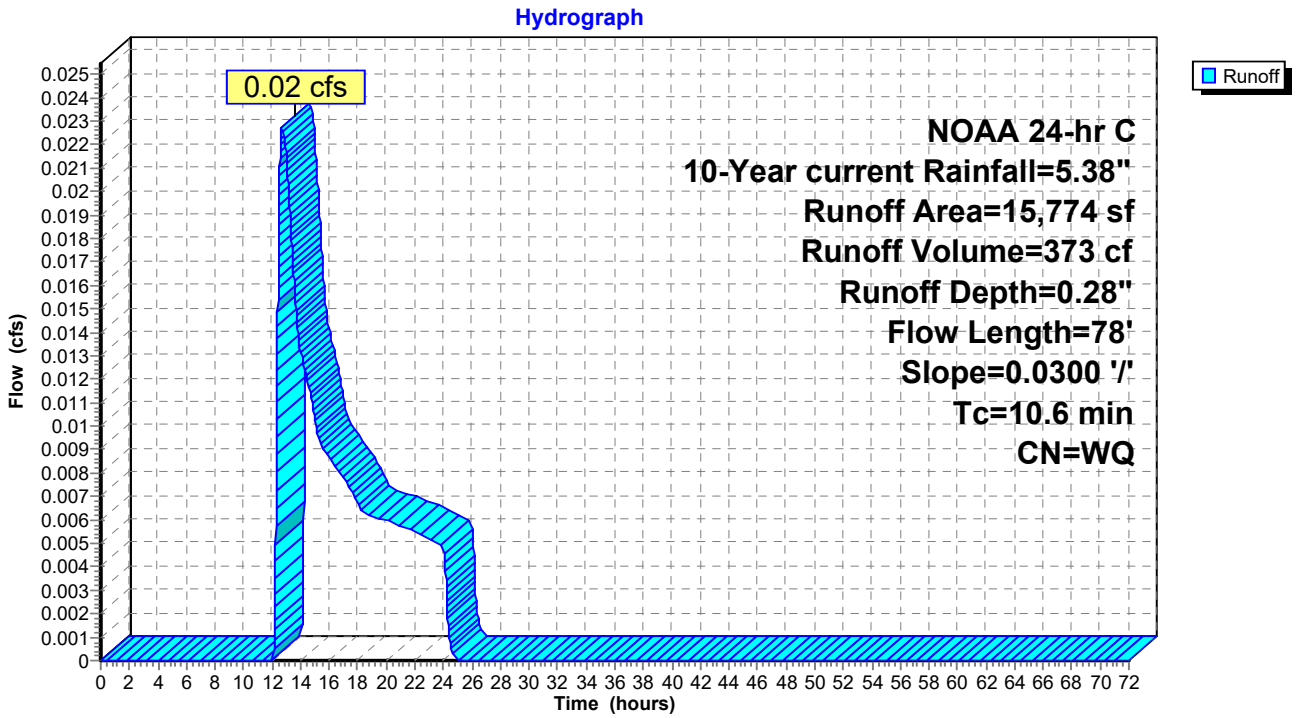
Runoff = 0.02 cfs @ 12.62 hrs, Volume= 373 cf, Depth= 0.28"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

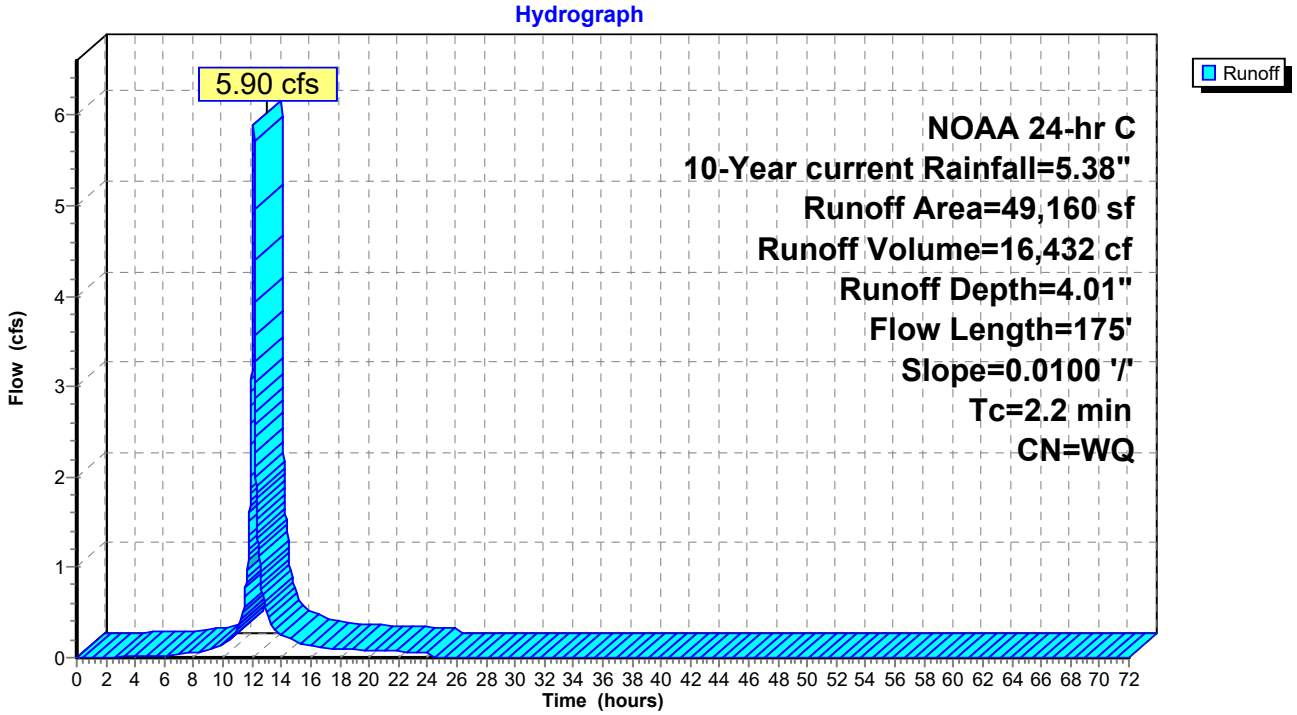
Runoff = 5.90 cfs @ 12.11 hrs, Volume= 16,432 cf, Depth= 4.01"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

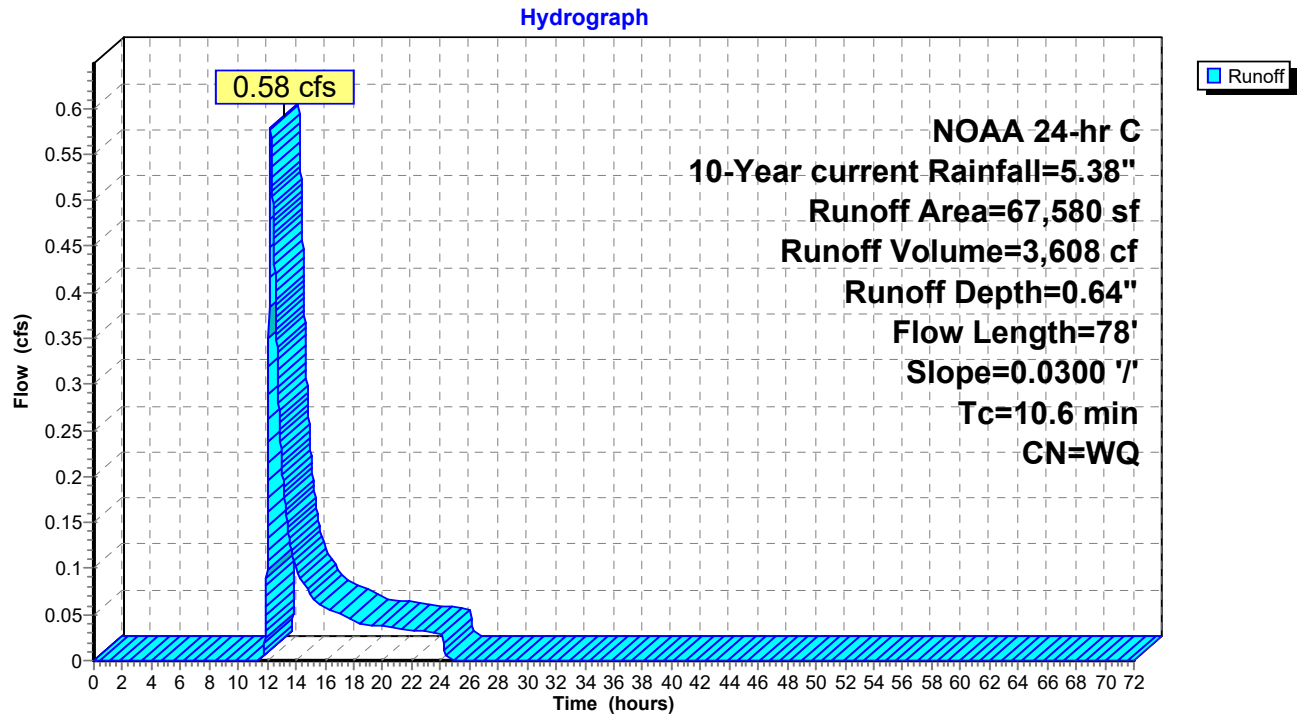
Runoff = 0.58 cfs @ 12.23 hrs, Volume= 3,608 cf, Depth= 0.64"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year current Rainfall=5.38"

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 1.66" for 10-Year current event
Inflow = 9.43 cfs @ 12.11 hrs, Volume= 23,760 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 16.13' @ 25.50 hrs Surf.Area= 16,934 sf Storage= 23,760 cf

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

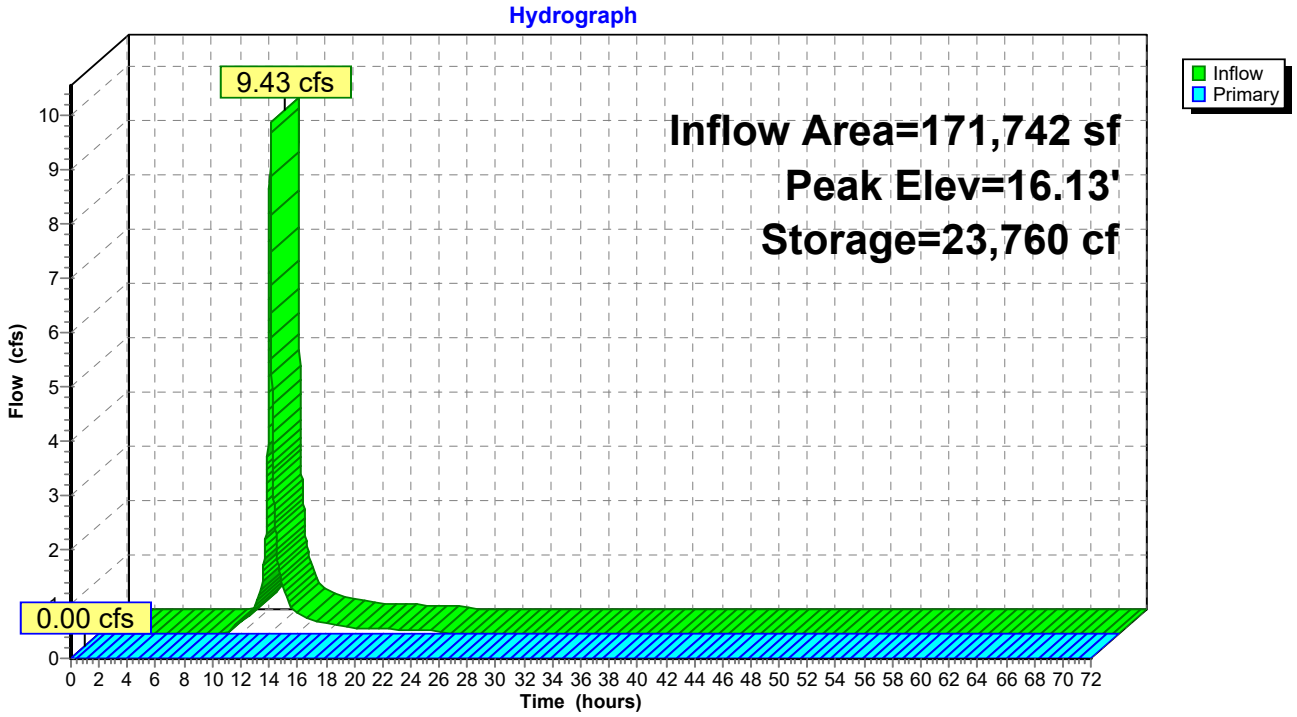
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 0.84" for 10-Year current event
Inflow = 5.59 cfs @ 12.13 hrs, Volume= 11,386 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 15.62' @ 17.80 hrs Surf.Area= 6,292 sf Storage= 11,386 cf

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

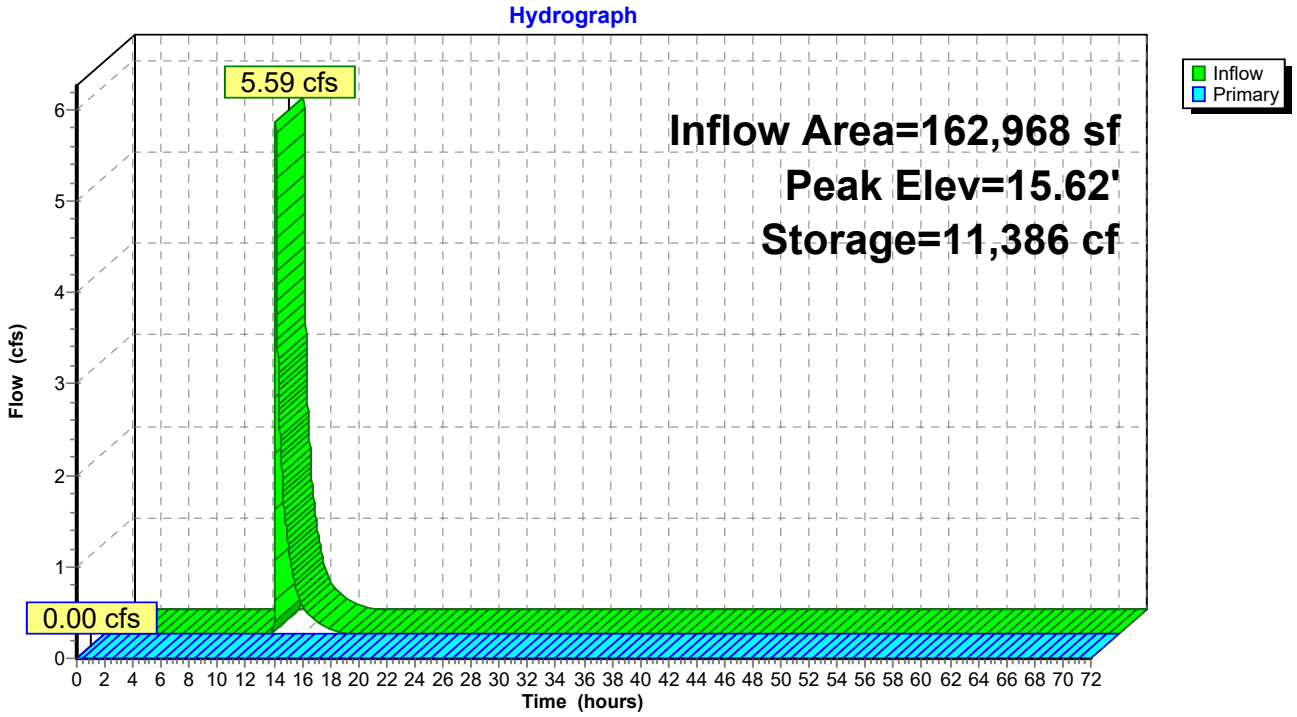
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=13.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 3.55" for 10-Year current event
Inflow = 2.06 cfs @ 12.11 hrs, Volume= 6,574 cf
Outflow = 1.98 cfs @ 12.12 hrs, Volume= 6,574 cf, Atten= 4%, Lag= 0.7 min
Discarded = 0.02 cfs @ 4.80 hrs, Volume= 2,858 cf
Primary = 1.96 cfs @ 12.12 hrs, Volume= 3,716 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.39' @ 12.12 hrs Surf.Area= 1,674 sf Storage= 1,625 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 273.4 min (1,025.7 - 752.2)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

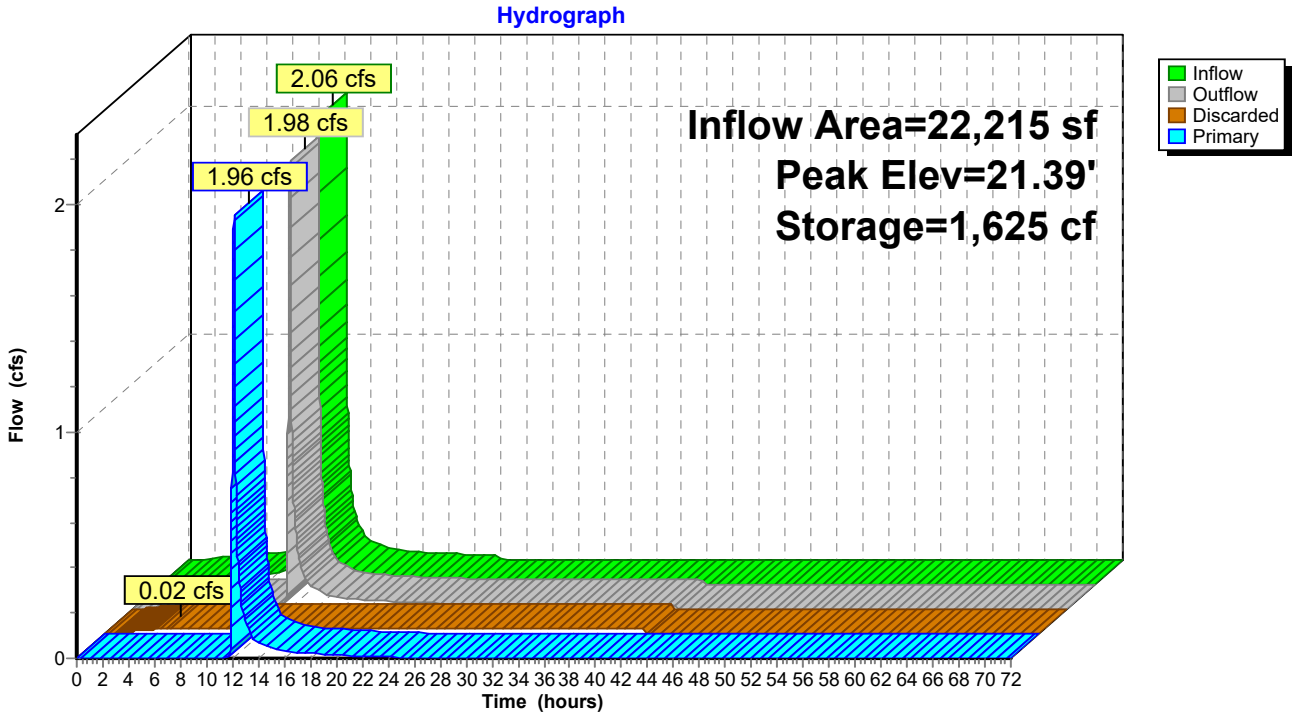
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 4.80 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.95 cfs @ 12.12 hrs HW=21.39' TW=18.63' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.95 cfs of 8.66 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 1.87 cfs @ 1.22 fps)
  └**4=Culvert** (Barrel Controls 0.08 cfs @ 1.68 fps)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 3.52" for 10-Year current event
Inflow = 9.68 cfs @ 12.11 hrs, Volume= 28,210 cf
Outflow = 9.48 cfs @ 12.11 hrs, Volume= 28,210 cf, Atten= 2%, Lag= 0.5 min
Discarded = 0.05 cfs @ 3.08 hrs, Volume= 5,366 cf
Primary = 9.43 cfs @ 12.11 hrs, Volume= 22,844 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.63' @ 12.11 hrs Surf.Area= 2,003 sf Storage= 2,099 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 64.5 min (821.6 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

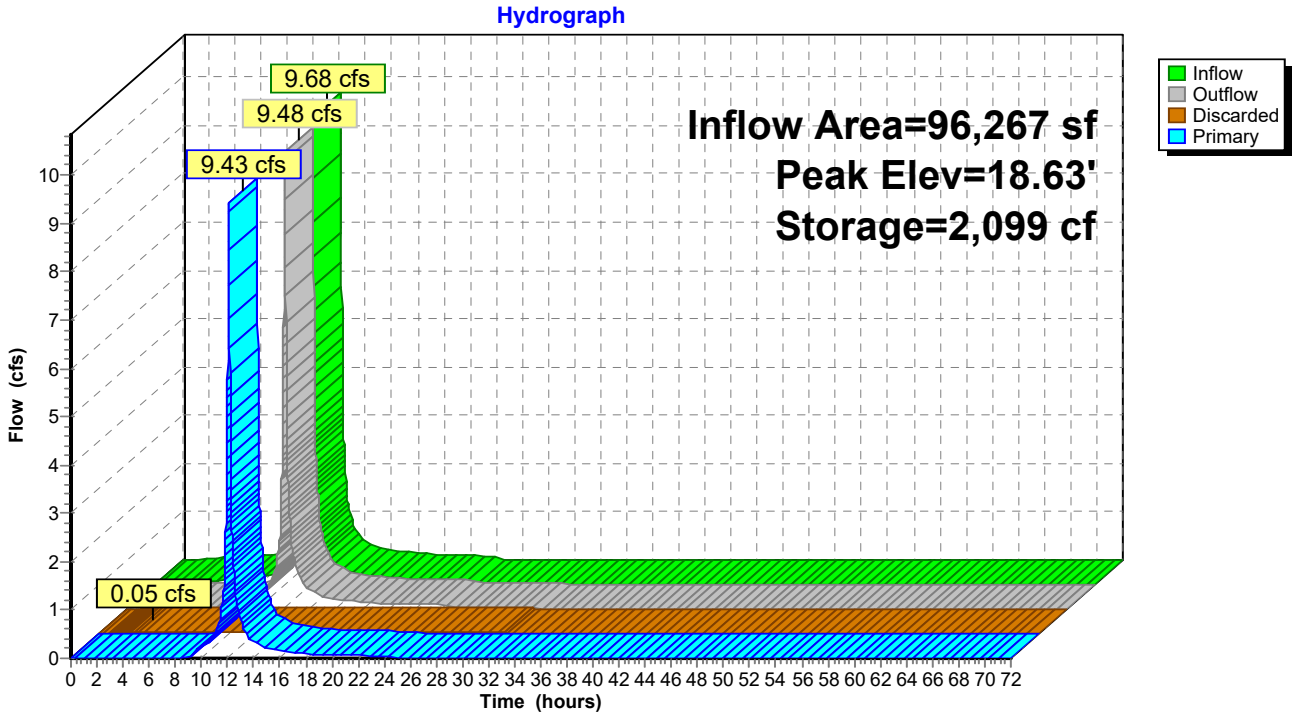
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 3.08 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=9.41 cfs @ 12.11 hrs HW=18.63' TW=15.21' (Dynamic Tailwater)
├**2=Culvert** (Passes 9.26 cfs of 21.18 cfs potential flow)
│└**1=Orifice/Grate** (Weir Controls 9.26 cfs @ 1.88 fps)
└**3=Culvert** (Inlet Controls 0.15 cfs @ 2.99 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

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[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=458)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 2.65" for 10-Year current event
Inflow = 2.55 cfs @ 12.11 hrs, Volume= 8,370 cf
Outflow = 0.37 cfs @ 12.57 hrs, Volume= 8,372 cf, Atten= 86%, Lag= 28.1 min
Discarded = 0.36 cfs @ 11.76 hrs, Volume= 8,344 cf
Primary = 0.01 cfs @ 12.57 hrs, Volume= 28 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.24' @ 12.57 hrs Surf.Area= 9,068 sf Storage= 2,066 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 31.0 min (790.7 - 759.7)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

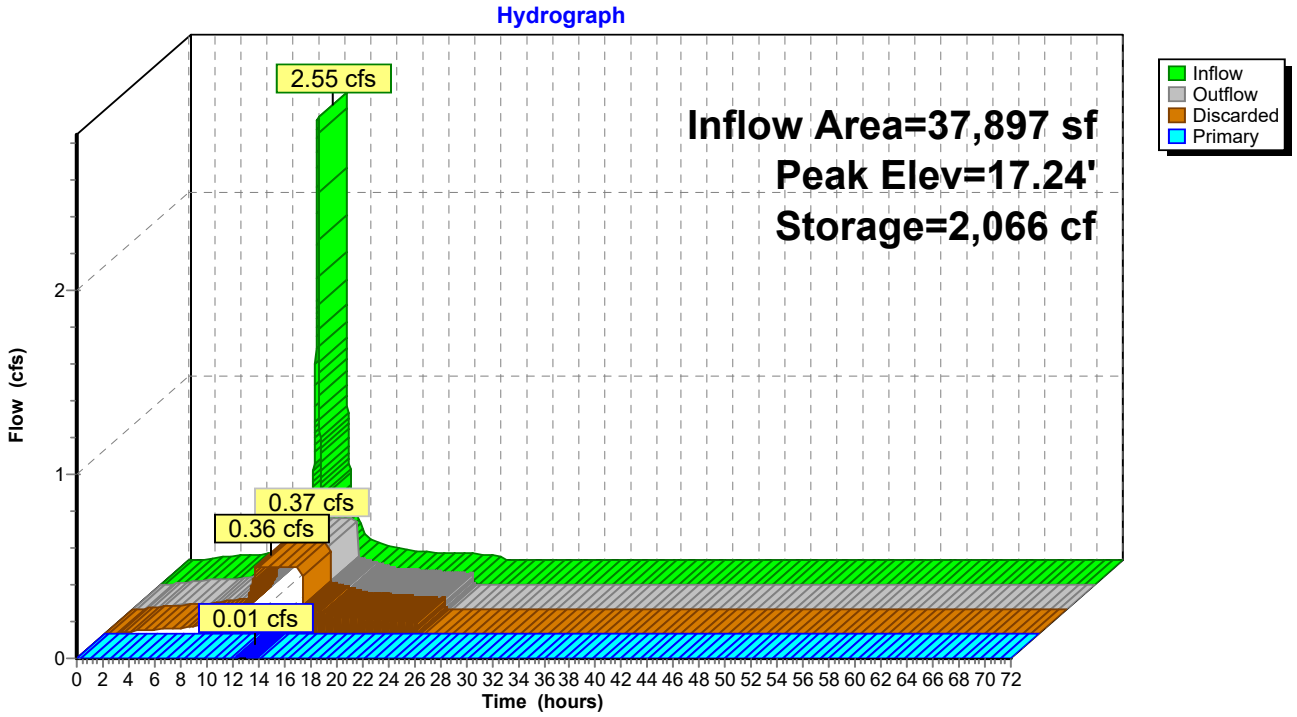
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 11.76 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.01 cfs @ 12.57 hrs HW=17.24' TW=15.60' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.01 cfs of 6.88 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Barrel Controls 0.01 cfs @ 0.86 fps)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=333)

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 2.22" for 10-Year current event
Inflow = 2.33 cfs @ 12.11 hrs, Volume= 7,819 cf
Outflow = 0.31 cfs @ 12.64 hrs, Volume= 7,821 cf, Atten= 87%, Lag= 32.1 min
Discarded = 0.18 cfs @ 11.41 hrs, Volume= 6,750 cf
Primary = 0.13 cfs @ 12.64 hrs, Volume= 1,071 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 23.83' @ 12.64 hrs Surf.Area= 3,575 sf Storage= 2,339 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 59.0 min (824.5 - 765.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

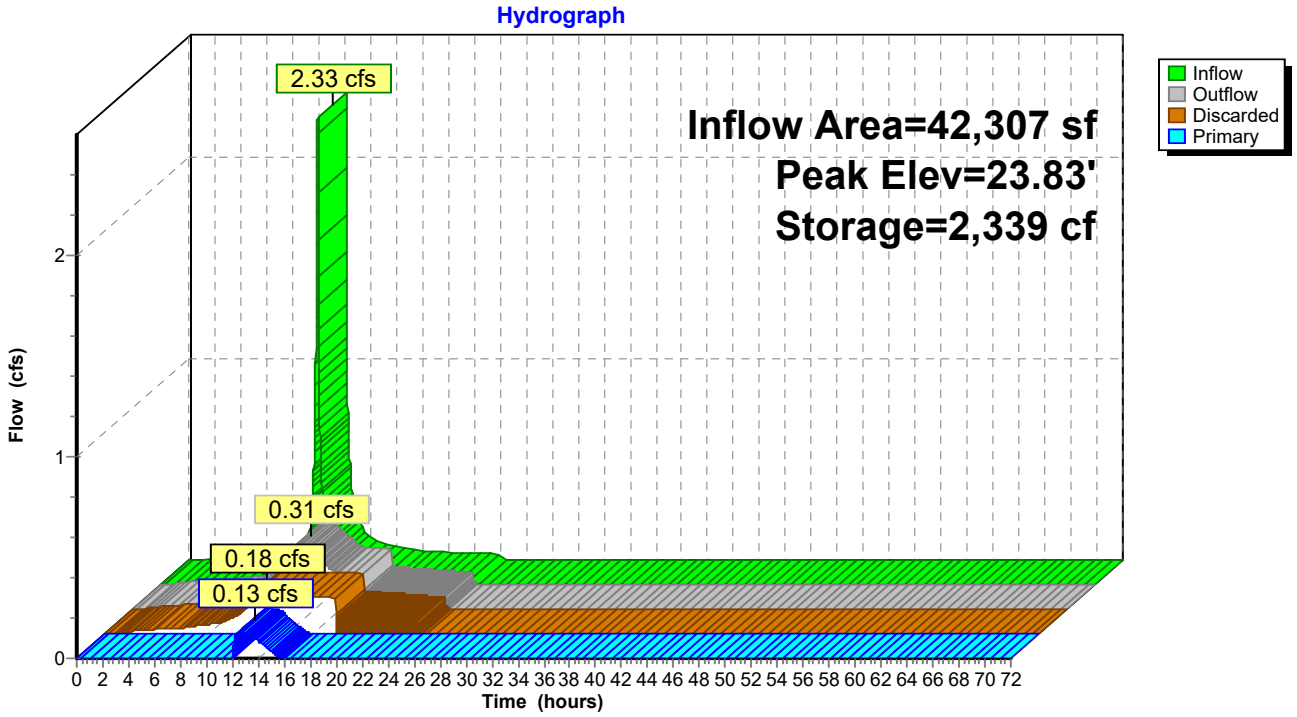
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 11.41 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.13 cfs @ 12.64 hrs HW=23.83' TW=14.75' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.13 cfs of 11.09 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Inlet Controls 0.13 cfs @ 2.62 fps)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 2.69" for 10-Year current event
Inflow = 6.82 cfs @ 12.11 hrs, Volume= 27,021 cf
Outflow = 5.76 cfs @ 12.13 hrs, Volume= 27,021 cf, Atten= 15%, Lag= 1.6 min
Discarded = 0.25 cfs @ 10.18 hrs, Volume= 16,706 cf
Primary = 5.51 cfs @ 12.13 hrs, Volume= 10,316 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.68' @ 12.13 hrs Surf.Area= 4,172 sf Storage= 5,408 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 85.8 min (855.7 - 769.9)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

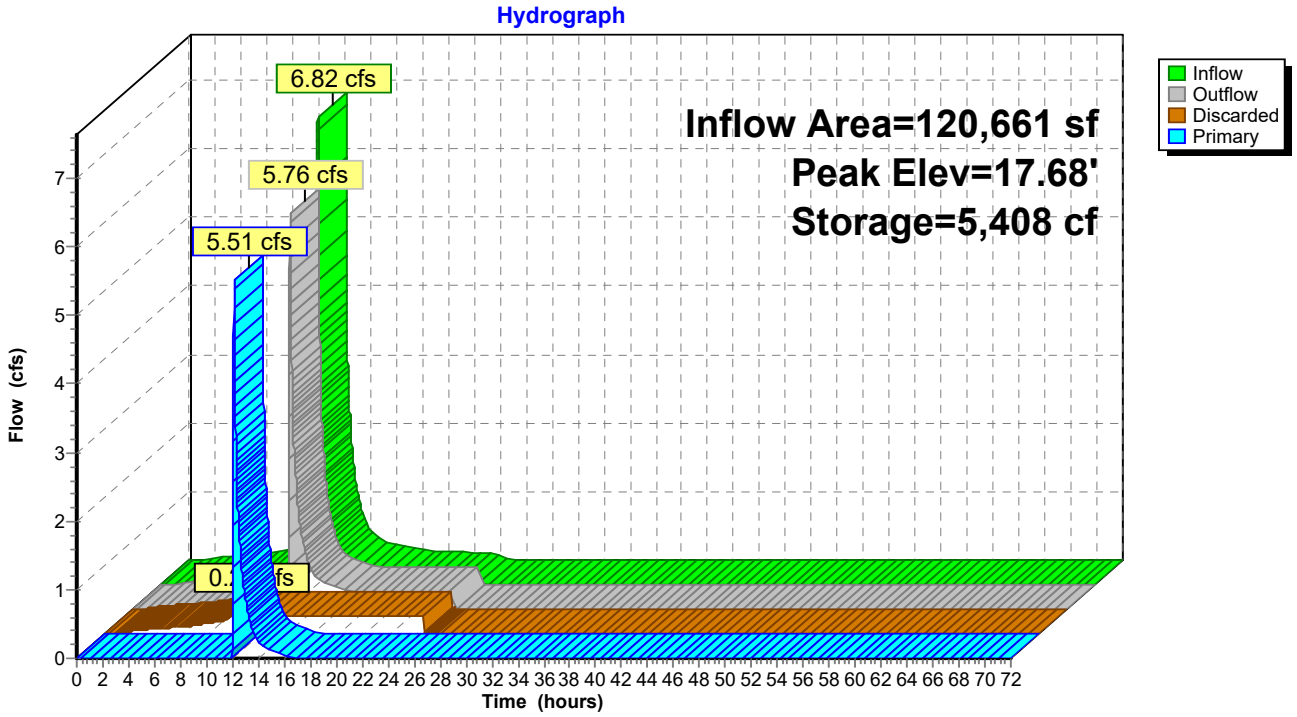
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 10.18 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=5.50 cfs @ 12.13 hrs HW=17.68' TW=13.50' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 5.05 cfs @ 1.29 fps)
└**2=Culvert** (Inlet Controls 0.44 cfs @ 2.25 fps)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 2.31" for 10-Year current event
Inflow = 6.24 cfs @ 12.14 hrs, Volume= 26,994 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 16.31' @ 52.42 hrs Surf.Area= 17,580 sf Storage= 26,994 cf

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

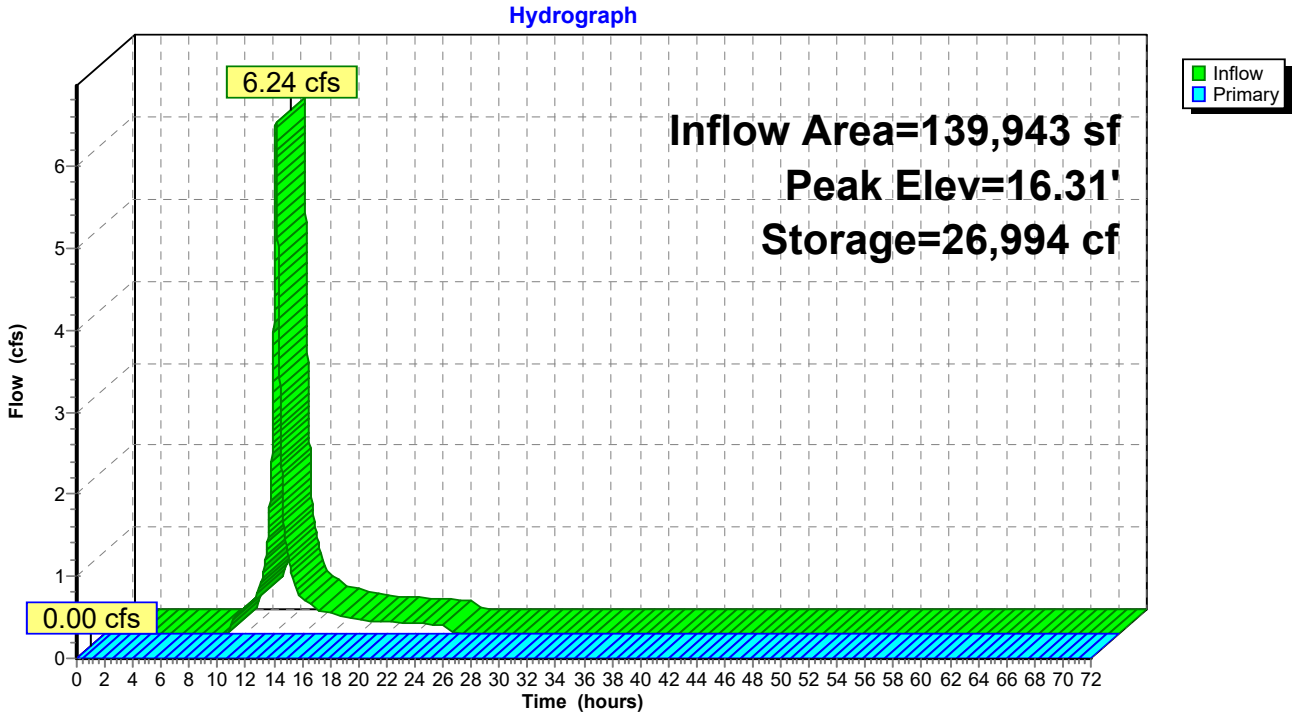
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 3.86" for 10-Year current event
Inflow = 6.56 cfs @ 12.11 hrs, Volume= 20,760 cf
Outflow = 4.40 cfs @ 12.15 hrs, Volume= 19,967 cf, Atten= 33%, Lag= 2.6 min
Primary = 4.40 cfs @ 12.15 hrs, Volume= 19,967 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.78' @ 12.15 hrs Surf.Area= 2,153 sf Storage= 2,420 cf

Plug-Flow detention time= 49.2 min calculated for 19,967 cf (96% of inflow)
Center-of-Mass det. time= 25.2 min (775.7 - 750.5)

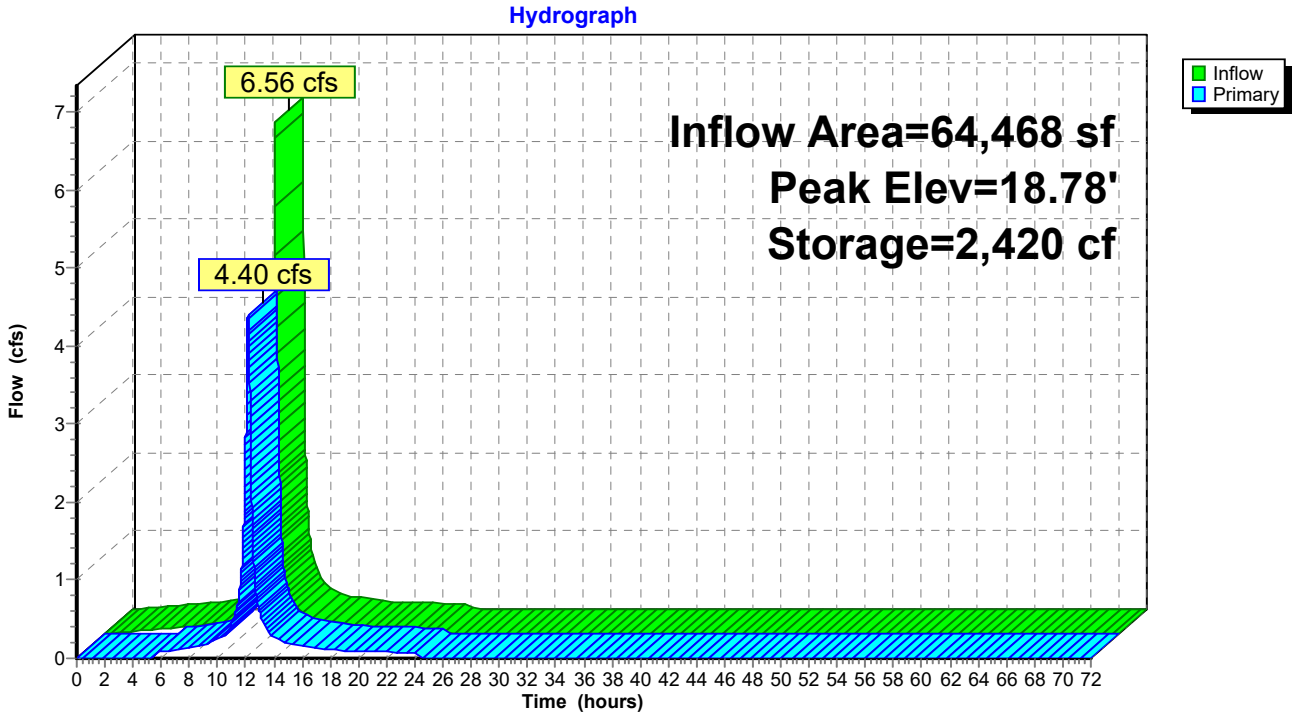
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.40 cfs @ 12.15 hrs HW=18.78' TW=18.07' (Dynamic Tailwater)
↑**2=Culvert** (Inlet Controls 4.40 cfs @ 3.58 fps)
↑**1=Orifice/Grate** (Passes 4.40 cfs of 43.89 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 3.32" for 10-Year current event
Inflow = 6.73 cfs @ 12.11 hrs, Volume= 28,337 cf
Outflow = 6.24 cfs @ 12.14 hrs, Volume= 26,107 cf, Atten= 7%, Lag= 1.8 min
Primary = 6.24 cfs @ 12.14 hrs, Volume= 26,107 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.07' @ 12.14 hrs Surf.Area= 5,394 sf Storage= 3,484 cf

Plug-Flow detention time= 80.9 min calculated for 26,107 cf (92% of inflow)
Center-of-Mass det. time= 37.2 min (808.1 - 770.9)

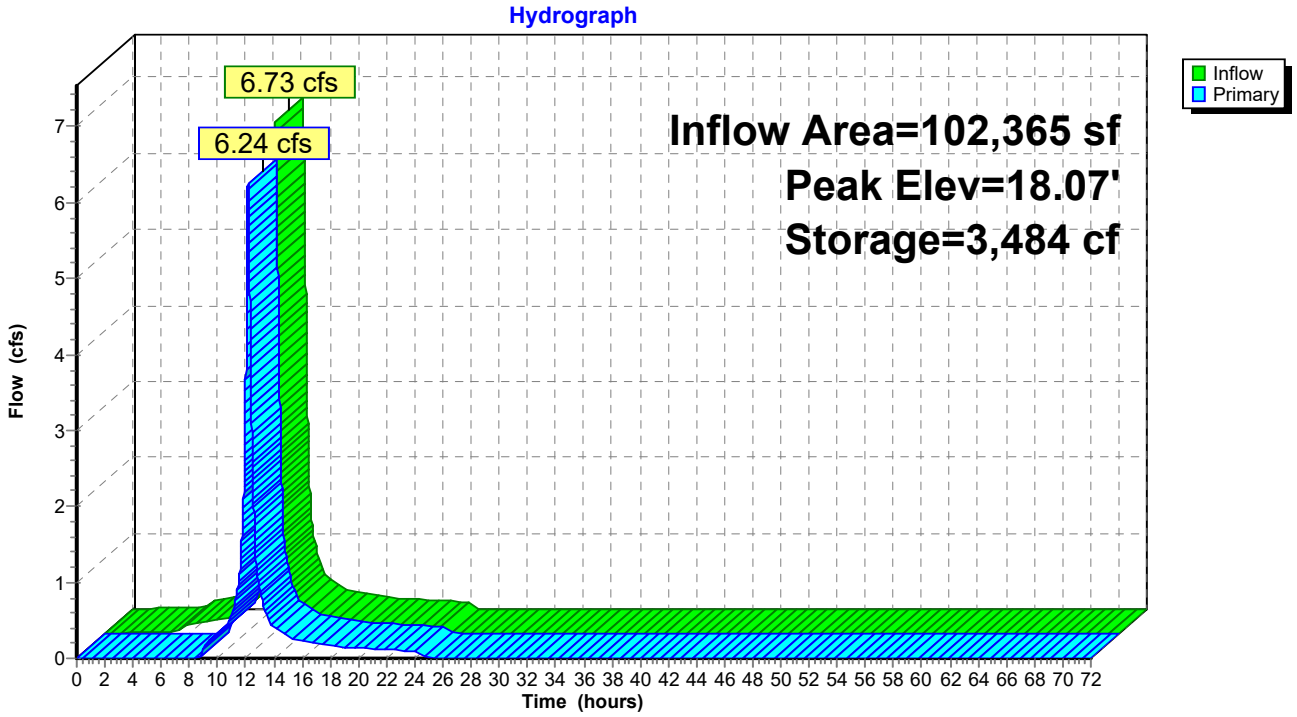
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.24 cfs @ 12.14 hrs HW=18.07' TW=15.22' (Dynamic Tailwater)
↑**2=Culvert** (Passes 6.24 cfs of 8.81 cfs potential flow)
↑**1=Orifice/Grate** (Weir Controls 6.24 cfs @ 1.64 fps)

Pond Pre bio-2: Pre Bio Ret 2

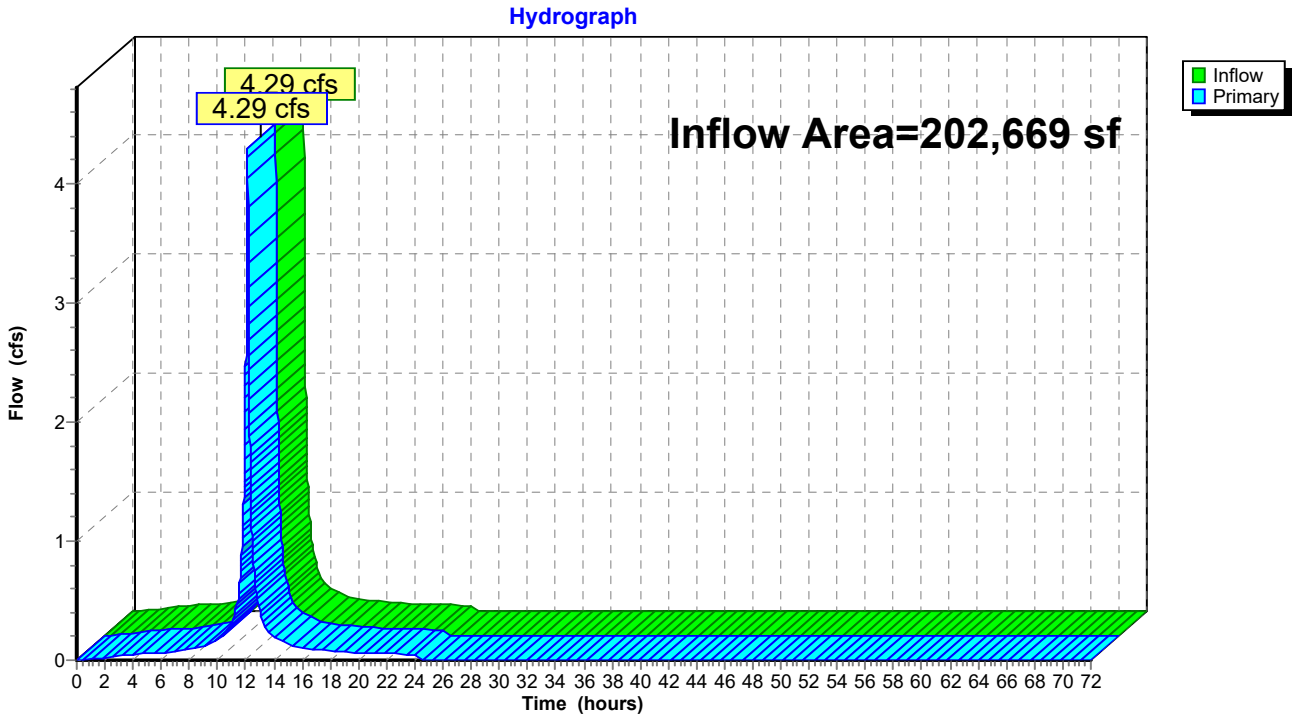


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 0.89" for 10-Year current event
Inflow = 4.29 cfs @ 12.12 hrs, Volume= 14,991 cf
Primary = 4.29 cfs @ 12.12 hrs, Volume= 14,991 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

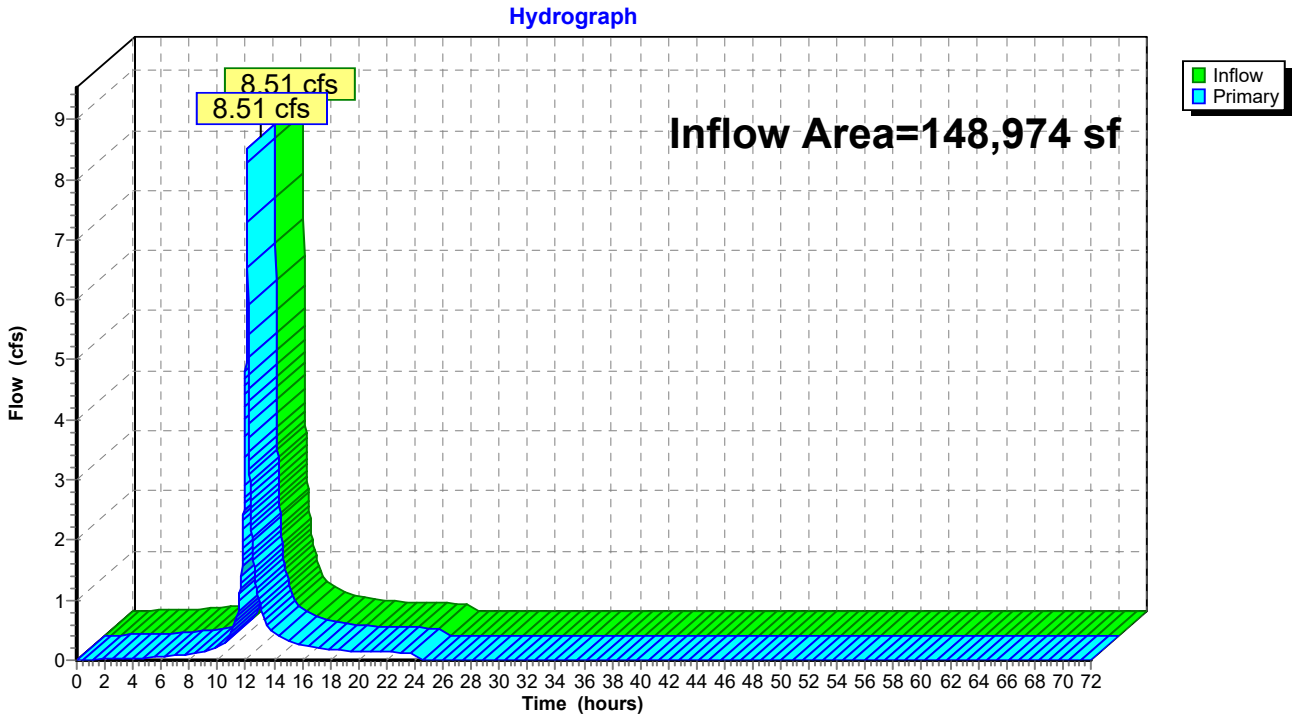


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 2.21" for 10-Year current event
Inflow = 8.51 cfs @ 12.11 hrs, Volume= 27,466 cf
Primary = 8.51 cfs @ 12.11 hrs, Volume= 27,466 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

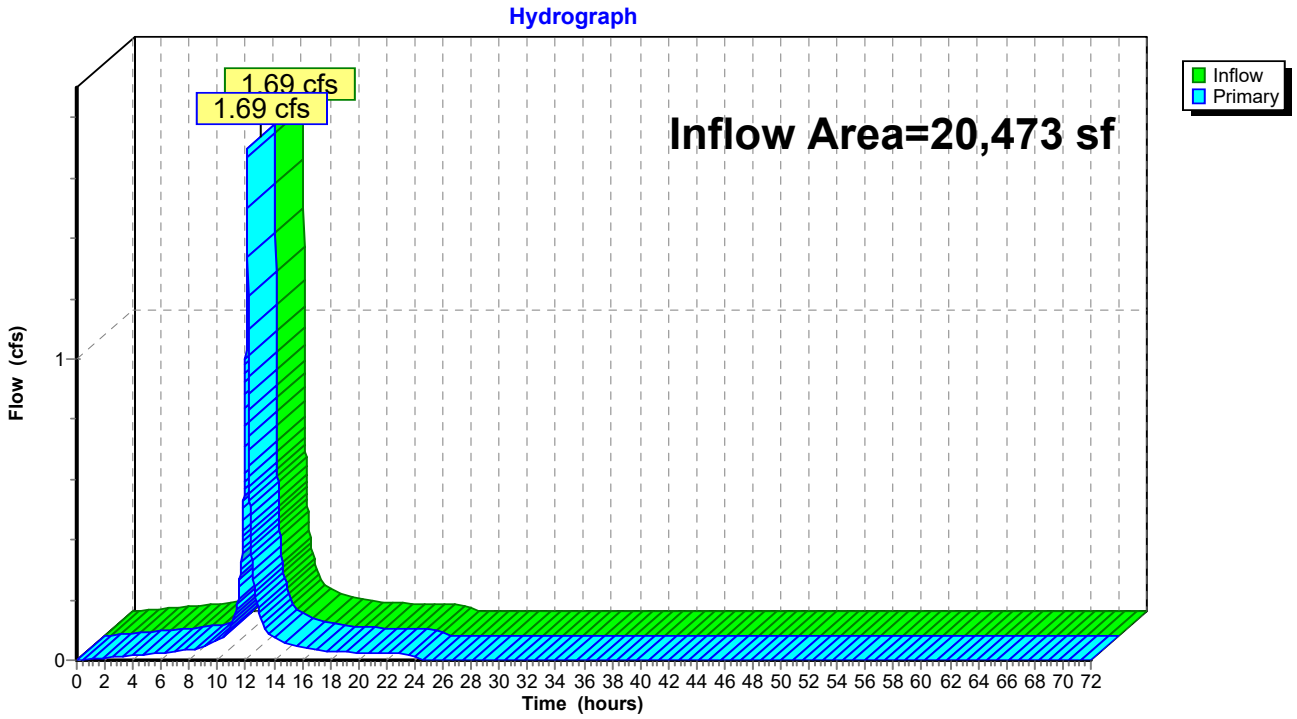


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 3.25" for 10-Year current event
Inflow = 1.69 cfs @ 12.11 hrs, Volume= 5,551 cf
Primary = 1.69 cfs @ 12.11 hrs, Volume= 5,551 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

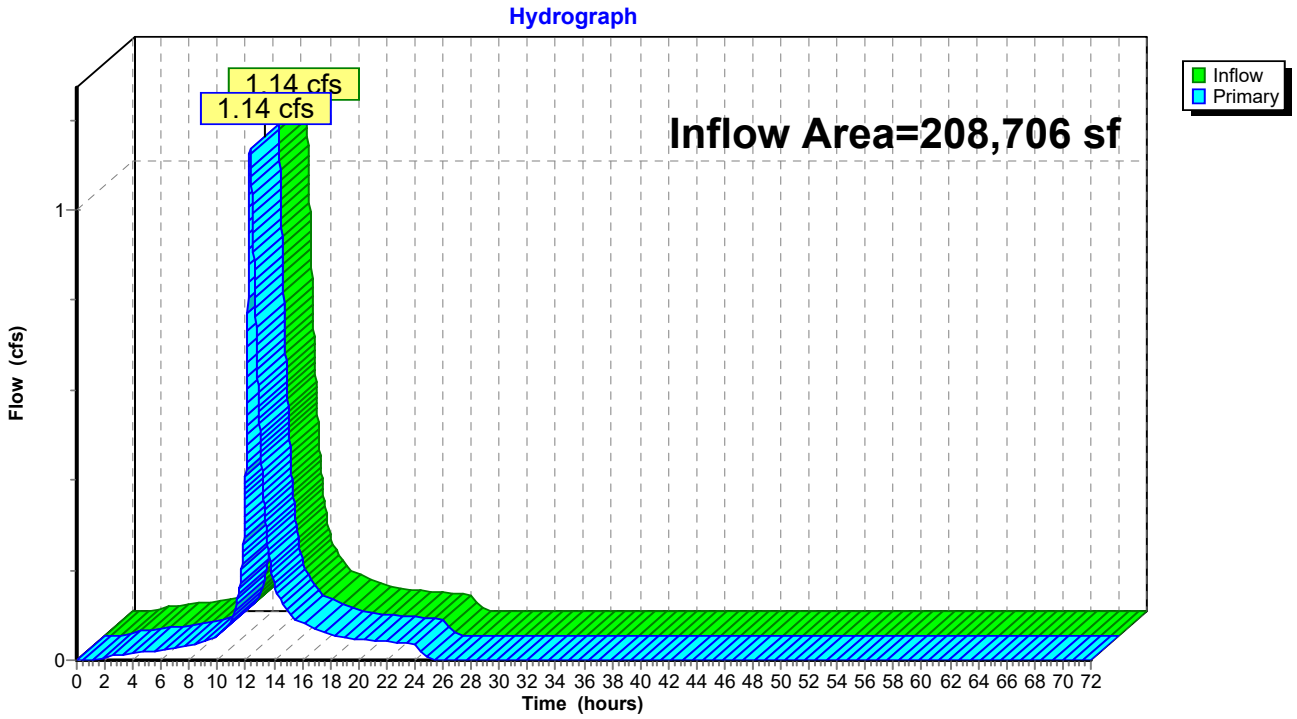


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 0.46" for 10-Year current event
Inflow = 1.14 cfs @ 12.31 hrs, Volume= 7,963 cf
Primary = 1.14 cfs @ 12.31 hrs, Volume= 7,963 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

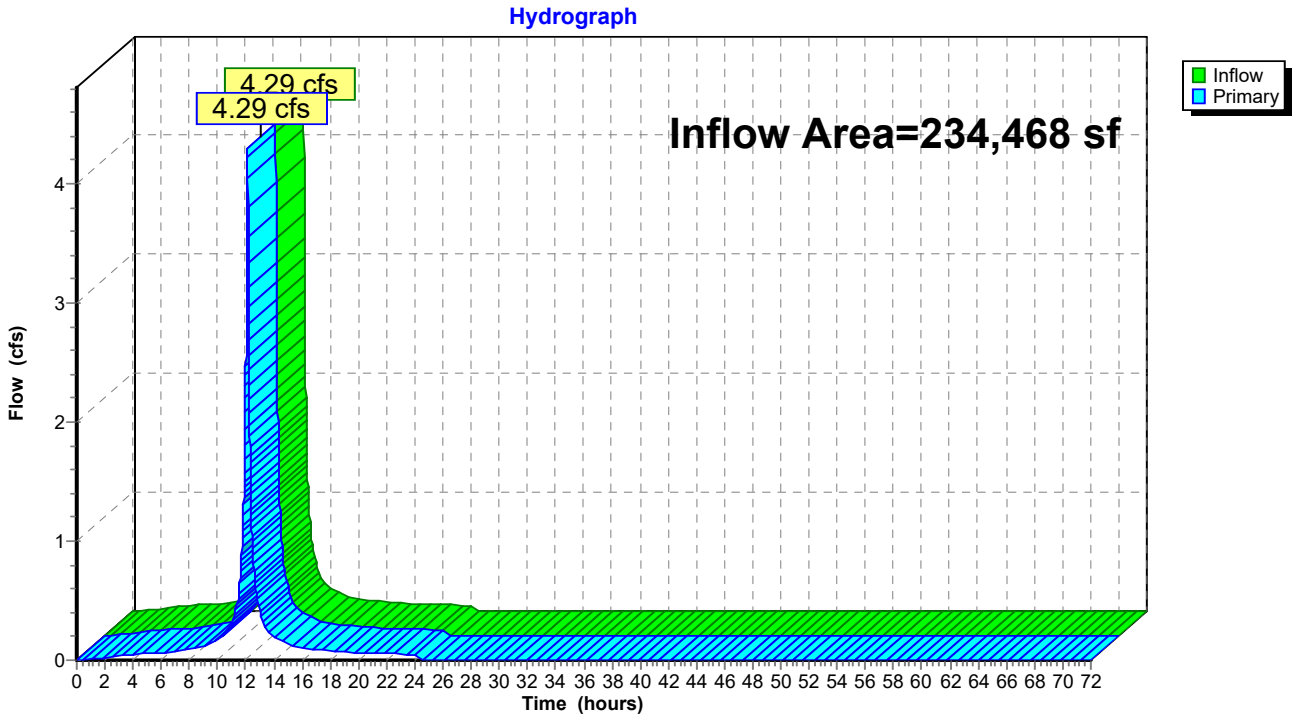


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 0.77" for 10-Year current event
Inflow = 4.29 cfs @ 12.12 hrs, Volume= 14,991 cf
Primary = 4.29 cfs @ 12.12 hrs, Volume= 14,991 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

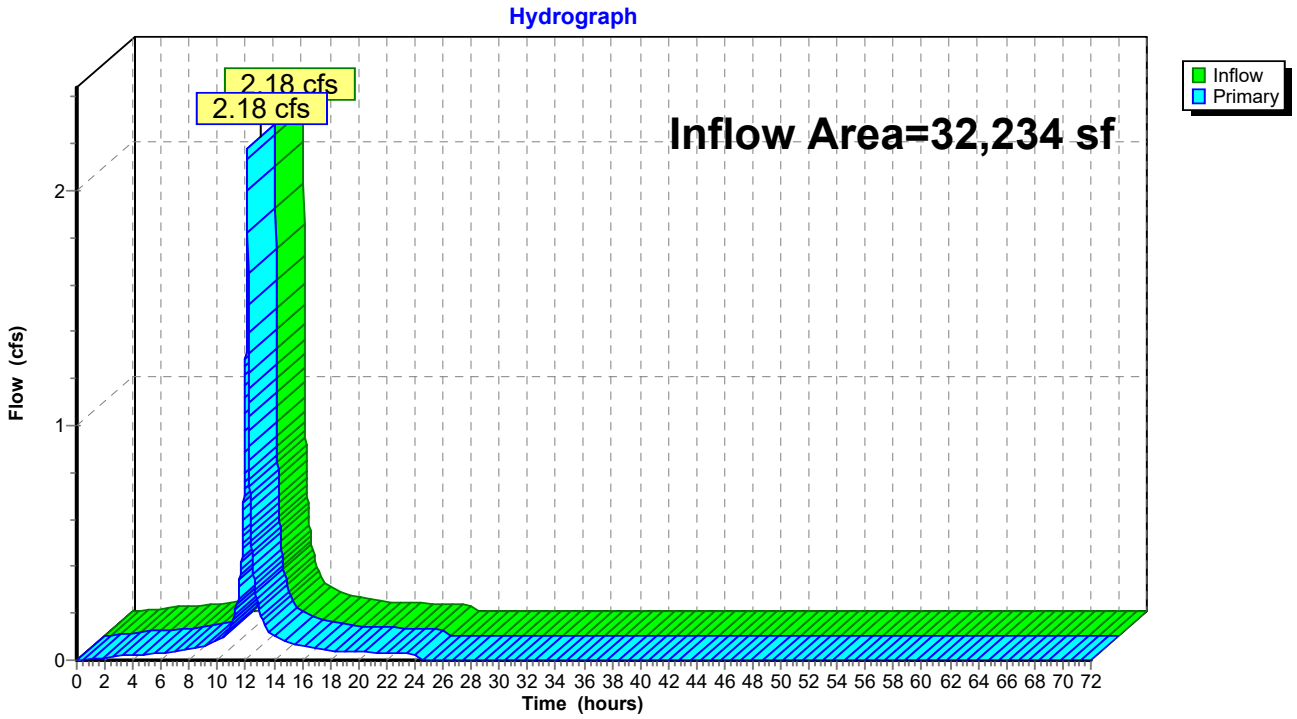


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 2.76" for 10-Year current event
Inflow = 2.18 cfs @ 12.11 hrs, Volume= 7,426 cf
Primary = 2.18 cfs @ 12.11 hrs, Volume= 7,426 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=9.15 cfs 28,560 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=2.68"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=1.49 cfs 10,226 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.43 cfs 7,595 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.03 cfs 332 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.08 cfs 815 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.01 cfs 9,386 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.08 cfs 886 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=2.00 cfs 6,363 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.03 cfs 363 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.16 cfs 1,713 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=330' Tc=3.9 min CN=98 Runoff=5.06 cfs 17,728 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.01 cfs 260 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.74 cfs 8,563 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.11 cfs 1,161 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=7.41 cfs 23,146 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.44 cfs 2,622 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=2.03"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=0.86 cfs 7,383 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=7.74 cfs 24,155 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.07 cfs 773 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.01 cfs 9,386 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.08 cfs 886 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=2.57 cfs 8,369 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.07 cfs 719 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.16 cfs 1,713 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=330' Tc=3.9 min CN=98 Runoff=5.06 cfs 17,728 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.01 cfs 260 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=6.10"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=2.68 cfs 8,369 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.07 cfs 719 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=4.93"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=7.17 cfs 20,179 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=0.99"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.97 cfs 5,585 cf

Pond 4P: Pre developed infiltration basin Peak Elev=16.53' Storage=30,781 cf Inflow=11.19 cfs 30,781 cf
Outflow=0.00 cfs 0 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=15.96' Storage=13,623 cf Inflow=7.26 cfs 16,614 cf
Outflow=0.49 cfs 3,419 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.41' Storage=1,654 cf Inflow=2.44 cfs 7,927 cf
Discarded=0.02 cfs 2,920 cf Primary=2.32 cfs 5,008 cf Outflow=2.34 cfs 7,927 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.67' Storage=2,180 cf Inflow=11.44 cfs 34,383 cf
Discarded=0.05 cfs 5,473 cf Primary=11.17 cfs 28,911 cf Outflow=11.22 cfs 34,384 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.31' Storage=2,767 cf Inflow=3.01 cfs 10,272 cf
Discarded=0.36 cfs 10,118 cf Primary=0.03 cfs 157 cf Outflow=0.39 cfs 10,275 cf

Pond Bio 70: Post Bio-70 Peak Elev=24.02' Storage=3,086 cf Inflow=2.75 cfs 9,725 cf
Discarded=0.18 cfs 7,873 cf Primary=0.16 cfs 1,853 cf Outflow=0.34 cfs 9,726 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.73' Storage=5,630 cf Inflow=8.13 cfs 33,151 cf
Discarded=0.25 cfs 18,392 cf Primary=7.15 cfs 14,762 cf Outflow=7.40 cfs 33,154 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=16.69' Storage=33,891 cf Inflow=7.19 cfs 33,891 cf
Outflow=0.00 cfs 0 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=18.99' Storage=2,888 cf Inflow=7.74 cfs 24,929 cf
Outflow=4.93 cfs 24,136 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=18.10' Storage=3,615 cf Inflow=7.68 cfs 34,408 cf
Outflow=7.15 cfs 32,178 cf

Link 1L: Pre dis 1 Inflow=5.06 cfs 17,988 cf
Primary=5.06 cfs 17,988 cf

Link 3L: Pre discharge point 3 Inflow=10.45 cfs 34,853 cf
Primary=10.45 cfs 34,853 cf

Link 4L: Post discharge point 2 Inflow=2.00 cfs 6,726 cf
Primary=2.00 cfs 6,726 cf

Link 6L: Discharge point 3 post Inflow=1.49 cfs 13,645 cf
Primary=1.49 cfs 13,645 cf

Link 11L: Post dis 1 Inflow=5.06 cfs 17,988 cf
Primary=5.06 cfs 17,988 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=2.58 cfs 9,088 cf
Primary=2.58 cfs 9,088 cf

Total Runoff Area = 847,524 sf Runoff Volume = 225,947 cf Average Runoff Depth = 3.20"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

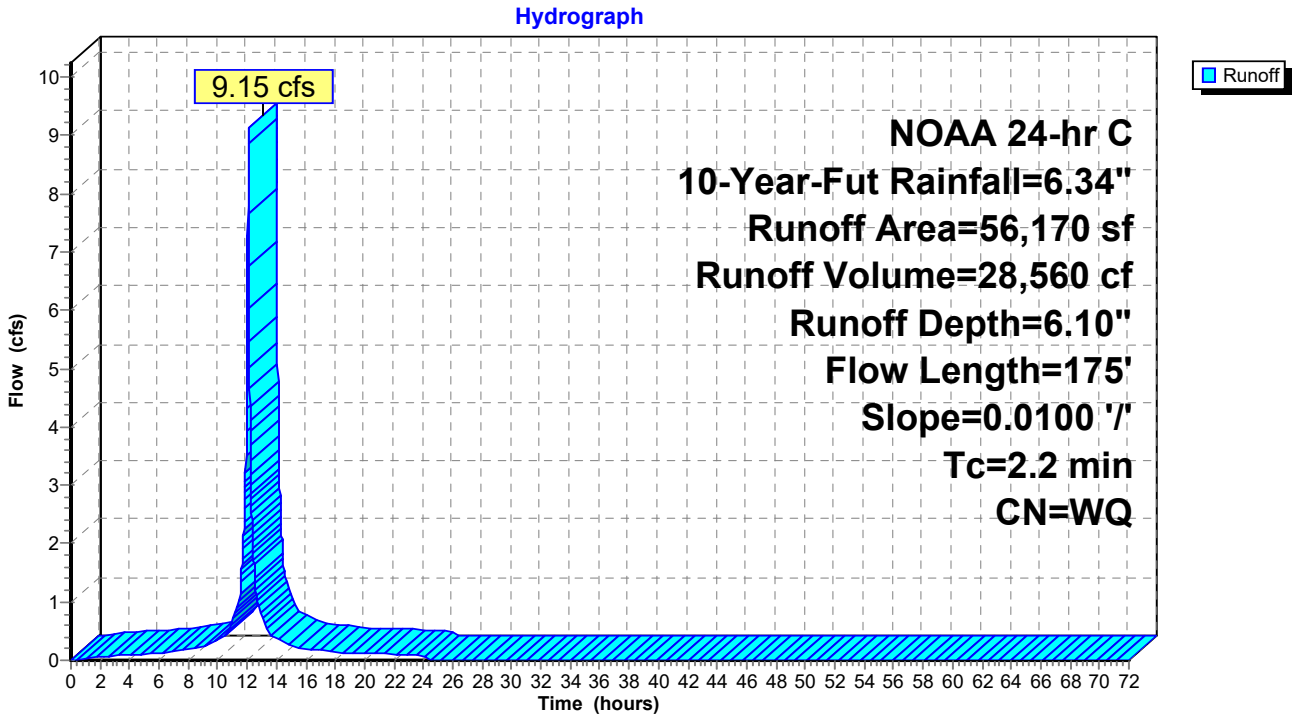
Runoff = 9.15 cfs @ 12.11 hrs, Volume= 28,560 cf, Depth= 6.10"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

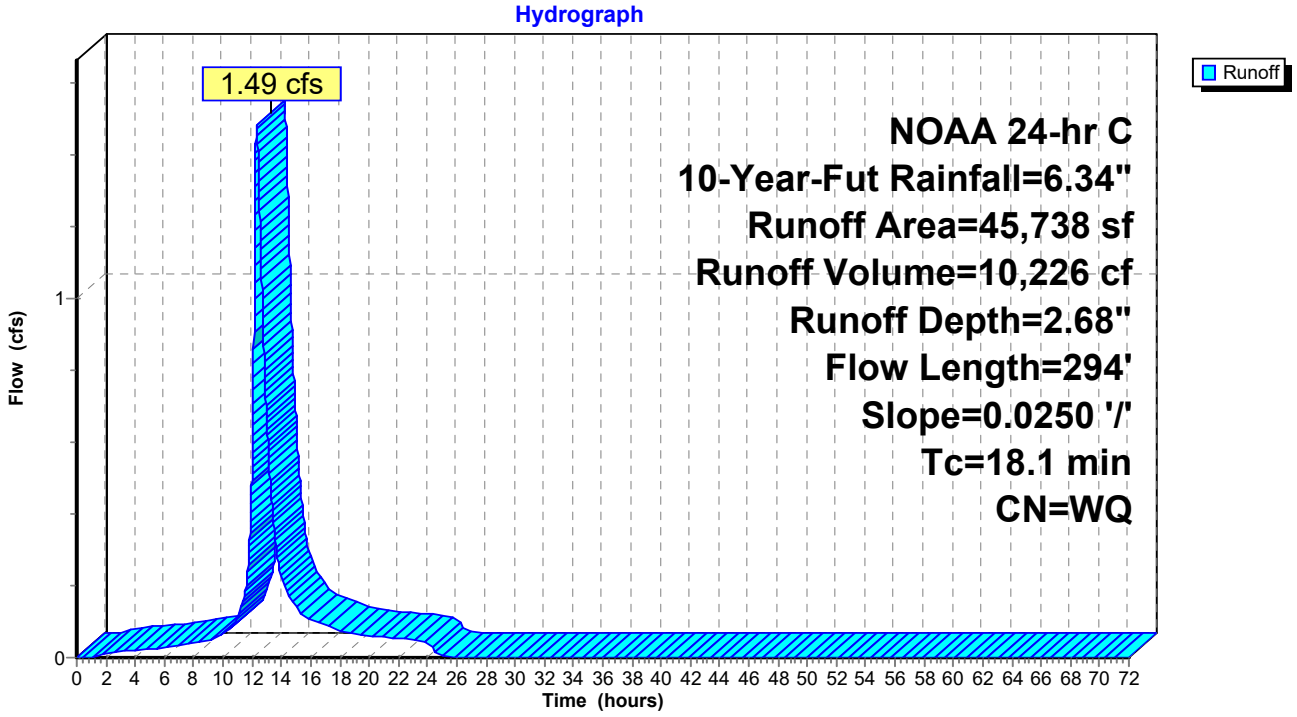
Runoff = 1.49 cfs @ 12.31 hrs, Volume= 10,226 cf, Depth= 2.68"
Routed to Link 6L : Discharge point 3 post

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

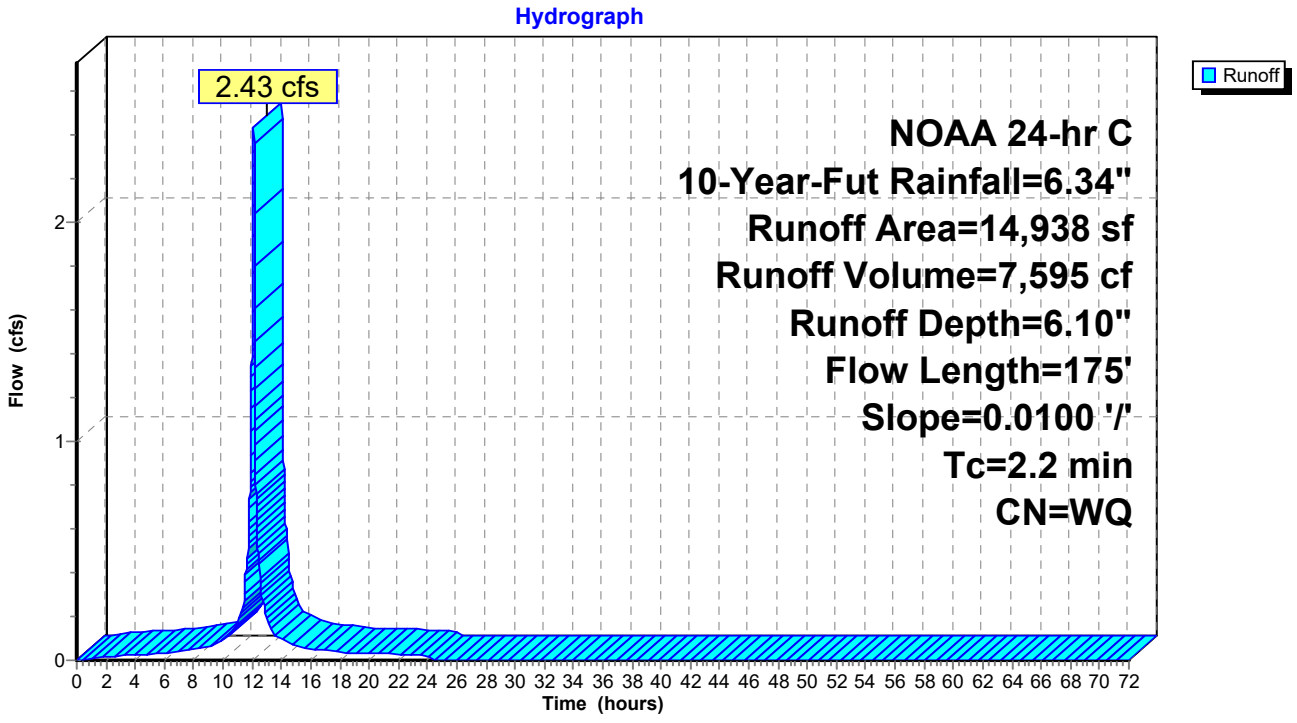
Runoff = 2.43 cfs @ 12.11 hrs, Volume= 7,595 cf, Depth= 6.10"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

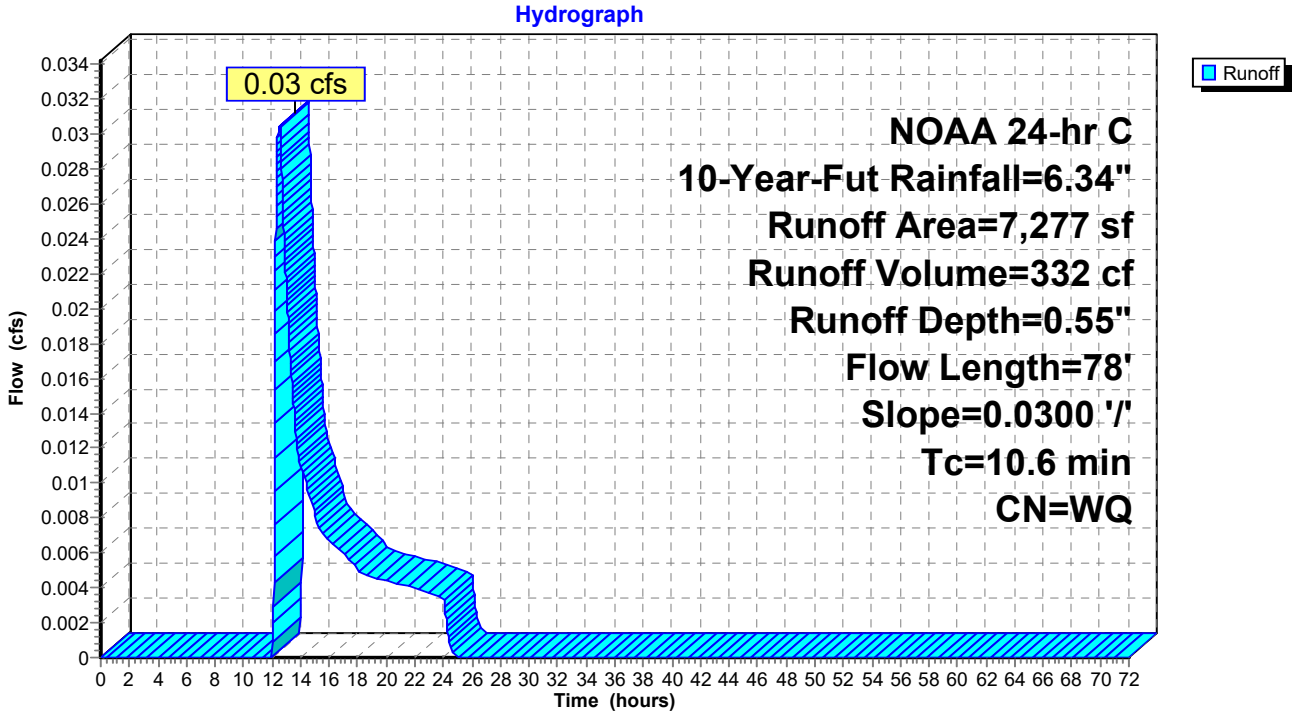
Runoff = 0.03 cfs @ 12.54 hrs, Volume= 332 cf, Depth= 0.55"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

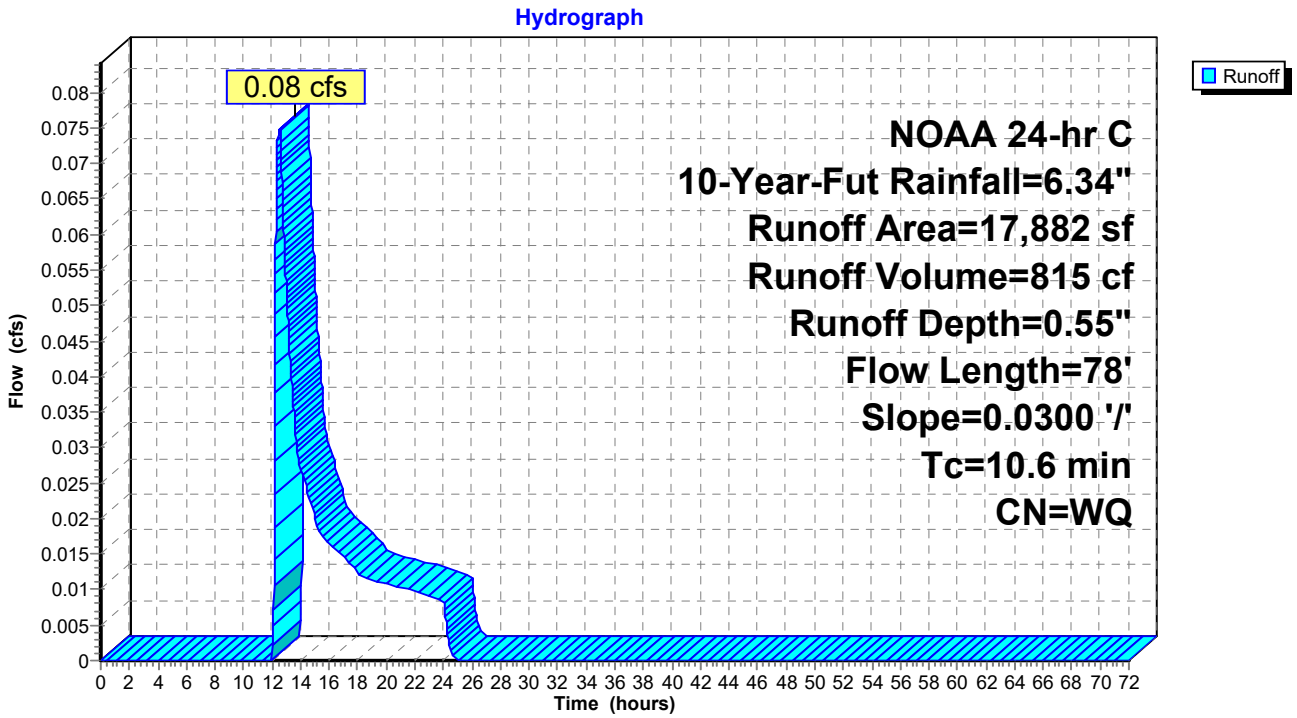
Runoff = 0.08 cfs @ 12.54 hrs, Volume= 815 cf, Depth= 0.55"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

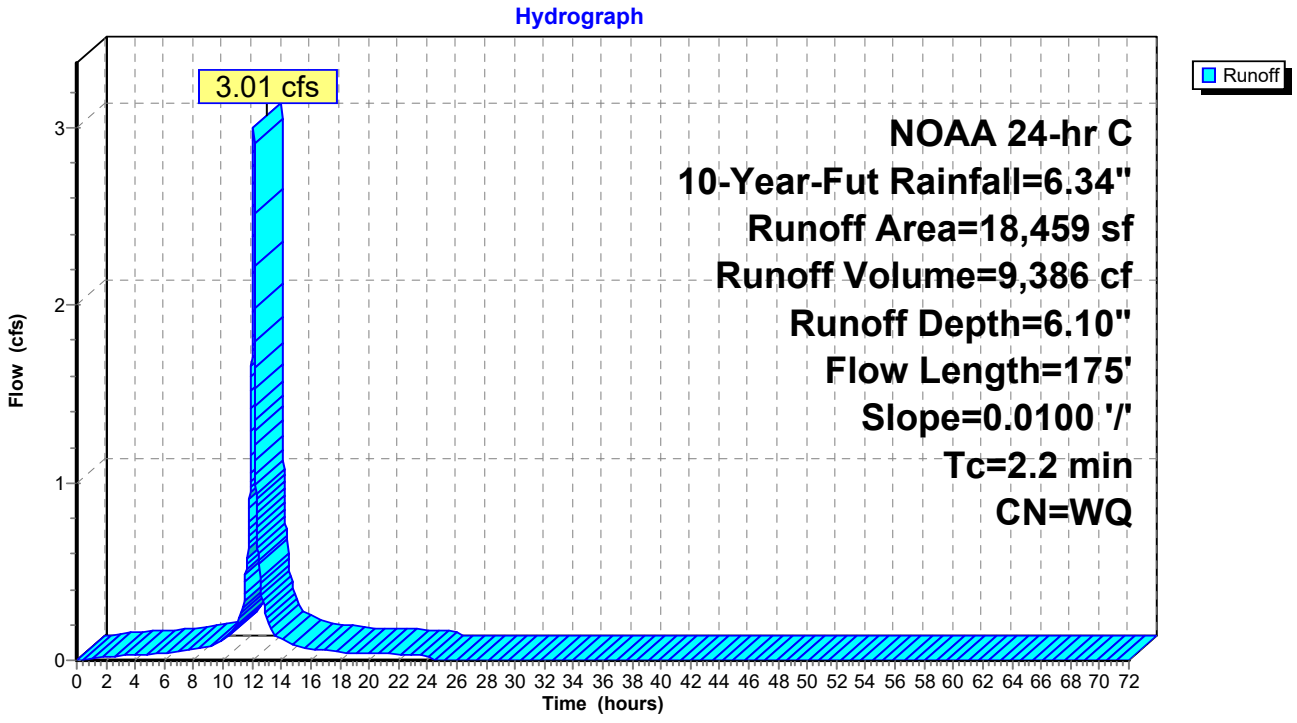
Runoff = 3.01 cfs @ 12.11 hrs, Volume= 9,386 cf, Depth= 6.10"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

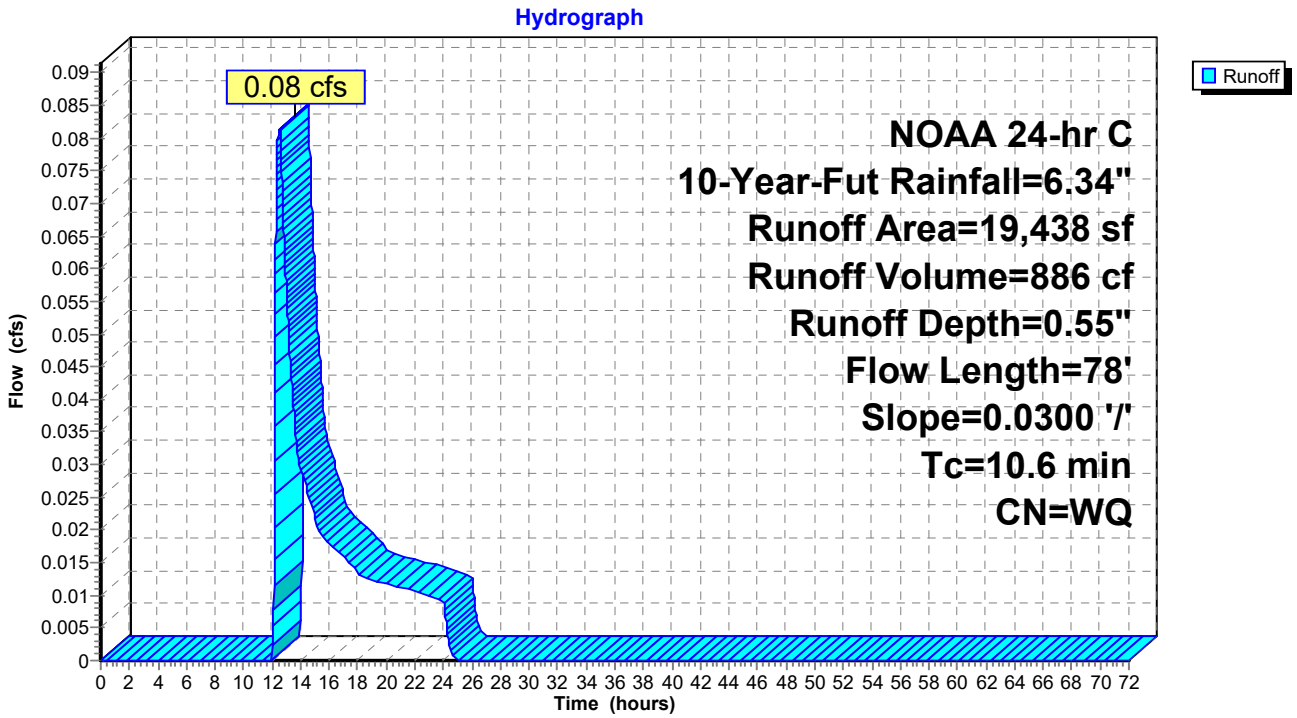
Runoff = 0.08 cfs @ 12.54 hrs, Volume= 886 cf, Depth= 0.55"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

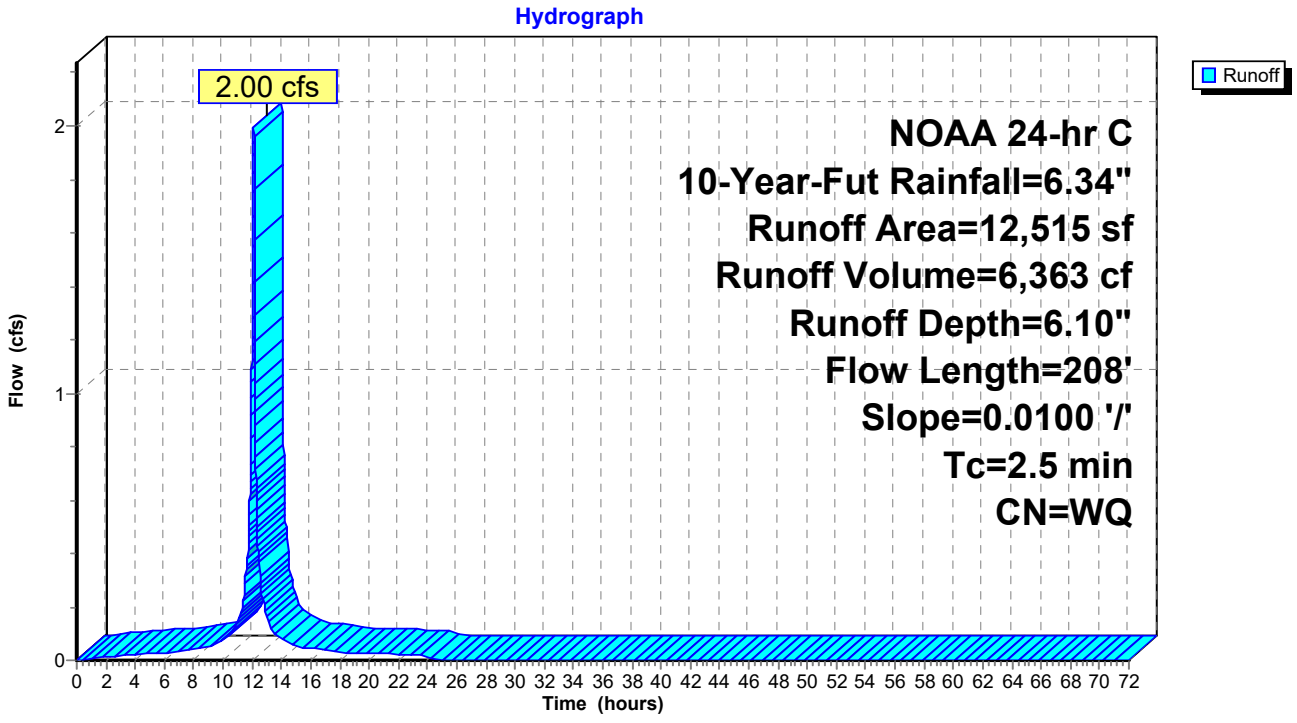
Runoff = 2.00 cfs @ 12.11 hrs, Volume= 6,363 cf, Depth= 6.10"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

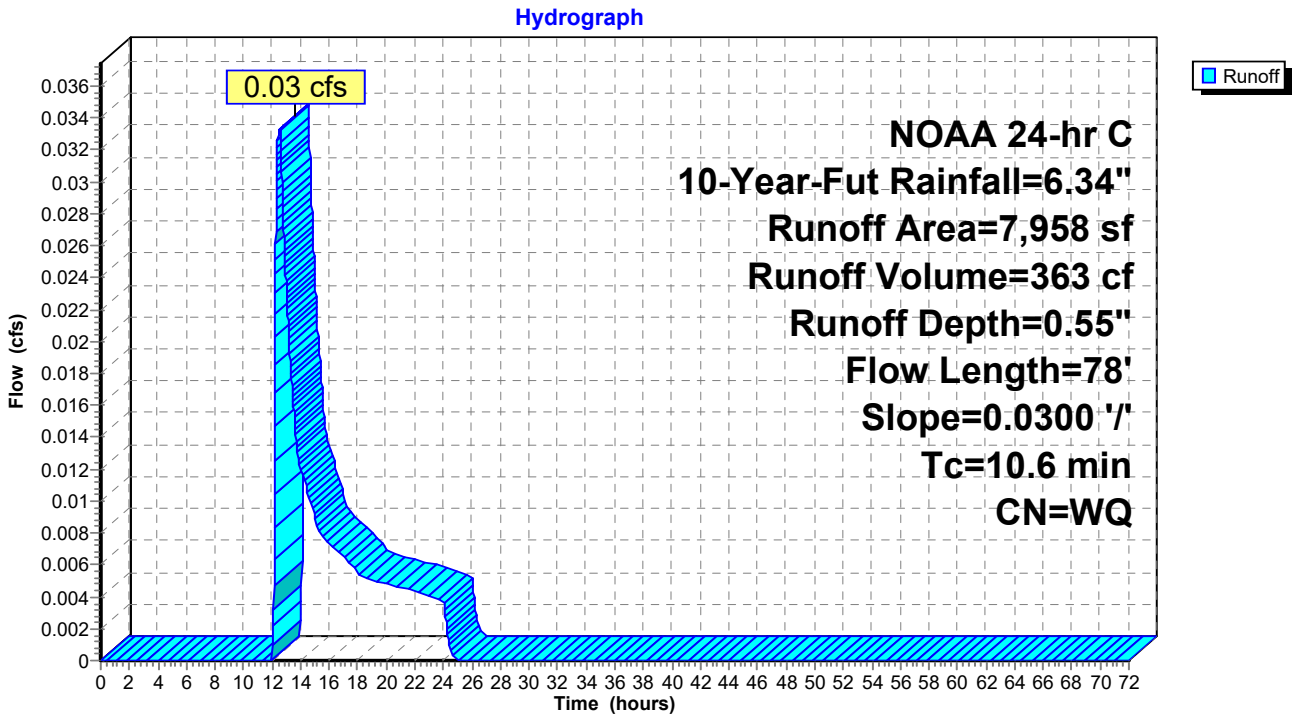
Runoff = 0.03 cfs @ 12.54 hrs, Volume= 363 cf, Depth= 0.55"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

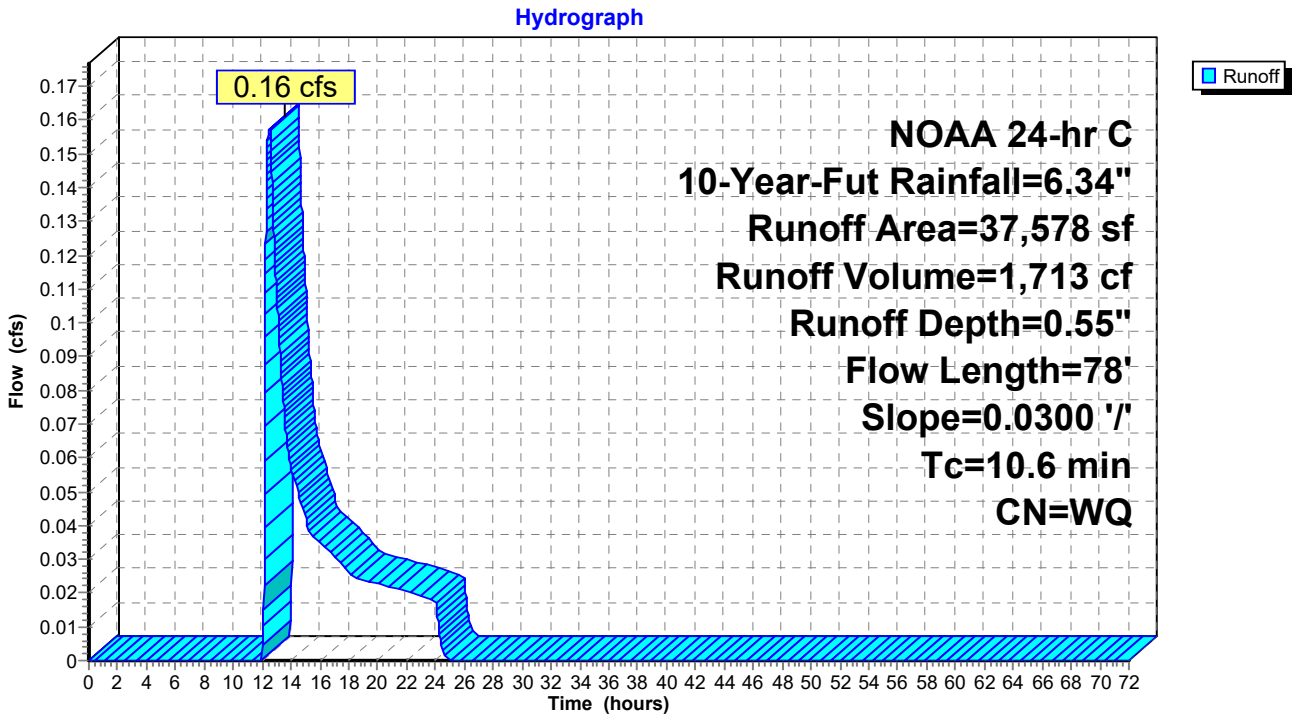
Runoff = 0.16 cfs @ 12.54 hrs, Volume= 1,713 cf, Depth= 0.55"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

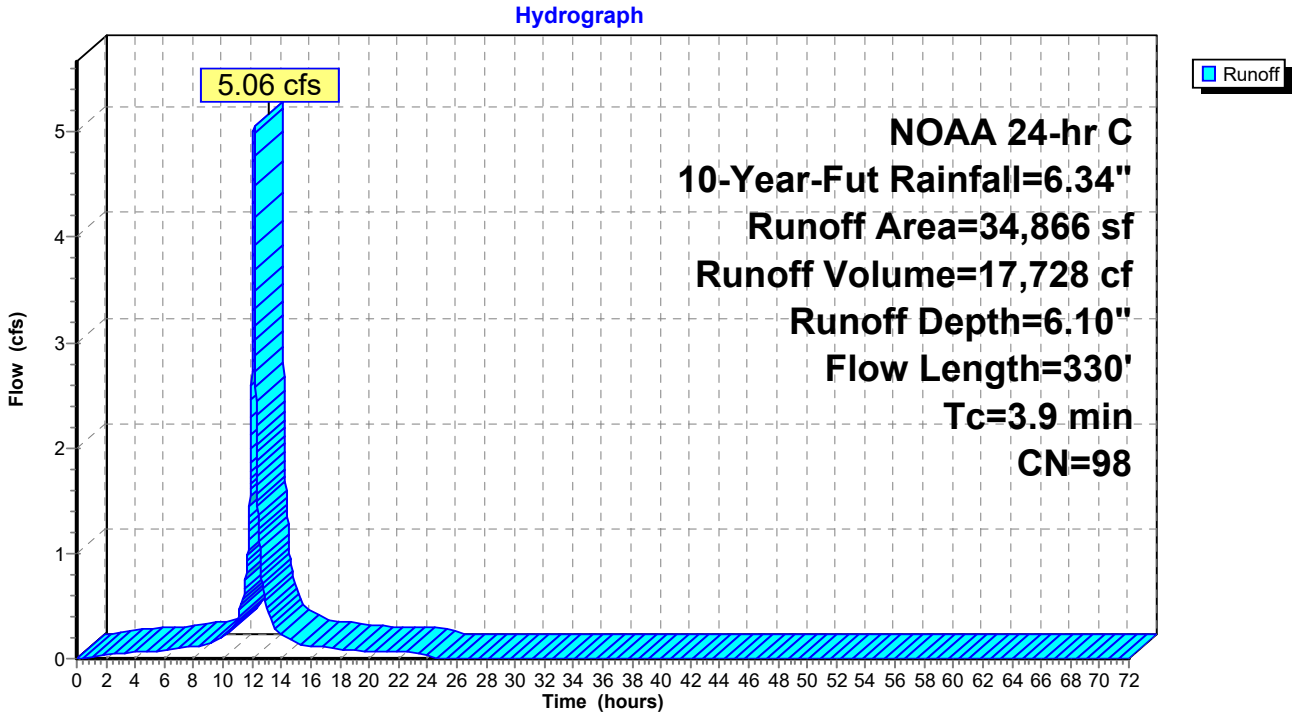
Runoff = 5.06 cfs @ 12.12 hrs, Volume= 17,728 cf, Depth= 6.10"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

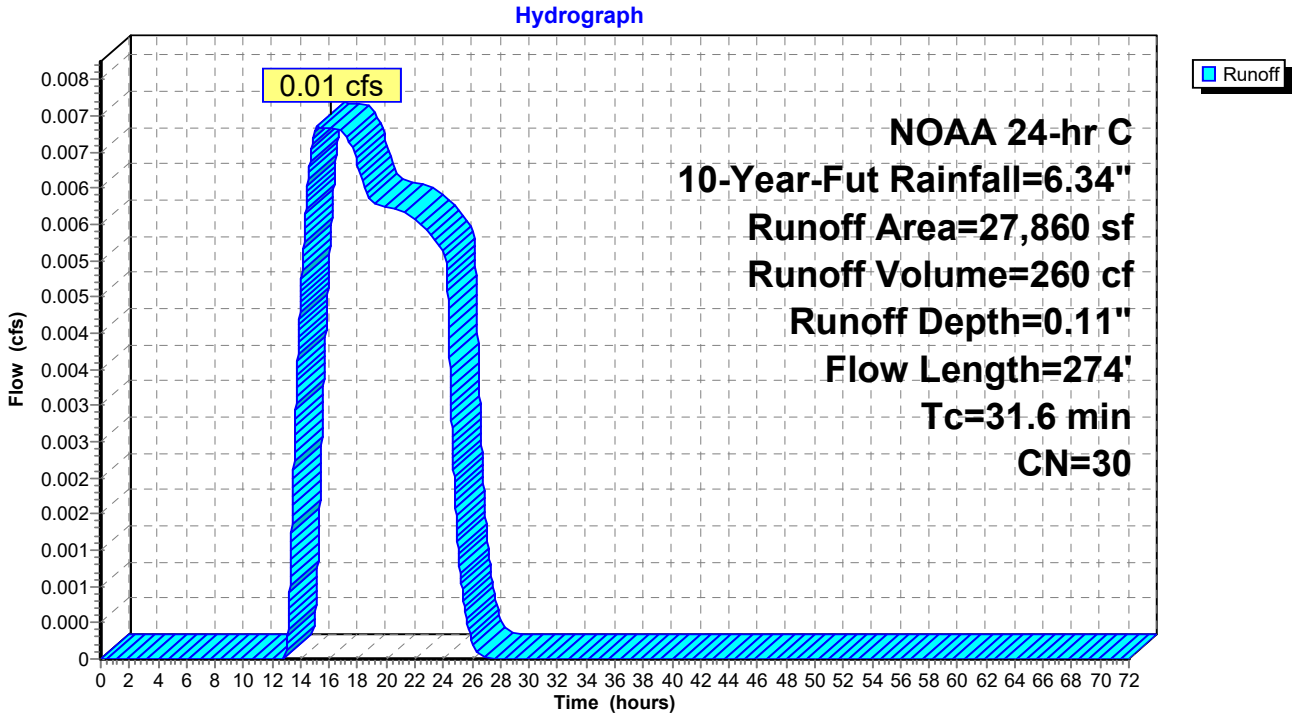
Runoff = 0.01 cfs @ 15.17 hrs, Volume= 260 cf, Depth= 0.11"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

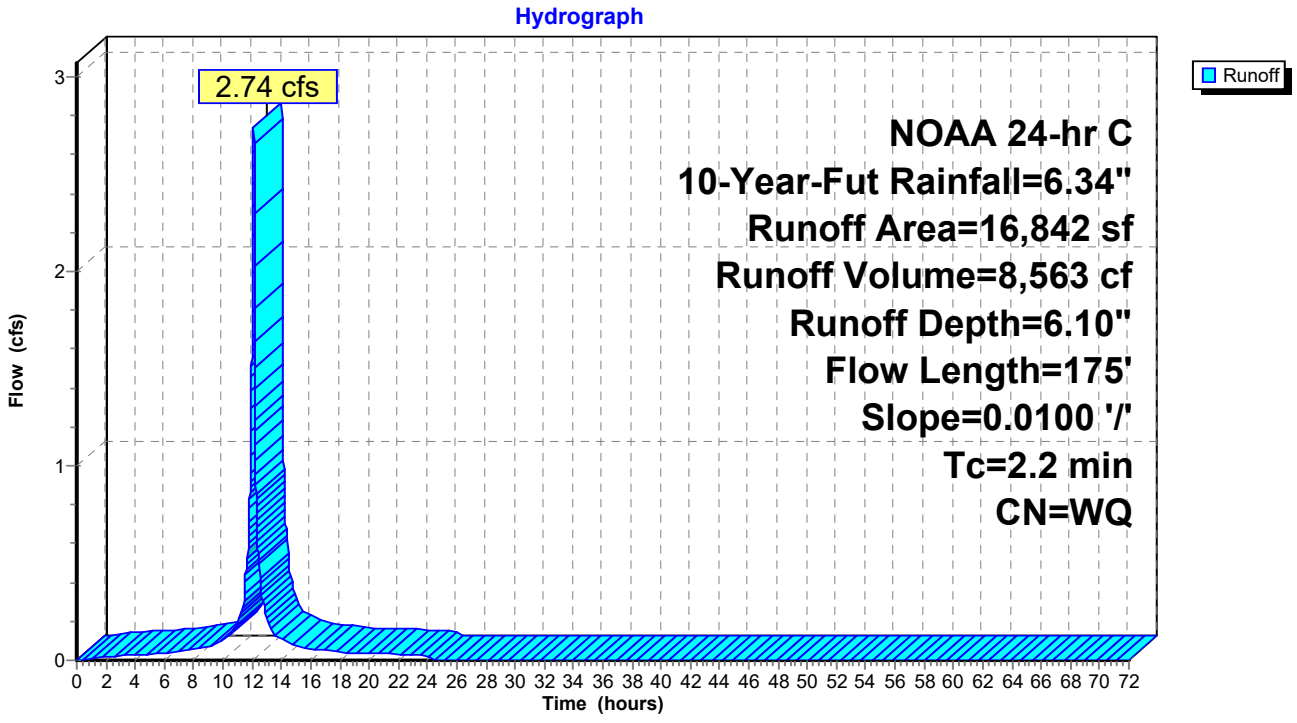
Runoff = 2.74 cfs @ 12.11 hrs, Volume= 8,563 cf, Depth= 6.10"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

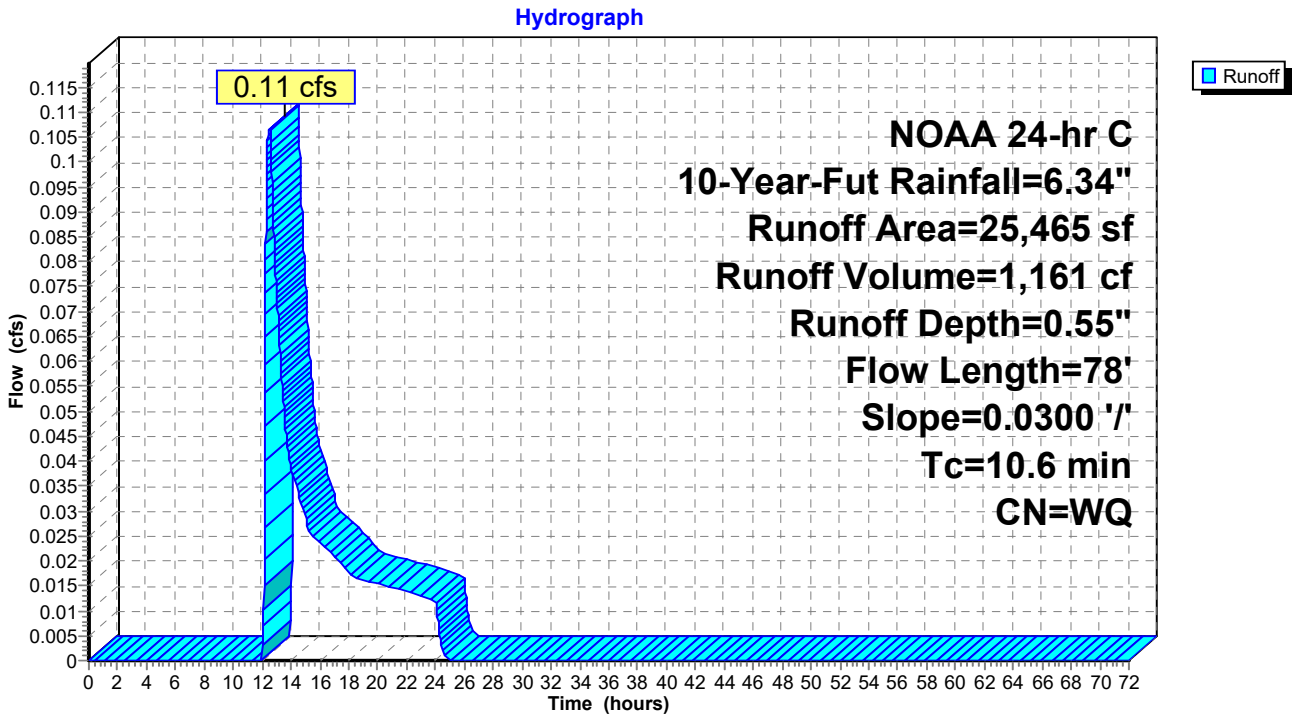
Runoff = 0.11 cfs @ 12.54 hrs, Volume= 1,161 cf, Depth= 0.55"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

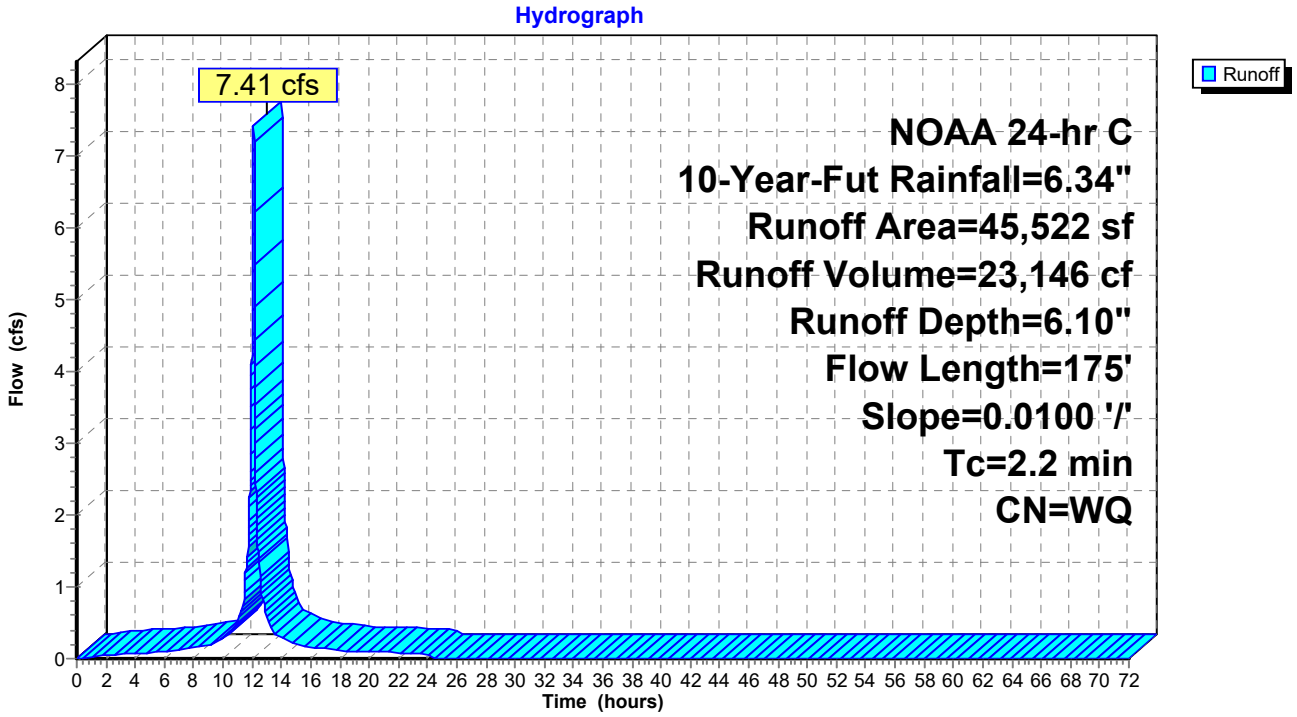
Runoff = 7.41 cfs @ 12.11 hrs, Volume= 23,146 cf, Depth= 6.10"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

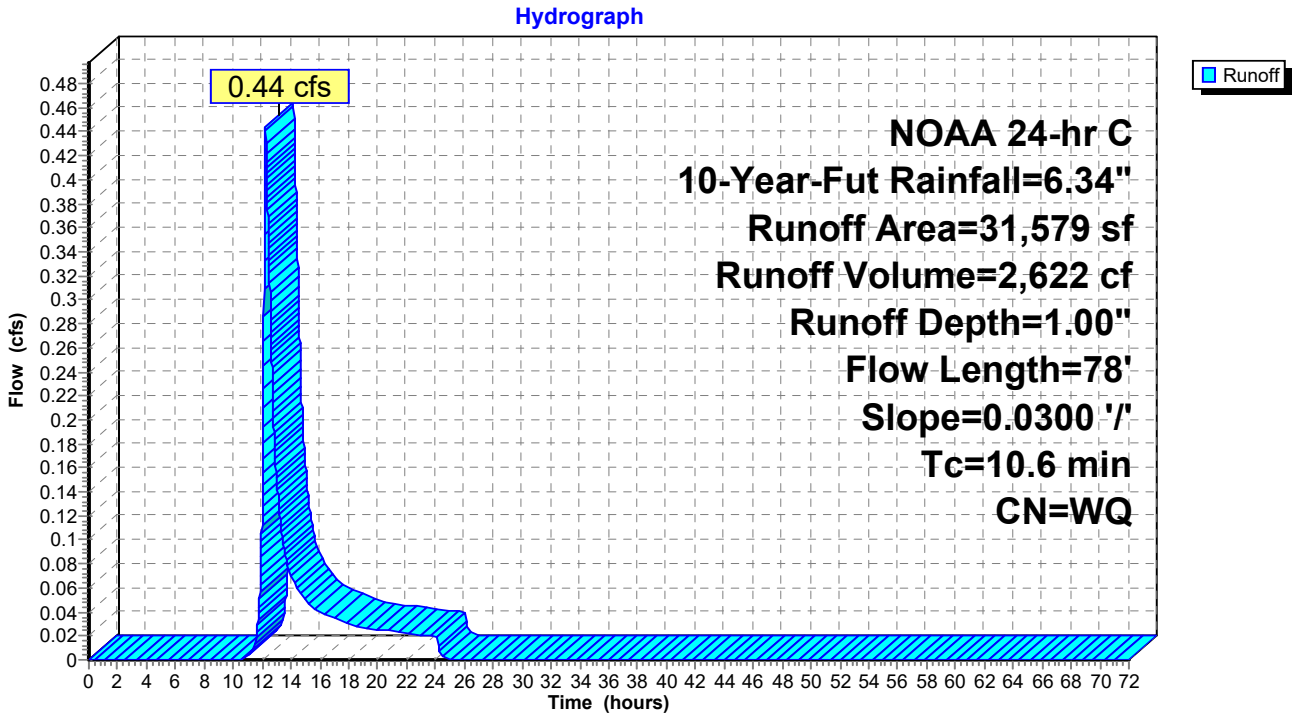
Runoff = 0.44 cfs @ 12.22 hrs, Volume= 2,622 cf, Depth= 1.00"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

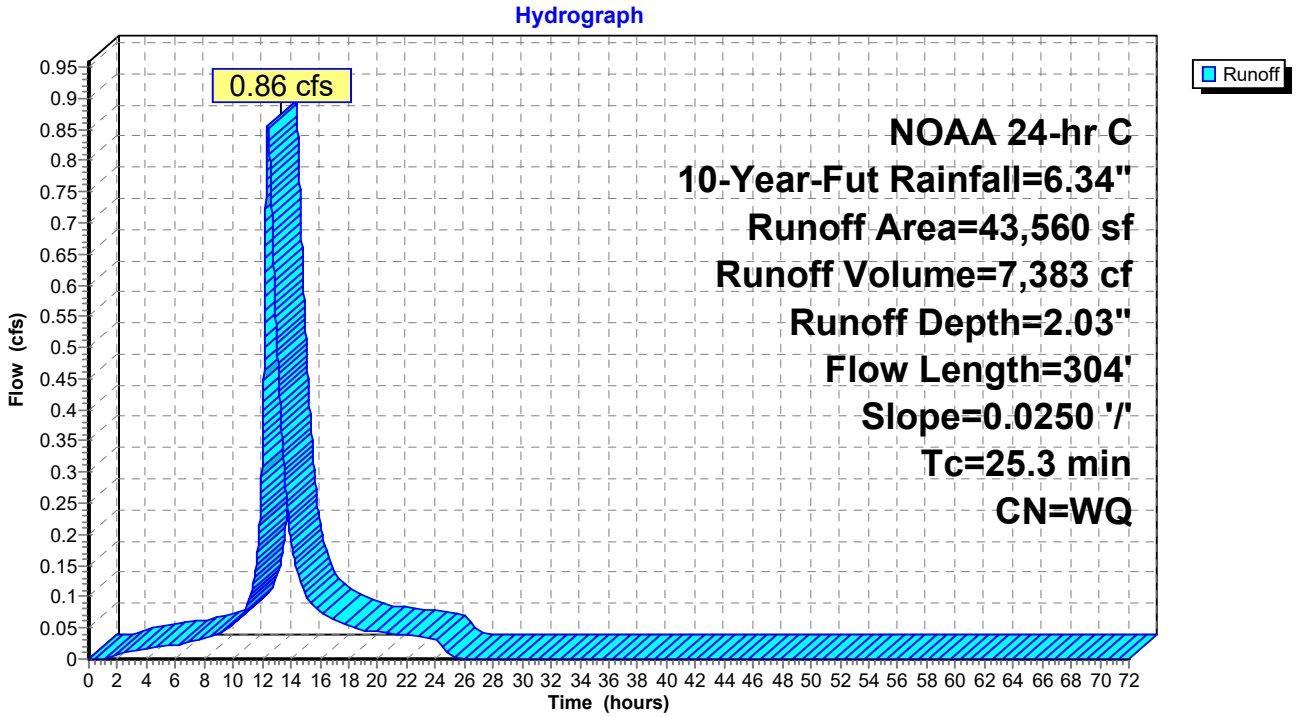
Runoff = 0.86 cfs @ 12.38 hrs, Volume= 7,383 cf, Depth= 2.03"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

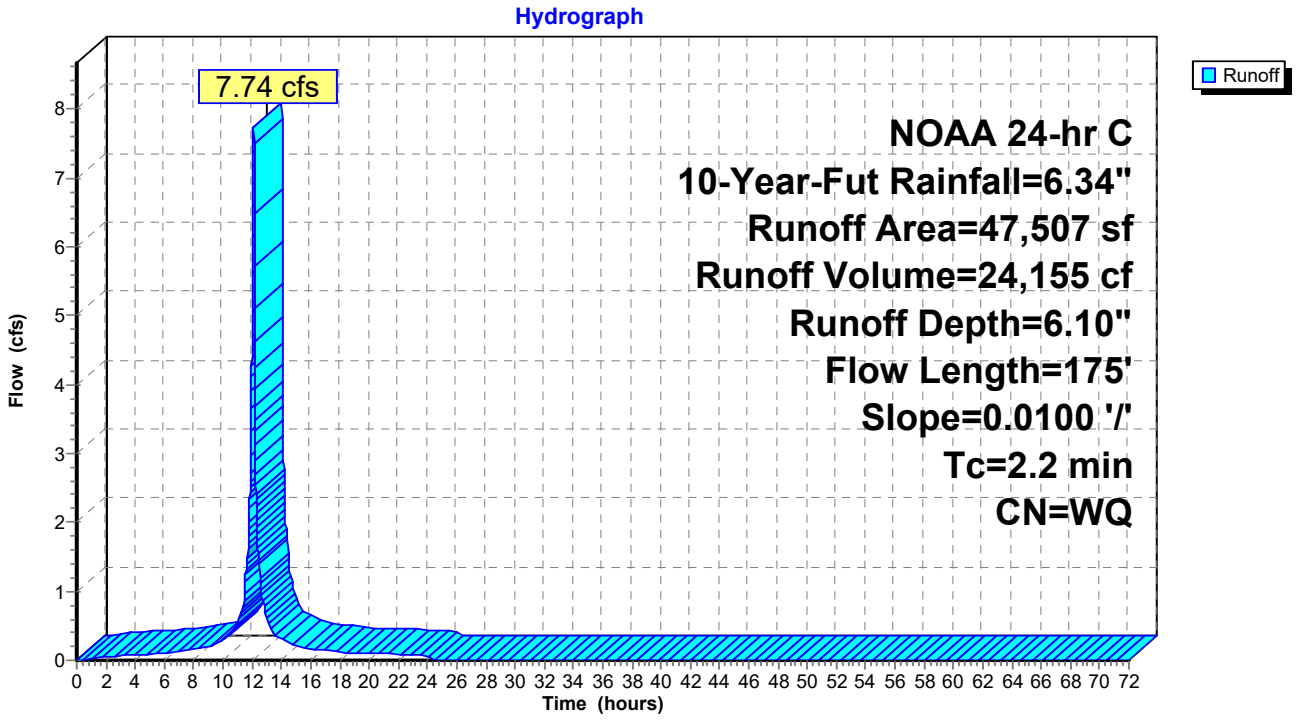
Runoff = 7.74 cfs @ 12.11 hrs, Volume= 24,155 cf, Depth= 6.10"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

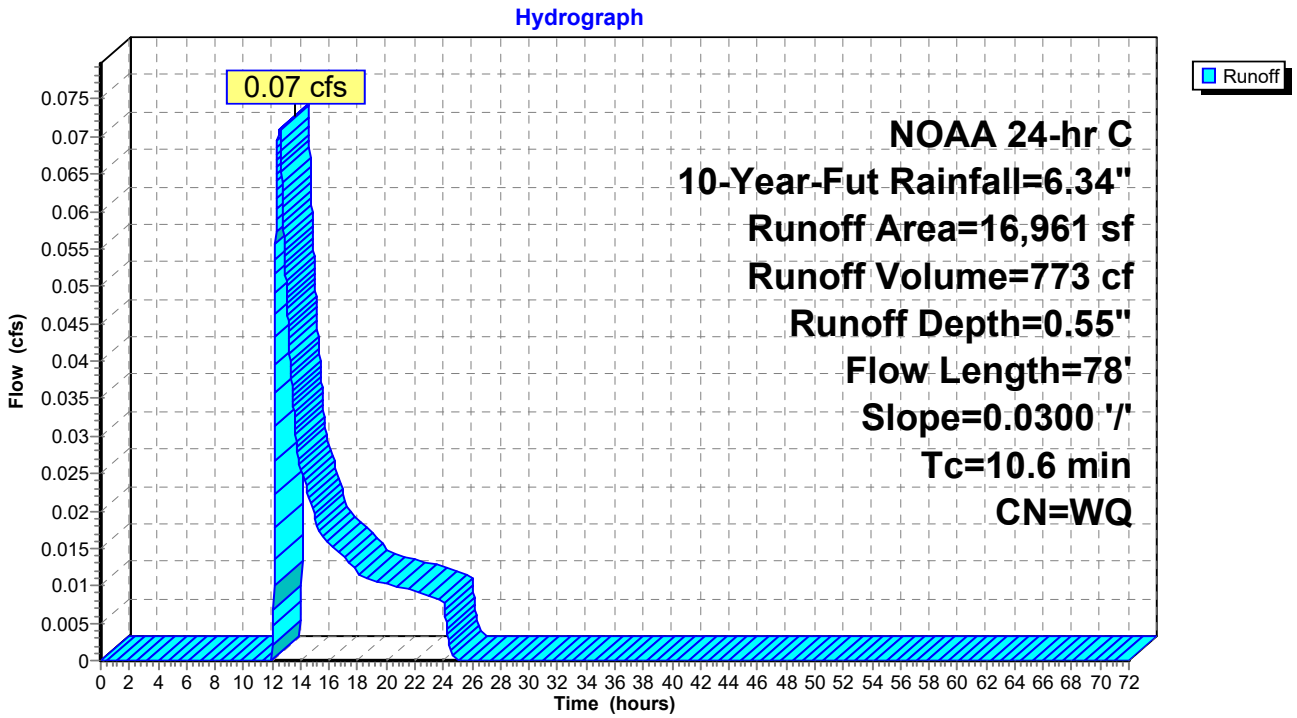
Runoff = 0.07 cfs @ 12.54 hrs, Volume= 773 cf, Depth= 0.55"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

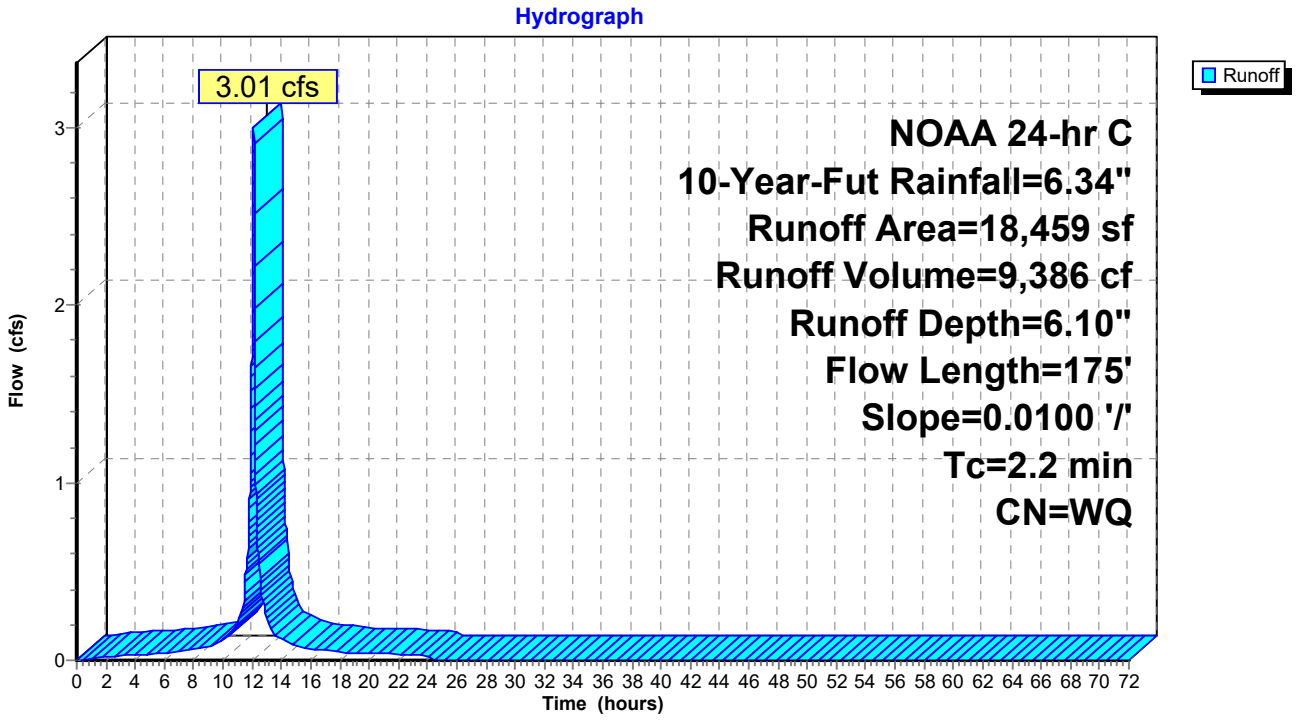
Runoff = 3.01 cfs @ 12.11 hrs, Volume= 9,386 cf, Depth= 6.10"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

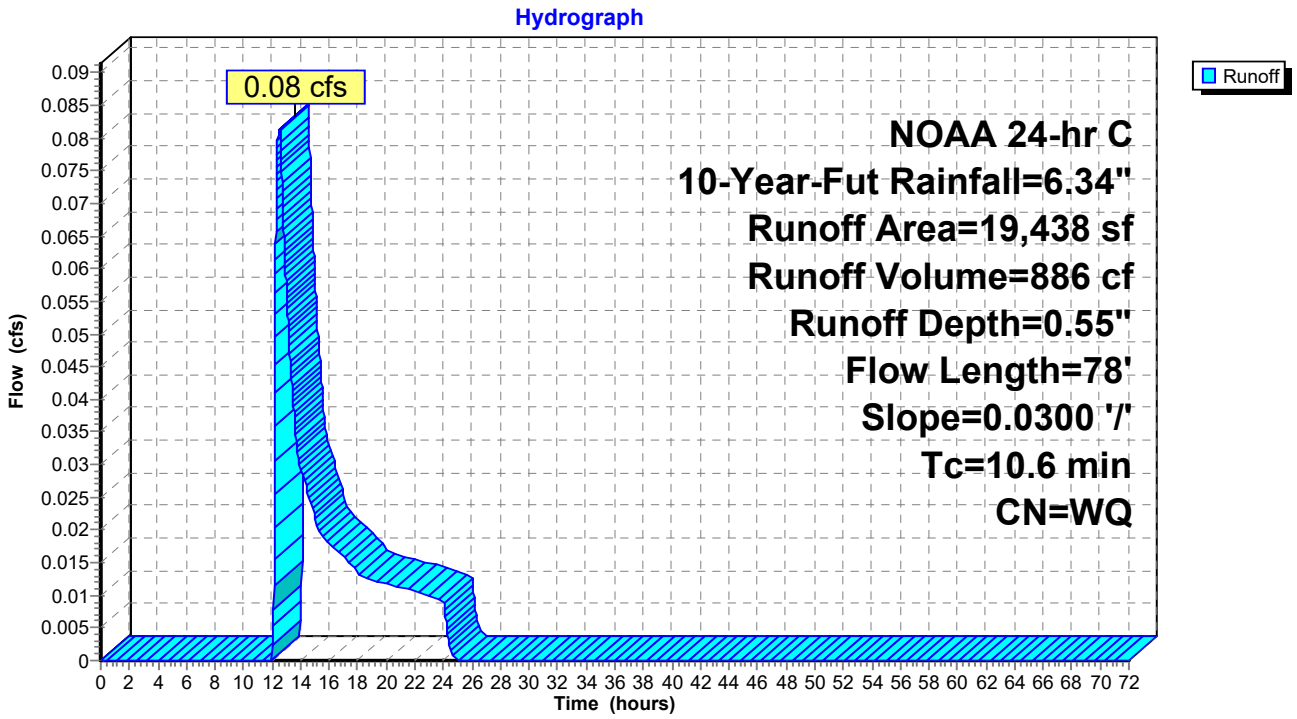
Runoff = 0.08 cfs @ 12.54 hrs, Volume= 886 cf, Depth= 0.55"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

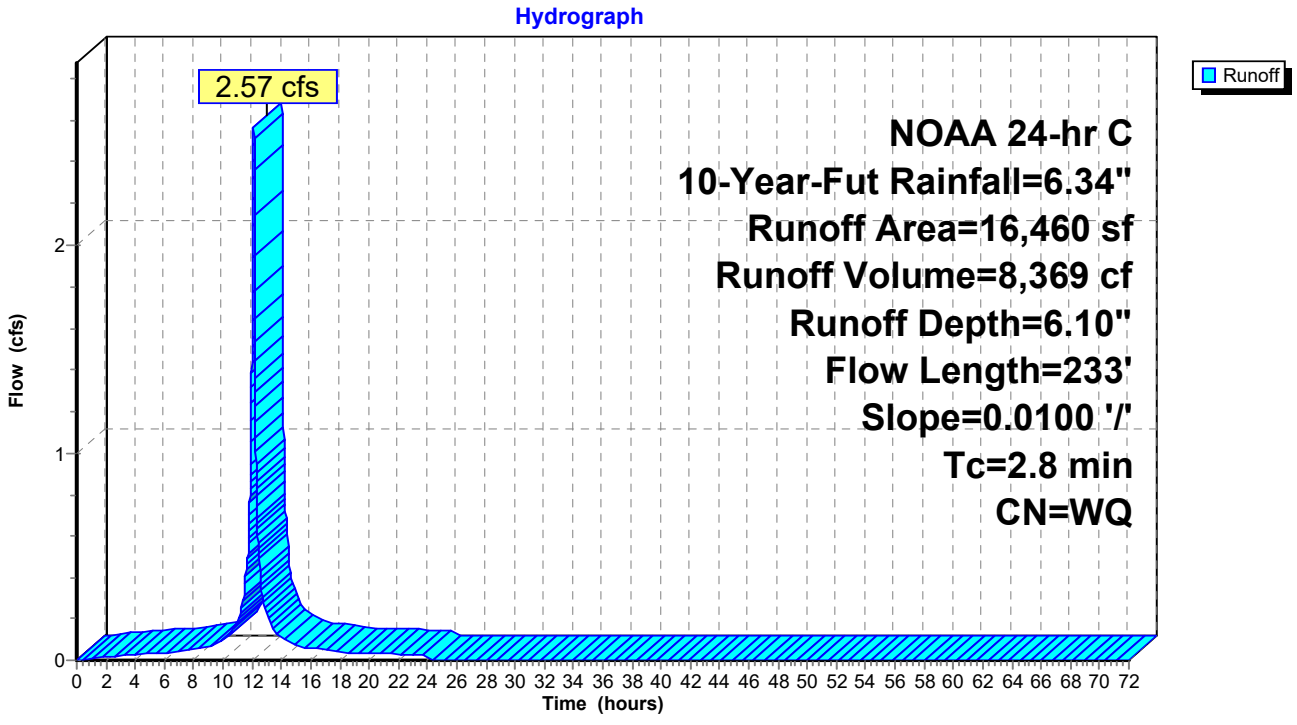
Runoff = 2.57 cfs @ 12.11 hrs, Volume= 8,369 cf, Depth= 6.10"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

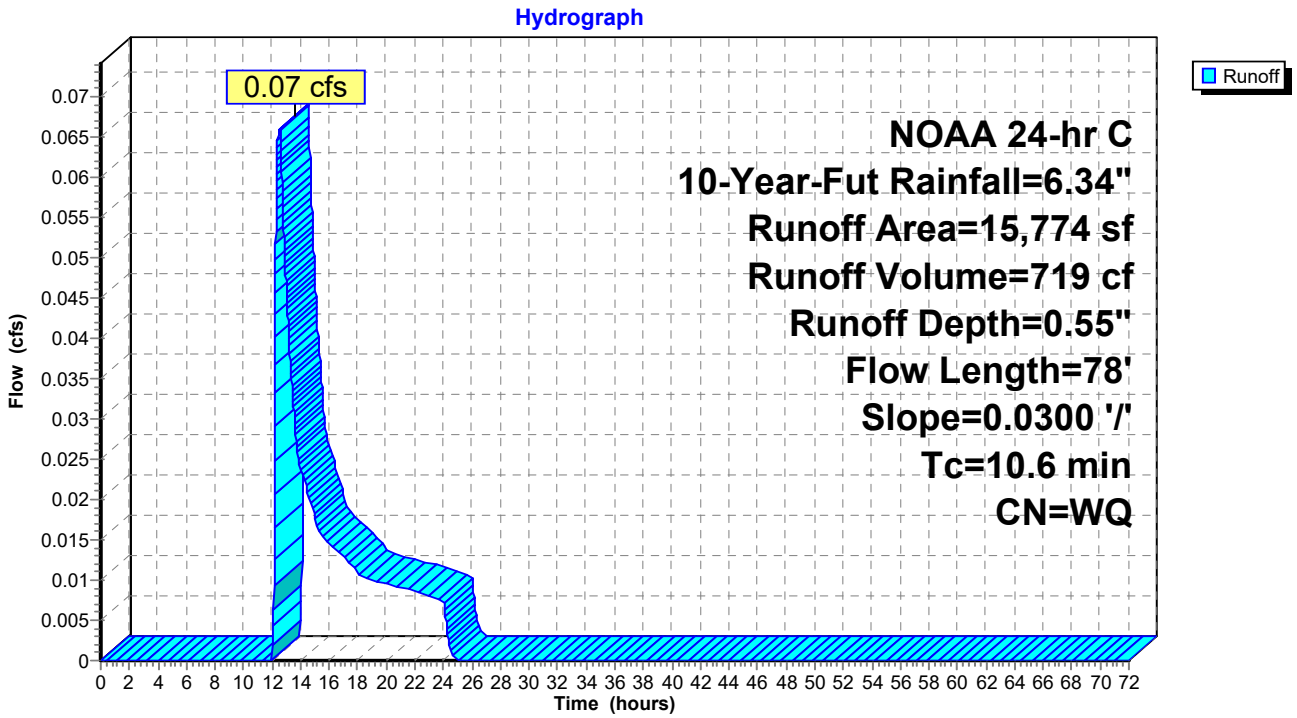
Runoff = 0.07 cfs @ 12.54 hrs, Volume= 719 cf, Depth= 0.55"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

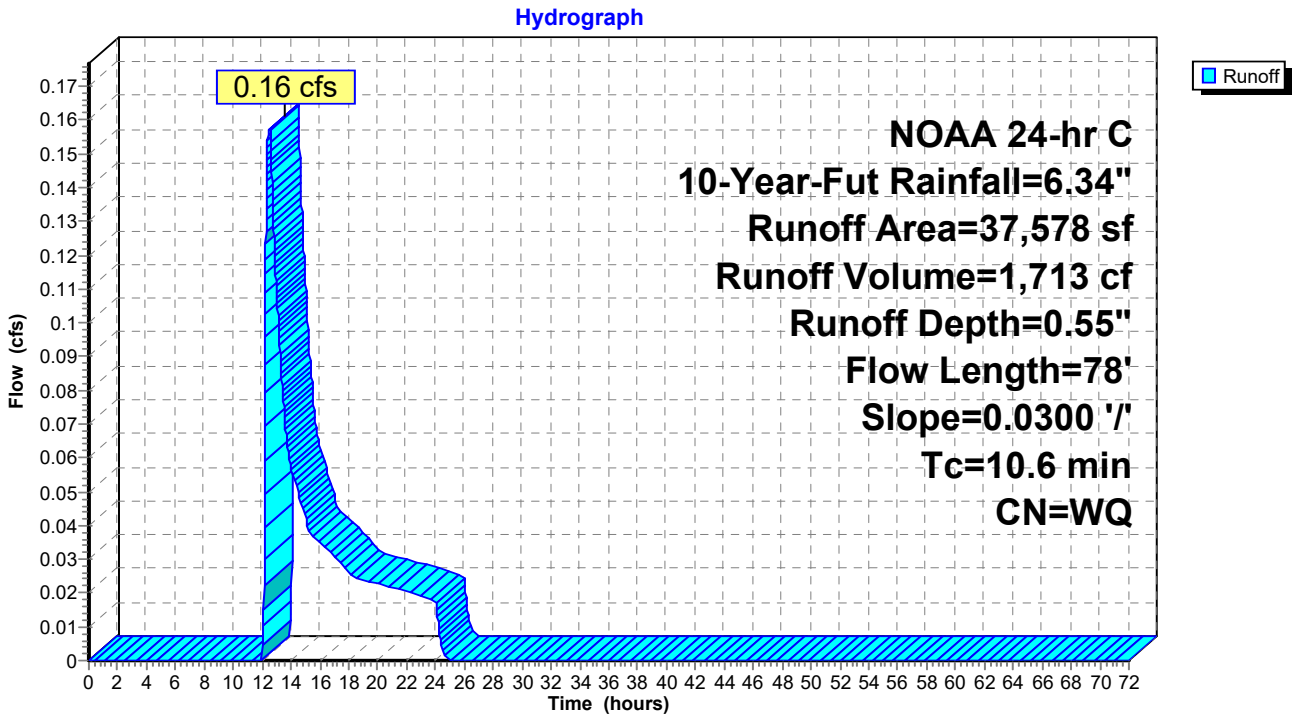
Runoff = 0.16 cfs @ 12.54 hrs, Volume= 1,713 cf, Depth= 0.55"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

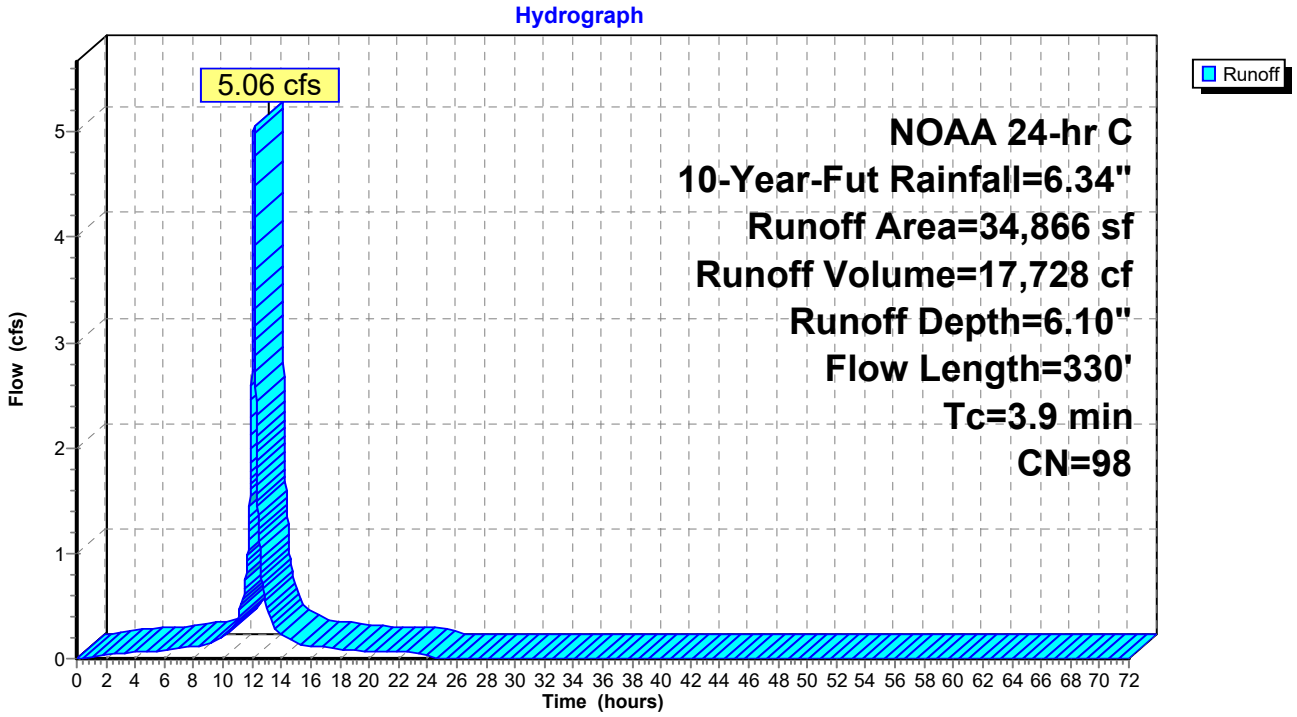
Runoff = 5.06 cfs @ 12.12 hrs, Volume= 17,728 cf, Depth= 6.10"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

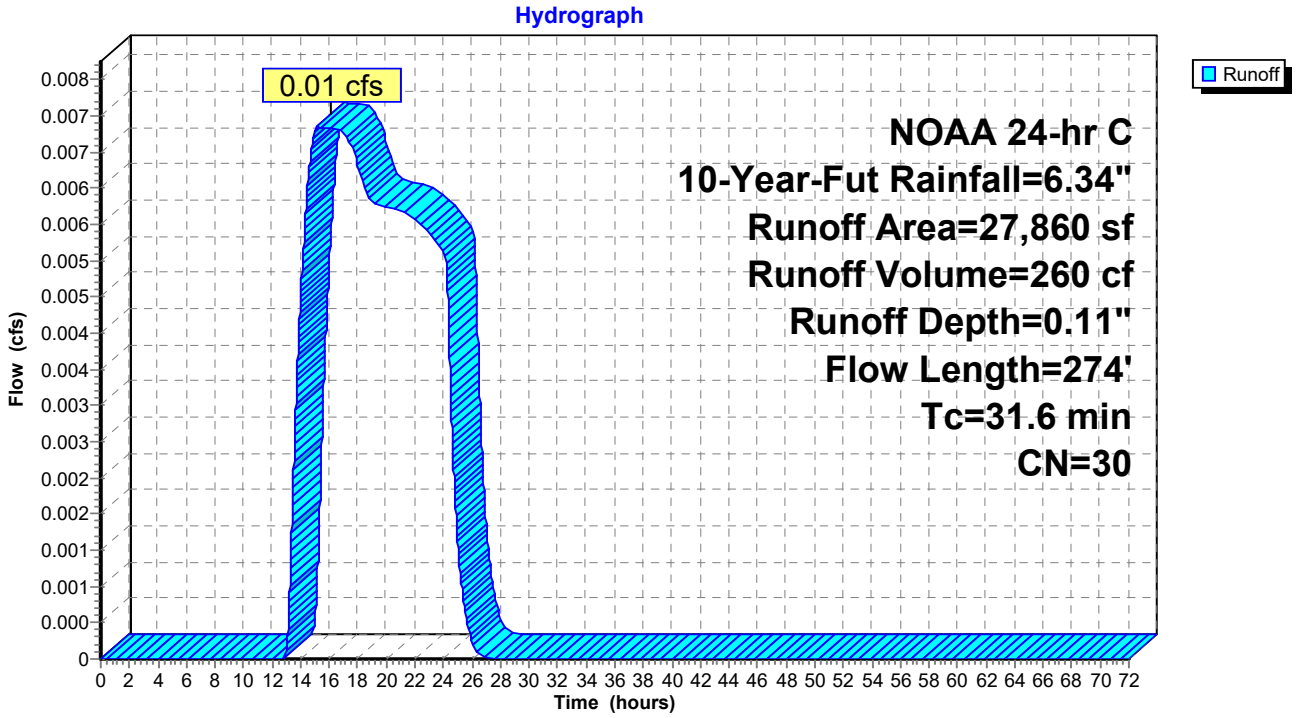
Runoff = 0.01 cfs @ 15.17 hrs, Volume= 260 cf, Depth= 0.11"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

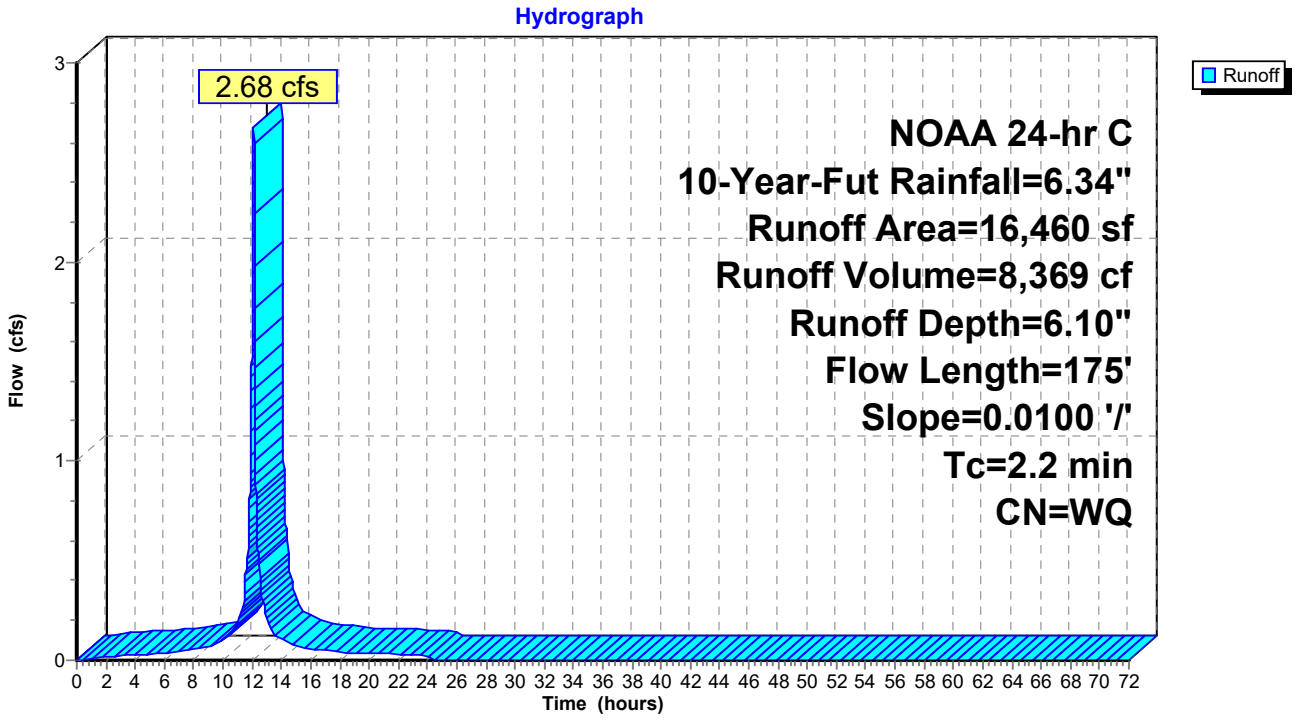
Runoff = 2.68 cfs @ 12.11 hrs, Volume= 8,369 cf, Depth= 6.10"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

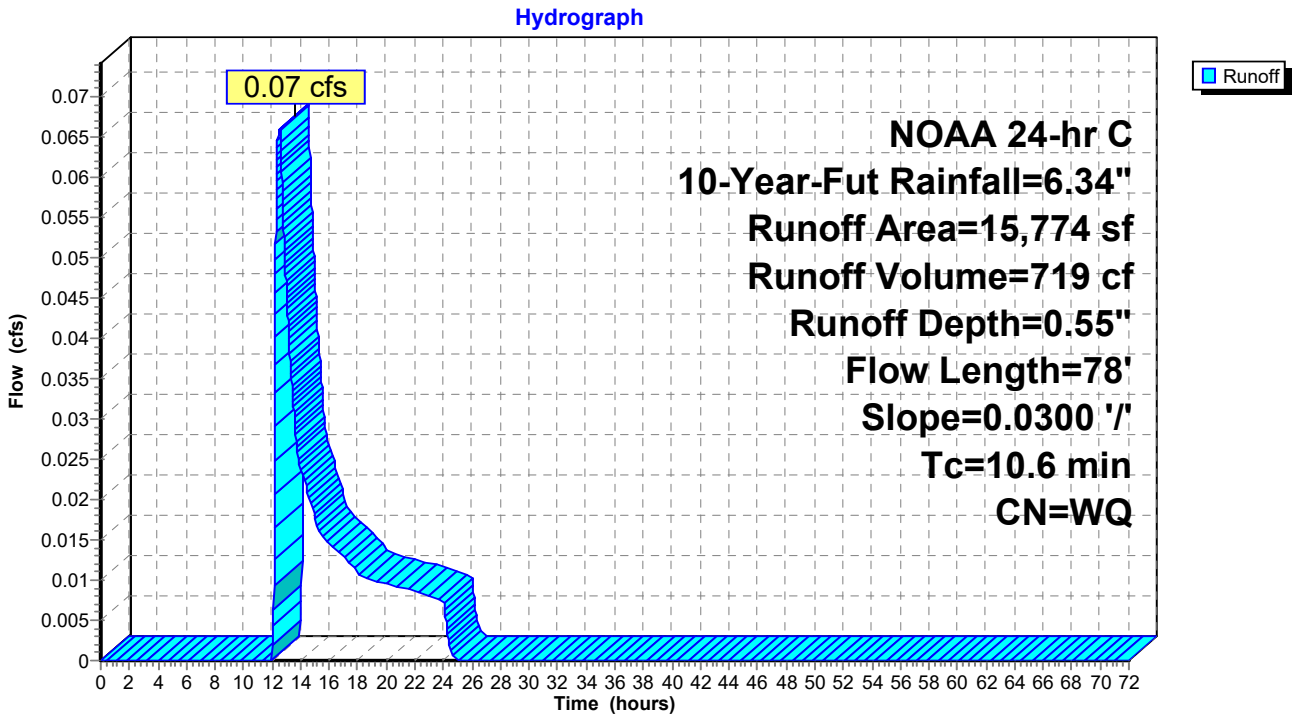
Runoff = 0.07 cfs @ 12.54 hrs, Volume= 719 cf, Depth= 0.55"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

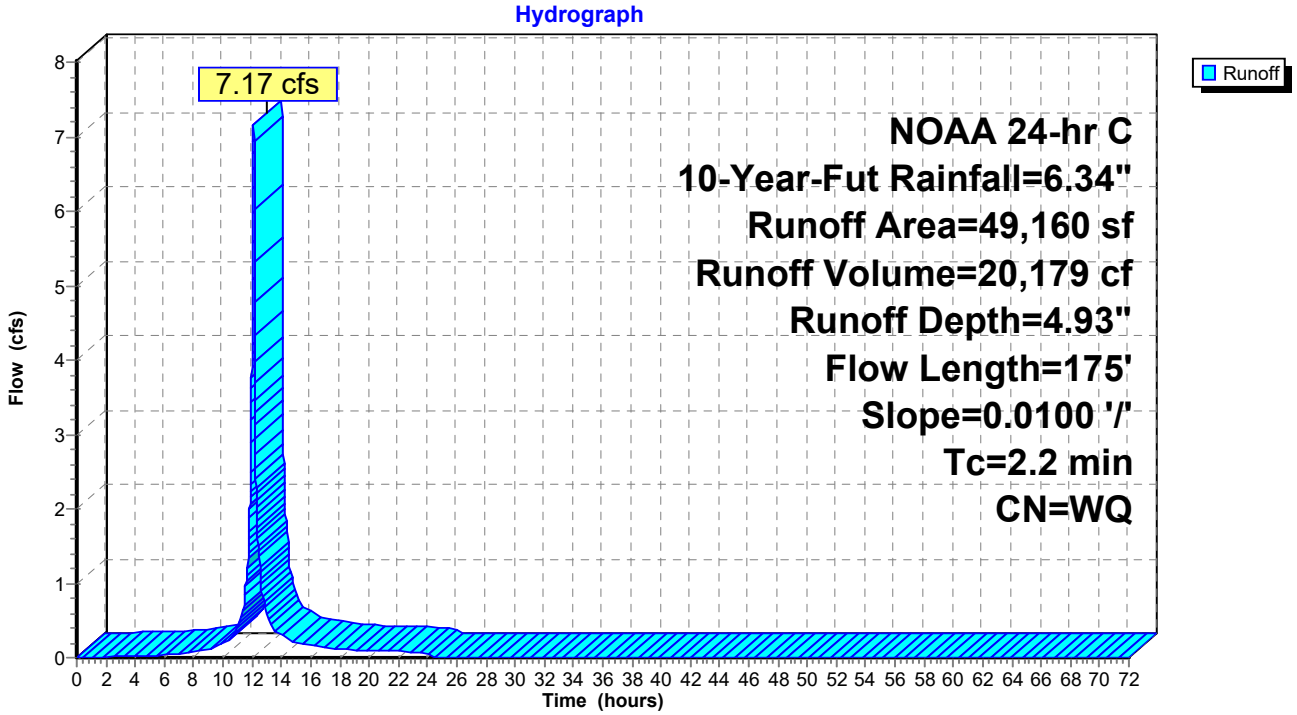
Runoff = 7.17 cfs @ 12.11 hrs, Volume= 20,179 cf, Depth= 4.93"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

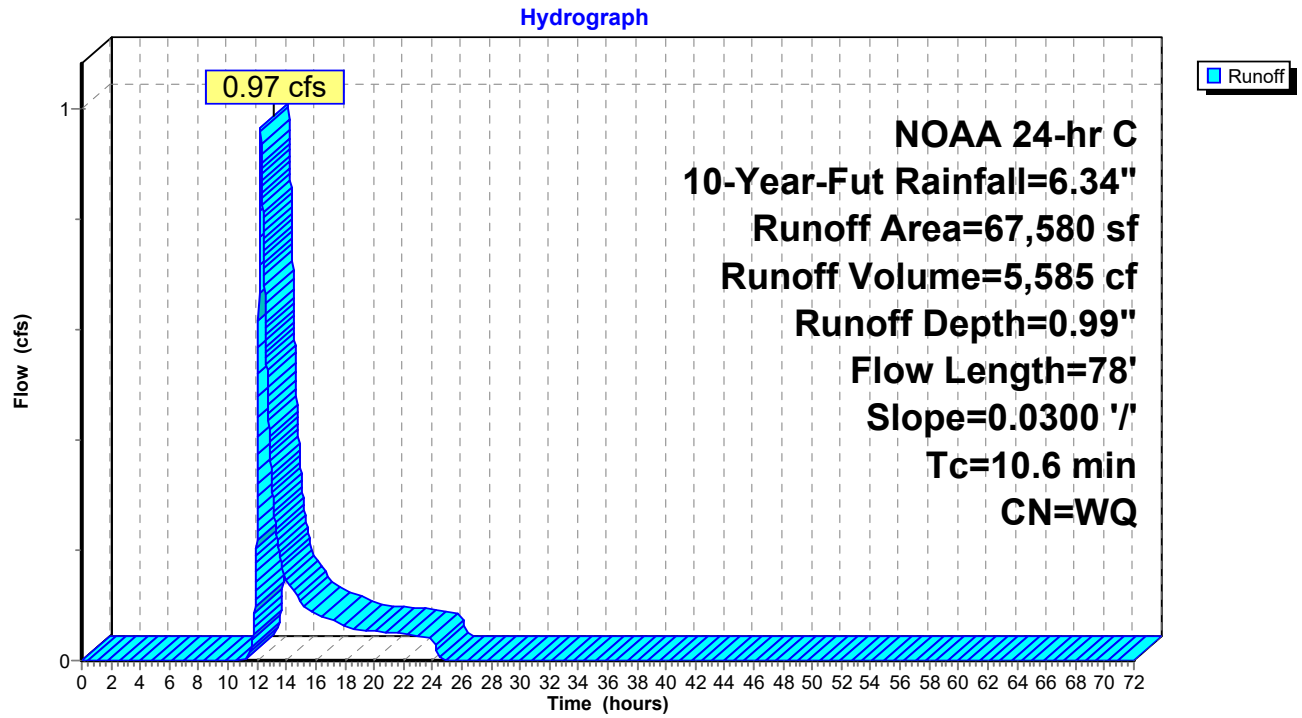
Runoff = 0.97 cfs @ 12.22 hrs, Volume= 5,585 cf, Depth= 0.99"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 10-Year-Fut Rainfall=6.34"

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 2.15" for 10-Year-Fut event
Inflow = 11.19 cfs @ 12.11 hrs, Volume= 30,781 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 16.53' @ 25.78 hrs Surf.Area= 18,308 sf Storage= 30,781 cf

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

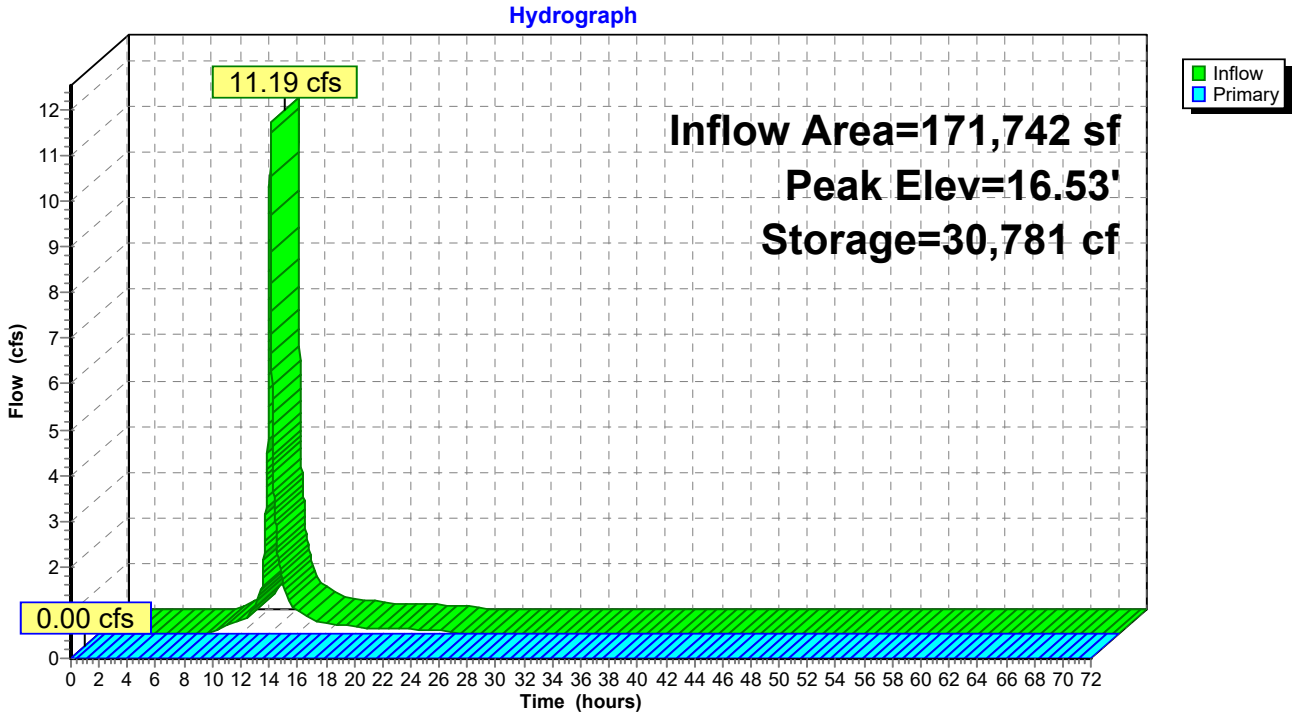
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 1.22" for 10-Year-Fut event
Inflow = 7.26 cfs @ 12.13 hrs, Volume= 16,614 cf
Outflow = 0.49 cfs @ 13.98 hrs, Volume= 3,419 cf, Atten= 93%, Lag= 111.1 min
Primary = 0.49 cfs @ 13.98 hrs, Volume= 3,419 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 15.96' @ 13.98 hrs Surf.Area= 6,800 sf Storage= 13,623 cf

Plug-Flow detention time= 179.0 min calculated for 3,419 cf (21% of inflow)
Center-of-Mass det. time= 127.0 min (903.3 - 776.3)

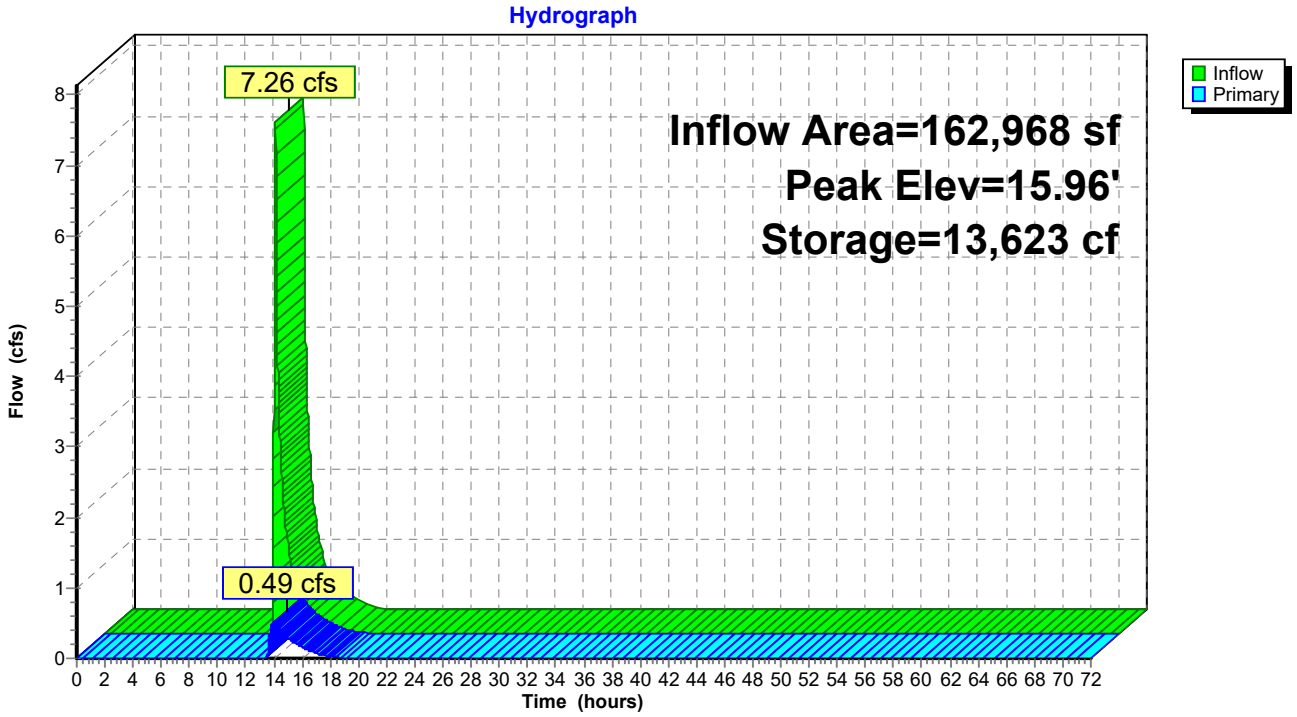
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.49 cfs @ 13.98 hrs HW=15.96' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.49 cfs @ 0.60 fps)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 4.28" for 10-Year-Fut event
Inflow = 2.44 cfs @ 12.11 hrs, Volume= 7,927 cf
Outflow = 2.34 cfs @ 12.12 hrs, Volume= 7,927 cf, Atten= 4%, Lag= 0.7 min
Discarded = 0.02 cfs @ 3.59 hrs, Volume= 2,920 cf
Primary = 2.32 cfs @ 12.12 hrs, Volume= 5,008 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.41' @ 12.12 hrs Surf.Area= 1,691 sf Storage= 1,654 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 239.0 min (991.2 - 752.2)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

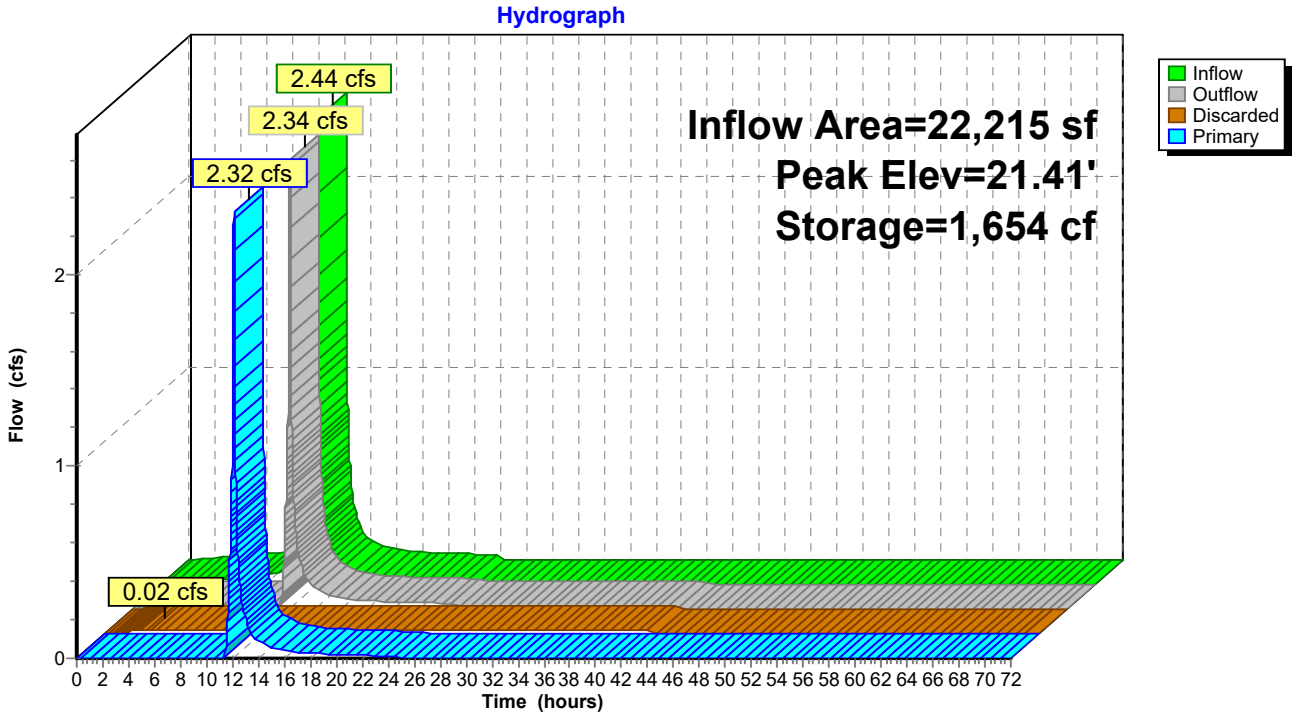
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 3.59 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.31 cfs @ 12.12 hrs HW=21.41' TW=18.67' (Dynamic Tailwater)
└**2=Culvert** (Passes 2.31 cfs of 8.63 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 2.23 cfs @ 1.29 fps)
  └**4=Culvert** (Barrel Controls 0.08 cfs @ 1.72 fps)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 4.29" for 10-Year-Fut event
Inflow = 11.44 cfs @ 12.11 hrs, Volume= 34,383 cf
Outflow = 11.22 cfs @ 12.11 hrs, Volume= 34,384 cf, Atten= 2%, Lag= 0.5 min
Discarded = 0.05 cfs @ 2.37 hrs, Volume= 5,473 cf
Primary = 11.17 cfs @ 12.11 hrs, Volume= 28,911 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.67' @ 12.11 hrs Surf.Area= 2,041 sf Storage= 2,180 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 57.0 min (814.2 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

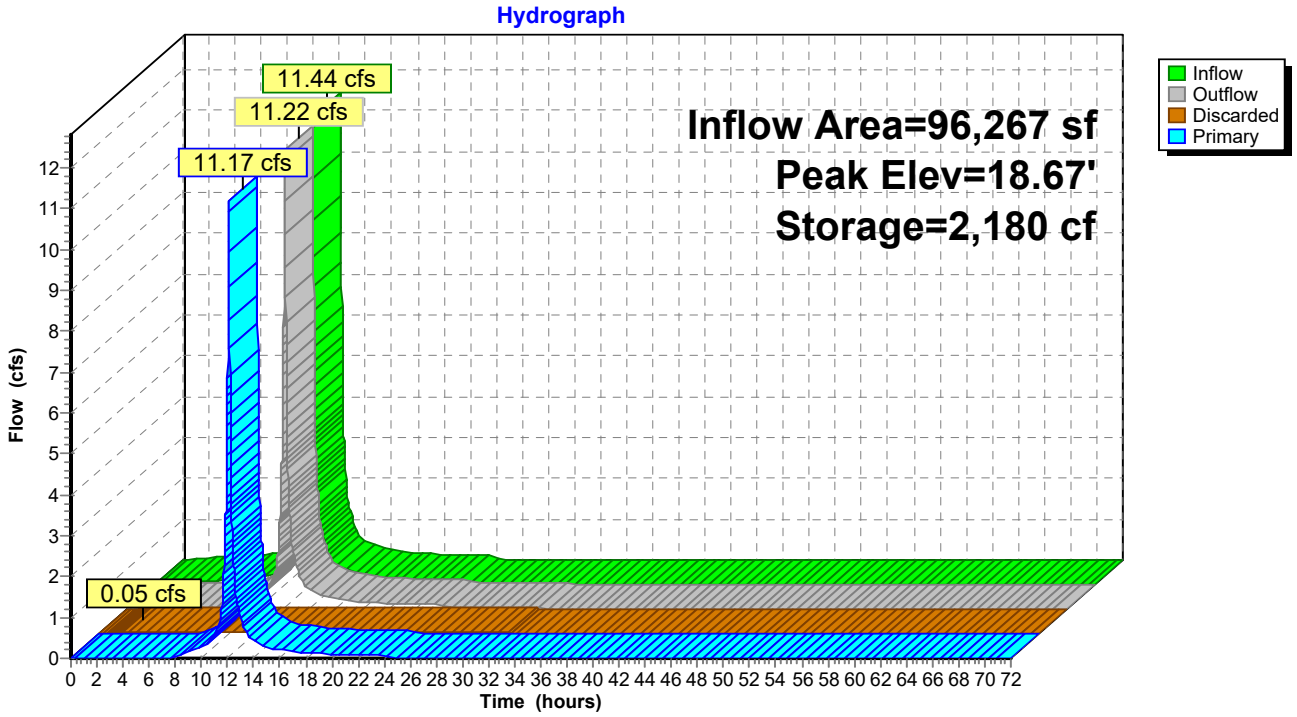
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 2.37 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=11.14 cfs @ 12.11 hrs HW=18.67' TW=15.42' (Dynamic Tailwater)
├**2=Culvert** (Passes 10.99 cfs of 21.31 cfs potential flow)
│└**1=Orifice/Grate** (Weir Controls 10.99 cfs @ 1.99 fps)
└**3=Culvert** (Inlet Controls 0.15 cfs @ 3.10 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=411)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 3.25" for 10-Year-Fut event
Inflow = 3.01 cfs @ 12.11 hrs, Volume= 10,272 cf
Outflow = 0.39 cfs @ 12.74 hrs, Volume= 10,275 cf, Atten= 87%, Lag= 38.0 min
Discarded = 0.36 cfs @ 11.69 hrs, Volume= 10,118 cf
Primary = 0.03 cfs @ 12.74 hrs, Volume= 157 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.31' @ 12.74 hrs Surf.Area= 9,278 sf Storage= 2,767 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 43.7 min (805.8 - 762.0)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

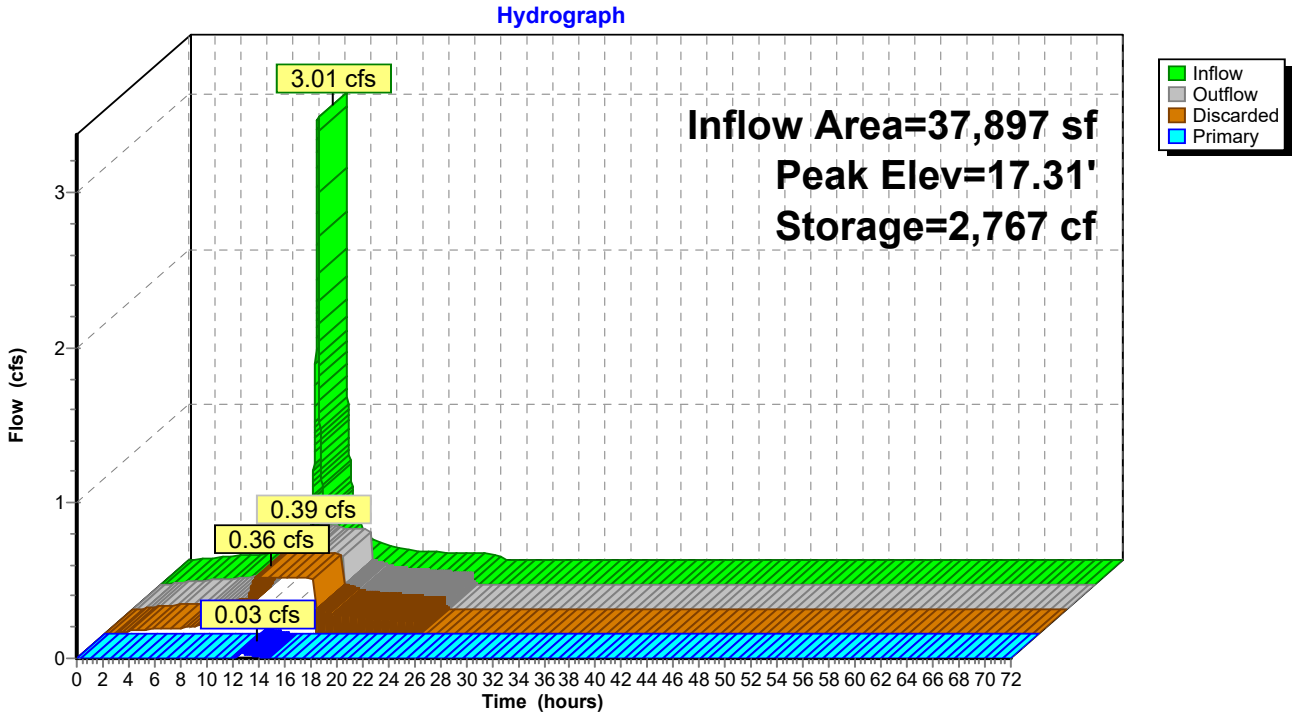
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 11.69 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.03 cfs @ 12.74 hrs HW=17.31' TW=15.93' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.03 cfs of 6.33 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Barrel Controls 0.03 cfs @ 1.24 fps)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=272)

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 2.76" for 10-Year-Fut event
Inflow = 2.75 cfs @ 12.11 hrs, Volume= 9,725 cf
Outflow = 0.34 cfs @ 12.87 hrs, Volume= 9,726 cf, Atten= 88%, Lag= 45.8 min
Discarded = 0.18 cfs @ 11.26 hrs, Volume= 7,873 cf
Primary = 0.16 cfs @ 12.87 hrs, Volume= 1,853 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 24.02' @ 12.87 hrs Surf.Area= 3,942 sf Storage= 3,086 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 73.9 min (843.3 - 769.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

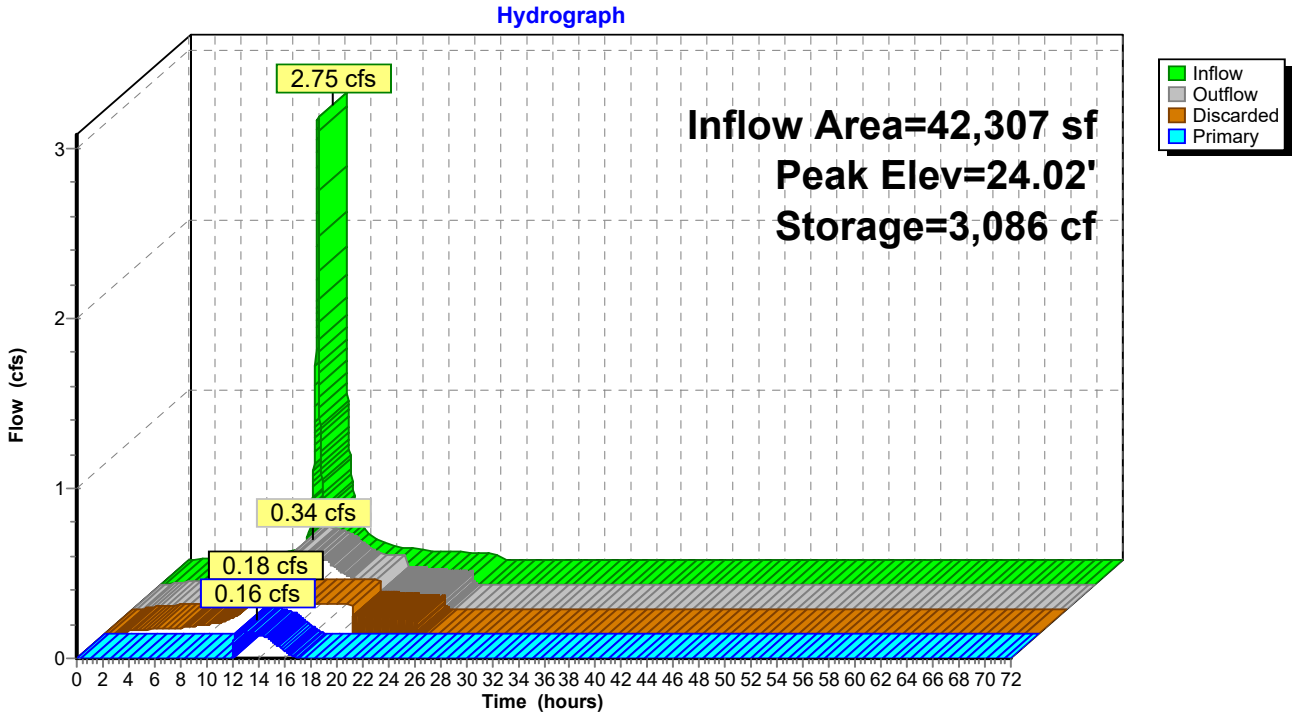
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 11.26 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.16 cfs @ 12.87 hrs HW=24.02' TW=15.51' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.16 cfs of 10.74 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Inlet Controls 0.16 cfs @ 3.23 fps)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 3.30" for 10-Year-Fut event
Inflow = 8.13 cfs @ 12.11 hrs, Volume= 33,151 cf
Outflow = 7.40 cfs @ 12.13 hrs, Volume= 33,154 cf, Atten= 9%, Lag= 1.1 min
Discarded = 0.25 cfs @ 9.75 hrs, Volume= 18,392 cf
Primary = 7.15 cfs @ 12.13 hrs, Volume= 14,762 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.73' @ 12.13 hrs Surf.Area= 4,236 sf Storage= 5,630 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 82.6 min (854.5 - 771.9)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

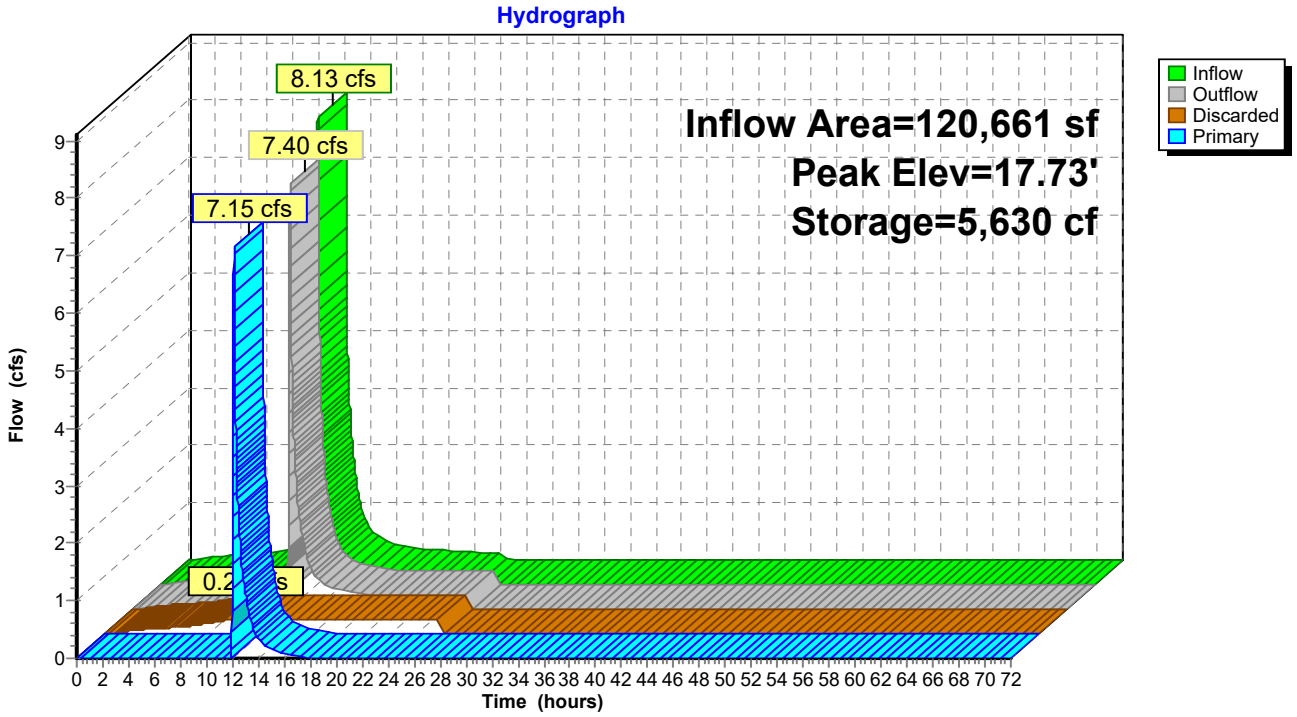
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 9.75 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=7.13 cfs @ 12.13 hrs HW=17.73' TW=13.90' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 6.64 cfs @ 1.42 fps)
└**2=Culvert** (Inlet Controls 0.48 cfs @ 2.45 fps)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 2.91" for 10-Year-Fut event
Inflow = 7.19 cfs @ 12.14 hrs, Volume= 33,891 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 16.69' @ 52.33 hrs Surf.Area= 18,884 sf Storage= 33,891 cf

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

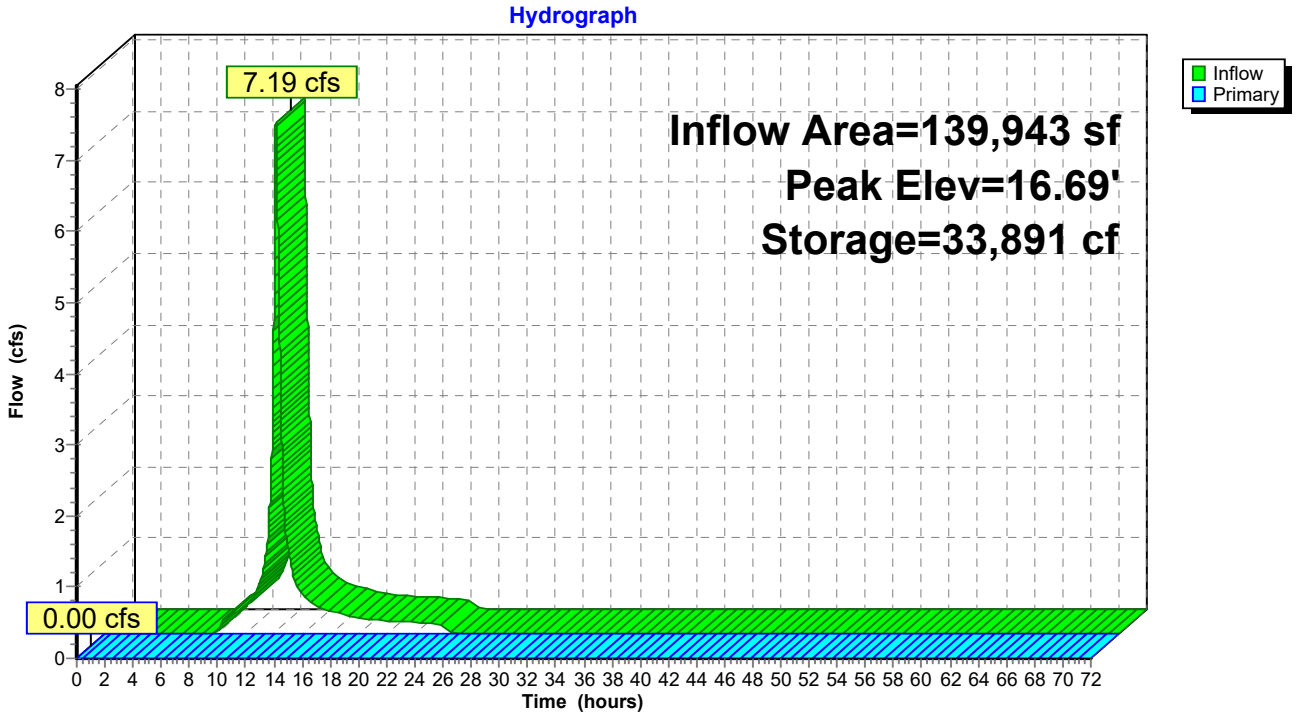
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 4.64" for 10-Year-Fut event
Inflow = 7.74 cfs @ 12.11 hrs, Volume= 24,929 cf
Outflow = 4.93 cfs @ 12.16 hrs, Volume= 24,136 cf, Atten= 36%, Lag= 3.0 min
Primary = 4.93 cfs @ 12.16 hrs, Volume= 24,136 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.99' @ 12.15 hrs Surf.Area= 2,355 sf Storage= 2,888 cf

Plug-Flow detention time= 42.9 min calculated for 24,133 cf (97% of inflow)
Center-of-Mass det. time= 22.6 min (772.4 - 749.7)

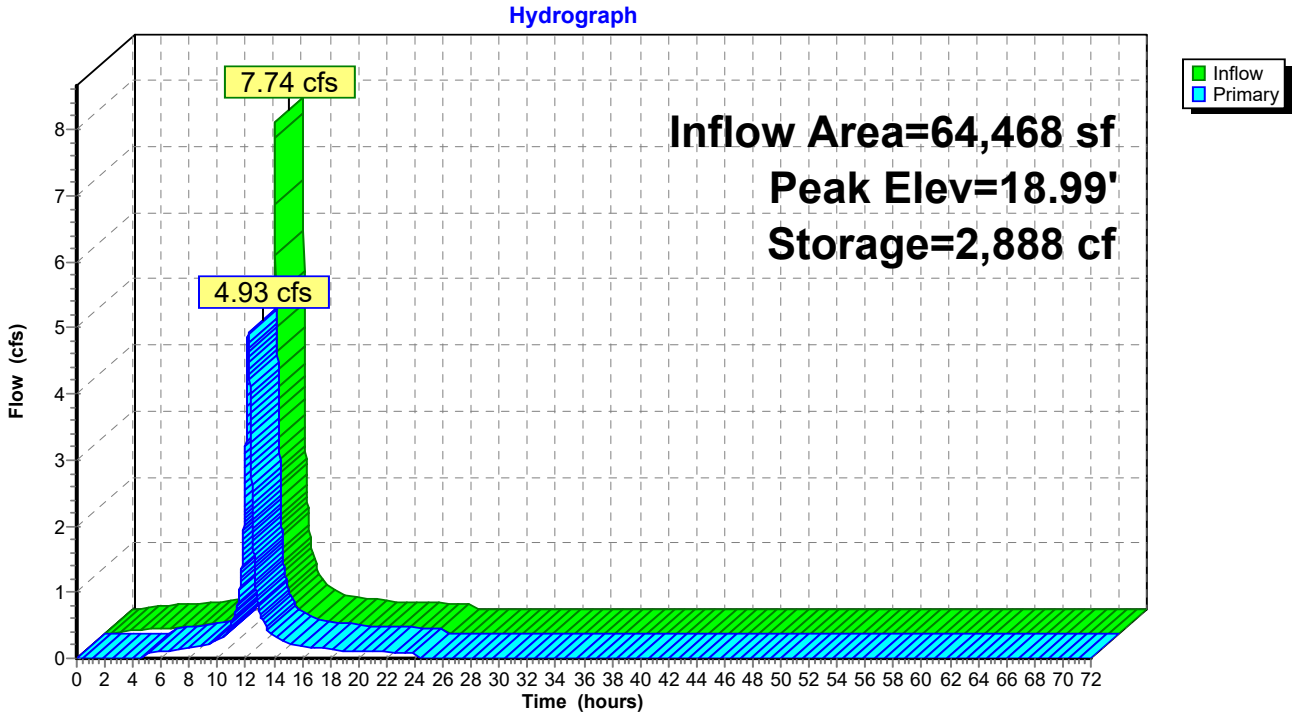
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.93 cfs @ 12.16 hrs HW=18.99' TW=18.10' (Dynamic Tailwater)
↑**2=Culvert** (Inlet Controls 4.93 cfs @ 4.02 fps)
↑**1=Orifice/Grate** (Passes 4.93 cfs of 59.30 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 4.03" for 10-Year-Fut event
Inflow = 7.68 cfs @ 12.11 hrs, Volume= 34,408 cf
Outflow = 7.15 cfs @ 12.14 hrs, Volume= 32,178 cf, Atten= 7%, Lag= 1.7 min
Primary = 7.15 cfs @ 12.14 hrs, Volume= 32,178 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.10' @ 12.14 hrs Surf.Area= 5,460 sf Storage= 3,615 cf

Plug-Flow detention time= 71.4 min calculated for 32,174 cf (94% of inflow)
Center-of-Mass det. time= 34.1 min (803.3 - 769.3)

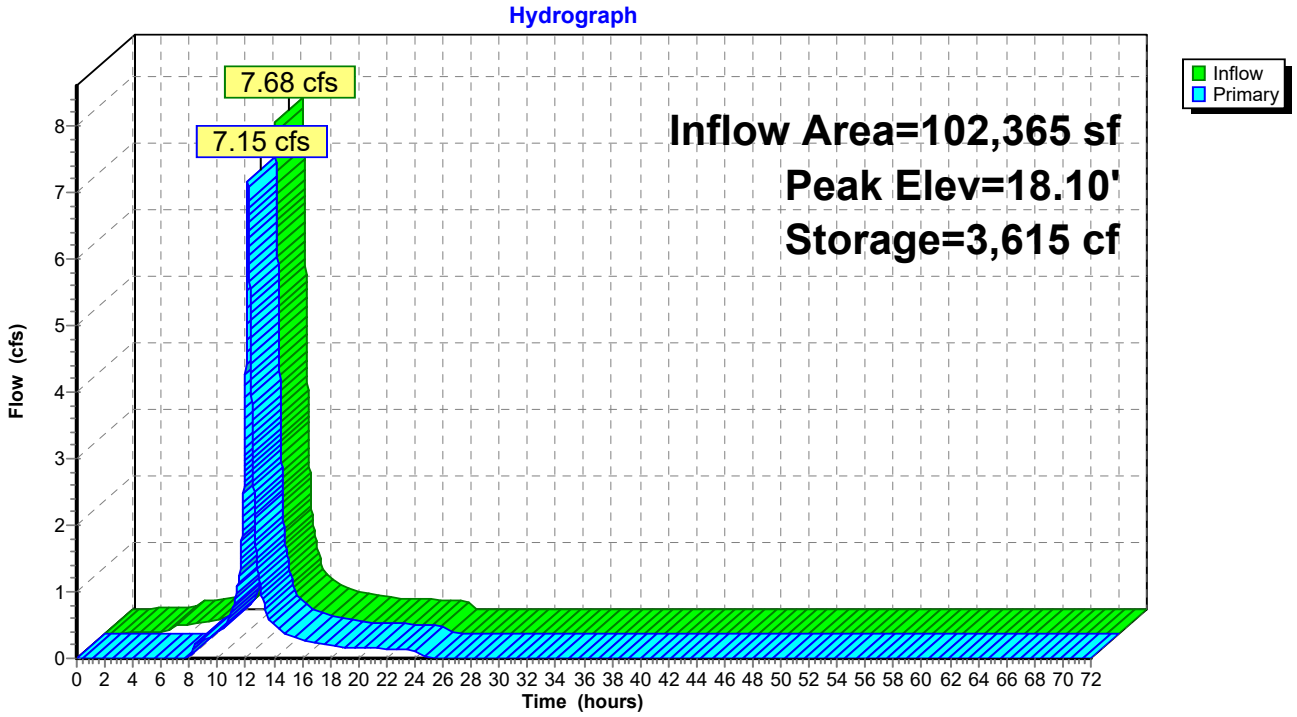
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.15 cfs @ 12.14 hrs HW=18.10' TW=15.39' (Dynamic Tailwater)
↑**2=Culvert** (Passes 7.15 cfs of 8.58 cfs potential flow)
↑**1=Orifice/Grate** (Weir Controls 7.15 cfs @ 1.72 fps)

Pond Pre bio-2: Pre Bio Ret 2

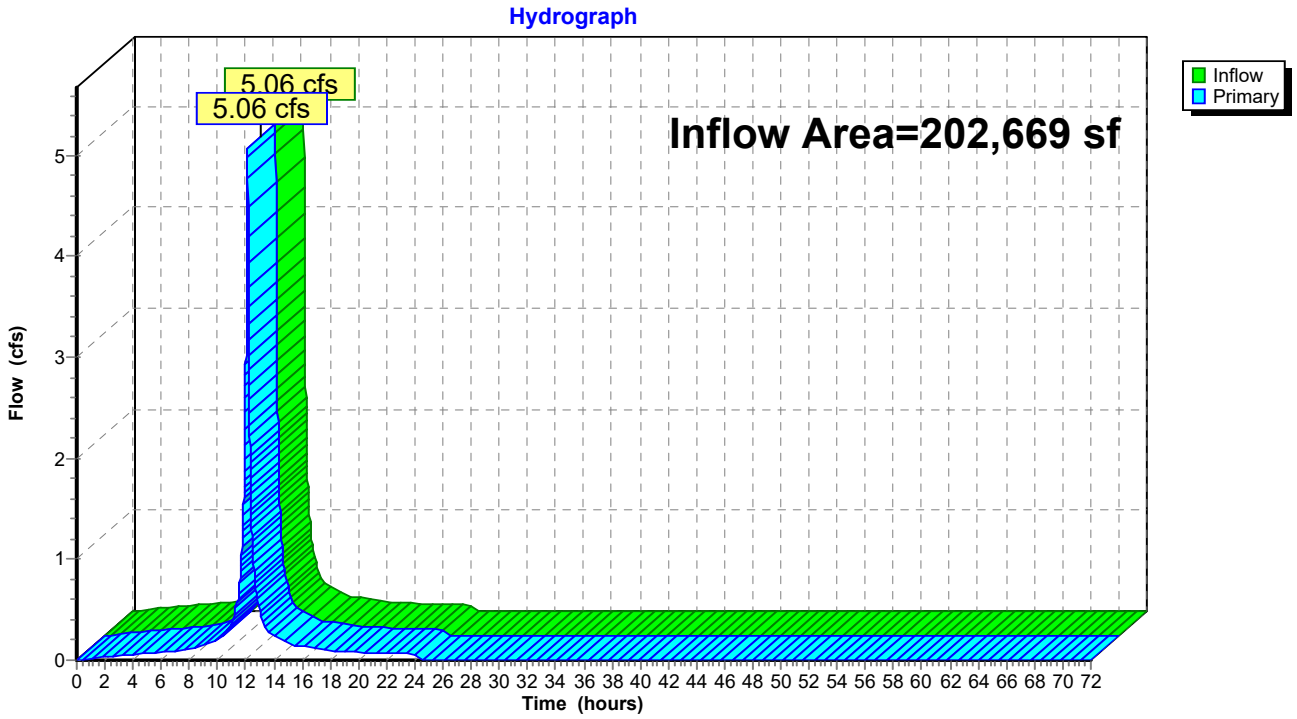


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 1.07" for 10-Year-Fut event
Inflow = 5.06 cfs @ 12.12 hrs, Volume= 17,988 cf
Primary = 5.06 cfs @ 12.12 hrs, Volume= 17,988 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

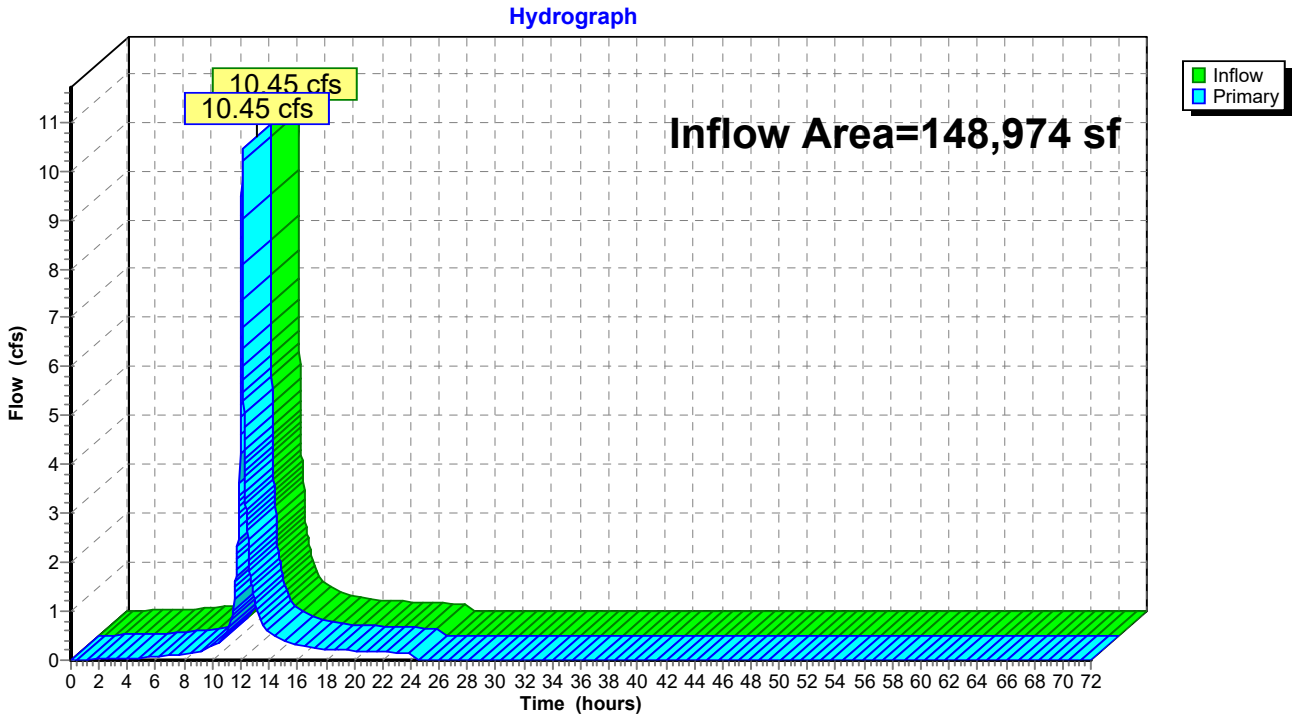


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 2.81" for 10-Year-Fut event
Inflow = 10.45 cfs @ 12.11 hrs, Volume= 34,853 cf
Primary = 10.45 cfs @ 12.11 hrs, Volume= 34,853 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

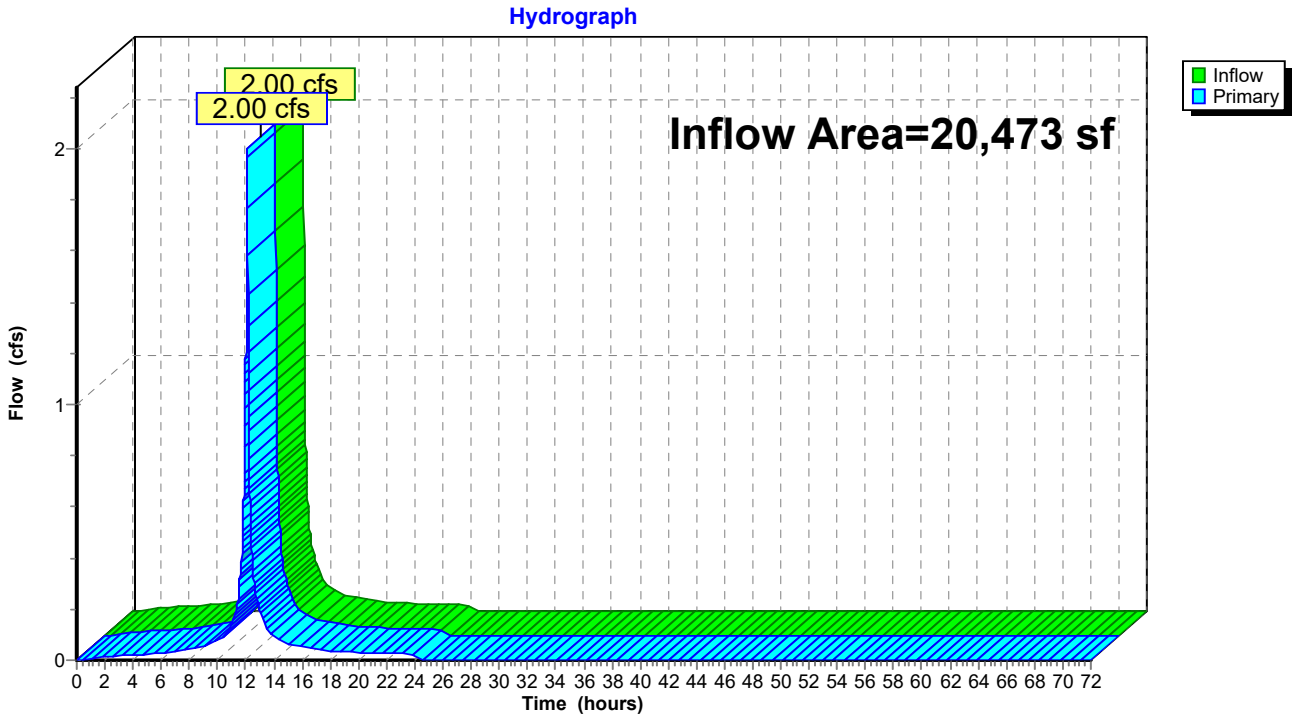


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 3.94" for 10-Year-Fut event
Inflow = 2.00 cfs @ 12.11 hrs, Volume= 6,726 cf
Primary = 2.00 cfs @ 12.11 hrs, Volume= 6,726 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

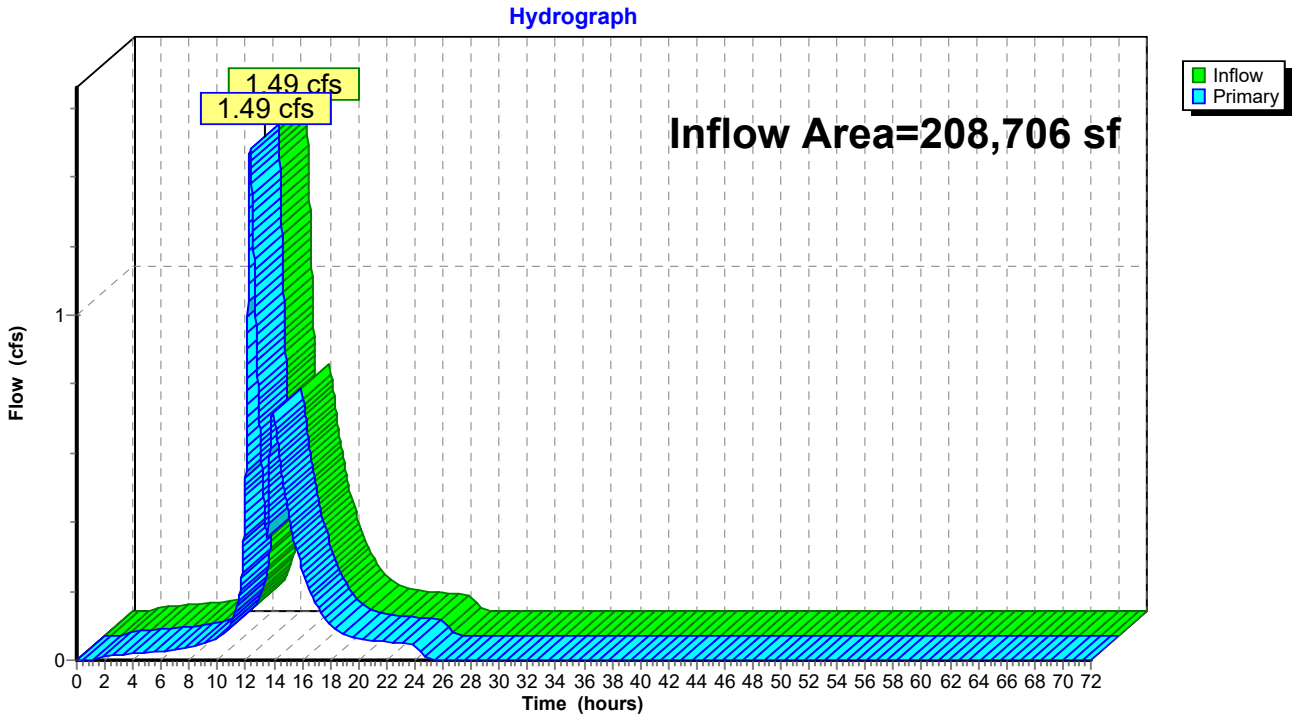


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 0.78" for 10-Year-Fut event
Inflow = 1.49 cfs @ 12.31 hrs, Volume= 13,645 cf
Primary = 1.49 cfs @ 12.31 hrs, Volume= 13,645 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

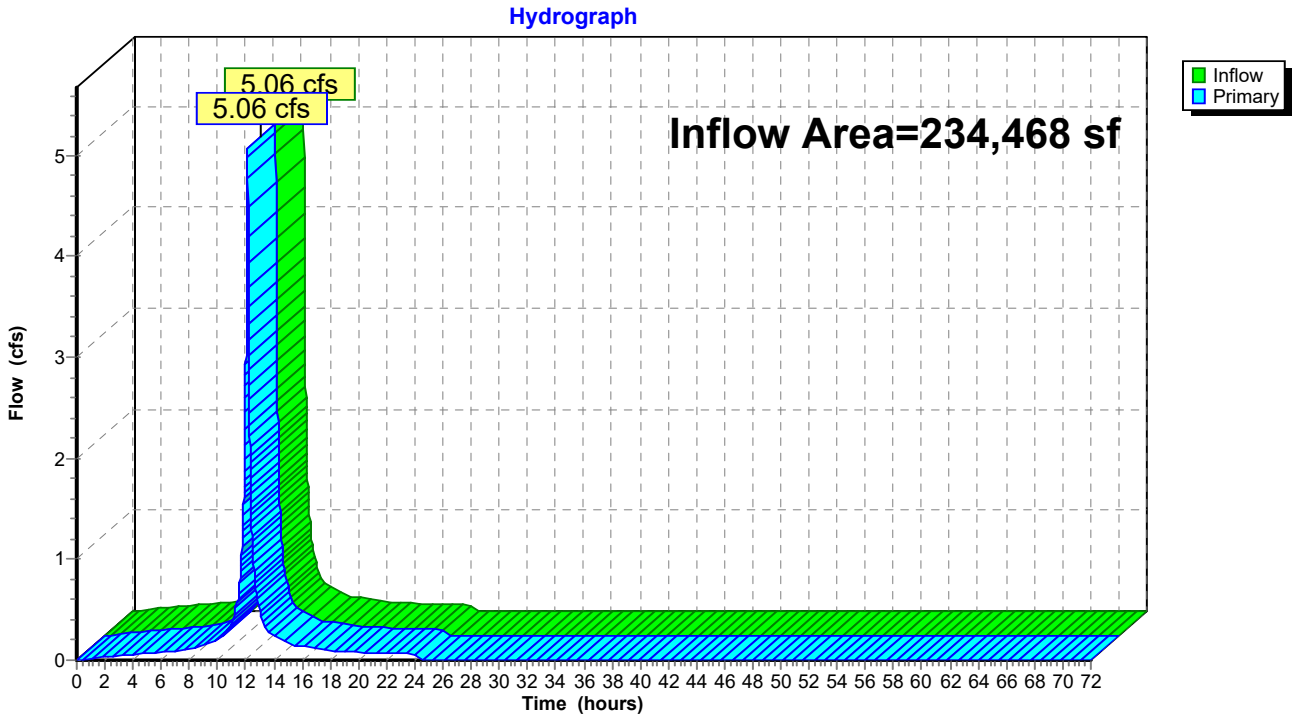


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 0.92" for 10-Year-Fut event
Inflow = 5.06 cfs @ 12.12 hrs, Volume= 17,988 cf
Primary = 5.06 cfs @ 12.12 hrs, Volume= 17,988 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

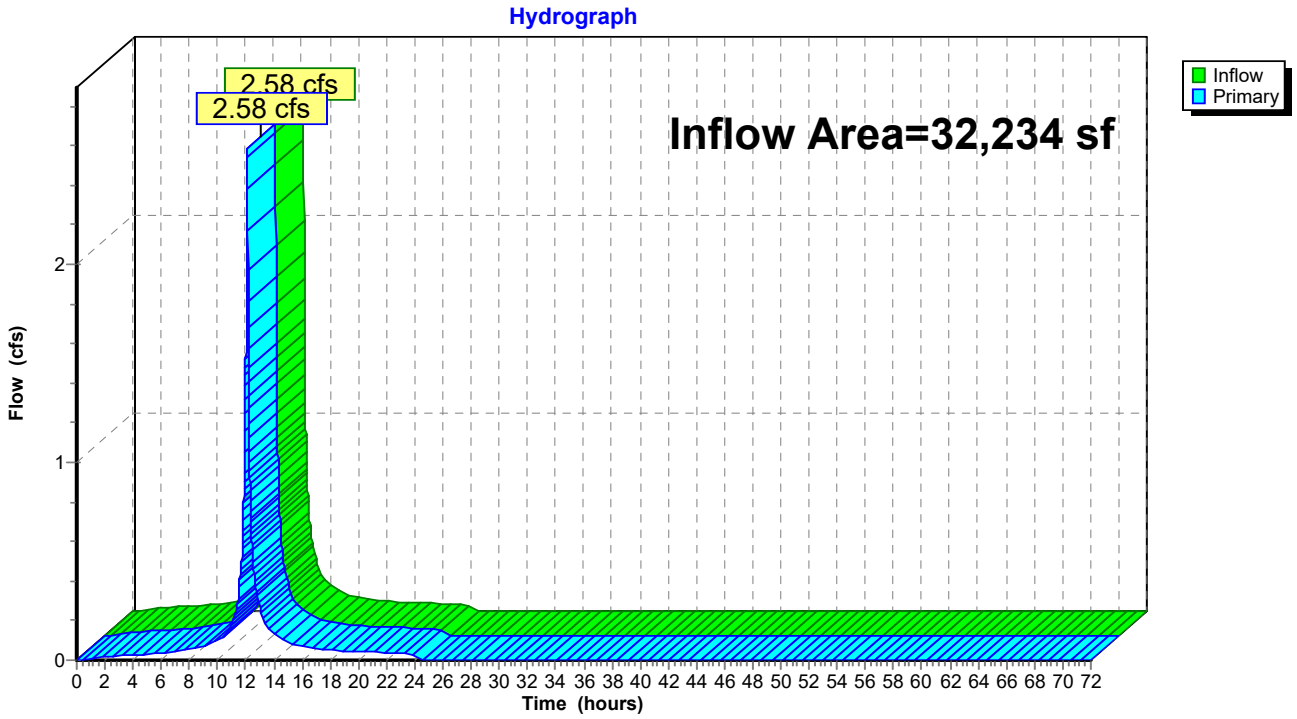


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 3.38" for 10-Year-Fut event
Inflow = 2.58 cfs @ 12.11 hrs, Volume= 9,088 cf
Primary = 2.58 cfs @ 12.11 hrs, Volume= 9,088 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=13.70 cfs 43,248 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=4.89"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=2.85 cfs 18,652 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.64 cfs 11,502 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.19 cfs 1,112 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.47 cfs 2,734 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.50 cfs 14,213 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.51 cfs 2,972 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=2.99 cfs 9,636 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.21 cfs 1,217 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.98 cfs 5,745 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=330' Tc=3.9 min CN=98 Runoff=7.58 cfs 26,845 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.82"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.12 cfs 1,911 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.11 cfs 12,968 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.67 cfs 3,893 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=11.11 cfs 35,050 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=2.53"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=1.29 cfs 6,645 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=3.75"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=1.60 cfs 13,615 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=11.59 cfs 36,578 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.44 cfs 2,593 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.50 cfs 14,213 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.51 cfs 2,972 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=3.85 cfs 12,673 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.41 cfs 2,411 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.98 cfs 5,745 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=330' Tc=3.9 min CN=98 Runoff=7.58 cfs 26,845 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.82"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.12 cfs 1,911 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=9.24"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.02 cfs 12,673 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=1.83"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.41 cfs 2,411 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=7.97"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=11.30 cfs 32,663 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=2.53"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=2.77 cfs 14,230 cf

Pond 4P: Pre developed infiltration basin Peak Elev=17.36' Storage=47,236 cf Inflow=17.82 cfs 57,245 cf
Outflow=0.46 cfs 13,325 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=16.18' Storage=15,108 cf Inflow=11.82 cfs 38,780 cf
Outflow=4.58 cfs 25,585 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.46' Storage=1,748 cf Inflow=3.75 cfs 12,614 cf
Discarded=0.02 cfs 3,019 cf Primary=3.60 cfs 9,595 cf Outflow=3.62 cfs 12,614 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.79' Storage=2,439 cf Inflow=17.51 cfs 55,577 cf
Discarded=0.05 cfs 5,612 cf Primary=17.15 cfs 49,966 cf Outflow=17.20 cfs 55,578 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.62' Storage=5,793 cf Inflow=4.78 cfs 17,184 cf
Discarded=0.36 cfs 15,654 cf Primary=0.14 cfs 1,534 cf Outflow=0.50 cfs 17,188 cf

Pond Bio 70: Post Bio-70 Peak Elev=24.75' Storage=6,543 cf Inflow=4.47 cfs 16,860 cf
Discarded=0.18 cfs 11,171 cf Primary=0.24 cfs 5,690 cf Outflow=0.42 cfs 16,861 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.86' Storage=6,158 cf Inflow=12.71 cfs 55,310 cf
Discarded=0.25 cfs 22,220 cf Primary=11.64 cfs 33,090 cf Outflow=11.89 cfs 55,310 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=17.31' Storage=46,276 cf Inflow=15.76 cfs 59,077 cf
Outflow=0.55 cfs 15,162 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=26.42' Storage=2,908 cf Inflow=11.83 cfs 39,171 cf
Outflow=12.29 cfs 38,379 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=24.14' Storage=6,035 cf Inflow=17.02 cfs 55,563 cf
Outflow=14.97 cfs 53,332 cf

Link 1L: Pre dis 1 Inflow=7.59 cfs 43,918 cf
Primary=7.59 cfs 43,918 cf

Link 3L: Pre discharge point 3 Inflow=17.41 cfs 61,978 cf
Primary=17.41 cfs 61,978 cf

Link 4L: Post discharge point 2 Inflow=3.11 cfs 10,853 cf
Primary=3.11 cfs 10,853 cf

Link 6L: Discharge point 3 post Inflow=7.05 cfs 44,237 cf
Primary=7.05 cfs 44,237 cf

Link 11L: Post dis 1 Inflow=7.59 cfs 42,081 cf
Primary=7.59 cfs 42,081 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=4.09 cfs 15,085 cf
Primary=4.09 cfs 15,085 cf

Total Runoff Area = 847,524 sf Runoff Volume = 379,874 cf Average Runoff Depth = 5.38"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

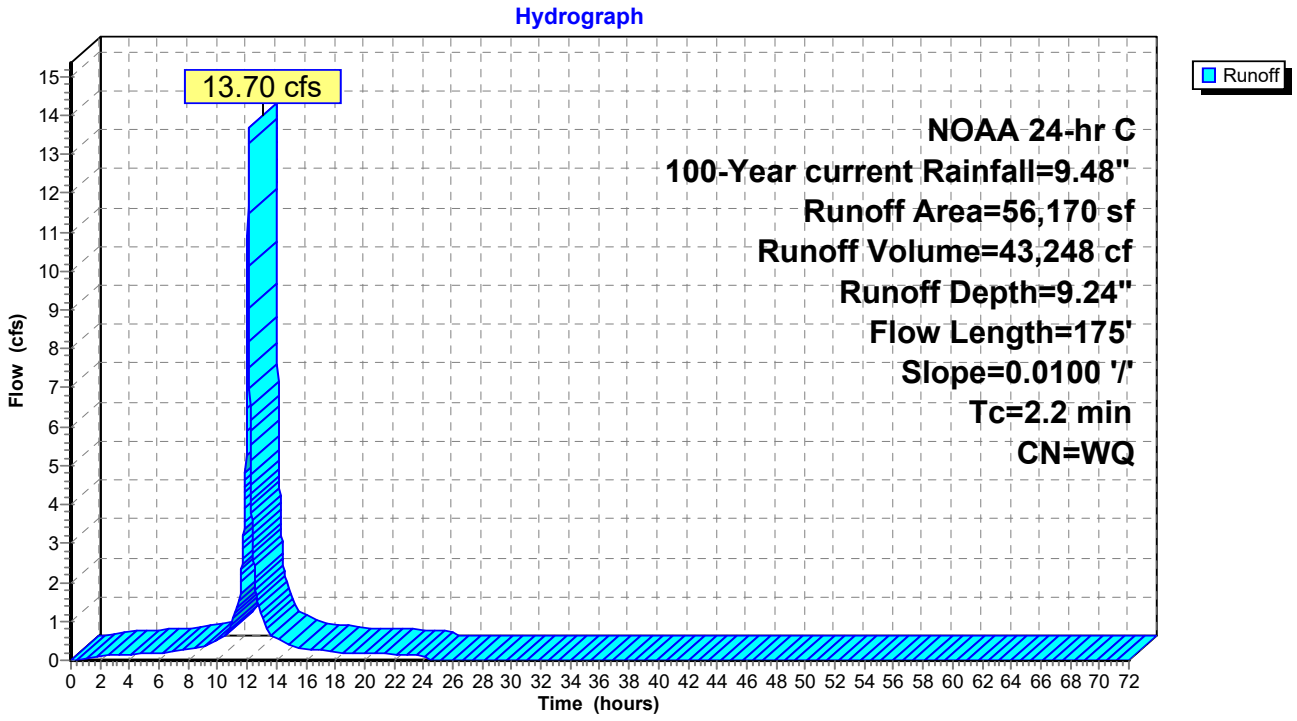
Runoff = 13.70 cfs @ 12.11 hrs, Volume= 43,248 cf, Depth= 9.24"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

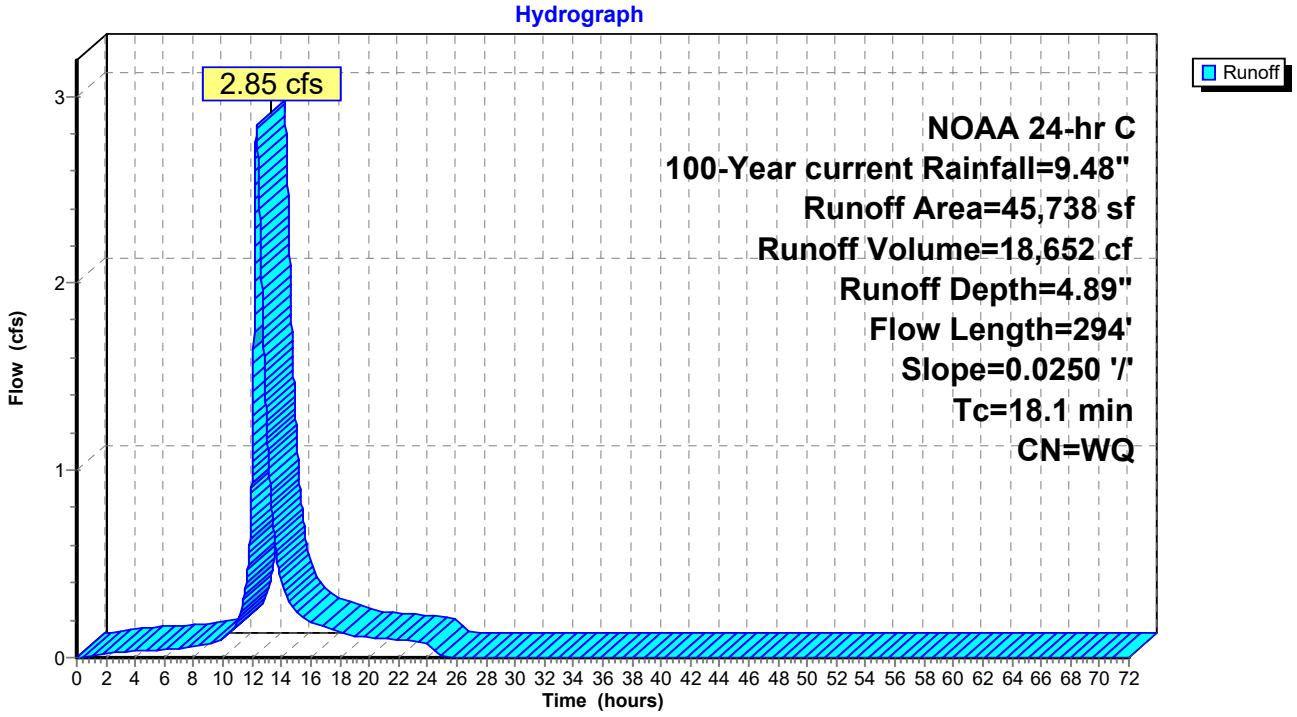
Runoff = 2.85 cfs @ 12.31 hrs, Volume= 18,652 cf, Depth= 4.89"
Routed to Link 6L : Discharge point 3 post

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

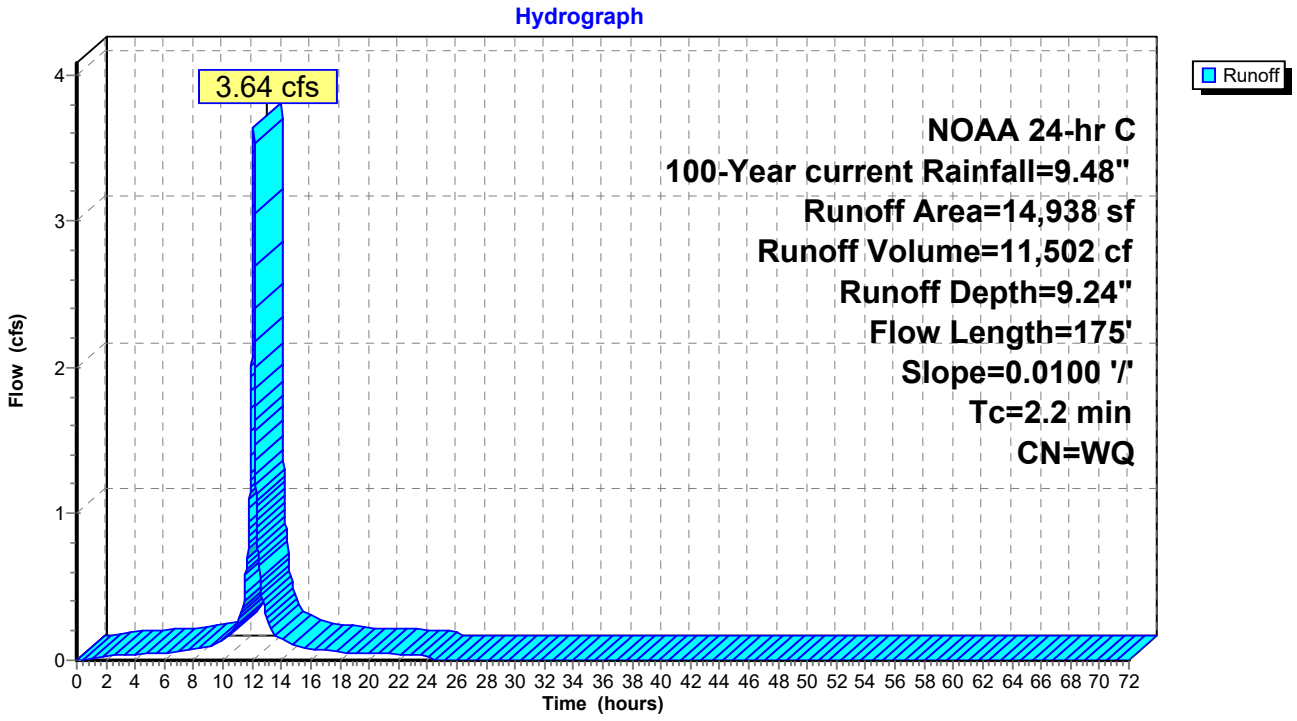
Runoff = 3.64 cfs @ 12.11 hrs, Volume= 11,502 cf, Depth= 9.24"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

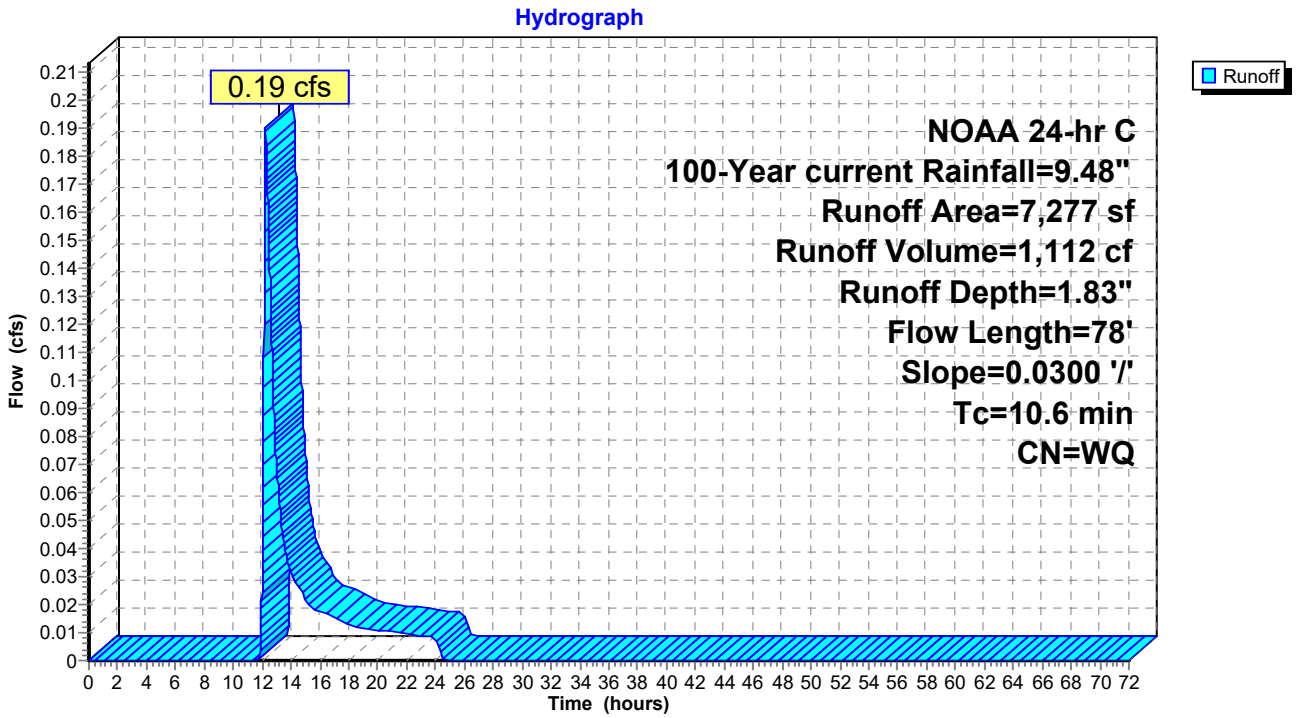
Runoff = 0.19 cfs @ 12.23 hrs, Volume= 1,112 cf, Depth= 1.83"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

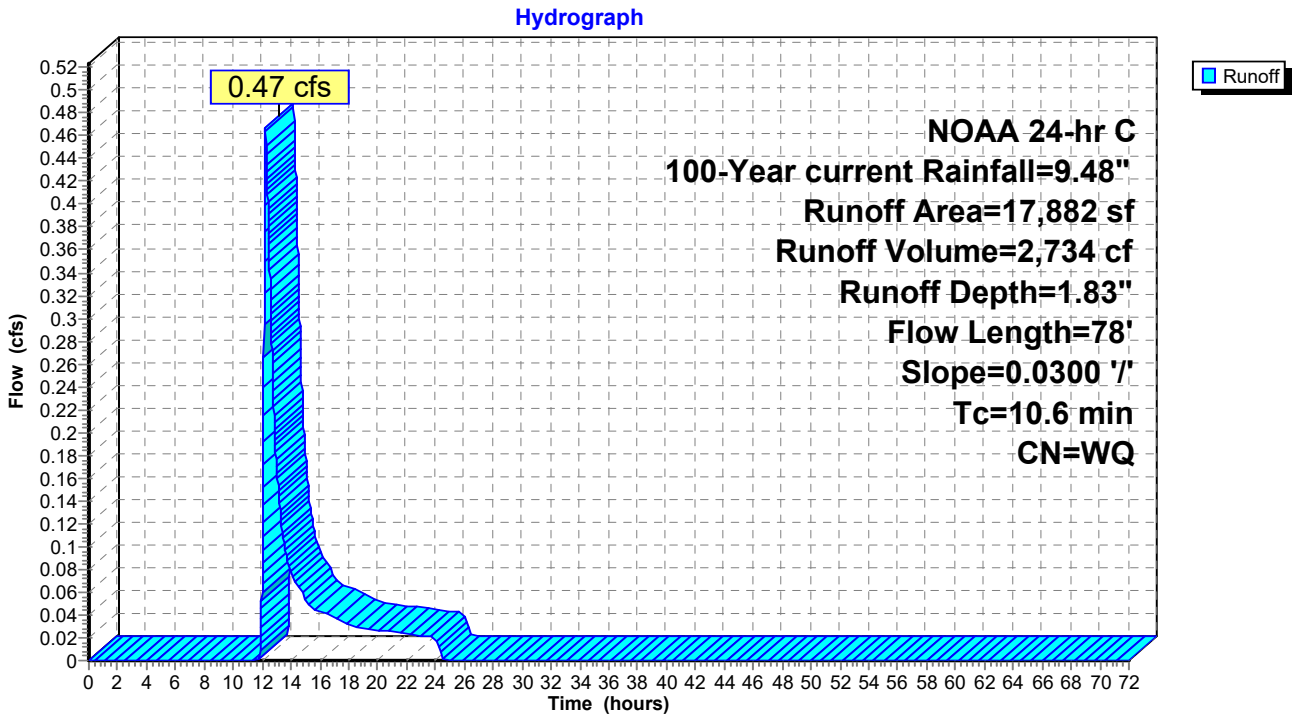
Runoff = 0.47 cfs @ 12.23 hrs, Volume= 2,734 cf, Depth= 1.83"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

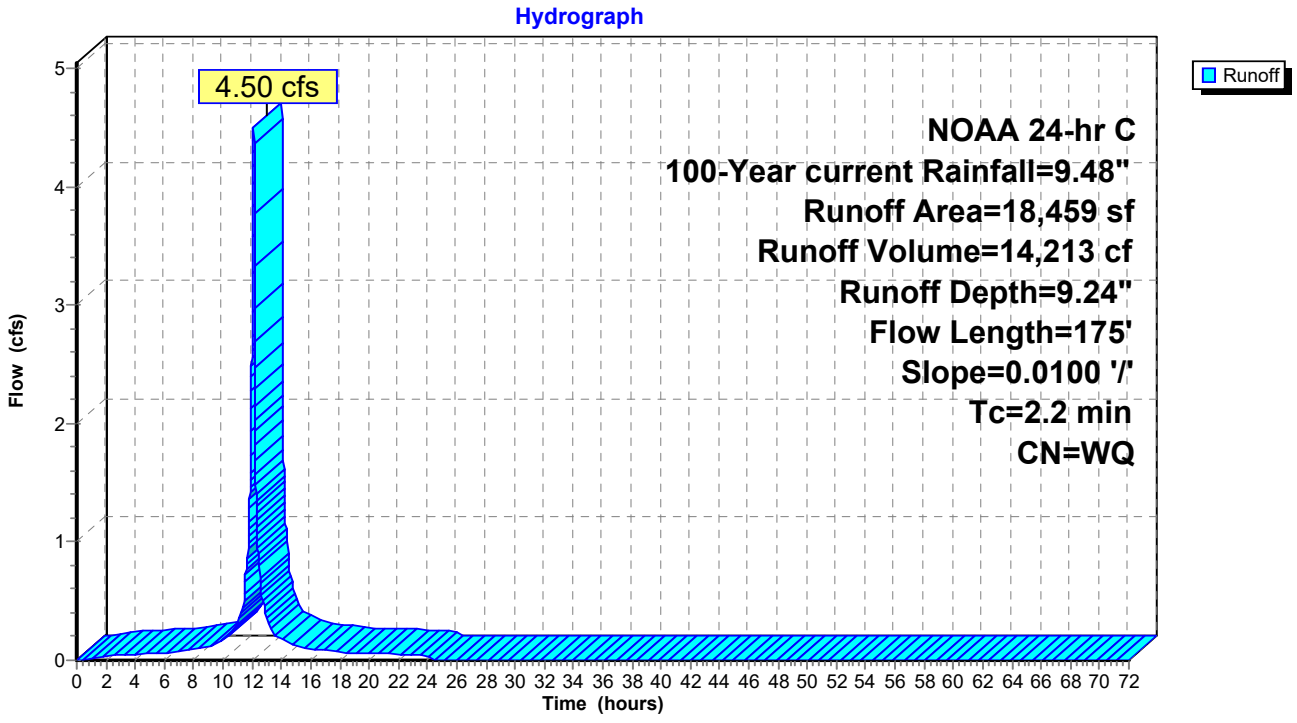
Runoff = 4.50 cfs @ 12.11 hrs, Volume= 14,213 cf, Depth= 9.24"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

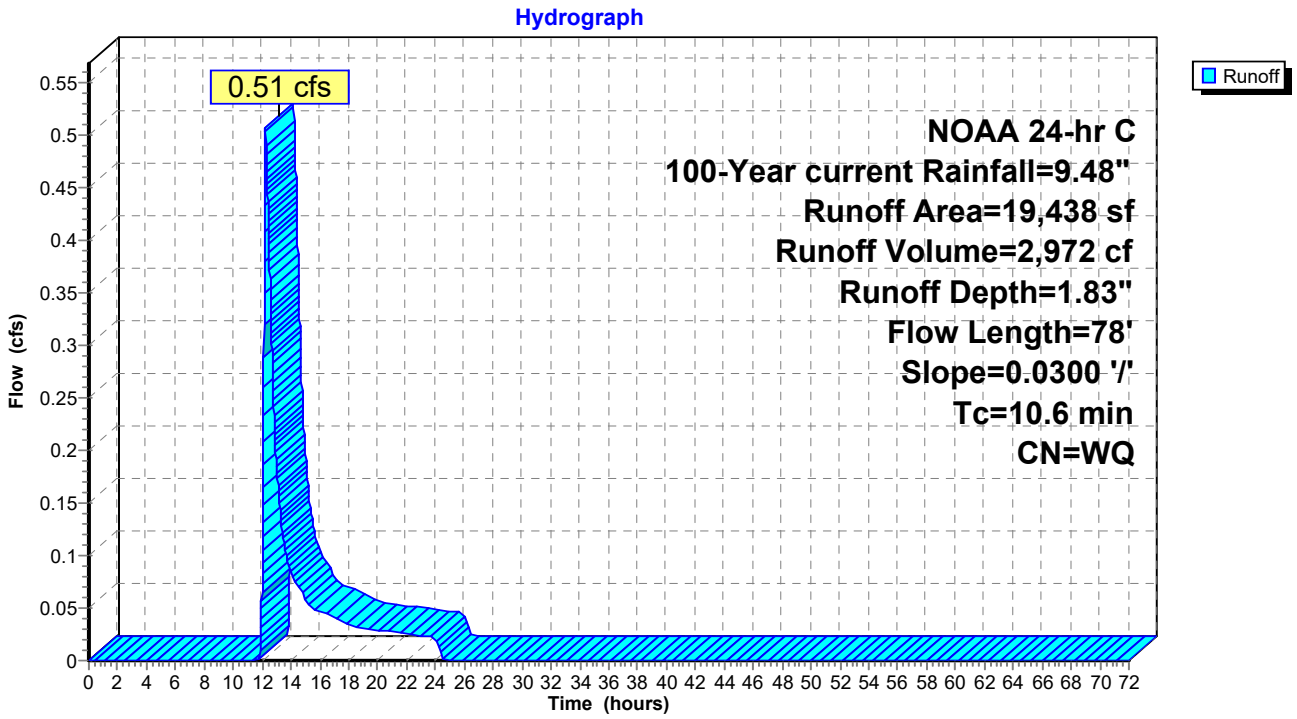
Runoff = 0.51 cfs @ 12.23 hrs, Volume= 2,972 cf, Depth= 1.83"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

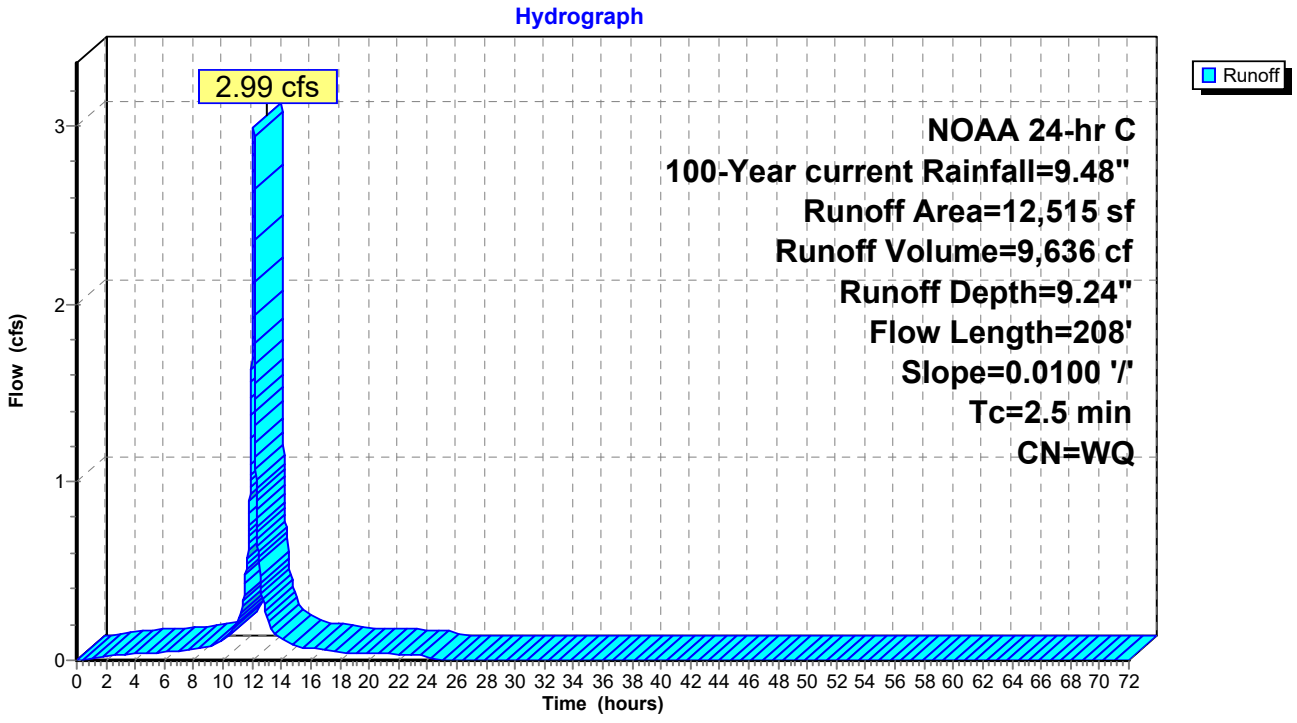
Runoff = 2.99 cfs @ 12.11 hrs, Volume= 9,636 cf, Depth= 9.24"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

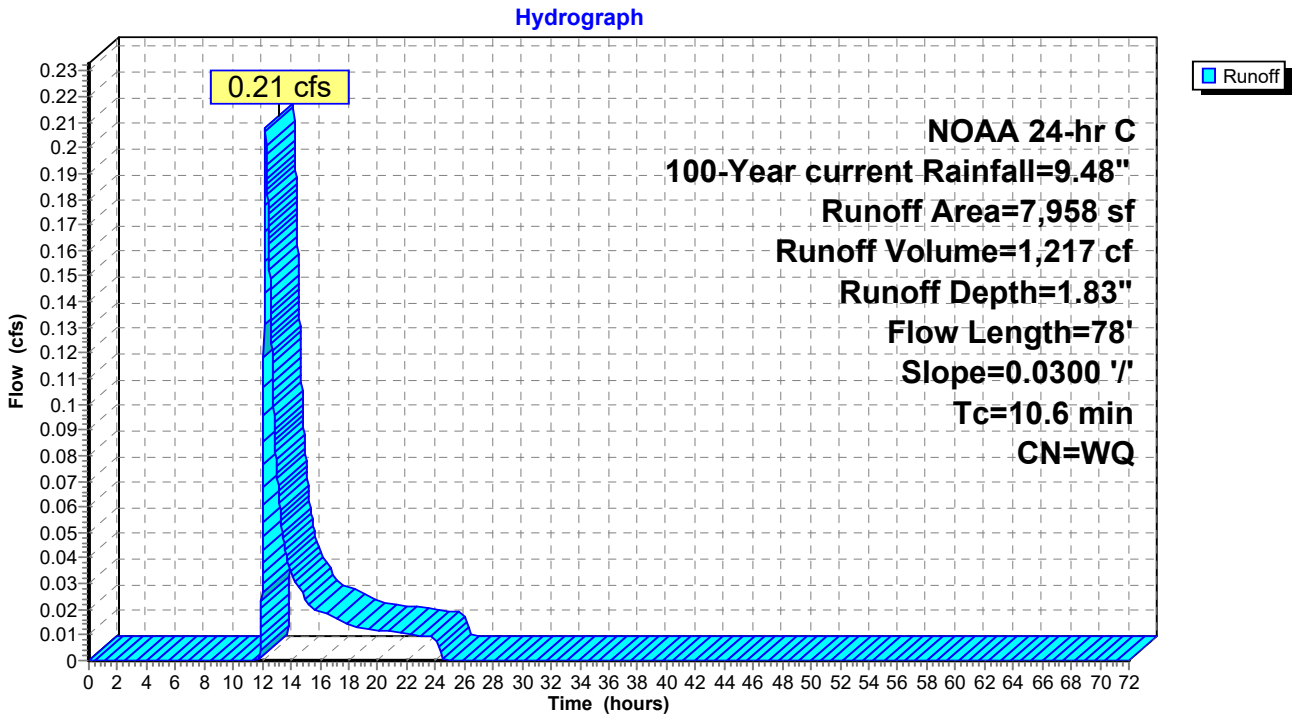
Runoff = 0.21 cfs @ 12.23 hrs, Volume= 1,217 cf, Depth= 1.83"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

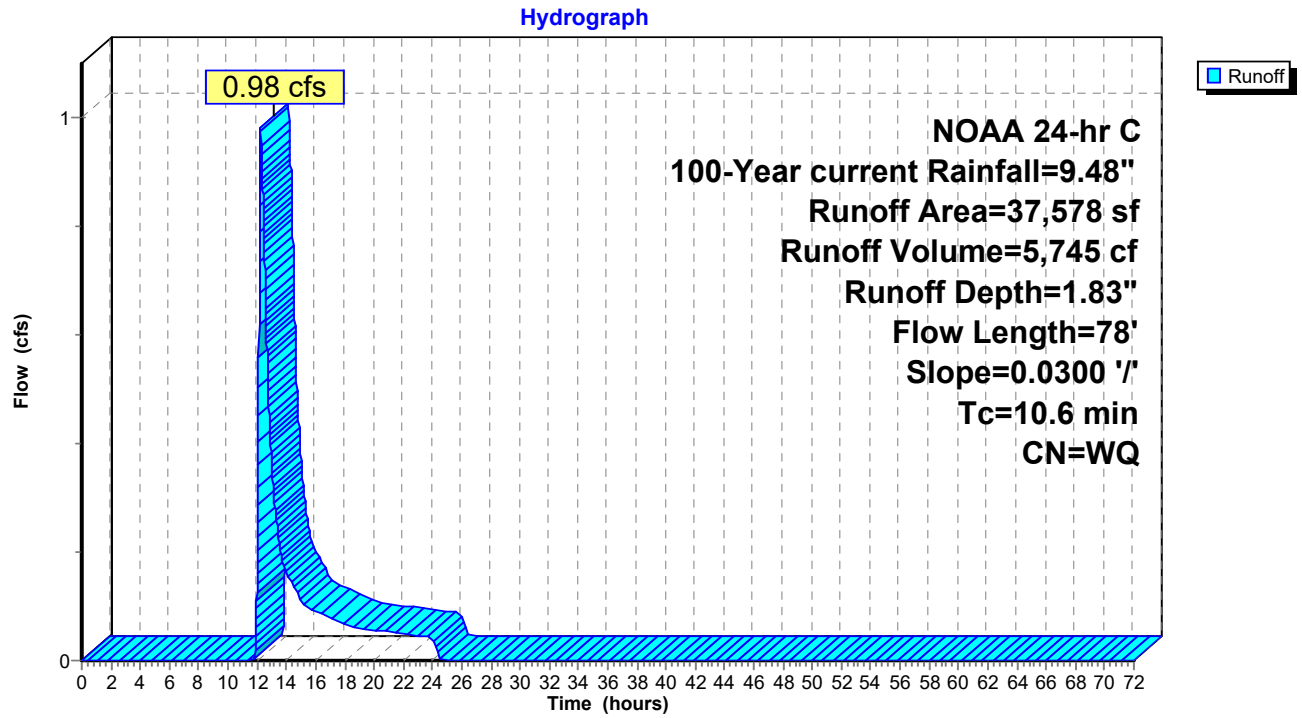
Runoff = 0.98 cfs @ 12.23 hrs, Volume= 5,745 cf, Depth= 1.83"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

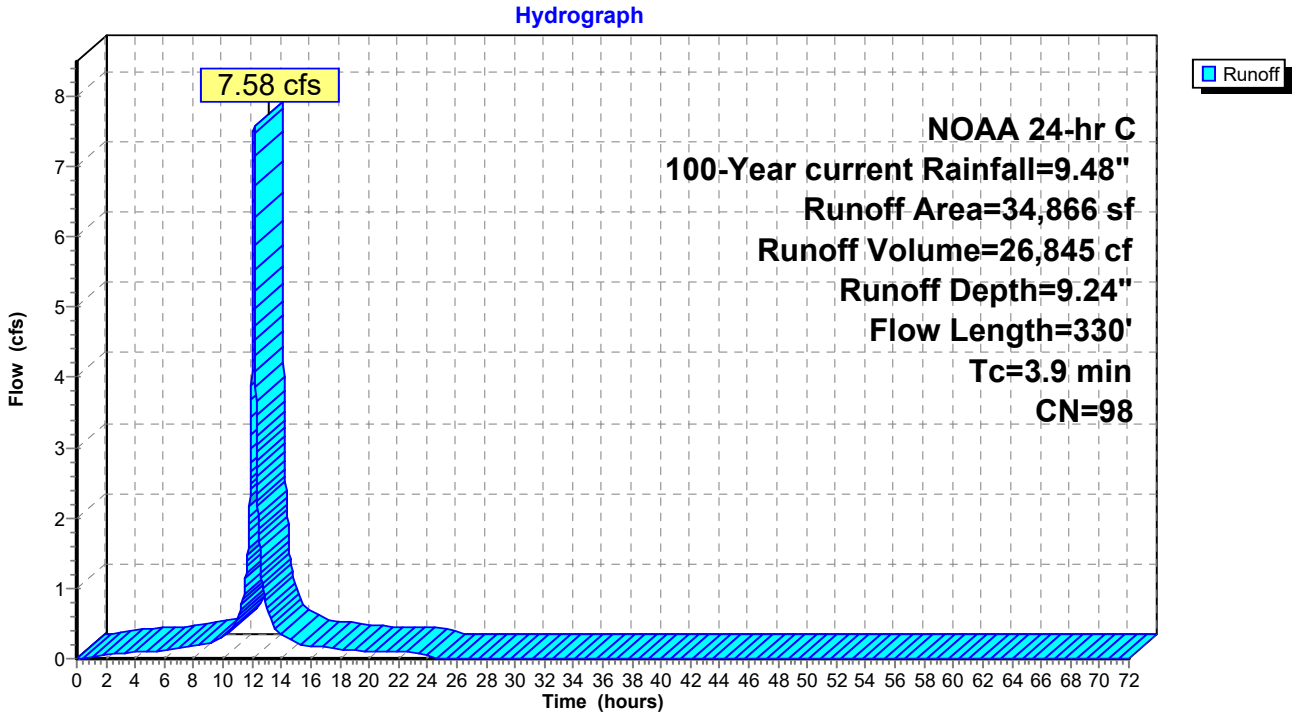
Runoff = 7.58 cfs @ 12.12 hrs, Volume= 26,845 cf, Depth= 9.24"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

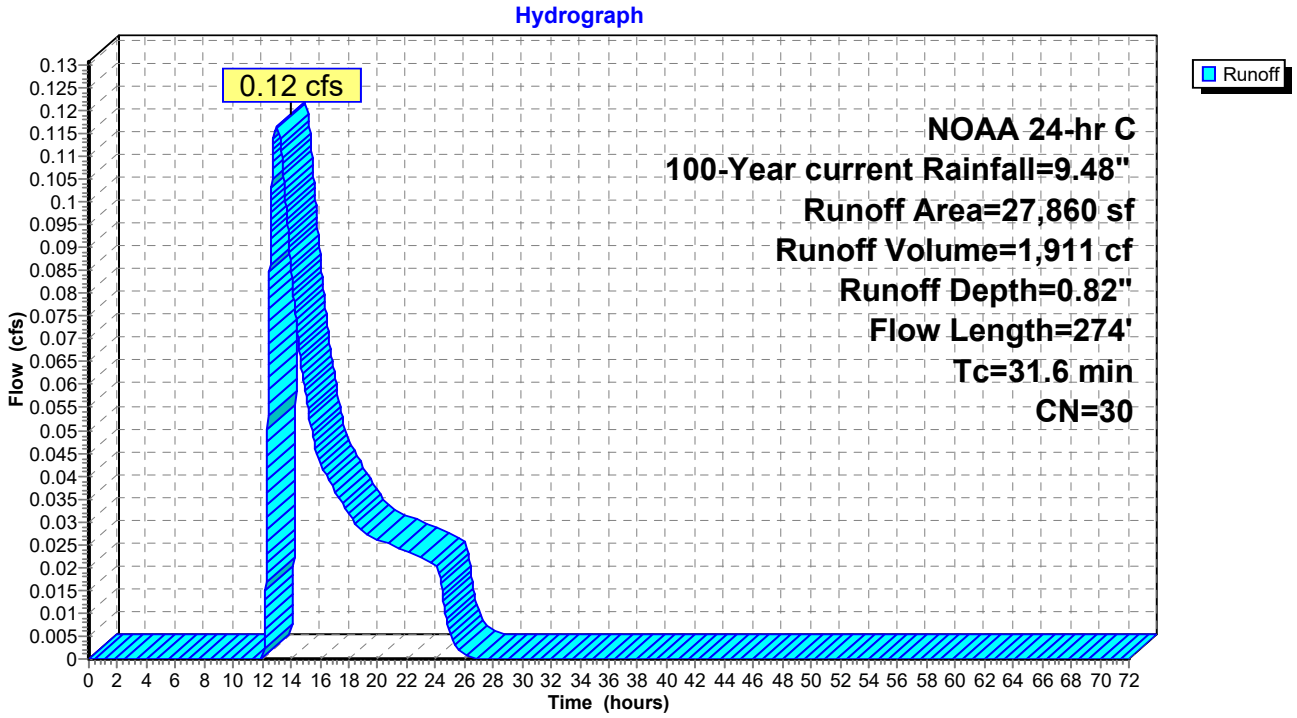
Runoff = 0.12 cfs @ 12.99 hrs, Volume= 1,911 cf, Depth= 0.82"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

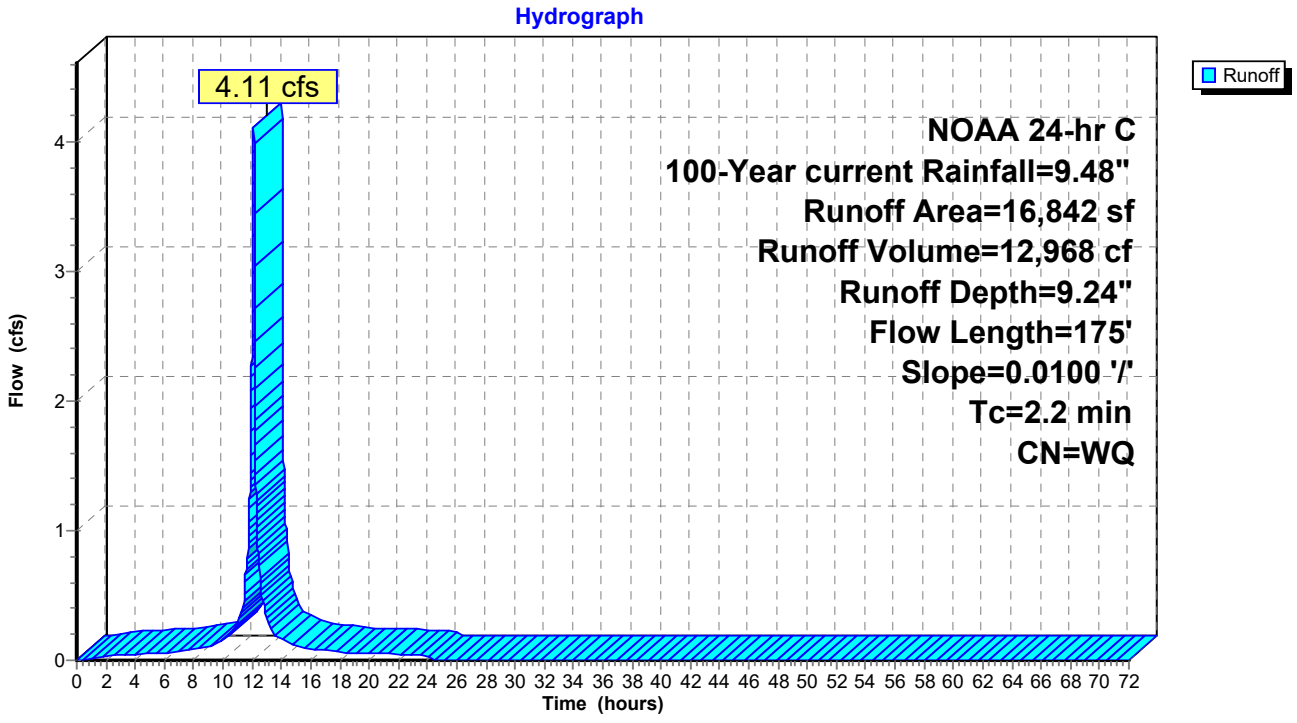
Runoff = 4.11 cfs @ 12.11 hrs, Volume= 12,968 cf, Depth= 9.24"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

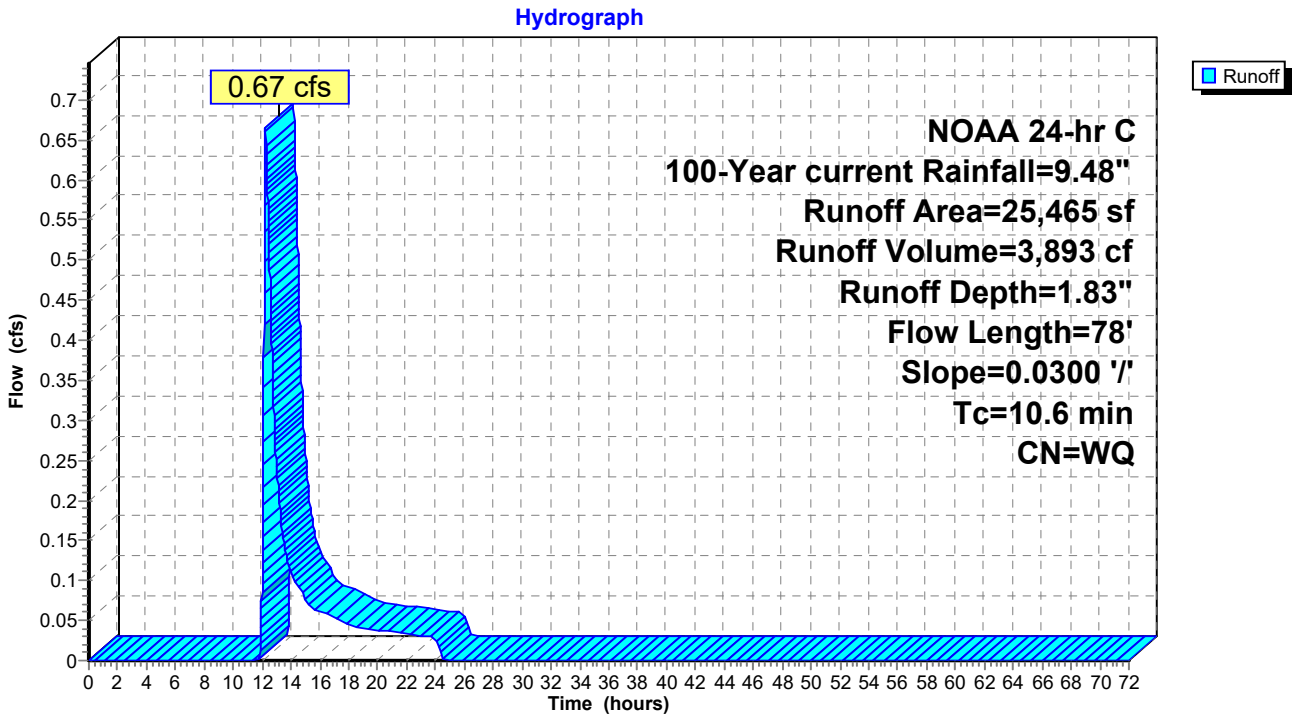
Runoff = 0.67 cfs @ 12.23 hrs, Volume= 3,893 cf, Depth= 1.83"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

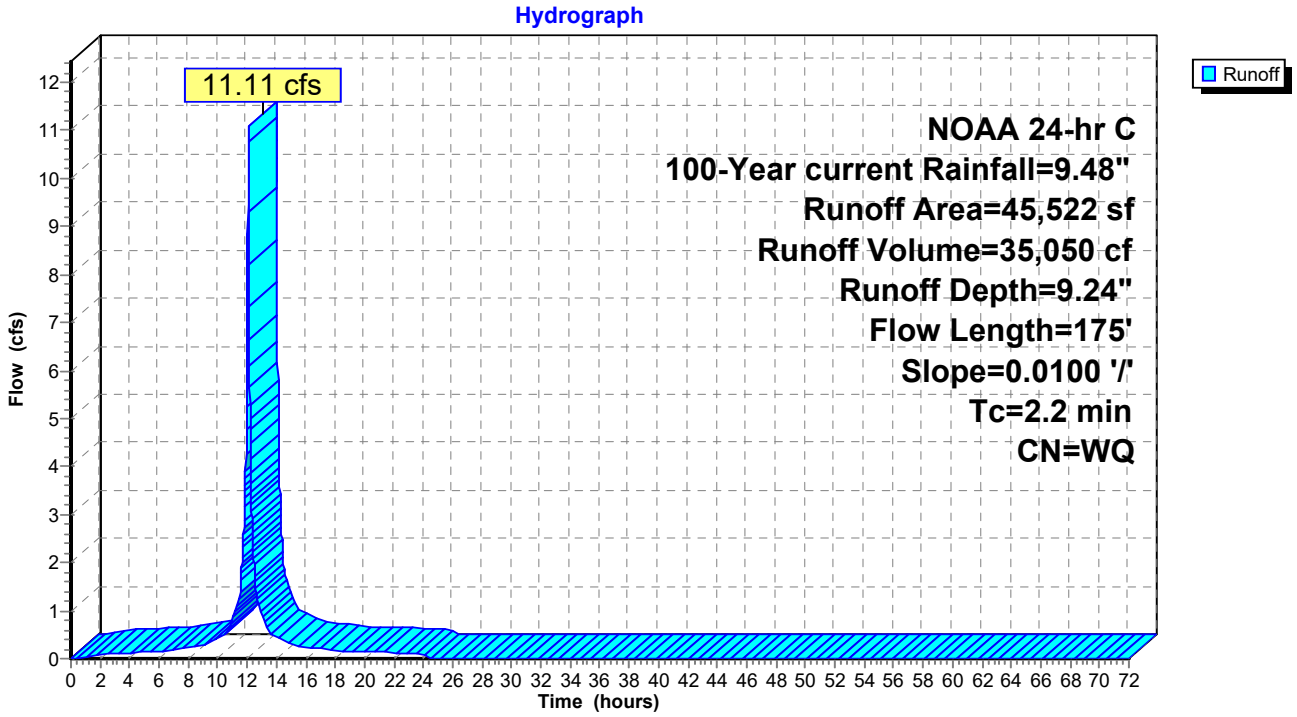
Runoff = 11.11 cfs @ 12.11 hrs, Volume= 35,050 cf, Depth= 9.24"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

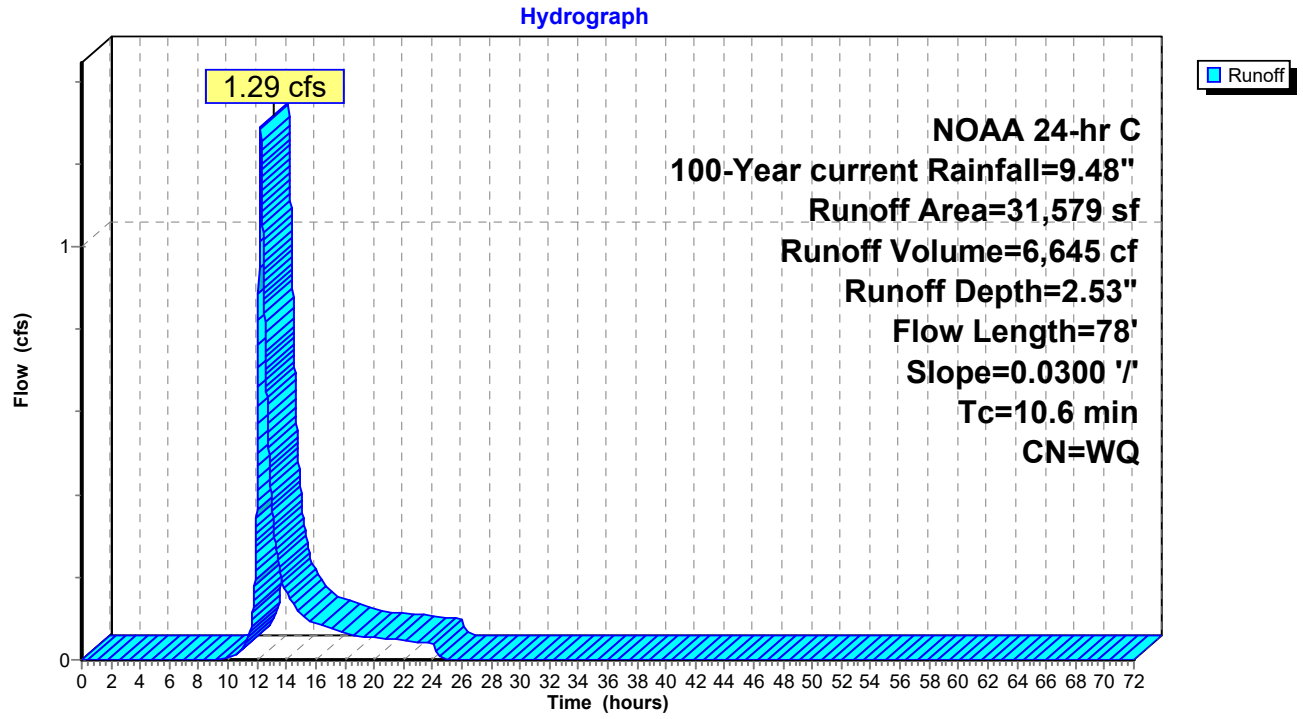
Runoff = 1.29 cfs @ 12.21 hrs, Volume= 6,645 cf, Depth= 2.53"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

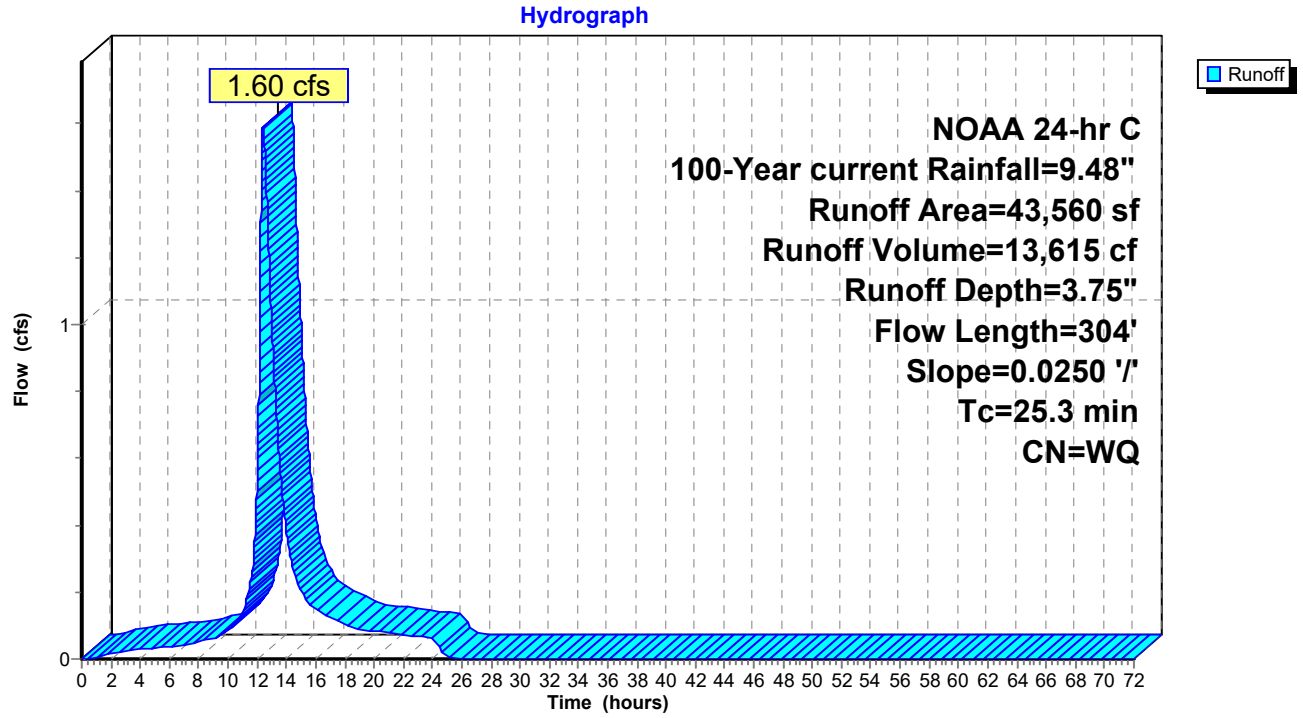
Runoff = 1.60 cfs @ 12.42 hrs, Volume= 13,615 cf, Depth= 3.75"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

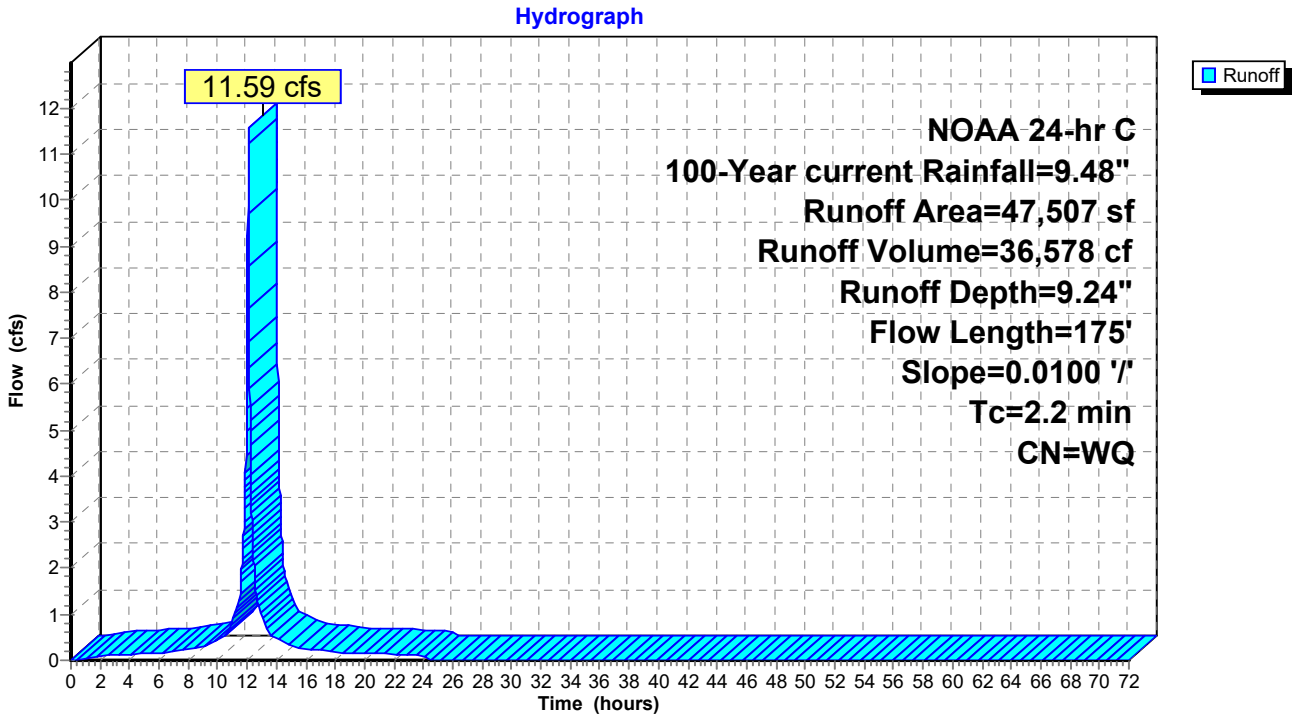
Runoff = 11.59 cfs @ 12.11 hrs, Volume= 36,578 cf, Depth= 9.24"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

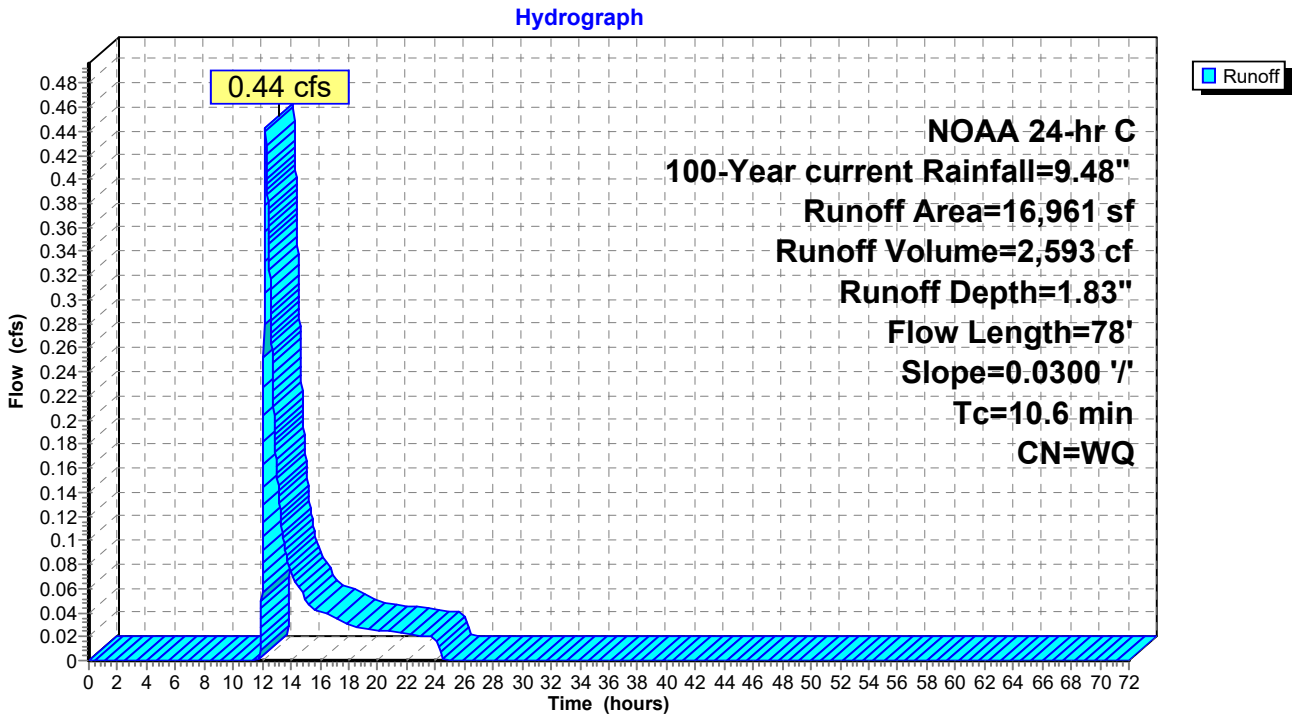
Runoff = 0.44 cfs @ 12.23 hrs, Volume= 2,593 cf, Depth= 1.83"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

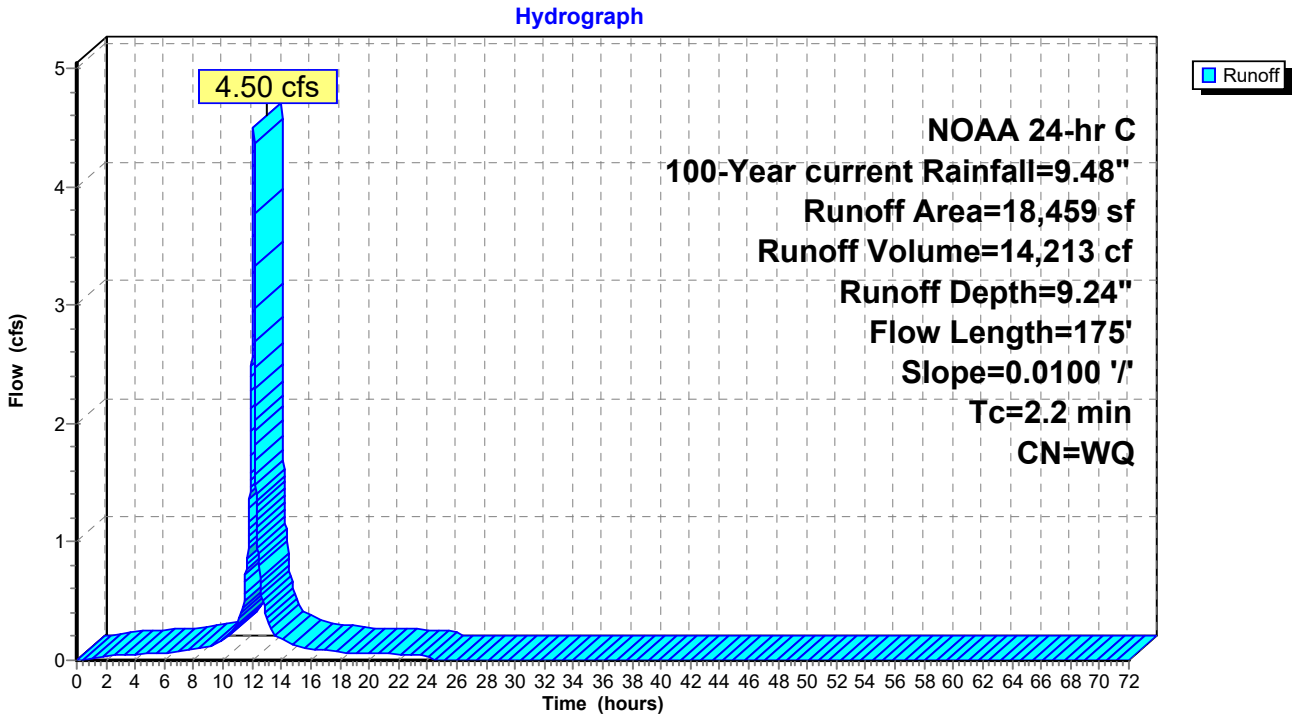
Runoff = 4.50 cfs @ 12.11 hrs, Volume= 14,213 cf, Depth= 9.24"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

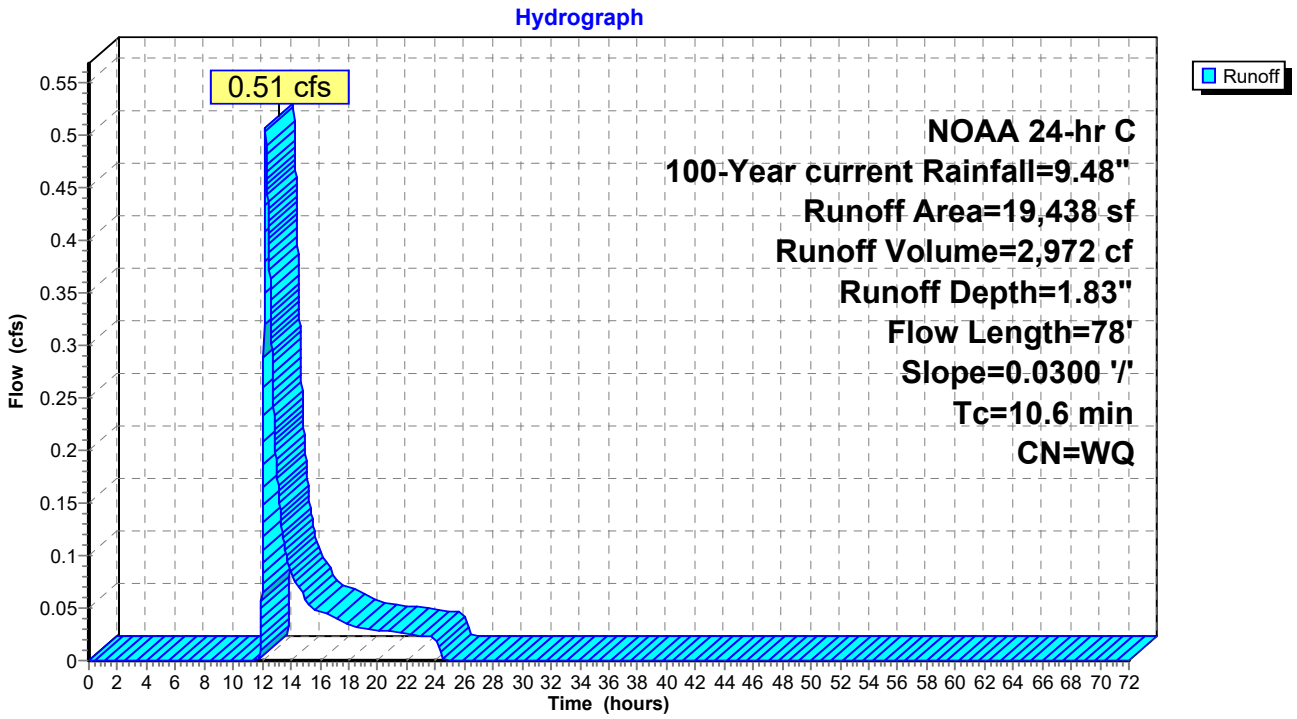
Runoff = 0.51 cfs @ 12.23 hrs, Volume= 2,972 cf, Depth= 1.83"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

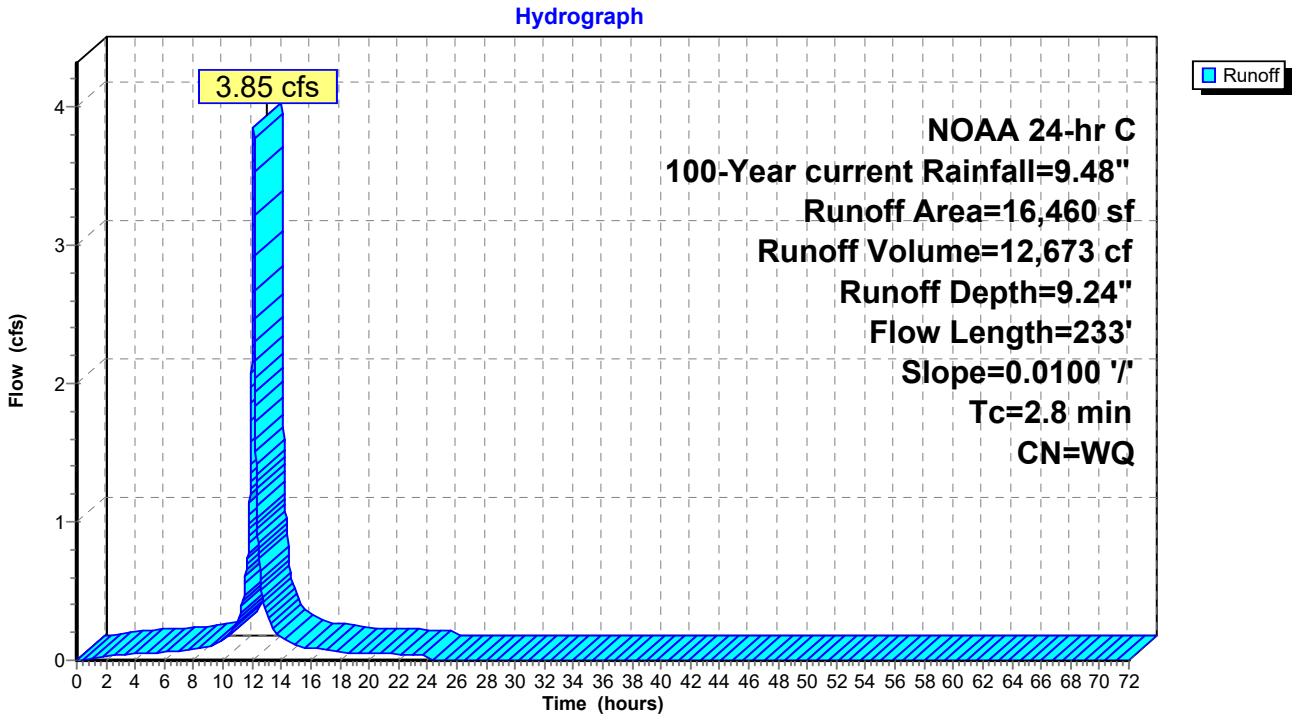
Runoff = 3.85 cfs @ 12.11 hrs, Volume= 12,673 cf, Depth= 9.24"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

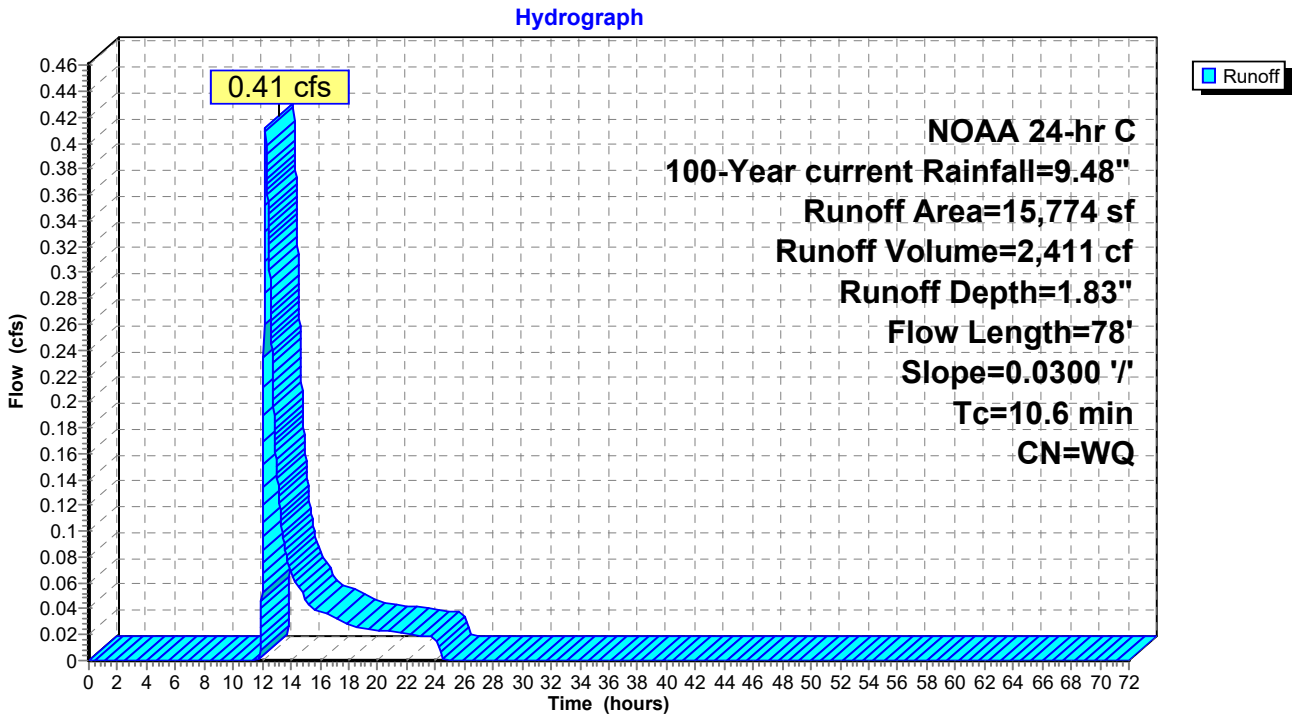
Runoff = 0.41 cfs @ 12.23 hrs, Volume= 2,411 cf, Depth= 1.83"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

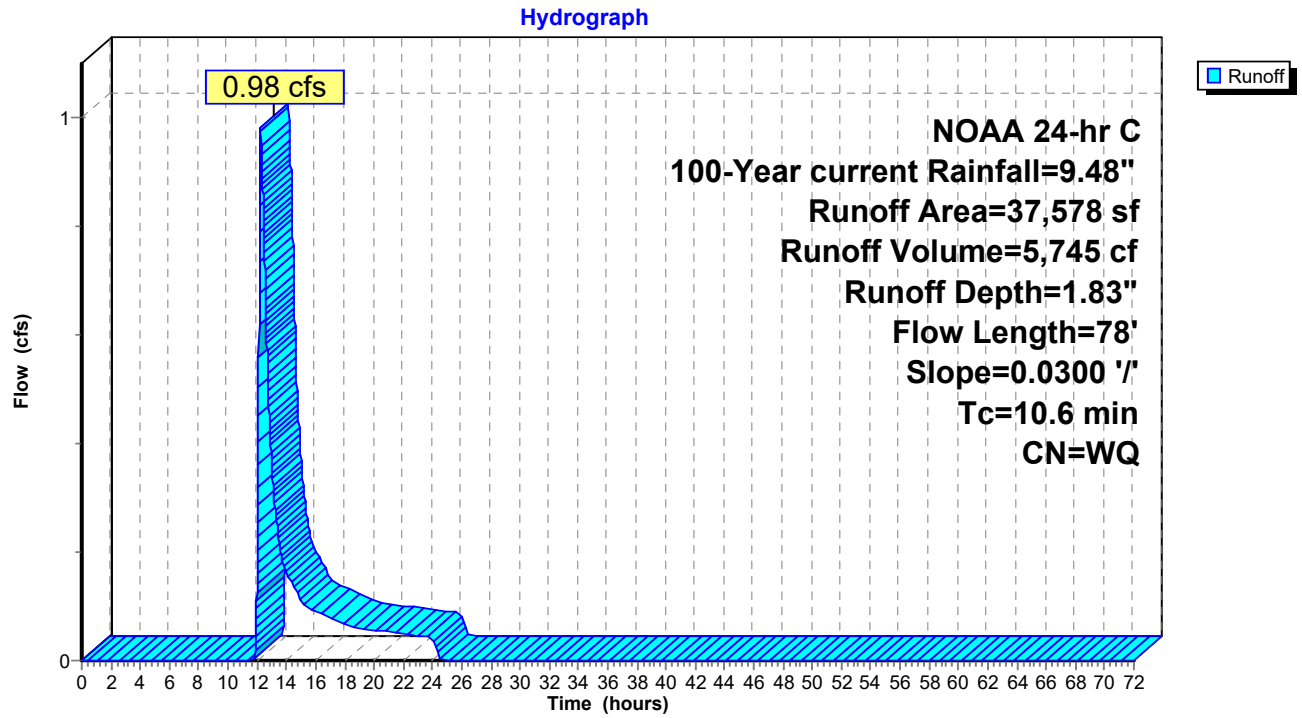
Runoff = 0.98 cfs @ 12.23 hrs, Volume= 5,745 cf, Depth= 1.83"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

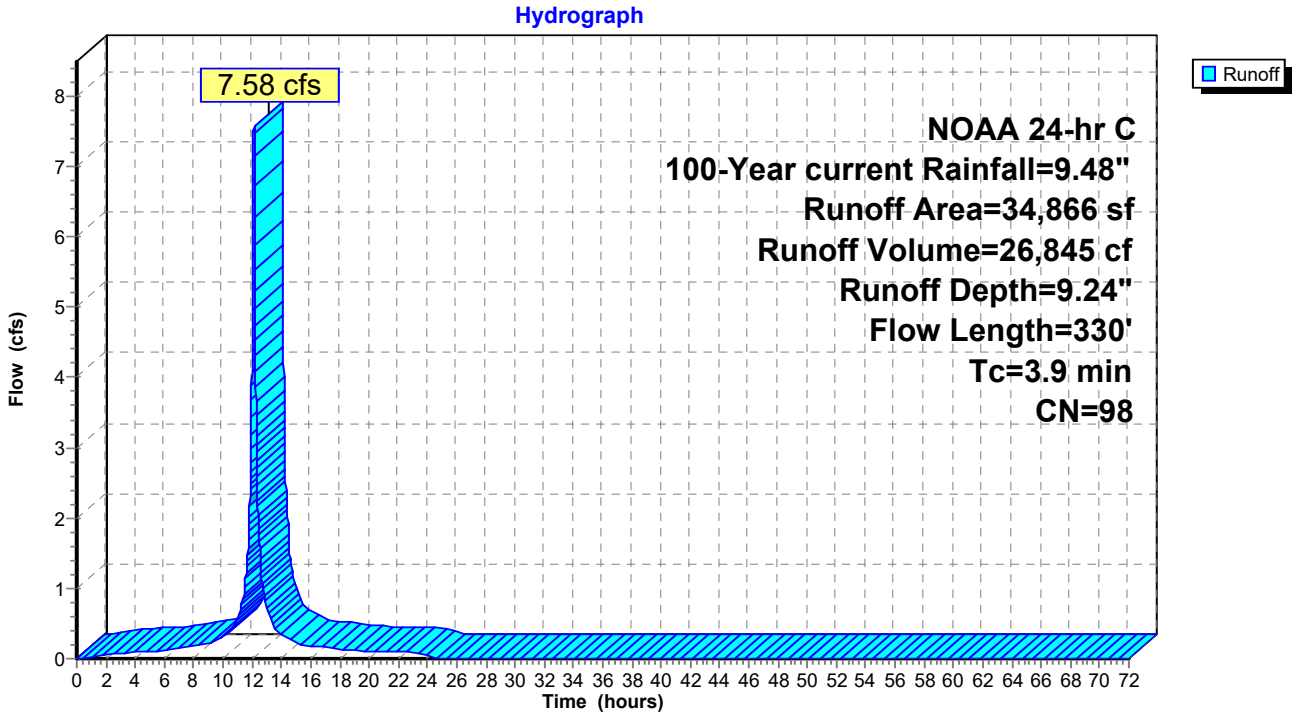
Runoff = 7.58 cfs @ 12.12 hrs, Volume= 26,845 cf, Depth= 9.24"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

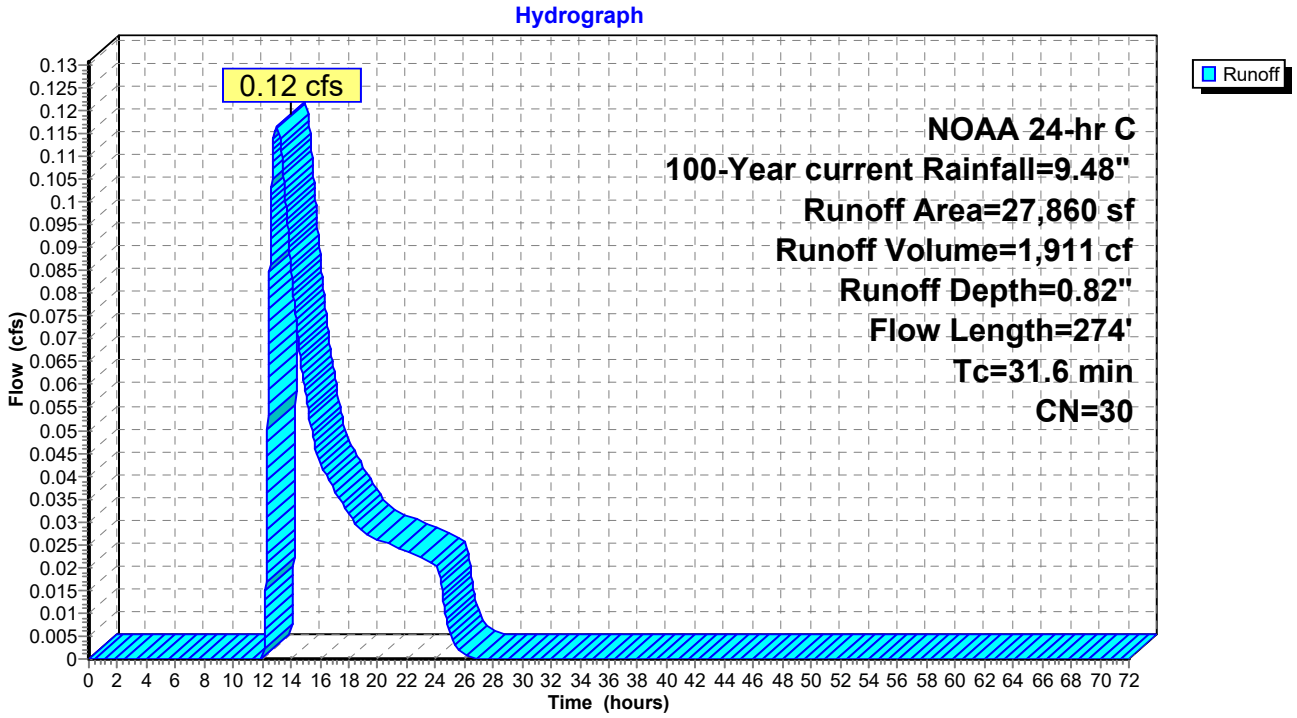
Runoff = 0.12 cfs @ 12.99 hrs, Volume= 1,911 cf, Depth= 0.82"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

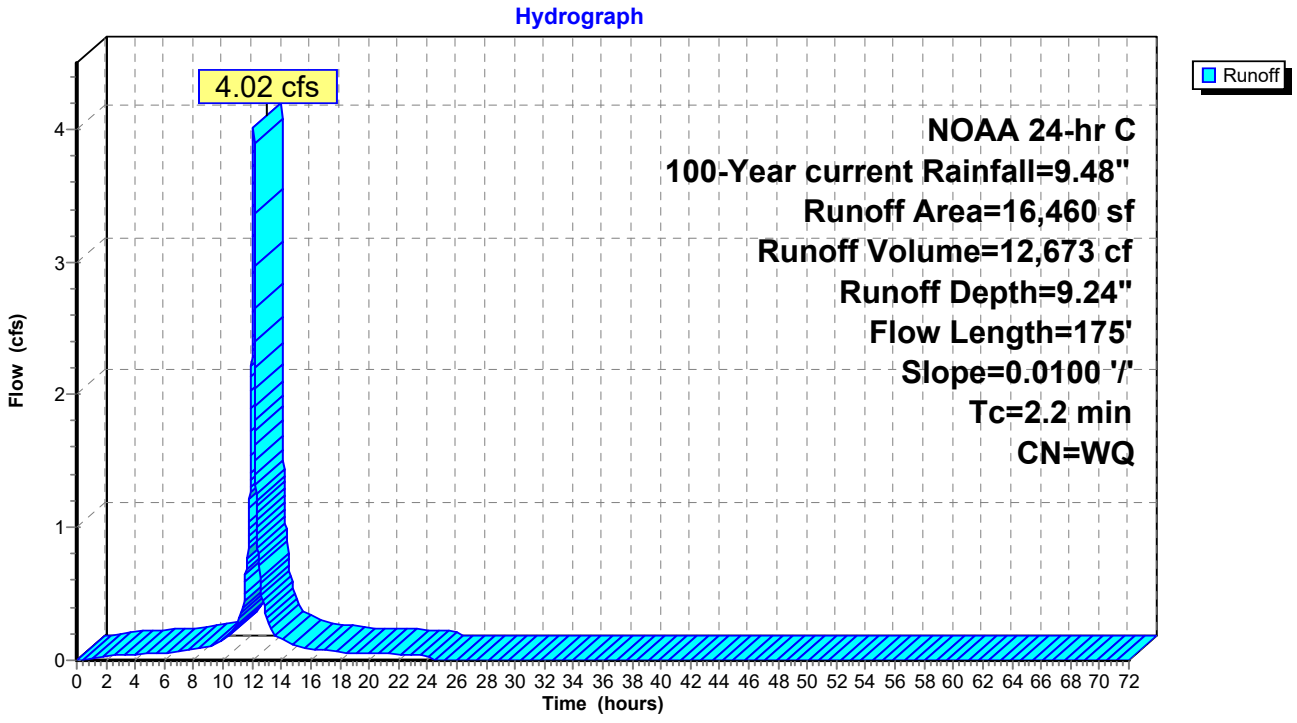
Runoff = 4.02 cfs @ 12.11 hrs, Volume= 12,673 cf, Depth= 9.24"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

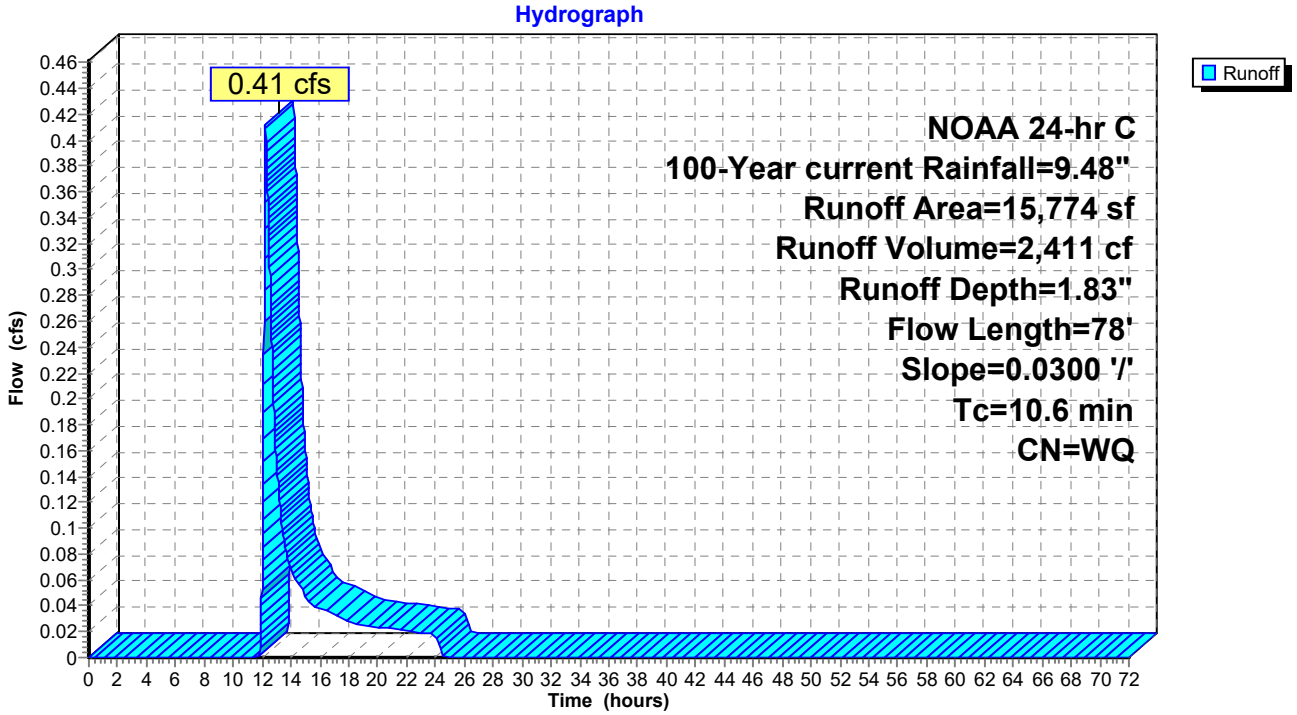
Runoff = 0.41 cfs @ 12.23 hrs, Volume= 2,411 cf, Depth= 1.83"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

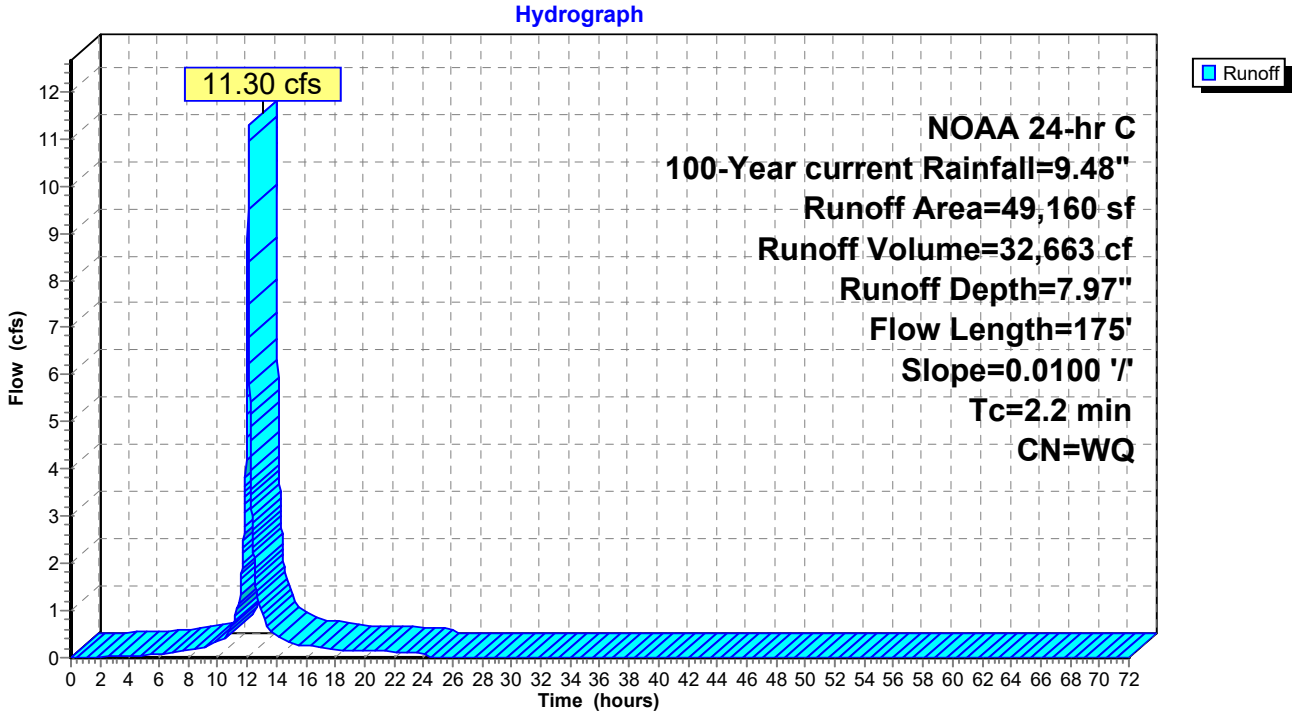
Runoff = 11.30 cfs @ 12.11 hrs, Volume= 32,663 cf, Depth= 7.97"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

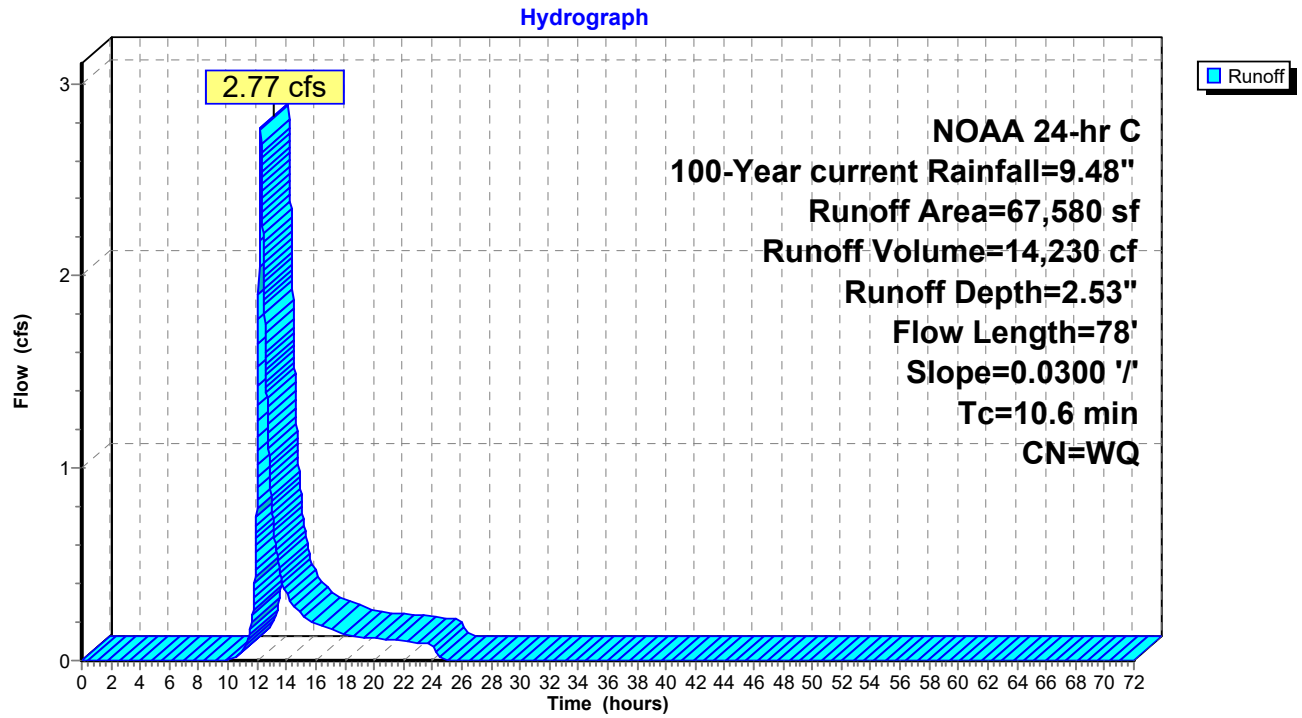
Runoff = 2.77 cfs @ 12.21 hrs, Volume= 14,230 cf, Depth= 2.53"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year current Rainfall=9.48"

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

[80] Warning: Exceeded Pond Bio 20 by 0.32' @ 19.79 hrs (0.03 cfs 1,646 cf)

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 4.00" for 100-Year current event
Inflow = 17.82 cfs @ 12.12 hrs, Volume= 57,245 cf
Outflow = 0.46 cfs @ 16.24 hrs, Volume= 13,325 cf, Atten= 97%, Lag= 247.5 min
Primary = 0.46 cfs @ 16.24 hrs, Volume= 13,325 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.36' @ 16.24 hrs Surf.Area= 21,009 sf Storage= 47,236 cf

Plug-Flow detention time= 582.3 min calculated for 13,323 cf (23% of inflow)
Center-of-Mass det. time= 419.0 min (1,210.5 - 791.5)

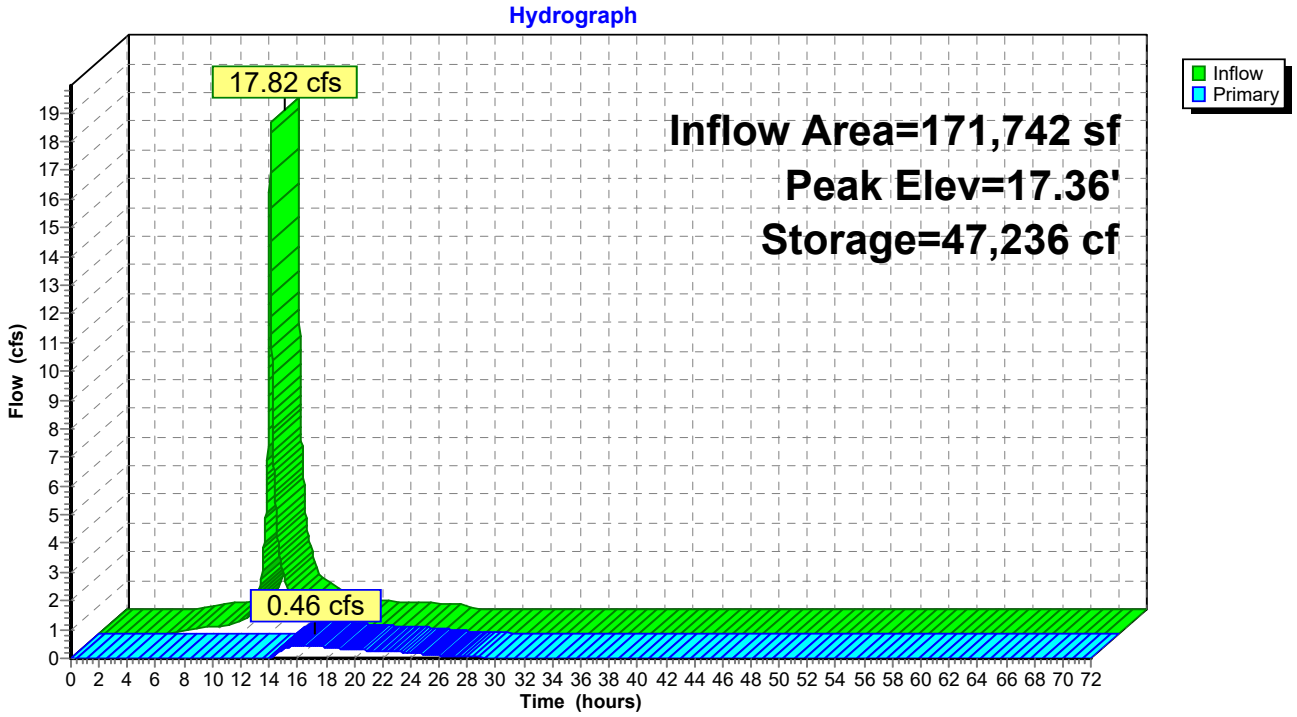
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.46 cfs @ 16.24 hrs HW=17.36' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.46 cfs @ 0.95 fps)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 2.86" for 100-Year current event
Inflow = 11.82 cfs @ 12.12 hrs, Volume= 38,780 cf
Outflow = 4.58 cfs @ 12.50 hrs, Volume= 25,585 cf, Atten= 61%, Lag= 22.6 min
Primary = 4.58 cfs @ 12.50 hrs, Volume= 25,585 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 16.18' @ 12.50 hrs Surf.Area= 7,118 sf Storage= 15,108 cf

Plug-Flow detention time= 123.0 min calculated for 25,581 cf (66% of inflow)
Center-of-Mass det. time= 55.5 min (862.8 - 807.3)

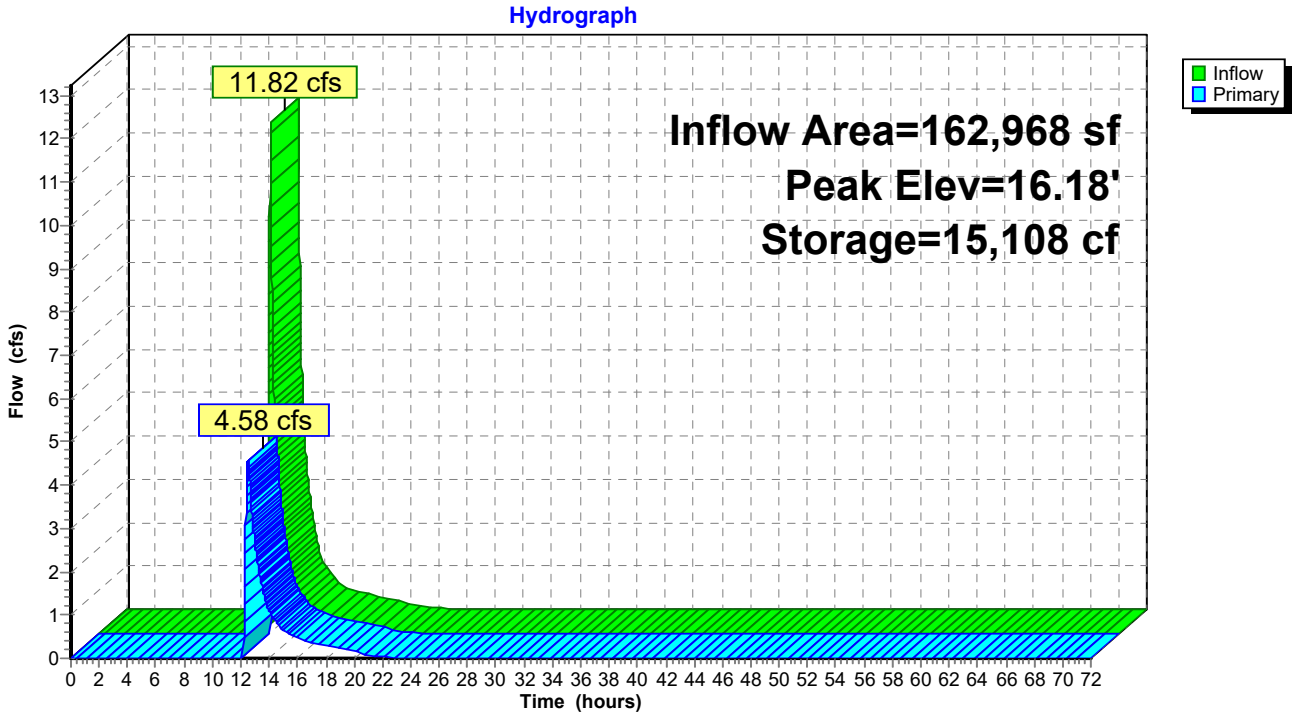
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.58 cfs @ 12.50 hrs HW=16.18' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.58 cfs @ 1.27 fps)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 6.81" for 100-Year current event
Inflow = 3.75 cfs @ 12.11 hrs, Volume= 12,614 cf
Outflow = 3.62 cfs @ 12.12 hrs, Volume= 12,614 cf, Atten= 3%, Lag= 0.6 min
Discarded = 0.02 cfs @ 1.78 hrs, Volume= 3,019 cf
Primary = 3.60 cfs @ 12.12 hrs, Volume= 9,595 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.46' @ 12.12 hrs Surf.Area= 1,743 sf Storage= 1,748 cf

Plug-Flow detention time= 170.3 min calculated for 12,612 cf (100% of inflow)
Center-of-Mass det. time= 170.4 min (923.0 - 752.6)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

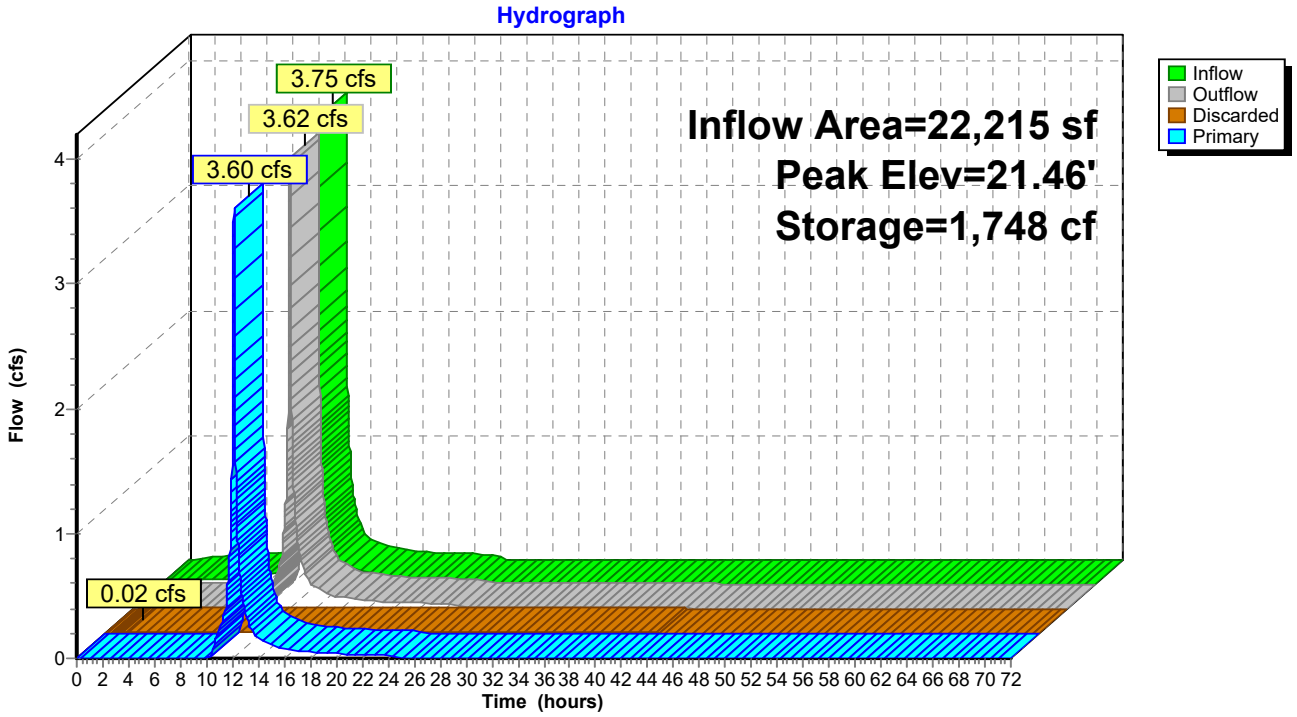
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 1.78 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=3.59 cfs @ 12.12 hrs HW=21.46' TW=18.79' (Dynamic Tailwater)
└**2=Culvert** (Passes 3.59 cfs of 8.52 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 3.49 cfs @ 1.50 fps)
  └**4=Culvert** (Barrel Controls 0.10 cfs @ 2.05 fps)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 6.93" for 100-Year current event
Inflow = 17.51 cfs @ 12.11 hrs, Volume= 55,577 cf
Outflow = 17.20 cfs @ 12.11 hrs, Volume= 55,578 cf, Atten= 2%, Lag= 0.5 min
Discarded = 0.05 cfs @ 1.29 hrs, Volume= 5,612 cf
Primary = 17.15 cfs @ 12.11 hrs, Volume= 49,966 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.79' @ 12.11 hrs Surf.Area= 2,162 sf Storage= 2,439 cf

Plug-Flow detention time= 39.8 min calculated for 55,570 cf (100% of inflow)
Center-of-Mass det. time= 39.8 min (796.9 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

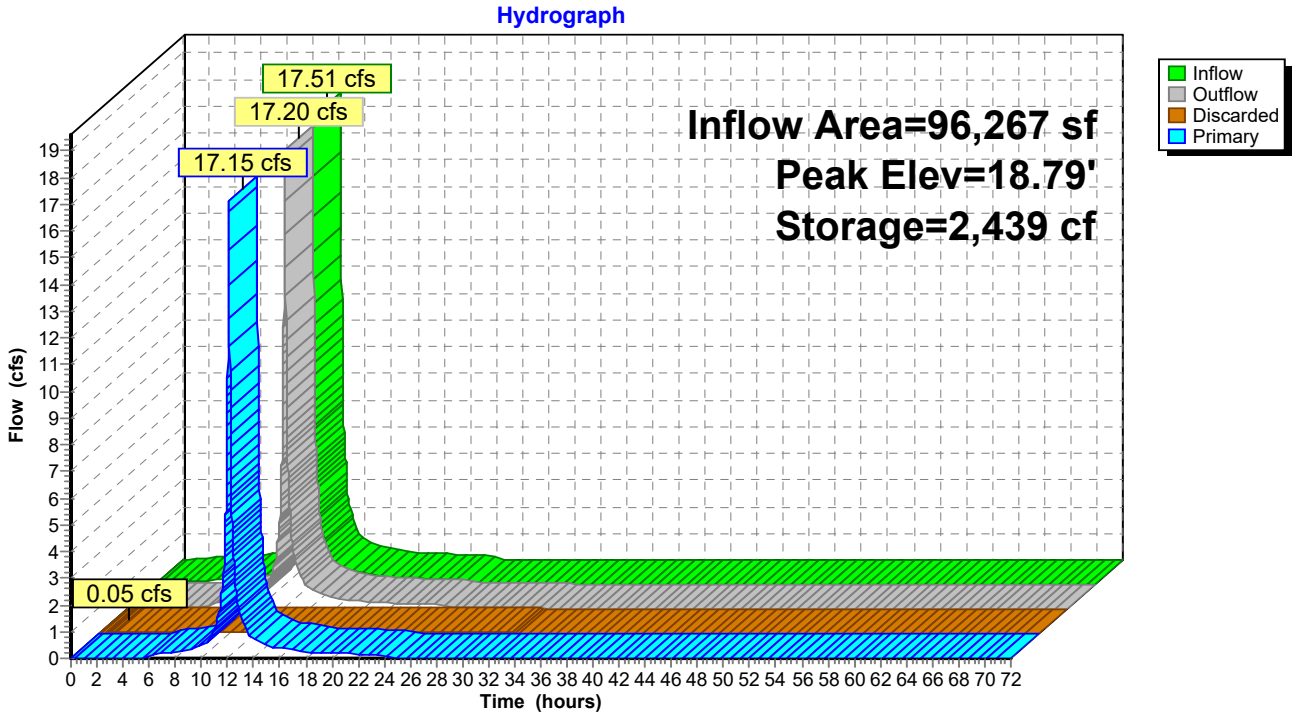
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 1.29 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=17.11 cfs @ 12.11 hrs HW=18.79' TW=16.05' (Dynamic Tailwater)
├**2=Culvert** (Passes 16.94 cfs of 19.82 cfs potential flow)
│└**1=Orifice/Grate** (Weir Controls 16.94 cfs @ 2.29 fps)
└**3=Culvert** (Inlet Controls 0.17 cfs @ 3.44 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=240)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 5.44" for 100-Year current event
Inflow = 4.78 cfs @ 12.11 hrs, Volume= 17,184 cf
Outflow = 0.50 cfs @ 13.08 hrs, Volume= 17,188 cf, Atten= 90%, Lag= 58.5 min
Discarded = 0.36 cfs @ 11.43 hrs, Volume= 15,654 cf
Primary = 0.14 cfs @ 13.08 hrs, Volume= 1,534 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.62' @ 13.08 hrs Surf.Area= 10,132 sf Storage= 5,793 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 92.0 min (859.2 - 767.1)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

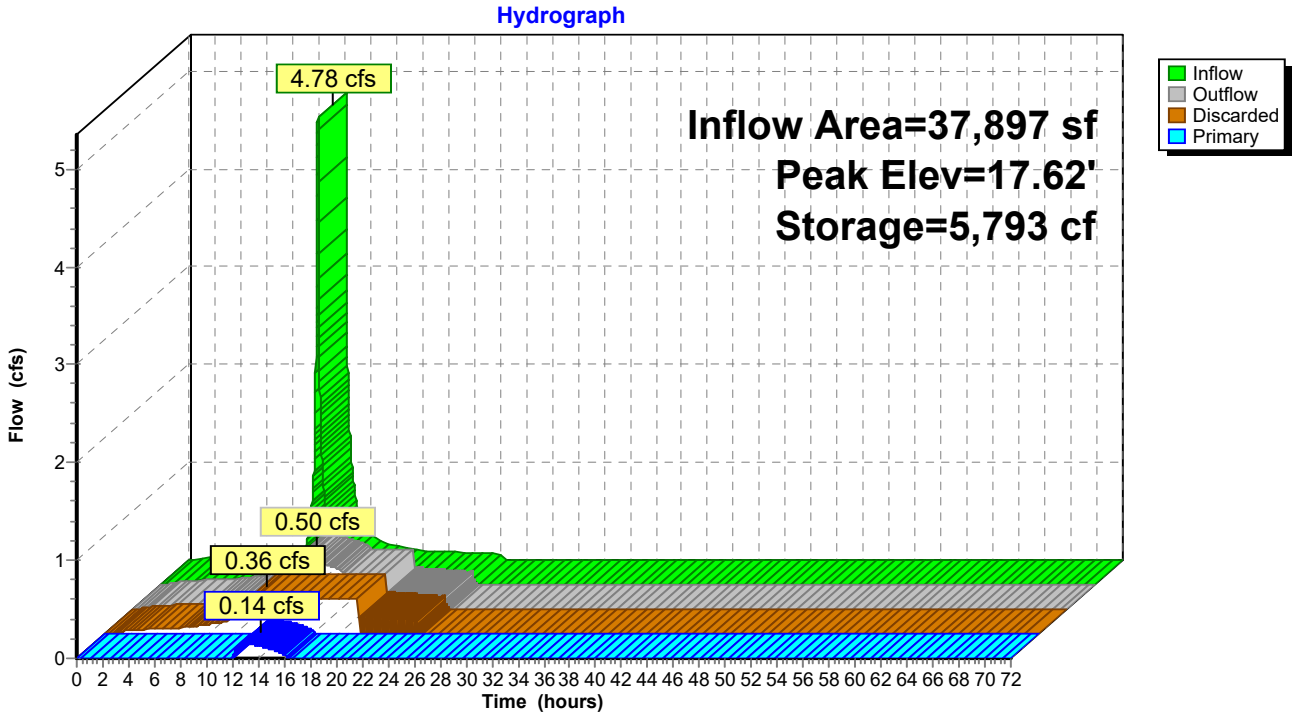
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 11.43 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.14 cfs @ 13.08 hrs HW=17.62' TW=16.99' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.14 cfs of 4.30 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Inlet Controls 0.14 cfs @ 2.85 fps)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=34)

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 4.78" for 100-Year current event
Inflow = 4.47 cfs @ 12.11 hrs, Volume= 16,860 cf
Outflow = 0.42 cfs @ 13.33 hrs, Volume= 16,861 cf, Atten= 91%, Lag= 73.2 min
Discarded = 0.18 cfs @ 10.82 hrs, Volume= 11,171 cf
Primary = 0.24 cfs @ 13.33 hrs, Volume= 5,690 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 24.75' @ 13.33 hrs Surf.Area= 5,539 sf Storage= 6,543 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 140.7 min (917.8 - 777.1)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

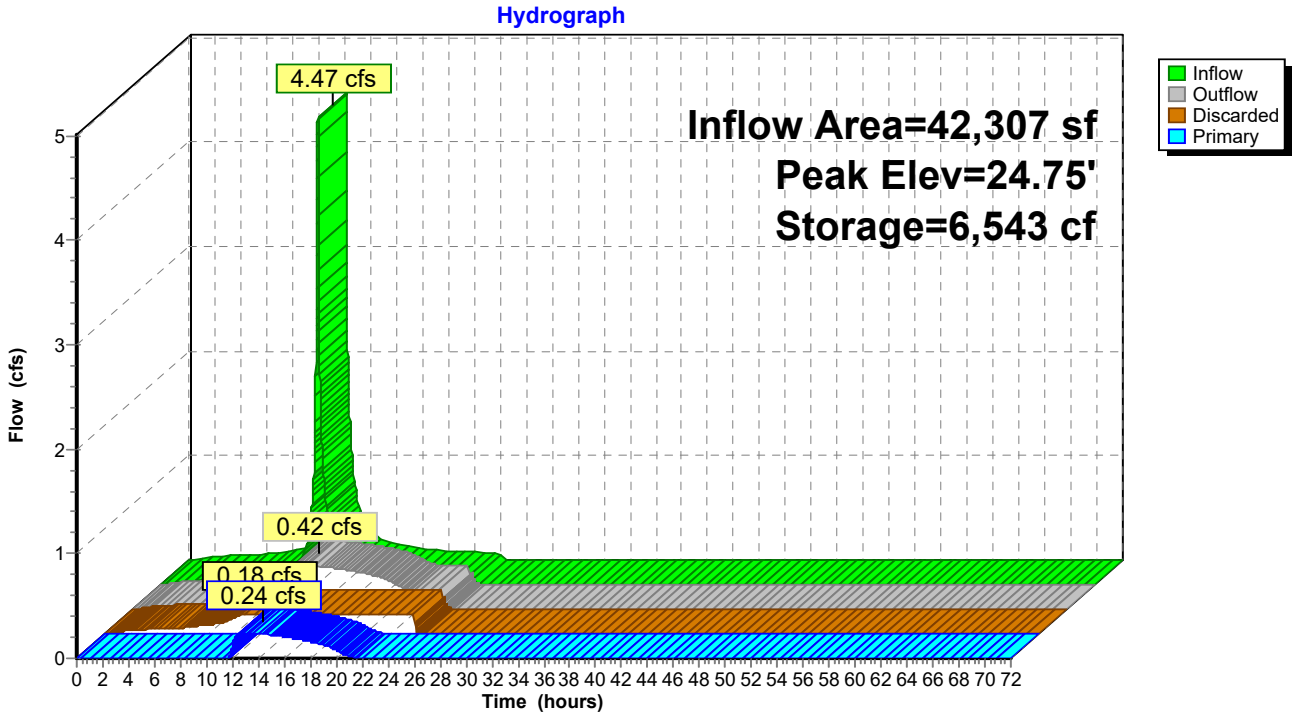
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 10.82 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.24 cfs @ 13.33 hrs HW=24.75' TW=16.06' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.24 cfs of 10.86 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Inlet Controls 0.24 cfs @ 4.86 fps)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 5.50" for 100-Year current event
Inflow = 12.71 cfs @ 12.11 hrs, Volume= 55,310 cf
Outflow = 11.89 cfs @ 12.12 hrs, Volume= 55,310 cf, Atten= 6%, Lag= 1.0 min
Discarded = 0.25 cfs @ 7.99 hrs, Volume= 22,220 cf
Primary = 11.64 cfs @ 12.12 hrs, Volume= 33,090 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.86' @ 12.12 hrs Surf.Area= 4,385 sf Storage= 6,158 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 69.4 min (845.7 - 776.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

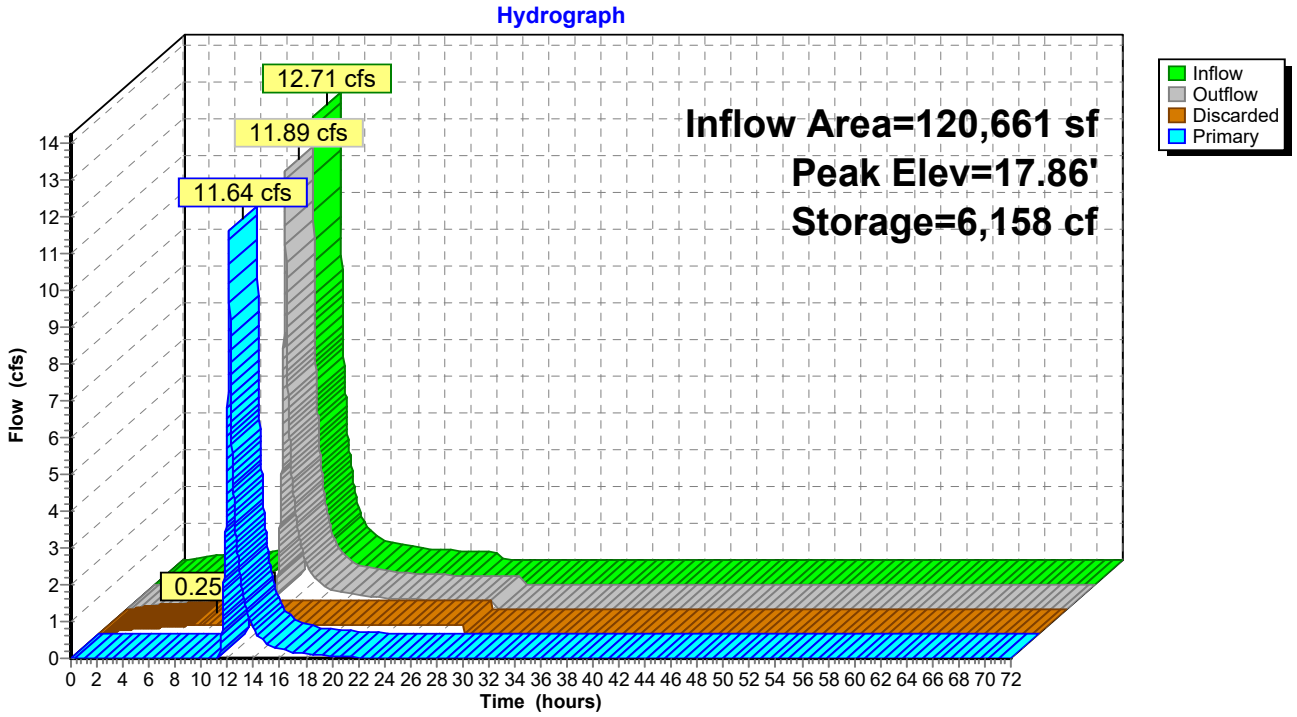
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 7.99 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=11.61 cfs @ 12.12 hrs HW=17.86' TW=15.16' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 11.05 cfs @ 1.73 fps)
└**2=Culvert** (Inlet Controls 0.56 cfs @ 2.87 fps)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 5.07" for 100-Year current event
Inflow = 15.76 cfs @ 12.15 hrs, Volume= 59,077 cf
Outflow = 0.55 cfs @ 15.94 hrs, Volume= 15,162 cf, Atten= 97%, Lag= 227.4 min
Primary = 0.55 cfs @ 15.94 hrs, Volume= 15,162 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.31' @ 15.94 hrs Surf.Area= 21,003 sf Storage= 46,276 cf

Plug-Flow detention time= 545.3 min calculated for 15,162 cf (26% of inflow)
Center-of-Mass det. time= 364.9 min (1,169.4 - 804.5)

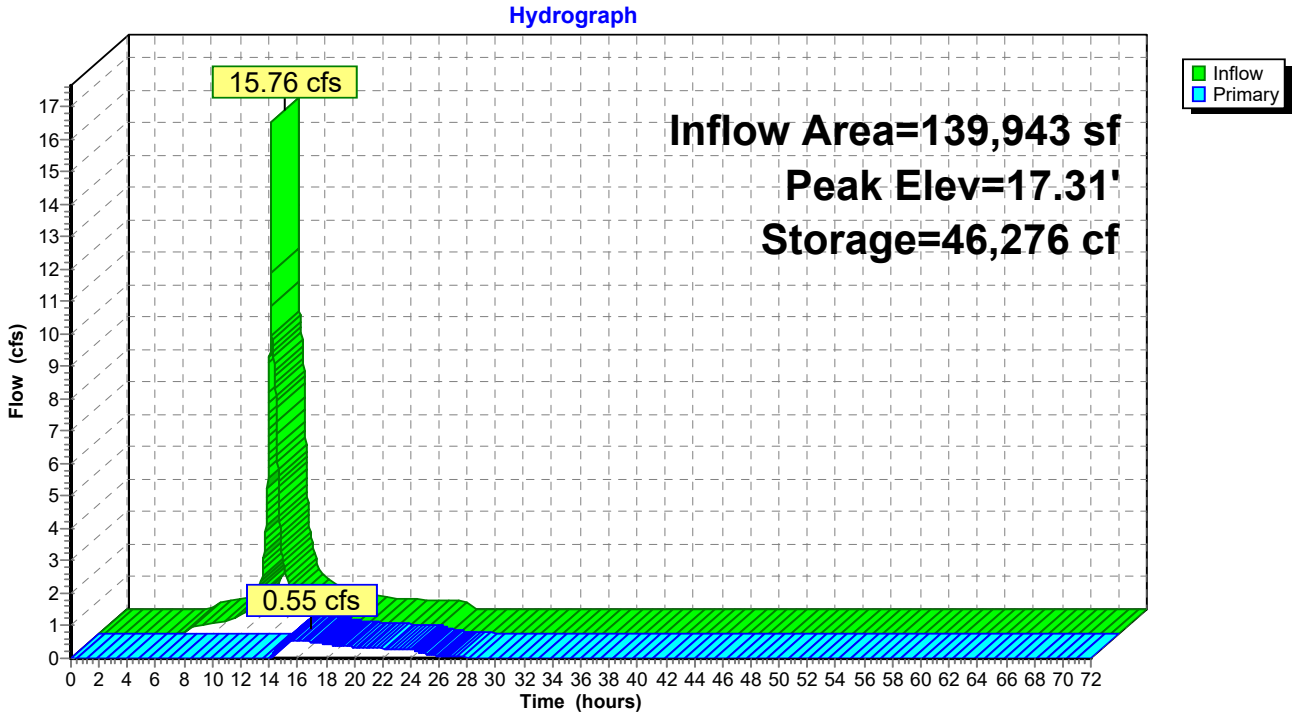
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.55 cfs @ 15.94 hrs HW=17.31' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.55 cfs @ 0.80 fps)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

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[93] Warning: Storage range exceeded by 7.42'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 7.29" for 100-Year current event
Inflow = 11.83 cfs @ 12.11 hrs, Volume= 39,171 cf
Outflow = 12.29 cfs @ 12.10 hrs, Volume= 38,379 cf, Atten= 0%, Lag= 0.0 min
Primary = 12.29 cfs @ 12.10 hrs, Volume= 38,379 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 26.42' @ 12.16 hrs Surf.Area= 2,363 sf Storage= 2,908 cf

Plug-Flow detention time= 30.3 min calculated for 38,379 cf (98% of inflow)
Center-of-Mass det. time= 16.9 min (765.8 - 748.9)

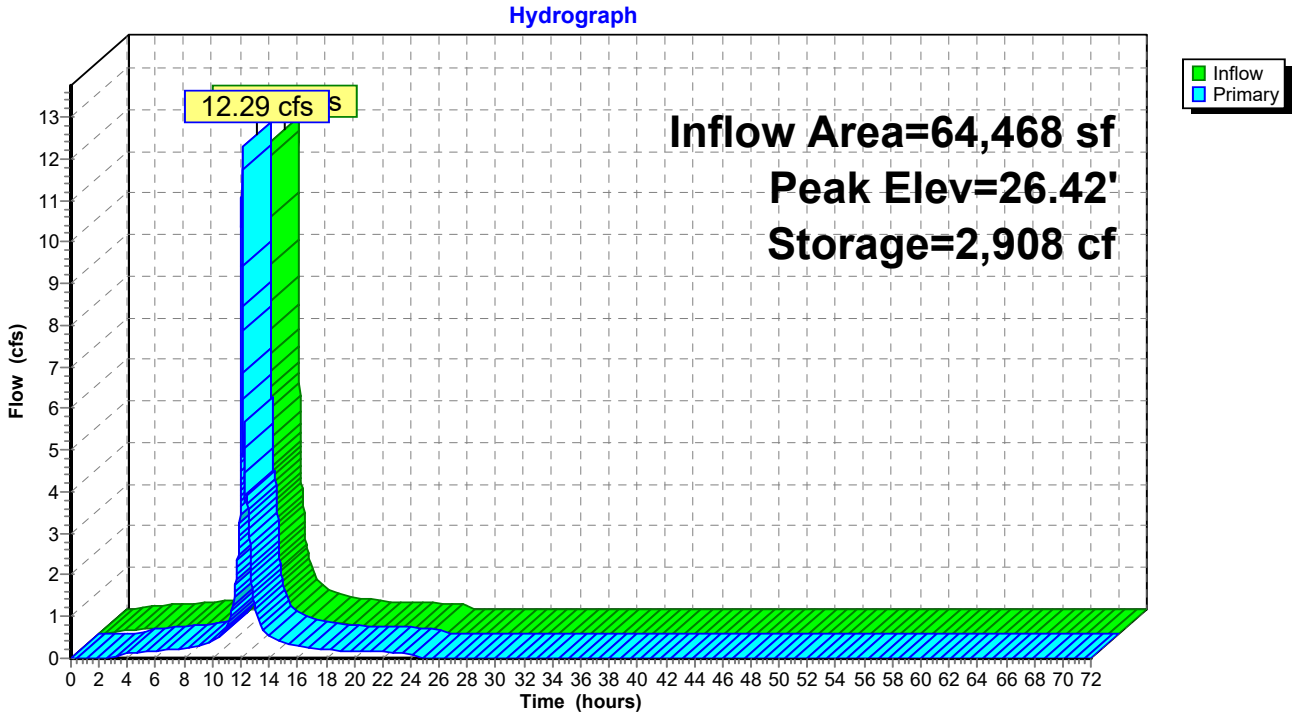
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=12.17 cfs @ 12.10 hrs HW=23.80' TW=18.35' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 12.17 cfs @ 9.92 fps)
↑—**1=Orifice/Grate** (Passes 12.17 cfs of 157.41 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

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[93] Warning: Storage range exceeded by 5.64'
[80] Warning: Exceeded Pond Pre bio-1 by 3.60' @ 12.15 hrs (9.89 cfs 356 cf)

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 6.51" for 100-Year current event
Inflow = 17.02 cfs @ 12.10 hrs, Volume= 55,563 cf
Outflow = 14.97 cfs @ 12.15 hrs, Volume= 53,332 cf, Atten= 12%, Lag= 2.9 min
Primary = 14.97 cfs @ 12.15 hrs, Volume= 53,332 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 24.14' @ 12.15 hrs Surf.Area= 6,554 sf Storage= 6,035 cf

Plug-Flow detention time= 51.9 min calculated for 53,332 cf (96% of inflow)
Center-of-Mass det. time= 27.0 min (793.3 - 766.2)

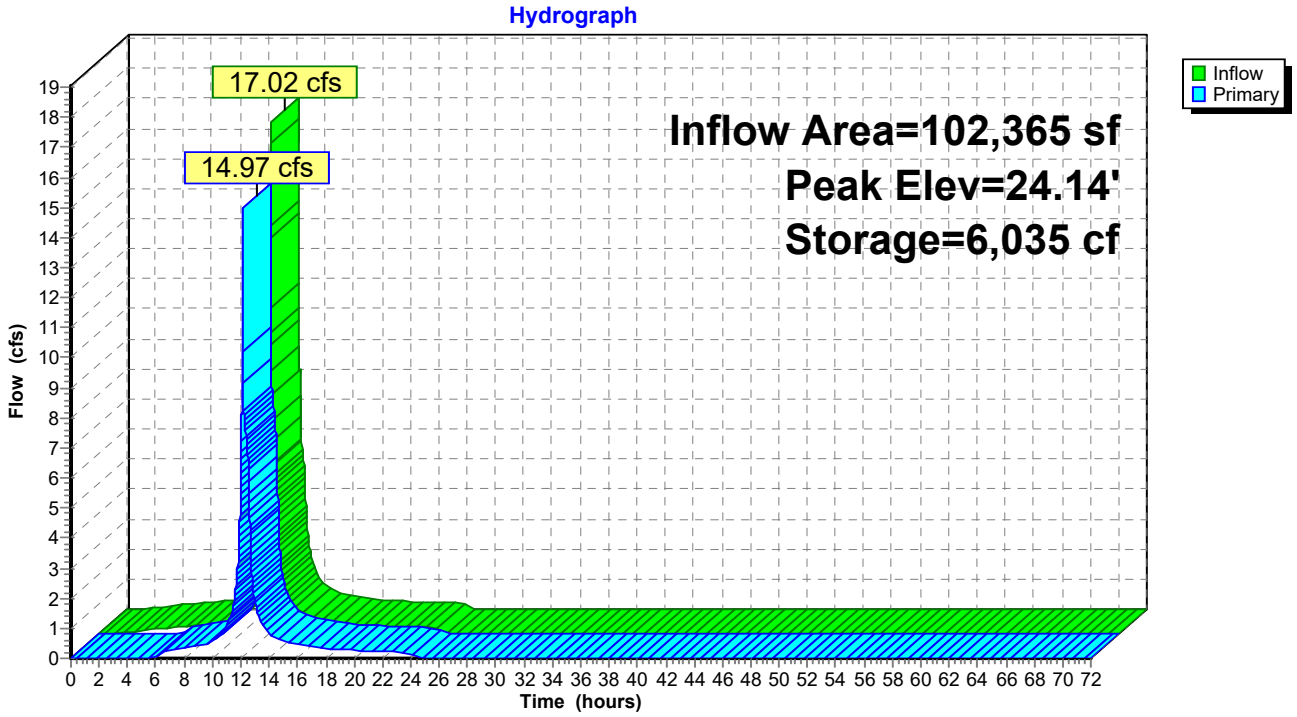
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=14.93 cfs @ 12.15 hrs HW=24.12' TW=15.92' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 14.93 cfs @ 12.16 fps)
↑—**1=Orifice/Grate** (Passes 14.93 cfs of 169.21 cfs potential flow)

Pond Pre bio-2: Pre Bio Ret 2

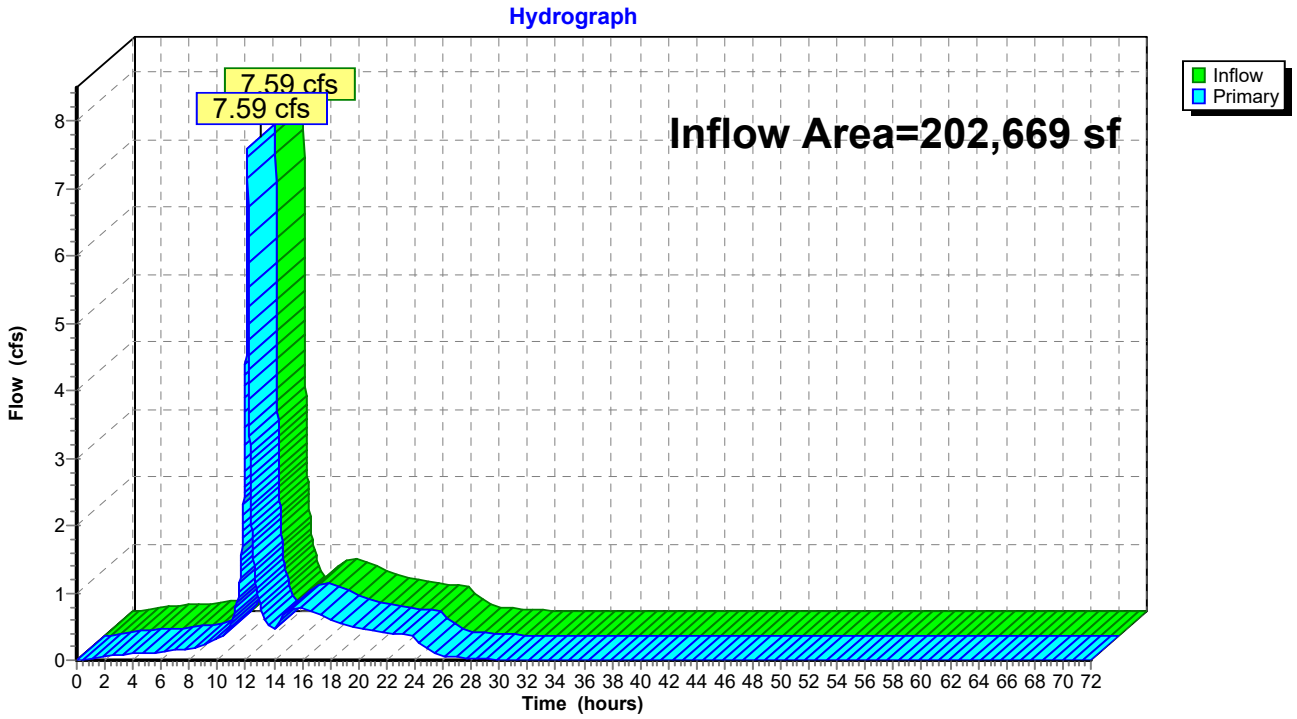


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 2.60" for 100-Year current event
Inflow = 7.59 cfs @ 12.12 hrs, Volume= 43,918 cf
Primary = 7.59 cfs @ 12.12 hrs, Volume= 43,918 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

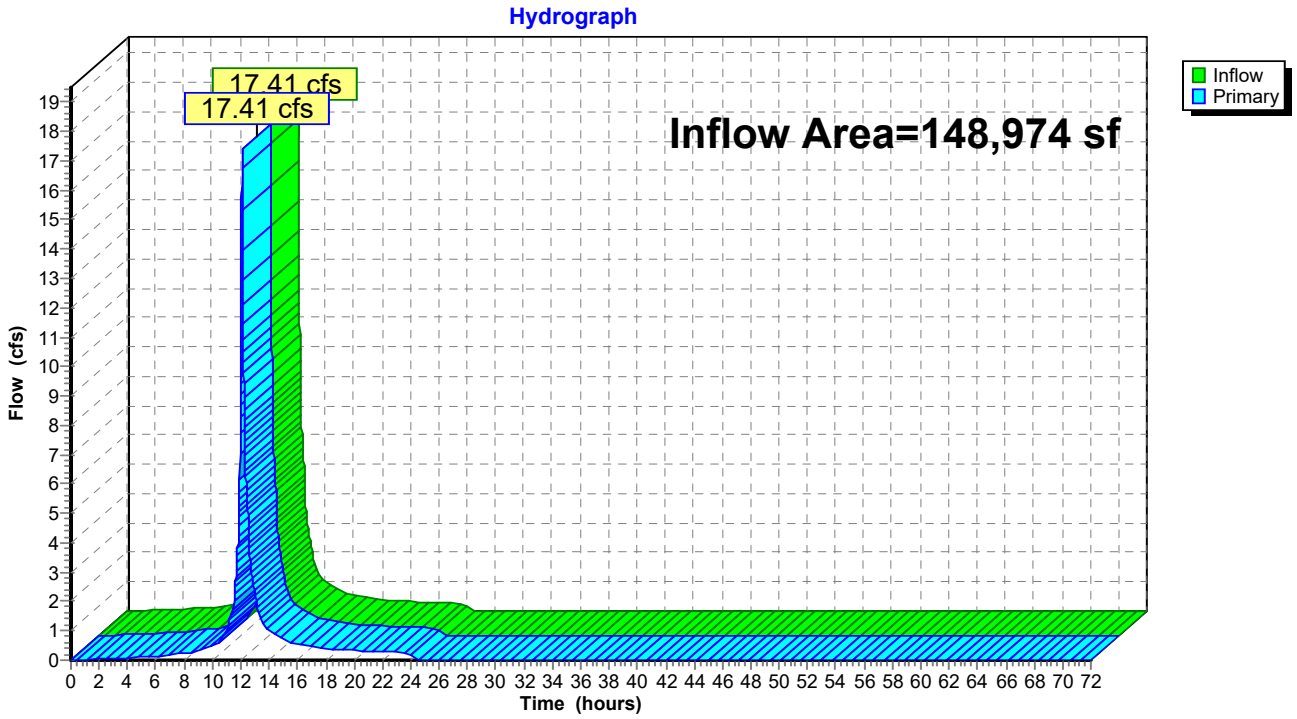


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 4.99" for 100-Year current event
Inflow = 17.41 cfs @ 12.11 hrs, Volume= 61,978 cf
Primary = 17.41 cfs @ 12.11 hrs, Volume= 61,978 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

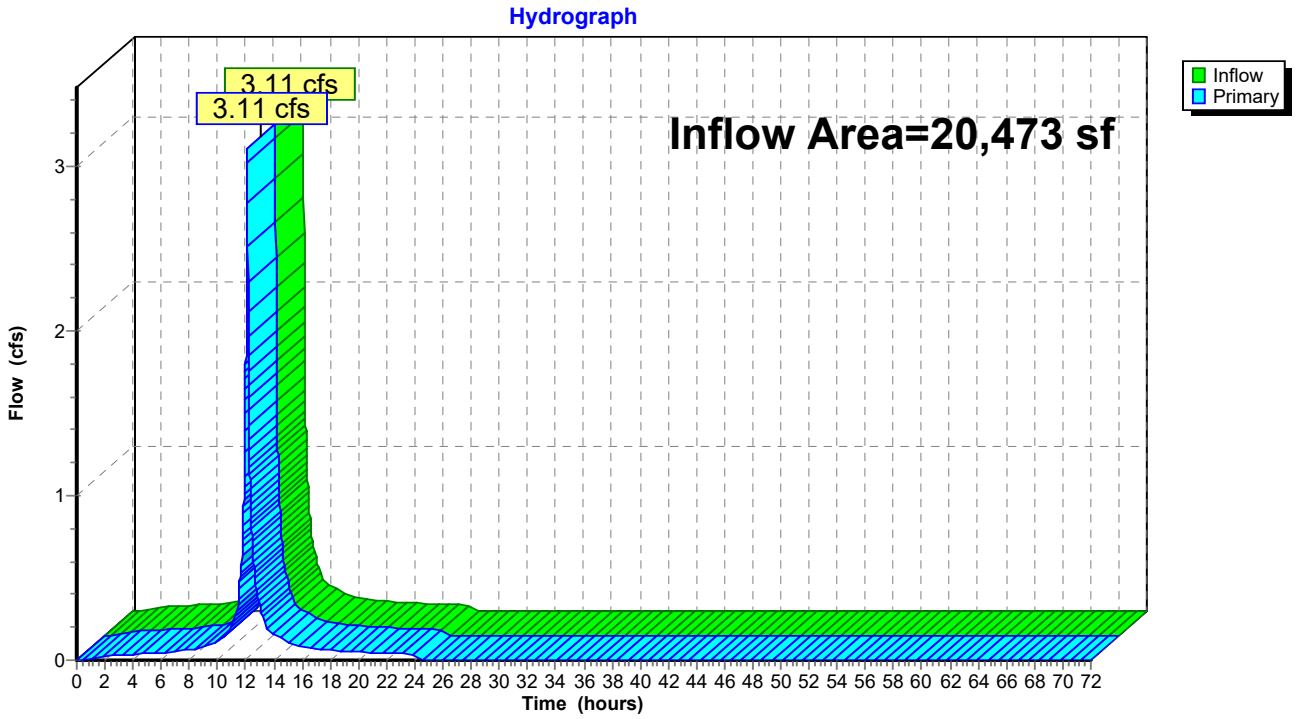


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 6.36" for 100-Year current event
Inflow = 3.11 cfs @ 12.11 hrs, Volume= 10,853 cf
Primary = 3.11 cfs @ 12.11 hrs, Volume= 10,853 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

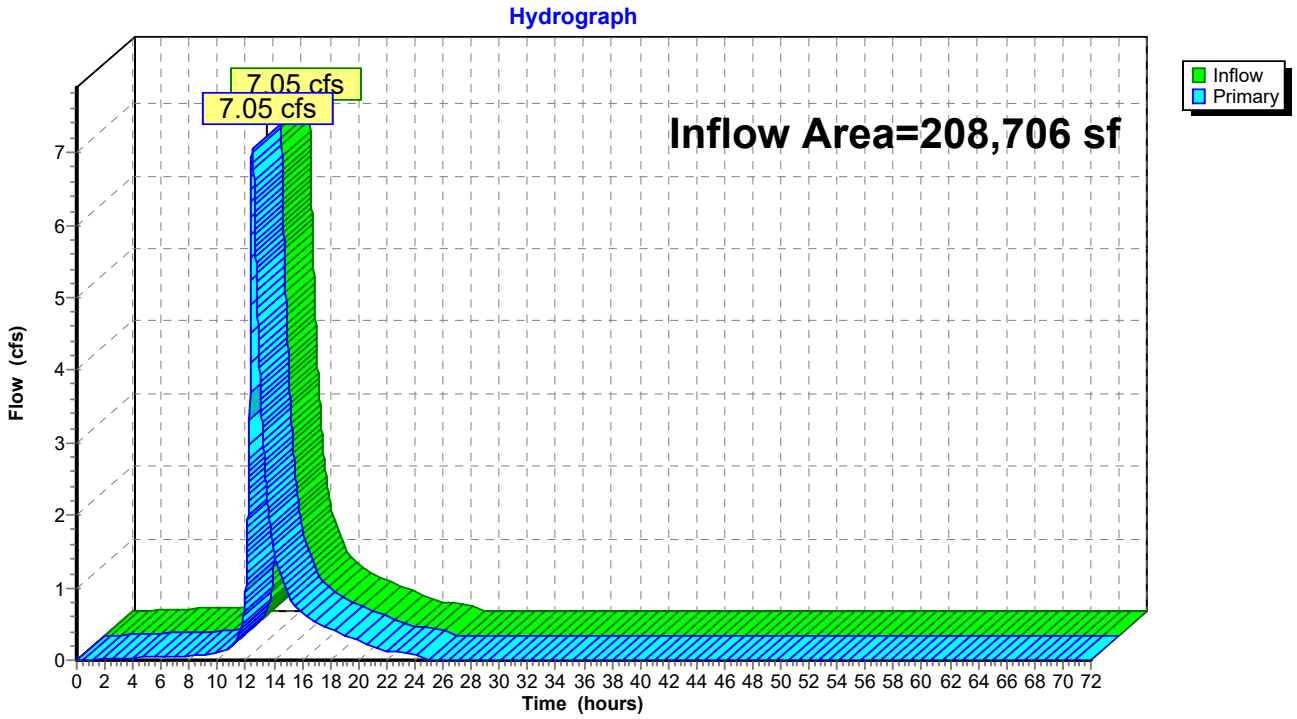


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 2.54" for 100-Year current event
Inflow = 7.05 cfs @ 12.46 hrs, Volume= 44,237 cf
Primary = 7.05 cfs @ 12.46 hrs, Volume= 44,237 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

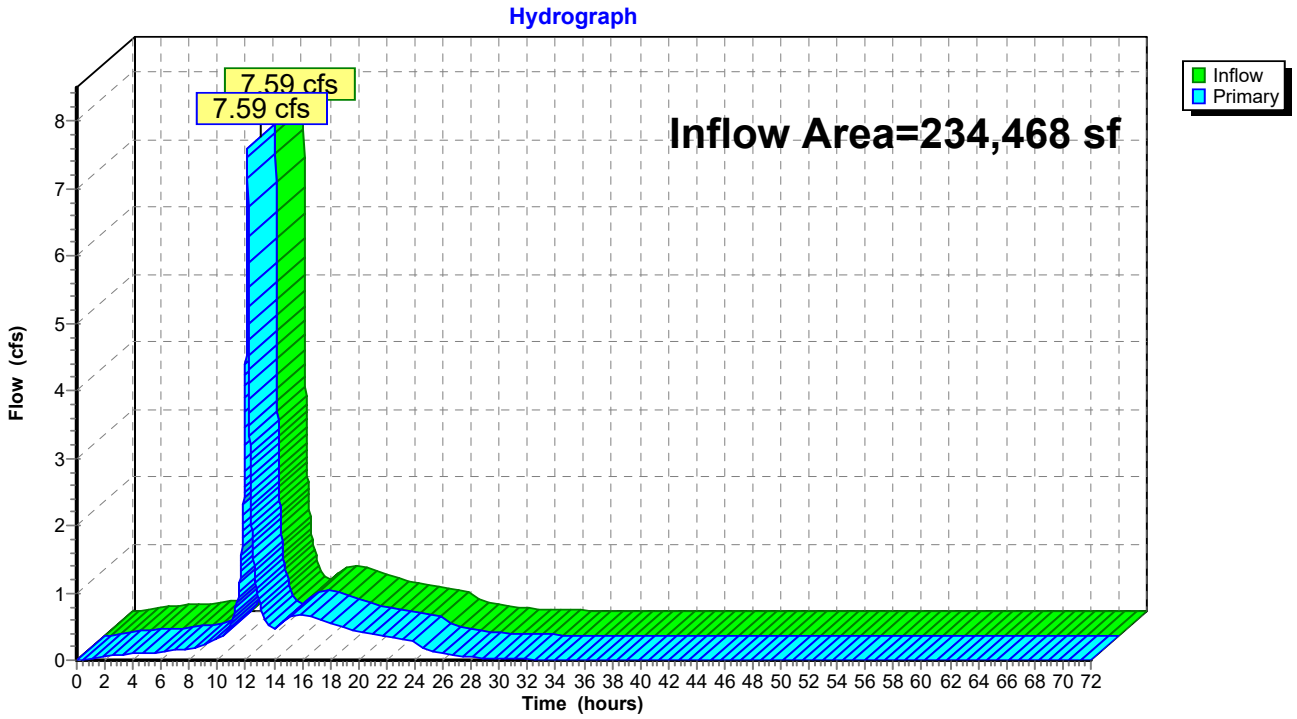


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 2.15" for 100-Year current event
Inflow = 7.59 cfs @ 12.12 hrs, Volume= 42,081 cf
Primary = 7.59 cfs @ 12.12 hrs, Volume= 42,081 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

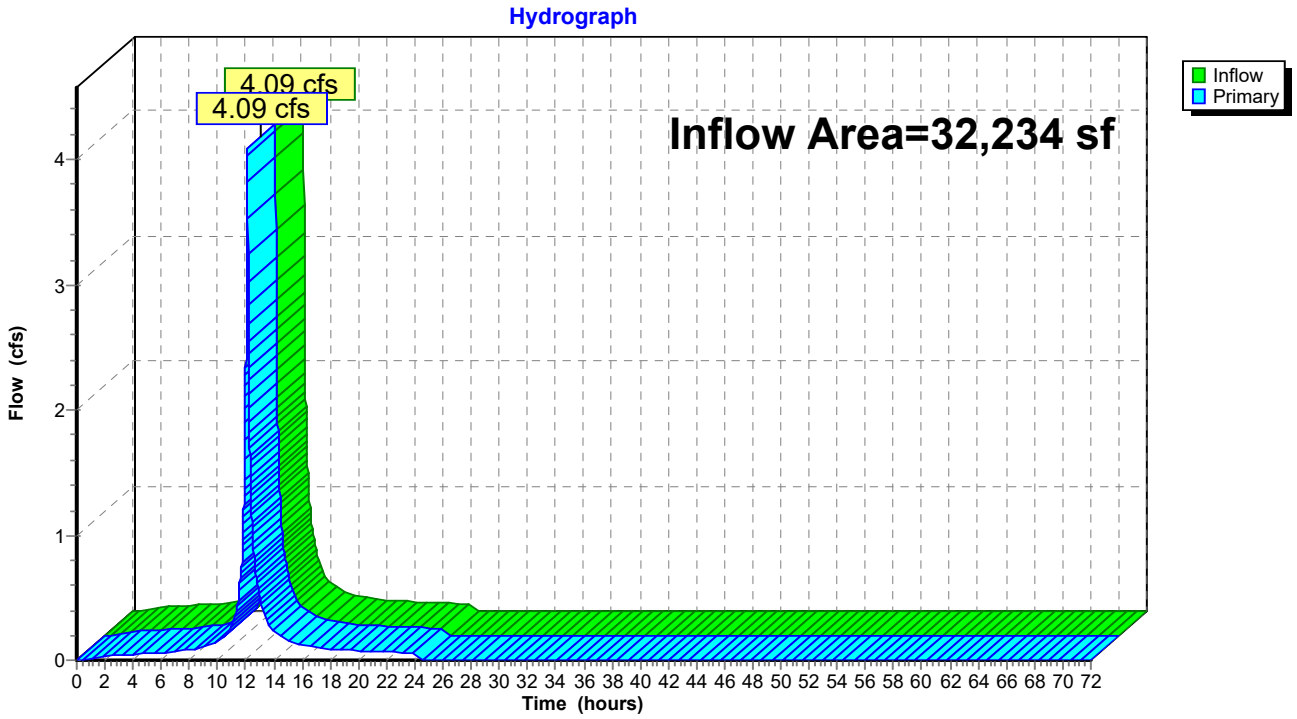


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 5.62" for 100-Year current event
Inflow = 4.09 cfs @ 12.11 hrs, Volume= 15,085 cf
Primary = 4.09 cfs @ 12.11 hrs, Volume= 15,085 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=16.50 cfs 52,279 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=6.39"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=3.80 cfs 24,372 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.39 cfs 13,903 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.34 cfs 1,739 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.83 cfs 4,272 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=5.42 cfs 17,180 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.90 cfs 4,644 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=3.61 cfs 11,648 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.37 cfs 1,901 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=1.73 cfs 8,978 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=330' Tc=3.9 min CN=98 Runoff=9.13 cfs 32,451 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=1.51"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.27 cfs 3,510 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.95 cfs 15,675 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=1.18 cfs 6,084 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=13.37 cfs 42,368 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=3.68"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=1.97 cfs 9,679 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=4.98"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=2.18 cfs 18,073 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=13.96 cfs 44,216 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.78 cfs 4,052 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=5.42 cfs 17,180 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.90 cfs 4,644 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=4.64 cfs 15,320 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.73 cfs 3,769 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=1.73 cfs 8,978 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=330' Tc=3.9 min CN=98 Runoff=9.13 cfs 32,451 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=1.51"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.27 cfs 3,510 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=11.17"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=4.84 cfs 15,320 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=2.87"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.73 cfs 3,769 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=9.87"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=13.82 cfs 40,429 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=3.68"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=4.25 cfs 20,744 cf

Pond 4P: Pre developed infiltration basin Peak Elev=17.55' Storage=51,369 cf Inflow=20.52 cfs 75,268 cf
Outflow=1.57 cfs 31,348 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=16.31' Storage=16,039 cf Inflow=14.79 cfs 56,077 cf
Outflow=8.45 cfs 42,882 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.49' Storage=1,804 cf Inflow=4.60 cfs 15,642 cf
Discarded=0.02 cfs 3,038 cf Primary=4.44 cfs 12,604 cf Outflow=4.46 cfs 15,642 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.94' Storage=2,766 cf Inflow=21.40 cfs 69,155 cf
Discarded=0.05 cfs 5,645 cf Primary=19.37 cfs 63,511 cf Outflow=19.42 cfs 69,156 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.84' Storage=8,054 cf Inflow=5.99 cfs 21,824 cf
Discarded=0.36 cfs 19,048 cf Primary=0.29 cfs 2,779 cf Outflow=0.65 cfs 21,827 cf

Pond Bio 70: Post Bio-70 Peak Elev=24.94' Storage=7,629 cf Inflow=5.69 cfs 21,759 cf
Discarded=0.18 cfs 12,380 cf Primary=1.26 cfs 9,382 cf Outflow=1.44 cfs 21,762 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.92' Storage=6,458 cf Inflow=15.73 cfs 70,120 cf
Discarded=0.25 cfs 23,425 cf Primary=14.58 cfs 46,695 cf Outflow=14.83 cfs 70,120 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=17.48' Storage=49,710 cf Inflow=23.42 cfs 76,048 cf
Outflow=2.10 cfs 32,133 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=39.85' Storage=2,908 cf Inflow=14.45 cfs 48,268 cf
Outflow=16.15 cfs 47,476 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=34.42' Storage=6,035 cf Inflow=22.12 cfs 69,300 cf
Outflow=22.30 cfs 67,070 cf

Link 1L: Pre dis 1 Inflow=9.15 cfs 68,094 cf
Primary=9.15 cfs 68,094 cf

Link 3L: Pre discharge point 3 Inflow=22.05 cfs 80,261 cf
Primary=22.05 cfs 80,261 cf

Link 4L: Post discharge point 2 Inflow=3.84 cfs 13,549 cf
Primary=3.84 cfs 13,549 cf

Link 6L: Discharge point 3 post Inflow=12.22 cfs 67,254 cf
Primary=12.22 cfs 67,254 cf

Link 11L: Post dis 1 Inflow=9.15 cfs 67,308 cf
Primary=9.15 cfs 67,308 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=5.11 cfs 19,088 cf
Primary=5.11 cfs 19,088 cf

Total Runoff Area = 847,524 sf Runoff Volume = 483,138 cf Average Runoff Depth = 6.84"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

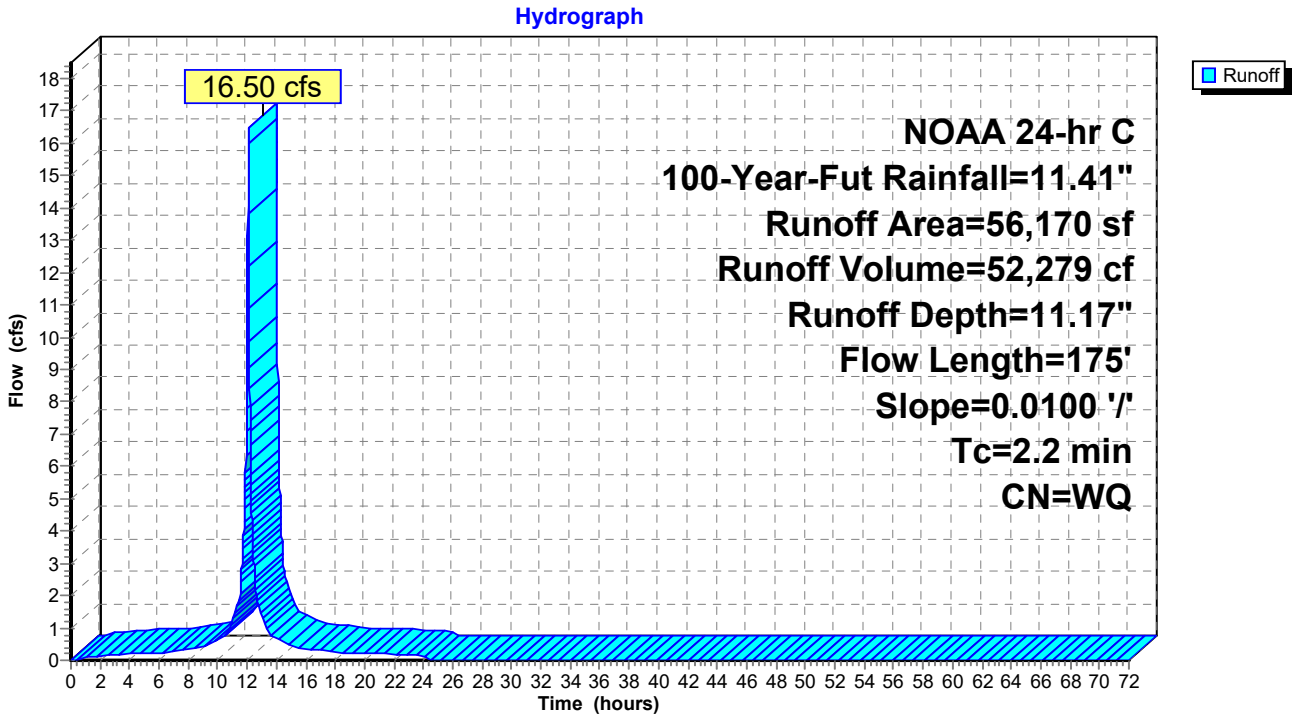
Runoff = 16.50 cfs @ 12.11 hrs, Volume= 52,279 cf, Depth=11.17"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

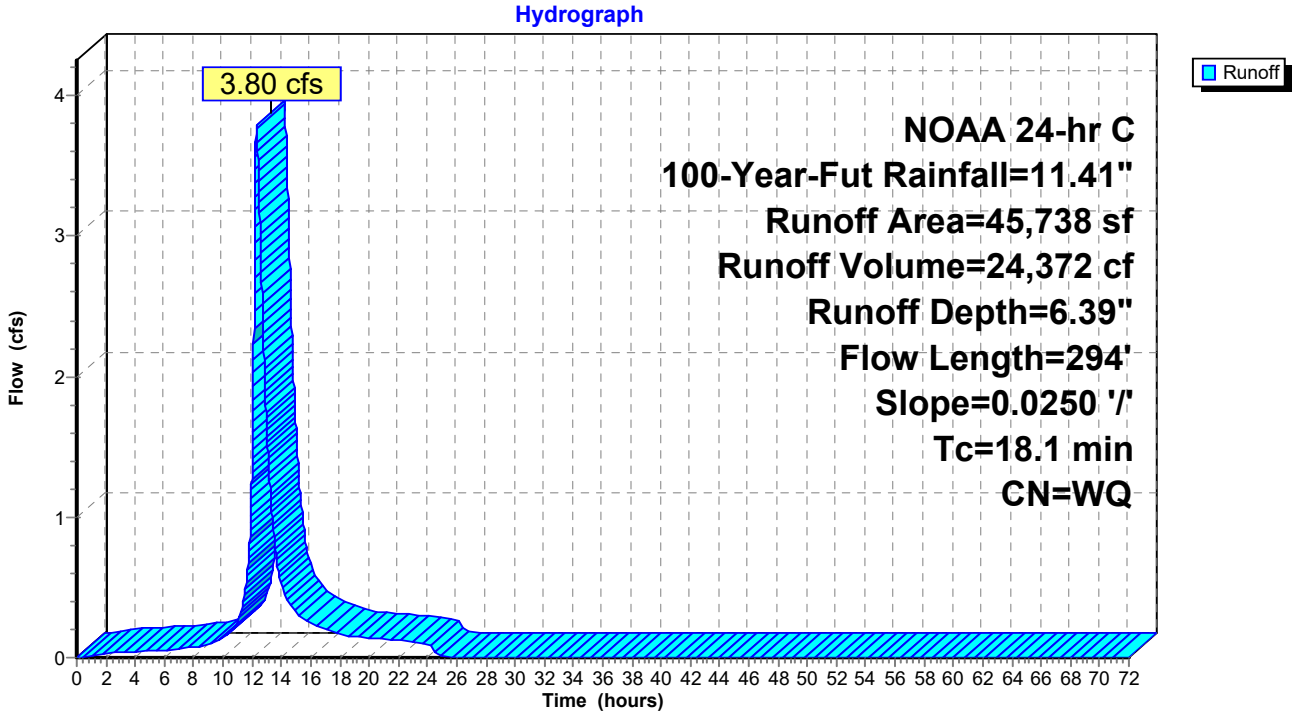
Runoff = 3.80 cfs @ 12.31 hrs, Volume= 24,372 cf, Depth= 6.39"
Routed to Link 6L : Discharge point 3 post

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

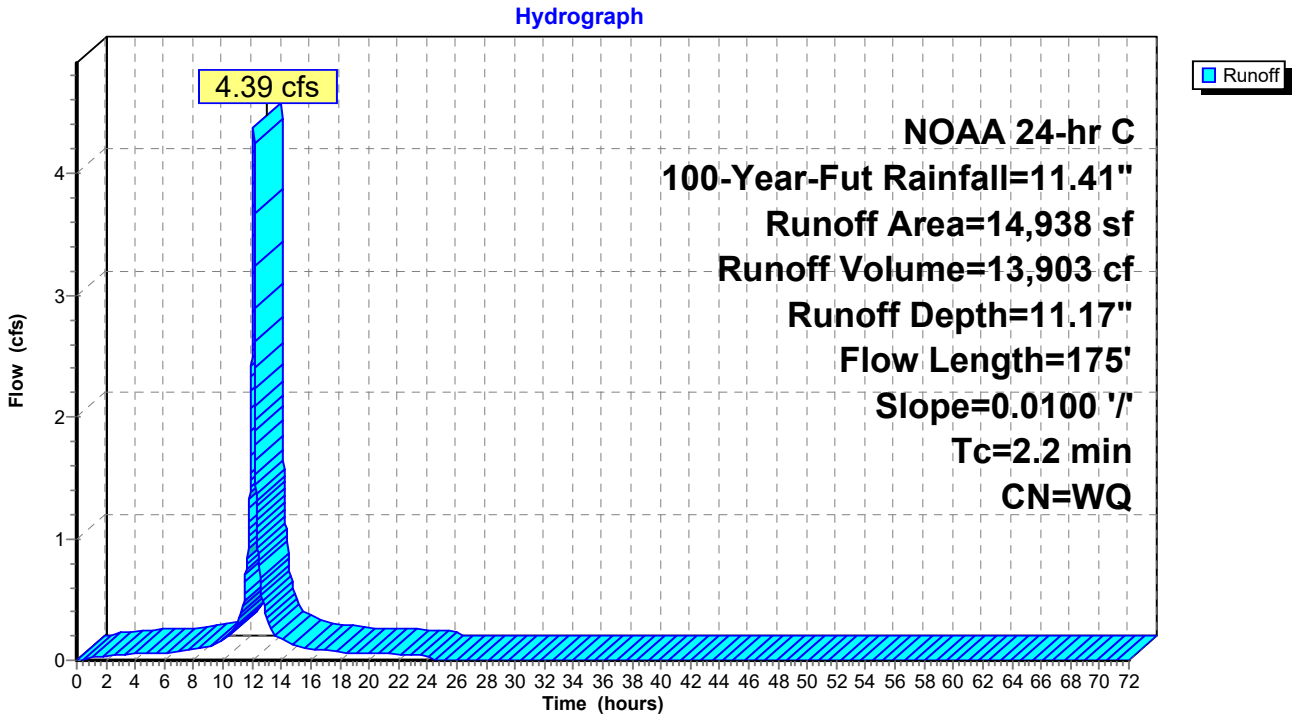
Runoff = 4.39 cfs @ 12.11 hrs, Volume= 13,903 cf, Depth=11.17"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

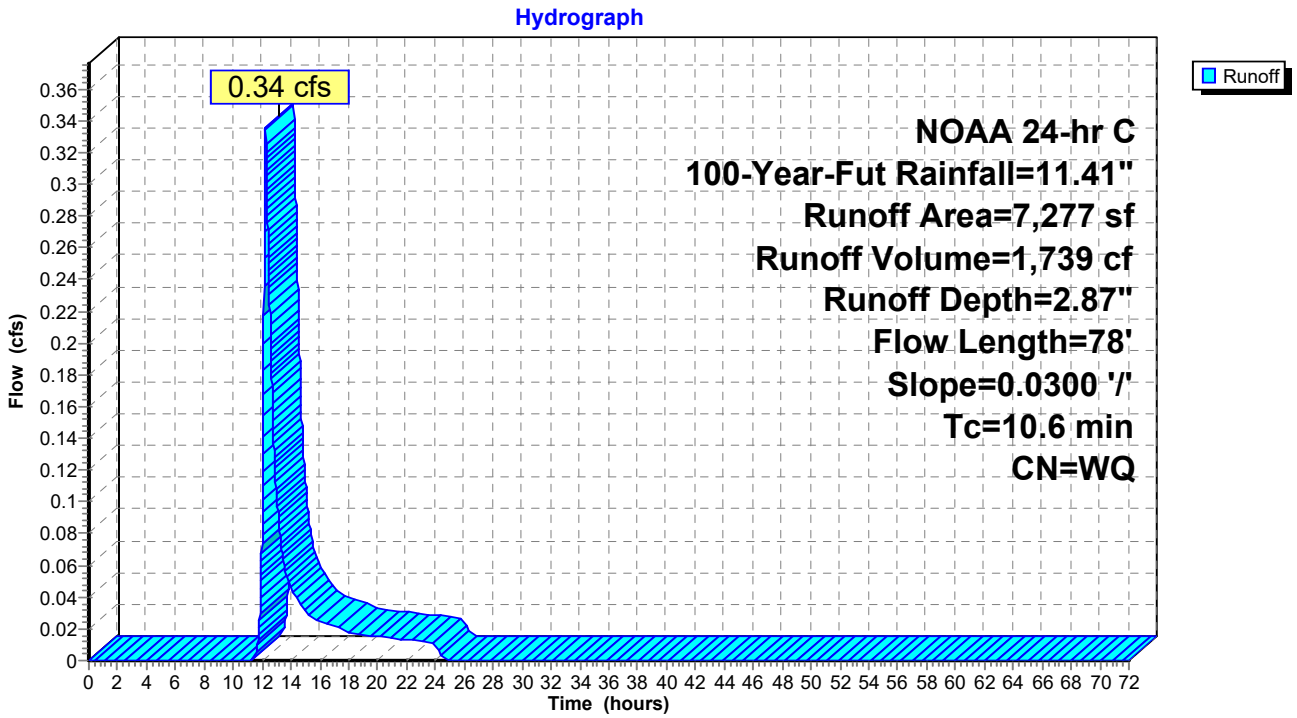
Runoff = 0.34 cfs @ 12.22 hrs, Volume= 1,739 cf, Depth= 2.87"
Routed to Pond Bio -30 : Post Bio-30

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

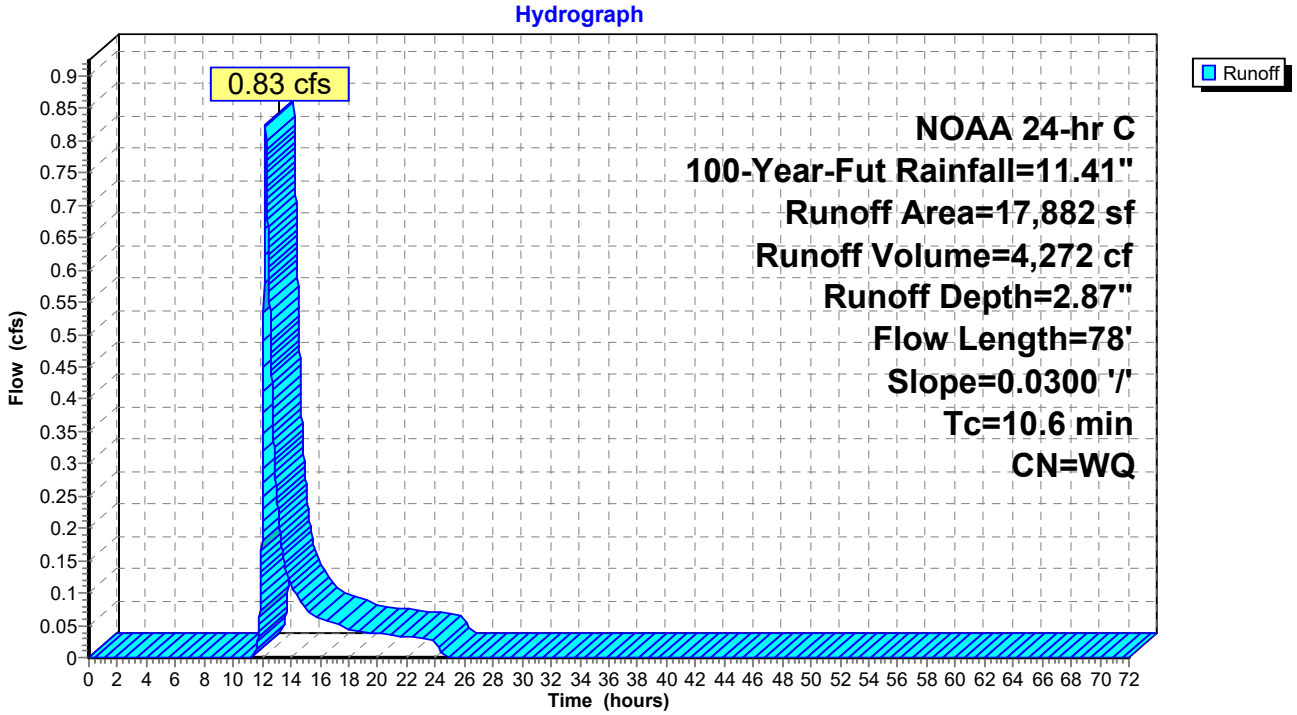
Runoff = 0.83 cfs @ 12.22 hrs, Volume= 4,272 cf, Depth= 2.87"
Routed to Pond Bio 10 : Pre Bio Ret 10

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

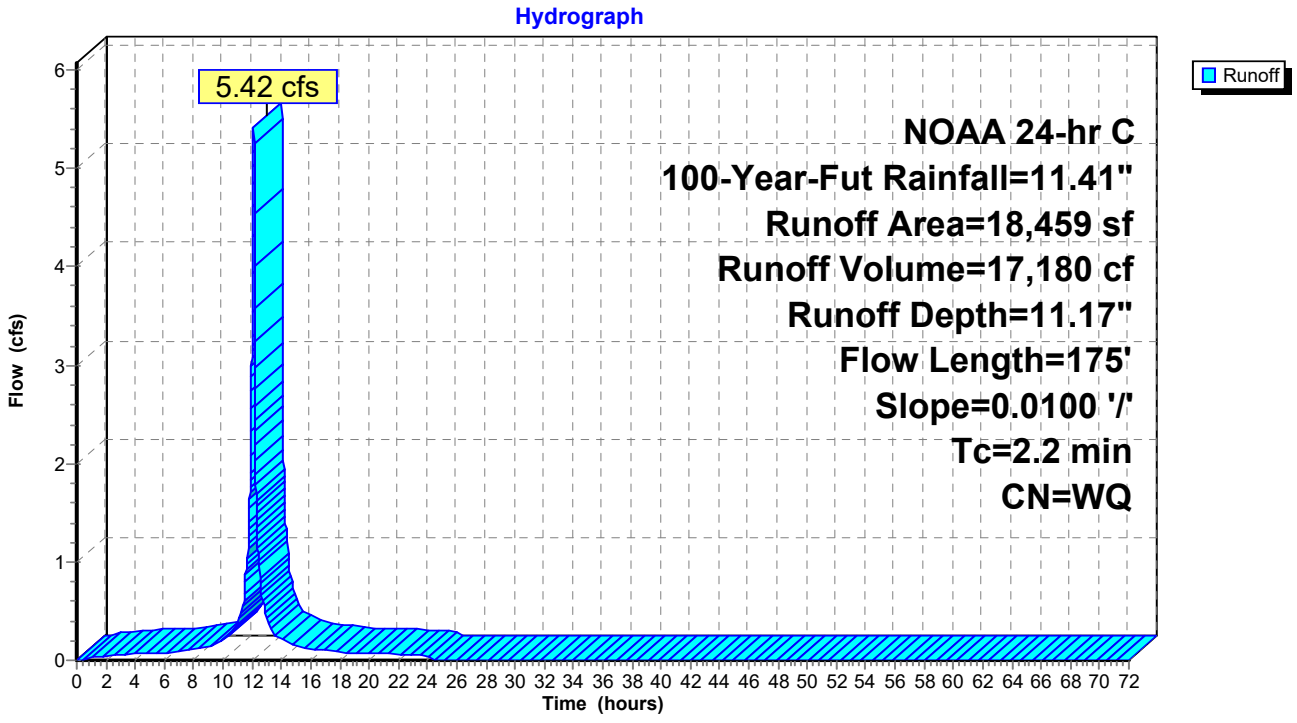
Runoff = 5.42 cfs @ 12.11 hrs, Volume= 17,180 cf, Depth=11.17"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

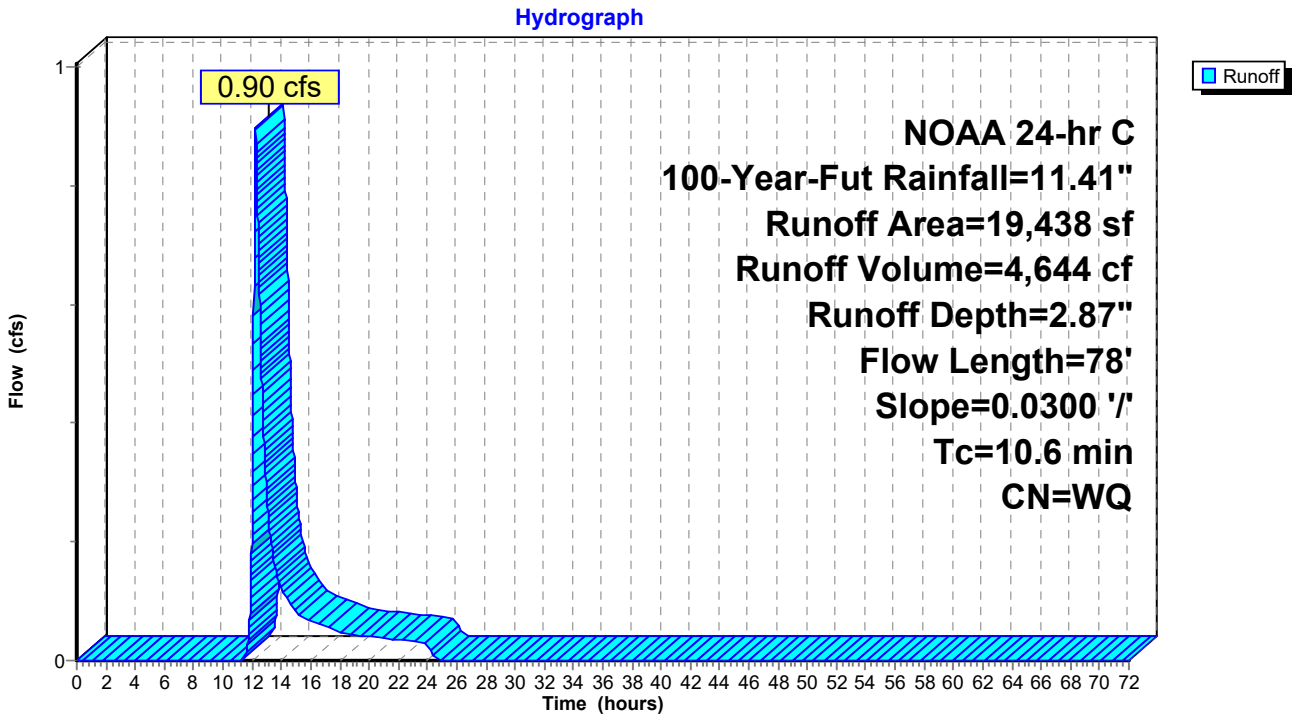
Runoff = 0.90 cfs @ 12.22 hrs, Volume= 4,644 cf, Depth= 2.87"
Routed to Pond Bio 20 : Post Bio-20

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

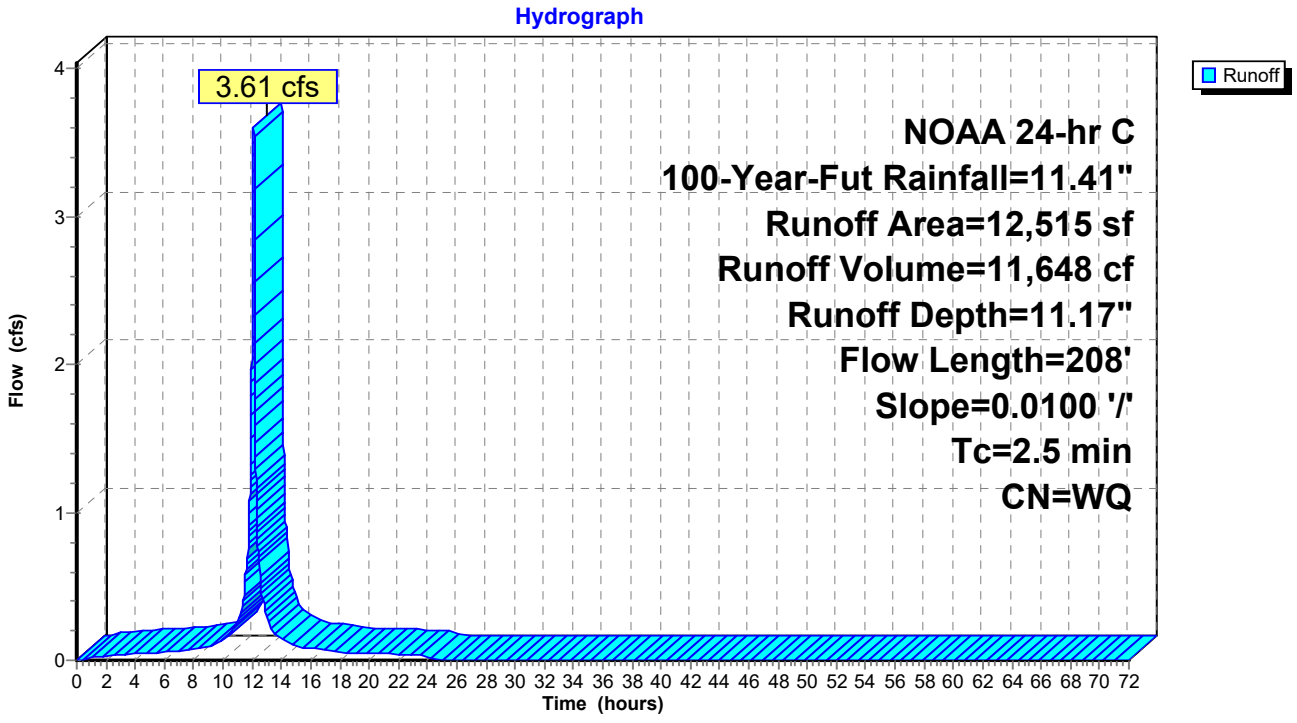
Runoff = 3.61 cfs @ 12.11 hrs, Volume= 11,648 cf, Depth=11.17"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

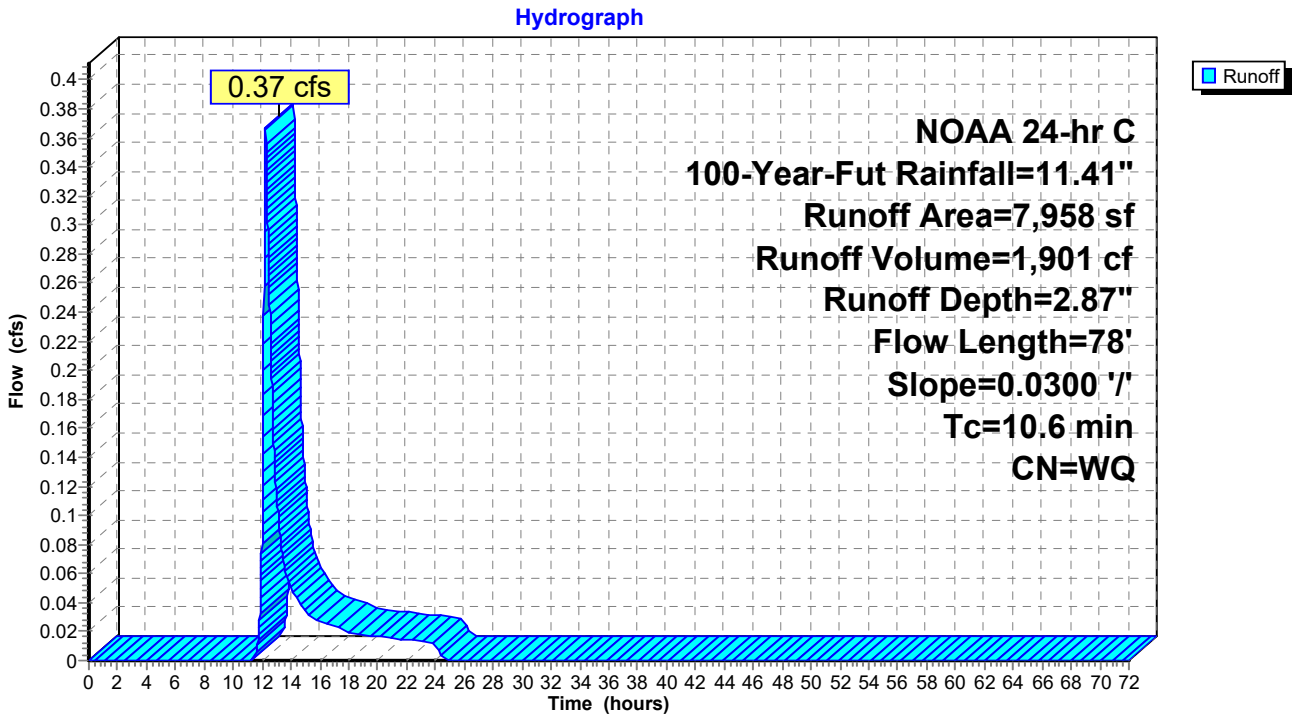
Runoff = 0.37 cfs @ 12.22 hrs, Volume= 1,901 cf, Depth= 2.87"
Routed to Link 4L : Post discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

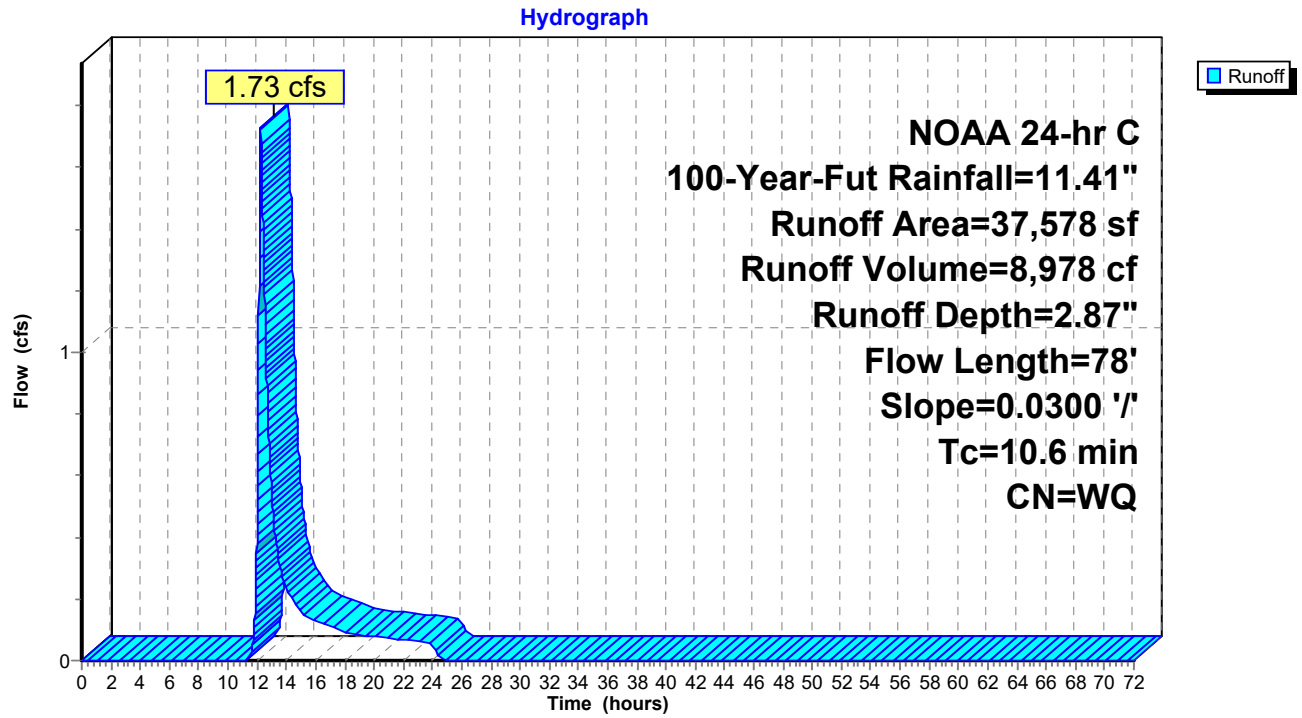
Runoff = 1.73 cfs @ 12.22 hrs, Volume= 8,978 cf, Depth= 2.87"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

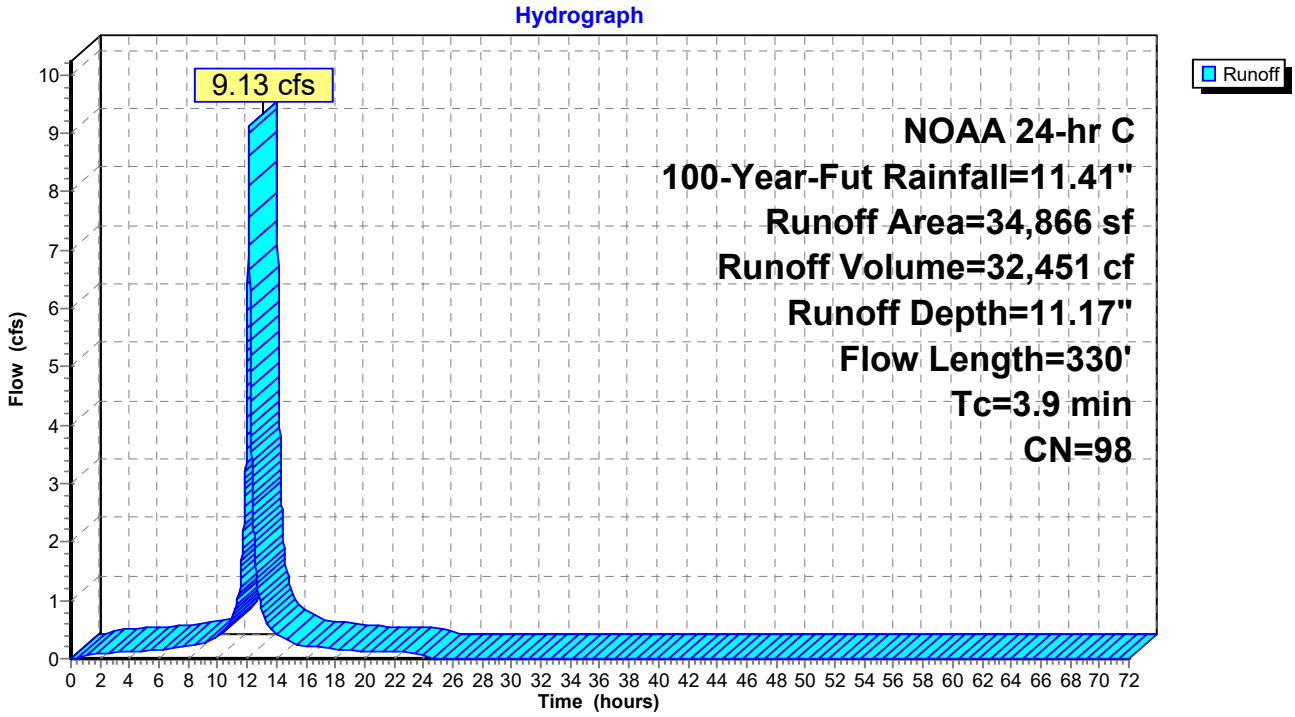
Runoff = 9.13 cfs @ 12.12 hrs, Volume= 32,451 cf, Depth=11.17"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

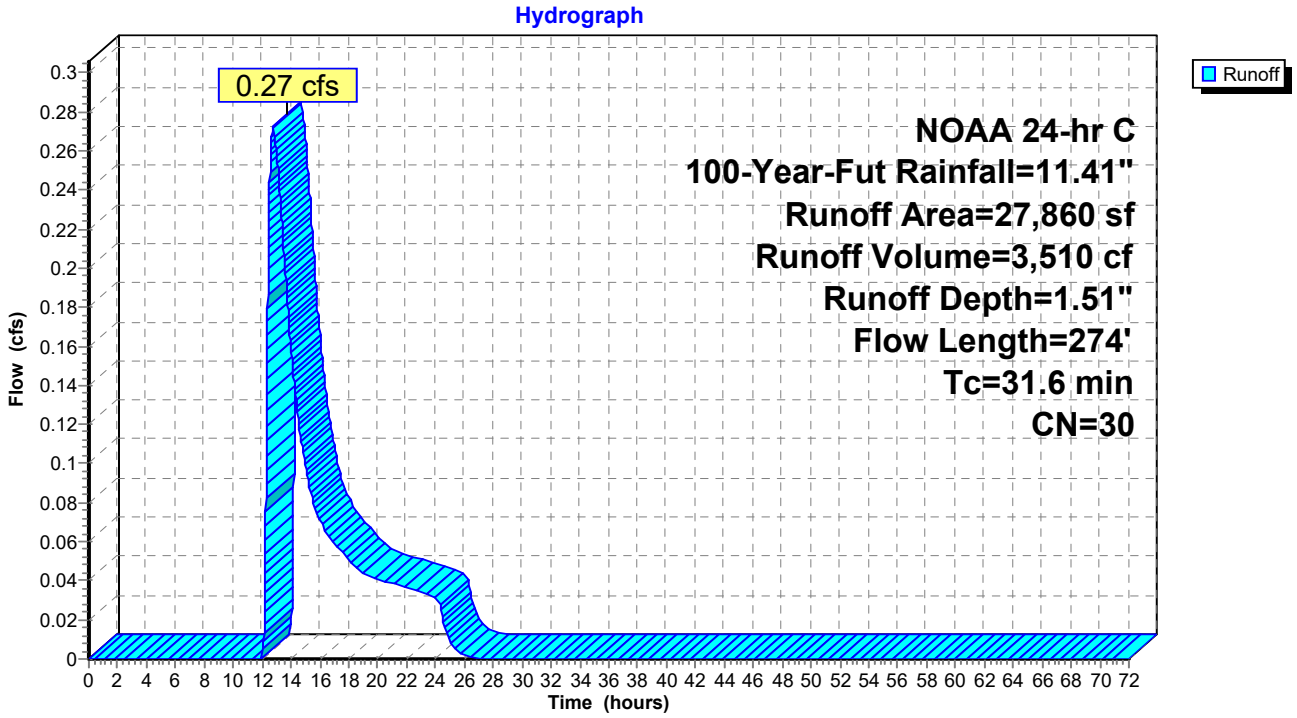
Runoff = 0.27 cfs @ 12.78 hrs, Volume= 3,510 cf, Depth= 1.51"
Routed to Link 11L : Post dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

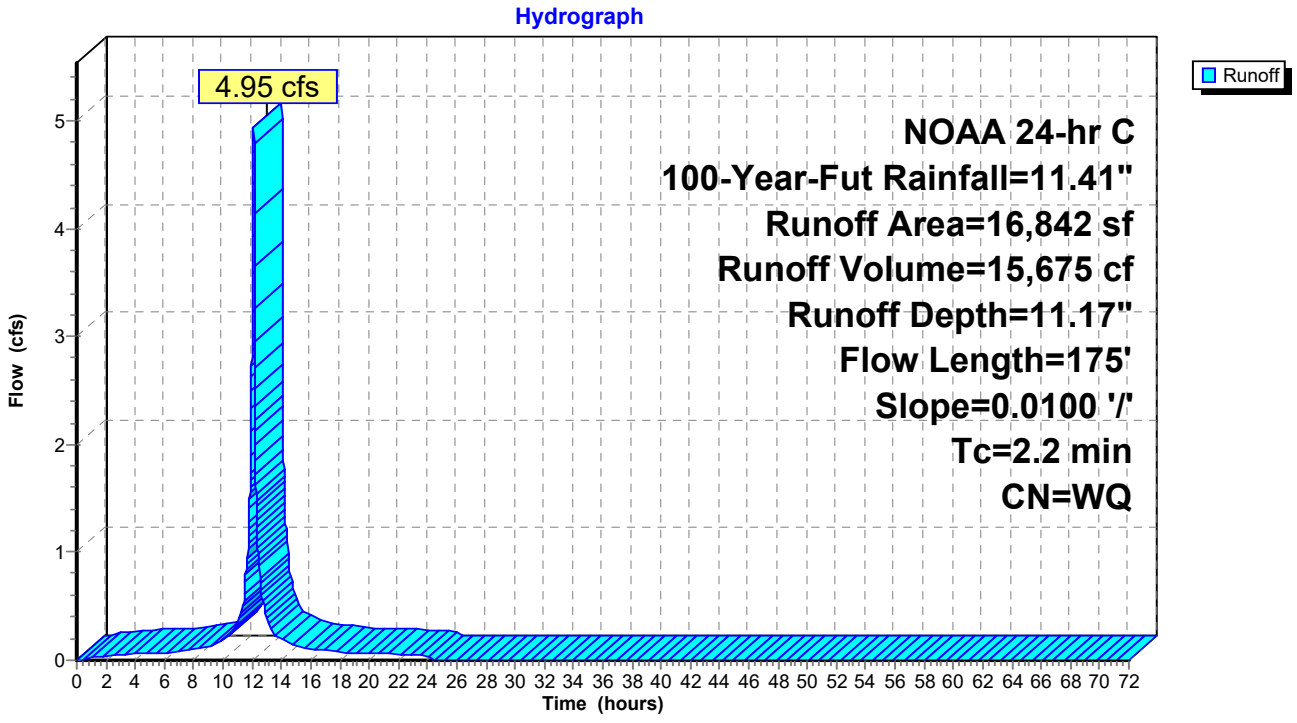
Runoff = 4.95 cfs @ 12.11 hrs, Volume= 15,675 cf, Depth=11.17"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

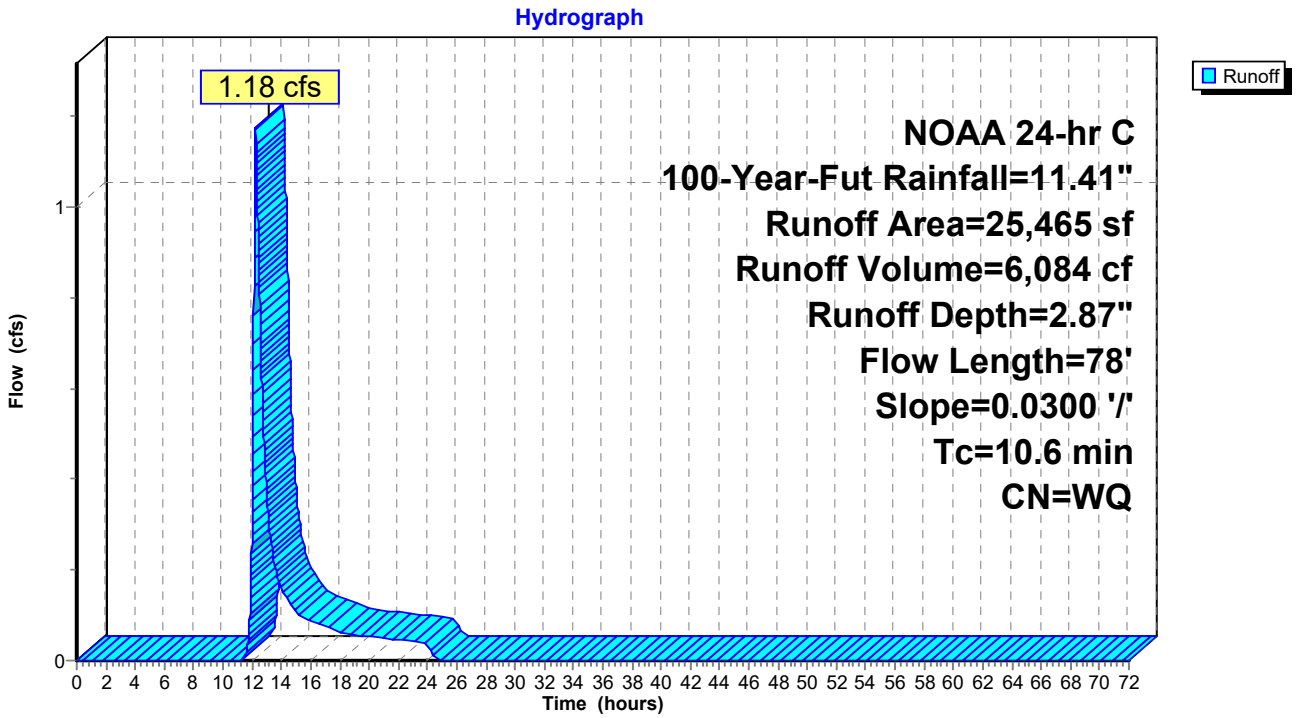
Runoff = 1.18 cfs @ 12.22 hrs, Volume= 6,084 cf, Depth= 2.87"
Routed to Pond Bio 70 : Post Bio-70

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

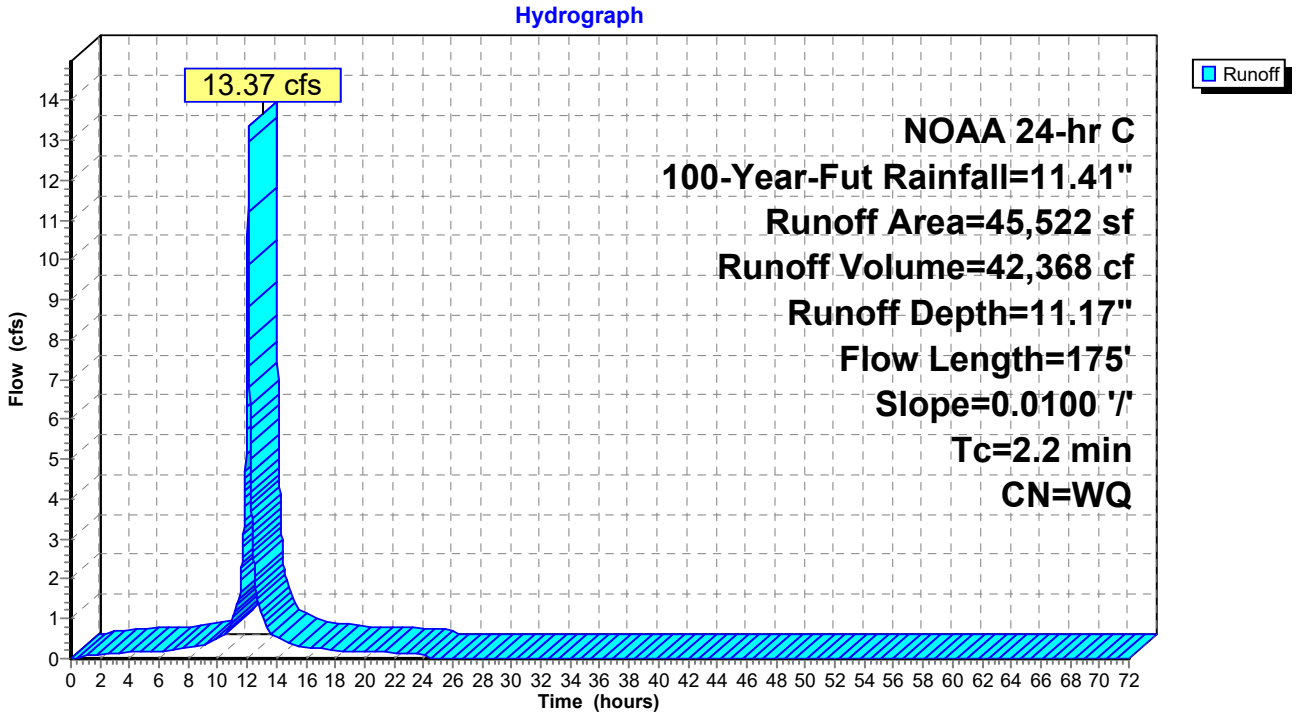
Runoff = 13.37 cfs @ 12.11 hrs, Volume= 42,368 cf, Depth=11.17"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

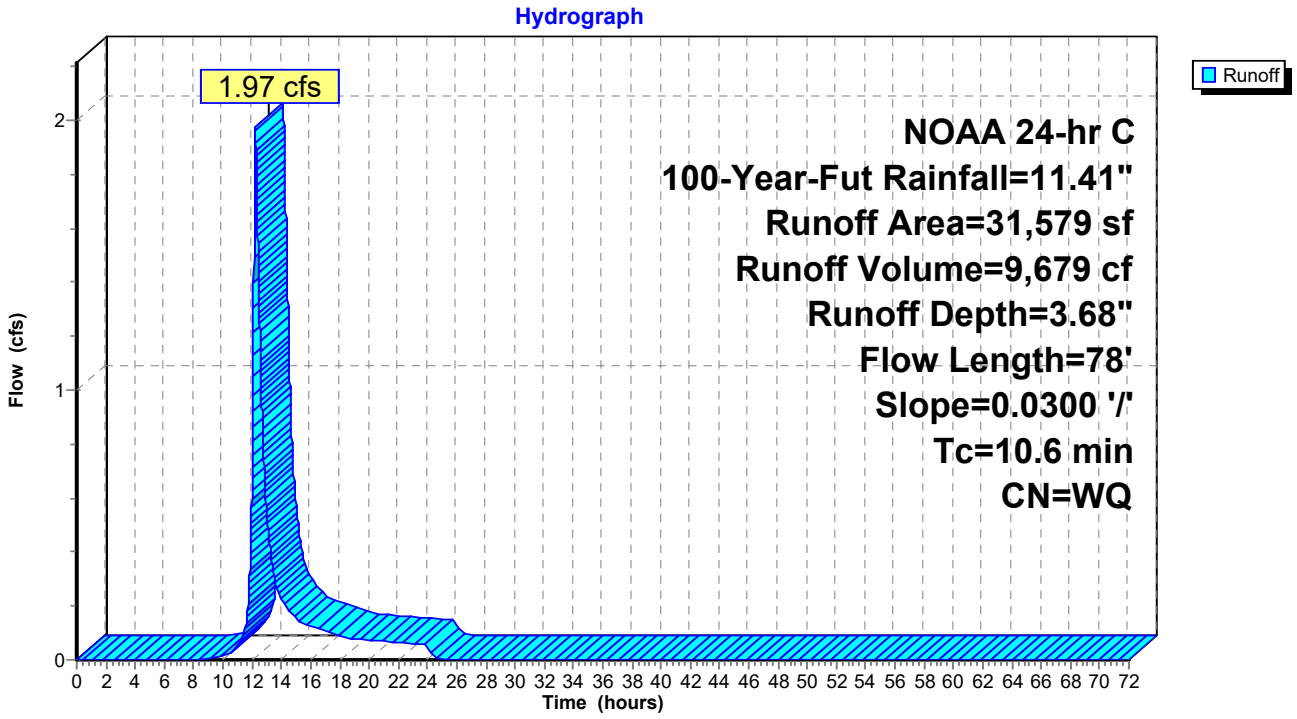
Runoff = 1.97 cfs @ 12.21 hrs, Volume= 9,679 cf, Depth= 3.68"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

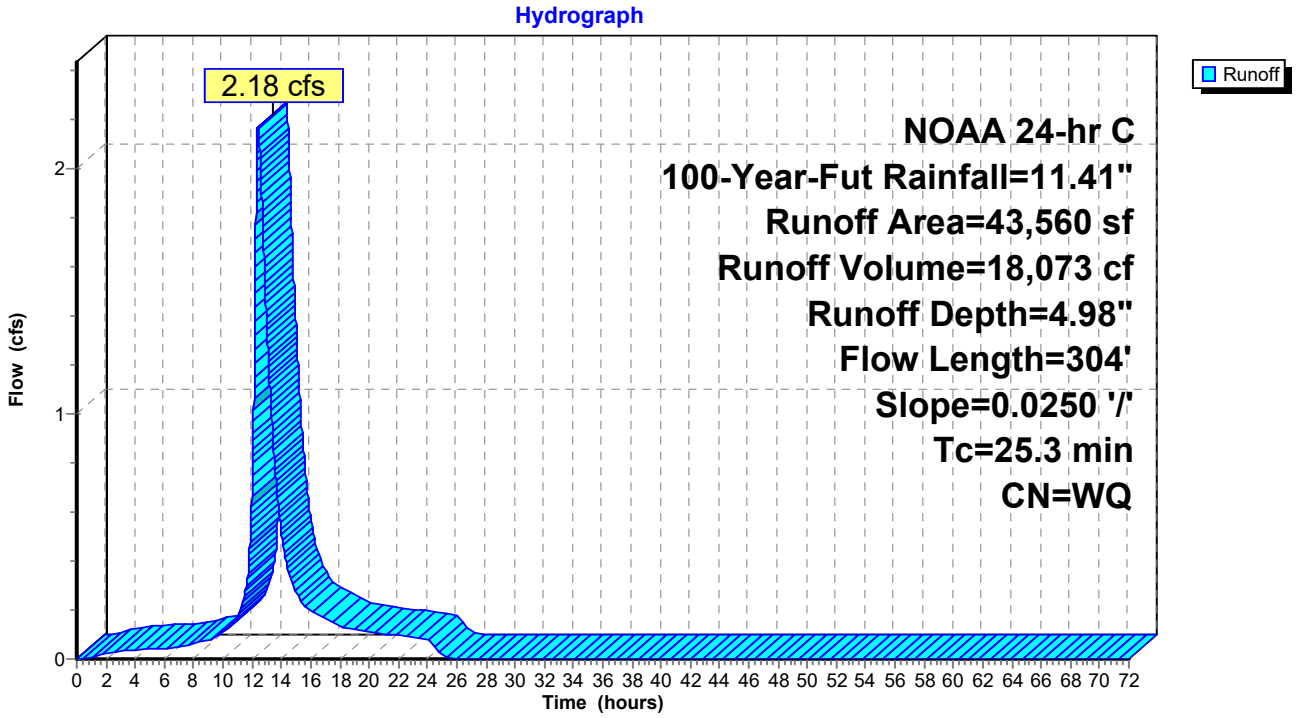
Runoff = 2.18 cfs @ 12.42 hrs, Volume= 18,073 cf, Depth= 4.98"
Routed to Pond Bio 80 : Post Bio-80

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

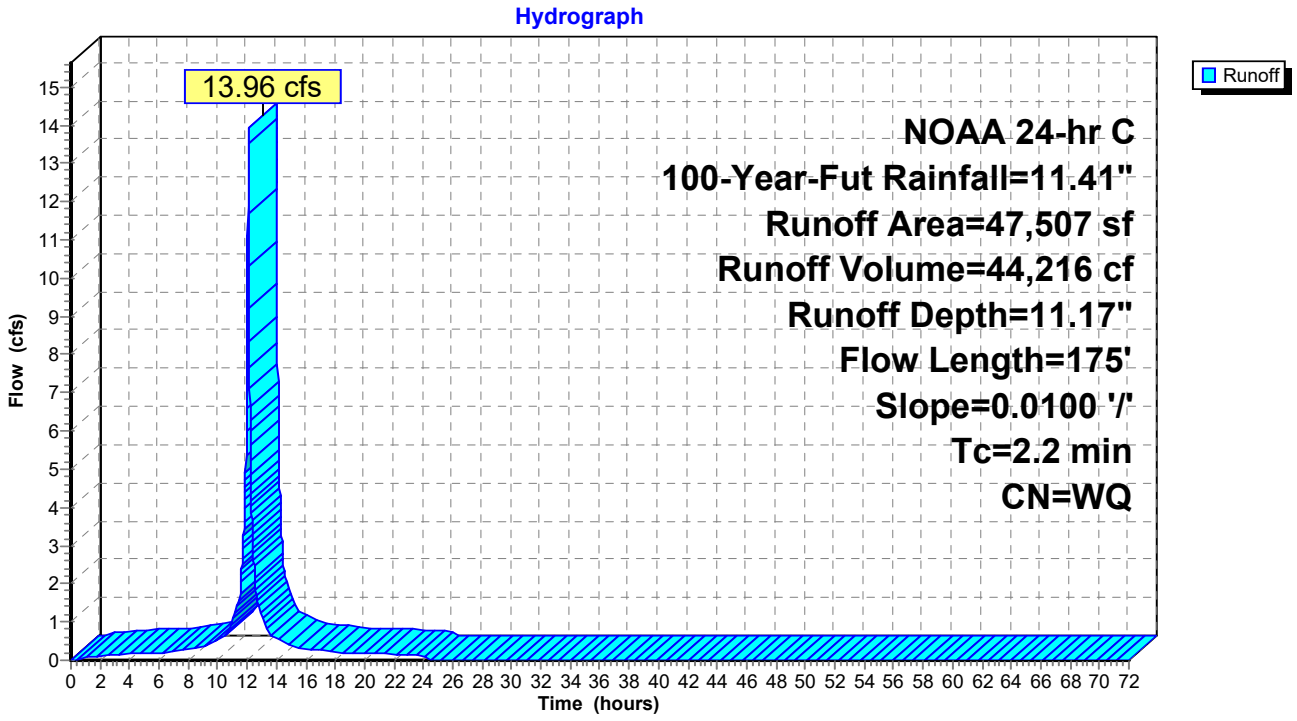
Runoff = 13.96 cfs @ 12.11 hrs, Volume= 44,216 cf, Depth=11.17"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

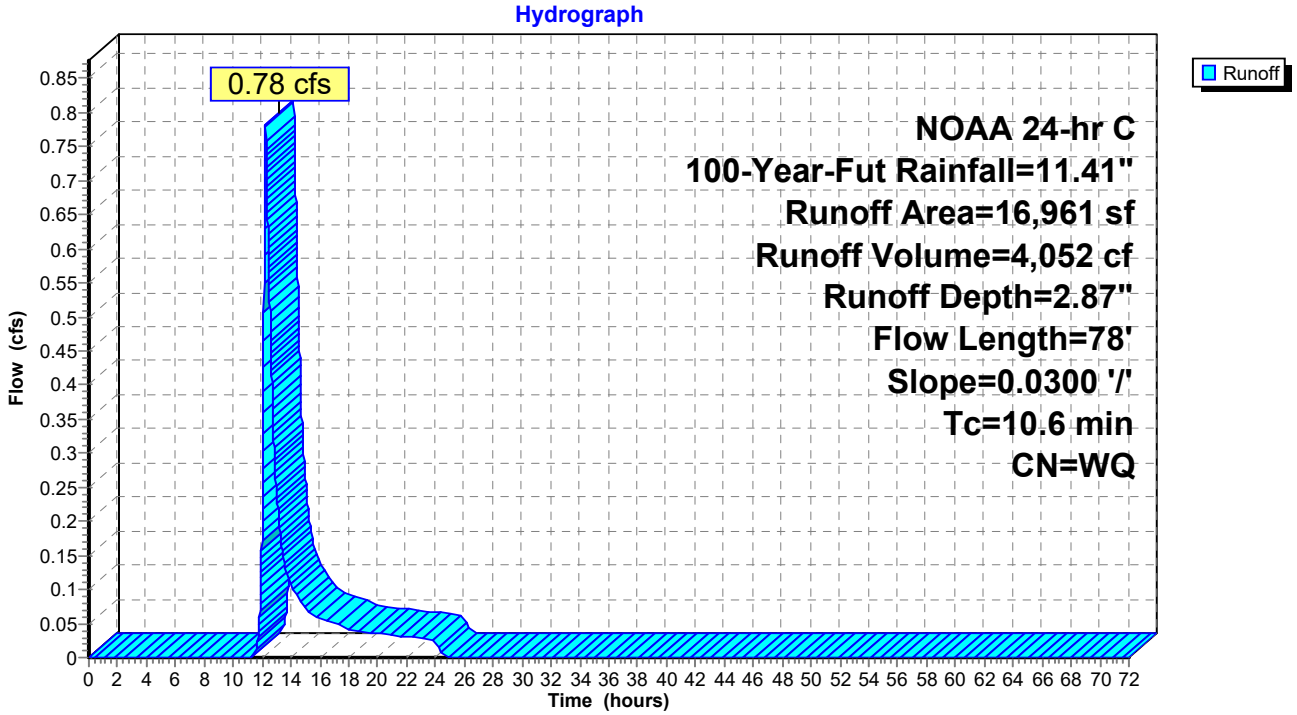
Runoff = 0.78 cfs @ 12.22 hrs, Volume= 4,052 cf, Depth= 2.87"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

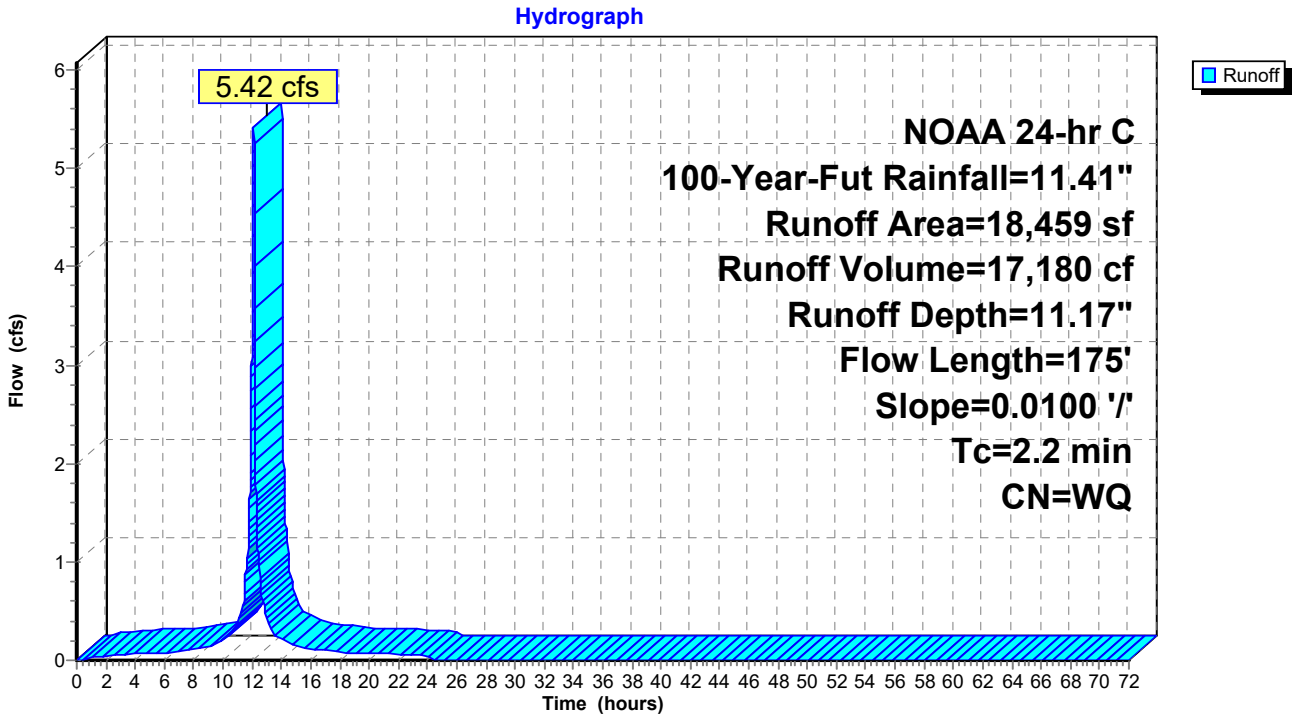
Runoff = 5.42 cfs @ 12.11 hrs, Volume= 17,180 cf, Depth=11.17"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

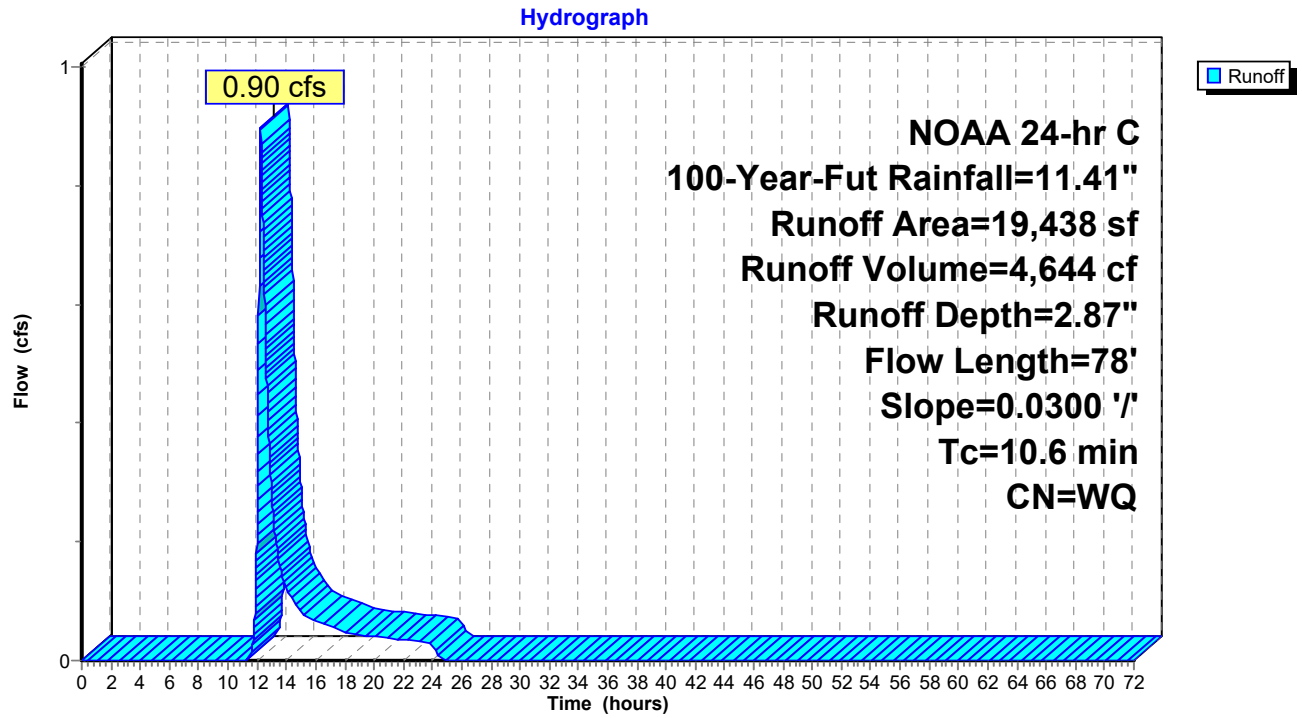
Runoff = 0.90 cfs @ 12.22 hrs, Volume= 4,644 cf, Depth= 2.87"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

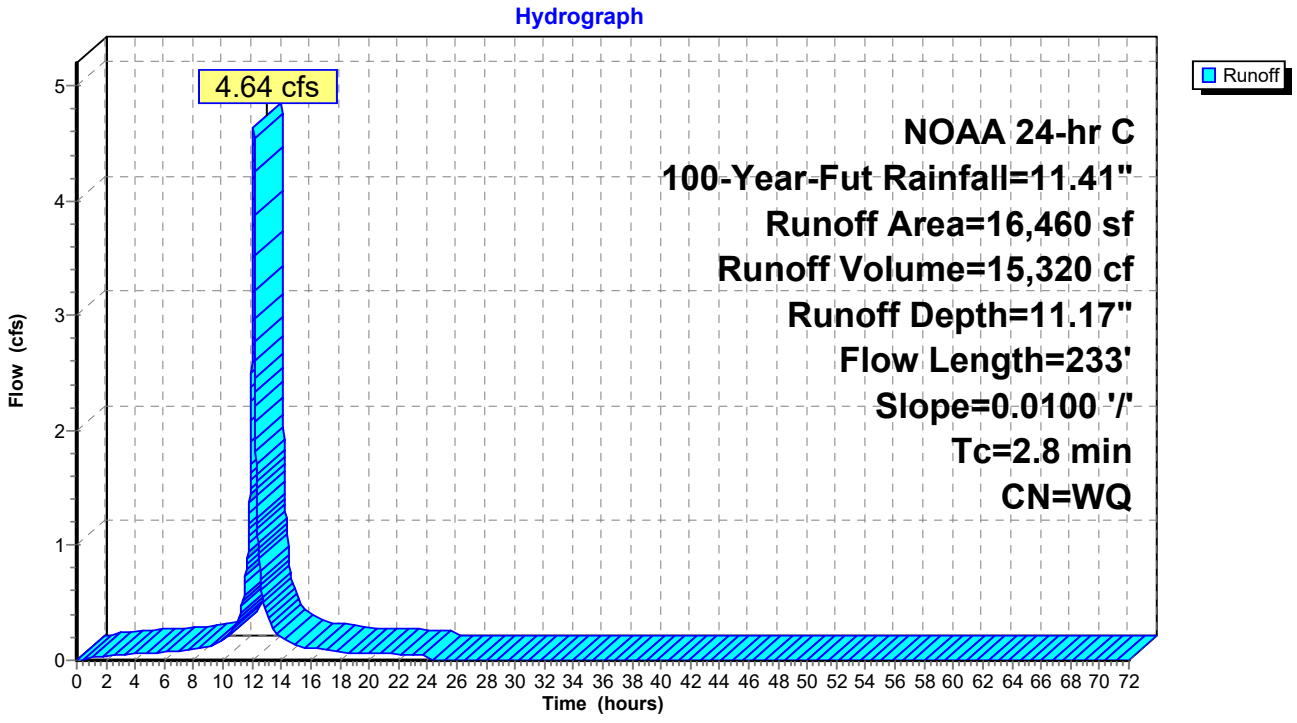
Runoff = 4.64 cfs @ 12.11 hrs, Volume= 15,320 cf, Depth=11.17"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

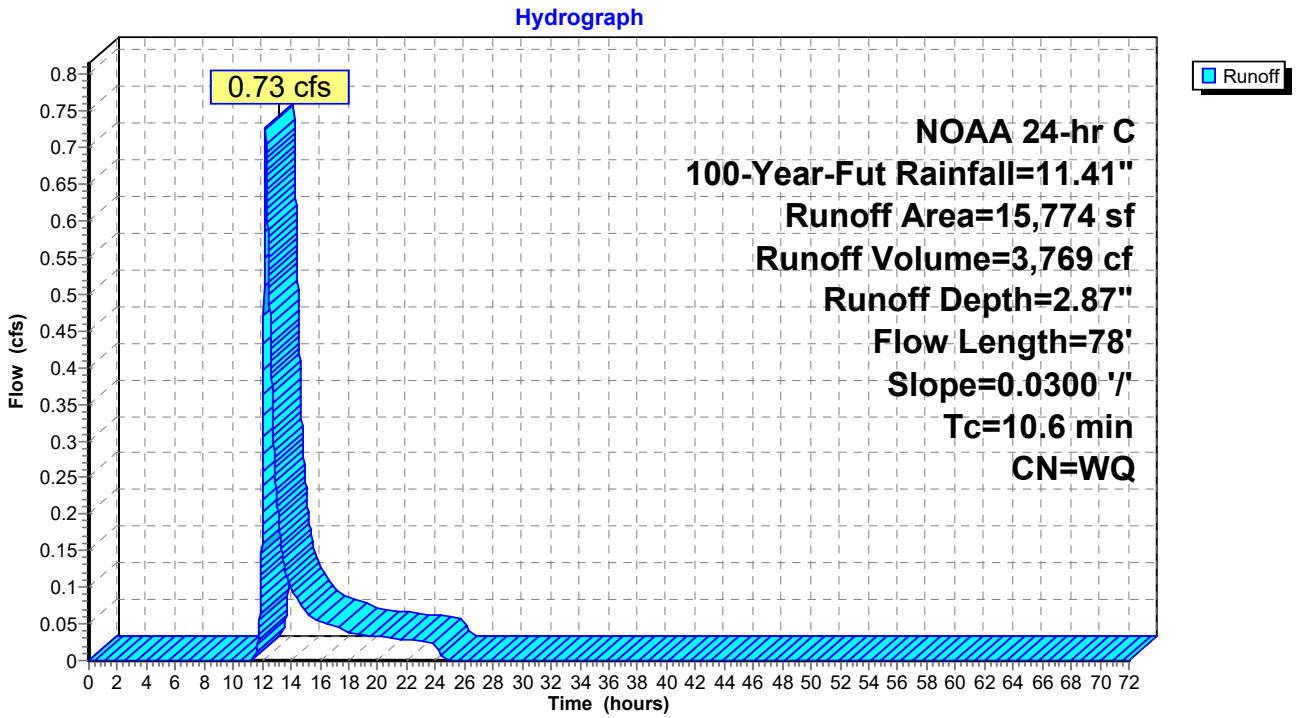
Runoff = 0.73 cfs @ 12.22 hrs, Volume= 3,769 cf, Depth= 2.87"
Routed to Link Pre Dis 2 : Pre discharge point 2

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

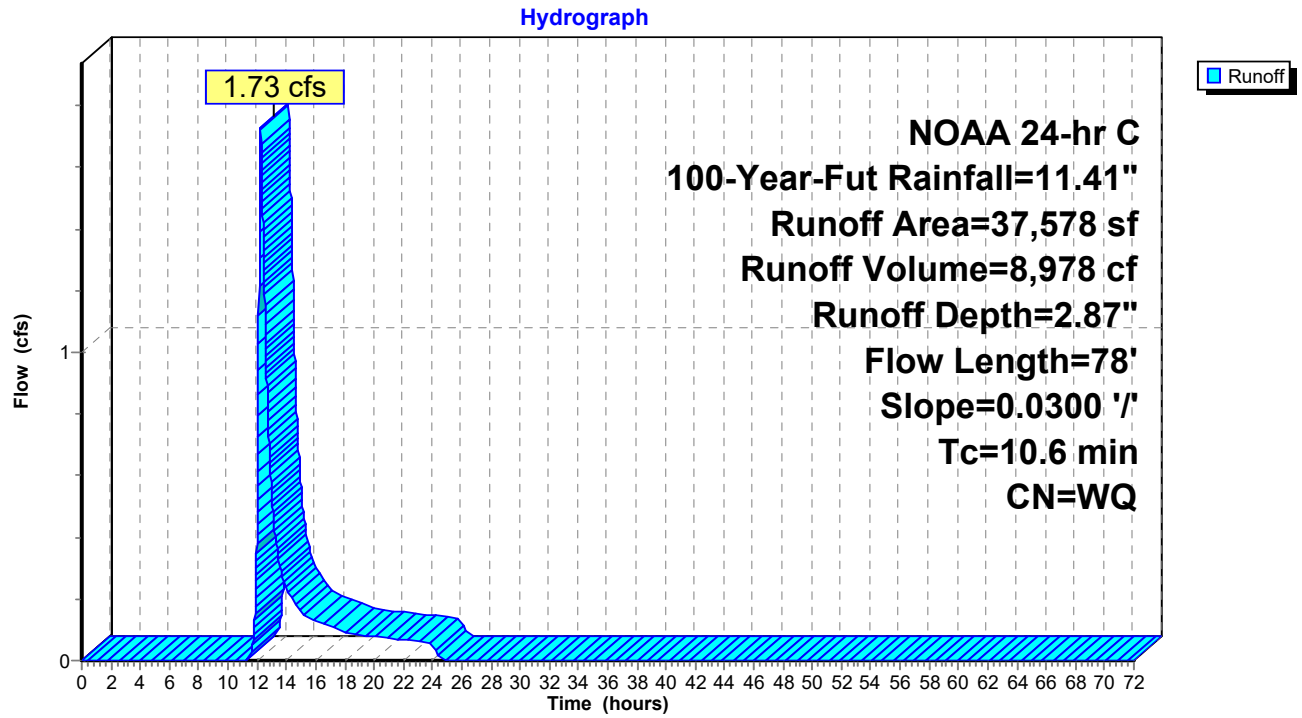
Runoff = 1.73 cfs @ 12.22 hrs, Volume= 8,978 cf, Depth= 2.87"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

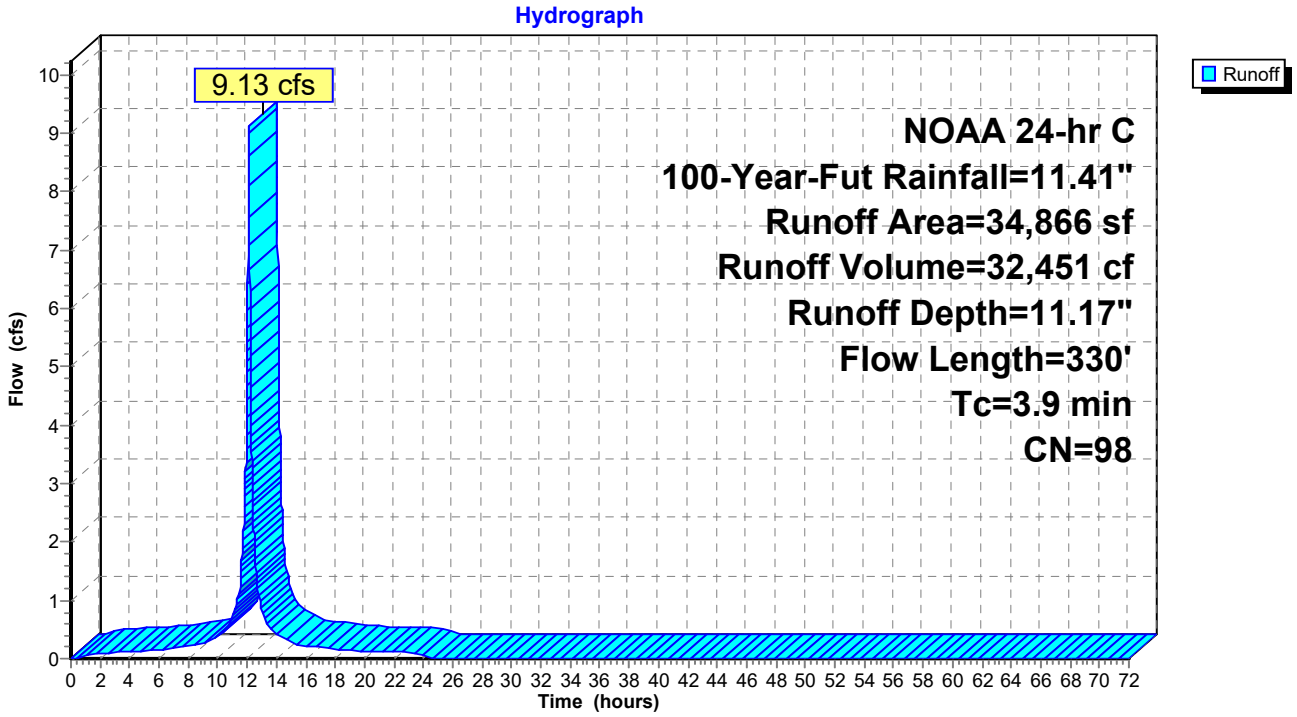
Runoff = 9.13 cfs @ 12.12 hrs, Volume= 32,451 cf, Depth=11.17"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

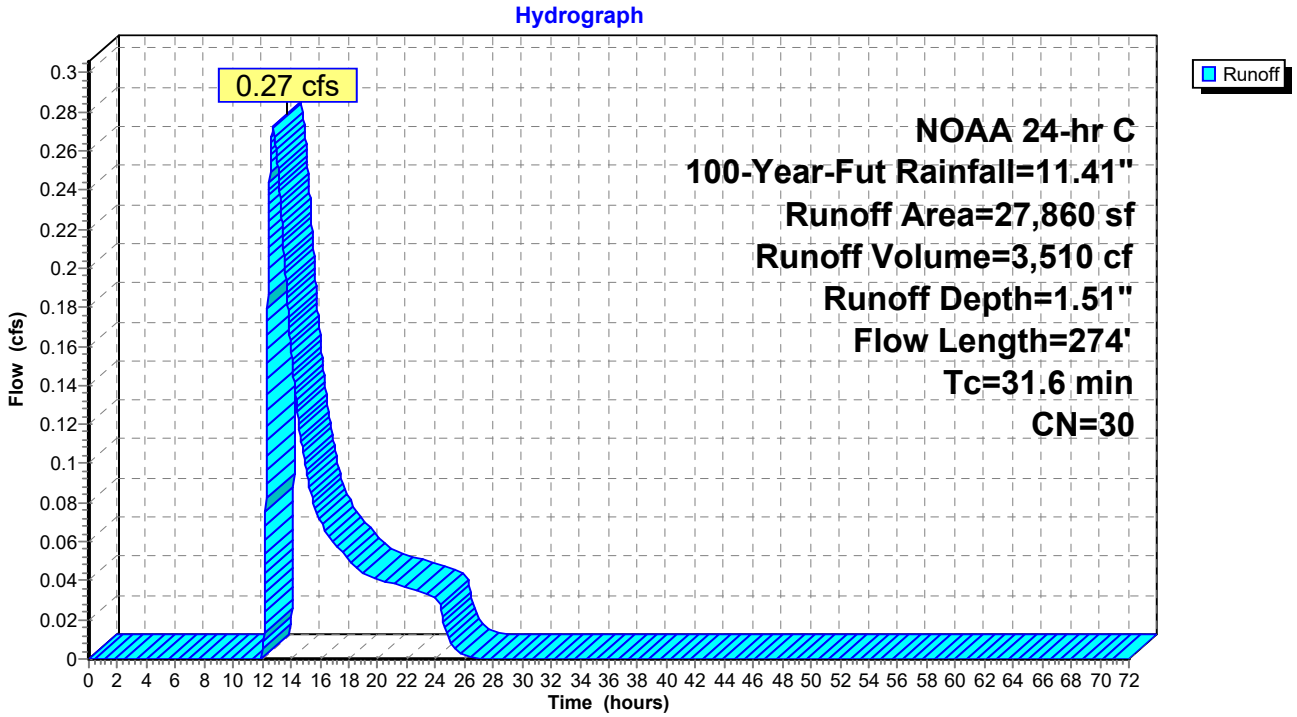
Runoff = 0.27 cfs @ 12.78 hrs, Volume= 3,510 cf, Depth= 1.51"
Routed to Link 1L : Pre dis 1

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

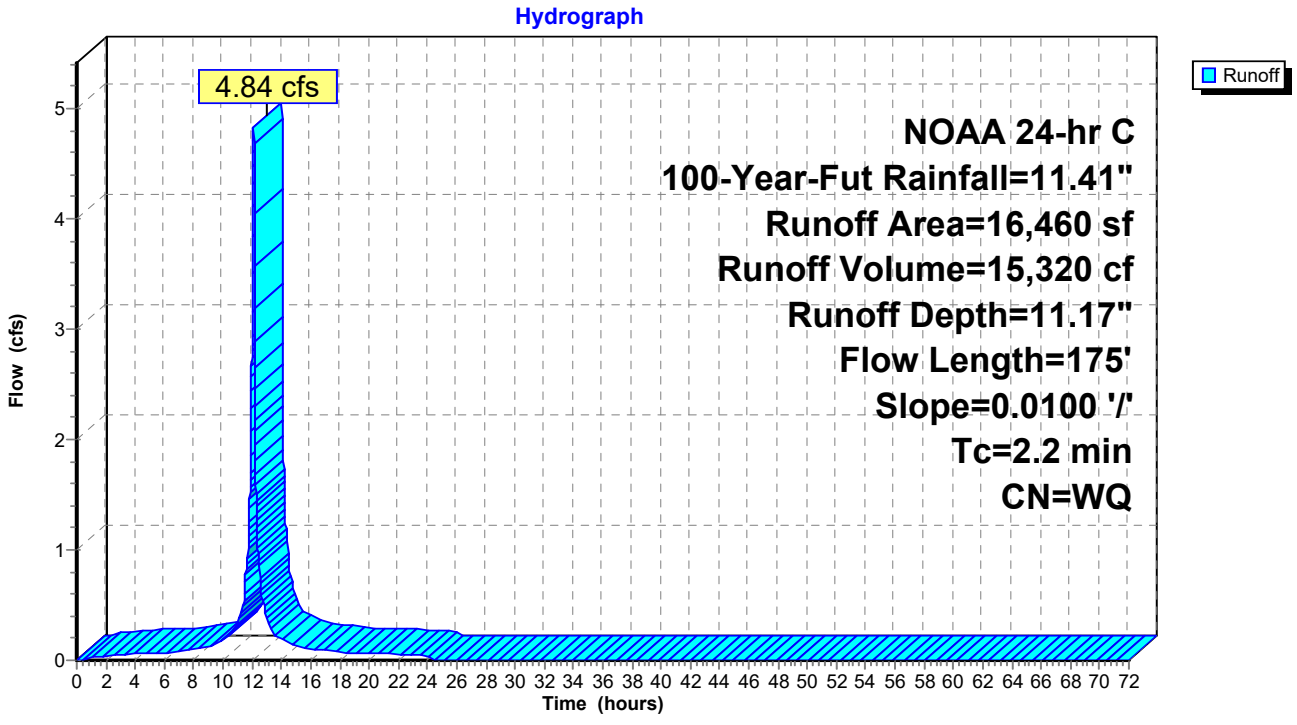
Runoff = 4.84 cfs @ 12.11 hrs, Volume= 15,320 cf, Depth=11.17"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

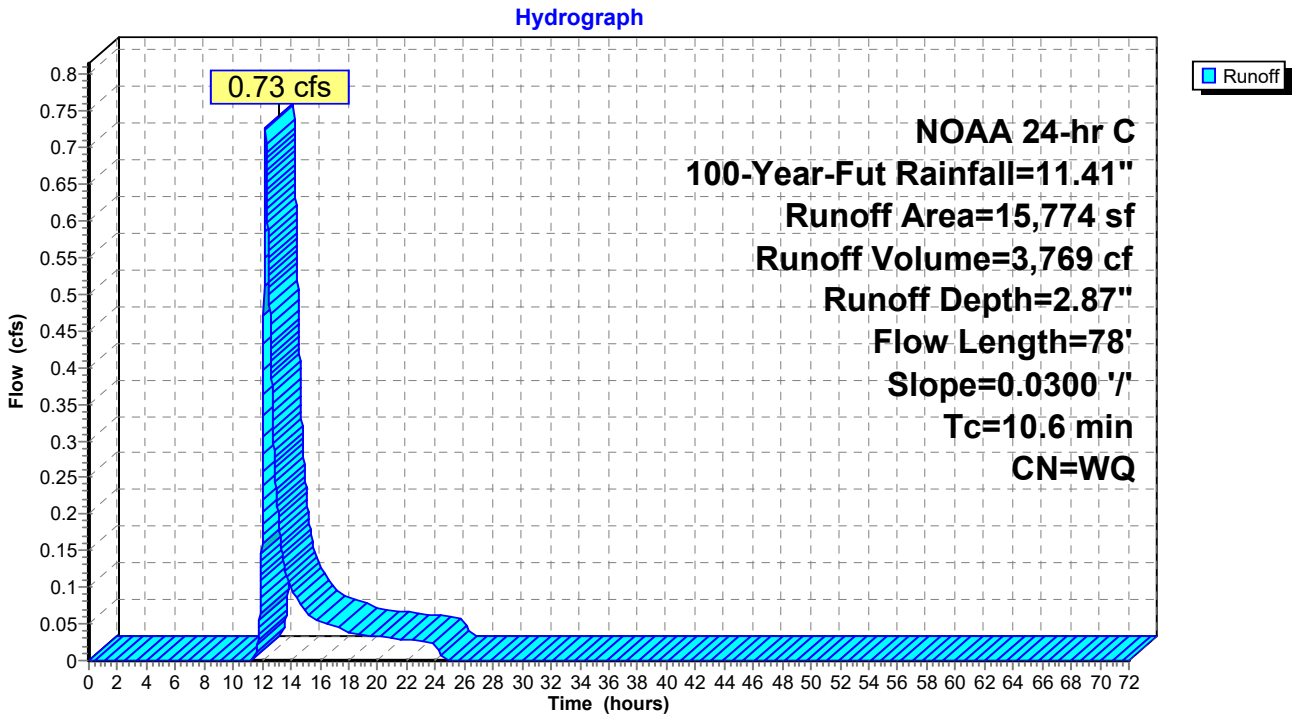
Runoff = 0.73 cfs @ 12.22 hrs, Volume= 3,769 cf, Depth= 2.87"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

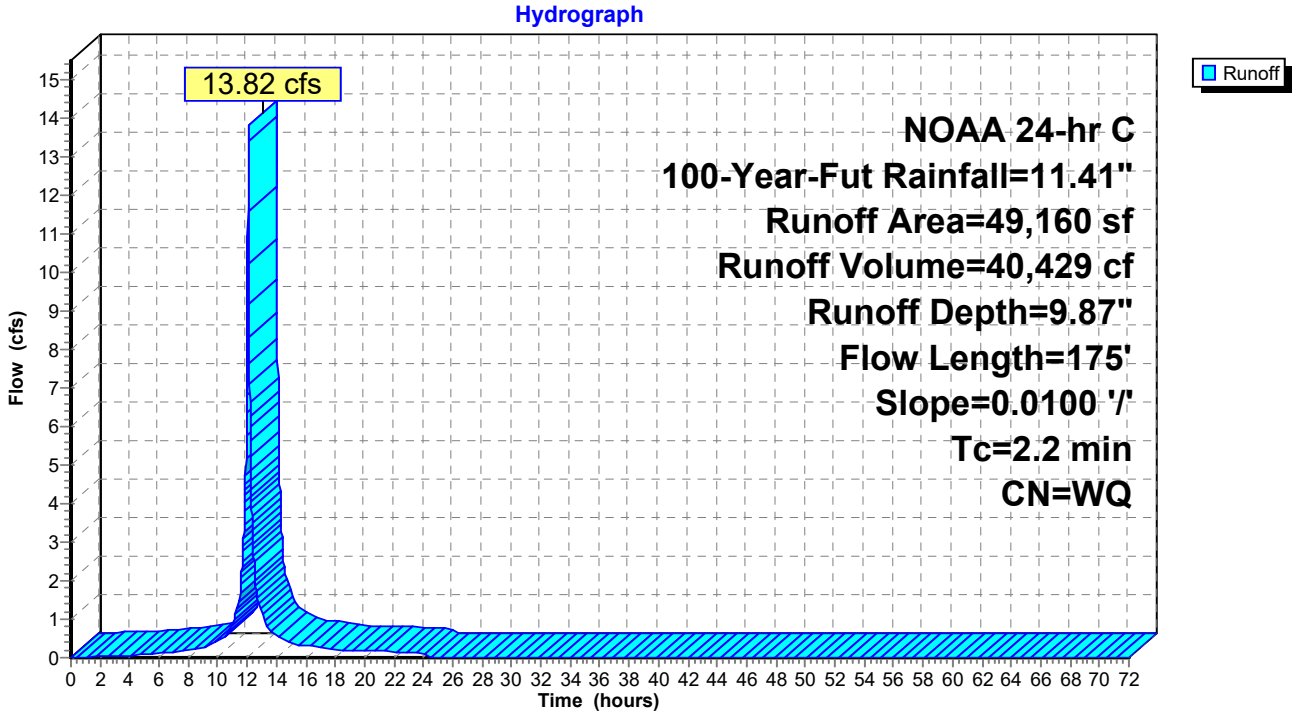
Runoff = 13.82 cfs @ 12.11 hrs, Volume= 40,429 cf, Depth= 9.87"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

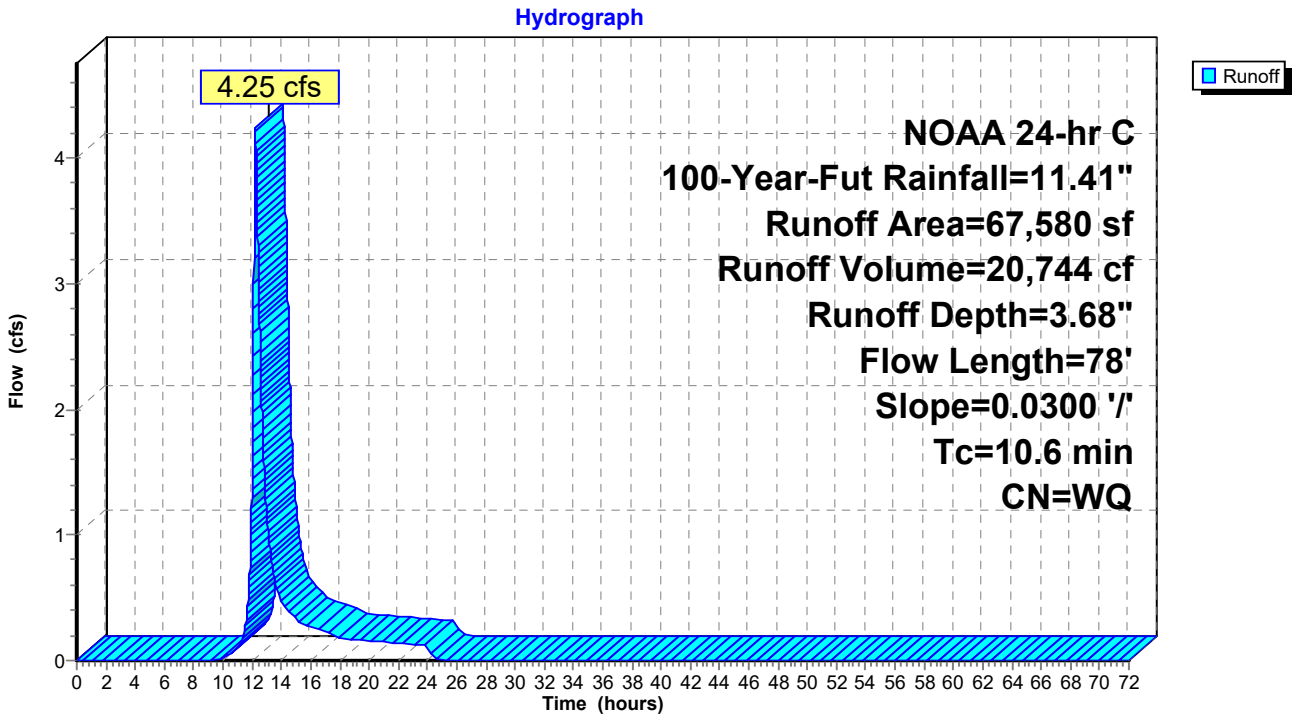
Runoff = 4.25 cfs @ 12.21 hrs, Volume= 20,744 cf, Depth= 3.68"
Routed to Link 3L : Pre discharge point 3

Runoff by SCS TR-20 method, UH=Delmarva, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr C 100-Year-Fut Rainfall=11.41"

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

[80] Warning: Exceeded Pond Bio 20 by 0.33' @ 22.35 hrs (0.03 cfs 1,491 cf)

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 5.26" for 100-Year-Fut event
Inflow = 20.52 cfs @ 12.12 hrs, Volume= 75,268 cf
Outflow = 1.57 cfs @ 13.61 hrs, Volume= 31,348 cf, Atten= 92%, Lag= 89.1 min
Primary = 1.57 cfs @ 13.61 hrs, Volume= 31,348 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.55' @ 13.61 hrs Surf.Area= 21,583 sf Storage= 51,369 cf

Plug-Flow detention time= 391.4 min calculated for 31,343 cf (42% of inflow)
Center-of-Mass det. time= 262.6 min (1,054.3 - 791.7)

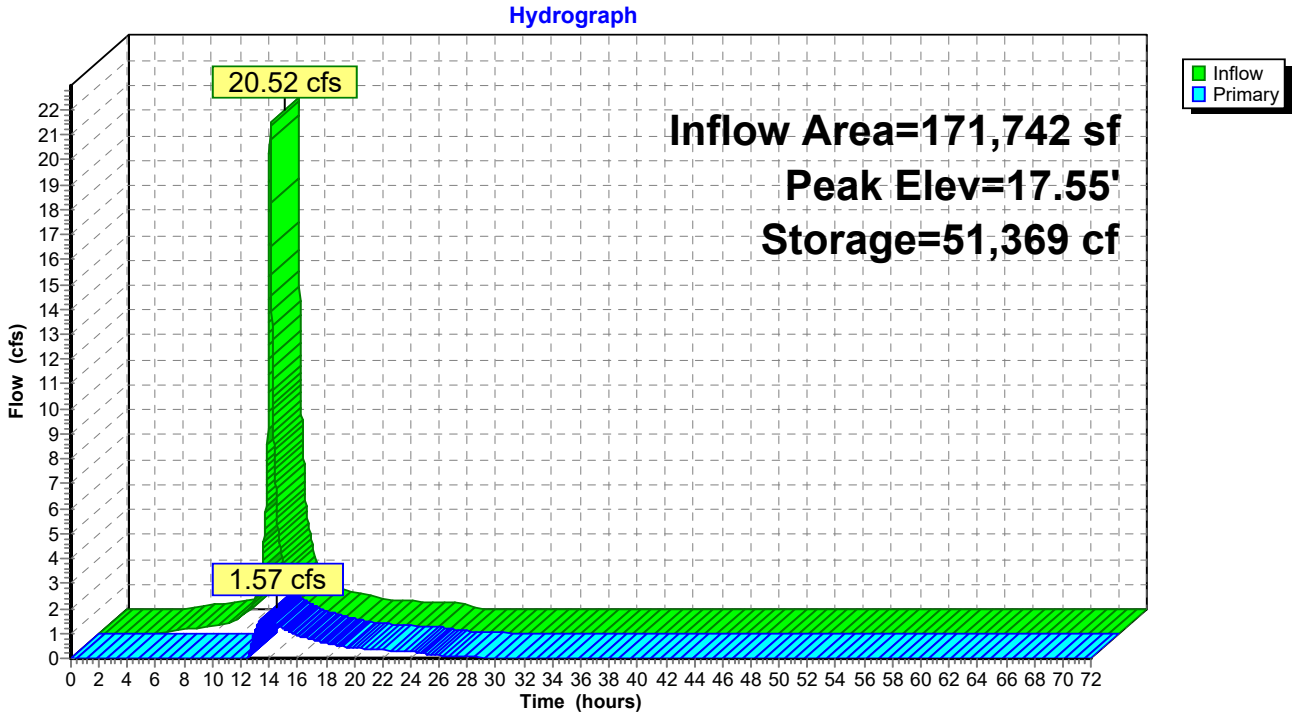
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.57 cfs @ 13.61 hrs HW=17.55' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.57 cfs @ 1.48 fps)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 4.13" for 100-Year-Fut event
Inflow = 14.79 cfs @ 12.12 hrs, Volume= 56,077 cf
Outflow = 8.45 cfs @ 12.27 hrs, Volume= 42,882 cf, Atten= 43%, Lag= 9.1 min
Primary = 8.45 cfs @ 12.27 hrs, Volume= 42,882 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 16.31' @ 12.27 hrs Surf.Area= 7,310 sf Storage= 16,039 cf

Plug-Flow detention time= 108.8 min calculated for 42,882 cf (76% of inflow)
Center-of-Mass det. time= 41.9 min (858.6 - 816.7)

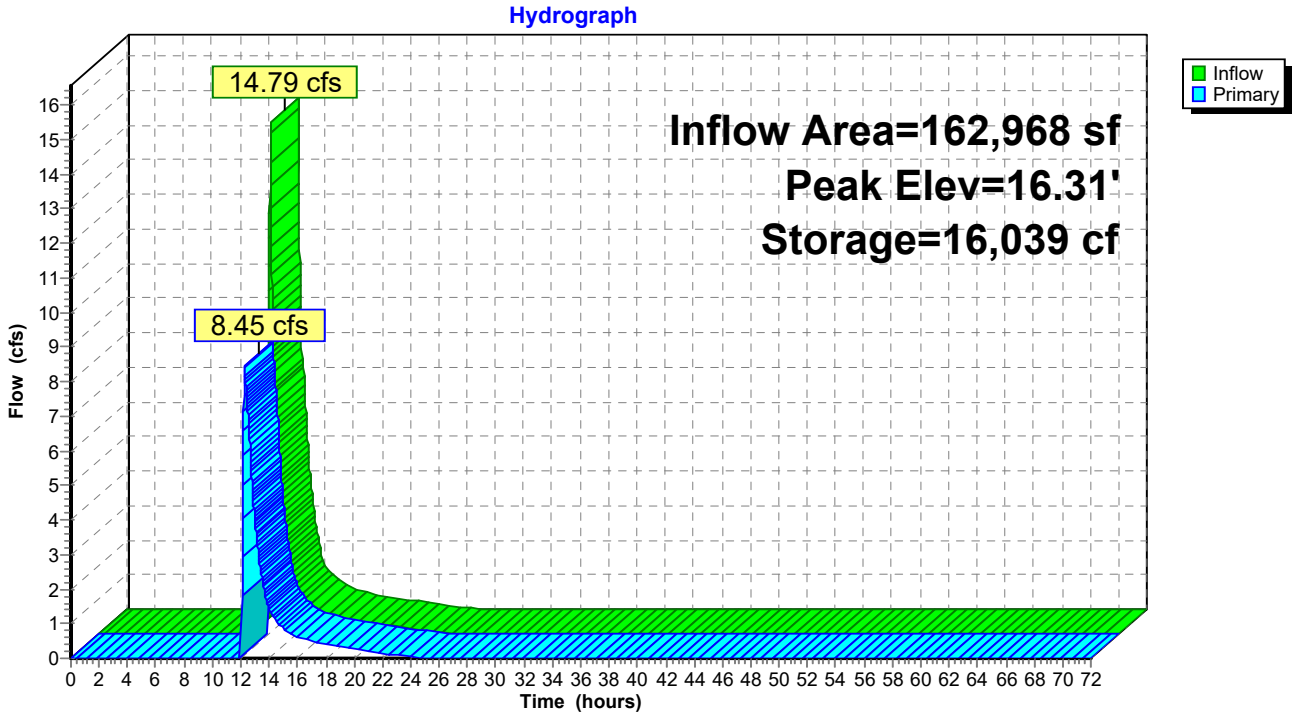
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.45 cfs @ 12.27 hrs HW=16.31' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 8.45 cfs @ 1.60 fps)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 8.45" for 100-Year-Fut event
Inflow = 4.60 cfs @ 12.11 hrs, Volume= 15,642 cf
Outflow = 4.46 cfs @ 12.12 hrs, Volume= 15,642 cf, Atten= 3%, Lag= 0.6 min
Discarded = 0.02 cfs @ 1.31 hrs, Volume= 3,038 cf
Primary = 4.44 cfs @ 12.12 hrs, Volume= 12,604 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.49' @ 12.12 hrs Surf.Area= 1,774 sf Storage= 1,804 cf

Plug-Flow detention time= 143.8 min calculated for 15,640 cf (100% of inflow)
Center-of-Mass det. time= 144.0 min (897.0 - 753.0)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

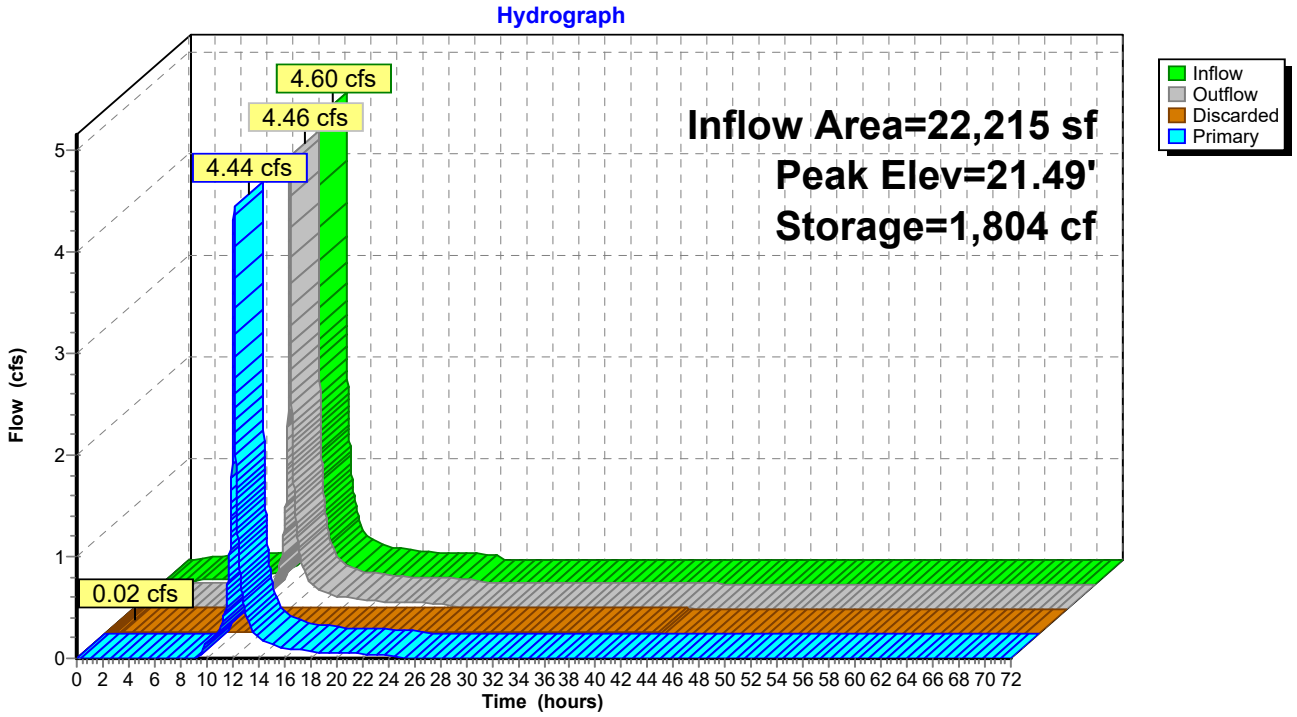
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 1.31 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=4.42 cfs @ 12.12 hrs HW=21.49' TW=18.92' (Dynamic Tailwater)
└**2=Culvert** (Passes 4.42 cfs of 8.36 cfs potential flow)
  ├**1=Orifice/Grate** (Weir Controls 4.31 cfs @ 1.61 fps)
  └**4=Culvert** (Barrel Controls 0.11 cfs @ 2.33 fps)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 8.62" for 100-Year-Fut event
Inflow = 21.40 cfs @ 12.11 hrs, Volume= 69,155 cf
Outflow = 19.42 cfs @ 12.09 hrs, Volume= 69,156 cf, Atten= 9%, Lag= 0.0 min
Discarded = 0.05 cfs @ 0.99 hrs, Volume= 5,645 cf
Primary = 19.37 cfs @ 12.09 hrs, Volume= 63,511 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.94' @ 12.13 hrs Surf.Area= 2,304 sf Storage= 2,766 cf

Plug-Flow detention time= 33.3 min calculated for 69,146 cf (100% of inflow)
Center-of-Mass det. time= 33.3 min (790.1 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

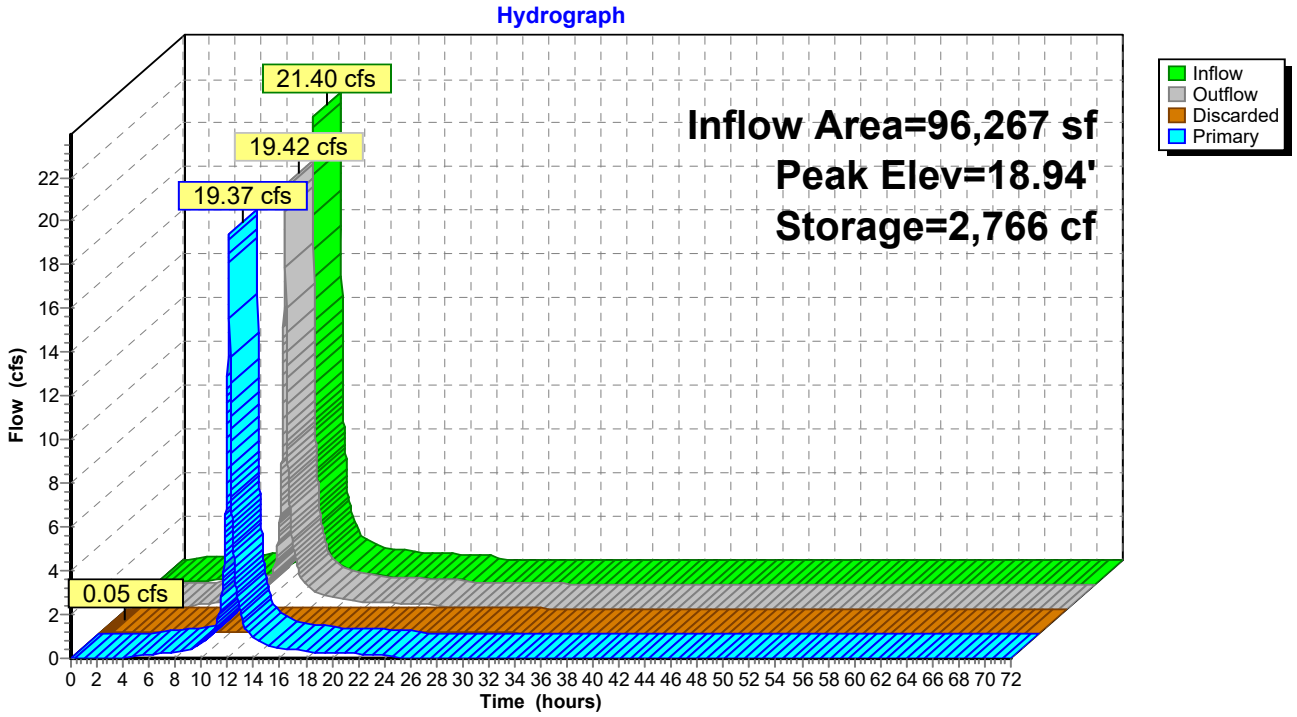
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 0.99 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=19.20 cfs @ 12.09 hrs HW=18.86' TW=16.33' (Dynamic Tailwater)
├**2=Culvert** (Outlet Controls 19.02 cfs @ 5.38 fps)
│ └**1=Orifice/Grate** (Passes 19.02 cfs of 20.28 cfs potential flow)
└**3=Culvert** (Inlet Controls 0.18 cfs @ 3.61 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=114)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 6.91" for 100-Year-Fut event
Inflow = 5.99 cfs @ 12.11 hrs, Volume= 21,824 cf
Outflow = 0.65 cfs @ 13.06 hrs, Volume= 21,827 cf, Atten= 89%, Lag= 57.2 min
Discarded = 0.36 cfs @ 11.26 hrs, Volume= 19,048 cf
Primary = 0.29 cfs @ 13.06 hrs, Volume= 2,779 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.84' @ 13.08 hrs Surf.Area= 10,727 sf Storage= 8,054 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 131.6 min (900.5 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

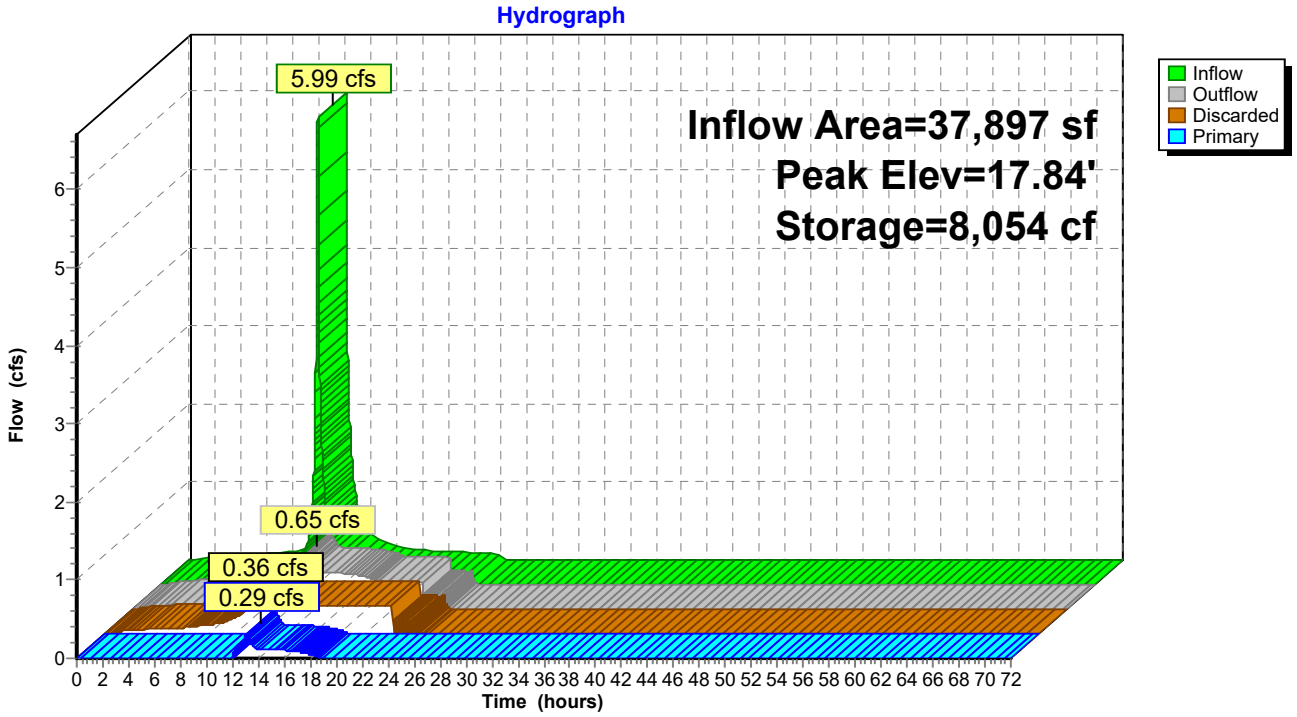
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 11.26 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.29 cfs @ 13.06 hrs HW=17.84' TW=17.50' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.29 cfs of 3.17 cfs potential flow)
  ├**2=Orifice/Grate** (Weir Controls 0.15 cfs @ 0.48 fps)
  └**3=Culvert** (Inlet Controls 0.14 cfs @ 2.83 fps)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 6.17" for 100-Year-Fut event
Inflow = 5.69 cfs @ 12.11 hrs, Volume= 21,759 cf
Outflow = 1.44 cfs @ 12.56 hrs, Volume= 21,762 cf, Atten= 75%, Lag= 27.1 min
Discarded = 0.18 cfs @ 10.45 hrs, Volume= 12,380 cf
Primary = 1.26 cfs @ 12.56 hrs, Volume= 9,382 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 24.94' @ 12.56 hrs Surf.Area= 5,953 sf Storage= 7,629 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 143.0 min (922.3 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

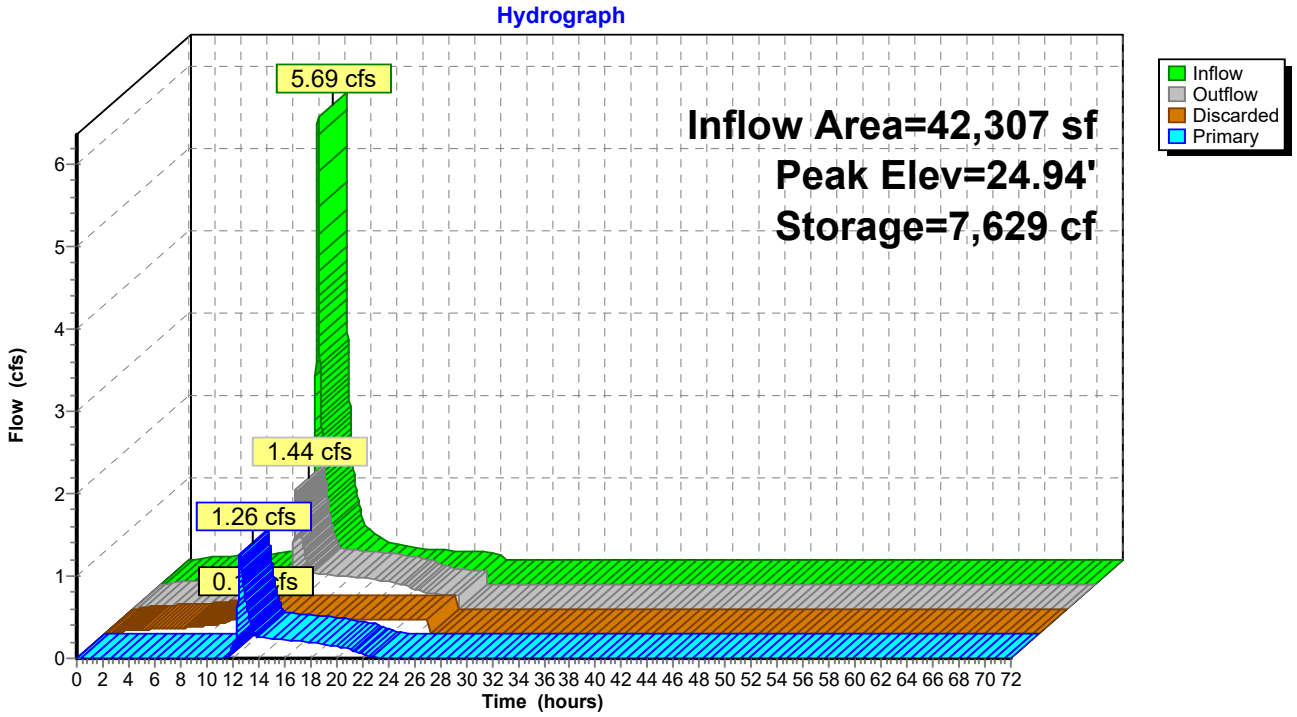
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 10.45 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=1.26 cfs @ 12.56 hrs HW=24.94' TW=16.26' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.26 cfs of 10.85 cfs potential flow)
  ├**2=Orifice/Grate** (Weir Controls 1.01 cfs @ 0.99 fps)
  └**3=Culvert** (Inlet Controls 0.26 cfs @ 5.20 fps)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 6.97" for 100-Year-Fut event
Inflow = 15.73 cfs @ 12.11 hrs, Volume= 70,120 cf
Outflow = 14.83 cfs @ 12.12 hrs, Volume= 70,120 cf, Atten= 6%, Lag= 0.9 min
Discarded = 0.25 cfs @ 7.03 hrs, Volume= 23,425 cf
Primary = 14.58 cfs @ 12.12 hrs, Volume= 46,695 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.92' @ 12.12 hrs Surf.Area= 4,467 sf Storage= 6,458 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 60.7 min (838.4 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

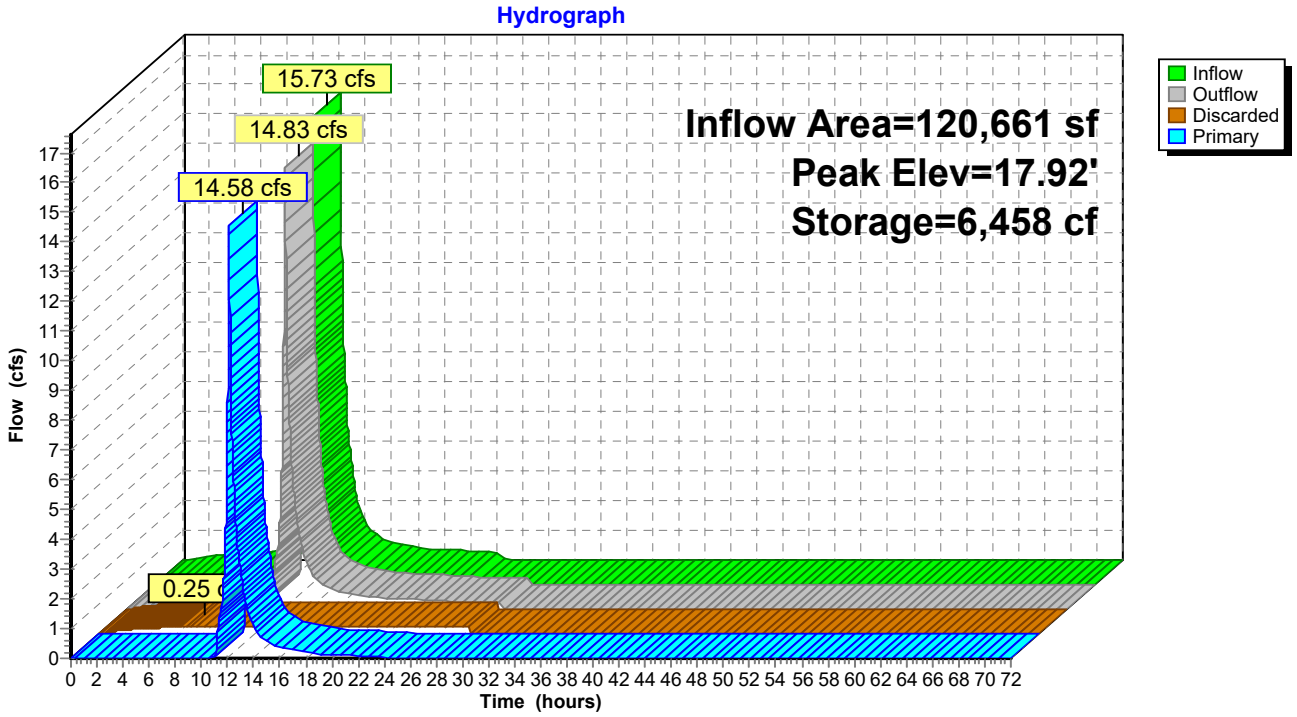
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 7.03 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=14.55 cfs @ 12.12 hrs HW=17.92' TW=15.85' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 13.95 cfs @ 1.90 fps)
└**2=Culvert** (Inlet Controls 0.60 cfs @ 3.07 fps)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 6.52" for 100-Year-Fut event
Inflow = 23.42 cfs @ 12.11 hrs, Volume= 76,048 cf
Outflow = 2.10 cfs @ 13.31 hrs, Volume= 32,133 cf, Atten= 91%, Lag= 71.9 min
Primary = 2.10 cfs @ 13.31 hrs, Volume= 32,133 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.48' @ 13.31 hrs Surf.Area= 21,548 sf Storage= 49,710 cf

Plug-Flow detention time= 373.1 min calculated for 32,133 cf (42% of inflow)
Center-of-Mass det. time= 230.2 min (1,031.8 - 801.5)

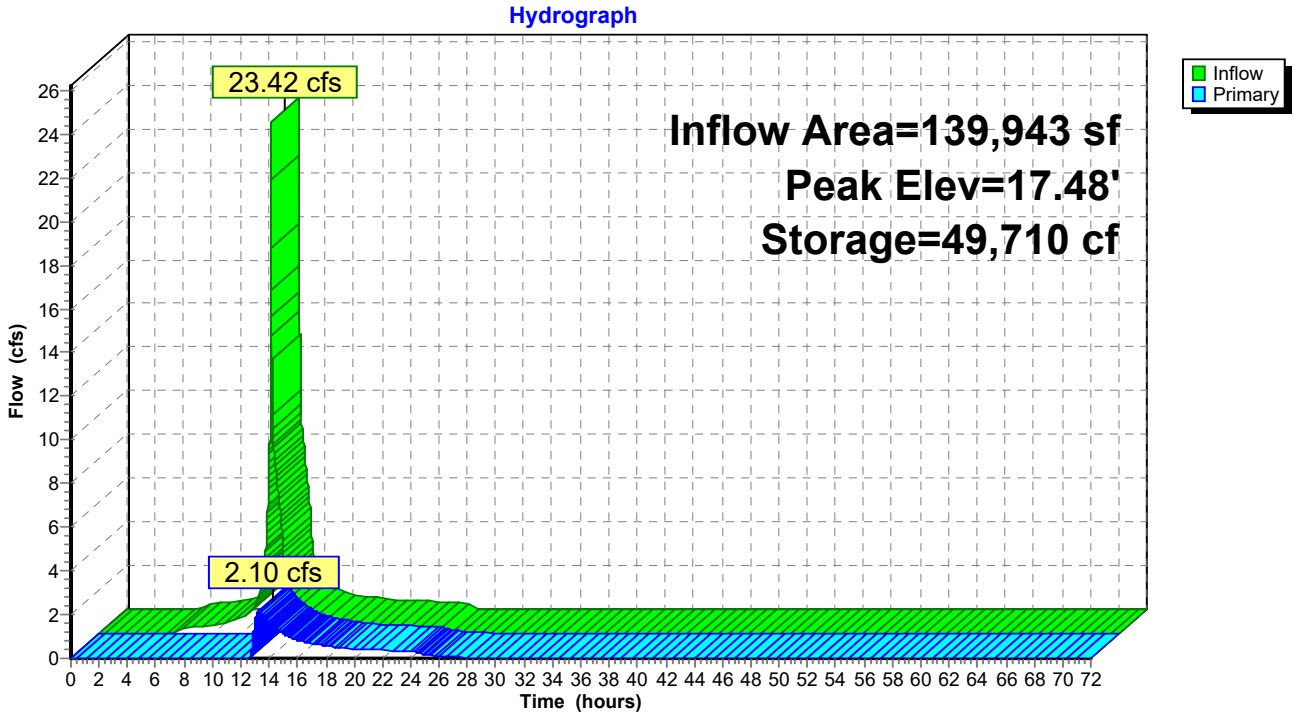
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.10 cfs @ 13.31 hrs HW=17.48' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.10 cfs @ 1.27 fps)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[93] Warning: Storage range exceeded by 20.85'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=15)

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 8.98" for 100-Year-Fut event
Inflow = 14.45 cfs @ 12.11 hrs, Volume= 48,268 cf
Outflow = 16.15 cfs @ 12.11 hrs, Volume= 47,476 cf, Atten= 0%, Lag= 0.2 min
Primary = 16.15 cfs @ 12.11 hrs, Volume= 47,476 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 39.85' @ 12.12 hrs Surf.Area= 2,363 sf Storage= 2,908 cf

Plug-Flow detention time= 25.8 min calculated for 47,469 cf (98% of inflow)
Center-of-Mass det. time= 14.9 min (763.6 - 748.7)

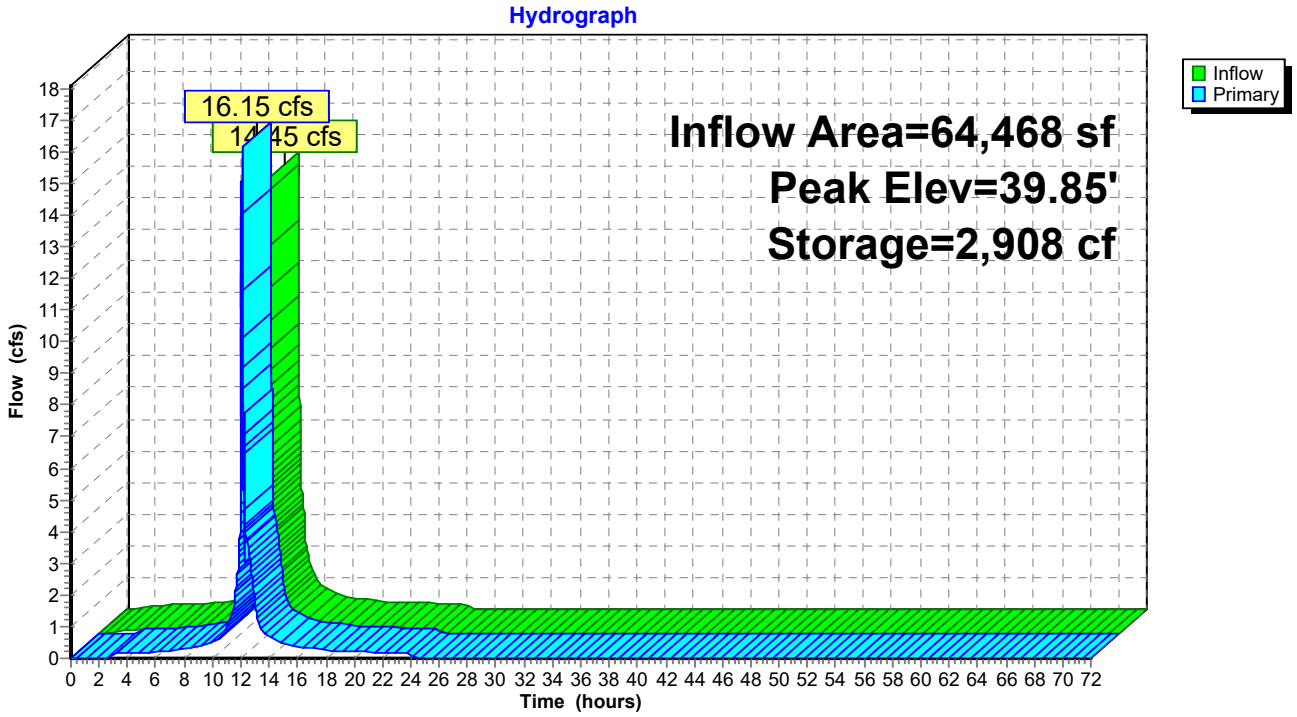
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=10.23 cfs @ 12.11 hrs HW=38.02' TW=34.17' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 10.23 cfs @ 8.34 fps)
↑—**1=Orifice/Grate** (Passes 10.23 cfs of 132.31 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

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[93] Warning: Storage range exceeded by 15.92'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[80] Warning: Exceeded Pond Pre bio-1 by 5.81' @ 12.09 hrs (12.56 cfs 493 cf)

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 8.12" for 100-Year-Fut event
Inflow = 22.12 cfs @ 12.11 hrs, Volume= 69,300 cf
Outflow = 22.30 cfs @ 12.11 hrs, Volume= 67,070 cf, Atten= 0%, Lag= 0.0 min
Primary = 22.30 cfs @ 12.11 hrs, Volume= 67,070 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 34.42' @ 12.11 hrs Surf.Area= 6,554 sf Storage= 6,035 cf

Plug-Flow detention time= 44.5 min calculated for 67,070 cf (97% of inflow)
Center-of-Mass det. time= 24.1 min (789.4 - 765.3)

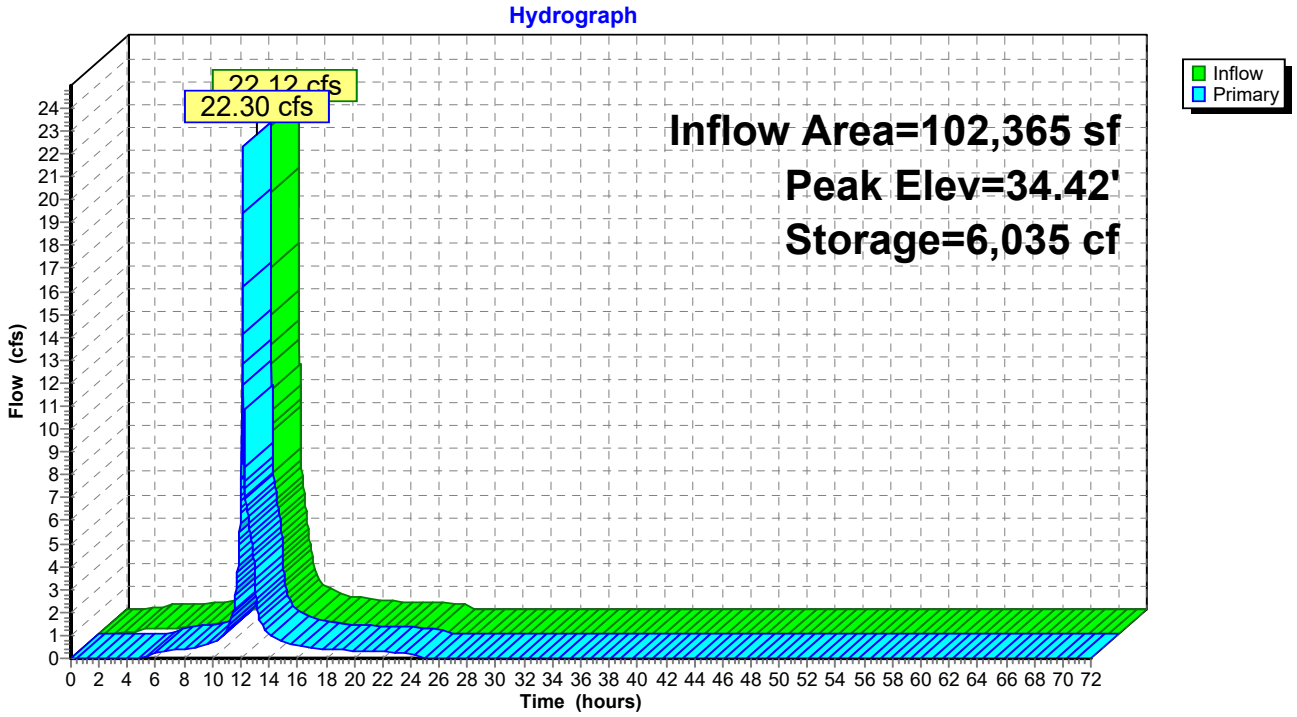
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=22.10 cfs @ 12.11 hrs HW=34.14' TW=16.18' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 22.10 cfs @ 18.01 fps)
↑—**1=Orifice/Grate** (Passes 22.10 cfs of 272.30 cfs potential flow)

Pond Pre bio-2: Pre Bio Ret 2

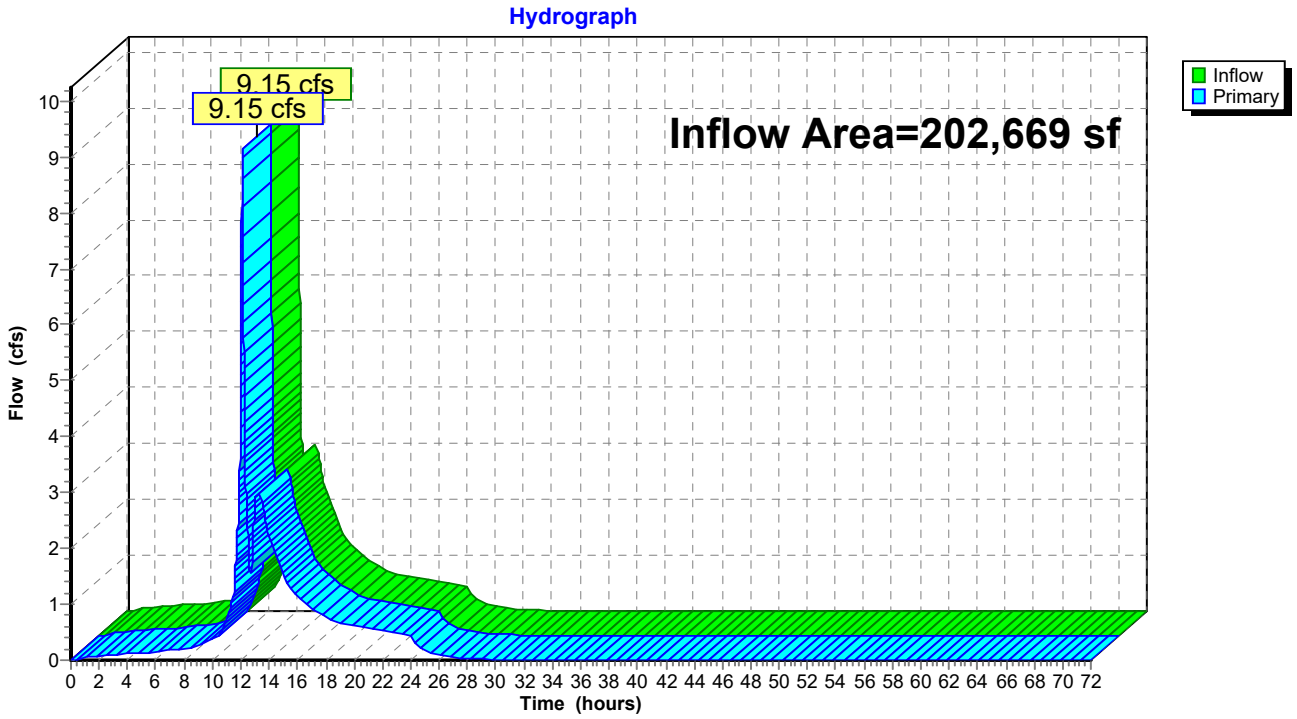


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 4.03" for 100-Year-Fut event
Inflow = 9.15 cfs @ 12.12 hrs, Volume= 68,094 cf
Primary = 9.15 cfs @ 12.12 hrs, Volume= 68,094 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

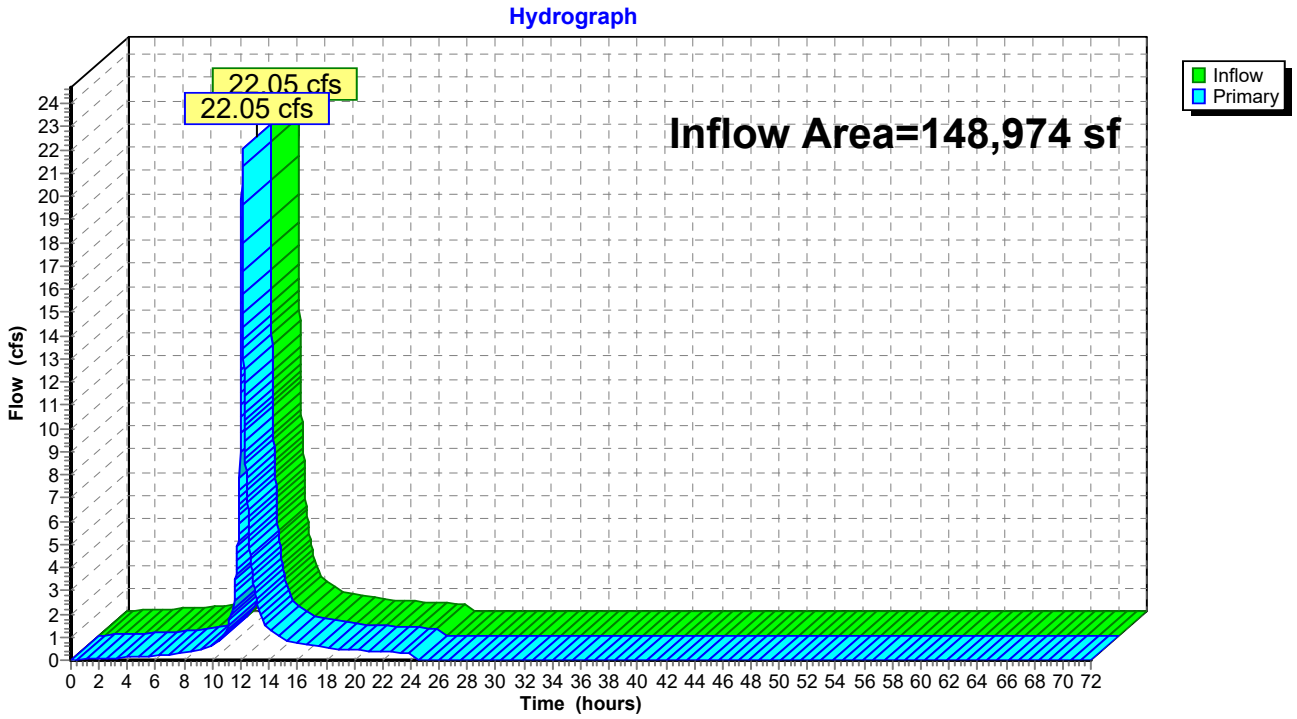


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 6.47" for 100-Year-Fut event
Inflow = 22.05 cfs @ 12.11 hrs, Volume= 80,261 cf
Primary = 22.05 cfs @ 12.11 hrs, Volume= 80,261 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

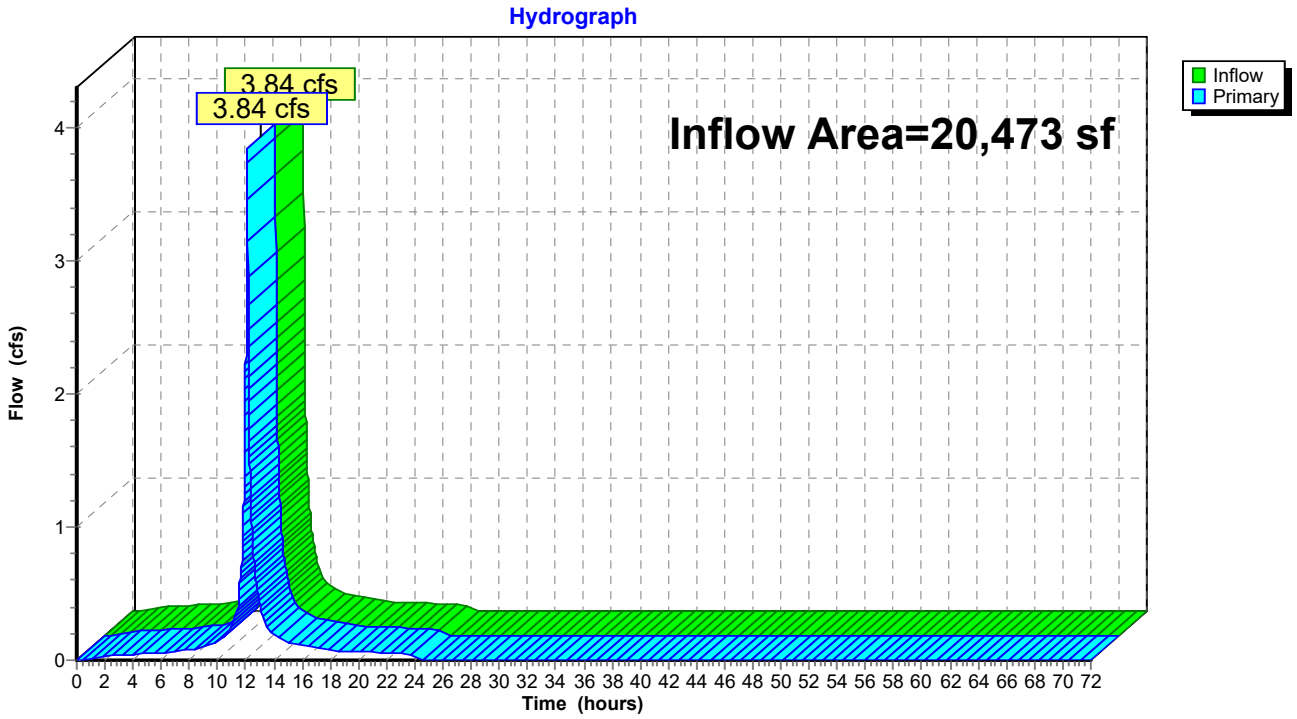


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 7.94" for 100-Year-Fut event
Inflow = 3.84 cfs @ 12.11 hrs, Volume= 13,549 cf
Primary = 3.84 cfs @ 12.11 hrs, Volume= 13,549 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

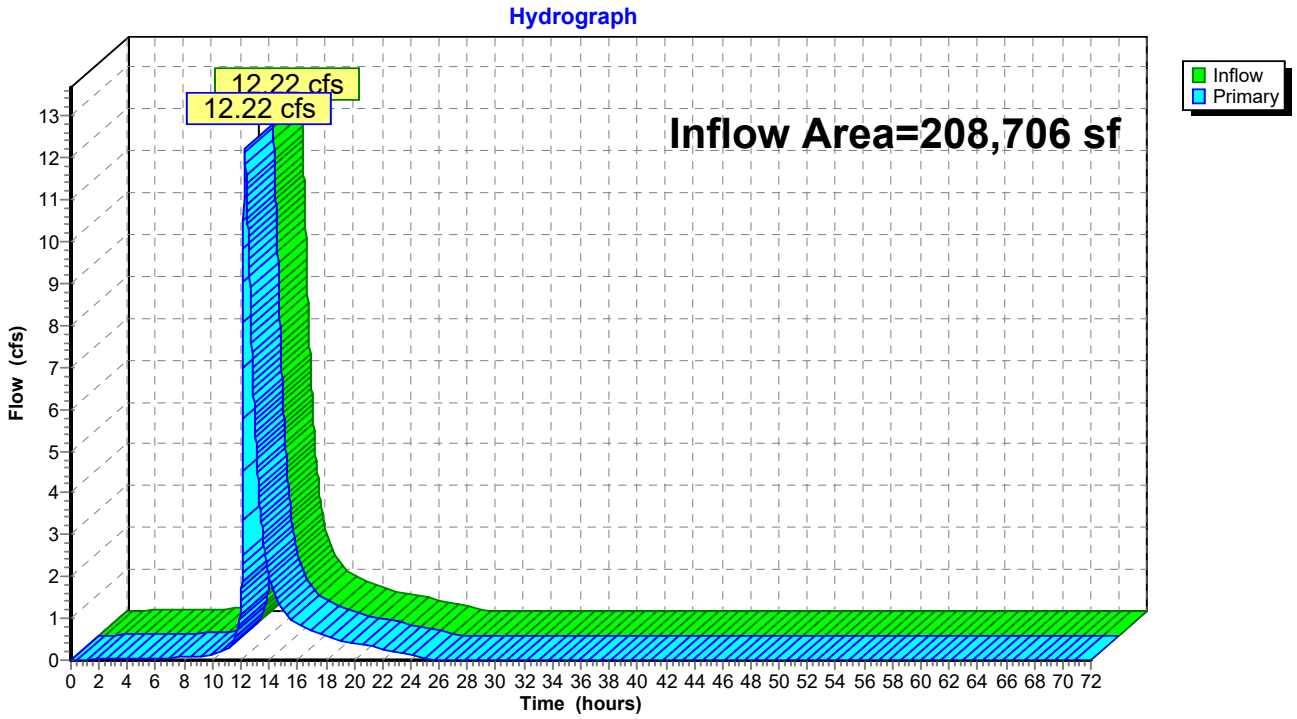


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 3.87" for 100-Year-Fut event
Inflow = 12.22 cfs @ 12.28 hrs, Volume= 67,254 cf
Primary = 12.22 cfs @ 12.28 hrs, Volume= 67,254 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

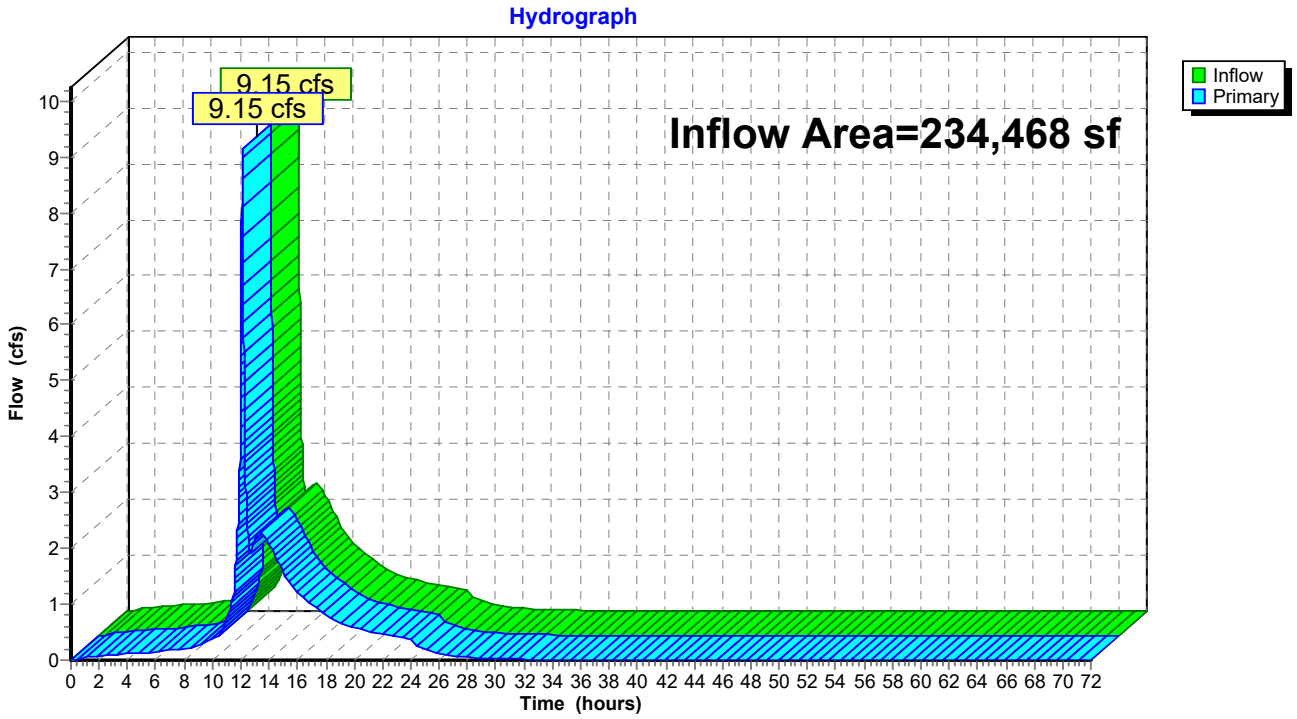


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 3.44" for 100-Year-Fut event
Inflow = 9.15 cfs @ 12.12 hrs, Volume= 67,308 cf
Primary = 9.15 cfs @ 12.12 hrs, Volume= 67,308 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

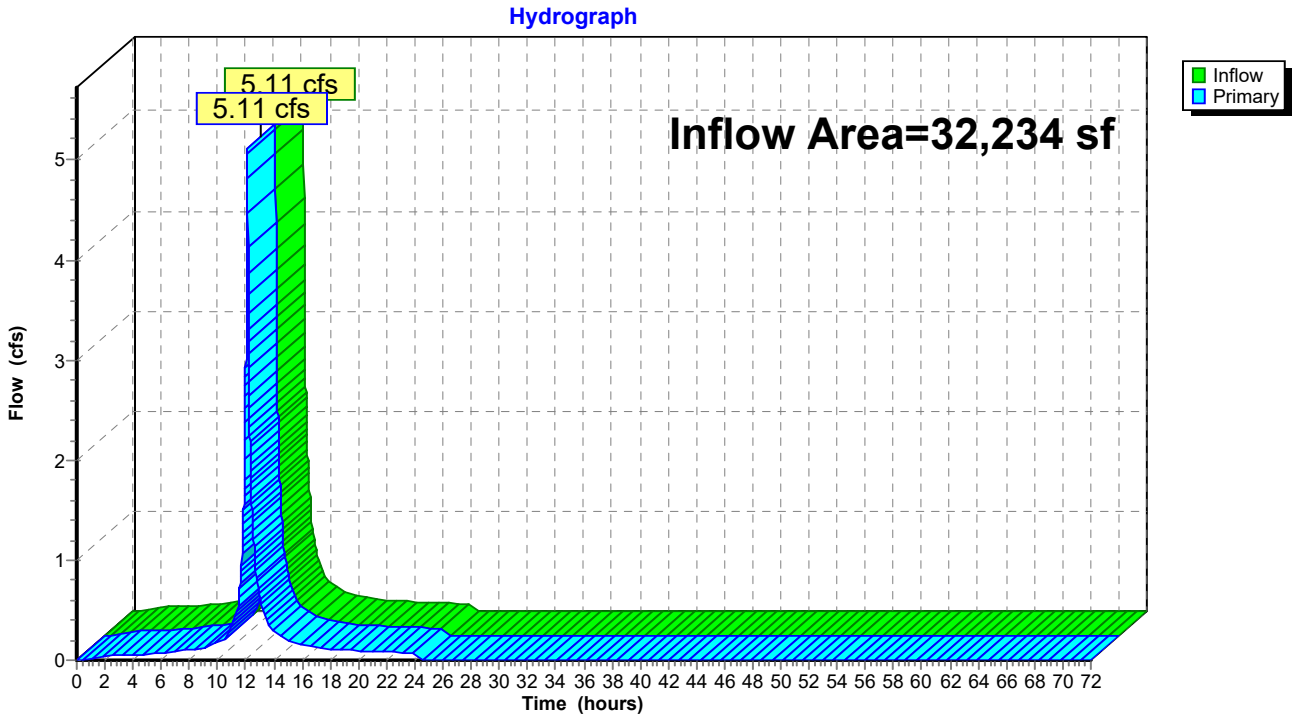


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 7.11" for 100-Year-Fut event
Inflow = 5.11 cfs @ 12.11 hrs, Volume= 19,088 cf
Primary = 5.11 cfs @ 12.11 hrs, Volume= 19,088 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



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

SubcatchmentPost 1: Post Area 1, Runoff Area=56,170 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.90 cfs 4,843 cf

SubcatchmentPost 10: Post Area 10, Runoff Area=45,738 sf 28.17% Impervious Runoff Depth=0.29"
Flow Length=294' Slope=0.0250 '/' Tc=18.1 min CN=WQ Runoff=0.39 cfs 1,111 cf

SubcatchmentPost 11: Post Area 11, Runoff Area=14,938 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.04 cfs 1,288 cf

SubcatchmentPost 11A: Post Area 11A, Runoff Area=7,277 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 1A: Post Area 1A, Runoff Area=17,882 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 2: Post Area 2, Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.28 cfs 1,591 cf

SubcatchmentPost 2A: Area 2A, landscape Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 3: Post Area 3, Pre Runoff Area=12,515 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=208' Slope=0.0100 '/' Tc=2.5 min CN=WQ Runoff=0.86 cfs 1,079 cf

SubcatchmentPost 3A: Post Area 3A, Pre Runoff Area=7,958 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 4A: Post Area 4A, Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 5: Post area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=330' Tc=3.9 min CN=98 Runoff=2.20 cfs 3,006 cf

SubcatchmentPost 5A: Post area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 0 cf

SubcatchmentPost 7: Post Area 7, Runoff Area=16,842 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.17 cfs 1,452 cf

SubcatchmentPost 7A: Post Area 7A, Runoff Area=25,465 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 8: Post Area 8, Runoff Area=45,522 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.16 cfs 3,925 cf

SubcatchmentPost 8A: Post Area 8A, Runoff Area=31,579 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPost 9: Post Area 9, Offsite Runoff Area=43,560 sf 26.38% Impervious Runoff Depth=0.27"
Flow Length=304' Slope=0.0250 '/' Tc=25.3 min CN=WQ Runoff=0.28 cfs 991 cf

Subcatchmentpre 1: Pre Area 1, Pre Runoff Area=47,507 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=3.29 cfs 4,096 cf

SubcatchmentPre 1A: Pre Area 1A, Pre Runoff Area=16,961 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPre 2: Pre Area 2, Pre Runoff Area=18,459 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.28 cfs 1,591 cf

SubcatchmentPre 2A: Pre Area 2A, Pre Runoff Area=19,438 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPre 3: Pre Area 3, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=233' Slope=0.0100 '/' Tc=2.8 min CN=WQ Runoff=1.11 cfs 1,419 cf

SubcatchmentPre 3A: Pre Area 3A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPre 4A: Pre Area 4A, Pre Runoff Area=37,578 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPre 5: Pre area 5, Runoff Area=34,866 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=330' Tc=3.9 min CN=98 Runoff=2.20 cfs 3,006 cf

SubcatchmentPre 5A: Pre area 5A, Runoff Area=27,860 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=274' Tc=31.6 min CN=30 Runoff=0.00 cfs 0 cf

SubcatchmentPre 6: Pre Area 7, Pre Runoff Area=16,460 sf 100.00% Impervious Runoff Depth=1.03"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.14 cfs 1,419 cf

SubcatchmentPre 6A: Pre Area 7A, Pre Runoff Area=15,774 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentPre 7: Pre Area 7, Pre Runoff Area=49,160 sf 20.41% Impervious Runoff Depth=0.45"
Flow Length=175' Slope=0.0100 '/' Tc=2.2 min CN=WQ Runoff=1.61 cfs 1,851 cf

SubcatchmentPre 7A: Pre Area 7A, Pre Runoff Area=67,580 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=78' Slope=0.0300 '/' Tc=10.6 min CN=WQ Runoff=0.00 cfs 0 cf

Pond 4P: Pre developed infiltration basin 1, Peak Elev=14.68' Storage=3,181 cf Inflow=3.72 cfs 3,181 cf
Outflow=0.00 cfs 0 cf

Pond Bas 3: Basin 3 to discharge point 3 Peak Elev=13.00' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond Bio -30: Post Bio-30 Peak Elev=21.09' Storage=1,166 cf Inflow=1.04 cfs 1,288 cf
Discarded=0.02 cfs 1,288 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,288 cf

Pond Bio 10: Pre Bio Ret 10 Peak Elev=18.48' Storage=1,801 cf Inflow=3.90 cfs 4,843 cf
Discarded=0.05 cfs 1,662 cf Primary=3.72 cfs 3,181 cf Outflow=3.77 cfs 4,843 cf

Pond Bio 20: Post Bio-20 Peak Elev=17.07' Storage=578 cf Inflow=1.28 cfs 1,591 cf
Discarded=0.36 cfs 1,594 cf Primary=0.00 cfs 0 cf Outflow=0.36 cfs 1,594 cf

Pond Bio 70: Post Bio-70 Peak Elev=23.31' Storage=747 cf Inflow=1.17 cfs 1,452 cf
Discarded=0.18 cfs 1,455 cf Primary=0.00 cfs 0 cf Outflow=0.18 cfs 1,455 cf

Pond Bio 80: Post Bio-80 Peak Elev=17.13' Storage=3,308 cf Inflow=3.25 cfs 4,915 cf
Discarded=0.25 cfs 4,919 cf Primary=0.00 cfs 0 cf Outflow=0.25 cfs 4,919 cf

Pond Pre bas 1: Pre developed infiltration Peak Elev=14.62' Storage=2,665 cf Inflow=1.80 cfs 2,665 cf
Outflow=0.00 cfs 0 cf

Pond Pre bio-1: Pre Bio Ret 1 Peak Elev=18.03' Storage=1,072 cf Inflow=3.29 cfs 4,096 cf
Outflow=3.13 cfs 3,303 cf

Pond Pre bio-2: Pre Bio Ret 2 Peak Elev=17.93' Storage=2,745 cf Inflow=4.38 cfs 4,895 cf
Outflow=1.80 cfs 2,665 cf

Link 1L: Pre dis 1 Inflow=2.20 cfs 3,006 cf
Primary=2.20 cfs 3,006 cf

Link 3L: Pre discharge point 3 Inflow=2.74 cfs 3,270 cf
Primary=2.74 cfs 3,270 cf

Link 4L: Post discharge point 2 Inflow=0.86 cfs 1,079 cf
Primary=0.86 cfs 1,079 cf

Link 6L: Discharge point 3 post Inflow=0.39 cfs 1,111 cf
Primary=0.39 cfs 1,111 cf

Link 11L: Post dis 1 Inflow=2.20 cfs 3,006 cf
Primary=2.20 cfs 3,006 cf

Link Pre Dis 2: Pre discharge point 2 Inflow=1.11 cfs 1,419 cf
Primary=1.11 cfs 1,419 cf

Total Runoff Area = 847,524 sf Runoff Volume = 32,667 cf Average Runoff Depth = 0.46"
56.64% Pervious = 480,050 sf 43.36% Impervious = 367,474 sf

Summary for Subcatchment Post 1: Post Area 1, imperviuos

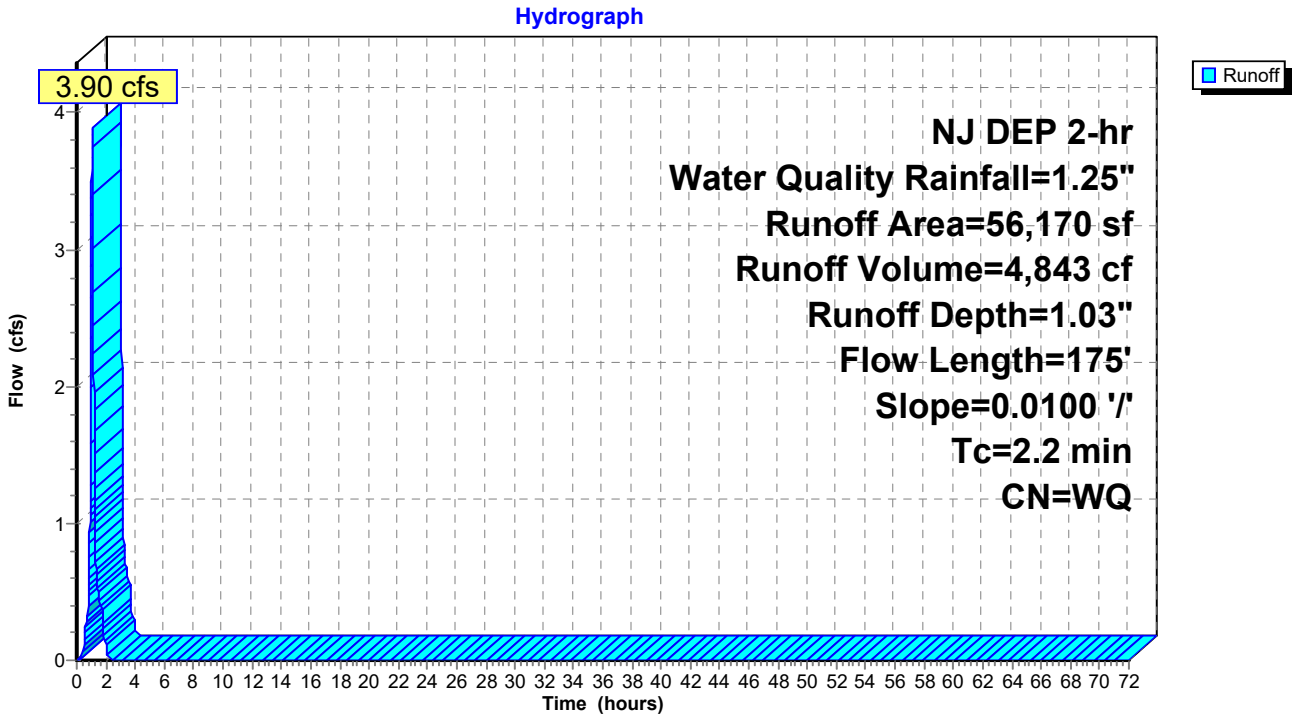
Runoff = 3.90 cfs @ 1.09 hrs, Volume= 4,843 cf, Depth= 1.03"
Routed to Pond Bio 10 : Pre Bio Ret 10

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

	Area (sf)	CN	Description
*	56,170	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	56,170		Weighted Average
	56,170		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 1: Post Area 1, imperviuos



Summary for Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious

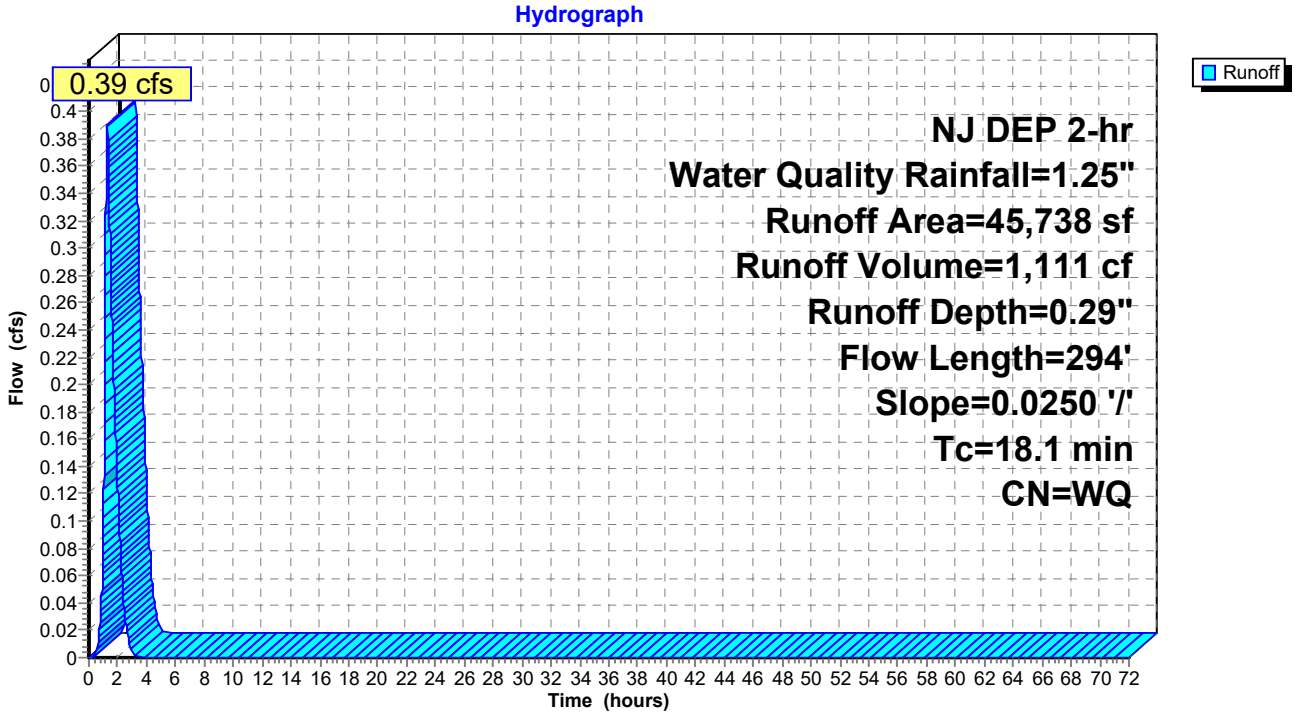
Runoff = 0.39 cfs @ 1.28 hrs, Volume= 1,111 cf, Depth= 0.29"
Routed to Link 6L : Discharge point 3 post

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

	Area (sf)	CN	Description
*	4,923	98	house and driveways
*	7,960	98	Portion of Frog Pond Road
	11,456	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	19,285	55	Woods, Good, HSG B
	45,738		Weighted Average
	32,855		71.83% Pervious Area
	12,883		28.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0250	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"
4.1	194	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
18.1	294	Total			

Subcatchment Post 10: Post Area 10, Offsite with unconnected impervious



Summary for Subcatchment Post 11: Post Area 11, imperviuos

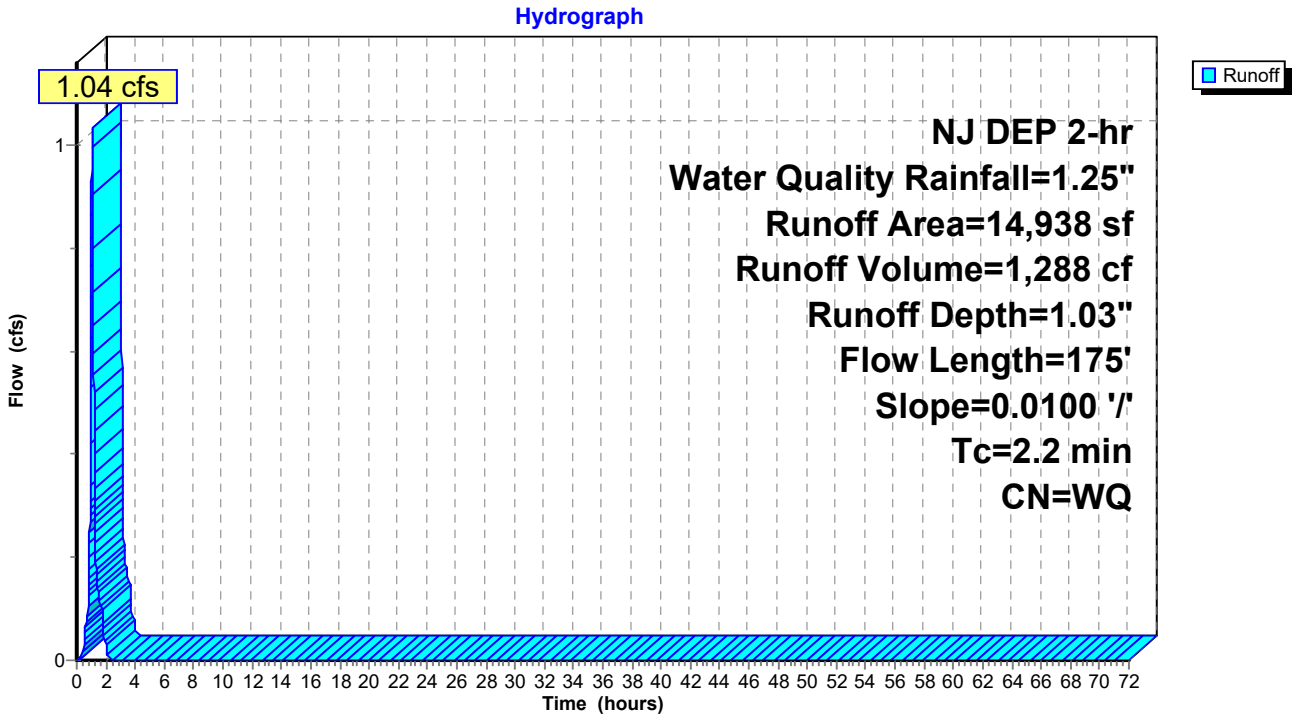
Runoff = 1.04 cfs @ 1.09 hrs, Volume= 1,288 cf, Depth= 1.03"
Routed to Pond Bio -30 : Post Bio-30

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

	Area (sf)	CN	Description
*	14,938	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	14,938		Weighted Average
	14,938		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 11: Post Area 11, imperviuos



Summary for Subcatchment Post 11A: Post Area 11A, landscape area

[45] Hint: Runoff=Zero

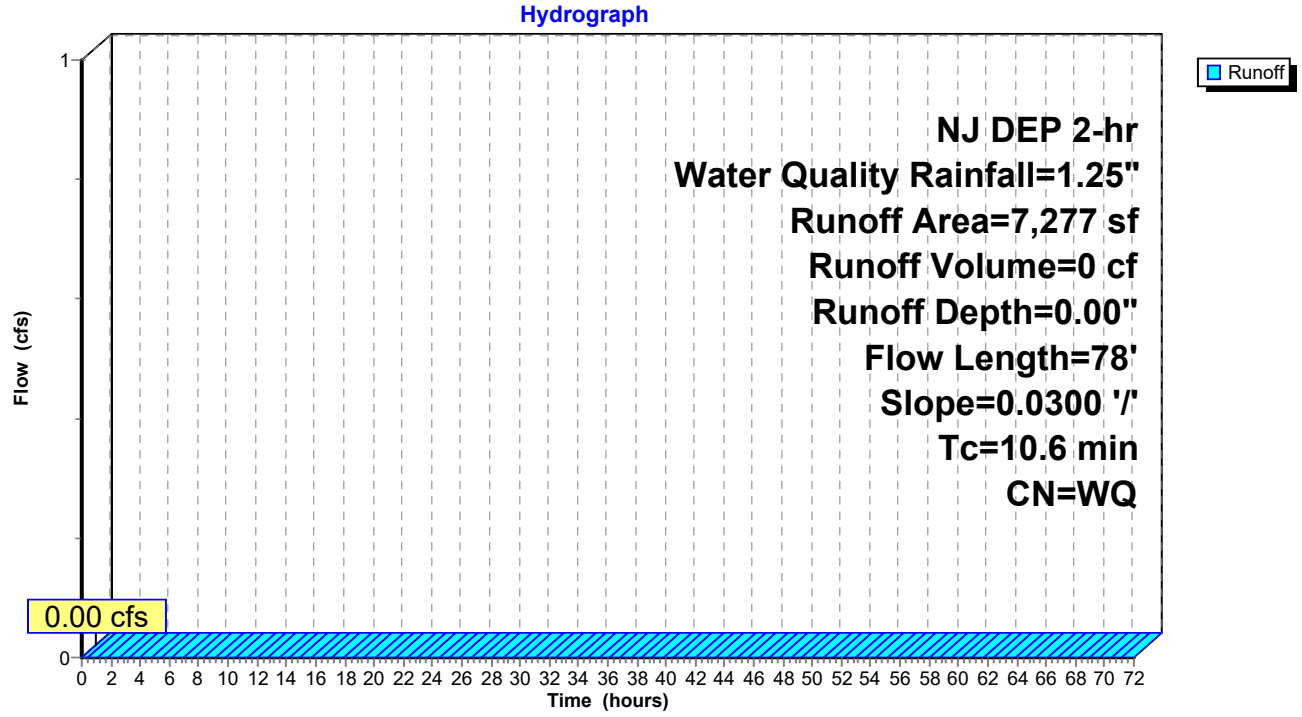
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Bio -30 : Post Bio-30

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,277	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,277		Weighted Average
	7,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 11A: Post Area 11A, landscape area



Summary for Subcatchment Post 1A: Post Area 1A, landscape area

[45] Hint: Runoff=Zero

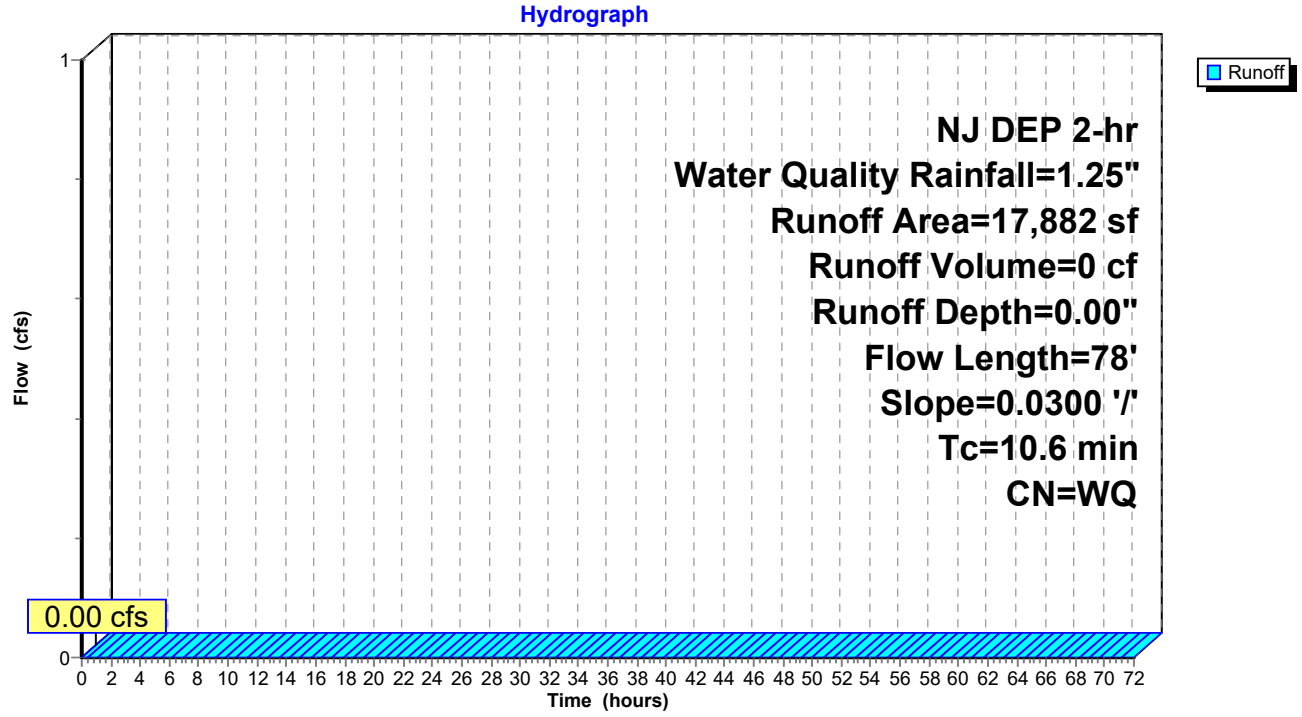
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Bio 10 : Pre Bio Ret 10

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	17,882	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	17,882		Weighted Average
	17,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 1A: Post Area 1A, landscape area



Summary for Subcatchment Post 2: Post Area 2, imperviuos

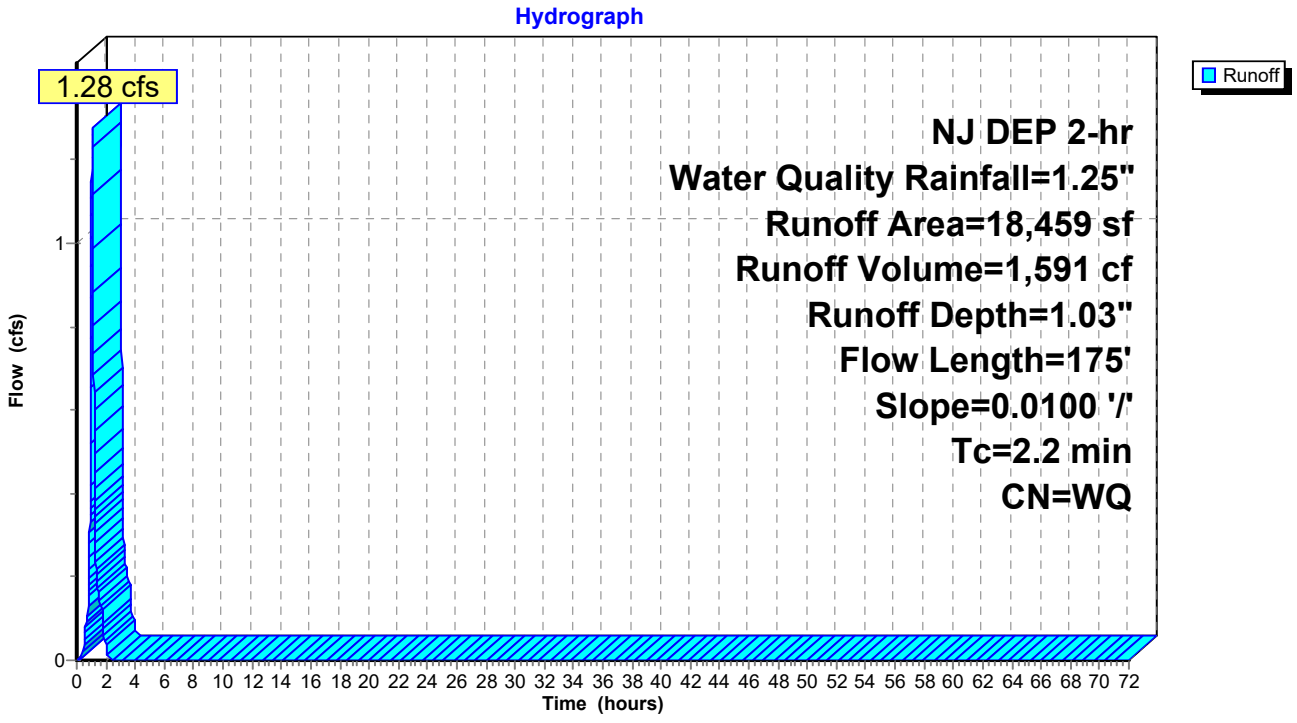
Runoff = 1.28 cfs @ 1.09 hrs, Volume= 1,591 cf, Depth= 1.03"
Routed to Pond Bio 20 : Post Bio-20

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

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 2: Post Area 2, imperviuos



Summary for Subcatchment Post 2A: Area 2A, landscape area

[45] Hint: Runoff=Zero

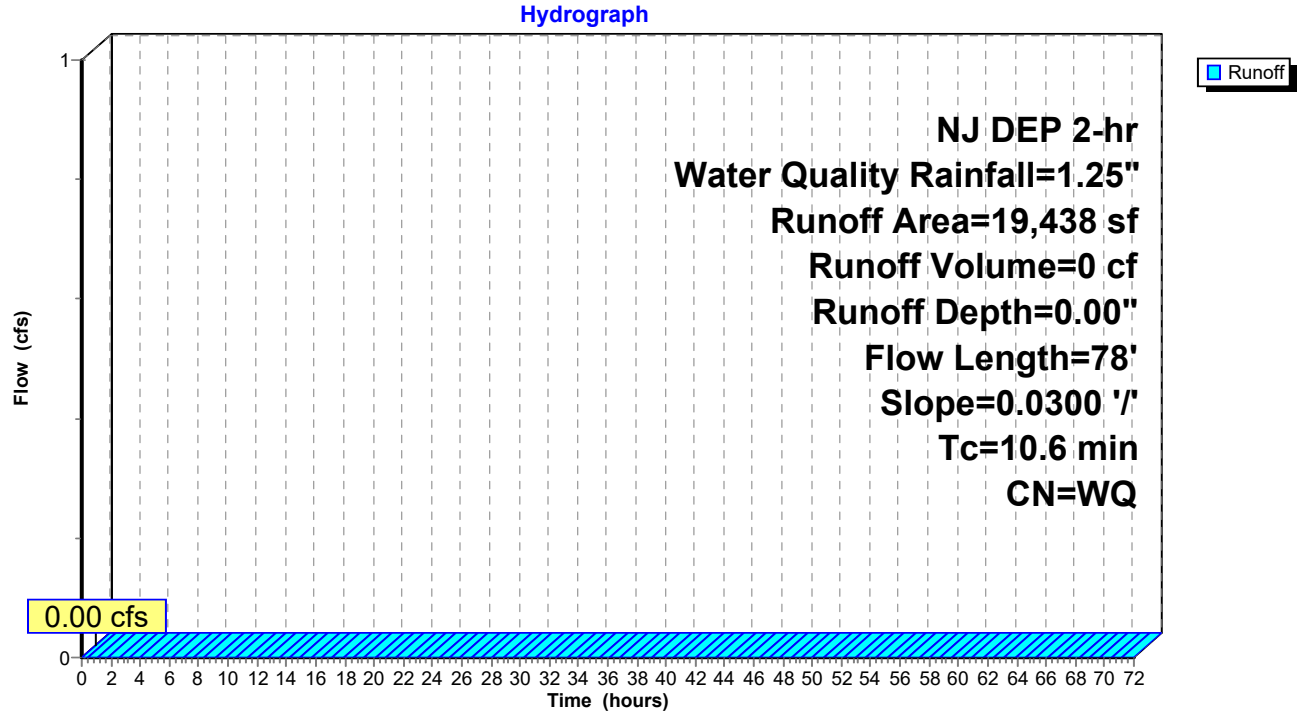
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Bio 20 : Post Bio-20

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 2A: Area 2A, landscape area



Summary for Subcatchment Post 3: Post Area 3, Pre imperviuos

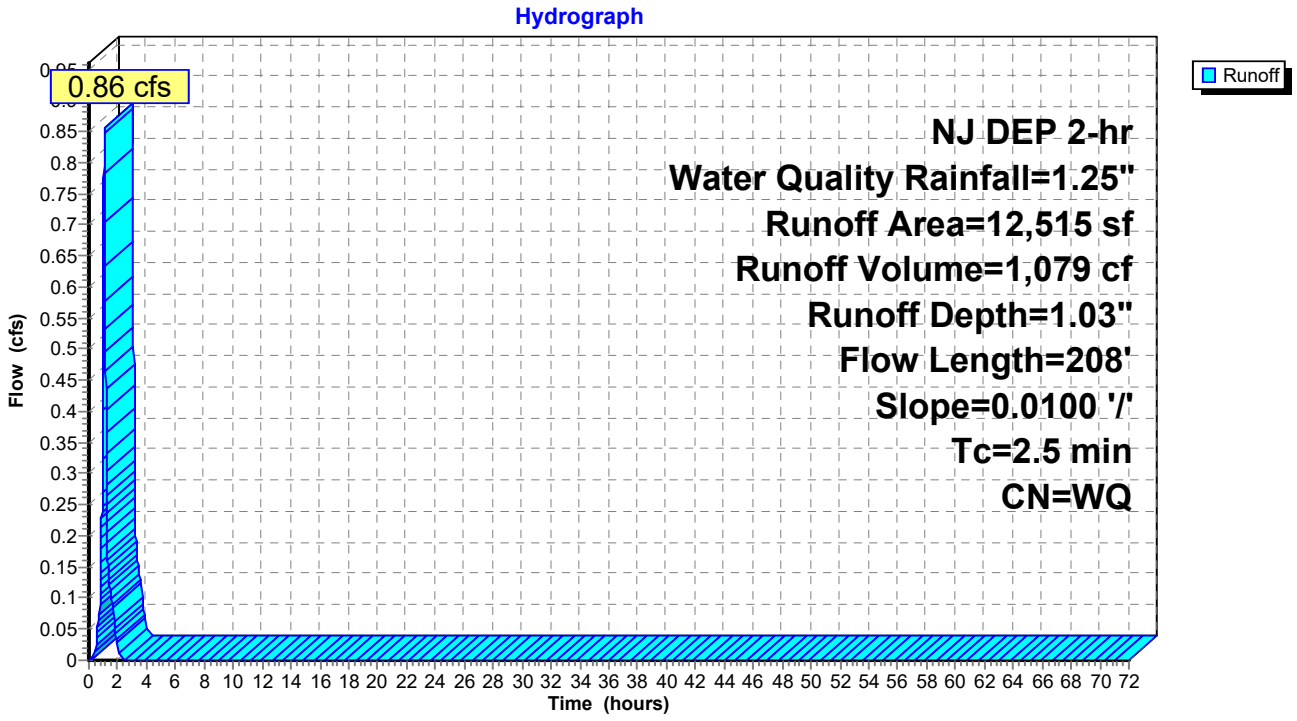
Runoff = 0.86 cfs @ 1.09 hrs, Volume= 1,079 cf, Depth= 1.03"
Routed to Link 4L : Post discharge point 2

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

	Area (sf)	CN	Description
*	12,515	98	impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	12,515		Weighted Average
	12,515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.5	208	Total			

Subcatchment Post 3: Post Area 3, Pre imperviuos



Summary for Subcatchment Post 3A: Post Area 3A, Pre landscape area

[45] Hint: Runoff=Zero

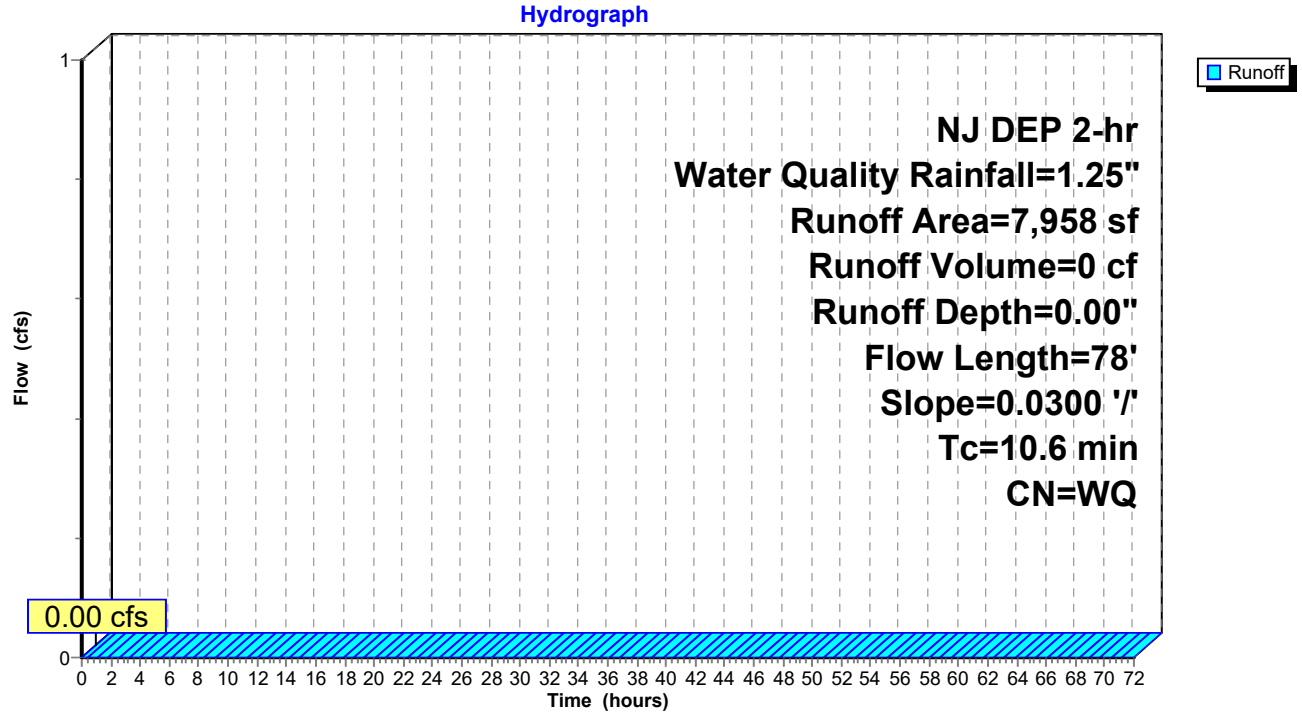
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 4L : Post discharge point 2

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	7,958	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	7,958		Weighted Average
	7,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 3A: Post Area 3A, Pre landscape area



Summary for Subcatchment Post 4A: Post Area 4A, landscape area

[45] Hint: Runoff=Zero

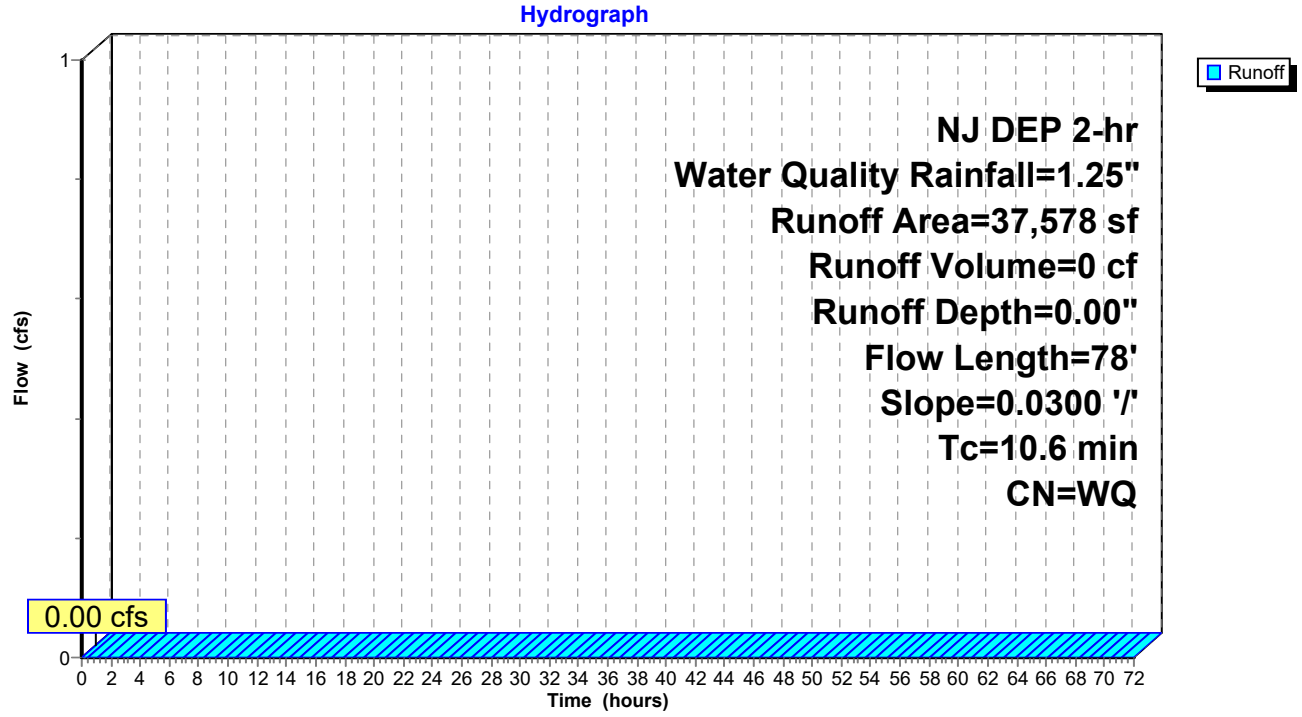
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 4A: Post Area 4A, landscape area



Summary for Subcatchment Post 5: Post area 5, Impervious (Offsite DA)

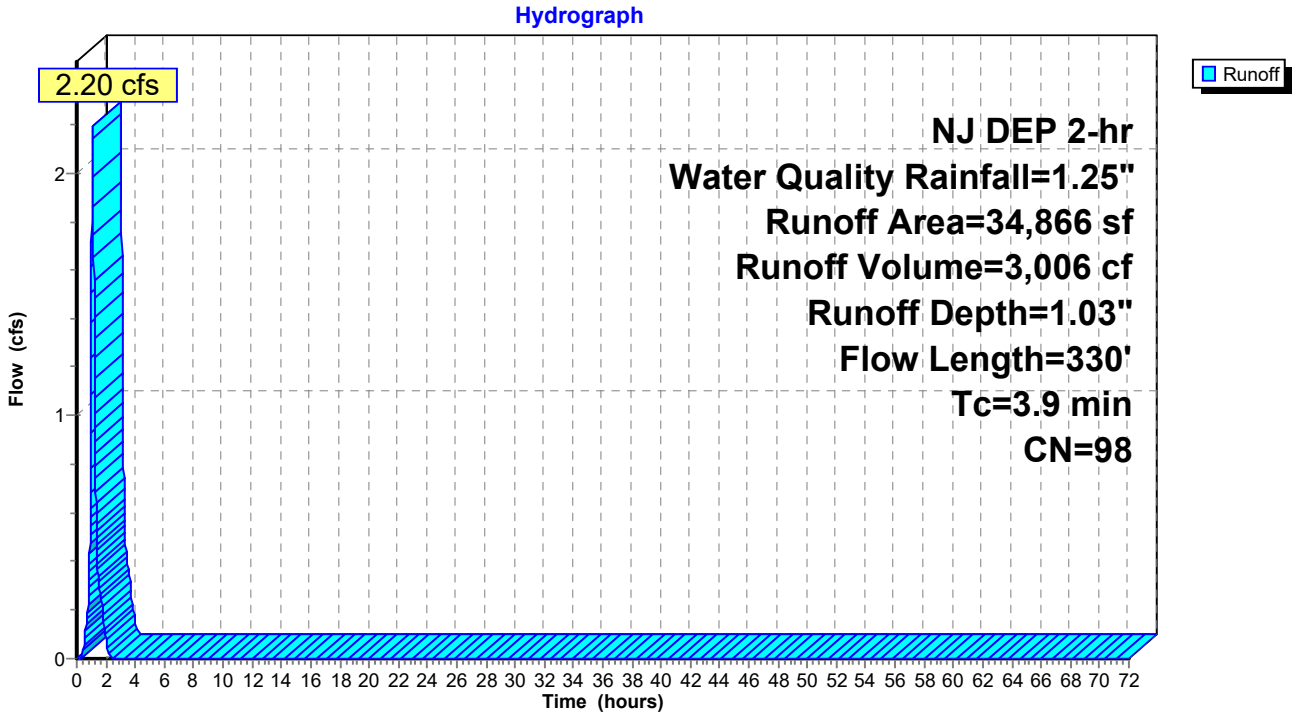
Runoff = 2.20 cfs @ 1.10 hrs, Volume= 3,006 cf, Depth= 1.03"
Routed to Link 11L : Post dis 1

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

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Post 5: Post area 5, Impervious (Offsite DA)



Summary for Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)

[45] Hint: Runoff=Zero

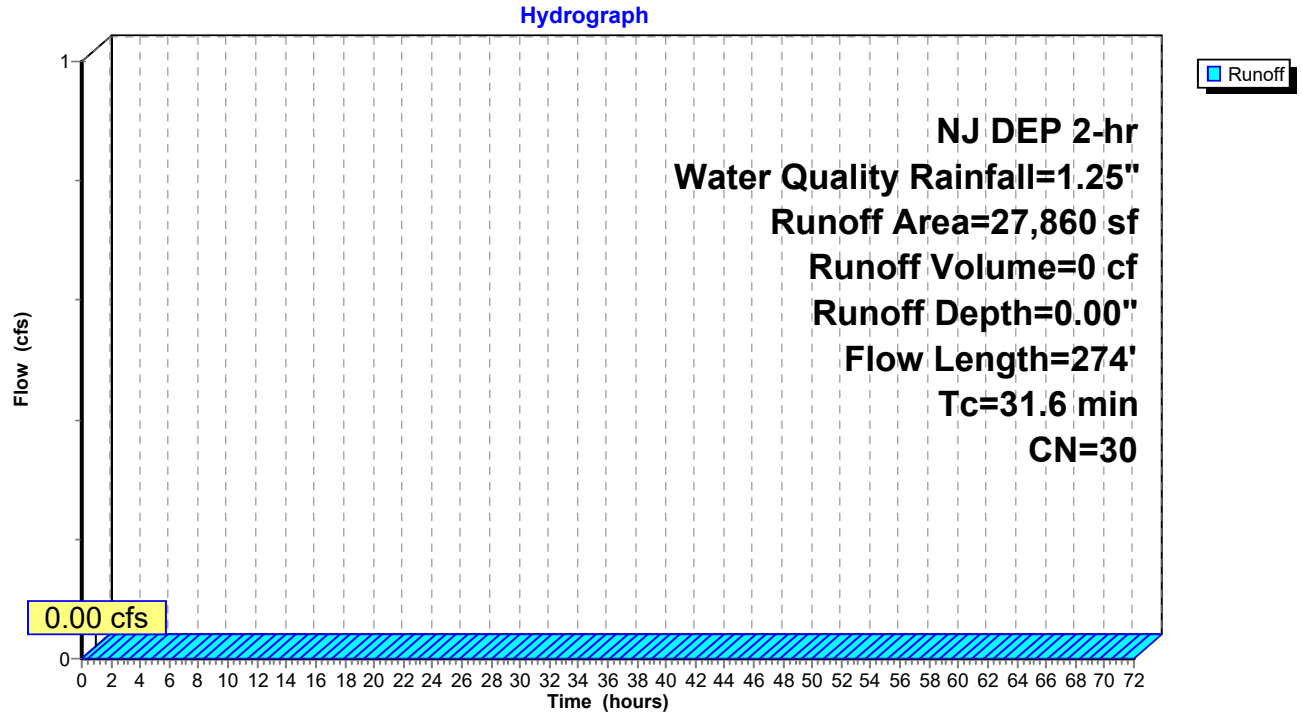
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 11L : Post dis 1

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

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Post 5A: Post area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Post 7: Post Area 7, Impervious

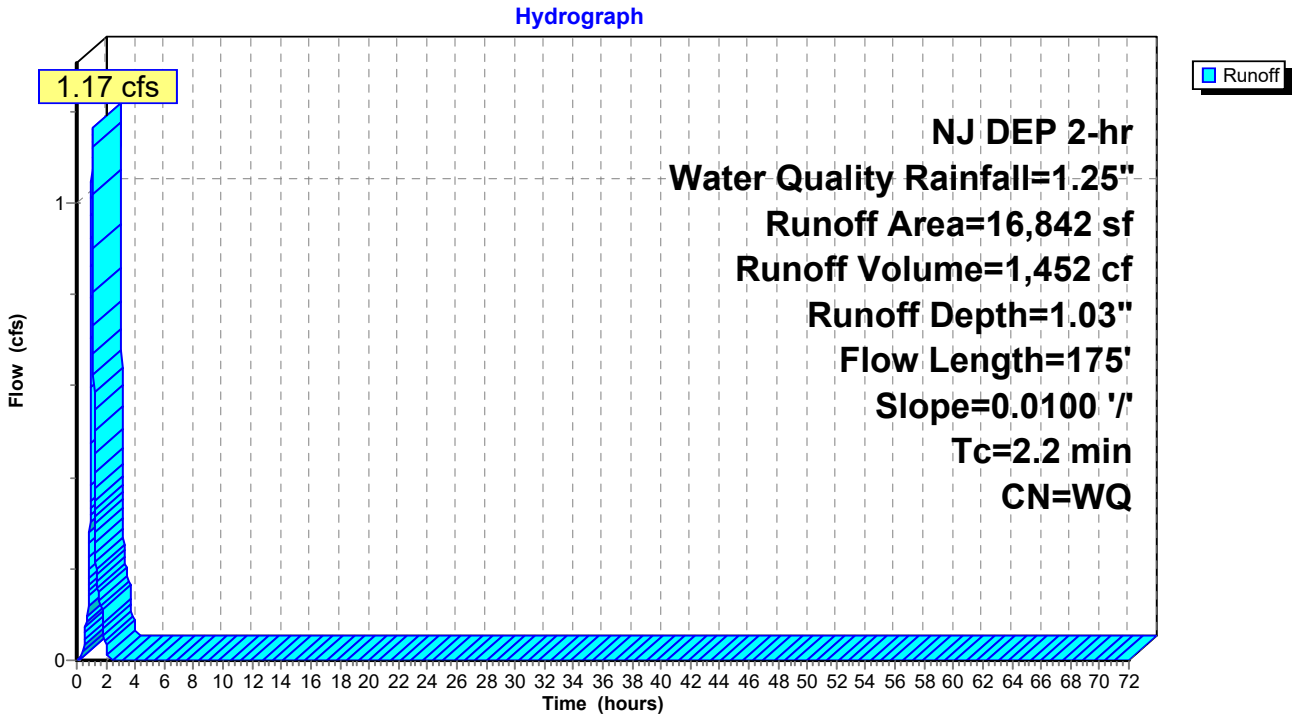
Runoff = 1.17 cfs @ 1.09 hrs, Volume= 1,452 cf, Depth= 1.03"
Routed to Pond Bio 70 : Post Bio-70

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

	Area (sf)	CN	Description
*	13,122	98	impervious
*	3,720	98	Existing Parkertown Dr.
*	0	55	woods, good condition
	16,842		Weighted Average
	16,842		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 7: Post Area 7, Impervious



Summary for Subcatchment Post 7A: Post Area 7A, landscape area

[45] Hint: Runoff=Zero

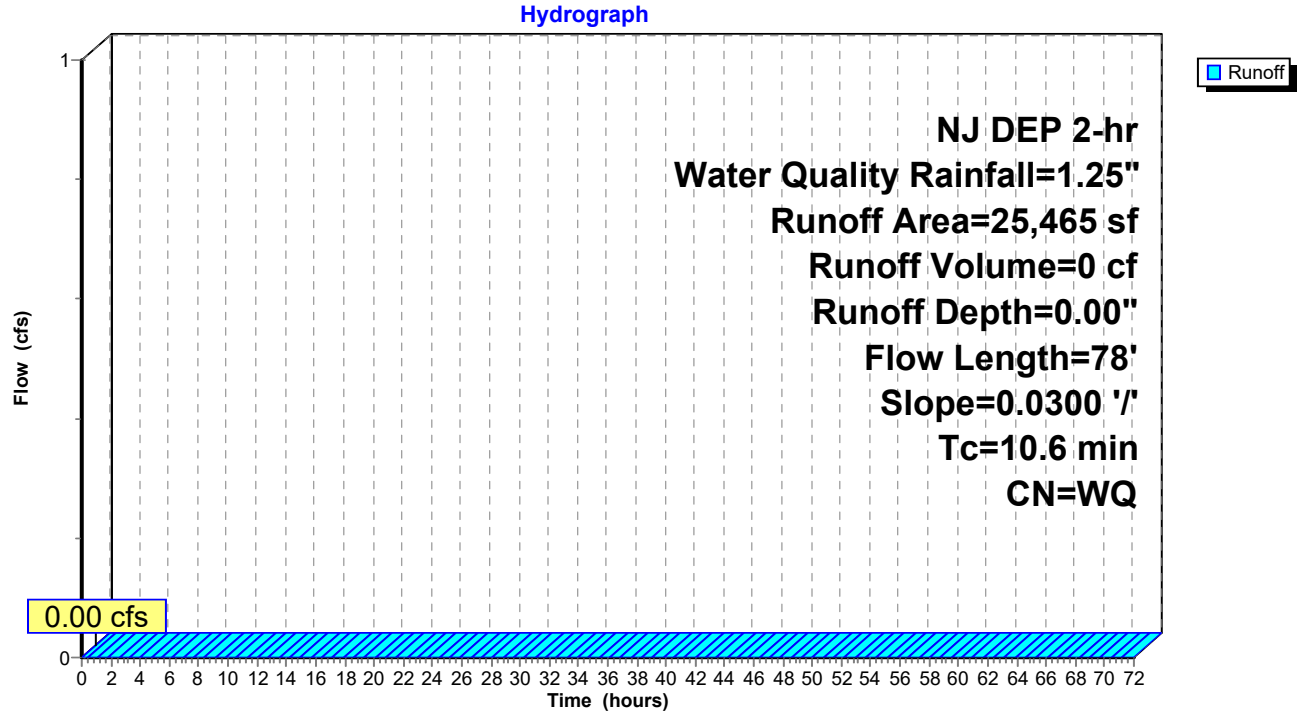
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Bio 70 : Post Bio-70

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	25,465	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	25,465		Weighted Average
	25,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 7A: Post Area 7A, landscape area



Summary for Subcatchment Post 8: Post Area 8, Impervious

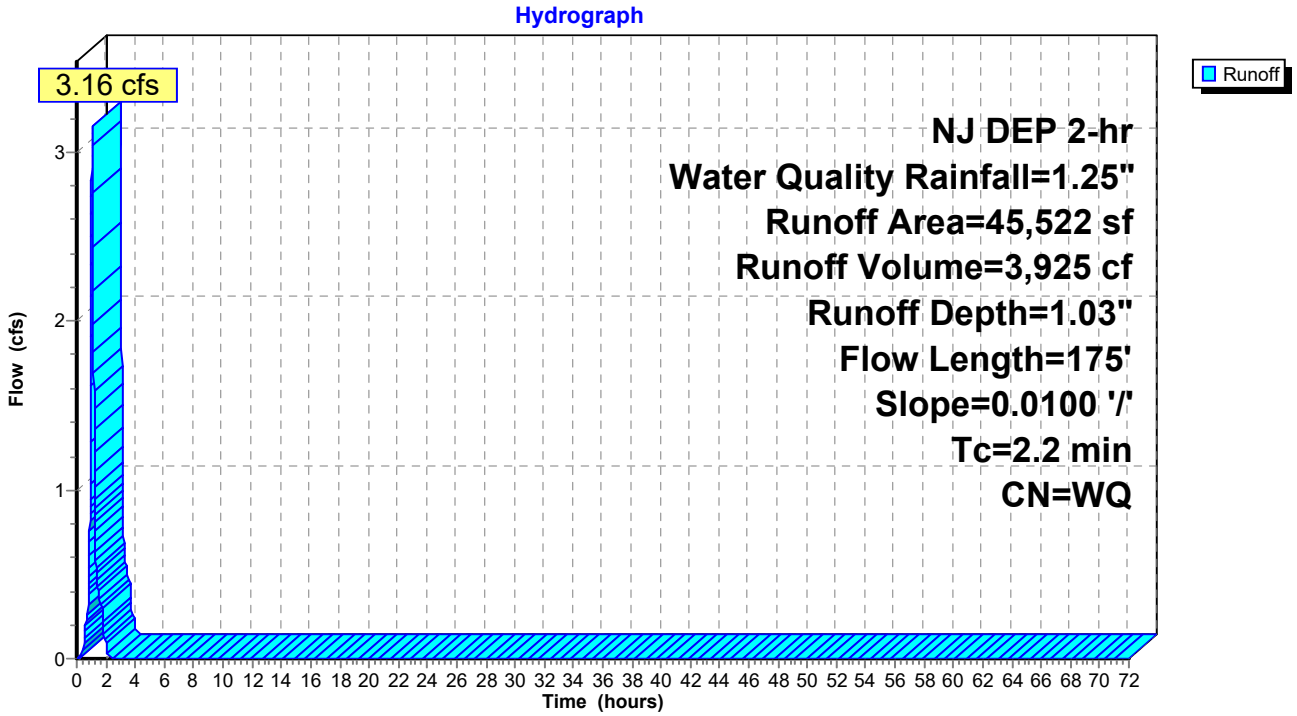
Runoff = 3.16 cfs @ 1.09 hrs, Volume= 3,925 cf, Depth= 1.03"
Routed to Pond Bio 80 : Post Bio-80

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

	Area (sf)	CN	Description
*	45,522	98	impervious
*	0	55	woods, good condition
	45,522		Weighted Average
	45,522		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Post 8: Post Area 8, Impervious



Summary for Subcatchment Post 8A: Post Area 8A, landscape area

[45] Hint: Runoff=Zero

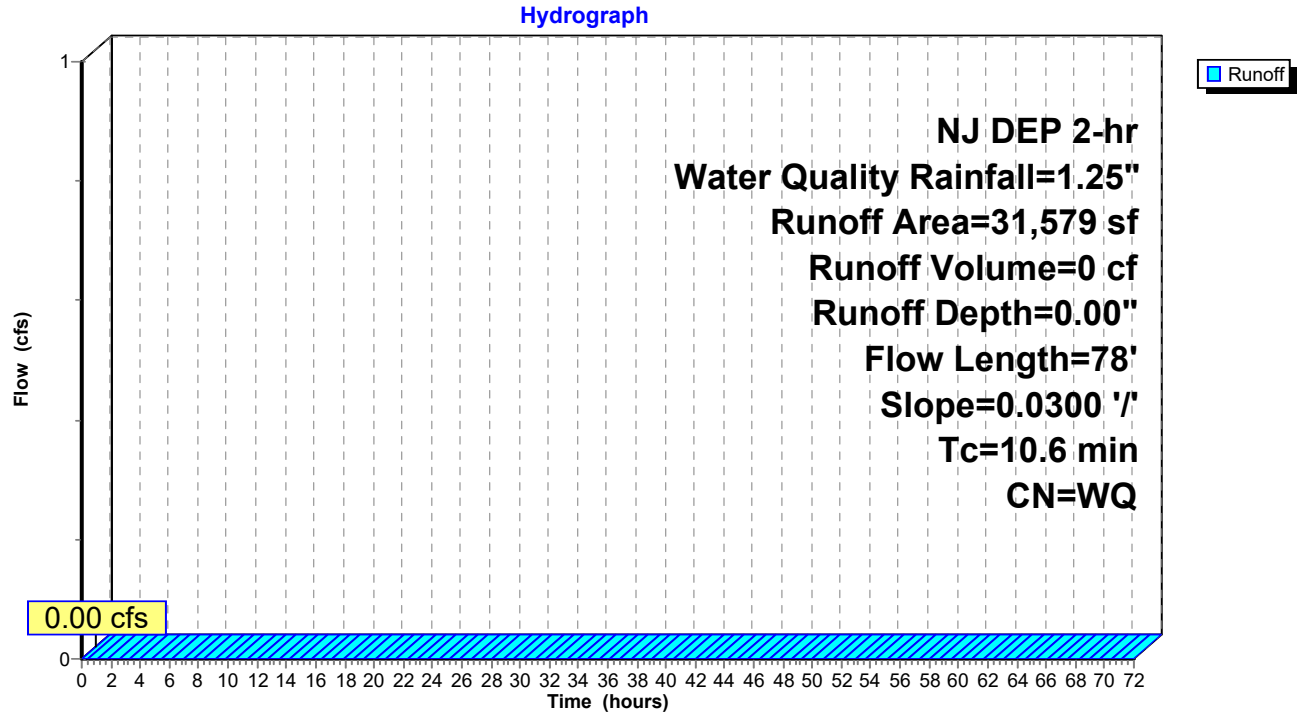
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Bio 80 : Post Bio-80

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

Area (sf)	CN	Description
12,554	39	>75% Grass cover, Good, HSG A
5,626	61	>75% Grass cover, Good, HSG B
6,551	55	Woods, Good, HSG B
6,848	30	Woods, Good, HSG A
31,579		Weighted Average
31,579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Post 8A: Post Area 8A, landscape area



Summary for Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious

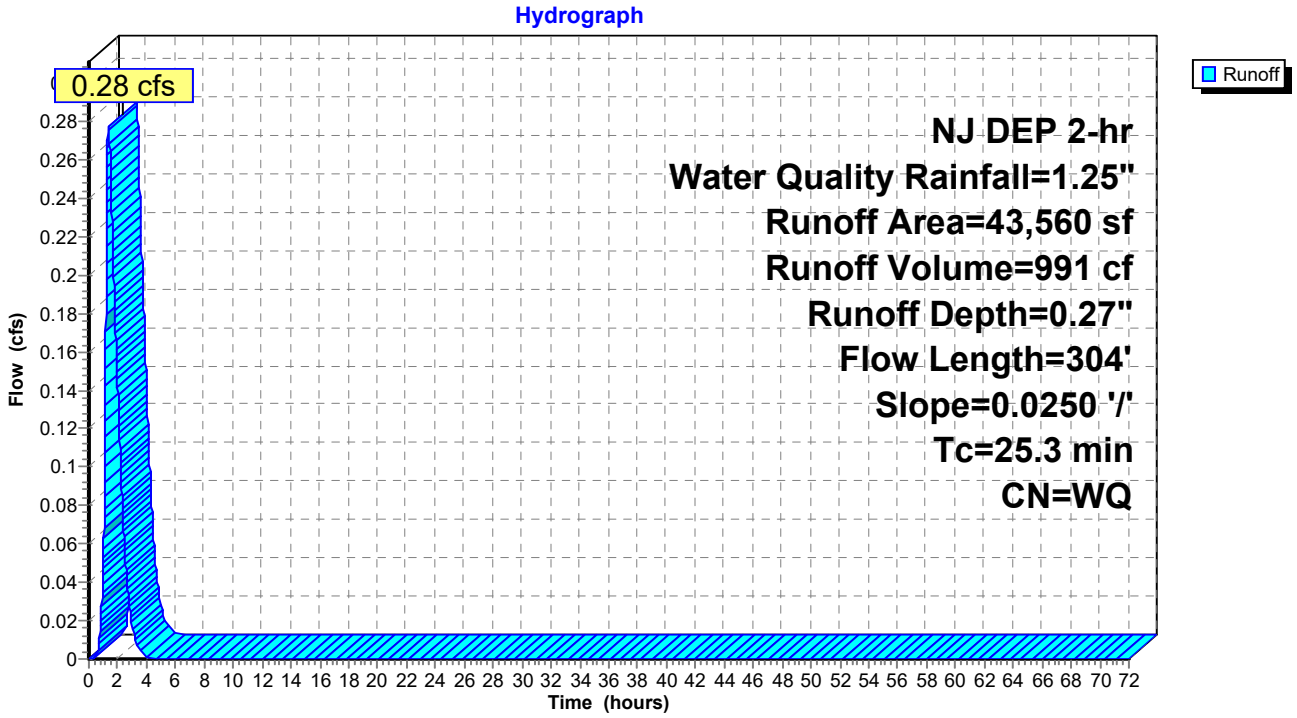
Runoff = 0.28 cfs @ 1.35 hrs, Volume= 991 cf, Depth= 0.27"
Routed to Pond Bio 80 : Post Bio-80

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

	Area (sf)	CN	Description
*	7,486	98	house and driveways
*	4,005	98	Portion of Frog Pond Road
	16,900	39	>75% Grass cover, Good, HSG A
	2,114	61	>75% Grass cover, Good, HSG B
	1,895	55	Woods, Good, HSG B
	11,160	30	Woods, Good, HSG A
	43,560		Weighted Average
	32,069		73.62% Pervious Area
	11,491		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.0	100	0.0250	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.80"
4.3	204	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
25.3	304	Total			

Subcatchment Post 9: Post Area 9, Offsite with unconnected impervious



Summary for Subcatchment pre 1: Pre Area 1, Pre imperviuos

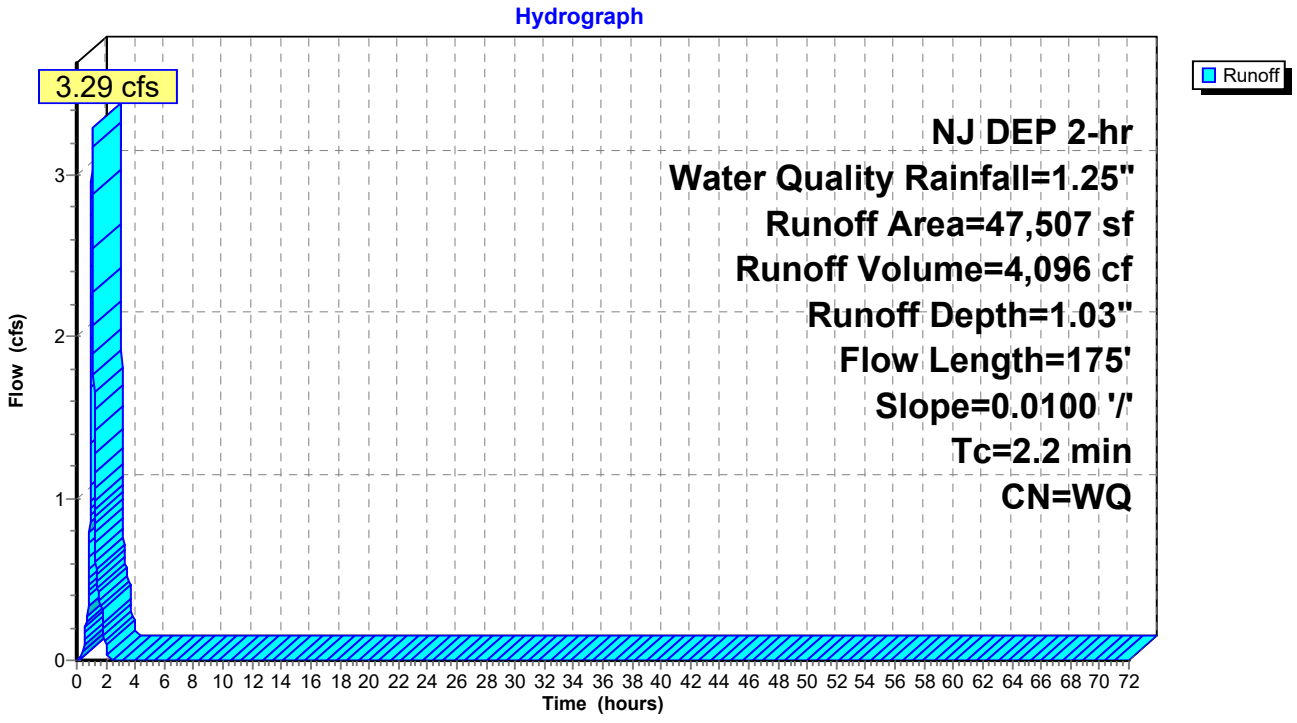
Runoff = 3.29 cfs @ 1.09 hrs, Volume= 4,096 cf, Depth= 1.03"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

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

	Area (sf)	CN	Description
*	47,507	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	47,507		Weighted Average
	47,507		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment pre 1: Pre Area 1, Pre imperviuos



Summary for Subcatchment Pre 1A: Pre Area 1A, Pre landscape area

[45] Hint: Runoff=Zero

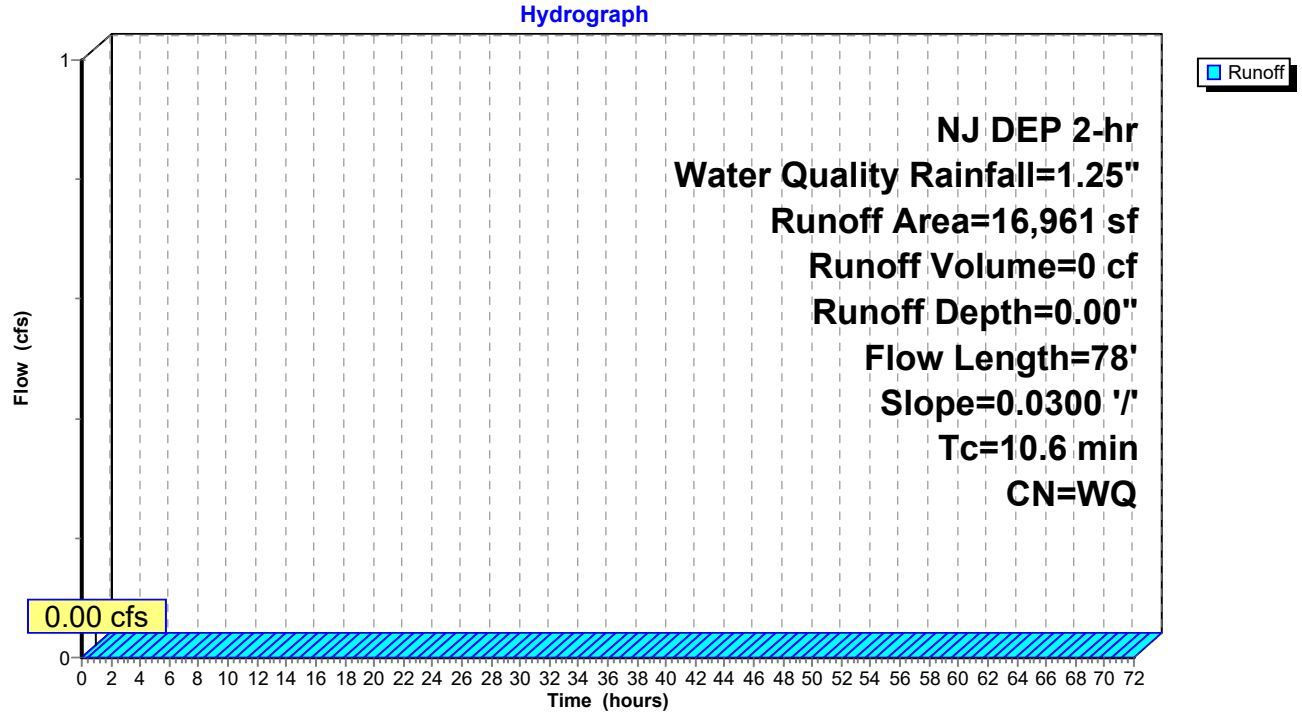
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Pre bio-1 : Pre Bio Ret 1

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	16,961	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,961		Weighted Average
	16,961		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 1A: Pre Area 1A, Pre landscape area



Summary for Subcatchment Pre 2: Pre Area 2, Pre imperviuos

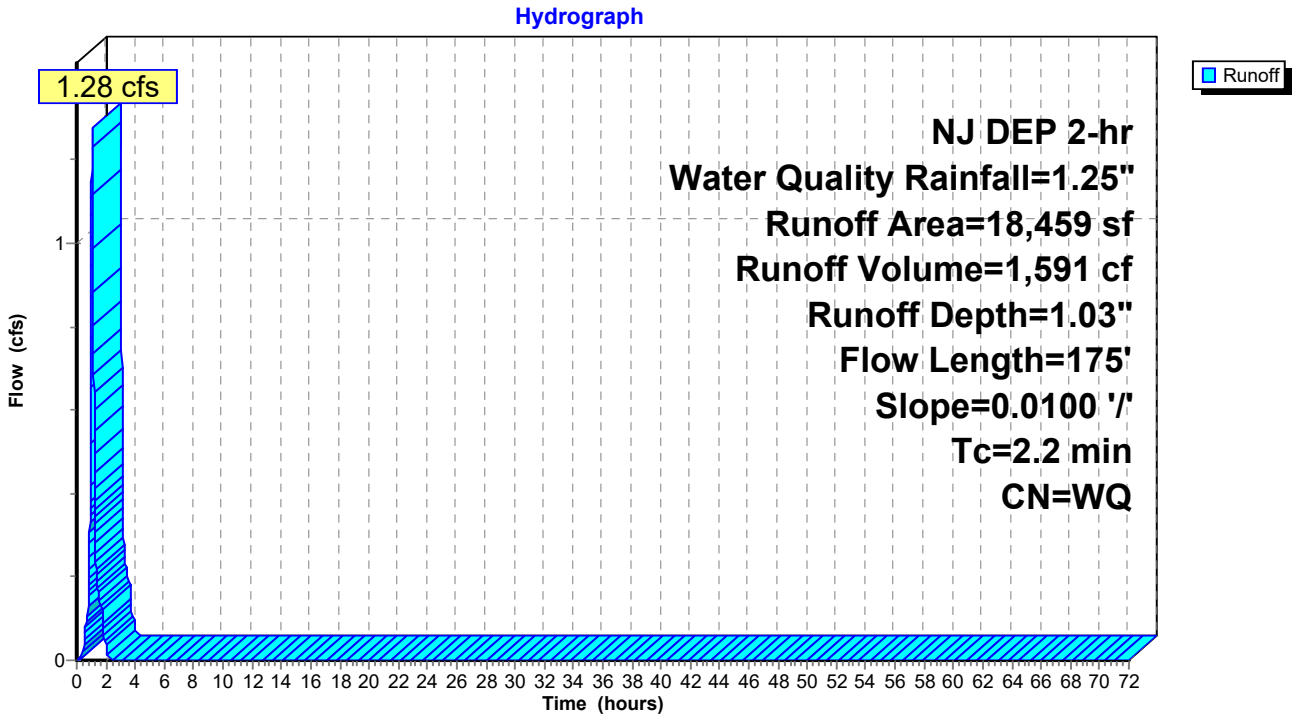
Runoff = 1.28 cfs @ 1.09 hrs, Volume= 1,591 cf, Depth= 1.03"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

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

	Area (sf)	CN	Description
*	18,459	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	18,459		Weighted Average
	18,459		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 2: Pre Area 2, Pre imperviuos



Summary for Subcatchment Pre 2A: Pre Area 2A, Pre landscape area

[45] Hint: Runoff=Zero

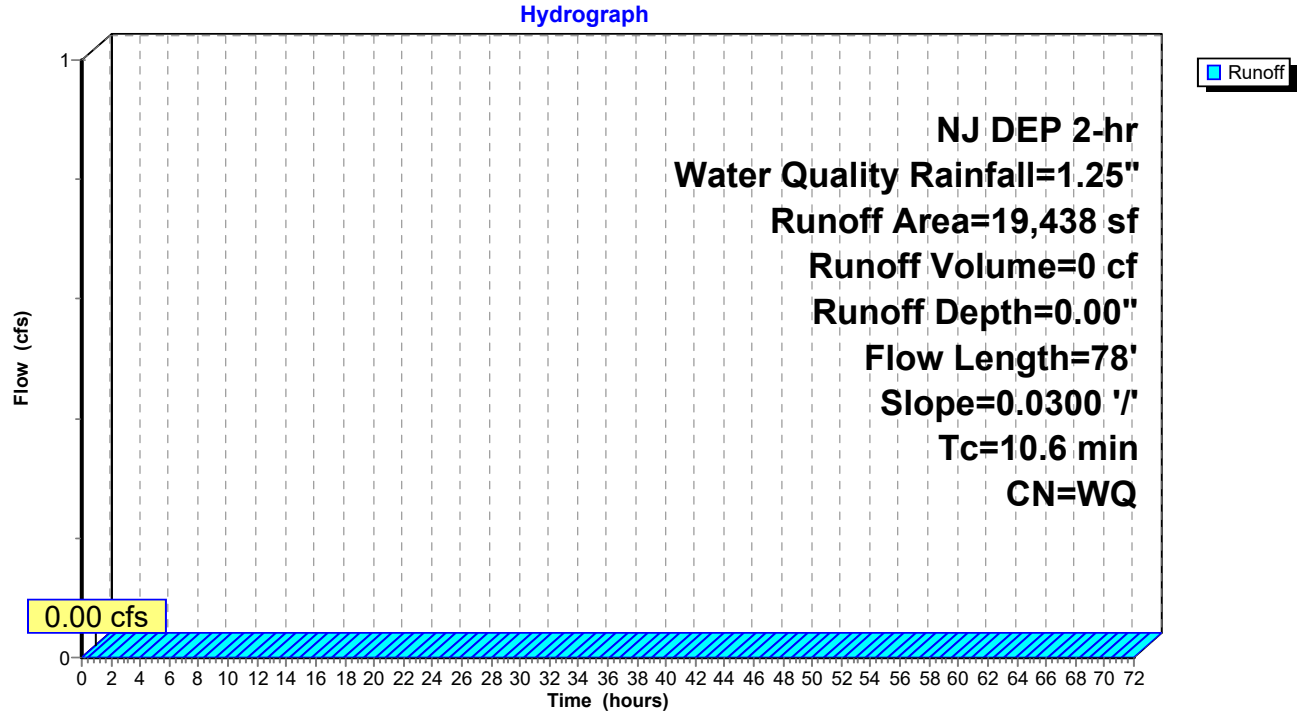
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Pre bio-2 : Pre Bio Ret 2

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	19,438	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	19,438		Weighted Average
	19,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 2A: Pre Area 2A, Pre landscape area



Summary for Subcatchment Pre 3: Pre Area 3, Pre imperviuos

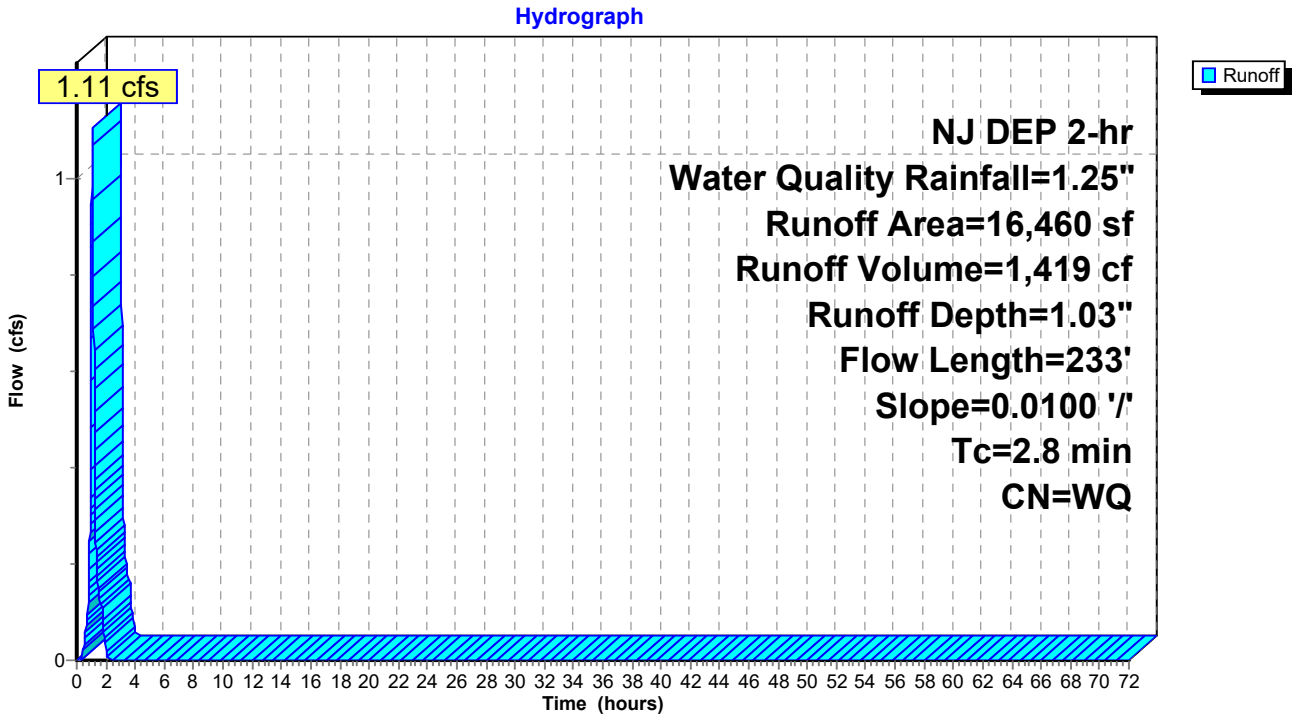
Runoff = 1.11 cfs @ 1.09 hrs, Volume= 1,419 cf, Depth= 1.03"
Routed to Link Pre Dis 2 : Pre discharge point 2

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

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	0.98		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
1.1	133	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.8	233	Total			

Subcatchment Pre 3: Pre Area 3, Pre imperviuos



Summary for Subcatchment Pre 3A: Pre Area 3A, Pre landscape area

[45] Hint: Runoff=Zero

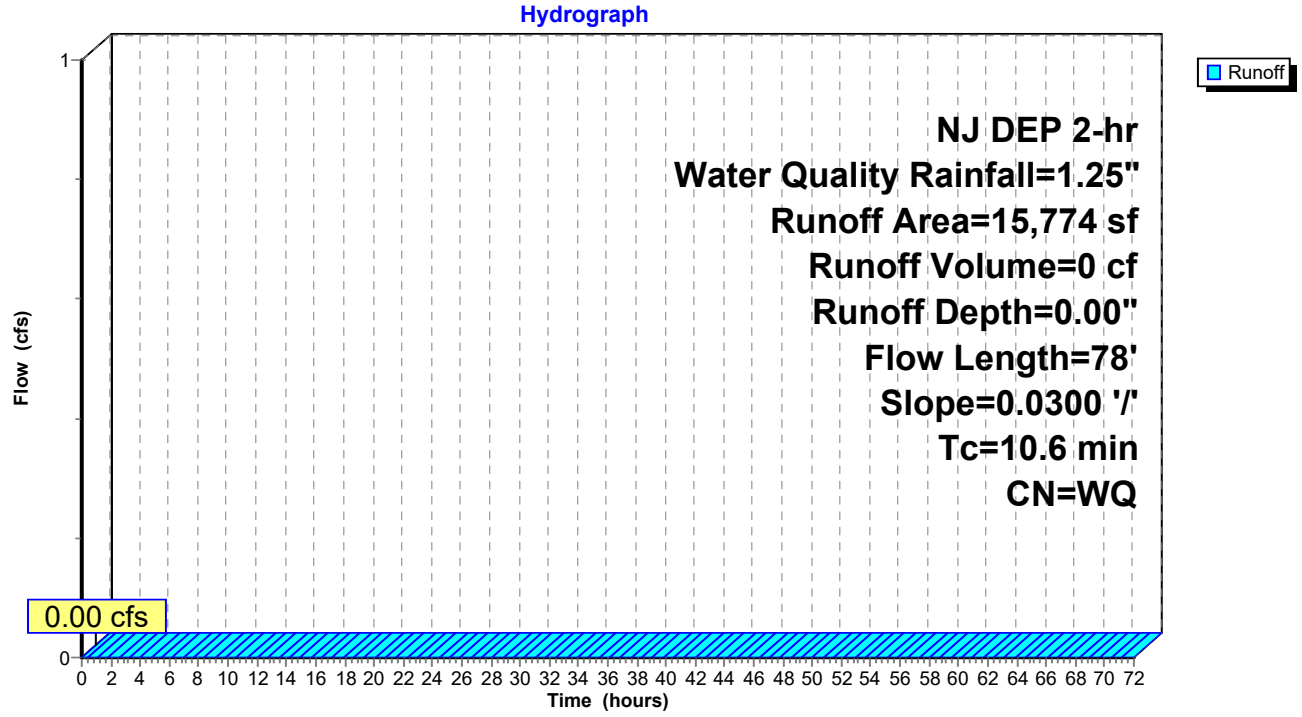
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link Pre Dis 2 : Pre discharge point 2

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 3A: Pre Area 3A, Pre landscape area



Summary for Subcatchment Pre 4A: Pre Area 4A, Pre landscape area

[45] Hint: Runoff=Zero

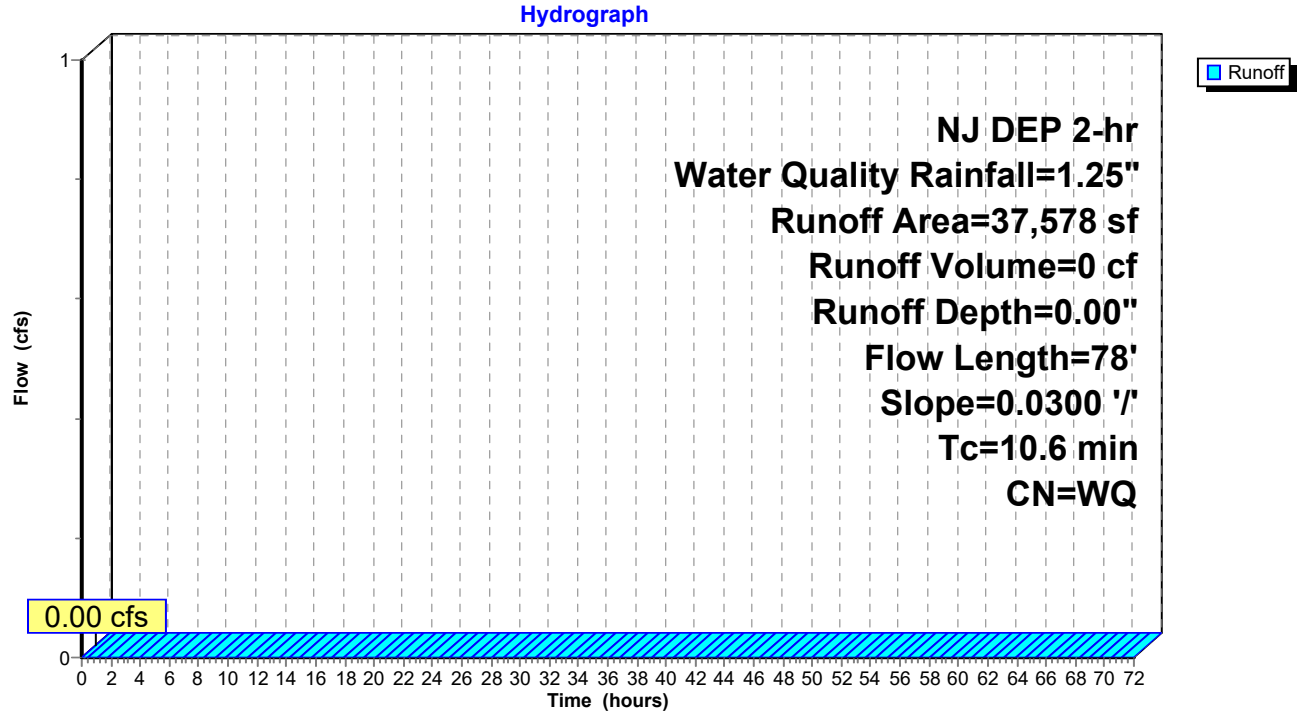
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	37,578	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	37,578		Weighted Average
	37,578		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 4A: Pre Area 4A, Pre landscape area



Summary for Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)

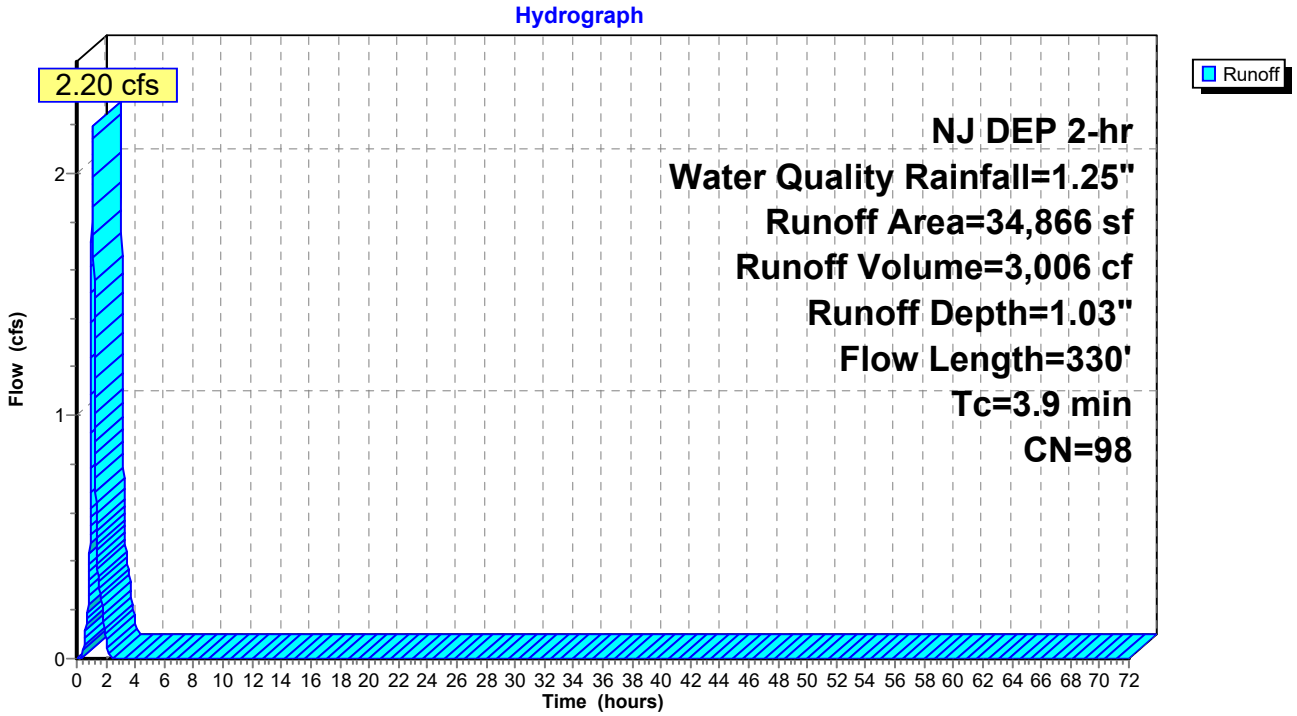
Runoff = 2.20 cfs @ 1.10 hrs, Volume= 3,006 cf, Depth= 1.03"
Routed to Link 1L : Pre dis 1

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

	Area (sf)	CN	Description
*	34,866	98	Exist paving & roof
	34,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0180	1.23		**Sheet Flow, paved** Smooth surfaces n= 0.011 P2= 2.80"
1.2	185	0.0150	2.49		**Shallow Concentrated Flow, paved** Paved Kv= 20.3 fps
1.3	45	0.0140	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
3.9	330	Total			

Subcatchment Pre 5: Pre area 5, Impervious (Offsite DA)



Summary for Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)

[45] Hint: Runoff=Zero

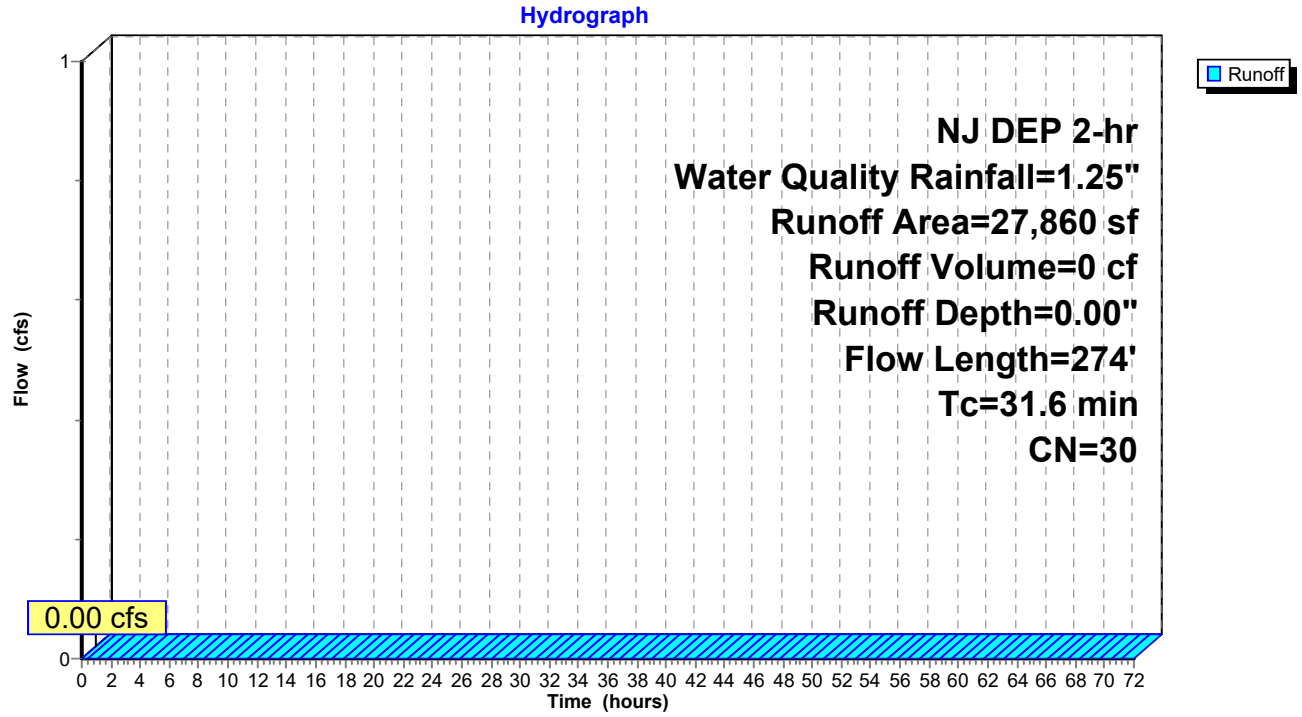
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Pre dis 1

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

Area (sf)	CN	Description
27,860	30	Woods, Good, HSG A
27,860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	100	0.0140	0.06		**Sheet Flow, sheet flow wooods** Woods: Light underbrush n= 0.400 P2= 2.80"
5.1	174	0.0130	0.57		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
31.6	274	Total			

Subcatchment Pre 5A: Pre area 5A, Landscape area (Offsite DA)



Summary for Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)

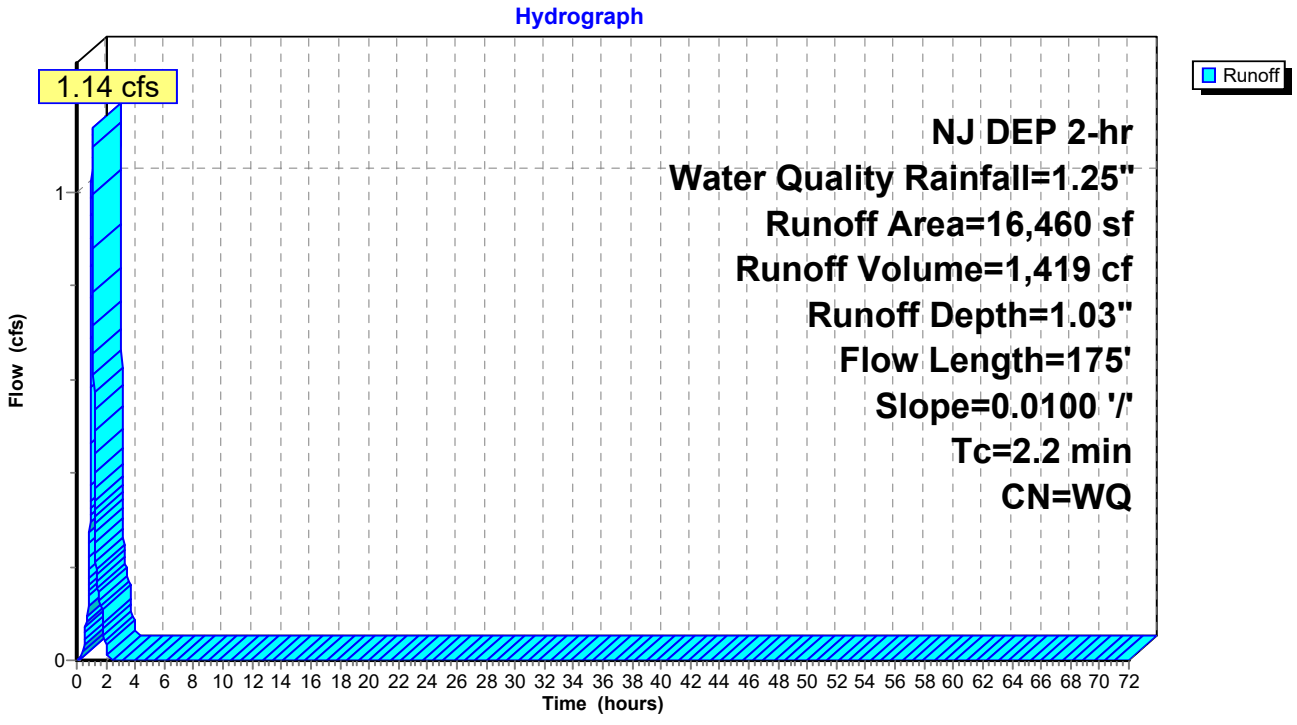
Runoff = 1.14 cfs @ 1.09 hrs, Volume= 1,419 cf, Depth= 1.03"
Routed to Link 3L : Pre discharge point 3

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

	Area (sf)	CN	Description
*	16,460	98	Exist impervious
	0	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	16,460		Weighted Average
	16,460		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 6: Pre Area 7, Pre impervious (Offsite drainage area)



Summary for Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)

[45] Hint: Runoff=Zero

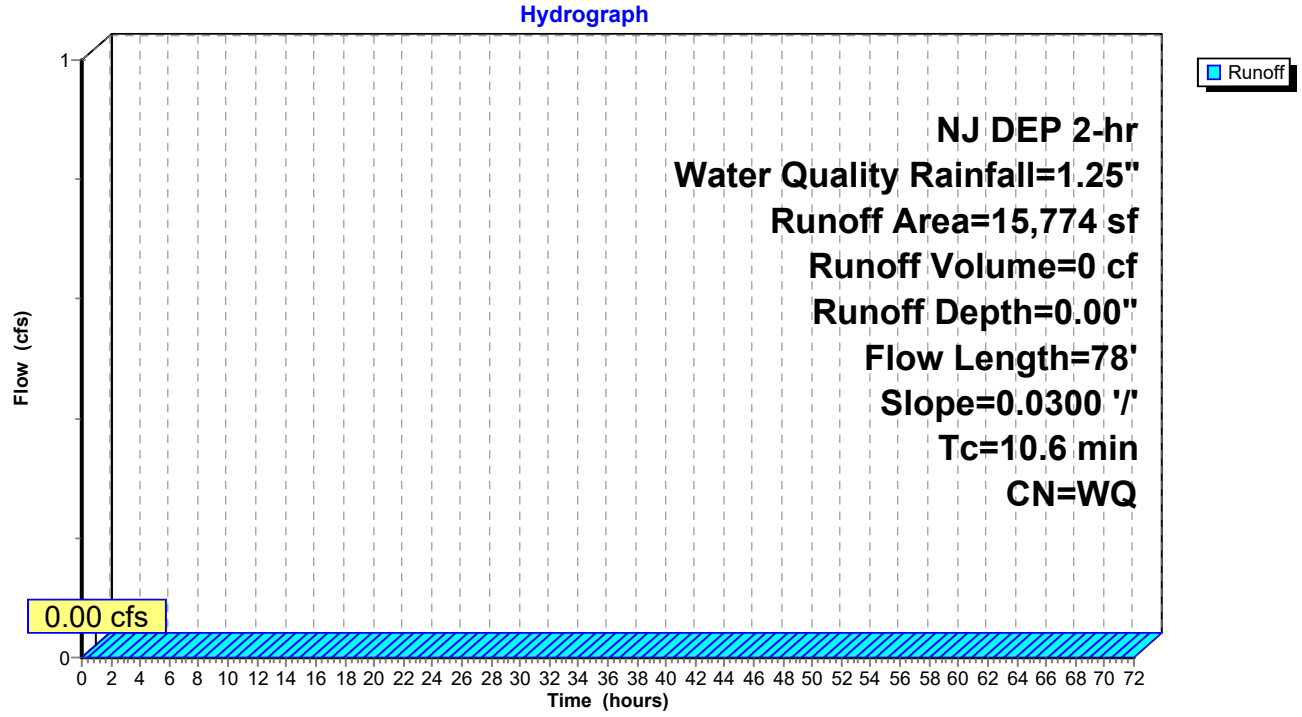
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 3L : Pre discharge point 3

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

	Area (sf)	CN	Description
*	0	98	Exist impervious
	15,774	39	>75% Grass cover, Good, HSG A
*	0	55	woods, good condition
	15,774		Weighted Average
	15,774		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 6A: Pre Area 7A, Pre landscape area (Offsite drinage area)



Summary for Subcatchment Pre 7: Pre Area 7, Pre impervious

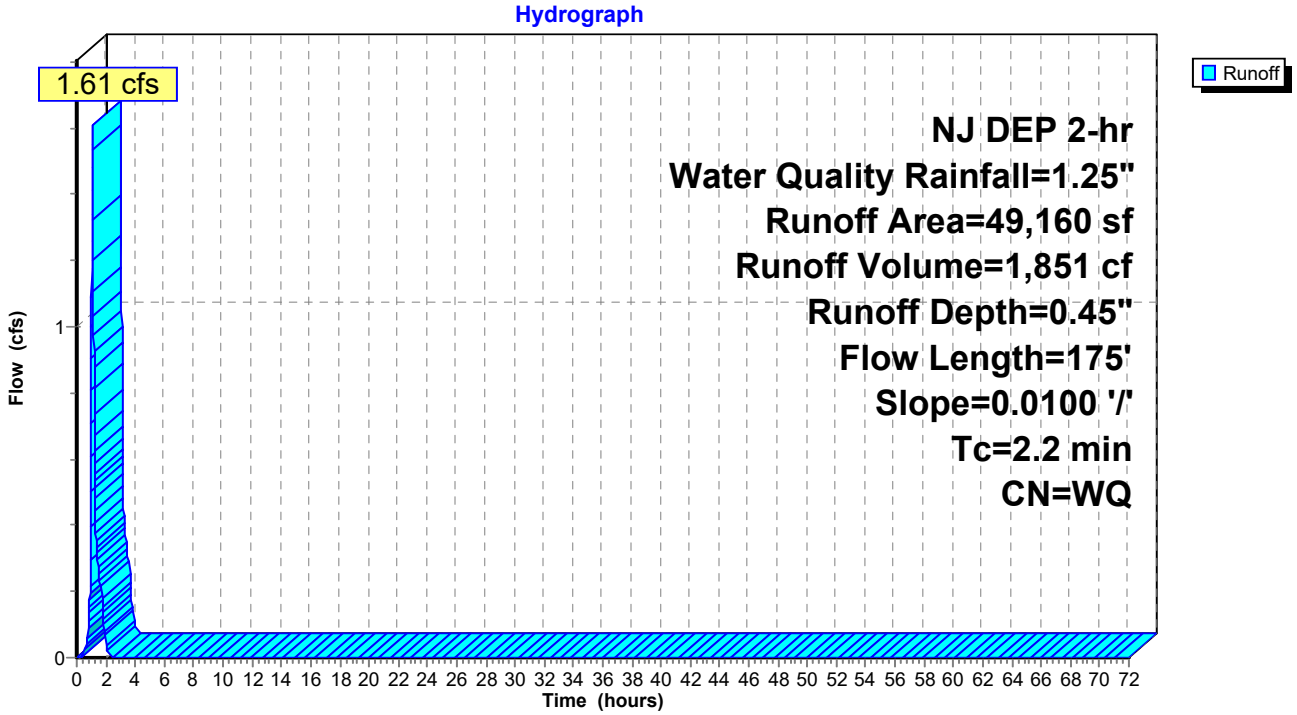
Runoff = 1.61 cfs @ 1.09 hrs, Volume= 1,851 cf, Depth= 0.45"
Routed to Link 3L : Pre discharge point 3

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

	Area (sf)	CN	Description
*	6,316	98	Exist paving
*	3,720	98	Exist Parkertown Dr.
*	39,124	85	Existing gravel
	49,160		Weighted Average
	39,124		79.59% Pervious Area
	10,036		20.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	75	0.0100	0.92		**Sheet Flow, jpaved** Smooth surfaces n= 0.011 P2= 2.80"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, gutter flow** Paved Kv= 20.3 fps
2.2	175	Total			

Subcatchment Pre 7: Pre Area 7, Pre impervious



Summary for Subcatchment Pre 7A: Pre Area 7A, Pre landscape area

[45] Hint: Runoff=Zero

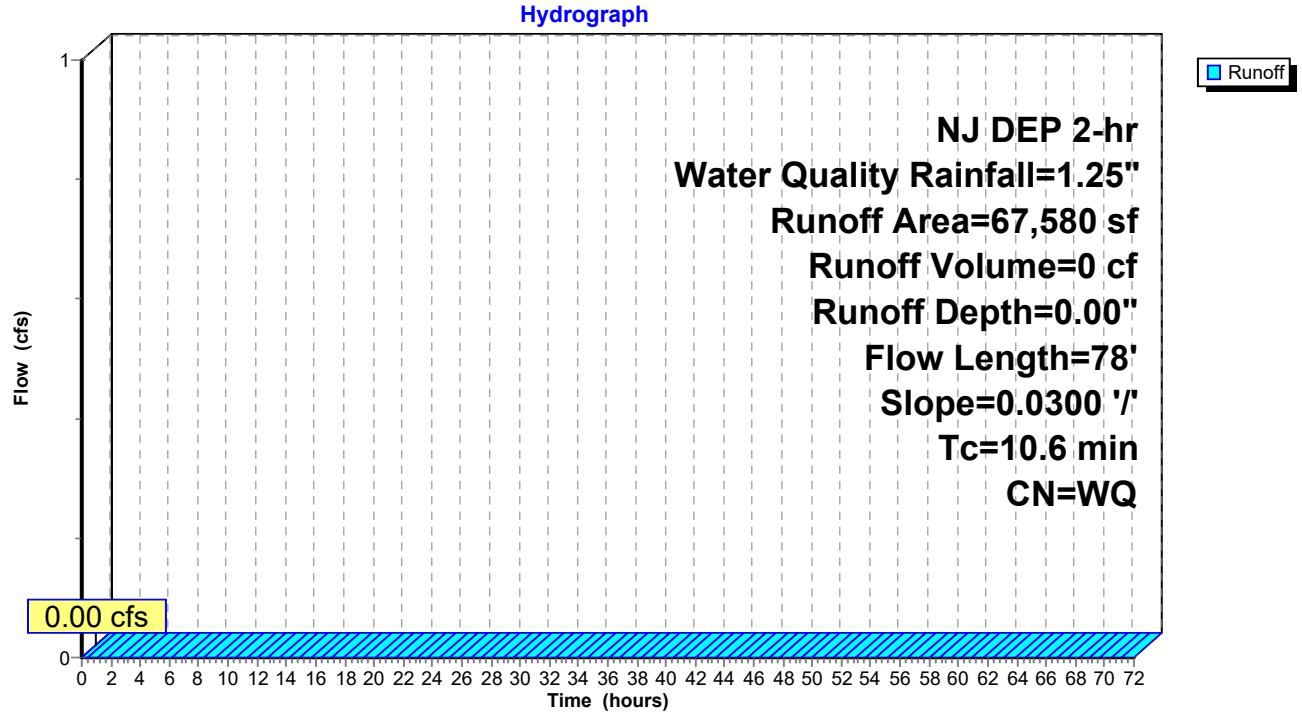
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 3L : Pre discharge point 3

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

	Area (sf)	CN	Description
	17,598	39	>75% Grass cover, Good, HSG A
	17,708	30	Woods, Good, HSG A
*	32,274	55	woods, good condition
	67,580		Weighted Average
	67,580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0300	0.12		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.80"

Subcatchment Pre 7A: Pre Area 7A, Pre landscape area



Summary for Pond 4P: Pre developed infiltration basin 1, under post-developed conditions

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 171,742 sf, 52.15% Impervious, Inflow Depth = 0.22" for Water Quality event
Inflow = 3.72 cfs @ 1.10 hrs, Volume= 3,181 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 11L : Post dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 14.68' @ 3.80 hrs Surf.Area= 9,067 sf Storage= 3,181 cf

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

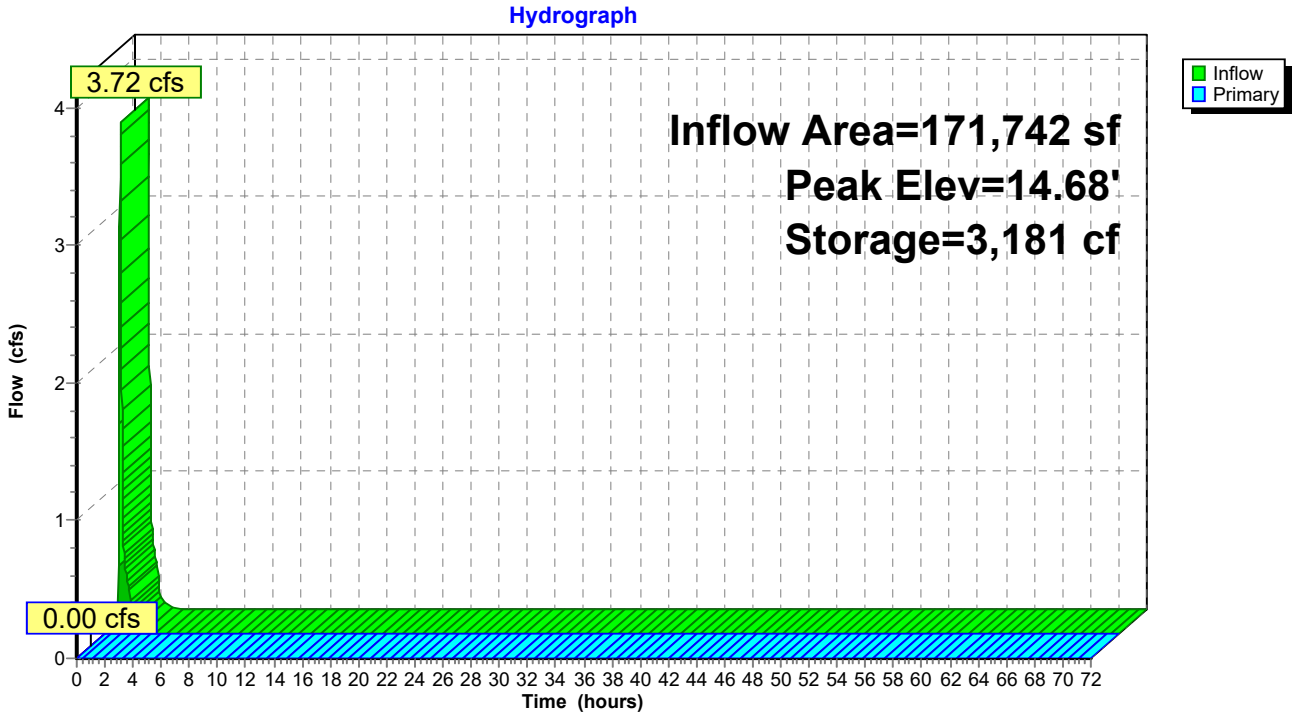
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	56,754 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.80	22,308	16,900	56,754

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**3.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pre developed infiltration basin 1, under post-developed conditions



Summary for Pond Bas 3: Basin 3 to discharge point 3

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 162,968 sf, 45.32% Impervious, Inflow Depth = 0.00" for Water Quality event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 6L : Discharge point 3 post

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 13.00' @ 0.00 hrs Surf.Area= 2,394 sf Storage= 0 cf

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

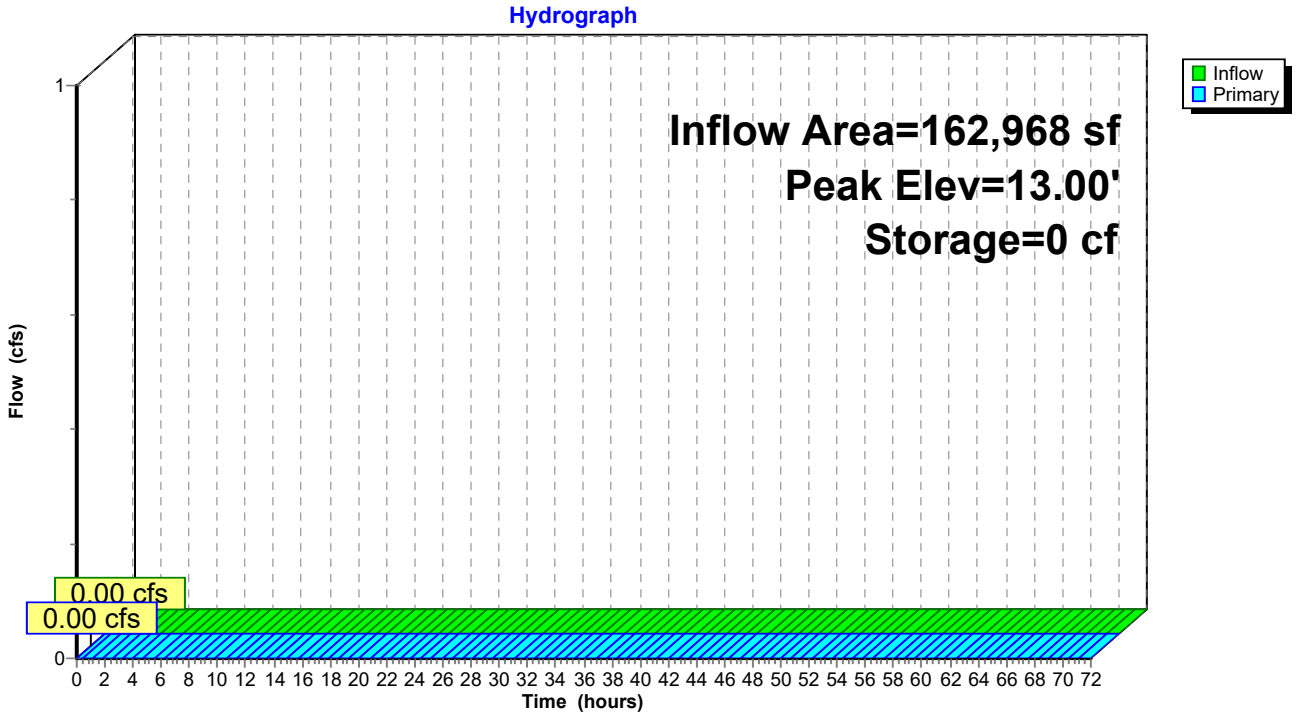
Volume	Invert	Avail.Storage	Storage Description
#1	13.00'	25,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.00	2,394	0	0
17.00	8,342	21,472	21,472
17.50	9,234	4,394	25,866

Device	Routing	Invert	Outlet Devices
#1	Primary	15.90'	**13.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=13.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Bas 3: Basin 3 to discharge point 3



Summary for Pond Bio -30: Post Bio-30

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 22,215 sf, 67.24% Impervious, Inflow Depth = 0.70" for Water Quality event
Inflow = 1.04 cfs @ 1.09 hrs, Volume= 1,288 cf
Outflow = 0.02 cfs @ 0.55 hrs, Volume= 1,288 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.02 cfs @ 0.55 hrs, Volume= 1,288 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond Bio 10 : Pre Bio Ret 10

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 21.09' @ 2.04 hrs Surf.Area= 1,387 sf Storage= 1,166 cf

Plug-Flow detention time= 491.7 min calculated for 1,288 cf (100% of inflow)
Center-of-Mass det. time= 491.8 min (559.9 - 68.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.50'	1,816 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

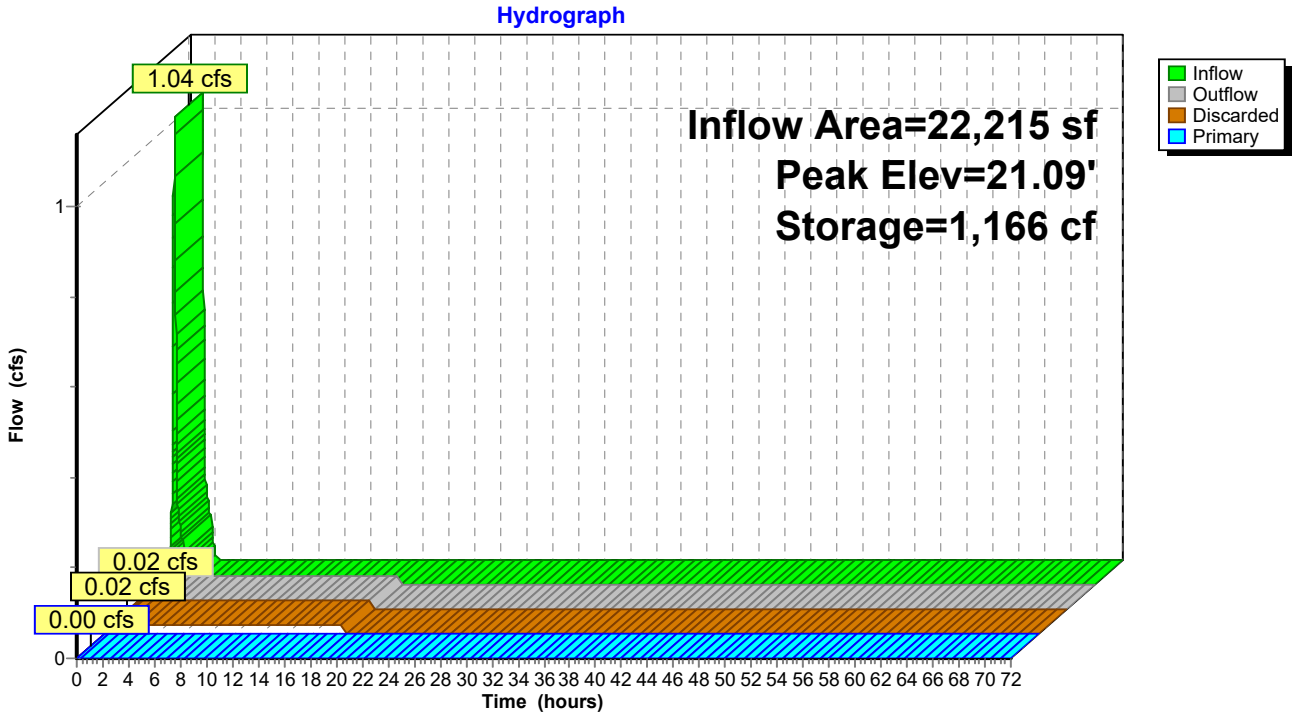
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.50	207	0	0
20.50	822	515	515
21.50	1,780	1,301	1,816

Device	Routing	Invert	Outlet Devices
#1	Device 2	21.25'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	17.50'	**15.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.50' / 14.00' S= 0.0625 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Discarded	19.50'	**0.02 cfs Exfiltration at all elevations**
#4	Device 2	21.10'	**3.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.10' / 21.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf

Discarded OutFlow Max=0.02 cfs @ 0.55 hrs HW=19.52' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.50' TW=17.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 6.11 cfs potential flow)
  ├**1=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Culvert** (Controls 0.00 cfs)

Pond Bio -30: Post Bio-30



Summary for Pond Bio 10: Pre Bio Ret 10

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 96,267 sf, 73.87% Impervious, Inflow Depth = 0.60" for Water Quality event
Inflow = 3.90 cfs @ 1.09 hrs, Volume= 4,843 cf
Outflow = 3.77 cfs @ 1.10 hrs, Volume= 4,843 cf, Atten= 3%, Lag= 0.8 min
Discarded = 0.05 cfs @ 0.51 hrs, Volume= 1,662 cf
Primary = 3.72 cfs @ 1.10 hrs, Volume= 3,181 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.48' @ 1.10 hrs Surf.Area= 1,852 sf Storage= 1,801 cf

Plug-Flow detention time= 86.6 min calculated for 4,842 cf (100% of inflow)
Center-of-Mass det. time= 86.7 min (154.8 - 68.1)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

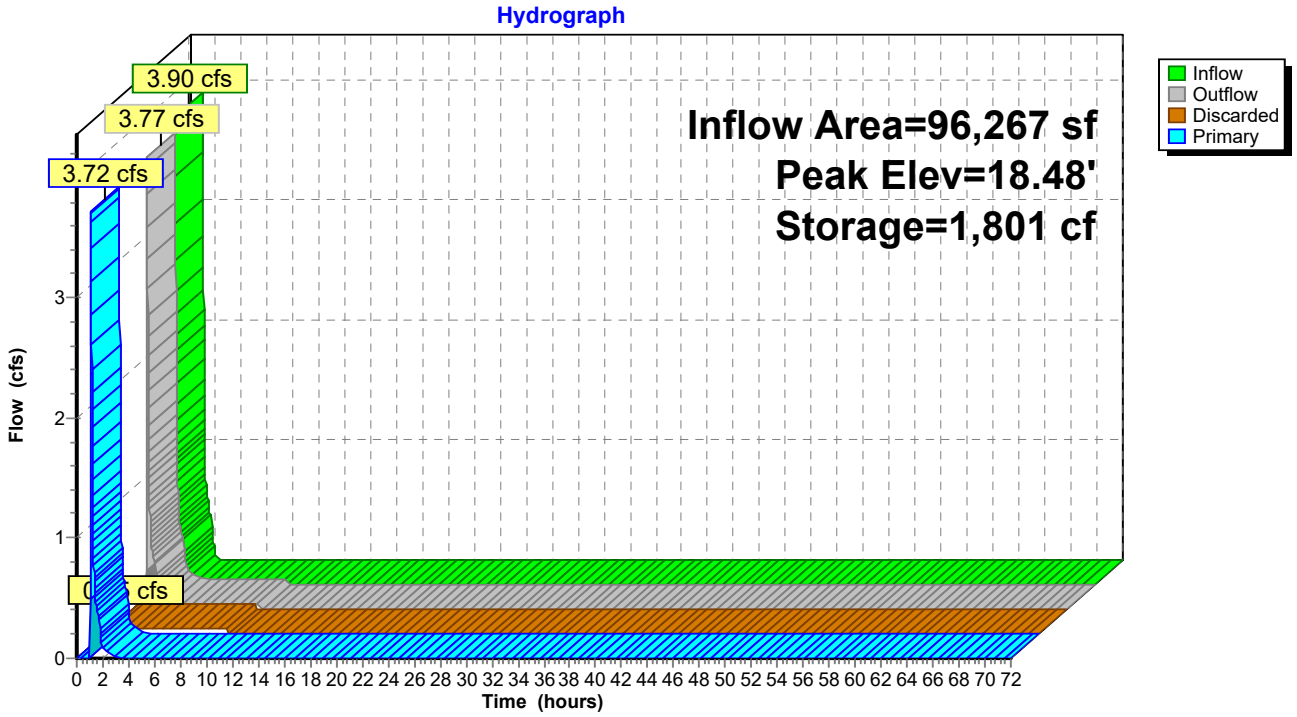
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	18.30'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**18.0" Round Culvert X 2.00** L= 214.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 14.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Primary	18.01'	**3.0" Round Culvert** L= 1.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 18.01' / 18.01' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.05 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.05 cfs @ 0.51 hrs HW=17.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=3.71 cfs @ 1.10 hrs HW=18.47' TW=14.30' (Dynamic Tailwater)
├**2=Culvert** (Passes 3.58 cfs of 20.65 cfs potential flow)
│└**1=Orifice/Grate** (Weir Controls 3.58 cfs @ 1.37 fps)
└**3=Culvert** (Inlet Controls 0.12 cfs @ 2.48 fps)

Pond Bio 10: Pre Bio Ret 10



Summary for Pond Bio 20: Post Bio-20

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area = 37,897 sf, 48.71% Impervious, Inflow Depth = 0.50" for Water Quality event
Inflow = 1.28 cfs @ 1.09 hrs, Volume= 1,591 cf
Outflow = 0.36 cfs @ 0.99 hrs, Volume= 1,594 cf, Atten= 72%, Lag= 0.0 min
Discarded = 0.36 cfs @ 0.99 hrs, Volume= 1,594 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 4P : Pre developed infiltration basin 1, under post-developed conditions

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.07' @ 1.24 hrs Surf.Area= 8,606 sf Storage= 578 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.2 min (81.3 - 68.1)

Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	9,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

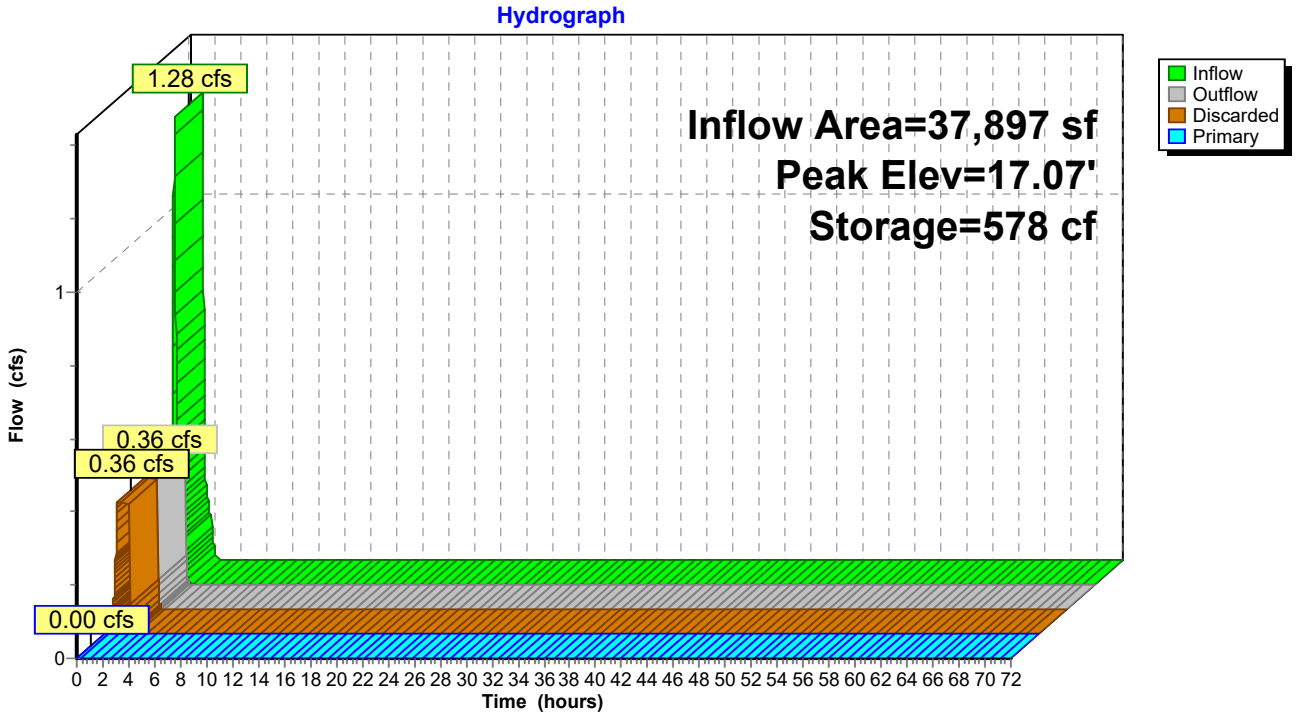
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	8,420	0	0
18.00	11,162	9,791	9,791

Device	Routing	Invert	Outlet Devices
#1	Primary	12.62'	**15.0" Round Culvert** L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	17.15'	**3.0" Round Culvert** L= 1.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.15' / 17.15' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	17.00'	**0.36 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.36 cfs @ 0.99 hrs HW=17.01' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.00' TW=14.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 9.33 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)

Pond Bio 20: Post Bio-20



Summary for Pond Bio 70: Post Bio-70

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 42,307 sf, 39.81% Impervious, Inflow Depth = 0.41" for Water Quality event
Inflow = 1.17 cfs @ 1.09 hrs, Volume= 1,452 cf
Outflow = 0.18 cfs @ 0.94 hrs, Volume= 1,455 cf, Atten= 85%, Lag= 0.0 min
Discarded = 0.18 cfs @ 0.94 hrs, Volume= 1,455 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 23.31' @ 1.33 hrs Surf.Area= 2,658 sf Storage= 747 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 37.9 min (106.0 - 68.1)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	7,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

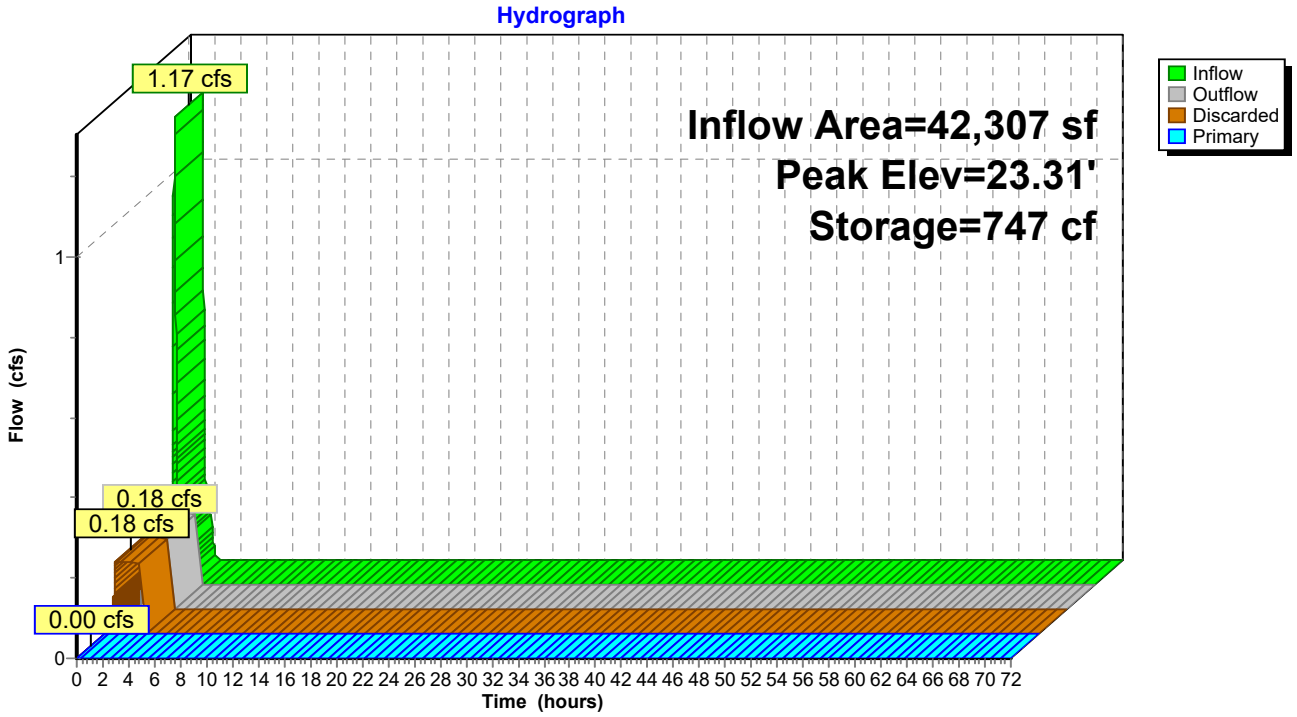
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.00	2,094	0	0
24.00	3,889	2,992	2,992
25.00	6,079	4,984	7,976

Device	Routing	Invert	Outlet Devices
#1	Primary	19.00'	**15.0" Round Culvert** L= 410.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.00' / 13.00' S= 0.0146 '/' Cc= 0.900 n= 0.010, Flow Area= 1.23 sf
#2	Device 1	24.85'	**42.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	23.32'	**3.0" Round Culvert** L= 1.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 23.32' / 23.32' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.05 sf
#4	Discarded	23.00'	**0.18 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.18 cfs @ 0.94 hrs HW=23.02' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=23.00' TW=13.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 10.86 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)

Pond Bio 70: Post Bio-70



Summary for Pond Bio 80: Post Bio-80

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 120,661 sf, 47.25% Impervious, Inflow Depth = 0.49" for Water Quality event
Inflow = 3.25 cfs @ 1.09 hrs, Volume= 4,915 cf
Outflow = 0.25 cfs @ 0.84 hrs, Volume= 4,919 cf, Atten= 92%, Lag= 0.0 min
Discarded = 0.25 cfs @ 0.84 hrs, Volume= 4,919 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond Bas 3 : Basin 3 to discharge point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.13' @ 1.97 hrs Surf.Area= 3,508 sf Storage= 3,308 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 119.8 min (195.1 - 75.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	6,799 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

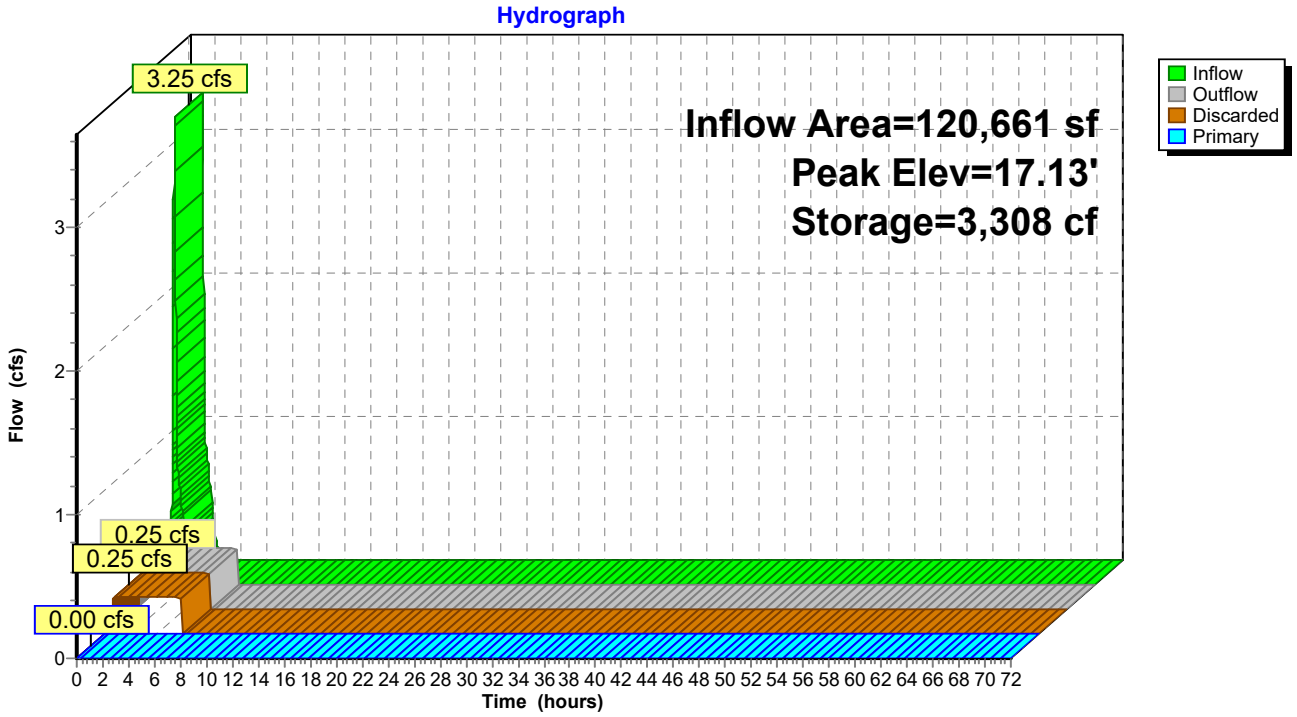
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	2,349	0	0
17.00	3,345	2,847	2,847
18.00	4,559	3,952	6,799

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**14.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	17.15'	**6.0" Round Culvert** L= 22.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.15' / 15.00' S= 0.0977 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Discarded	16.00'	**0.25 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.25 cfs @ 0.84 hrs HW=16.02' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=16.00' TW=13.00' (Dynamic Tailwater)
├**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Controls 0.00 cfs)

Pond Bio 80: Post Bio-80



Summary for Pond Pre bas 1: Pre developed infiltration basin 1

exfiltration at 5 in/hr over 4,555 but not counted as exfiltration

Inflow Area = 139,943 sf, 47.14% Impervious, Inflow Depth = 0.23" for Water Quality event
Inflow = 1.80 cfs @ 1.22 hrs, Volume= 2,665 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Pre dis 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 14.62' @ 71.76 hrs Surf.Area= 8,299 sf Storage= 2,665 cf

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

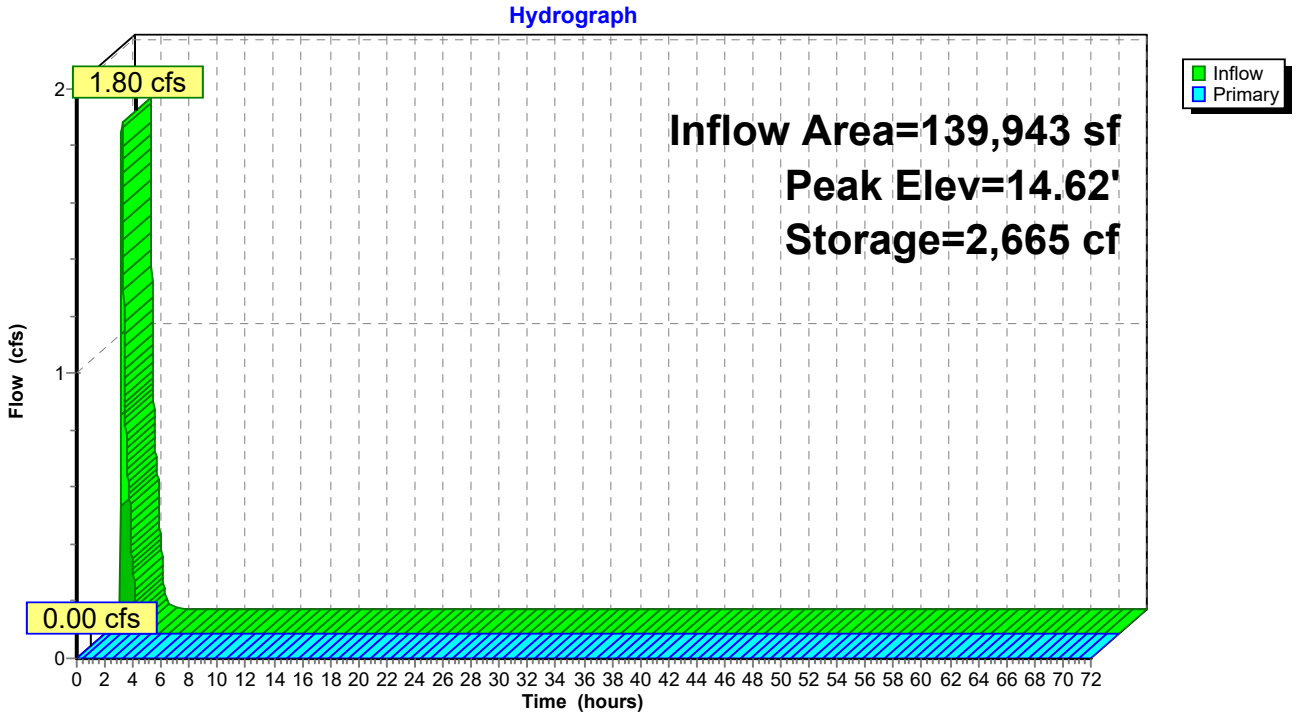
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	54,641 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	322	0	0
15.00	13,225	6,774	6,774
16.00	16,496	14,861	21,634
17.00	19,943	18,220	39,854
17.70	22,308	14,788	54,641

Device	Routing	Invert	Outlet Devices
#1	Primary	17.20'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond Pre bas 1: Pre developed infiltration basin 1



Summary for Pond Pre bio-1: Pre Bio Ret 1

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 64,468 sf, 73.69% Impervious, Inflow Depth = 0.76" for Water Quality event
Inflow = 3.29 cfs @ 1.09 hrs, Volume= 4,096 cf
Outflow = 3.13 cfs @ 1.06 hrs, Volume= 3,303 cf, Atten= 5%, Lag= 0.0 min
Primary = 3.13 cfs @ 1.06 hrs, Volume= 3,303 cf
Routed to Pond Pre bio-2 : Pre Bio Ret 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 18.03' @ 1.13 hrs Surf.Area= 1,419 sf Storage= 1,072 cf

Plug-Flow detention time= 13.7 min calculated for 3,303 cf (81% of inflow)
Center-of-Mass det. time= 7.2 min (75.3 - 68.1)

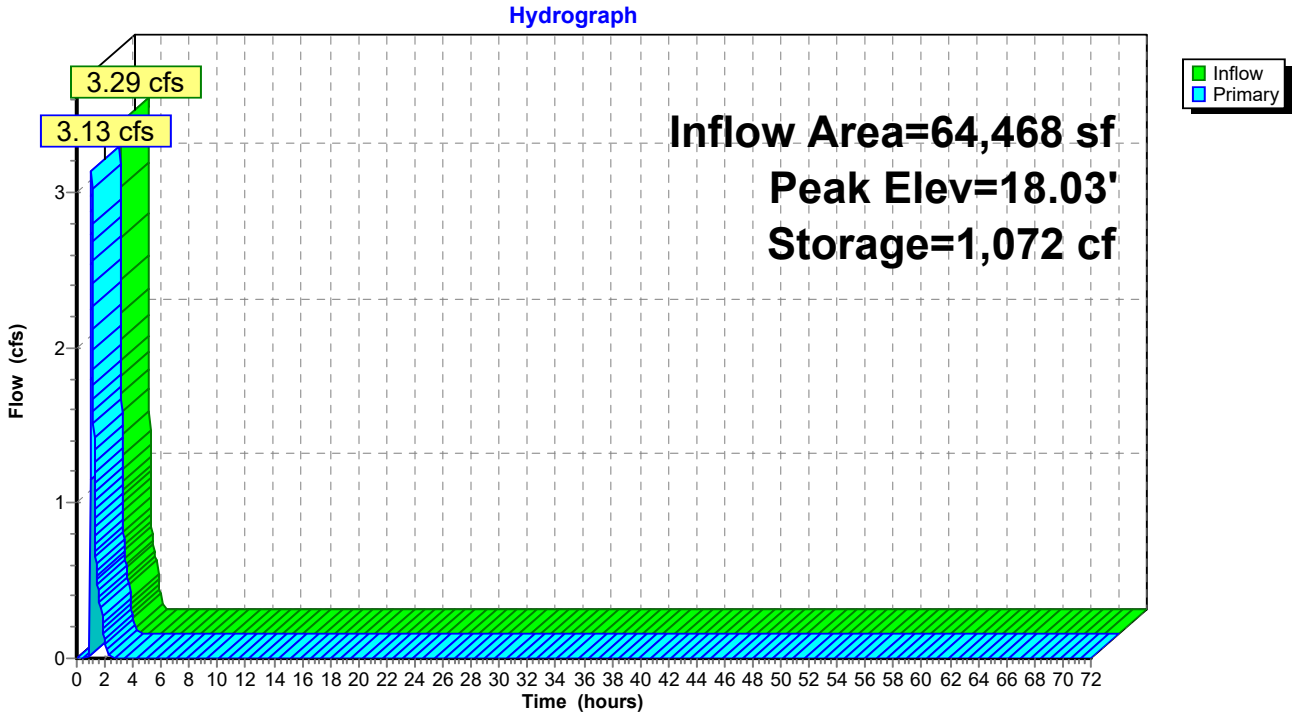
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	2,908 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	672	0	0
18.00	1,390	1,031	1,031
19.00	2,363	1,877	2,908

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	15.22'	**15.0" Round Culvert** L= 38.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 15.22' / 13.49' S= 0.0455 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.05 cfs @ 1.06 hrs HW=17.98' TW=17.64' (Dynamic Tailwater)
↑**2=Culvert** (Inlet Controls 3.05 cfs @ 2.49 fps)
↑**1=Orifice/Grate** (Passes 3.05 cfs of 3.15 cfs potential flow)

Pond Pre bio-1: Pre Bio Ret 1



Summary for Pond Pre bio-2: Pre Bio Ret 2

Exfiltratiion taken as 5 in/hr perm rate over 1,089 sf resulting in 2.5 in/hour allowable or 0.06 cfs

Inflow Area = 102,365 sf, 64.44% Impervious, Inflow Depth = 0.57" for Water Quality event
Inflow = 4.38 cfs @ 1.06 hrs, Volume= 4,895 cf
Outflow = 1.80 cfs @ 1.22 hrs, Volume= 2,665 cf, Atten= 59%, Lag= 9.2 min
Primary = 1.80 cfs @ 1.22 hrs, Volume= 2,665 cf
Routed to Pond Pre bas 1 : Pre developed infiltration basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 17.93' @ 1.22 hrs Surf.Area= 4,903 sf Storage= 2,745 cf

Plug-Flow detention time= 27.7 min calculated for 2,664 cf (54% of inflow)
Center-of-Mass det. time= 16.9 min (89.8 - 73.0)

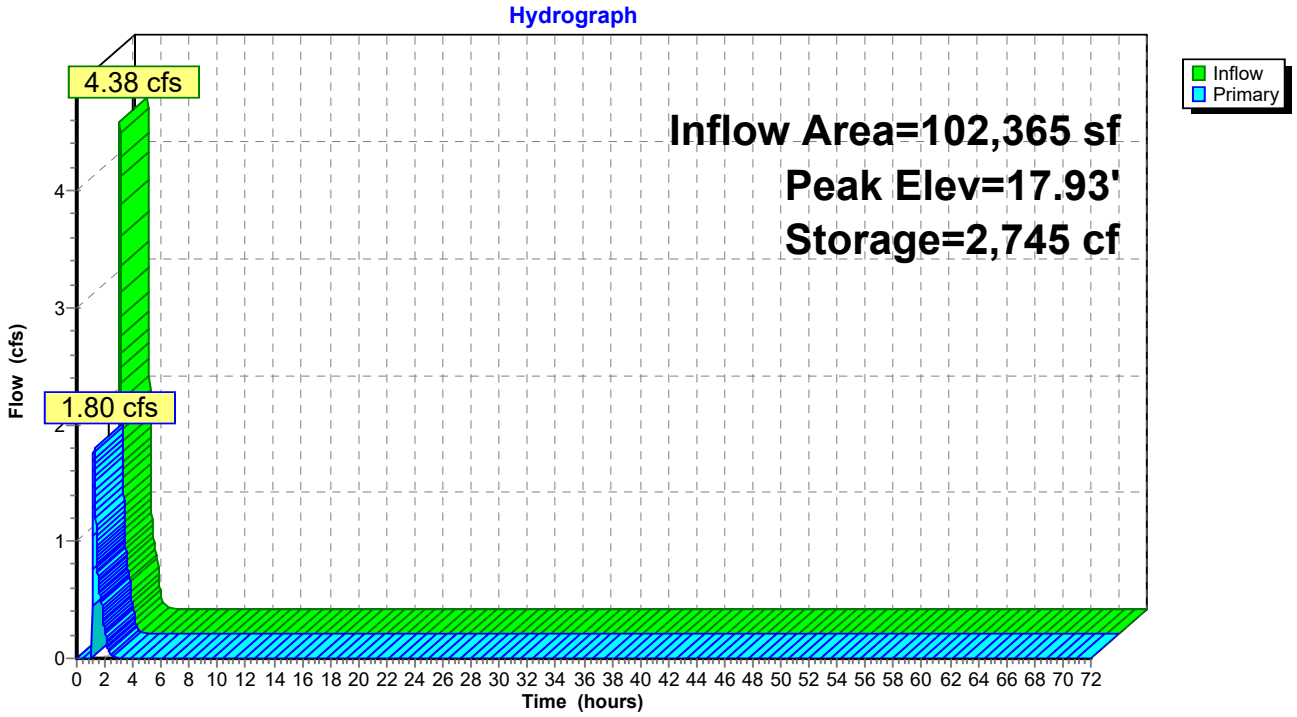
Volume	Invert	Avail.Storage	Storage Description
#1	17.00'	6,035 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.00	999	0	0
18.00	5,196	3,098	3,098
18.50	6,554	2,938	6,035

Device	Routing	Invert	Outlet Devices
#1	Device 2	17.82'	**42.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	12.62'	**15.0" Round Culvert** L= 79.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 12.62' / 10.01' S= 0.0330 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.79 cfs @ 1.22 hrs HW=17.93' TW=14.24' (Dynamic Tailwater)
↑**2=Culvert** (Passes 1.79 cfs of 10.02 cfs potential flow)
↑**1=Orifice/Grate** (Weir Controls 1.79 cfs @ 1.09 fps)

Pond Pre bio-2: Pre Bio Ret 2

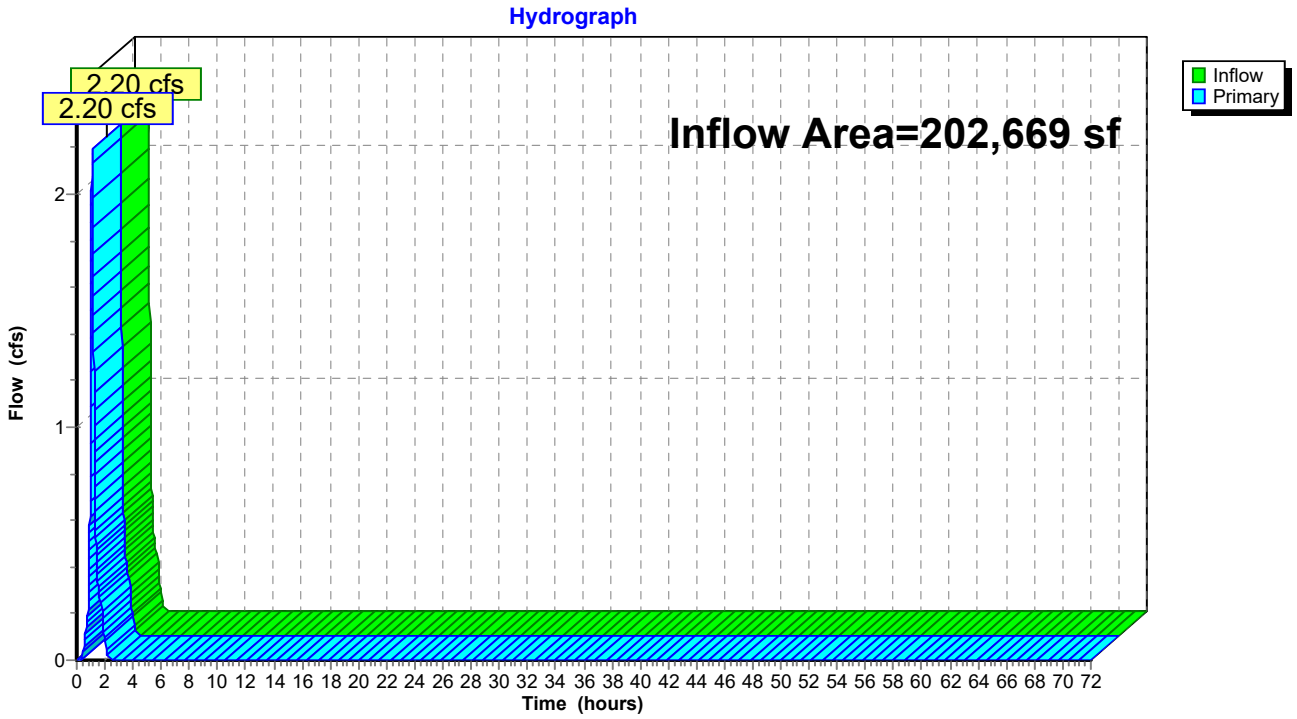


Summary for Link 1L: Pre dis 1

Inflow Area = 202,669 sf, 49.75% Impervious, Inflow Depth = 0.18" for Water Quality event
Inflow = 2.20 cfs @ 1.10 hrs, Volume= 3,006 cf
Primary = 2.20 cfs @ 1.10 hrs, Volume= 3,006 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Pre dis 1

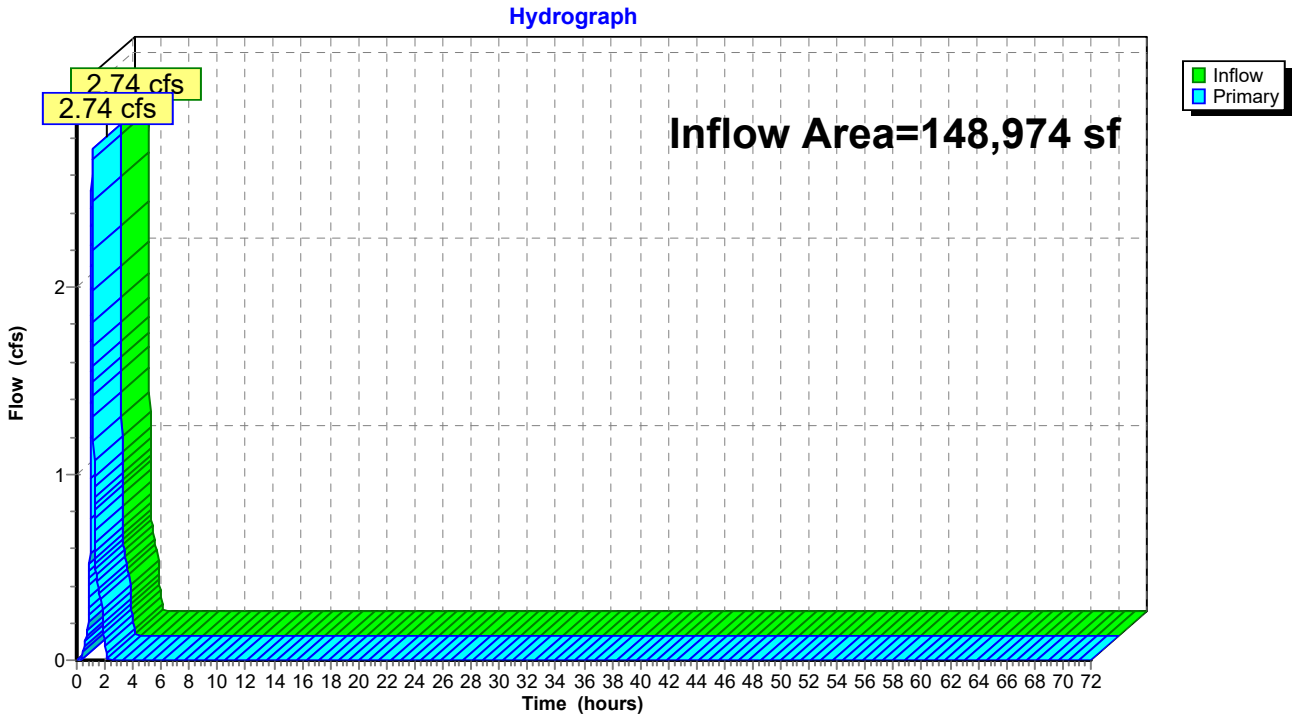


Summary for Link 3L: Pre discharge point 3

Inflow Area = 148,974 sf, 17.79% Impervious, Inflow Depth = 0.26" for Water Quality event
Inflow = 2.74 cfs @ 1.09 hrs, Volume= 3,270 cf
Primary = 2.74 cfs @ 1.09 hrs, Volume= 3,270 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Pre discharge point 3

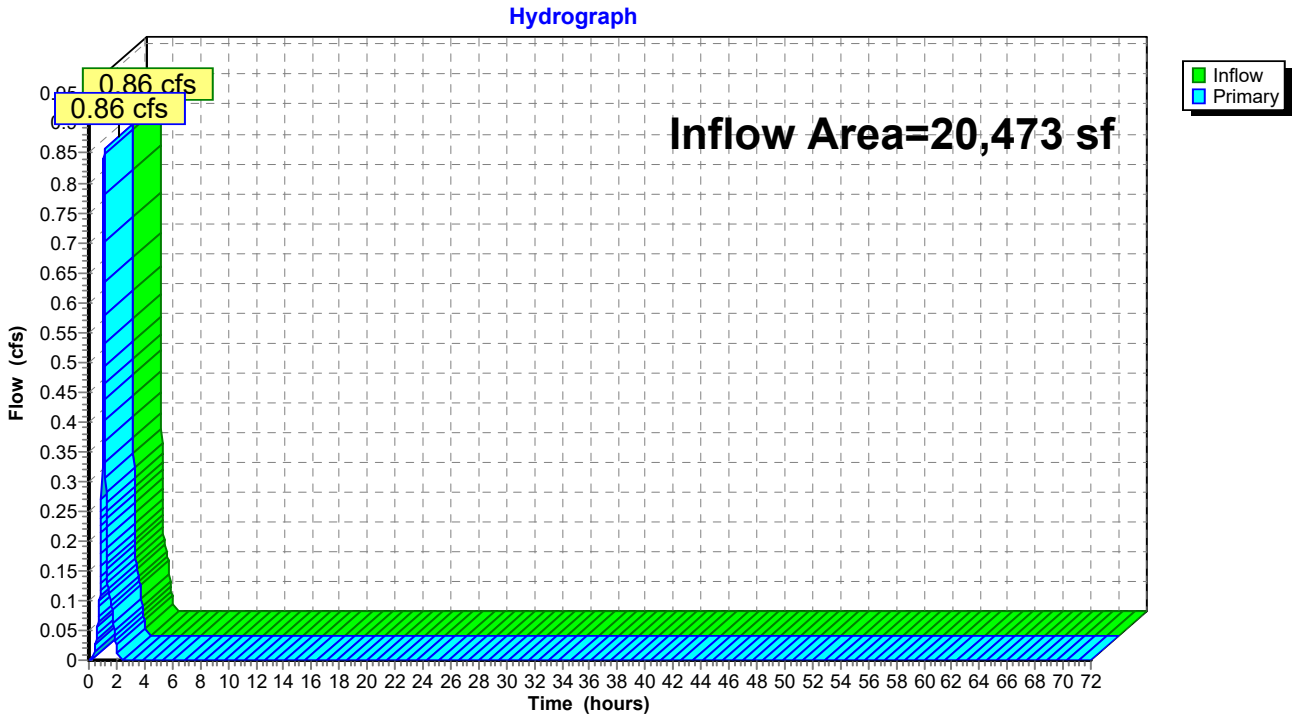


Summary for Link 4L: Post discharge point 2

Inflow Area = 20,473 sf, 61.13% Impervious, Inflow Depth = 0.63" for Water Quality event
Inflow = 0.86 cfs @ 1.09 hrs, Volume= 1,079 cf
Primary = 0.86 cfs @ 1.09 hrs, Volume= 1,079 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Post discharge point 2

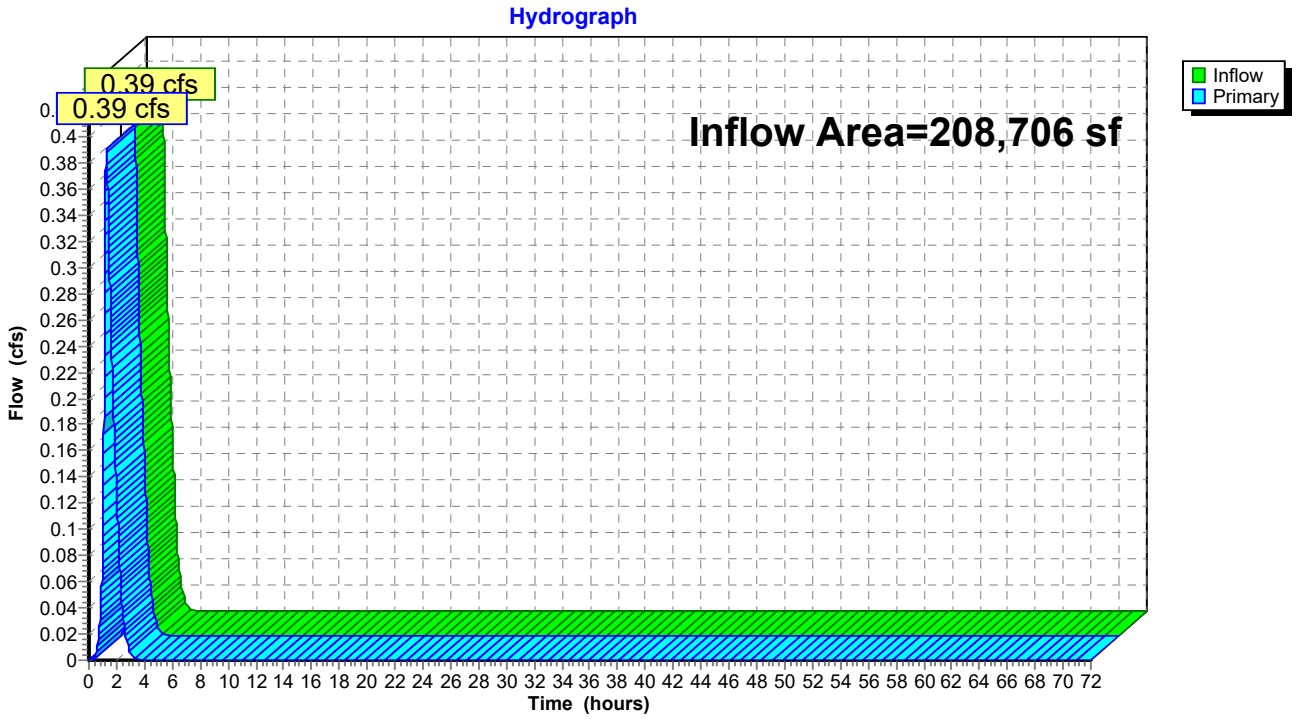


Summary for Link 6L: Discharge point 3 post

Inflow Area = 208,706 sf, 41.56% Impervious, Inflow Depth = 0.06" for Water Quality event
Inflow = 0.39 cfs @ 1.28 hrs, Volume= 1,111 cf
Primary = 0.39 cfs @ 1.28 hrs, Volume= 1,111 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Discharge point 3 post

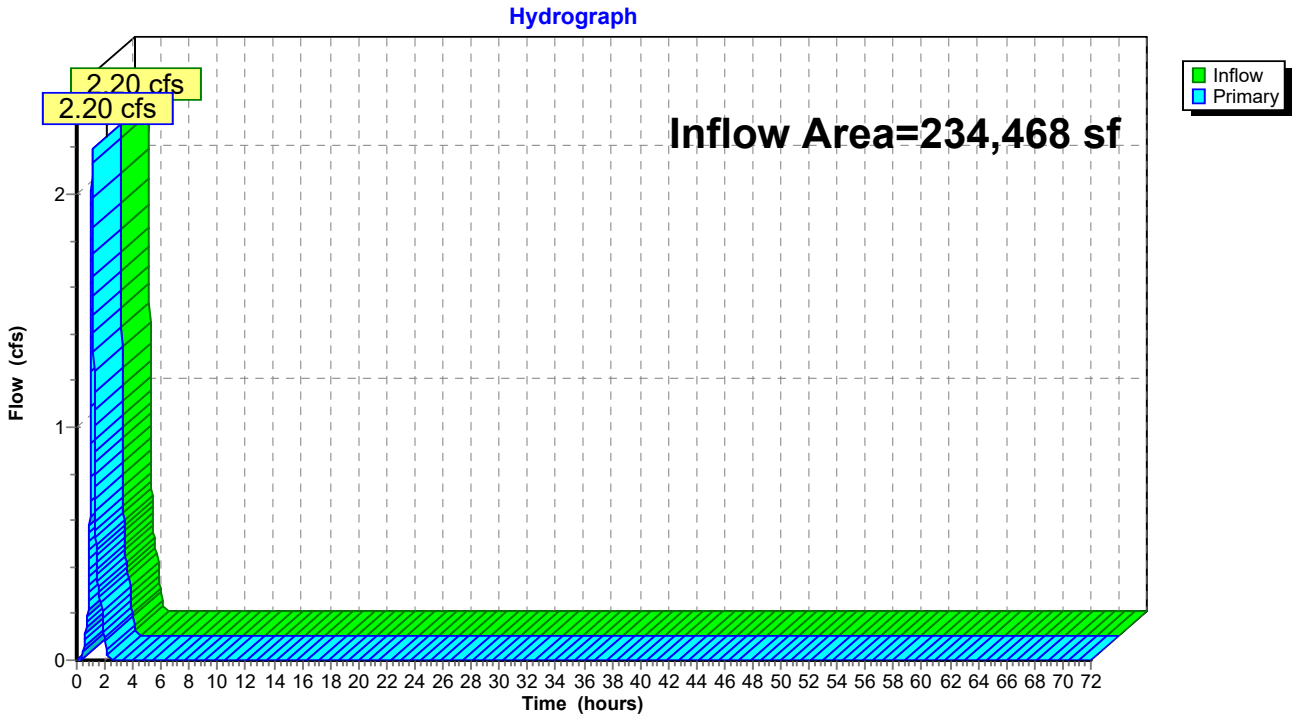


Summary for Link 11L: Post dis 1

Inflow Area = 234,468 sf, 53.07% Impervious, Inflow Depth = 0.15" for Water Quality event
Inflow = 2.20 cfs @ 1.10 hrs, Volume= 3,006 cf
Primary = 2.20 cfs @ 1.10 hrs, Volume= 3,006 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 11L: Post dis 1

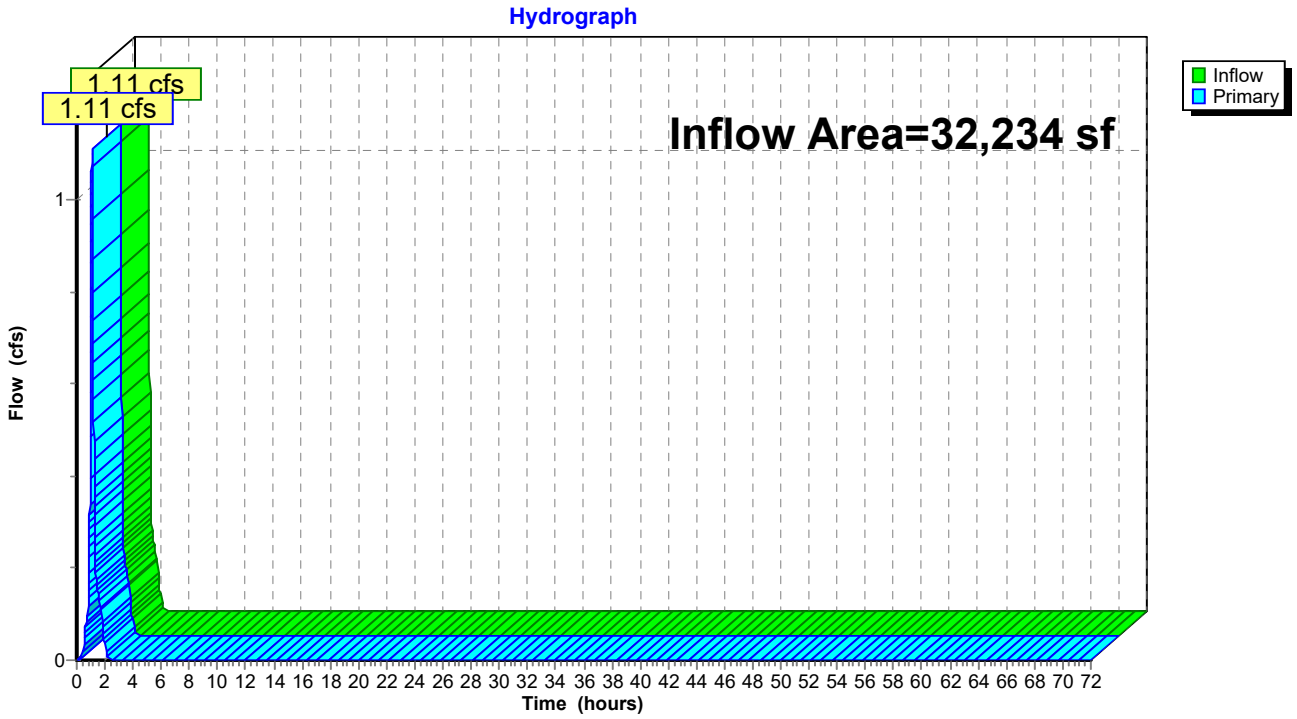


Summary for Link Pre Dis 2: Pre discharge point 2

Inflow Area = 32,234 sf, 51.06% Impervious, Inflow Depth = 0.53" for Water Quality event
Inflow = 1.11 cfs @ 1.09 hrs, Volume= 1,419 cf
Primary = 1.11 cfs @ 1.09 hrs, Volume= 1,419 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link Pre Dis 2: Pre discharge point 2



BASIN DIS PT 1

OFFSITE DIS PT 1

DIS PT 2

DIS PT 3

PRE-1
1.48 Ac
(ONSITE)

PRE-2
0.87 Ac
(ONSITE)

PRE-3
0.74 Ac
(TO EXIST MUNICIPAL SYSTEM)

PRE-4
0.87 Ac
(ONSITE)

PRE-5
1.44 Ac
(OFFSITE)

PRE-6
2.10 Ac
(OFFSITE)

PRE-7
2.69 Ac
(ONSITE)

EXIST BIO-1

EXIST BIO-2

BLOCK 190
LOTS 1, 2.01, 2.03 & 2.09 – 2.12
3.039± ACRES

RAILROAD DRIVE
(66.00' WIDE COUNTY RT 35)

PARKERTOWN DRIVE
(WIDTH VARIES)

HOG POND ROAD
(WIDTH VARIES)

NOTE:
ELEVATIONS ARE N.A.V.D. 1988 DATUM.

LEGEND:
x 00.00 EXISTING ELEVATION SPOT SHOT

IMPERVIOUS EXISTING:

o ROOF	32,267 SF
o ASPHALT	35,951 SF
o CONC WALK	9,452 SF
TOTAL	77,670 SF

IMPERVIOUS PROPOSED:

o ROOF	33,643 SF
o ASPHALT	45,472 SF
o CONC WALK	5,105 SF
TOTAL	84,220 SF

GRAPHIC SCALE
30 0 15 30 60 120
1 INCH = 30 FT

PLANS FOR PERMIT PURPOSES ONLY

Schaeffer Nassar Scheidegg
CONSULTING ENGINEERS, LLC
Surveyors • Environmentalists • Planners
1425 Cantillon Boulevard • Maye Landing • New Jersey
Telephone: (609) 625 - 7400 • Fax: (609) 909 - 0253
Certificate of Authorization #24GA28103800

THE PLAN IS SHALL BE AND VOID UNLESS THE ORIGINAL IMPRESSED SEAL OF THE SIGNING ENGINEER IS AFFIXED HEREON.

ANDREW F. SCHAEFFER
PROFESSIONAL ENGINEER
NEW JERSEY LIC. NO. 28883
DATE

PROPOSED PRE-DEVELOPED DRAINAGE AREA PLAN FOR:
CAVALRY CHAPEL GATEWAY
RAILROAD DRIVE, BLOCK 170, LOTS 3.01/4 & BLOCK 190, LOTS 1, 2.01, 2.03, 2.09-2.12
TOWNSHIP OF UPPER, CAPE MAY COUNTY, NEW JERSEY
ZONE: R-100 RESIDENTIAL DISTRICT, TAX MAP SHEET 12

REV #	DATE	REVISION DESCRIPTION	BY

DATE	2-18-26
SCALE	1"=30'
BY	MJE
CHECKED	H.A.T.
SHEET NO.	DA-PRE

FILE# 25-169

BASIN DIS PT 1

OFFSITE DIS PT 1

HASPCS NAD '83 REFERENCE

POST 4
0.87 Ac
(ONSITE)

POST 5
1.44 Ac
(OFFSITE)

DIS PT 2

POST 8
1.77 Ac

BIO-80

BAS-3

DIS PT 3

POST 10
1.05 Ac

POST 3
0.47Ac
(TO EXIST
MUNICIPAL
SYSTEM)

POST 2
0.87 Ac
(ONSITE)

POST 1
1.24 Ac
(ONSITE)

POST 11
0.51 Ac
(ONSITE)

BIO-30

BIO-10

BIO-20

POST 7
0.97 Ac

BIO-70

POST 9
1.00 Ac
(OFFSITE)

BAS-2

BASIN 1
TO REMAIN
SAME AS
EXISTING

BLOCK 190
LOTS 1, 2.01, 2.03 &
2.09 – 2.12
5.0556 ACRES

LOT 21
LOT 5
LOT 5.01
LOT 2.01
LOT 2.08
LOT 2.07
LOT 2.09
LOT 2.02
LOT 2
LOT 1.01

N47°34'30"W
N42°25'30"E
N47°16'23"W
N40°21'42"E
S40°21'42"W
S47°37'07"W
S42°25'30"W
S48°52'59"E 76.92

380.69
225.28
181.65'
221.32'
90.32'
R=203.67'
L=91.77'
CHORD BEARING=S61°46'56"E

PROP. 220 LF
FOREBAY● 4.5 FT WIDE x 0.9' DEEP
(SEE DETAIL)

64' x 36.7' WIDE x
1.5' DEEP PLANT BED
W/ SOIL REPLACE W/
K5 SAND TO 7.8'
(SEE DETAIL)

14.0' WIDE EARTH
WEIR W/ CREST
ELEV=17.4'
(SEE DETAIL)

136' X 17.6' WIDE
K5 SAND REPLACE
BOT ELEV=5.6'
(SEE DETAIL)

13.0' WIDE EARTH
WEIR W/ CREST
ELEV=15.9'
(SEE DETAIL)

PROP. 4'H POST &
RAIL VINYL FENCE
(SEE DETAILS)

PROP. 208 LF
FOREBAY ❶3.5' WIDE x 0.5' DEEP
(SEE DETAIL)

PROP. 208 LF
FOREBAY ❶4.6' WIDE x 1.1' DEEP
(SEE DETAIL)

46' x 4.5' WIDE x
1.5' DEEP PLANT BED
W/ SOIL REPLACE W/
K5 SAND TO 13.8'
(SEE DETAIL)

PROP. 194 LF
FOREBAY ❶3.0 WIDE x 0.5' DEEP
(SEE DETAIL)

PROP. 230 LF
FOREBAY ❶4.5' WIDE x 0.30' DEEP
(SEE DETAIL)

15.4' WIDE x
DEEP PLANT BED
W/ SOIL REPLACE W/
K5 SAND TO 18.9'
(SEE DETAIL)

26,251 SF OF WOODLAND TO BE PRESERVED.
(APPROX. 71,554 SF OF EXIST. WOODLAND.
25,044 SF PRESERVATION IS NEEDED)

30' REAR SETBACK
30' FRONT SETBACK

PROP. 6' CONC. WALK
PROP. 4' CONC. WALK
EXIST. WOODS
EXIST. VEGETATION
EXIST. WOODLINE
VINYL FENCE

RAILROAD DRIVE
(66.00' WIDE COUNTY RT 35)

PARKERTOWN DRIVE
(WIDTH VARIES)

HOG POND ROAD
(WIDTH VARIES)

ROAD
(WIDTH VARIES)

GRAPHIC SCALE
30 0 15 30 60 120
1 INCH = 30 FT

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Telephone: (609) 625 - 7400 • Fax: (609) 909 - 0253
Certificate of Authorization #24GA28103800

THE PLAN IS SHALL NOT BE USED OR REPRODUCED WITHOUT THE CONSENT OF THE SIGNING ENGINEER IN WITHOUT HIS/HER

ANDREW F. SCHAEFFER
PROFESSIONAL ENGINEER
NEW JERSEY LIC. NO. 28883
DATE

PROPOSED POST-DEVELOPED DRAINAGE AREA PLAN FOR:
CAVALRY CHAPEL GATEWAY
RAILROAD DRIVE, BLOCK 170, LOTS 3.03,04 & BLOCK 190, LOTS 1, 2.01, 2.03, 2.09-2.12
TOWNSHIP OF LITTLE EGG HARBOR, OCEAN COUNTY, NEW JERSEY
ZONE: R-100 RESIDENTIAL DISTRICT, TAX MAP SHEET 12

REV.#	DATE	BY	REVISION DESCRIPTION
-	-	-	-

DATE	2-18-26
SCALE	1"=30'
BY	MJE
CHECKED	H.A.T.
SHEET NO.	DA-POST
FILE#	25-169