STORMWATER REPORT

Waterford Solar

117 Oil Mill Road
Waterford, CT

PREPARED FOR

GRE Gacrux, LLC
10 Main Street, Suite E
Middletown, CT 06457

PREPARED BY

100 Great Meadow Road
Suite 200
Wethersfield, Connecticut
860.807.4300

December 2019

Table of Contents

Table of Contents i

Project Summary 1

Project Description 1
Site Description 1
Methodology 2

Existing Drainage Conditions 3

Summary 3
Hydrologic Information 3

Proposed Drainage Conditions 6

Summary 6
Hydrologic Information 6

Hydrologic Analysis 8

Hydrologic Analysis 8
Floodplain Information / Analysis 10
Water Quality Volume 10
Water Quality Flow 11
Stream Channel Protection 11
Conveyance Protection 11

List of Figures

Figure 1: Site Location Map
Figure 2: Existing Drainage Areas
Figure 3: Proposed Drainage Areas

List of Tables

Table 1: Existing Conditions Hydrologic Data
Table 2: Proposed Conditions Hydrologic Data
Table 3: Peak Discharge Rates

Appendices

Appendix A: FEMA Flood Insurance Rate Map
NOAA Rainfall Depth Estimates
CTDEEP Groundwater Classification Map

Appendix B: NRCS Soil Survey Information
Test Pit and Infiltration Testing Data

Appendix C: Erosion and Sedimentation Control Checklist
Long Term Stormwater and Operation and Maintenance Measures
Appendix D: Diversion Swale & Sediment Trap/Basin Sizing
Water Quality Computations
HydroCAD: Existing Conditions
HydroCAD: Proposed Conditions

1

Project Summary

Project Description

The Petitioner, GRE Gacrux, LLC, is proposing to construct a 15.3 MW solar farm on undeveloped primarily wooded land along with all associated utilities, access paths, fencing, and landscaping to support this use (the Project). When the Project reaches the end of its life cycle, the improvements constructed as part of this petition will be removed and the land will be restored in accordance with the decommissioning plan.

Site Description

The ±152-acre Project Site (Site) is comprised of a single parcel at 117 Oil Mill Road (Map 80 / Lot 5497) in Waterford, Connecticut (see Figure 1). The parcel is generally bounded by undeveloped industrially-zoned properties to the south and east, and by single-family residential properties to the west and north. The parcel is zoned RU-120 (Rural Residential District).

Under existing conditions, the majority of the Project area is wooded. A timber harvest performed by the current land owner over the past couple years resulted in the cutting of approximately 45 acres of the Project's wooded area within the development limits, and a total of approximately 66 acres of the Site. There are on-site wetland systems in the eastern and western portions of the site. Under existing conditions, runoff from the Project area generally flows to the west to the on-site wetland system which appears to have become a tributary of Oil Mill Brook during construction of Route 95, or to the east down a steep embankment to Stony Brook which is approximately 600 feet away from the parcel. Both Oil Mill Brook and Stony Brook discharge to the Niantic River.

According to available soil mapping[1], a boring test pit investigation dated March 21, 2019, a hydrologic soil group confirmation study performed in September 2019, and a stormwater basin geotechnical investigation performed in September 2019, on-site soils range in depth to restrictive layers from ±2 feet to greater than 10 feet. The soil profiles examined in test

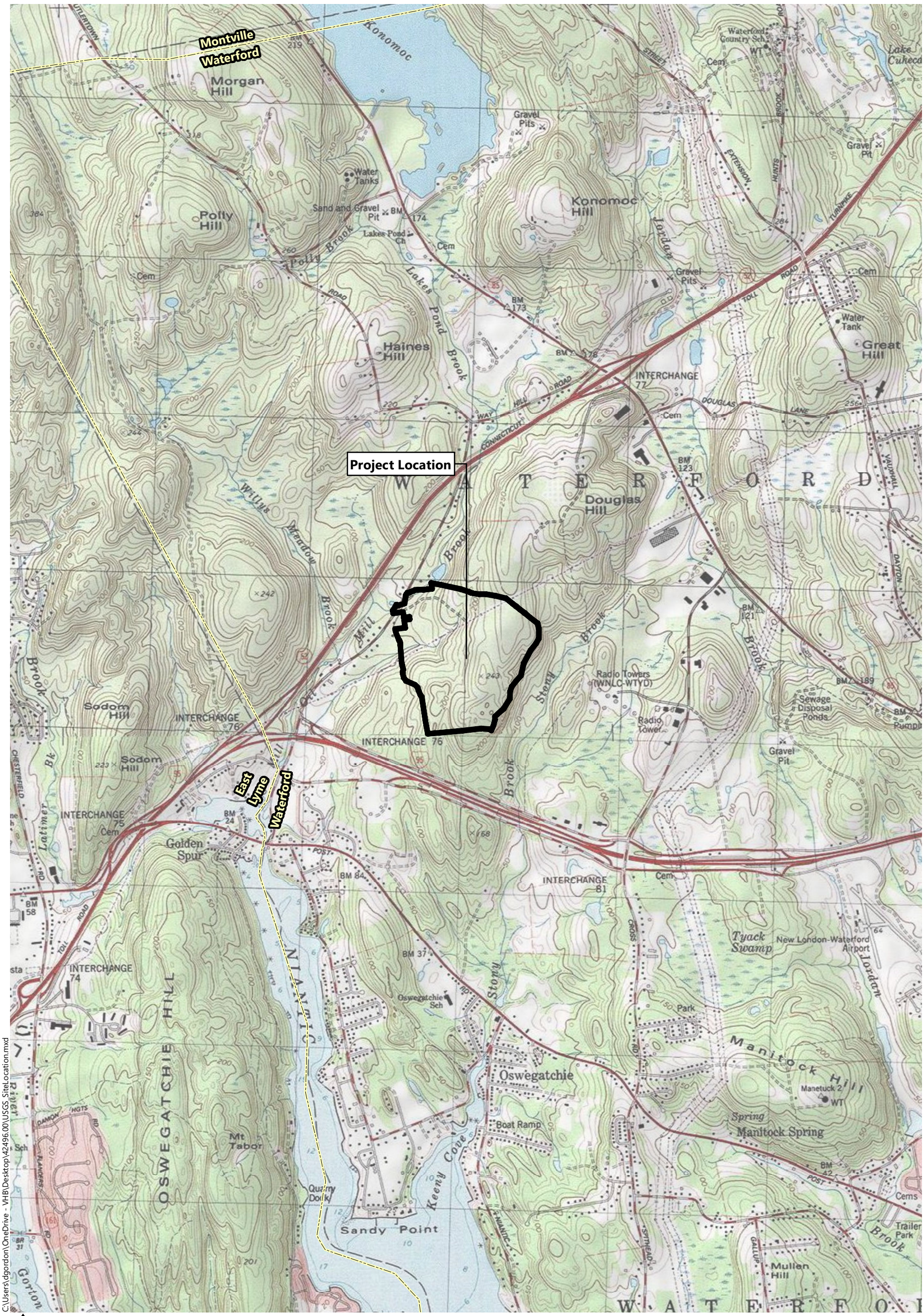
[1] https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

pits were generally consistent or similar to the named series in the mapped units available on-line[1]. Based on this mapping, the majority of on-Site soils within the Project area belong to the Hydraulic Soil Group "B", indicating that the soils have a moderate infiltration rate when thoroughly wet. See Appendix A for NRCS Web Soil Survey output and field-performed test pit and infiltration data.

Methodology

The Project was designed to incorporate measures provided in the Connecticut Stormwater Quality Manual (CTDEP 2004). The conclusion of this analysis is that the proposed improvements will not increase the post-development peak runoff rates in comparison to existing pre-development rates at any of the critical design points analyzed and the quality of stormwater runoff leaving the Site will be improved compared to existing. It is also proposed to meet State channel protection requirements for frequent rainfall events.

Figure 1: Site Location Map



C:\Users\dgordon\OneDrive - VHB\Desktop\42496.00\USGS_SiteLocation.mxd

42496.00 - Oil Mill Rd | Waterford, Connecticut

Property Boundary

Town Boundary

USGS Locus Map

Source: VHB, CTDEEP, ESRI

2

Existing Drainage Conditions

Summary

Under existing conditions, untreated stormwater runoff from the Project area generally flows to the west to the on-site wetland system which is a tributary of Oil Mill Brook, or to the east down a steep embankment to Stony Brook. The Site is generally at its highest elevation in the central portion of the Project and slopes down in all directions to the adjacent wetland systems and brooks. The majority of the Project area is wooded. A timber harvest performed by the current land owner over the past couple years resulted in the cutting of approximately 45 acres of the Project's wooded area within the limits of development, and a total of approximately 66 acres of the Site. Terrain slopes in the Project area range from 0% to approximately 20% with the majority of the Project area (roughly 95%) at less than 15% existing slope. Most of the Project Site perimeter is woodland.

Hydrologic Information

For the existing conditions hydrologic analysis, the Site is divided into 26 drainage areas, which have been identified as areas at the Project limits where flow begins to concentrate naturally. Table 1 provides a summary of the existing conditions hydrologic data. Figure 2 illustrates the existing drainage patterns on the Site. Only the areas of the Site that are proposed to be affected by construction have been included in this drainage analysis, while portions of the Site unaffected by construction have been excluded.

Drainage Area 1 - This ±3-acre area is the only development area to the north/west of the Eversource right-of-way which transects the Site. Stormwater in this area flows untreated generally to the southwest to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 2 - This ±3-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 2A - This ±1-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 3- This ±3-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 3A- This ±1-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 4- This ±6-acre area is located at the northeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 5- This ±3-acre area is located in the eastern portion of the Site. Stormwater in this area flows untreated generally to the east to a small onsite rocky wetland which discharges to the east to Stony Brook.

Drainage Area 6- This ±3-acre area is located at the eastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook.

Drainage Area 6A- This ±1-acre area is located at the southeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 6B- This small area is located at the southeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 6C- This ±1-acre area is located at the southeastern portion of the Site. Stormwater in this area flows untreated generally to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 7- This ±1-acre area is located at the southern portion of the Site. Stormwater in this area flows untreated generally to the south across the parcel line, and then to the east to Stony Brook.

Drainage Area 7A- This small area is located at the southern portion of the Site. Stormwater in this area flows untreated generally to the south across the parcel line, and then to the east to Stony Brook. No infrastructure is proposed in this watershed.

Drainage Area 8- This ±5-acre area is located at the southern portion of the Site. Stormwater in this area flows untreated generally to the south across the parcel line, and then to the east to Stony Brook.

Drainage Area 8A- This ±1-acre area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook. No infrastructure is proposed in this watershed.

Drainage Area 9- This ±2-acre area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook.

Drainage Area 9A- This small area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook. No infrastructure is proposed in this watershed.

Drainage Area 10- This ±2-acre area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook.

Drainage Area 10A- This small area is located at the southwestern portion of the Site. Stormwater in this area flows untreated generally to the west across the parcel line, and then to the south towards Route 95 and ultimately to Oil Mill Brook. No infrastructure is proposed in this watershed.

Drainage Area 11- This ±1-acre area is located at the western portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 11A- This small area is located at the western portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately. No infrastructure is proposed in this watershed.

Drainage Area 12- This ±4-acre area is located at the western portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 13- This ±12-acre area is located at the central portion of the Site. Stormwater in this area flows untreated generally to the north to the on-site wetlands tributary to Oil Mill Brook ultimately. Two onsite depressions which have the capacity to store some stormwater runoff exist in this watershed and have been delineated as Ponds 13.1 and 13.2.

Drainage Area 14- This ±4-acre area is located at the central portion of the Site. Stormwater in this area flows untreated generally to the west to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 16- This ±17-acre area is located at the northern portion of the Site. Stormwater in this area flows untreated generally to the west to the on-site wetlands tributary to Oil Mill Brook ultimately.

Drainage Area 16A- This ±1-acre area is located at the northern portion of the Site. Stormwater in this area flows untreated generally to the west to the on-site wetlands tributary to Oil Mill Brook ultimately. No infrastructure is proposed in this watershed.

Table 1 summarizes the key hydrologic parameters for each drainage area used in the existing conditions analysis.

Table 1 Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Onsite Wetlands (Oil Mill Brook)	3.0	60	13
2	Stony Brook	2.5	60	18
2A	Stony Brook	0.8	67	10
3	Stony Brook	2.6	60	19
3A	Stony Brook	0.3	78	10
4	Stony Brook	5.9	64	26
5	Stony Brook	2.6	60	15
6	Stony Brook	3.2	65	13
6A	Stony Brook	0.9	68	10
6B	Stony Brook	0.03	60	10
6C	Stony Brook	0.7	60	10
7	Stony Brook	1.2	60	11
7A	Stony Brook	0.2	60	10
8	Stony Brook	4.7	60	16
8A	Southwest	0.8	60	10
9	Southwest	1.5	60	11
9A	Southwest	0.3	60	10
10	Southwest	2.3	60	18
10A	Southwest	0.3	60	10
11	Onsite Wetlands (Oil Mill Brook)	1.1	60	8
11A	Onsite Wetlands (Oil Mill Brook)	0.4	60	10
12	Onsite Wetlands (Oil Mill Brook)	3.7	60	13
13.1	Onsite Wetlands (Oil Mill Brook)	3.1	60	10
13.2	Onsite Wetlands (Oil Mill Brook)	7.0	60	16
13.3	Onsite Wetlands (Oil Mill Brook)	2.3	60	14
14	Onsite Wetlands (Oil Mill Brook)	4.4	60	13
16	Onsite Wetlands (Oil Mill Brook)	16.9	60	39
16A	Onsite Wetlands (Oil Mill Brook)	0.6	60	10

Figure 2: Existing Drainage Areas

Legend

SYMBOLS

X — DRAINAGE AREA DESIGNATION

X — POND

LINETYPES

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

0 250 500 Feet

Existing Drainage Areas

Figure 2

Waterford Solar
117 Oil Mill Road - Waterford, CT

11/19/2019

3

Proposed Drainage Conditions

Summary

The Site has been designed to mimic existing topography and drainage patterns to maintain the current hydrologic balance. In the majority of the on-Site areas, the Project proposes to install permanent turf-forming grasses to help stabilize the topsoil from erosion, sequester nutrients and pollutants, and lower runoff rates from the facility to the surrounding discharge points. Mature vegetation has been preserved to the maximum extents practicable. As a result, the proposed Project will have minimal impact to surrounding ecologically sensitive areas.

The only impervious surfaces that exist at the Site today are the existing access paths, and the only impervious surfaces proposed to be constructed are access roads and small concrete pads for utility equipment. No work will be performed within 100 feet of the on-Site wetlands. Once operational, vehicular access to the Project will be limited to infrequent maintenance visits. The vegetated buffers and proposed stormwater basins between the crushed stone access path and the wetland systems will provide water quality treatment in all portions of the Site.

Hydrologic Information

Natural drainage patterns will be maintained throughout the Site so that the proposed hydrologic conditions will closely match existing conditions. The proposed conditions analysis utilized the same 26 drainage areas from existing conditions as shown in the proposed conditions area map (see Figure 3).

Table 2 summarizes the key hydrologic parameters for each drainage area used in the proposed conditions analysis. Only the areas of the Site that are proposed to be disturbed by construction have been included in this drainage analysis, while portions of the Site unaffected by construction have been excluded.

Table 2 Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Onsite Wetlands (Oil Mill Brook)	3.0	70	8
2	Stony Brook	2.5	72	12
2A	Stony Brook	0.8	65	10
3	Stony Brook	2.6	73	13
3A	Stony Brook	0.3	77	10
4	Stony Brook	5.9	73	16
5	Stony Brook	2.6	68	10
6	Stony Brook	3.2	73	8
6A	Stony Brook	0.9	67	10
6B	Stony Brook	0.03	58	10
6C	Stony Brook	0.7	58	10
7	Stony Brook	1.2	70	6
7A	Stony Brook	0.2	58	10
8	Stony Brook	4.7	72	10
8A	Southwest	0.8	58	10
9	Southwest	1.5	73	6
9A	Southwest	0.3	58	10
10	Southwest	2.3	72	11
10A	Southwest	0.3	58	10
11	Onsite Wetlands (Oil Mill Brook)	1.1	74	5
11A	Onsite Wetlands (Oil Mill Brook)	0.4	58	10
12	Onsite Wetlands (Oil Mill Brook)	3.7	71	8
13.1	Onsite Wetlands (Oil Mill Brook)	3.1	75	7
13.2	Onsite Wetlands (Oil Mill Brook)	9.3	73	12
14	Onsite Wetlands (Oil Mill Brook)	4.4	67	9
16	Onsite Wetlands (Oil Mill Brook)	16.9	74	31
16A	Onsite Wetlands (Oil Mill Brook)	0.6	58	10

Figure 3: Proposed Drainage Areas

Legend

SYMBOLS

X — DRAINAGE AREA DESIGNATION

X — POND

LINETYPES

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

0 250 500 Feet

vhb

Proposed Drainage Areas

Figure 3

Waterford Solar
117 Oil Mill Road - Waterford, CT

11/19/2019

4

Hydrologic Analysis

Hydrologic Analysis

The rainfall-runoff was evaluated for the 2-, 10-, 25-, and 100-year storm recurrence. Rainfall volumes used for this analysis were based on the National Weather Service NOAA Hydrometeorological Design Studies Center, Type III, 24—hour storm event for the Site. Rainfall depths were 3.45, 6.19, 6.97, 7.81 inches respectively. Runoff coefficients for the pre- and post- development conditions provided in the tables below were determined using NRCS Technical Release 55 (TR-55) methodology as provided in the HydroCAD reports found in Appendix D.

In accordance with the guidance of CTDEEP Draft Solar Appendix I, the proposed conditions have been modelled with a loss of one class of Hydrologic Soil Group to conservatively estimate the effects of compaction during construction. The results of the pre- and post-development hydrologic models indicate that peak runoff rates from the Site will be reduced at all design points for all design storms with the implementation of the proposed permanent stormwater basins. The field soil test data was used in the design of the stormwater basins. One-half of the lowest field-tested infiltration rate for each infiltration basin has been assumed in the hydrologic model, to be conservative.

It is noted that no hydraulic analysis has been performed because no closed pipe systems are proposed or impacted by the proposed development.

Table 3 presents a summary of the existing and proposed conditions peak discharge rates where stormwater basins are proposed.

Table 3 Peak Discharge Rates (cfs*)

Watershed	2-year	25-year	50-year	100-year
Watershed 1				
Existing	0.94	5.45	7.01	8.79
Proposed	0.25	4.80	6.66	8.64
Watershed 2				
Existing	0.72	4.06	5.23	6.55
Proposed	0.00	2.38	4.30	6.50
Watershed 3				
Existing	0.71	3.95	5.08	6.37
Proposed	0.21	3.40	4.64	6.04
Watershed 4				
Existing	2.27	9.63	12.09	14.86
Proposed	0.00	5.72	9.81	14.21
Watershed 5				
Existing	0.79	4.49	5.79	7.26
Proposed	0.02	2.75	4.28	6.09
Watershed 6				
Existing	1.79	7.29	9.10	11.13
Proposed	0.19	5.36	7.84	10.50
Watershed 7				
Existing	0.39	2.27	2.92	3.66
Proposed	0.00	0.75	1.56	2.57
Watershed 8				
Existing	1.38	7.82	10.07	12.62
Proposed	0.45	6.77	9.19	11.88
Watershed 9				
Existing	0.51	2.95	3.80	4.76
Proposed	0.00	1.35	2.35	3.52
Watershed 10				
Existing	0.66	3.71	4.78	5.98
Proposed	0.00	2.24	3.61	5.19
Watershed 11				
Existing	0.41	2.31	2.98	3.77
Proposed	0.00	0.57	1.34	2.24
Watershed 12				
Existing	1.16	6.68	8.60	10.77
Proposed	0.27	5.33	7.50	9.87

Watershed 13				
Existing	0.70	13.20	19.91	27.53
Proposed	0.00	3.39	10.57	19.43
Watershed 14				
Existing	1.37	7.89	10.16	12.73
Proposed	0.00	4.99	7.64	10.82
Watershed 15				
Existing	0.74	4.34	5.58	6.99
Proposed	0.00	2.38	3.83	5.77
Watershed 16				
Existing	3.57	19.13	24.60	30.79
Proposed	0.00	8.28	16.80	27.30

* Expressed in cubic feet per second

Floodplain Information / Analysis

The Site is generally elevated above the surrounding network of brooks and rivers. No portions of the Site lie within the Federal Emergency Management Agency (FEMA) mapped 1% annual chance flood A/AE flood zones as shown on the FEMA Flood Insurance Rate Map No. 09011C0343G, dated July 18, 2011 (included in Appendix A).

Water Quality Volume

Water Quality Volume (WQV) is based upon the first inch of rainfall, or a 1-inch rainfall event, over the acreage of proposed impervious surfaces for the development. Neither the solar panels nor the concrete equipment pads will be subject to vehicular access nor will they produce any pollutants to stormwater runoff. The crushed stone access paths will be trafficked infrequently and the grassy meadows downstream of the paths will provide residence time of stormwater runoff to remove the small amount of sediment from runoff.

To be conservative, water quality computations have been performed using a combination of 2004 CTDEEP Stormwater Quality Manual for the access roads and Minnesota Drainage Manual for the solar panels to determine required water quality volumes. These water quality volumes are addressed in the design of the proposed permanent stormwater basins. Computations can be found in Appendix D.

Water Quality Flow

Water Quality Flow (WQF) is a rate of stormwater runoff based upon the first inch of rainfall, or a 1-inch rainfall event. This regulation is generally followed for "flow-through" treatment devices. As the proposed development does not incorporate any "flow-through" water quality treatment devices, WQF is not applicable to this project.

Stream Channel Protection

Stream channel protection is provided at the discharge point of each permanent stormwater basin, in accordance with the guidance in 2004 CTDEEP Stormwater Quality Manual. The 2-year, 24-hour post-development peak flow rate is mitigated to 50% of the 2-year, 24-hour pre-development peak flow for each watershed containing development. This will assist in protecting the base flow streambanks in Oil Mill Brook and Stony Brook.

Conveyance Protection

Stream channel protection is provided at the discharge point of each permanent stormwater basin, in accordance with the guidance in 2004 CTDEEP Stormwater Quality Manual. Energy dissipators are proposed at the exit of each basin spillway which will help to slow and spread the discharge of runoff from infrequent storm events.

Appendix A:

FEMA Flood Insurance Rate Map

NOAA Rainfall Depth Estimates

CTDEEP Groundwater Classification Map

FEMA Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA

41°22'56.82"N

72°10'56.98"W

72°10'19.52"W

41°22'29.82"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/2/2019 at 3:57:54 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NOAA Rainfall Depth Estimates

NOAA Atlas 14, Volume 10, Version 3
Location name: Waterford, Connecticut, USA*
Latitude: 41.3796°, Longitude: -72.1773°
Elevation: 196.62 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.337 (0.263-0.420)	0.403 (0.314-0.502)	0.511 (0.397-0.638)	0.601 (0.464-0.754)	0.724 (0.542-0.944)	0.816 (0.599-1.08)	0.914 (0.652-1.25)	1.03 (0.691-1.43)	1.19 (0.771-1.71)	1.33 (0.839-1.93)
10-min	0.478 (0.373-0.595)	0.571 (0.445-0.712)	0.724 (0.562-0.905)	0.851 (0.657-1.07)	1.03 (0.767-1.34)	1.16 (0.849-1.54)	1.30 (0.923-1.78)	1.45 (0.979-2.03)	1.69 (1.09-2.42)	1.88 (1.19-2.74)
15-min	0.562 (0.439-0.699)	0.672 (0.524-0.837)	0.852 (0.662-1.06)	1.00 (0.773-1.26)	1.21 (0.903-1.57)	1.36 (0.998-1.81)	1.52 (1.09-2.09)	1.71 (1.15-2.38)	1.98 (1.29-2.84)	2.21 (1.40-3.22)
30-min	0.796 (0.621-0.990)	0.951 (0.741-1.18)	1.21 (0.936-1.51)	1.42 (1.09-1.78)	1.71 (1.28-2.22)	1.92 (1.41-2.56)	2.15 (1.54-2.96)	2.42 (1.63-3.37)	2.80 (1.81-4.01)	3.11 (1.97-4.54)
60-min	1.03 (0.803-1.28)	1.23 (0.958-1.53)	1.56 (1.21-1.95)	1.83 (1.41-2.30)	2.21 (1.65-2.88)	2.49 (1.82-3.30)	2.78 (1.98-3.82)	3.12 (2.10-4.35)	3.61 (2.34-5.18)	4.02 (2.54-5.86)
2-hr	1.35 (1.07-1.67)	1.62 (1.27-2.00)	2.05 (1.60-2.54)	2.40 (1.87-3.00)	2.90 (2.19-3.75)	3.26 (2.41-4.31)	3.66 (2.63-4.98)	4.11 (2.78-5.67)	4.78 (3.11-6.78)	5.34 (3.39-7.71)
3-hr	1.57 (1.24-1.94)	1.88 (1.48-2.31)	2.38 (1.87-2.93)	2.79 (2.18-3.46)	3.36 (2.54-4.32)	3.78 (2.81-4.96)	4.23 (3.05-5.74)	4.76 (3.23-6.53)	5.54 (3.62-7.82)	6.20 (3.95-8.90)
6-hr	2.00 (1.59-2.44)	2.38 (1.90-2.91)	3.00 (2.38-3.68)	3.52 (2.78-4.33)	4.23 (3.23-5.40)	4.76 (3.56-6.19)	5.32 (3.87-7.16)	5.98 (4.09-8.13)	6.96 (4.57-9.72)	7.78 (4.98-11.0)
12-hr	2.47 (1.99-3.00)	2.93 (2.36-3.56)	3.69 (2.96-4.50)	4.33 (3.44-5.29)	5.19 (3.99-6.58)	5.84 (4.40-7.53)	6.53 (4.77-8.69)	7.33 (5.03-9.86)	8.50 (5.60-11.7)	9.48 (6.09-13.3)
24-hr	2.89 (2.35-3.48)	3.45 (2.80-4.16)	4.37 (3.53-5.28)	5.14 (4.12-6.23)	6.19 (4.80-7.78)	6.97 (5.29-8.92)	7.81 (5.75-10.3)	8.79 (6.07-11.7)	10.2 (6.78-14.0)	11.4 (7.39-15.9)
2-day	3.23 (2.65-3.86)	3.90 (3.19-4.67)	5.00 (4.07-5.99)	5.91 (4.78-7.11)	7.16 (5.60-8.95)	8.09 (6.19-10.3)	9.09 (6.76-12.0)	10.3 (7.15-13.6)	12.1 (8.06-16.4)	13.7 (8.86-18.8)
3-day	3.50 (2.88-4.17)	4.23 (3.48-5.04)	5.41 (4.43-6.46)	6.40 (5.20-7.67)	7.75 (6.09-9.64)	8.75 (6.73-11.1)	9.83 (7.34-12.9)	11.1 (7.76-14.6)	13.1 (8.75-17.6)	14.8 (9.63-20.2)
4-day	3.76 (3.11-4.46)	4.52 (3.73-5.37)	5.76 (4.73-6.86)	6.79 (5.54-8.11)	8.21 (6.47-10.2)	9.26 (7.14-11.7)	10.4 (7.78-13.5)	11.8 (8.21-15.3)	13.8 (9.24-18.5)	15.6 (10.1-21.2)
7-day	4.48 (3.73-5.29)	5.31 (4.41-6.26)	6.66 (5.51-7.87)	7.77 (6.39-9.23)	9.31 (7.39-11.4)	10.5 (8.10-13.1)	11.7 (8.77-15.0)	13.1 (9.21-17.0)	15.3 (10.3-20.3)	17.1 (11.2-23.0)
10-day	5.20 (4.34-6.10)	6.06 (5.06-7.12)	7.46 (6.21-8.80)	8.63 (7.13-10.2)	10.2 (8.15-12.5)	11.4 (8.89-14.2)	12.7 (9.55-16.2)	14.2 (9.99-18.3)	16.3 (11.0-21.5)	18.1 (11.9-24.2)
20-day	7.38 (6.23-8.61)	8.30 (6.99-9.69)	9.80 (8.23-11.5)	11.1 (9.21-13.0)	12.8 (10.2-15.4)	14.1 (11.0-17.2)	15.4 (11.6-19.2)	16.8 (11.9-21.4)	18.8 (12.7-24.4)	20.3 (13.3-26.8)
30-day	9.20 (7.81-10.7)	10.2 (8.61-11.8)	11.7 (9.90-13.7)	13.0 (10.9-15.2)	14.8 (11.9-17.7)	16.2 (12.7-19.6)	17.6 (13.2-21.7)	18.9 (13.5-23.9)	20.7 (14.1-26.7)	21.9 (14.5-28.8)
45-day	11.5 (9.77-13.2)	12.5 (10.6-14.4)	14.1 (12.0-16.4)	15.5 (13.1-18.0)	17.4 (14.0-20.6)	18.9 (14.8-22.6)	20.3 (15.2-24.7)	21.6 (15.5-27.1)	23.2 (15.8-29.7)	24.2 (16.0-31.6)
60-day	13.3 (11.4-15.4)	14.4 (12.3-16.6)	16.1 (13.7-18.6)	17.6 (14.9-20.4)	19.6 (15.8-23.1)	21.2 (16.6-25.2)	22.6 (17.0-27.4)	23.9 (17.2-29.8)	25.4 (17.4-32.4)	26.3 (17.5-34.1)

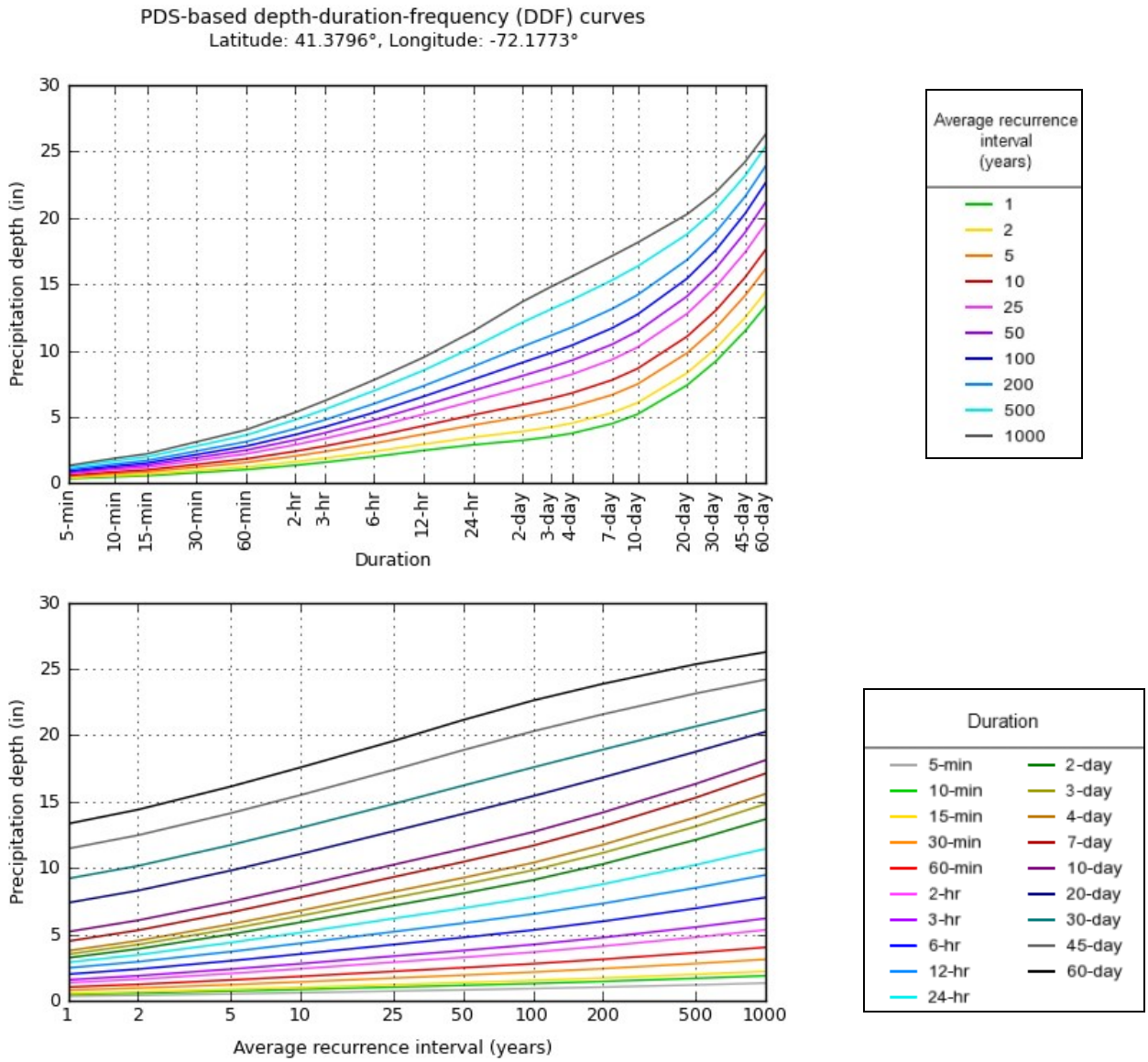
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



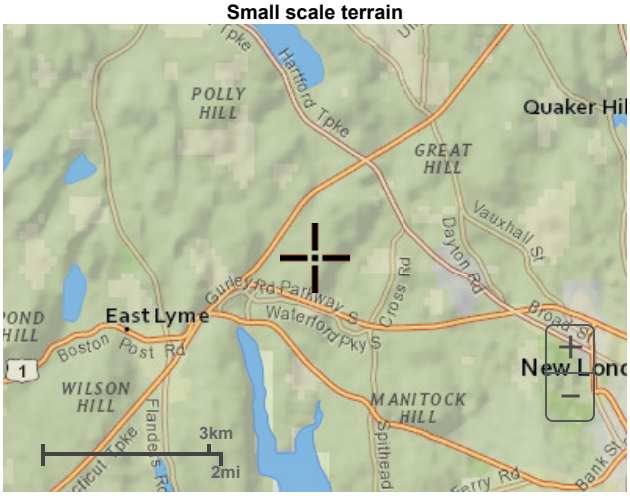
NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed Sep 25 13:52:34 2019

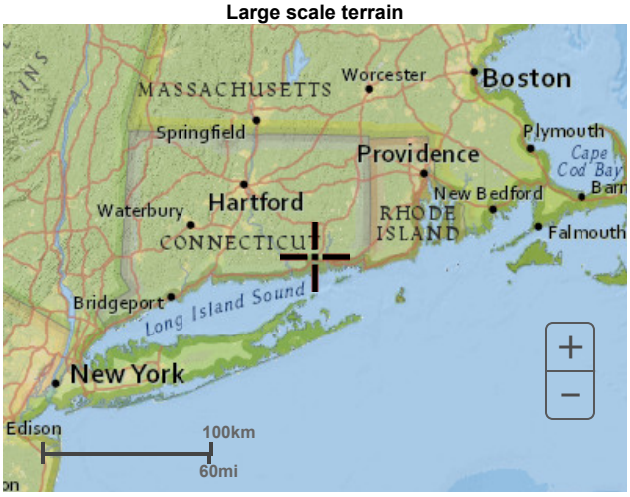
Back to Top

Maps & aerials

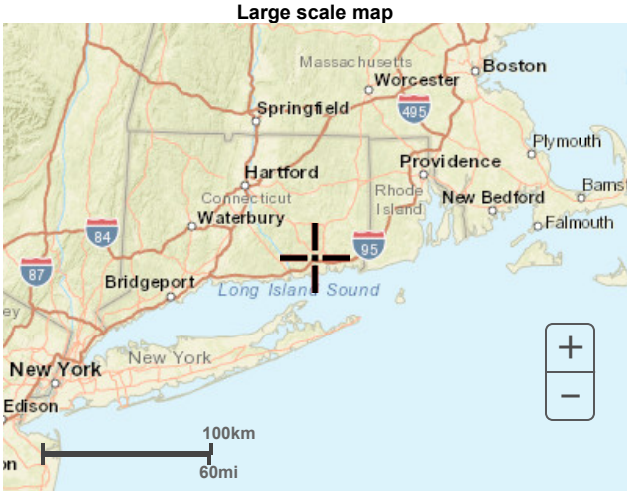
Small scale terrain



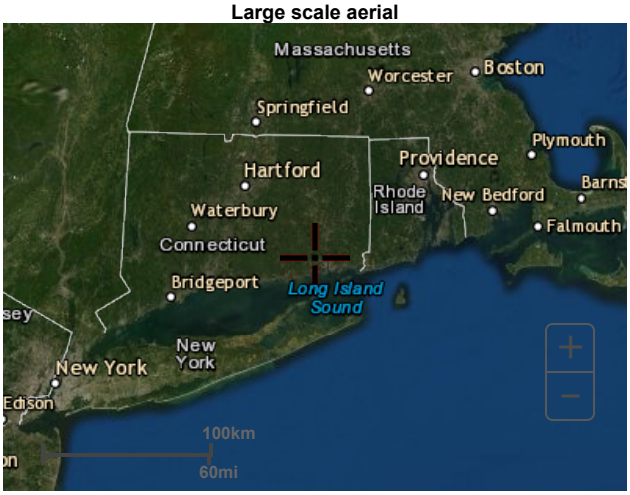
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

CTDEEP Groundwater Classification Map

WATER QUALITY CLASSIFICATIONS
WATERFORD, CT

SURFACE WATER QUALITY CLASSES

A	A
AA	AA
B, B*	B, B*
SA	SA
SB	SB

NOTES:
Surface Water Classifications beginning with S refer to Coastal and Marine Surface Water.
B* is a subset of Class B where no direct wastewater discharges are allowed other than those consistent with Class AA, A and SA surface waters.

GROUND WATER QUALITY CLASSES

GA (white background)
GAA, GAAs
GA, GAA may not meet current standards
GB
GC

Area of Contribution to Public Supply Well

Final Aquifer Protection Area (Level A)
Major Basin Boundary

EXPLANATION

WATER QUALITY CLASSIFICATIONS (WQC) MAPS are one of the elements of the Water Quality Standards (WQS) for the State of Connecticut. The WQS are a part of Connecticut's clean water program and are essential for protecting and improving water quality. The WQS follow the principles of Connecticut's Clean Water Act which is in Chapter 446K of the Connecticut General Statutes. The WQS provide policy guidance in many areas, for example decisions on acceptable discharges to water resources, siting of landfills, remediation or prioritization of municipal sewerage system projects. The first two elements of the WQS are the Standards, which set an overall policy for management of water quality, and the Criteria, which are descriptive and numerical standards that describe the allowable parameters and goals for various water quality classifications. A discussion of these two elements is found in the Water Quality Standards document available on the CT DEEP website. The third element is the Classifications and the Water Quality Classification Maps which show the Classification assigned to each surface and groundwater resource throughout the State. The WQS are adopted using a public participation process. The WQC maps are also adopted using a public participation process but go through hearings separately from the Standards and Criteria hearings. Revision and adoption of the WQC data occurs in accordance with the public participation procedures contained in Section 22a-426 of the Connecticut General Statutes. Ground WQC is subject to Connecticut regulation and changes must be reviewed and adopted. All changes to the Surface WQC require an adoption process which is subject to federal review and approval in addition to CT regulation. The adoption dates for the WQC by major drainage basin are: Housatonic River, Hudson River and Southwest Coastal Basins - March 1999; Connecticut River and South Central Coastal Basins - February 1993; Thames River, Pawcatuck River and Southeast Coastal Basins - December 1986. Surface Water Classifications do not change after the adoption date until the next major revision. Ground Water Classifications may change after the adoption date under specific circumstances. The map may have more than one WQC adoption date because a town may be in more than one major drainage basin.

SURFACE WATERS in Connecticut are divided into freshwater classified as AA, A, B or B* and saline waters classified as SA or SB. Class AA designated uses are existing or proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture. Class A designated uses are habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. Class B designated uses are habitat for fish and aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. Class B*, applicable to Candlewood Lake, is a subset of Class B and is identical in all ways to the designated uses, criteria and standards for Class B waters except for the restriction on direct discharges. Class SB designated uses are habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation.

Surface waters which are not specifically classified shall be considered as Class A or Class AA. Surface waters in GA ground water areas are assumed Class A or Class SA unless otherwise indicated. Surface waters in GAA ground water areas are assumed Class AA unless otherwise indicated.

On the WQC map a surface water quality goal of A is represented by blue colored water bodies. Surface water quality goal of AA is represented by purple colored water bodies. Surface water quality goal of B is represented by gold colored water bodies.

GROUND WATERS in Connecticut are classified as GAA, GA, GB and GC. Class GAA designated uses are existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. The Class GAAs is a subclass of GAA for ground water that is tributary to a public water supply reservoir. The area of contribution to a public water supply well is represented by a 500-foot radius around the well and is assumed to be Class GAA unless otherwise classified. Class GA designated uses are existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. All ground waters not specifically classified are considered as Class GA. Class GB designated uses are industrial process water and cooling waters and baseflow for hydraulically-connected water bodies and is presumed not suitable for human consumption without treatment. Class GC designated uses are assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes.

On the WQC map GA is represented by white colored land areas. Class GAA and class GAAs are represented by blue colored land areas. The area of contribution to a public water supply well is shown by a blue cross-hatch overprint. A notation of GAA followed by a state abbreviation indicates a watershed that contributes to the public water supply for a state other than Connecticut. Class GA or Class GAA areas that currently may not be meeting the GA or GAA standards are represented on the WQC maps by tan colored land areas. Class GB is represented by green colored land areas. Class GC is represented by magenta colored land areas.

FINAL AQUIFER PROTECTION AREAS (Level A) are included on the WQC maps for informational purposes. These areas are anticipated to be reclassified GAA during the next major basin updates, subject to public participation. The Aquifer Protection Program helps protect Connecticut's public drinking water resources by delineating aquifer protection areas (also called wellhead protection areas) for public supply wells and establishing land use regulations within these areas. These areas represent the land area contributing ground water to active public water supply wells or well fields that serve more than 1000 people and are set in sand and gravel aquifers (stratified drift deposits).

DATA SOURCES

WATER QUALITY CLASSIFICATIONS DATA – Water quality classifications shown on this map are based on information from the following digital spatial datasets that are typically shown together – Ground Water Quality Classifications Poly, Surface Water Quality Classifications Line, and Surface Water Quality Classifications Poly. The map legend above reflects the content of these three data sources. These WQC data were initially compiled on 1:24,000-scale 7.5 minute USGS topographic quadrangle maps and later digitized at 1:24,000 scale. For example, the Surface Water Quality Classifications Line and Surface Water Quality Classifications Poly digital data assigns surface water quality classifications to water bodies such as rivers, streams, reservoirs, lakes, ponds and coves found in 1:24,000-scale hydrography data available from CT DEEP. The hydrography may not include all the waterbodies in Connecticut. The Ground Water Quality Classifications Poly data assigns ground water quality classifications, at 1:24,000 scale, to the remaining land areas in Connecticut.

AQUIFER PROTECTION AREA DATA – Aquifer Protection Areas shown on this map are from the Aquifer Protection Area digital dataset which contains polygon data intended to be used at 1:24,000 scale. The dataset contains regulated areas classified as Level A Aquifer Protection Area (Final) and Level B Aquifer Protection Area (Preliminary). The Level B areas are not shown on the WQC maps. The data was collected from 1991 to the present and is actively updated as Final area mapping replaces earlier Preliminary areas. The Aquifer Protection Areas are delineated by the individual water companies owning the well fields and submitted to the CT DEEP for approval. Preliminary mapping provides a general estimate of the area contributing ground water to the well field. Final mapping is based on extensive, site-specific, detailed modeling of the ground water flow system. CT DEEP may adjust Final area boundaries to be consistent with 1:24,000 scale topography and base map data where appropriate during the approval process.

MAJOR DRAINAGE BASIN DATA – Major drainage basins shown on this map are from Major Basin Line data developed by CT DEEP and intended to be used at 1:24,000 scale.

BASE MAP DATA - Based on data originally from 1:24,000-scale USGS 7.5 minute topographic quadrangle maps published between 1969 and 1992. It includes political boundaries, railroads, airports, hydrography, geographic names and geographic places. Streets and street names are from Tele Atlas® copyrighted data. Base map information is neither current nor complete.

RELATED INFORMATION
This map is intended to be printed at its original dimensions in order to maintain the 1:24,000 scale (1 inch = 2000 feet).
WATER QUALITY STANDARDS - Go to the CT DEEP website for a summary and the full text of the "Water Quality Standards" and for other information on water quality.
AQUIFER PROTECTION AREAS - Go to the CT DEEP website for more information.

ADOPTED DATES

Water Quality Standards
February 25, 2011

Thames River, Pawcatuck River and Southeast Coastal Basins: December 1986

Connecticut River and South Central Coastal Basins: February 1993

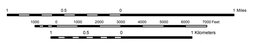
Housatonic River, Hudson River and Southwest Coastal Basins: March 1999

MAJOR BASINS

1 Pawcatuck
2 Southeast Coast
3 Thames
4 Connecticut
5 South Central Coast
6 Housatonic
7 Southwest Coast
8 Hudson

MAP LOCATION

State Plane Coordinate System of 1983. Zone 3526
Lambert Conformal Conic Projection
North American Datum of 1983



SCALE 1:24,000 (1 inch = 2000 feet) when map is printed at original size

STATE OF CONNECTICUT
DEPARTMENT OF
ENERGY & ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, CT 06106-5127

Map created by CT DEEP
October 2018

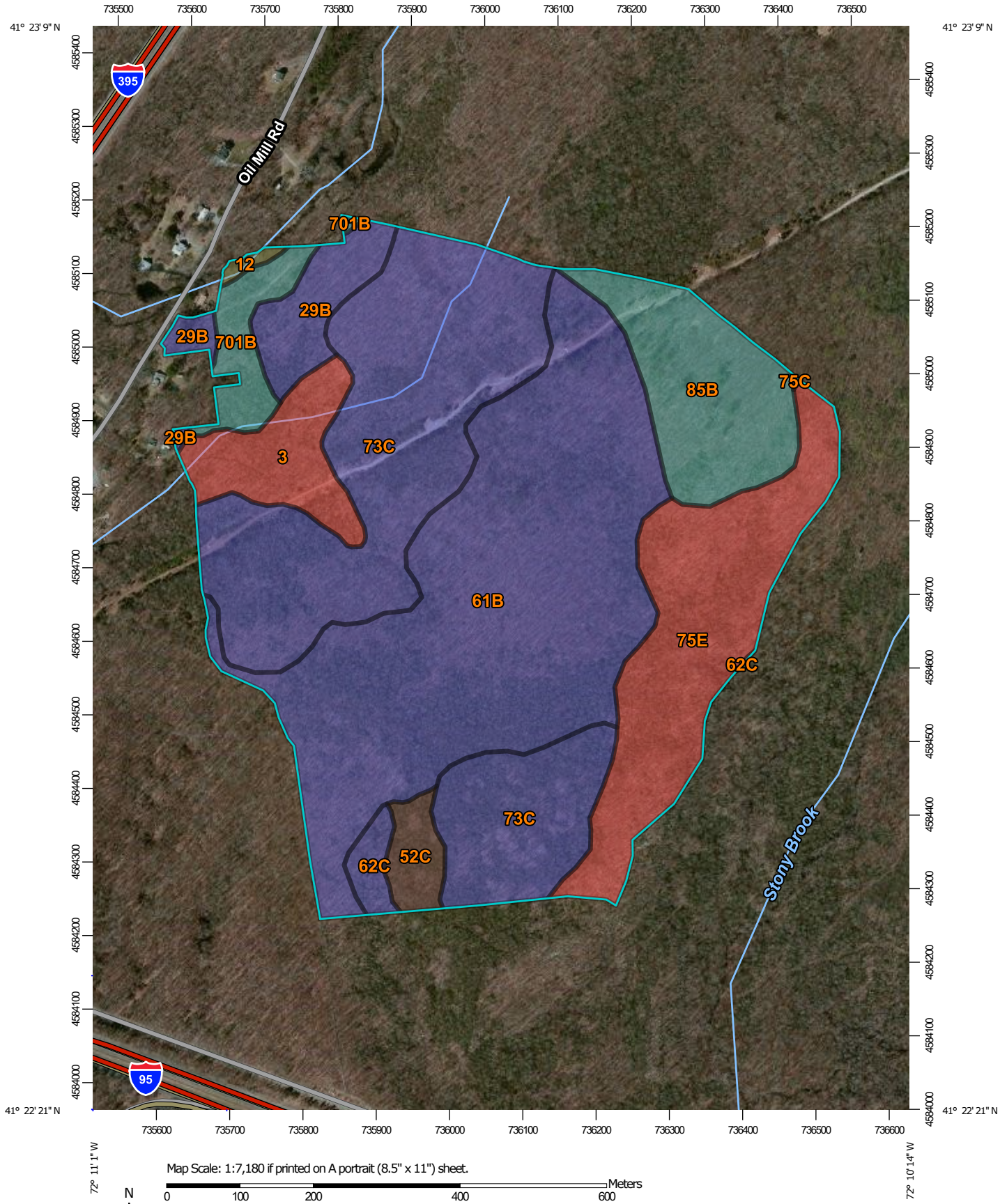
Map is not colorfast
Protect from light and moisture

Appendix B:

NRCS Soil Survey Information
Test Pit and Infiltration Testing Data

NRCS Soil Survey Information

Hydrologic Soil Group—State of Connecticut
(Waterford Property Line)



Map Scale: 1:7,180 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

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

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	7.3	4.8%
12	Raypol silt loam	C/D	0.4	0.3%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	B	6.0	4.0%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	B/D	2.6	1.7%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	B	52.2	34.3%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	B	1.6	1.1%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	43.6	28.7%
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	D	0.0	0.0%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	21.1	13.8%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	C	13.1	8.6%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	C	4.3	2.8%
Totals for Area of Interest			**152.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Test Pit and Infiltration Testing Data

March 21, 2019

BL Companies
355 Research Parkway
Meriden, CT 06450

Attn: Mr. Christopher Albino, P.E. – Senior Project Manager / Principal
P: (203) 608 2509
E: calbino@blcompanies.com

Re: Addendum to Geotechnical Engineering Report – *In-Situ* Permeability Testing
Photovoltaic Installation
117 Oil Mill Road
Waterford, Connecticut
Terracon Project No. J2185052

Dear Mr. Albino:

At your request, Terracon Consultants, Inc. (Terracon) has completed this addendum to our Geotechnical Engineering Report, dated May 22, 2018, for the above-referenced project. The additional services included performing *in-situ* permeability testing at 13 locations throughout the site. Our services were conducted in general accordance with our supplemental proposal dated January 23, 2019. The General Conditions in our report apply to the *in-situ* testing in this letter.

1.0 PROJECT INFORMATION

The project site is an approximately 140-acre parcel west of Oil Mill Road and north of Parkway North, in the town of Waterford, Connecticut. The site undulates between relative highs and lows, generally sloping downward to the west from approximately Elevations 240 to 100 feet. The majority of the site is heavily wooded. However, portions of the site have been cleared, presumably in anticipation of site development.

Our understanding of the project comes from our recent conversations and review of the site plan titled *"SWMB – Geotech Boring Locations"*, Project No. 17D3515, Sheet No. EXH-1, dated July 30, 2018, by BL Companies of Meriden, Connecticut. As such, we understand that the project will include the construction of 13 stormwater management basins within the solar power facility. Cuts and fills, up to about 10 feet, are anticipated for site and stormwater detention development.

2.0 FIELD EXPLORATION AND GEOLOGIC DESCRIPTION

Field Exploration Description

The approximate exploration and test locations, which are shown in Exhibit A-2, were obtained using a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolating from 7.5 minute topographic quadrangle maps, including Montville, Connecticut (1983) and Niantic, Connecticut (1983). Ground surface elevations rounded to the nearest foot are shown on the individual exploration logs. The locations of the explorations and tests as well as their elevations should be considered accurate only to the degree implied by the method used to define them.

Terracon advanced 13 test probes (INF-1 through INF-13) between February 22 and April 1, 2019 for the purpose of performing *in-situ* infiltration tests. With the exception of INF-6, INF-7, and INF-8, the probes were advanced using 3¼-inch inside diameter continuous flight hollow-stem augers or 4-inch diameter continuous flight solid stem augers powered by an all-terrain vehicle (ATV) mounted Diedrich D-50 rotary drill rig. INF-6, INF-7, and INF-8 were in an area that was inaccessible to our drill rig and therefore were advanced by hand using a 2-inch diameter auger.

Select soil samples were collected in the field and placed in labeled bags and glass jars and transported to our Rocky Hill (Hartford) laboratory for further review by a Terracon geotechnical engineer, laboratory testing, and classification. Information provided on the exploration logs attached to this report includes soil descriptions, exploration depths, and groundwater conditions. Field logs of the explorations were prepared by a Terracon field engineer. These logs included visual classifications of the materials encountered during drilling as well as interpretation by our field engineer of the subsurface conditions between samples. Final exploration logs included with this report represent further interpretation by the geotechnical engineer of the field logs and incorporate, where appropriate, modifications based on observations and laboratory classification of the samples.

Geotechnical Characterization

Based on our knowledge of the site, the subsurface conditions consist of forest mat underlain by glacial till over bedrock. The glacial till consists of brown, medium dense to very dense silty, silty sand (SM), with gravel, occasional to frequent cobbles and boulders. Bedrock, the upper several feet of which is weathered, consists of gray granitic gneiss.

INF-1 through INF-5, INF-9, INF-12, and INF-13 terminated without refusal in the glacial till at a depth of approximately 10 feet below existing grade. INF-6 terminated on a probable boulder in the glacial till at a depth of approximately 2 feet. INF-7, INF-8, INF-10, and INF-11 terminated on bedrock at depths ranging from approximately 2 to 4 feet.

Groundwater

With the exception of INF-1 and INF-2, groundwater was not encountered at the time of our explorations. Fluctuations in groundwater level may occur because of seasonal variations in the amount of rainfall, runoff, and other factors. Additionally, grade adjustments on and around the site, as well as surrounding drainage improvements, may affect the water table. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project. Groundwater levels are tabulated below:

Boring	Depth to Groundwater While Drilling (feet)
INF-1	0.5
INF-2	1.0

3.0 *IN-SITU* PERMEABILITY TESTING

Between February 22 and March 15, 2019, Terracon performed *in-situ* soil hydraulic conductivity testing at 13 locations (INF-1 through INF-13) using falling head infiltration testing. Testing was performed by installing 2-inch diameter PVC well pipe to the bottom of the test hole. Granular filter media (i.e. coarse sand) was placed at the bottom of the pipe to prevent scouring and silting. The pipes were then filled with water to the top of pipe and allowed to presoak. Following the presoaking period, infiltration testing was performed in general accordance with the *2004 Connecticut Stormwater Quality Manual* by the Connecticut Department of Environmental Protection. The results are tabulated below.

Soils at the appropriate test depths from each location were collected and classified using the USDA Textural Triangle. Classification was by visual/manual procedures. Results of the field permeability testing is summarized below:

Test No.	Approximate Depth (feet)	Material at Test Depth	Textural Class	Infiltration Rate, K, (inches/hour)
INF-1	10	Weathered Rock	Loamy Sand	<0.1
INF-2	10	Glacial Till	Loamy Sand	No Movement[1]
INF-3	10	Glacial Till	Loamy Sand	No Movement[1]
INF-4	10	Glacial Till	Loamy Sand	No Movement[1]
INF-5	10	Glacial Till	Loamy Sand	No Movement[1]

Test No.	Approximate Depth (feet)	Material at Test Depth	Textural Class	Infiltration Rate, K, (inches/hour)
INF-6	2	Glacial Till	Loamy Sand	2.8
INF-7	2	Bedrock	Not Applicable	No Movement[1]
INF-8	3.6	Bedrock	Not Applicable	No Movement[1]
INF-9	10	Glacial Till	Loamy Sand	3.0
INF-10	2.6	Weathered Rock	Loamy Sand	<0.1
INF-11	4	Bedrock	Not Applicable	0.1
INF-12	10	Glacial Till	Loamy Sand	2.3
INF-13	10	Glacial Till	Loamy Sand	2.3

1. No perceivable movement in water level after 60 minutes.

Individual permeability tests only measure the hydraulic conductivity in the immediate vicinity of the test, and may not be representative of the average hydraulic conductivity of the soil. Additionally, field hydraulic conductivity values are generally accurate to an order of magnitude.

Various factors may influence field infiltration testing results, including lack of soil saturation, a non-homogenous soil profile surrounding the test interval, the presence of bedrock, gravel, cobbles, boulders, or deleterious material, or variation in soil density. Field infiltration values should be evaluated based on the measured data in conjunction with published values for the material.

We trust that this report meets your current needs. We appreciate the opportunity to have been of service to you on this project. Should you require further information, please contact us.

Sincerely,
Terracon Consultants, Inc.

Brian D. Opp, P.E.	Stephen C. Lanne, P.E.
Senior Engineer	Geotechnical Department Manager

/bdo/J2185052

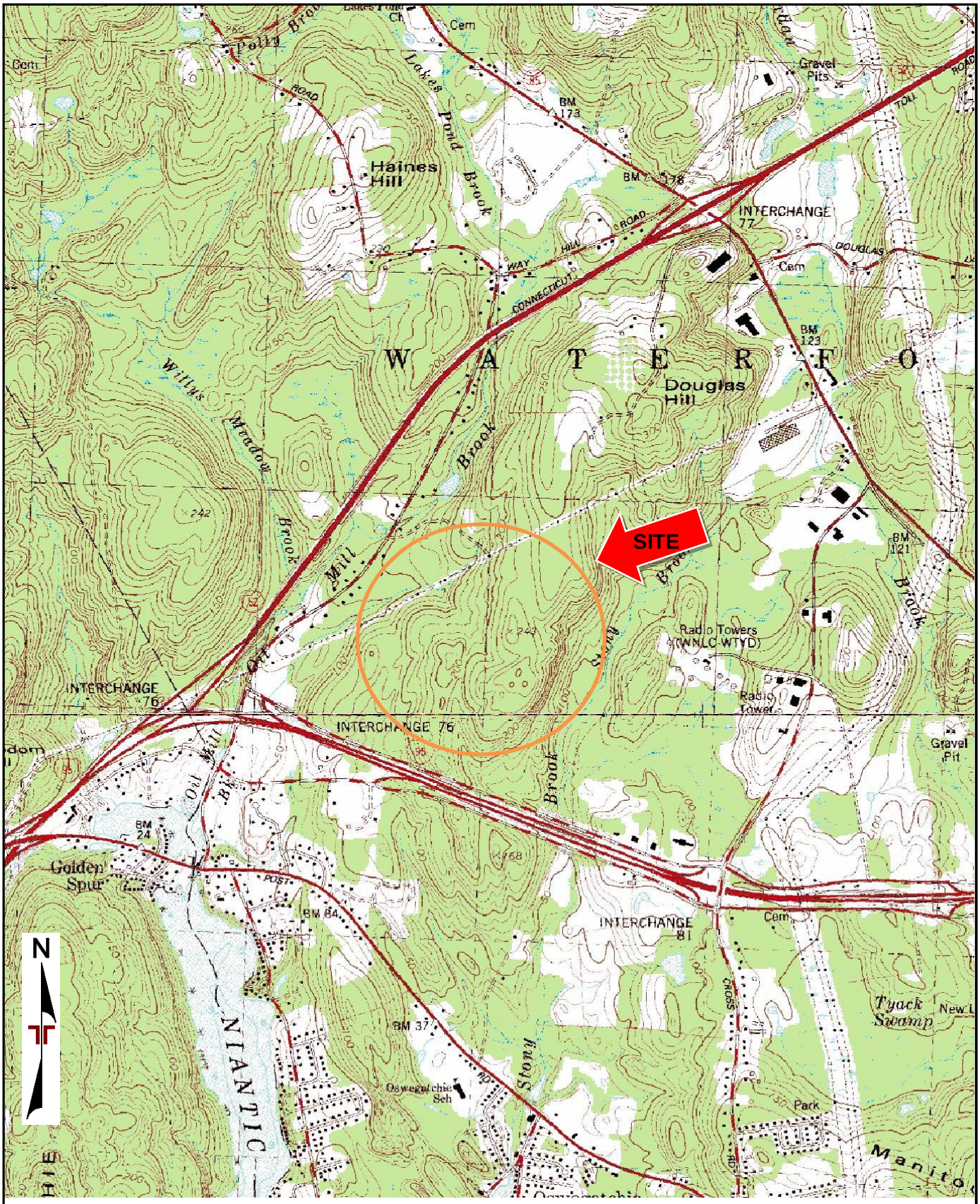
APPENDIX A – FIELD EXPLORATION

Exhibit A-1	Site Location Map
Exhibit A-2	Test Location Diagram
Exhibits A-3 to A-15	Test Probe Logs (INF-1 through INF-13)

APPENDIX B – SUPPORTING DOCUMENTS

Exhibit B-1	General Notes
Exhibit B-2	Unified Soil Classification System
Exhibit B-3	Description of Rock Properties

APPENDIX A
FIELD EXPLORATION



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: MONTVILLE, CT (1/1/1983) and NIANTIC, CT (1/1/1983).

Project Manager: BDO	Project No. J2185052	Terracon 201 Hammer Mill Rd Rocky Hill, CT 06067-3768	SITE LOCATION MAP	Exhibit
Drawn by: BDO	Scale: 1"=2,000'		Proposed Solar Power Facility, Waterford, CT **117 Oil Mill Road** **Waterford, CT**	A-1
Checked by: SCL	File Name: J2185052			
Approved by: SCL	Date: MAR 2019			

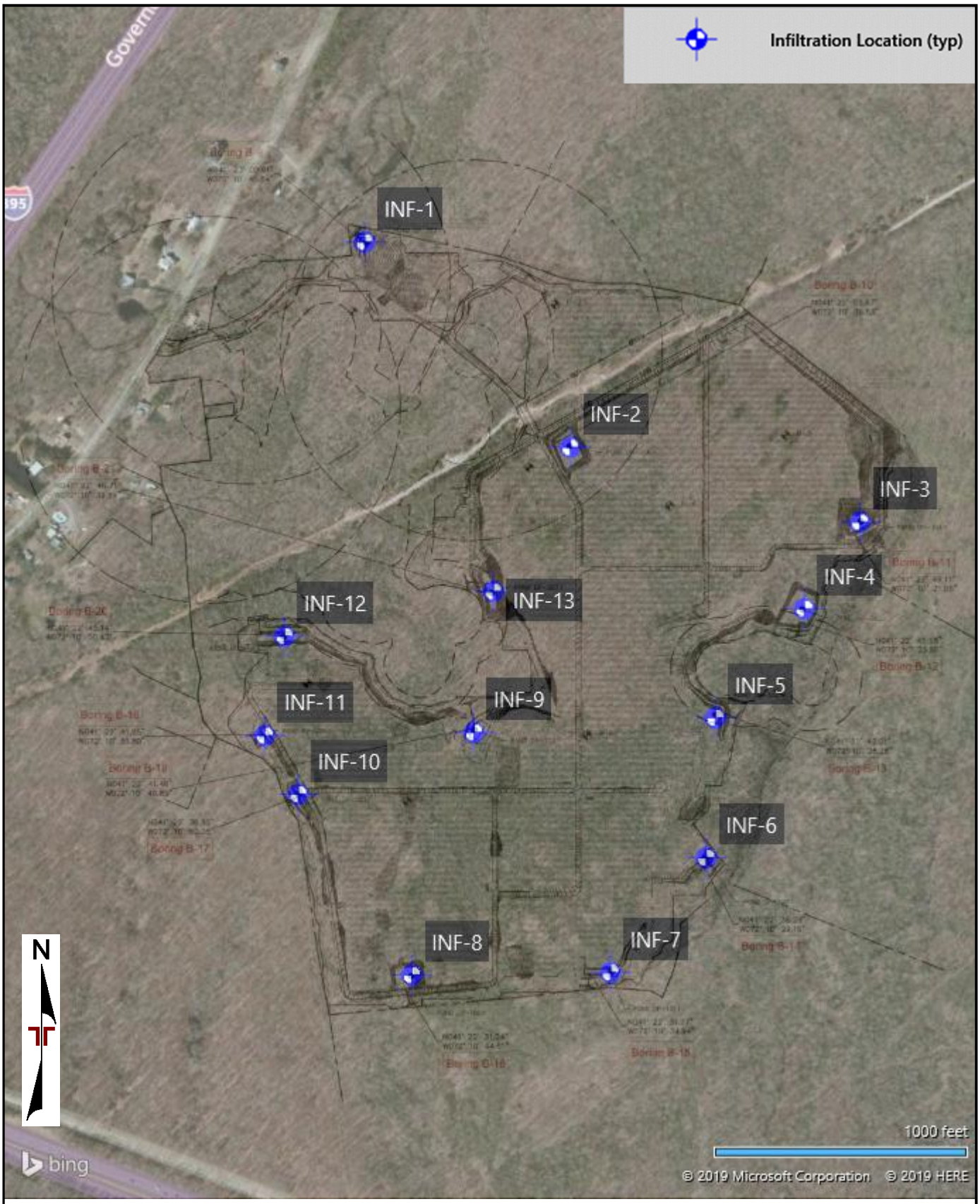


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

BASED ON THE SITE PLAN TITLED *'SWMB – GEOTECH BORING LOCATIONS'*, SHEET No. EXH-1, DATED JULY 30, 2018, BY BL COMPANIES AND AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: BDO	Project No. J218505	Terracon 201 Hammer Mill Rd Rocky Hill, CT 06067-3768	TEST LOCATION PLAN	Exhibit
Drawn by: BDO	Scale: AS SHOWN		Proposed Solar Power Facility, Waterford, CT **117 Oil Mill Road** **Waterford, CT**	A-2
Checked by: SCL	File Name: J2185052			
Approved by: SCL	Date: MAR 2019			

PROBE LOG NO. INF-1

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3835° Longitude: -72.1796°

Approximate Surface Elev.: 130 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description
0.5	129.5+/-	**FOREST MAT**
1.5	128.5+/-	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**
6.0	124+/-	**SILTY SAND (SM)**, with gravel, gray
10.0	120+/-	**COMPLETLEY WEATHERED GRANITIC GNEISS**, gray to black

Probe Terminated at 10 Feet

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

DEPTH (Ft.): 5, 10

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
3 1/4-inch I.D. continuous flight hollow stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

While drilling

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-2

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3813° Longitude: -72.1766°

Approximate Surface Elev.: 220 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	219.5+/-
	SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	
2.0		218+/-
	SILTY SAND (SM), with gravel, gray	
10.0		210+/-
	Probe Terminated at 10 Feet	

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

While drilling

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-3

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

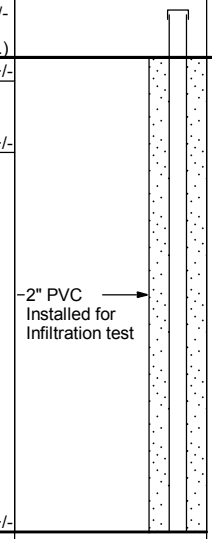
LOCATION See Exhibit A-2

Latitude: 41.3805° Longitude: -72.1724°

Approximate Surface Elev.: 230 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	229.5+/-
	SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	
2.0		228+/-
	SILTY SAND (SM), with gravel, gray	
10.0		220+/-
	Probe Terminated at 10 Feet	

INSTALLATION DETAILS



DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-28-2019	Probe Completed: 02-28-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-4

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

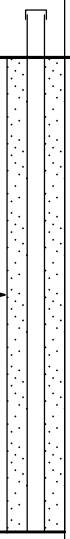
LOCATION See Exhibit A-2

Latitude: 41.3795° Longitude: -72.1732°

Approximate Surface Elev.: 200 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	199.5+/-
	SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	
2.0		198+/-
	SILTY SAND (SM), with gravel, gray	
10.0		190+/-
	Probe Terminated at 10 Feet	

INSTALLATION DETAILS



DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-28-2019	Probe Completed: 02-28-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-5

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

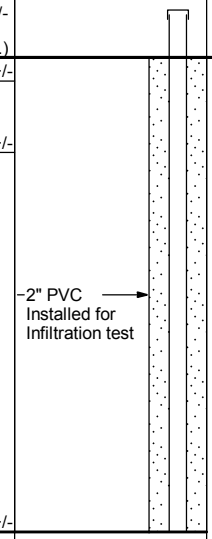
LOCATION See Exhibit A-2

Latitude: 41.3783° Longitude: -72.1745°

Approximate Surface Elev.: 220 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	219.5+/-
	SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	
2.0		218+/-
	SILTY SAND (SM), with gravel, gray	
10.0		210+/-
	Probe Terminated at 10 Feet	

INSTALLATION DETAILS



DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-28-2019	Probe Completed: 02-28-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-6

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3768° Longitude: -72.1747°

Approximate Surface Elev.: 235 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	234.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	233.5+/-	2" PVC Installed for Infiltration test			
	2.0	**SILTY SAND (SM)**, with gravel, gray	233+/-				

Auger Refusal on Probable Boulder at 2 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
2-inch diameter hand auger

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 03-01-2019	Probe Completed: 03-01-2019
Drill Rig:	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-7

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3756° Longitude: -72.176°

Approximate Surface Elev.: 240 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	239.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	238.5+/-	2" PVC Installed for Infiltration test			
	2.0	**SILTY SAND (SM)**, with gravel, gray	238+/-				

Auger Refusal on Probable Bedrock at 2 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
2-inch diameter hand auger

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 03-01-2019	Probe Completed: 03-01-2019
Drill Rig:	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-8

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3755° Longitude: -72.1789°

Approximate Surface Elev.: 190 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	189.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**					
	2.0		188+/-	2" PVC Installed for Infiltration test			
		SILTY SAND (SM), with gravel, gray					
	3.6		186.5+/-				
		Auger Refusal on Probable Bedrock at 3.58 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
2-inch diameter hand auger

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 03-01-2019	Probe Completed: 03-01-2019
Drill Rig:	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-9

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3782° Longitude: -72.178°

Approximate Surface Elev.: 195 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	194.5+/-
	SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**	
2.5		192.5+/-
	SILTY SAND (SM), with gravel, gray	
10.0		185+/-
	Probe Terminated at 10 Feet	

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-10

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3775° Longitude: -72.1806°

Approximate Surface Elev.: 190 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	189.5+/-				
		SILTY SAND (SM), trace roots, brown, **(SUBSOIL)**		2" PVC Installed for Infiltration test			
	2.0		188+/-				
	2.6	**COMPLETLEY WEATHERED GRANITIC GNEISS**, gray to black	187.5+/-				
		Auger Refusal on Competent Bedrock at 2.58 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:

See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS

No free water observed

Terracon

Probe Started: 02-26-2019	Probe Completed: 02-26-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-12

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-11

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3781° Longitude: -72.181°

Approximate Surface Elev.: 170 (Ft.) +/-

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
	0.5	**FOREST MAT**	169.5+/-				
	1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	168.5+/-				
	4.0	**COMPLETLEY WEATHERED GRANITIC GNEISS**, gray to black	166+/-	2" PVC Installed for Infiltration test			
		Auger Refusal on Competent Bedrock at 4 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-27-2019	Probe Completed: 02-27-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-13

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-12

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3792° Longitude: -72.1807°

Approximate Surface Elev.: 160 (Ft.) +/-

DEPTH		ELEVATION (Ft.)
0.5	**FOREST MAT**	159.5+/-
1.5	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**	158.5+/-
10.0	**SILTY SAND (SM)**, with gravel, gray	150+/-
	Probe Terminated at 10 Feet	

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-27-2019	Probe Completed: 02-27-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-14

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

PROBE LOG NO. INF-13

PROJECT: Photovoltaic Installation

CLIENT: BL Companies
Meriden, Connecticut

SITE: 117 Oil Mill Road
Waterford, Connecticut

LOCATION See Exhibit A-2

Latitude: 41.3797° Longitude: -72.1777°

Approximate Surface Elev.: 190 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description
0.8	189+/-	**FOREST MAT**
4.0	186+/-	**SILTY SAND (SM)**, trace roots, brown, **(SUBSOIL)**
10.0	180+/-	**SILTY SAND (SM)**, with gravel, gray
		Probe Terminated at 10 Feet

INSTALLATION DETAILS: 2" PVC Installed for Infiltration test

DEPTH (Ft.): 5, 10

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
4-inch diameter continuous flight solid stem augers.

Abandonment Method:

Notes:
See addendum report for description of field procedures.
See Appendix B for explanation of symbols and abbreviations.
Elevations were interpolated from topographic maps.

WATER LEVEL OBSERVATIONS
No free water observed

Terracon

Probe Started: 02-22-2019	Probe Completed: 02-22-2019
Drill Rig: Diedrich D-50	Driller: C.Johnston
Project No.: J2185052	Exhibit: A-15

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL J2185052 INFILTRATION TESTING.GPJ TERRACON_DATATEMPLATE.GDT 3/21/19

APPENDIX B
SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Auger	Split Spoon
Shelby Tube	Macro Core
Ring Sampler	Rock Core
Grab Sample	No Recovery

WATER LEVEL

- Water Initially Encountered
- Water Level After a Specified Period of Time
- Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				BEDROCK		
Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, tsf	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Ring Sampler Blows/Ft.	Standard Penetration or N-Value Blows/Ft.	Descriptive Term (Consistency)
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3	< 30	< 20	Weathered
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4	30 - 49	20 - 29	Firm
Medium Dense	10 - 29	19 - 58	Medium-Stiff	0.50 to 1.00	4 - 8	5 - 9	50 - 89	30 - 49	Medium Hard
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18	90 - 119	50 - 79	Hard
Very Dense	> 50	≥ 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42	> 119	>79	Very Hard
			Hard	> 4.00	> 30	> 42			

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

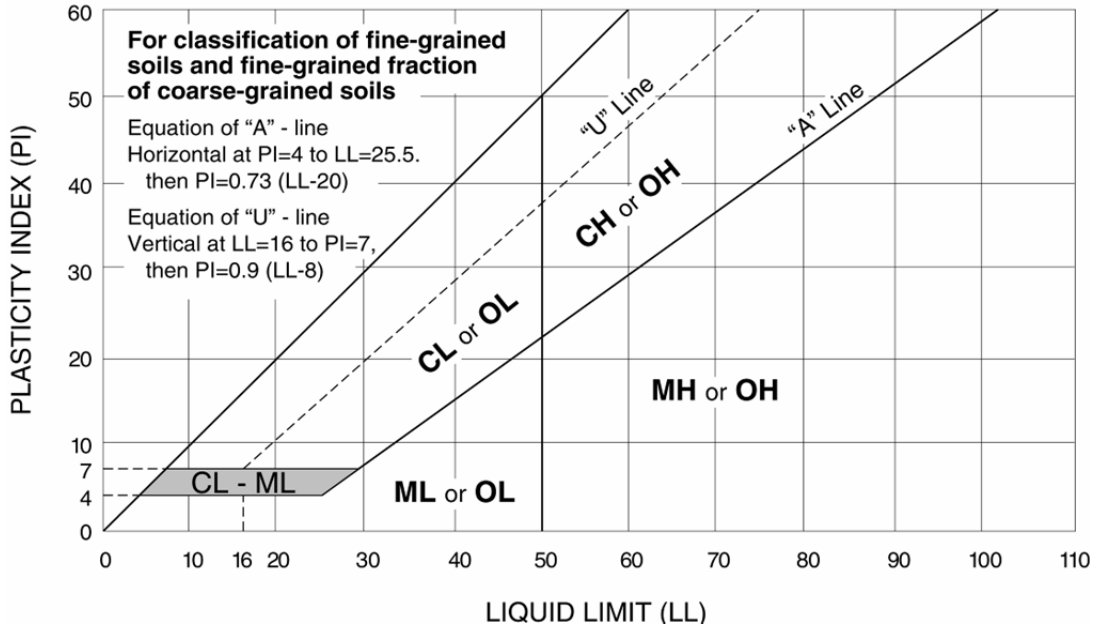
UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	$PI > 7$ and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			$PI < 4$ or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay [K,L,M,N]
						Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay [K,L,M,P]
						Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] $PI \geq 4$ and plots on or above "A" line.
[O] $PI < 4$ or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



Terracon

Exhibit B-2

DESCRIPTION OF ROCK PROPERTIES

WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, PSI (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft (50 – 300 mm)
Moderate	8 in – 2 ft (200 – 600 mm)	**Medium**	1 ft – 3 ft (300 – 900 mm)
Wide	2 ft – 6 ft (600 mm – 2.0 m)	**Thick**	3 ft – 10 ft (900 mm – 3 m)
Very Wide	6 ft – 20 ft (2.0 – 6 m)	**Massive**	> 10 ft (3 m)

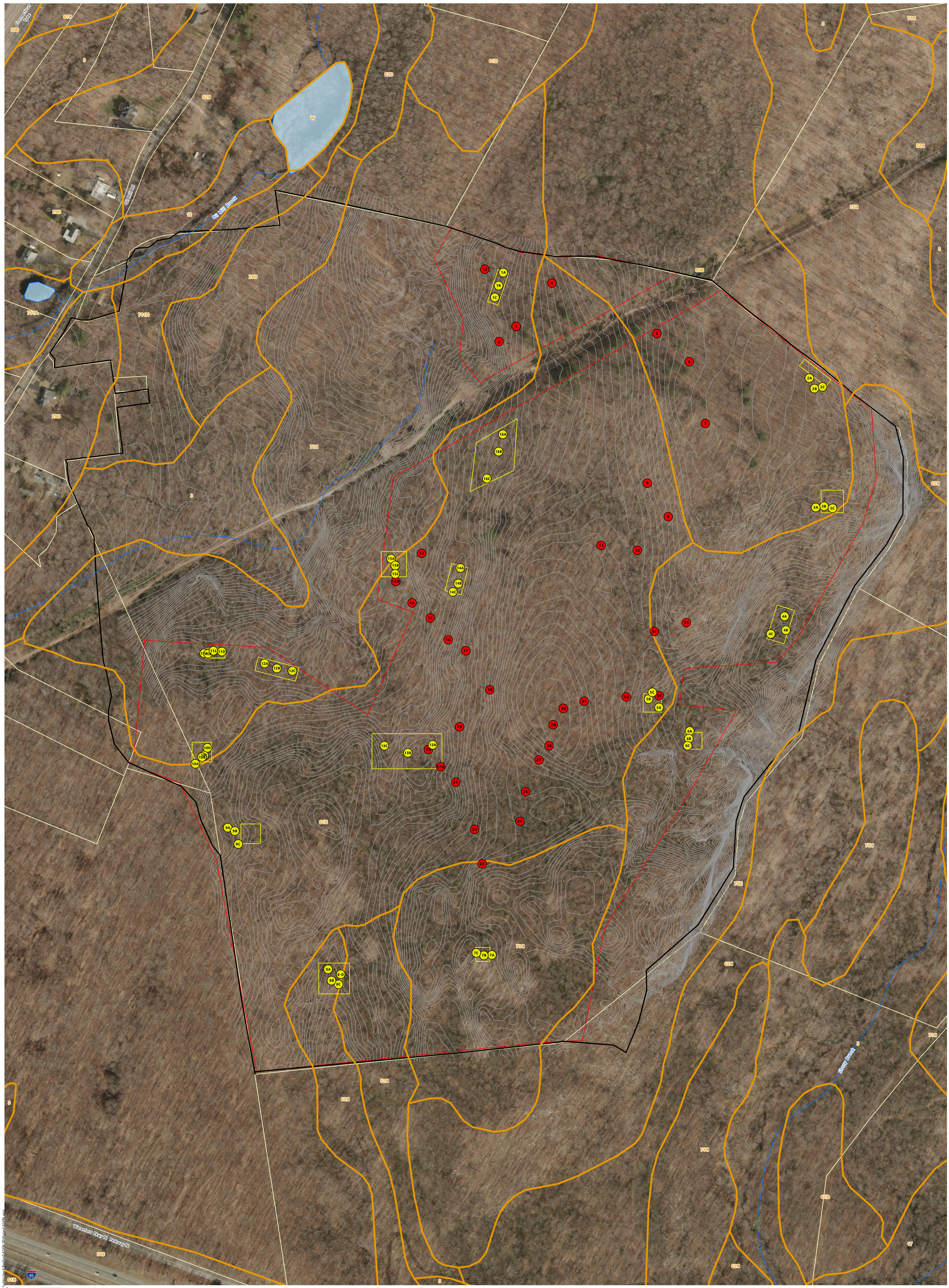
Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0 degree angle.

ROCK QUALITY DESIGNATION (RQD*)	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

*The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements

vhb October 7, 2019 | **Test Pits**



Parcel Boundary
Adjacent Parcels
Limit of Work
Stormwater Test Pits
Site-Specific HSG Soil Survey
Stormwater Test Pit Areas
NRSC Soil Boundary
Stream/River
2' Elevation Contour
Waterbody

Waterford Solar | Waterford, Connecticut

Test Pit Locations

Hydrologic Soil Map Unit Test Pits
VHB
September 10-11, 2019

Test Pit **1**

A	0 to 5 inches	Dark brown (10YR 3/3) fine sandy loam, weak fine granular structure, friable, many roots, abrupt smooth boundary.
Bw1	5 to 12 inches	Dark yellowish brown (10YR 4/6) stony sandy loam, moderate medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	12 to 22 inches	Yellowish brown (10YR 5/6) stony sandy loam, common, fine, distinct 7.5YR 5/6 redox concentrations, moderate medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
BC	22 to 29 inches	Light olive brown (2.5Y 5/3) stony gravelly loamy sand, massive, friable, few fine roots., abrupt, smooth boundary.
Cd	29 to 37 inches	Grayish brown (2.5Y 5/2) gravelly loamy sand, common, fine to medium, prominent 7.5YR (5/6) concentrations along ped faces weak medium platy structure, firm, no roots.
		Seasonal high water table estimated at 29 inches

Test Pit **2**

A	0 to 4 inches	Brown (10YR 4/3) fine sandy loam, weak medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	4 to 16 inches	Brown (7.5YR 4/4) stony sandy loam, moderate medium subangular blocky structure, friable, common medium/fine roots, clear smooth boundary.
Bw2	16 to 27 inches	Brown (7.5YR 5/4) stony sandy loam, weak fine to medium subangular blocky structure, friable, few roots, clear smooth boundary.
BC	27 to 48 inches	Yellowish brown (10YR 5/6) stony loamy sand, weak fine subangular blocky structure, few roots, clear smooth boundary.
C	48 to 52+ inches	Olive brown (2.5Y 4/4) fine sandy loam, structureless massive, friable, no roots.

Test Pit **4**

A	0 to 6 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 15 inches	Yellowish brown (10YR 5/6) sandy loam, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw2	15 to 26 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, common medium/fine roots, clear smooth boundary.

Bw3	26 to 36 inches	Light olive brown (2.5Y 5/4) sandy loam, common, fine to medium, prominent 7.5YR 5/6 redox concentrations, structureless massive, friable, few fine roots, abrupt smooth boundary.
Cd	36 to 43 inches	Light brownish gray (2.5Y 6/2) gravelly loamy sand, common, fine to medium, prominent 7.5YR 5/6 redox concentrations between geogenic structural units, weak medium platy structure, firm, no roots.
		Estimate seasonal high water at 26 inches

Test Pit **5**

Ap	0 to 7 inches	Dark brown (10YR 3/3) fine sandy loam, weak fine granular structure, friable, many roots.
Bw1	7 to 16 inches	Dark yellowish brown (10YR 4/4) sandy loam, weak fine to medium subangular blocky structure, friable, many roots.
Bw2	16 to 28 inches	Dark yellowish brown (10YR 4/6) gravelly sandy loam, moderate medium subangular blocky structure, friable, common roots.
BC	28 to 38 inches	Olive brown (2.5Y 4/4) gravelly sandy loam, structureless massive, friable, few roots. Common, medium to coarse, prominent 7.5YR 5/6 concentrations.
C	38 to 44 inches	Light gray (10YR 7/1) loamy sand, common, fine to medium, prominent 7.5YR 5/6 redox concentrations, structureless massive, friable, no roots.
		Estimate seasonal high water at 28 inches

Test Pit **6**

A	0 to 11 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak fine granular structure, friable, many medium roots, clear smooth boundary.
Bw	10 to 22 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
BC1	22 to 28 inches	Yellowish brown (10YR 5/4) fine sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
2C1	28 to 43 inches	Dark yellowish Brown (10YR 4/4) sandy loam with silt and silt loam masses, grayish brown (10YR 5/2) redox depletions, massive, firm, common medium roots, abrupt, wavy boundary. (flow till?)
3C2	43 to 48 inches	Light olive brown (2.5Y 5/4) gravelly loamy sand, silt skins on some coarse fragments, single grain, loose.
		Estimate seasonal high water at 28 inches

Test Pit **7**

A	0 to 3 inches	Very dark grayish brown (10YR 3/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.

Ap	3 to 9 inches	Dark brown (10YR 3/3) stony fine sandy loam, moderate medium subangular blocky structure, friable, common fine/medium roots, abrupt smooth boundary.
Bw1	9 to 15 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	15 to 23 inches	Yellowish brown (10YR 5/4) stony loamy sand, weak fine subangular blocky structure, friable, few fine roots, clear smooth boundary.
BC	23 to 29 inches	Light olive brown (2.5Y 5/4) loamy sand, structureless massive, friable, few fine roots, clear wavy boundary.
C	29 to 48 inches	Olive brown (2.5Y 4/3) gravelly loamy sand, structureless massive, friable, no roots.

Test Pit **8**

A	0 to 3 inches	Dark yellowish brown (10YR 4/4) sandy loam, weak fine subangular blocky structure, friable, many fine roots, abrupt smooth boundary.
Bw1	3 to 9 inches	Brown (7.5YR 4/4) stony sandy loam, weak medium subangular blocky structure, friable, common fine and medium roots, abrupt smooth boundary.
Bw2	9 to 14 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak medium subangular blocky structure, friable, common fine/medium roots, abrupt smooth boundary.
Bw3	14 to 20 inches	Yellowish brown (10YR 5/4) stony loamy sand, weak fine subangular blocky structure, friable, few medium roots clear smooth boundary.
C	20 to 45 inches	Light yellowish brown (2.5Y 6/3) loamy sand, common, coarse, prominent 7.5YR 5/6 redox concentrations, structureless massive, friable, no roots.
		Estimated seasonal high water table at 20 inches.

Test Pit **9**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, weak, moderate to fine granular structure, friable, many fine roots, clear smooth boundary.
Ap	2 to 8 inches	Dark yellowish brown (10YR 3/6) sandy loam, weak fine subangular blocky structure, friable, many fine roots, clear smooth boundary.
Bw	8 to 21 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, common fine roots, clear wavy boundary.
2C	21 to 48 inches	Reddish brown (2.5Y 5/3) stony loamy sand, single grain, loose, few fine roots.

Test Pit **10**

Oe	0 to 2 inches	Partially decomposed deciduous leaf litter, many fine roots, abrupt smooth boundary
A	2 to 6 inches	Very dark grayish brown (10YR 3/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 10 inches	Brown (10YR 4/4) sandy loam, weak medium subangular blocky structure, friable, common fine and medium roots, abrupt smooth boundary.
Bw2	10 to 18 inches	Yellowish brown (10YR 5/4) sandy loam, weak fine subangular blocky structure, friable, few medium roots, clear smooth boundary.
BC	18 to 42 inches	Light olive brown (2.5Y 5/3) loamy sand, many, coarse, prominent 7.5YR 5/8 redox concentrations, structureless massive, friable, no roots. Estimated seasonal high groundwater at 18 inches, water seeping into bottom of test pit.

Test Pit **11**

A	0 to 10 inches	Very dark grayish brown (10YR 3/2) stony sandy loam, weak fine granular structure, friable, common medium and fine roots abrupt smooth boundary.
B/A	10 to 13 inches	Dark yellowish brown (10YR 4/4) and very dark grayish brown (10YR 3/2) sandy loam, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw	13 to 23 inches	Strong brown (7.5YR 4/6) coarse sandy loam, weak medium subangular blocky structure, friable, clear smooth boundary.
BC	23 to 32 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, few fine roots, single grain, loose, abrupt smooth boundary.
C1	32 to 41 inches	Light olive brown (2.5Y 5/4) gravelly loamy sand, silt skins partially coat coarse fragments, massive, friable to firm, abrupt, smooth boundary.
C2	41 to 48 inches	Dark yellowish brown (10YR 4/4) gravelly coarse sand, single grain, loose.

Test Pit **12**

A	0 to 6 inches	Brown (10YR 4/3) sandy loam, weak fine granular structure, friable, common fine roots, abrupt smooth boundary.
Bw1	6 to 12 inches	Brown (7.5YR 4/4) stony sandy loam, weak medium subangular blocky structure, friable, fine few roots, abrupt smooth boundary.
Bw2	12 to 27 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, few medium roots, abrupt smooth boundary.
2C1	27 to 36 inches	Light olive brown (2.5Y 5/3) stony gravelly loamy sand, common, fine, distinct 7.5YR 5/6 redox concentrations, structureless massive, friable, few roots, abrupt smooth boundary.

Cd	36 to 48 inches	Grayish brown (2.5Y 5/2) gravelly loamy sand, common, fine to medium, prominent 7.5YR 5/6 redox concentrations, weak fine to medium platy structure, firm, no roots. Estimated seasonal high water table at 27 inches

---

Test Pit **13**

A	0 to 6 inches	Dark brown (10YR 3/3) sandy loam, weak fine to medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 13 inches	Dark yellowish brown (10YR 4/4) stony sandy loam, weak medium subangular blocky structure, friable, many fine/medium roots, clear smooth boundary.
Bw2	13 to 25 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak fine to medium subangular blocky structure, friable, common medium roots, abrupt wavy boundary.
2C	25 to 48 inches	Yellowish brown (10YR 5/4) extremely cobbly, stony coarse sand, structureless single grain, loose, no roots.

Test Pit **13A**

A	0 to 6 inches	Very dark grayish brown (10YR 3/2) sandy loam, moderate medium subangular blocky structure, friable, many fine roots, abrupt smooth boundary.
Bw1	6 to 16 inches	Dark yellowish brown (10YR 4/6) stony loamy sand, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw2	16 to 22 inches	Light olive brown (2.5Y 5/4) stony loamy sand, weak medium subangular blocky structure, friable, common medium and fine roots, clear smooth boundary.
BC	22 to 34 inches	Light olive brown (2.5Y 5/4) stony gravelly loamy sand, structureless single grain, loose, few fine roots, clear smooth boundary.
C	34 to 42 inches	Light yellowish brown (2.5Y 6/3) silt loam, common, coarse, prominent 7.5YR 5/8 redox concentrations, massive, friable, no roots. Estimated seasonal high water table at 34 inches.

Test Pit **14**

A	0 to 7 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, moderate fine to medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	7 to 19 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, common, fine, distinct 7.5YR 5/6 concentrations and common, fine, distinct 10YR 6/2 depletions, weak medium subangular blocky structure, friable, common medium roots clear smooth boundary.

Bw2	19 to 28 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, many, medium, prominent 7.5YR 5/8 concentrations, structureless massive, friable, common fine roots.
BC	28 to 44 inches	Light yellowish brown (2.5Y 6/3) gravelly loamy sand, many, medium to coarse, prominent 7.5YR 5/8 redox concentrations and many, medium to coarse, distinct 2.5Y 6/1 redox depletions structureless, massive, friable, few roots.
		Estimated seasonal high water table at 7 inches

Test Pit **15**

A	0 to 6 inches	Dark brown (10YR 3/3) sandy loam, weak medium subangular blocky structure to weak medium granular structure, friable, many fine roots, clear smooth boundary
Bw1	6 to 17 inches	Brown (7.5YR 4/4) sandy loam, weak medium subangular blocky structure, common roots, friable, clear smooth boundary
Bw2	17 to 32 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, no roots, clear smooth boundary
2C1	32 to 37 inches	Yellowish brown (10YR 5/4) gravelly sand, few fine and medium distinct strong brown (7.5Y 5/6) redox concentrations, single grain, loose, clear smooth boundary.
3C2	37 to 44 inches	Light yellowish brown (2.5Y 6/4) sand, single grain, loose.
		Estimated seasonal high water table at 32 inches

Test Pit **16**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Ap	2 to 7 inches	Dark brown (10YR 3/3) sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	7 to 20 inches	Dark yellowish brown (10YR 4/4) loamy sand, weak medium subangular blocky structure, many medium roots, friable, clear smooth boundary.
Bw2	20 to 40 inches	Dark yellowish brown (10YR 4/6) gravelly loamy sand, weak medium subangular blocky structure, friable, common roots, clear smooth boundary.
C	40 to 44 inches+	Light yellowish brown (2.5Y 6/3) very gravelly coarse sand, single grain, loose.

Test Pit **17**

A	0 to 3 inches	Very dark brown (10YR 2/2) fine sandy loam, weak fine granular structure, friable, many fine and medium roots, abrupt smooth boundary.

Ap	3 to 10 inches	Dark brown (10YR 3/3) fine sandy loam, fine to medium subangular blocky structure, friable, many roots, abrupt smooth boundary.	
Bw1	10 to 20 inches	Dark yellowish brown (10YR 4/4) sandy loam, fine to medium subangular blocky structure, friable, common medium roots, clear smooth boundary.	
Bw2	20 to 32 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, few roots, clear smooth boundary.	Test Pit **17A**
BC	32 to 42 inches	Light yellowish brown (10YR 5/4) sandy loam, massive, friable, few roots	
Oa	0 to 1 inch	Well decomposed deciduous leaf litter.	
A	1 to 3 inches	Very dark grayish brown (10YR 3/2) silt loam, fine granular structure, friable, many fine roots, abrupt smooth boundary	
Ap	3 to 16 inches	Brown (10YR 4/3) sandy loam, weak medium subangular blocky structure, friable, many roots, clear smooth boundary	
Bw	16 to 32 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, many roots, abrupt smooth boundary.	
2C	32 to 48 inches	Light olive brown (2.5Y 5/4) stony coarse sand, single grain, loose.	

Test Pit **18**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.	
Ap	1 to 4 inches	Dark grayish brown (10YR 4/2) stony sandy loam, weak fine granular structure, friable, many fine roots, abrupt wavy boundary.	
A/B	4 to 7 inches	Brown (10YR 4/3) and yellowish brown (10YR 5/6) stony sandy loam, medium subangular blocky structure, friable, few roots, abrupt wavy boundary.	
Bw1	7 to 23 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, no roots, clear smooth boundary.	
Bw2	23 to 37 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, clear smooth boundary.	
2C	37 to 47 inches	Light brownish gray (2.5Y 6/2) gravelly loamy sand, common (5 to15 percent) medium to coarse faint light yellowish brown (10YR 6/2) redox concentrations, massive, friable. Estimate seasonal high water at 37 inches	

Test Pit **19**

A	0 to 3 inches	Very dark brown (10YR 2/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.

Bw1	3 to 7 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, common medium and fine roots, clear smooth boundary.
Bw2	7 to 15 inches	Brownish yellow (10YR 6/6) sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
Bw3	15 to 22 inches	Light yellowish brown (10YR 6/4) sandy loam, weak medium subangular blocky structure, friable, few fine roots, abrupt wavy boundary.
2C1	22 to 29 inches	Light yellowish brown (2.5Y 6/4) extremely cobbly coarse sand, single grain, loose, clear smooth boundary.
2C2	29 to 44 inches	Light yellowish brown (2.5Y 6/4) very cobbly coarse sand, single grain, loose

Test

Pit **20**

A	0 to 2 inches	Very dark brown (10YR 2/2) silt loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Ap	2 to 6 inches	Dark brown (10YR 3/3) fine sandy loam, weak medium and fine subangular blocky structure, friable, few medium roots, abrupt smooth boundary.
Bw1	6 to 12 inches	Brown (7.5YR 4/4) sandy loam, weak fine to medium subangular blocky structure, friable, few roots, clear smooth boundary.
Bw2	12 to 19 inches	Brown (7.5YR 4/3) sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
Bw3	19 to 28 inches	Yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure, friable, few fine roots,
BC	28 to 44 inches	Brown (10YR 5/3), fine sandy loam, massive, friable.

Test Pit **21**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	2 to 8 inches	Dark yellowish brown (10YR 4/4) fine sandy loam, weak medium subangular blocky structure, friable, many fine/medium roots, clear smooth boundary.
Bw2	8 to 21 inches	Dark yellowish brown (10YR 4/6) fine sandy loam, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw3	21 to 29 inches	Yellowish brown (10YR 5/6) fine sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
BC	29 to 35 inches	Light yellowish brown (10YR 6/4) fine sandy loam, structureless massive, friable, few fine roots, abrupt wavy boundary.
Cg	35 to 49 inches	Light brownish gray (2.5Y 6/2) cobbly fine sandy loam, few, fine, prominent 10YR 6/6 redox concentrations, structureless massive, friable, no roots.

Estimated seasonal high water table at 35 inches.

Test Pit **22**

A	0 to 2 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak fine granular structure, friable, many fine roots, abrupt smooth boundary.
Ap	2 to 9 inches	Dark yellowish brown (10YR 3/4) gravelly sandy loam, weak medium subangular blocky structure, friable, common medium and fine roots, abrupt smooth boundary.
Bw1	9 to 16 inches	Dark yellowish brown (10YR 4/4) very gravelly sandy loam, weak fine subangular blocky structure, friable, common medium roots, clear smooth boundary.
2C1	16 to 29 inches	Yellowish brown (10YR 4/6) very cobbly loamy coarse sand, massive, friable, few fine roots, clear smooth boundary.
3C2	29 to 37 inches	Yellowish brown (10YR 5/8) gravelly sand, structureless single grain, loose, few roots, clear smooth boundary.
4C3	37 to 45 inches	Light yellowish brown (10YR 6/4) sand, common, fine, faint 7.5YR 5/4 redox concentrations, structureless single grain, loose, no roots.

Estimated seasonal high water at 37 inches

Test Pit **23**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.
A	1 to 2 inches	Black (10YR 2/1) sandy loam, weak fine granular structure, friable many fine roots, abrupt smooth boundary.
Bw1	2 to 16 inches	Dark yellowish brown (10YR 4/6) sandy loam, weak medium subangular blocky structure, friable, few medium and fine roots, clear smooth boundary.
Bw2	16 to 27 inches	Yellowish brown (10YR 5/6) cobbly sandy loam, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
2C1	27 to 31 inches	Pale brown (10YR 6/3) cobbly sand, olive yellow (2.5Y 6/6) few medium faint redox, single grain loose, clear smooth boundary.
2C2	31 inches +	Very pale brown (10YR 7/3) very gravelly loamy sand, single grain loose

---

Test Pit **24**

Oe	0 to 1 inch	Partially decomposed deciduous leaf litter, abrupt smooth boundary.

A	1 to 4 inches	Very dark brown (10YR 2/2) sandy loam, moderate fine subangular blocky structure, friable, few roots, abrupt smooth boundary.
Bw1	4 to 16 inches	Strong brown (7.5YR 5/6) stony loamy sand, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	16 to 27 inches	Strong brown (7.5YR 5/8) stony loamy sand, weak medium subangular blocky structure, friable, few fine roots, clear smooth boundary.
C	27 to 40 inches	Light yellowish brown (10YR 6/4) loamy fine sand, structureless massive, friable, no roots. Common, coarse, prominent 5YR 4/6 redox concentrations with a sand texture and common, coarse, distinct 2.5Y 6/2 depletion masses.
		Estimated seasonal high water table at 27 inches.

Test Pit **26**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.
A	1 to 3 inches	Very dark brown (10YR 2/2) stony sandy loam, weak medium and fine granular structure, friable, many fine roots, abrupt smooth boundary.
Bw1	3 to 17 inches	Dark yellowish brown (10YR 4/6) cobbly loamy sand, weak medium subangular blocky structure, friable, few medium roots, clear smooth boundary.
Bw2	17 to 31 inches	Light olive brown (2.5Y 5/6) very cobbly loamy sand, massive, friable, few medium roots, clear smooth boundary.
C	31 to 44 inches	Light brownish gray (2.5YR 6/2) cobbly sand, single grain, loose

---

Test Pit **27**

Oa	0 to 1 inch	Well decomposed deciduous leaf litter.
A	1 to 5 inches	Dark brown (10YR 3/3) stony sandy loam, weak medium subangular blocky structure, friable, many fine roots, abrupt smooth boundary
Bw1	5 to 16 inches	Dark yellowish brown (10YR 4/6) stony sandy loam, weak medium subangular blocky structure, friable, many medium roots, clear smooth boundary.
Bw2	16 to 22 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine subangular blocky structure, friable, common medium roots, clear smooth boundary.
BC	22 to 28 inches	Light brownish yellow (2.5Y 6/4) very cobbly loamy sand, massive, friable, clear smooth boundary.
C	28 to 45 inches	Light brownish gray (2.5YR 6/2) cobbly sand, single grain, loose

Test Pit **28**

Oe	0 to 2 inches	Partially decomposed deciduous leaf litter, abrupt smooth boundary.
A	2 to 5 inches	Dark brown (10YR 3/3) sandy loam, moderate fine subangular blocky structure, friable, many fine roots abrupt smooth boundary.
Bw1	5 to 17 inches	Yellowish brown (10YR 4/6) stony gravelly loamy sand, weak fine to medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
1C1	17 to 23 inches	Brownish yellow (10YR 6/6) stony very gravelly loamy coarse sand, structureless massive, friable, no roots, clear wavy boundary.
2C2	23 to 45 inches	Light yellowish brown (2.5Y 6/3) very cobbly coarse sand, structureless single grain, loose, no roots.

Test Pit **29**

Oe	0 to 3 inches	Partially decomposed deciduous leaf litter.
A	3 to 6 inches	Very dark grayish brown (10YR 3/2) sandy loam, weak medium subangular blocky breaking to medium granular structure, friable, many fine roots, abrupt smooth boundary.
Bw	6 to 13 inches	Dark yellowish brown (10YR 4/6) gravelly loamy sand, weak medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
BC	13 to 20 inches	Yellowish brown (10YR 5/4) gravelly loamy sand, massive, friable, few fine roots, clear smooth boundary.
C	20 to 45 inches	Yellowish brown (10YR 6/3) gravelly sand, common medium faint olive yellow (2.5Y 5/6) redox concentrations, single grain, loose
		Estimated high seasonal water at 20 inches

Test Pit **30**

Oa	0 to 2 inches	
A	2 to 6 inches	Dark grayish brown (10YR 4/2) sandy loam, many fine roots, fine to medium granular structure, friable
Bw	6 to 17 inches	Yellowish brown (10YR 5/4) gravely loamy sand, common roots, weak to medium subangular blocky structure, friable
B/C	17 to 25 inches	Light olive brown (2.5Y 5/3) gravelly loamy sand, few roots, massive friable
C	25 to 45 inches	Gray (2.5YR 6/1) gravelly sand, single grain loose olive yellow (2.5Y 6/6) faint concentrations common, medium to coarse

*very stony profile

Test Pit **31**

A	0 to 3 inches	
Ap	3 to11 inches	Very dark brown (10YR 2/2) sandy loam, many fine roots, fine granular structure, friable
Bw1	11 to 18 inches	Dark brown (10YR 3/3) sandy loam, many roots, medium moderate granular structure, friable
Bw2	18 to 25 inches	Yellowish brown (10YR 5/6) loamy sand, common roots, weak medium subangular blocky structure, friable.
B/C	25 to 34 inches	Light olive brown (2.5YR 5/4) loamy sand, few roots, massive friable
C	34 inches +	Grayish brown (2.5YR 5/2) sand, prominent silt lenses throughout, single grain, loose

Test Pit **32**

A	0 to 4 inches	Dark brown (10YR 3/3) sandy loam, moderate fine subangular blocky structure, friable, many fine roots, abrupt smooth boundary.
Bw1	4 to 12 inches	Yellowish brown (10YR 4/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, common medium roots, clear smooth boundary.
Bw2	12 to 23 inches	Yellowish brown (10YR 5/6) stony sandy loam, weak fine to medium subangular blocky structure, friable, common medium/fine roots, clear smooth boundary.
BC	23 to 36 inches	Brownish yellow (10YR 6/6) stony loamy sand, structureless massive, friable, few roots, clear smooth boundary.
C	36 to 48 inches	Light yellowish brown (10YR 6/4) coarse sandy loam, common, medium, distinct 7.5YR 5/6 and 10YR6/6 redox concentrations structureless massive, friable, few fine roots. Estimated seasonal high water table at 36 inches.

Test Pit **33**

A	0 to 4 inches	Brown (10YR 4/3) sandy loam, many roots, medium granular structure, friable
Bw1	4 to13 inches	Dark yellowish brown (10YR 3/4) silt loam, common roots, medium moderate subangular blocky structure, friable
Bw2	13 to 19 inches	Dark yellowish brown (10YR 4/6) silt loam, common roots, medium moderate subangular blocky structure, friable
Bw3	19 to 24 inches	Yellowish brown (10YR 5/4) l silt loam, common roots, medium moderate subangular blocky structure, friable

Bw4	24 to 45 inches	Light olive brown (2.5YR 5/4) silt loam, massive, friable Strong brown (7.5YR 5/6) prominent concentrations, coarse to very coarse Gray (2.5Y 6/1) depletions
Cd	45 to 48 inches	Grayish brown (2.5YR 5/2) loamy sand, firm, platy, medium sized, dense

Estimated seasonal high water at 24 inches

Test Pit **34**

A	0 to 3 inches	Very dark grayish brown (10YR 3/2) fine sandy loam, many roots, medium granular structure, friable
Bw1	3 to12 inches	Dark yellowish brown (10YR 4/4) fine sandy loam, common roots, medium subangular blocky structure, friable
Bw2	12 to 22 inches	Dark yellowish brown (10YR 4/6) fine sandy loam, medium subangular blocky structure, friable
Bw3	22 to 46 inches	Light olive brown (2.5YR 5/4) silt loam, massive, friable Grey (7.5YR 6/1) prominent concentrations, coarse to very coarse Gray (2.5Y 6/1) depletions
Cd	46 to 49 inches	Light olive brown (2.5YR 5/3) loamy sand, firm, platy, medium sized, dense

*****upper Cd has concentrations on the ped faces

Estimated seasonal high water at 22 inches

Test Pit **35**

A	0 to 4 inches	Very dark grayish brown (10YR 3/2) sandy loam, many roots, weak fine granular structure, friable
Bw1	4 to15 inches	Dark yellowish brown (10YR 4/6) sandy loam, common roots, medium subangular blocky structure, friable
Bw2	15 to 30 inches	Yellowish brown (10YR 5/4) sandy loam, moderate medium subangular blocky structure, friable
Cd	30 to 37 inches	Grayish brown (2.5Y 5/2) loamy sand, massive, dense Strong brown (7.5YR 5/8) prominent concentrations along the ped faces off the plates
	37 inches+	Ledge

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 1A	TEST PIT: 1B	TEST PIT: 1C	TEST PIT:
0-1" organic 1-6" brown sandy loam 6-33" yellow-brown loamy sand 33-50" gray loamy sand	0-2" organic 2-9" brown sandy loam 9-15" yellow-brown loamy sand 15-59" gray loamy sand	0-1" organic 1-7" brown sandy loam 7-26" yellow-brown loamy sand 26-63" gray loamy sand	
Mottles: 33"	Mottles: 15"	Mottles: 26"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 50"	Ledge: 59"	Ledge: 63"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 2A	TEST PIT: 2B	TEST PIT: 2C	TEST PIT:
0-1" organic 1-12" brown cobbley sandy loam 12-35" yellow-brown sandy loam with cobbles 35-90" gray loamy sand with cobbles	0-1" organic 1-8" brown cobbley sandy loam 8-29" yellow-brown sandy loam 29-92" gray loamy sand with cobbles	0-1" organic 1-12" brown sandy loam 12-26" yellow-brown loamy sand 26-86" yellow-gray loamy sand with cobbles	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/27/19 (Record all Perc Tests)

PERC: 2A		PERC: 2B		PERC: 2C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 20" @ 36" bench		DEPTH:	
PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
12:08	2.4"	12:10	3.0"	12:12	1.9"		
12:18	6.0"	12:20	7.7"	12:22	5.9"		
12:28	8.3"	12:30	10.3"	12:32	8.4"		
12:38	10.0"	12:40	12.1"	12:42	10.1"		
12:48	11.1"	12:50	13.8"	12:52	11.4"		
12:58	12.3"	1:00	15.0"	1:02	12.7"		
1:08	13.3"	1:10	16.1"	1:12	13.8"		
PERC RATE: 6.0 in./hr		PERC RATE: 6.6 in./hr		PERC RATE: 6.6 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 3A	TEST PIT: 3B	TEST PIT: 3C	TEST PIT:
0-2" organic 2-6" brown sandy loam 6-22" yellow-brown sandy loam 22-78" gray loamy sand	0-1" organic 1-14" brown fine sandy loam 14-46" yellow-brown sandy loam 46-78" gray loamy sand with cobbles	0-1" organic 1-6" brown sandy loam 6-32" yellow-brown sandy loam 32-46" gray loamy sand with cobbles	
Mottles:	Mottles: 46"	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge: 46"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 4A	TEST PIT: 4B	TEST PIT: 4C	TEST PIT:
0-3" organic 3-26" brown sandy loam 26-80" brown loamy sand with cobbles	0-6" organic 6-21" gray sandy loam with cobbles 21-42" brown sandy loam with cobbles 42-84" gray sandy loam	0-3" organic 3-21" gray sandy loam 21-76" brown loamy sand with cobbles	
Mottles: 26"	Mottles: 21"	Mottles: 21"	Mottles:
GW: seepage @ 53"	GW: seepage @ 42"	GW: seepage @ 48"	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 5A	TEST PIT: 5B	TEST PIT: 5C	TEST PIT:
0-2" organic 2-8" brown loamy sand 8-33" yellow-brown sandy loam 33-40" gray fine loamy sand 40-72" gray coarse sand with cobbles	0-2" organic 2-6" brown fine sandy loam 6-30" yellow-brown fine sandy loam 30-48" gray fine sandy loam	0-2" organic 2-6" brown sandy loam 6-24" yellow-brown sandy loam 24-39" gray sandy loam 39-62" gray sand	
Mottles: 26"	Mottles: 29"	Mottles: 23"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 72"	Ledge: 48"	Ledge: 62"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/26/19 (Record all Perc Tests)

PERC: 5A		PERC:		PERC:		PERC:	
DEPTH: 20" @ 36" bench		DEPTH:		DEPTH:		DEPTH:	
PRESOAK: 10:30 AM		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
11:38 11:48 11:58 12:08 12:18 12:28 12:38	3.2" 7.0" 10.2" 12.7" 14.7" 18.0" 20.0"						
PERC RATE: 12.0 in./hr		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 6A	TEST PIT: 6B	TEST PIT: 6C	TEST PIT:
0-2" organic 2-6" brown loamy sand 6-32" yellow-brown loamy sand 32-88" gray fine sandy loam	0-1" organic 1-8" brown sandy loam 8-22" yellow-brown loamy sand 22-89" gray fine sandy loam	0-1" organic 1-8" brown sandy loam 8-34" yellow-brown sandy loam 34-81" gray sandy loam	
Mottles: 23"	Mottles: 22"	Mottles: 24"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 88"	Ledge: 89"	Ledge: 81"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/26/19 (Record all Perc Tests)

PERC: 6A		PERC: 6B		PERC: 6C		PERC:	
DEPTH: 21" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH: 20" @ 36" bench		DEPTH:	
PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK: 10:00 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
11:36	2.3"	11:35	3.1"	11:34	2.8"		
11:46	6.3"	11:45	6.2"	11:44	10.6"		
11:56	8.8"	11:55	8.2"	11:54	15.0"		
12:06	11.3"	12:05	9.3"	12:04	17.4"		
12:16	13.0"	12:15	11.0"	12:14	20.0"		
12:26	14.9"	12:25	12.2"				
12:36	16.3"	12:35	13.0"				
PERC RATE: 8.4 in./hr		PERC RATE: 4.8 in./hr		PERC RATE: 14.4 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/23/19 (Record all Test Pits)

TEST PIT: 7A	TEST PIT: 7B	TEST PIT: 7C	TEST PIT:
0-4" organic 4-13" yellow-brown fine sandy loam 13-48" yellow-brown fine sandy loam 48-96" gray fine sand	0-13" brown fine sandy loam 13-22" light brown fine sandy loam 22-96" yellow-brown fine sand	0-27" brown fine sandy loam 27-48" light brown fine sandy loam 48-84" yellow-brown fine sand	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/23/19 (Record all Perc Tests)

PERC: 7A		PERC: 7B		PERC: 7C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 3:00 PM		PRESOAK: 3:00 PM		PRESOAK: 3:00 PM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
4:07	4.5"	4:08	3.0"	4:09	3.2"		
4:17	8.3"	4:18	10.0"	4:19	7.6"		
4:27	10.7"	4:28	15.4"	4:29	10.9"		
4:37	13.0"	4:38	19.0"	4:39	13.3"		
4:47	15.3"			4:49	14.8"		
4:57	18.0"			4:59	16.7"		
				5:09	18.0"		
PERC RATE: 13.8 in./hr		PERC RATE: 21.6 in./hr		PERC RATE: 7.8 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/23/19 (Record all Test Pits)

TEST PIT: 8A	TEST PIT: 8B	TEST PIT: 8C	TEST PIT: 8D
0-30" brown sandy loam 30-43" brown fine sandy loam	0-24" brown sandy loam	0-21" brown sandy loam 21-35" yellow-brown sandy loam	0-30" brown sandy loam
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge: 43"	Ledge: 24"	Ledge: 35"	Ledge: 30"
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 9A	TEST PIT: 9B	TEST PIT: 9C	TEST PIT:
0-2" organic 2-17" brown sandy loam 17-34" light brown sandy loam 34-55" gray sandy loam 55-70" gray sand with cobbles	0-2" organic 2-15" brown sandy loam 15-25" light brown sandy loam 25-50" gray silty loam 50-72" gray sand with cobbles	0-2" organic 5-28" brown sandy loam 28-42" gray fine sandy loam 42-82" gray loamy sand with cobbles	
Mottles: 30-55"	Mottles: 25-50"	Mottles: 28"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 70"	Ledge: 72"	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/24/19 (Record all Perc Tests)

PERC: 9A		PERC: 9B		PERC: 9C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 11:30 AM		PRESOAK: 11:30 AM		PRESOAK: 11:30 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
1:00	1.5"	1:01	4.0"	1:02	3.8"		
1:10	3.5"	1:11	12.0"	1:12	10.8"		
1:20	5.3"	1:21	15.8"	1:22	14.5"		
1:30	6.8"	1:31	18.0"	1:32	18.0"		
1:40	8.2"						
1:50	9.7"						
2:00	11.0"						
PERC RATE: 7.8 in./hr		PERC RATE: 13.2 in./hr		PERC RATE: 21.0 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 10A	TEST PIT: 10B	TEST PIT: 10C	TEST PIT: 10D
0-2" organic 2-20" brown loamy sand with cobbles 20-38" stony coarse sand	0-2" organic 2-16" brown sandy loam with cobbles 16-35" fine sandy loam with cobbles	0-2" organic 2-10" brown sandy loam 10-27" yellow-brown sandy loam 27-48" yellow-brown loamy sand with cobbles	0-1" organic 1-7" brown sandy loam 7-36" yellow-brown sandy loam 36-62" gray sand with cobbles
Mottles: 35"	Mottles:	Mottles:	Mottles: 37"
GW:	GW:	GW:	GW:
Ledge: 38"	Ledge: 35"	Ledge: 48"	Ledge: 62"
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 11A	TEST PIT: 11B	TEST PIT: 11C	TEST PIT: 11D
0-3" organic 3-7" brown sandy loam 7-32" yellow brown sandy loam 32-48" gray fine sandy loam	0-2" organic 2-6" brown sandy loam 6-18" yellow-brown sandy loam 18-25" gray fine sandy loam 25-51" dark gray coarse sand with cobbles	0-2" organic 2-8" brown sandy loam 8-23" yellow-brown sandy loam 23-37" gray fine sandy loam 37-64" dark gray coarse sand	0-2" organic 2-15" brown sandy loam 15-33" yellow-brown fine sandy loam 33-58" gray coarse sand wtih cobbles
Mottles: 32"	Mottles: 18"	Mottles: 23"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 48"	Ledge: 51"	Ledge: 64"	Ledge: 58"
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/24/19 (Record all Test Pits)

TEST PIT: 12A	TEST PIT: 12B	TEST PIT: 12C	TEST PIT:
0-2" organic 2-12" brown sandy loam with cobbles 12-44" yellow-brown sand with cobbles 44-56" gray sand 56-72" gray fine sand	0-8" brown sandy loam with cobbles 8-25" yellow-brown sandy loam 25-46" gray fine sandy loam 46-58" gray fine sand 58-84" gray sand	0-2" organic 2-15" brown sandy loam 15-28" yellow-brown sandy loam 28-44" gray fine sandy loam 44-59" brown sand 59-72" gray sand	
Mottles: 44"	Mottles: 25"	Mottles: 33"	Mottles:
GW:	GW:	GW:	GW:
Ledge: 72"	Ledge: 84"	Ledge: 72"	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/24/19 (Record all Perc Tests)

PERC: 12A		PERC: 12B		PERC: 12C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH:	
PRESOAK: 2:30 PM		PRESOAK: 2:30 PM		PRESOAK: 2:30 PM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
3:44 3:54 4:04	4.0" 13.5" 18.0"	3:42 3:52 4:02	3.0" 12.0" 19.0"	3:40 3:50 4:00	3.8" 13.2" 19.0"		
PERC RATE: 27.0 in./hr		PERC RATE: 42.0 in./hr		PERC RATE: 34.8 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/25/19 (Record all Test Pits)

TEST PIT: 13A	TEST PIT: 13B	TEST PIT: 13C	TEST PIT:
0-2" organic 2-10" brown sandy loam 10-33" yellow-brown sandy loam 33-86" gray sand with cobbles	0-3" organic 3-11" brown loamy sand 11-46" yellow-brown sand 46-96" brown coarse sand	0-2" organic 2-10" brown fine sandy loam 10-28" yellow-brown fine sandy loam 28-49" gray fine sandy loam 49-70" gray coarse sand 70-96" gray coarse sand	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/25/19 (Record all Perc Tests)

PERC: 13A		PERC: 13B		PERC: 13C		PERC:	
DEPTH: 20" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 11:00 AM		PRESOAK: 11:00 AM		PRESOAK: 11:00 AM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
12:55 1:05 1:15 1:25 1:35 1:45	4.2" 11.2" 15.1" 17.5" 19.1" 20.0"	12:57 1:07 1:17	5.5" 14.3" 19.0"	1:00 1:10 1:20 1:30	3.7" 13.1" 16.5" 18.0"		
PERC RATE: 5.4 in./hr		PERC RATE: 28.2 in./hr		PERC RATE: 9.0 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____ Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/26/19 (Record all Test Pits)

TEST PIT: 14A	TEST PIT: 14B	TEST PIT: 14C	TEST PIT:
0-1" organic 1-10" brown sandy loam 10-40" yellow-brown fine sandy loam 40-86" coarse sand with cobbles	0-1" organic 1-8" brown sandy loam 8-36" yellow-brown loamy sand 36-45" yellow-brown fine sandy loam 45-72" coarse sand	0-2" organic 2-16" brown loamy sand 16-37" yellow-brown loamy sand 37-52" yellow-brown sandy loam 52-80" gray coarse sand	
Mottles:	Mottles:	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE: 9/26/19 (Record all Perc Tests)

PERC: 14A		PERC: 14B		PERC: 14C		PERC:	
DEPTH: 18" @ 36" bench		DEPTH: 19" @ 36" bench		DEPTH: 18" @ 36" bench		DEPTH:	
PRESOAK: 1:00 PM		PRESOAK: 1:00 PM		PRESOAK: 1:00 PM		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
2:58 3:08 3:18 3:28	3.7" 13.2" 15.3" 18.0"	2:56 3:06 3:16 3:26 3:36	6.5" 14.0" 15.5" 16.8" 19.0"	2:54 3:04 3:14	5.4" 11.8" 18.0"		
PERC RATE: 12.6 in./hr		PERC RATE: 7.8 in./hr		PERC RATE: 37.2 in./hr		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/25/19 (Record all Test Pits)

TEST PIT: 15A	TEST PIT: 15B	TEST PIT: 15C	TEST PIT:
0-1" organic 1-10" brown loamy sand 10-26" yellow-brown loamy sand 26-81" sand with cobbles	0-1" organic 1-17" brown loamy sand 17-41" yellow-brown loamy sand 41-60" gray fine sandy loam 60-87" gray sand	0-14" brown loamy sand 14-27" yellow-brown loamy sand 27-33" gray loamy sand 33-88" gray sand with cobbles	
Mottles: 37"	Mottles: 41"	Mottles:	Mottles:
GW:	GW:	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 117 Oil Mill Road, Waterford, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 9/27/19 (Record all Test Pits)

TEST PIT: 16A	TEST PIT: 16B	TEST PIT: 16C	TEST PIT:
0-1" organic 1-8" brown sandy loam 8-25" yellow-brown sandy loam 25-36" yellow-brown sandy loam with cobbles 36-61" gray loamy sand 61-85" loamy sand with cobbles	0-2" organic 2-26" brown sandy loam with cobbles 26-61" yellow-brown loamy sand with cobbles 61-70" yellow-brown coarse sand	0-3" organic 2-11" brown sandy loam 11-29" yellow-brown loamy sand with cobbles 29-78" gray loamy sand with cobbles	
Mottles: 25"	Mottles: 26"	Mottles: 29"	Mottles:
GW:	GW: seepage @ 50"	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive:	Restrictive:	Restrictive:	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

Appendix C:

Erosion and Sedimentation Control Checklist
Long Term Stormwater Operation and Maintenance Measures

Erosion and Sedimentation Control Checklist

Waterford Solar – Waterford, CT – 117 Oil Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Construction Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Silt Fencing	Once per week or after a 0.5″ or greater storm event						
Compost Filter Sock	Once per week or after a 0.5″ or greater storm event						
Straw Wattles	Once per week or after a 0.5″ or greater storm event						
Stabilized Construction Exit	Once per week or after a 0.5″ or greater storm event						
Temporary Sediment Trap/Basin & Diversion Swales	Once per week or after a 0.5″ or greater storm event						
Vegetated Slope Stabilization	Once per week or after a 0.5″ or greater storm event						
Energy Dissipators	Once per week or after a 0.5″ or greater storm event						

Stormwater Control Manager _____

Long Term Stormwater Operation and Maintenance Measures

Waterford Solar – Waterford, CT – 117 Oil Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Trash/Litter	Routinely pick up and remove litter from entire property as required.						
Vegetated Areas	Inspect bi-annually. Replant bare areas upon identification.						
Energy Dissipators	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Diversion Swales	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Sand Filter	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Wet Pond	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Infiltration Basin	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						

Stormwater Control Manager _____

Project Information

Site

Project Name:	Waterford Solar
Address or Locus:	117 Oil Mill Road
City, State & Zip:	Waterford, CT 06385

Developer

Client Name:	GRE Gacrux, LLC
Client Address:	10 Main Street, Suite E
Client City, State & Zip:	Middletown, CT 06457
Client Telephone No.:	
Client Cell Phone:	
Client E-Mail:	

Site Supervisor

Site Manager Name:	To be determined
Site Manager Address:	
Site Manager City, State & Zip:	
Site Manager Telephone No.:	
Site Manager Cell Phone:	
Site Manager E-Mail:	

Appendix D:

Diversion Swale & Sediment Trap/Basin Sizing
Water Quality Computations
HydroCAD: Existing Conditions
HydroCAD: Proposed Conditions

Diversion Swale & Sediment Trap/Basin Sizing

Temporary Diversion Sizing

TD	1-1	
95,000	sf	
2.18	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.010	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	10.73	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	1	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**2.68**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	4.00	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	7.32	ft	
R = A / P =	0.55	ft	
A * R^(2/3) =	**2.67**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.62**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.68**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	2-1	
20,000	sf	
0.46	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.040	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.26	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.36	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.28**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.75	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.28	ft	
R = A / P =	0.23	ft	
A * R^(2/3) =	**0.28**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.90**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.02**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	4-1	
10,000	sf	
0.23	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.100	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.13	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.09**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.32	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.26	ft	
R = A / P =	0.14	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
τd = y * d * S =	**1.25**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.53**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	5-1	
40,000	sf	
0.92	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.015	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	4.52	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.63	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.92**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.82	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.98	ft	
R = A / P =	0.37	ft	
A * R^(2/3) =	**0.93**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.59**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.48**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	6-1	
3,000	sf	
0.07	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.34	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.15	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.05**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.22	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	1.95	ft	
R = A / P =	0.11	ft	
A * R^(2/3) =	**0.05**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.28**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**1.56**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	7-1	
1,000	sf	
0.02	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.11	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.1	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.02**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.13	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	1.63	ft	
R = A / P =	0.08	ft	
A * R^(2/3) =	**0.02**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.19**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**0.87**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	8-1	
18,000	sf	
0.41	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.100	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.03	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.16**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.52	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.26	ft	
R = A / P =	0.16	ft	
A * R^(2/3) =	**0.15**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.25**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.91**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	8-2	
5,000	sf	
0.11	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.040	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.56	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.18	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.07**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.28	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.14	ft	
R = A / P =	0.13	ft	
A * R^(2/3) =	**0.07**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.45**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.04**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	9-1	
26,000	sf	
0.60	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.060	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.94	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.37	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.30**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.78	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.34	ft	
R = A / P =	0.23	ft	
A * R^(2/3) =	**0.30**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**1.39**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.76**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	10-1
23,000	sf
0.53	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.090	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.60	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.25	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.22**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.69	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.58	ft	
R = A / P =	0.19	ft	
A * R^(2/3) =	**0.23**	(must be close to target)	
y =	62.4	pcf	
ɨd = y * d * S =	**1.40**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.78**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	11-1	
9,000	sf	
0.21	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.02	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.27	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.15**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.49	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.71	ft	
R = A / P =	0.18	ft	
A * R^(2/3) =	**0.16**	(must be close to target)	
y =	62.4	pcf	
τd = y * d * S =	**0.51**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.08**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	11-2	
10,000	sf	
0.23	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.100	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.13	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.09**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.32	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.26	ft	
R = A / P =	0.14	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**1.25**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.53**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	12-1	
5,000	sf	
0.11	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	0.56	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.2	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.08**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.32	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.26	ft	
R = A / P =	0.14	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.37**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**1.76**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	12-2	
64,000	sf	
1.47	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.020	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	7.23	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.73	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**1.28**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	2.33	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	5.62	ft	
R = A / P =	0.41	ft	
A * R^(2/3) =	**1.29**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.91**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.10**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	13-1
18,000	sf
0.41	ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.010	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	2.03	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.48	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.51**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.17	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.04	ft	
R = A / P =	0.29	ft	
A * R^(2/3) =	**0.51**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.30**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**1.74**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-1	
11,000	sf	
0.25	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.030	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.24	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.3	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.18**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.57	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.90	ft	
R = A / P =	0.20	ft	
A * R^(2/3) =	**0.19**	(must be close to target)	
y =	62.4	pcf	
ɫd = y * d * S =	**0.56**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.18**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-2	
11,000	sf	
0.25	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.140	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	1.24	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.15	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.08**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.37	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	2.95	ft	
R = A / P =	0.12	ft	
A * R^(2/3) =	**0.09**	(must be close to target)	
y =	62.4	pcf	
ɨd = y * d * S =	**1.31**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.38**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-3	
63,000	sf	
1.45	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.015	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	7.12	cfs	
Bottom width, w =	2	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.65	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**1.45**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	2.57	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	6.11	ft	
R = A / P =	0.42	ft	
A * R^(2/3) =	**1.44**	(must be close to target)	
y =	62.4	pcf	
τd = y * d * S =	**0.61**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**2.77**	fps	< 5.00 fps for ECB - OK

Temporary Diversion Sizing

TD	14-4	
63,000	sf	
1.45	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.200	ft / ft	
Manning's n for riprap, n =	0.075		
Q25 (disturbed soil) =	7.12	cfs	
Bottom width, w =	5	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.4	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**1.19**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	2.48	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	7.53	ft	
R = A / P =	0.33	ft	
A * R^(2/3) =	**1.18**	(must be close to target)	
y =	62.4	pcf	
ɨd = y * d * S =	**4.99**	psf	< 5.00 psf for 15 in. riprap - OK
Velocity, V = Q / A =	**2.87**	fps	< 14.00 fps for riprap - OK

Temporary Diversion Sizing

TD	16-1	
600,000	sf	
13.77	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.010	ft / ft	
Manning's n for riprap, n =	0.075		
Q25 (disturbed soil) =	67.77	cfs	
Bottom width, w =	12	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	2.1	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**50.83**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	38.43	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	25.28	ft	
R = A / P =	1.52	ft	
A * R^(2/3) =	**50.81**	(must be close to target)	
y =	62.4	pcf	
ɨd = y * d * S =	**1.31**	psf	< 5.00 psf for 15 in. riprap - OK
Velocity, V = Q / A =	**1.76**	fps	< 14.00 fps for riprap - OK

Temporary Diversion Sizing

TD	16-2	
180,000	sf	
4.13	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.060	ft / ft	
Manning's n for riprap, n =	0.075		
Q25 (disturbed soil) =	20.33	cfs	
Bottom width, w =	6	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.92	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**6.22**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	8.06	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	11.82	ft	
R = A / P =	0.68	ft	
A * R^(2/3) =	**6.24**	(must be close to target)	
y =	62.4	pcf	
ɨd = y * d * S =	**3.44**	psf	< 5.00 psf for 15 in. riprap - OK
Velocity, V = Q / A =	**2.52**	fps	< 14.00 fps for riprap - OK

Temporary Diversion Sizing

TD	16-3	
57,000	sf	
1.31	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.070	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (disturbed soil) =	6.44	cfs	
Bottom width, w =	6	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.25	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.61**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.69	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	7.58	ft	
R = A / P =	0.22	ft	
A * R^(2/3) =	**0.62**	(must be close to target)	
y =	62.4	pcf	
ɨd = y * d * S =	**1.09**	psf	< 1.45 psf for ECB - OK
Velocity, V = Q / A =	**3.82**	fps	< 5.00 fps for ECB - OK

Temporary Sediment Trap Sizing
Waterford Solar
November 2019

TST #	Tributary Acreage, ac	*(134 cy / acre)** **Volume Required Below Top of Spillway, cf**	**Volume Provided in Permanent Basin Below Top of Spillway, cf**
1	3.0	10,854	19,071
2	2.6	9,407	17,625
3	2.6	9,407	13,164
4	5.9	21,346	69,193
5	2.6	9,407	15,057
6	3.2	11,578	24,822
7	1.2	4,342	8,339
8	4.7	17,005	19,374
9	1.5	5,427	17,960
10	2.3	8,321	17,175
11	1.1	3,980	14,619
12	3.7	13,387	24,875
13.1	3.2	11,578	27,720
14	4.4	15,919	16,375

* Per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control

SEDIMENT BASIN SIZING

SB	4	
DA, drainage area =	255,700	sf
	5.87	ac
	0.009	sq mi.
Construction Duration:	8	months
(DA) (A) = 5.87 ac * 50 tons =	294	tons / year
	196	tons for life of basin
Delivery Ratio DR (from Figure SB-12) for sandy loam =	60%	
Density of sediment (from Figure SB-2) for sandy loam =	85	pcf
Trap Efficiency TE =	80%	
V sediment storage = (DA)(A)(DR)(TE)(2,000) / Density =	**2,214**	**cf**
10-year, 24-hour rainfall, P =	5.14	in.
Vr (from Hydrographs) =	3.38	watershed inches
Q10 = Qi (from Hydrographs) =	21.07	cfs
Qi / DA =	3.59	
Qo / Qi (from Figure SB-13) =	0.06	
Qo =	1.26	cfs
Release rate = Qo * 640 / DA =	137.8	csm
Vs (from Figure DB-6) =	1.8	watershed inches
Vs = Vs * DA / 12 * 43,560 =	**38,355**	**cf**
Minimum volume required below crest of emergency spillway =	**40,569**	**cf**
Minimum volume provided below crest of emergency spillway =	***46,128***	***cf***

SEDIMENT BASIN SIZING

SB	13	
DA, drainage area =	401,150	sf
	9.21	ac
	0.014	sq mi.
Construction Duration:	8	months
(DA) (A) = 12.41 ac * 50 tons =	461	tons / year
	308	tons for life of basin
Delivery Ratio DR (from Figure SB-12) for sandy loam =	57%	
Density of sediment (from Figure SB-2) for sandy loam =	85	pcf
Trap Efficiency TE =	80%	
V sediment storage = (DA)(A)(DR)(TE)(2,000) / Density =	**3,305**	**cf**
10-year, 24-hour rainfall, P =	5.14	in.
Vr (from Hydrographs) =	3.38	watershed inches
Q10 = Qi (from Hydrographs) =	33.02	cfs
Qi / DA =	3.59	
Qo / Qi (from Figure SB-13) =	0.06	
Qo =	1.98	cfs
Release rate = Qo * 640 / DA =	137.7	csm
Vs (from Figure DB-6) =	1.8	watershed inches
Vs = Vs * DA / 12 * 43,560 =	**60,173**	**cf**
Minimum volume required below crest of emergency spillway =	**63,477**	**cf**
Minimum volume provided below crest of emergency spillway =	***67,168***	***cf***

SEDIMENT BASIN SIZING

SB 16

DA, drainage area =	736,000	sf
	16.90	ac
	0.026	sq mi.
Construction Duration:	8	months
(DA) (A) = 16.9 ac * 50 tons =	845	tons / year
	564	tons for life of basin
Delivery Ratio DR (from Figure SB-12) for sandy loam =	55%	
Density of sediment (from Figure SB-2) for sandy loam =	85	pcf
Trap Efficiency TE =	80%	
V sediment storage = (DA)(A)(DR)(TE)(2,000) / Density =	**5,839**	**cf**
10-year, 24-hour rainfall, P =	5.14	in.
Vr (from Hydrographs) =	3.38	watershed inches
Q10 = Qi (from Hydrographs) =	60.66	cfs
Qi / DA =	3.59	
Qo / Qi (from Figure SB-13) =	0.06	
Qo =	3.64	cfs
Release rate = Qo * 640 / DA =	137.8	csm
Vs (from Figure DB-6) =	1.8	watershed inches
Vs = Vs * DA / 12 * 43,560 =	**110,425**	**cf**
Minimum volume required below crest of emergency spillway =	**116,264**	**cf**
Minimum volume provided below crest of emergency spillway =	***131,329***	***cf***

Water Quality Computations

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	**1**	**2**	**3**	**4**	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	1.25 ac	0.81 ac	0.41 ac	2.41 ac	b
Access Road & Equipment Pad Area	0.22 ac	0.24 ac	0.11 ac	0.30 ac	c
% Impervious, I	18 %	30 %	27 %	12 %	
Volumetric Runoff Coeff., R	0.208	0.317	0.291	0.162	d
Water Quality Volume for impervious areas, WQV	**0.022** ac-ft	**0.021** ac-ft	**0.010** ac-ft	**0.033** ac-ft	e
	946 cf	**931** cf	**434** cf	**1,418** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf	1.00 cf	1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf	1.21 cf	1.21 cf	g
HSG 'C' Panel Area in Watershed	1.76 ac	1.75 ac	2.14 ac	3.28 ac	
Water Quality Volume for panelized areas, WQV	**0.025** ac-ft	**0.025** ac-ft	**0.030** ac-ft	**0.046** ac-ft	h
	1,082 cf	**1,075** cf	**1,315** cf	**2,016** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf	1.53 cf	1.53 cf	g
HSG 'D' Panel Area in Watershed	ac	ac	ac	0.19 ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.003** ac-ft	h
	0 cf	**0** cf	**0** cf	**148** cf	
Total WQV required	**0.047** ac-ft	**0.046** ac-ft	**0.040** ac-ft	**0.082** ac-ft	
	2,027 cf	**2,007** cf	**1,749** cf	**3,581** cf	
Total WQV Provided in Basin	***10,689*** *cf*	***9,991*** *cf*	***5,651*** *cf*	***46,128*** *cf*	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	**5**	**6**	**7**	**8**	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	1.02 ac	1.69 ac	0.54 ac	1.40 ac	b
Access Road & Equipment Pad Area	0.00 ac	0.21 ac	0.12 ac	0.29 ac	c
% Impervious, I	0 %	13 %	22 %	21 %	
Volumetric Runoff Coeff., R	0.050	0.163	0.250	0.236	d
Water Quality Volume for impervious areas, WQV	**0.004** ac-ft	**0.023** ac-ft	**0.011** ac-ft	**0.028** ac-ft	e
	185 cf	**1,003** cf	**490** cf	**1,202** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf	1.00 cf	1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf	1.21 cf	1.21 cf	g
HSG 'C' Panel Area in Watershed	1.62 ac	1.40 ac	0.63 ac	3.28 ac	
Water Quality Volume for panelized areas, WQV	**0.023** ac-ft	**0.020** ac-ft	**0.009** ac-ft	**0.046** ac-ft	h
	996 cf	**860** cf	**384** cf	**2,016** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf	1.53 cf	1.53 cf	g
HSG 'D' Panel Area in Watershed	ac	0.11 ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.002** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**85** cf	**0** cf	**0** cf	
Total WQV required	**0.027** ac-ft	**0.045** ac-ft	**0.020** ac-ft	**0.074** ac-ft	
	1,181 cf	**1,948** cf	**874** cf	**3,217** cf	
Total WQV Provided in Basin	***7,416*** *cf*	***15,568*** *cf*	***4,344*** *cf*	***8,553*** *cf*	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	**9**	**10**	**11**	**12**	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	0.60 ac	0.67 ac	0.31 ac	0.94 ac	b
Access Road & Equipment Pad Area	0.20 ac	0.16 ac	0.14 ac	0.10 ac	c
% Impervious, I	33 %	24 %	45 %	11 %	
Volumetric Runoff Coeff., R	0.350	0.265	0.456	0.146	d
Water Quality Volume for impervious areas, WQV	**0.018** ac-ft	**0.015** ac-ft	**0.012** ac-ft	**0.011** ac-ft	e
	762 cf	**644** cf	**514** cf	**497** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf	1.00 cf	1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf	1.21 cf	1.21 cf	g
HSG 'C' Panel Area in Watershed	0.92 ac	1.64 ac	0.81 ac	2.74 ac	
Water Quality Volume for panelized areas, WQV	**0.013** ac-ft	**0.023** ac-ft	**0.011** ac-ft	**0.039** ac-ft	h
	565 cf	**1,008** cf	**498** cf	**1,684** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf	85.77 sf	85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf	1.53 cf	1.53 cf	g
HSG 'D' Panel Area in Watershed	ac	ac	ac	ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	**0.000** ac-ft	h
	0 cf	**0** cf	**0** cf	**0** cf	
Total WQV required	**0.030** ac-ft	**0.038** ac-ft	**0.023** ac-ft	**0.050** ac-ft	
	1,328 cf	**1,652** cf	**1,011** cf	**2,181** cf	
Total WQV Provided in Basin	***10,848*** *cf*	***4,316*** *cf*	***8,508*** *cf*	***14,600*** *cf*	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

Water Quality Volume Calculations

Project: **CF/GRE Waterford Solar** By: JDW Date:
Location: 117 Oil Mill Road, Waterford, CT Checked: SJK Date:

Basin Name	**13**	**14**		**16**	
Rainfall, P	1.0 in.	1.0 in.		1.0 in.	a
Area, A	2.45 ac	2.48 ac		2.37 ac	b
Access Road & Equipment Pad Area	0.88 ac	0.19 ac		1.07 ac	c
% Impervious, I	36 %	8 %		45 %	
Volumetric Runoff Coeff., R	0.373	0.119		0.456	d
Water Quality Volume for impervious areas, WQV	**0.076** ac-ft	**0.025** ac-ft		**0.090** ac-ft	e
	3,320 cf	**1,071** cf		**3,926** cf	
HSG 'B' Pervious Area Unit	85.77 sf	85.77 sf		85.77 sf	f
WQV per Unit	1.00 cf	1.00 cf		1.00 cf	g
HSG 'B' Panel Area in Watershed	ac	ac		ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft		**0.000** ac-ft	h
	0 cf	**0** cf		**0** cf	
HSG 'C' Pervious Area Unit	85.77 sf	85.77 sf		85.77 sf	f
WQV per Unit	1.21 cf	1.21 cf		1.21 cf	g
HSG 'C' Panel Area in Watershed	9.97 ac	1.96 ac		14.55 ac	
Water Quality Volume for panelized areas, WQV	**0.141** ac-ft	**0.028** ac-ft		**0.205** ac-ft	h
	6,127 cf	**1,204** cf		**8,941** cf	
HSG 'D' Pervious Area Unit	85.77 sf	85.77 sf		85.77 sf	f
WQV per Unit	1.53 cf	1.53 cf		1.53 cf	g
HSG 'D' Panel Area in Watershed	0.01 ac	ac		ac	
Water Quality Volume for panelized areas, WQV	**0.000** ac-ft	**0.000** ac-ft		**0.000** ac-ft	h
	8 cf	**0** cf		**0** cf	
Total WQV required	**0.217** ac-ft	**0.052** ac-ft		**0.295** ac-ft	
	9,454 cf	**2,275** cf		**12,867** cf	
Total WQV Provided in Basin	***67,168*** *cf*	***9,510*** *cf*		***131,329*** *cf*	i

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

[c] Impervious cover area tributary to the stormwater management basin

[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

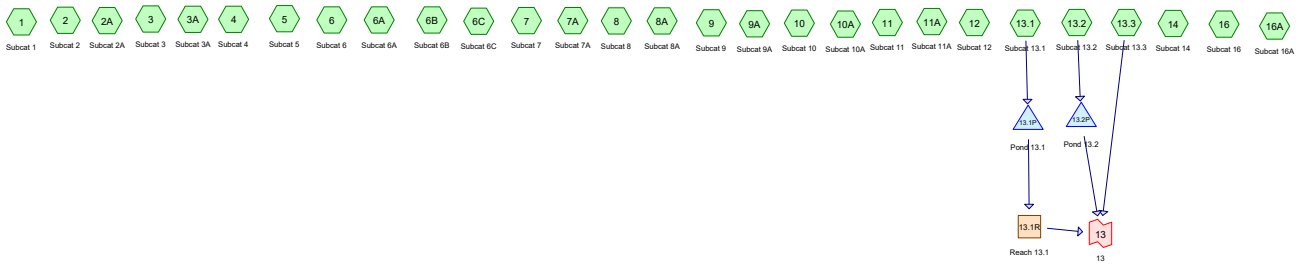
[f] Width of solar panel multiplied by length of 2 panels in portrait and pervious clear area; Solar Panel Calculator from Minnesota Public Drainage Manual

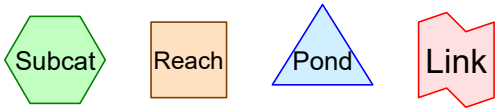
[g] Water quality volume to be treated per unit of 2-panels in portrait; Solar Panel Calculator from Minnesota Public Drainage Manual

[h] Computed by Solar Panel Calculator from Minnesota Public Drainage Manual

[i] Volume below crest of spillway from proposed stormwater basin

HydroCAD Analysis: Existing Conditions





Routing Diagram for 42496.00 HydroCAD Existing
Prepared by VHB, Printed 12/2/2019
HydroCAD® 10.00-22 s/n 01038 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
70.153	60	Woods, Fair, HSG B (1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 13.3, 14, 16, 16A)
3.273	79	Woods, Fair, HSG D (2A, 3, 3A, 4, 6, 6A, 13.1)
73.426	**61**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
70.153	HSG B	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 13.3, 14, 16, 16A
0.000	HSG C	
3.273	HSG D	2A, 3, 3A, 4, 6, 6A, 13.1
0.000	Other	
73.426		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	70.153	0.000	3.273	0.000	73.426	Woods, Fair	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 13.3, 14, 16, 16A
0.000	**70.153**	**0.000**	**3.273**	**0.000**	**73.426**	**TOTAL AREA**	

2-Year Storm Event – Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=0.94 cfs 0.112 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=440' Tc=18.0 min CN=60 Runoff=0.72 cfs 0.094 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>0.74"
Tc=10.0 min CN=67 Runoff=0.56 cfs 0.048 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=700' Tc=19.2 min CN=60 Runoff=0.71 cfs 0.094 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>1.34"
Tc=10.0 min CN=78 Runoff=0.47 cfs 0.036 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=950' Tc=26.2 min CN=64 Runoff=2.27 cfs 0.293 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=0.79 cfs 0.098 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>0.65"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=1.79 cfs 0.172 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>0.79"
Tc=10.0 min CN=68 Runoff=0.72 cfs 0.060 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.01 cfs 0.001 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.23 cfs 0.026 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=300' Tc=10.5 min CN=60 Runoff=0.39 cfs 0.043 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.07 cfs 0.008 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=720' Tc=15.8 min CN=60 Runoff=1.38 cfs 0.174 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.26 cfs 0.029 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=0.51 cfs 0.057 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.10 cfs 0.011 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=490' Tc=17.5 min CN=60 Runoff=0.66 cfs 0.085 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.10 cfs 0.011 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=0.41 cfs 0.042 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.14 cfs 0.016 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=1.16 cfs 0.137 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=1.05 cfs 0.116 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=800' Tc=16.0 min CN=60 Runoff=2.06 cfs 0.260 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=0.70 cfs 0.085 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>0.45"
Flow Length=500' Tc=13.4 min CN=60 Runoff=1.37 cfs 0.165 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>0.44"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=3.57 cfs 0.617 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>0.45"
Tc=10.0 min CN=60 Runoff=0.21 cfs 0.023 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.03' Max Vel=0.92 fps Inflow=0.09 cfs 0.026 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=0.09 cfs 0.024 af

Pond 13.1P: Pond 13.1 Peak Elev=224.21' Storage=3,971 cf Inflow=1.05 cfs 0.116 af
Outflow=0.09 cfs 0.026 af

Pond 13.2P: Pond 13.2 Peak Elev=189.40' Storage=4,210 cf Inflow=2.06 cfs 0.260 af
Discarded=0.39 cfs 0.214 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.214 af

Link 13: 13 Inflow=0.70 cfs 0.109 af
Primary=0.70 cfs 0.109 af

Total Runoff Area = 73.426 ac Runoff Volume = 2.912 af Average Runoff Depth = 0.48"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

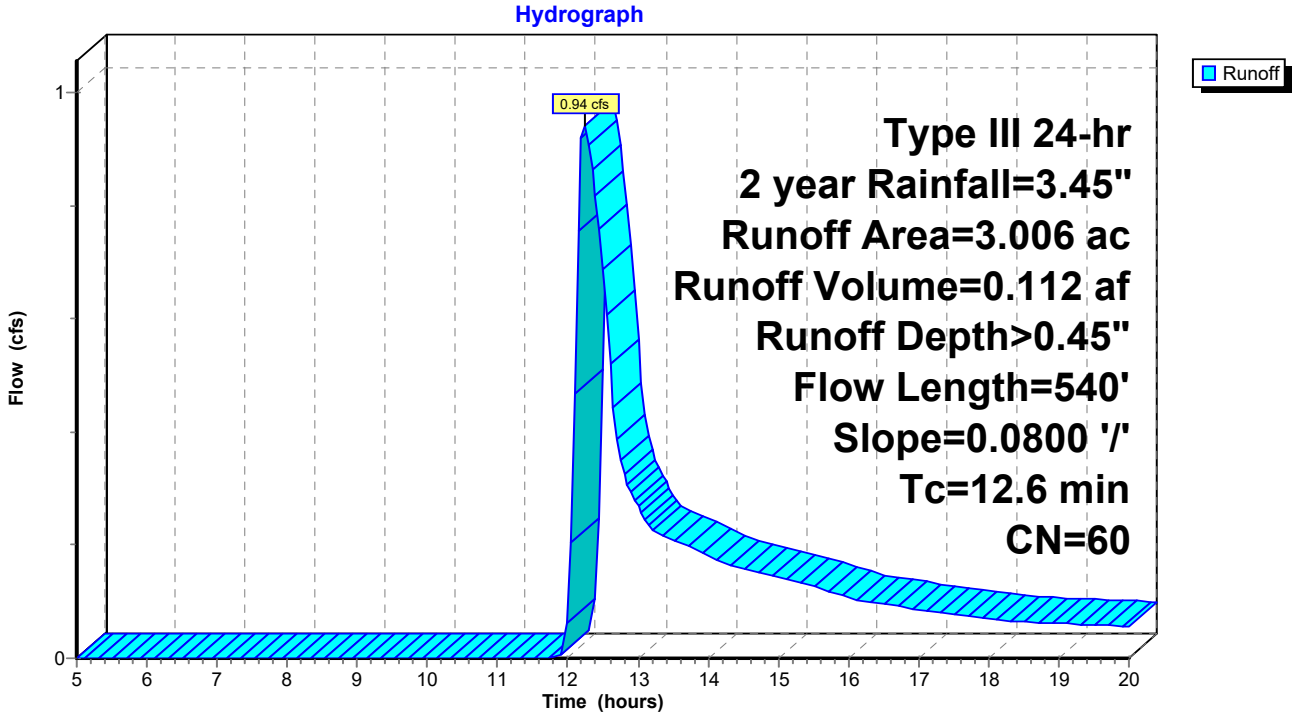
Runoff = 0.94 cfs @ 12.24 hrs, Volume= 0.112 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

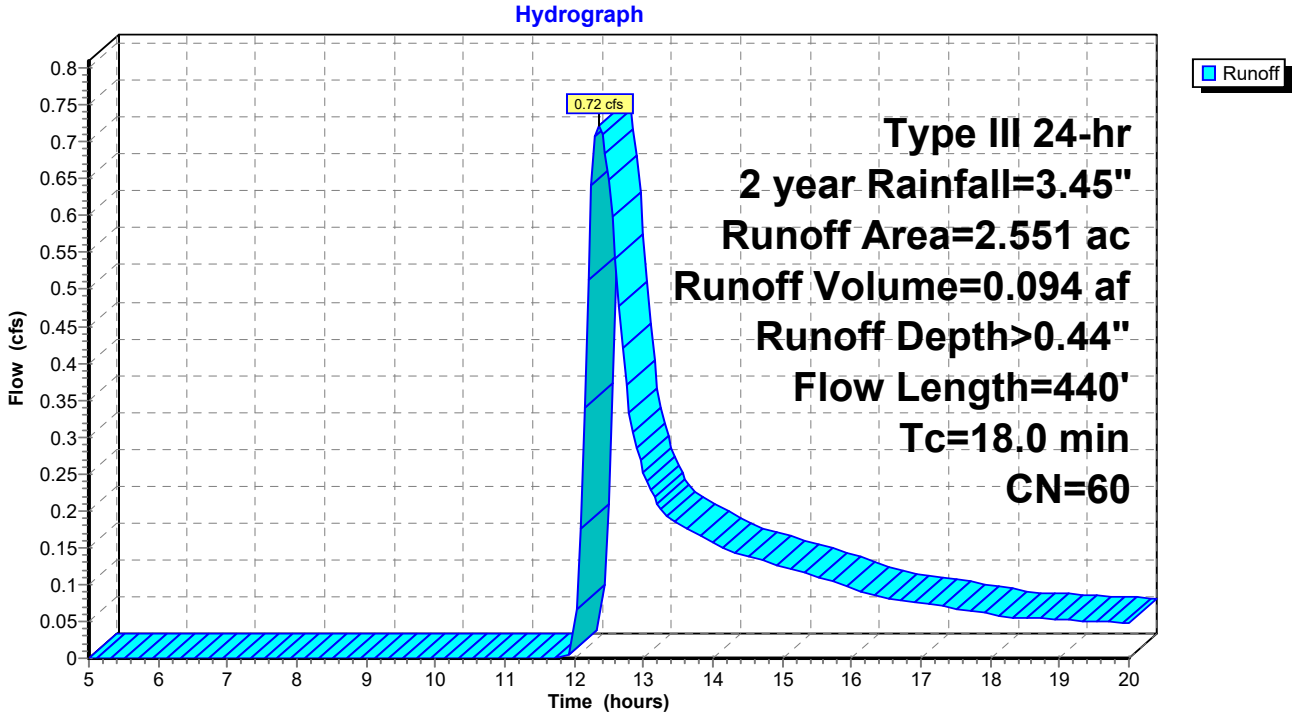
Runoff = 0.72 cfs @ 12.35 hrs, Volume= 0.094 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

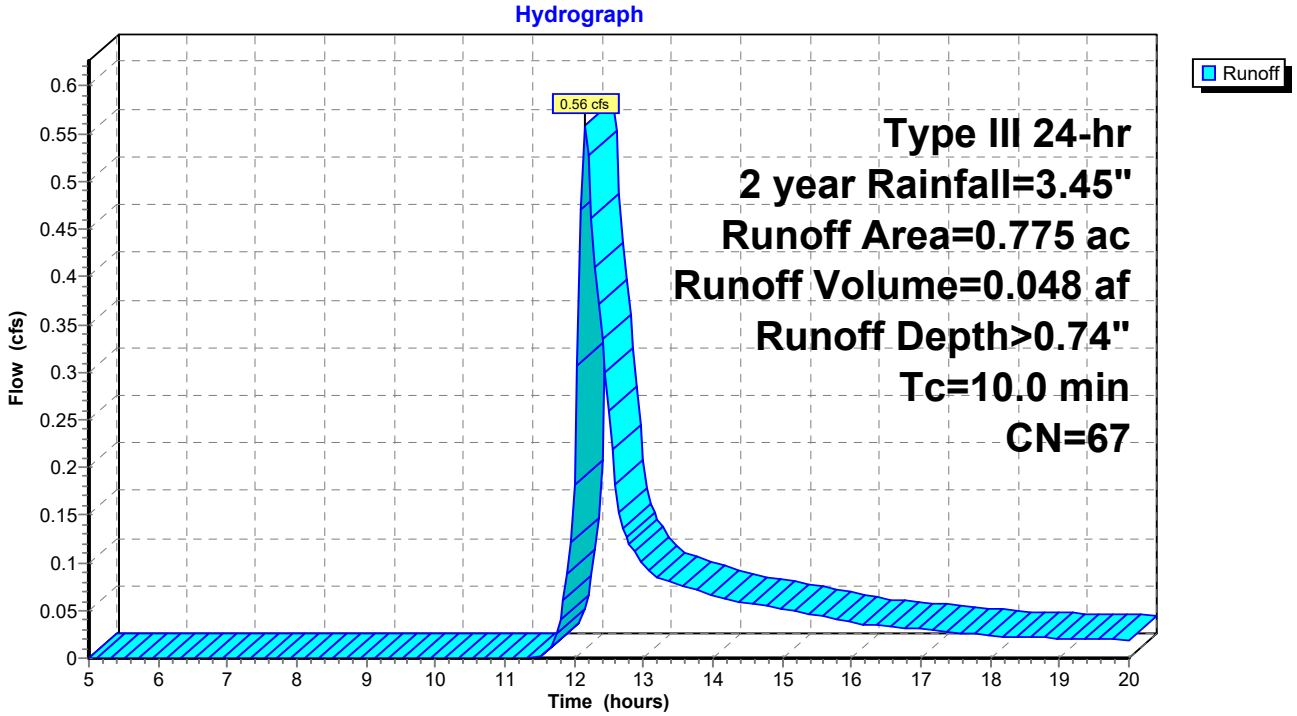
Runoff = 0.56 cfs @ 12.16 hrs, Volume= 0.048 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

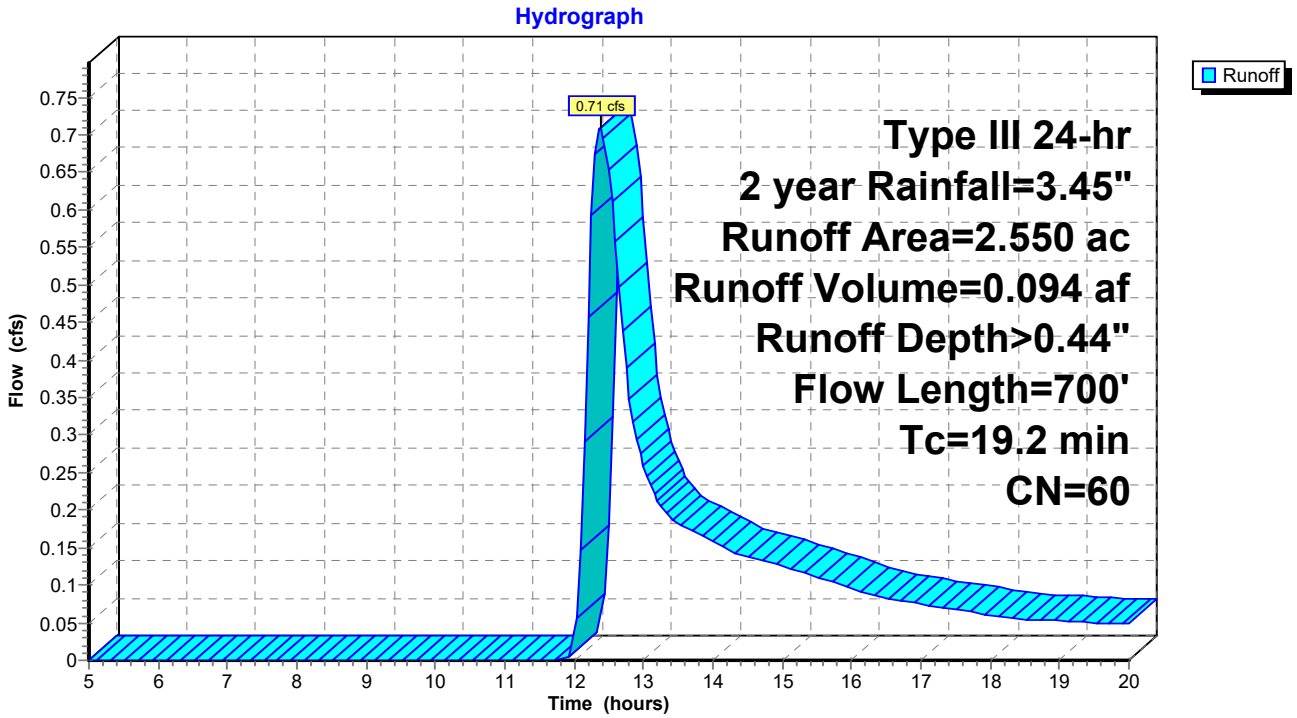
Runoff = 0.71 cfs @ 12.37 hrs, Volume= 0.094 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

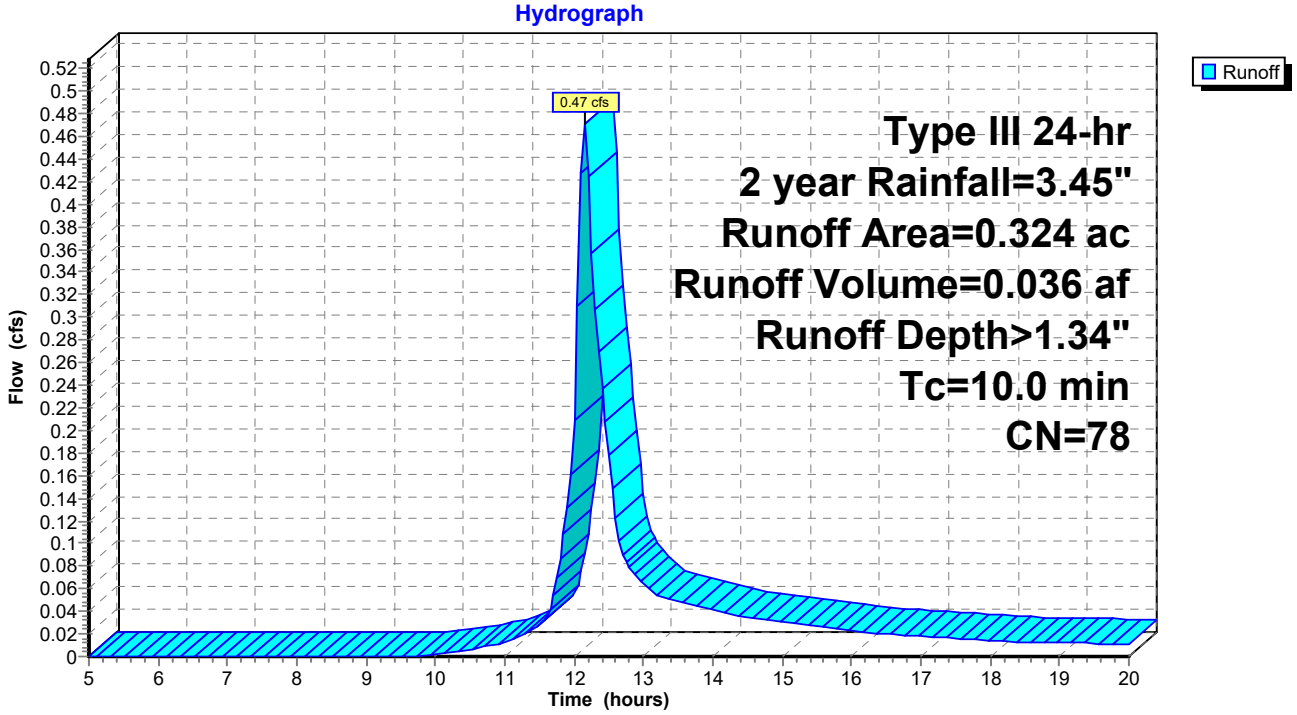
Runoff = 0.47 cfs @ 12.15 hrs, Volume= 0.036 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

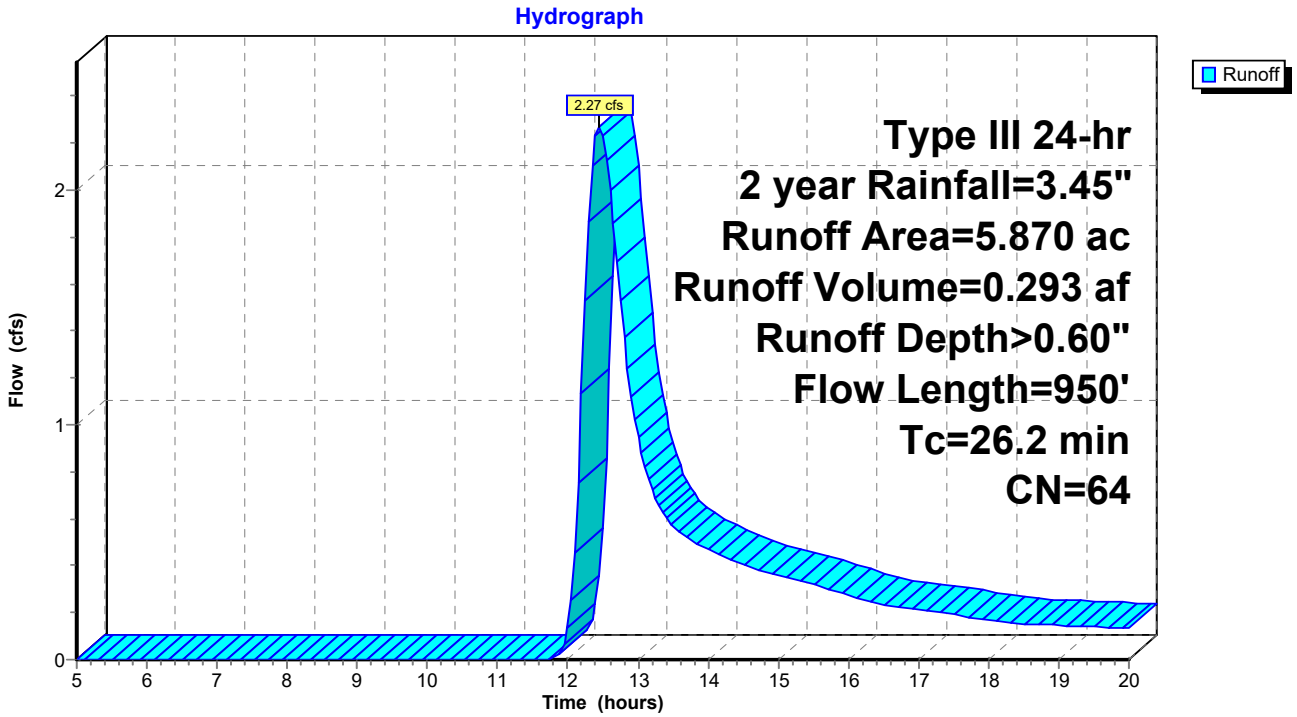
Runoff = 2.27 cfs @ 12.45 hrs, Volume= 0.293 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

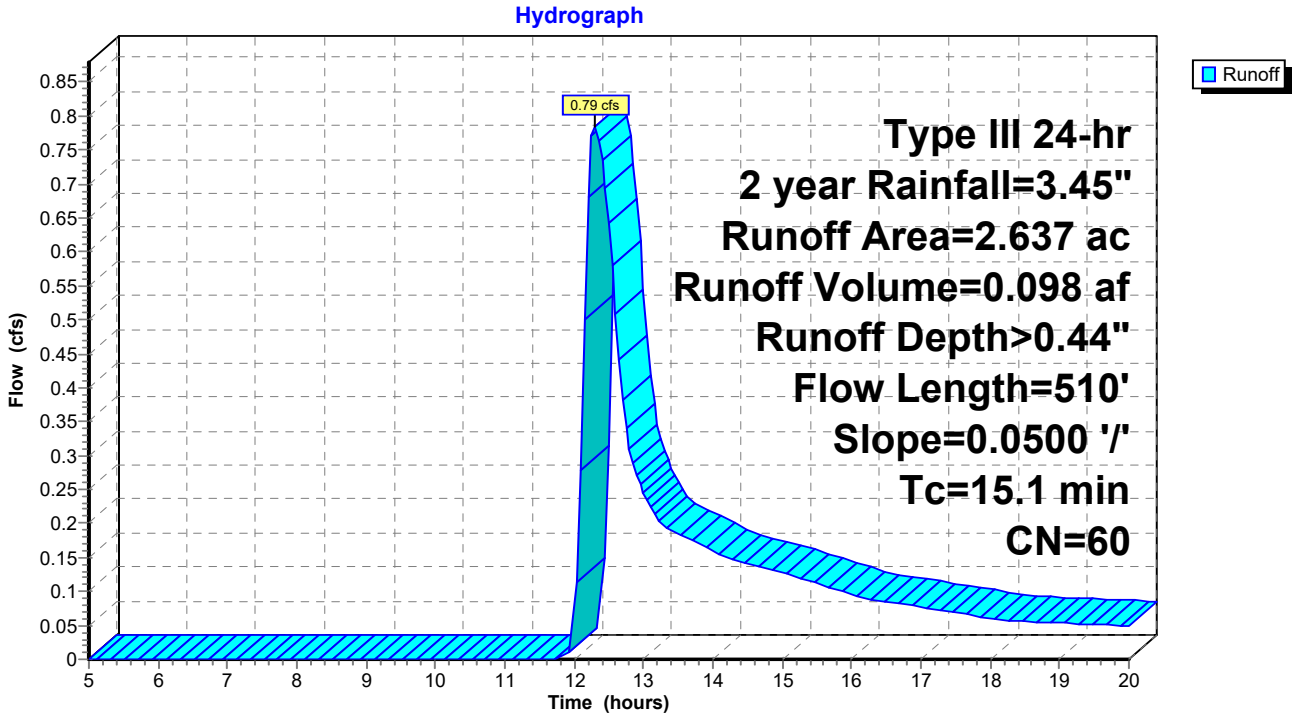
Runoff = 0.79 cfs @ 12.29 hrs, Volume= 0.098 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

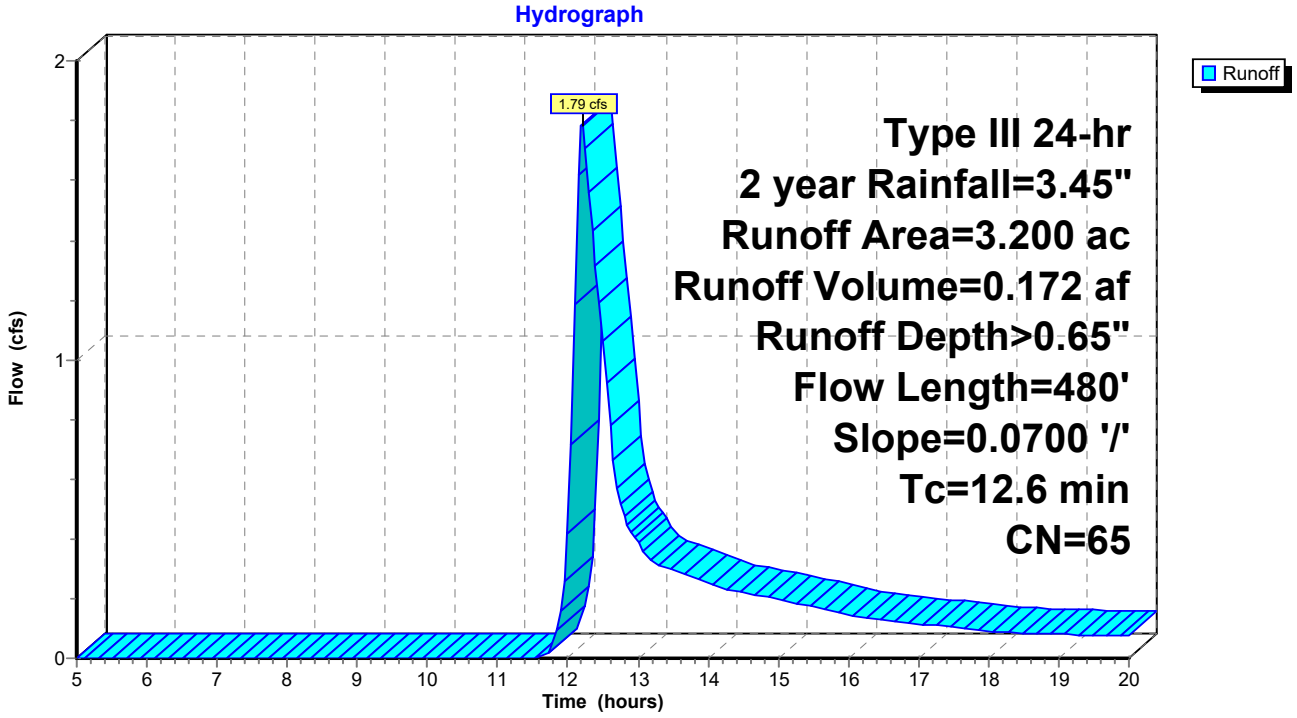
Runoff = 1.79 cfs @ 12.21 hrs, Volume= 0.172 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

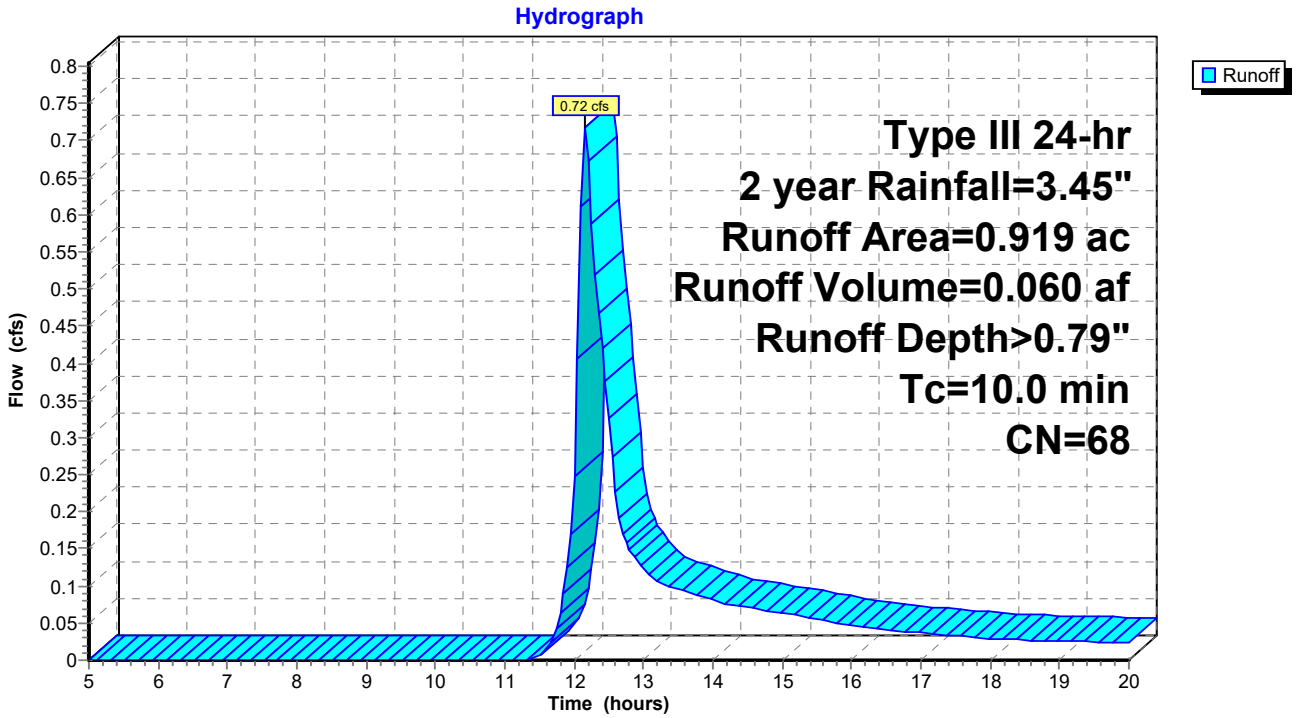
Runoff = 0.72 cfs @ 12.16 hrs, Volume= 0.060 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

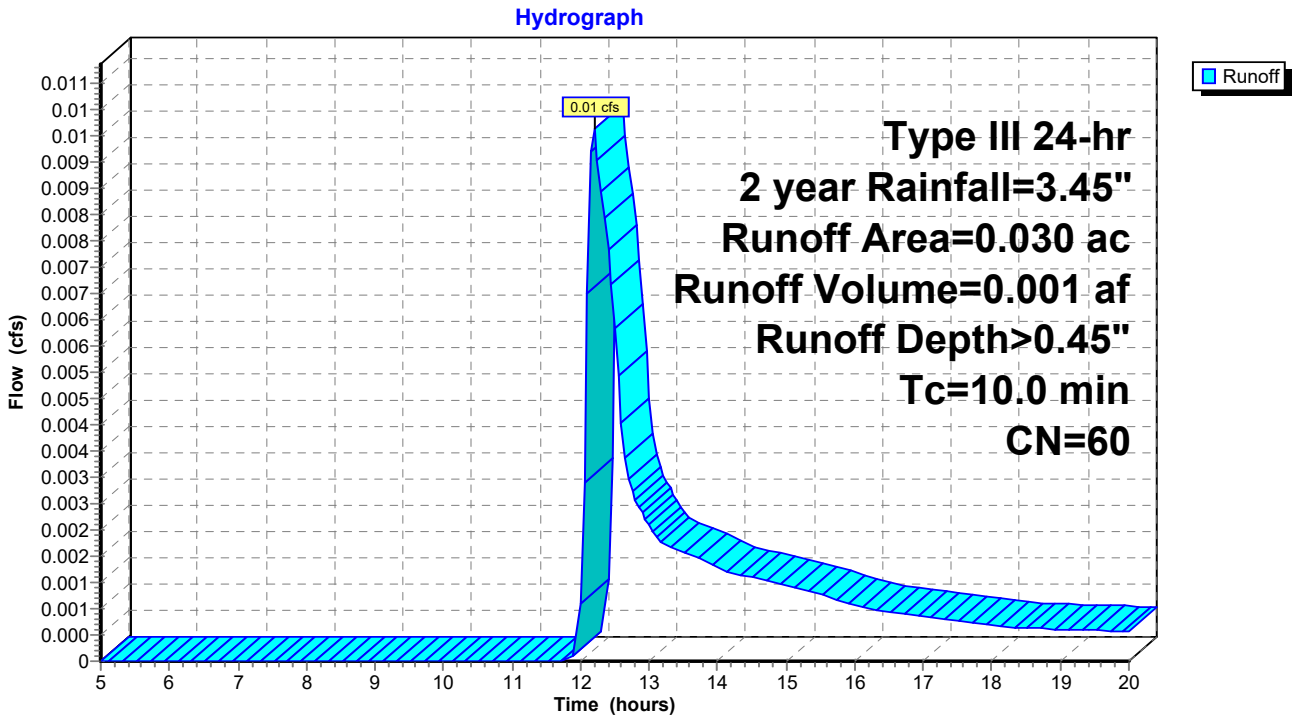
Runoff = 0.01 cfs @ 12.20 hrs, Volume= 0.001 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

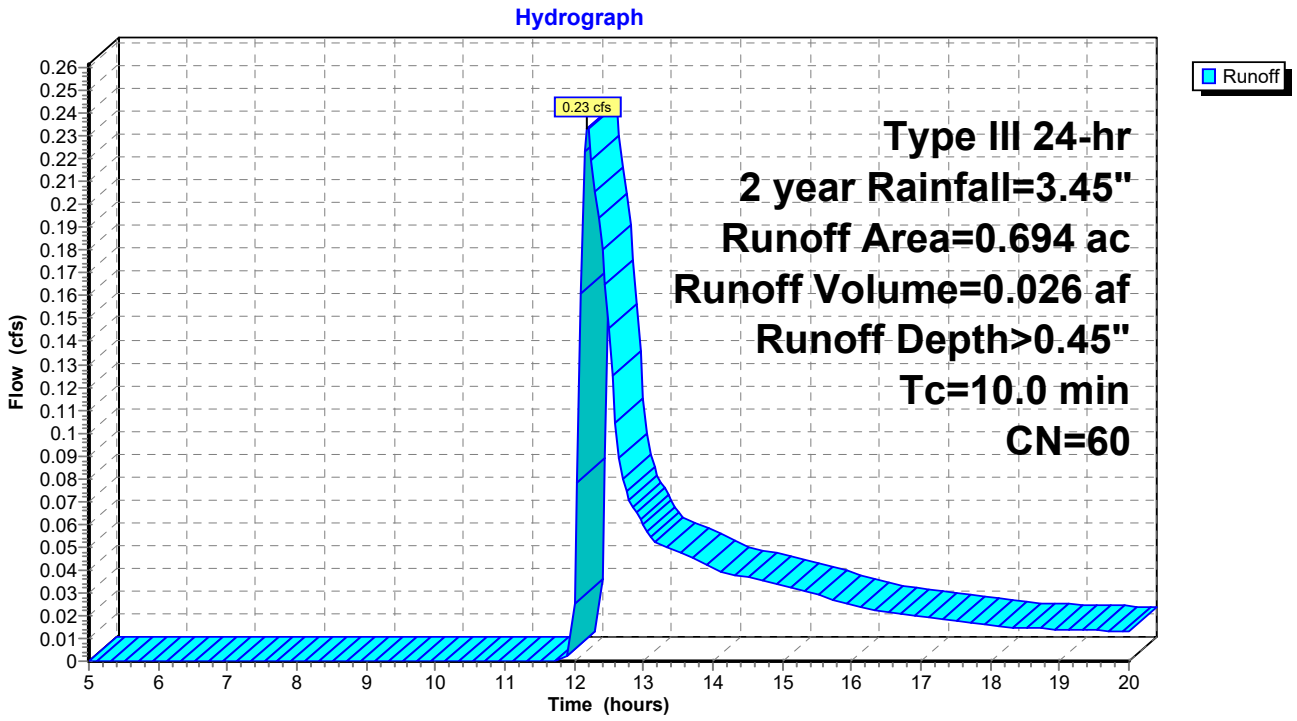
Runoff = 0.23 cfs @ 12.20 hrs, Volume= 0.026 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

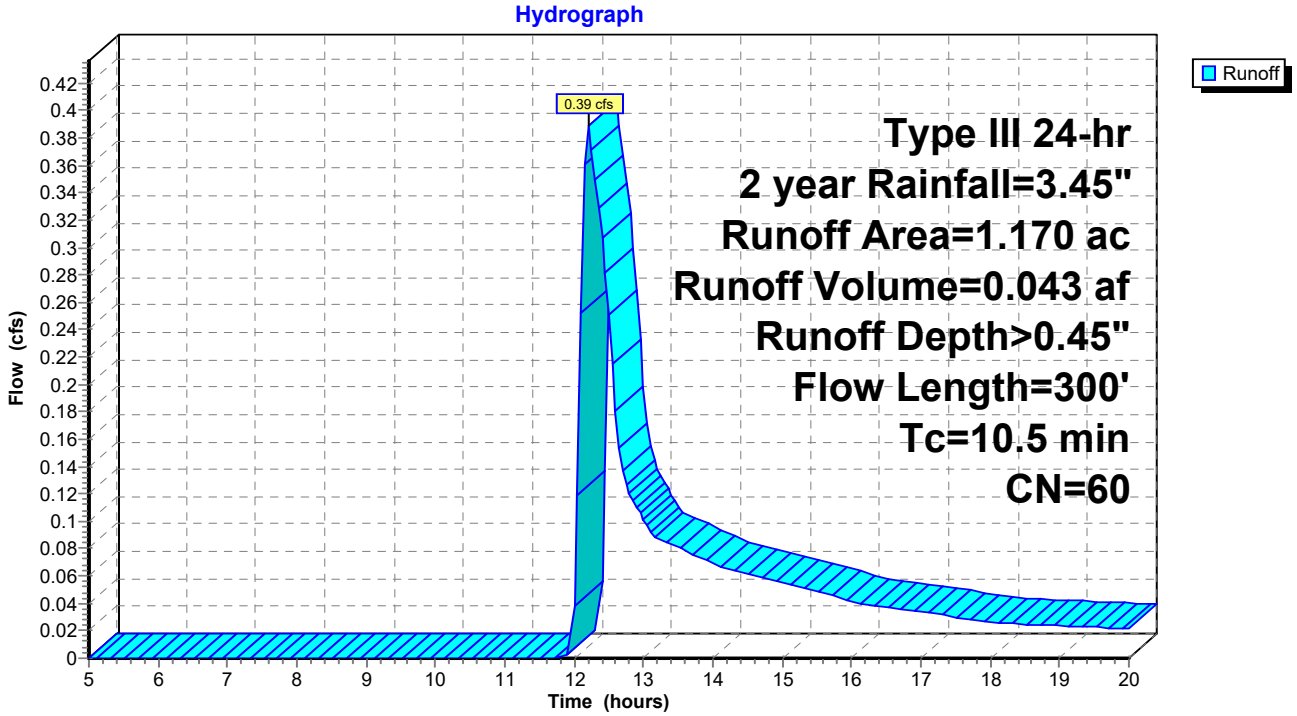
Runoff = 0.39 cfs @ 12.21 hrs, Volume= 0.043 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

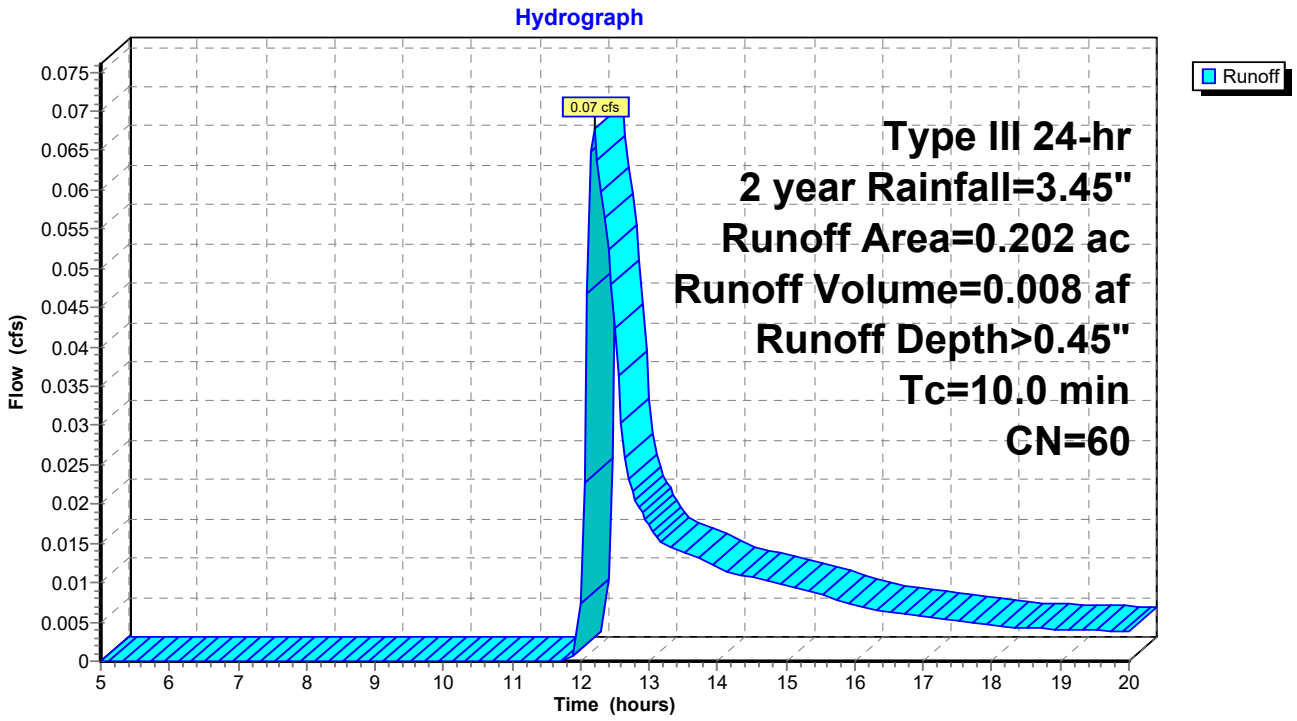
Runoff = 0.07 cfs @ 12.20 hrs, Volume= 0.008 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

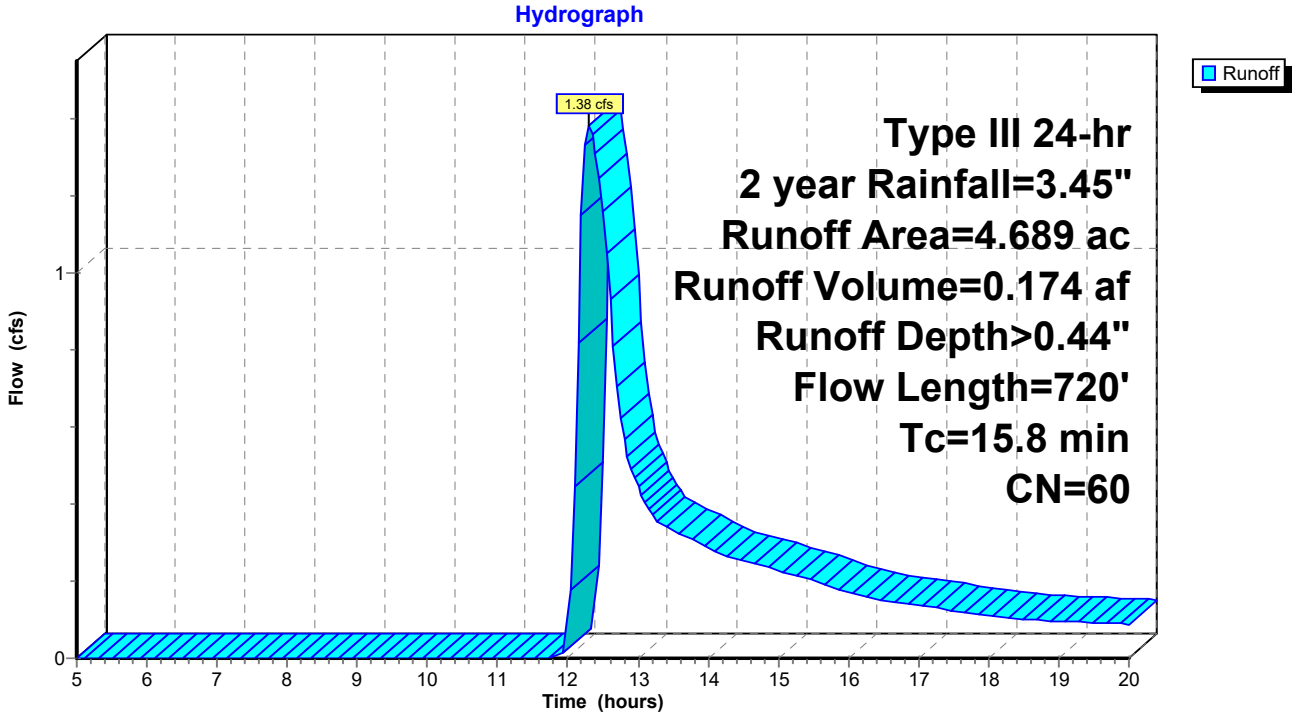
Runoff = 1.38 cfs @ 12.31 hrs, Volume= 0.174 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

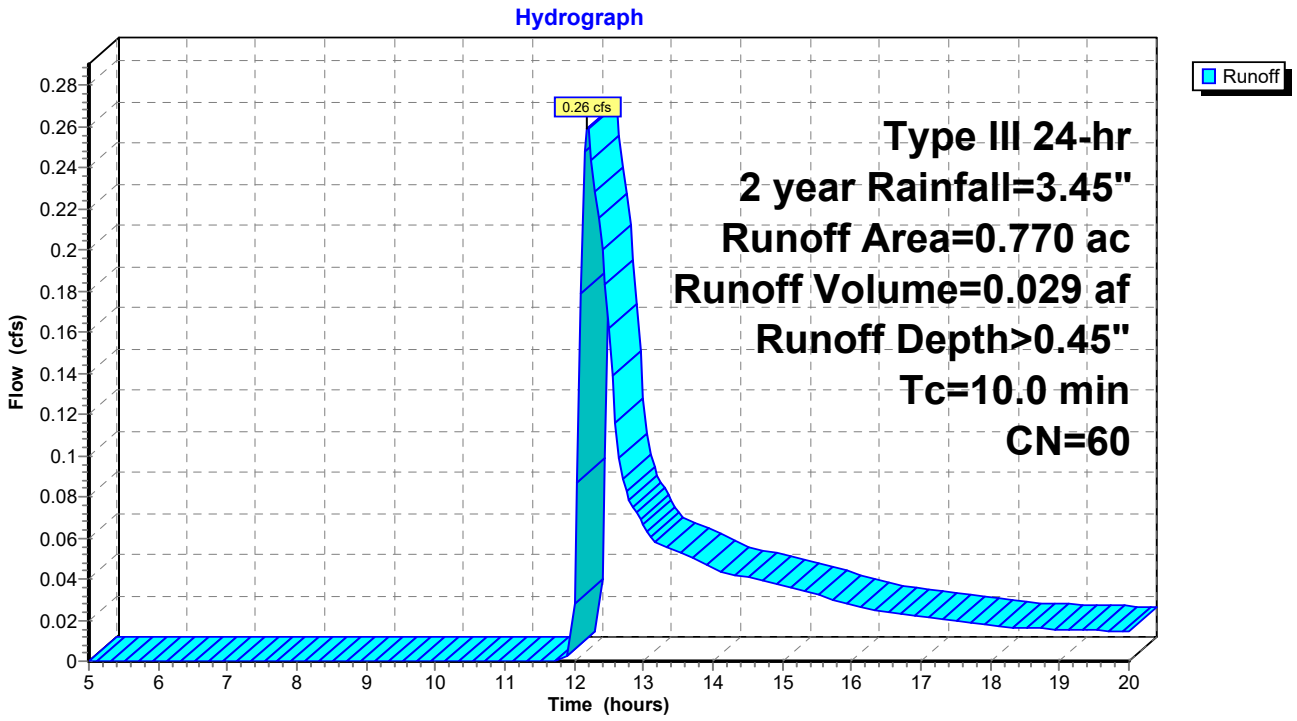
Runoff = 0.26 cfs @ 12.20 hrs, Volume= 0.029 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

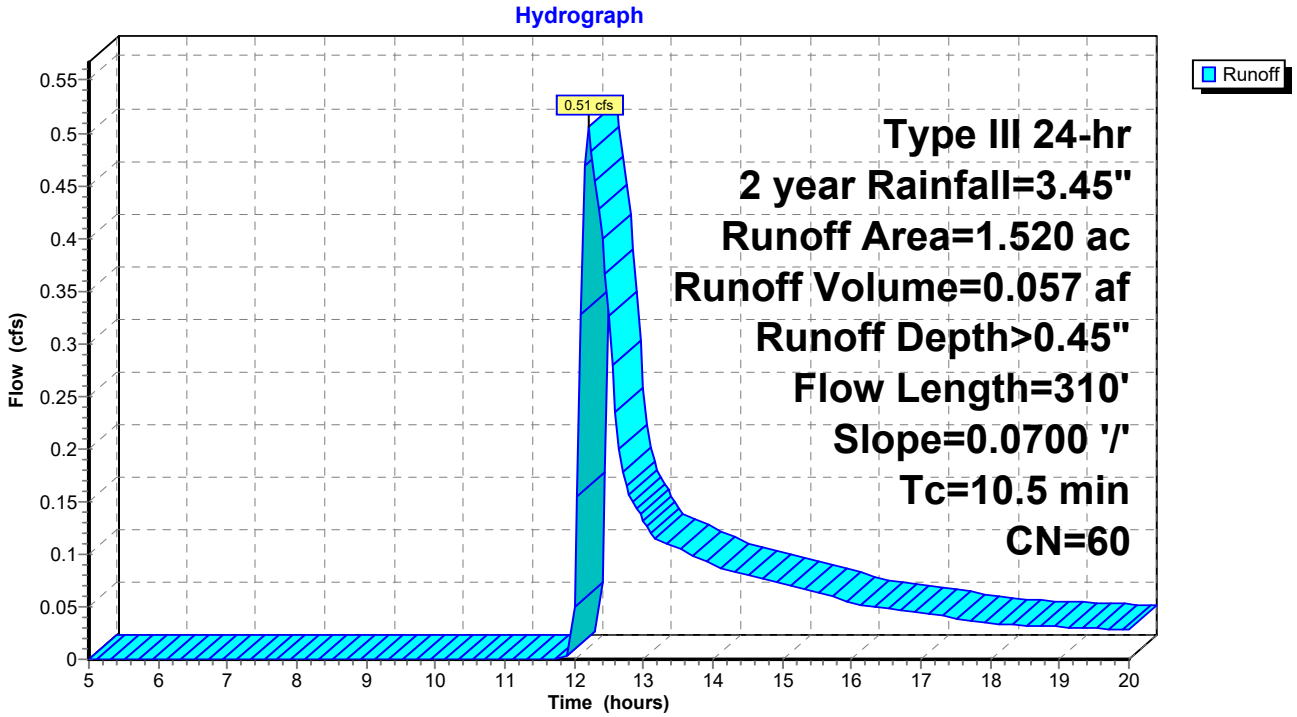
Runoff = 0.51 cfs @ 12.21 hrs, Volume= 0.057 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

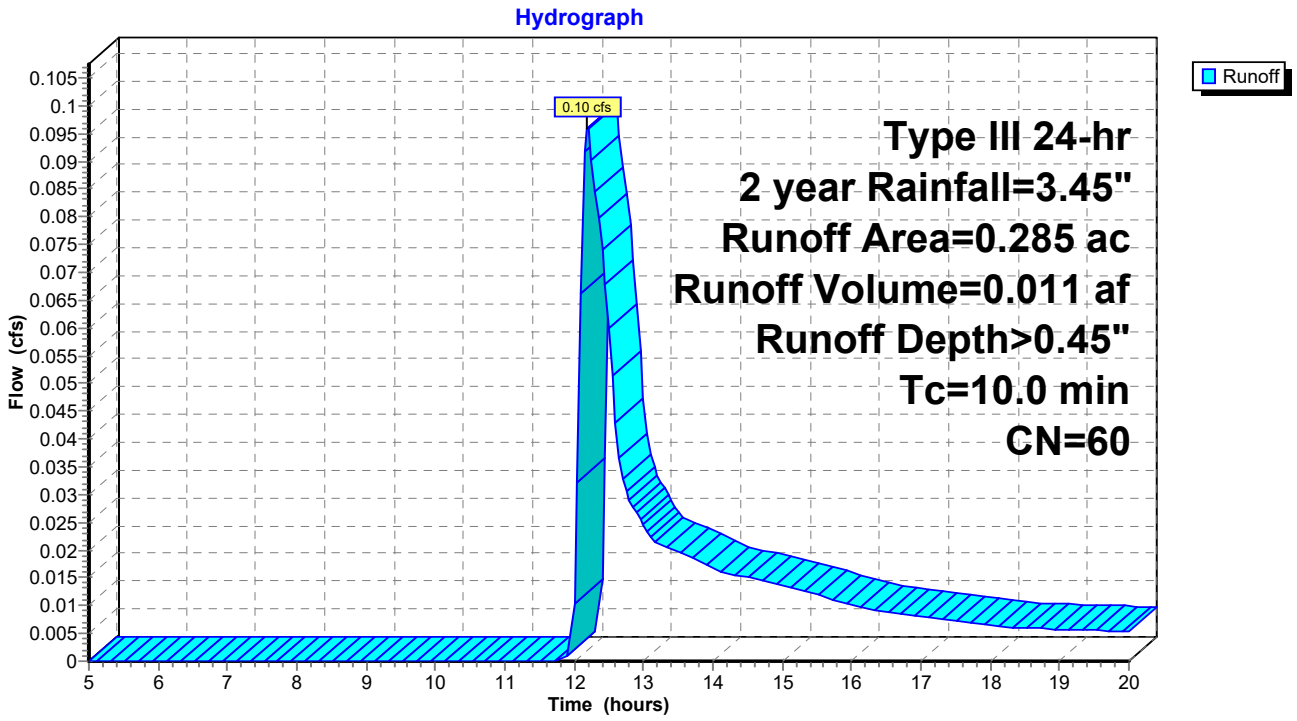
Runoff = 0.10 cfs @ 12.20 hrs, Volume= 0.011 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

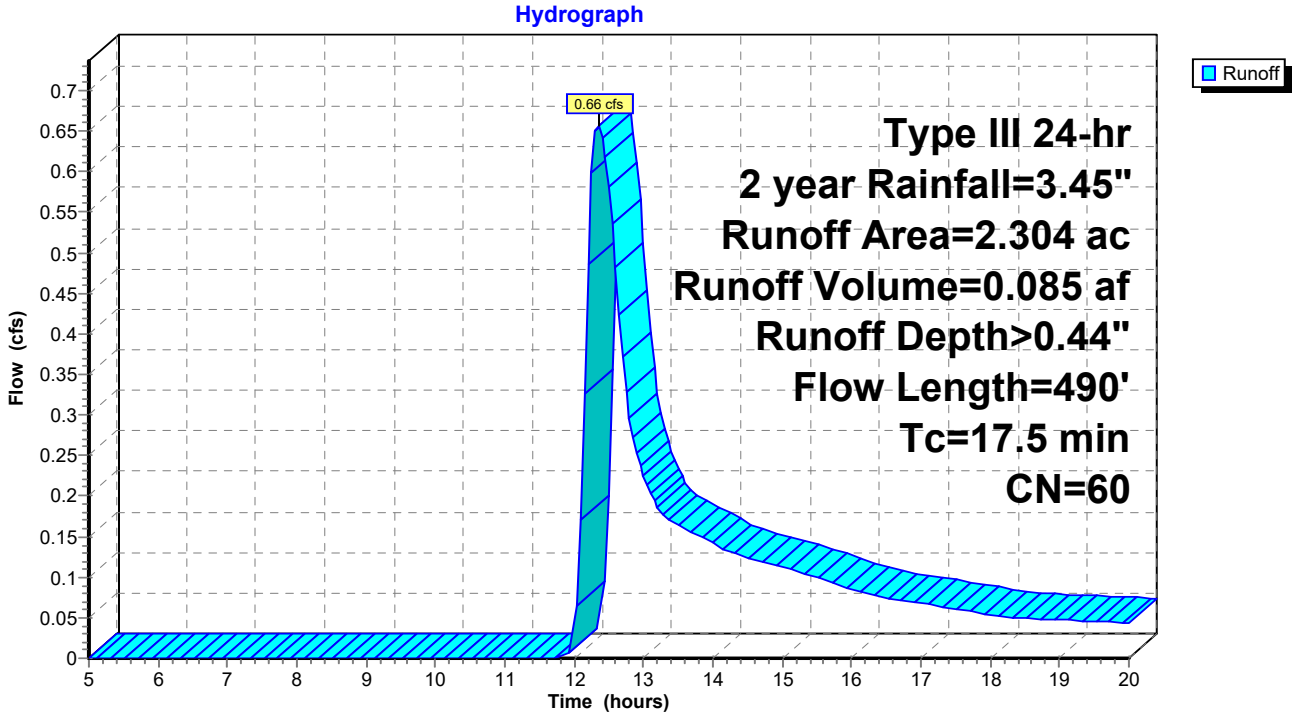
Runoff = 0.66 cfs @ 12.34 hrs, Volume= 0.085 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

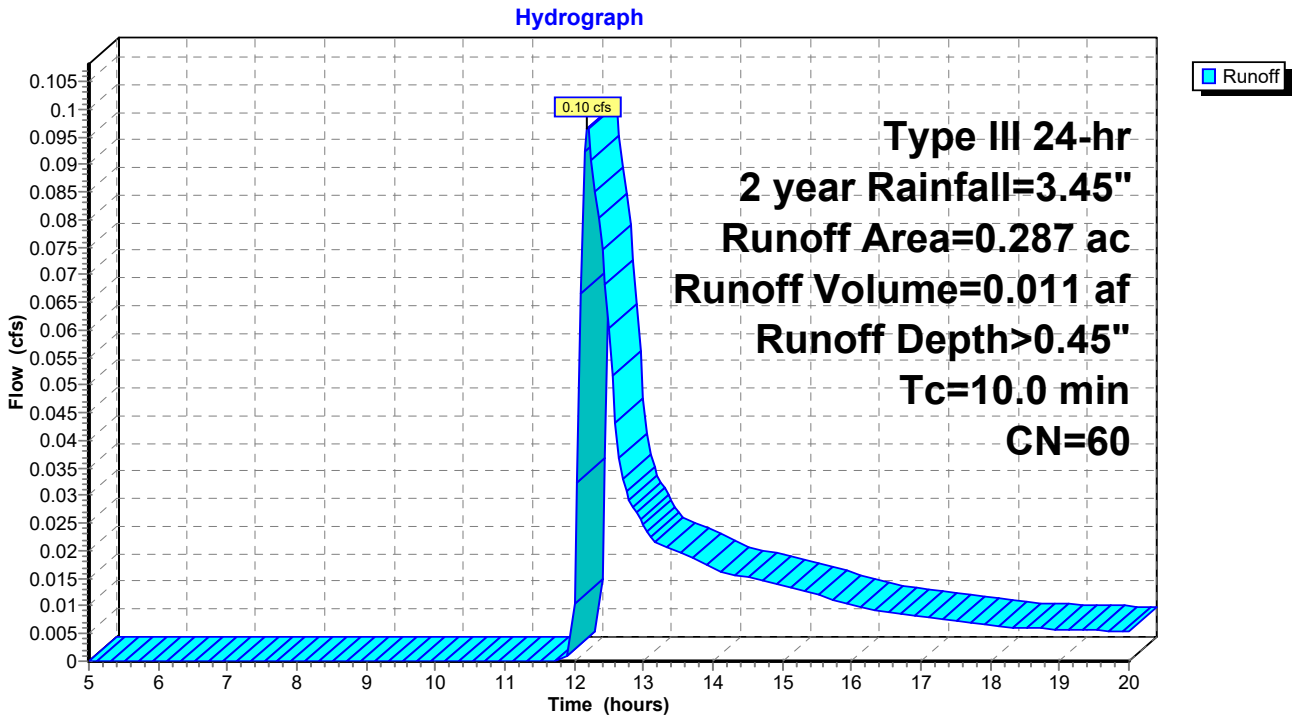
Runoff = 0.10 cfs @ 12.20 hrs, Volume= 0.011 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

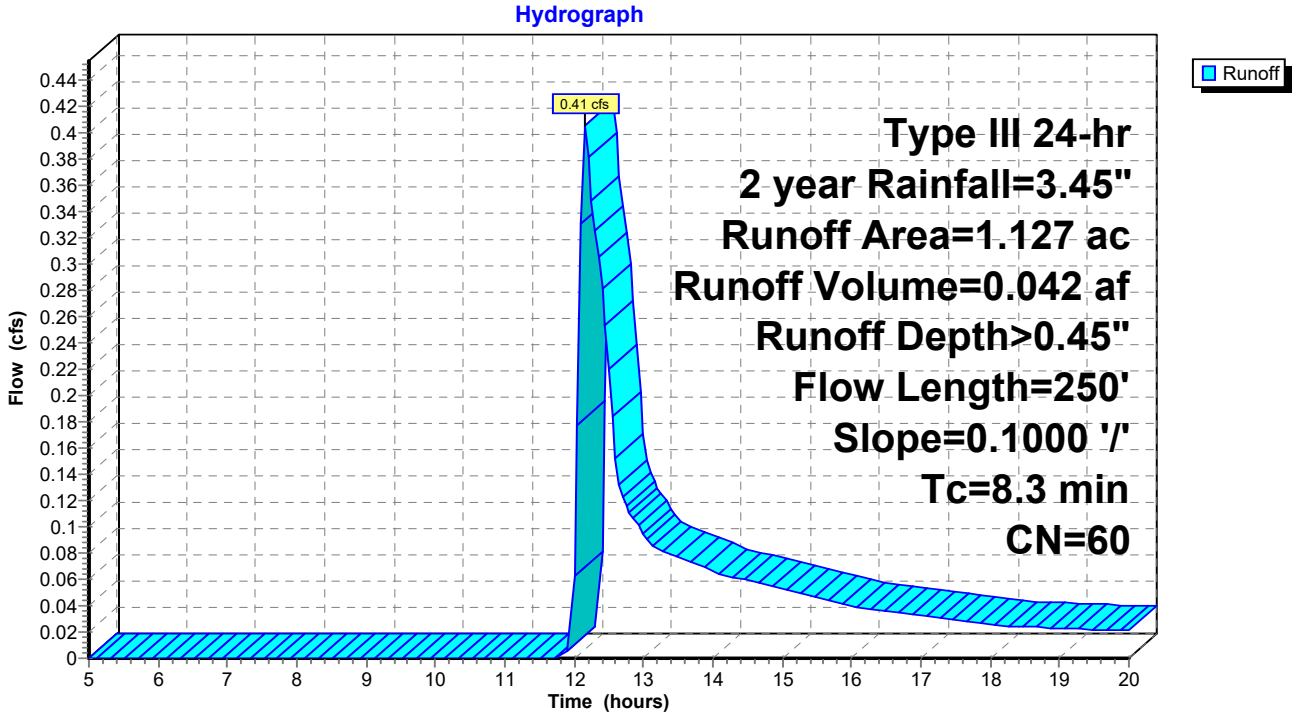
Runoff = 0.41 cfs @ 12.16 hrs, Volume= 0.042 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

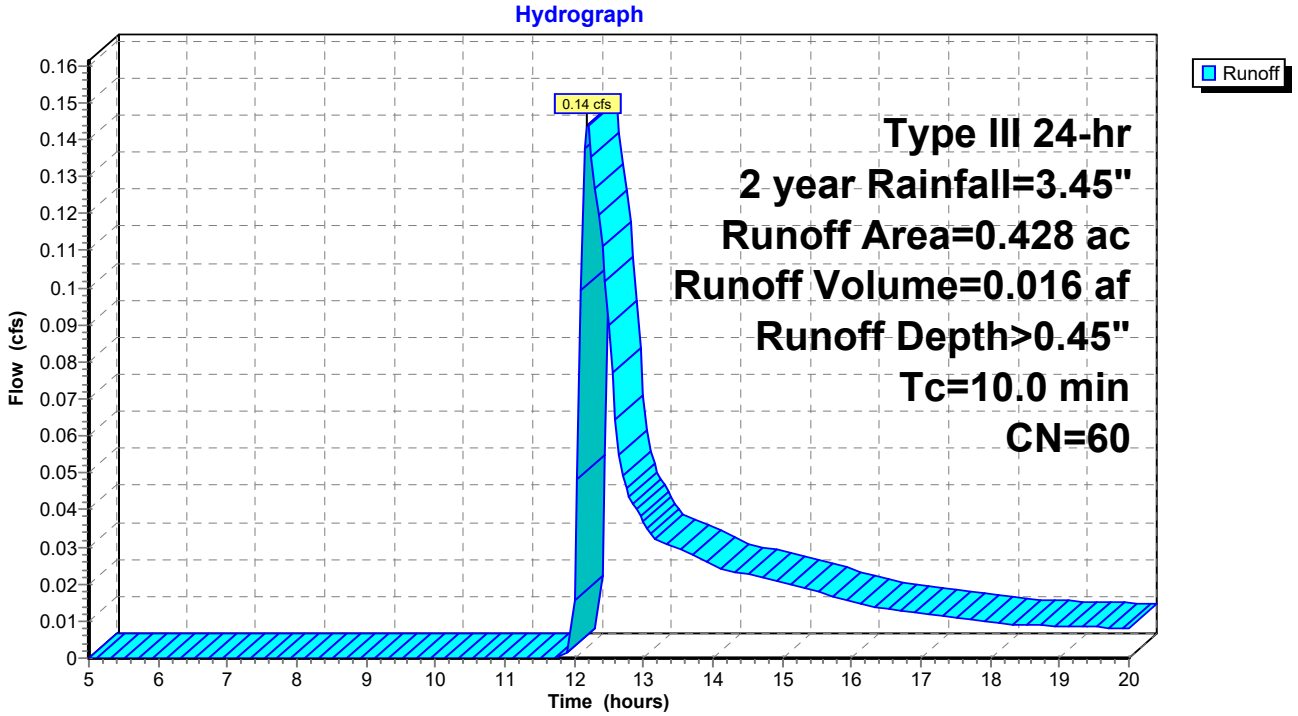
Runoff = 0.14 cfs @ 12.20 hrs, Volume= 0.016 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

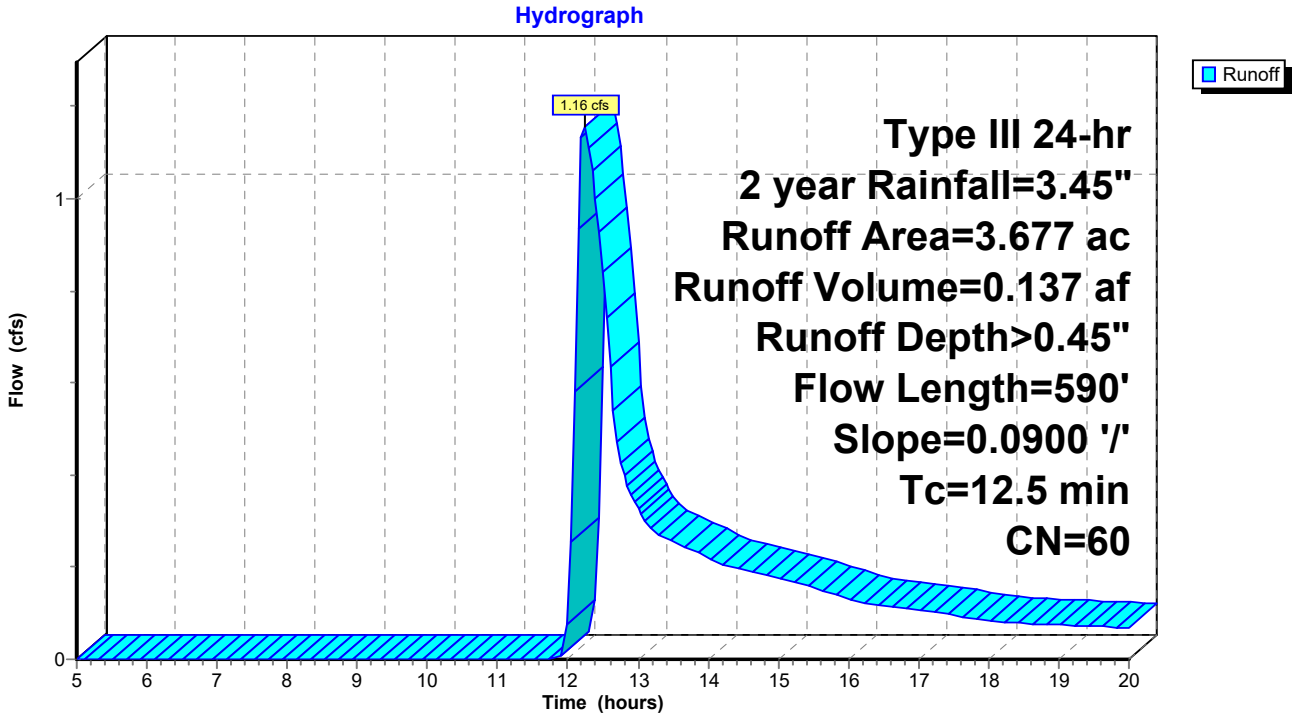
Runoff = 1.16 cfs @ 12.24 hrs, Volume= 0.137 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

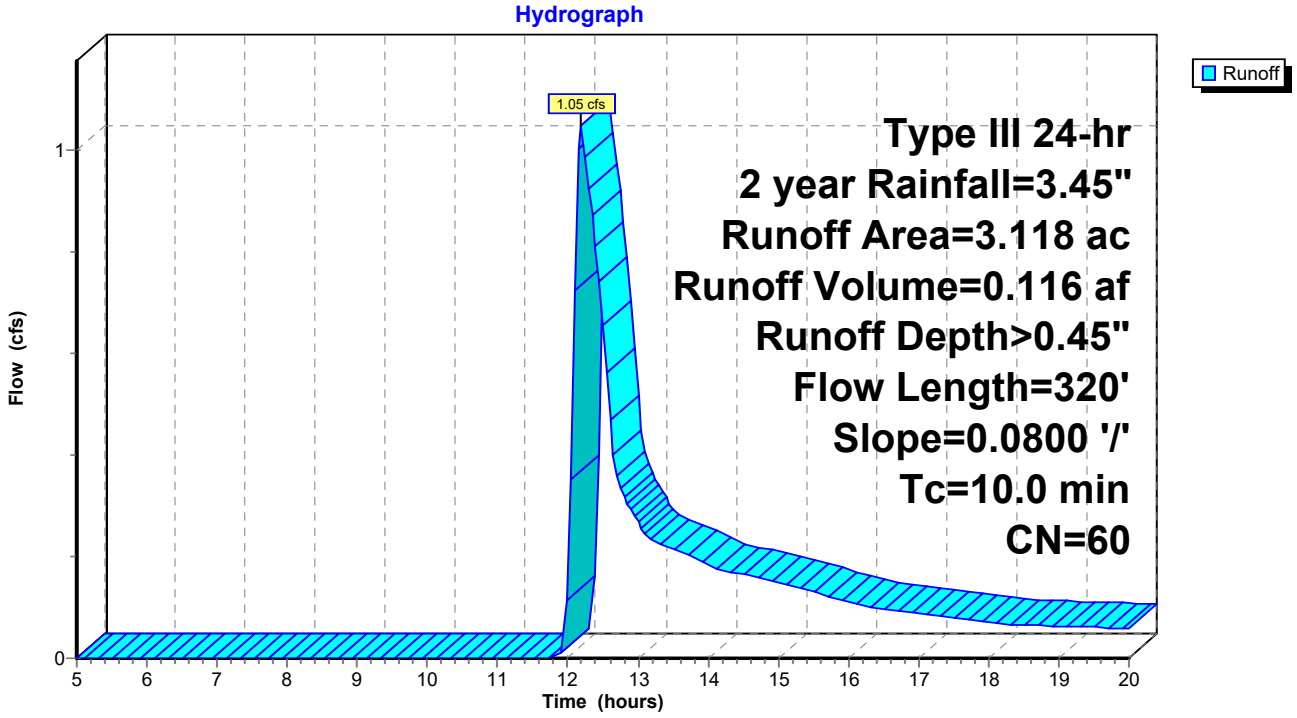
Runoff = 1.05 cfs @ 12.20 hrs, Volume= 0.116 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

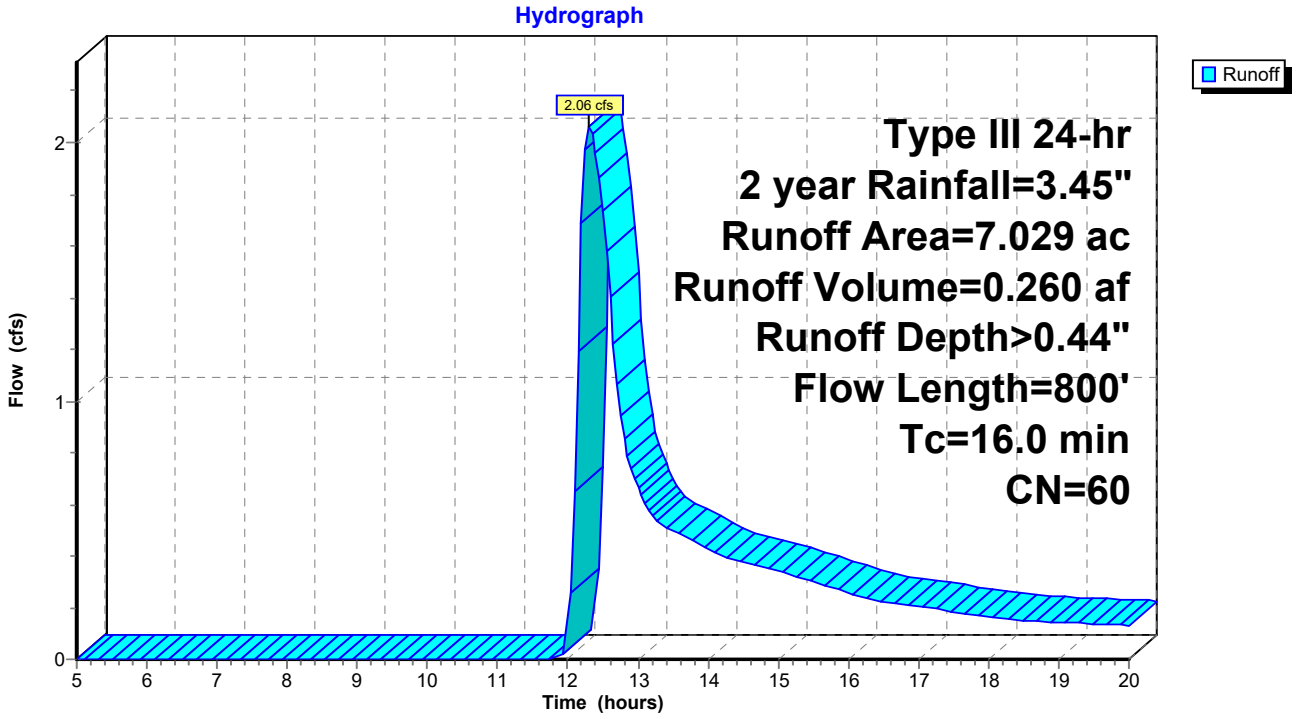
Runoff = 2.06 cfs @ 12.31 hrs, Volume= 0.260 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

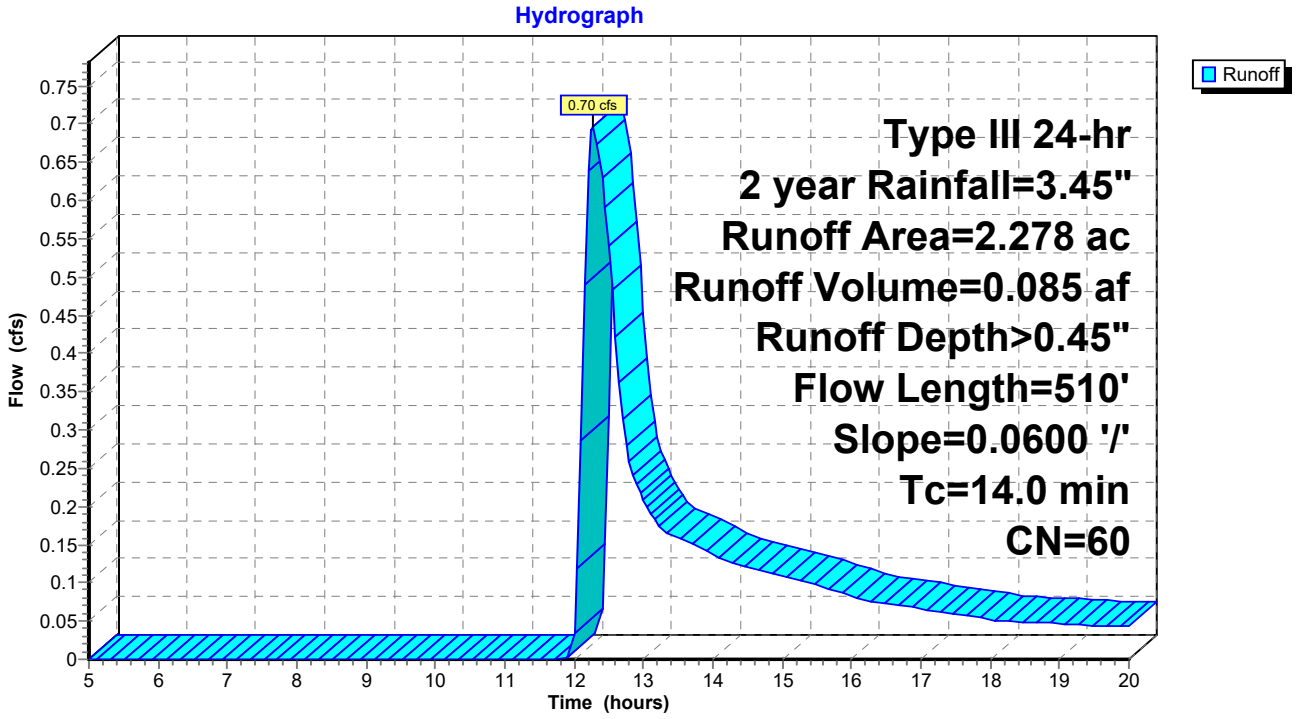
Runoff = 0.70 cfs @ 12.27 hrs, Volume= 0.085 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

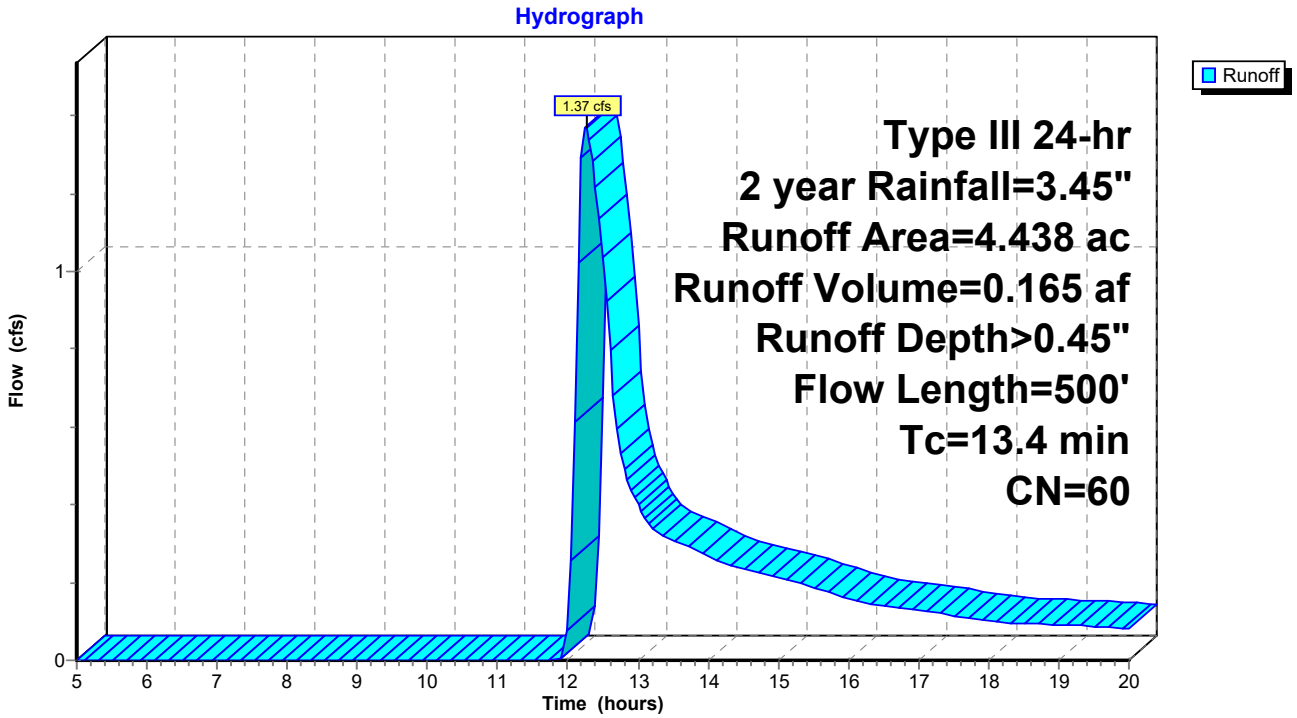
Runoff = 1.37 cfs @ 12.26 hrs, Volume= 0.165 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

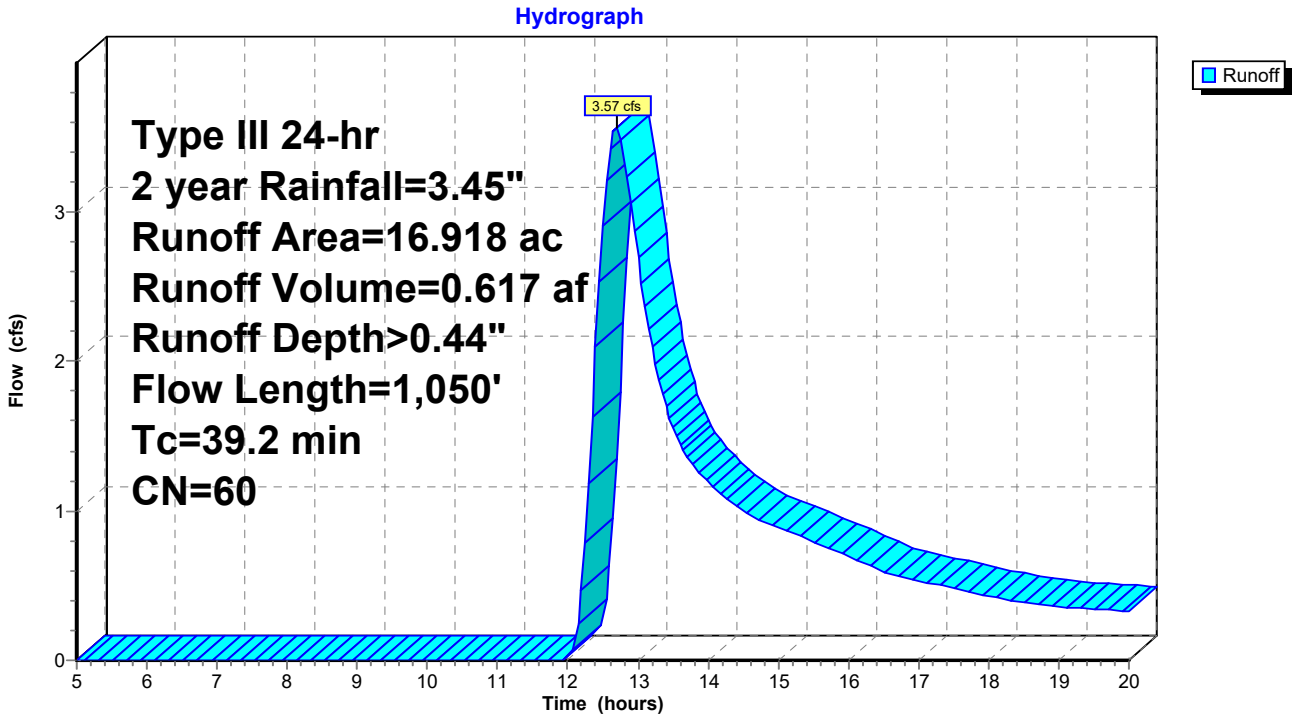
Runoff = 3.57 cfs @ 12.69 hrs, Volume= 0.617 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

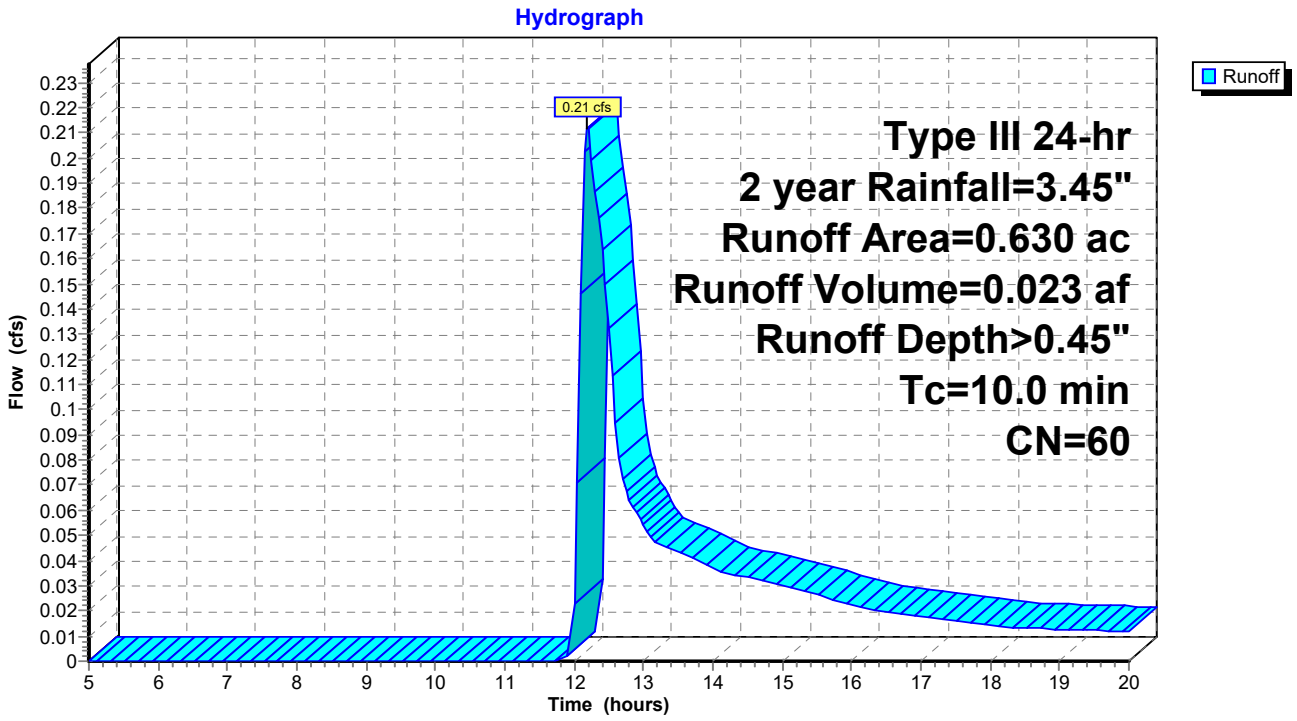
Runoff = 0.21 cfs @ 12.20 hrs, Volume= 0.023 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[81] Warning: Exceeded Pond 13.1P by 0.01' @ 17.20 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 0.10" for 2 year event
Inflow = 0.09 cfs @ 16.96 hrs, Volume= 0.026 af
Outflow = 0.09 cfs @ 17.23 hrs, Volume= 0.024 af, Atten= 0%, Lag= 15.8 min

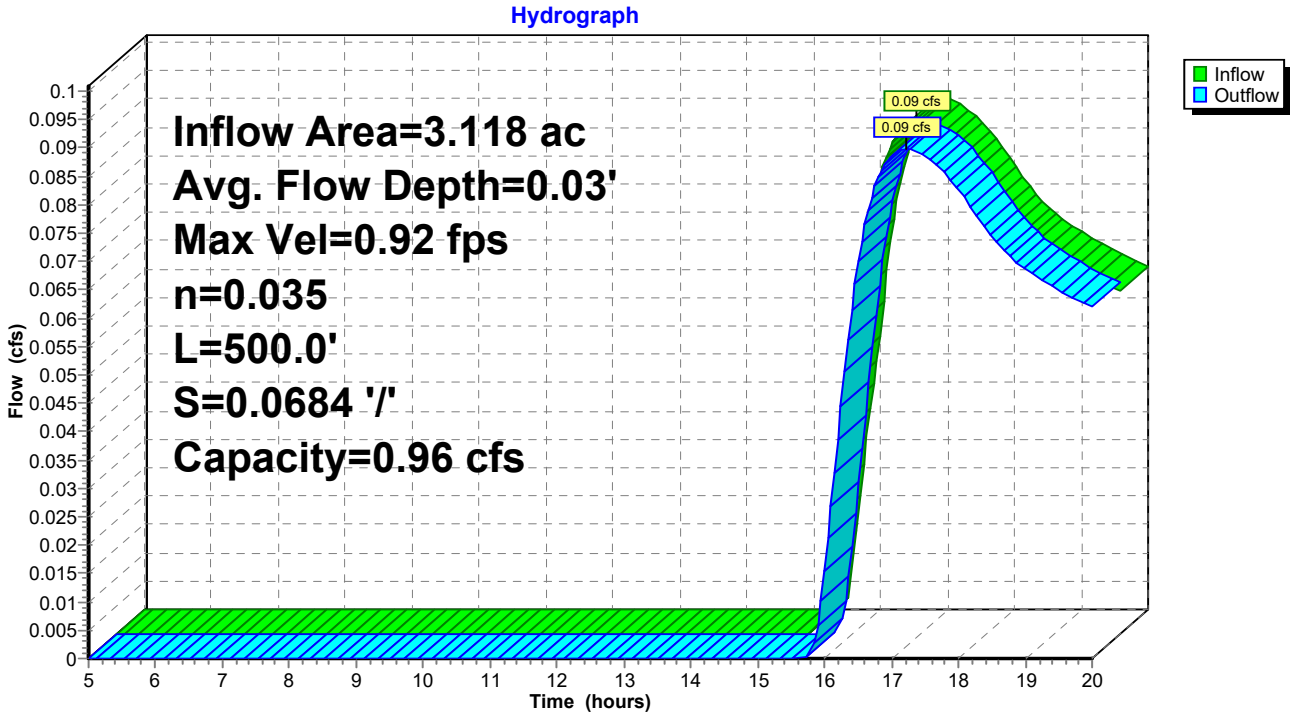
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.92 fps, Min. Travel Time= 9.1 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 10.4 min

Peak Storage= 49 cf @ 17.08 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 0.45" for 2 year event
Inflow = 1.05 cfs @ 12.20 hrs, Volume= 0.116 af
Outflow = 0.09 cfs @ 16.96 hrs, Volume= 0.026 af, Atten= 91%, Lag= 286.1 min
Primary = 0.09 cfs @ 16.96 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.21' @ 16.96 hrs Surf.Area= 15,088 sf Storage= 3,971 cf

Plug-Flow detention time= 336.4 min calculated for 0.026 af (22% of inflow)
Center-of-Mass det. time= 213.1 min (1,069.8 - 856.6)

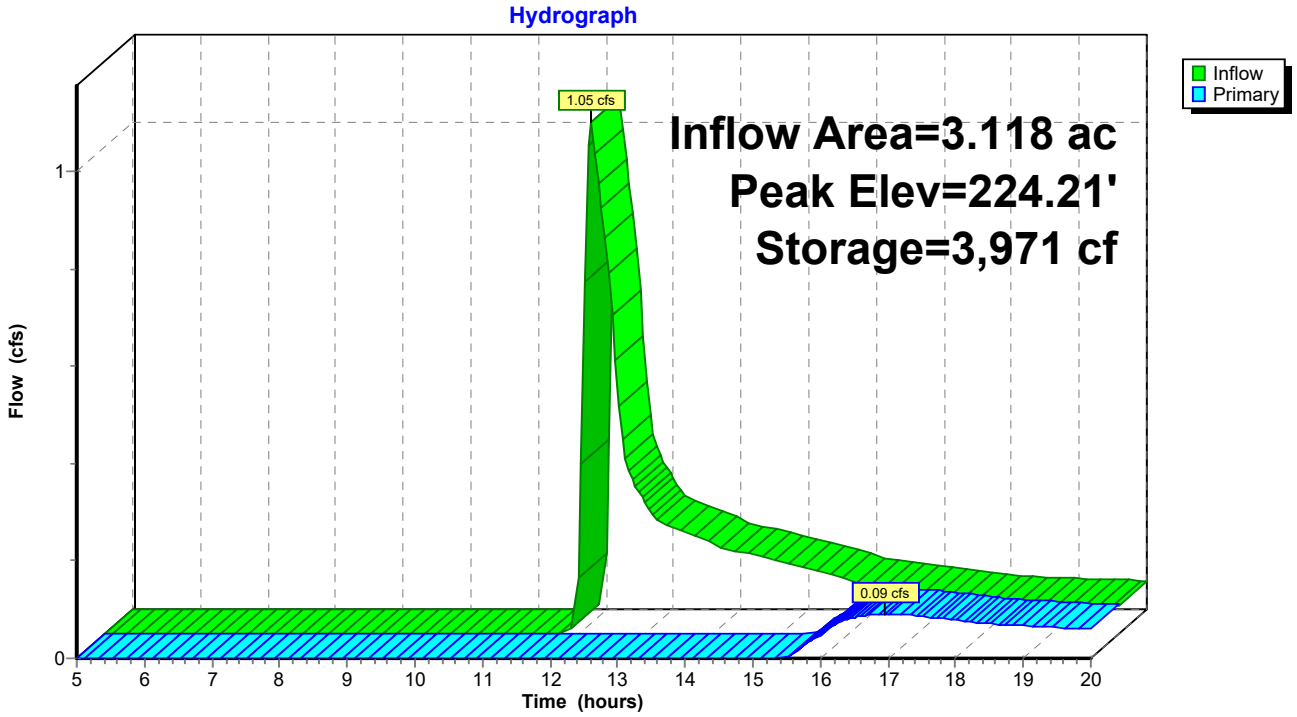
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.08 cfs @ 16.96 hrs HW=224.21' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.08 cfs @ 0.28 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area =	7.029 ac,	0.00% Impervious,	Inflow Depth >	0.44"	for 2 year event
Inflow =	2.06 cfs @	12.31 hrs,	Volume=	0.260 af	
Outflow =	0.39 cfs @	14.38 hrs,	Volume=	0.214 af,	Atten= 81%, Lag= 123.9 min
Discarded =	0.39 cfs @	14.38 hrs,	Volume=	0.214 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 189.40' @ 14.38 hrs Surf.Area= 5,678 sf Storage= 4,210 cf

Plug-Flow detention time= 144.2 min calculated for 0.214 af (82% of inflow)
Center-of-Mass det. time= 94.7 min (955.6 - 860.9)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

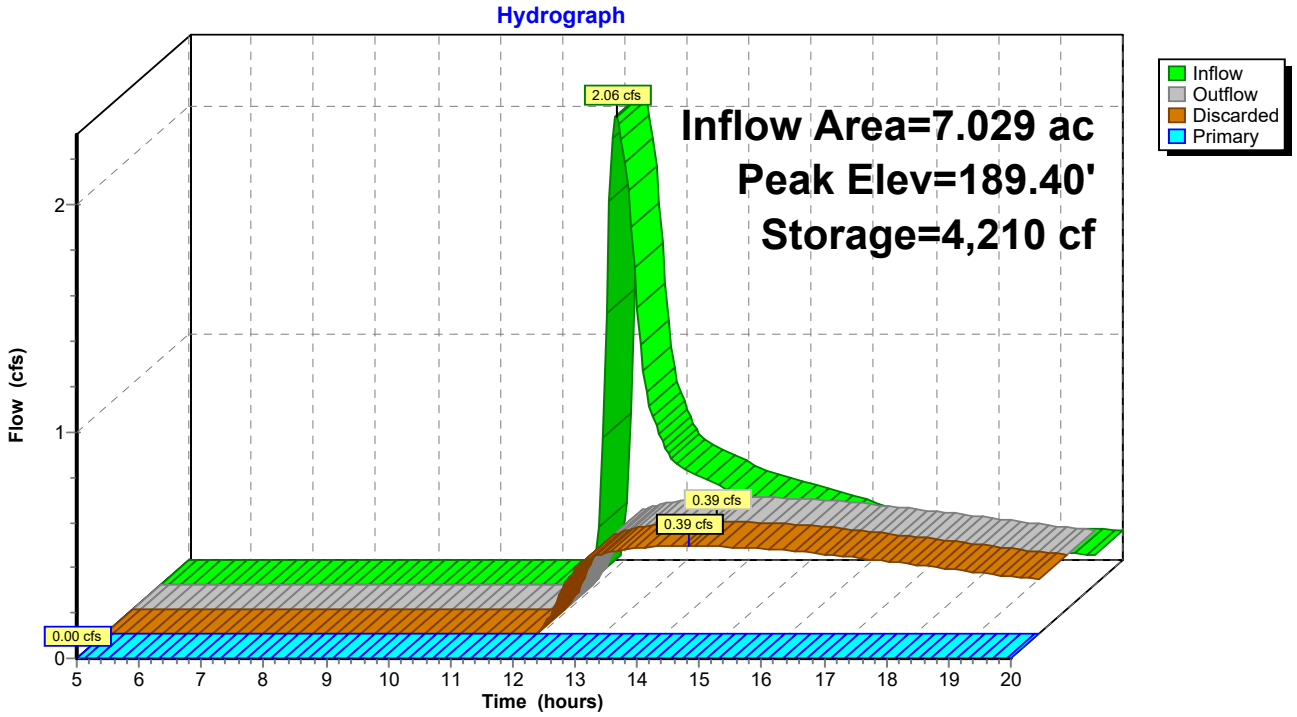
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.39 cfs @ 14.38 hrs HW=189.40' (Free Discharge)
└─**2=Exfiltration** (Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=187.70' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13.2P: Pond 13.2

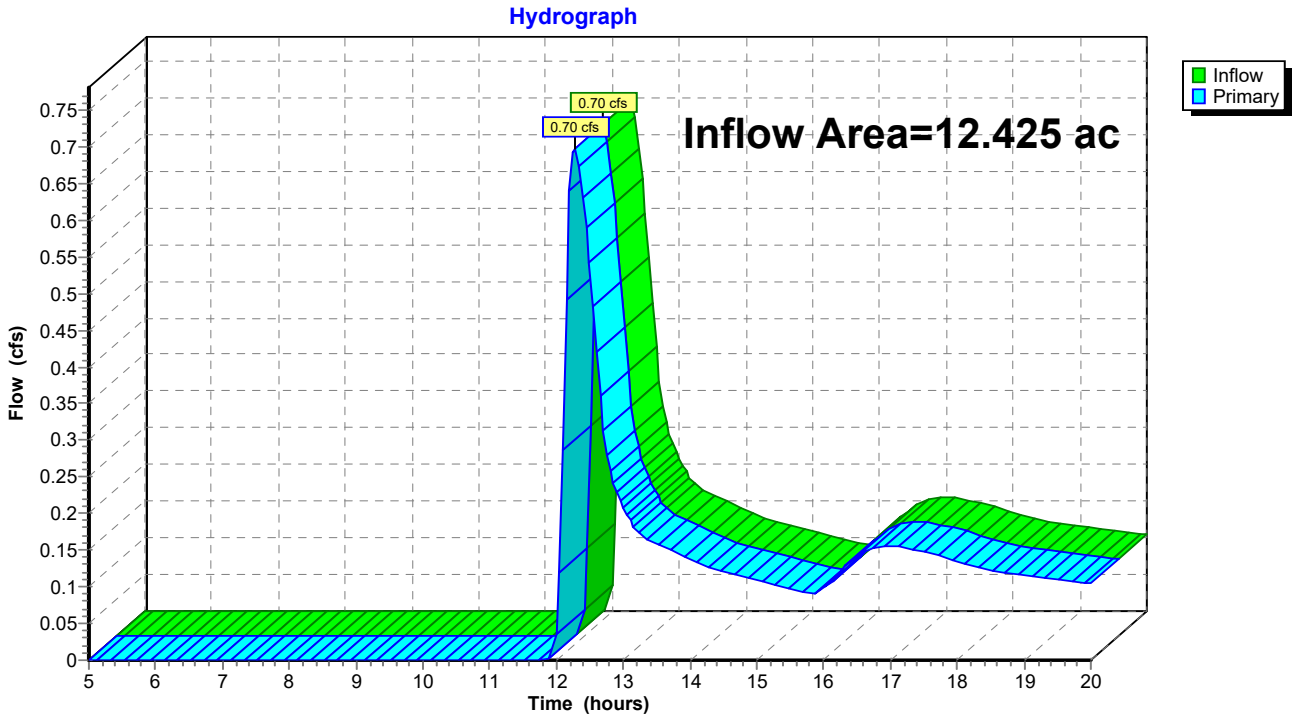


Summary for Link 13: 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 0.11" for 2 year event
Inflow = 0.70 cfs @ 12.27 hrs, Volume= 0.109 af
Primary = 0.70 cfs @ 12.27 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



25-Year Storm Event – Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=5.45 cfs 0.467 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=440' Tc=18.0 min CN=60 Runoff=4.06 cfs 0.395 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>2.46"
Tc=10.0 min CN=67 Runoff=2.07 cfs 0.159 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=700' Tc=19.2 min CN=60 Runoff=3.95 cfs 0.395 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>3.50"
Tc=10.0 min CN=78 Runoff=1.23 cfs 0.095 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>2.19"
Flow Length=950' Tc=26.2 min CN=64 Runoff=9.63 cfs 1.070 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=4.49 cfs 0.409 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>2.29"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=7.29 cfs 0.610 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>2.55"
Tc=10.0 min CN=68 Runoff=2.55 cfs 0.196 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.06 cfs 0.005 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=1.37 cfs 0.108 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=300' Tc=10.5 min CN=60 Runoff=2.27 cfs 0.182 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.40 cfs 0.031 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=720' Tc=15.8 min CN=60 Runoff=7.82 cfs 0.727 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=1.52 cfs 0.120 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=2.95 cfs 0.236 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.56 cfs 0.044 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=490' Tc=17.5 min CN=60 Runoff=3.71 cfs 0.357 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.56 cfs 0.045 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>1.87"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=2.31 cfs 0.175 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=0.84 cfs 0.066 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=6.68 cfs 0.571 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>1.87"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=6.13 cfs 0.485 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=800' Tc=16.0 min CN=60 Runoff=11.67 cfs 1.090 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=3.99 cfs 0.353 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>1.86"
Flow Length=500' Tc=13.4 min CN=60 Runoff=7.89 cfs 0.689 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>1.84"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=19.13 cfs 2.595 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>1.87"
Tc=10.0 min CN=60 Runoff=1.24 cfs 0.098 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.22' Max Vel=2.38 fps Inflow=3.24 cfs 0.390 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=3.15 cfs 0.388 af

Pond 13.1P: Pond 13.1 Peak Elev=224.37' Storage=6,365 cf Inflow=6.13 cfs 0.485 af
Outflow=3.24 cfs 0.390 af

Pond 13.2P: Pond 13.2 Peak Elev=190.35' Storage=11,993 cf Inflow=11.67 cfs 1.090 af
Discarded=0.73 cfs 0.423 af Primary=7.77 cfs 0.502 af Outflow=8.50 cfs 0.925 af

Link 13: 13 Inflow=13.20 cfs 1.243 af
Primary=13.20 cfs 1.243 af

Total Runoff Area = 73.426 ac Runoff Volume = 11.770 af Average Runoff Depth = 1.92"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

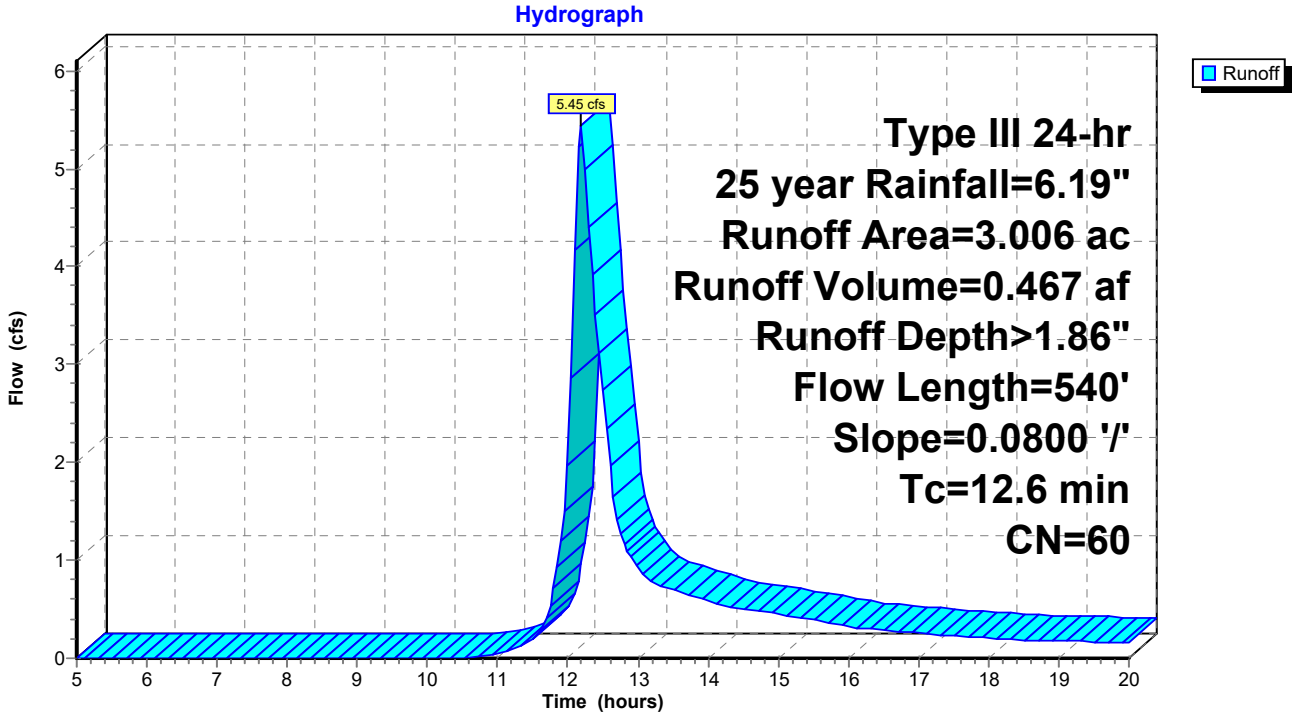
Runoff = 5.45 cfs @ 12.19 hrs, Volume= 0.467 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

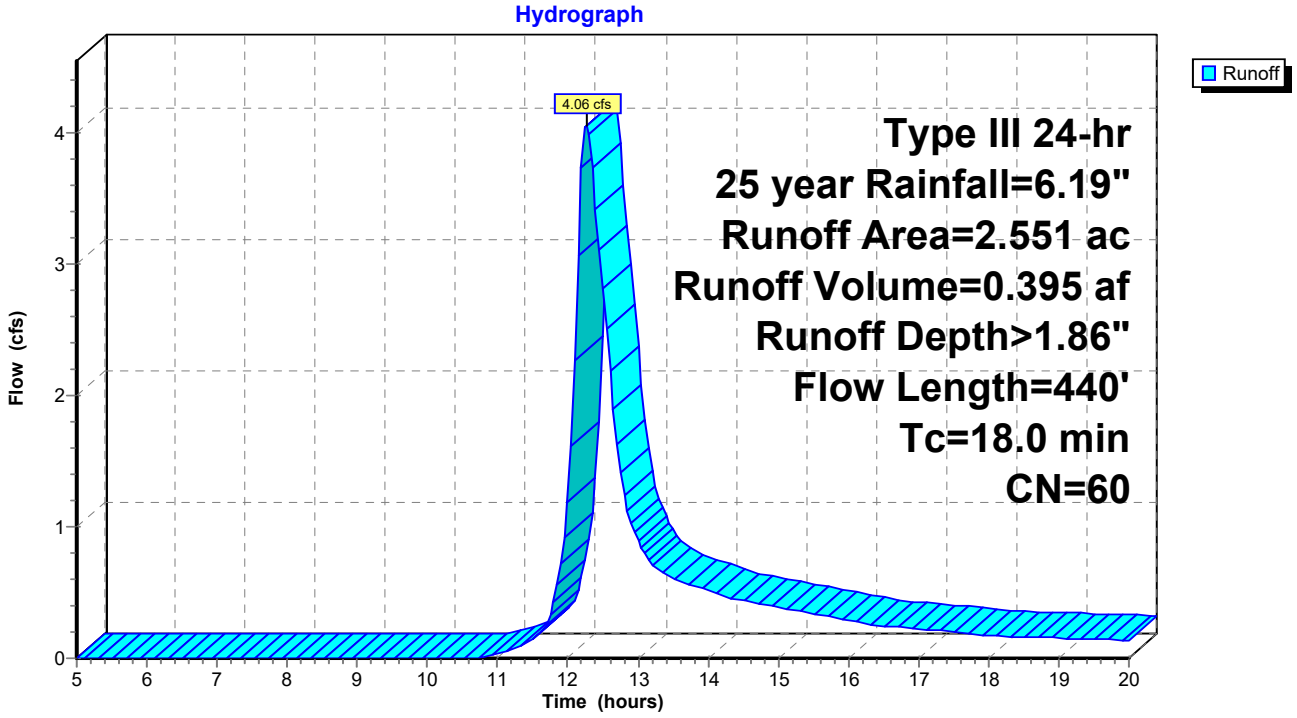
Runoff = 4.06 cfs @ 12.27 hrs, Volume= 0.395 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

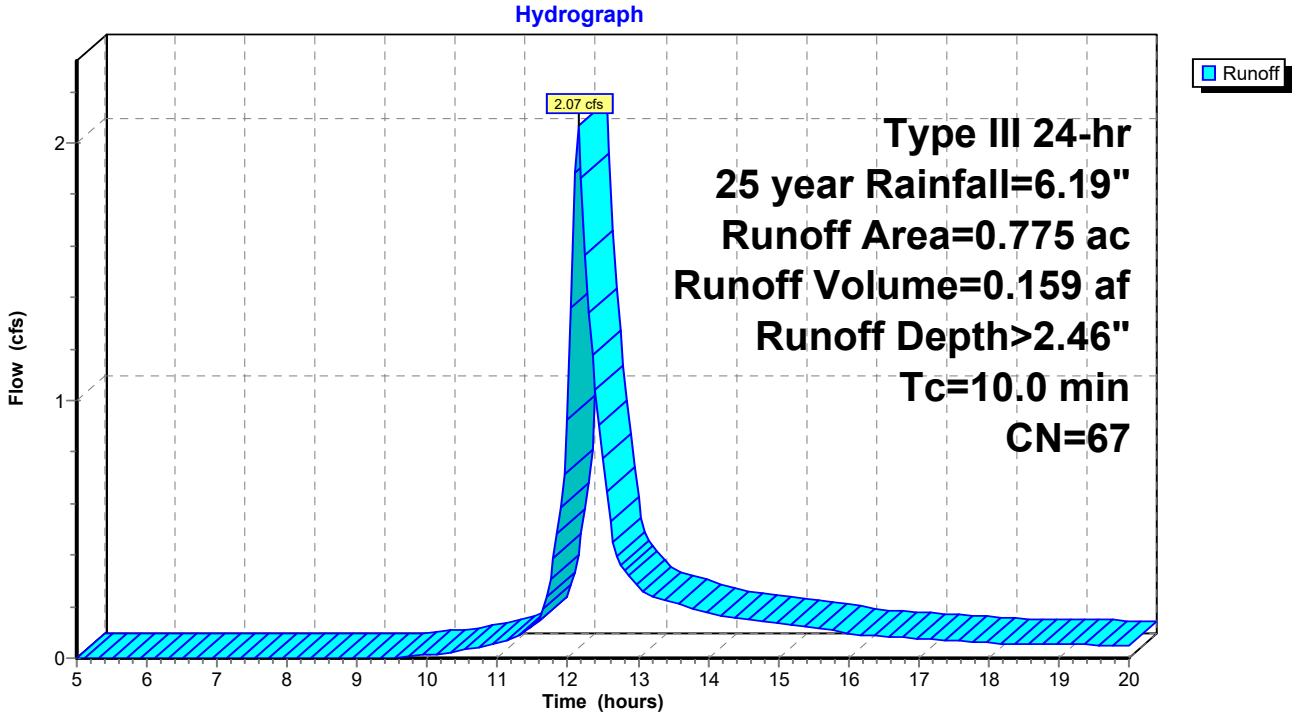
Runoff = 2.07 cfs @ 12.15 hrs, Volume= 0.159 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

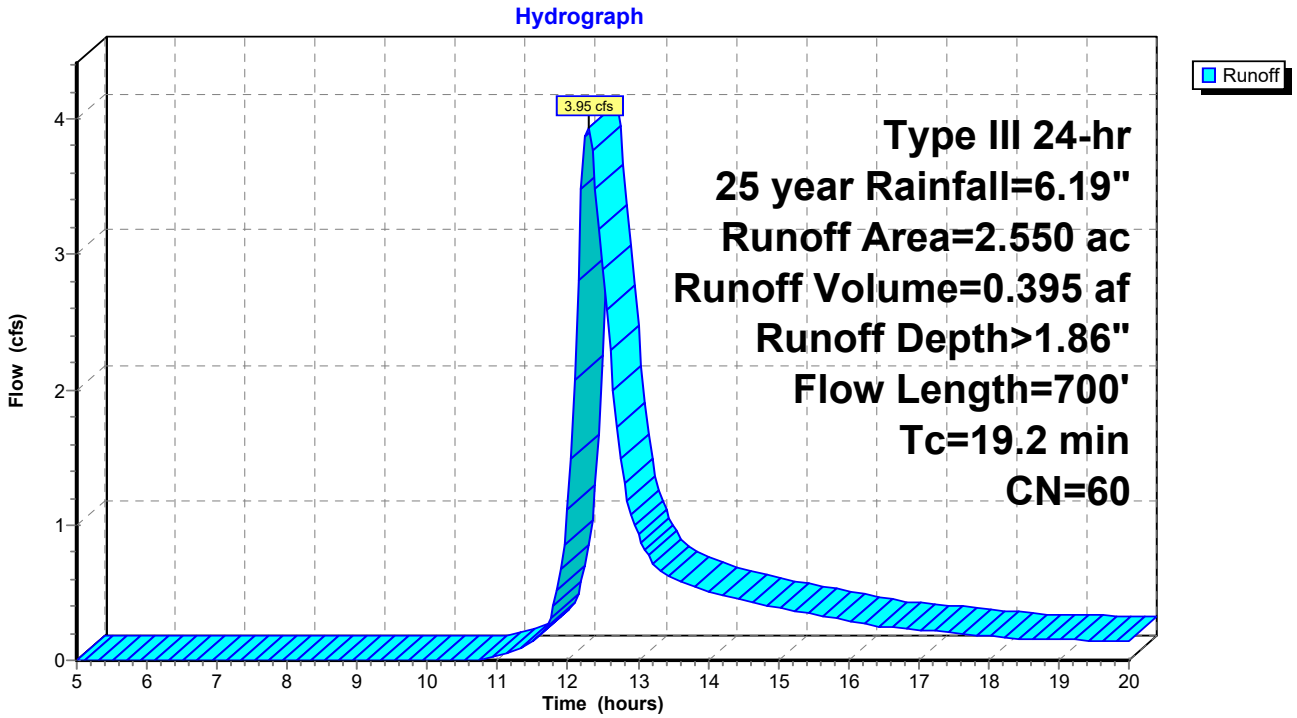
Runoff = 3.95 cfs @ 12.29 hrs, Volume= 0.395 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

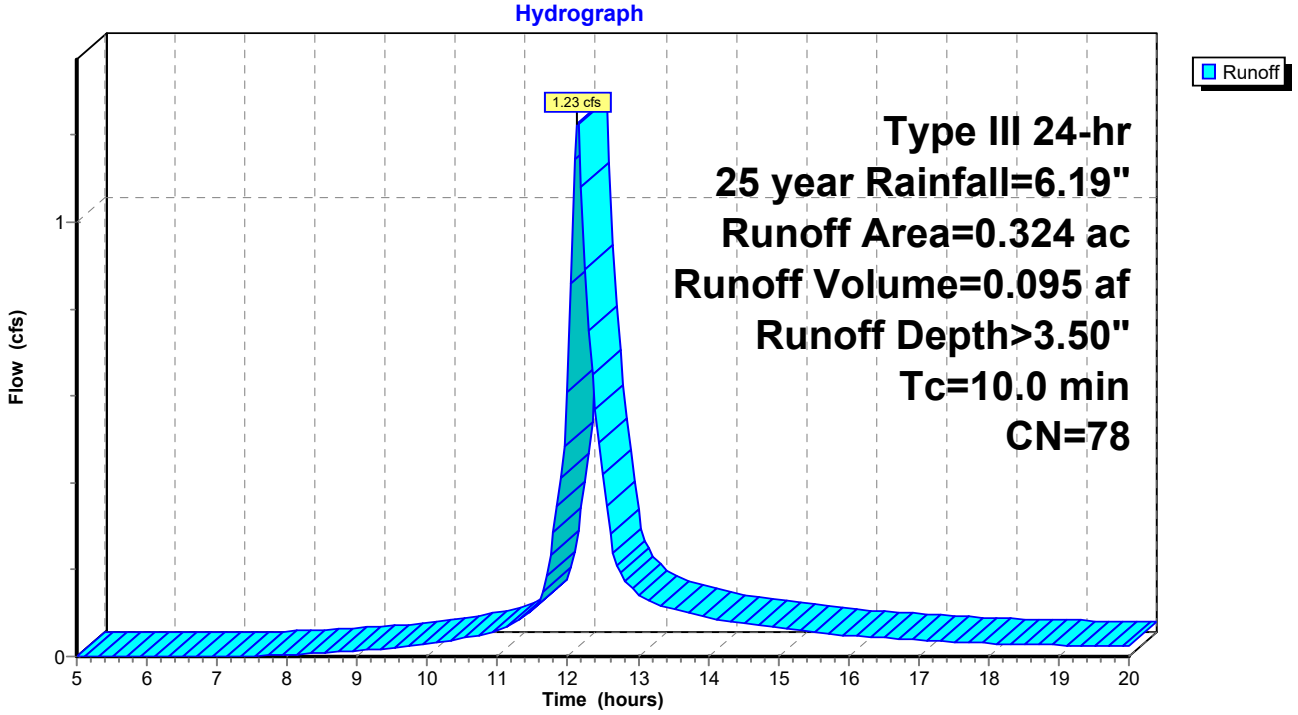
Runoff = 1.23 cfs @ 12.14 hrs, Volume= 0.095 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

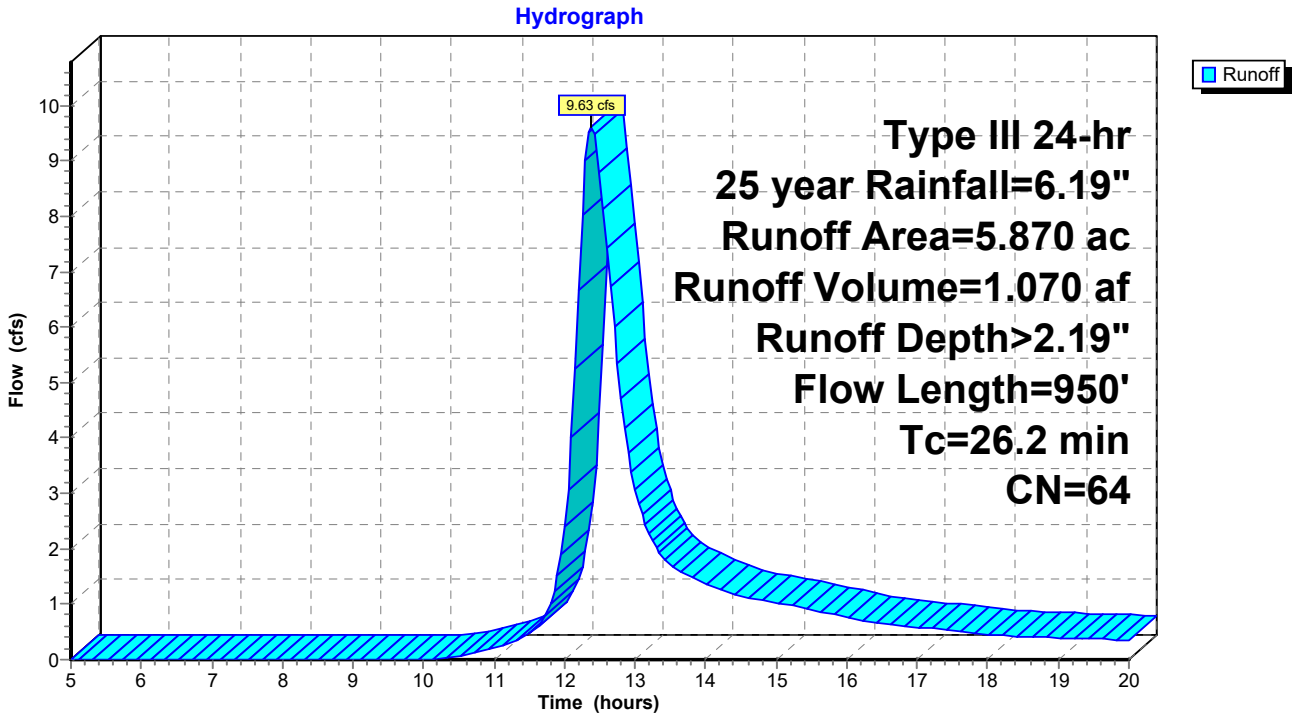
Runoff = 9.63 cfs @ 12.39 hrs, Volume= 1.070 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

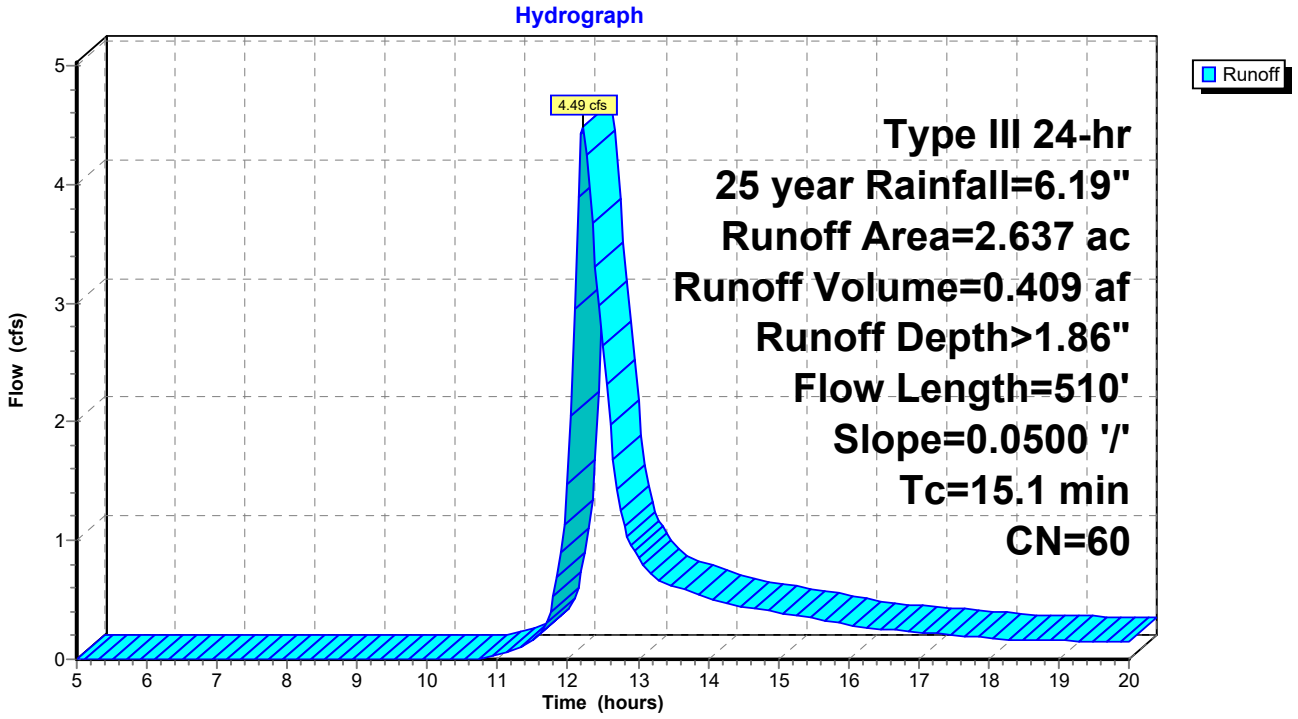
Runoff = 4.49 cfs @ 12.22 hrs, Volume= 0.409 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

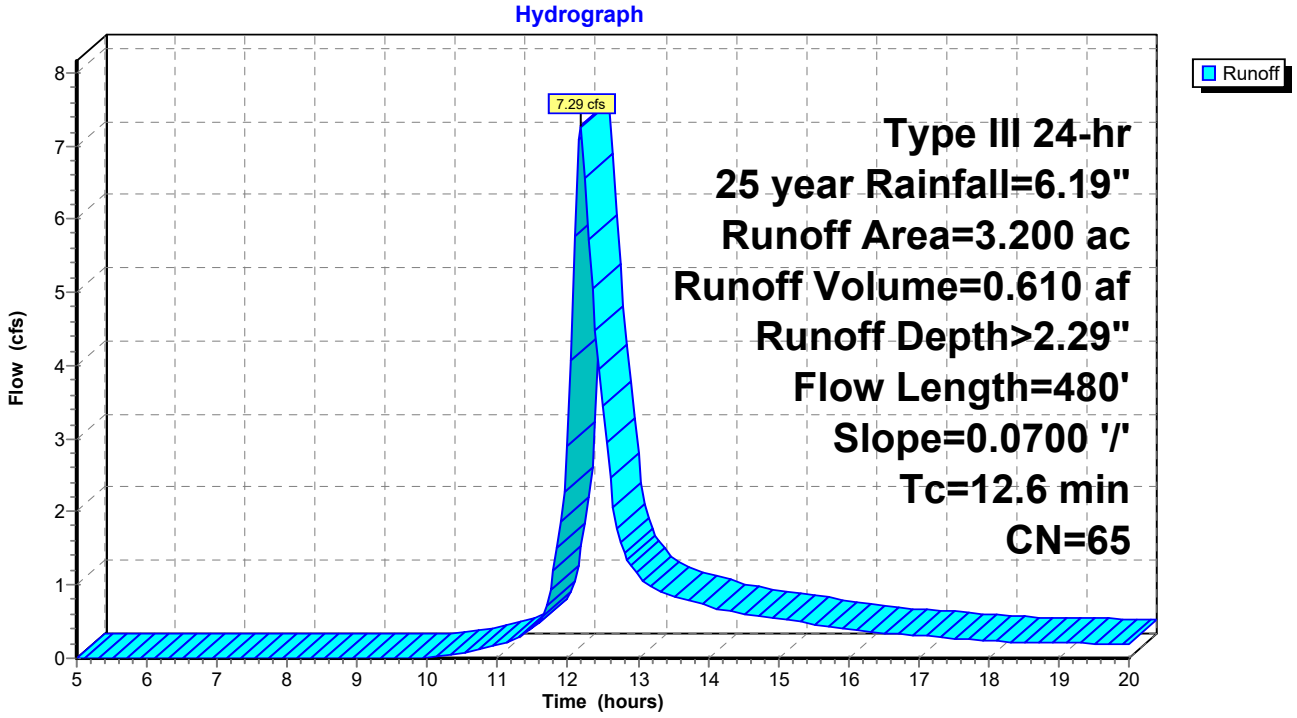
Runoff = 7.29 cfs @ 12.18 hrs, Volume= 0.610 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

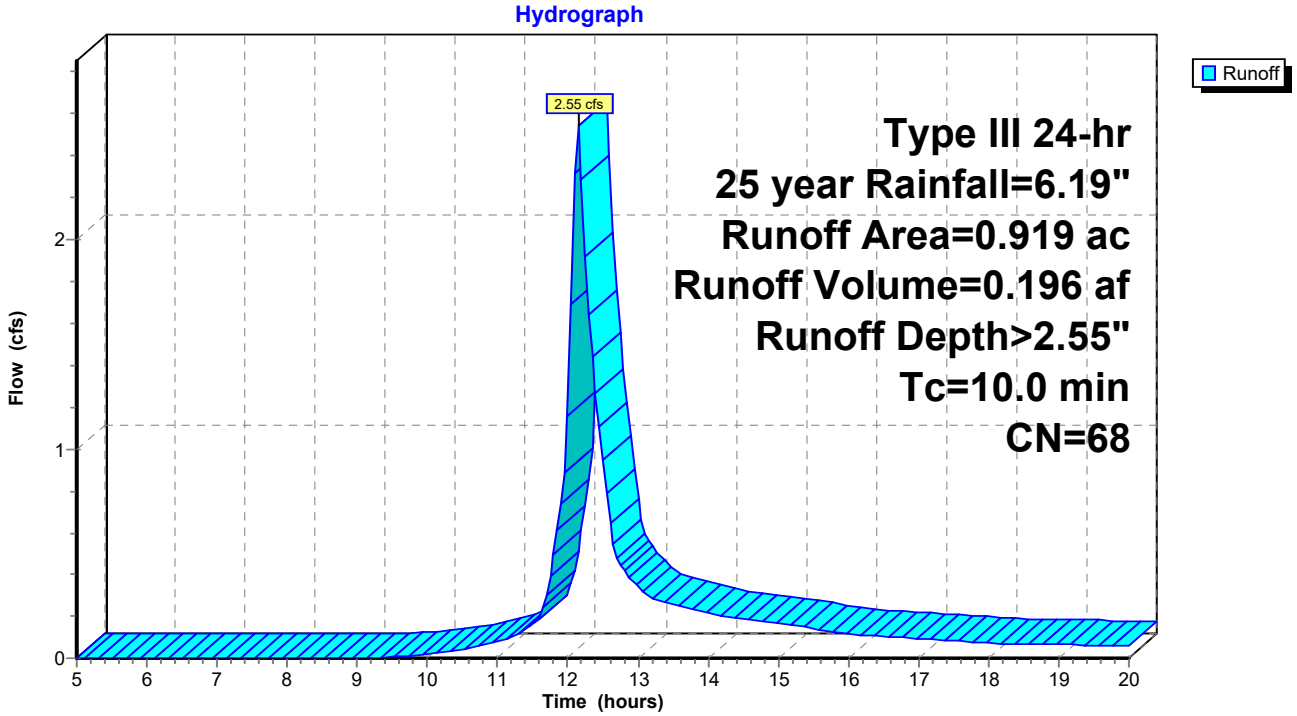
Runoff = 2.55 cfs @ 12.15 hrs, Volume= 0.196 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

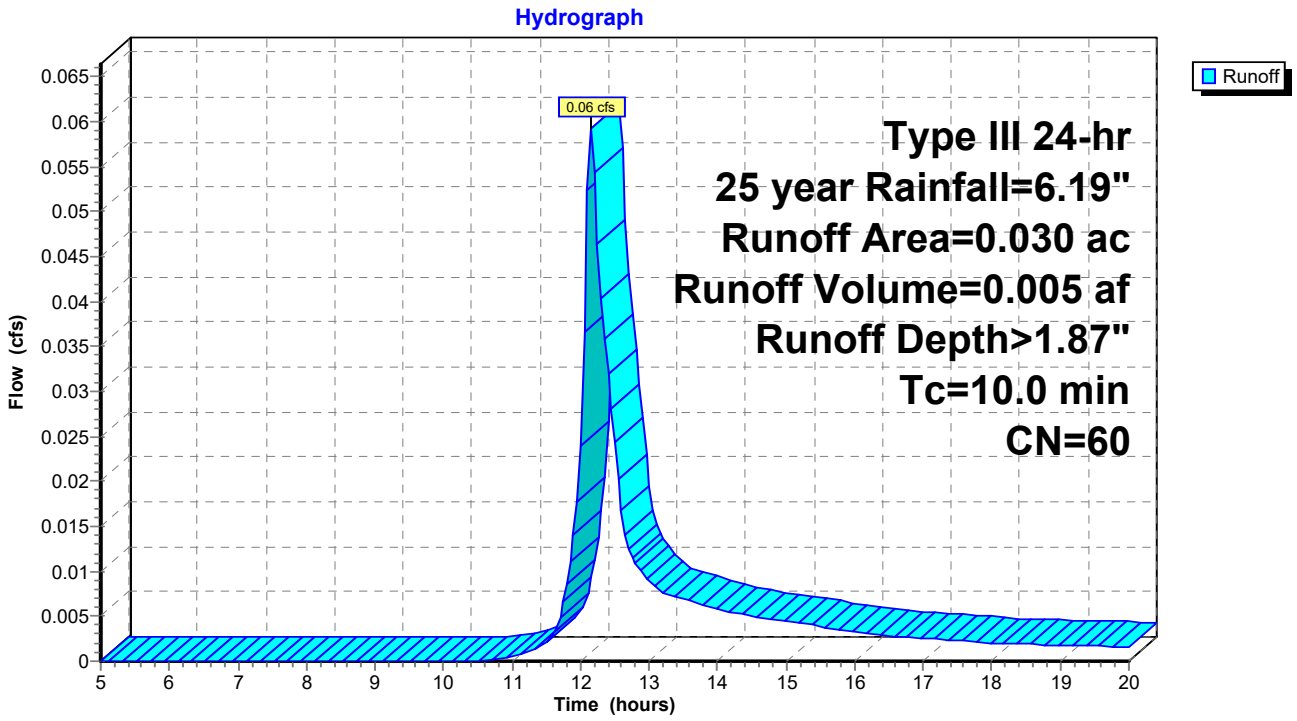
Runoff = 0.06 cfs @ 12.15 hrs, Volume= 0.005 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

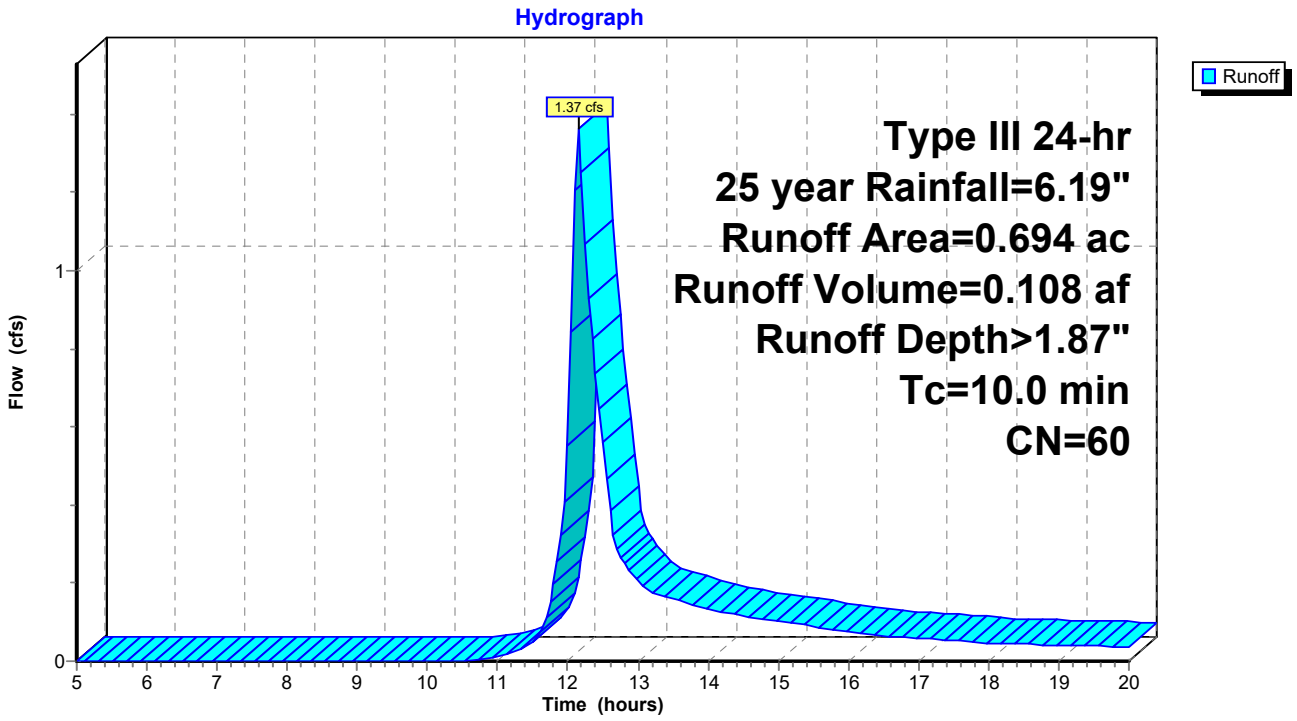
Runoff = 1.37 cfs @ 12.15 hrs, Volume= 0.108 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

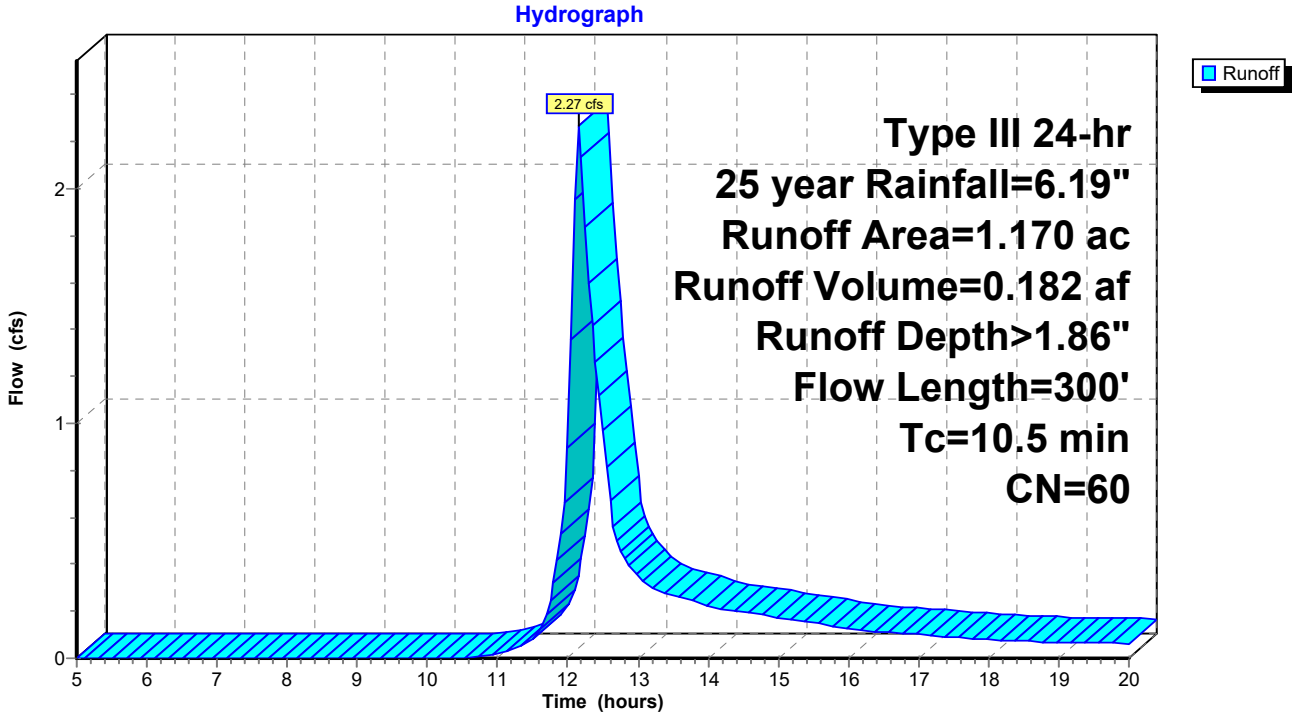
Runoff = 2.27 cfs @ 12.16 hrs, Volume= 0.182 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

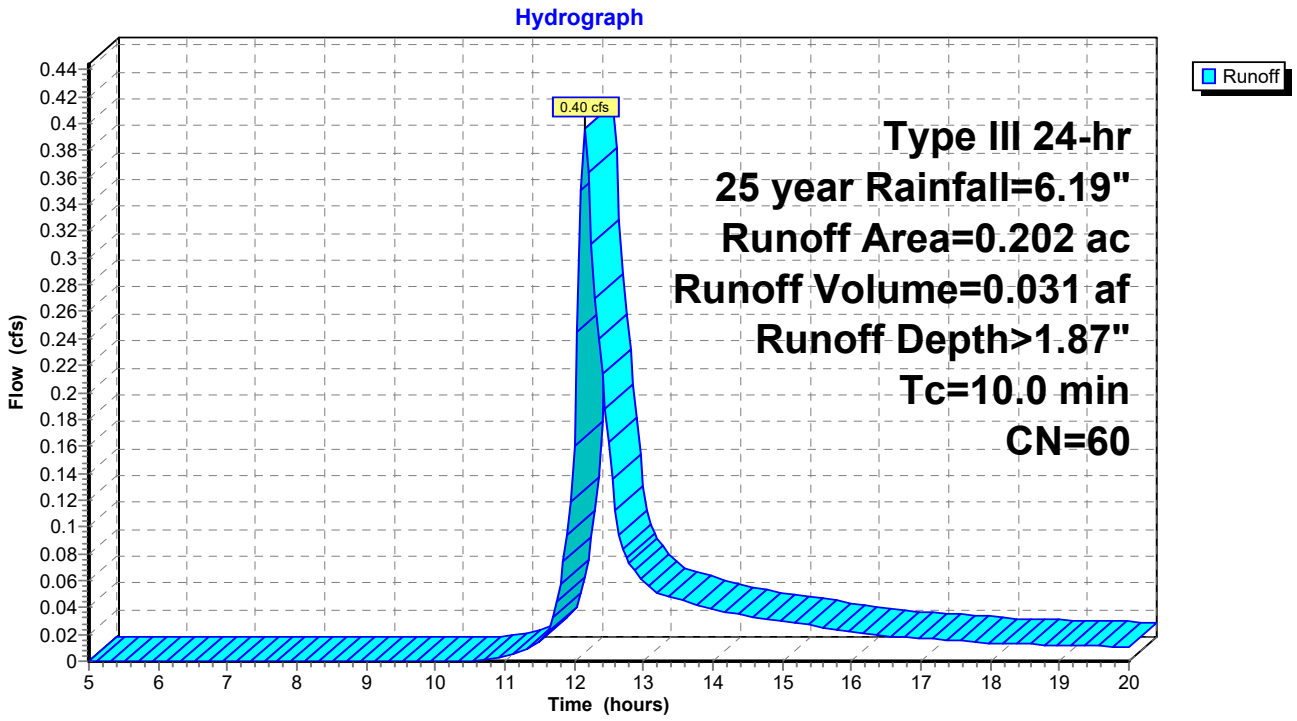
Runoff = 0.40 cfs @ 12.15 hrs, Volume= 0.031 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

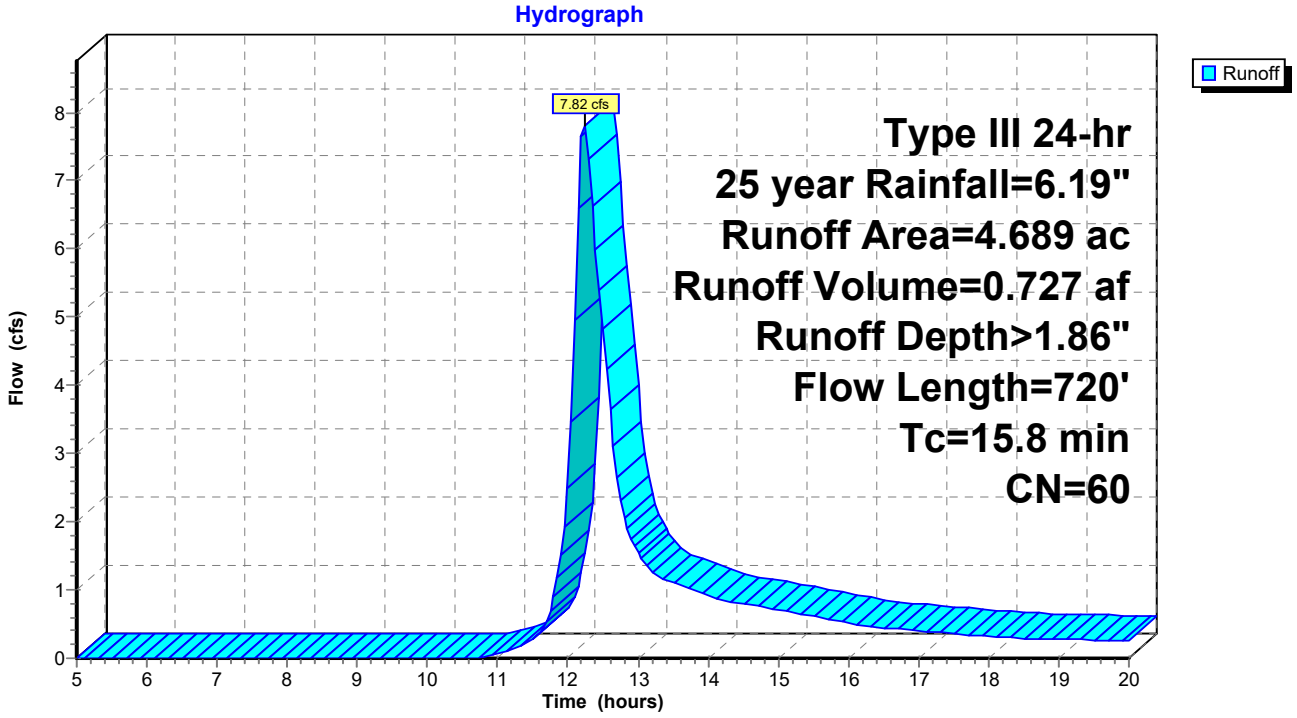
Runoff = 7.82 cfs @ 12.24 hrs, Volume= 0.727 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

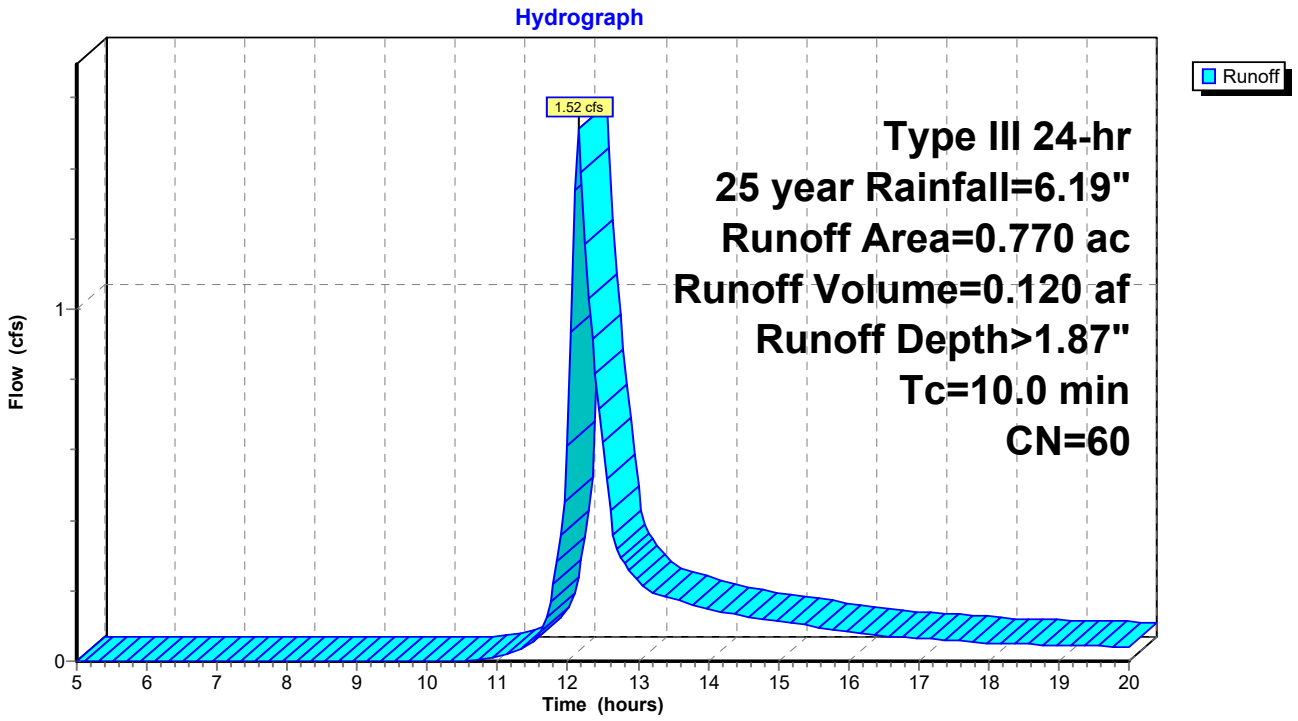
Runoff = 1.52 cfs @ 12.15 hrs, Volume= 0.120 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

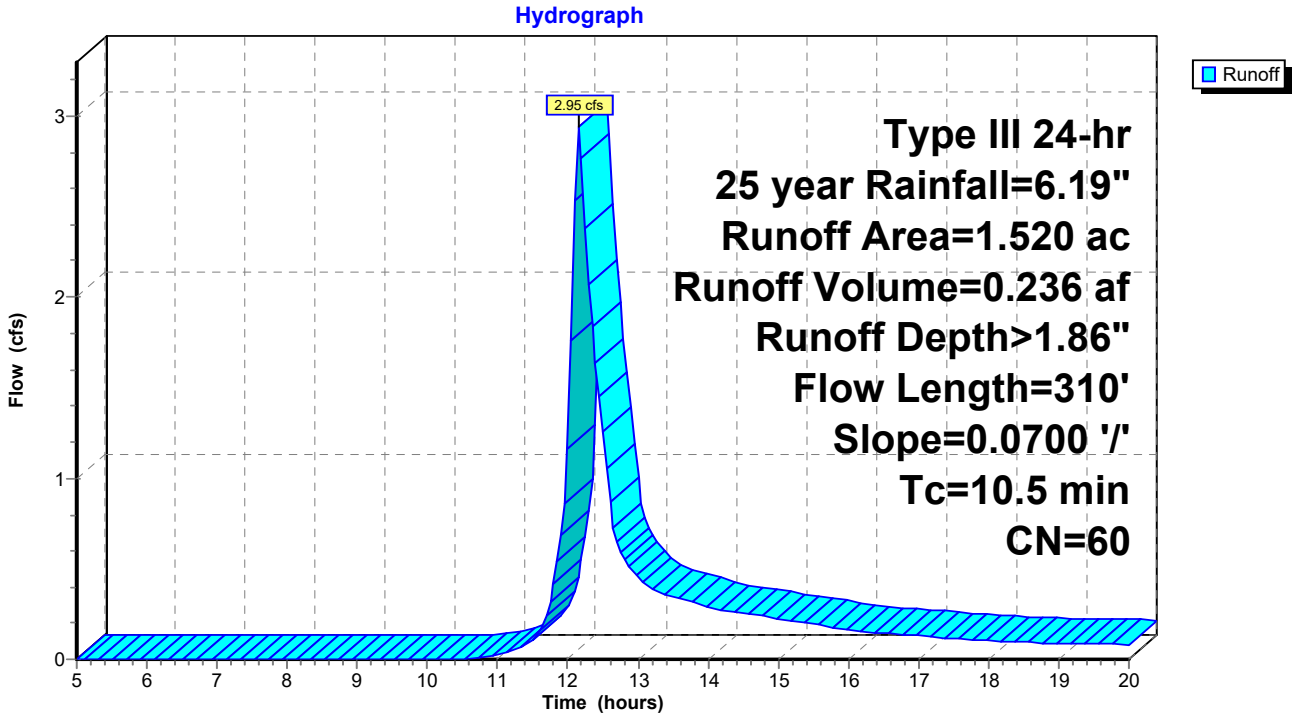
Runoff = 2.95 cfs @ 12.16 hrs, Volume= 0.236 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

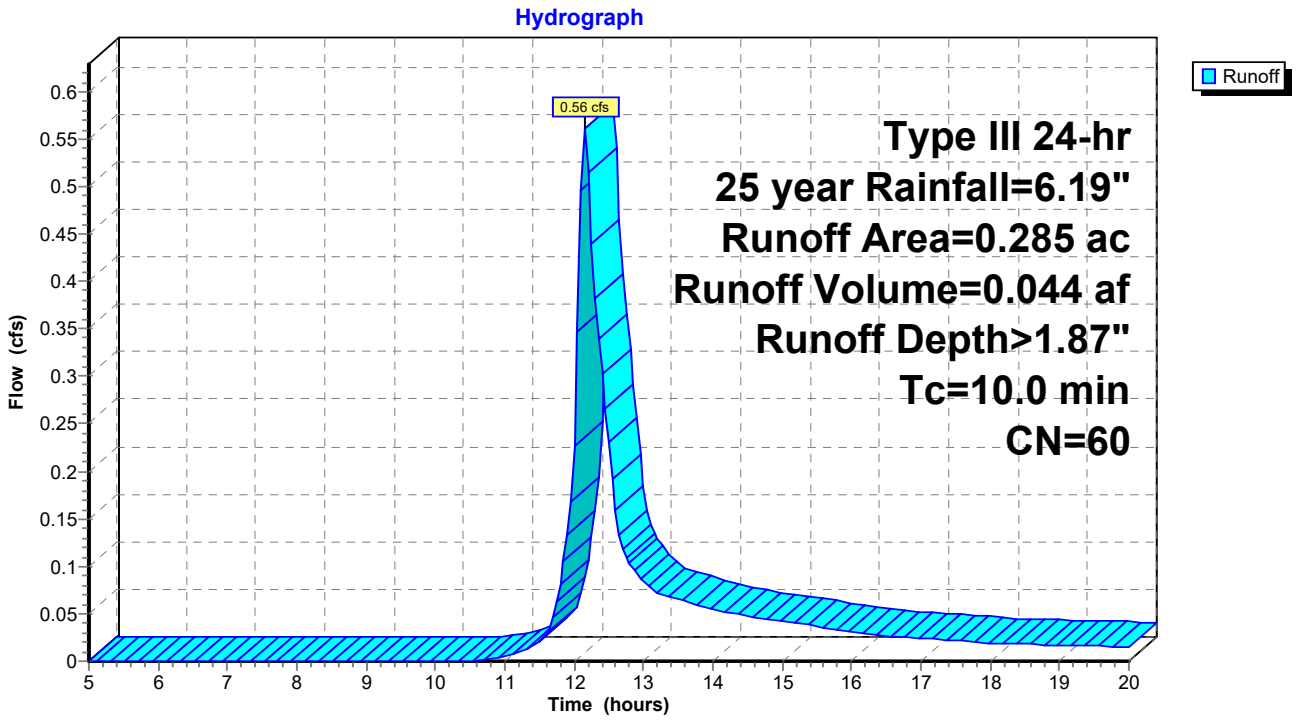
Runoff = 0.56 cfs @ 12.15 hrs, Volume= 0.044 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

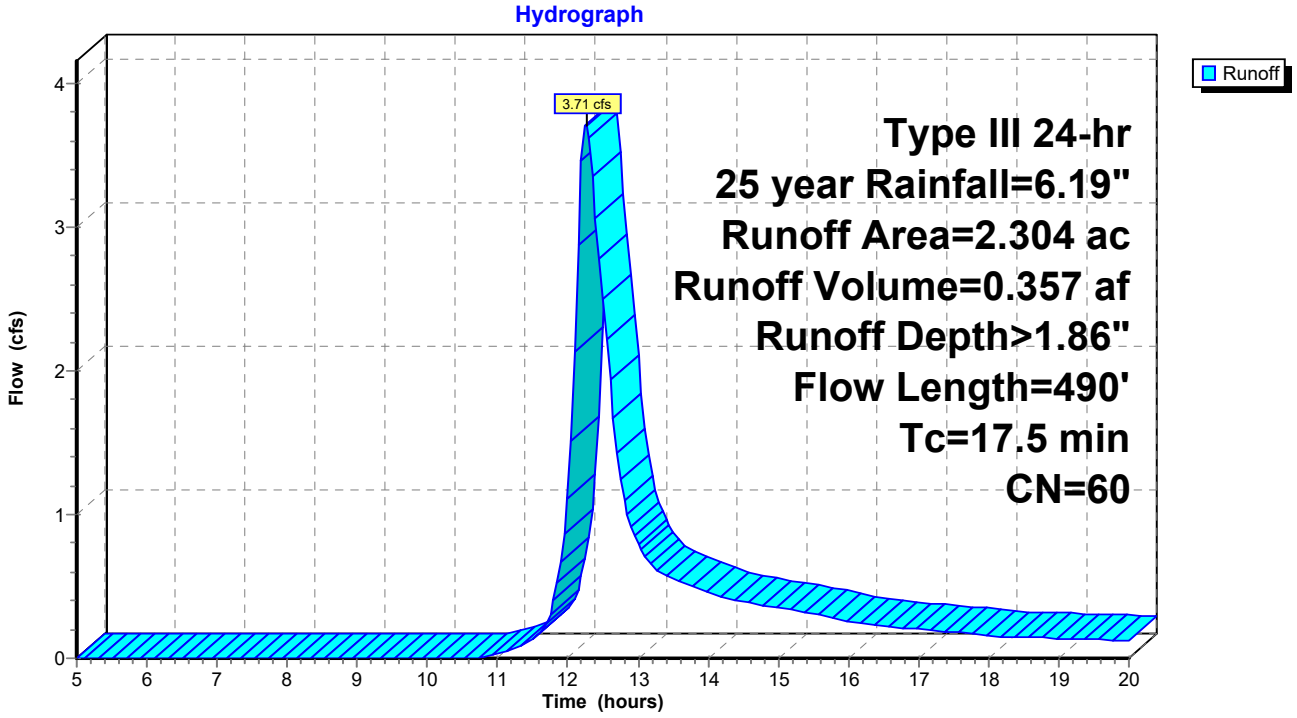
Runoff = 3.71 cfs @ 12.26 hrs, Volume= 0.357 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

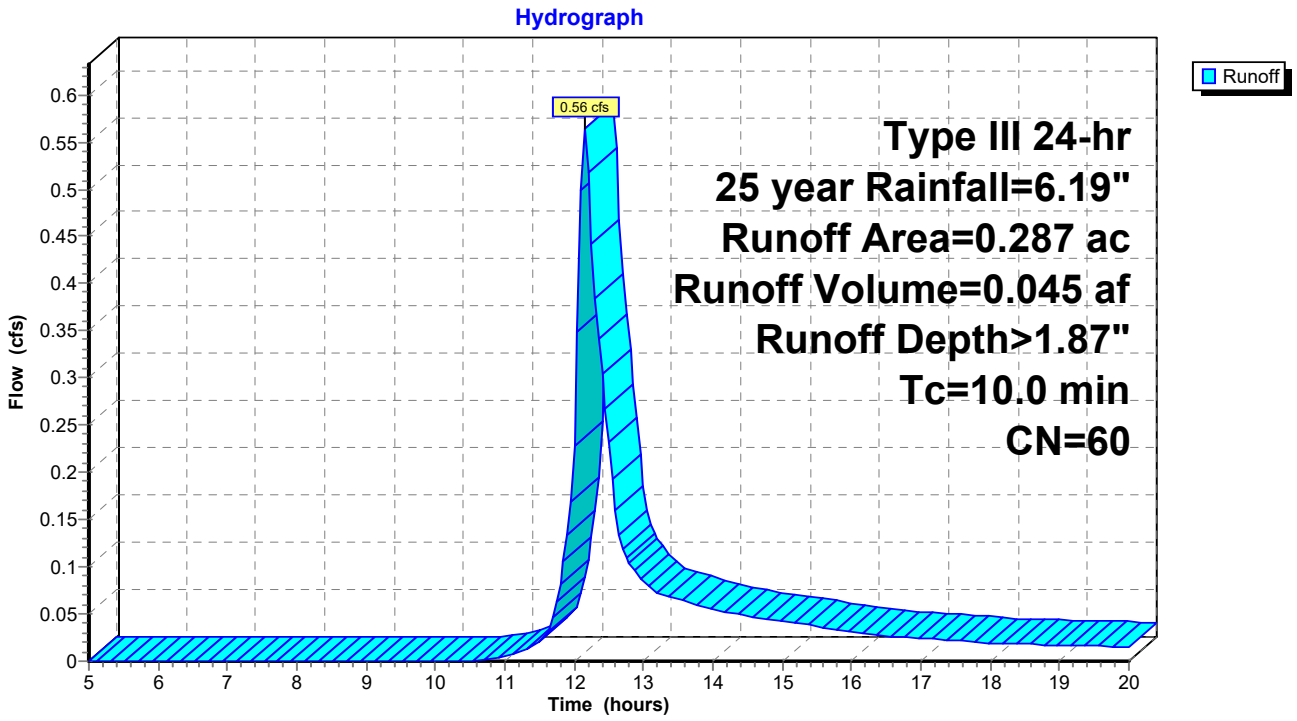
Runoff = 0.56 cfs @ 12.15 hrs, Volume= 0.045 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

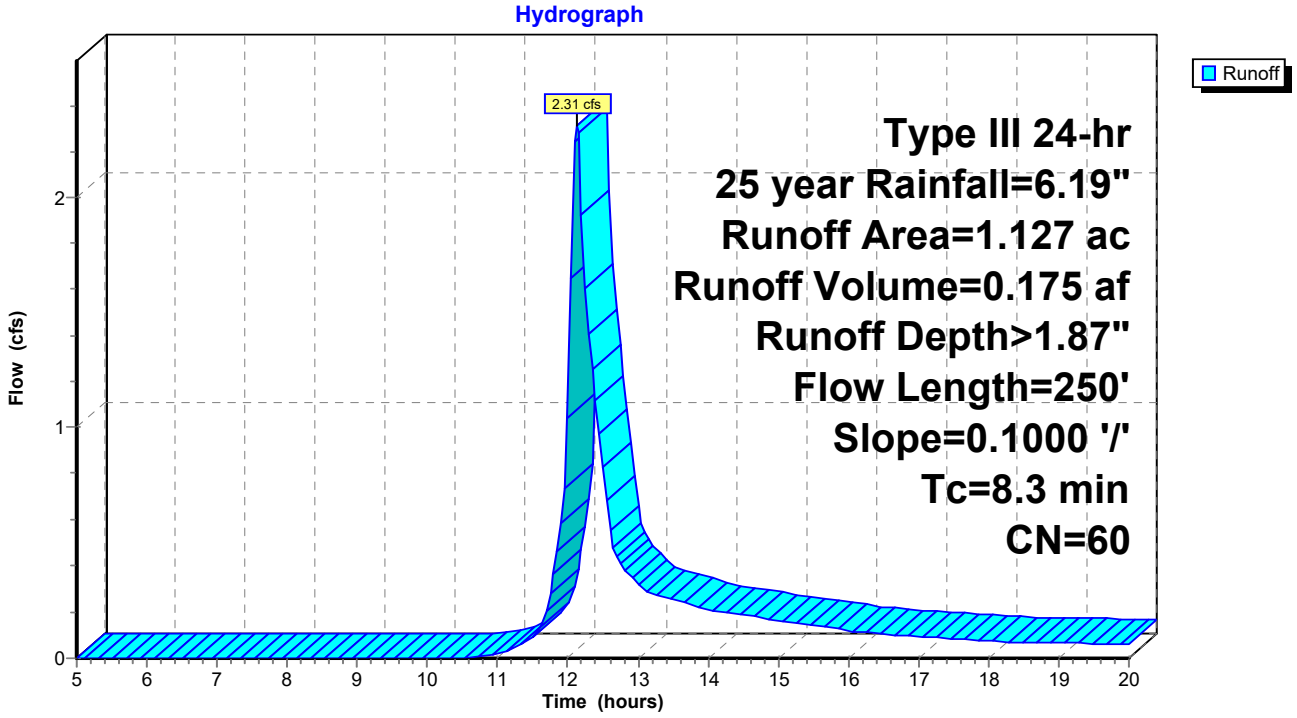
Runoff = 2.31 cfs @ 12.13 hrs, Volume= 0.175 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

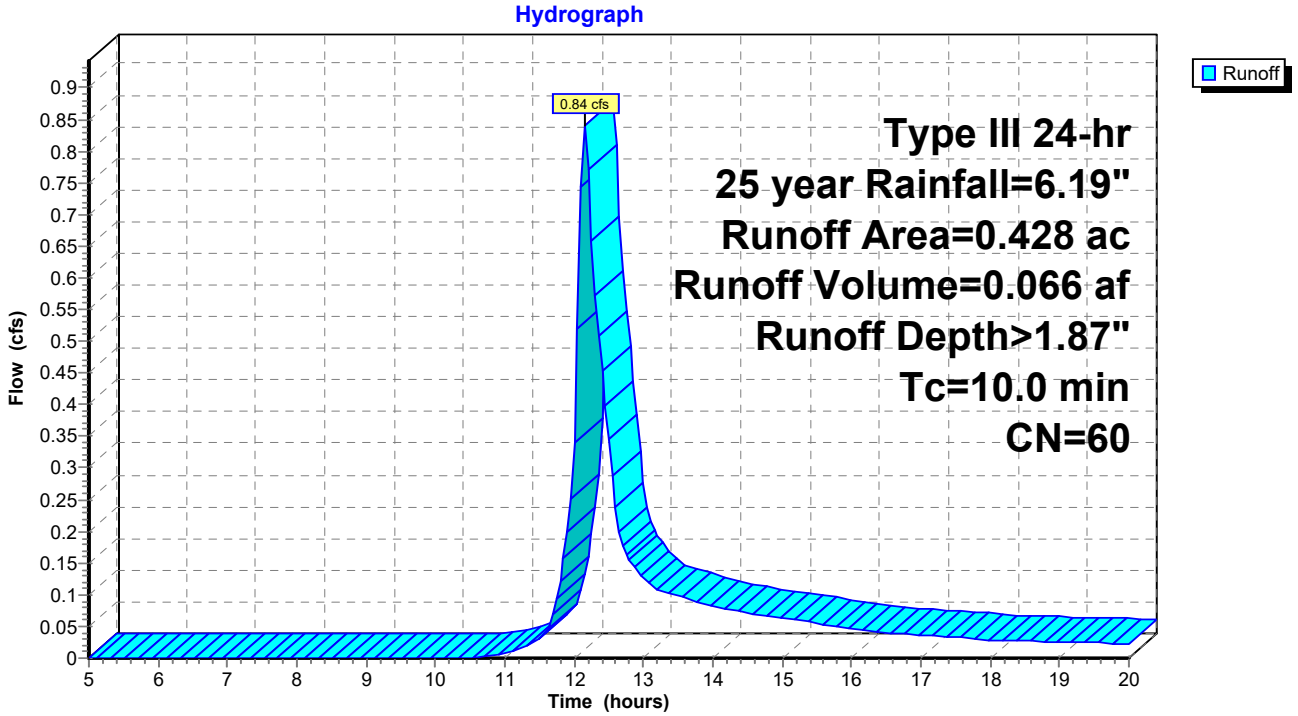
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 0.066 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

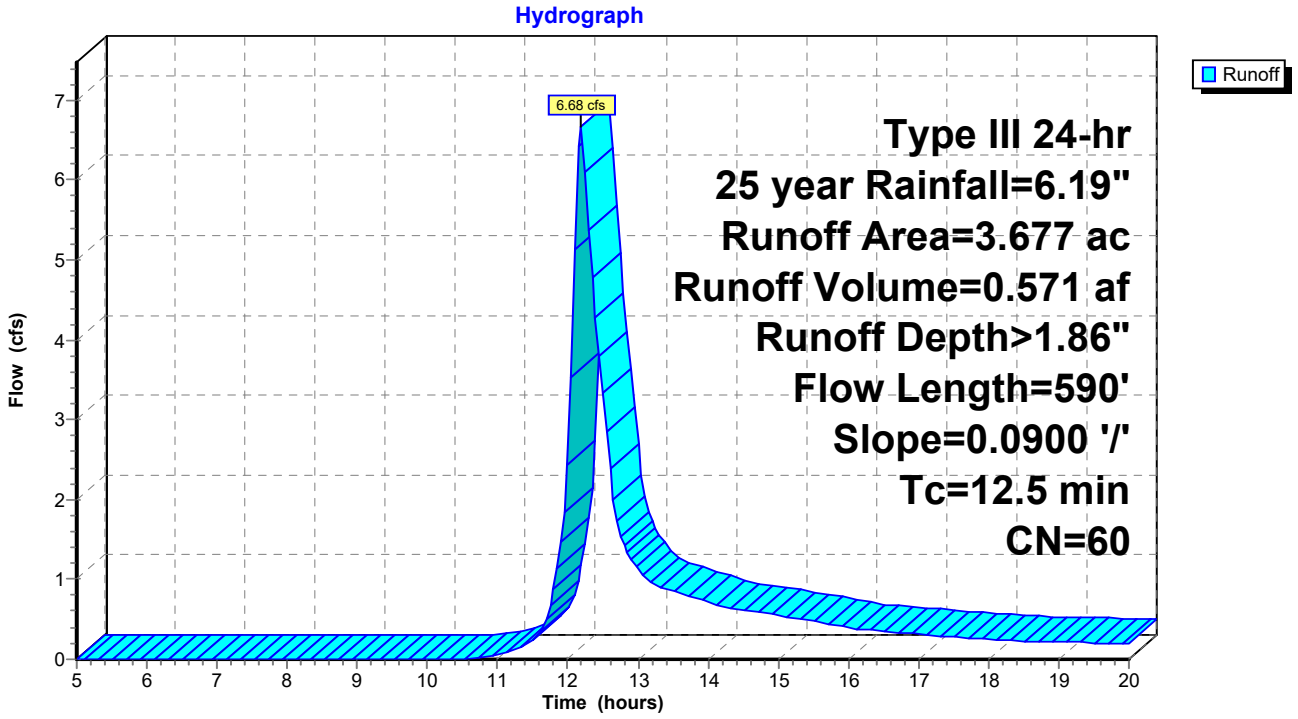
Runoff = 6.68 cfs @ 12.19 hrs, Volume= 0.571 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

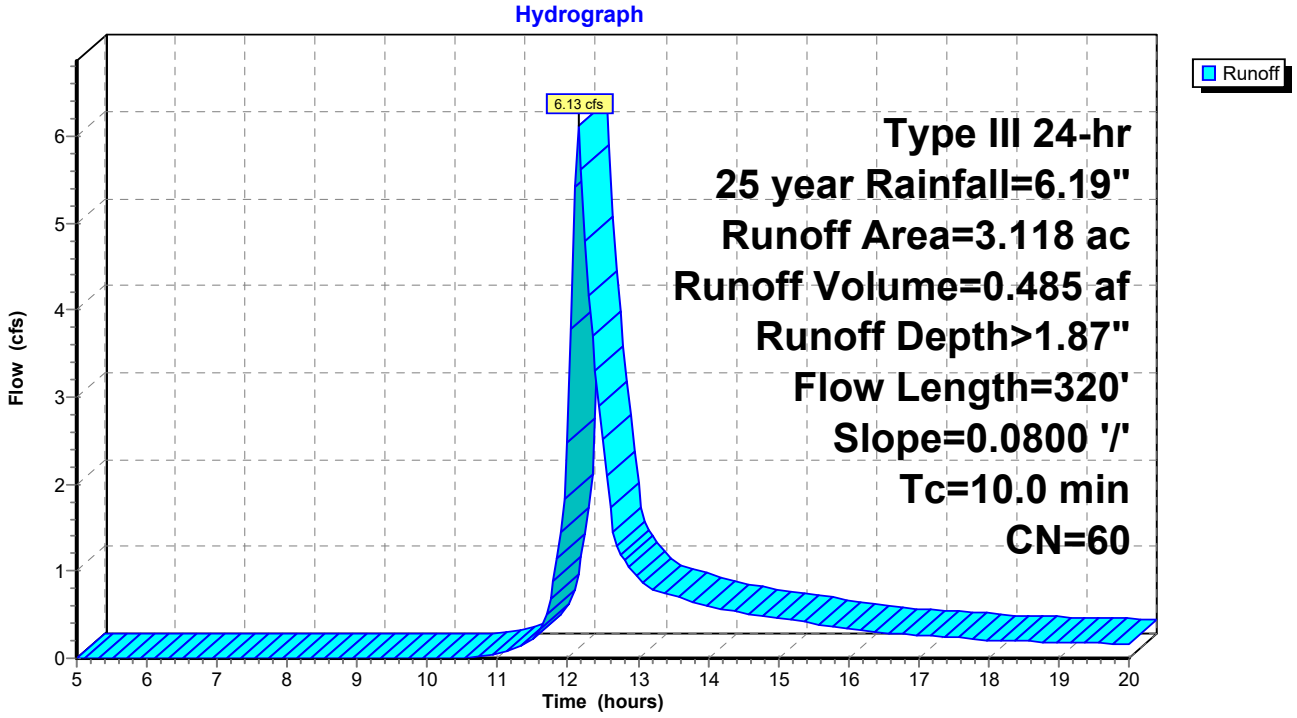
Runoff = 6.13 cfs @ 12.15 hrs, Volume= 0.485 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

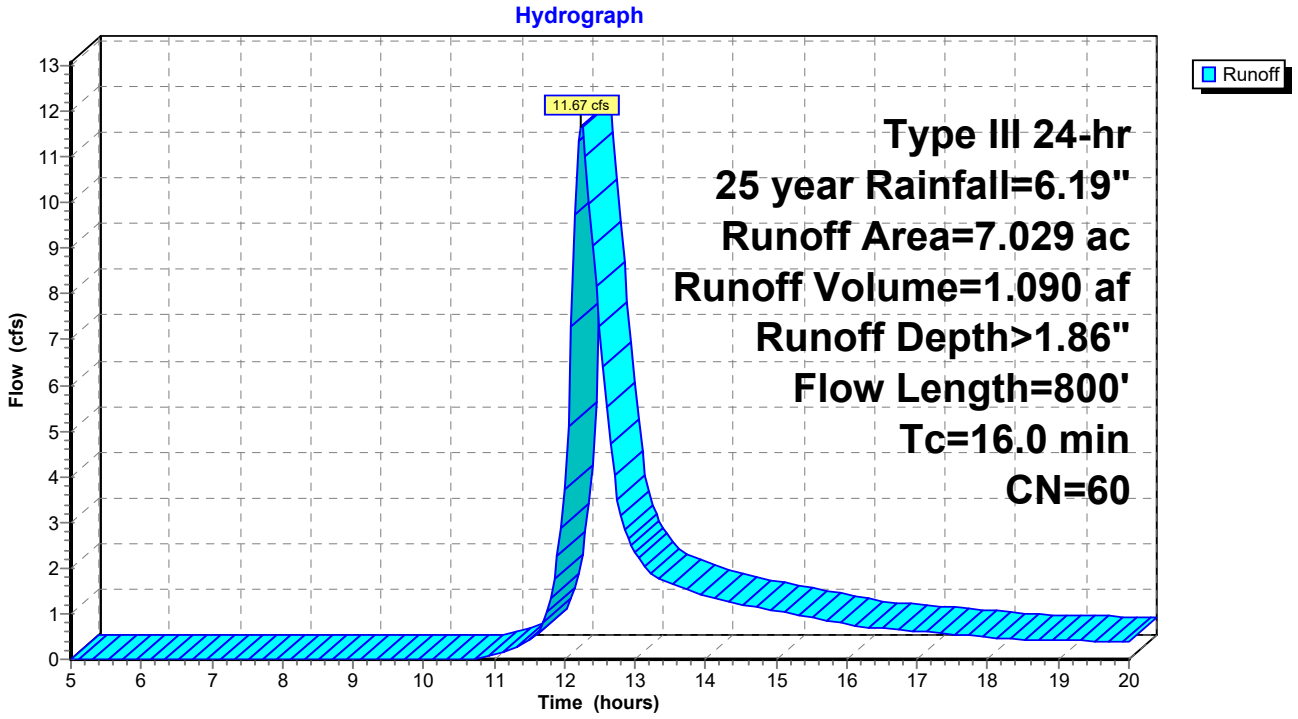
Runoff = 11.67 cfs @ 12.24 hrs, Volume= 1.090 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

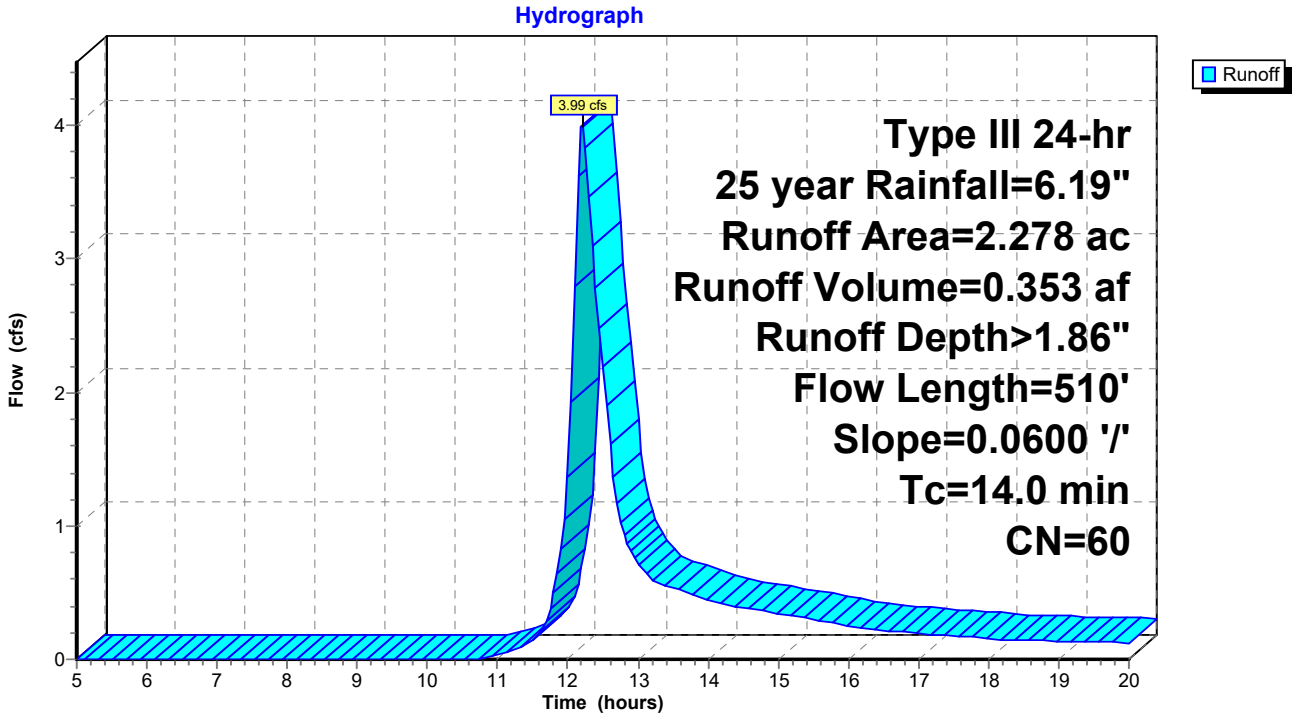
Runoff = 3.99 cfs @ 12.21 hrs, Volume= 0.353 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

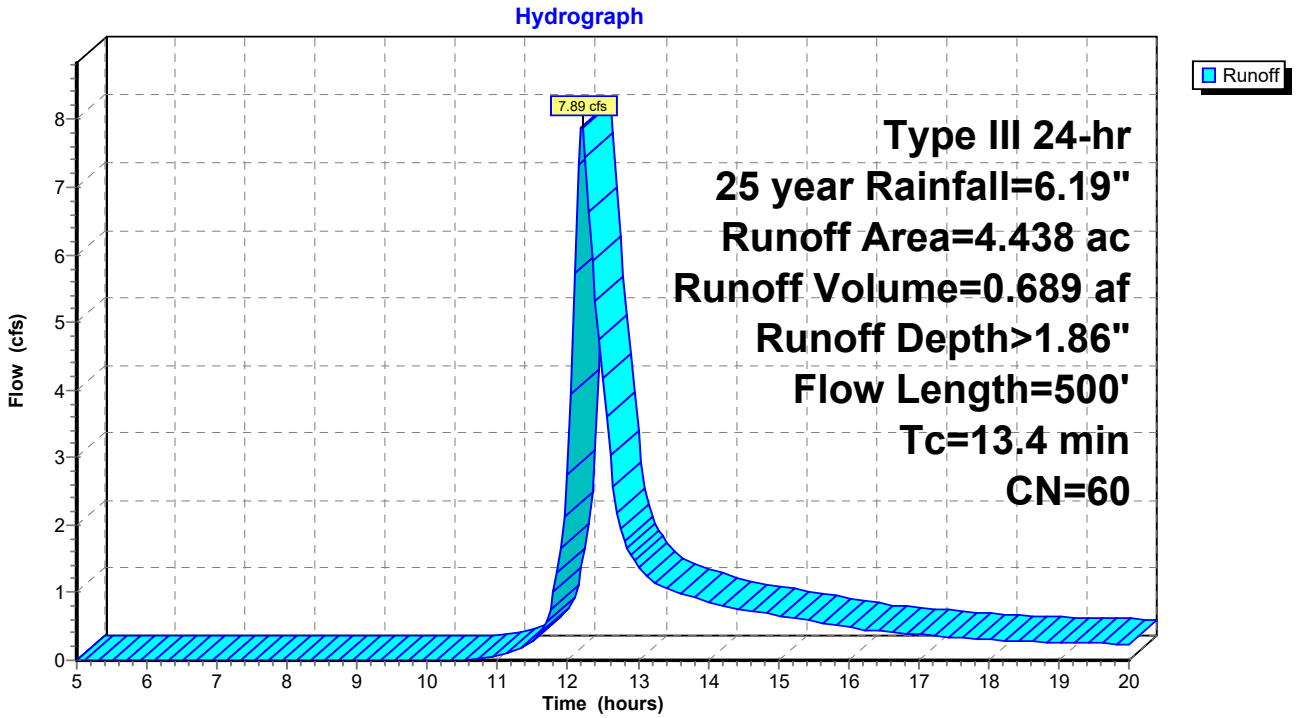
Runoff = 7.89 cfs @ 12.20 hrs, Volume= 0.689 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

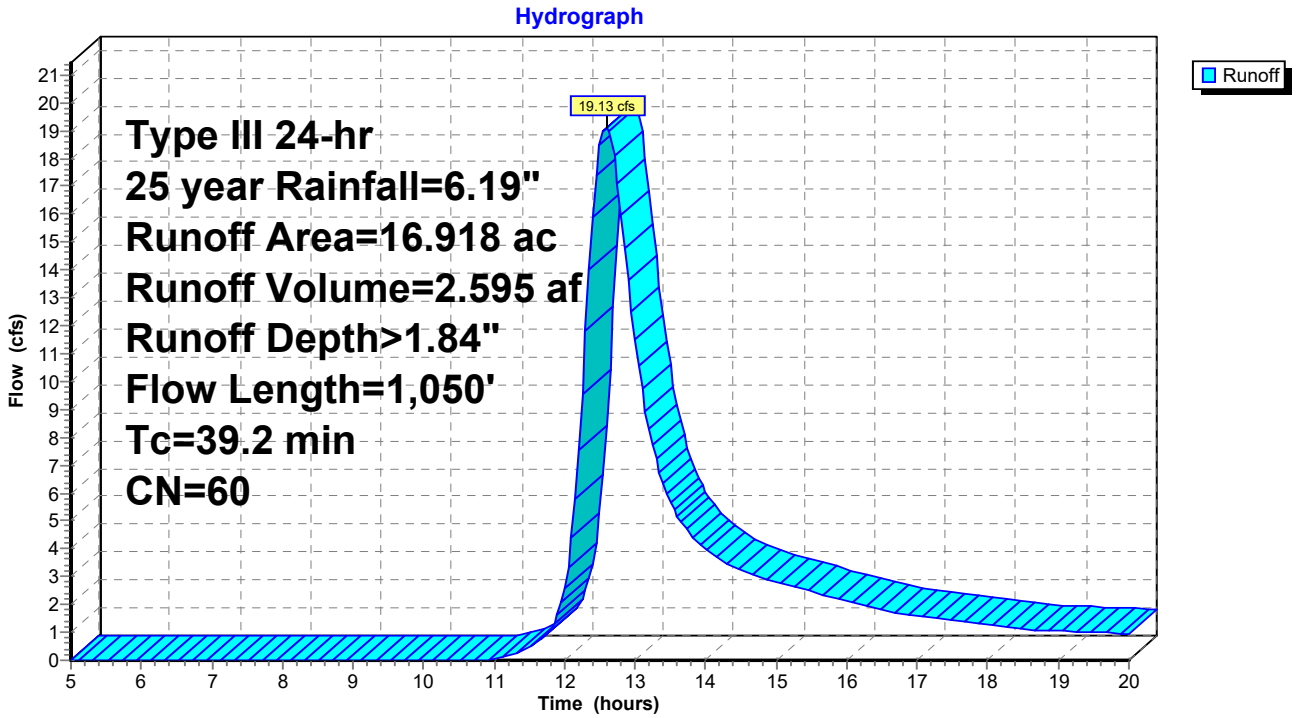
Runoff = 19.13 cfs @ 12.59 hrs, Volume= 2.595 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

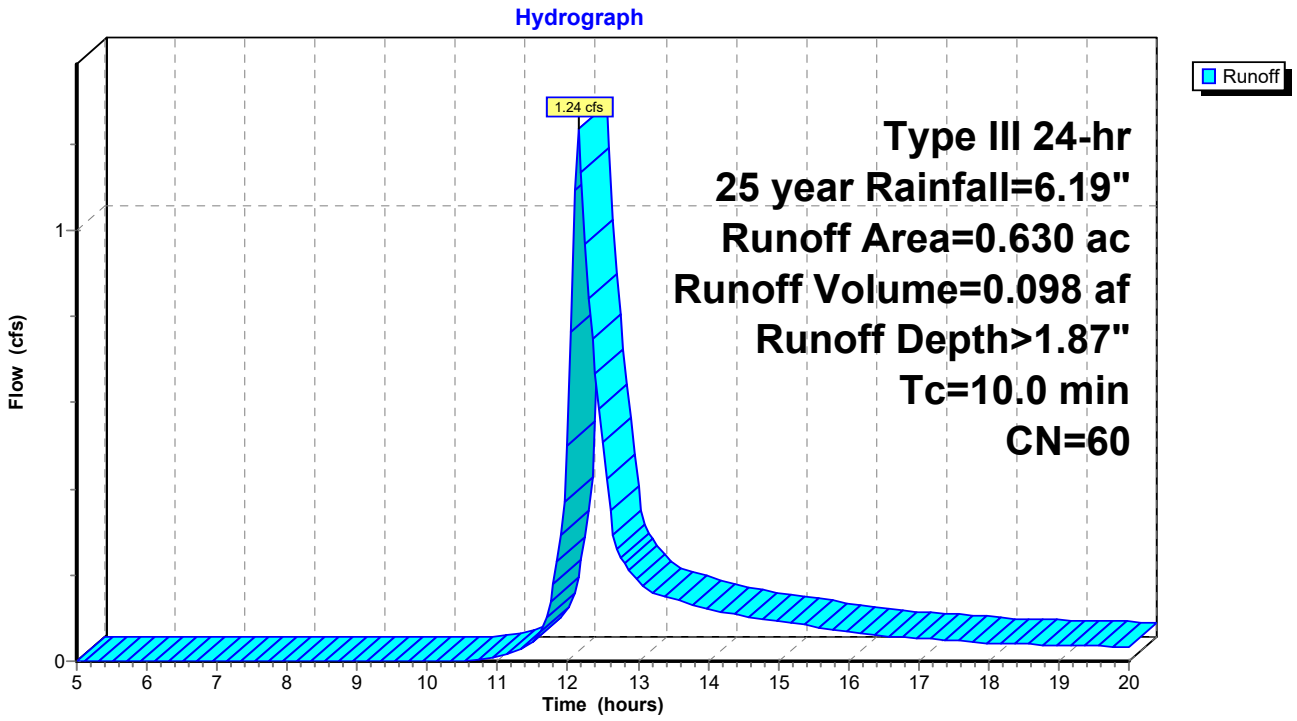
Runoff = 1.24 cfs @ 12.15 hrs, Volume= 0.098 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.12'
[55] Hint: Peak inflow is 340% of Manning's capacity
[81] Warning: Exceeded Pond 13.1P by 0.06' @ 12.55 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 1.50" for 25 year event
Inflow = 3.24 cfs @ 12.41 hrs, Volume= 0.390 af
Outflow = 3.15 cfs @ 12.53 hrs, Volume= 0.388 af, Atten= 3%, Lag= 7.3 min

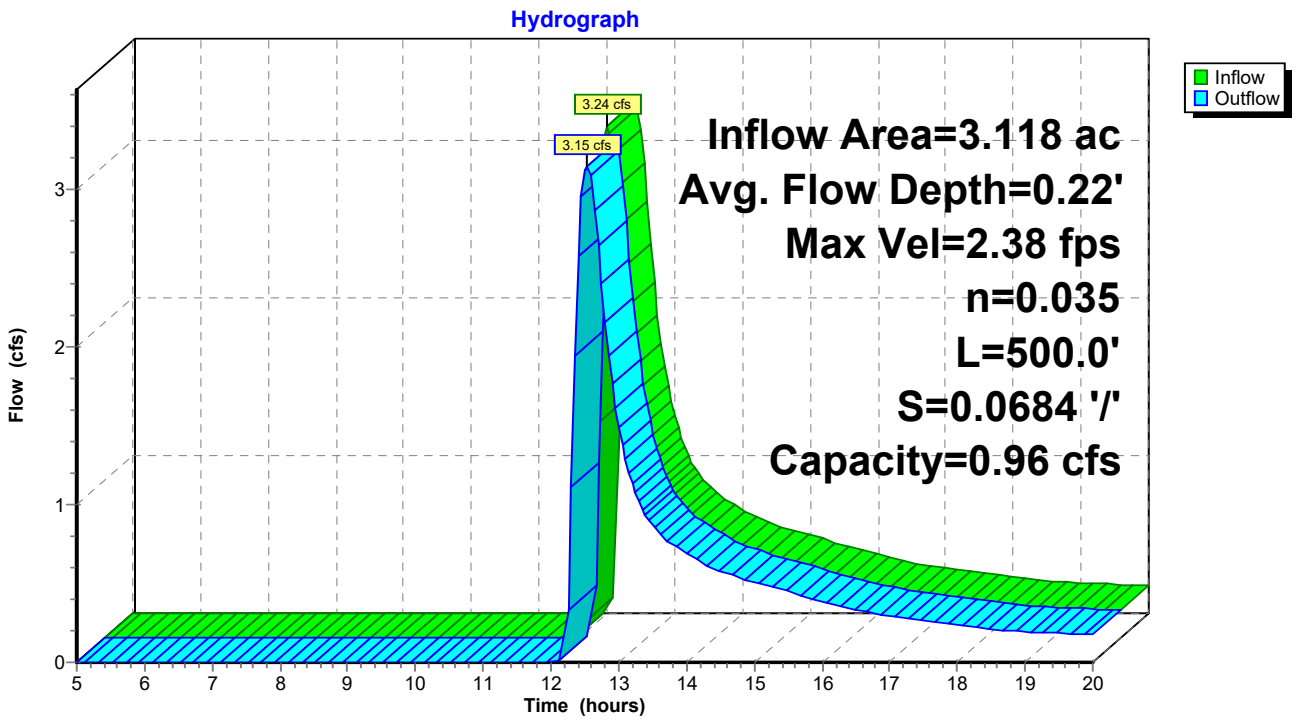
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.38 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 5.5 min

Peak Storage= 665 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 1.87" for 25 year event
Inflow = 6.13 cfs @ 12.15 hrs, Volume= 0.485 af
Outflow = 3.24 cfs @ 12.41 hrs, Volume= 0.390 af, Atten= 47%, Lag= 15.4 min
Primary = 3.24 cfs @ 12.41 hrs, Volume= 0.390 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.37' @ 12.41 hrs Surf.Area= 16,012 sf Storage= 6,365 cf

Plug-Flow detention time= 89.4 min calculated for 0.390 af (81% of inflow)
Center-of-Mass det. time= 36.4 min (856.8 - 820.5)

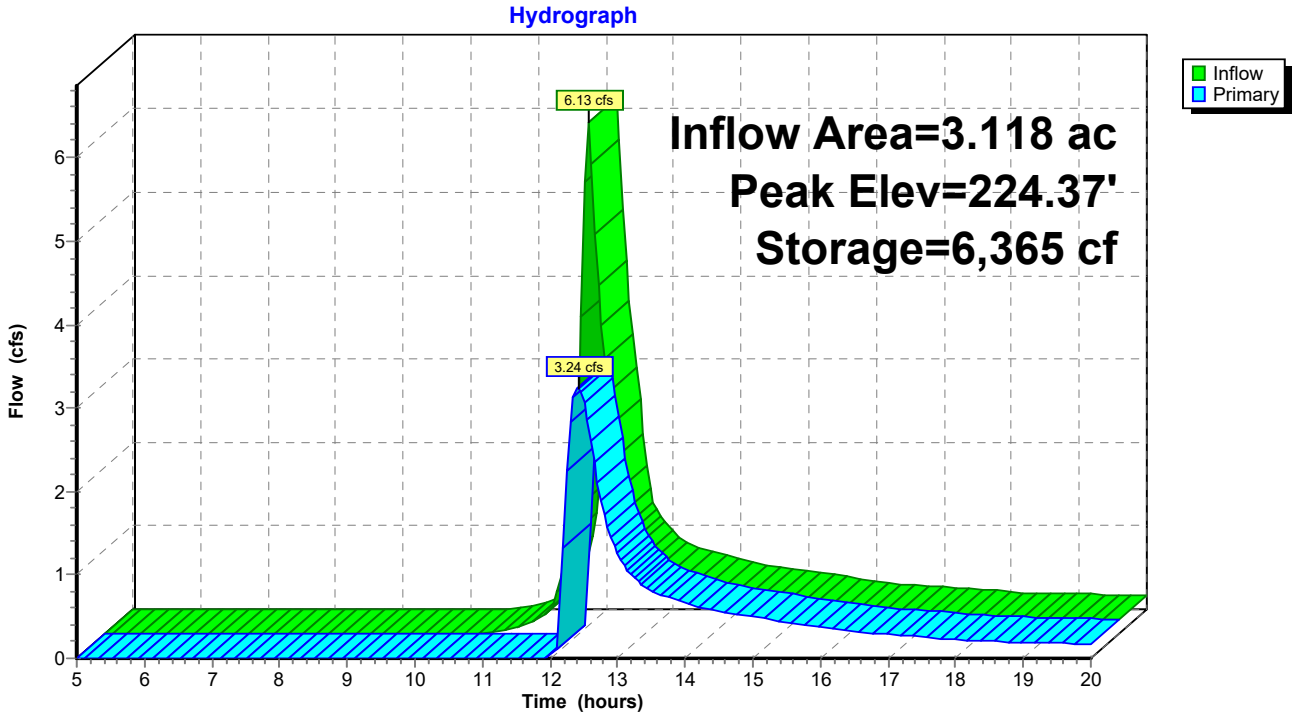
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.23 cfs @ 12.41 hrs HW=224.37' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.23 cfs @ 0.96 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area =	7.029 ac,	0.00% Impervious,	Inflow Depth >	1.86"	for 25 year event
Inflow =	11.67 cfs @	12.24 hrs,	Volume=	1.090 af	
Outflow =	8.50 cfs @	12.44 hrs,	Volume=	0.925 af,	Atten= 27%, Lag= 11.8 min
Discarded =	0.73 cfs @	12.44 hrs,	Volume=	0.423 af	
Primary =	7.77 cfs @	12.44 hrs,	Volume=	0.502 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.35' @ 12.44 hrs Surf.Area= 10,297 sf Storage= 11,993 cf

Plug-Flow detention time= 81.9 min calculated for 0.922 af (85% of inflow)
Center-of-Mass det. time= 38.8 min (863.8 - 825.0)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

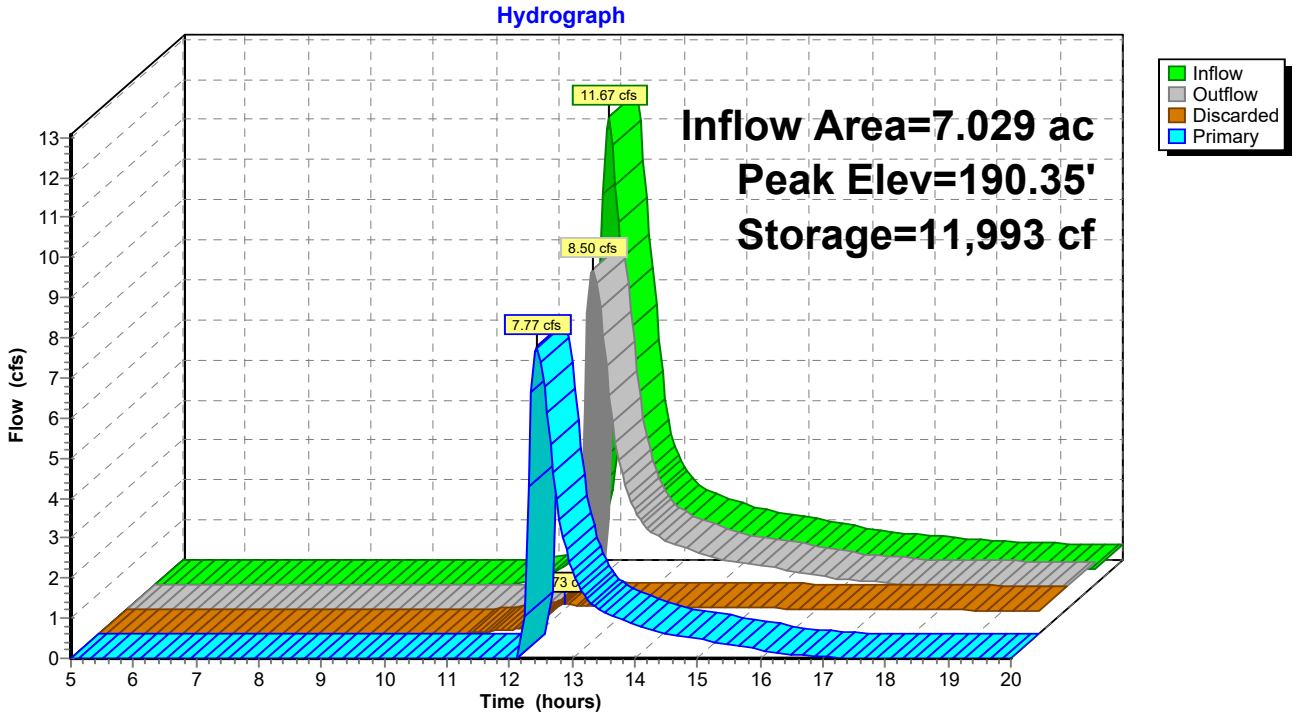
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.73 cfs @ 12.44 hrs HW=190.35' (Free Discharge)
└─**2=Exfiltration** (Controls 0.73 cfs)

Primary OutFlow Max=7.71 cfs @ 12.44 hrs HW=190.35' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 7.71 cfs @ 1.46 fps)

Pond 13.2P: Pond 13.2

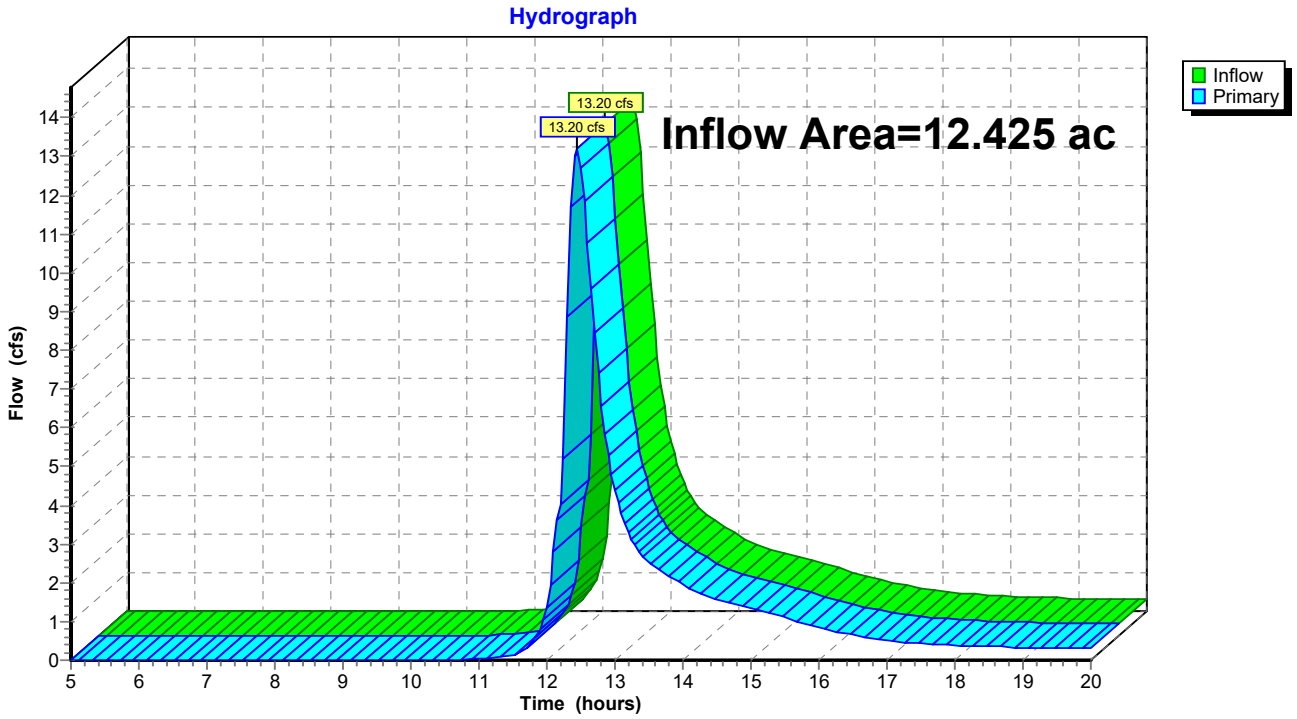


Summary for Link 13: 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 1.20" for 25 year event
Inflow = 13.20 cfs @ 12.44 hrs, Volume= 1.243 af
Primary = 13.20 cfs @ 12.44 hrs, Volume= 1.243 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



50-Year Storm Event- Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=7.01 cfs 0.592 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=440' Tc=18.0 min CN=60 Runoff=5.23 cfs 0.501 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>3.04"
Tc=10.0 min CN=67 Runoff=2.56 cfs 0.196 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=700' Tc=19.2 min CN=60 Runoff=5.08 cfs 0.500 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.17"
Tc=10.0 min CN=78 Runoff=1.45 cfs 0.112 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>2.73"
Flow Length=950' Tc=26.2 min CN=64 Runoff=12.09 cfs 1.334 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=5.79 cfs 0.518 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>2.84"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=9.10 cfs 0.757 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>3.14"
Tc=10.0 min CN=68 Runoff=3.14 cfs 0.240 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.08 cfs 0.006 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.76 cfs 0.137 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=300' Tc=10.5 min CN=60 Runoff=2.92 cfs 0.230 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.51 cfs 0.040 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=720' Tc=15.8 min CN=60 Runoff=10.07 cfs 0.922 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.95 cfs 0.152 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=3.80 cfs 0.300 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.72 cfs 0.056 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=490' Tc=17.5 min CN=60 Runoff=4.78 cfs 0.453 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=0.73 cfs 0.057 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>2.37"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=2.98 cfs 0.222 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.08 cfs 0.084 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=8.60 cfs 0.724 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=7.89 cfs 0.614 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=800' Tc=16.0 min CN=60 Runoff=15.03 cfs 1.382 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=5.14 cfs 0.448 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>2.36"
Flow Length=500' Tc=13.4 min CN=60 Runoff=10.16 cfs 0.873 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>2.34"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=24.60 cfs 3.292 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>2.36"
Tc=10.0 min CN=60 Runoff=1.60 cfs 0.124 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.31' Max Vel=2.46 fps Inflow=4.93 cfs 0.519 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=4.76 cfs 0.516 af

Pond 13.1P: Pond 13.1 Peak Elev=224.42' Storage=7,225 cf Inflow=7.89 cfs 0.614 af
Outflow=4.93 cfs 0.519 af

Pond 13.2P: Pond 13.2 Peak Elev=190.46' Storage=13,071 cf Inflow=15.03 cfs 1.382 af
Discarded=0.76 cfs 0.440 af Primary=11.81 cfs 0.761 af Outflow=12.57 cfs 1.201 af

Link 13: 13 Inflow=19.91 cfs 1.726 af
Primary=19.91 cfs 1.726 af

Total Runoff Area = 73.426 ac Runoff Volume = 14.866 af Average Runoff Depth = 2.43"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

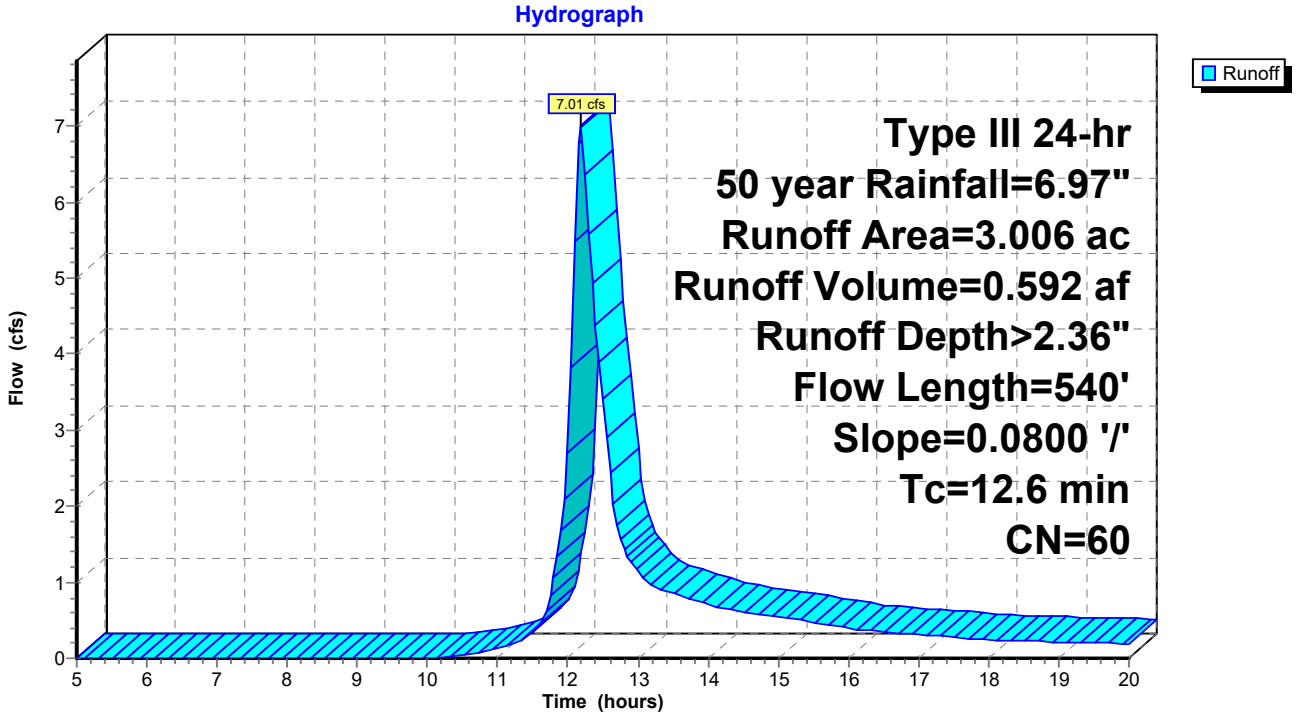
Runoff = 7.01 cfs @ 12.19 hrs, Volume= 0.592 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

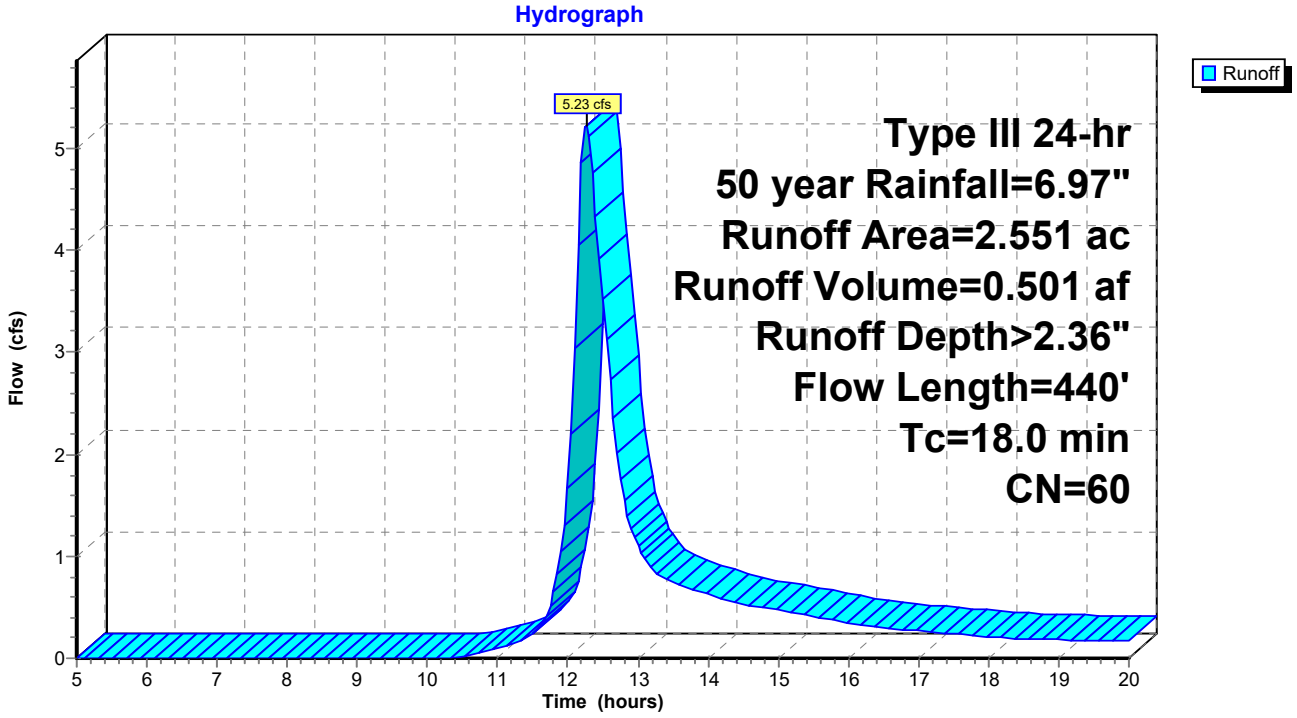
Runoff = 5.23 cfs @ 12.26 hrs, Volume= 0.501 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

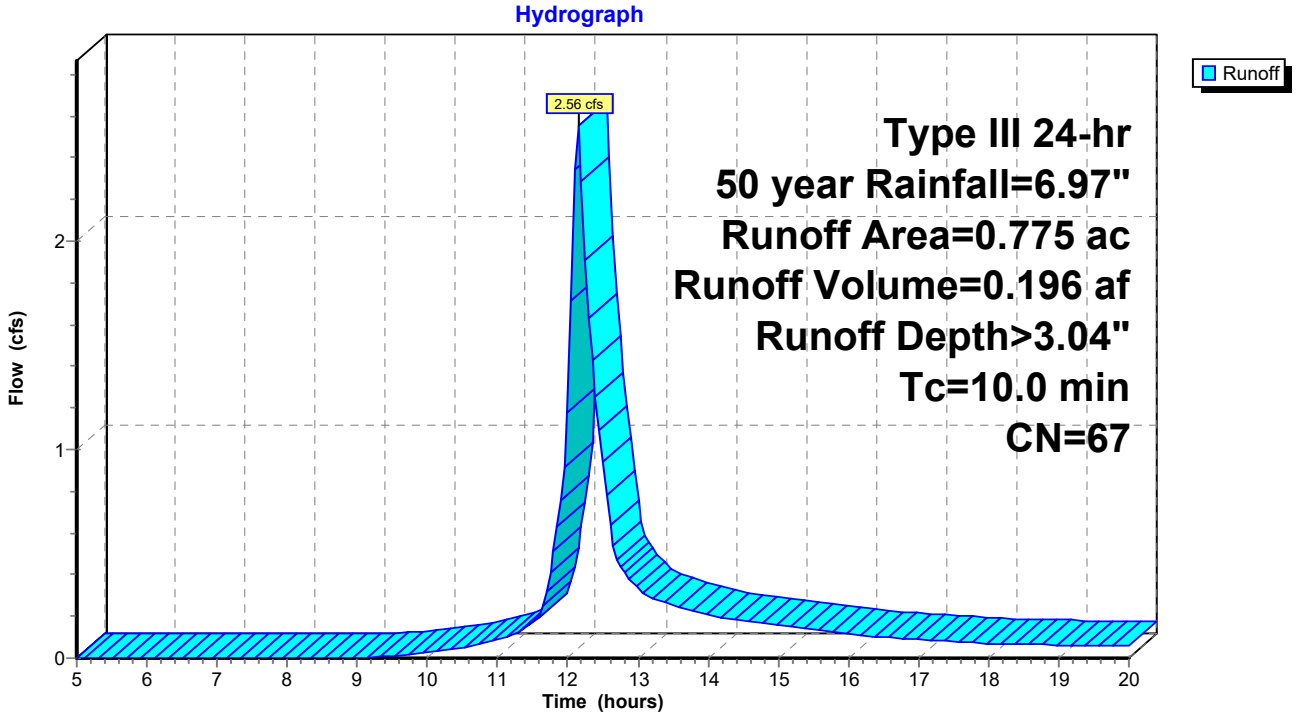
Runoff = 2.56 cfs @ 12.15 hrs, Volume= 0.196 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

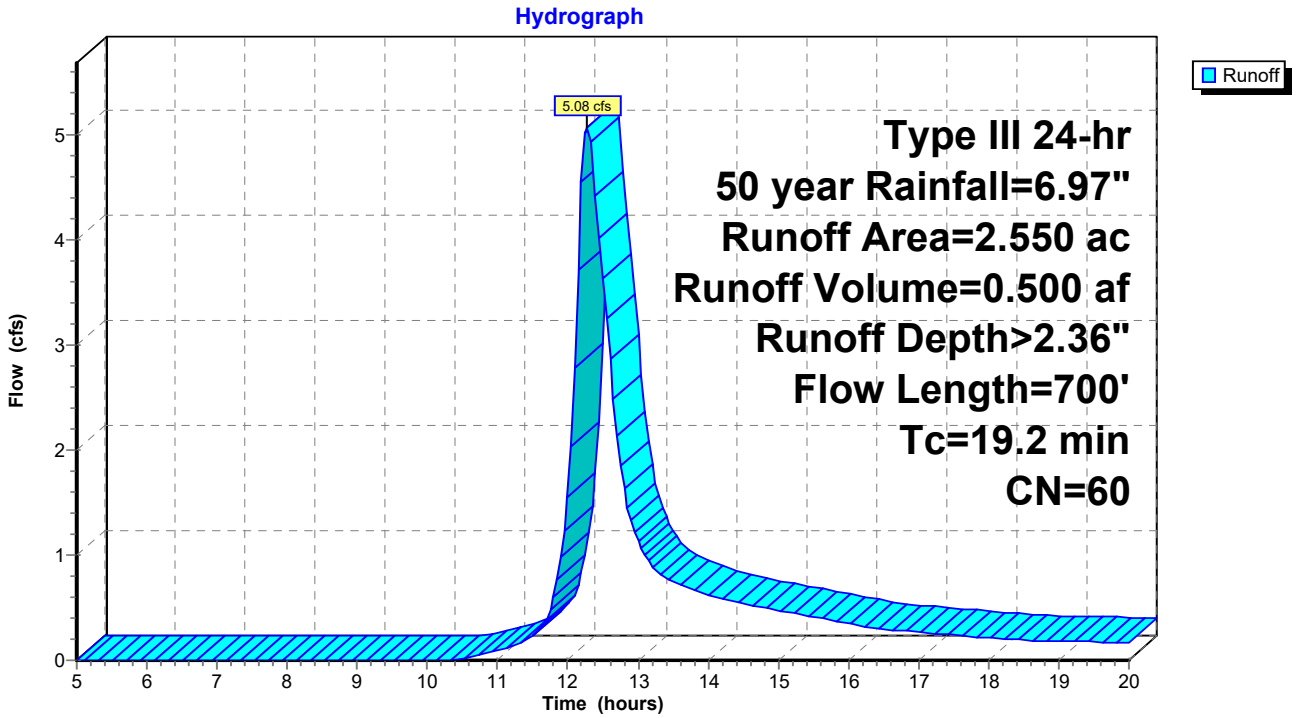
Runoff = 5.08 cfs @ 12.28 hrs, Volume= 0.500 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

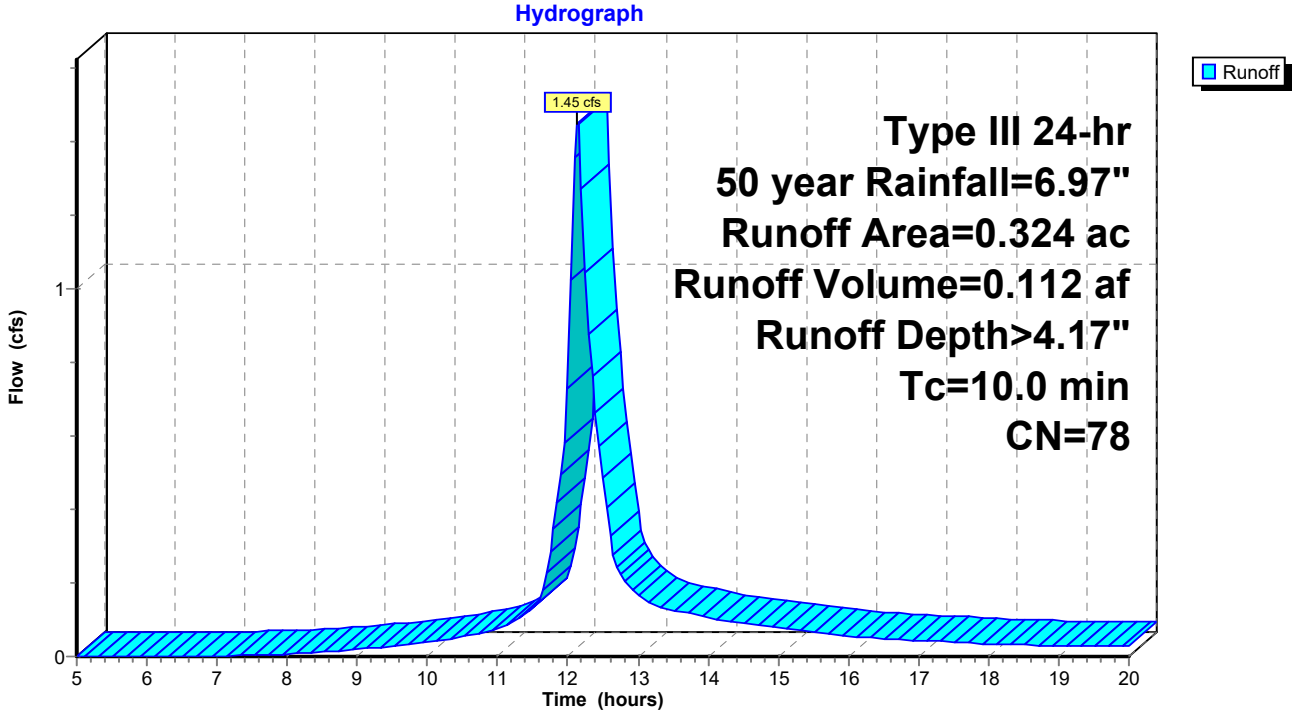
Runoff = 1.45 cfs @ 12.14 hrs, Volume= 0.112 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

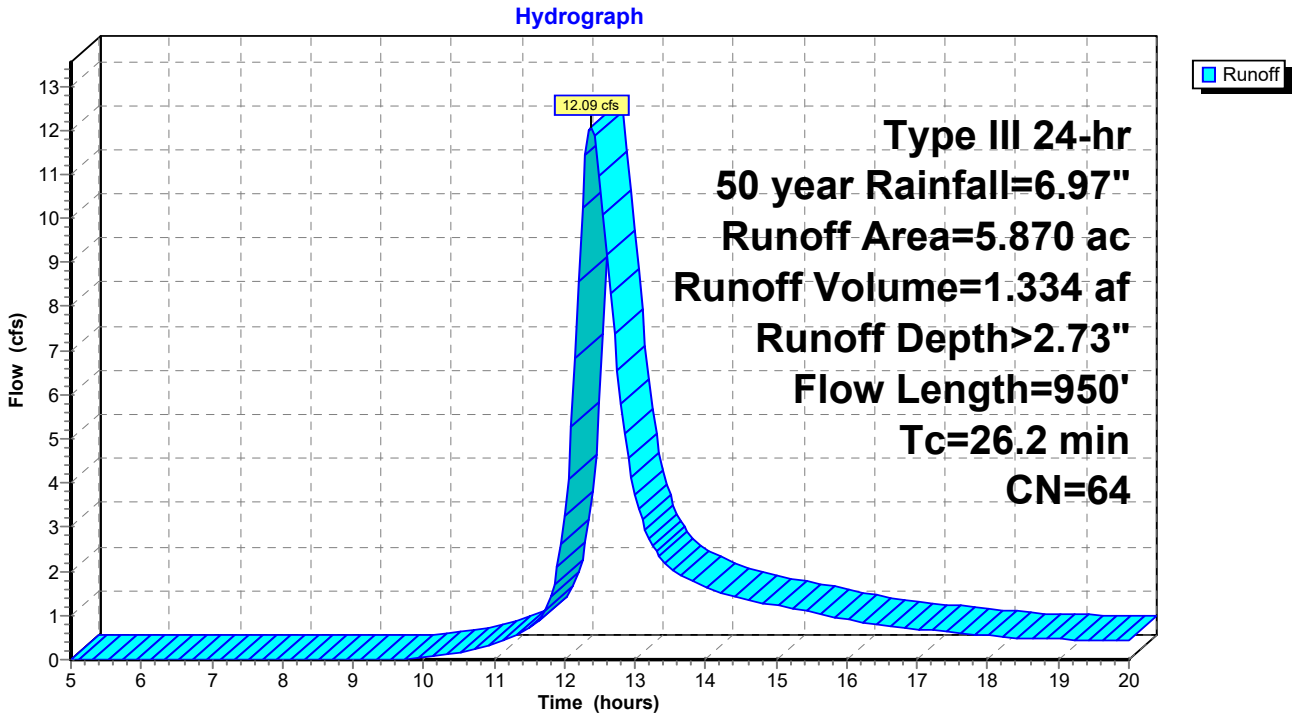
Runoff = 12.09 cfs @ 12.38 hrs, Volume= 1.334 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

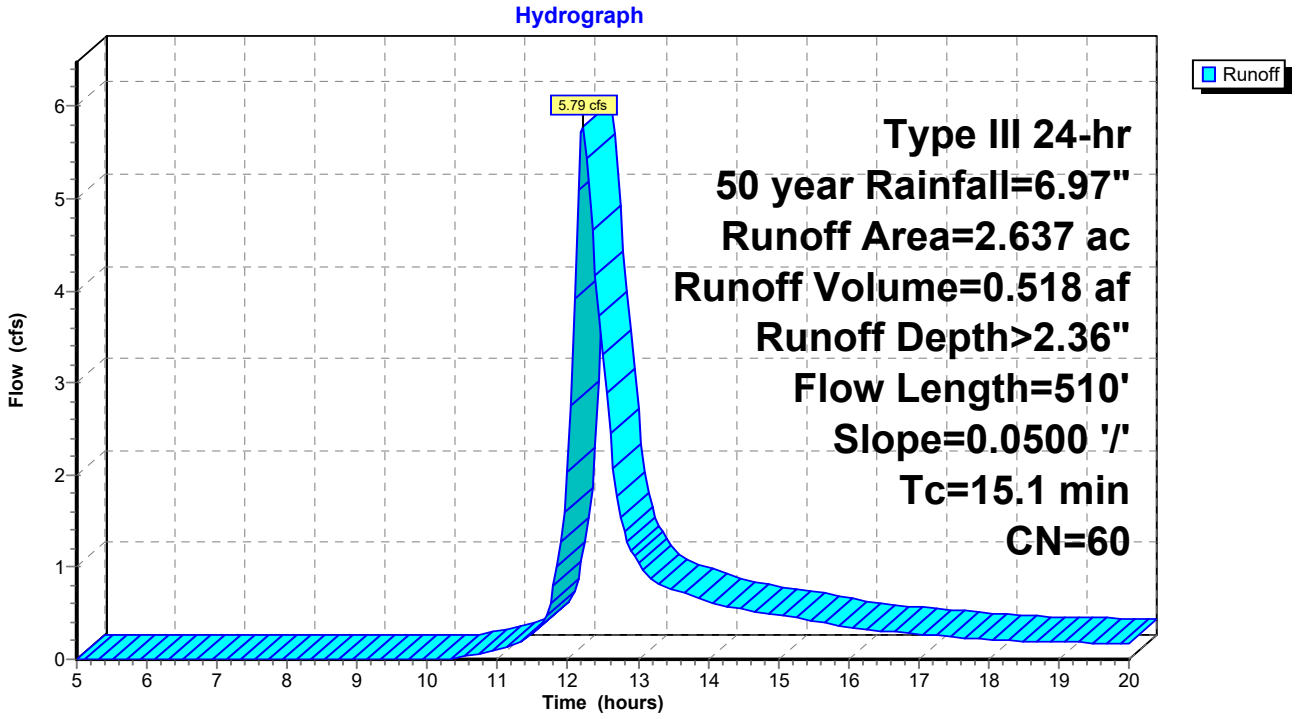
Runoff = 5.79 cfs @ 12.22 hrs, Volume= 0.518 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

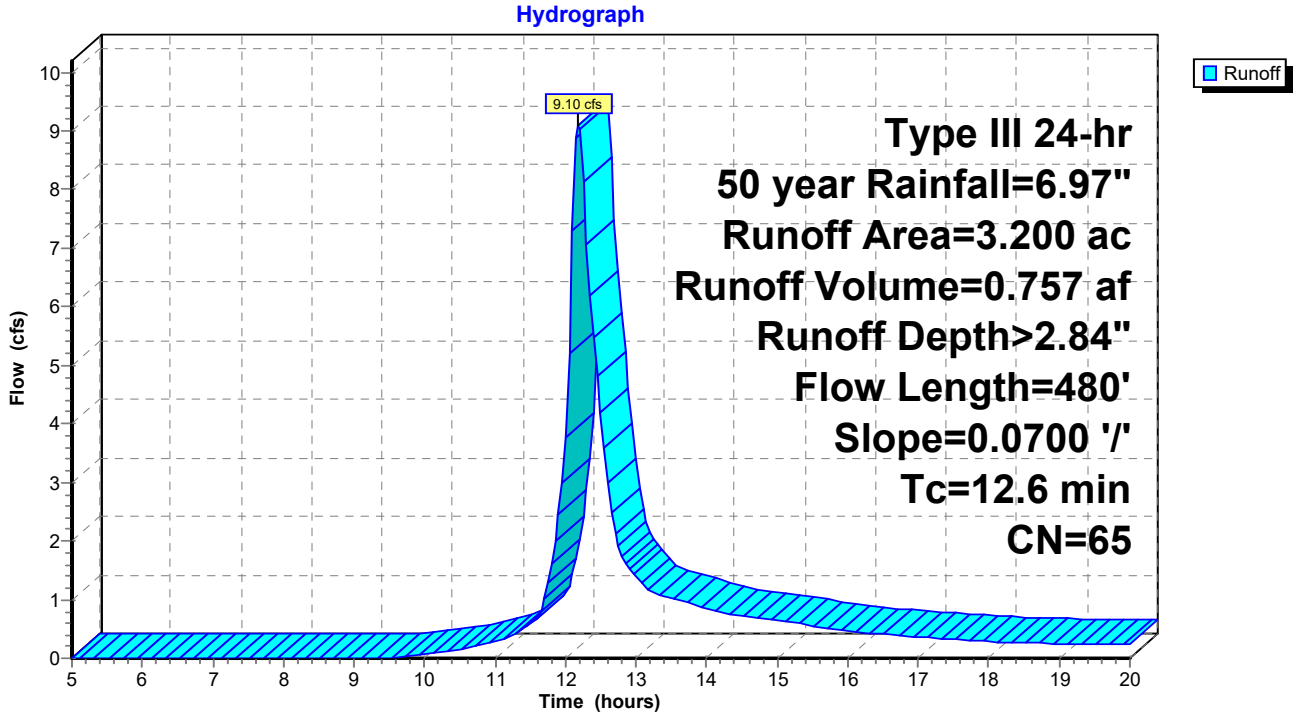
Runoff = 9.10 cfs @ 12.18 hrs, Volume= 0.757 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

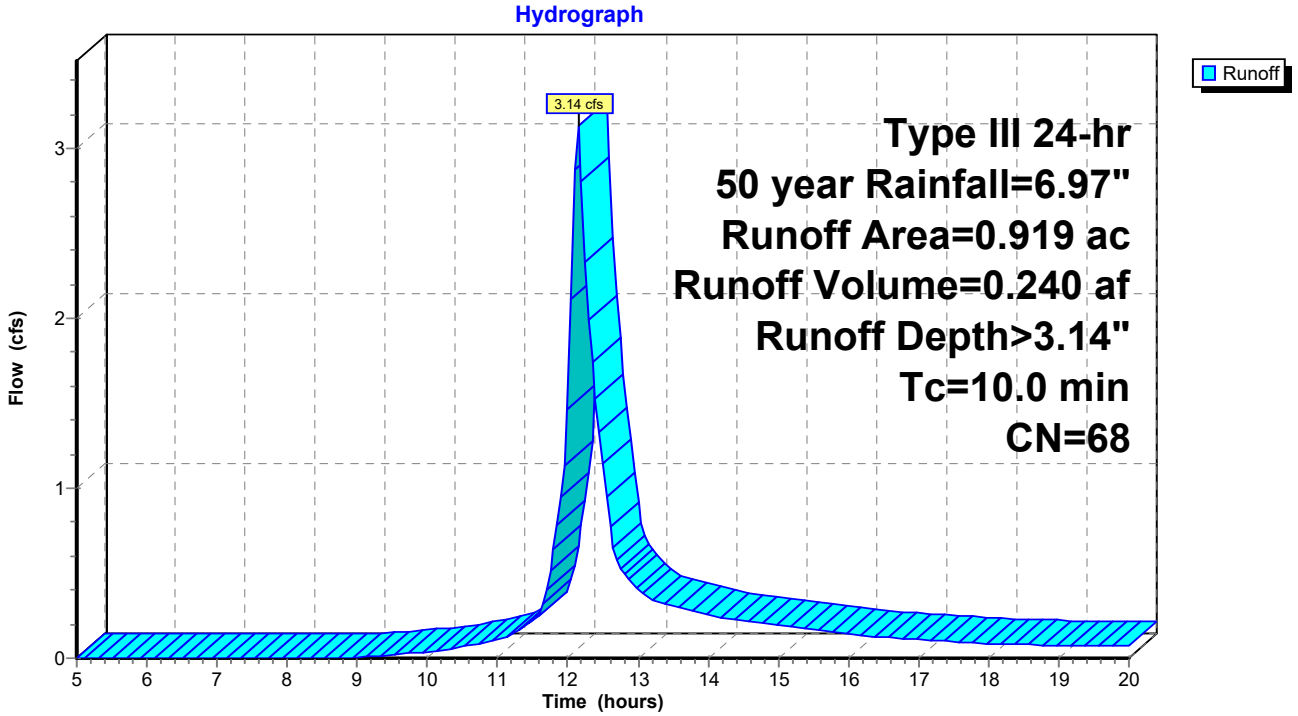
Runoff = 3.14 cfs @ 12.15 hrs, Volume= 0.240 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

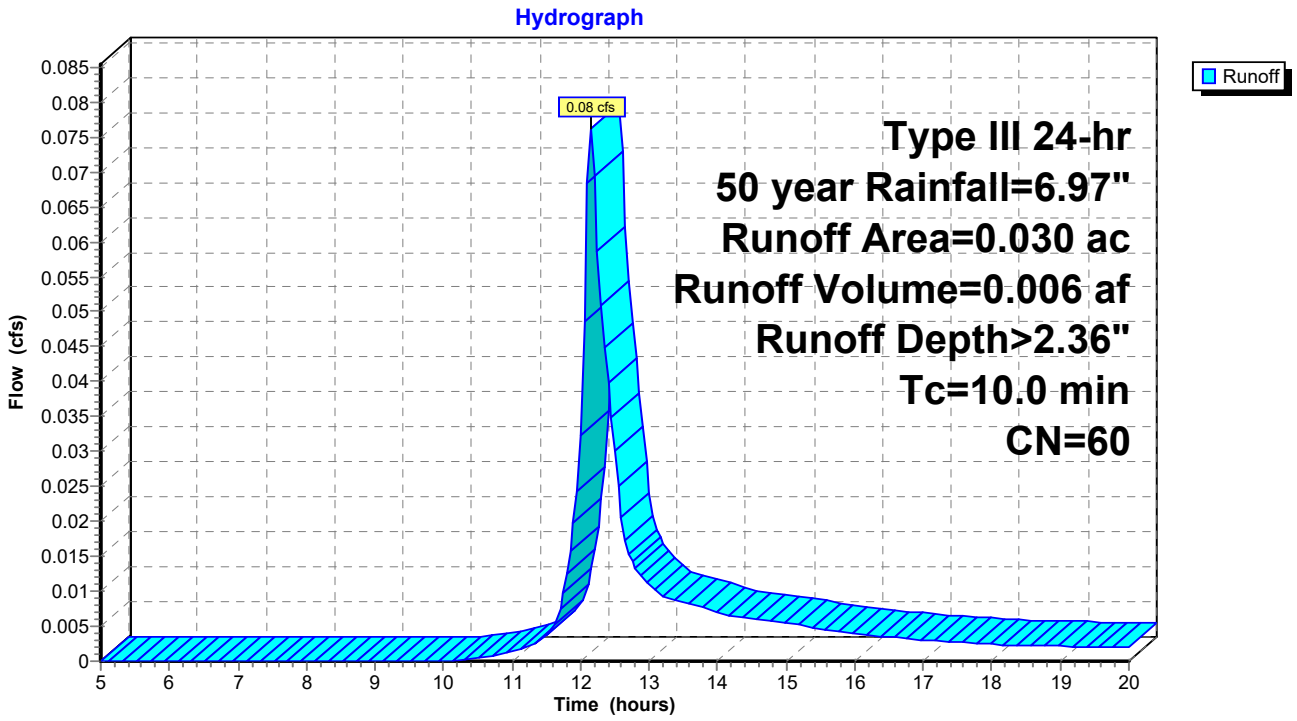
Runoff = 0.08 cfs @ 12.15 hrs, Volume= 0.006 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

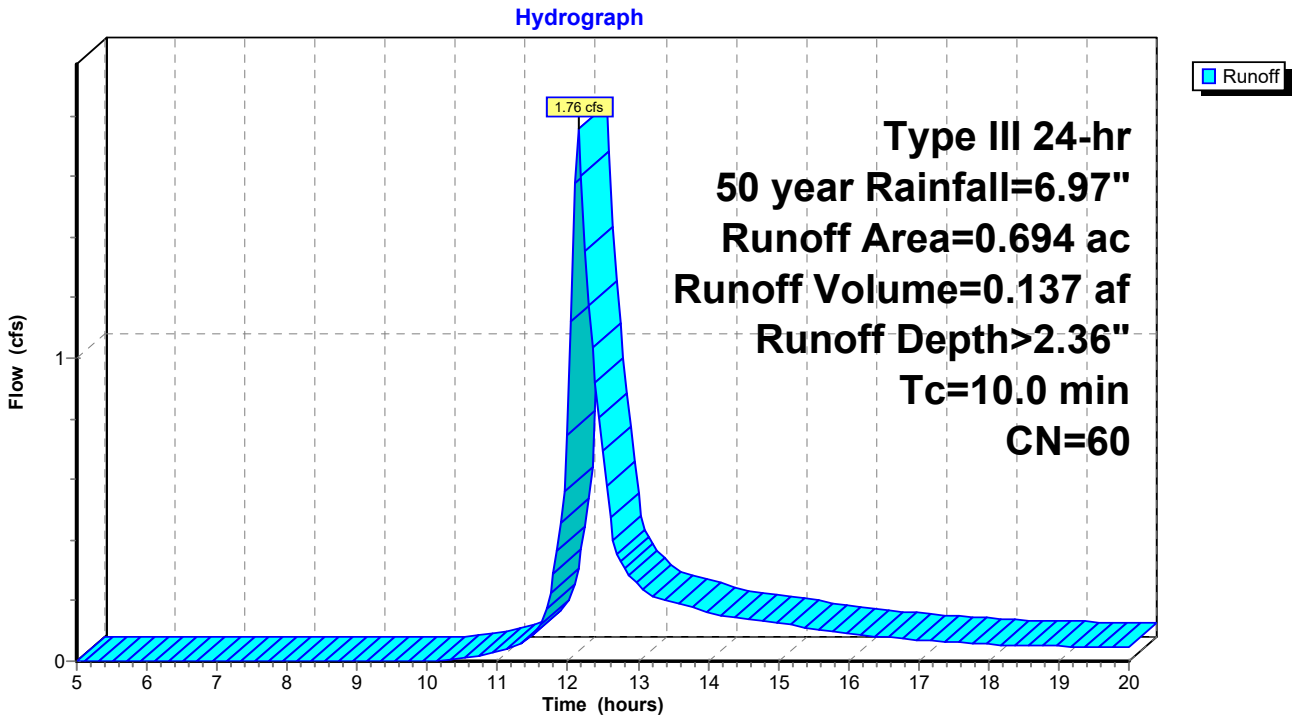
Runoff = 1.76 cfs @ 12.15 hrs, Volume= 0.137 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

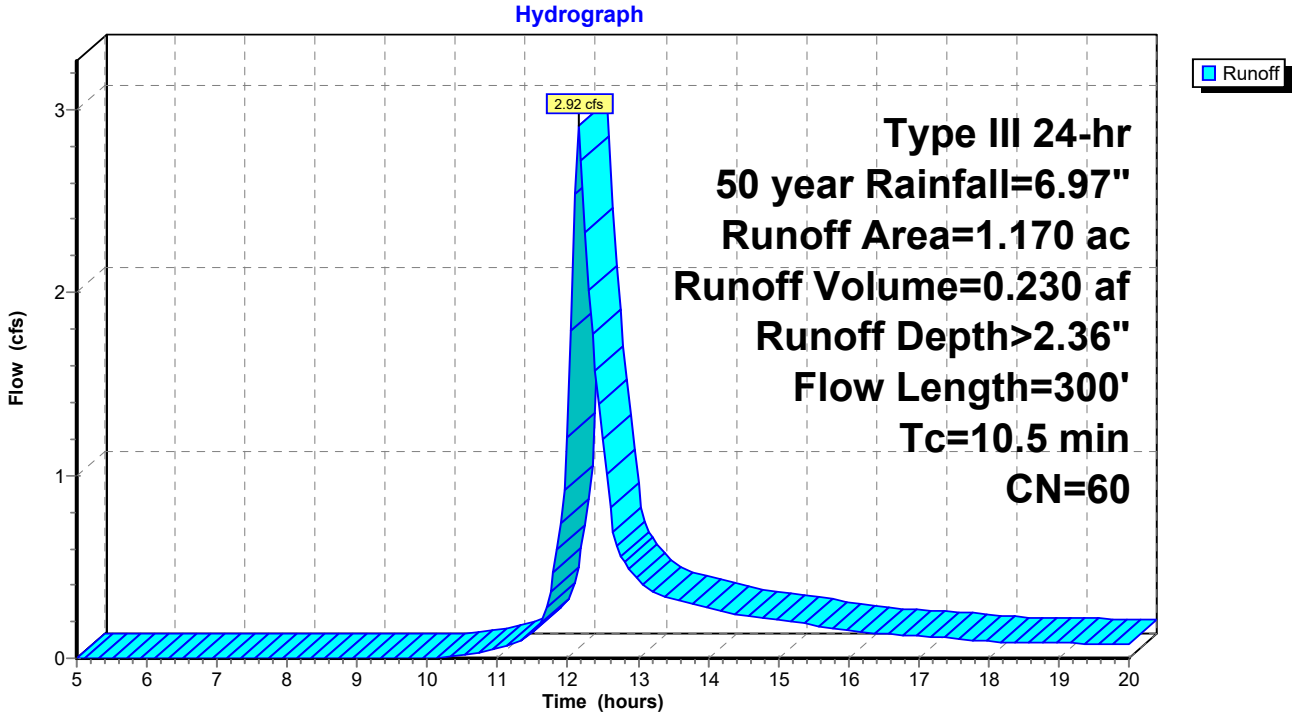
Runoff = 2.92 cfs @ 12.16 hrs, Volume= 0.230 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

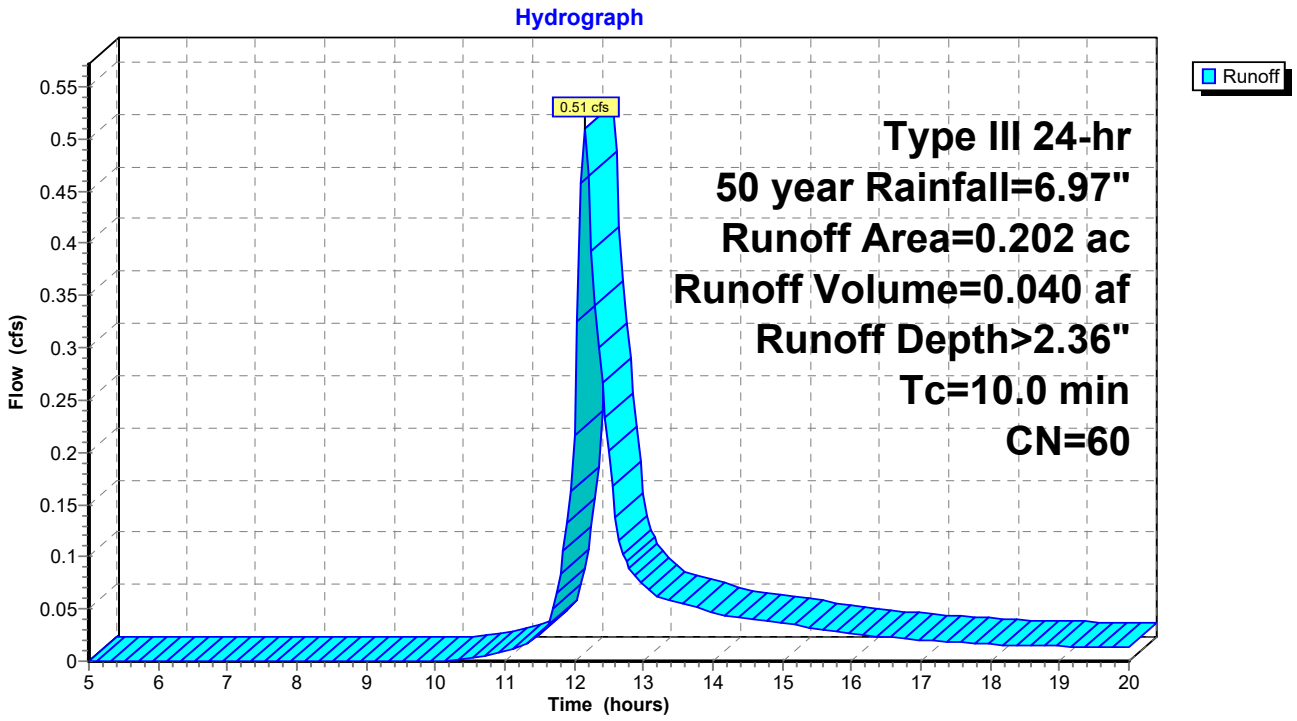
Runoff = 0.51 cfs @ 12.15 hrs, Volume= 0.040 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

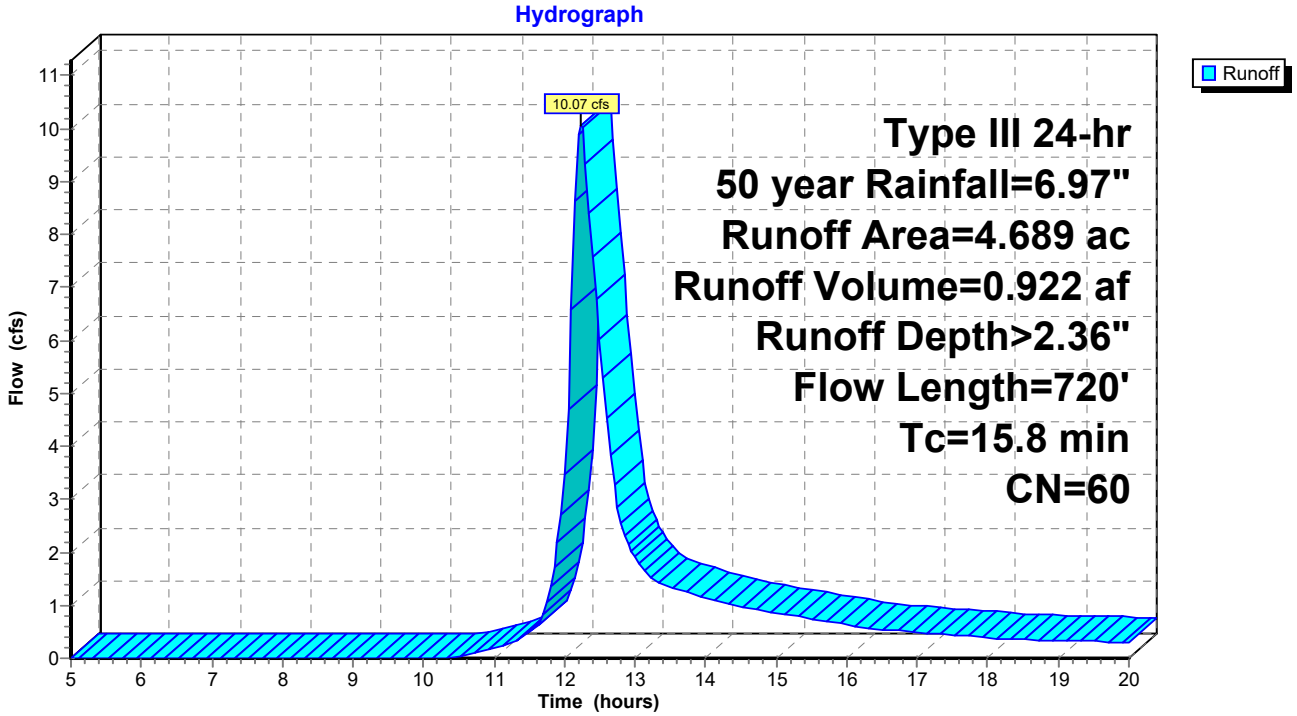
Runoff = 10.07 cfs @ 12.23 hrs, Volume= 0.922 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

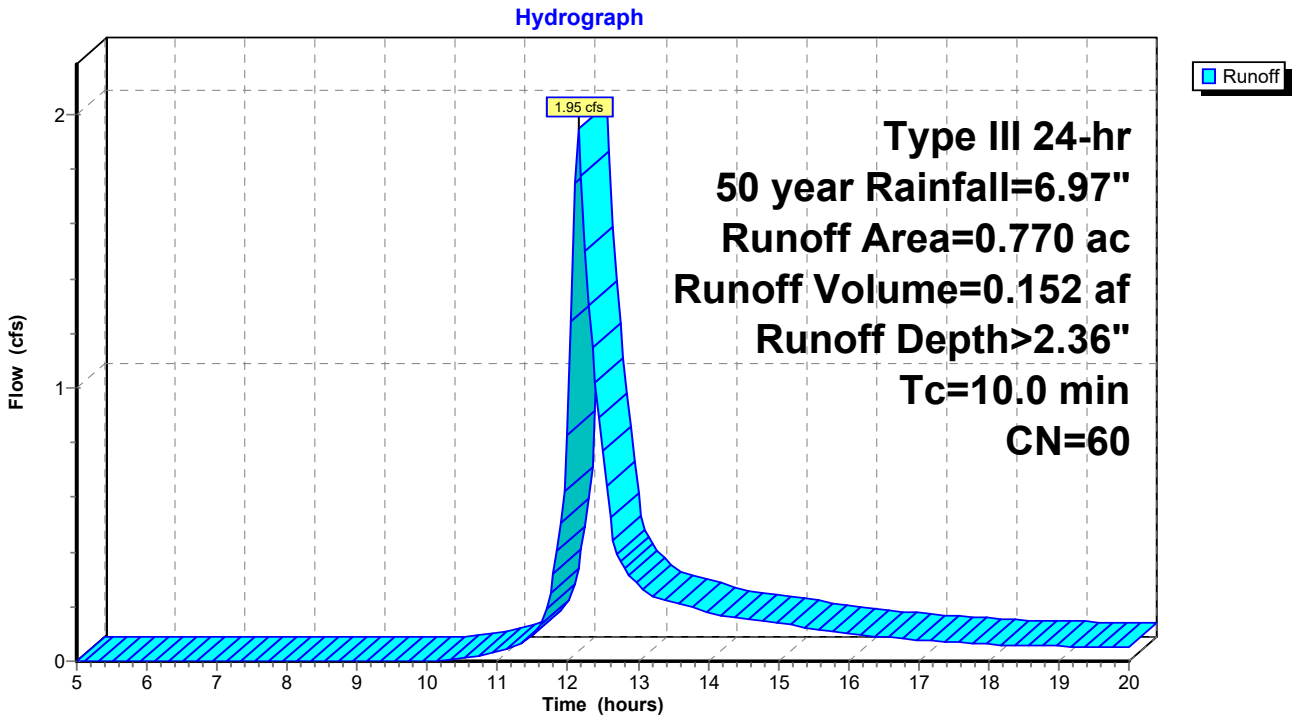
Runoff = 1.95 cfs @ 12.15 hrs, Volume= 0.152 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

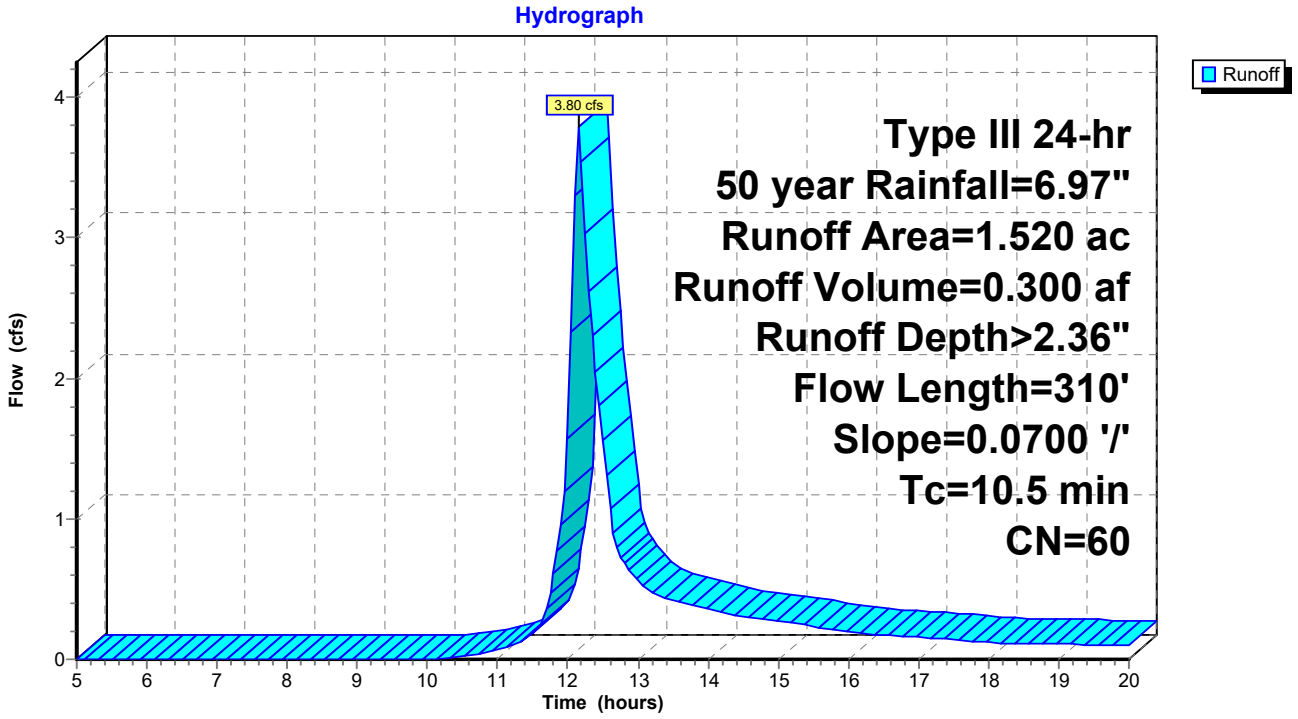
Runoff = 3.80 cfs @ 12.16 hrs, Volume= 0.300 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

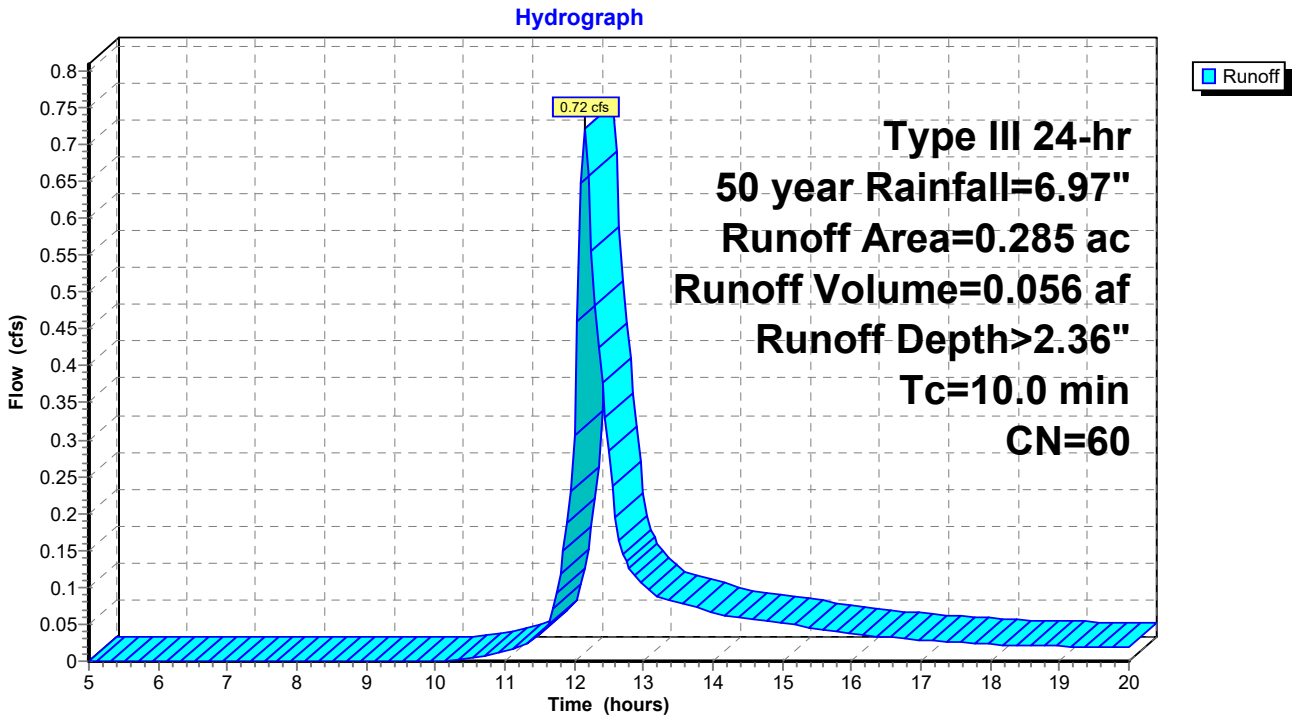
Runoff = 0.72 cfs @ 12.15 hrs, Volume= 0.056 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

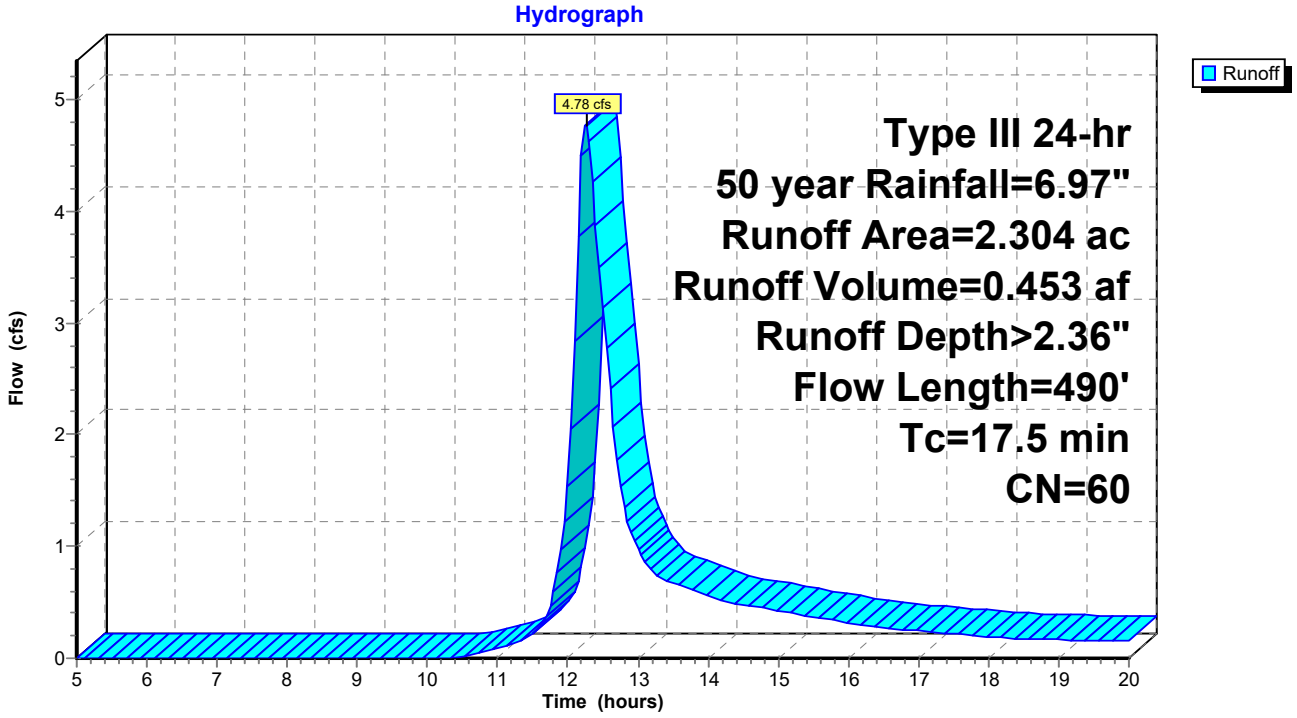
Runoff = 4.78 cfs @ 12.26 hrs, Volume= 0.453 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

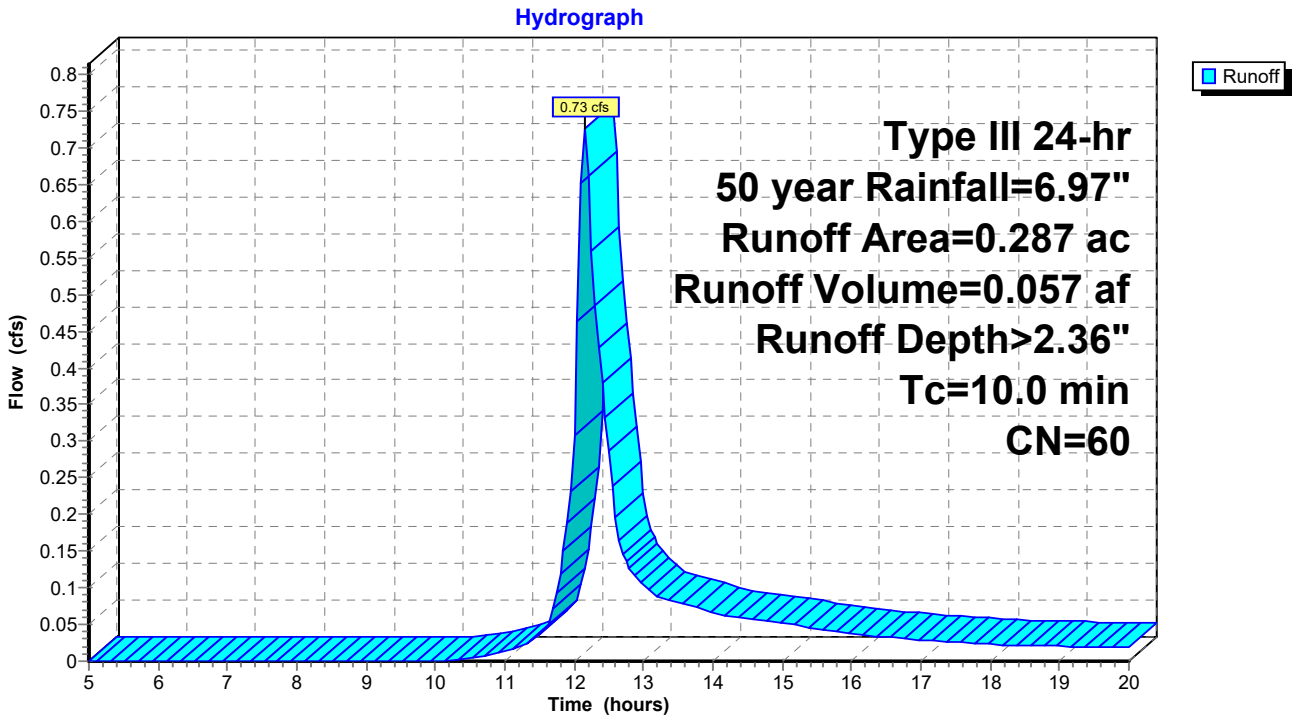
Runoff = 0.73 cfs @ 12.15 hrs, Volume= 0.057 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

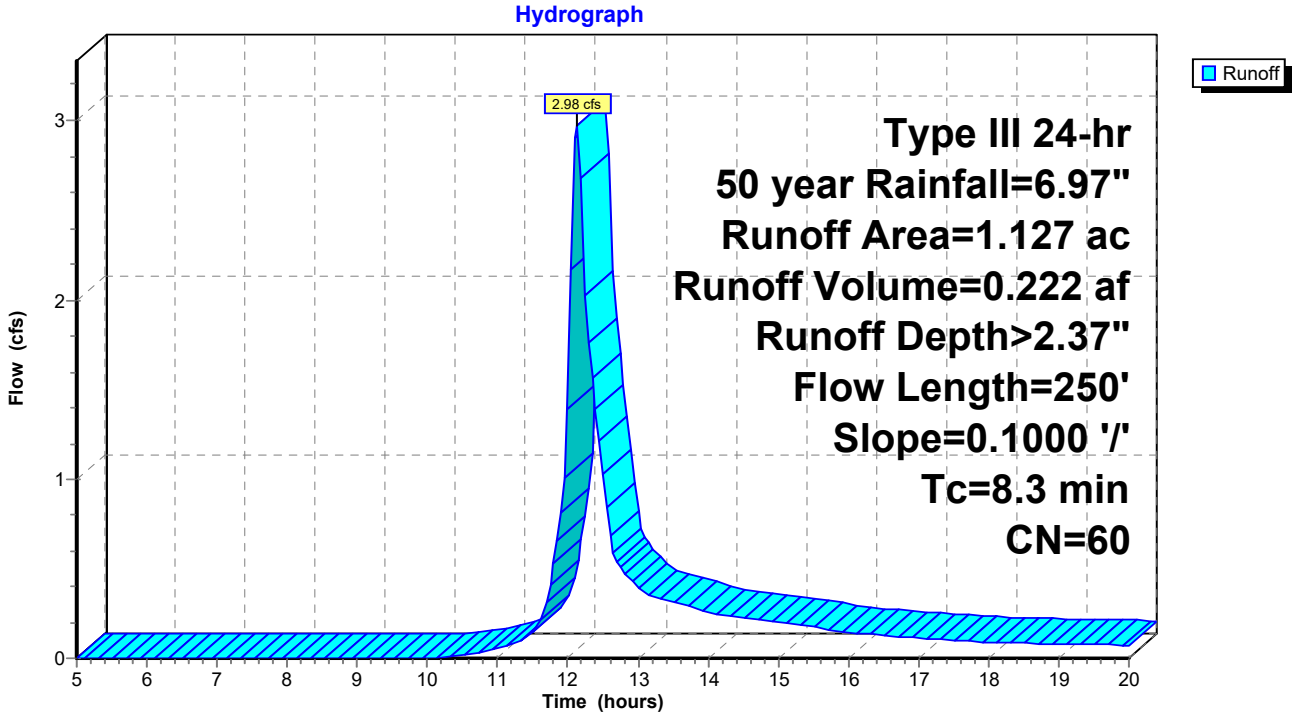
Runoff = 2.98 cfs @ 12.13 hrs, Volume= 0.222 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

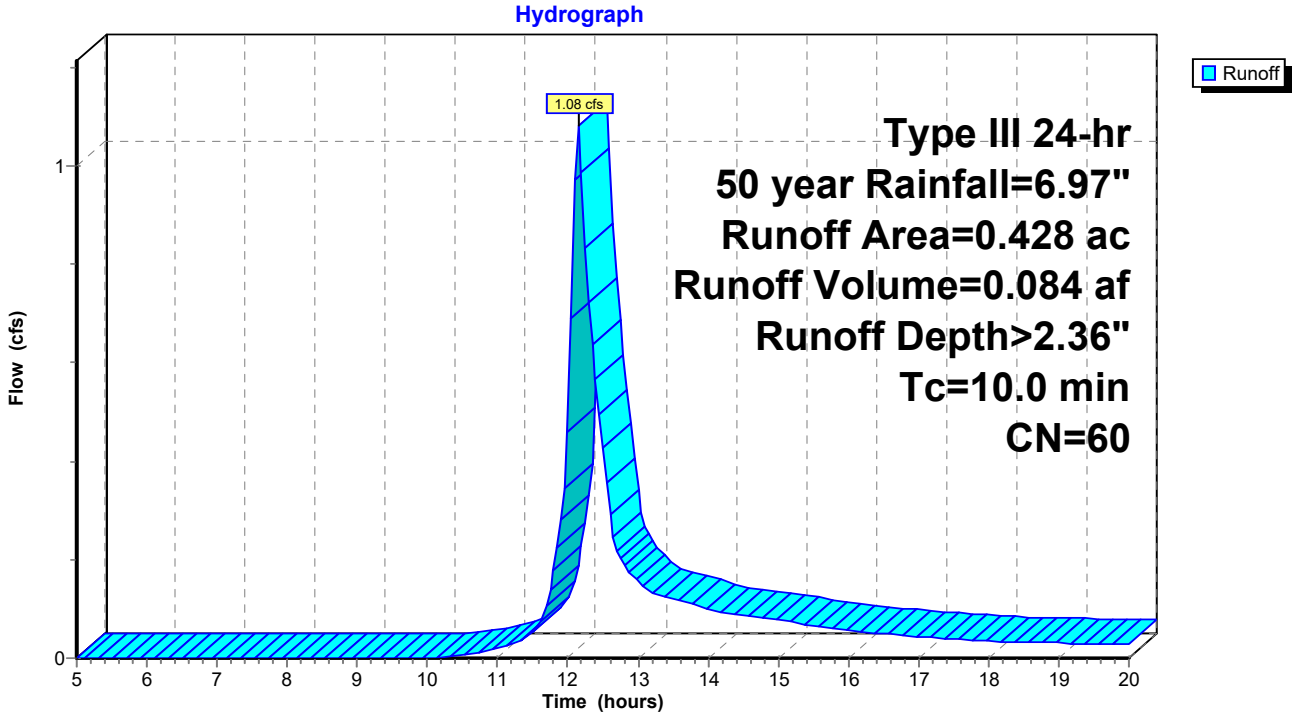
Runoff = 1.08 cfs @ 12.15 hrs, Volume= 0.084 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

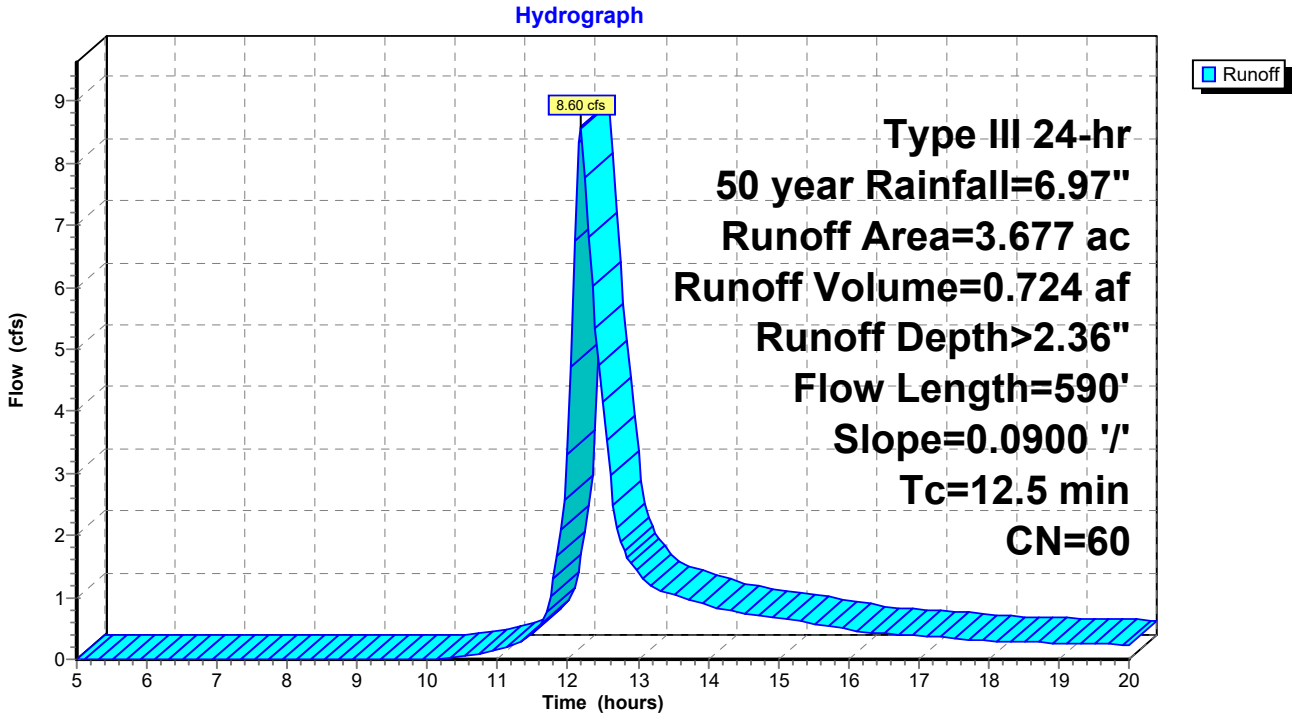
Runoff = 8.60 cfs @ 12.19 hrs, Volume= 0.724 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

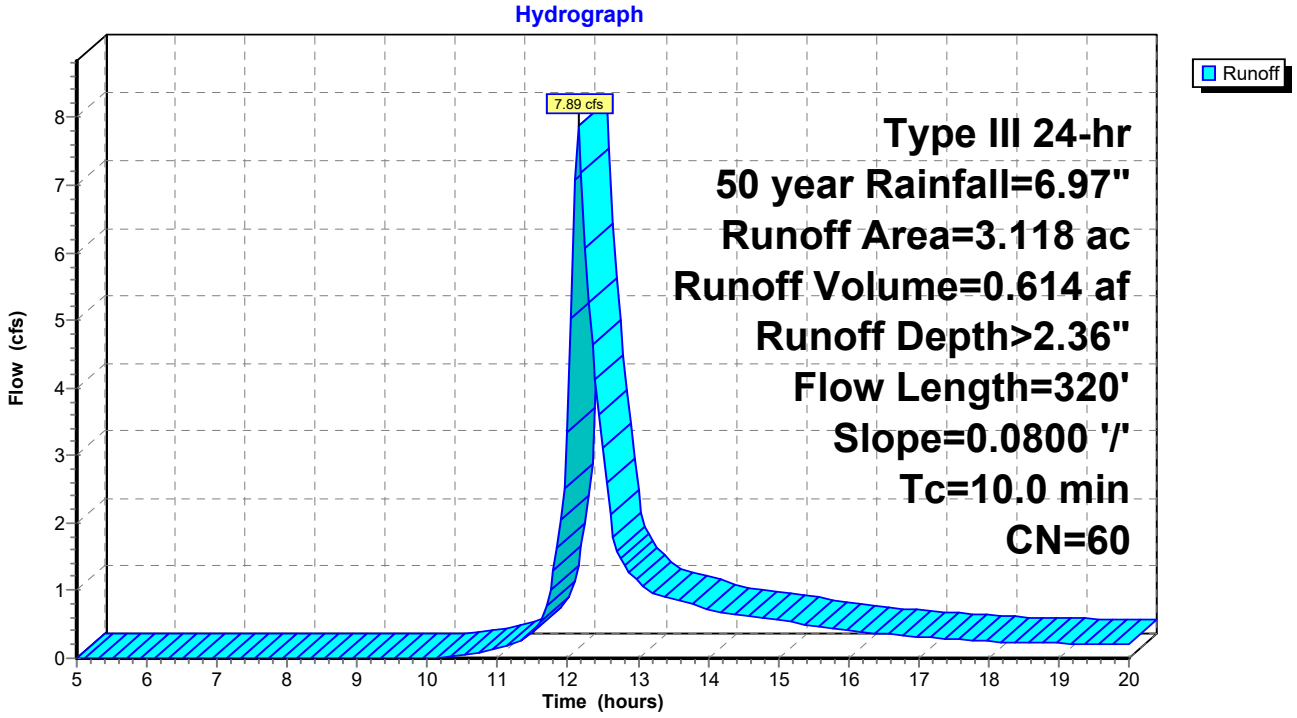
Runoff = 7.89 cfs @ 12.15 hrs, Volume= 0.614 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

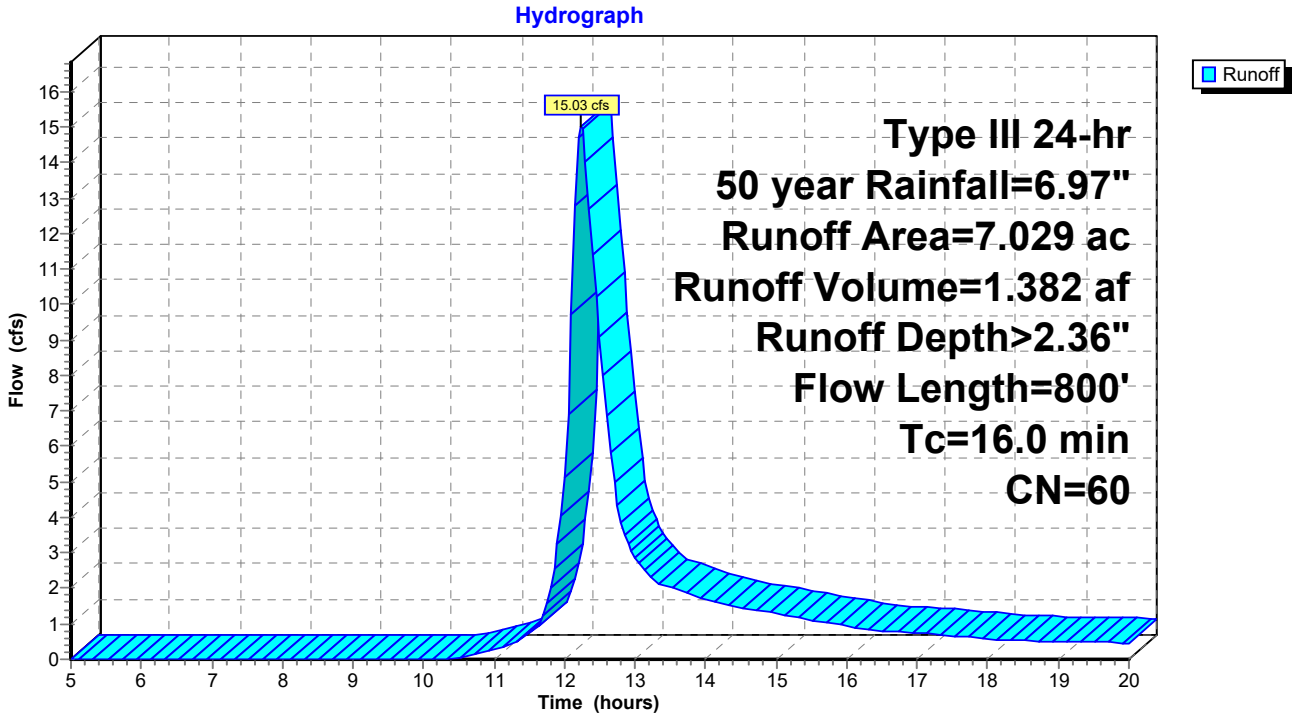
Runoff = 15.03 cfs @ 12.24 hrs, Volume= 1.382 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

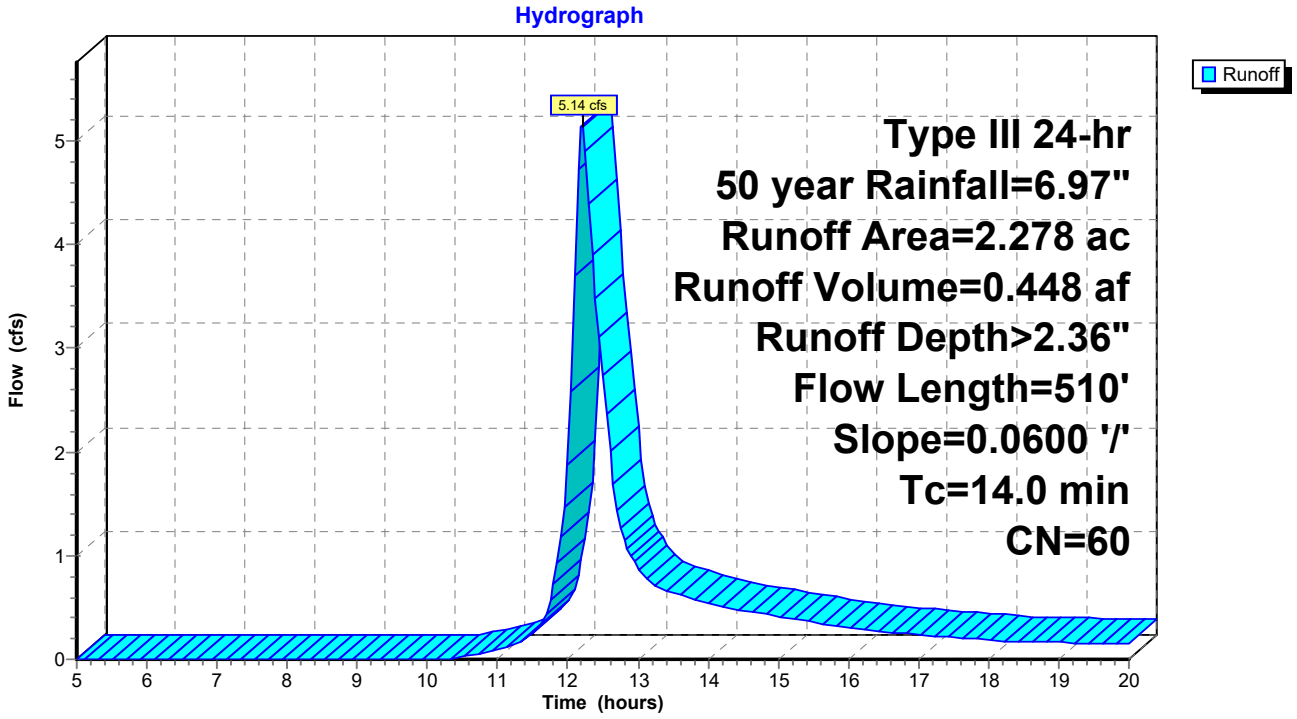
Runoff = 5.14 cfs @ 12.21 hrs, Volume= 0.448 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

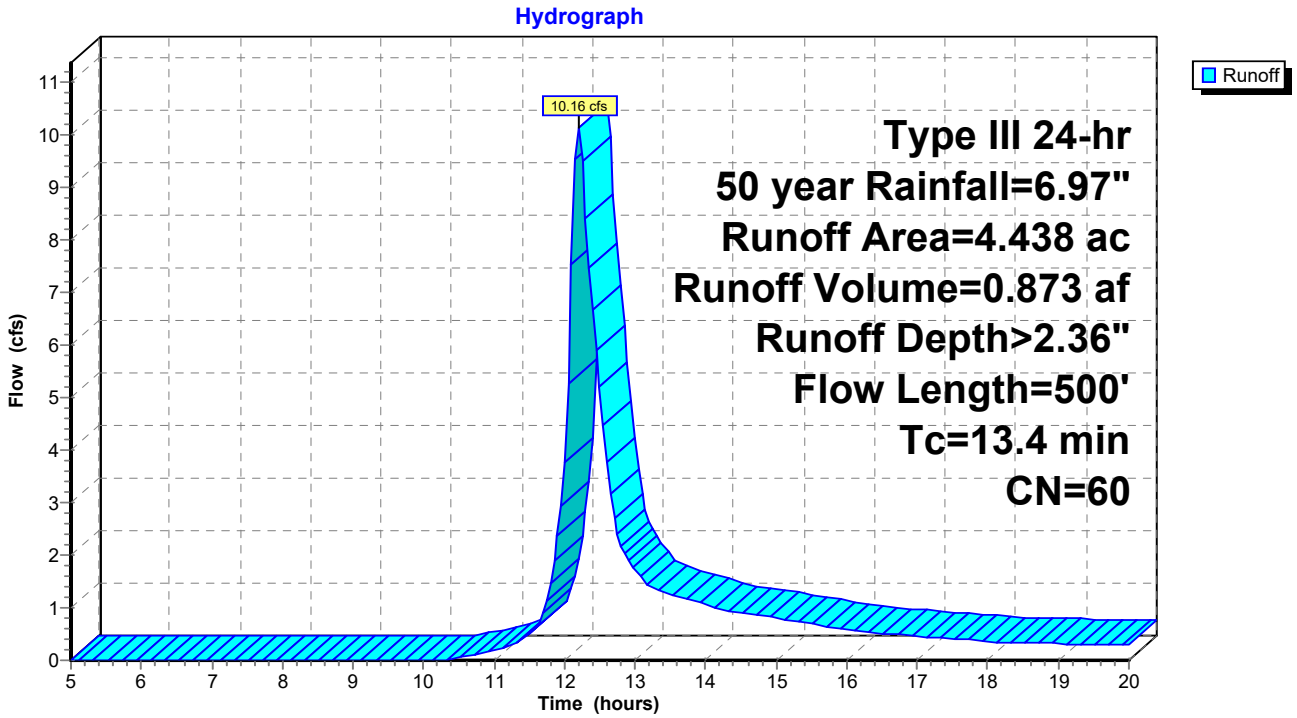
Runoff = 10.16 cfs @ 12.20 hrs, Volume= 0.873 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

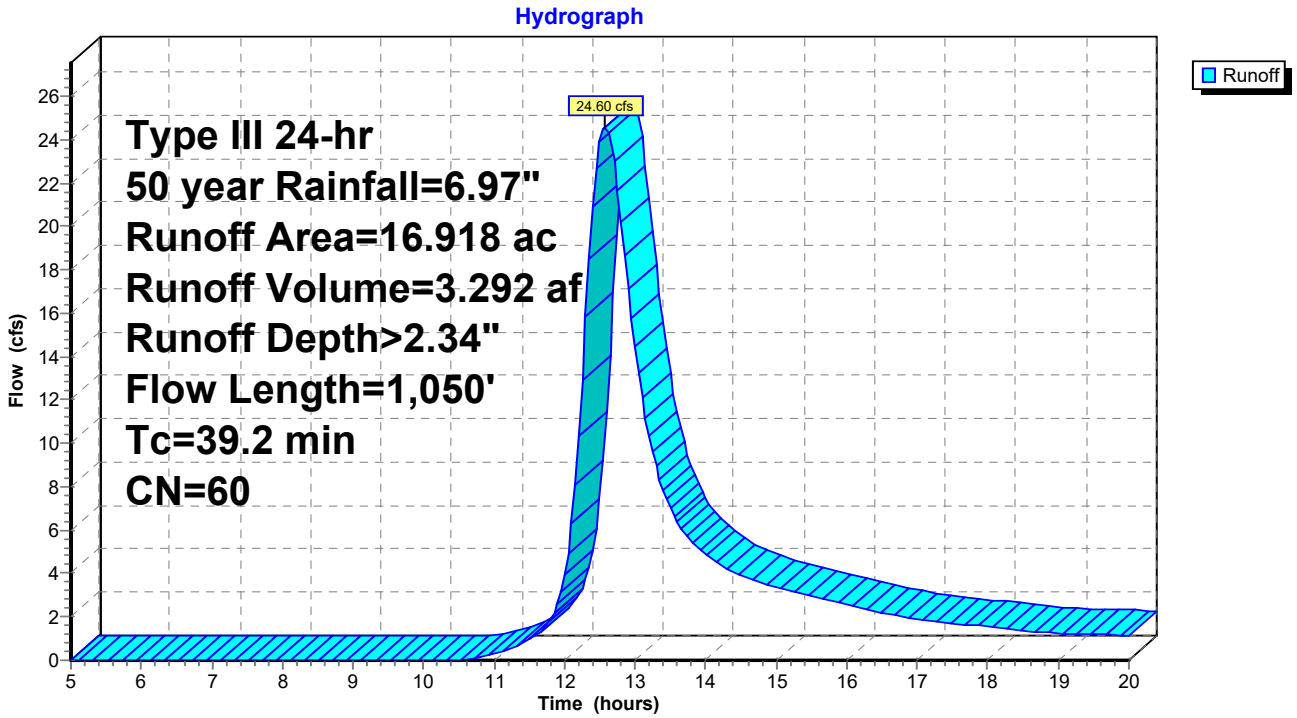
Runoff = 24.60 cfs @ 12.58 hrs, Volume= 3.292 af, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

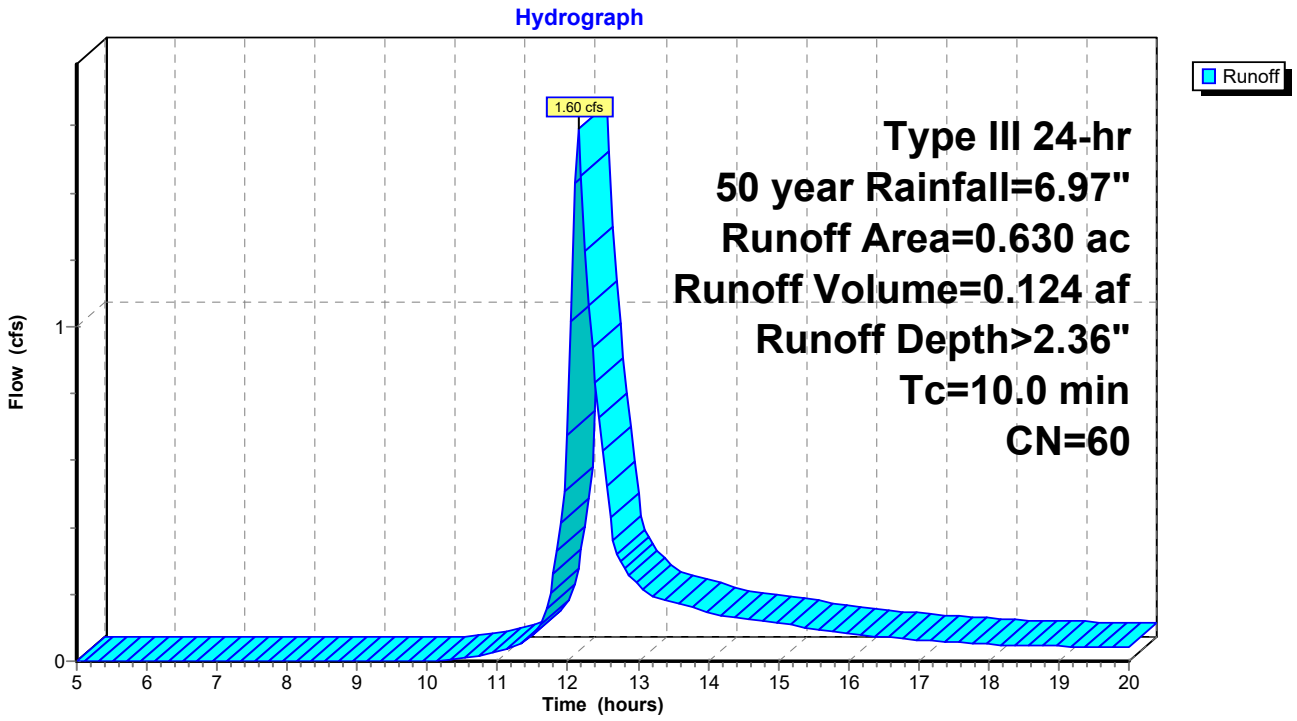
Runoff = 1.60 cfs @ 12.15 hrs, Volume= 0.124 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.21'
[55] Hint: Peak inflow is 516% of Manning's capacity
[81] Warning: Exceeded Pond 13.1P by 0.09' @ 12.45 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.00" for 50 year event
Inflow = 4.93 cfs @ 12.33 hrs, Volume= 0.519 af
Outflow = 4.76 cfs @ 12.46 hrs, Volume= 0.516 af, Atten= 3%, Lag= 7.6 min

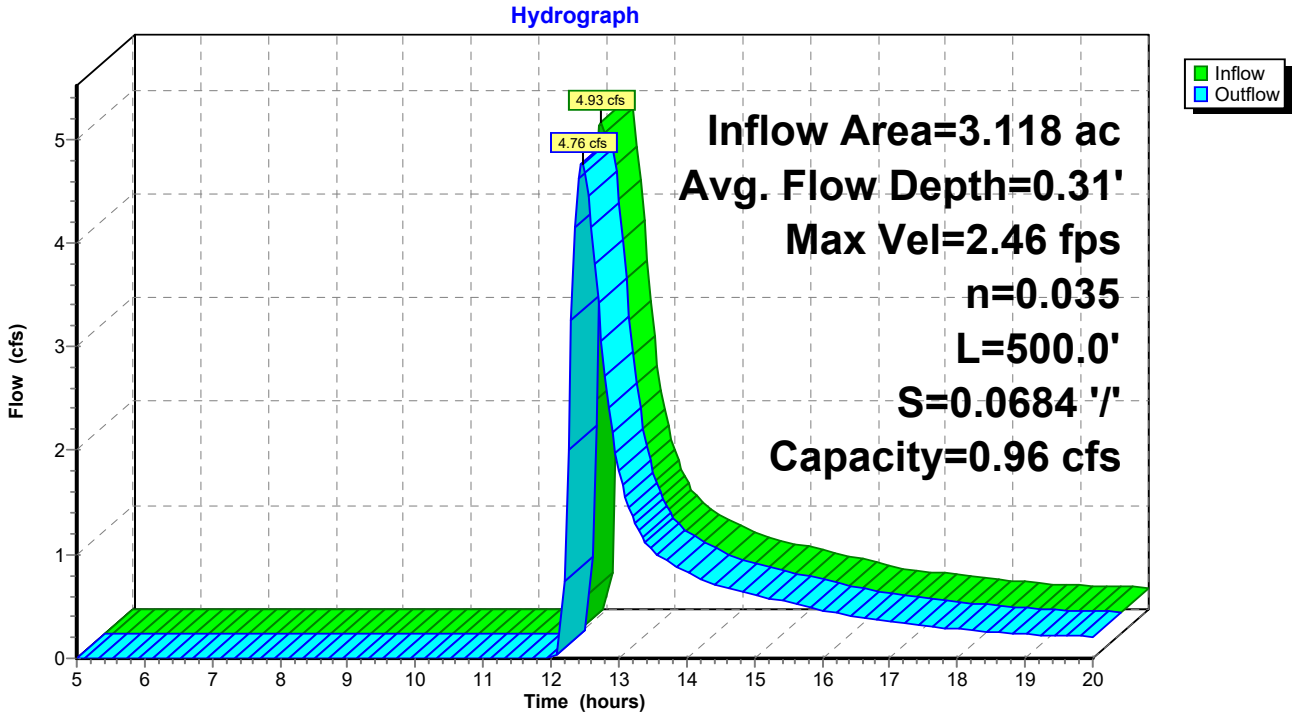
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 5.2 min

Peak Storage= 968 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.36" for 50 year event
Inflow = 7.89 cfs @ 12.15 hrs, Volume= 0.614 af
Outflow = 4.93 cfs @ 12.33 hrs, Volume= 0.519 af, Atten= 38%, Lag= 10.7 min
Primary = 4.93 cfs @ 12.33 hrs, Volume= 0.519 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.42' @ 12.33 hrs Surf.Area= 16,331 sf Storage= 7,225 cf

Plug-Flow detention time= 74.5 min calculated for 0.517 af (84% of inflow)
Center-of-Mass det. time= 30.2 min (845.4 - 815.2)

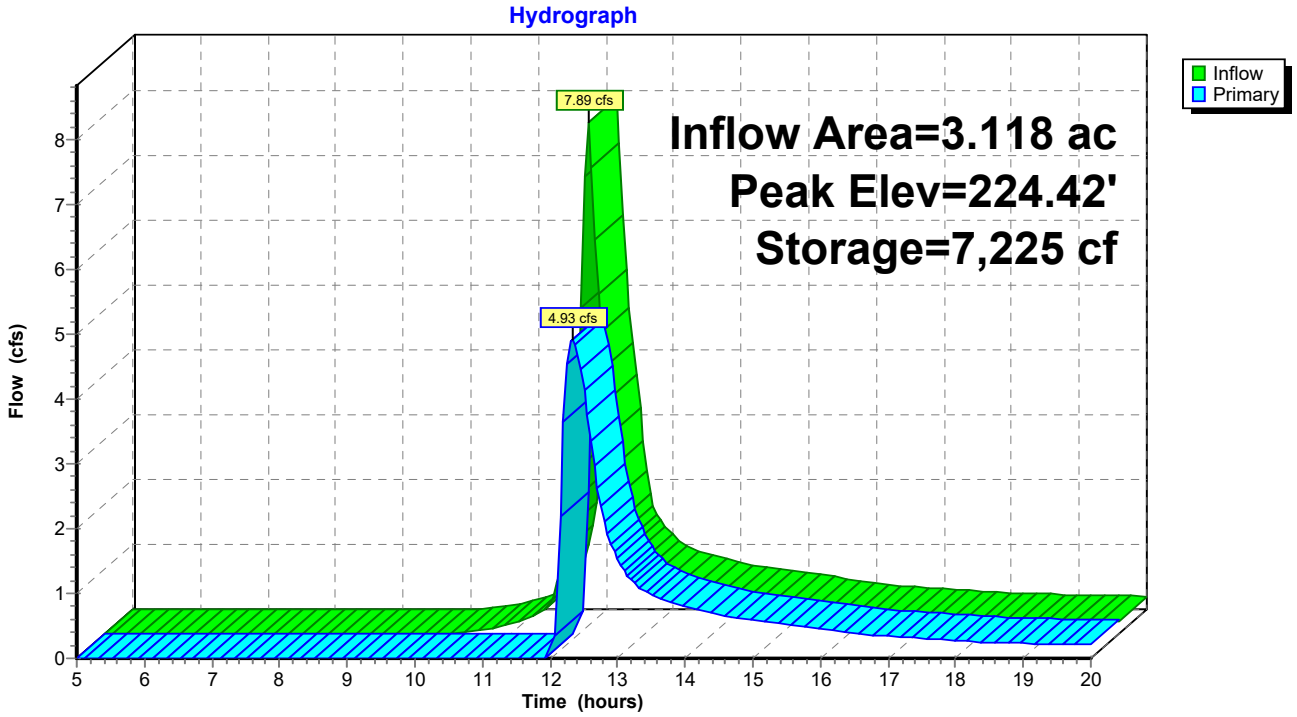
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.90 cfs @ 12.33 hrs HW=224.42' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.90 cfs @ 1.11 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area = 7.029 ac, 0.00% Impervious, Inflow Depth > 2.36" for 50 year event
Inflow = 15.03 cfs @ 12.24 hrs, Volume= 1.382 af
Outflow = 12.57 cfs @ 12.36 hrs, Volume= 1.201 af, Atten= 16%, Lag= 7.7 min
Discarded = 0.76 cfs @ 12.36 hrs, Volume= 0.440 af
Primary = 11.81 cfs @ 12.36 hrs, Volume= 0.761 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.46' @ 12.36 hrs Surf.Area= 10,691 sf Storage= 13,071 cf

Plug-Flow detention time= 67.3 min calculated for 1.201 af (87% of inflow)
Center-of-Mass det. time= 28.3 min (848.0 - 819.8)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

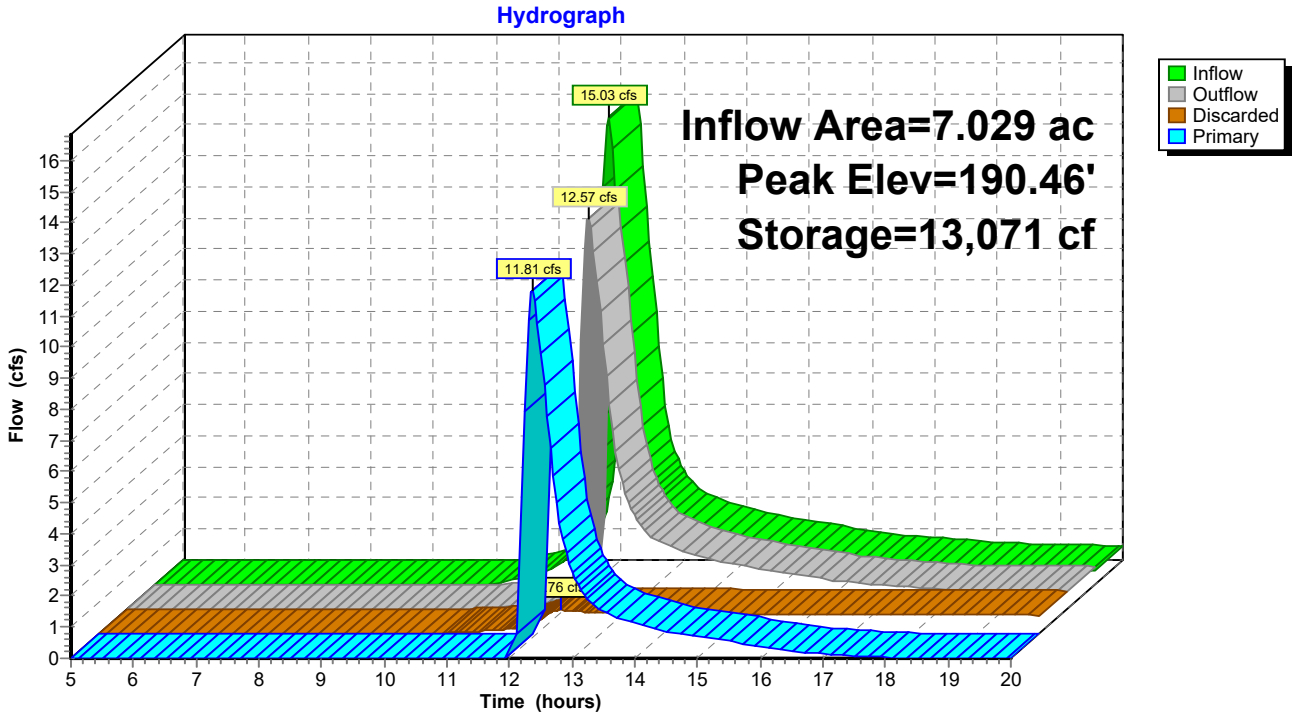
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.76 cfs @ 12.36 hrs HW=190.45' (Free Discharge)
└**2=Exfiltration** (Controls 0.76 cfs)

Primary OutFlow Max=11.68 cfs @ 12.36 hrs HW=190.45' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 11.68 cfs @ 1.72 fps)

Pond 13.2P: Pond 13.2

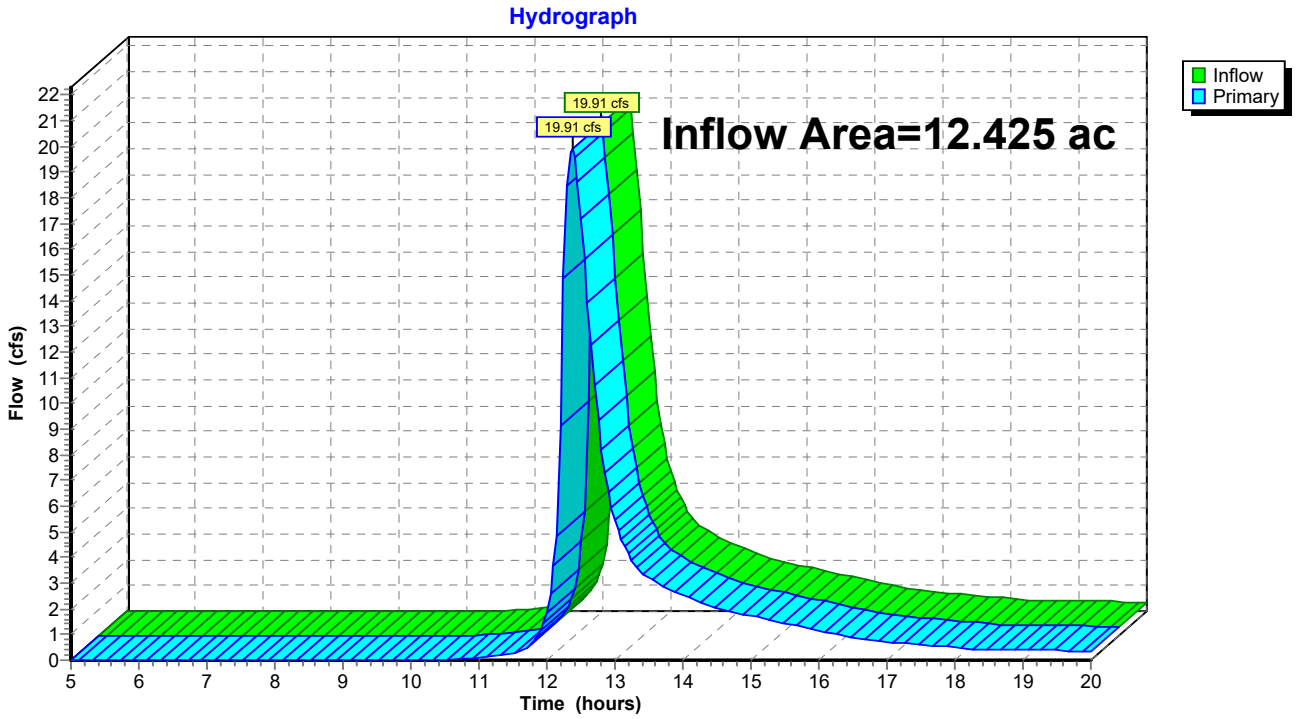


Summary for Link 13: 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 1.67" for 50 year event
Inflow = 19.91 cfs @ 12.37 hrs, Volume= 1.726 af
Primary = 19.91 cfs @ 12.37 hrs, Volume= 1.726 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



100-Year Storm Event – Existing

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=540' Slope=0.0800 '/' Tc=12.6 min CN=60 Runoff=8.79 cfs 0.734 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=440' Tc=18.0 min CN=60 Runoff=6.55 cfs 0.622 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>3.68"
Tc=10.0 min CN=67 Runoff=3.11 cfs 0.238 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=700' Tc=19.2 min CN=60 Runoff=6.37 cfs 0.621 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.89"
Tc=10.0 min CN=78 Runoff=1.70 cfs 0.132 af

Subcatchment4: Subcat 4 Runoff Area=5.870 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=950' Tc=26.2 min CN=64 Runoff=14.86 cfs 1.632 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=510' Slope=0.0500 '/' Tc=15.1 min CN=60 Runoff=7.26 cfs 0.644 af

Subcatchment6: Subcat 6 Runoff Area=3.200 ac 0.00% Impervious Runoff Depth>3.46"
Flow Length=480' Slope=0.0700 '/' Tc=12.6 min CN=65 Runoff=11.13 cfs 0.923 af

Subcatchment6A: Subcat 6A Runoff Area=0.919 ac 0.00% Impervious Runoff Depth>3.79"
Tc=10.0 min CN=68 Runoff=3.79 cfs 0.290 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.10 cfs 0.007 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=2.20 cfs 0.170 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=300' Tc=10.5 min CN=60 Runoff=3.66 cfs 0.286 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.64 cfs 0.049 af

Subcatchment8: Subcat 8 Runoff Area=4.689 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=720' Tc=15.8 min CN=60 Runoff=12.62 cfs 1.144 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=2.44 cfs 0.188 af

Subcatchment9: Subcat 9 Runoff Area=1.520 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=310' Slope=0.0700 '/' Tc=10.5 min CN=60 Runoff=4.76 cfs 0.372 af

Subcatchment9A: Subcat 9A Runoff Area=0.285 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.90 cfs 0.070 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=490' Tc=17.5 min CN=60 Runoff=5.98 cfs 0.562 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=0.91 cfs 0.070 af

Subcatchment11: Subcat 11 Runoff Area=1.127 ac 0.00% Impervious Runoff Depth>2.94"
Flow Length=250' Slope=0.1000 '/' Tc=8.3 min CN=60 Runoff=3.77 cfs 0.276 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=1.36 cfs 0.105 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=590' Slope=0.0900 '/' Tc=12.5 min CN=60 Runoff=10.77 cfs 0.898 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.118 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=320' Slope=0.0800 '/' Tc=10.0 min CN=60 Runoff=9.89 cfs 0.762 af

Subcatchment13.2: Subcat 13.2 Runoff Area=7.029 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=800' Tc=16.0 min CN=60 Runoff=18.84 cfs 1.715 af

Subcatchment13.3: Subcat 13.3 Runoff Area=2.278 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=510' Slope=0.0600 '/' Tc=14.0 min CN=60 Runoff=6.44 cfs 0.556 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=500' Tc=13.4 min CN=60 Runoff=12.73 cfs 1.084 af

Subcatchment16: Subcat 16 Runoff Area=16.918 ac 0.00% Impervious Runoff Depth>2.90"
Flow Length=1,050' Tc=39.2 min CN=60 Runoff=30.79 cfs 4.088 af

Subcatchment16A: Subcat 16A Runoff Area=0.630 ac 0.00% Impervious Runoff Depth>2.93"
Tc=10.0 min CN=60 Runoff=2.00 cfs 0.154 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.41' Max Vel=2.52 fps Inflow=6.98 cfs 0.666 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=6.69 cfs 0.663 af

Pond 13.1P: Pond 13.1 Peak Elev=224.48' Storage=8,125 cf Inflow=9.89 cfs 0.762 af
Outflow=6.98 cfs 0.666 af

Pond 13.2P: Pond 13.2 Peak Elev=190.55' Storage=14,099 cf Inflow=18.84 cfs 1.715 af
Discarded=0.79 cfs 0.457 af Primary=16.25 cfs 1.066 af Outflow=17.04 cfs 1.522 af

Link 13: 13 Inflow=27.53 cfs 2.285 af
Primary=27.53 cfs 2.285 af

Total Runoff Area = 73.426 ac Runoff Volume = 18.392 af Average Runoff Depth = 3.01"
100.00% Pervious = 73.426 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

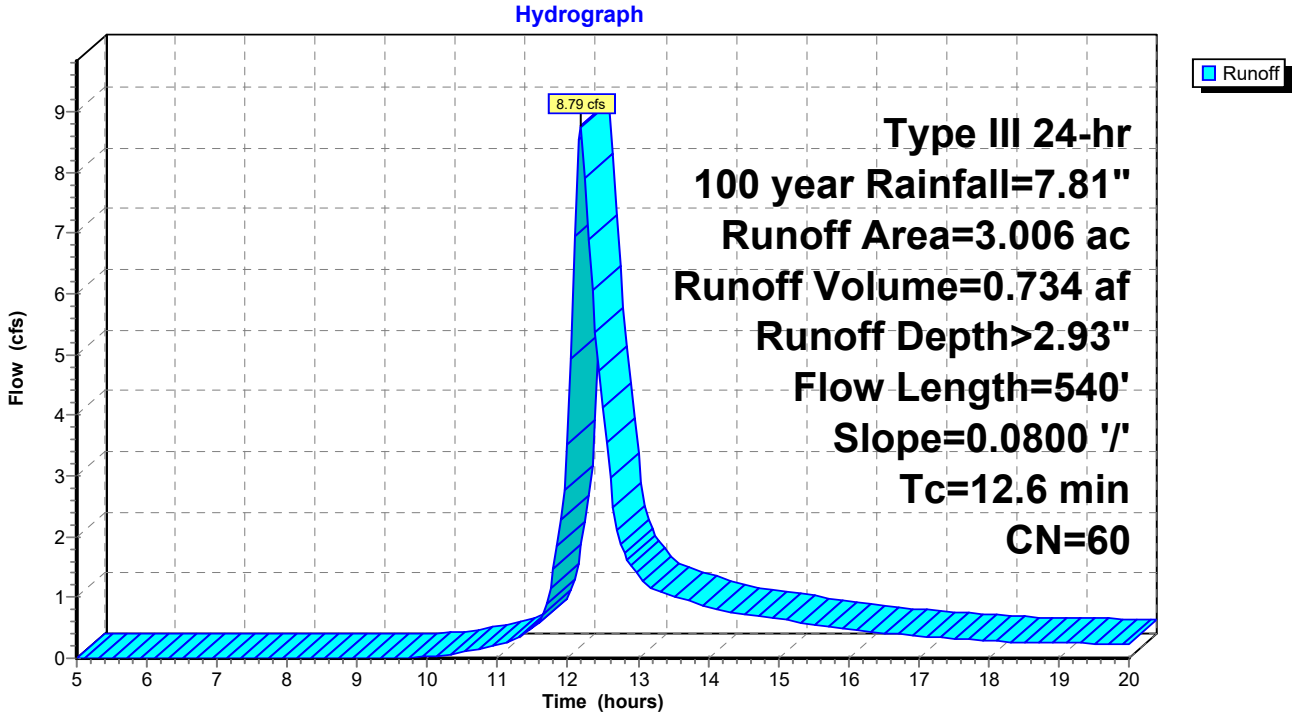
Runoff = 8.79 cfs @ 12.18 hrs, Volume= 0.734 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
3.005	60	Woods, Fair, HSG B
3.006	60	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.8	490	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	540	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

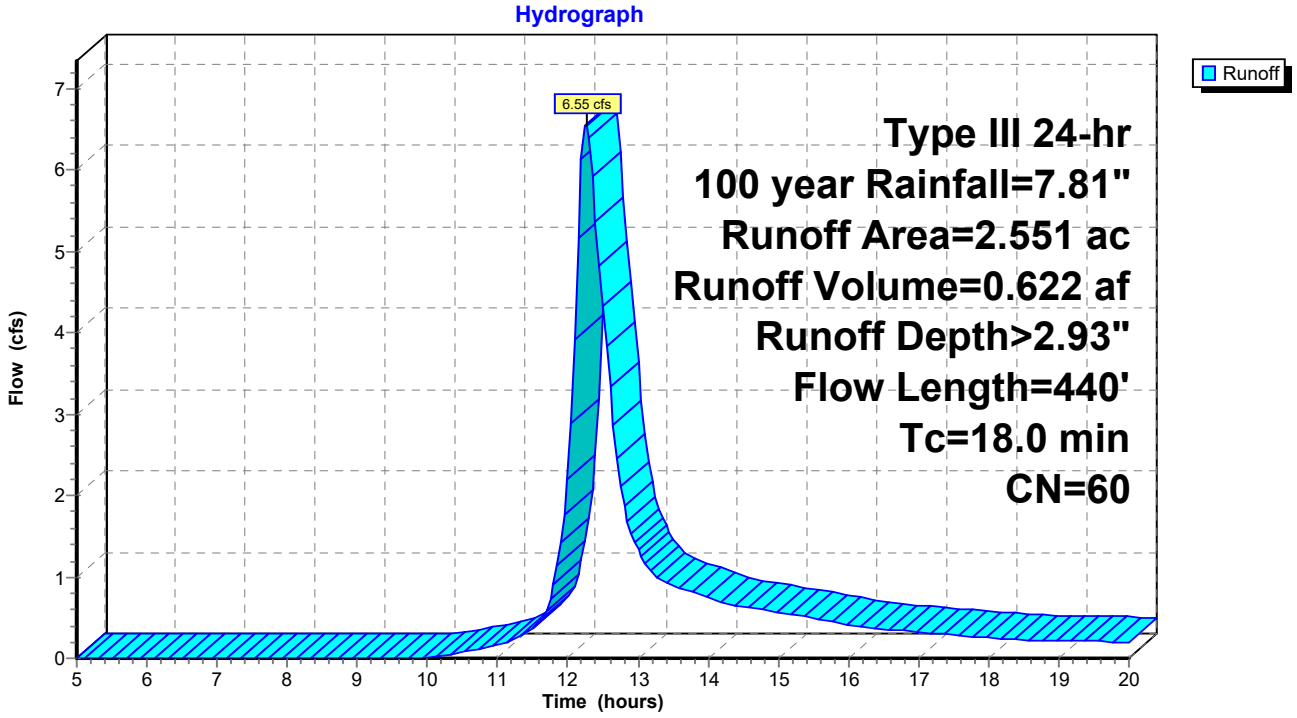
Runoff = 6.55 cfs @ 12.26 hrs, Volume= 0.622 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.551	60	Woods, Fair, HSG B
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.7	340	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.0	440	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

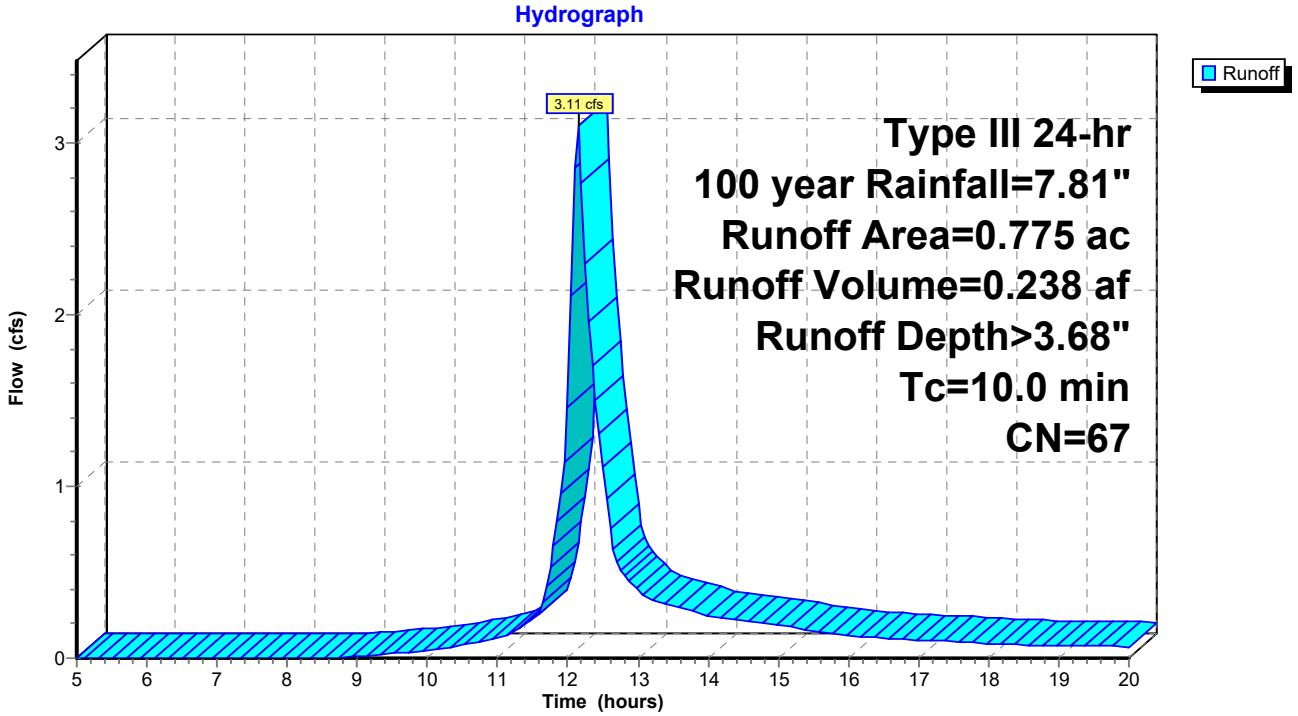
Runoff = 3.11 cfs @ 12.15 hrs, Volume= 0.238 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.488	60	Woods, Fair, HSG B
0.287	79	Woods, Fair, HSG D
0.775	67	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

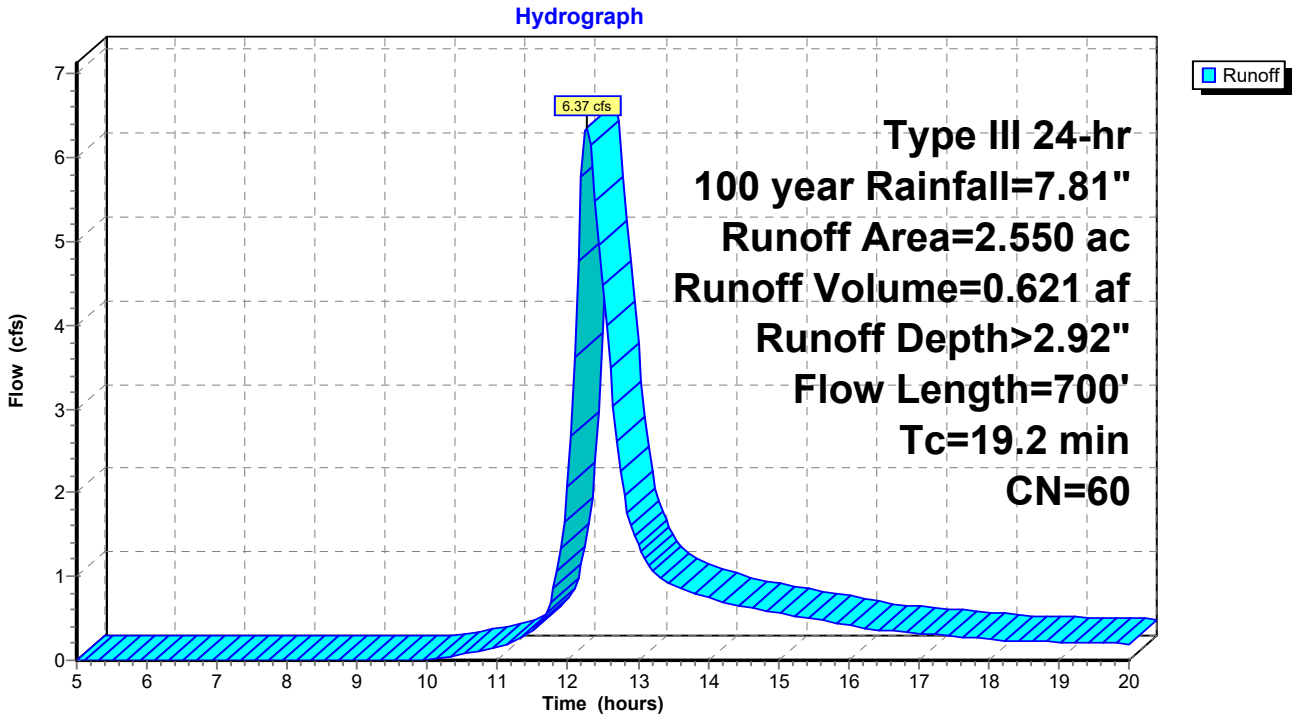
Runoff = 6.37 cfs @ 12.28 hrs, Volume= 0.621 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.515	60	Woods, Fair, HSG B
0.034	79	Woods, Fair, HSG D
2.550	60	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.3	500	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	150	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.2	700	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

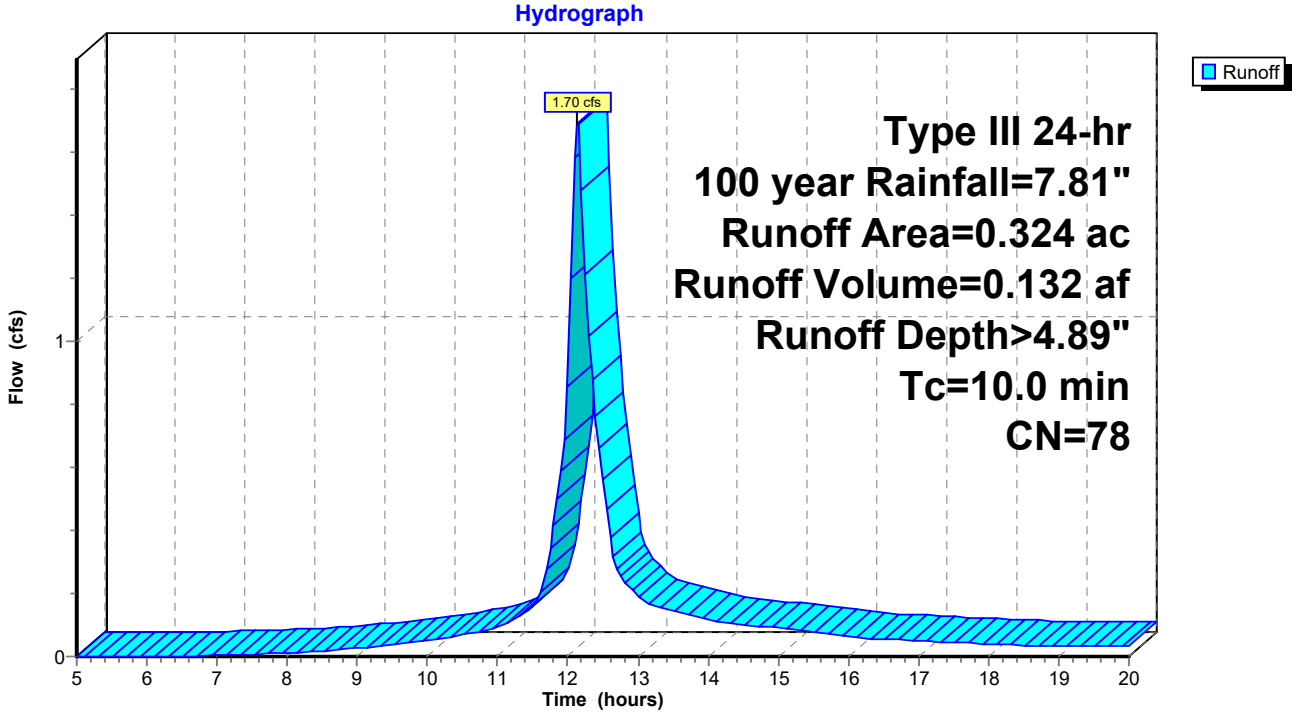
Runoff = 1.70 cfs @ 12.14 hrs, Volume= 0.132 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.008	60	Woods, Fair, HSG B
0.002	60	Woods, Fair, HSG B
0.315	79	Woods, Fair, HSG D
0.324	78	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

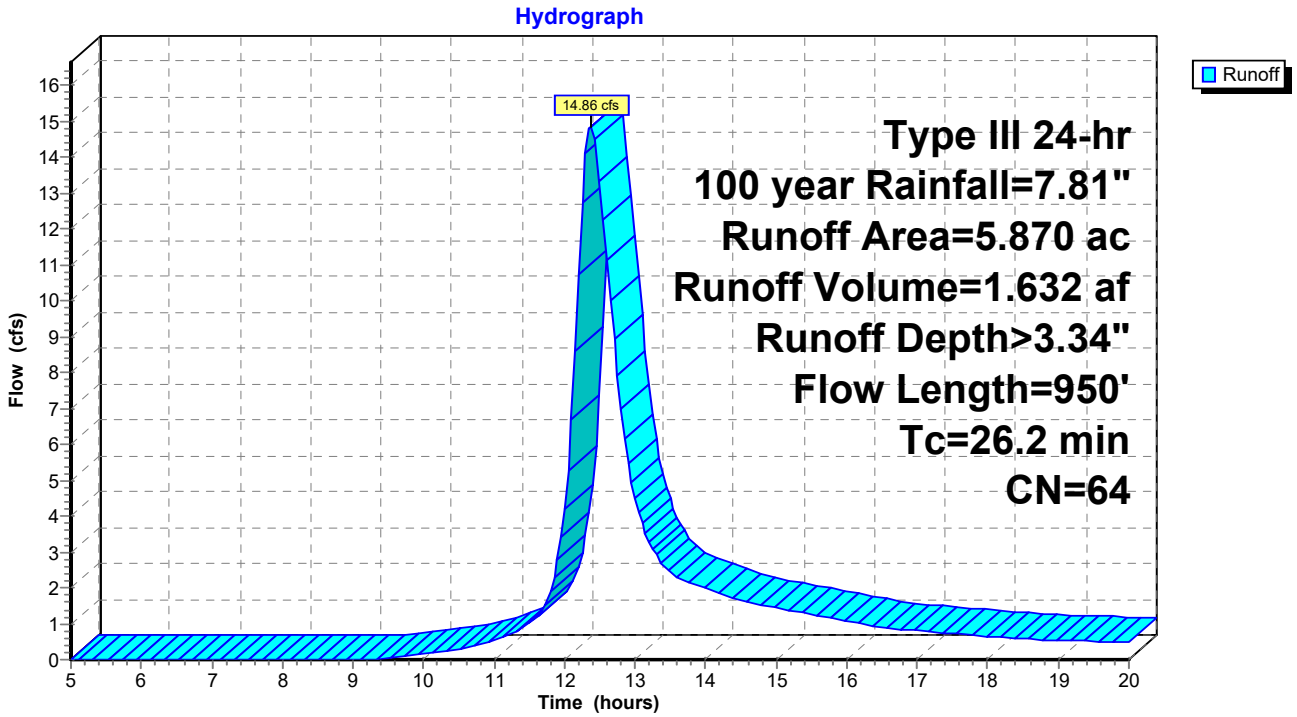
Runoff = 14.86 cfs @ 12.37 hrs, Volume= 1.632 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
4.578	60	Woods, Fair, HSG B
1.292	79	Woods, Fair, HSG D
5.870	64	Weighted Average
5.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	50	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	360	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	400	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	140	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	950	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

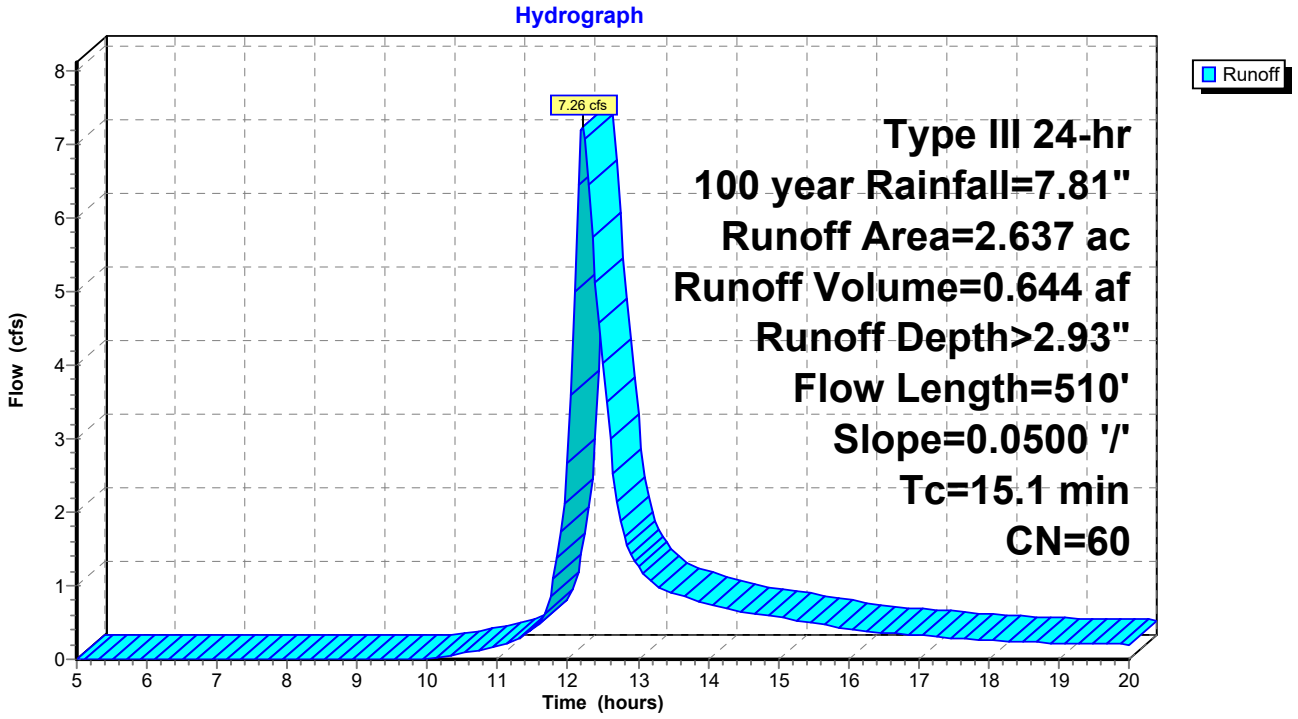
Runoff = 7.26 cfs @ 12.22 hrs, Volume= 0.644 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.637	60	Woods, Fair, HSG B
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

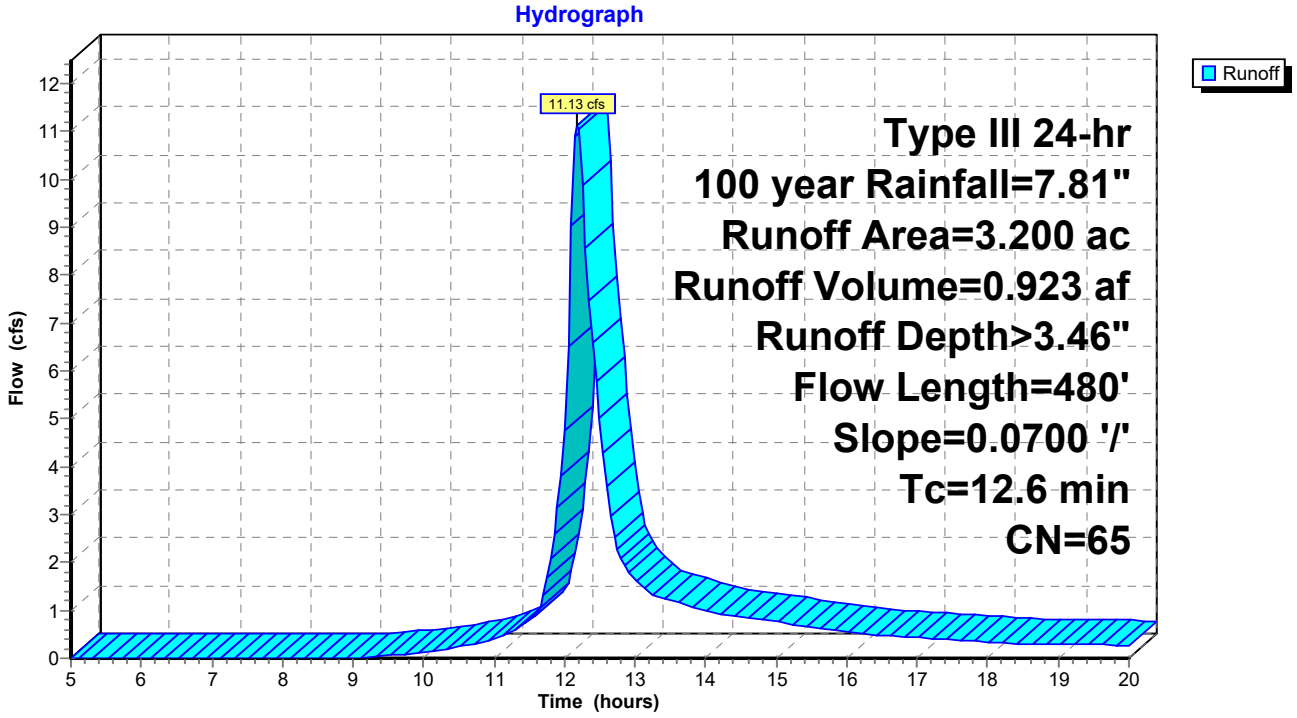
Runoff = 11.13 cfs @ 12.18 hrs, Volume= 0.923 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.281	60	Woods, Fair, HSG B
0.919	79	Woods, Fair, HSG D
3.200	65	Weighted Average
3.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
5.4	430	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	480	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

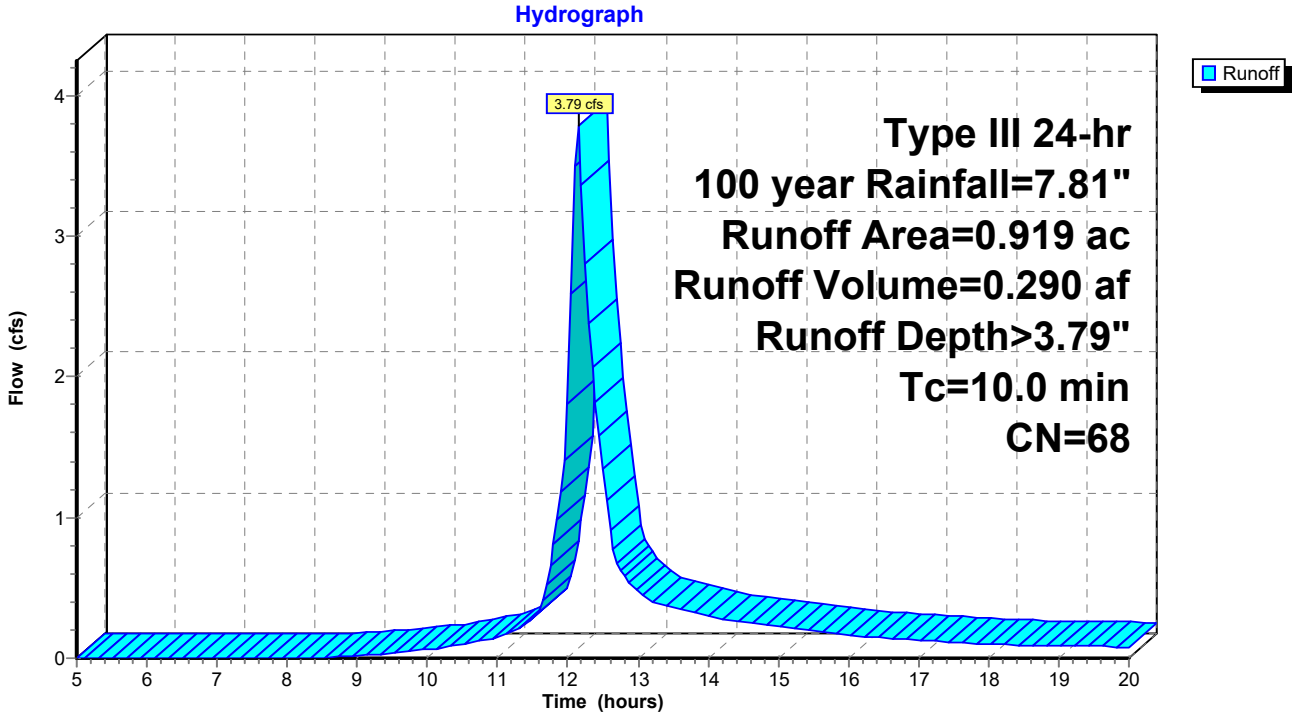
Runoff = 3.79 cfs @ 12.15 hrs, Volume= 0.290 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.003	60	Woods, Fair, HSG B
0.517	60	Woods, Fair, HSG B
0.000	79	Woods, Fair, HSG D
0.400	79	Woods, Fair, HSG D
0.919	68	Weighted Average
0.919		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

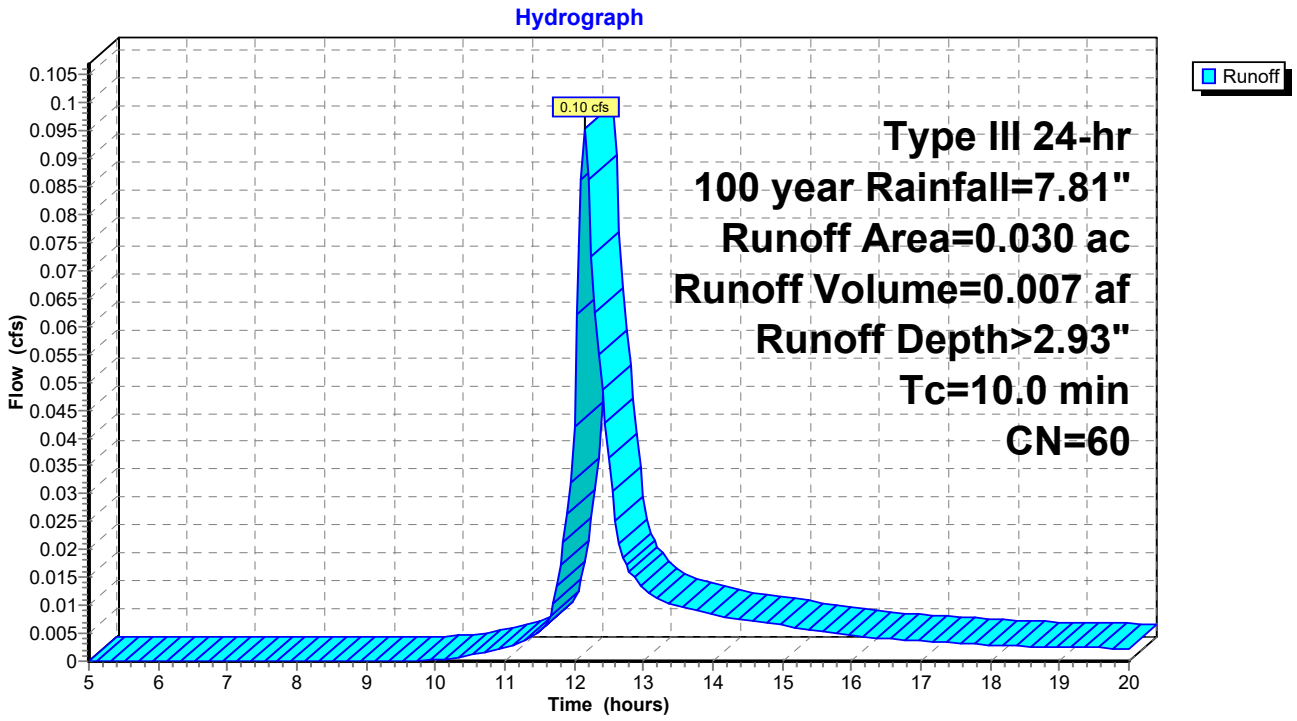
Runoff = 0.10 cfs @ 12.15 hrs, Volume= 0.007 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.030	60	Woods, Fair, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

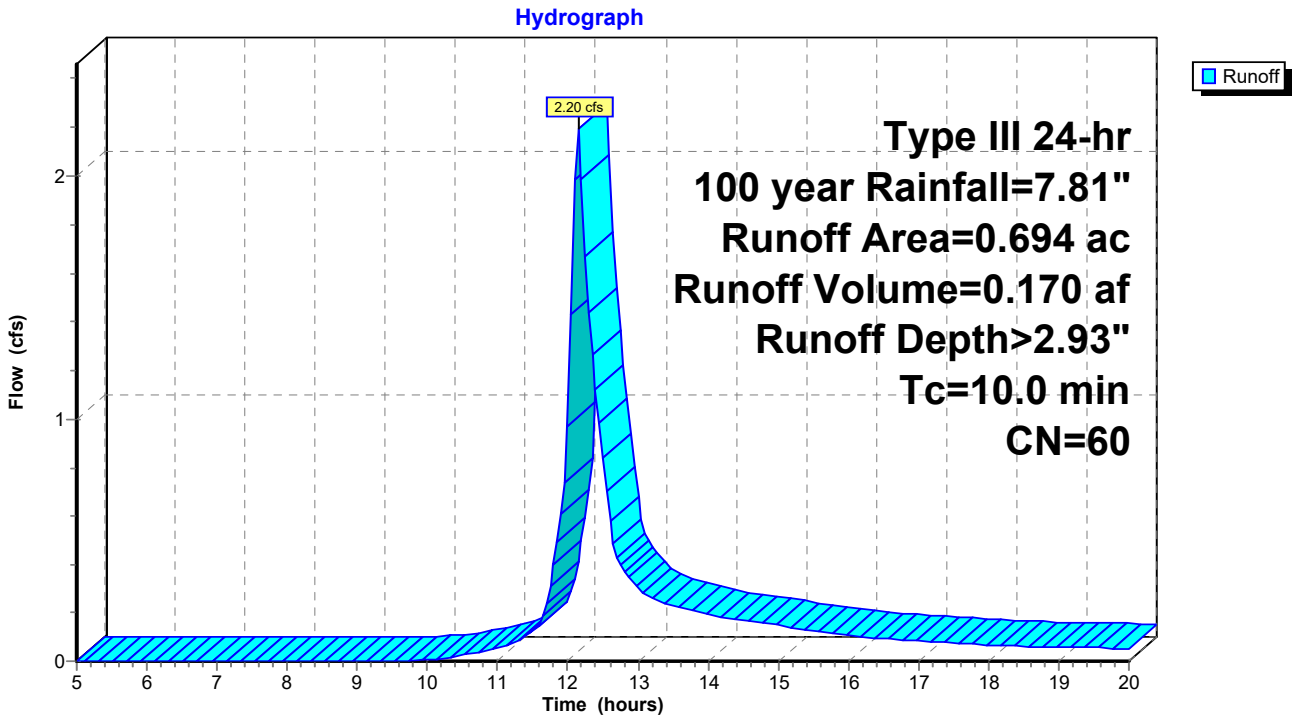
Runoff = 2.20 cfs @ 12.15 hrs, Volume= 0.170 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.694	60	Woods, Fair, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

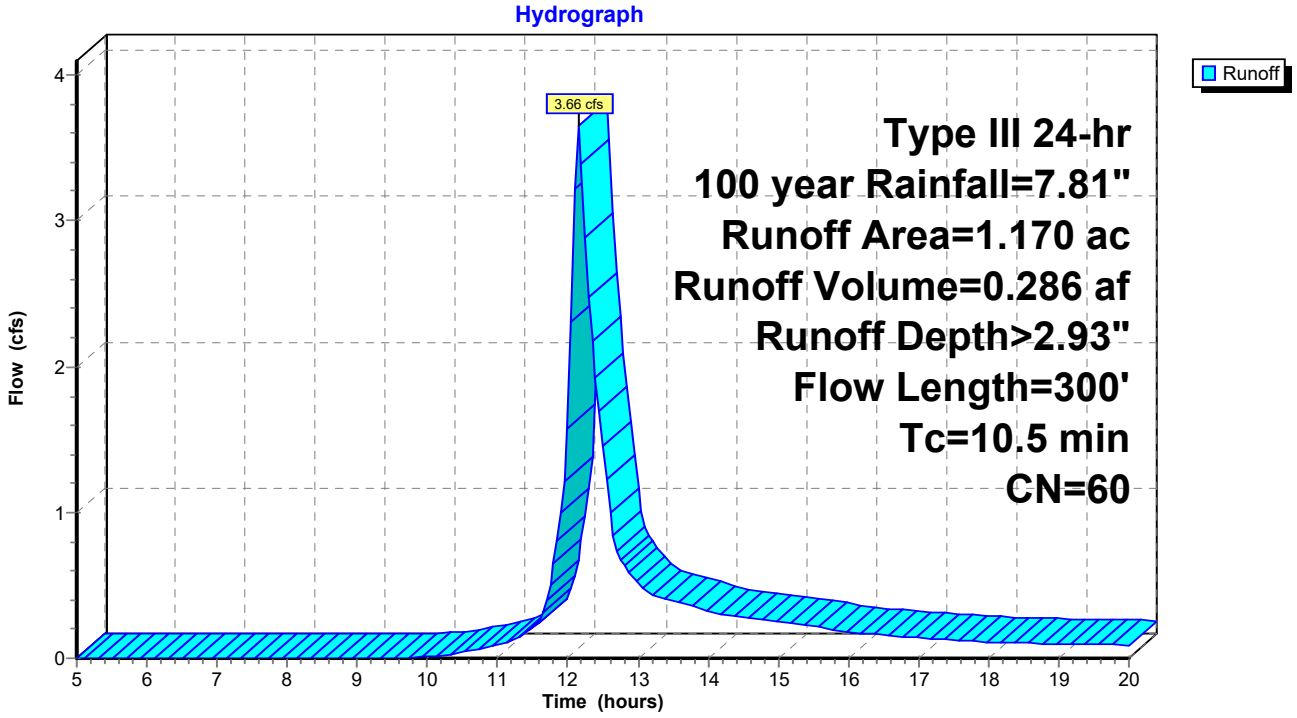
Runoff = 3.66 cfs @ 12.16 hrs, Volume= 0.286 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.170	60	Woods, Fair, HSG B
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.8	150	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	300	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

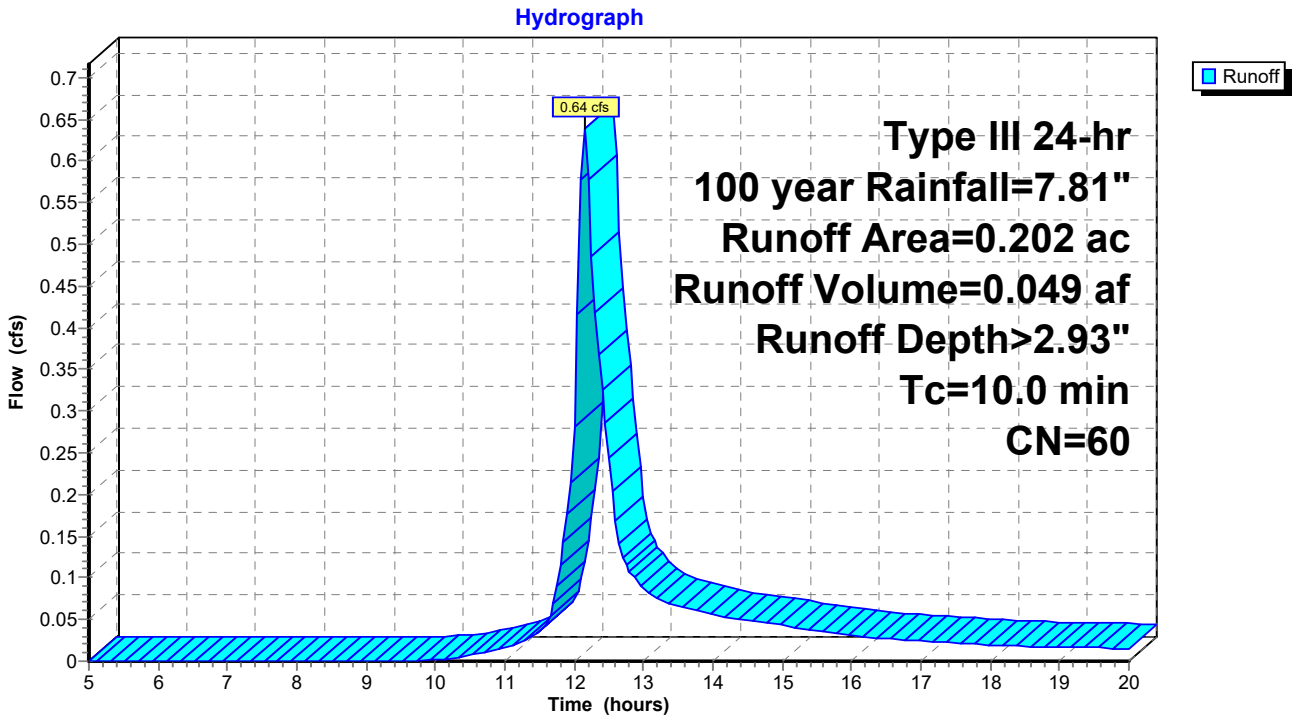
Runoff = 0.64 cfs @ 12.15 hrs, Volume= 0.049 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.202	60	Woods, Fair, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

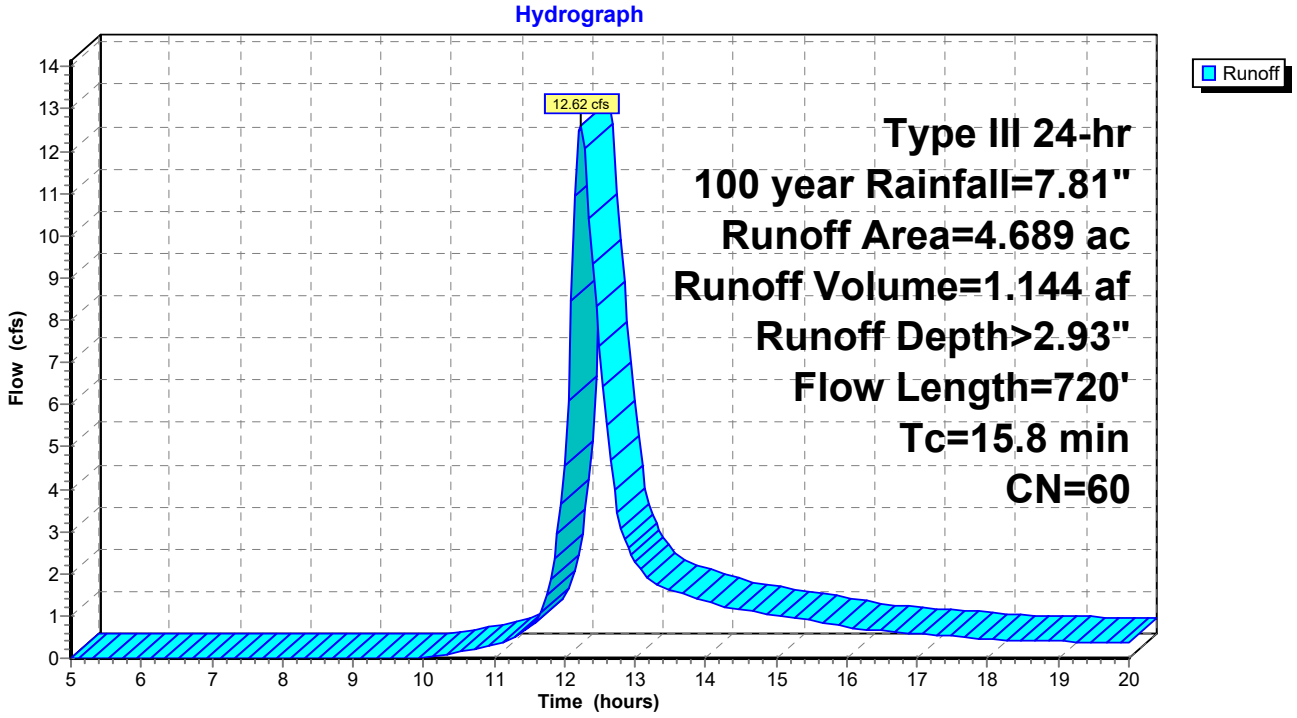
Runoff = 12.62 cfs @ 12.23 hrs, Volume= 1.144 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
4.689	60	Woods, Fair, HSG B
4.689		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1100	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.7	270	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.8	720	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

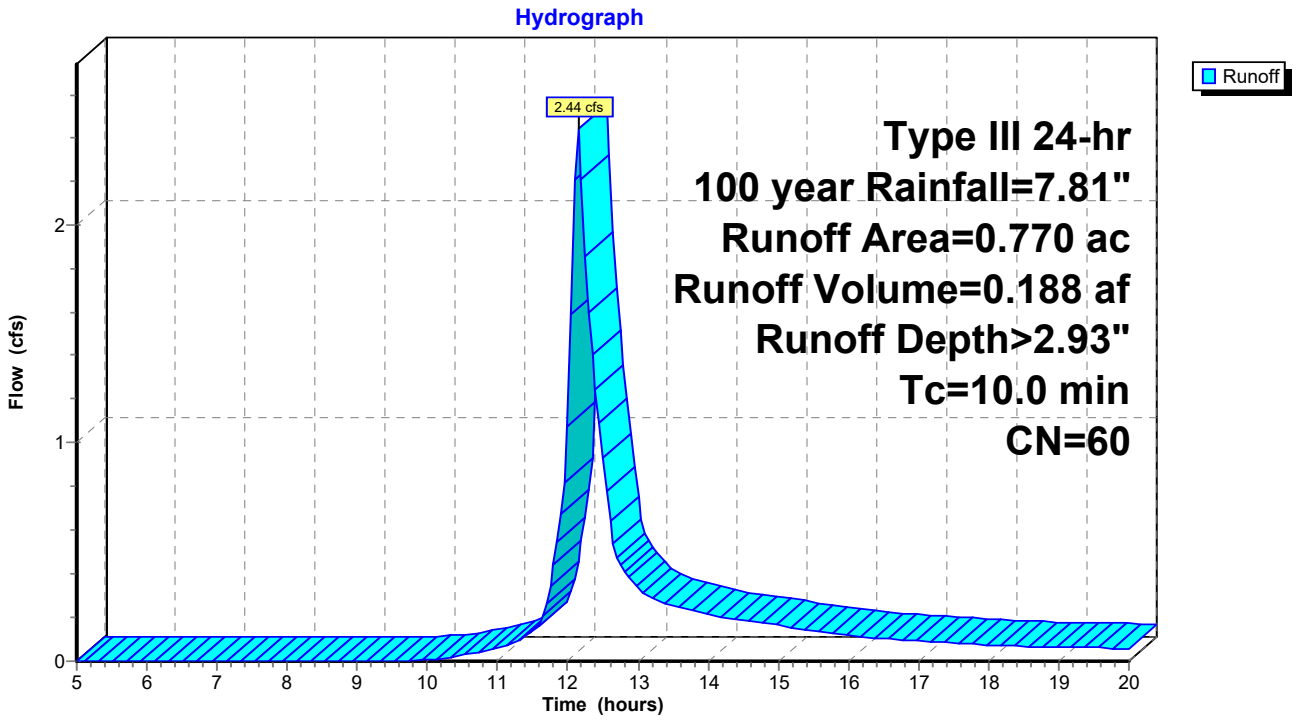
Runoff = 2.44 cfs @ 12.15 hrs, Volume= 0.188 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.770	60	Woods, Fair, HSG B
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

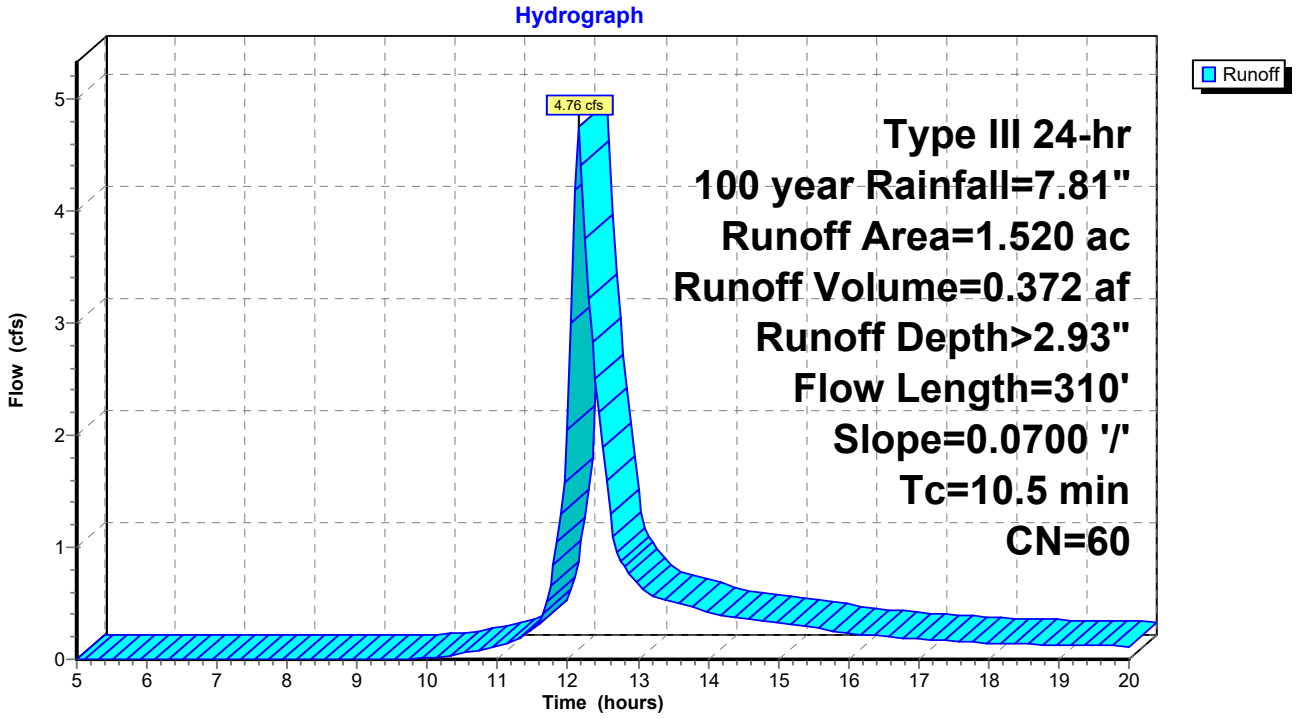
Runoff = 4.76 cfs @ 12.16 hrs, Volume= 0.372 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.520	60	Woods, Fair, HSG B
1.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.3	260	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	310	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

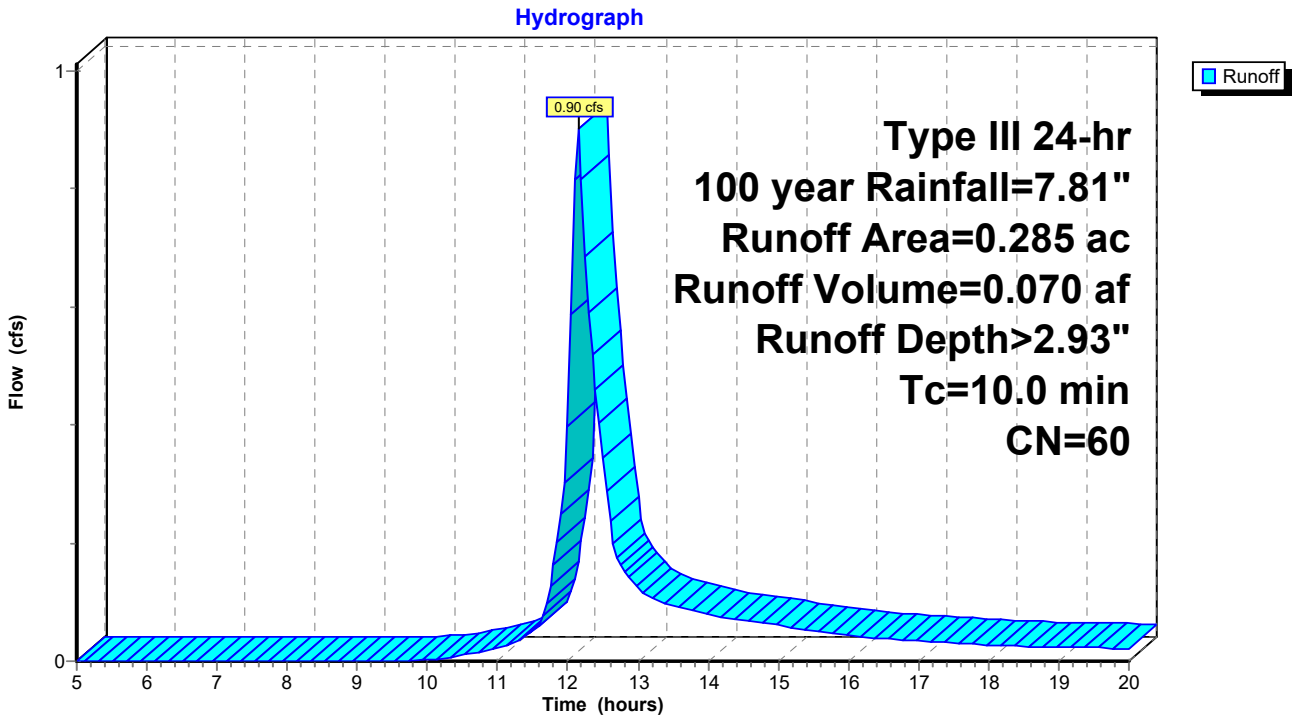
Runoff = 0.90 cfs @ 12.15 hrs, Volume= 0.070 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.285	60	Woods, Fair, HSG B
0.285		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

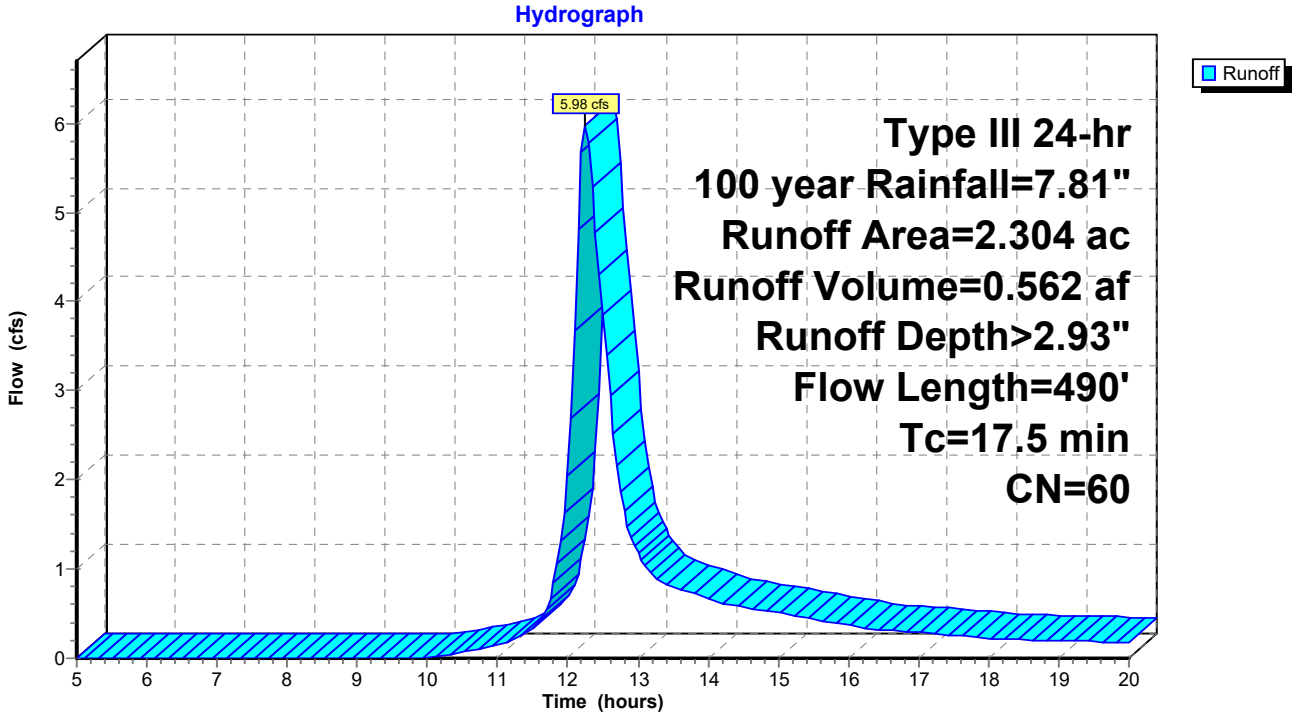
Runoff = 5.98 cfs @ 12.25 hrs, Volume= 0.562 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.304	60	Woods, Fair, HSG B
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	170	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.5	490	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

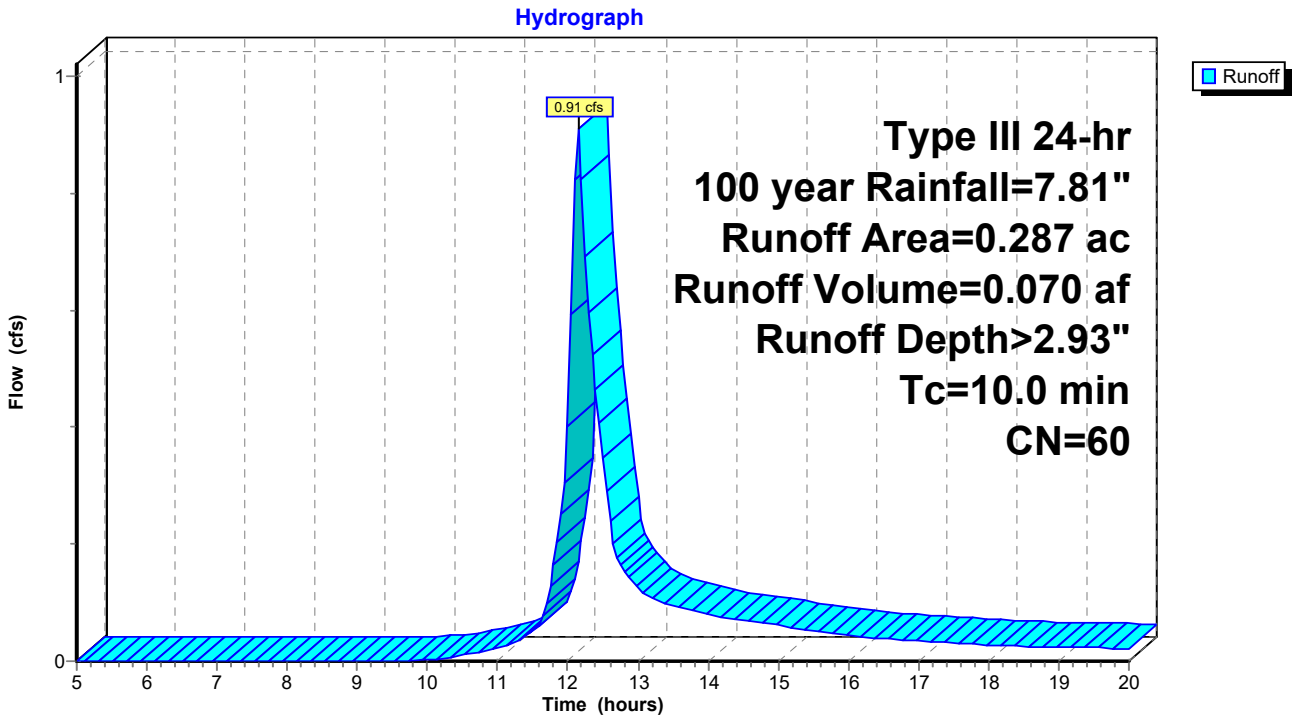
Runoff = 0.91 cfs @ 12.15 hrs, Volume= 0.070 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.287	60	Woods, Fair, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

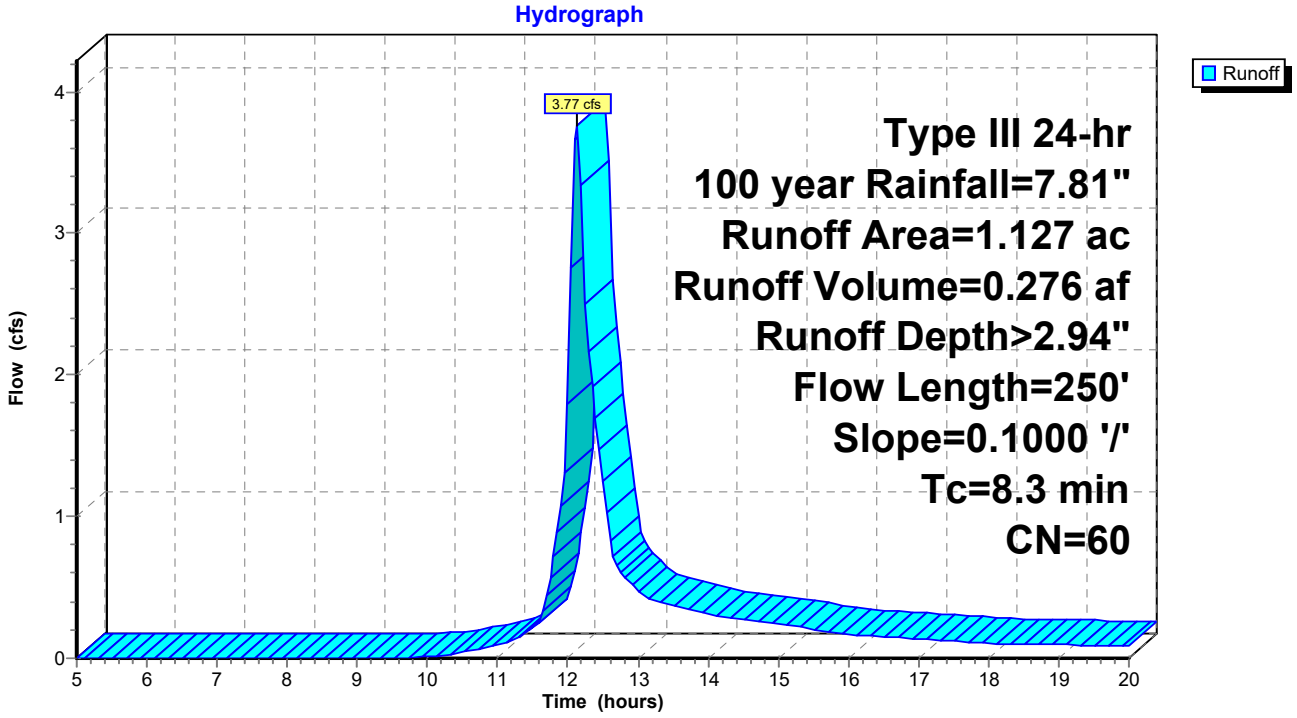
Runoff = 3.77 cfs @ 12.12 hrs, Volume= 0.276 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
1.127	60	Woods, Fair, HSG B
1.127	60	Weighted Average
1.127		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
2.1	200	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.3	250	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

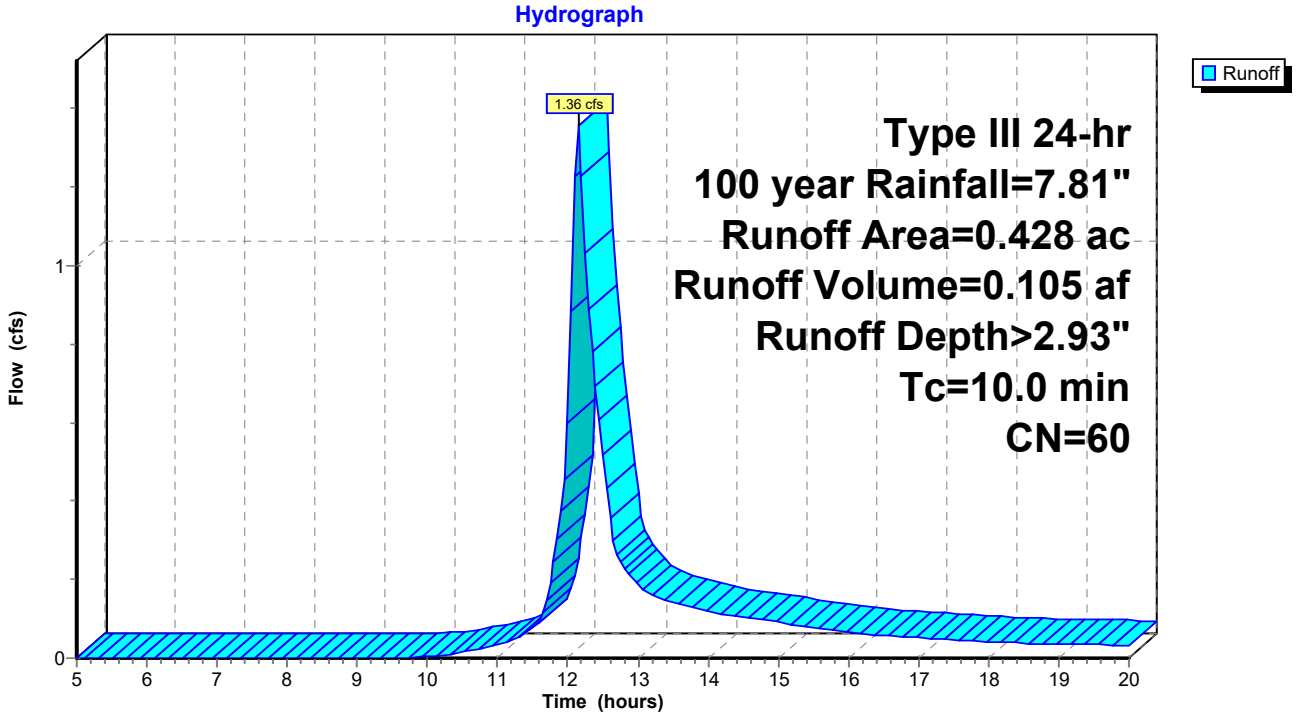
Runoff = 1.36 cfs @ 12.15 hrs, Volume= 0.105 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
0.428	60	Woods, Fair, HSG B
0.428	60	Weighted Average
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

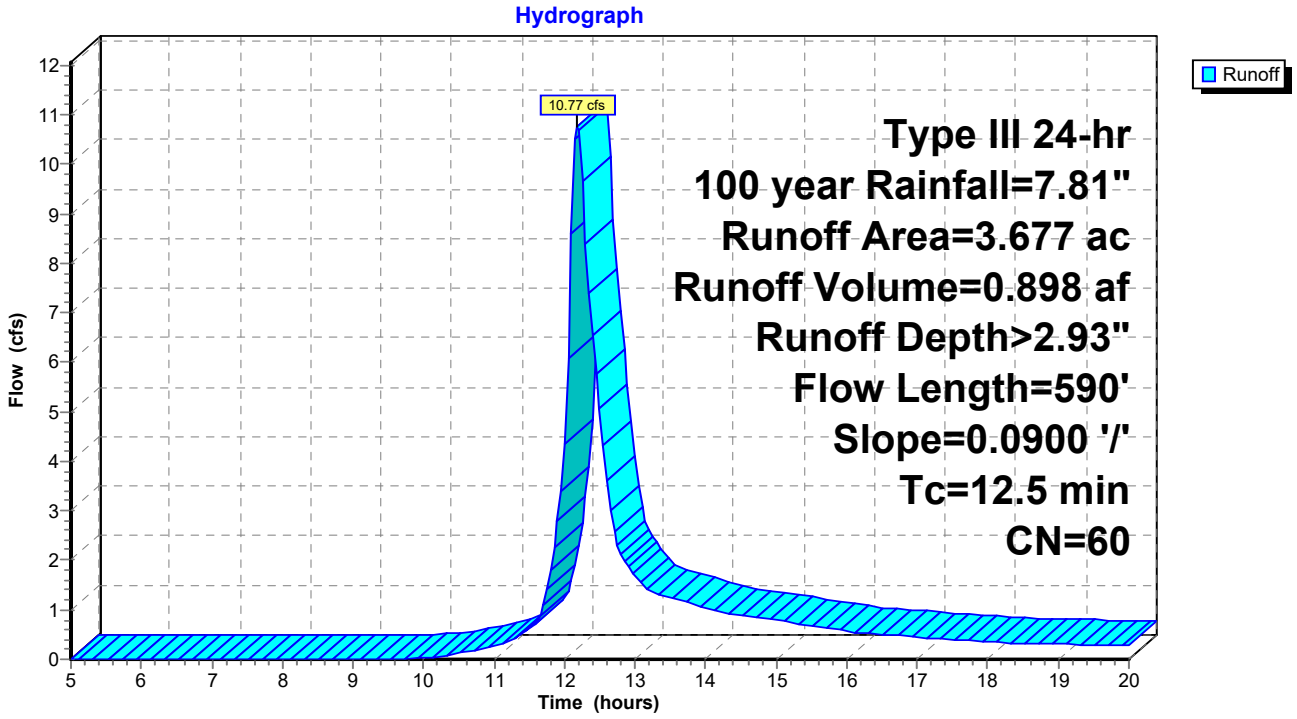
Runoff = 10.77 cfs @ 12.18 hrs, Volume= 0.898 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.677	60	Woods, Fair, HSG B
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.0	540	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.5	590	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

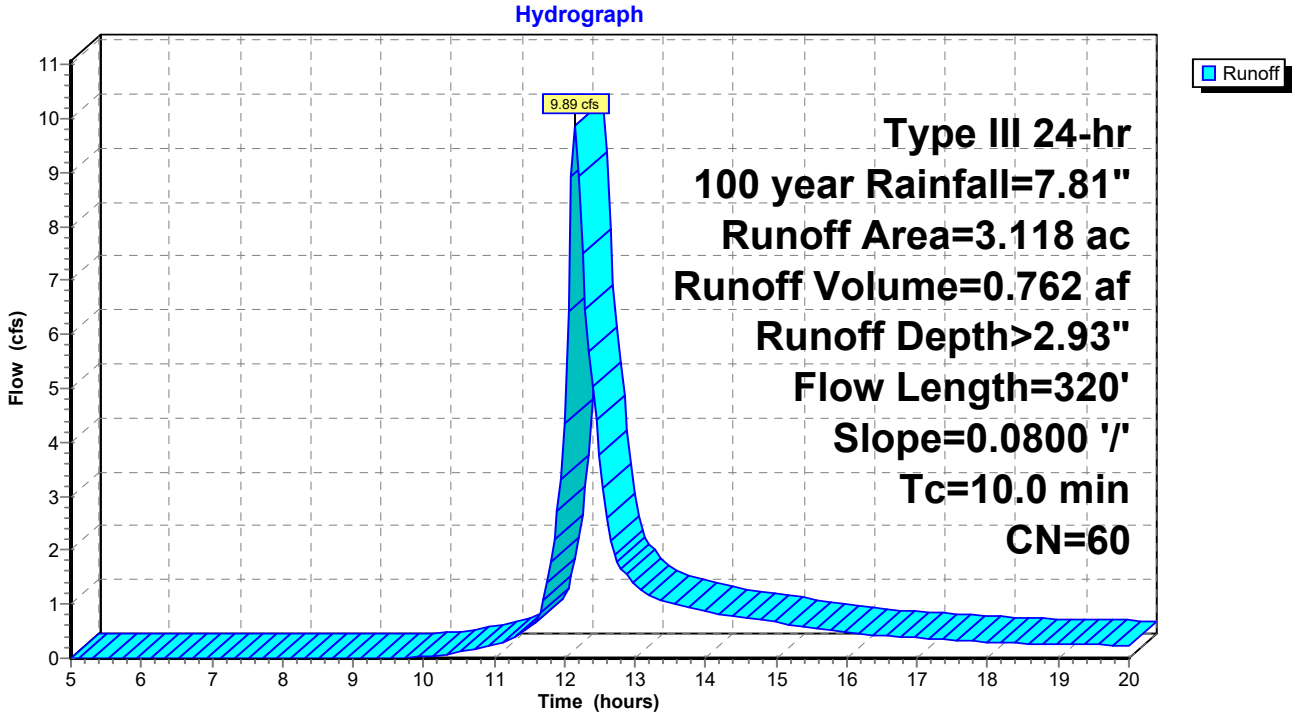
Runoff = 9.89 cfs @ 12.15 hrs, Volume= 0.762 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.092	60	Woods, Fair, HSG B
0.026	79	Woods, Fair, HSG D
3.118	60	Weighted Average
3.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
3.2	270	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.0	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

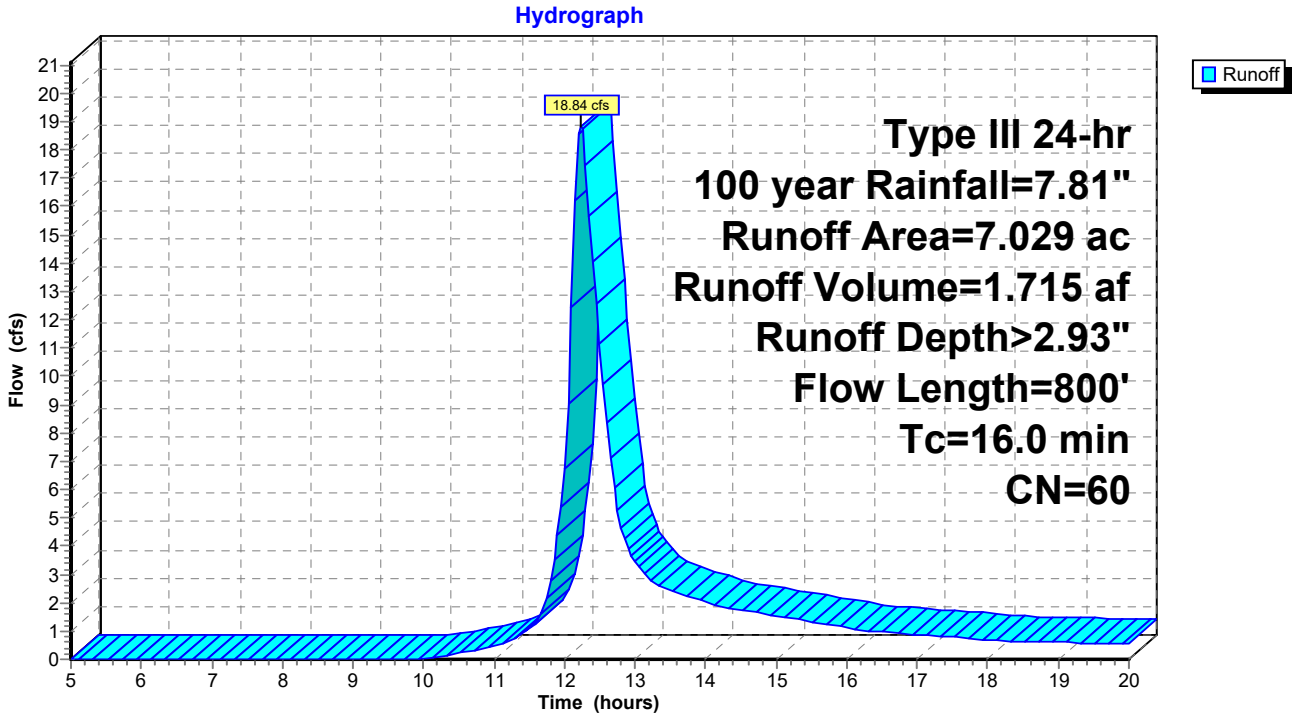
Runoff = 18.84 cfs @ 12.23 hrs, Volume= 1.715 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
7.029	60	Woods, Fair, HSG B
7.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0700	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
8.8	750	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 13.3: Subcat 13.3

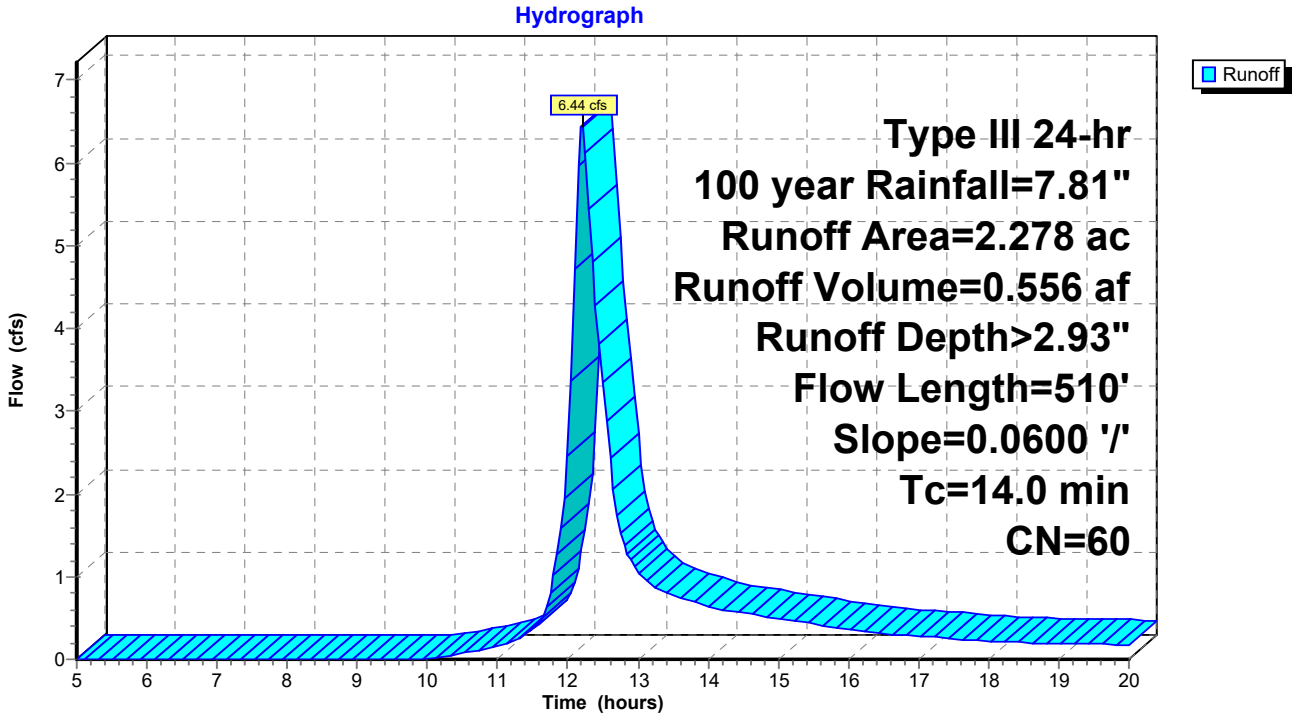
Runoff = 6.44 cfs @ 12.20 hrs, Volume= 0.556 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.278	60	Woods, Fair, HSG B
2.278		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
6.3	460	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.0	510	Total			

Subcatchment 13.3: Subcat 13.3



Summary for Subcatchment 14: Subcat 14

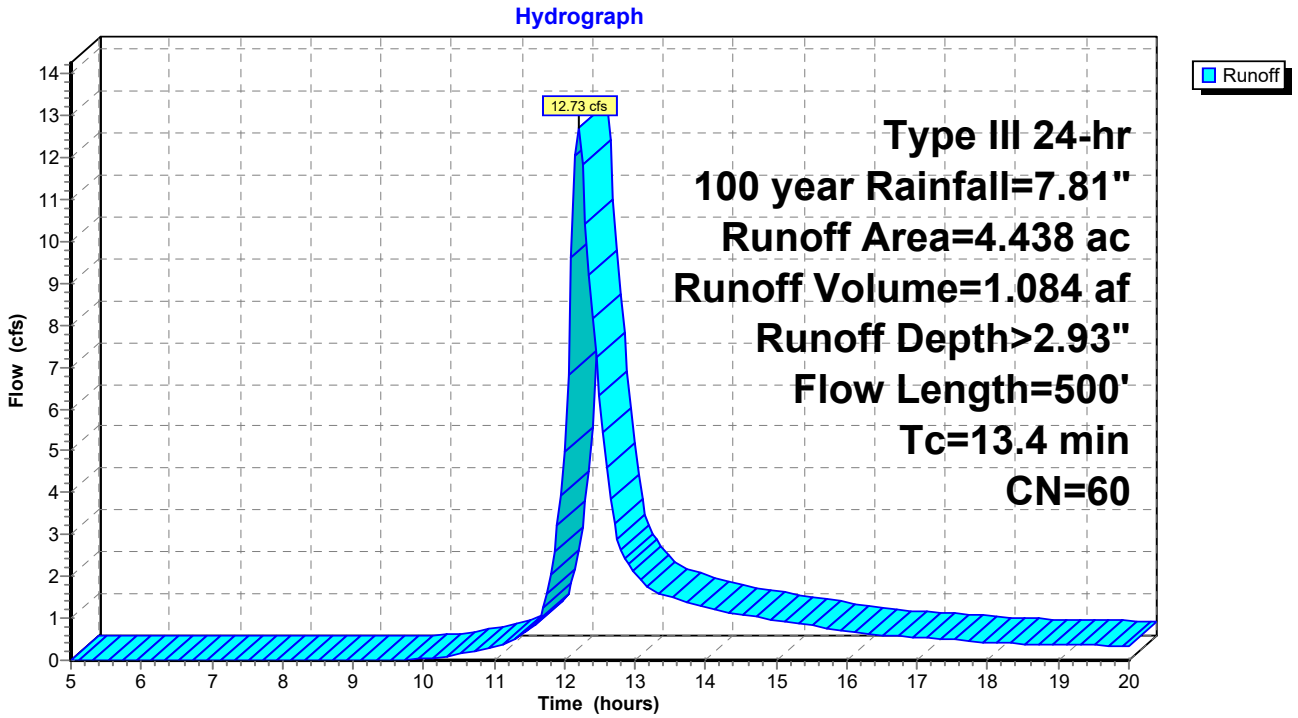
Runoff = 12.73 cfs @ 12.20 hrs, Volume= 1.084 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
4.438	60	Woods, Fair, HSG B
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
1.9	160	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	180	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	110	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

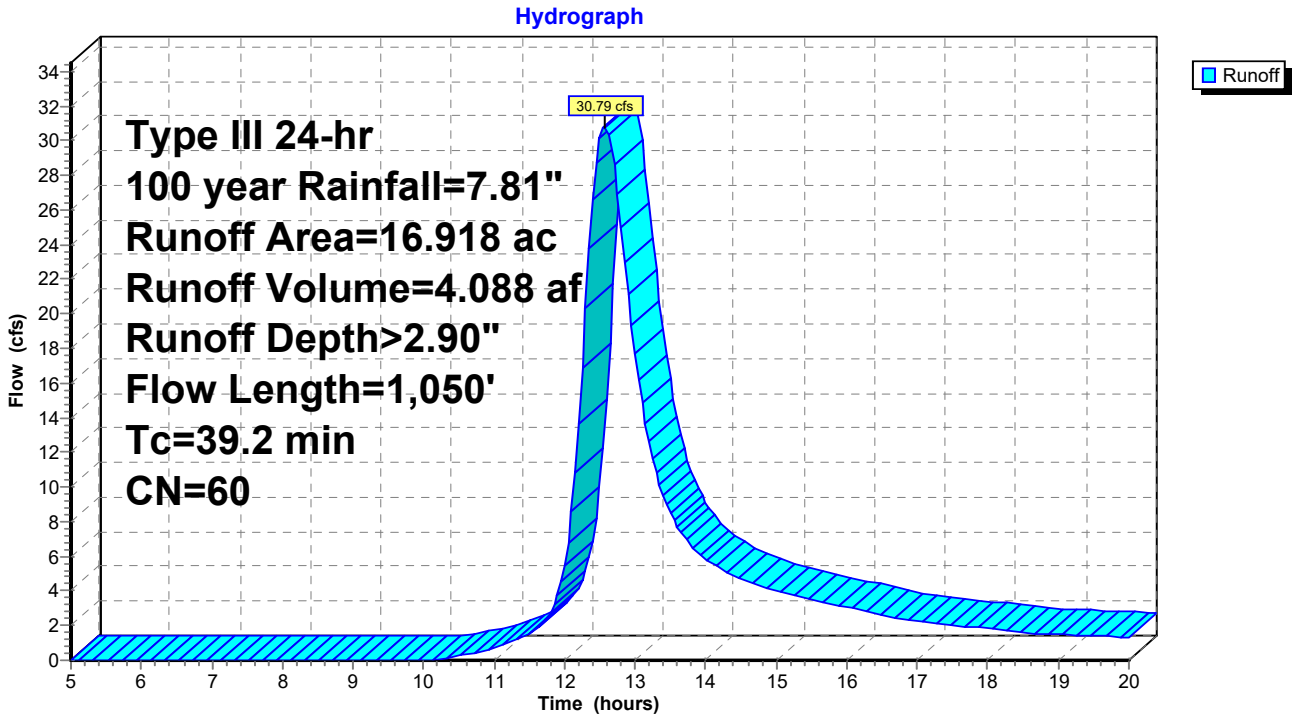
Runoff = 30.79 cfs @ 12.57 hrs, Volume= 4.088 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	60	Woods, Fair, HSG B
16.918	60	Woods, Fair, HSG B
16.918	60	Weighted Average
16.918		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.45"
16.7	500	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	500	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.2	1,050	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

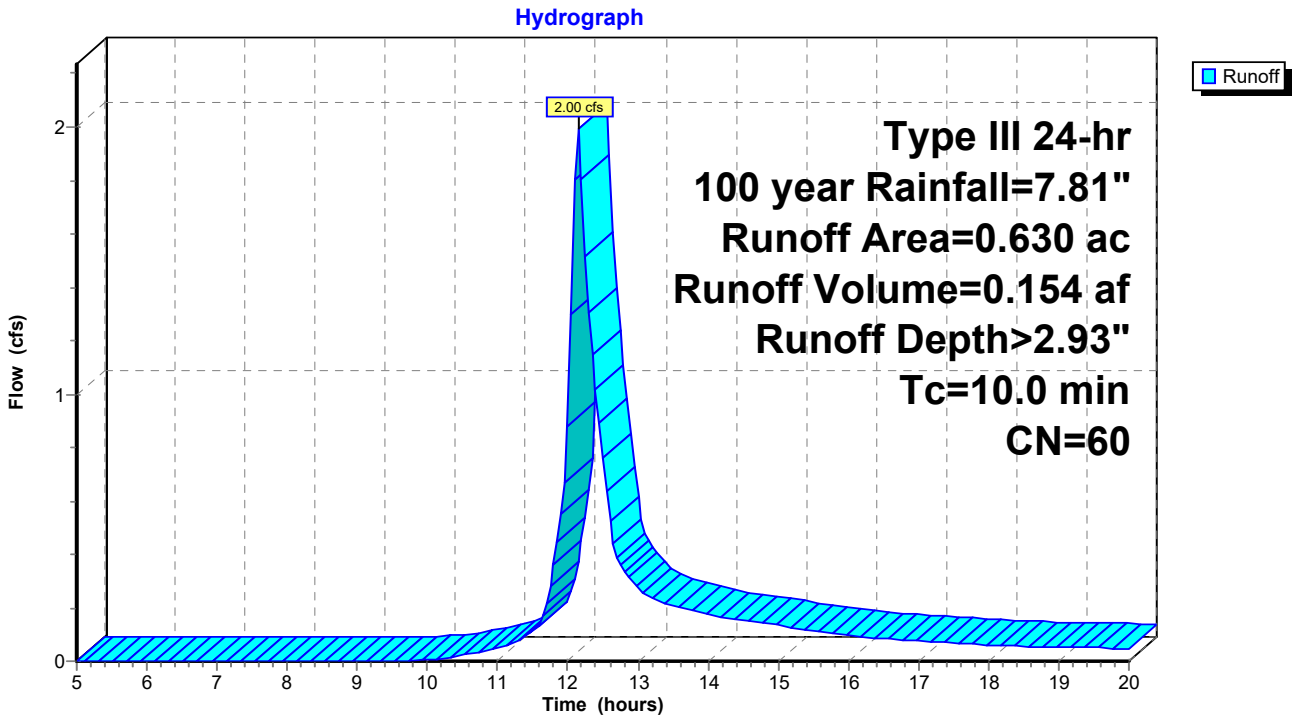
Runoff = 2.00 cfs @ 12.15 hrs, Volume= 0.154 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.630	60	Woods, Fair, HSG B
0.630		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.31'
[55] Hint: Peak inflow is 731% of Manning's capacity
[81] Warning: Exceeded Pond 13.1P by 0.14' @ 12.40 hrs

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.56" for 100 year event
Inflow = 6.98 cfs @ 12.28 hrs, Volume= 0.666 af
Outflow = 6.69 cfs @ 12.40 hrs, Volume= 0.663 af, Atten= 4%, Lag= 7.5 min

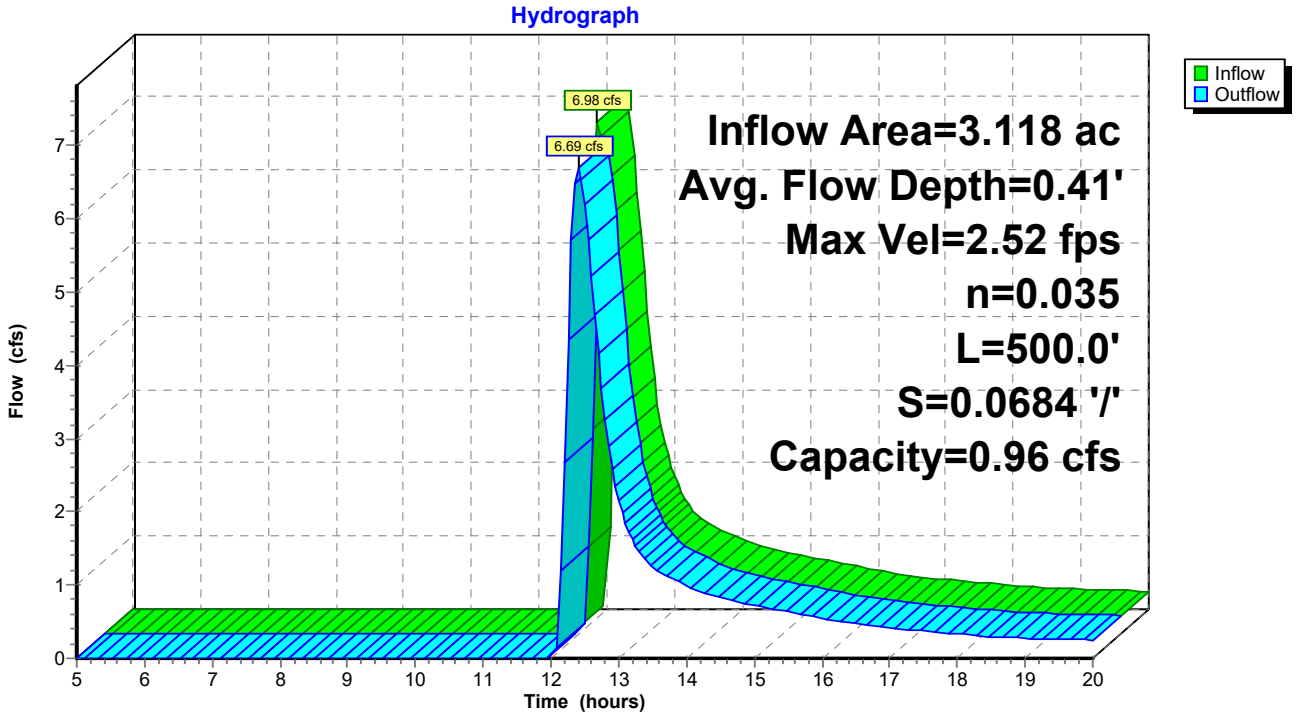
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 4.9 min

Peak Storage= 1,333 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.118 ac, 0.00% Impervious, Inflow Depth > 2.93" for 100 year event
Inflow = 9.89 cfs @ 12.15 hrs, Volume= 0.762 af
Outflow = 6.98 cfs @ 12.28 hrs, Volume= 0.666 af, Atten= 29%, Lag= 7.7 min
Primary = 6.98 cfs @ 12.28 hrs, Volume= 0.666 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.48' @ 12.28 hrs Surf.Area= 16,658 sf Storage= 8,125 cf

Plug-Flow detention time= 64.6 min calculated for 0.666 af (87% of inflow)
Center-of-Mass det. time= 26.3 min (836.7 - 810.4)

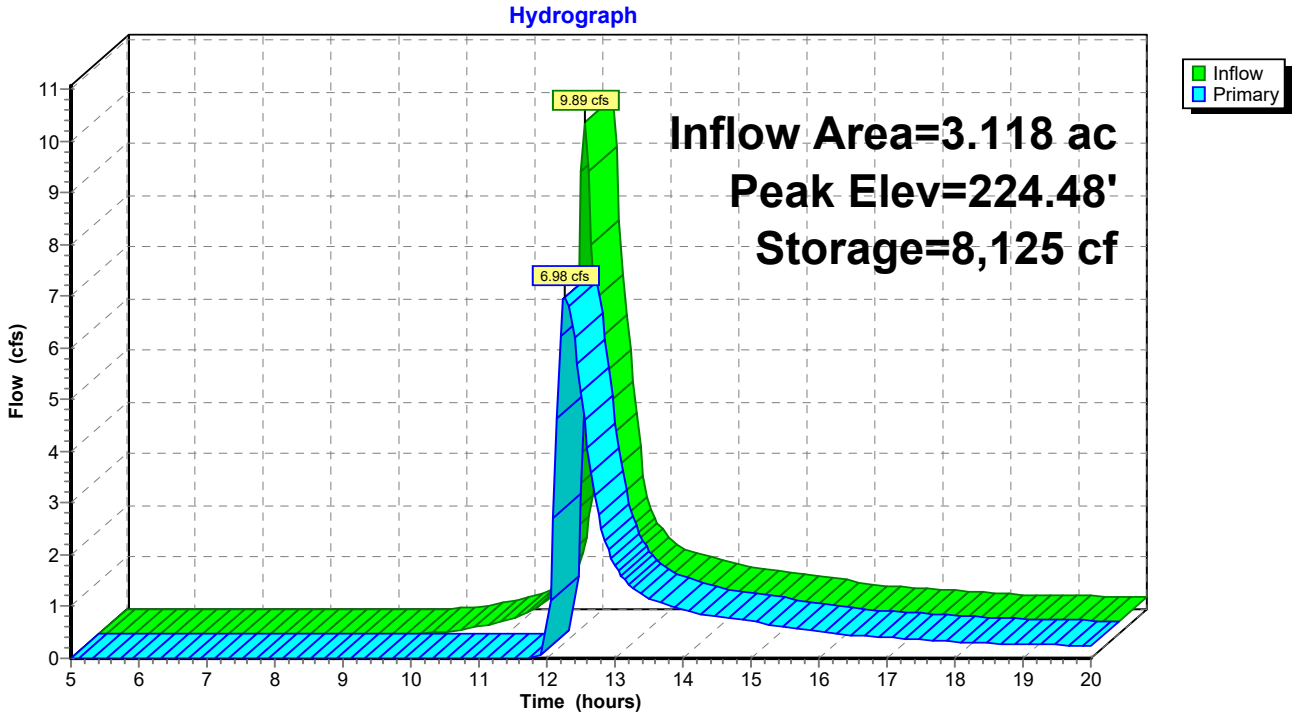
Volume	Invert	Avail.Storage	Storage Description
#1	223.70'	21,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.70	0	0	0
224.20	15,000	3,750	3,750
225.20	21,000	18,000	21,750

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**20.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.94 cfs @ 12.28 hrs HW=224.48' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 6.94 cfs @ 1.26 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13.2P: Pond 13.2

Inflow Area =	7.029 ac,	0.00% Impervious,	Inflow Depth >	2.93"	for 100 year event
Inflow =	18.84 cfs @	12.23 hrs,	Volume=	1.715 af	
Outflow =	17.04 cfs @	12.32 hrs,	Volume=	1.522 af,	Atten= 10%, Lag= 5.3 min
Discarded =	0.79 cfs @	12.32 hrs,	Volume=	0.457 af	
Primary =	16.25 cfs @	12.32 hrs,	Volume=	1.066 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.55' @ 12.32 hrs Surf.Area= 11,060 sf Storage= 14,099 cf

Plug-Flow detention time= 56.0 min calculated for 1.517 af (88% of inflow)
Center-of-Mass det. time= 21.8 min (836.8 - 815.0)

Volume	Invert	Avail.Storage	Storage Description
#1	187.70'	34,621 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

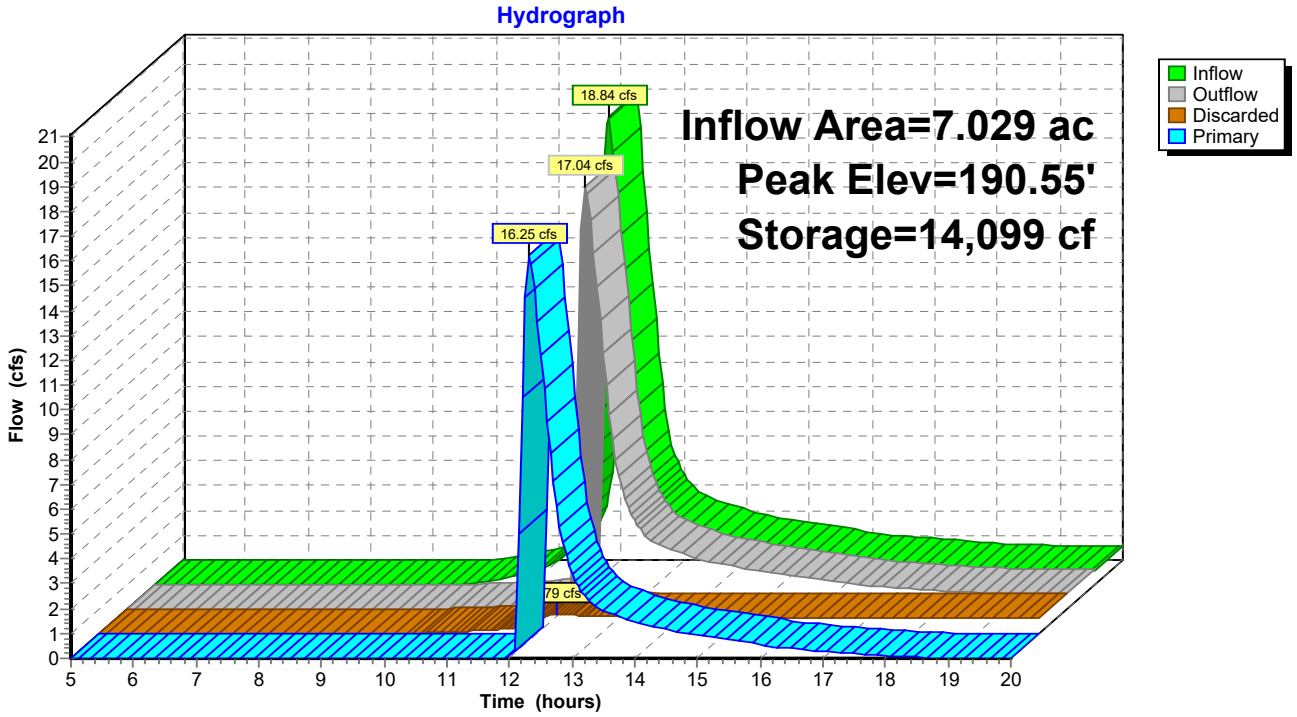
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
187.70	0	0	0	0
188.00	900	90	90	900
190.00	9,000	8,497	8,587	9,012
192.00	17,500	26,033	34,621	17,550

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**15.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	187.70'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 180.00'

Discarded OutFlow Max=0.79 cfs @ 12.32 hrs HW=190.55' (Free Discharge)
└─**2=Exfiltration** (Controls 0.79 cfs)

Primary OutFlow Max=16.02 cfs @ 12.32 hrs HW=190.55' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 16.02 cfs @ 1.96 fps)

Pond 13.2P: Pond 13.2

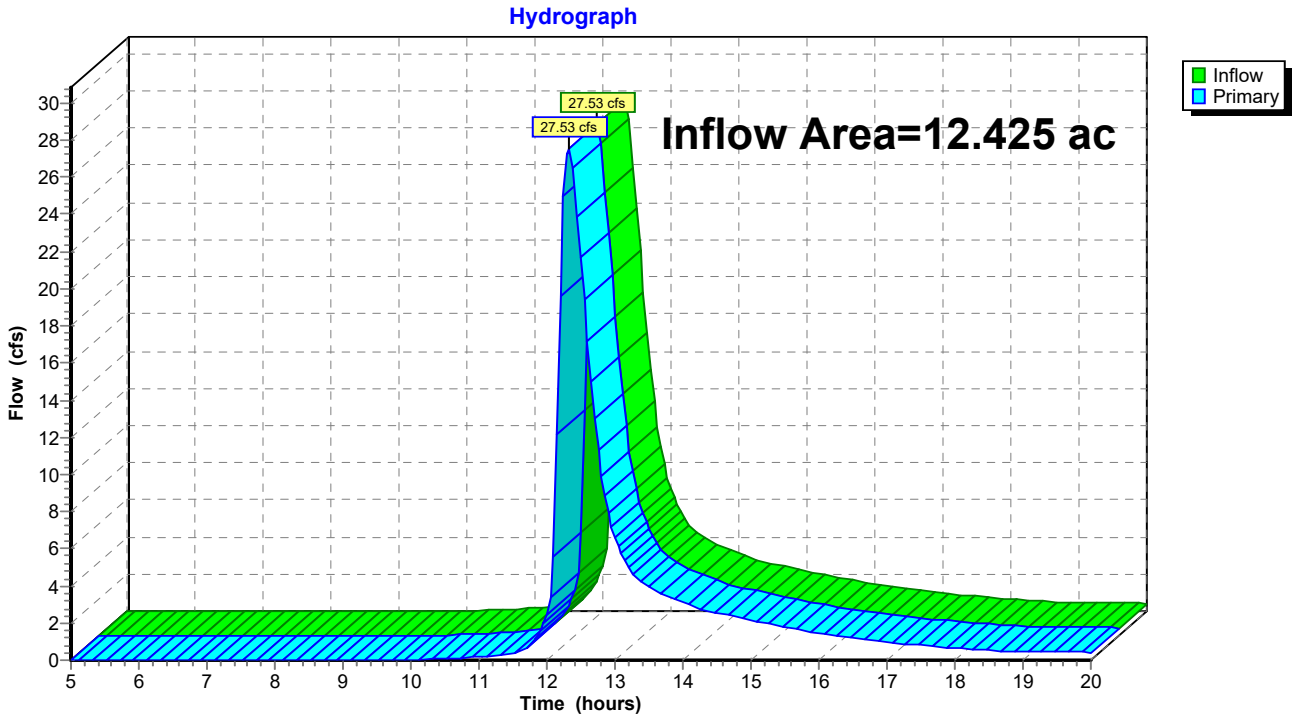


Summary for Link 13: 13

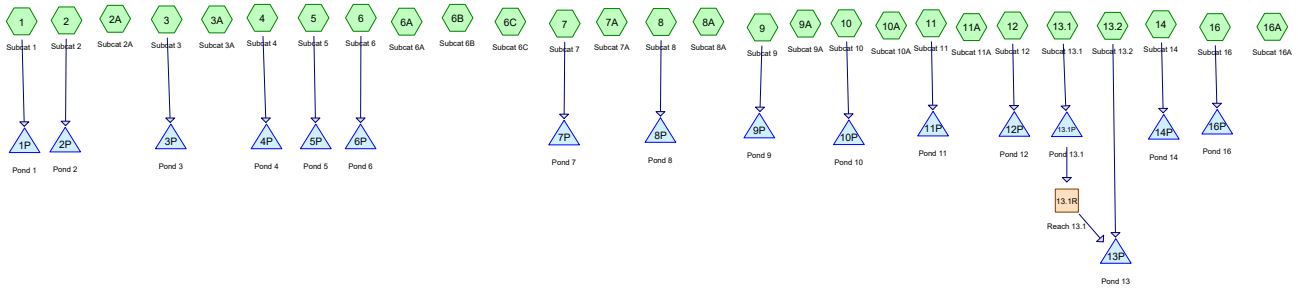
Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 2.21" for 100 year event
Inflow = 27.53 cfs @ 12.32 hrs, Volume= 2.285 af
Primary = 27.53 cfs @ 12.32 hrs, Volume= 2.285 af, Atten= 0%, Lag= 0.0 min

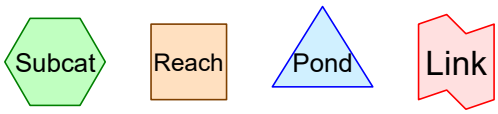
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 13: 13



HydroCAD Analysis: Proposed Conditions





Routing Diagram for 42496.00 HydroCAD Proposed
Prepared by VHB, Printed 12/3/2019
HydroCAD® 10.00-22 s/n 01038 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
48.441	74	>75% Grass cover, Good, HSG C (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16)
0.313	80	>75% Grass cover, Good, HSG D (4, 6, 13.1)
0.003	96	Gravel surface, HSG B (8A)
4.122	96	Gravel surface, HSG C (1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16)
0.096	96	Gravel surface, HSG D (4, 6)
17.514	58	Meadow, non-grazed, HSG B (1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 14, 16, 16A)
2.545	78	Meadow, non-grazed, HSG D (2A, 3, 3A, 4, 6, 6A, 13.1)
0.032	60	Woods, Fair, HSG B (6)
0.319	79	Woods, Fair, HSG D (6)
73.385	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
17.549	HSG B	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 14, 16, 16A
52.563	HSG C	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16
3.273	HSG D	2A, 3, 3A, 4, 6, 6A, 13.1
0.000	Other	
73.385		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	48.441	0.313	0.000	48.754	>75% Grass cover, Good	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.1, 13.2, 14, 16
0.000	0.003	4.122	0.096	0.000	4.221	Gravel surface	1, 2, 3, 4, 6, 7, 8, 8A, 9, 10, 11, 12, 13.1, 13.2, 14, 16
0.000	17.514	0.000	2.545	0.000	20.059	Meadow, non-grazed	1, 2, 2A, 3, 3A, 4, 5, 6, 6A, 6B, 6C, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 13.1, 13.2, 14, 16, 16A
0.000	0.032	0.000	0.319	0.000	0.351	Woods, Fair	6
0.000	**17.549**	**52.563**	**3.273**	**0.000**	**73.385**	**TOTAL AREA**	

2-Year Storm Event – Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>0.89"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=2.87 cfs 0.222 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=430' Tc=12.4 min CN=72 Runoff=2.45 cfs 0.210 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>0.65"
Tc=10.0 min CN=65 Runoff=0.47 cfs 0.042 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>1.04"
Flow Length=620' Tc=12.6 min CN=73 Runoff=2.59 cfs 0.222 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>1.28"
Tc=10.0 min CN=77 Runoff=0.45 cfs 0.035 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>1.04"
Flow Length=810' Tc=16.2 min CN=73 Runoff=5.44 cfs 0.510 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>0.79"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=2.04 cfs 0.173 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>1.05"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=3.70 cfs 0.279 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>0.74"
Tc=10.0 min CN=67 Runoff=0.66 cfs 0.056 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.01 cfs 0.001 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.17 cfs 0.022 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>0.89"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=1.22 cfs 0.086 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.05 cfs 0.006 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=650' Tc=10.1 min CN=72 Runoff=4.84 cfs 0.386 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.19 cfs 0.024 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>1.05"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=1.89 cfs 0.133 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.06 cfs 0.008 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=410' Tc=11.0 min CN=72 Runoff=2.32 cfs 0.190 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.07 cfs 0.009 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>1.10"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=1.53 cfs 0.104 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.11 cfs 0.013 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>0.94"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=3.81 cfs 0.287 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>1.16"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=4.30 cfs 0.302 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>1.04"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=9.81 cfs 0.810 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>0.74"
Flow Length=500' Tc=9.1 min CN=67 Runoff=3.29 cfs 0.273 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>1.09"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=12.75 cfs 1.538 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>0.38"
Tc=10.0 min CN=58 Runoff=0.15 cfs 0.019 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.04' Max Vel=1.19 fps Inflow=0.20 cfs 0.067 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=0.20 cfs 0.065 af

Pond 1P: Pond 1 Peak Elev=193.14' Storage=11,380 cf Inflow=2.87 cfs 0.222 af
Outflow=0.25 cfs 0.091 af

Pond 2P: Pond 2 Peak Elev=229.53' Storage=4,555 cf Inflow=2.45 cfs 0.210 af
Discarded=0.23 cfs 0.145 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.145 af

Pond 3P: Pond 3 Peak Elev=226.70' Storage=6,537 cf Inflow=2.59 cfs 0.222 af
Outflow=0.21 cfs 0.081 af

Pond 4P: Pond 4 Peak Elev=187.75' Storage=42,620 cf Inflow=5.44 cfs 0.510 af
Outflow=0.00 cfs 0.000 af

Pond 5P: Pond 5 Peak Elev=218.02' Storage=7,497 cf Inflow=2.04 cfs 0.173 af
Outflow=0.02 cfs 0.000 af

Pond 6P: Pond 6 Peak Elev=209.09' Storage=16,047 cf Inflow=3.70 cfs 0.279 af
Outflow=0.19 cfs 0.059 af

Pond 7P: Pond 7 Peak Elev=224.42' Storage=1,533 cf Inflow=1.22 cfs 0.086 af
Discarded=0.13 cfs 0.079 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.079 af

Pond 8P: Pond 8 Peak Elev=188.75' Storage=10,191 cf Inflow=4.84 cfs 0.386 af
Outflow=0.45 cfs 0.172 af

Pond 9P: Pond 9 Peak Elev=189.76' Storage=9,888 cf Inflow=1.89 cfs 0.133 af
Outflow=0.00 cfs 0.000 af

Pond 10P: Pond 10 Peak Elev=168.45' Storage=8,267 cf Inflow=2.32 cfs 0.190 af
Outflow=0.00 cfs 0.000 af

Pond 11P: Pond 11 Peak Elev=151.40' Storage=6,549 cf Inflow=1.53 cfs 0.104 af
Outflow=0.00 cfs 0.000 af

Pond 12P: Pond 12 Peak Elev=158.65' Storage=15,492 cf Inflow=3.81 cfs 0.287 af
Outflow=0.27 cfs 0.098 af

Pond 13.1P: Pond 13.1 Peak Elev=224.25' Storage=10,445 cf Inflow=4.30 cfs 0.302 af
Outflow=0.20 cfs 0.067 af

Pond 13P: Pond 13 Peak Elev=185.08' Storage=15,595 cf Inflow=9.81 cfs 0.875 af
Discarded=1.07 cfs 0.708 af Primary=0.00 cfs 0.000 af Outflow=1.07 cfs 0.708 af

Pond 14P: Pond 14 Peak Elev=188.84' Storage=5,450 cf Inflow=3.29 cfs 0.273 af
Discarded=0.33 cfs 0.202 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.202 af

Pond 16P: Pond 16 Peak Elev=194.21' Storage=98,214 cf Inflow=12.75 cfs 1.538 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 73.385 ac Runoff Volume = 5.959 af Average Runoff Depth = 0.97"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

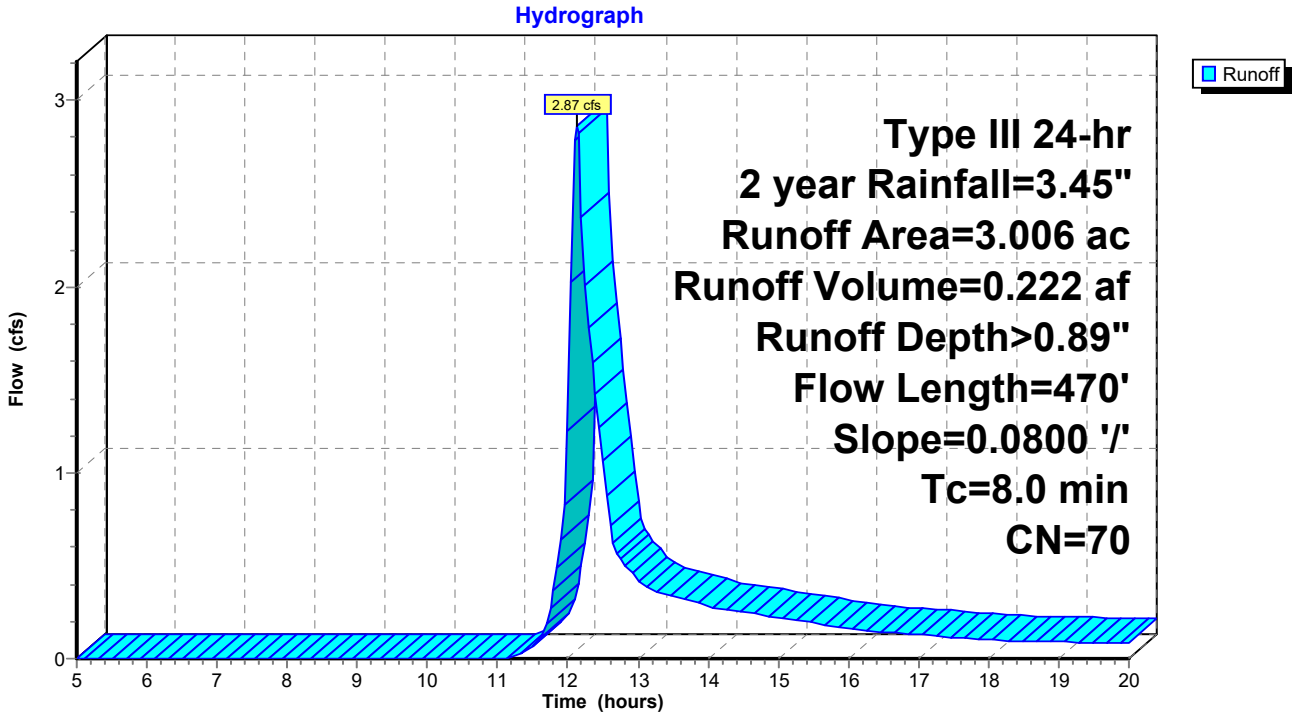
Runoff = 2.87 cfs @ 12.13 hrs, Volume= 0.222 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

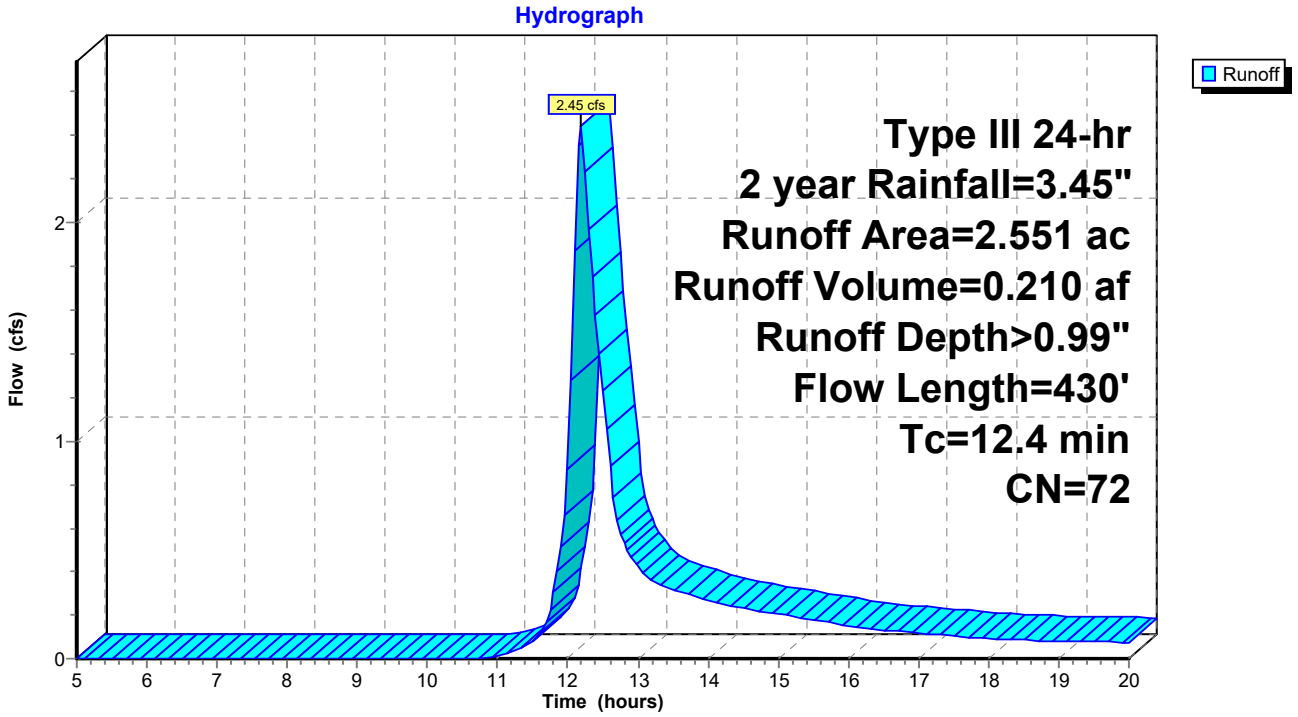
Runoff = 2.45 cfs @ 12.19 hrs, Volume= 0.210 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

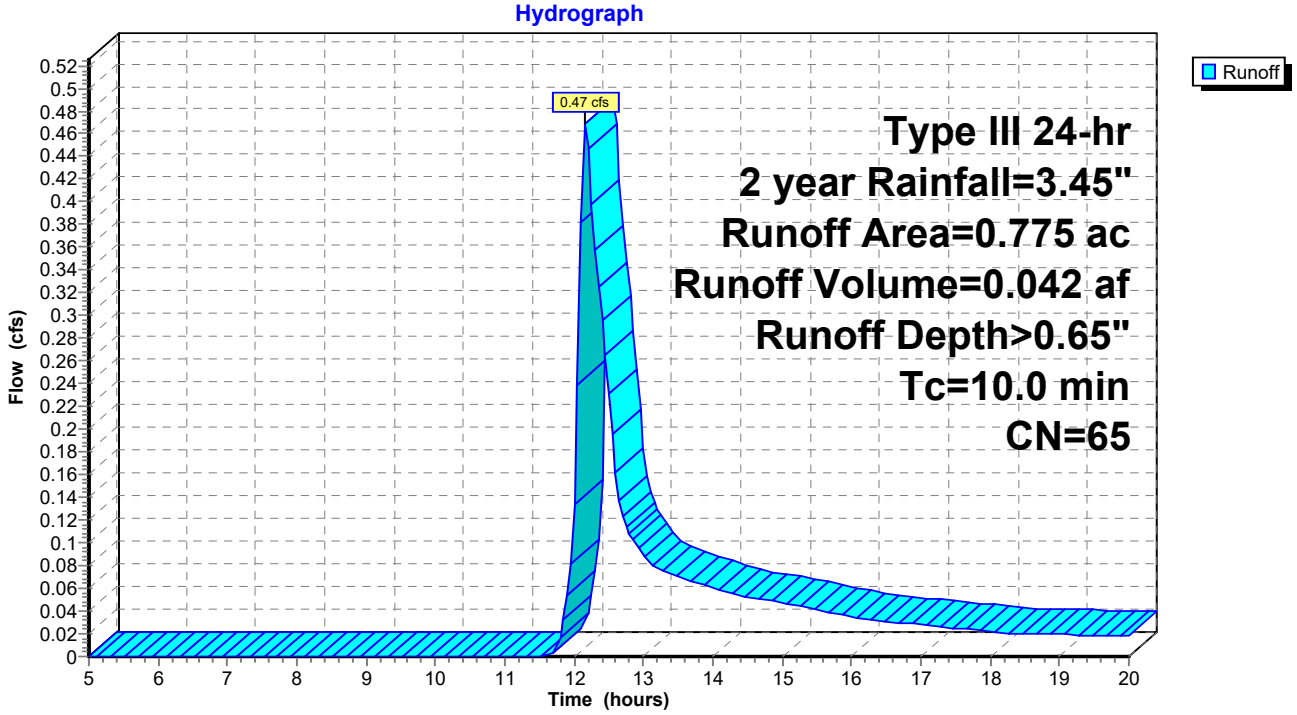
Runoff = 0.47 cfs @ 12.17 hrs, Volume= 0.042 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

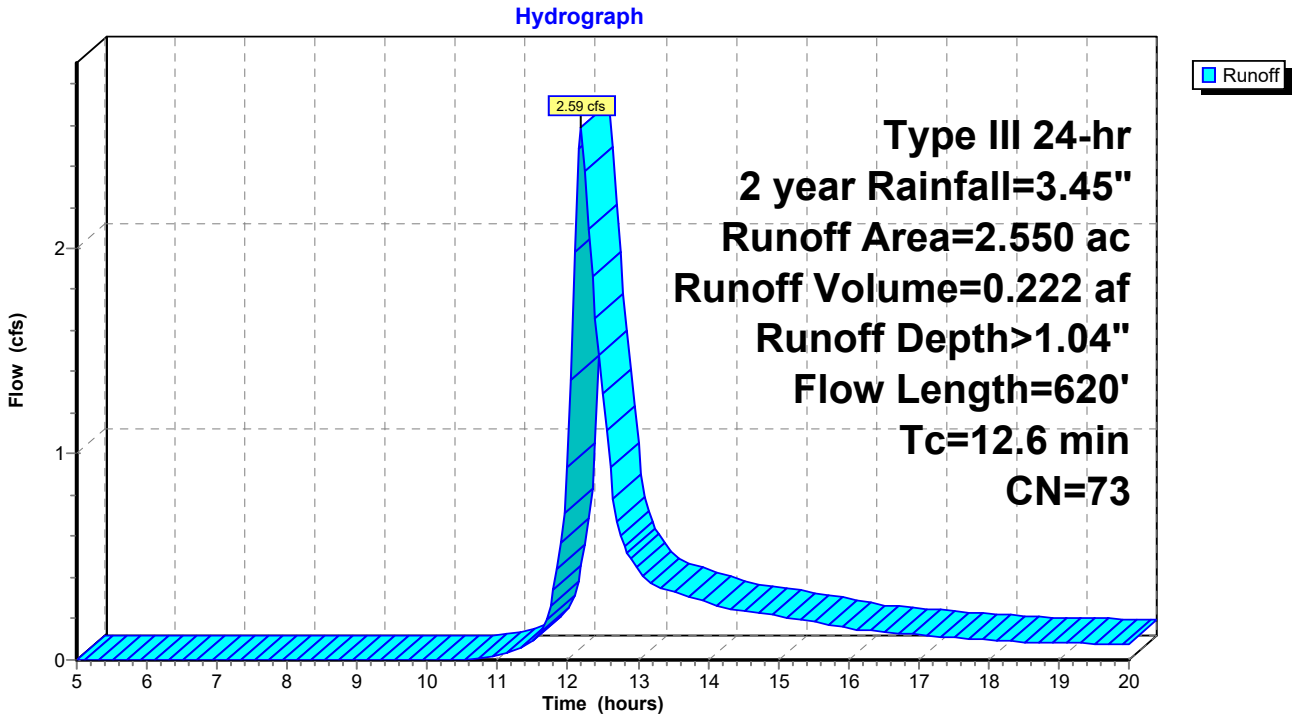
Runoff = 2.59 cfs @ 12.19 hrs, Volume= 0.222 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

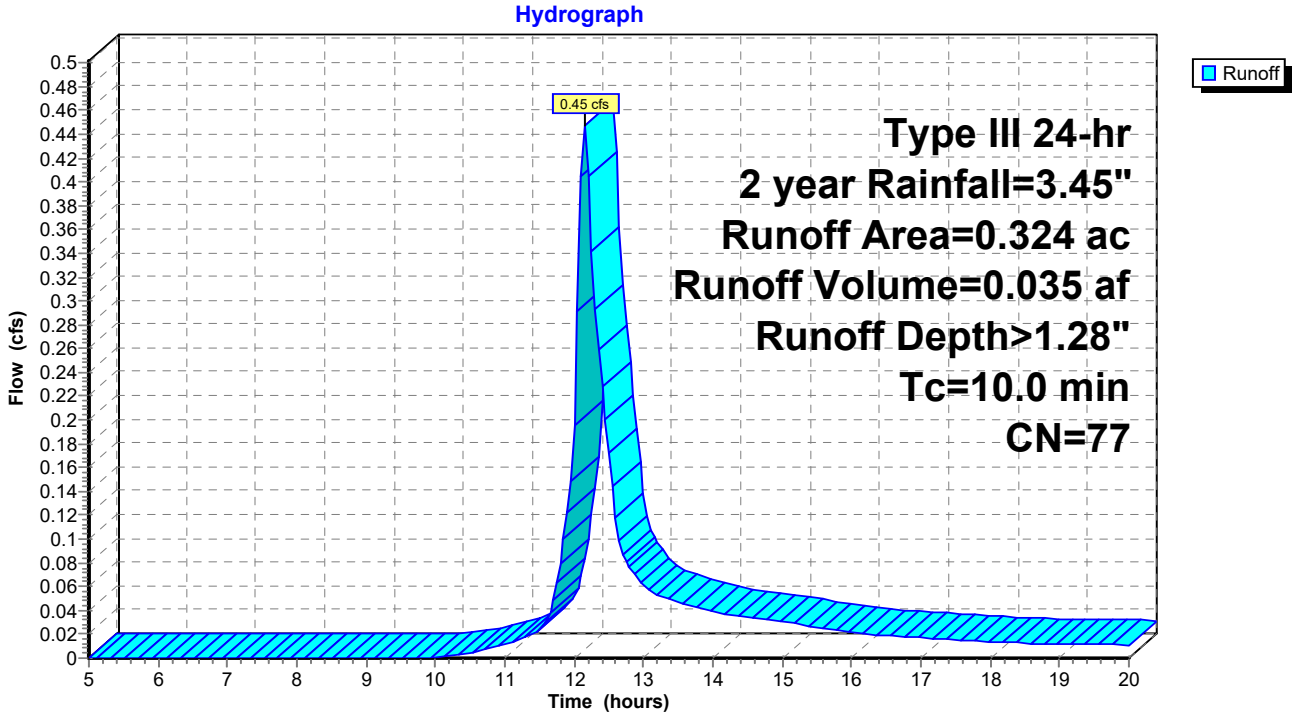
Runoff = 0.45 cfs @ 12.15 hrs, Volume= 0.035 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

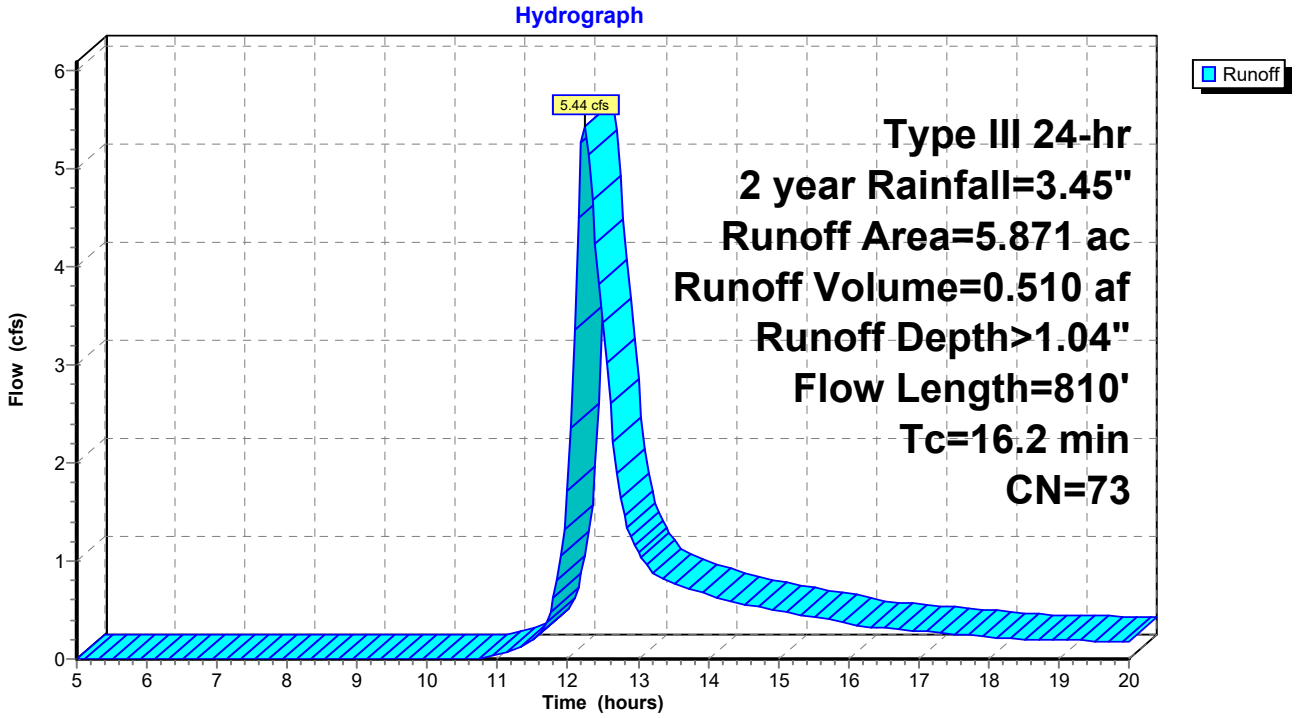
Runoff = 5.44 cfs @ 12.24 hrs, Volume= 0.510 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

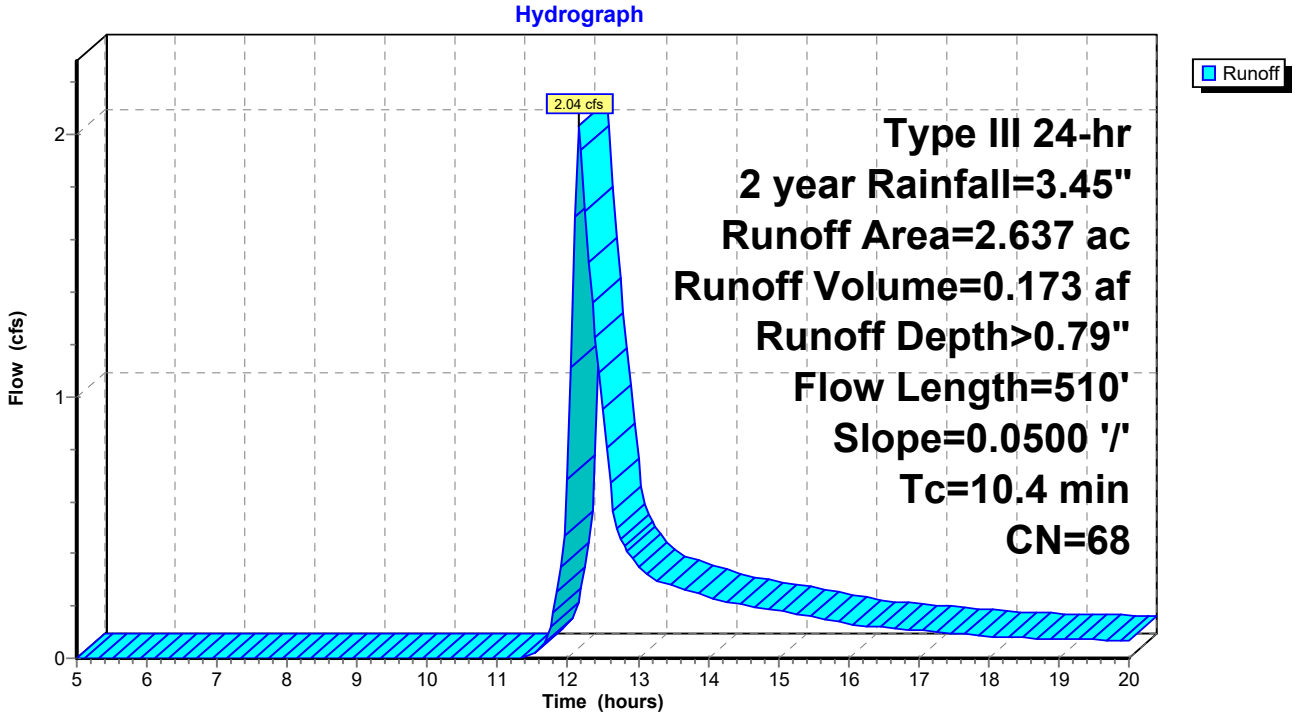
Runoff = 2.04 cfs @ 12.17 hrs, Volume= 0.173 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

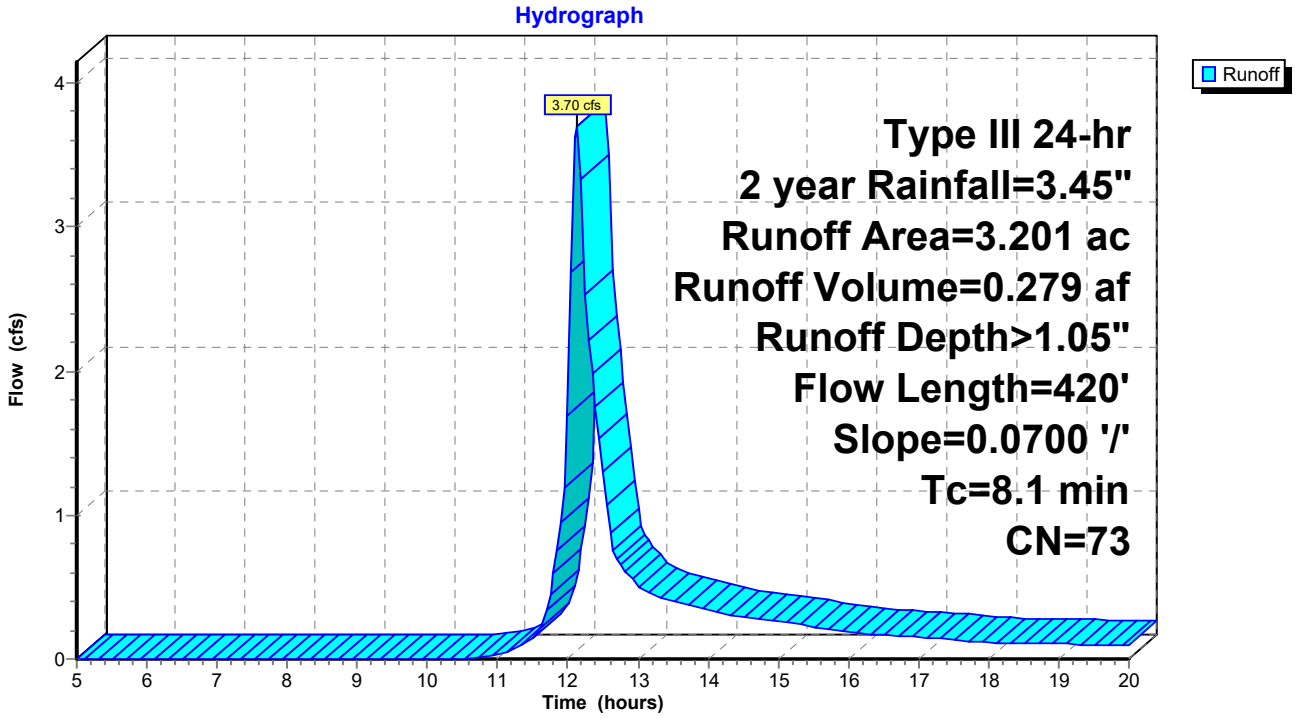
Runoff = 3.70 cfs @ 12.13 hrs, Volume= 0.279 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

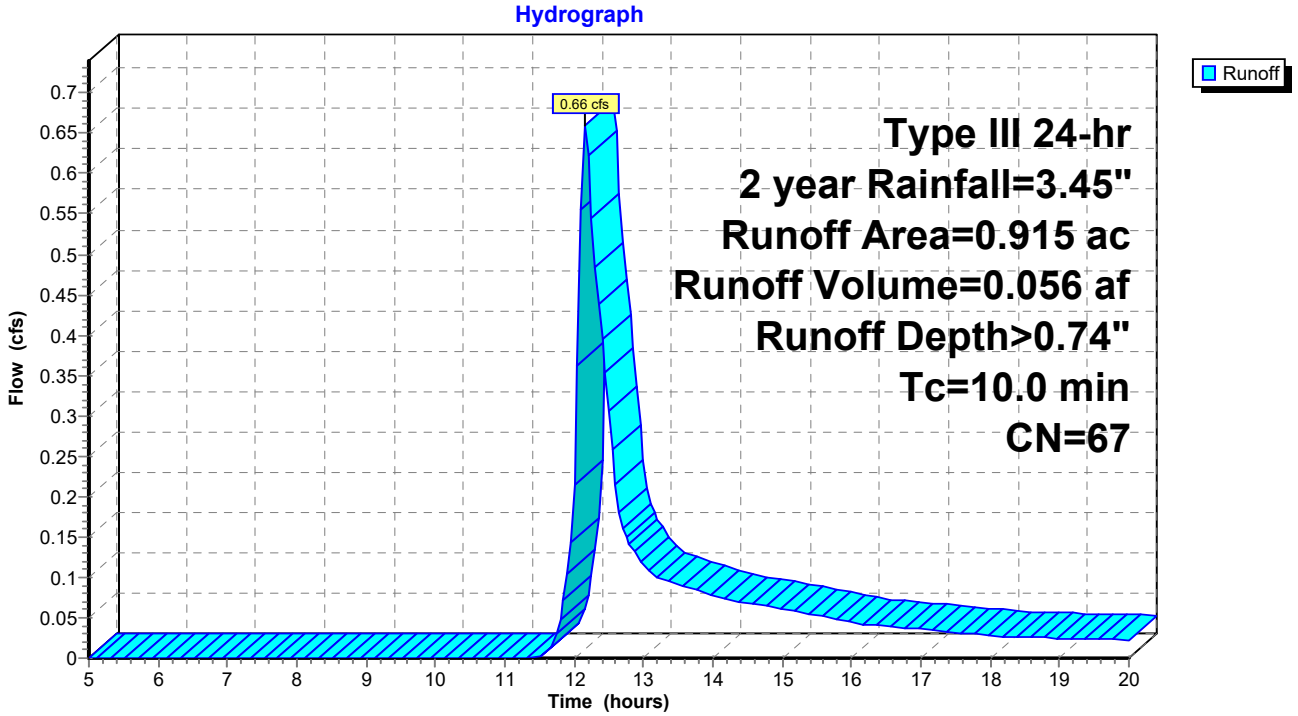
Runoff = 0.66 cfs @ 12.16 hrs, Volume= 0.056 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

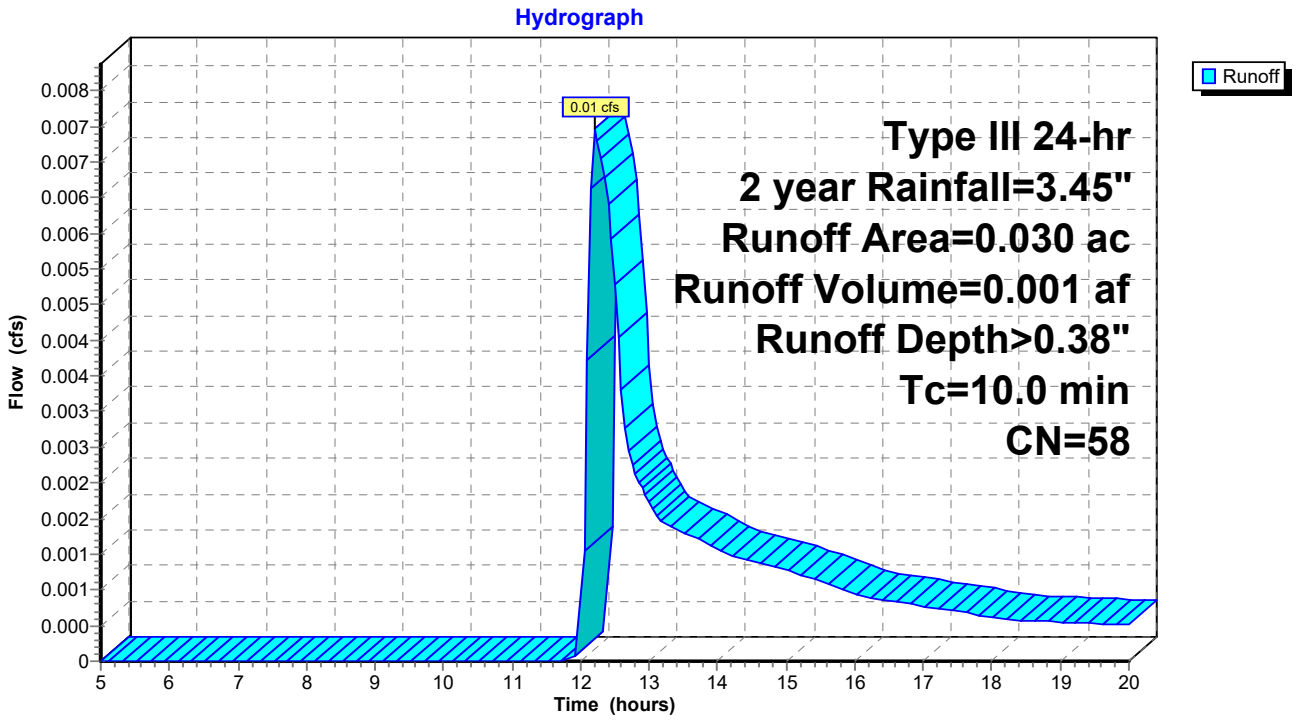
Runoff = 0.01 cfs @ 12.22 hrs, Volume= 0.001 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

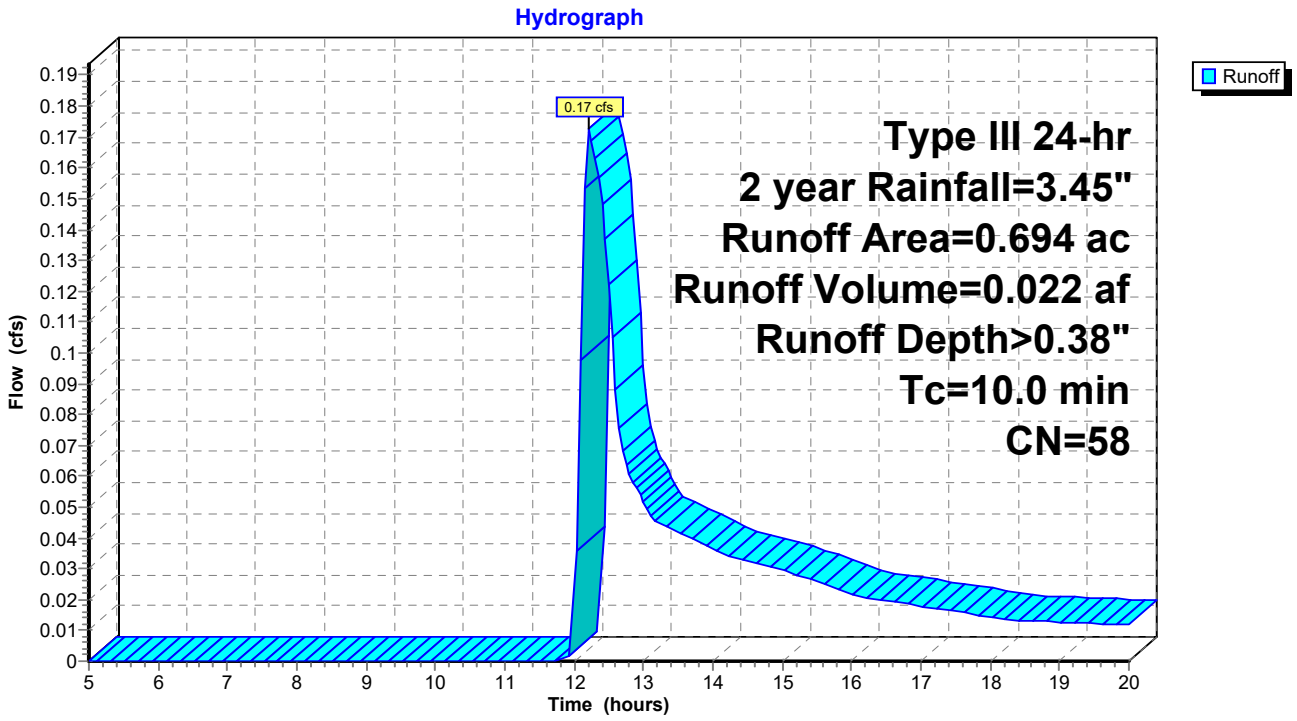
Runoff = 0.17 cfs @ 12.22 hrs, Volume= 0.022 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

[49] Hint: Tc<2dt may require smaller dt

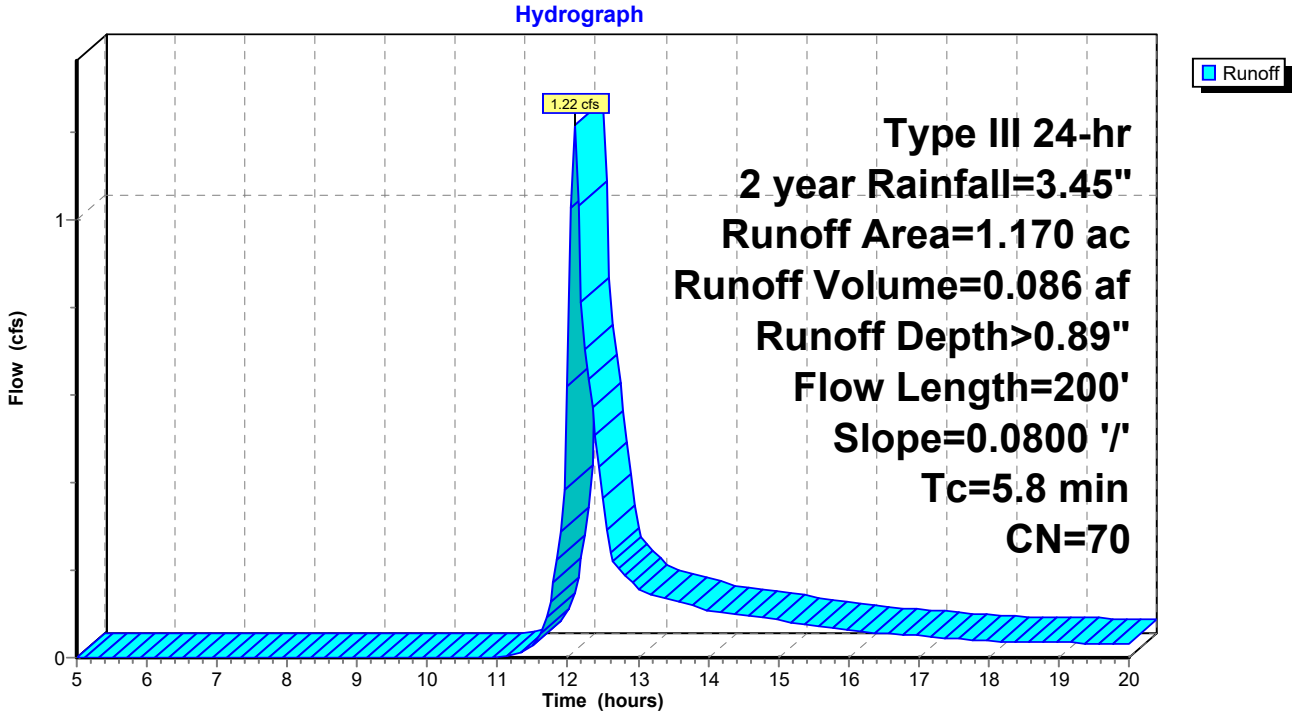
Runoff = 1.22 cfs @ 12.10 hrs, Volume= 0.086 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

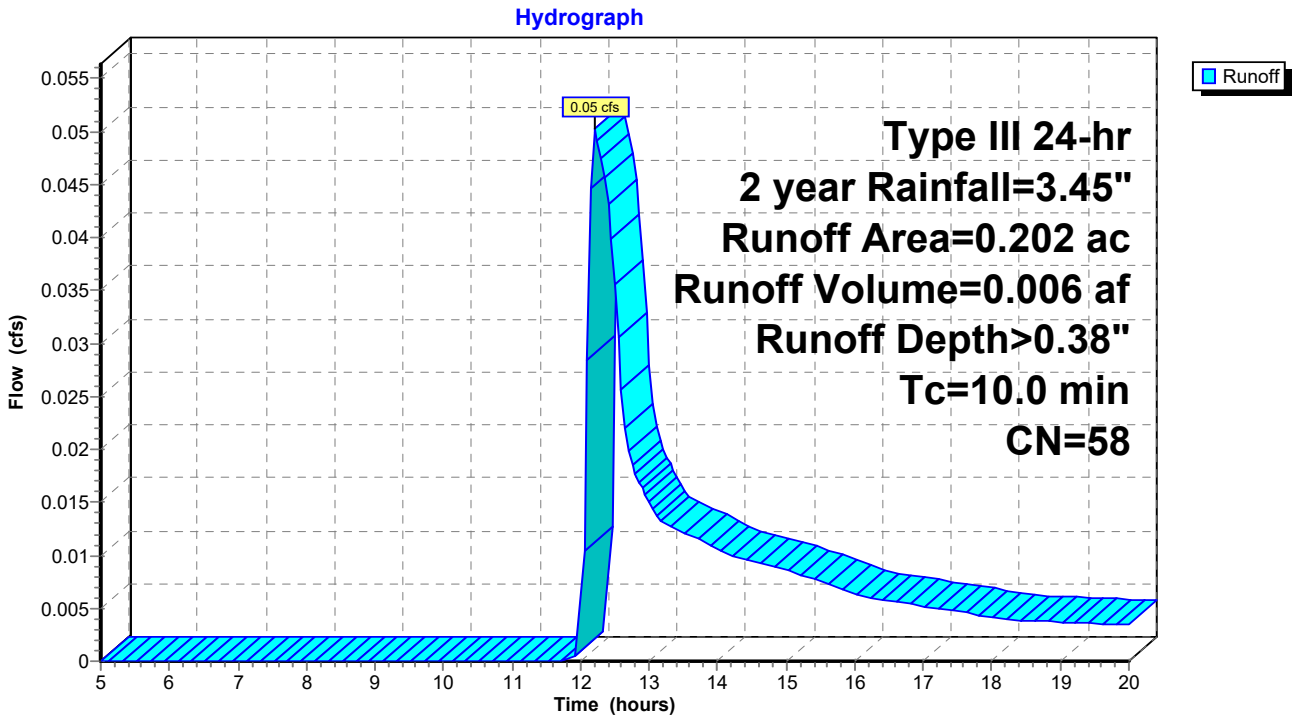
Runoff = 0.05 cfs @ 12.22 hrs, Volume= 0.006 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

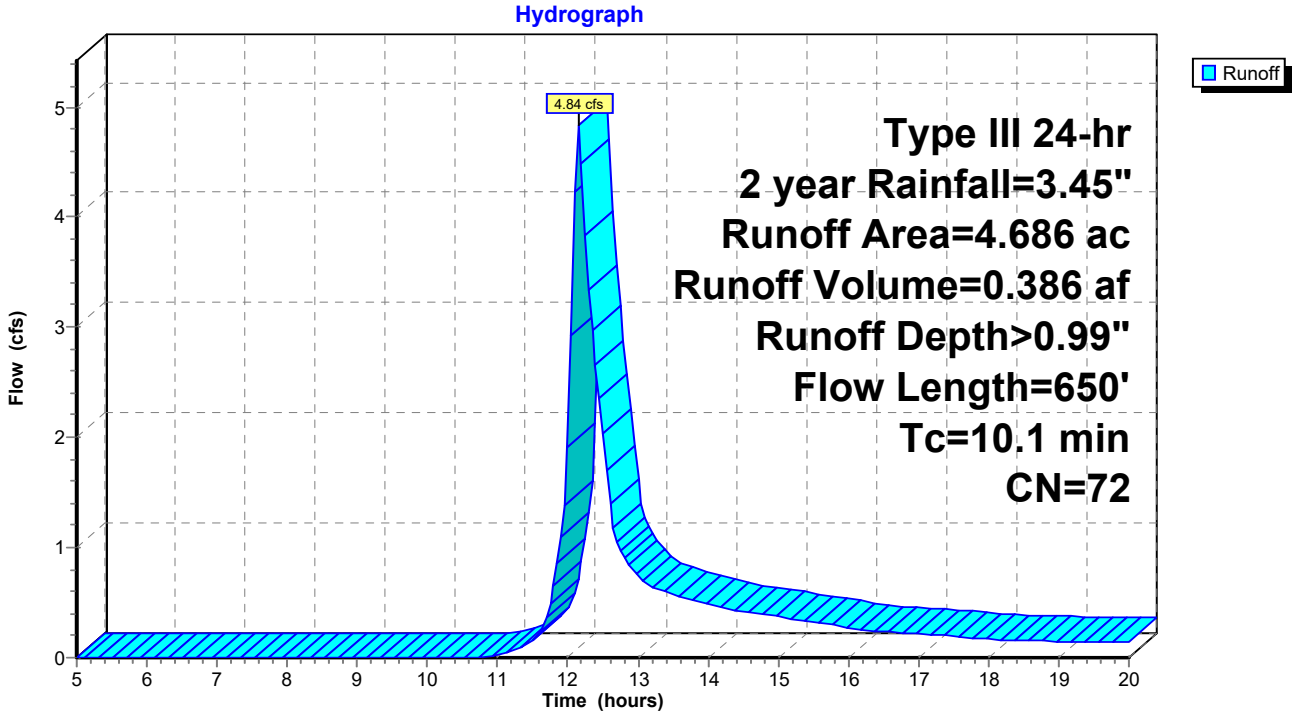
Runoff = 4.84 cfs @ 12.16 hrs, Volume= 0.386 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

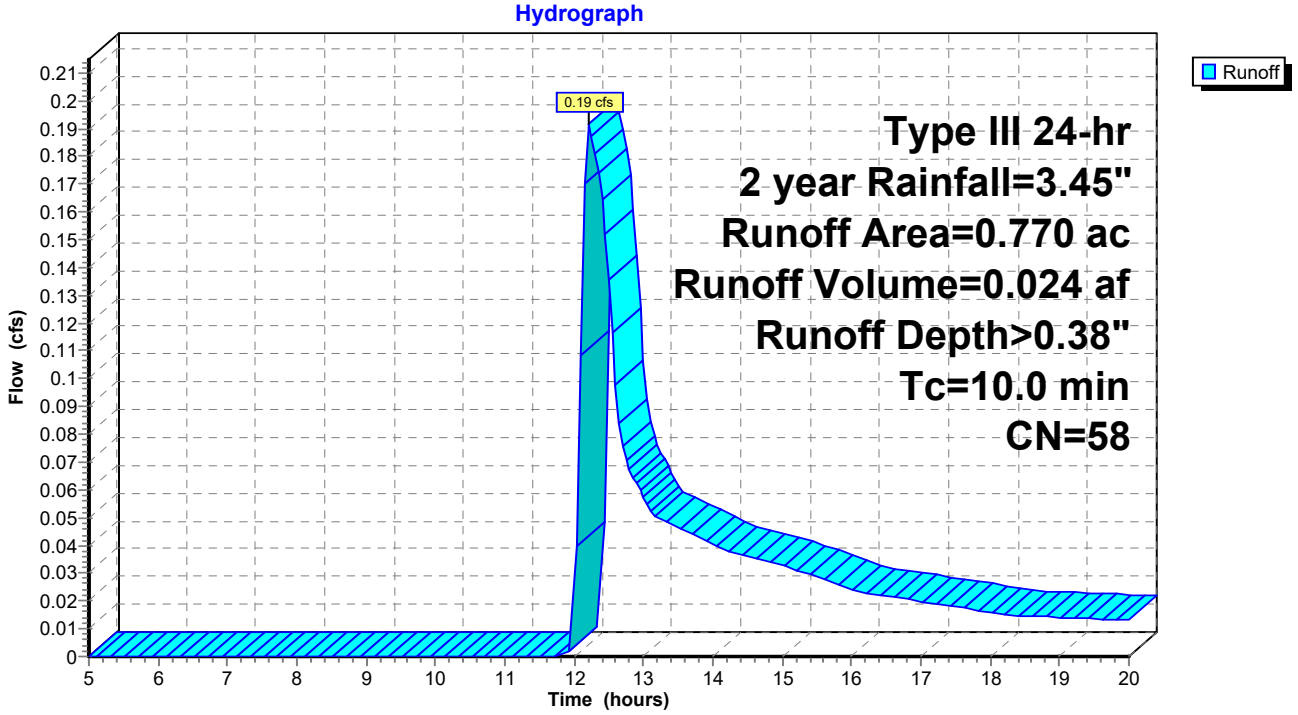
Runoff = 0.19 cfs @ 12.22 hrs, Volume= 0.024 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

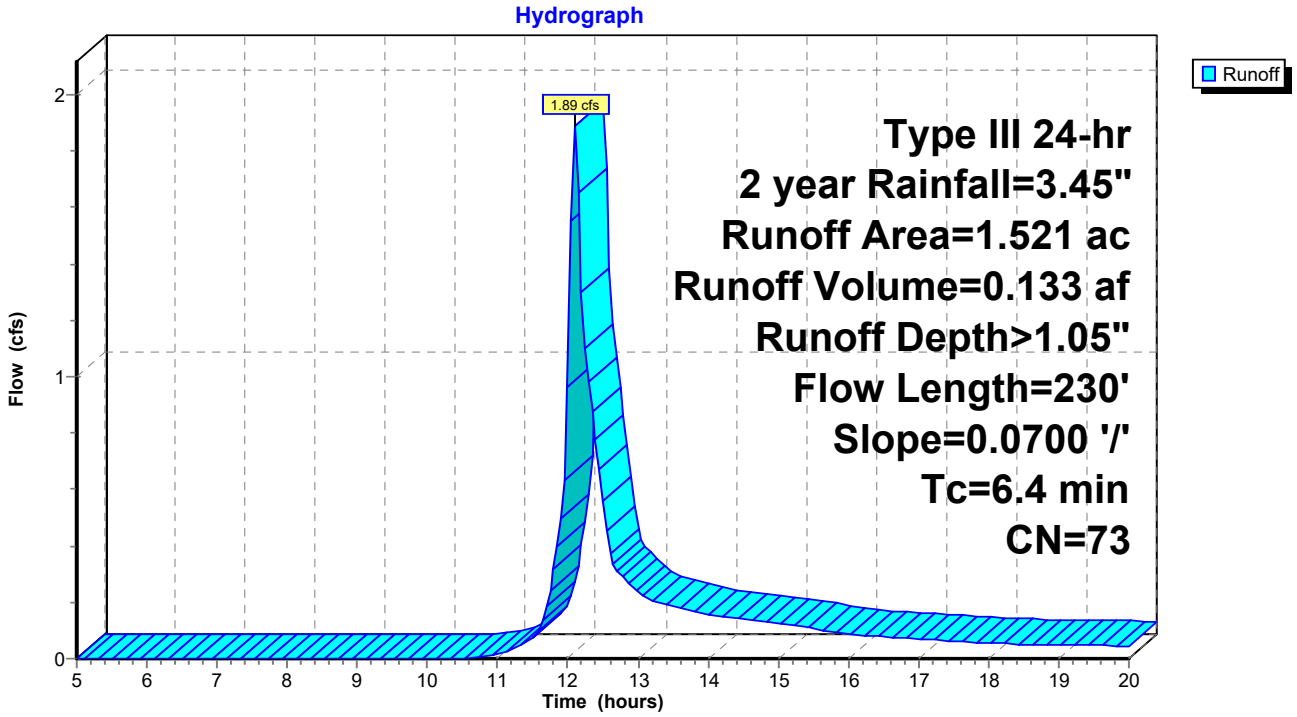
Runoff = 1.89 cfs @ 12.10 hrs, Volume= 0.133 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

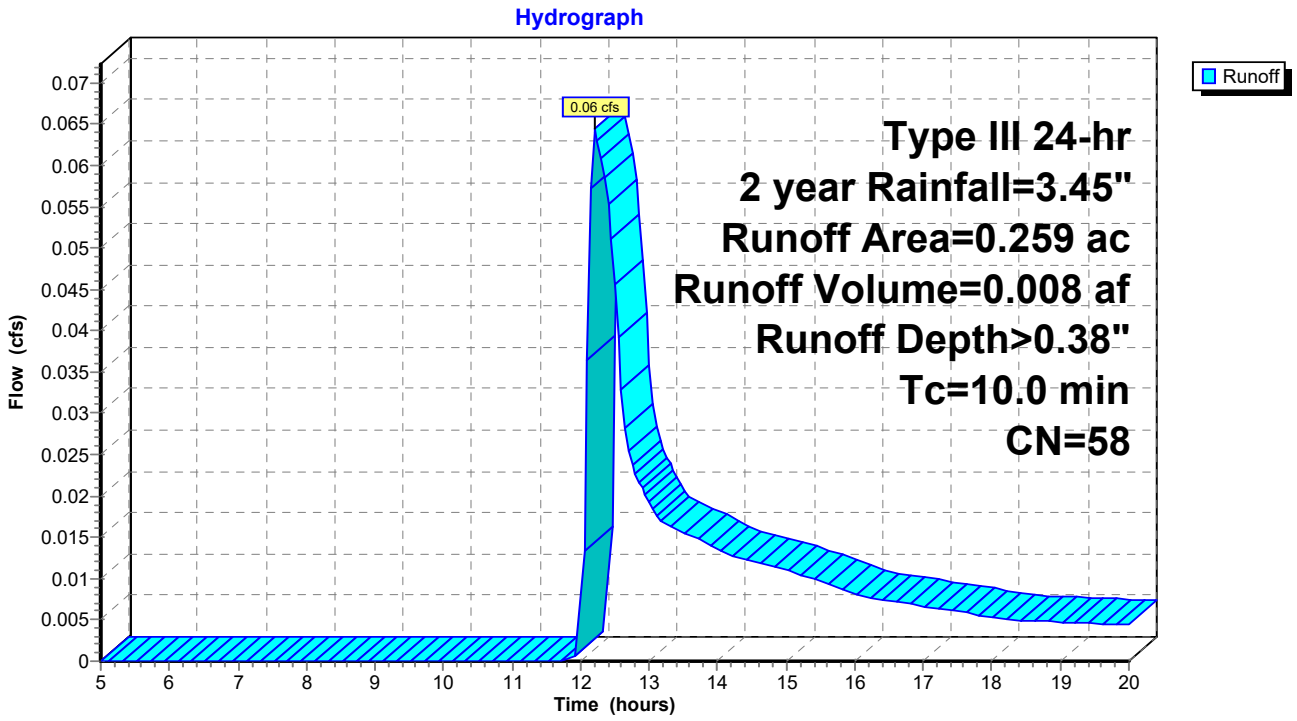
Runoff = 0.06 cfs @ 12.22 hrs, Volume= 0.008 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

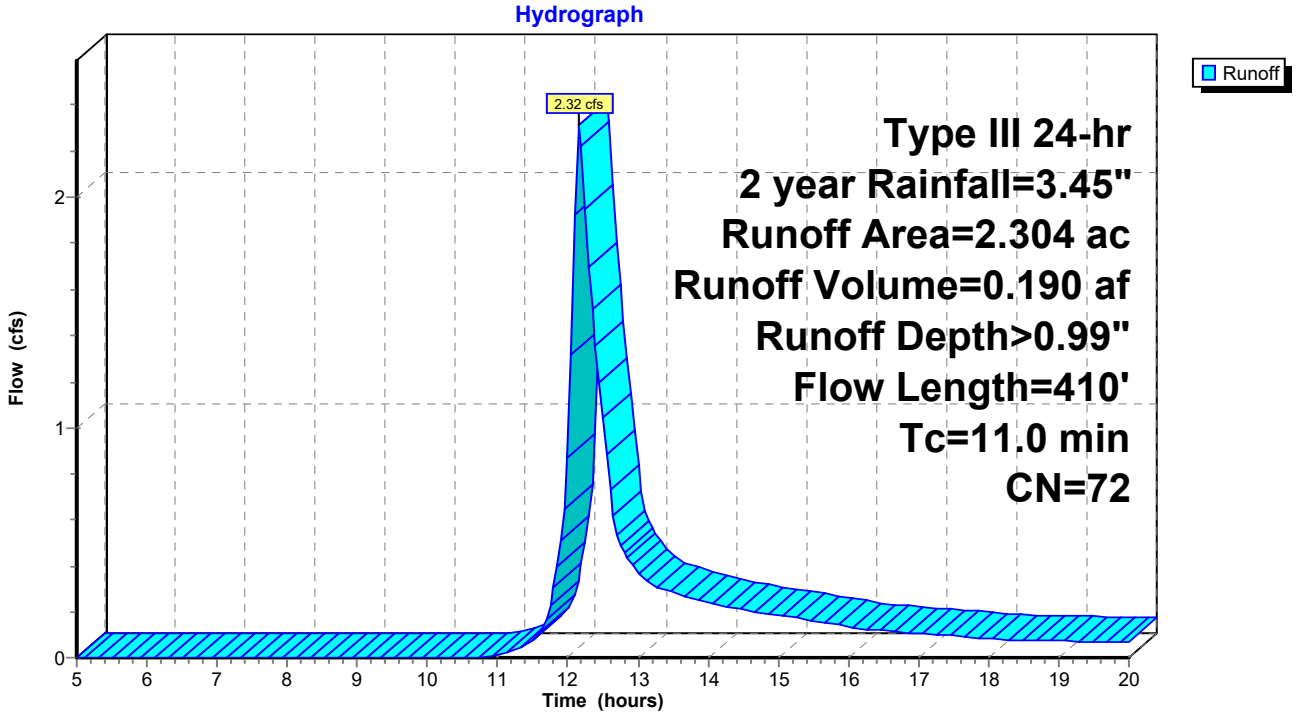
Runoff = 2.32 cfs @ 12.17 hrs, Volume= 0.190 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

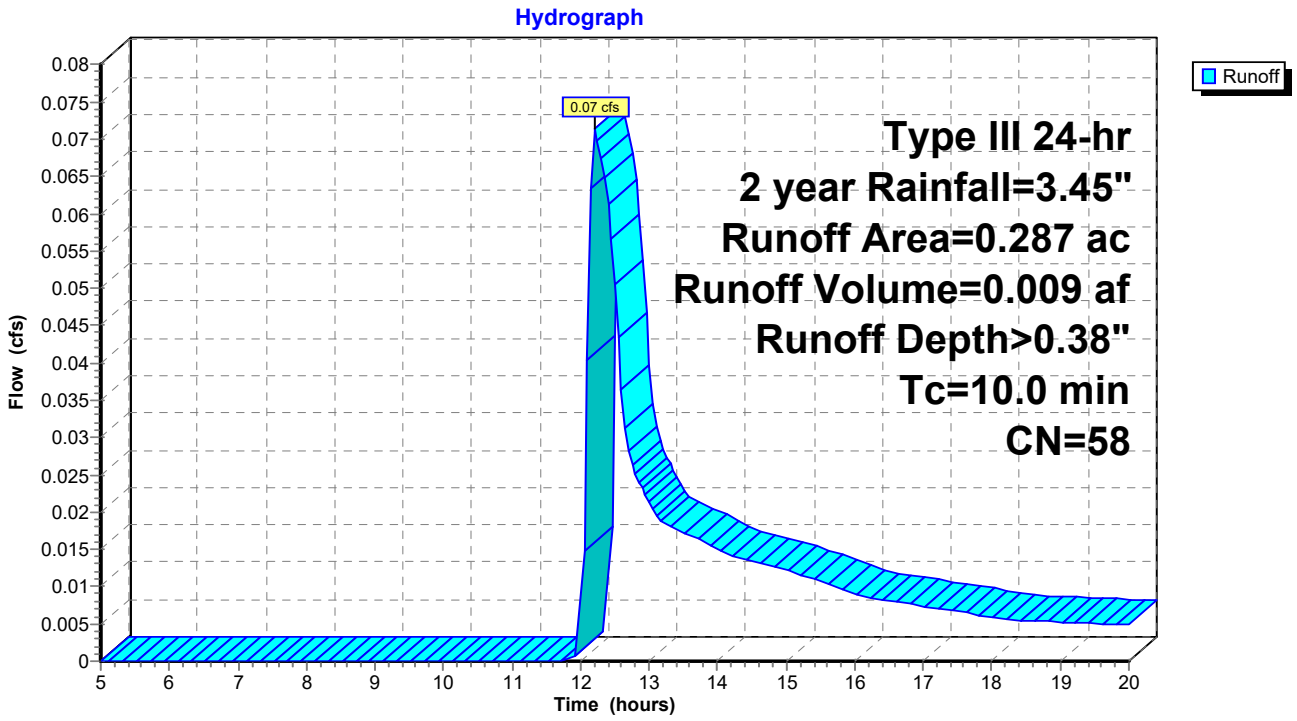
Runoff = 0.07 cfs @ 12.22 hrs, Volume= 0.009 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

[49] Hint: Tc<2dt may require smaller dt

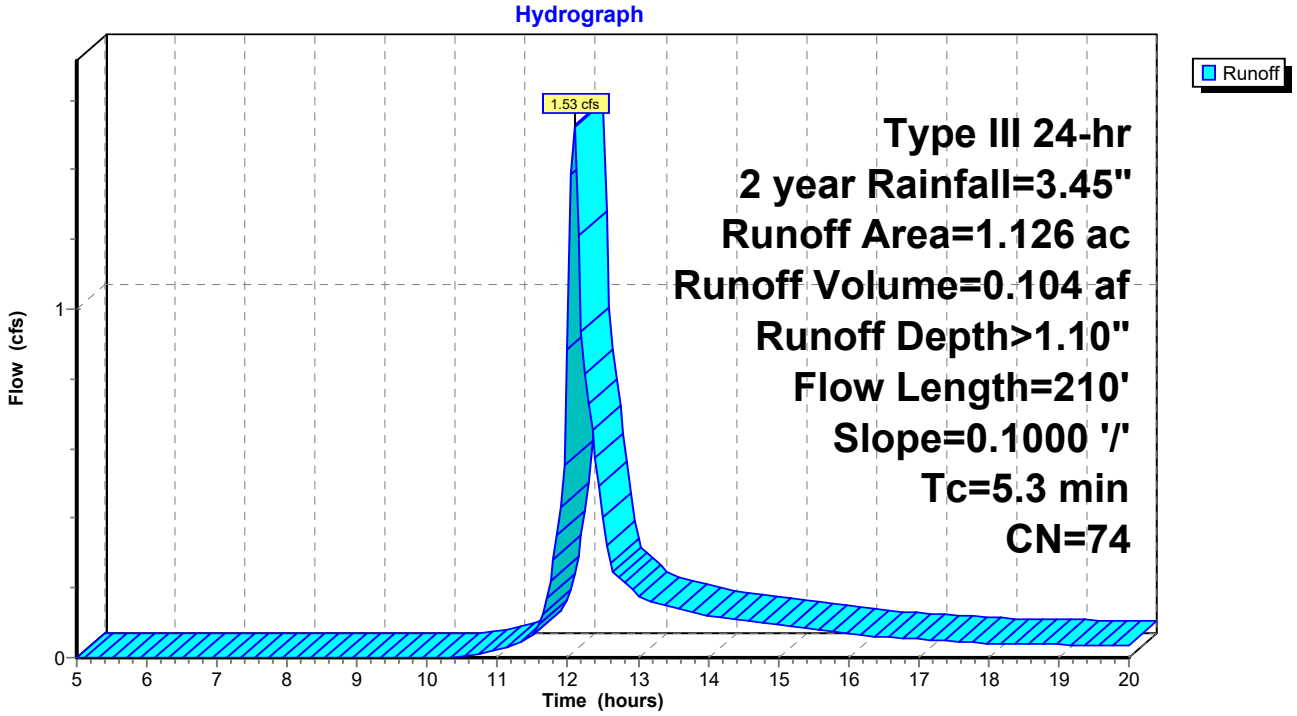
Runoff = 1.53 cfs @ 12.09 hrs, Volume= 0.104 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

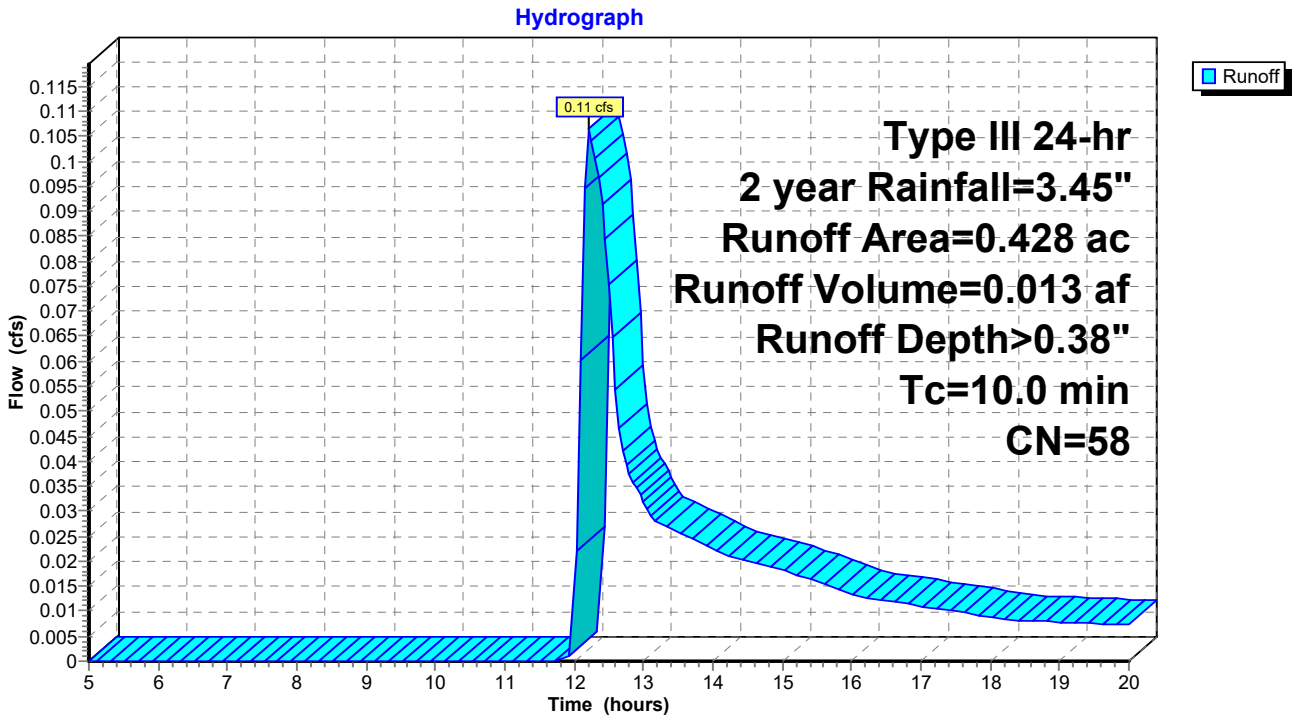
Runoff = 0.11 cfs @ 12.22 hrs, Volume= 0.013 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

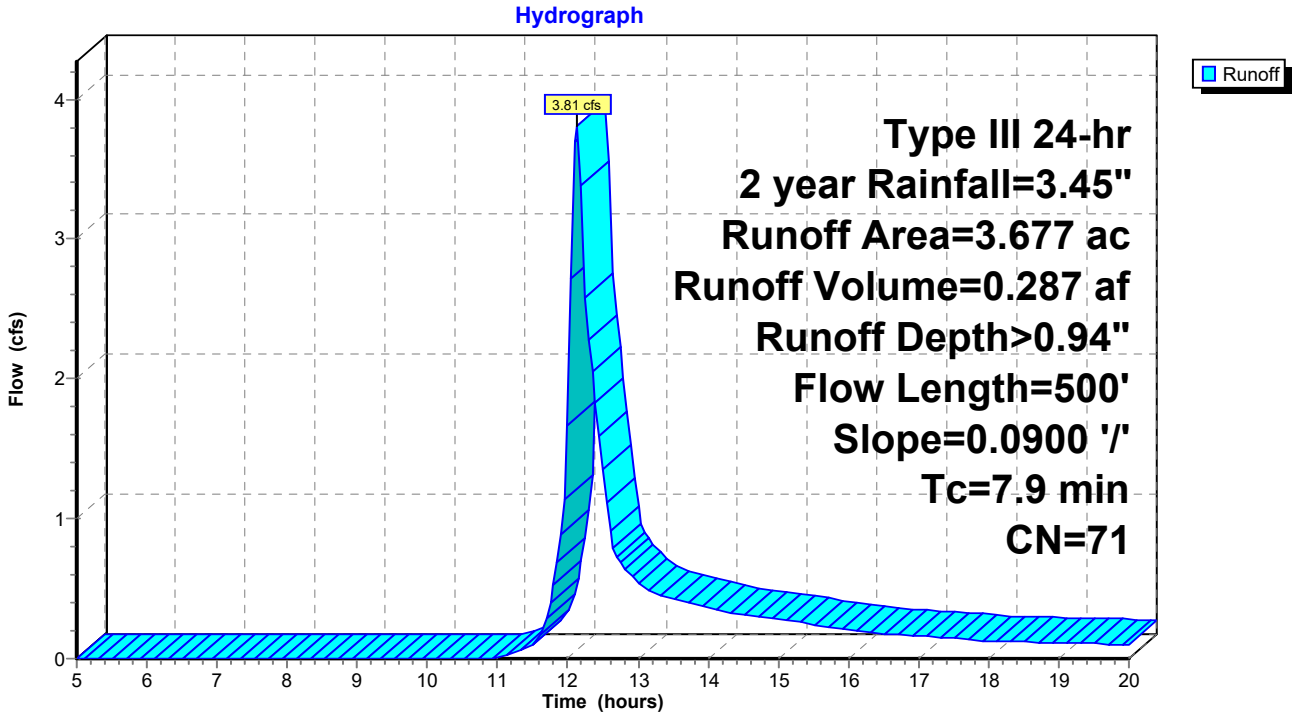
Runoff = 3.81 cfs @ 12.12 hrs, Volume= 0.287 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

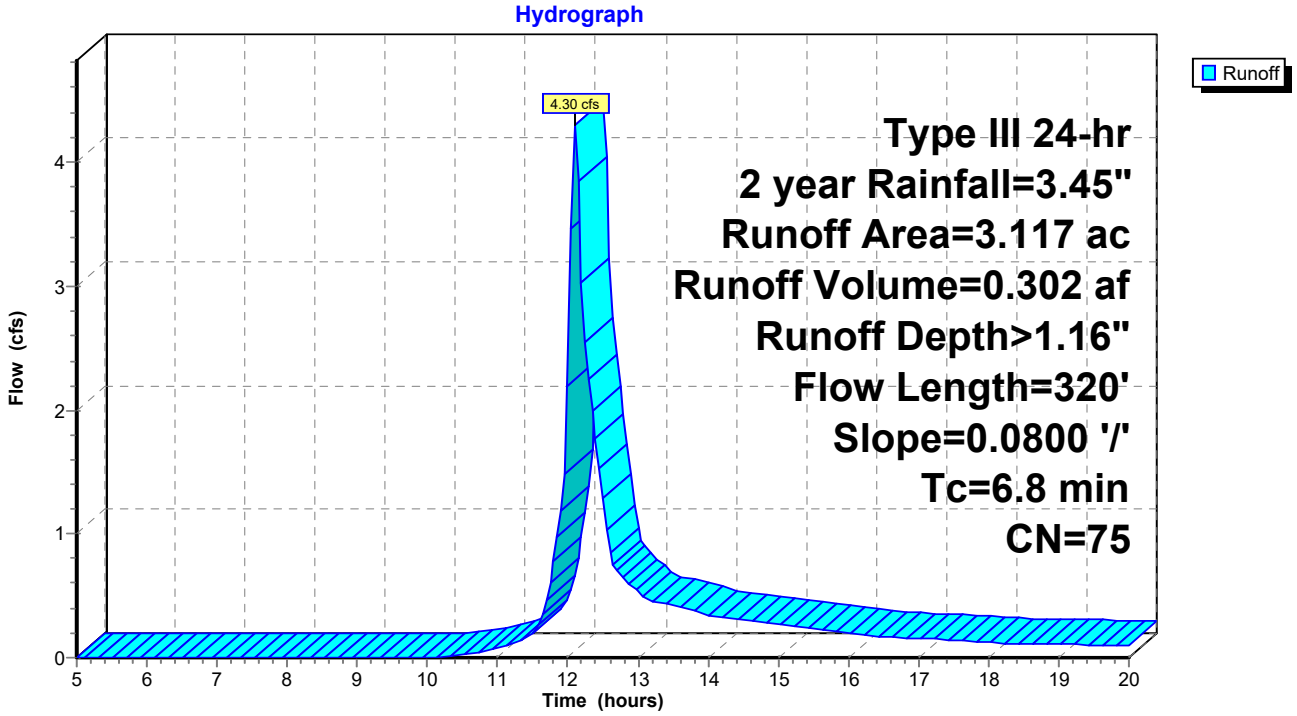
Runoff = 4.30 cfs @ 12.11 hrs, Volume= 0.302 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

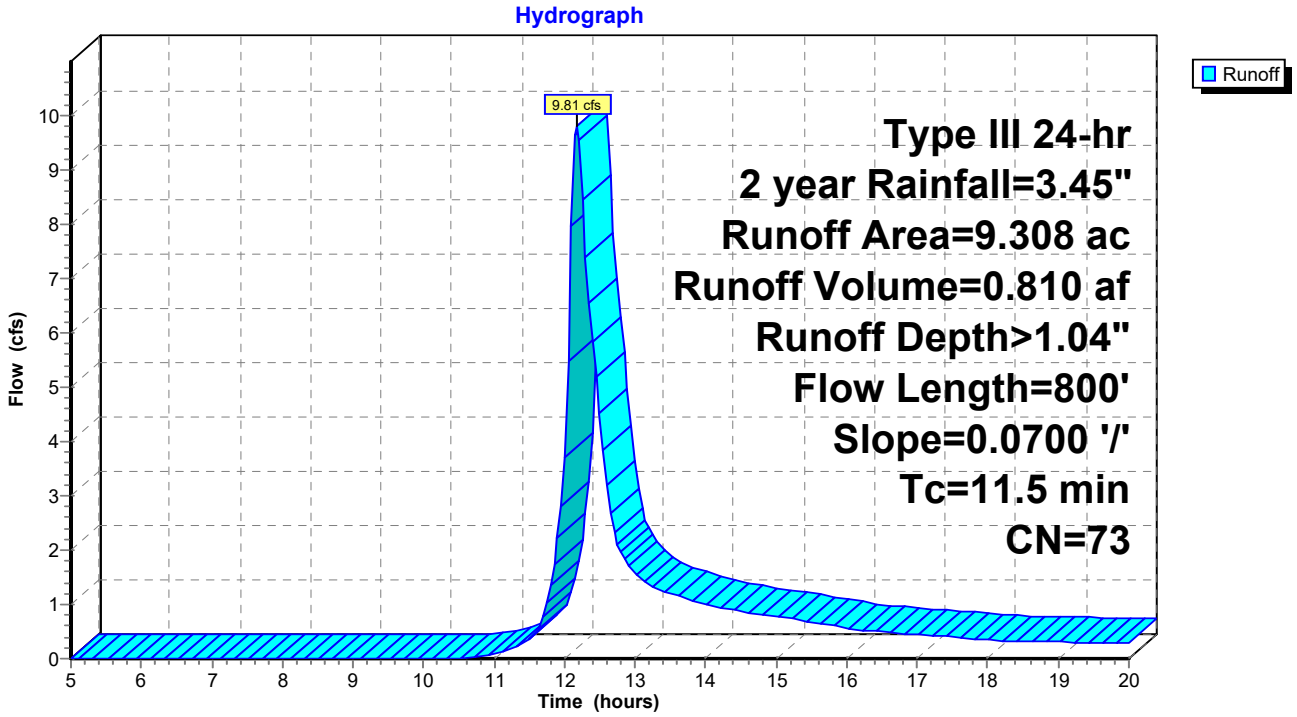
Runoff = 9.81 cfs @ 12.17 hrs, Volume= 0.810 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

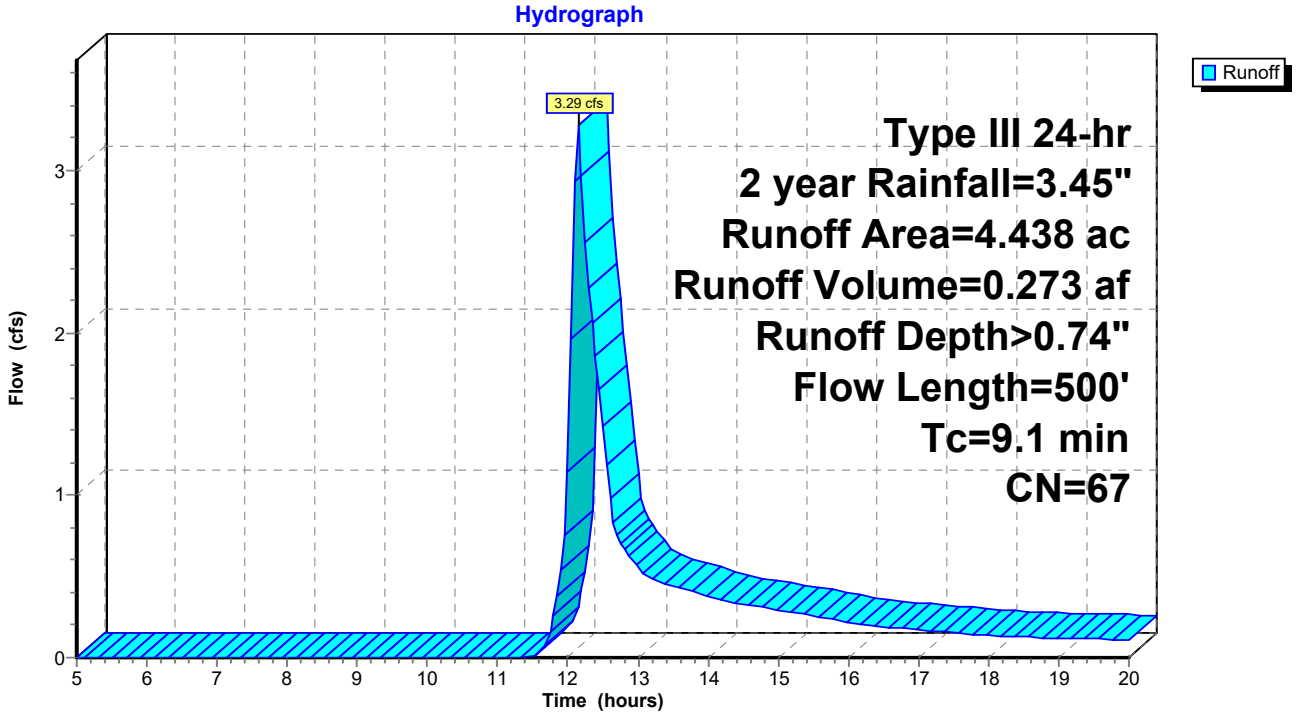
Runoff = 3.29 cfs @ 12.15 hrs, Volume= 0.273 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

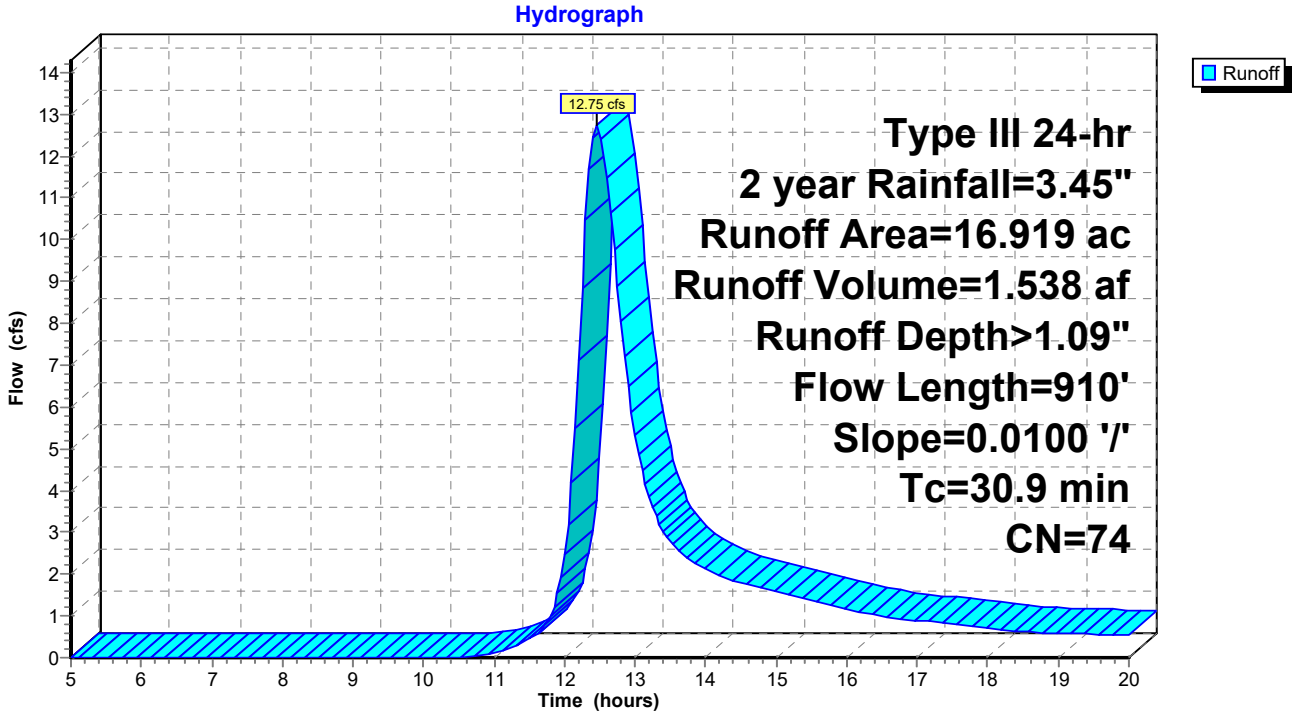
Runoff = 12.75 cfs @ 12.46 hrs, Volume= 1.538 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

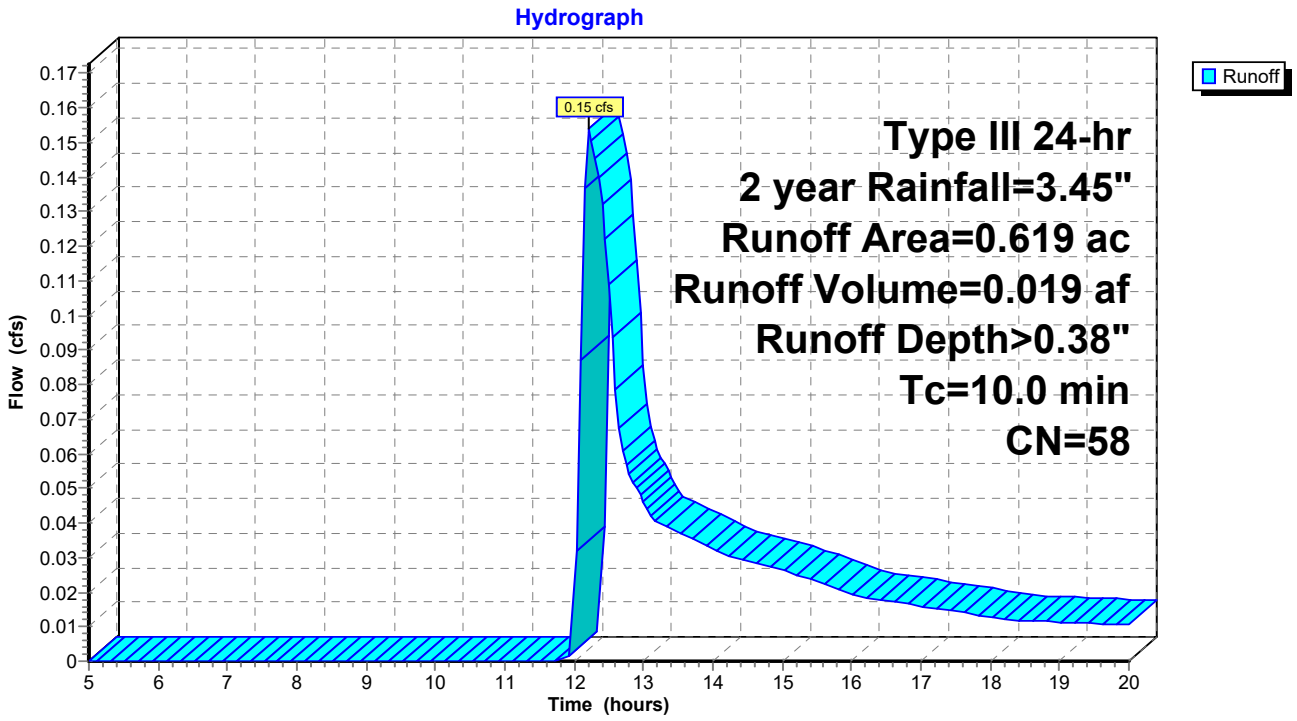
Runoff = 0.15 cfs @ 12.22 hrs, Volume= 0.019 af, Depth> 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.45"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.04'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 0.26" for 2 year event
Inflow = 0.20 cfs @ 15.94 hrs, Volume= 0.067 af
Outflow = 0.20 cfs @ 16.14 hrs, Volume= 0.065 af, Atten= 0%, Lag= 12.1 min

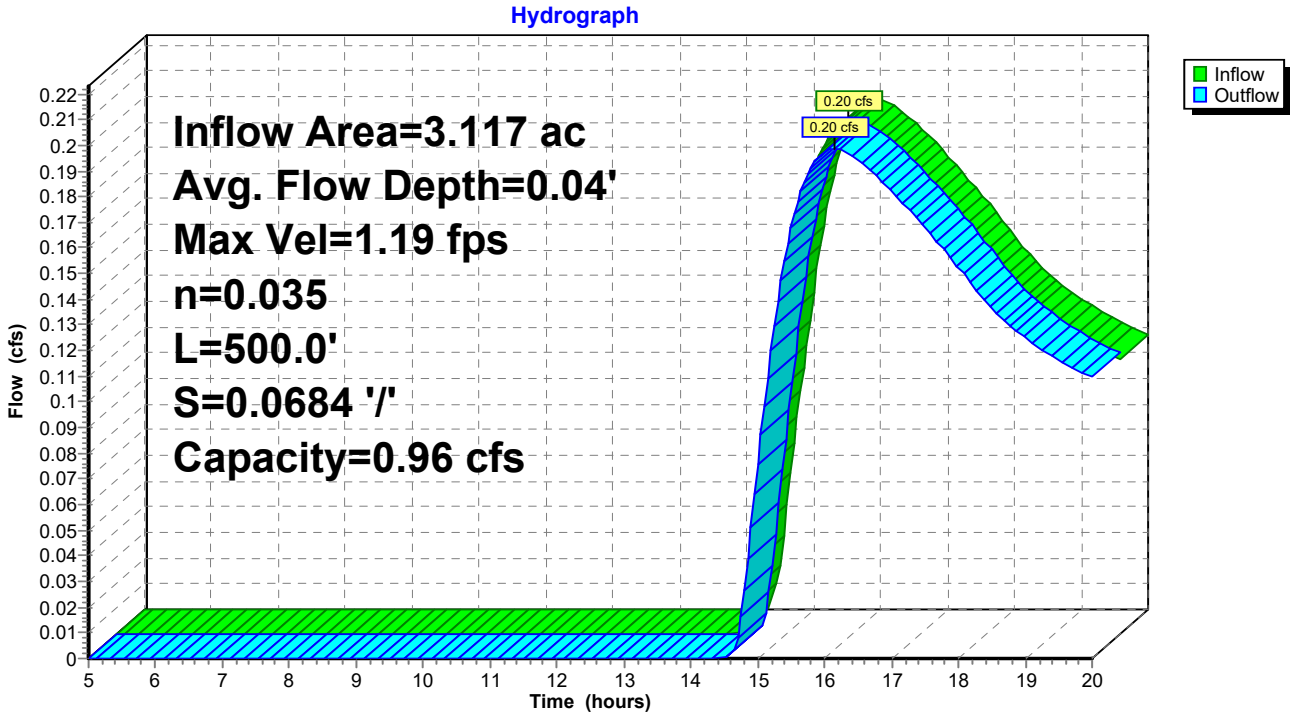
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.19 fps, Min. Travel Time= 7.0 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 8.0 min

Peak Storage= 83 cf @ 16.03 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 0.89" for 2 year event
Inflow = 2.87 cfs @ 12.13 hrs, Volume= 0.222 af
Outflow = 0.25 cfs @ 14.47 hrs, Volume= 0.091 af, Atten= 91%, Lag= 140.3 min
Primary = 0.25 cfs @ 14.47 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 193.14' @ 14.47 hrs Surf.Area= 4,991 sf Storage= 11,380 cf (6,057 cf above start)

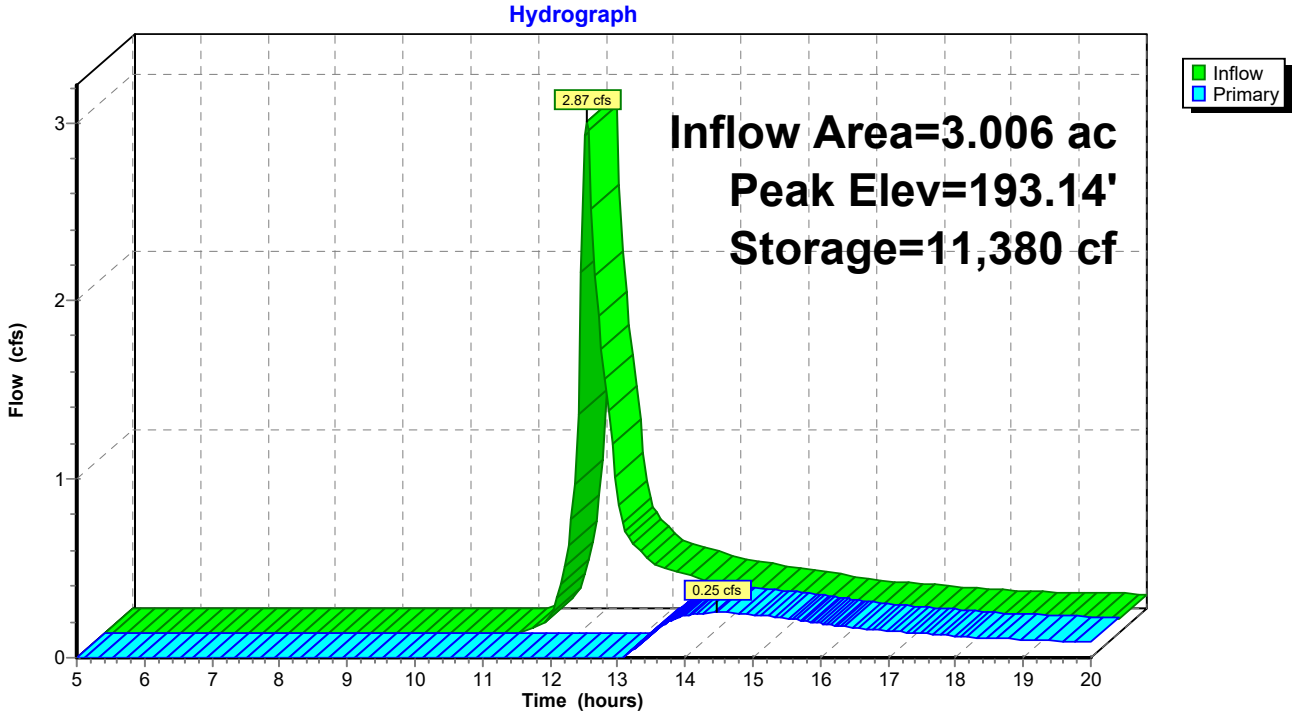
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 140.3 min (966.2 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.25 cfs @ 14.47 hrs HW=193.14' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.89 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area =	2.551 ac,	0.00% Impervious,	Inflow Depth >	0.99"	for 2 year event
Inflow =	2.45 cfs @	12.19 hrs,	Volume=	0.210 af	
Outflow =	0.23 cfs @	14.56 hrs,	Volume=	0.145 af,	Atten= 91%, Lag= 142.0 min
Discarded =	0.23 cfs @	14.56 hrs,	Volume=	0.145 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 229.53' @ 14.56 hrs Surf.Area= 3,046 sf Storage= 4,555 cf

Plug-Flow detention time= 196.9 min calculated for 0.145 af (69% of inflow)
Center-of-Mass det. time= 125.8 min (950.2 - 824.4)

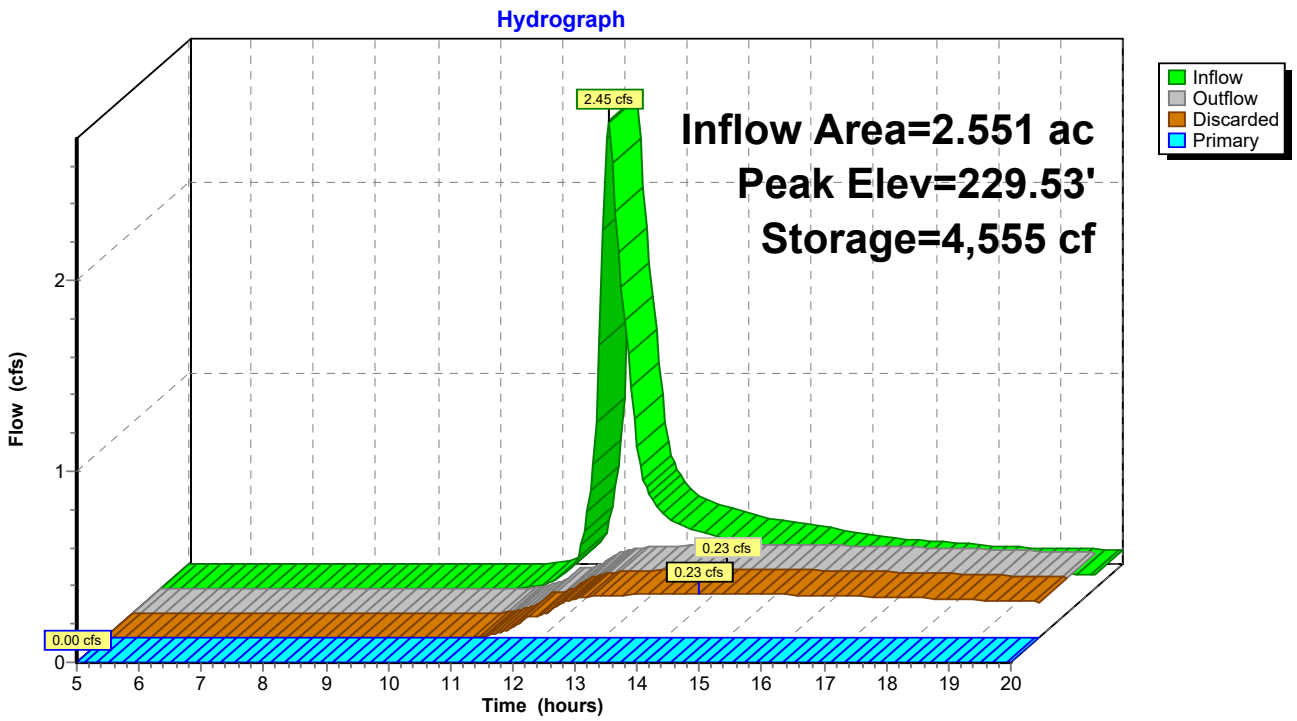
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.23 cfs @ 14.56 hrs HW=229.53' (Free Discharge)
└**2=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=227.50' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 1.04" for 2 year event
Inflow = 2.59 cfs @ 12.19 hrs, Volume= 0.222 af
Outflow = 0.21 cfs @ 14.99 hrs, Volume= 0.081 af, Atten= 92%, Lag= 168.2 min
Primary = 0.21 cfs @ 14.99 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.70' @ 14.99 hrs Surf.Area= 4,528 sf Storage= 6,537 cf

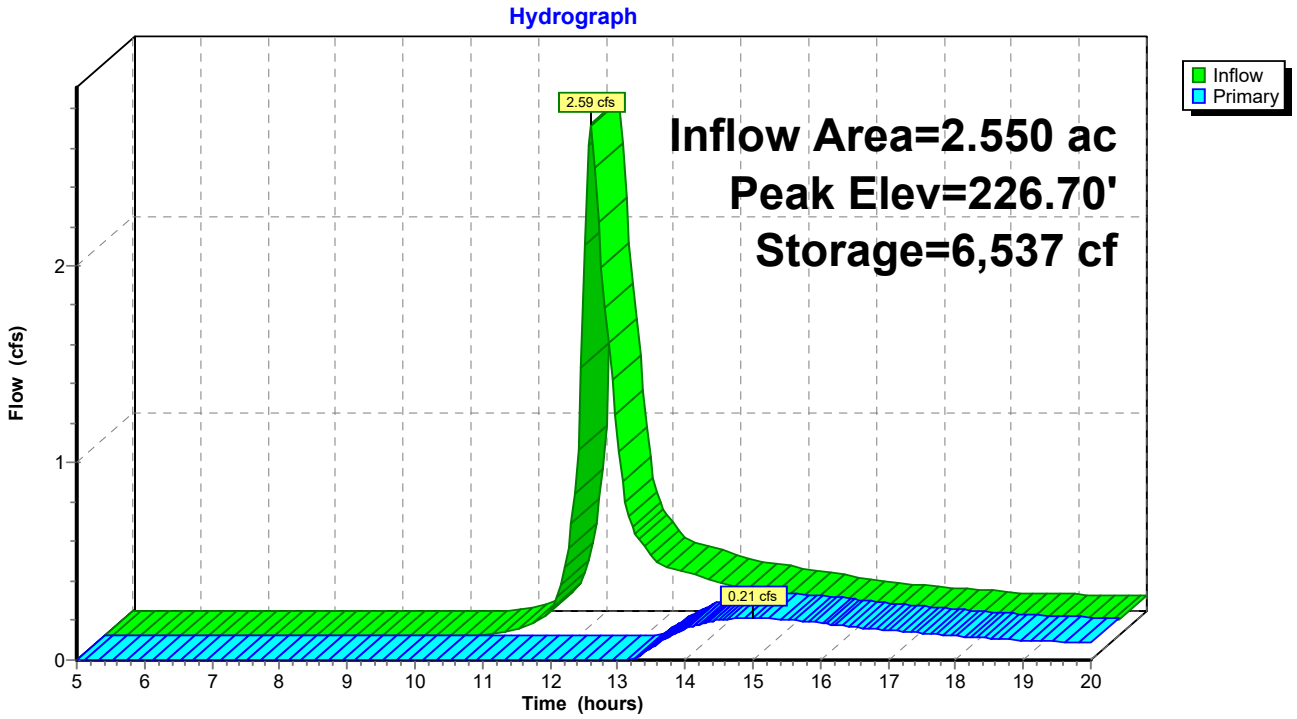
Plug-Flow detention time= 253.4 min calculated for 0.081 af (36% of inflow)
Center-of-Mass det. time= 158.7 min (980.9 - 822.2)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.21 cfs @ 14.99 hrs HW=226.70' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.21 cfs @ 1.06 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 1.04" for 2 year event
Inflow = 5.44 cfs @ 12.24 hrs, Volume= 0.510 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 187.75' @ 20.00 hrs Surf.Area= 13,895 sf Storage= 42,620 cf (22,184 cf above start)

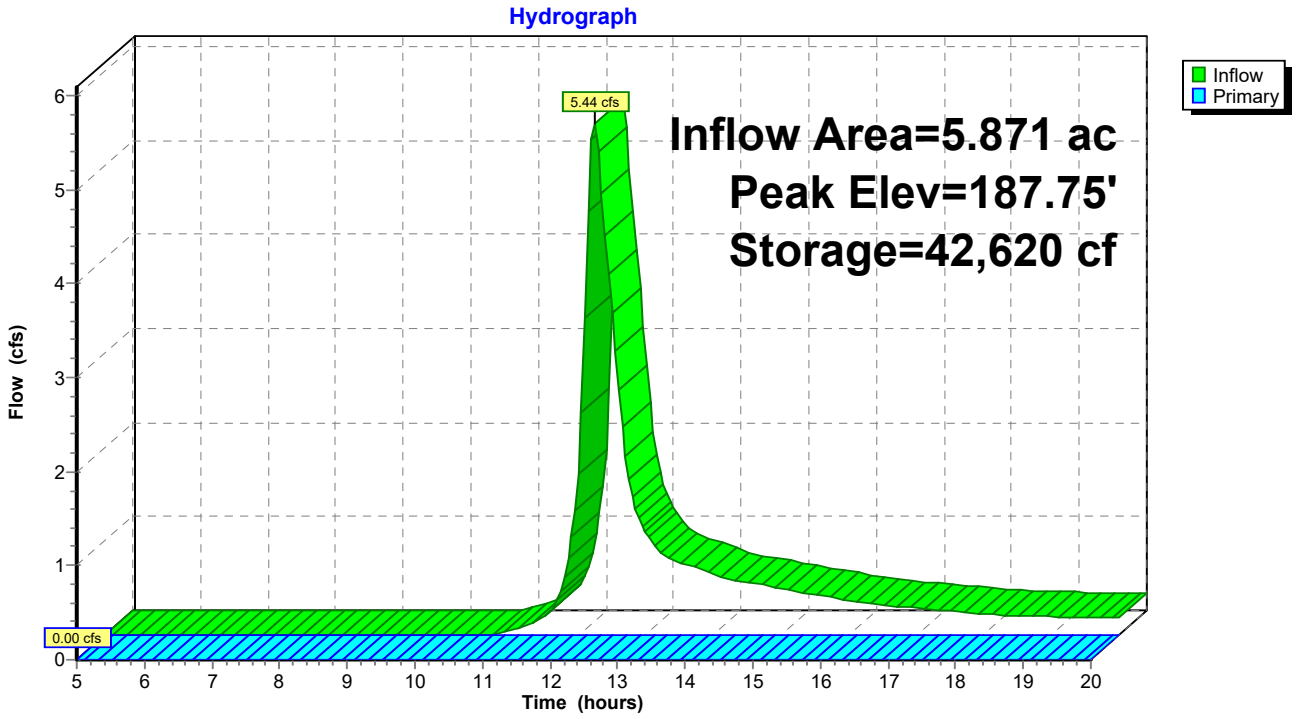
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=186.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2 year event
Inflow = 2.04 cfs @ 12.17 hrs, Volume= 0.173 af
Outflow = 0.02 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 99%, Lag= 470.1 min
Primary = 0.02 cfs @ 20.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 218.02' @ 20.00 hrs Surf.Area= 4,478 sf Storage= 7,497 cf

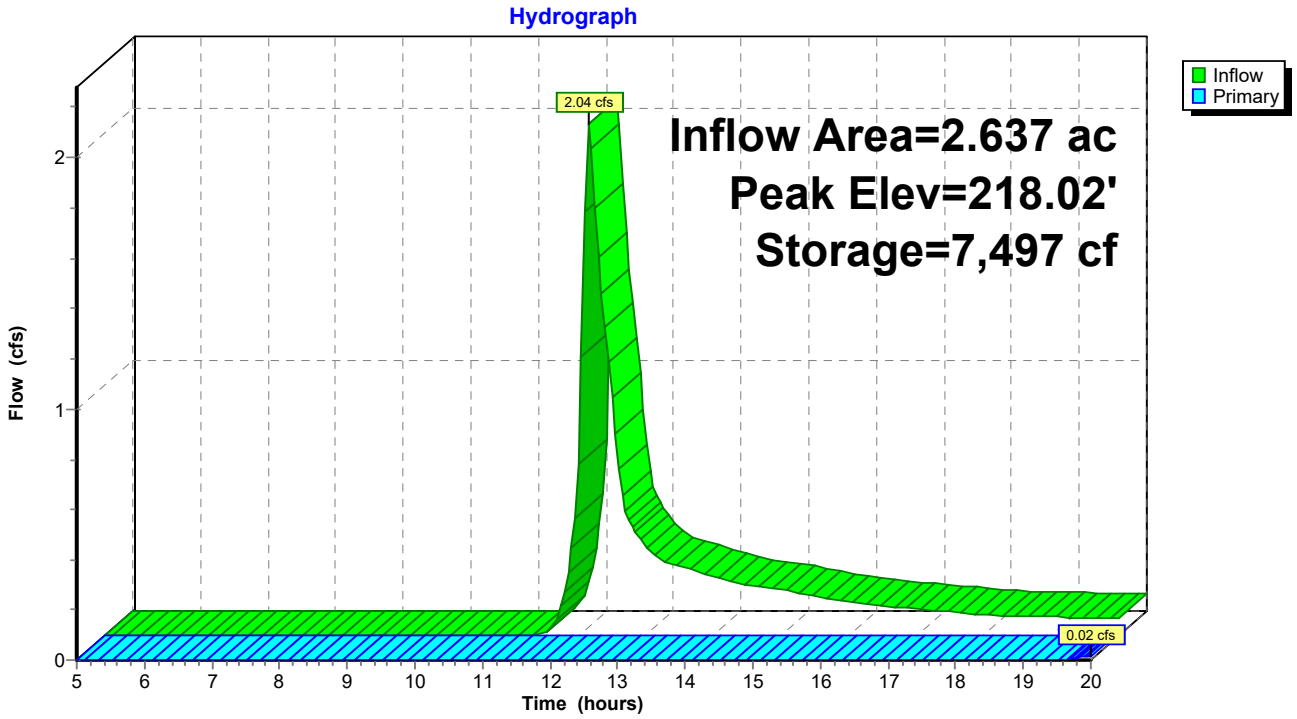
Plug-Flow detention time= 499.1 min calculated for 0.000 af (0% of inflow)
Center-of-Mass det. time= 360.5 min (1,193.2 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.01 cfs @ 20.00 hrs HW=218.02' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.32 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 1.05" for 2 year event
Inflow = 3.70 cfs @ 12.13 hrs, Volume= 0.279 af
Outflow = 0.19 cfs @ 16.02 hrs, Volume= 0.059 af, Atten= 95%, Lag= 233.4 min
Primary = 0.19 cfs @ 16.02 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 209.09' @ 16.02 hrs Surf.Area= 5,553 sf Storage= 16,047 cf (9,751 cf above start)

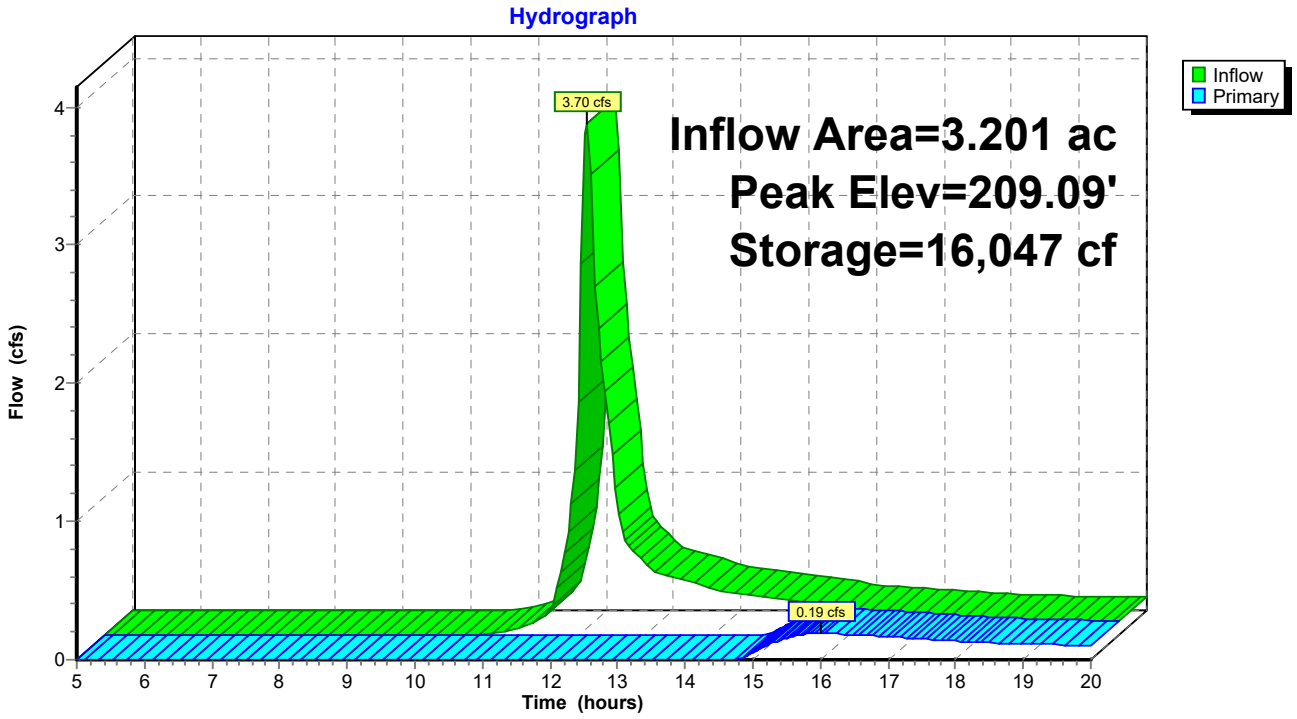
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 220.5 min (1,039.4 - 818.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.18 cfs @ 16.02 hrs HW=209.09' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.70 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area =	1.170 ac,	0.00% Impervious,	Inflow Depth >	0.89"	for 2 year event
Inflow =	1.22 cfs @	12.10 hrs,	Volume=	0.086 af	
Outflow =	0.13 cfs @	13.42 hrs,	Volume=	0.079 af,	Atten= 89%, Lag= 79.3 min
Discarded =	0.13 cfs @	13.42 hrs,	Volume=	0.079 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.42' @ 13.42 hrs Surf.Area= 1,384 sf Storage= 1,533 cf

Plug-Flow detention time= 141.0 min calculated for 0.079 af (91% of inflow)
Center-of-Mass det. time= 114.0 min (938.2 - 824.2)

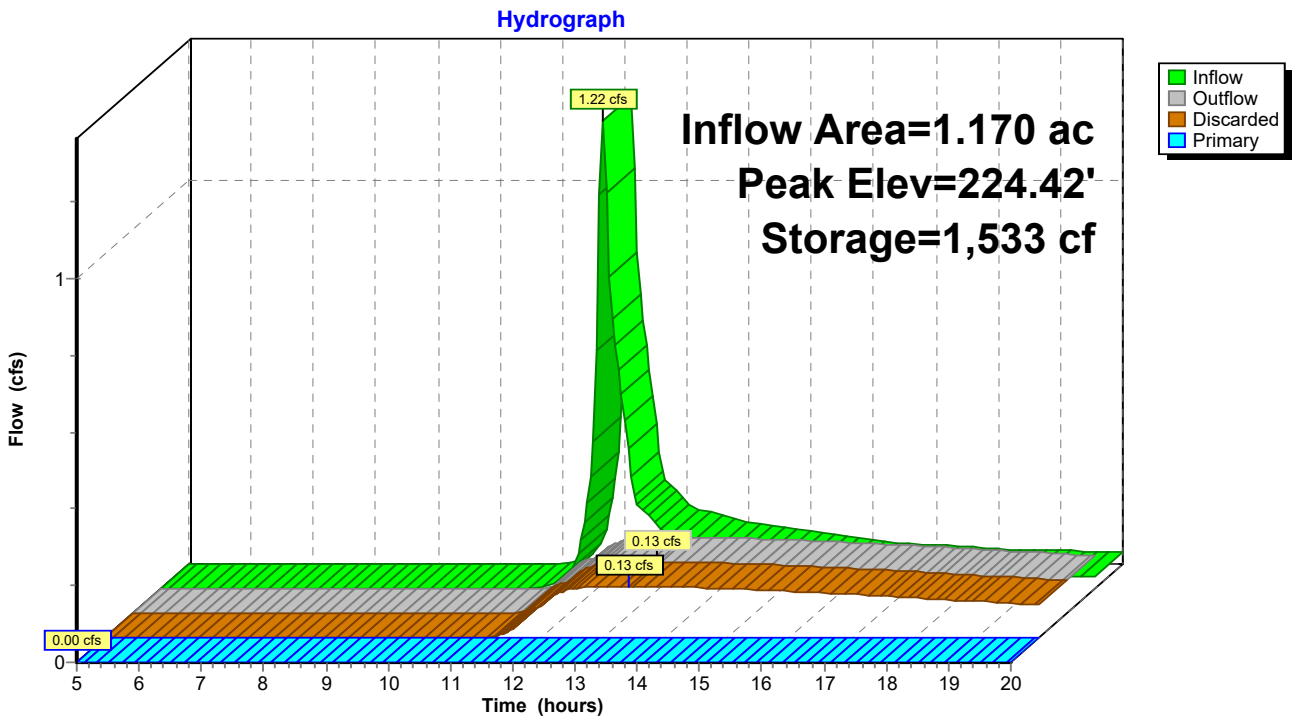
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.13 cfs @ 13.42 hrs HW=224.42' (Free Discharge)
└**2=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=223.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2 year event
Inflow = 4.84 cfs @ 12.16 hrs, Volume= 0.386 af
Outflow = 0.45 cfs @ 14.17 hrs, Volume= 0.172 af, Atten= 91%, Lag= 120.9 min
Primary = 0.45 cfs @ 14.17 hrs, Volume= 0.172 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.75' @ 14.17 hrs Surf.Area= 6,685 sf Storage= 10,191 cf

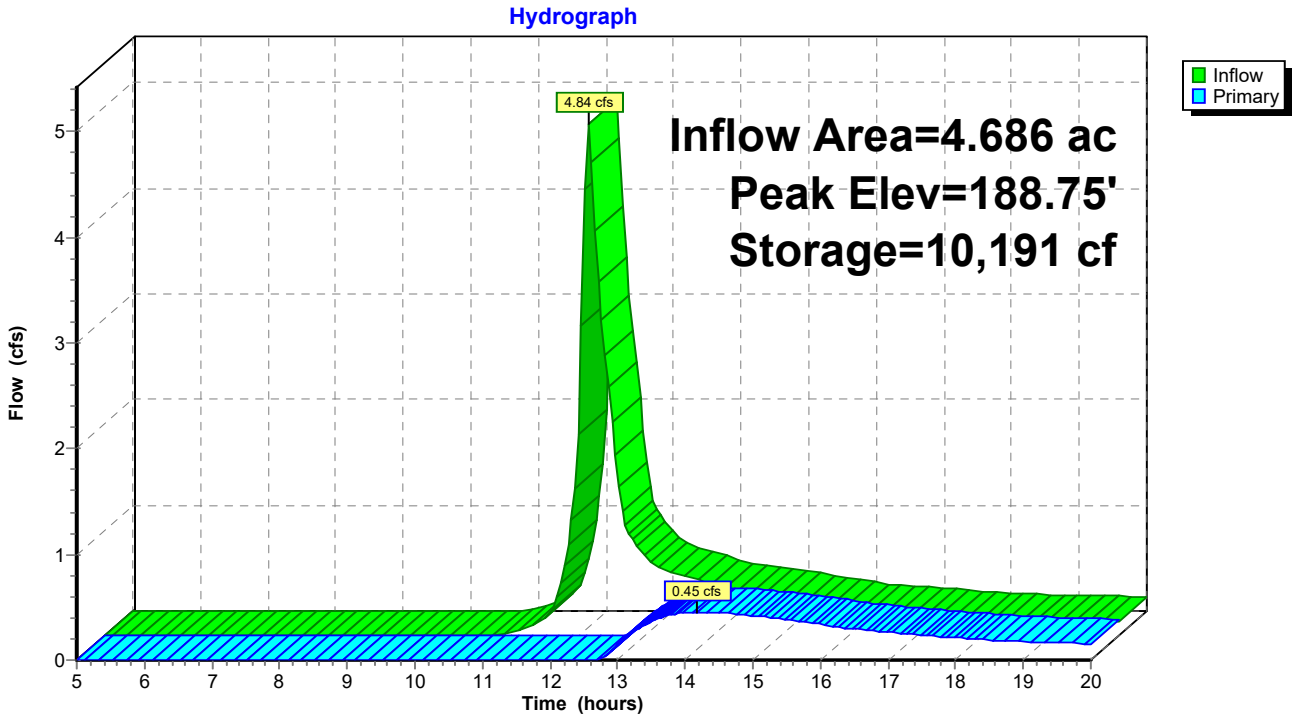
Plug-Flow detention time= 224.7 min calculated for 0.172 af (44% of inflow)
Center-of-Mass det. time= 131.6 min (954.3 - 822.7)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.45 cfs @ 14.17 hrs HW=188.75' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.45 cfs @ 1.21 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 1.05" for 2 year event
Inflow = 1.89 cfs @ 12.10 hrs, Volume= 0.133 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 189.76' @ 20.00 hrs Surf.Area= 3,928 sf Storage= 9,888 cf (5,772 cf above start)

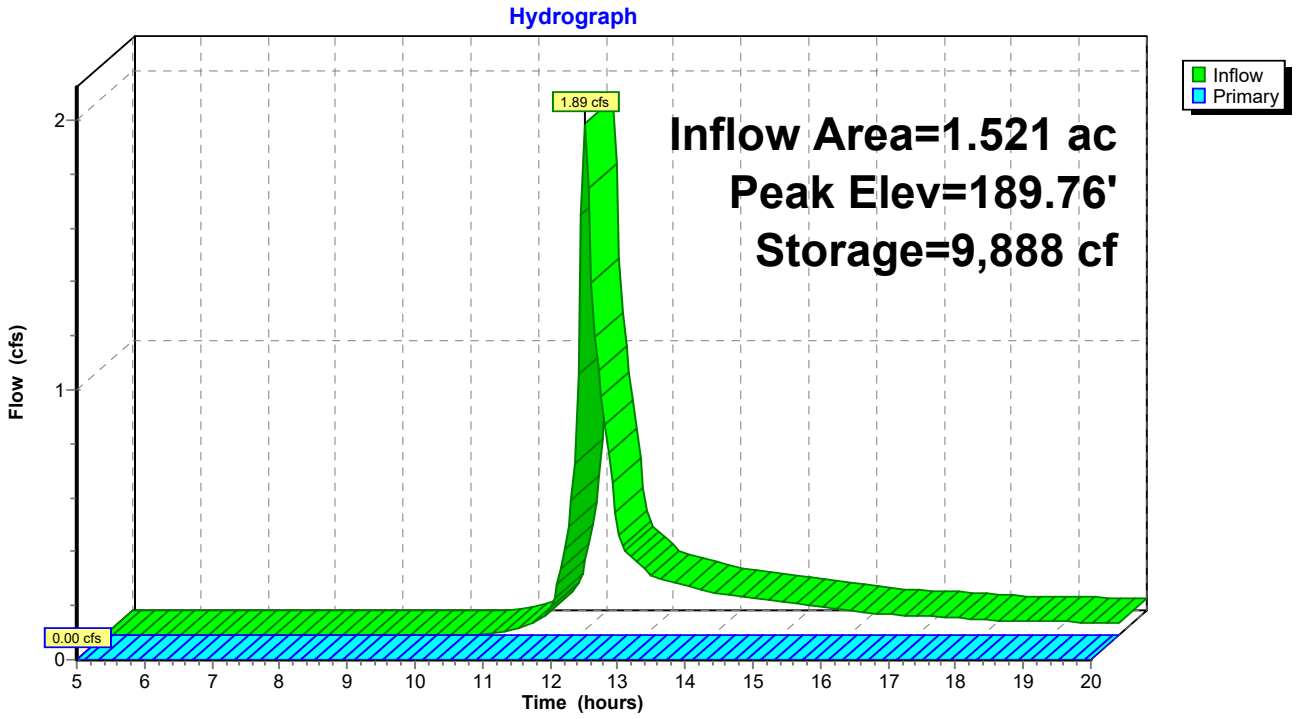
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=188.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2 year event
Inflow = 2.32 cfs @ 12.17 hrs, Volume= 0.190 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 168.45' @ 20.00 hrs Surf.Area= 5,038 sf Storage= 8,267 cf

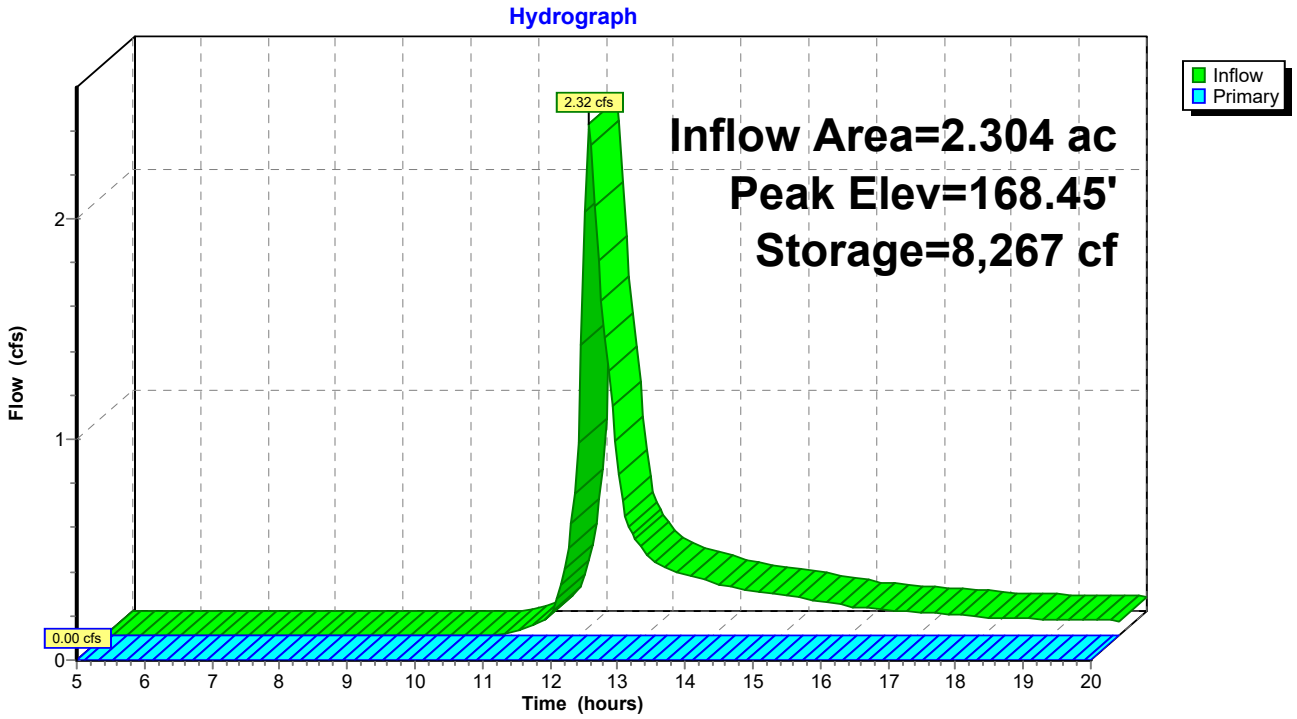
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=166.50' (Free Discharge)
└**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 1.10" for 2 year event
Inflow = 1.53 cfs @ 12.09 hrs, Volume= 0.104 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 151.40' @ 20.00 hrs Surf.Area= 3,020 sf Storage= 6,549 cf (4,506 cf above start)

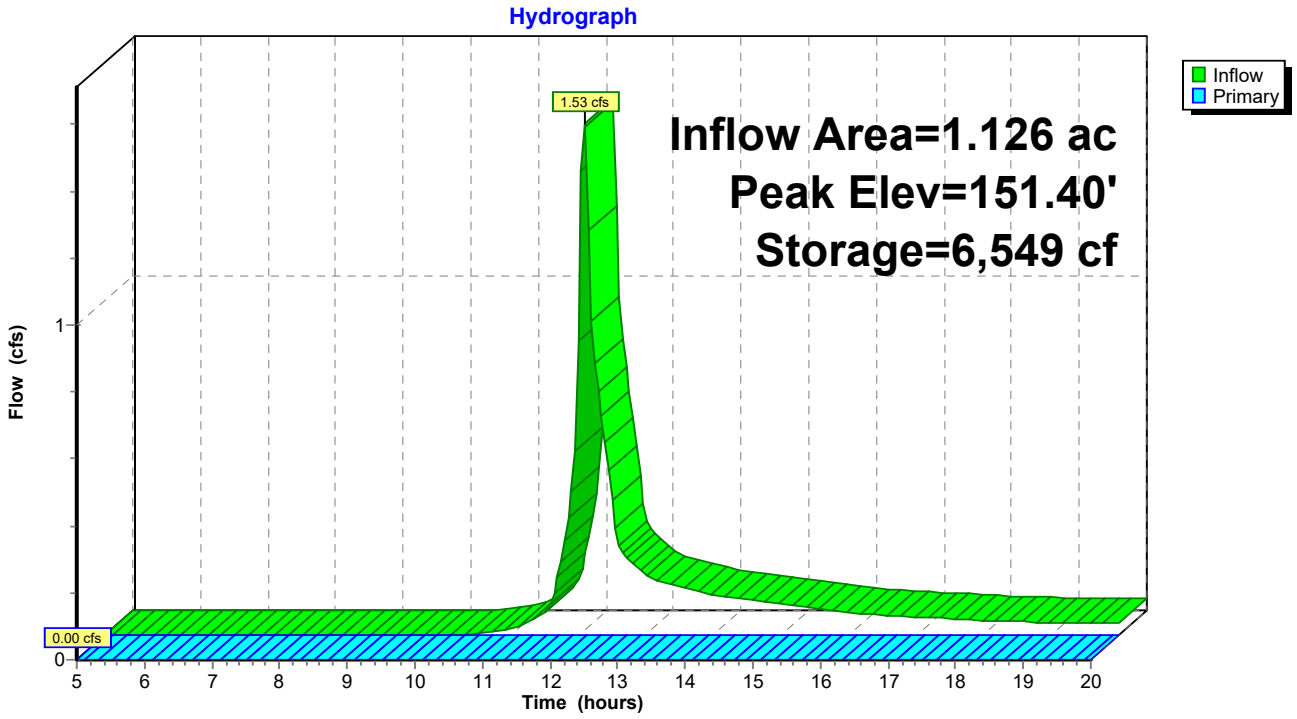
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=149.50' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2 year event
Inflow = 3.81 cfs @ 12.12 hrs, Volume= 0.287 af
Outflow = 0.27 cfs @ 15.10 hrs, Volume= 0.098 af, Atten= 93%, Lag= 178.4 min
Primary = 0.27 cfs @ 15.10 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 158.65' @ 15.10 hrs Surf.Area= 6,153 sf Storage= 15,492 cf (8,656 cf above start)

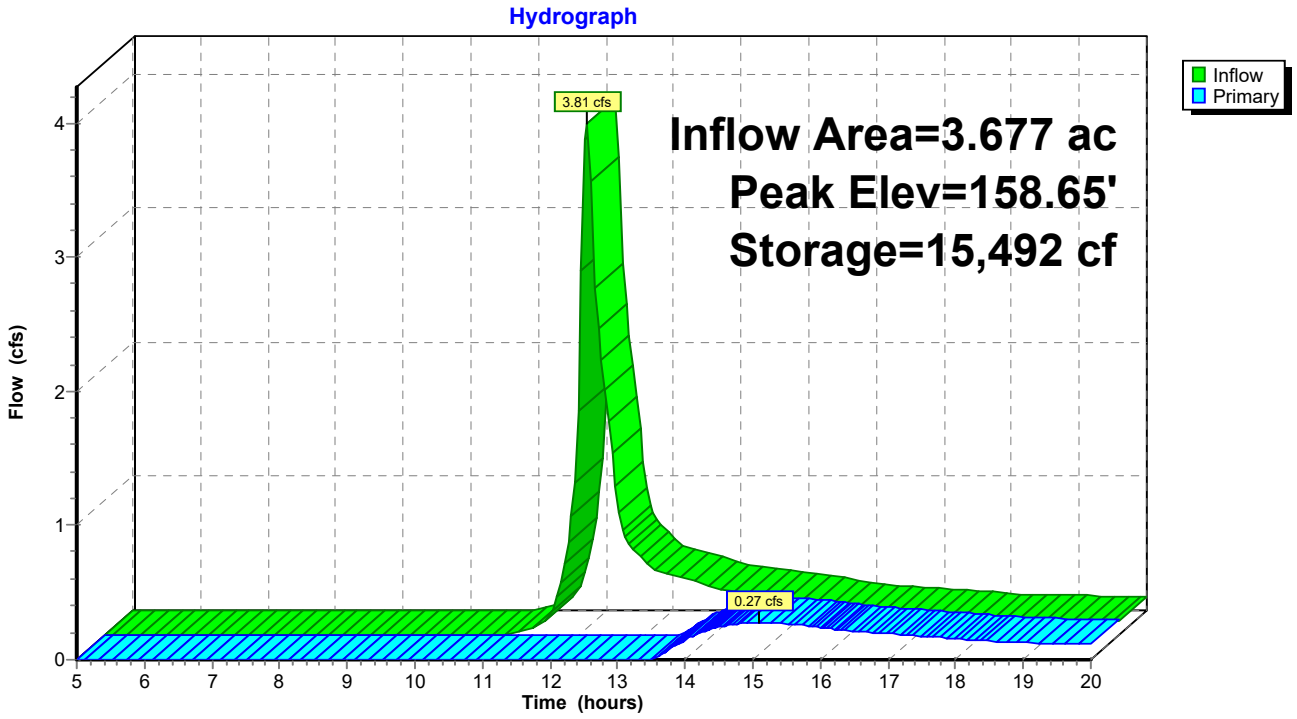
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 166.3 min (989.7 - 823.4)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.27 cfs @ 15.10 hrs HW=158.65' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 0.92 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 1.16" for 2 year event
Inflow = 4.30 cfs @ 12.11 hrs, Volume= 0.302 af
Outflow = 0.20 cfs @ 15.94 hrs, Volume= 0.067 af, Atten= 95%, Lag= 230.1 min
Primary = 0.20 cfs @ 15.94 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.25' @ 15.94 hrs Surf.Area= 15,287 sf Storage= 10,445 cf

Plug-Flow detention time= 317.3 min calculated for 0.067 af (22% of inflow)
Center-of-Mass det. time= 216.0 min (1,029.2 - 813.2)

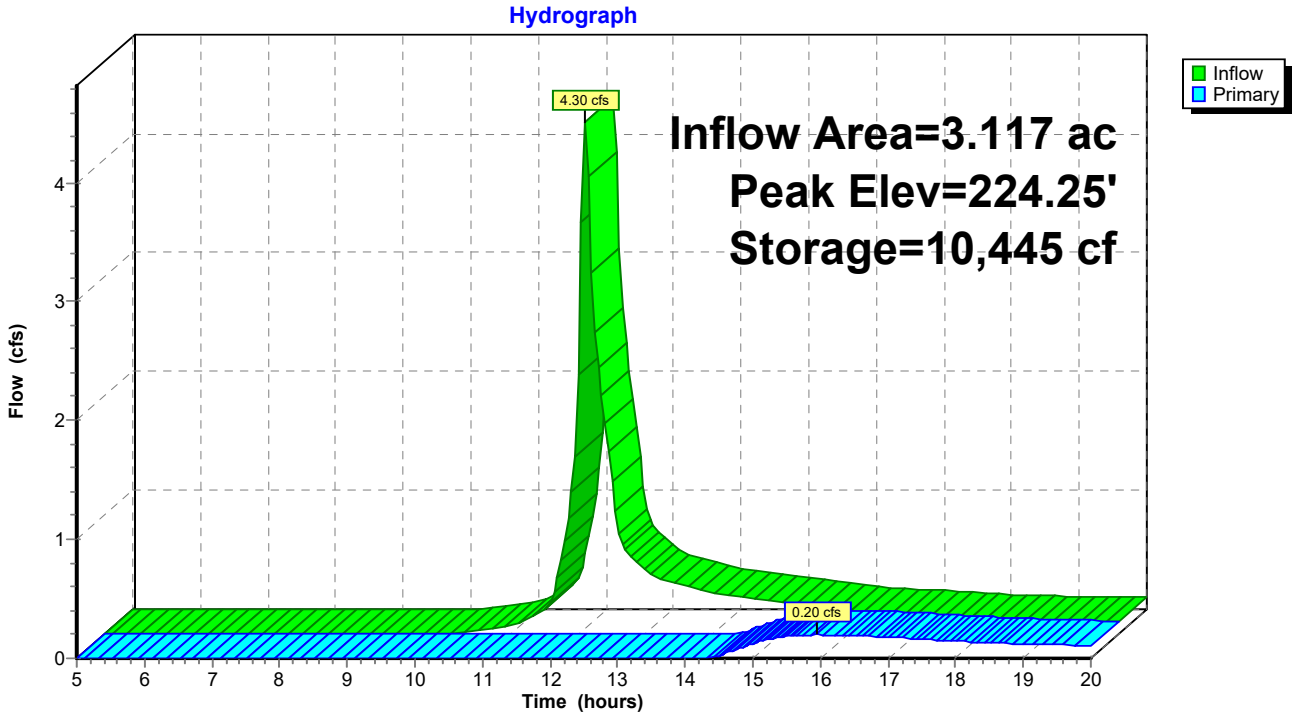
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.20 cfs @ 15.94 hrs HW=224.25' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.51 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area =	12.425 ac,	0.00% Impervious,	Inflow Depth >	0.84"	for 2 year event
Inflow =	9.81 cfs @	12.17 hrs,	Volume=	0.875 af	
Outflow =	1.07 cfs @	13.84 hrs,	Volume=	0.708 af,	Atten= 89%, Lag= 100.3 min
Discarded =	1.07 cfs @	13.84 hrs,	Volume=	0.708 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 185.08' @ 13.84 hrs Surf.Area= 15,264 sf Storage= 15,595 cf

Plug-Flow detention time= 165.8 min calculated for 0.708 af (81% of inflow)
Center-of-Mass det. time= 110.5 min (947.9 - 837.5)

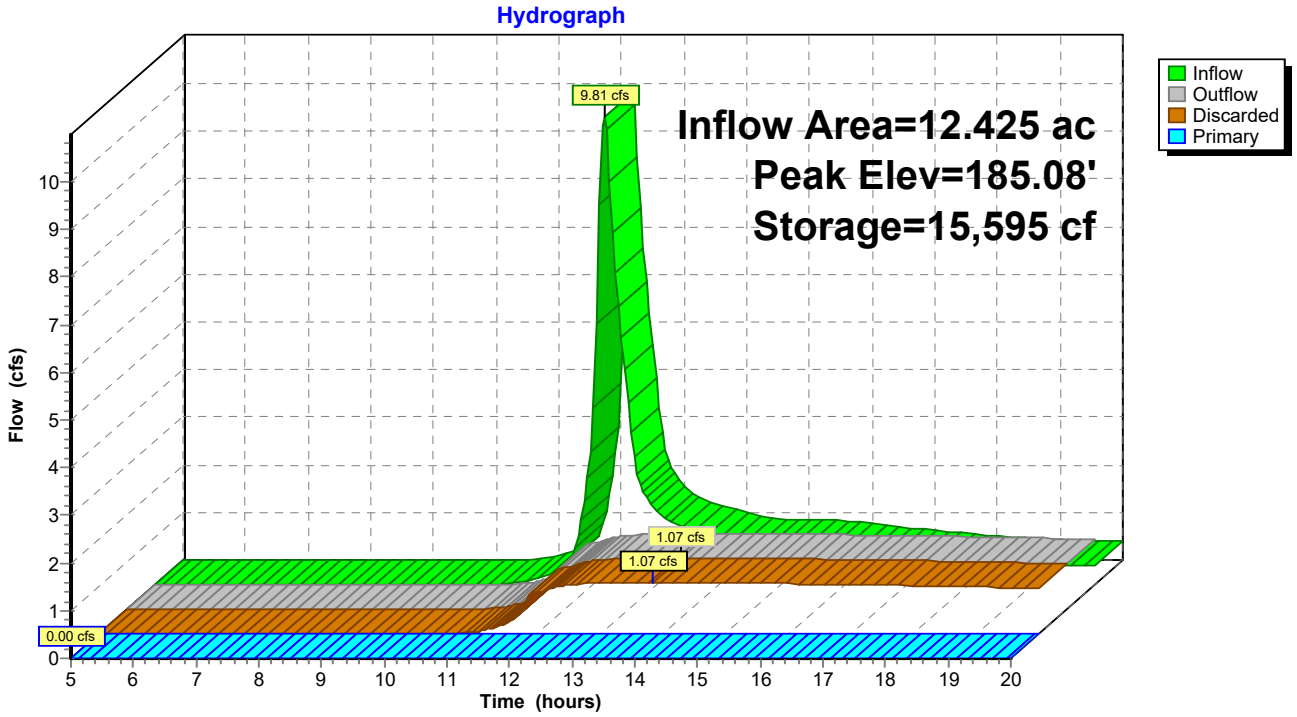
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.07 cfs @ 13.84 hrs HW=185.08' (Free Discharge)
└**2=Exfiltration** (Controls 1.07 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=184.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area =	4.438 ac,	0.00% Impervious,	Inflow Depth >	0.74"	for 2 year event
Inflow =	3.29 cfs @	12.15 hrs,	Volume=	0.273 af	
Outflow =	0.33 cfs @	14.51 hrs,	Volume=	0.202 af,	Atten= 90%, Lag= 141.4 min
Discarded =	0.33 cfs @	14.51 hrs,	Volume=	0.202 af	
Primary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.84' @ 14.51 hrs Surf.Area= 3,089 sf Storage= 5,450 cf

Plug-Flow detention time= 184.9 min calculated for 0.202 af (74% of inflow)
Center-of-Mass det. time= 118.8 min (953.1 - 834.3)

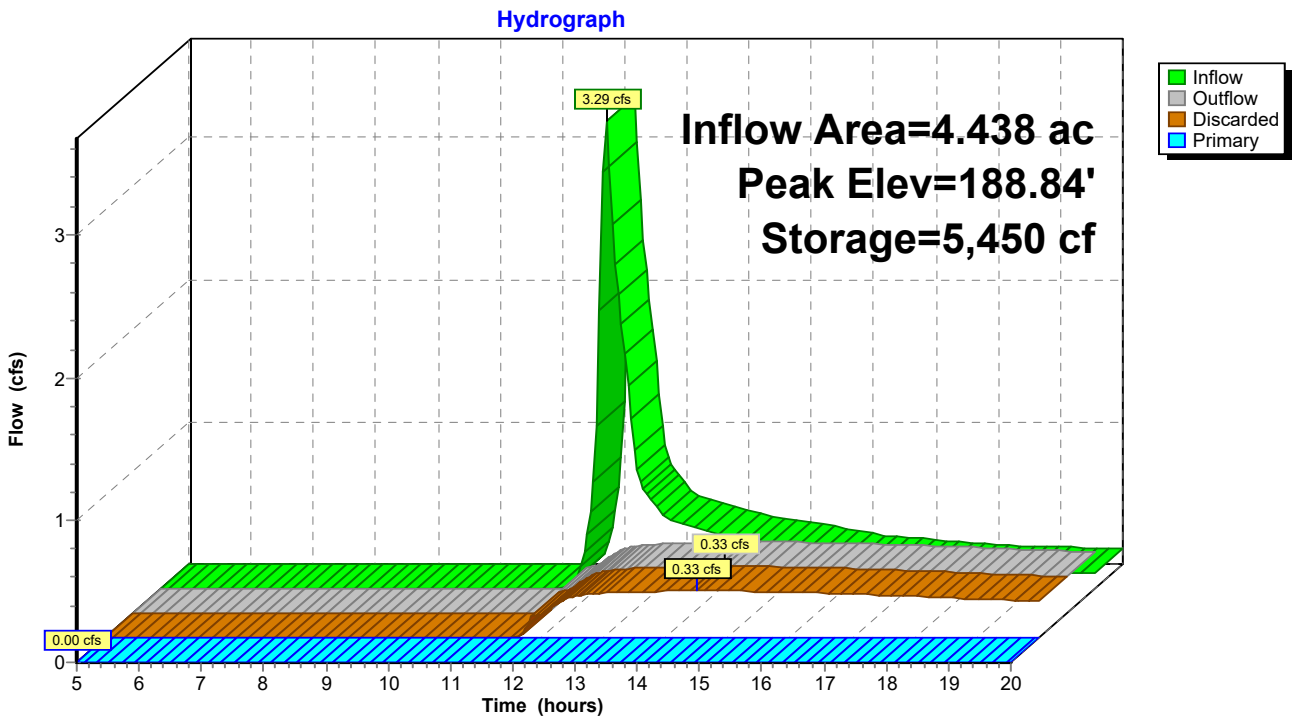
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.33 cfs @ 14.51 hrs HW=188.84' (Free Discharge)
└**2=Exfiltration** (Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=186.50' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 1.09" for 2 year event
Inflow = 12.75 cfs @ 12.46 hrs, Volume= 1.538 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 194.21' @ 20.00 hrs Surf.Area= 24,265 sf Storage= 98,214 cf (66,958 cf above start)

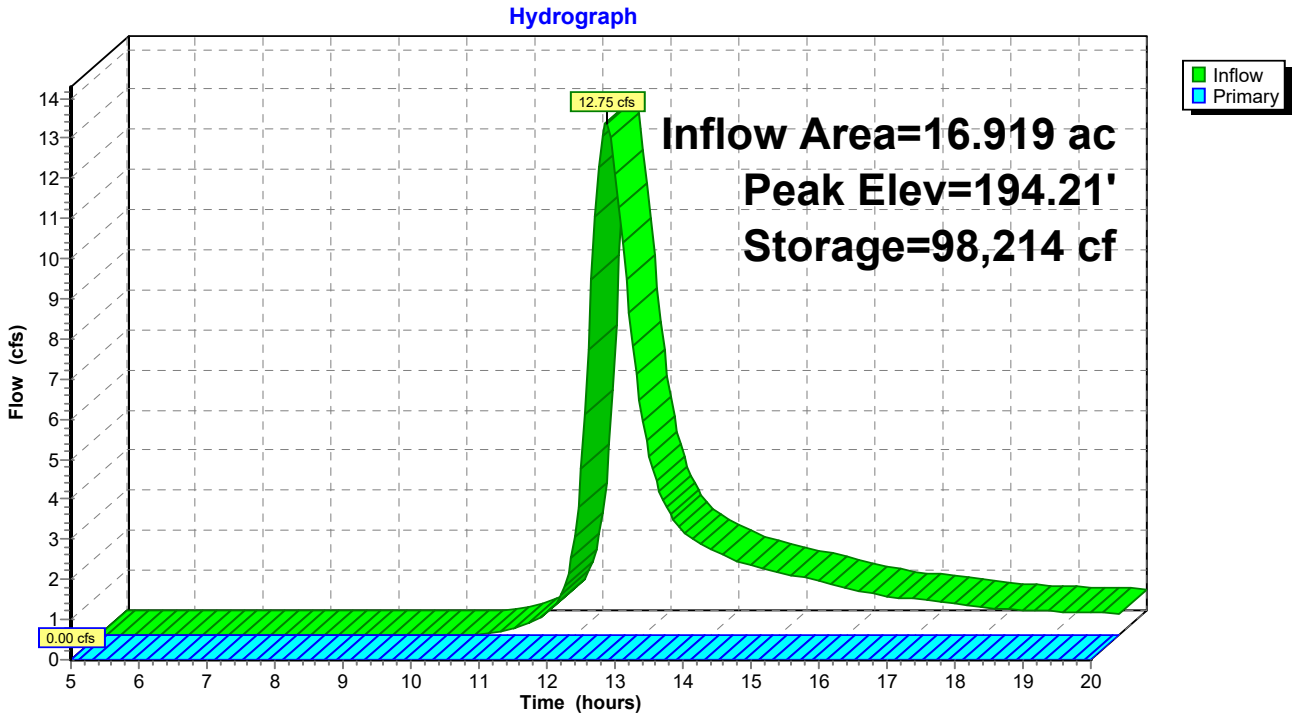
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=191.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 16P: Pond 16



25-Year Storm Event- Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>2.74"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=9.55 cfs 0.686 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=430' Tc=12.4 min CN=72 Runoff=7.58 cfs 0.621 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>2.29"
Tc=10.0 min CN=65 Runoff=1.91 cfs 0.148 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>3.01"
Flow Length=620' Tc=12.6 min CN=73 Runoff=7.73 cfs 0.640 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>3.40"
Tc=10.0 min CN=77 Runoff=1.19 cfs 0.092 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>3.01"
Flow Length=810' Tc=16.2 min CN=73 Runoff=16.27 cfs 1.473 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>2.55"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=7.24 cfs 0.561 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>3.02"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=11.18 cfs 0.805 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>2.46"
Tc=10.0 min CN=67 Runoff=2.45 cfs 0.188 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.05 cfs 0.004 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=1.23 cfs 0.098 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>2.74"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=3.98 cfs 0.267 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.36 cfs 0.029 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=650' Tc=10.1 min CN=72 Runoff=14.88 cfs 1.141 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=1.36 cfs 0.109 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>3.02"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=5.62 cfs 0.383 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.46 cfs 0.037 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>2.92"
Flow Length=410' Tc=11.0 min CN=72 Runoff=7.14 cfs 0.561 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.51 cfs 0.041 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>3.12"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=4.39 cfs 0.292 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=0.76 cfs 0.061 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>2.83"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=12.13 cfs 0.868 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>3.21"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=12.08 cfs 0.834 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>3.02"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=29.33 cfs 2.339 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>2.47"
Flow Length=500' Tc=9.1 min CN=67 Runoff=12.13 cfs 0.912 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>3.09"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=36.93 cfs 4.356 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>1.70"
Tc=10.0 min CN=58 Runoff=1.10 cfs 0.088 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.29' Max Vel=2.45 fps Inflow=4.52 cfs 0.592 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=4.44 cfs 0.589 af

Pond 1P: Pond 1 Peak Elev=193.93' Storage=15,624 cf Inflow=9.55 cfs 0.686 af
Outflow=4.80 cfs 0.549 af

Pond 2P: Pond 2 Peak Elev=231.38' Storage=11,717 cf Inflow=7.58 cfs 0.621 af
Discarded=0.37 cfs 0.248 af Primary=2.38 cfs 0.174 af Outflow=2.75 cfs 0.422 af

Pond 3P: Pond 3 Peak Elev=227.67' Storage=11,360 cf Inflow=7.73 cfs 0.640 af
Outflow=3.40 cfs 0.492 af

Pond 4P: Pond 4 Peak Elev=188.43' Storage=52,343 cf Inflow=16.27 cfs 1.473 af
Outflow=5.72 cfs 0.857 af

Pond 5P: Pond 5 Peak Elev=218.64' Storage=10,437 cf Inflow=7.24 cfs 0.561 af
Outflow=2.75 cfs 0.380 af

Pond 6P: Pond 6 Peak Elev=209.76' Storage=20,009 cf Inflow=11.18 cfs 0.805 af
Outflow=5.36 cfs 0.580 af

Pond 7P: Pond 7 Peak Elev=226.29' Storage=4,998 cf Inflow=3.98 cfs 0.267 af
Discarded=0.24 cfs 0.155 af Primary=0.75 cfs 0.048 af Outflow=0.99 cfs 0.202 af

Pond 8P: Pond 8 Peak Elev=189.93' Storage=18,785 cf Inflow=14.88 cfs 1.141 af
Outflow=6.77 cfs 0.914 af

Pond 9P: Pond 9 Peak Elev=190.41' Storage=12,610 cf Inflow=5.62 cfs 0.383 af
Outflow=1.35 cfs 0.221 af

Pond 10P: Pond 10 Peak Elev=169.08' Storage=11,612 cf Inflow=7.14 cfs 0.561 af
Outflow=2.34 cfs 0.352 af

Pond 11P: Pond 11 Peak Elev=152.24' Storage=9,362 cf Inflow=4.39 cfs 0.292 af
Outflow=0.57 cfs 0.139 af

Pond 12P: Pond 12 Peak Elev=159.50' Storage=21,143 cf Inflow=12.13 cfs 0.868 af
Outflow=5.33 cfs 0.670 af

Pond 13.1P: Pond 13.1 Peak Elev=224.57' Storage=15,737 cf Inflow=12.08 cfs 0.834 af
Outflow=4.52 cfs 0.592 af

Pond 13P: Pond 13 Peak Elev=188.19' Storage=70,957 cf Inflow=29.56 cfs 2.928 af
Discarded=1.79 cfs 1.277 af Primary=1.54 cfs 0.257 af Outflow=3.33 cfs 1.535 af

Pond 14P: Pond 14 Peak Elev=190.95' Storage=13,658 cf Inflow=12.13 cfs 0.912 af
Discarded=0.55 cfs 0.329 af Primary=4.99 cfs 0.387 af Outflow=5.53 cfs 0.716 af

Pond 16P: Pond 16 Peak Elev=195.97' Storage=144,272 cf Inflow=36.93 cfs 4.356 af
Outflow=8.28 cfs 1.969 af

Total Runoff Area = 73.385 ac Runoff Volume = 17.634 af Average Runoff Depth = 2.88"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

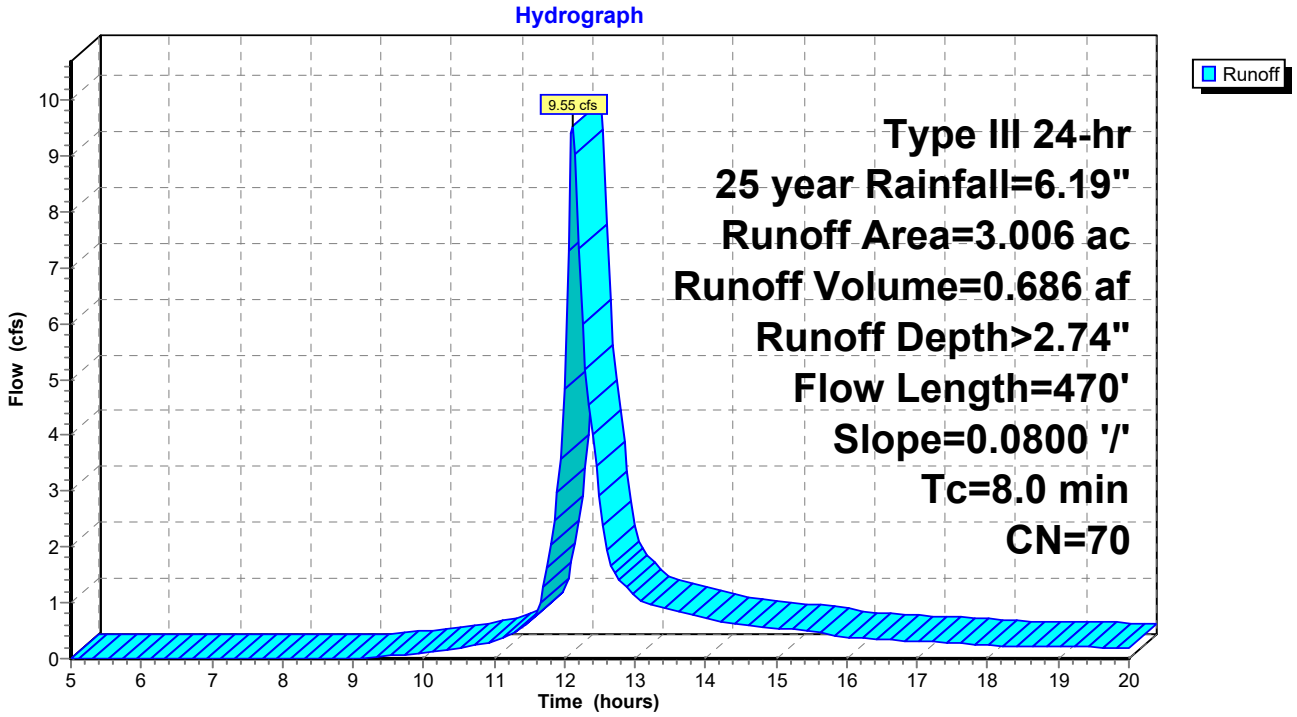
Runoff = 9.55 cfs @ 12.12 hrs, Volume= 0.686 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

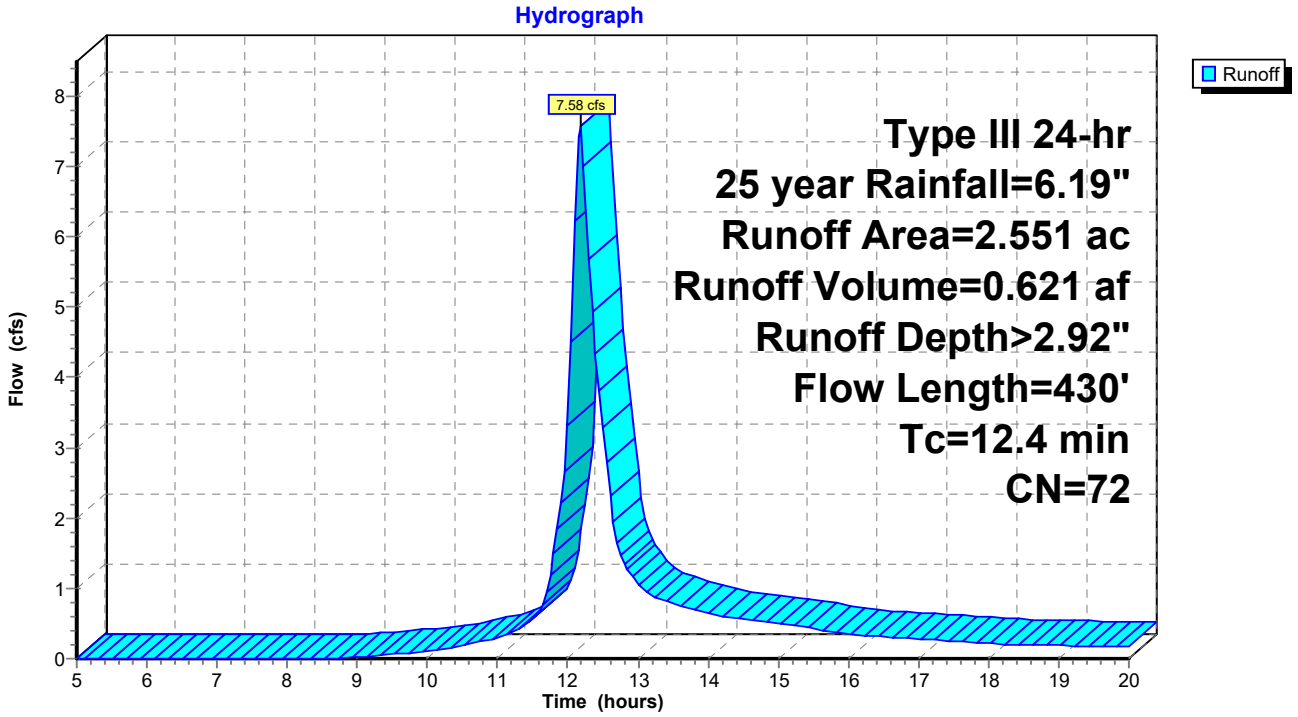
Runoff = 7.58 cfs @ 12.17 hrs, Volume= 0.621 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

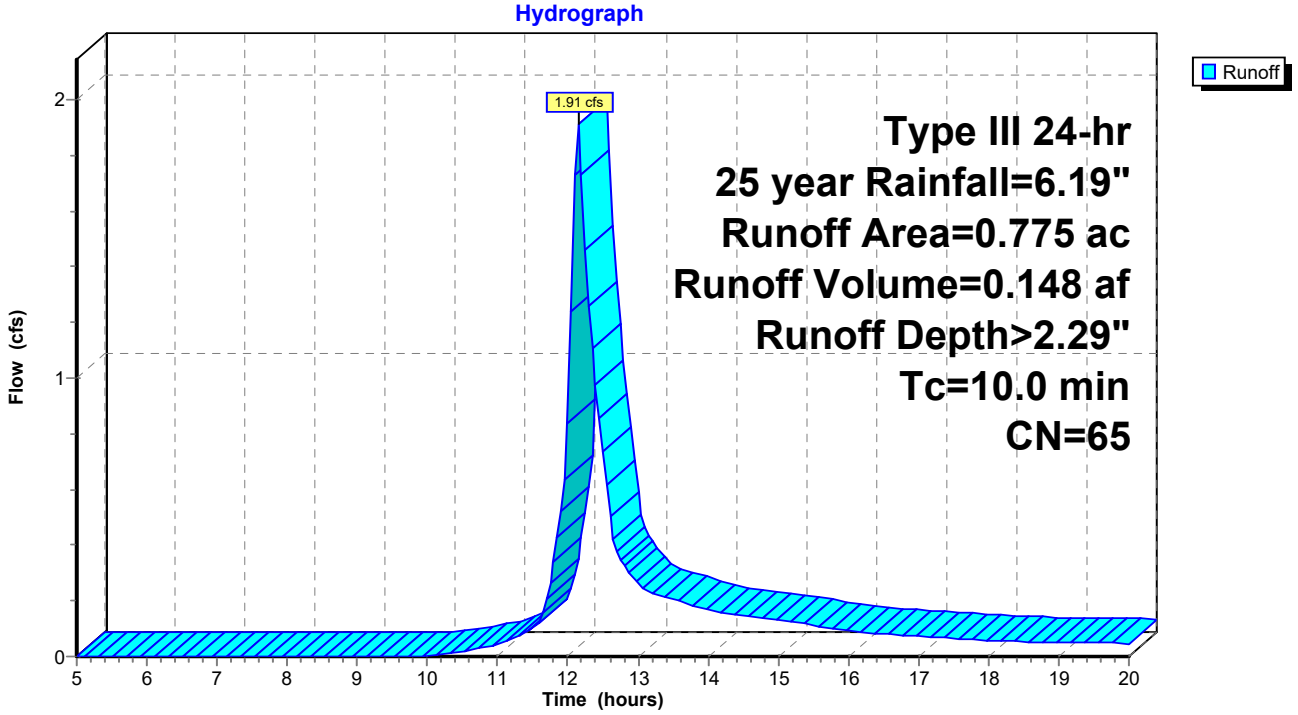
Runoff = 1.91 cfs @ 12.15 hrs, Volume= 0.148 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

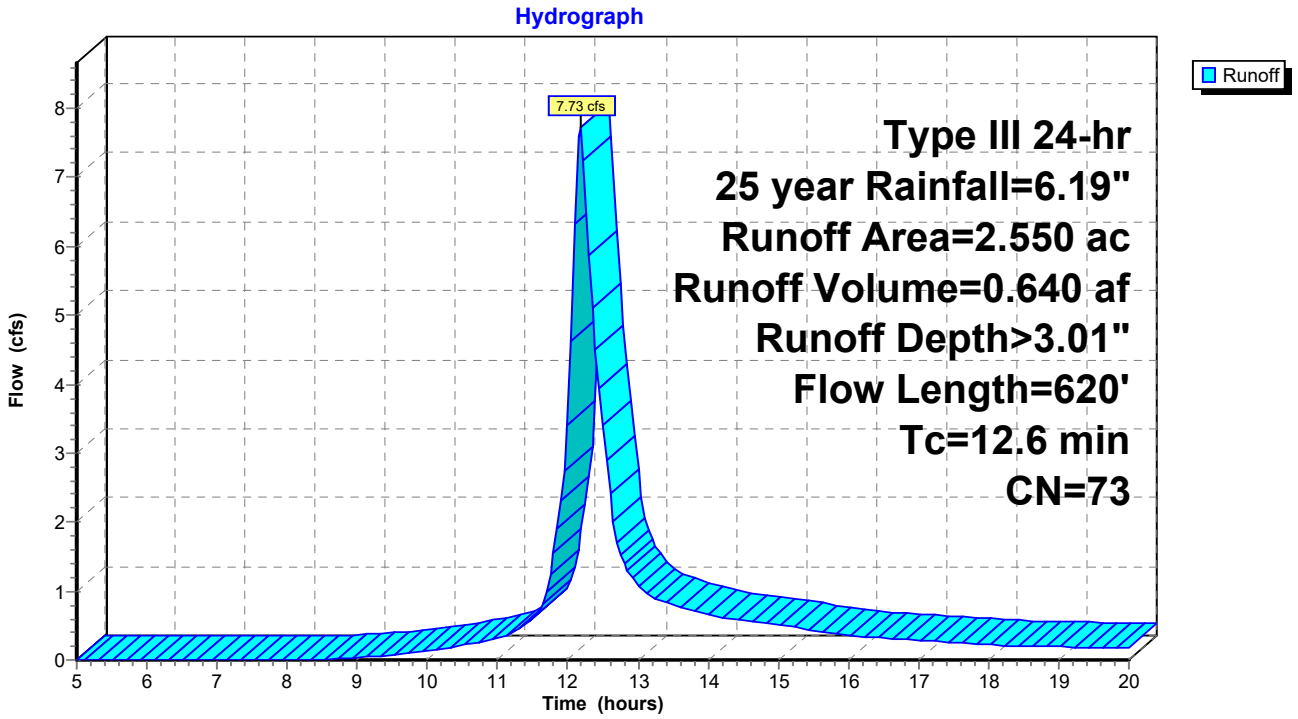
Runoff = 7.73 cfs @ 12.18 hrs, Volume= 0.640 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

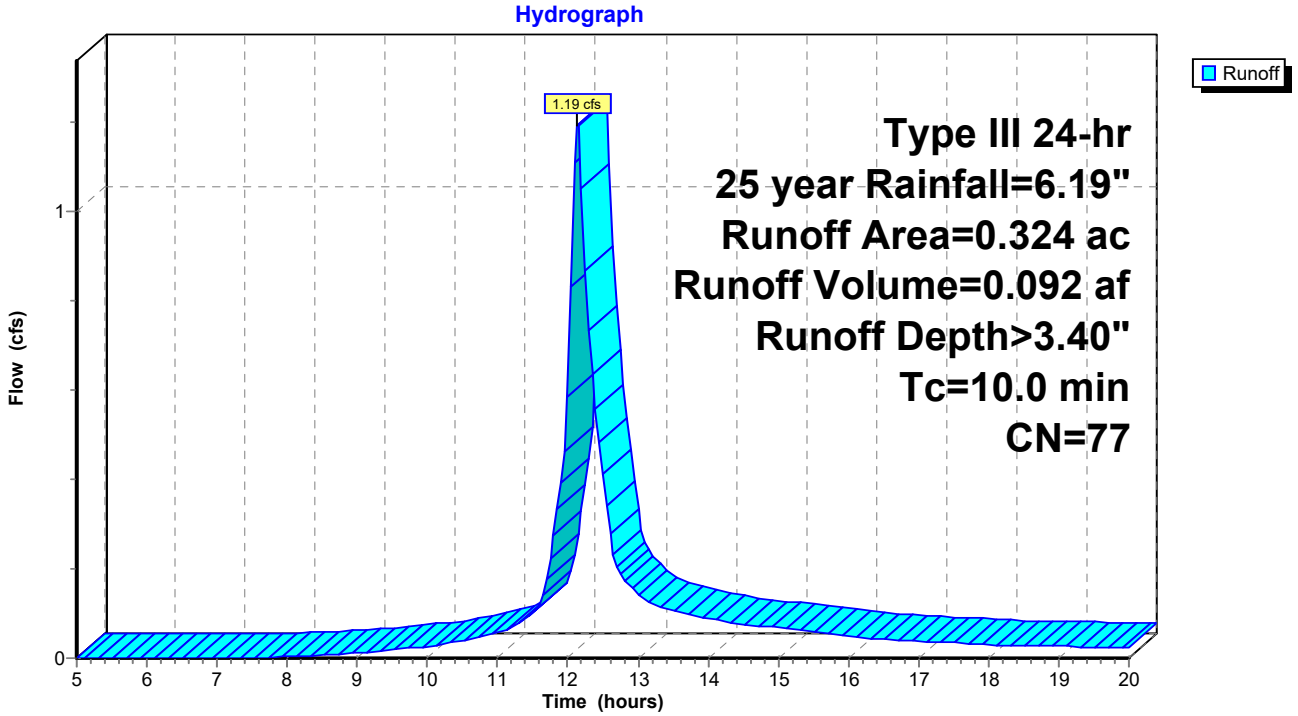
Runoff = 1.19 cfs @ 12.14 hrs, Volume= 0.092 af, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

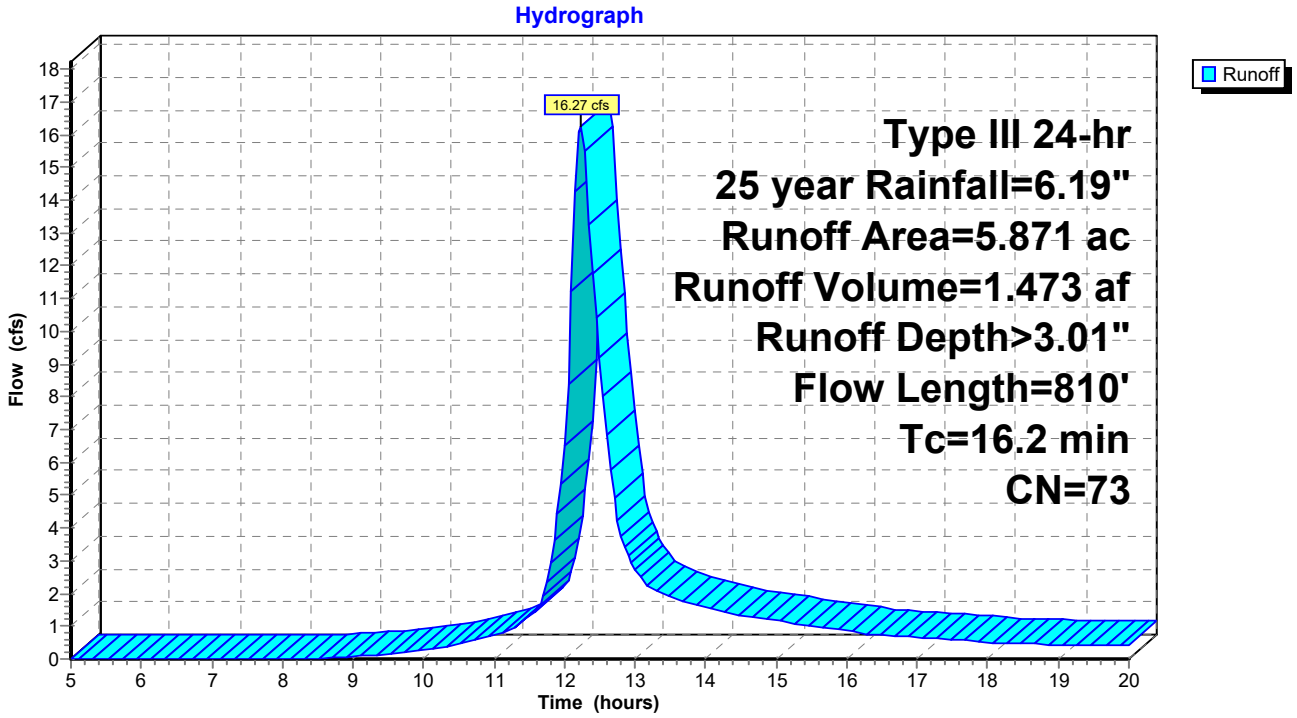
Runoff = 16.27 cfs @ 12.23 hrs, Volume= 1.473 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

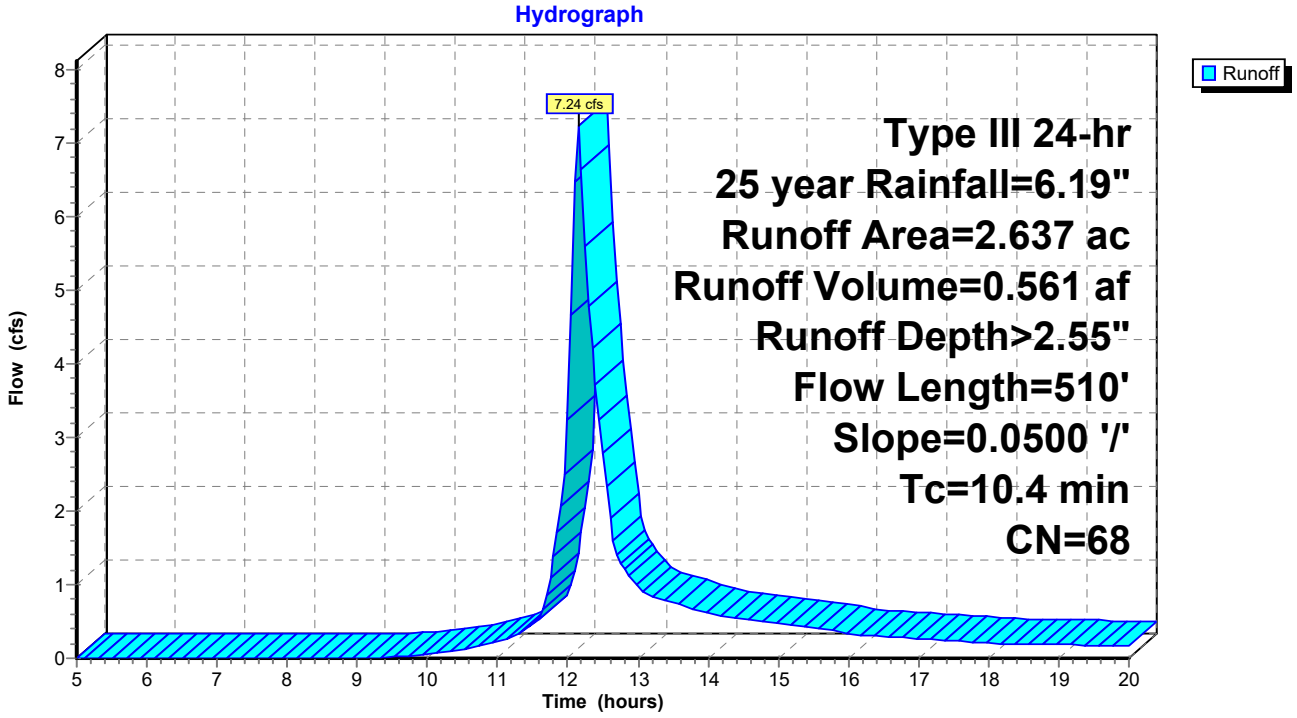
Runoff = 7.24 cfs @ 12.15 hrs, Volume= 0.561 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

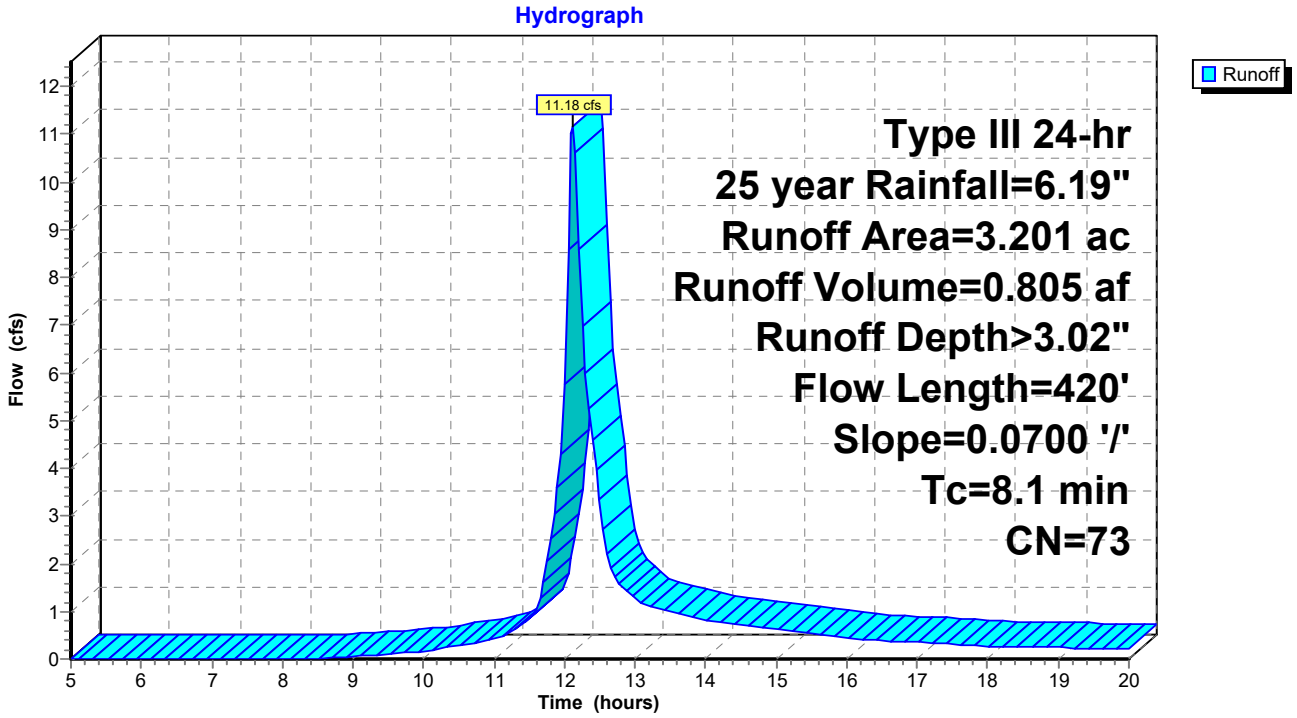
Runoff = 11.18 cfs @ 12.12 hrs, Volume= 0.805 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

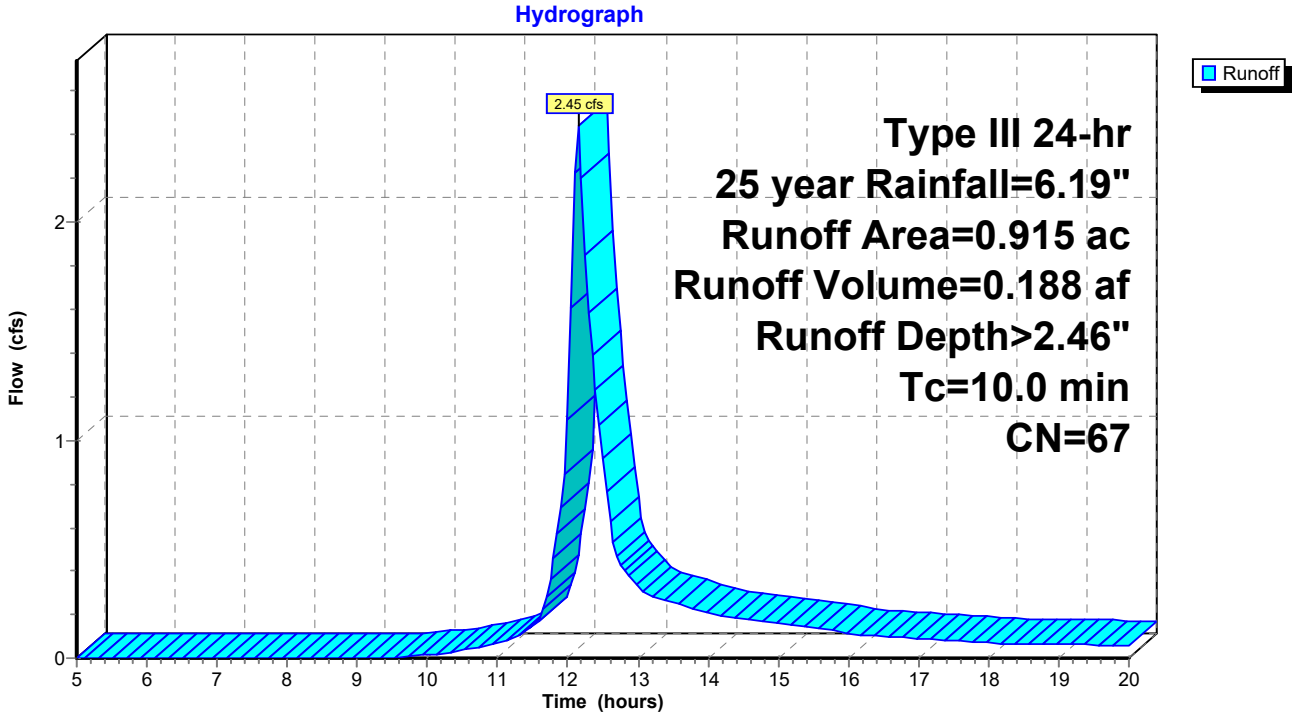
Runoff = 2.45 cfs @ 12.15 hrs, Volume= 0.188 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

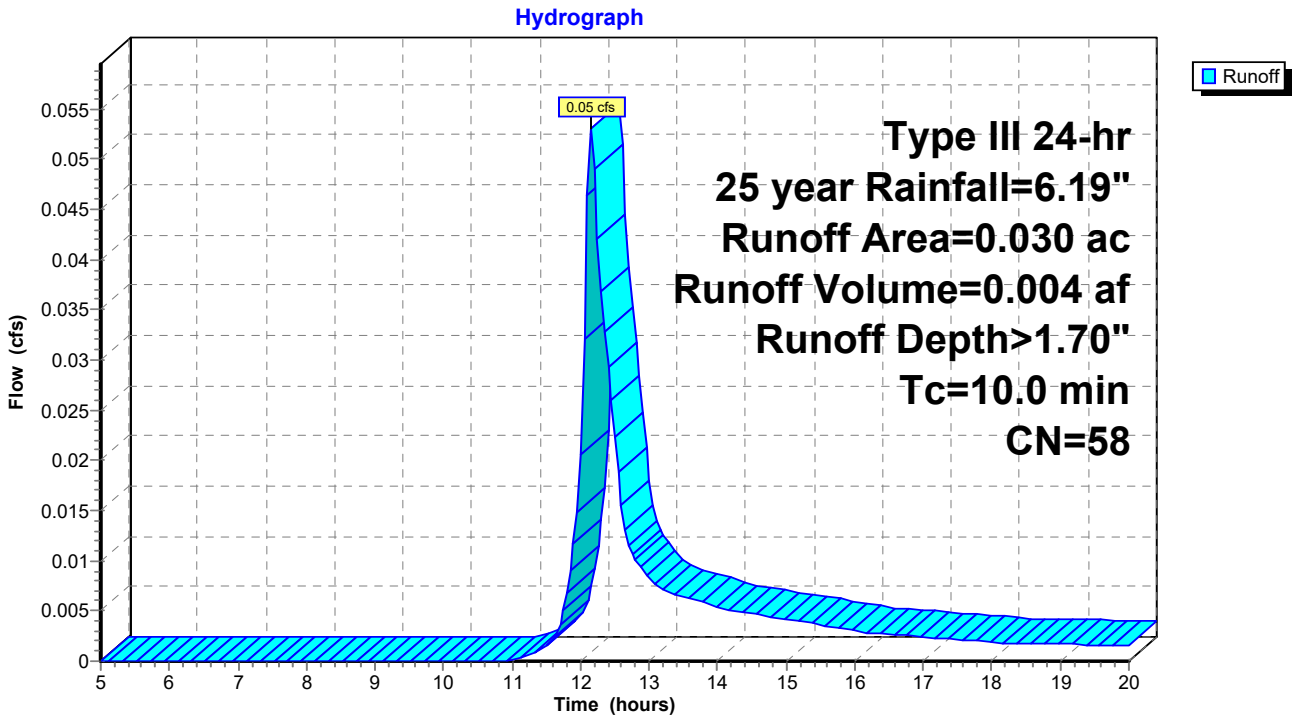
Runoff = 0.05 cfs @ 12.16 hrs, Volume= 0.004 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

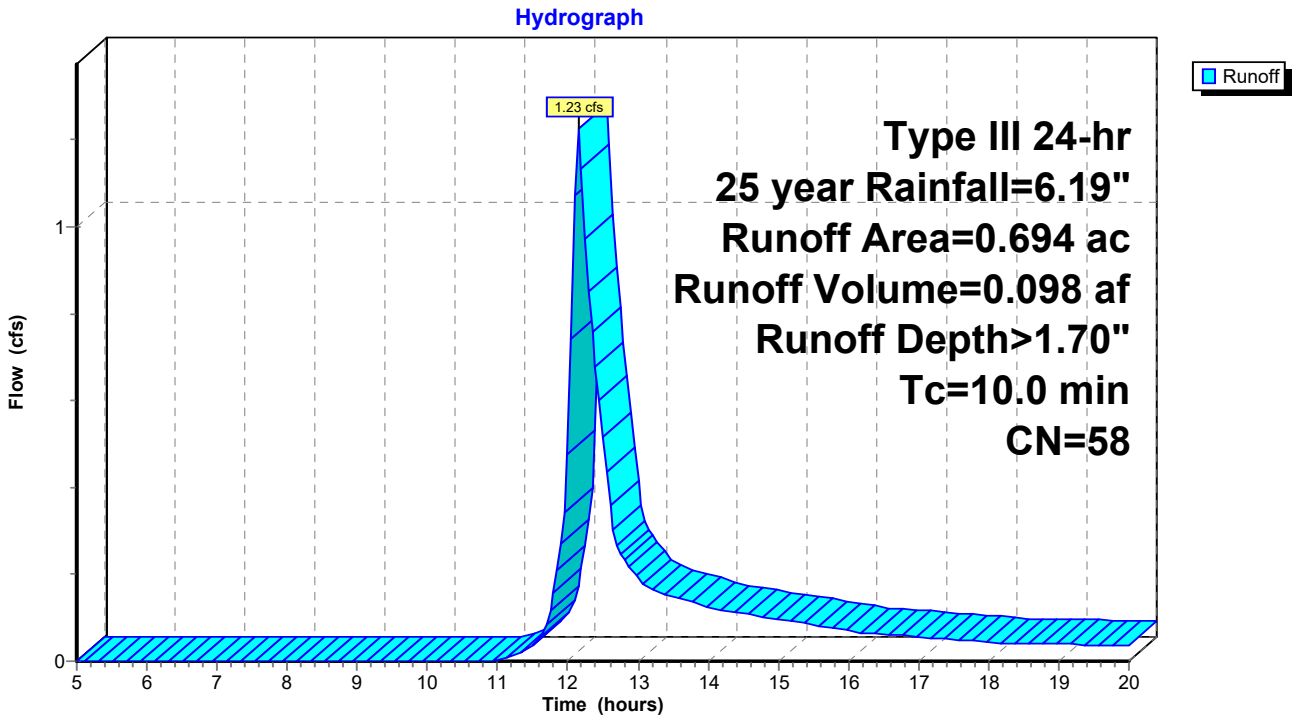
Runoff = 1.23 cfs @ 12.16 hrs, Volume= 0.098 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

[49] Hint: Tc<2dt may require smaller dt

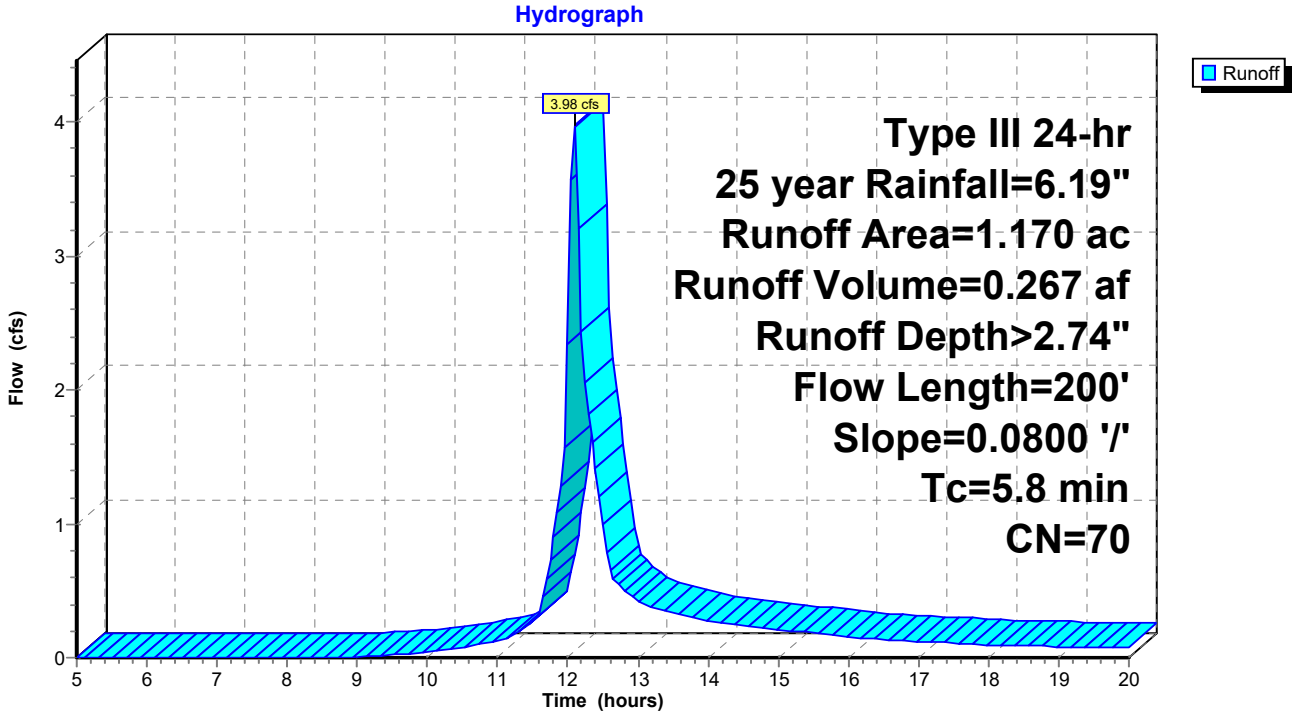
Runoff = 3.98 cfs @ 12.09 hrs, Volume= 0.267 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

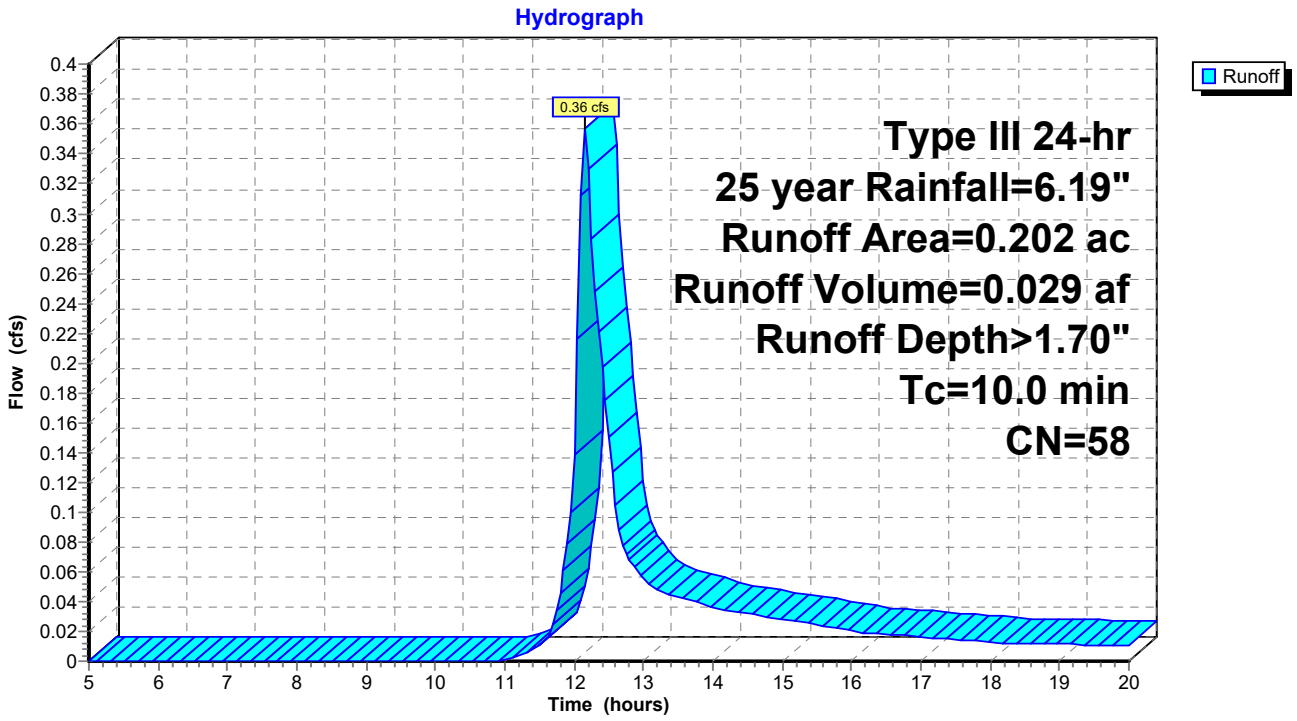
Runoff = 0.36 cfs @ 12.16 hrs, Volume= 0.029 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

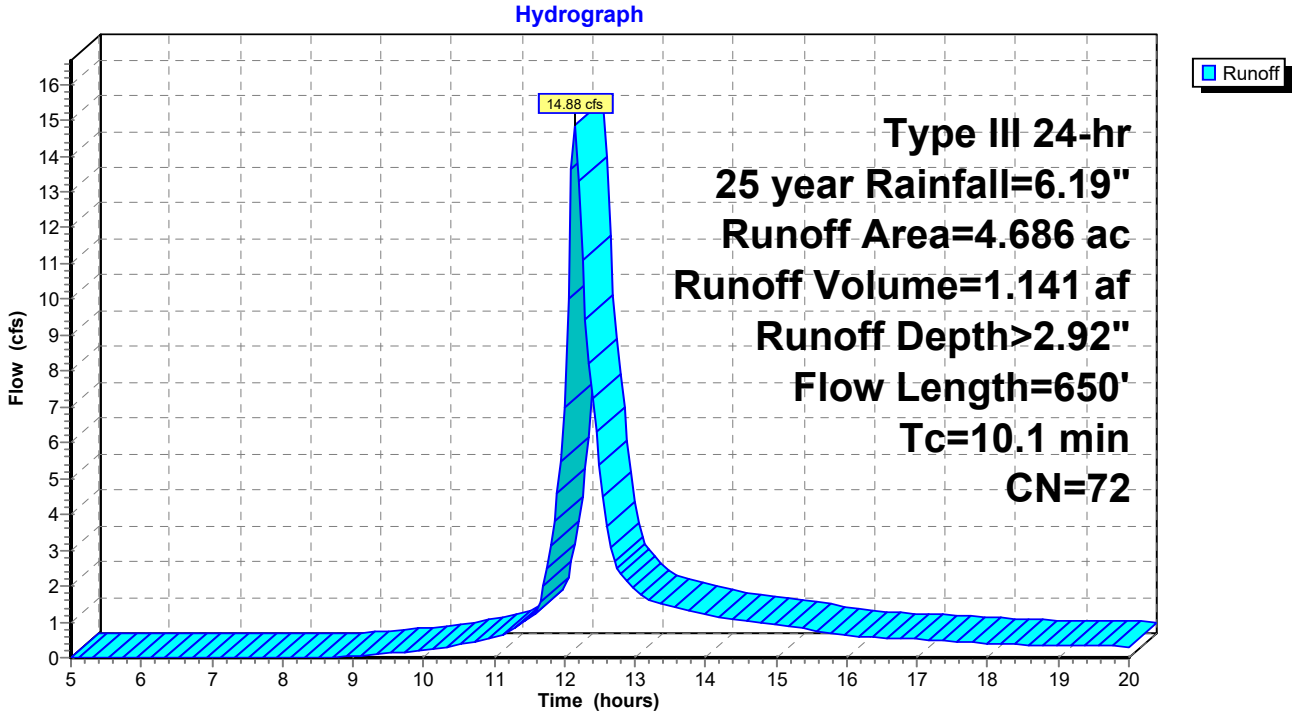
Runoff = 14.88 cfs @ 12.15 hrs, Volume= 1.141 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

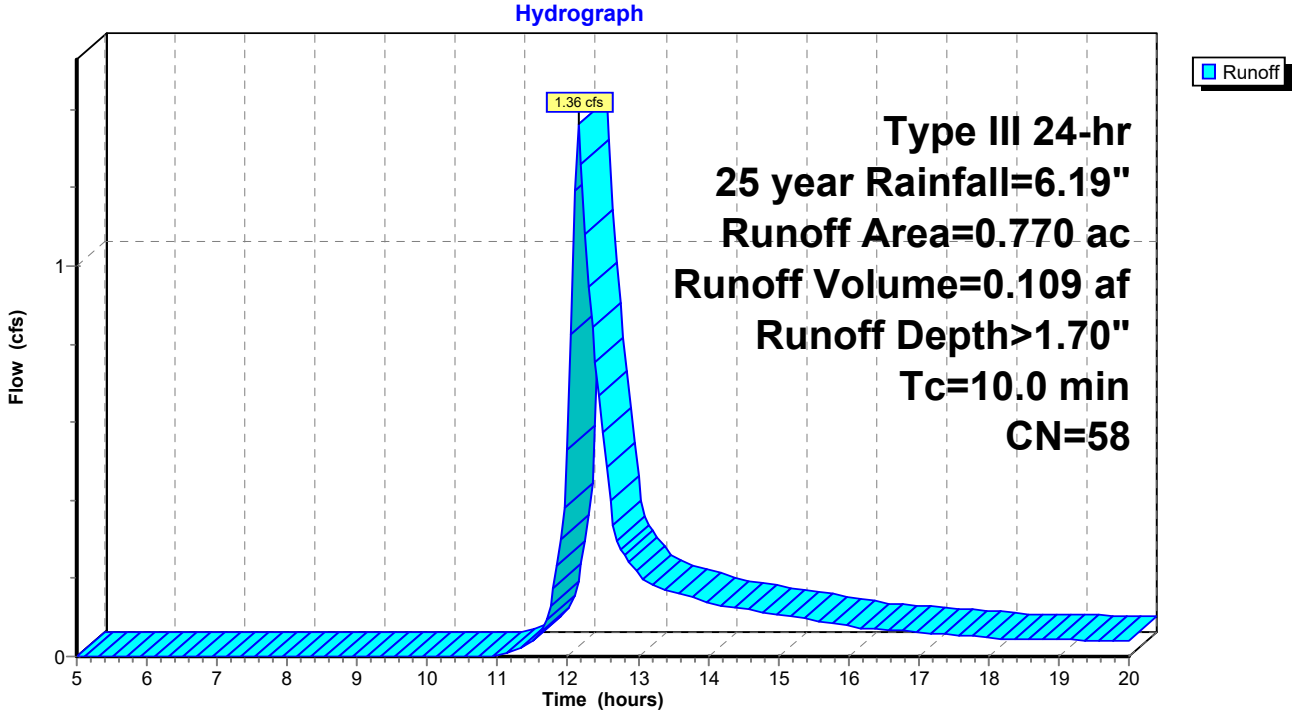
Runoff = 1.36 cfs @ 12.16 hrs, Volume= 0.109 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

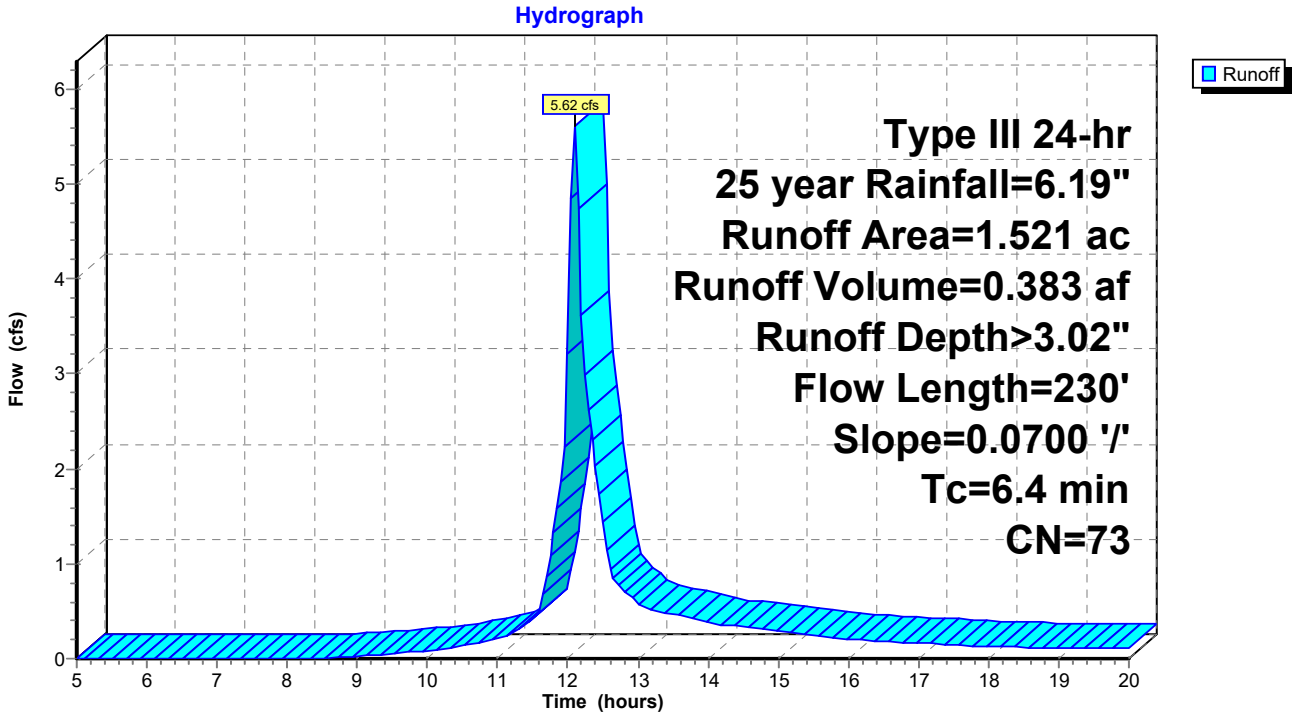
Runoff = 5.62 cfs @ 12.10 hrs, Volume= 0.383 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

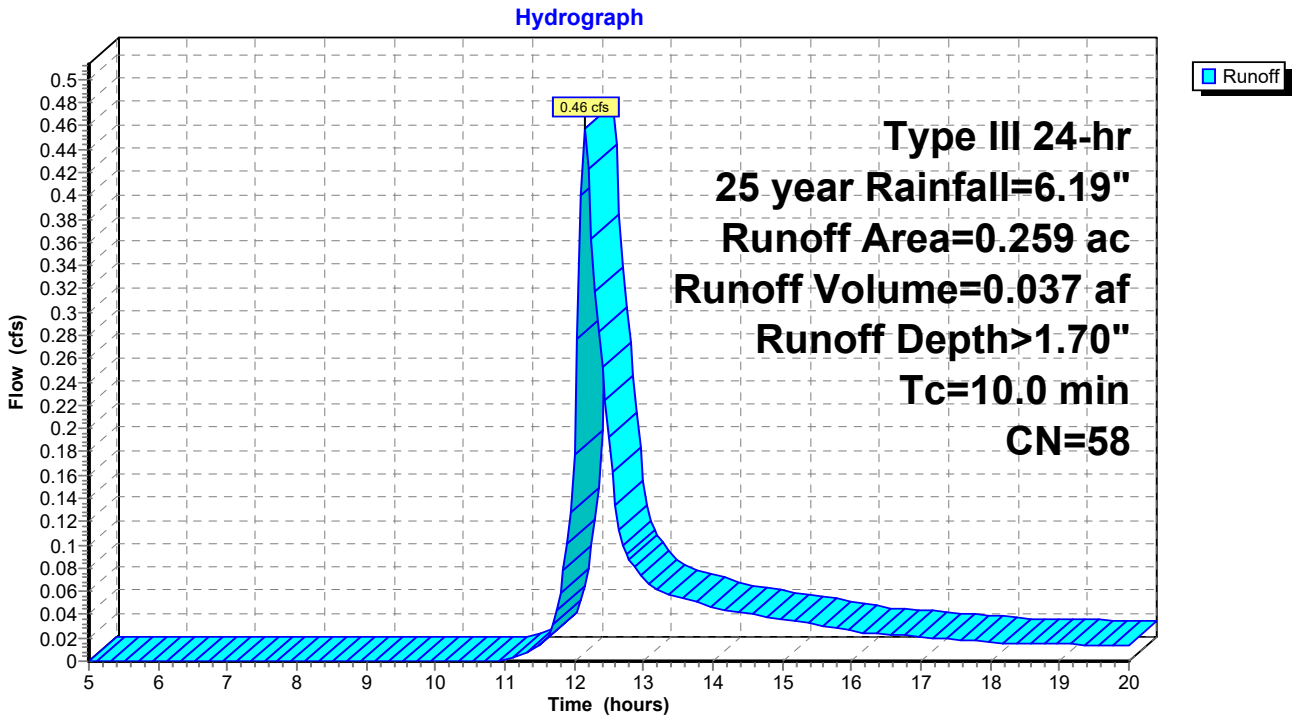
Runoff = 0.46 cfs @ 12.16 hrs, Volume= 0.037 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

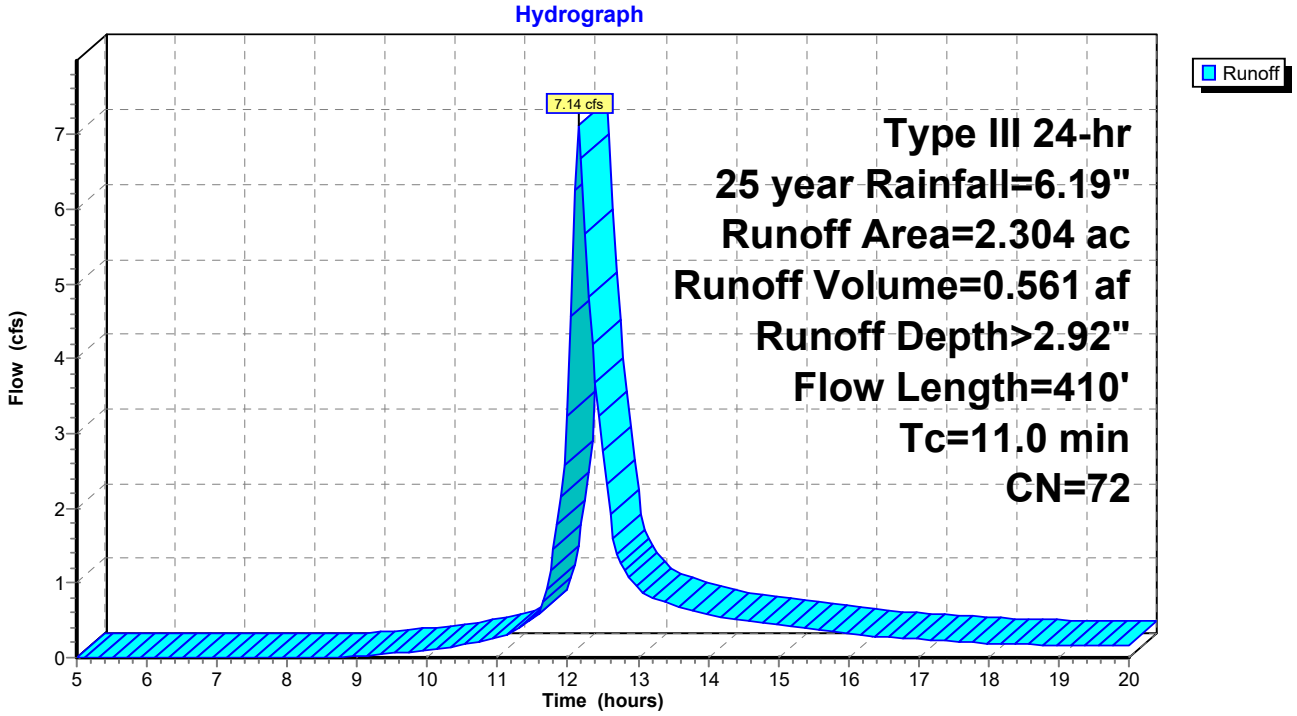
Runoff = 7.14 cfs @ 12.16 hrs, Volume= 0.561 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

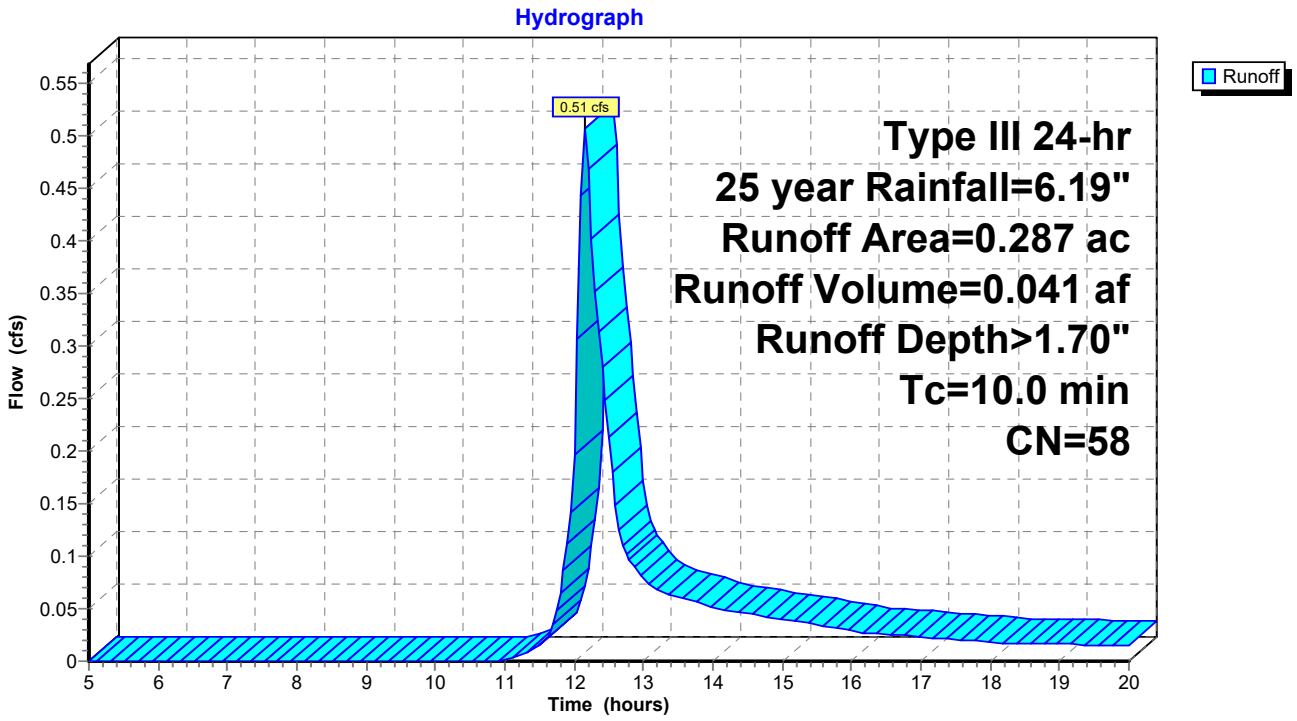
Runoff = 0.51 cfs @ 12.16 hrs, Volume= 0.041 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

[49] Hint: Tc<2dt may require smaller dt

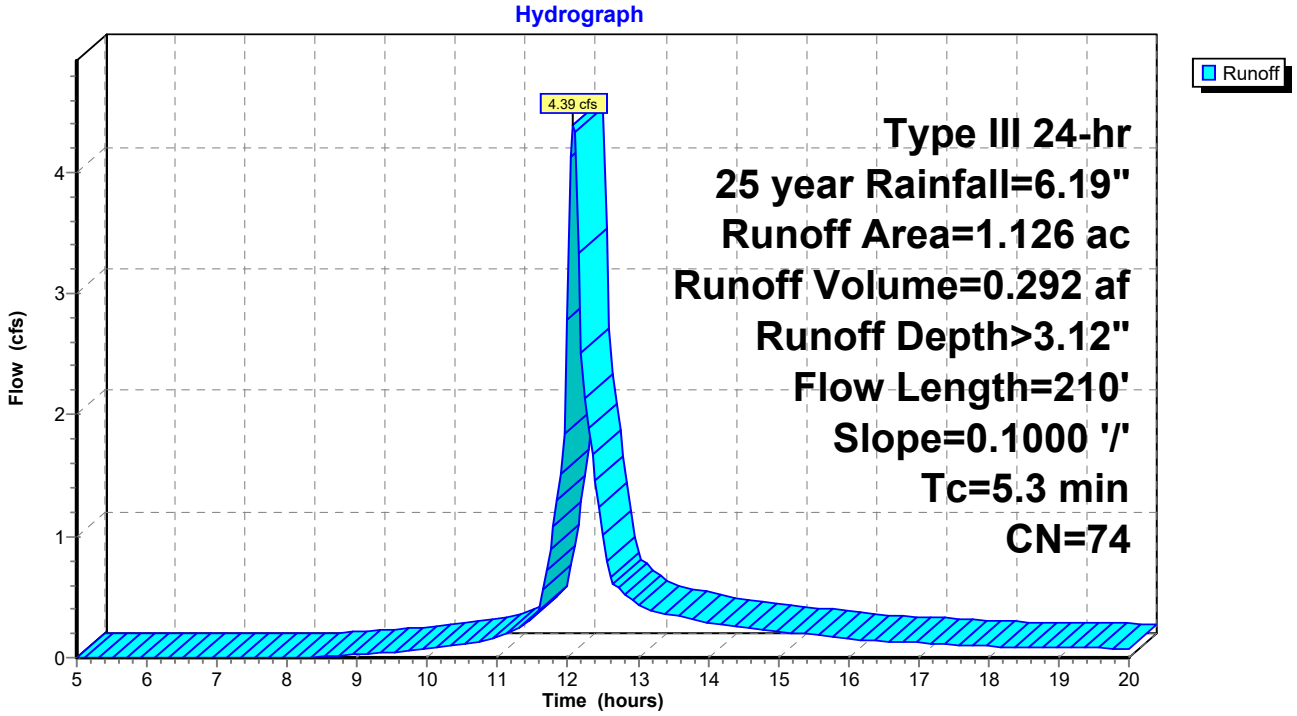
Runoff = 4.39 cfs @ 12.08 hrs, Volume= 0.292 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

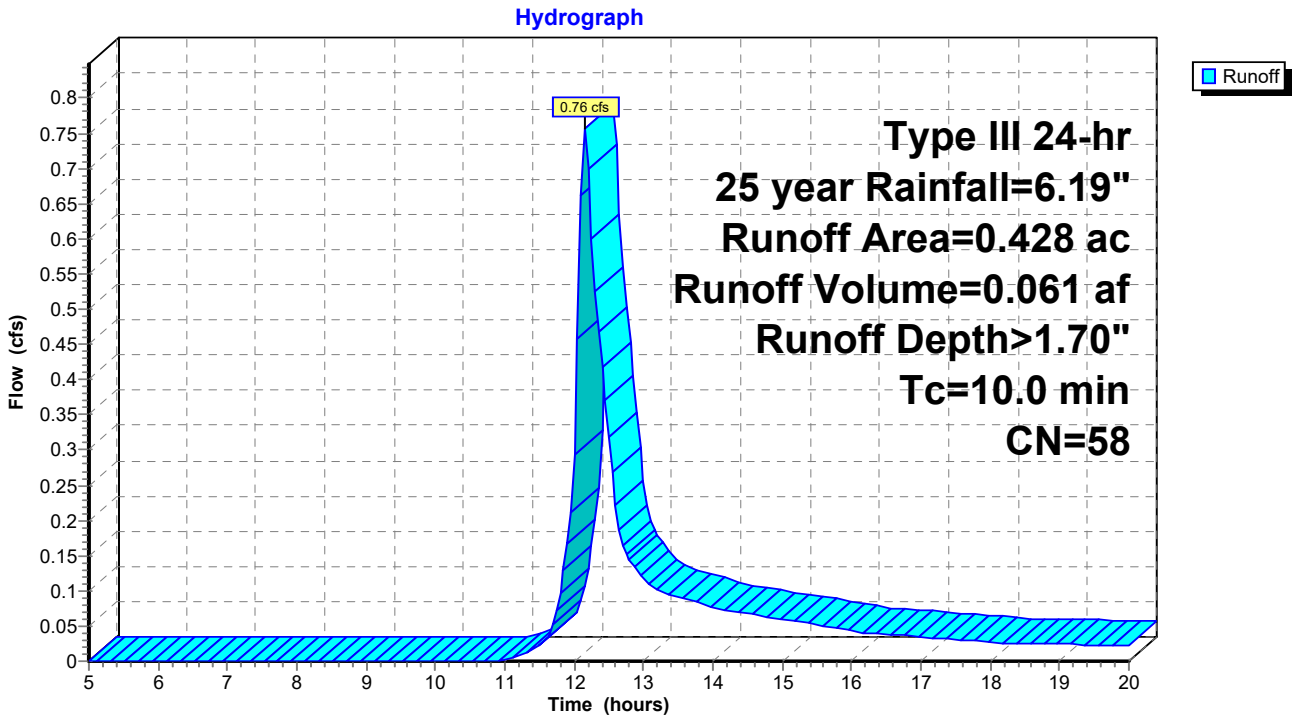
Runoff = 0.76 cfs @ 12.16 hrs, Volume= 0.061 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

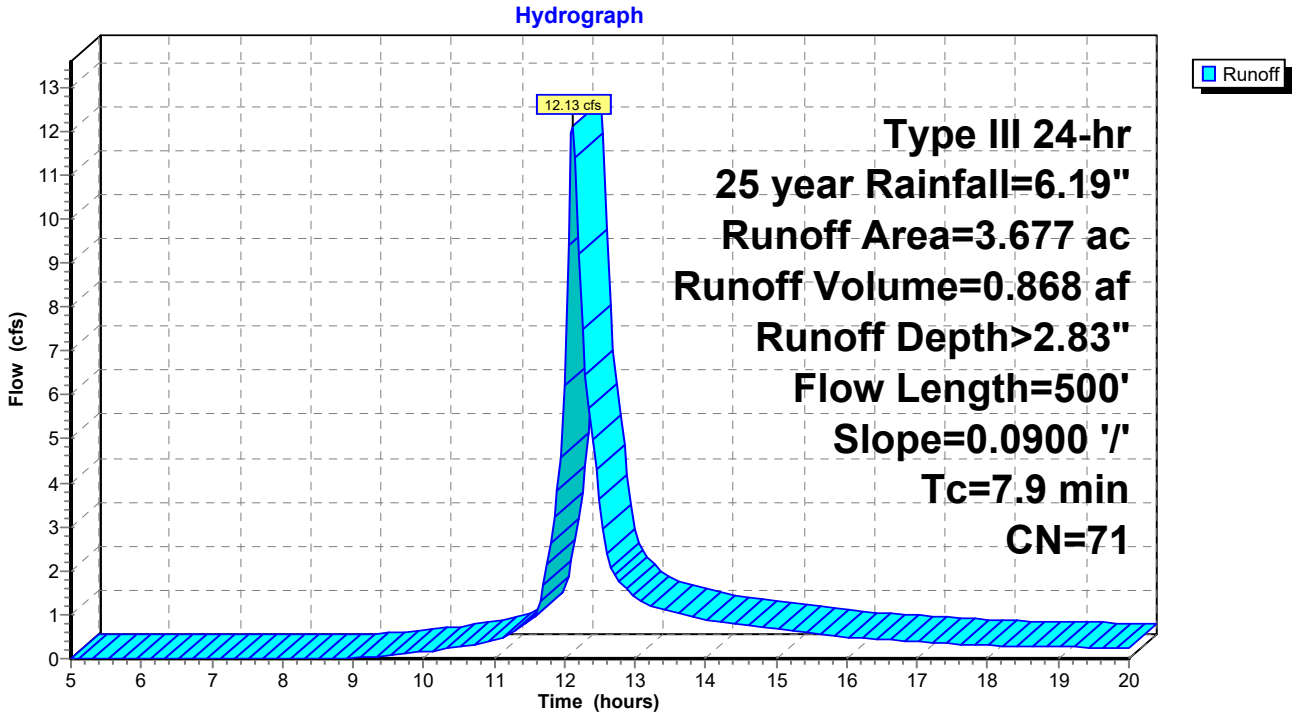
Runoff = 12.13 cfs @ 12.12 hrs, Volume= 0.868 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

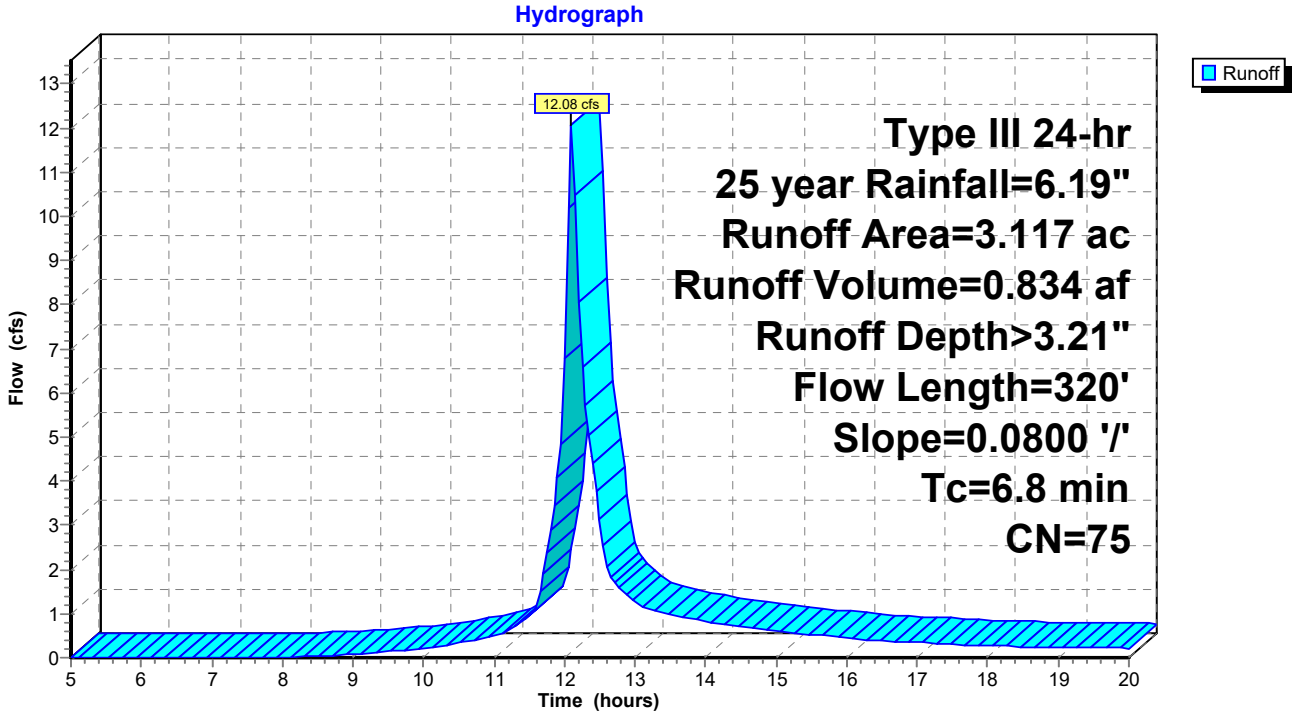
Runoff = 12.08 cfs @ 12.10 hrs, Volume= 0.834 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

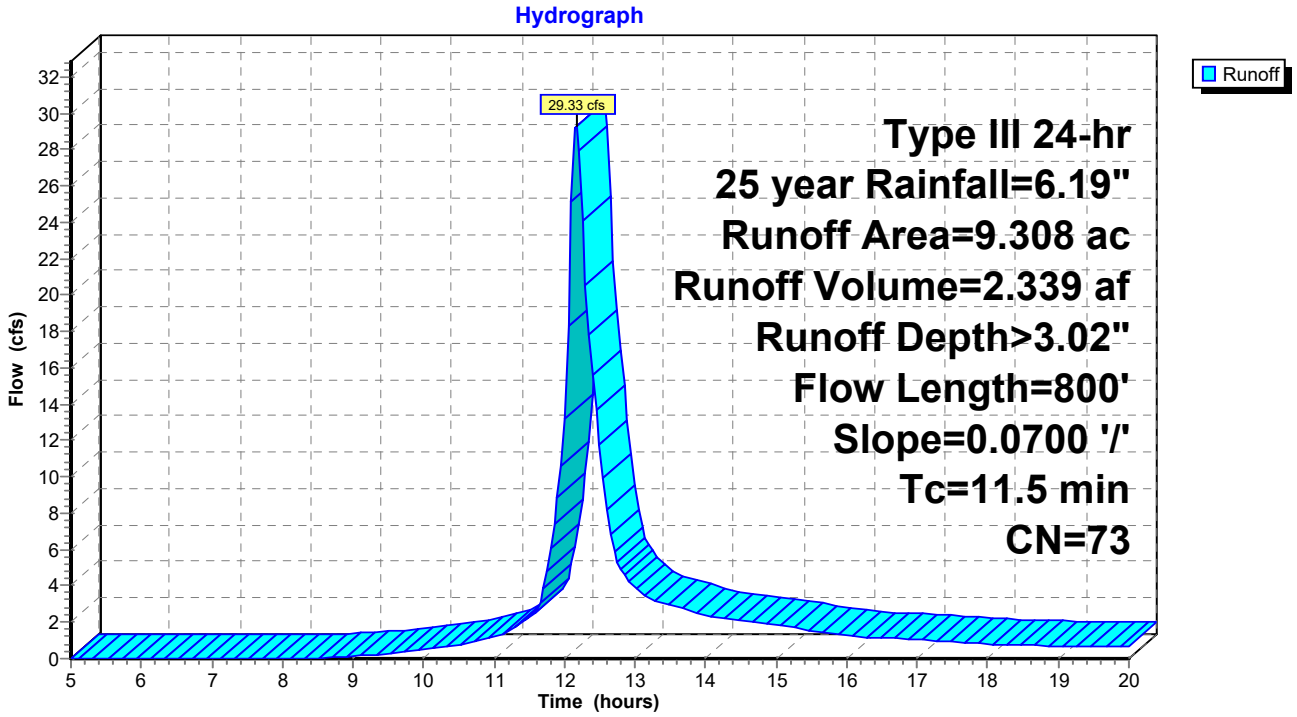
Runoff = 29.33 cfs @ 12.16 hrs, Volume= 2.339 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

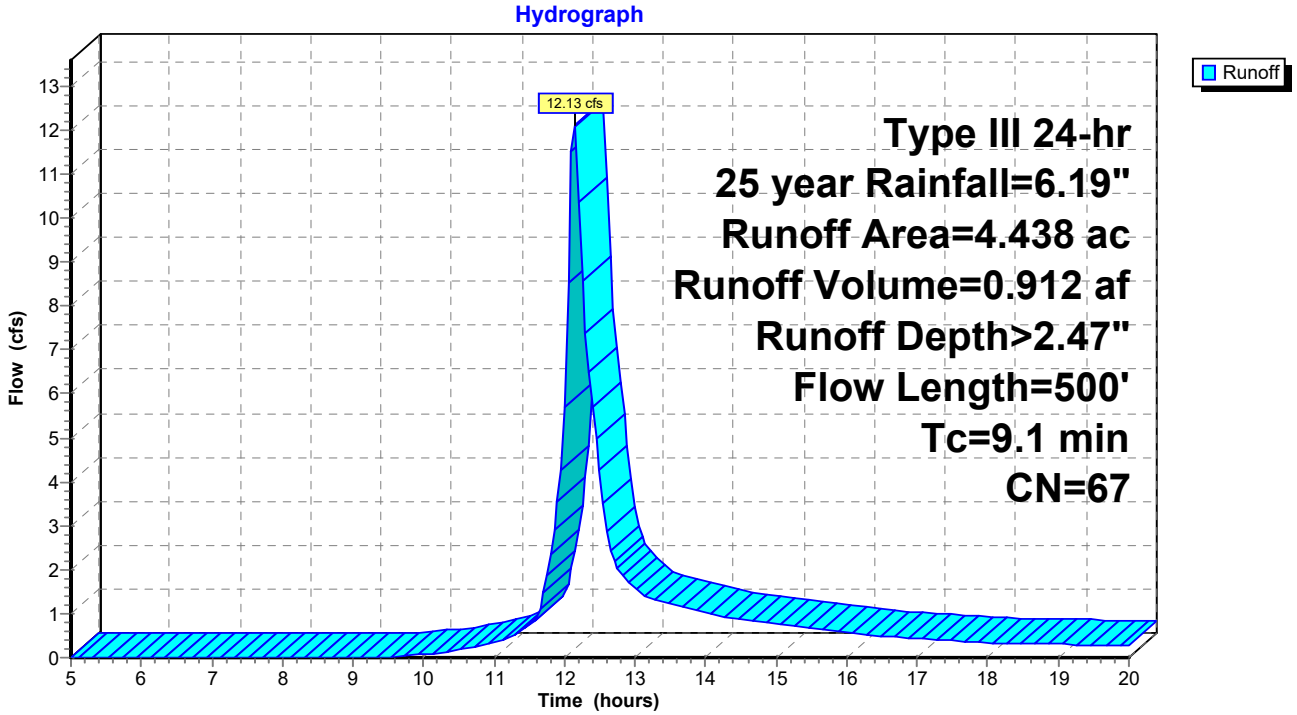
Runoff = 12.13 cfs @ 12.14 hrs, Volume= 0.912 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

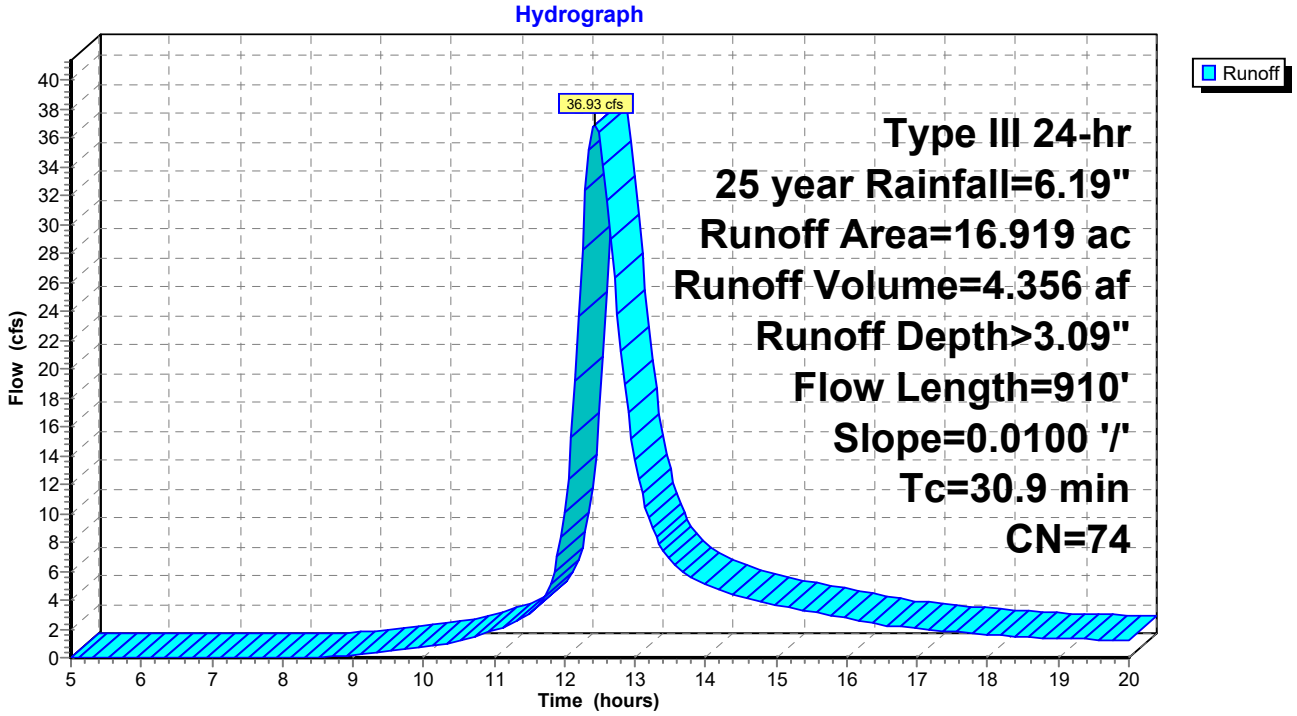
Runoff = 36.93 cfs @ 12.43 hrs, Volume= 4.356 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

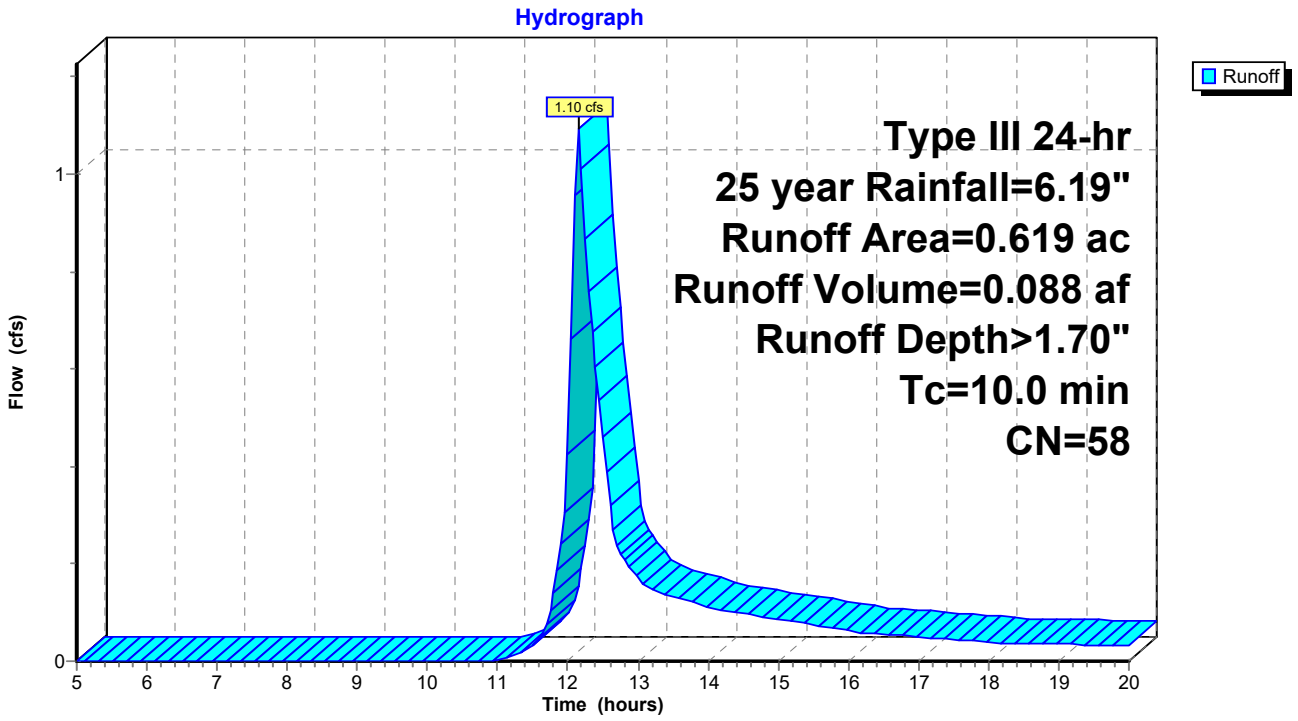
Runoff = 1.10 cfs @ 12.16 hrs, Volume= 0.088 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.19"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.19'
[55] Hint: Peak inflow is 474% of Manning's capacity
[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.29'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 2.28" for 25 year event
Inflow = 4.52 cfs @ 12.39 hrs, Volume= 0.592 af
Outflow = 4.44 cfs @ 12.51 hrs, Volume= 0.589 af, Atten= 2%, Lag= 7.0 min

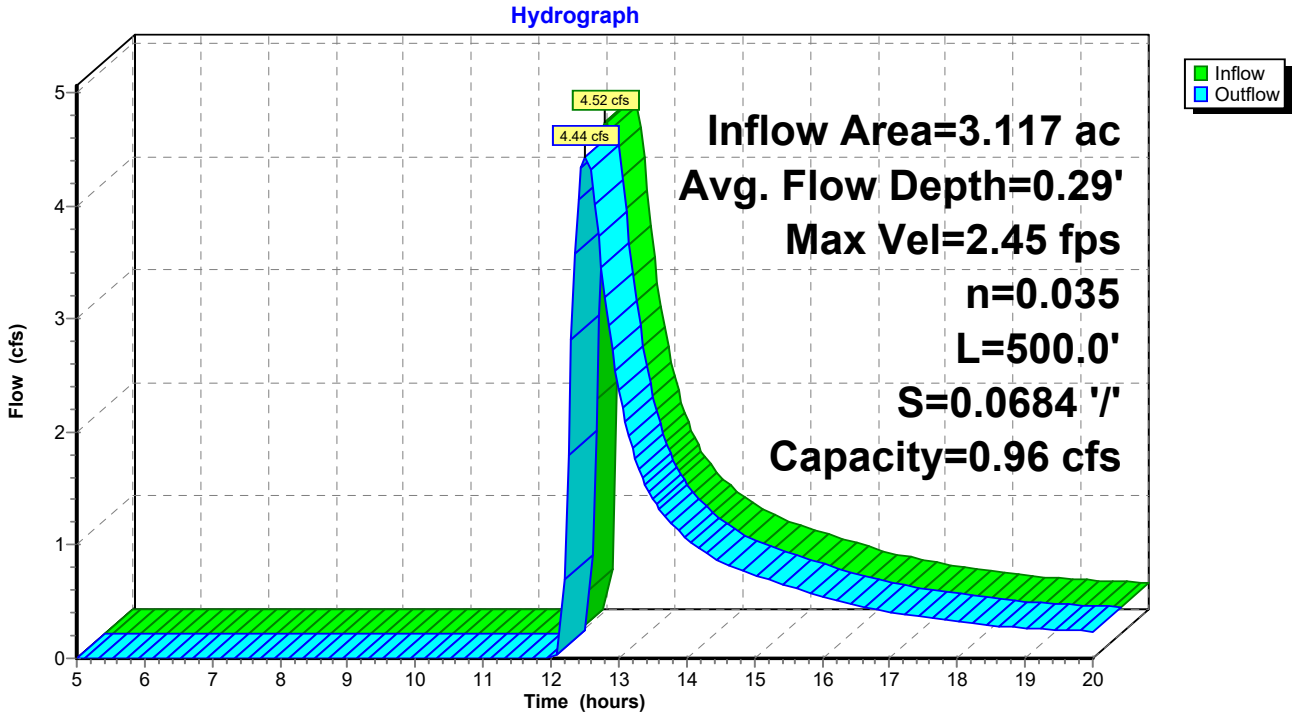
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 4.9 min

Peak Storage= 906 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 2.74" for 25 year event
Inflow = 9.55 cfs @ 12.12 hrs, Volume= 0.686 af
Outflow = 4.80 cfs @ 12.33 hrs, Volume= 0.549 af, Atten= 50%, Lag= 12.9 min
Primary = 4.80 cfs @ 12.33 hrs, Volume= 0.549 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 193.93' @ 12.33 hrs Surf.Area= 5,761 sf Storage= 15,624 cf (10,301 cf above start)

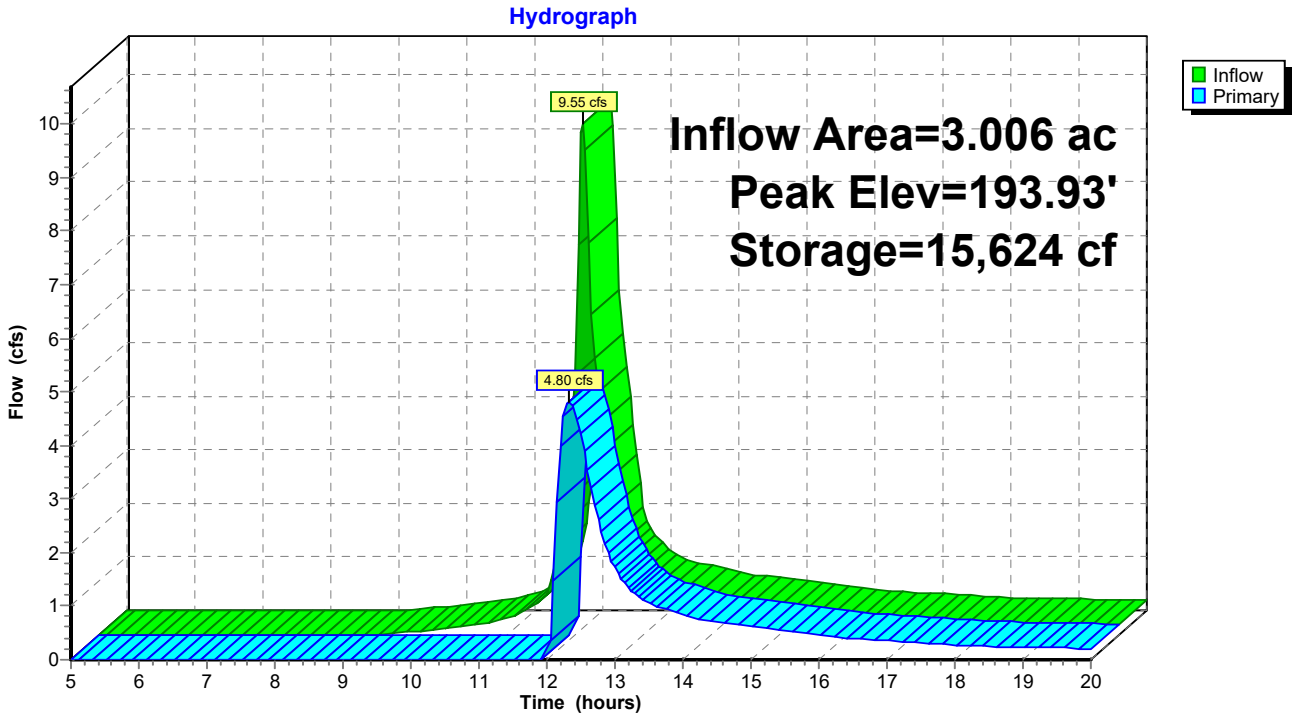
Plug-Flow detention time= 148.5 min calculated for 0.427 af (62% of inflow)
Center-of-Mass det. time= 42.0 min (842.5 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.78 cfs @ 12.33 hrs HW=193.93' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 4.78 cfs @ 2.58 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area =	2.551 ac,	0.00% Impervious,	Inflow Depth >	2.92"	for 25 year event
Inflow =	7.58 cfs @	12.17 hrs,	Volume=	0.621 af	
Outflow =	2.75 cfs @	12.56 hrs,	Volume=	0.422 af,	Atten= 64%, Lag= 23.2 min
Discarded =	0.37 cfs @	12.56 hrs,	Volume=	0.248 af	
Primary =	2.38 cfs @	12.56 hrs,	Volume=	0.174 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 231.38' @ 12.56 hrs Surf.Area= 4,720 sf Storage= 11,717 cf

Plug-Flow detention time= 142.9 min calculated for 0.420 af (68% of inflow)
Center-of-Mass det. time= 74.3 min (874.7 - 800.3)

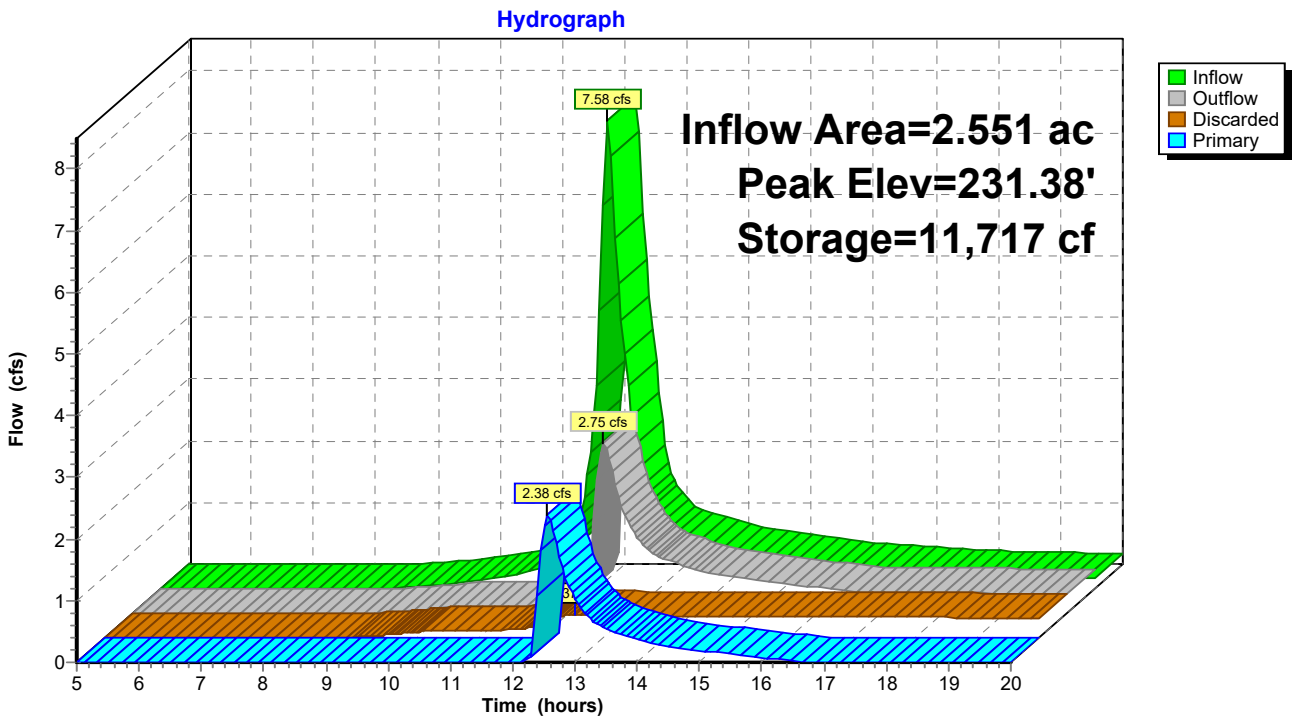
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.37 cfs @ 12.56 hrs HW=231.38' (Free Discharge)
└**2=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=2.35 cfs @ 12.56 hrs HW=231.38' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.35 cfs @ 1.55 fps)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25 year event
Inflow = 7.73 cfs @ 12.18 hrs, Volume= 0.640 af
Outflow = 3.40 cfs @ 12.50 hrs, Volume= 0.492 af, Atten= 56%, Lag= 19.5 min
Primary = 3.40 cfs @ 12.50 hrs, Volume= 0.492 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.67' @ 12.50 hrs Surf.Area= 5,383 sf Storage= 11,360 cf

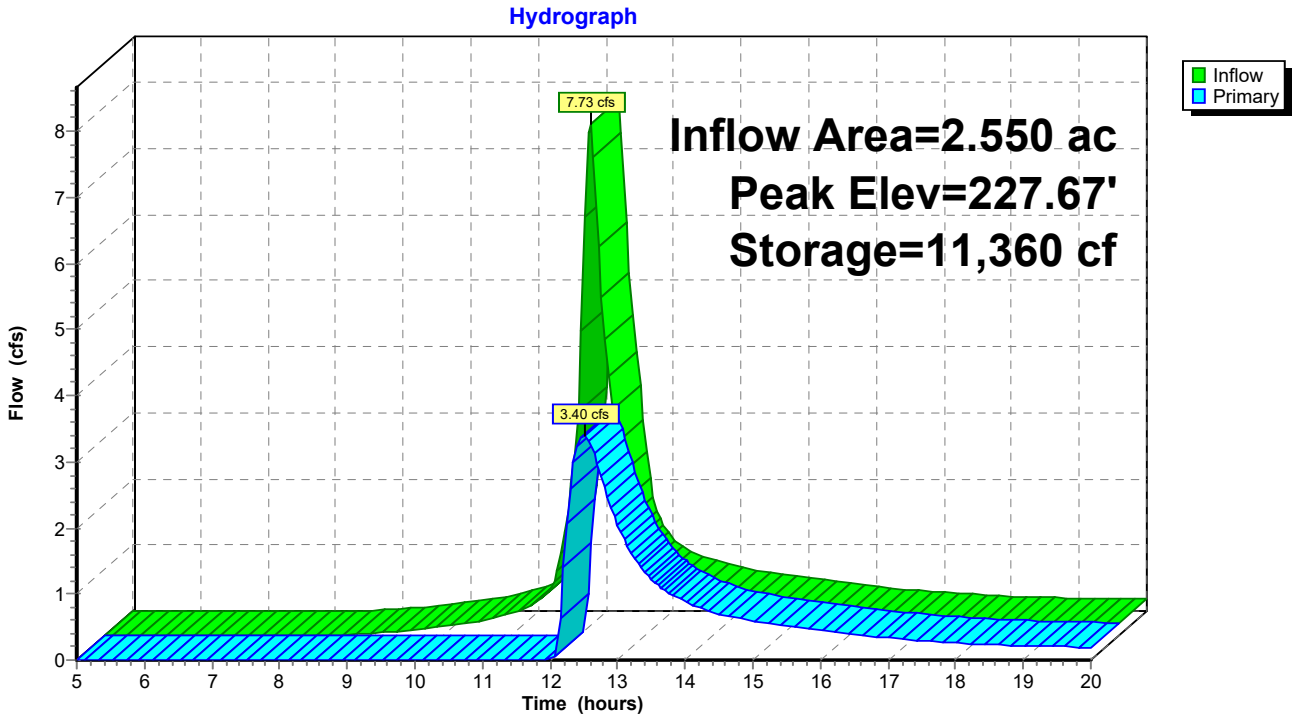
Plug-Flow detention time= 112.2 min calculated for 0.492 af (77% of inflow)
Center-of-Mass det. time= 54.5 min (853.1 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.39 cfs @ 12.50 hrs HW=227.67' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 2.89 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25 year event
Inflow = 16.27 cfs @ 12.23 hrs, Volume= 1.473 af
Outflow = 5.72 cfs @ 12.66 hrs, Volume= 0.857 af, Atten= 65%, Lag= 26.0 min
Primary = 5.72 cfs @ 12.66 hrs, Volume= 0.857 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 188.43' @ 12.66 hrs Surf.Area= 14,884 sf Storage= 52,343 cf (31,907 cf above start)

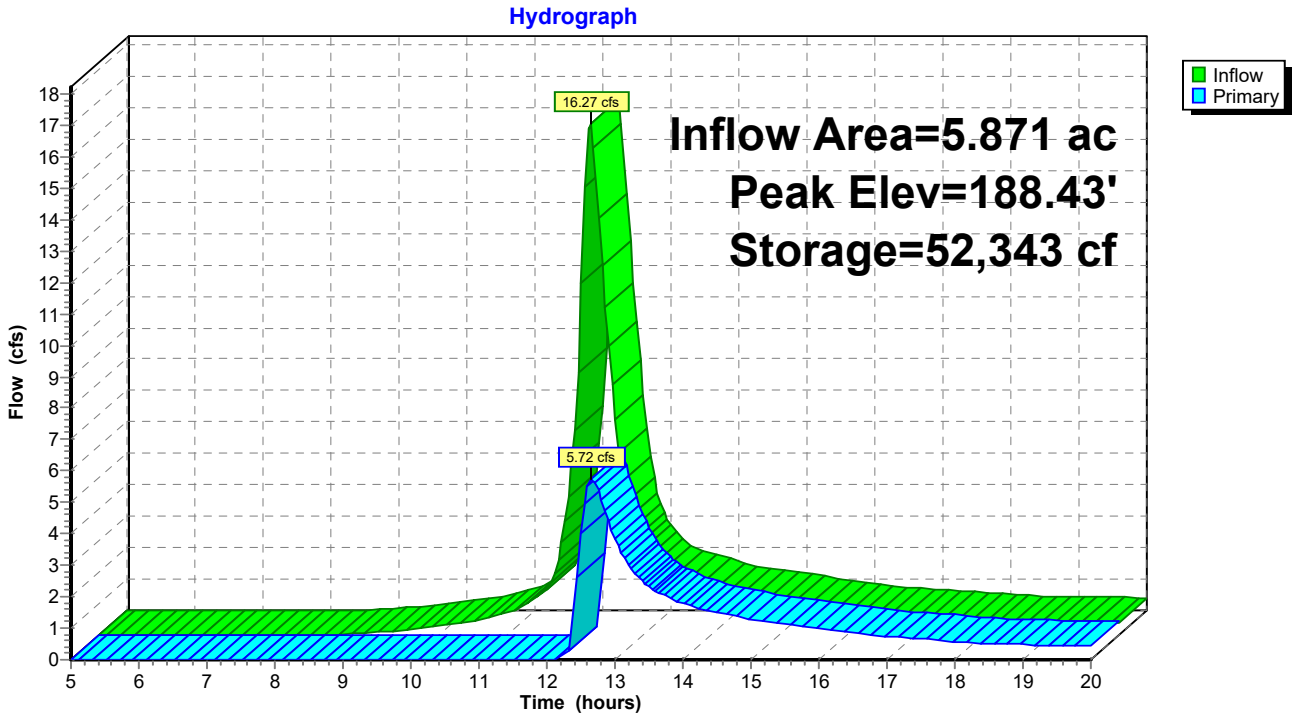
Plug-Flow detention time= 287.4 min calculated for 0.388 af (26% of inflow)
Center-of-Mass det. time= 77.0 min (878.4 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.69 cfs @ 12.66 hrs HW=188.43' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.69 cfs @ 1.67 fps)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 2.55" for 25 year event
Inflow = 7.24 cfs @ 12.15 hrs, Volume= 0.561 af
Outflow = 2.75 cfs @ 12.51 hrs, Volume= 0.380 af, Atten= 62%, Lag= 21.2 min
Primary = 2.75 cfs @ 12.51 hrs, Volume= 0.380 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 218.64' @ 12.51 hrs Surf.Area= 4,993 sf Storage= 10,437 cf

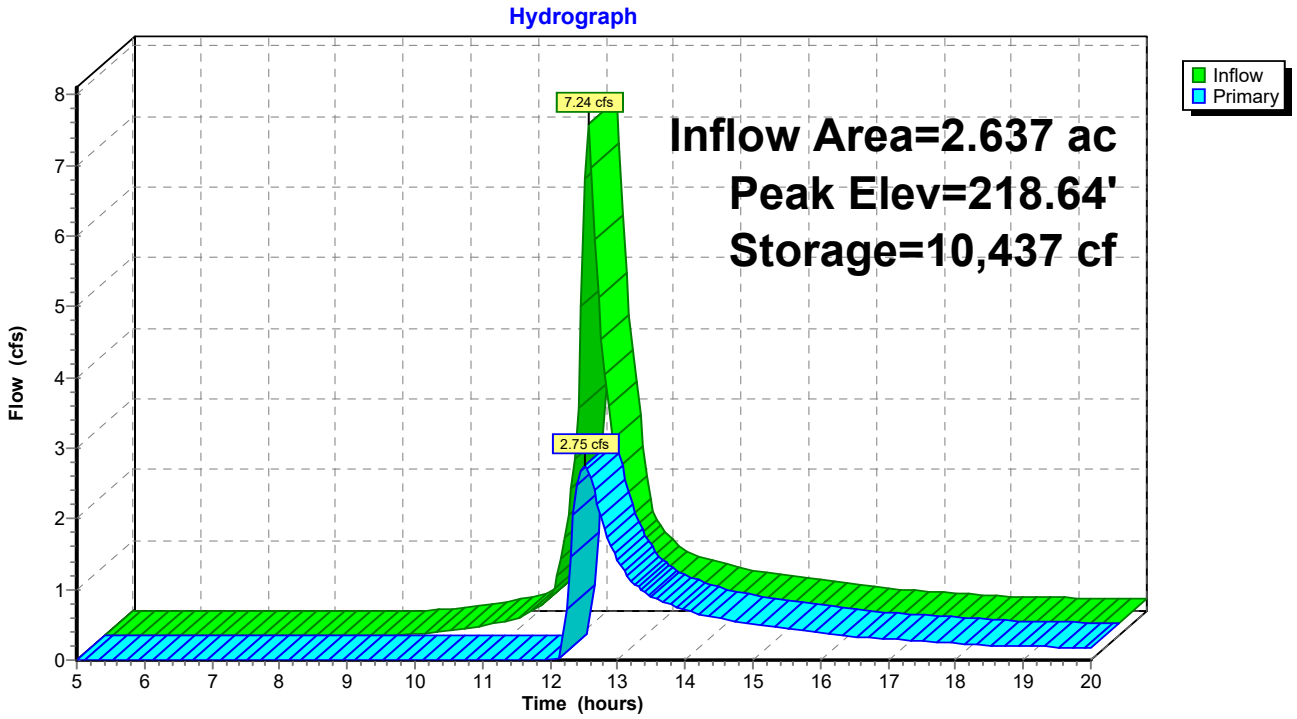
Plug-Flow detention time= 130.9 min calculated for 0.380 af (68% of inflow)
Center-of-Mass det. time= 60.2 min (866.2 - 806.0)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.74 cfs @ 12.51 hrs HW=218.64' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.74 cfs @ 2.15 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25 year event
Inflow = 11.18 cfs @ 12.12 hrs, Volume= 0.805 af
Outflow = 5.36 cfs @ 12.35 hrs, Volume= 0.580 af, Atten= 52%, Lag= 13.8 min
Primary = 5.36 cfs @ 12.35 hrs, Volume= 0.580 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 209.76' @ 12.35 hrs Surf.Area= 6,174 sf Storage= 20,009 cf (13,713 cf above start)

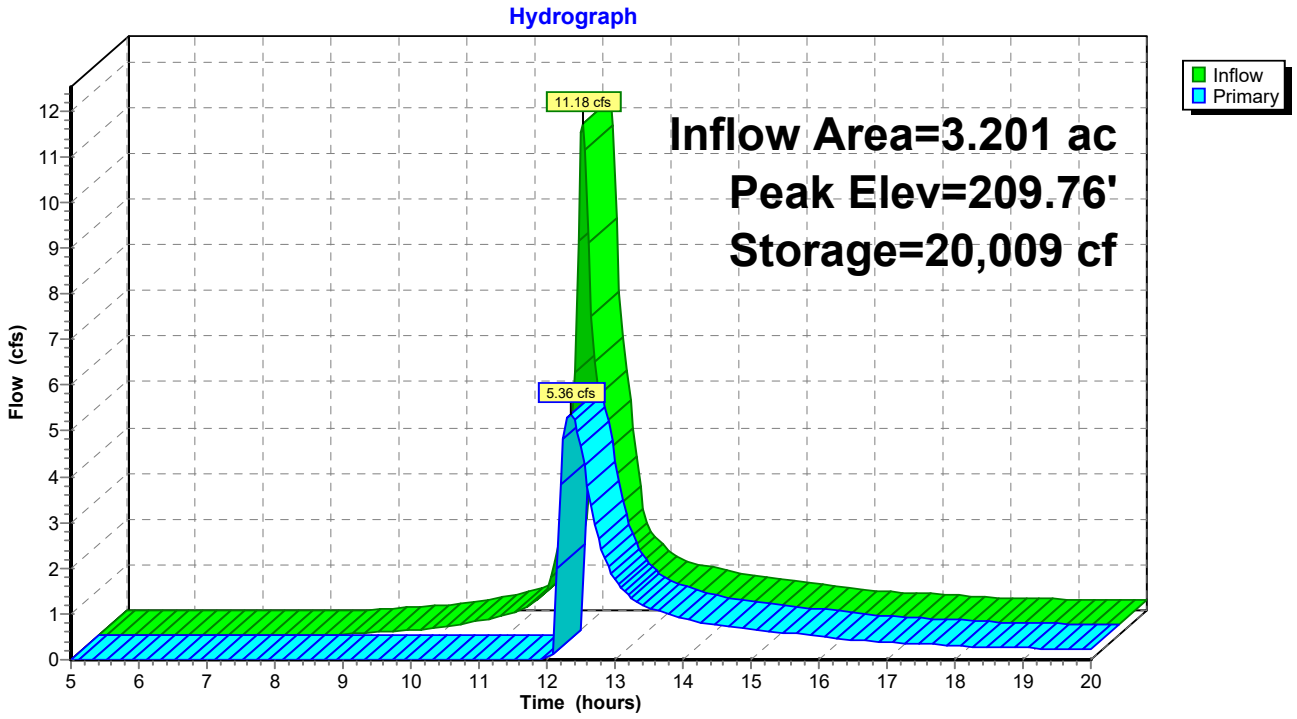
Plug-Flow detention time= 167.3 min calculated for 0.435 af (54% of inflow)
Center-of-Mass det. time= 51.3 min (846.3 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.36 cfs @ 12.35 hrs HW=209.76' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 5.36 cfs @ 2.34 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area =	1.170 ac,	0.00% Impervious,	Inflow Depth >	2.74"	for 25 year event
Inflow =	3.98 cfs @	12.09 hrs,	Volume=	0.267 af	
Outflow =	0.99 cfs @	12.51 hrs,	Volume=	0.202 af,	Atten= 75%, Lag= 24.8 min
Discarded =	0.24 cfs @	12.51 hrs,	Volume=	0.155 af	
Primary =	0.75 cfs @	12.51 hrs,	Volume=	0.048 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.29' @ 12.51 hrs Surf.Area= 2,372 sf Storage= 4,998 cf

Plug-Flow detention time= 153.1 min calculated for 0.202 af (76% of inflow)
Center-of-Mass det. time= 92.4 min (891.2 - 798.8)

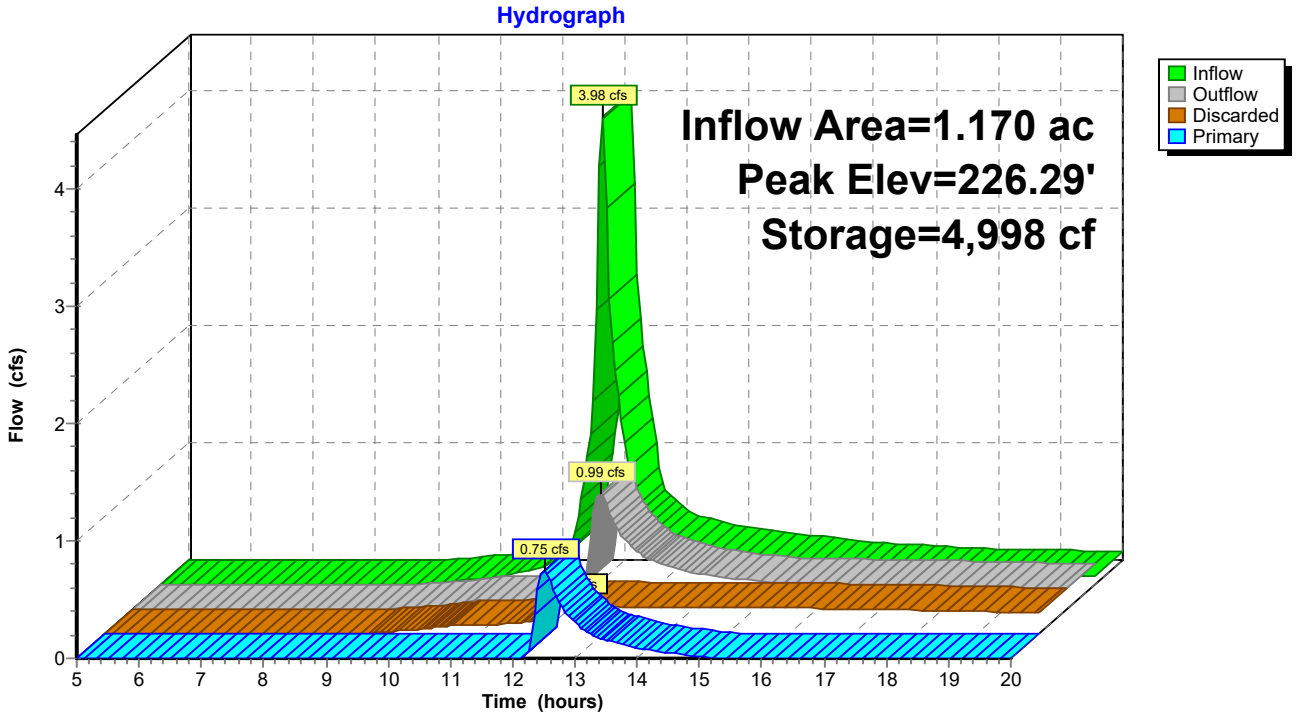
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.24 cfs @ 12.51 hrs HW=226.29' (Free Discharge)
└**2=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.75 cfs @ 12.51 hrs HW=226.29' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.75 cfs @ 1.31 fps)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 2.92" for 25 year event
Inflow = 14.88 cfs @ 12.15 hrs, Volume= 1.141 af
Outflow = 6.77 cfs @ 12.42 hrs, Volume= 0.914 af, Atten= 54%, Lag= 16.7 min
Primary = 6.77 cfs @ 12.42 hrs, Volume= 0.914 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 189.93' @ 12.42 hrs Surf.Area= 7,942 sf Storage= 18,785 cf

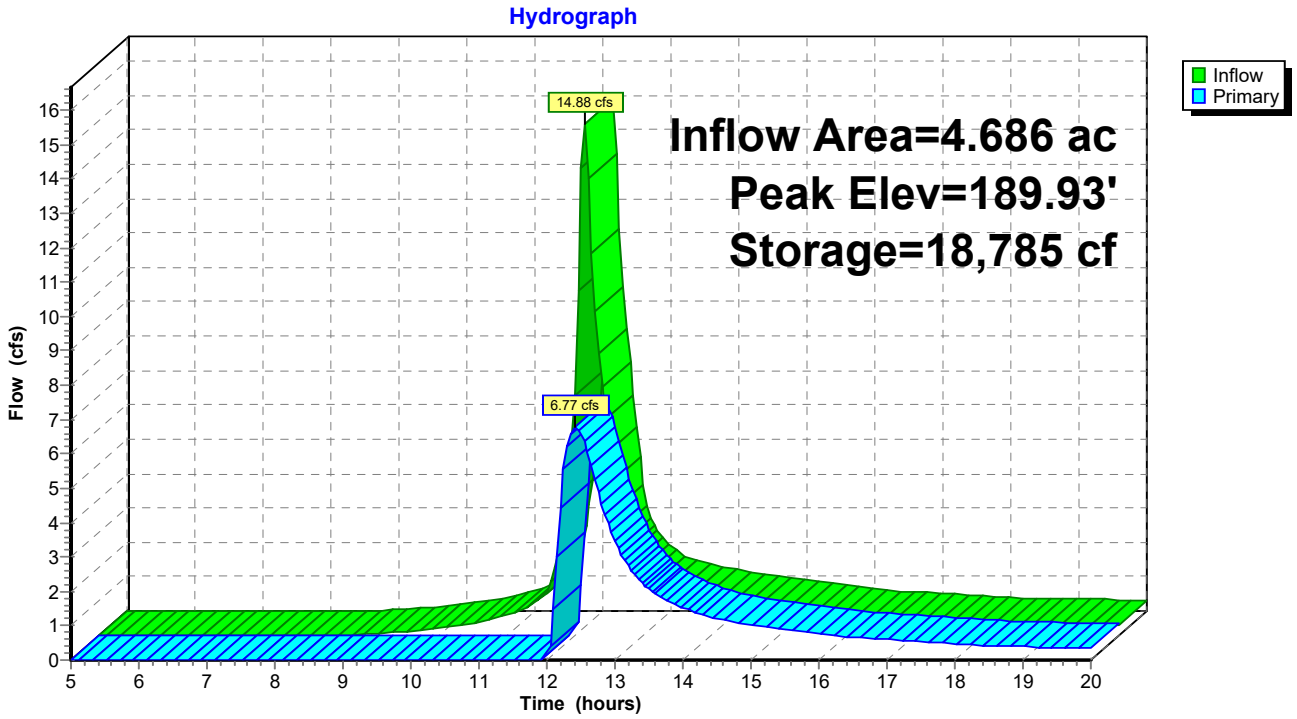
Plug-Flow detention time= 100.0 min calculated for 0.911 af (80% of inflow)
Center-of-Mass det. time= 48.0 min (846.5 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.75 cfs @ 12.42 hrs HW=189.92' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.75 cfs @ 3.16 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25 year event
Inflow = 5.62 cfs @ 12.10 hrs, Volume= 0.383 af
Outflow = 1.35 cfs @ 12.52 hrs, Volume= 0.221 af, Atten= 76%, Lag= 25.2 min
Primary = 1.35 cfs @ 12.52 hrs, Volume= 0.221 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 190.41' @ 12.52 hrs Surf.Area= 4,450 sf Storage= 12,610 cf (8,494 cf above start)

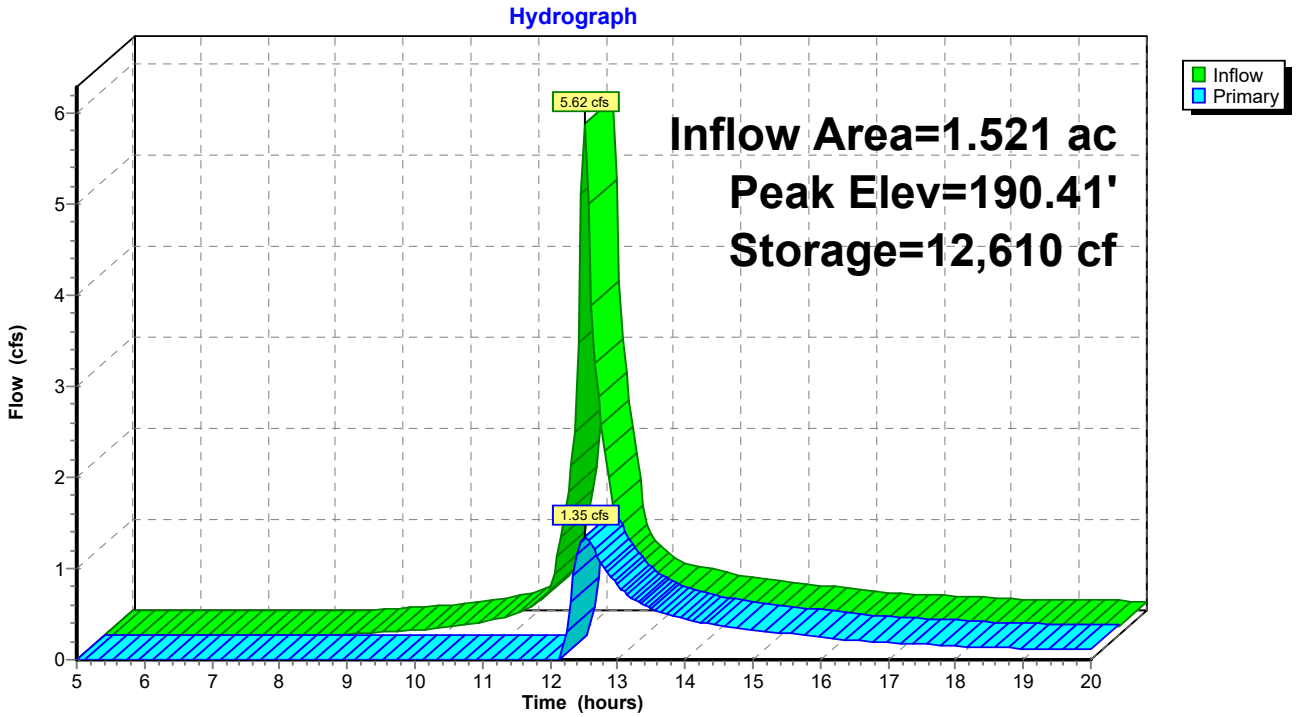
Plug-Flow detention time= 255.1 min calculated for 0.126 af (33% of inflow)
Center-of-Mass det. time= 81.1 min (874.8 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.34 cfs @ 12.52 hrs HW=190.41' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.34 cfs @ 1.63 fps)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 2.92" for 25 year event
Inflow = 7.14 cfs @ 12.16 hrs, Volume= 0.561 af
Outflow = 2.34 cfs @ 12.55 hrs, Volume= 0.352 af, Atten= 67%, Lag= 23.7 min
Primary = 2.34 cfs @ 12.55 hrs, Volume= 0.352 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.08' @ 12.55 hrs Surf.Area= 5,594 sf Storage= 11,612 cf

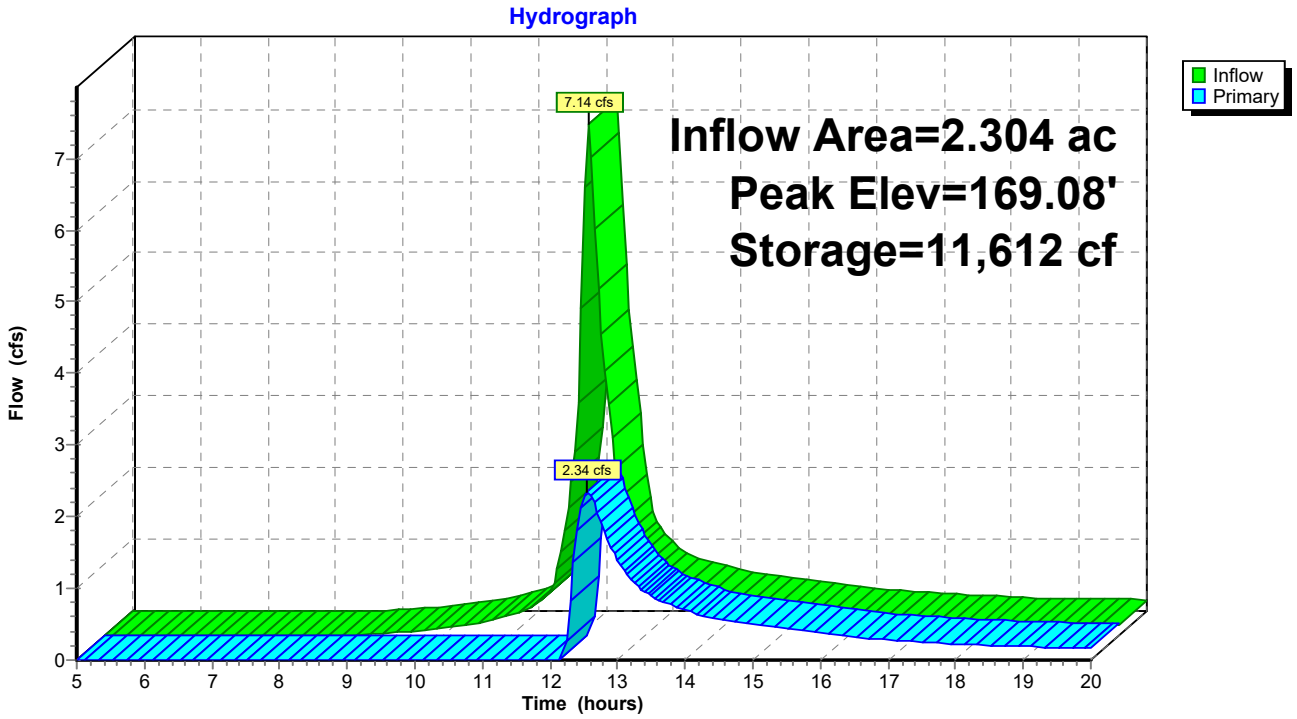
Plug-Flow detention time= 144.4 min calculated for 0.351 af (63% of inflow)
Center-of-Mass det. time= 71.3 min (870.6 - 799.2)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.34 cfs @ 12.55 hrs HW=169.08' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.34 cfs @ 2.03 fps)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 3.12" for 25 year event
Inflow = 4.39 cfs @ 12.08 hrs, Volume= 0.292 af
Outflow = 0.57 cfs @ 12.73 hrs, Volume= 0.139 af, Atten= 87%, Lag= 39.0 min
Primary = 0.57 cfs @ 12.73 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 152.24' @ 12.73 hrs Surf.Area= 3,657 sf Storage= 9,362 cf (7,319 cf above start)

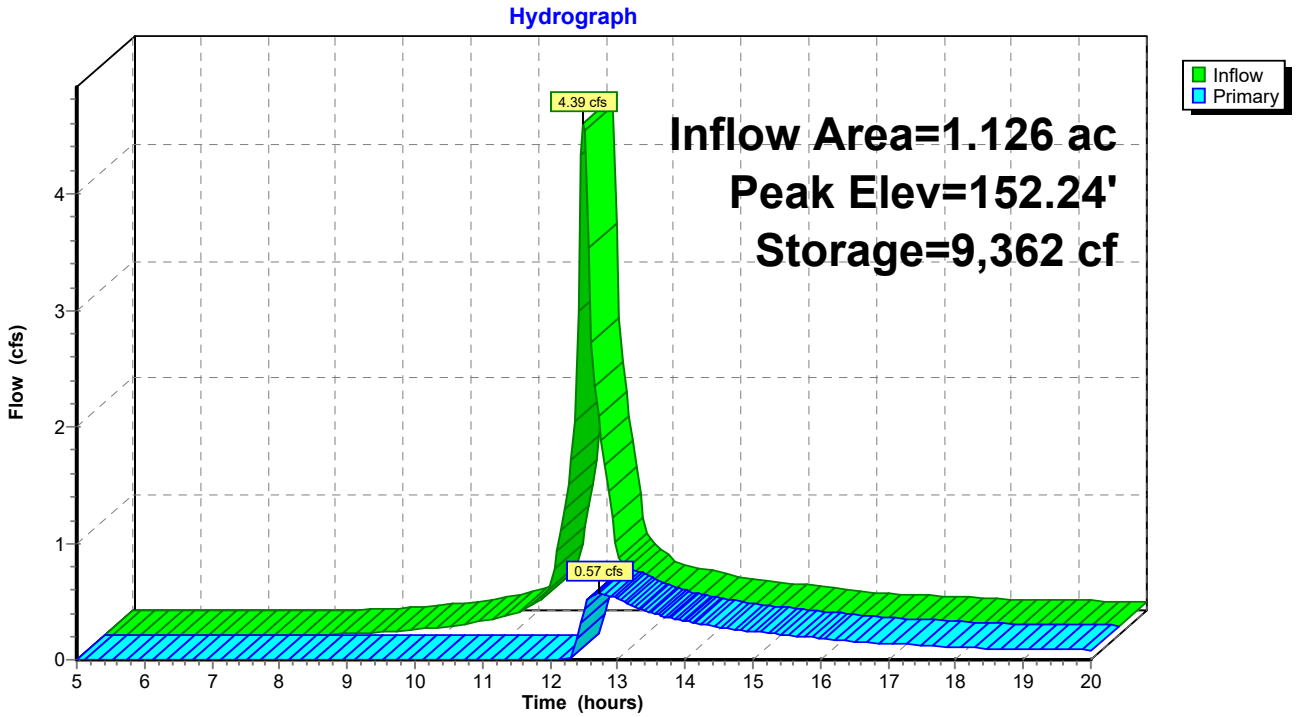
Plug-Flow detention time= 262.2 min calculated for 0.092 af (31% of inflow)
Center-of-Mass det. time= 105.3 min (896.3 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.57 cfs @ 12.73 hrs HW=152.24' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.57 cfs @ 1.18 fps)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 2.83" for 25 year event
Inflow = 12.13 cfs @ 12.12 hrs, Volume= 0.868 af
Outflow = 5.33 cfs @ 12.38 hrs, Volume= 0.670 af, Atten= 56%, Lag= 15.7 min
Primary = 5.33 cfs @ 12.38 hrs, Volume= 0.670 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 159.50' @ 12.38 hrs Surf.Area= 7,143 sf Storage= 21,143 cf (14,307 cf above start)

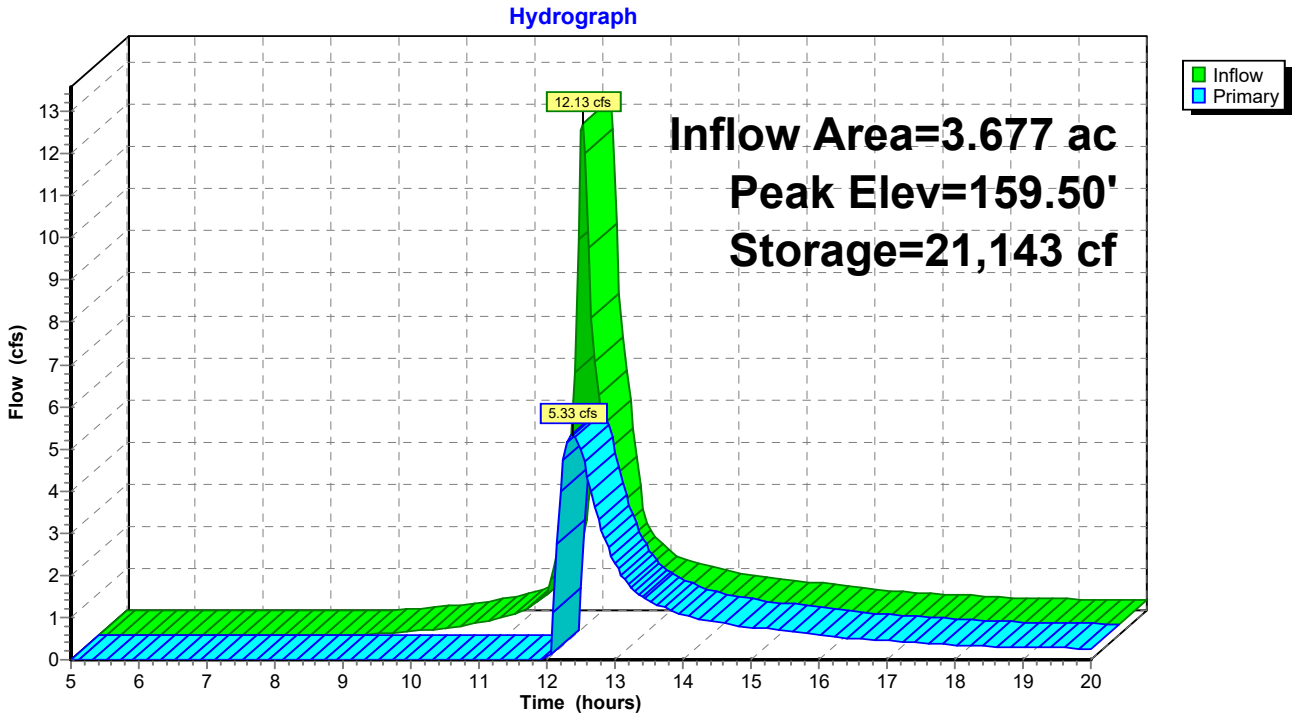
Plug-Flow detention time= 158.4 min calculated for 0.511 af (59% of inflow)
Center-of-Mass det. time= 48.3 min (846.9 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.31 cfs @ 12.38 hrs HW=159.50' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.31 cfs @ 2.67 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 3.21" for 25 year event
Inflow = 12.08 cfs @ 12.10 hrs, Volume= 0.834 af
Outflow = 4.52 cfs @ 12.39 hrs, Volume= 0.592 af, Atten= 63%, Lag= 17.5 min
Primary = 4.52 cfs @ 12.39 hrs, Volume= 0.592 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.57' @ 12.39 hrs Surf.Area= 17,240 sf Storage= 15,737 cf

Plug-Flow detention time= 125.5 min calculated for 0.592 af (71% of inflow)
Center-of-Mass det. time= 59.8 min (850.1 - 790.3)

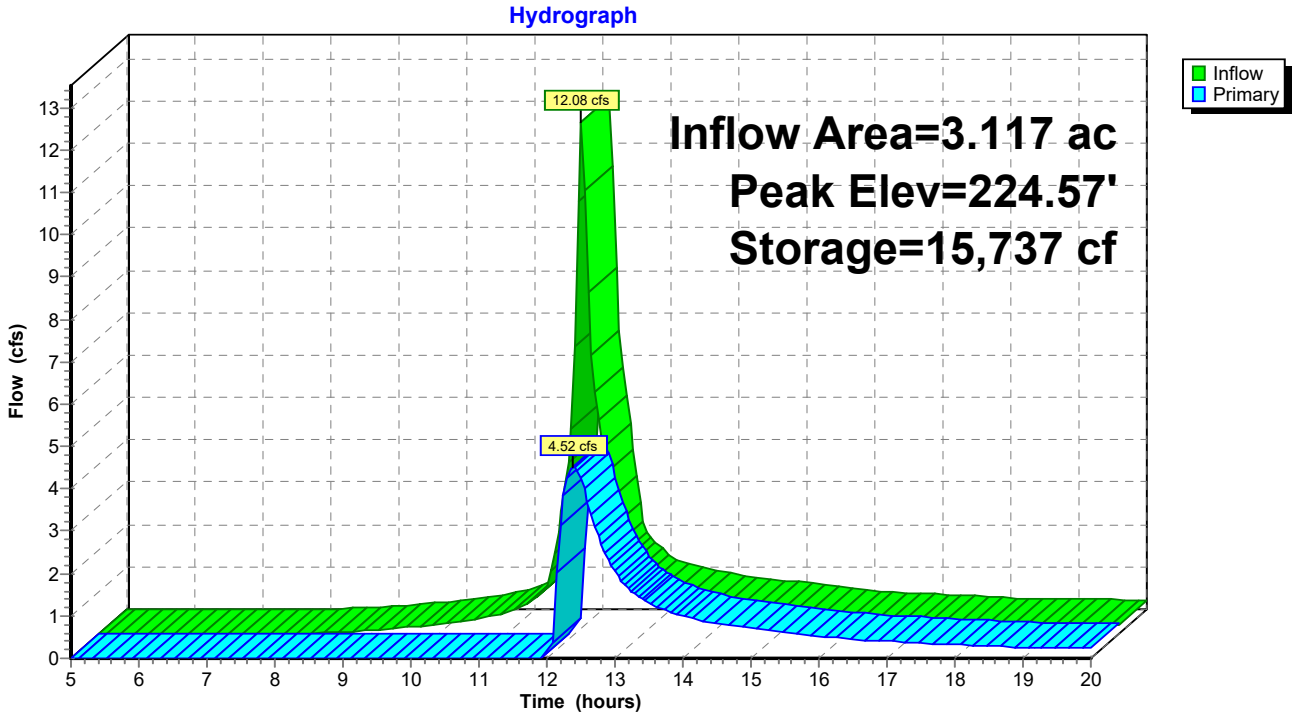
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.51 cfs @ 12.39 hrs HW=224.57' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 4.51 cfs @ 1.51 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area =	12.425 ac,	0.00% Impervious,	Inflow Depth >	2.83"	for 25 year event
Inflow =	29.56 cfs @	12.17 hrs,	Volume=	2.928 af	
Outflow =	3.33 cfs @	14.10 hrs,	Volume=	1.535 af,	Atten= 89%, Lag= 116.2 min
Discarded =	1.79 cfs @	14.10 hrs,	Volume=	1.277 af	
Primary =	1.54 cfs @	14.10 hrs,	Volume=	0.257 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.19' @ 14.10 hrs Surf.Area= 20,510 sf Storage= 70,957 cf

Plug-Flow detention time= 196.9 min calculated for 1.535 af (52% of inflow)
Center-of-Mass det. time= 111.2 min (920.7 - 809.5)

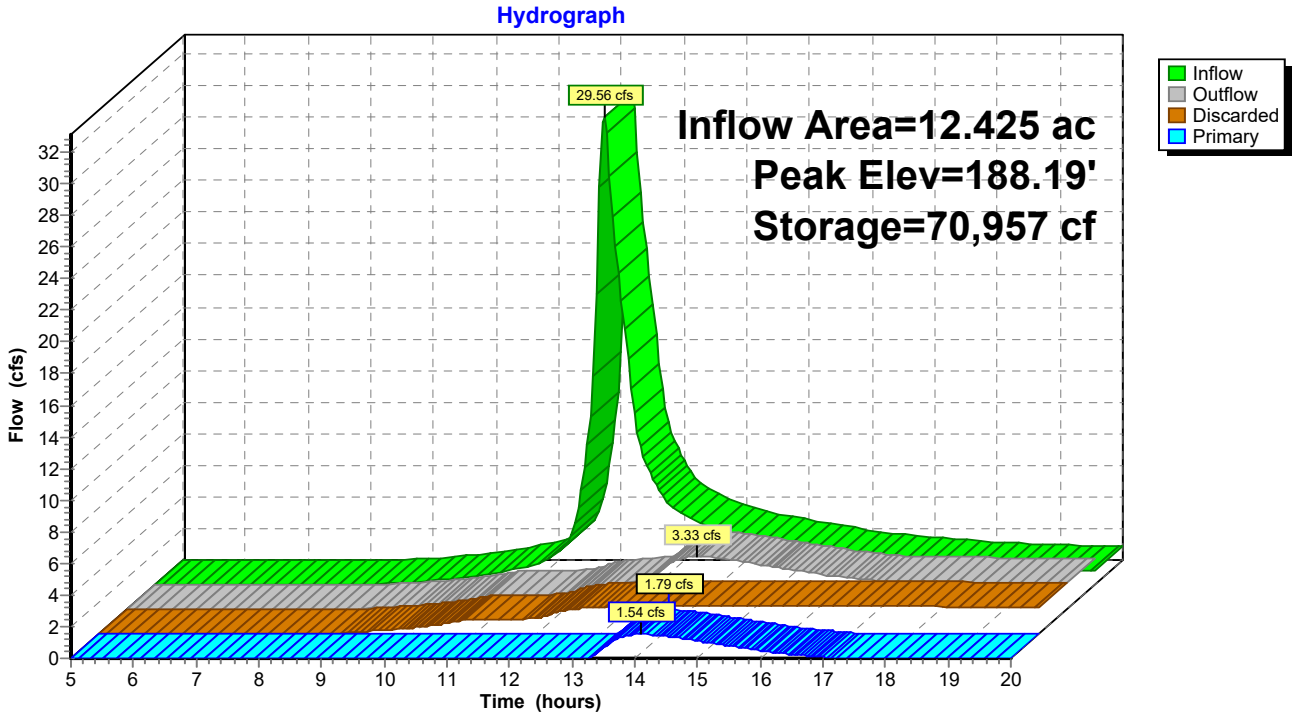
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.79 cfs @ 14.10 hrs HW=188.19' (Free Discharge)
└**2=Exfiltration** (Controls 1.79 cfs)

Primary OutFlow Max=1.53 cfs @ 14.10 hrs HW=188.19' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.53 cfs @ 1.03 fps)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area =	4.438 ac,	0.00% Impervious,	Inflow Depth >	2.47"	for 25 year event
Inflow =	12.13 cfs @	12.14 hrs,	Volume=	0.912 af	
Outflow =	5.53 cfs @	12.42 hrs,	Volume=	0.716 af,	Atten= 54%, Lag= 16.8 min
Discarded =	0.55 cfs @	12.42 hrs,	Volume=	0.329 af	
Primary =	4.99 cfs @	12.42 hrs,	Volume=	0.387 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.95' @ 12.42 hrs Surf.Area= 4,745 sf Storage= 13,658 cf

Plug-Flow detention time= 105.4 min calculated for 0.713 af (78% of inflow)
Center-of-Mass det. time= 49.9 min (856.7 - 806.8)

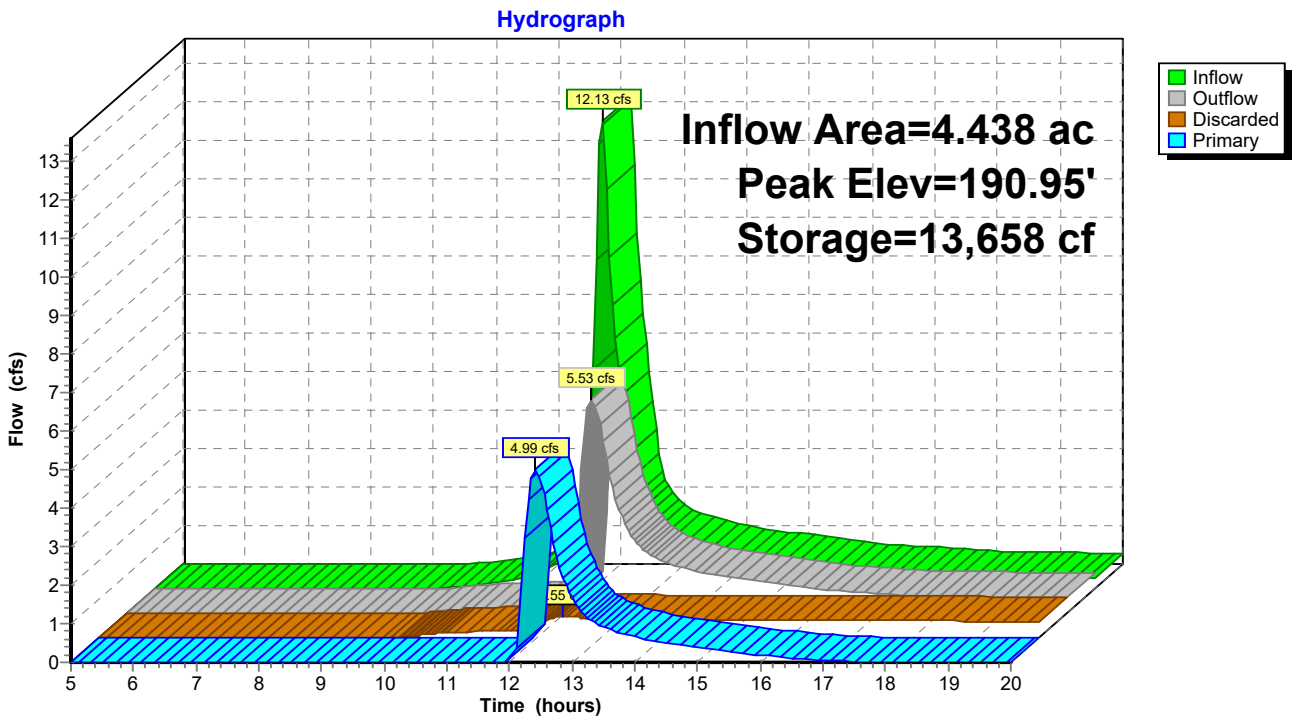
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.55 cfs @ 12.42 hrs HW=190.95' (Free Discharge)
└**2=Exfiltration** (Controls 0.55 cfs)

Primary OutFlow Max=4.96 cfs @ 12.42 hrs HW=190.95' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.96 cfs @ 2.61 fps)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 3.09" for 25 year event
Inflow = 36.93 cfs @ 12.43 hrs, Volume= 4.356 af
Outflow = 8.28 cfs @ 13.31 hrs, Volume= 1.969 af, Atten= 78%, Lag= 52.9 min
Primary = 8.28 cfs @ 13.31 hrs, Volume= 1.969 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 195.97' @ 13.31 hrs Surf.Area= 28,247 sf Storage= 144,272 cf (113,016 cf above start)

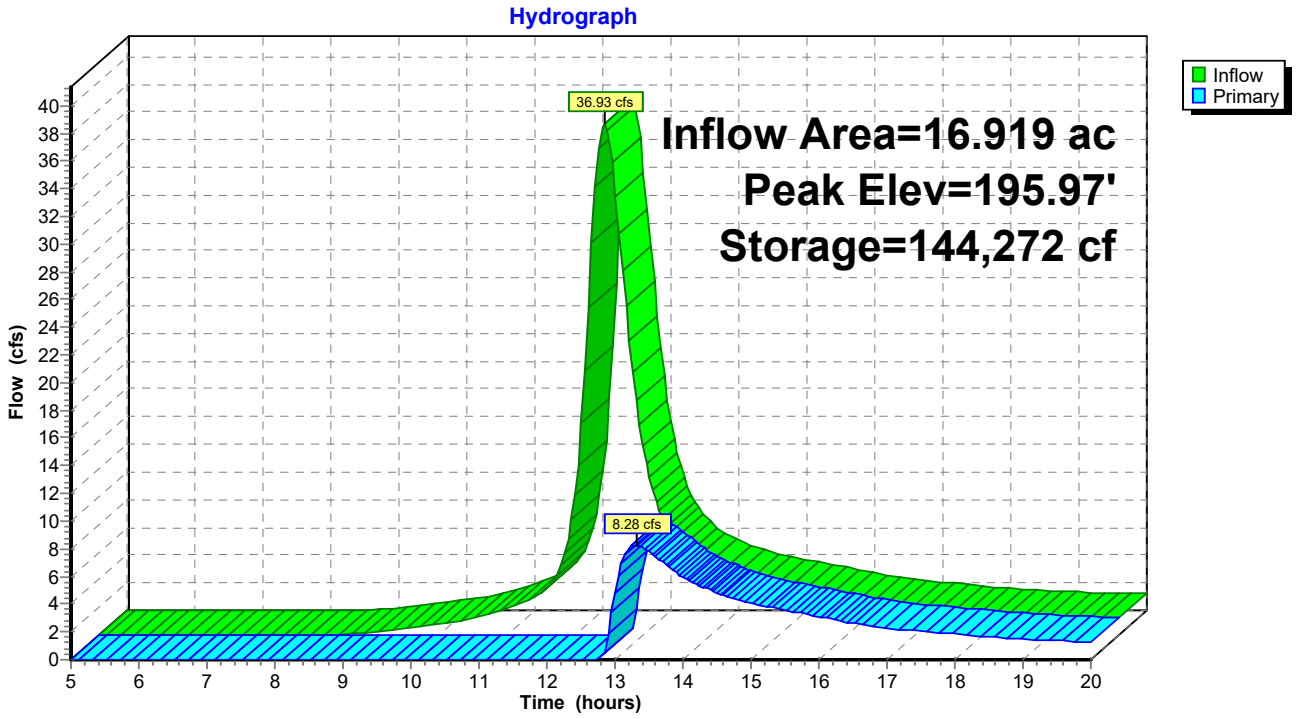
Plug-Flow detention time= 271.2 min calculated for 1.248 af (29% of inflow)
Center-of-Mass det. time= 109.8 min (921.0 - 811.1)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=8.26 cfs @ 13.31 hrs HW=195.97' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 8.26 cfs @ 1.77 fps)

Pond 16P: Pond 16



50-Year Storm Event- Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=11.65 cfs 0.836 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>3.54"
Flow Length=430' Tc=12.4 min CN=72 Runoff=9.18 cfs 0.752 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>2.84"
Tc=10.0 min CN=65 Runoff=2.39 cfs 0.183 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=620' Tc=12.6 min CN=73 Runoff=9.32 cfs 0.773 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.06"
Tc=10.0 min CN=77 Runoff=1.42 cfs 0.110 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>3.63"
Flow Length=810' Tc=16.2 min CN=73 Runoff=19.71 cfs 1.778 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>3.14"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=8.91 cfs 0.689 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=13.47 cfs 0.972 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>3.04"
Tc=10.0 min CN=67 Runoff=3.02 cfs 0.232 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.07 cfs 0.005 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=1.60 cfs 0.126 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=4.85 cfs 0.326 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.47 cfs 0.037 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>3.54"
Flow Length=650' Tc=10.1 min CN=72 Runoff=18.00 cfs 1.382 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=1.78 cfs 0.140 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>3.65"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=6.77 cfs 0.462 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.60 cfs 0.047 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>3.54"
Flow Length=410' Tc=11.0 min CN=72 Runoff=8.64 cfs 0.679 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.66 cfs 0.052 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>3.75"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=5.27 cfs 0.352 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=0.99 cfs 0.078 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>3.44"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=14.74 cfs 1.054 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>3.85"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=14.44 cfs 1.001 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=35.36 cfs 2.824 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>3.04"
Flow Length=500' Tc=9.1 min CN=67 Runoff=15.00 cfs 1.124 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>3.72"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=44.36 cfs 5.244 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>2.18"
Tc=10.0 min CN=58 Runoff=1.43 cfs 0.112 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.40' Max Vel=2.51 fps Inflow=6.64 cfs 0.757 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=6.48 cfs 0.754 af

Pond 1P: Pond 1 Peak Elev=194.16' Storage=16,964 cf Inflow=11.65 cfs 0.836 af
Outflow=6.66 cfs 0.698 af

Pond 2P: Pond 2 Peak Elev=231.55' Storage=12,521 cf Inflow=9.18 cfs 0.752 af
Discarded=0.38 cfs 0.257 af Primary=4.30 cfs 0.286 af Outflow=4.69 cfs 0.543 af

Pond 3P: Pond 3 Peak Elev=227.95' Storage=12,896 cf Inflow=9.32 cfs 0.773 af
Outflow=4.64 cfs 0.623 af

Pond 4P: Pond 4 Peak Elev=188.59' Storage=54,851 cf Inflow=19.71 cfs 1.778 af
Outflow=9.81 cfs 1.160 af

Pond 5P: Pond 5 Peak Elev=218.86' Storage=11,564 cf Inflow=8.91 cfs 0.689 af
Outflow=4.28 cfs 0.506 af

Pond 6P: Pond 6 Peak Elev=209.99' Storage=21,405 cf Inflow=13.47 cfs 0.972 af
Outflow=7.84 cfs 0.745 af

Pond 7P: Pond 7 Peak Elev=226.45' Storage=5,397 cf Inflow=4.85 cfs 0.326 af
Discarded=0.25 cfs 0.162 af Primary=1.56 cfs 0.093 af Outflow=1.81 cfs 0.255 af

Pond 8P: Pond 8 Peak Elev=190.24' Storage=21,369 cf Inflow=18.00 cfs 1.382 af
Outflow=9.19 cfs 1.152 af

Pond 9P: Pond 9 Peak Elev=190.58' Storage=13,367 cf Inflow=6.77 cfs 0.462 af
Outflow=2.35 cfs 0.299 af

Pond 10P: Pond 10 Peak Elev=169.28' Storage=12,789 cf Inflow=8.64 cfs 0.679 af
Outflow=3.72 cfs 0.470 af

Pond 11P: Pond 11 Peak Elev=152.41' Storage=9,998 cf Inflow=5.27 cfs 0.352 af
Outflow=1.34 cfs 0.198 af

Pond 12P: Pond 12 Peak Elev=159.76' Storage=23,018 cf Inflow=14.74 cfs 1.054 af
Outflow=7.50 cfs 0.854 af

Pond 13.1P: Pond 13.1 Peak Elev=224.67' Storage=17,447 cf Inflow=14.44 cfs 1.001 af
Outflow=6.64 cfs 0.757 af

Pond 13P: Pond 13 Peak Elev=188.41' Storage=75,679 cf Inflow=36.98 cfs 3.578 af
Discarded=1.85 cfs 1.336 af Primary=5.45 cfs 0.801 af Outflow=7.30 cfs 2.137 af

Pond 14P: Pond 14 Peak Elev=191.27' Storage=15,209 cf Inflow=15.00 cfs 1.124 af
Discarded=0.58 cfs 0.343 af Primary=7.64 cfs 0.573 af Outflow=8.23 cfs 0.916 af

Pond 16P: Pond 16 Peak Elev=196.23' Storage=151,820 cf Inflow=44.36 cfs 5.244 af
Outflow=16.80 cfs 2.849 af

Total Runoff Area = 73.385 ac Runoff Volume = 21.372 af Average Runoff Depth = 3.49"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

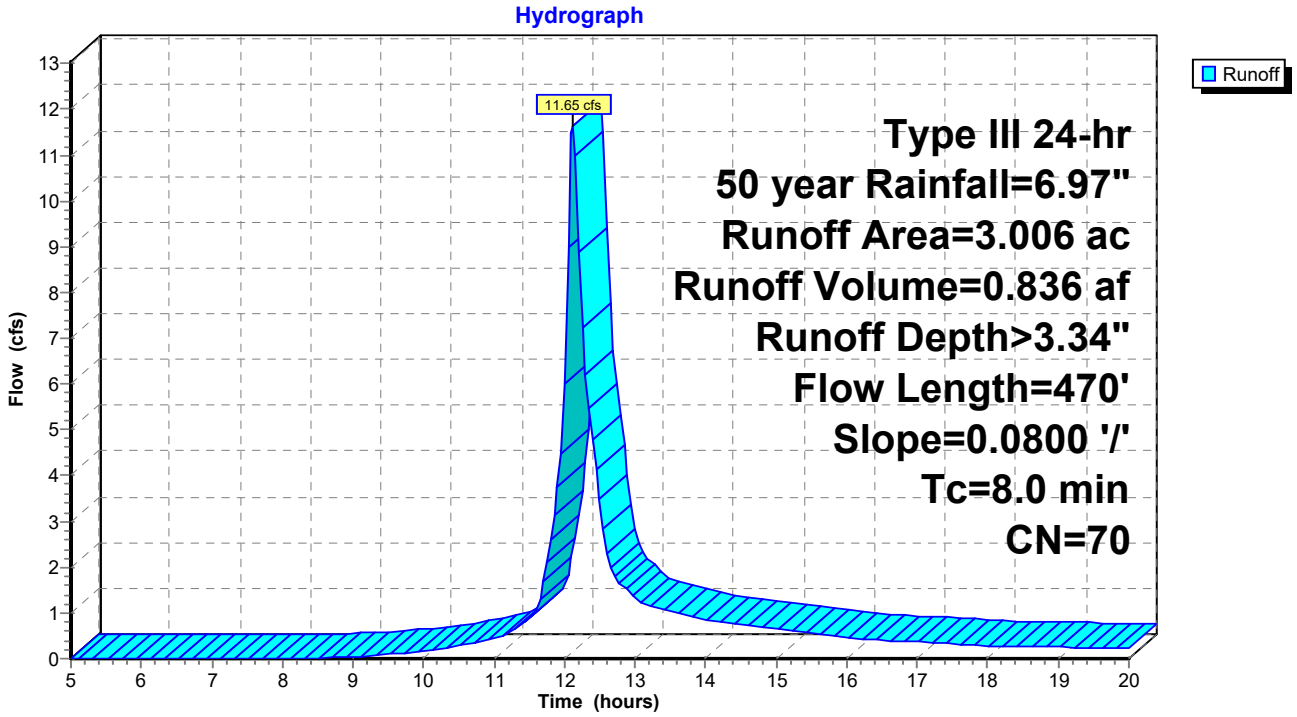
Runoff = 11.65 cfs @ 12.12 hrs, Volume= 0.836 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

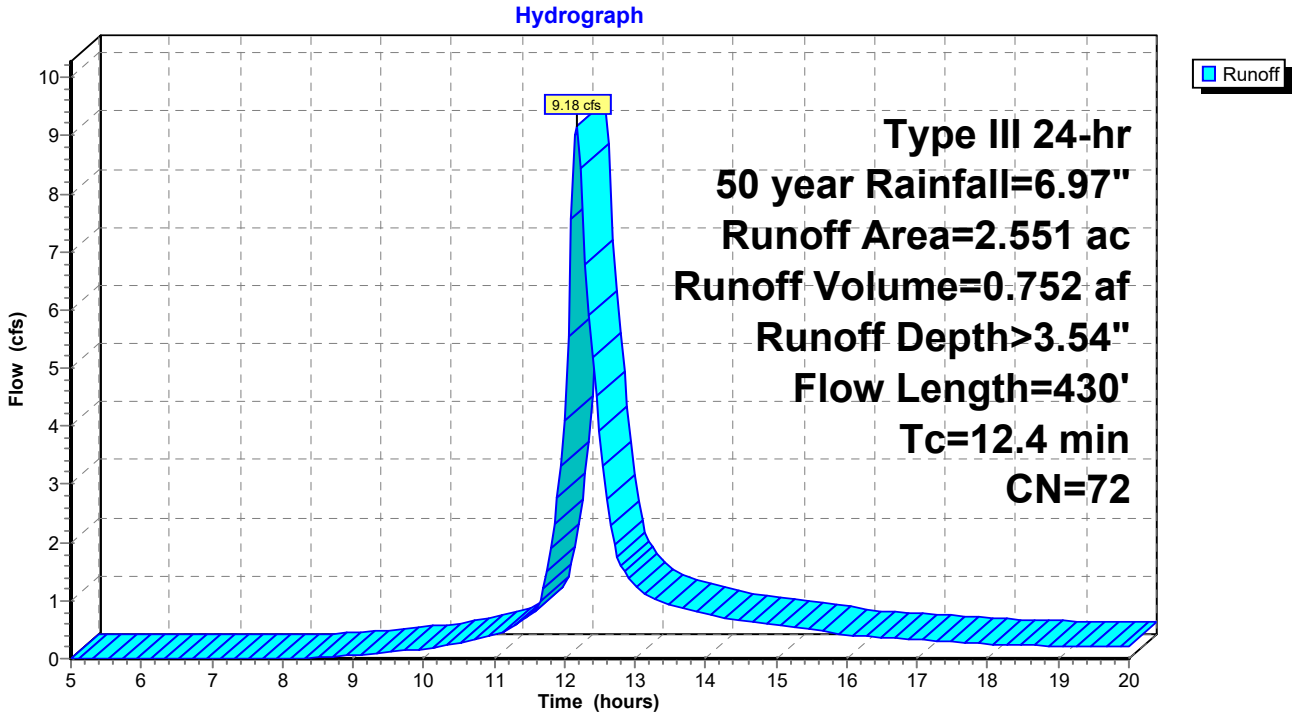
Runoff = 9.18 cfs @ 12.17 hrs, Volume= 0.752 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

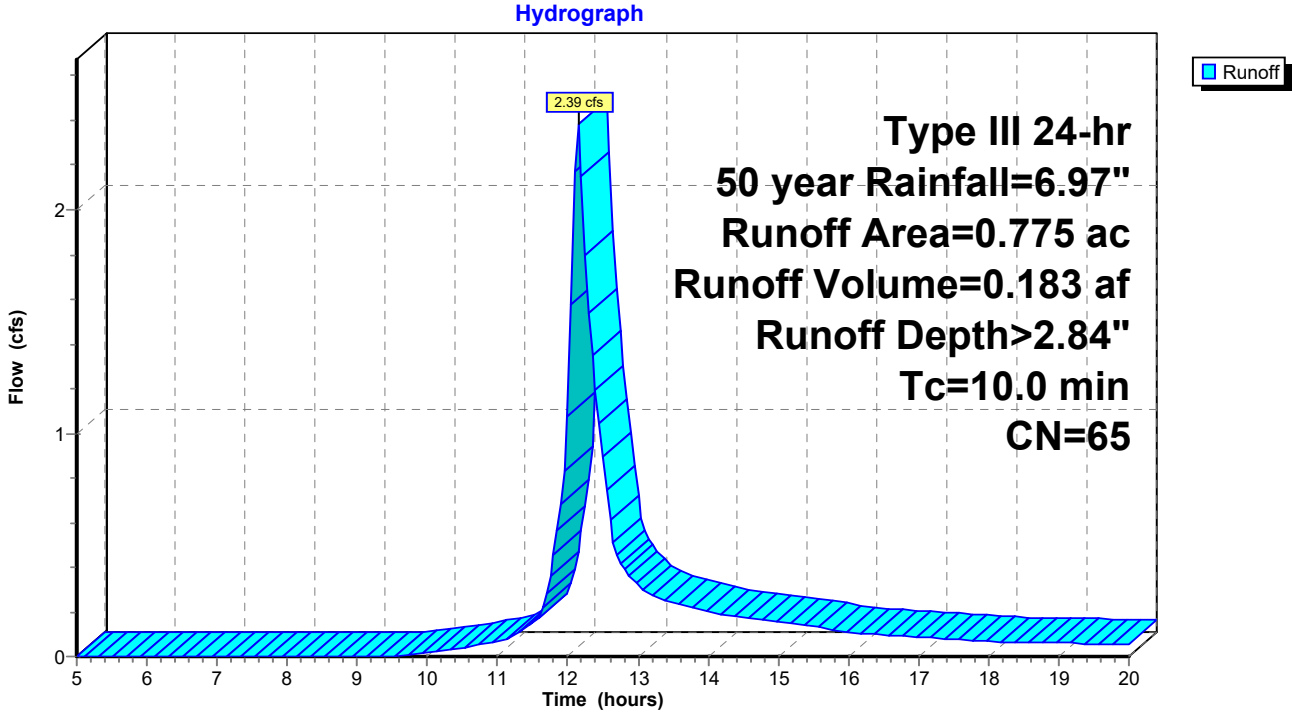
Runoff = 2.39 cfs @ 12.15 hrs, Volume= 0.183 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

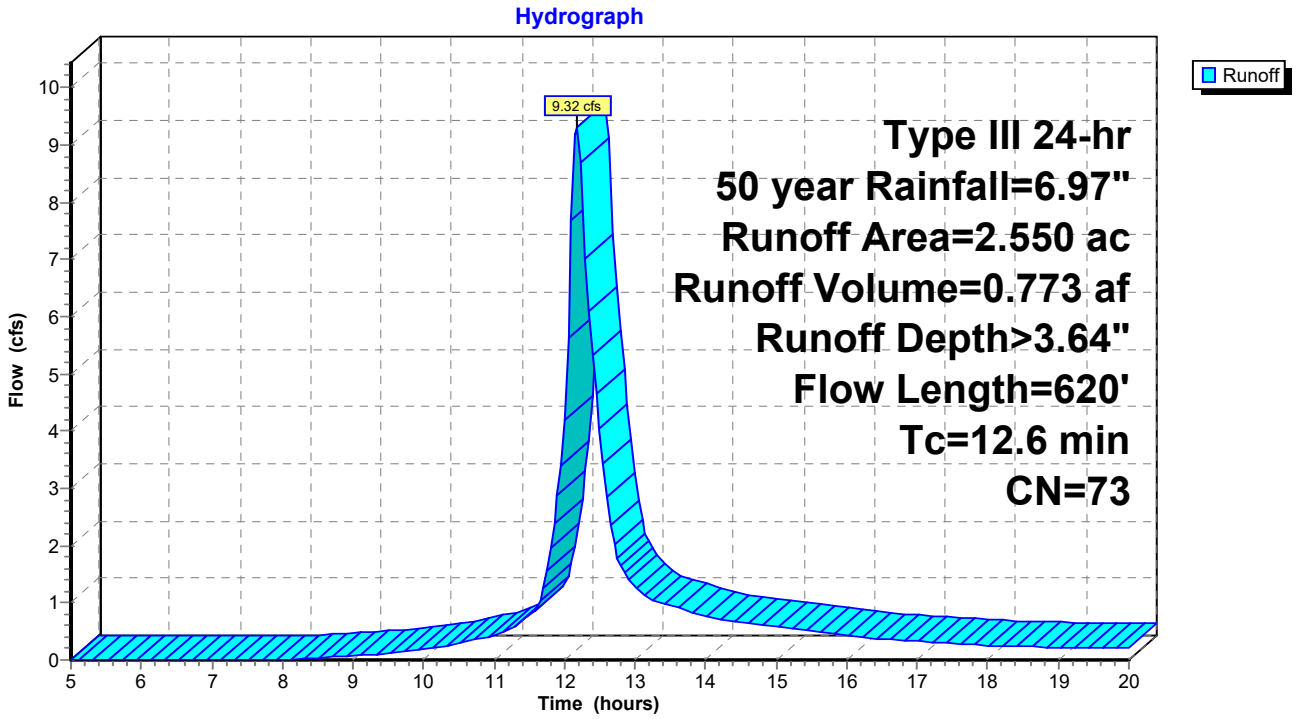
Runoff = 9.32 cfs @ 12.18 hrs, Volume= 0.773 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

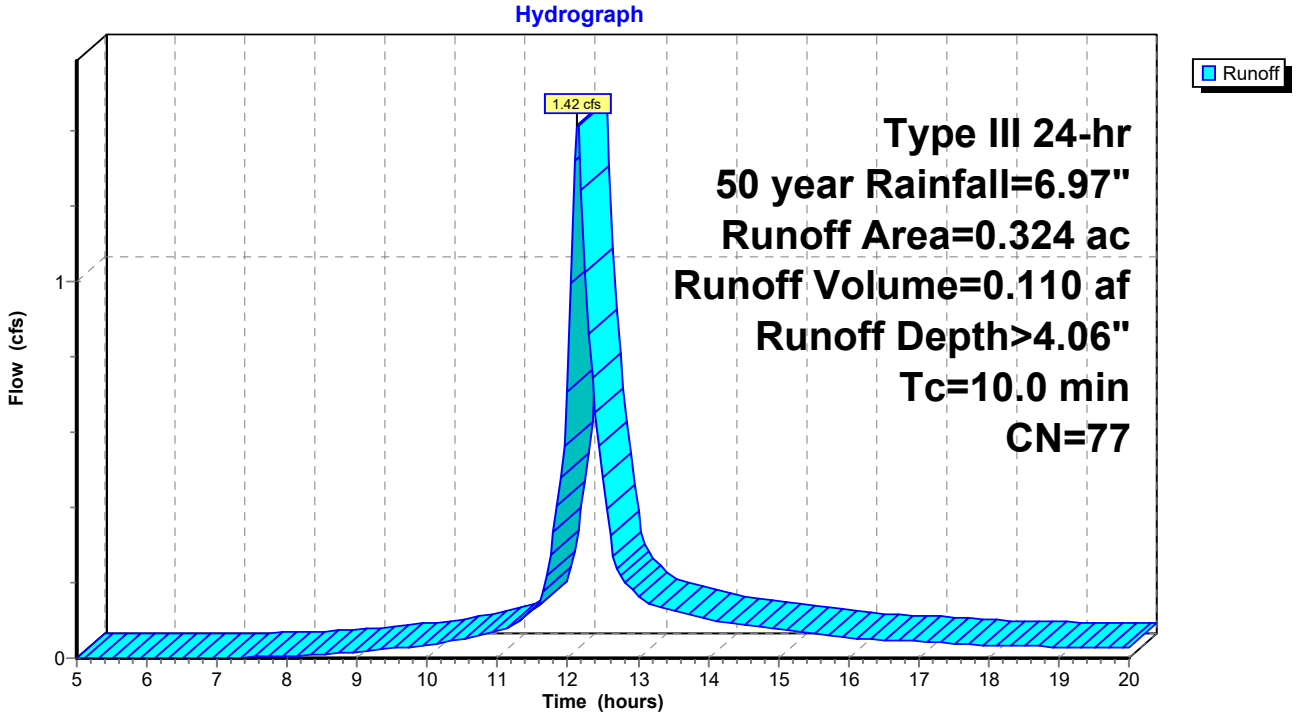
Runoff = 1.42 cfs @ 12.14 hrs, Volume= 0.110 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

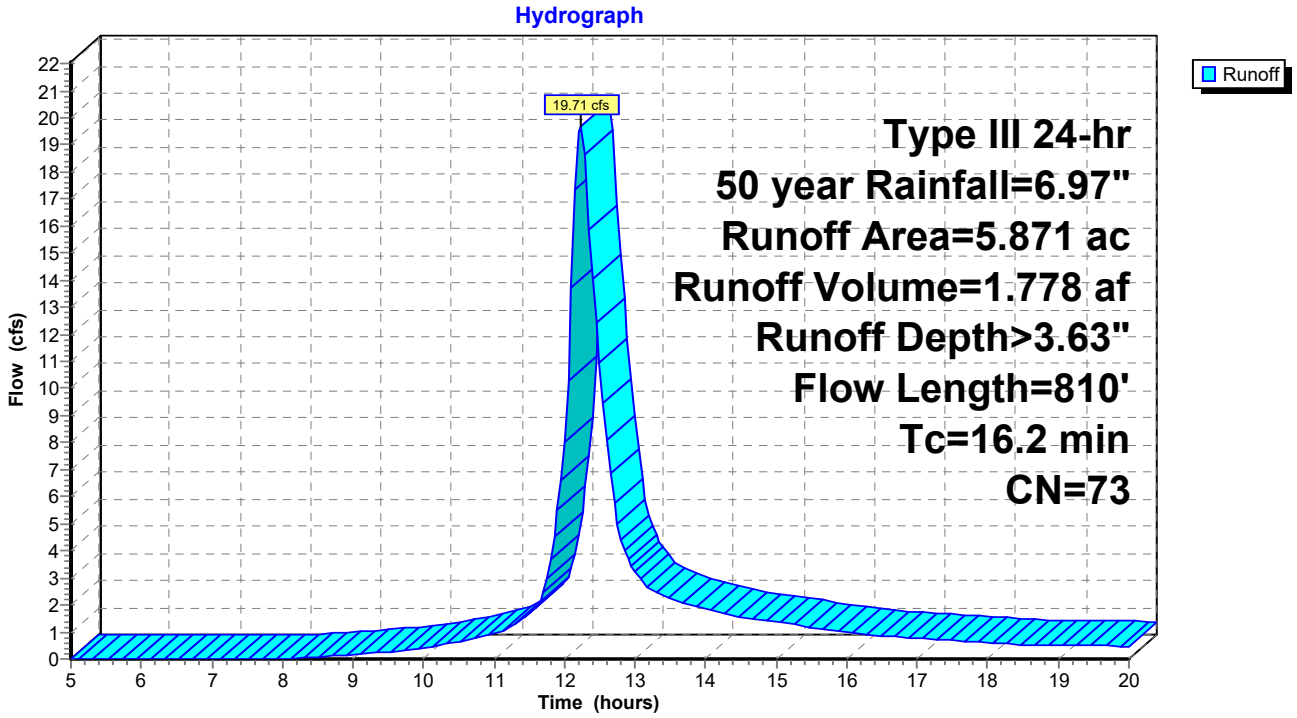
Runoff = 19.71 cfs @ 12.22 hrs, Volume= 1.778 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

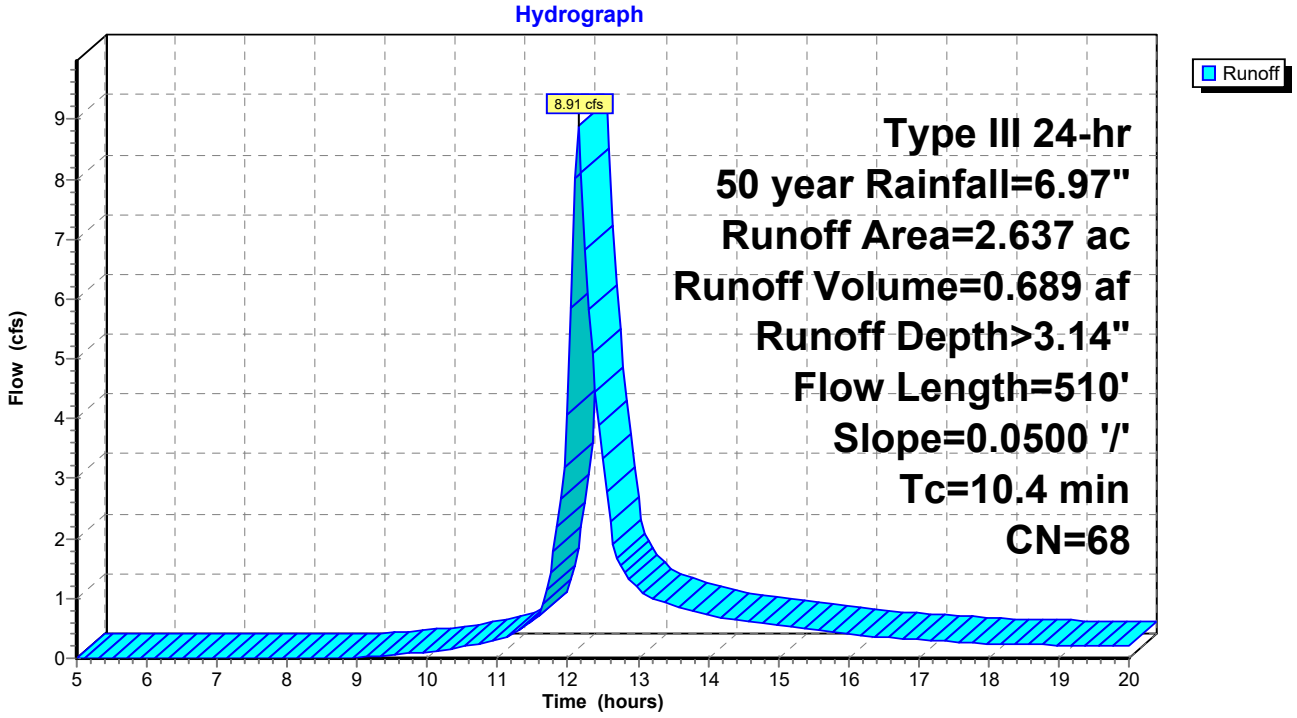
Runoff = 8.91 cfs @ 12.15 hrs, Volume= 0.689 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

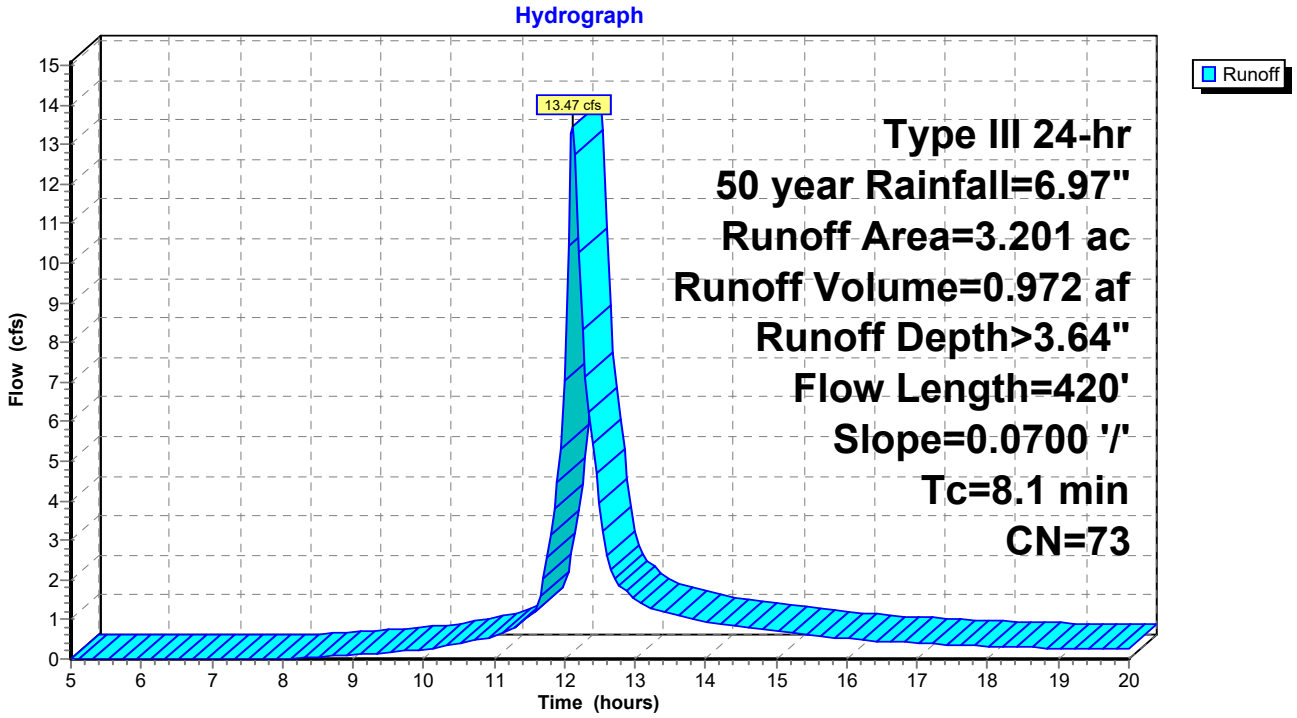
Runoff = 13.47 cfs @ 12.12 hrs, Volume= 0.972 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

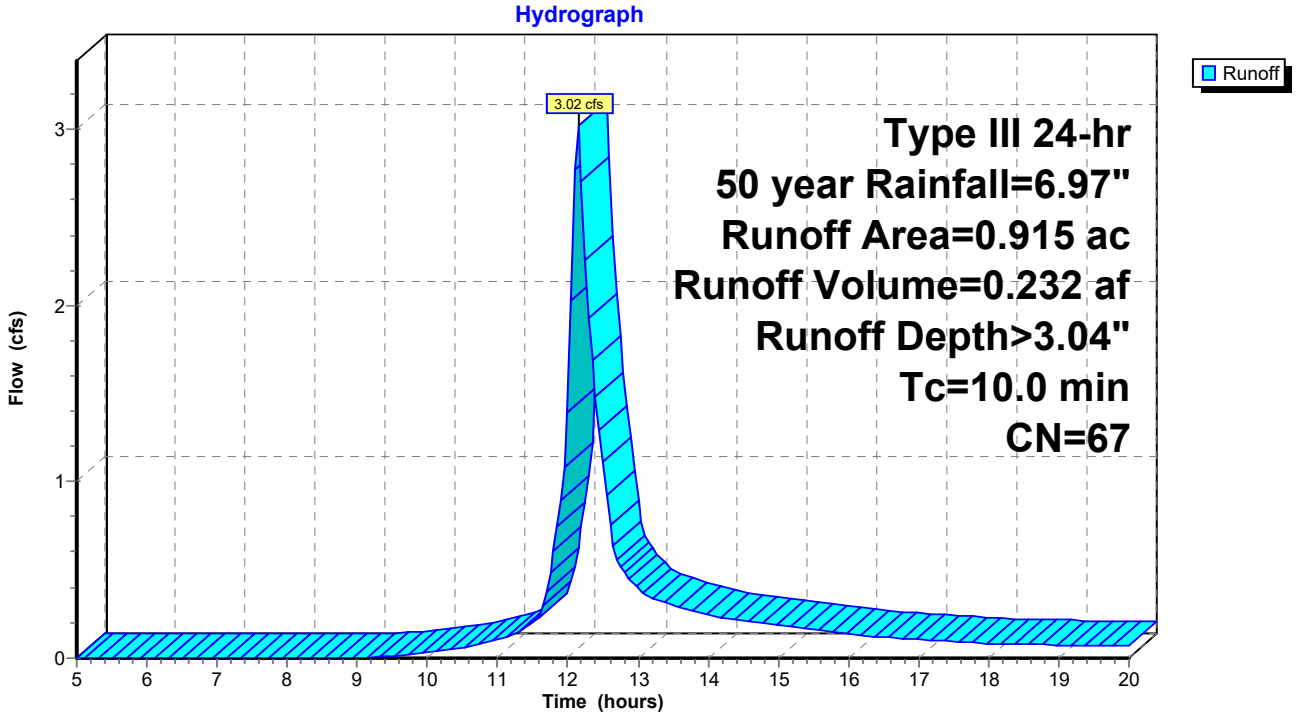
Runoff = 3.02 cfs @ 12.15 hrs, Volume= 0.232 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

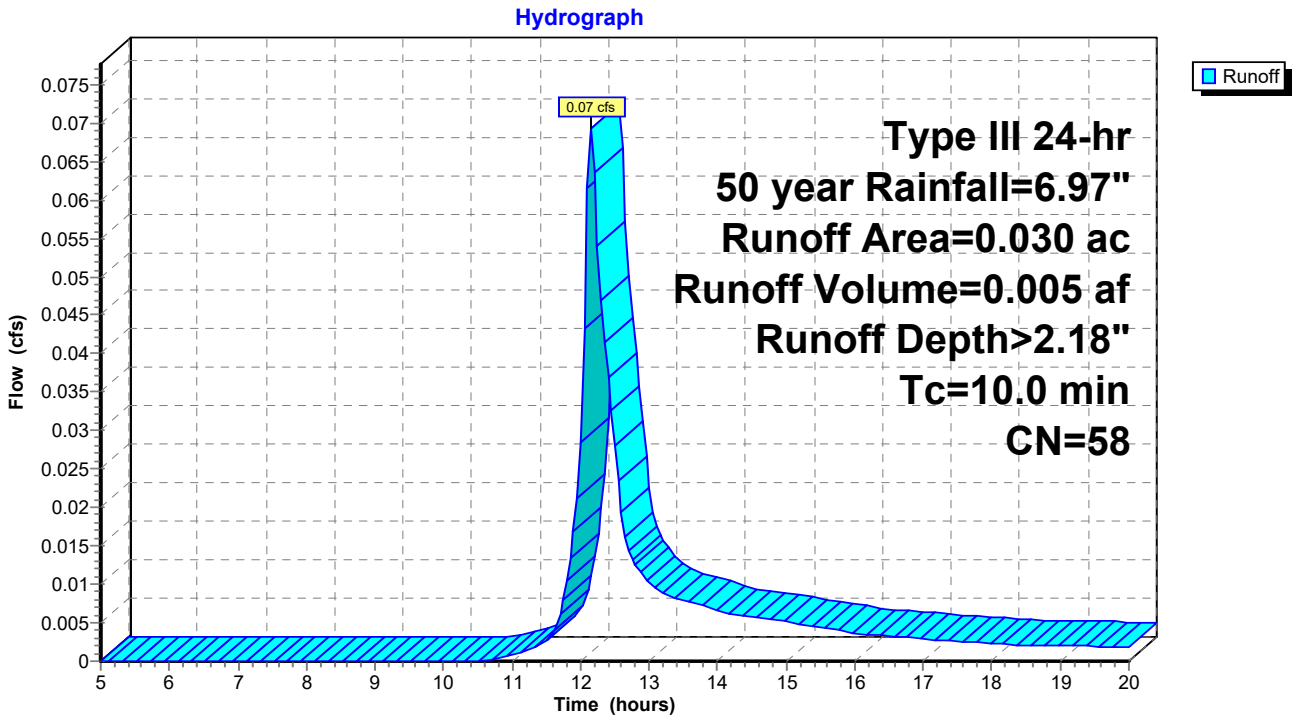
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 0.005 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

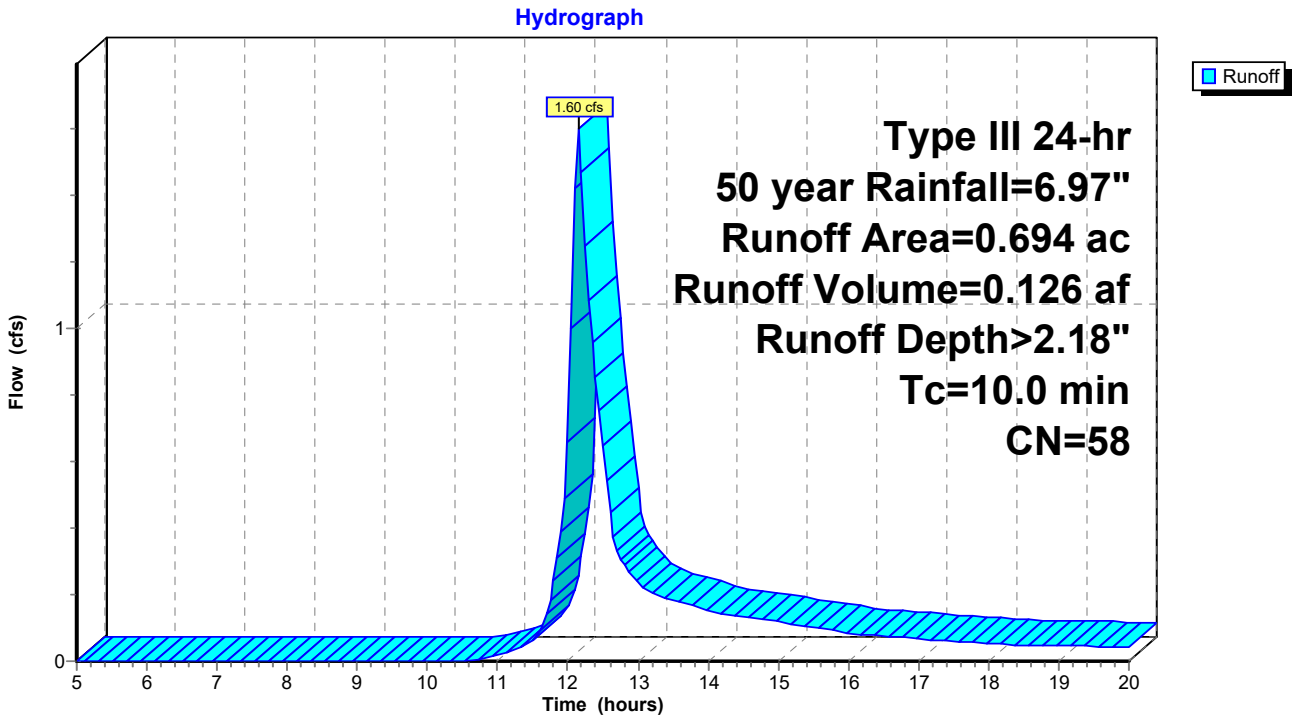
Runoff = 1.60 cfs @ 12.15 hrs, Volume= 0.126 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

[49] Hint: Tc<2dt may require smaller dt

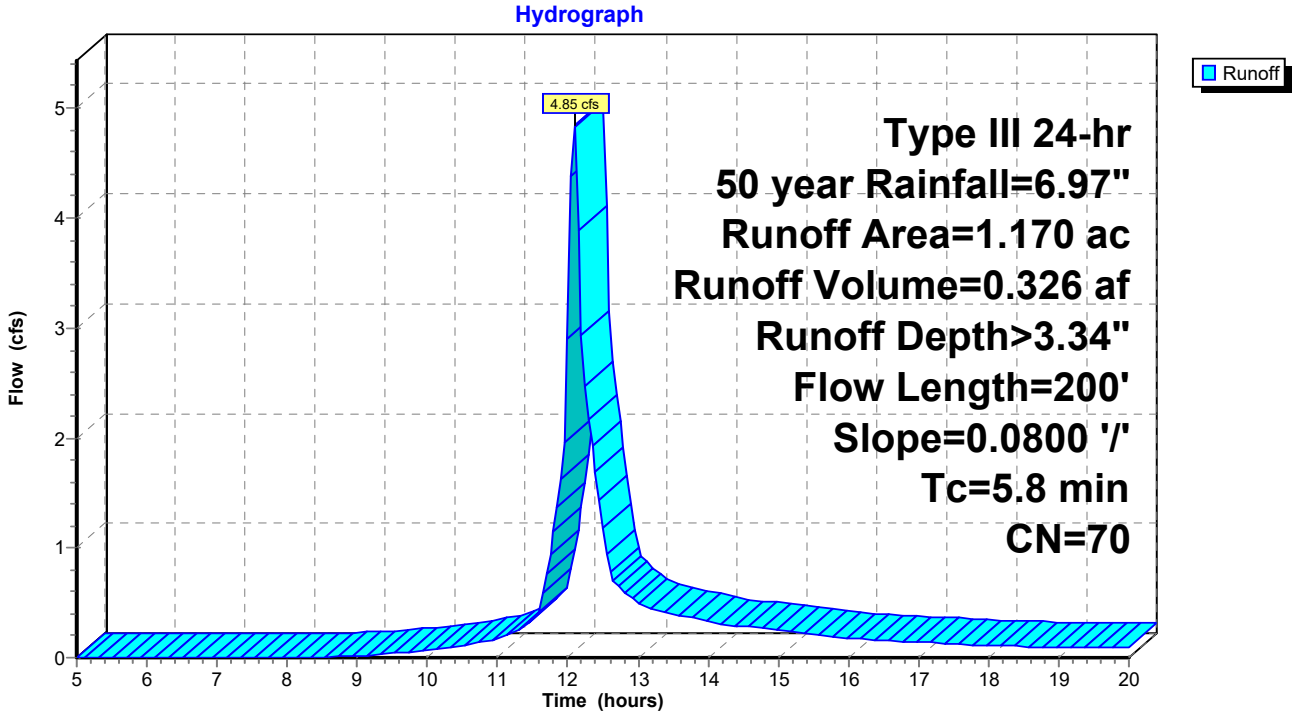
Runoff = 4.85 cfs @ 12.09 hrs, Volume= 0.326 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

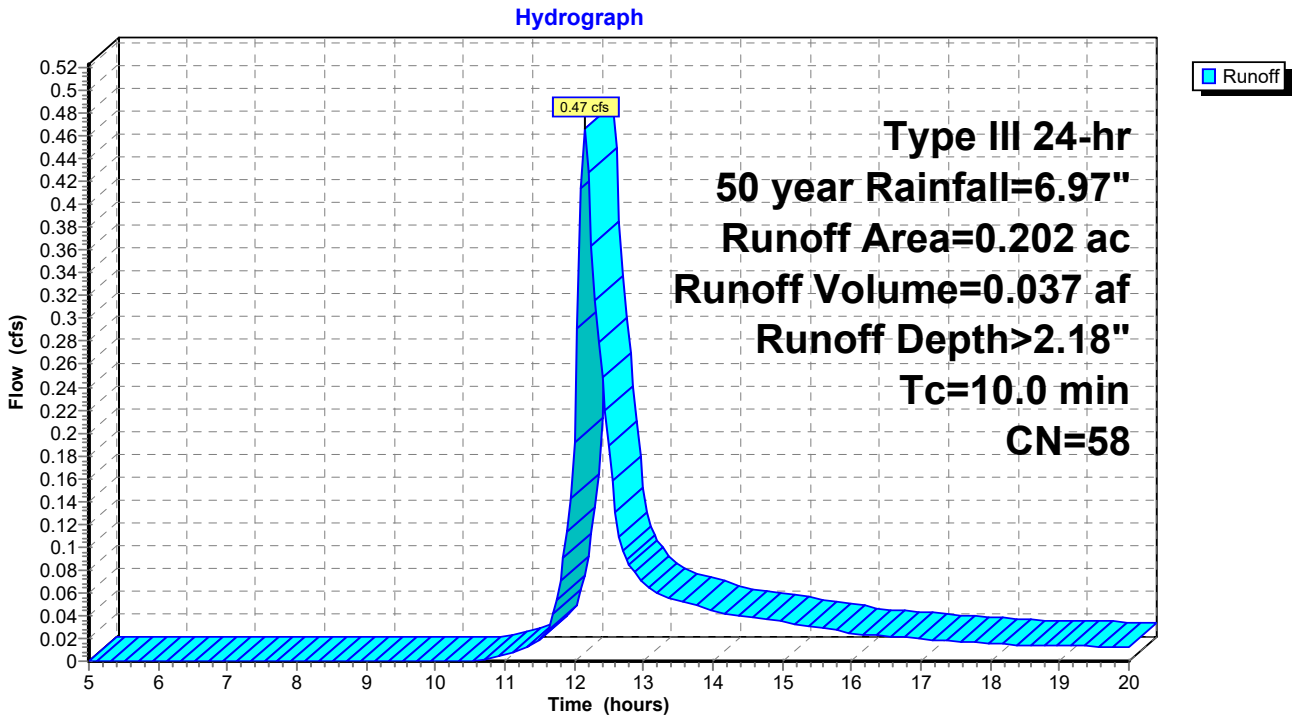
Runoff = 0.47 cfs @ 12.15 hrs, Volume= 0.037 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

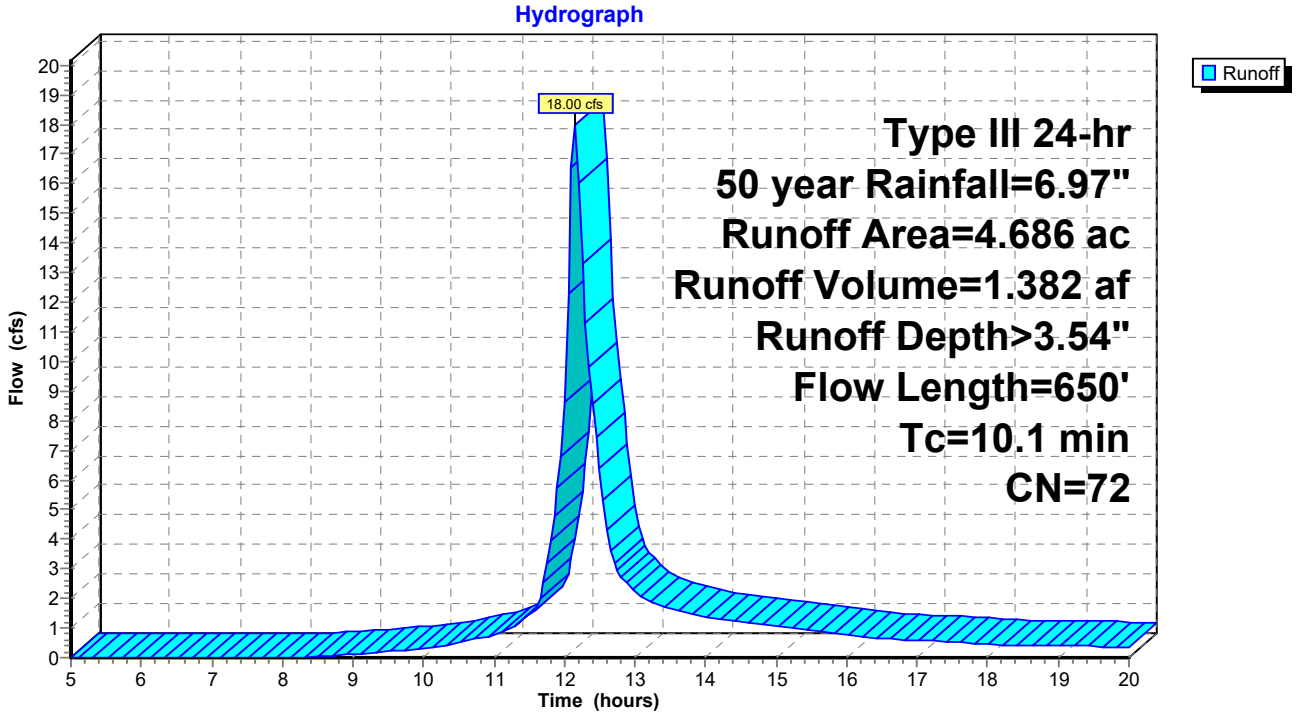
Runoff = 18.00 cfs @ 12.15 hrs, Volume= 1.382 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

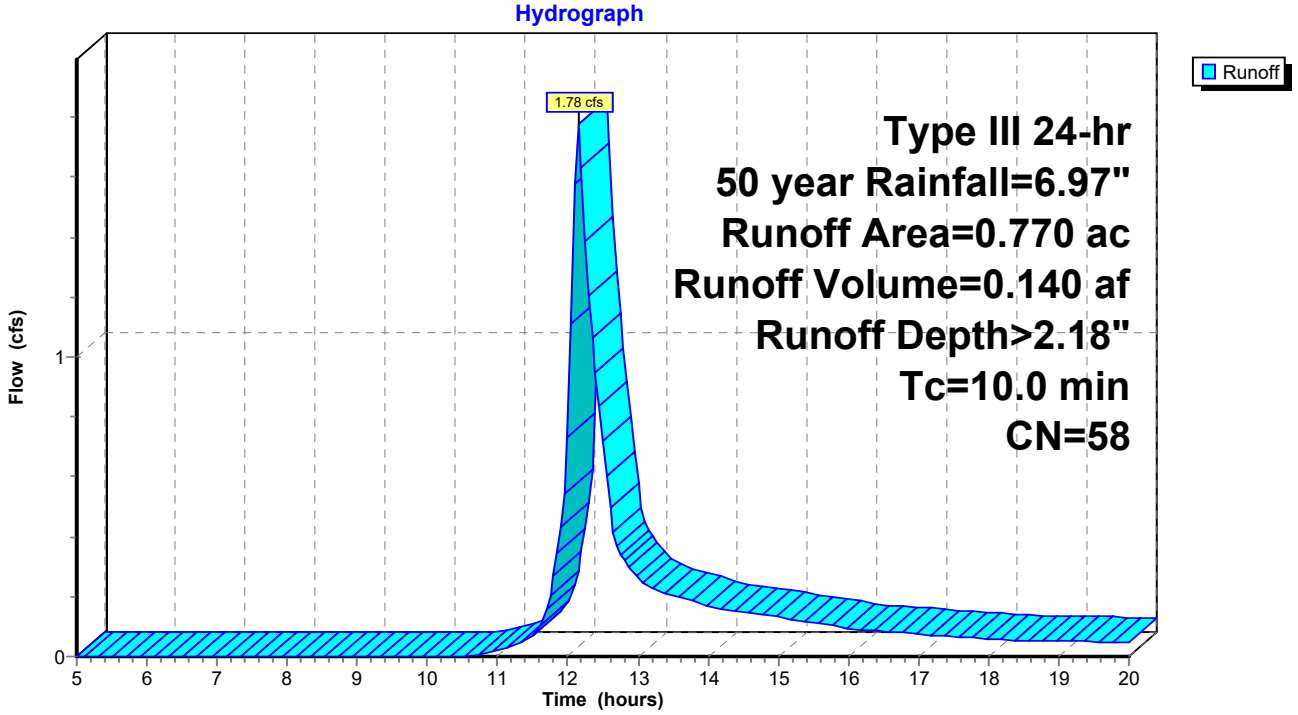
Runoff = 1.78 cfs @ 12.15 hrs, Volume= 0.140 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

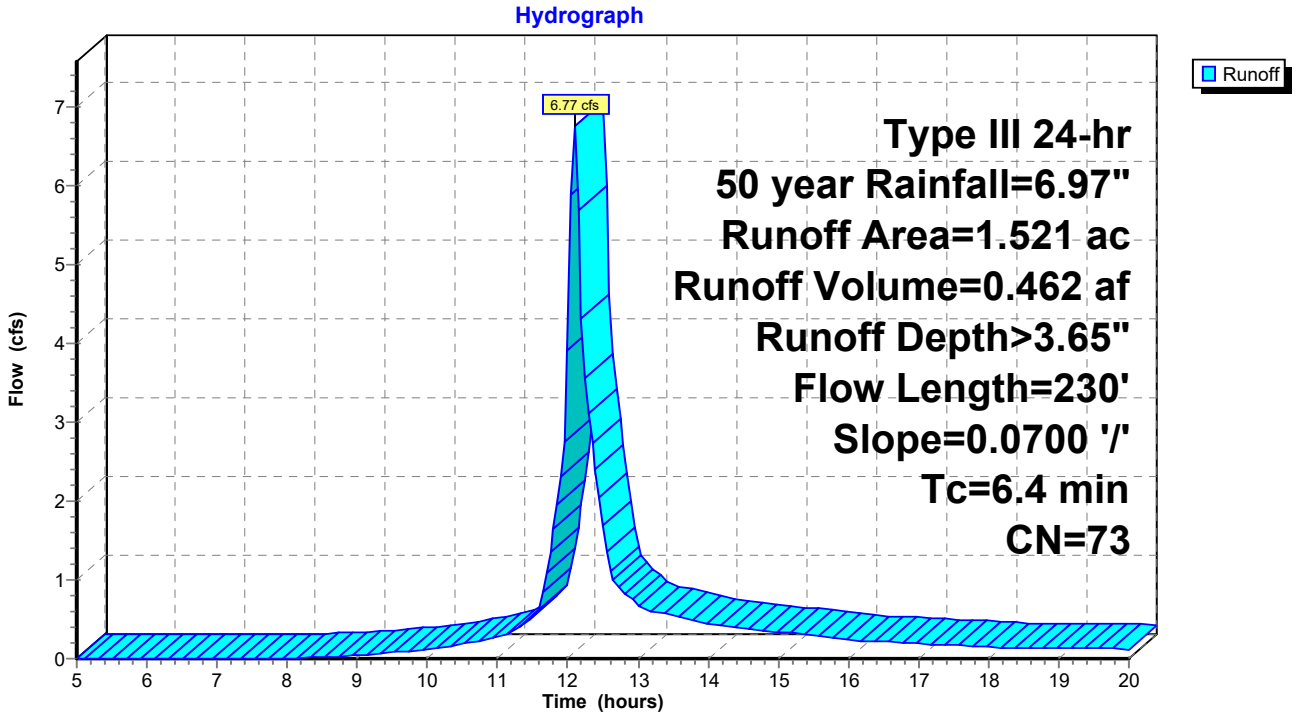
Runoff = 6.77 cfs @ 12.10 hrs, Volume= 0.462 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

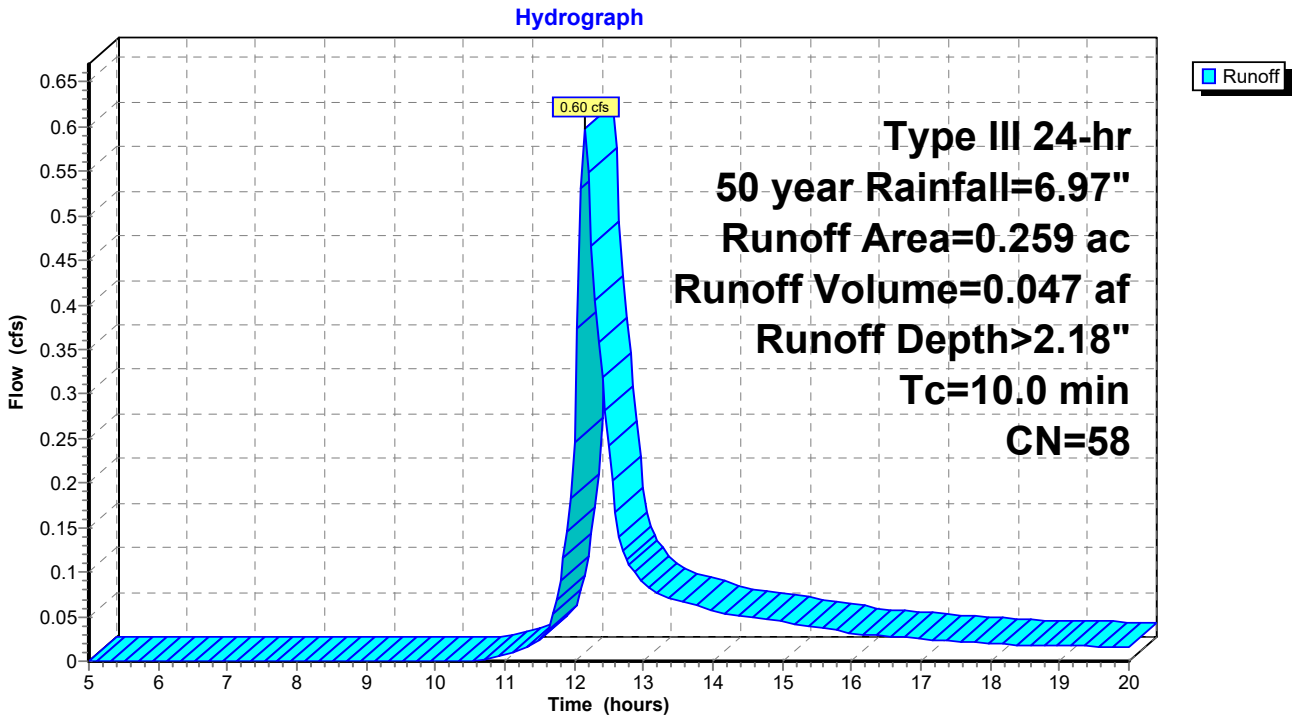
Runoff = 0.60 cfs @ 12.15 hrs, Volume= 0.047 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

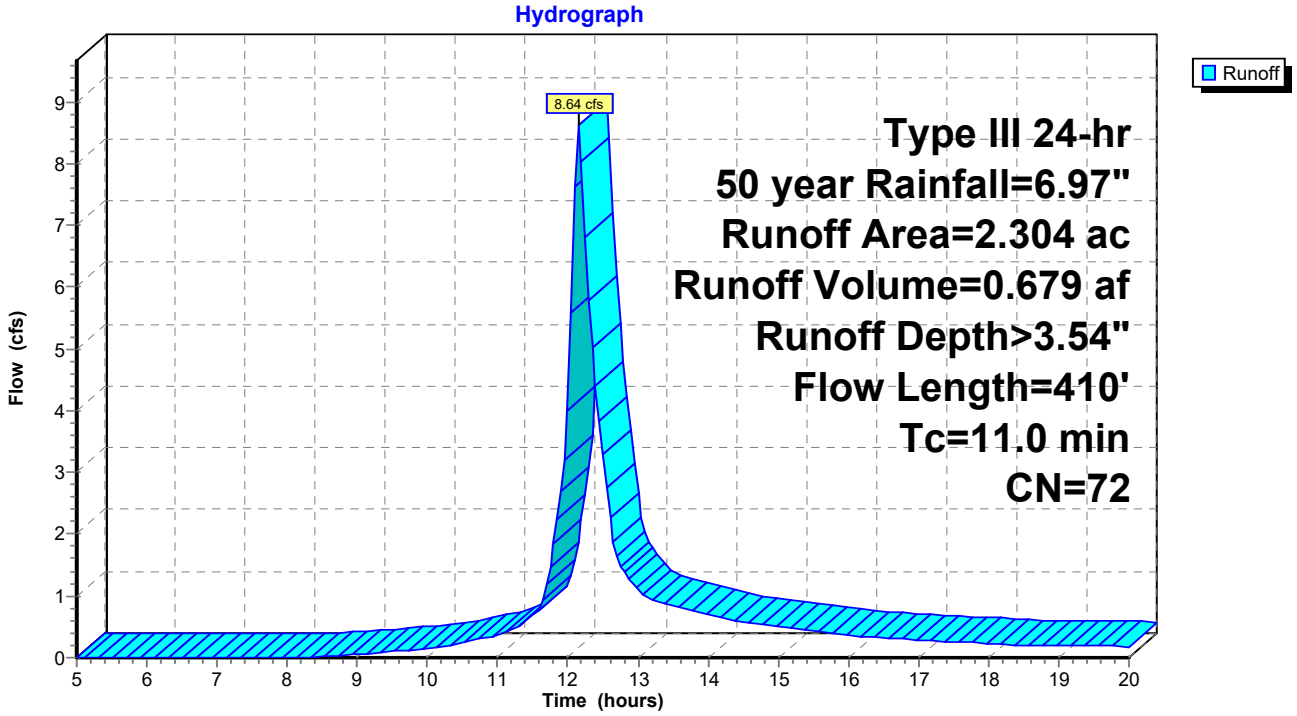
Runoff = 8.64 cfs @ 12.16 hrs, Volume= 0.679 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

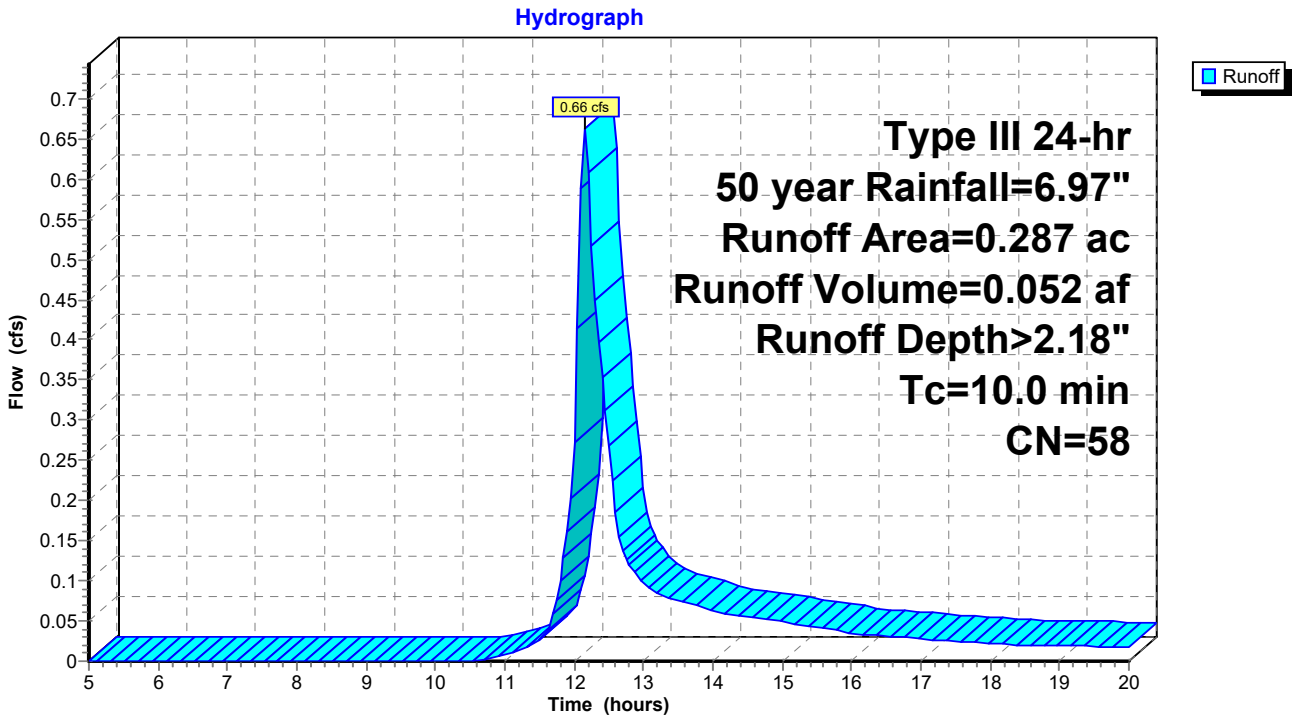
Runoff = 0.66 cfs @ 12.15 hrs, Volume= 0.052 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

[49] Hint: Tc<2dt may require smaller dt

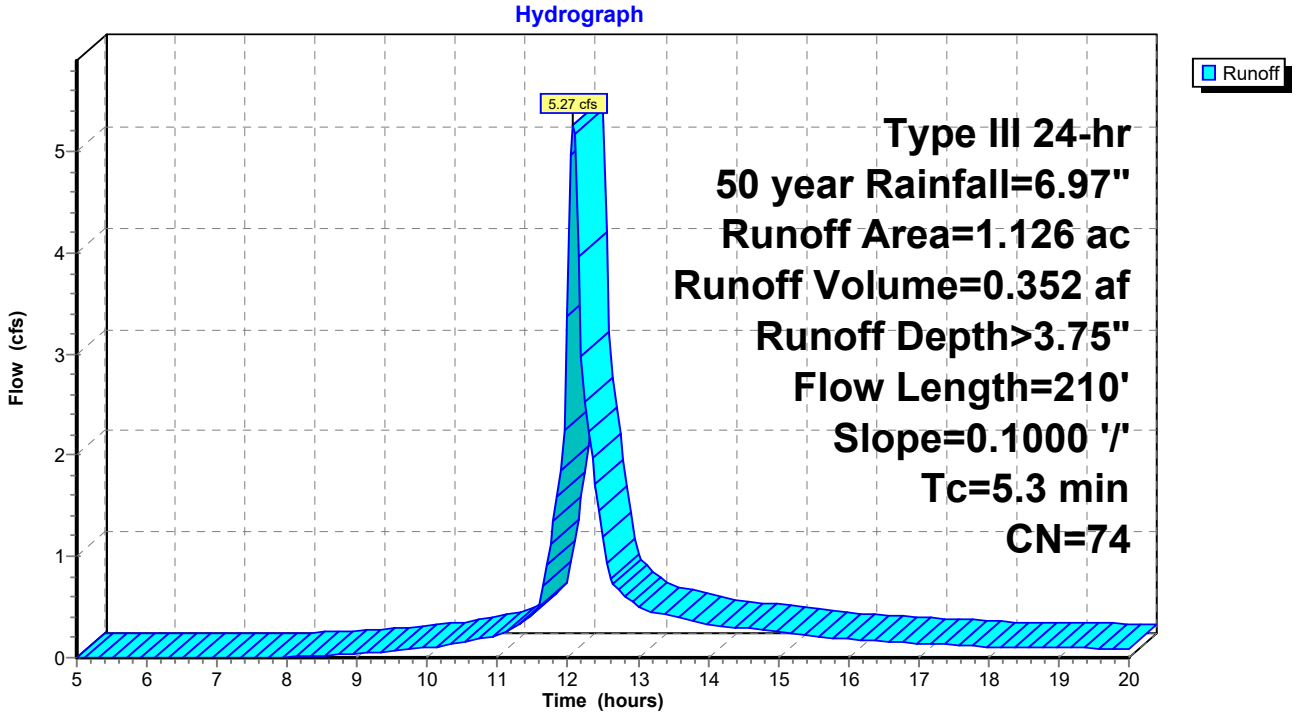
Runoff = 5.27 cfs @ 12.08 hrs, Volume= 0.352 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

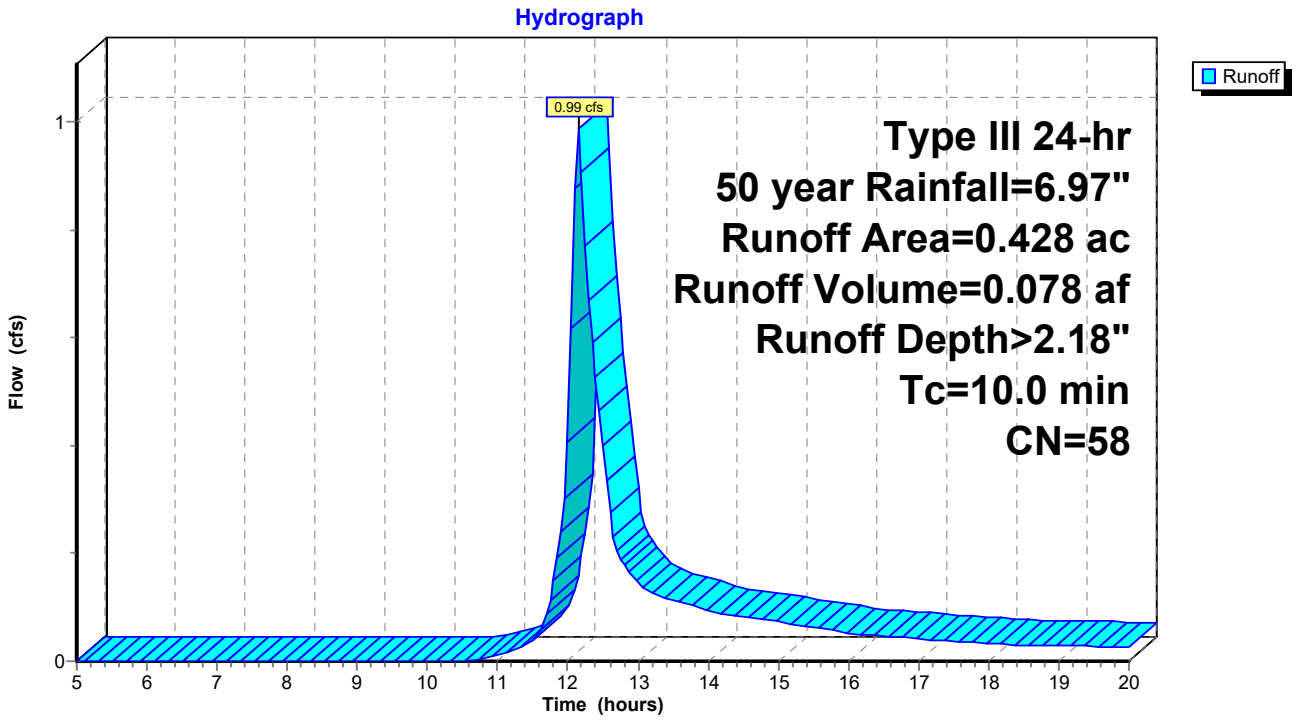
Runoff = 0.99 cfs @ 12.15 hrs, Volume= 0.078 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

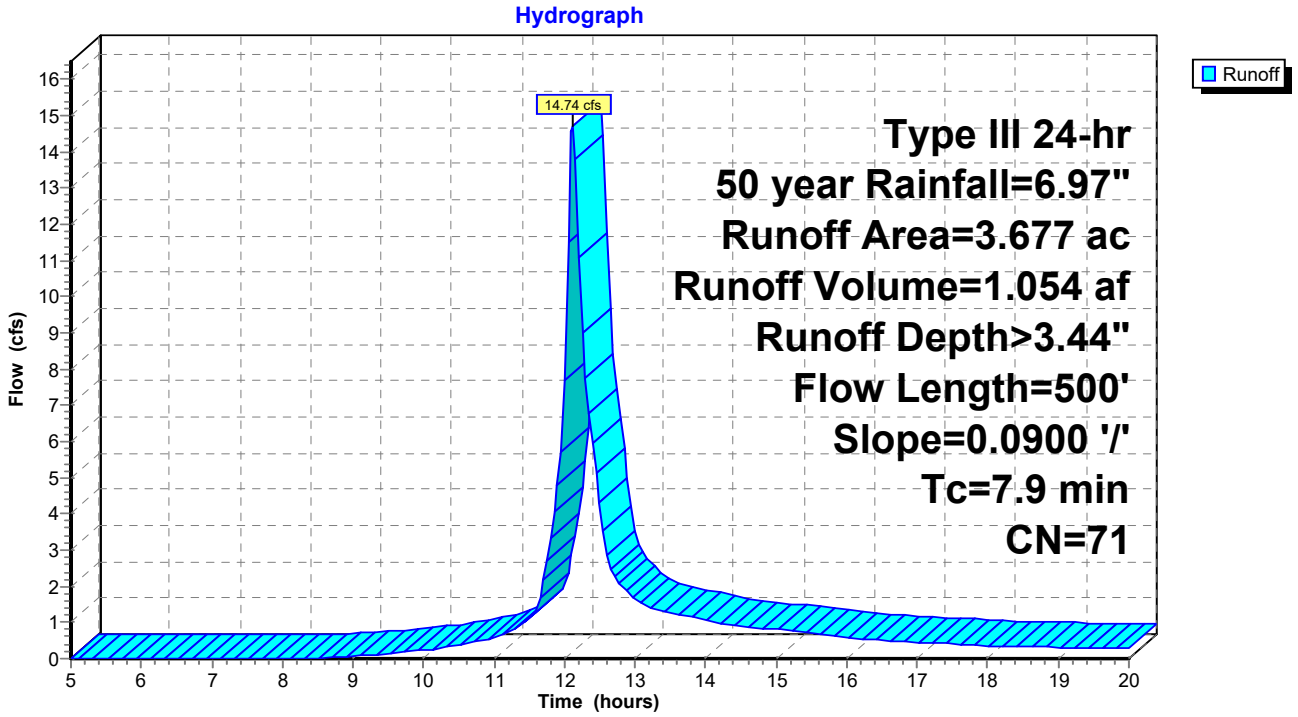
Runoff = 14.74 cfs @ 12.12 hrs, Volume= 1.054 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

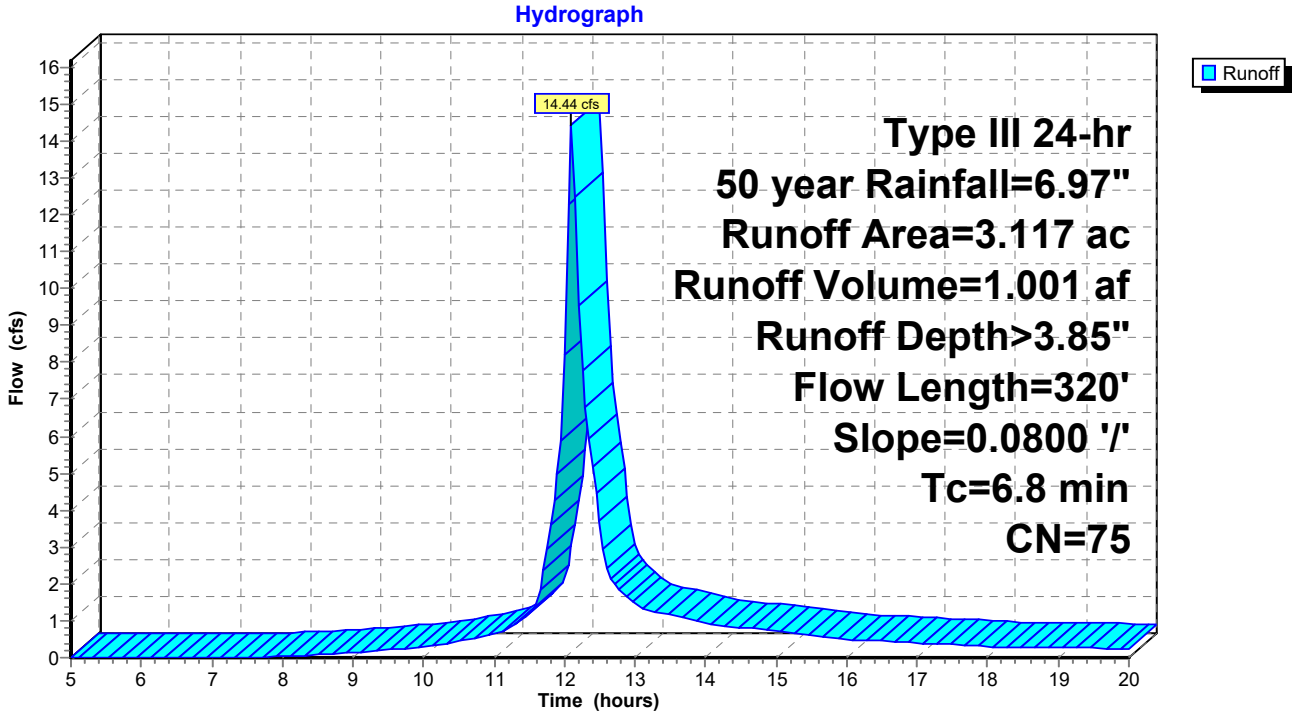
Runoff = 14.44 cfs @ 12.10 hrs, Volume= 1.001 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

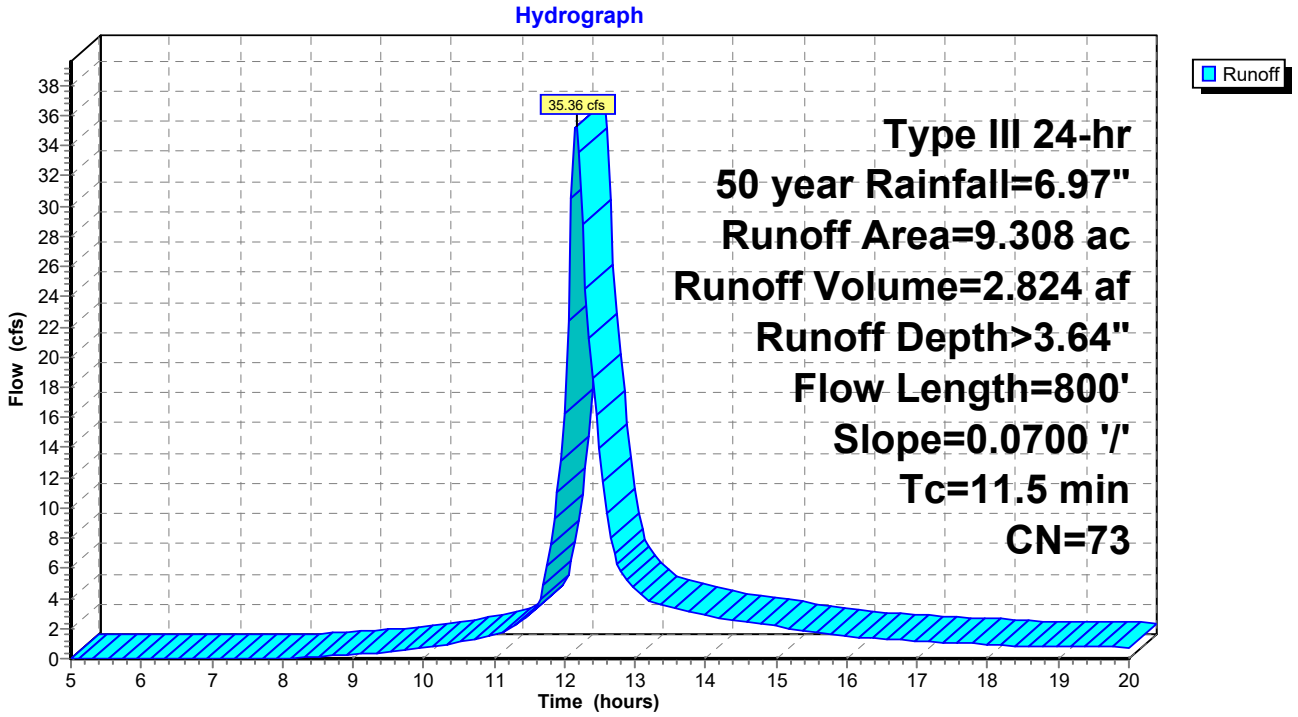
Runoff = 35.36 cfs @ 12.16 hrs, Volume= 2.824 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

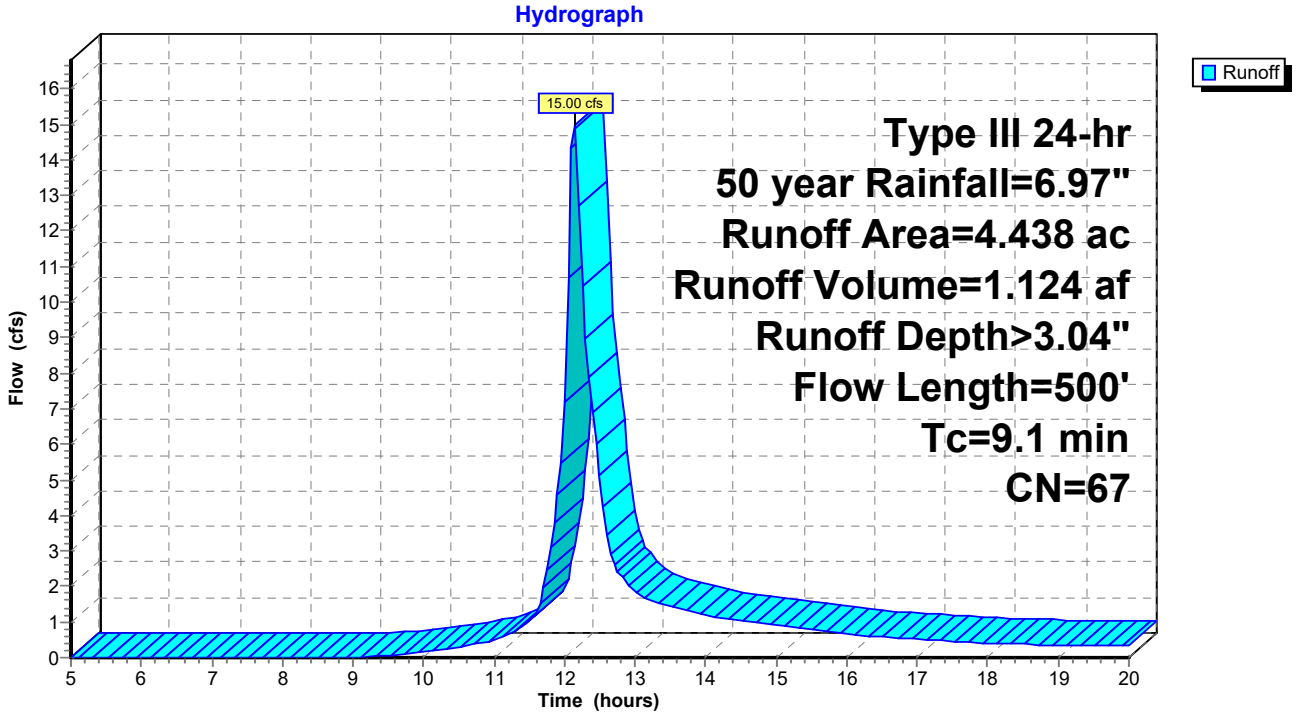
Runoff = 15.00 cfs @ 12.14 hrs, Volume= 1.124 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

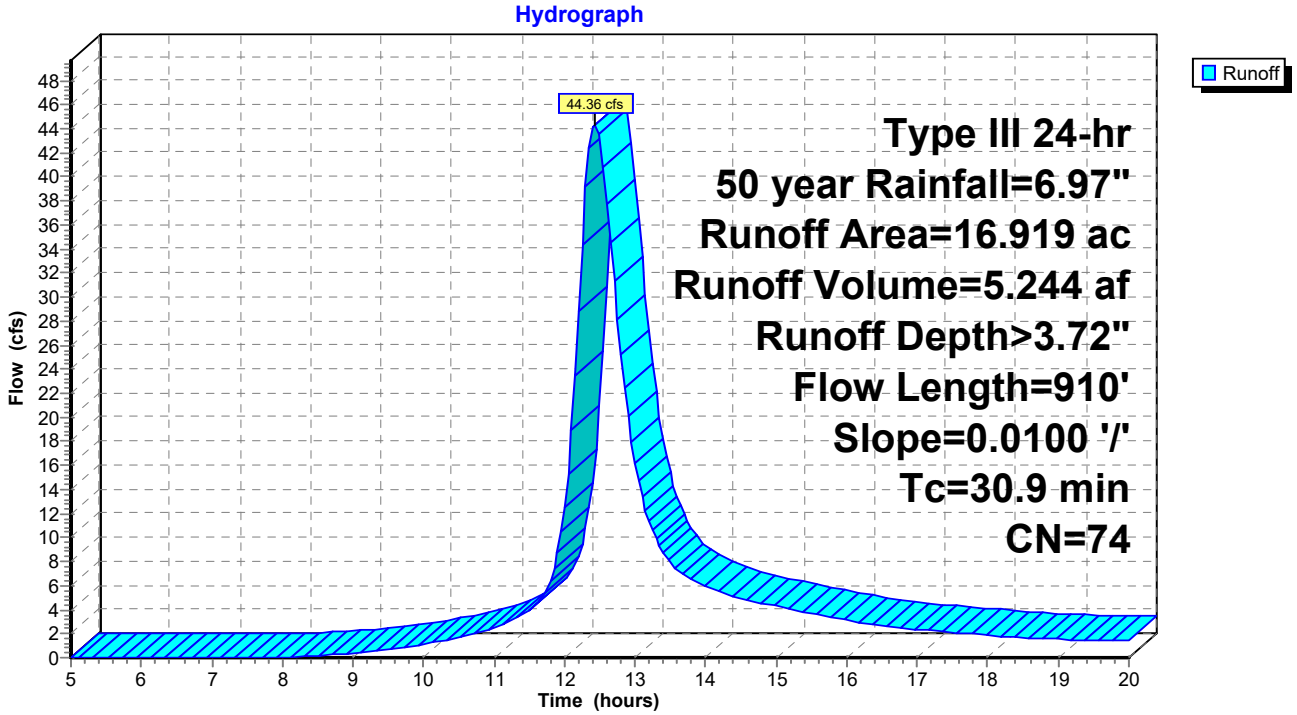
Runoff = 44.36 cfs @ 12.43 hrs, Volume= 5.244 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

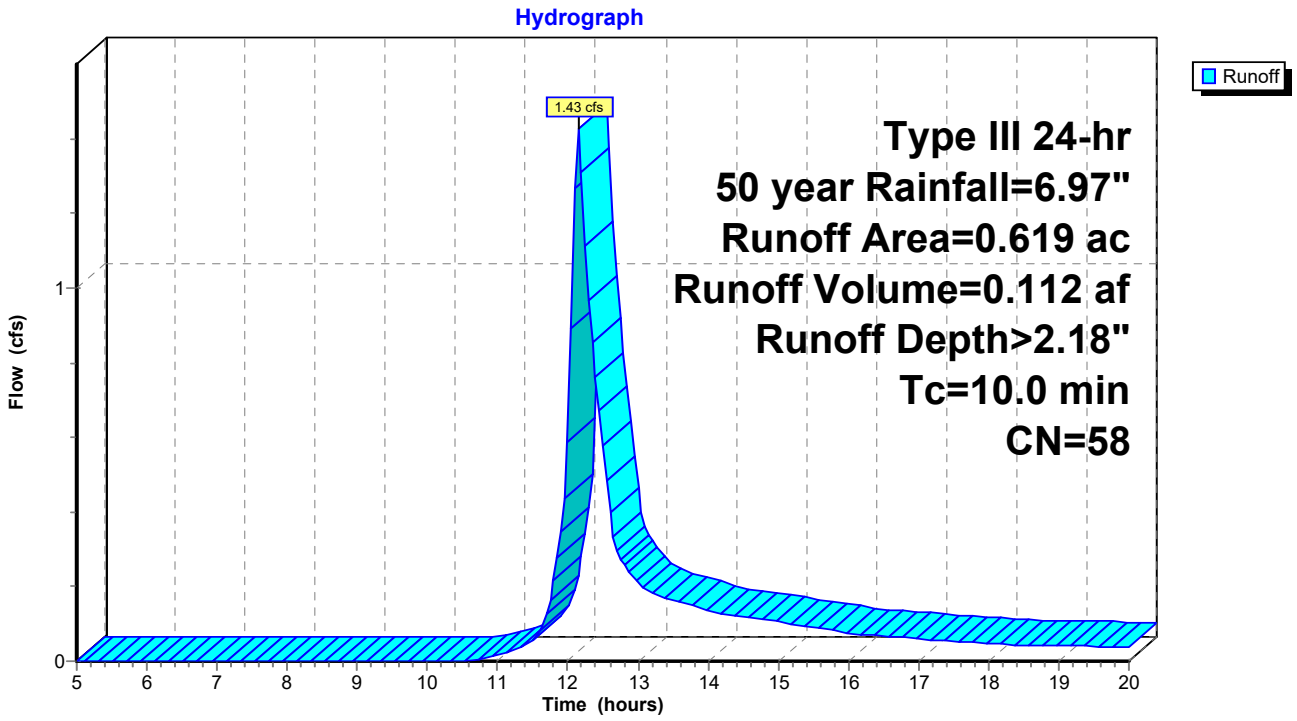
Runoff = 1.43 cfs @ 12.15 hrs, Volume= 0.112 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=6.97"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.30'
[55] Hint: Peak inflow is 696% of Manning's capacity
[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.40'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 2.92" for 50 year event
Inflow = 6.64 cfs @ 12.31 hrs, Volume= 0.757 af
Outflow = 6.48 cfs @ 12.43 hrs, Volume= 0.754 af, Atten= 3%, Lag= 7.3 min

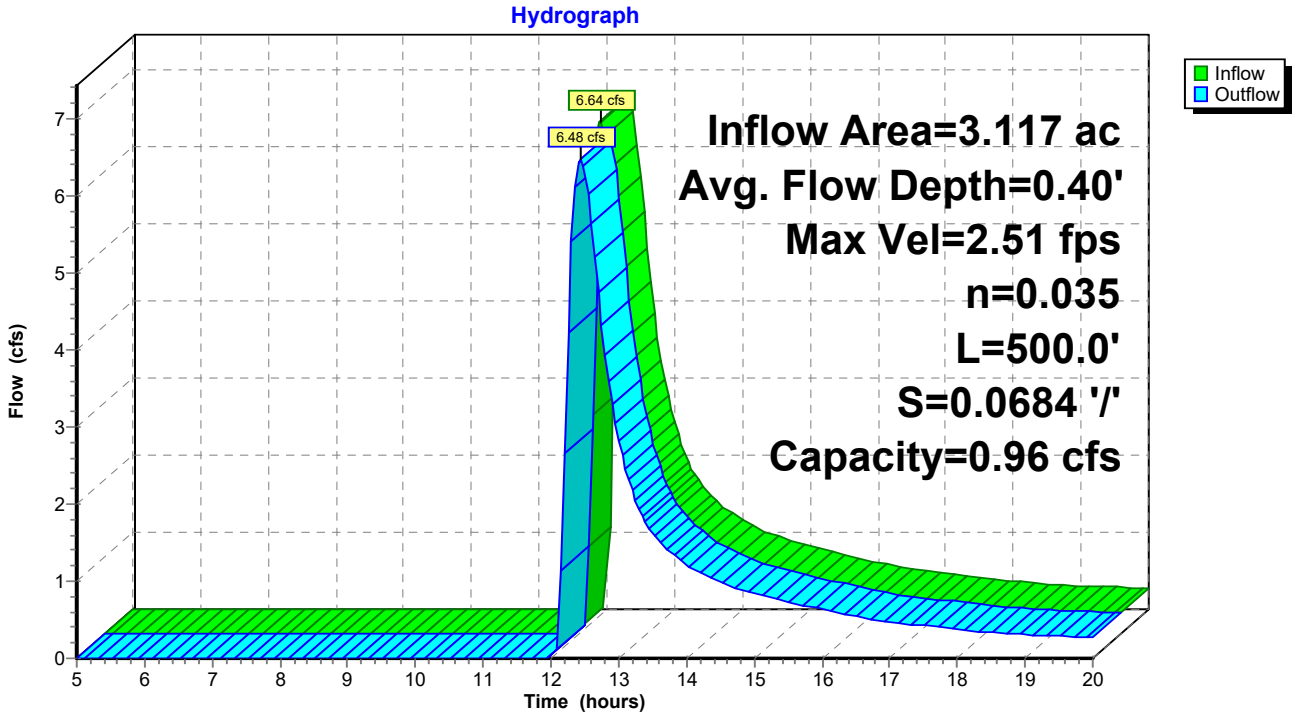
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.51 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.75 fps, Avg. Travel Time= 4.8 min

Peak Storage= 1,291 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 3.34" for 50 year event
Inflow = 11.65 cfs @ 12.12 hrs, Volume= 0.836 af
Outflow = 6.66 cfs @ 12.28 hrs, Volume= 0.698 af, Atten= 43%, Lag= 9.8 min
Primary = 6.66 cfs @ 12.28 hrs, Volume= 0.698 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 194.16' @ 12.28 hrs Surf.Area= 5,992 sf Storage= 16,964 cf (11,641 cf above start)

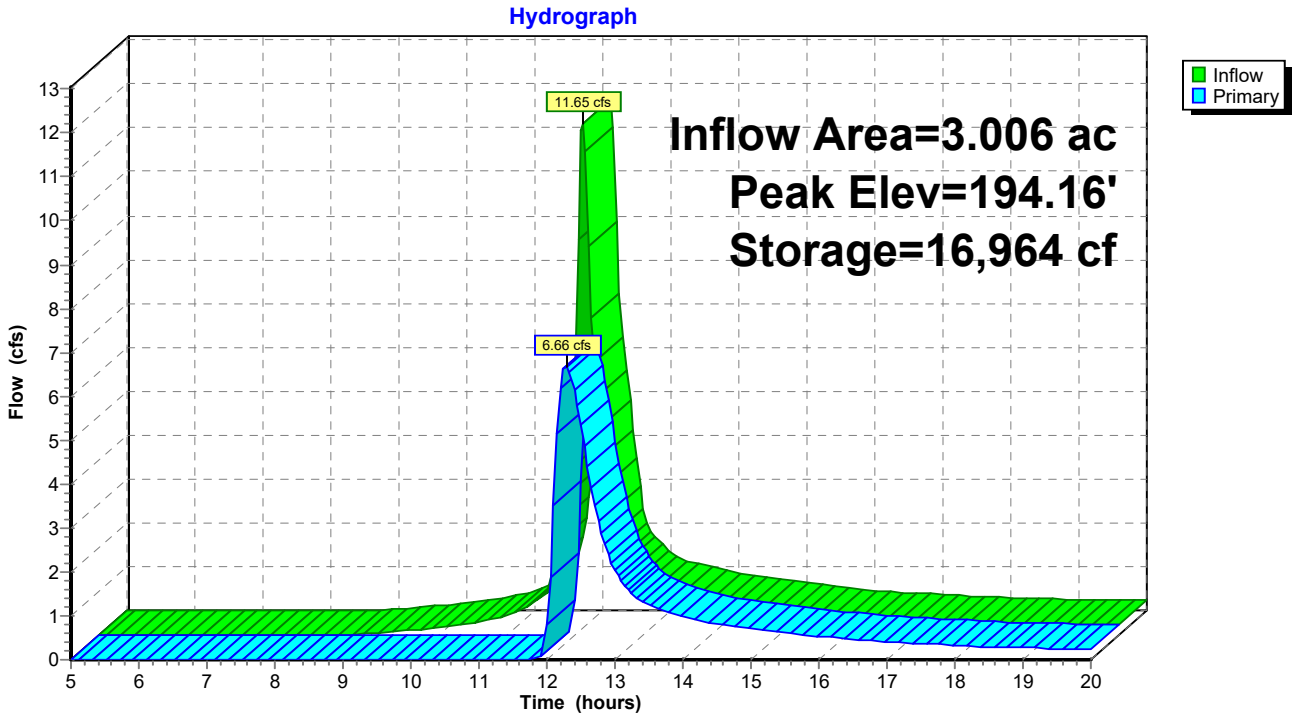
Plug-Flow detention time= 127.6 min calculated for 0.574 af (69% of inflow)
Center-of-Mass det. time= 37.5 min (833.6 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.63 cfs @ 12.28 hrs HW=194.16' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.63 cfs @ 2.87 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area =	2.551 ac,	0.00% Impervious,	Inflow Depth >	3.54"	for 50 year event
Inflow =	9.18 cfs @	12.17 hrs,	Volume=	0.752 af	
Outflow =	4.69 cfs @	12.44 hrs,	Volume=	0.543 af,	Atten= 49%, Lag= 16.2 min
Discarded =	0.38 cfs @	12.44 hrs,	Volume=	0.257 af	
Primary =	4.30 cfs @	12.44 hrs,	Volume=	0.286 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 231.55' @ 12.44 hrs Surf.Area= 4,883 sf Storage= 12,521 cf

Plug-Flow detention time= 119.9 min calculated for 0.542 af (72% of inflow)
Center-of-Mass det. time= 56.8 min (852.7 - 796.0)

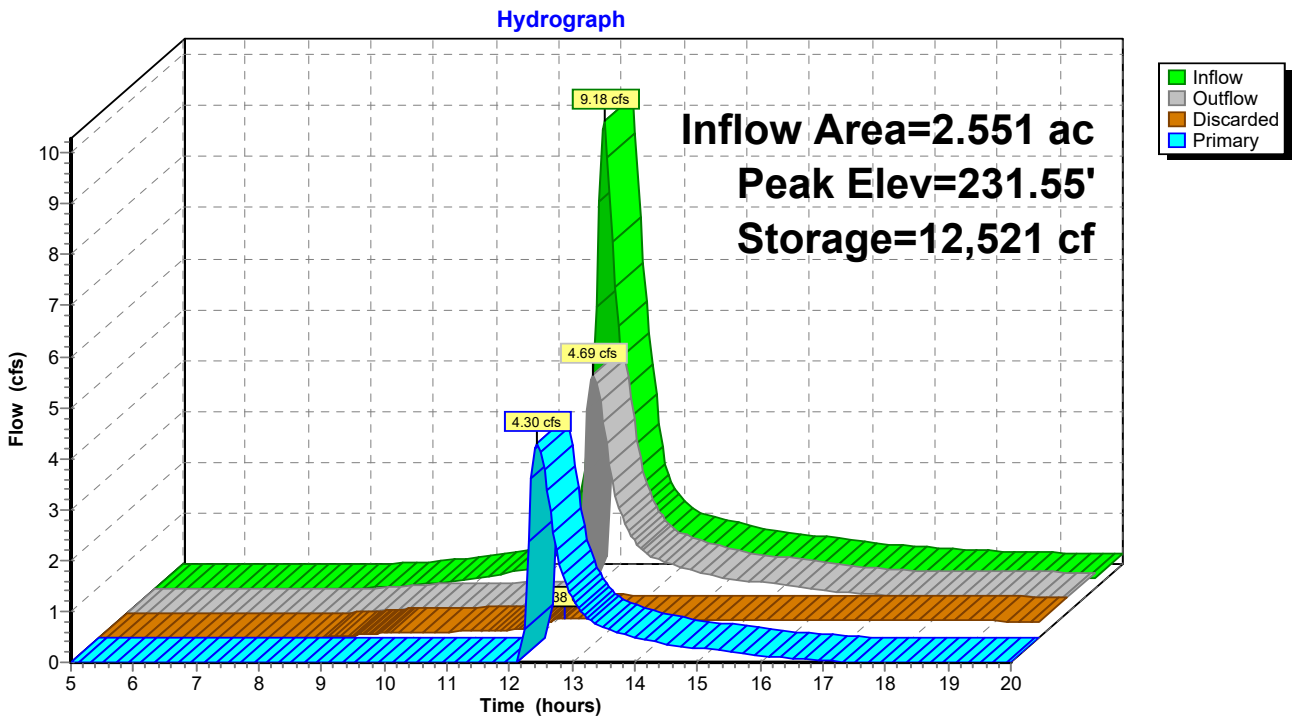
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.38 cfs @ 12.44 hrs HW=231.55' (Free Discharge)
└**2=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=4.29 cfs @ 12.44 hrs HW=231.55' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.29 cfs @ 1.96 fps)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 3.64" for 50 year event
Inflow = 9.32 cfs @ 12.18 hrs, Volume= 0.773 af
Outflow = 4.64 cfs @ 12.45 hrs, Volume= 0.623 af, Atten= 50%, Lag= 16.7 min
Primary = 4.64 cfs @ 12.45 hrs, Volume= 0.623 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 227.95' @ 12.45 hrs Surf.Area= 5,640 sf Storage= 12,896 cf

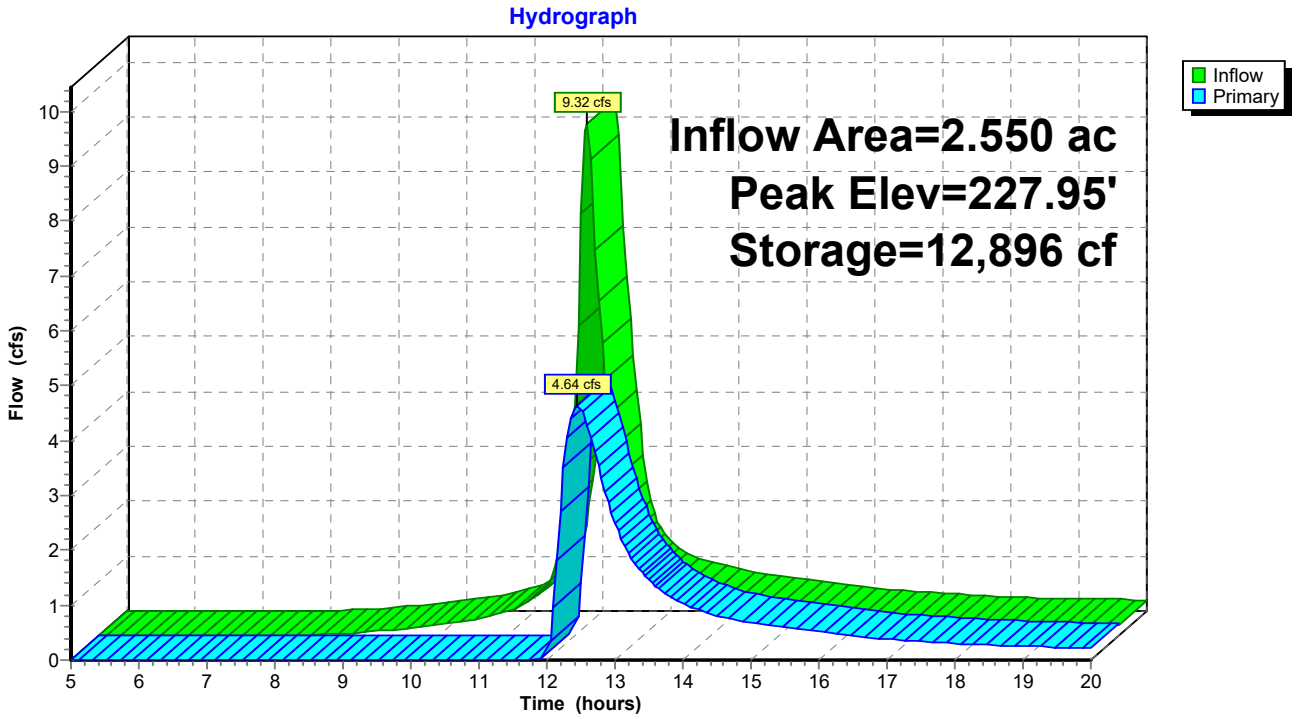
Plug-Flow detention time= 101.0 min calculated for 0.623 af (81% of inflow)
Center-of-Mass det. time= 49.5 min (843.9 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.64 cfs @ 12.45 hrs HW=227.95' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.64 cfs @ 3.20 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 3.63" for 50 year event
Inflow = 19.71 cfs @ 12.22 hrs, Volume= 1.778 af
Outflow = 9.81 cfs @ 12.54 hrs, Volume= 1.160 af, Atten= 50%, Lag= 19.1 min
Primary = 9.81 cfs @ 12.54 hrs, Volume= 1.160 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 188.59' @ 12.54 hrs Surf.Area= 15,134 sf Storage= 54,851 cf (34,415 cf above start)

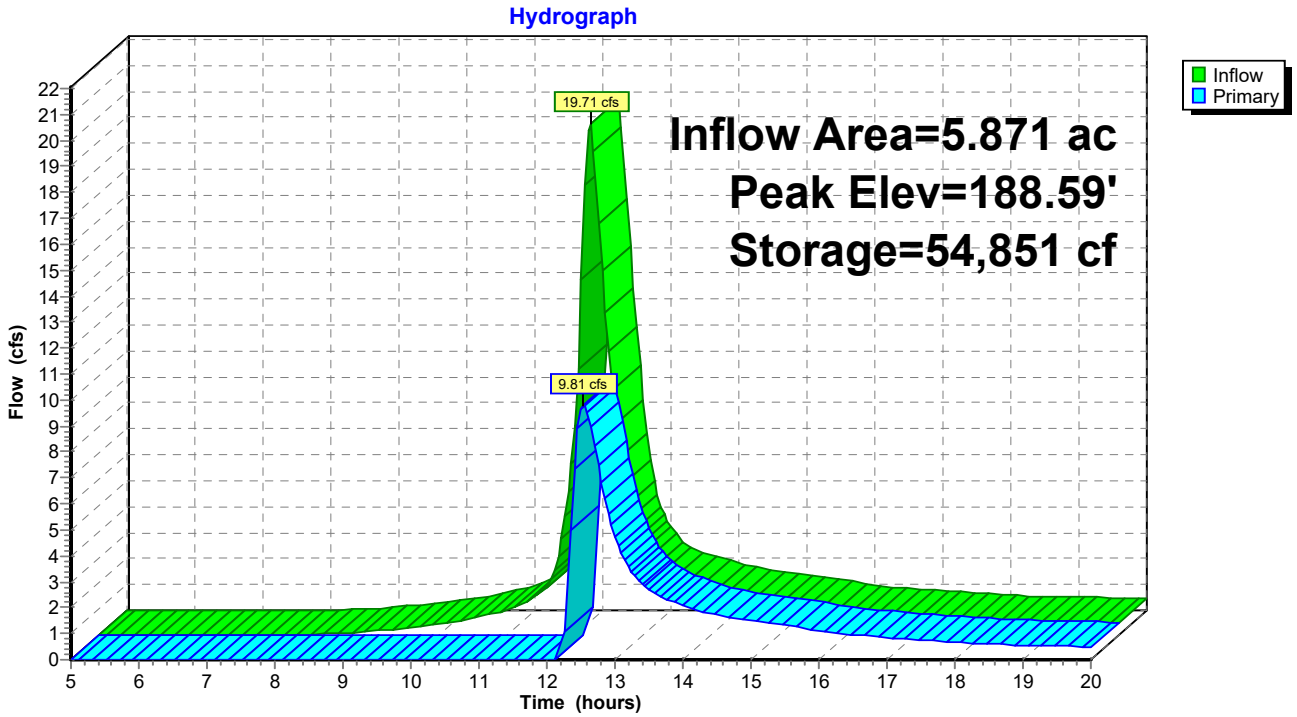
Plug-Flow detention time= 221.1 min calculated for 0.691 af (39% of inflow)
Center-of-Mass det. time= 63.1 min (860.3 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.80 cfs @ 12.54 hrs HW=188.59' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 9.80 cfs @ 2.07 fps)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 3.14" for 50 year event
Inflow = 8.91 cfs @ 12.15 hrs, Volume= 0.689 af
Outflow = 4.28 cfs @ 12.42 hrs, Volume= 0.506 af, Atten= 52%, Lag= 16.1 min
Primary = 4.28 cfs @ 12.42 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 218.86' @ 12.42 hrs Surf.Area= 5,183 sf Storage= 11,564 cf

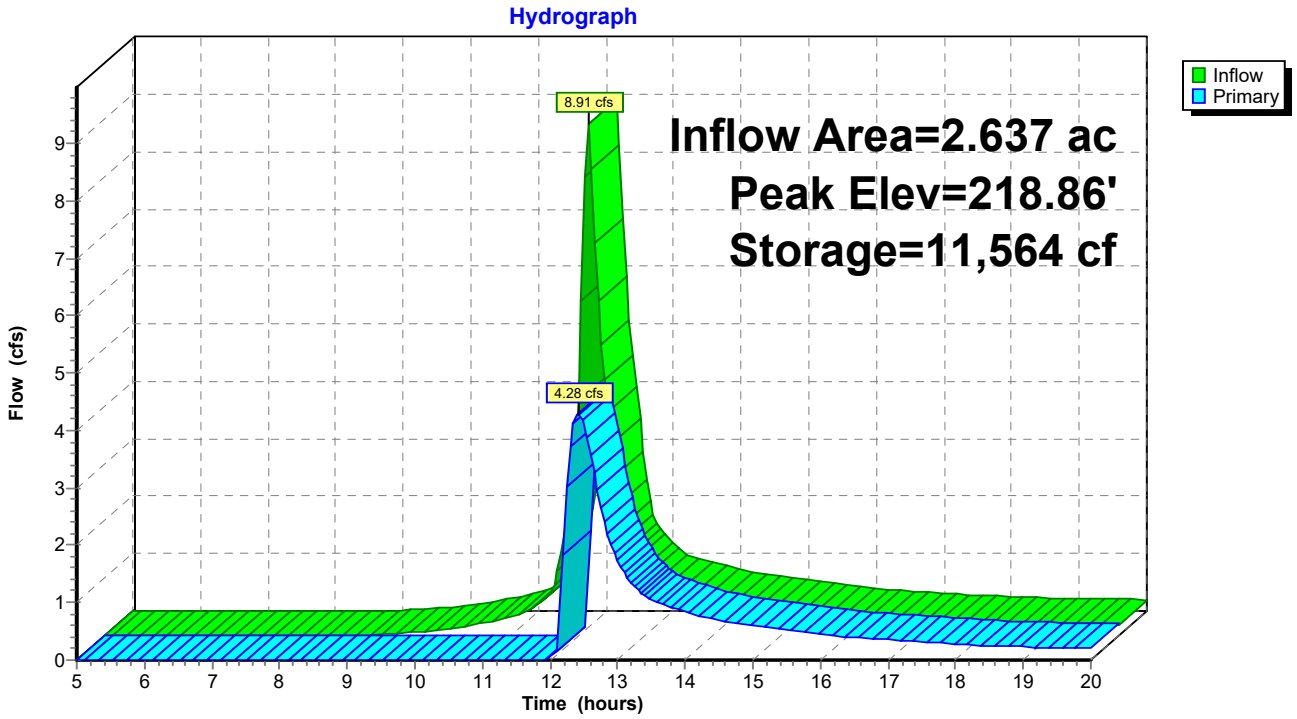
Plug-Flow detention time= 113.0 min calculated for 0.506 af (73% of inflow)
Center-of-Mass det. time= 50.0 min (851.4 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.26 cfs @ 12.42 hrs HW=218.86' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.26 cfs @ 2.48 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 3.64" for 50 year event
Inflow = 13.47 cfs @ 12.12 hrs, Volume= 0.972 af
Outflow = 7.84 cfs @ 12.27 hrs, Volume= 0.745 af, Atten= 42%, Lag= 9.4 min
Primary = 7.84 cfs @ 12.27 hrs, Volume= 0.745 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 209.99' @ 12.27 hrs Surf.Area= 6,386 sf Storage= 21,405 cf (15,109 cf above start)

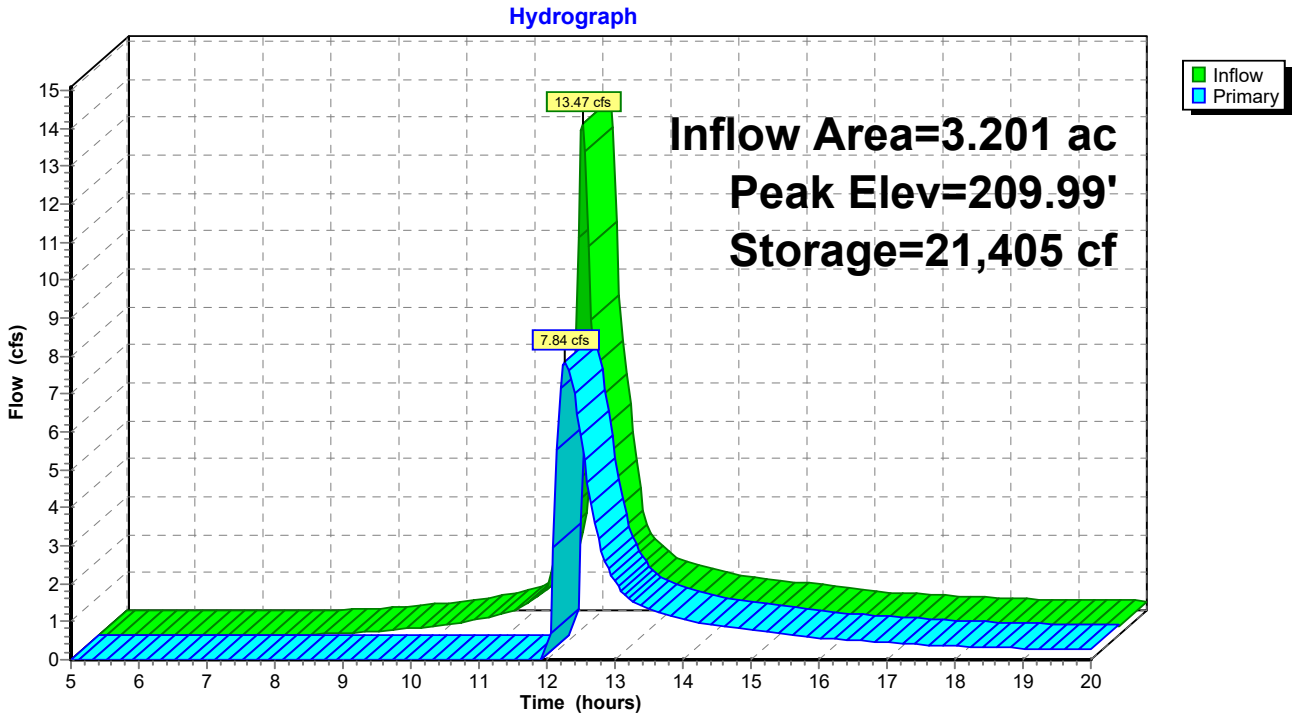
Plug-Flow detention time= 143.9 min calculated for 0.601 af (62% of inflow)
Center-of-Mass det. time= 44.6 min (835.4 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.76 cfs @ 12.27 hrs HW=209.98' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 7.76 cfs @ 2.64 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area =	1.170 ac,	0.00% Impervious,	Inflow Depth >	3.34"	for 50 year event
Inflow =	4.85 cfs @	12.09 hrs,	Volume=	0.326 af	
Outflow =	1.81 cfs @	12.38 hrs,	Volume=	0.255 af,	Atten= 63%, Lag= 17.0 min
Discarded =	0.25 cfs @	12.38 hrs,	Volume=	0.162 af	
Primary =	1.56 cfs @	12.38 hrs,	Volume=	0.093 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.45' @ 12.38 hrs Surf.Area= 2,471 sf Storage= 5,397 cf

Plug-Flow detention time= 128.4 min calculated for 0.255 af (78% of inflow)
Center-of-Mass det. time= 71.9 min (866.2 - 794.3)

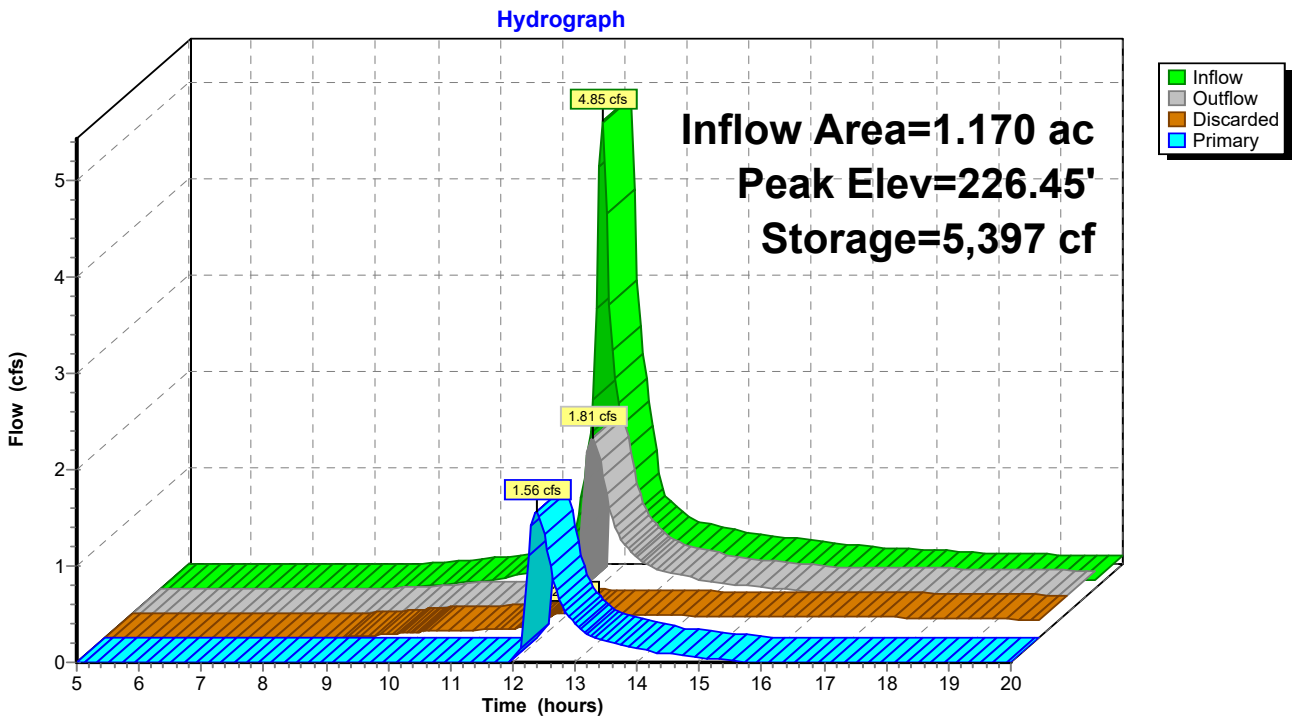
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.25 cfs @ 12.38 hrs HW=226.45' (Free Discharge)
└**2=Exfiltration** (Controls 0.25 cfs)

Primary OutFlow Max=1.55 cfs @ 12.38 hrs HW=226.45' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.55 cfs @ 1.73 fps)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 3.54" for 50 year event
Inflow = 18.00 cfs @ 12.15 hrs, Volume= 1.382 af
Outflow = 9.19 cfs @ 12.38 hrs, Volume= 1.152 af, Atten= 49%, Lag= 13.8 min
Primary = 9.19 cfs @ 12.38 hrs, Volume= 1.152 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.24' @ 12.38 hrs Surf.Area= 8,299 sf Storage= 21,369 cf

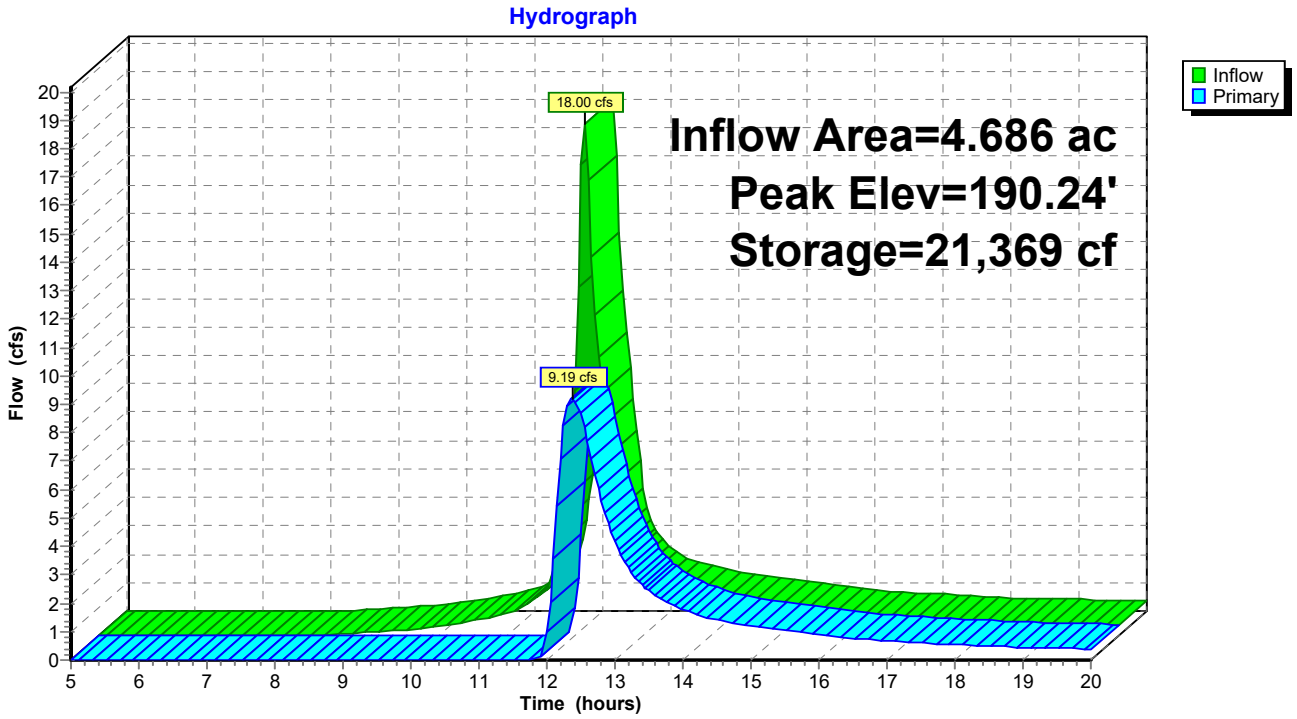
Plug-Flow detention time= 90.5 min calculated for 1.152 af (83% of inflow)
Center-of-Mass det. time= 43.9 min (838.0 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.17 cfs @ 12.38 hrs HW=190.24' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 9.17 cfs @ 3.51 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 3.65" for 50 year event
Inflow = 6.77 cfs @ 12.10 hrs, Volume= 0.462 af
Outflow = 2.35 cfs @ 12.41 hrs, Volume= 0.299 af, Atten= 65%, Lag= 18.7 min
Primary = 2.35 cfs @ 12.41 hrs, Volume= 0.299 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 190.58' @ 12.41 hrs Surf.Area= 4,590 sf Storage= 13,367 cf (9,251 cf above start)

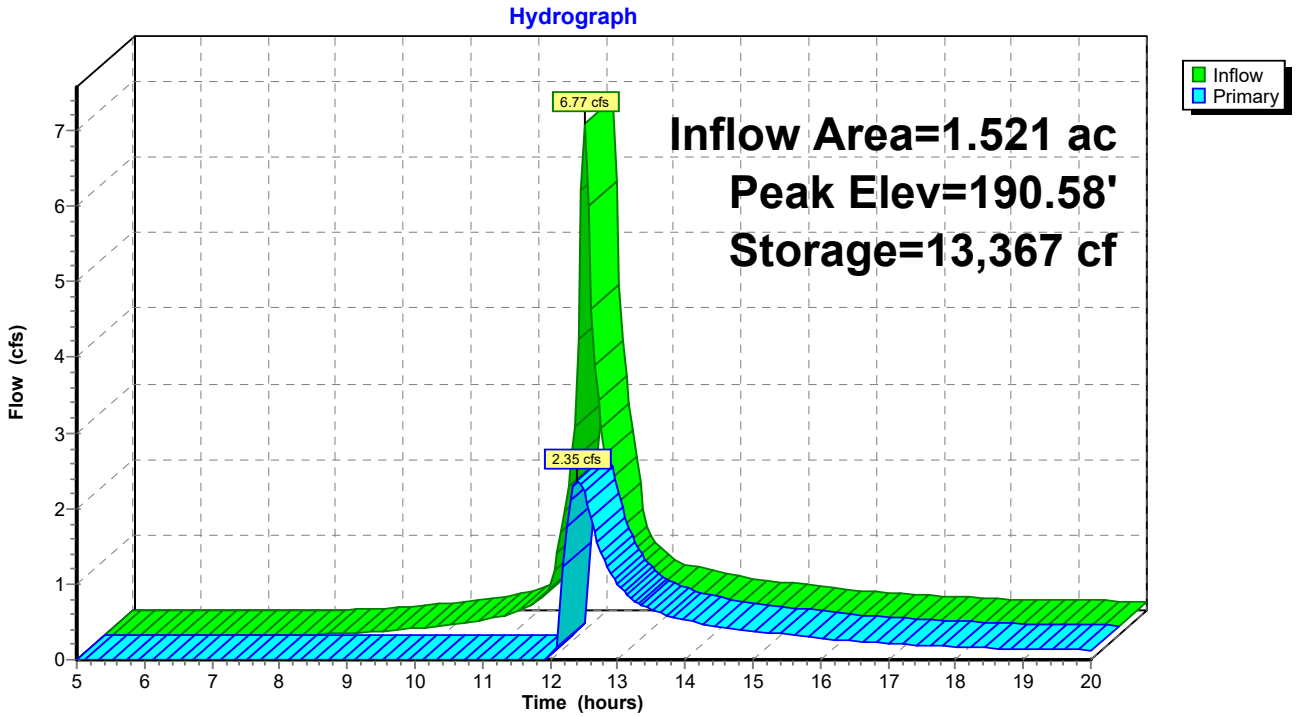
Plug-Flow detention time= 203.1 min calculated for 0.205 af (44% of inflow)
Center-of-Mass det. time= 66.4 min (855.9 - 789.4)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.35 cfs @ 12.41 hrs HW=190.58' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.35 cfs @ 2.03 fps)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 3.54" for 50 year event
Inflow = 8.64 cfs @ 12.16 hrs, Volume= 0.679 af
Outflow = 3.72 cfs @ 12.46 hrs, Volume= 0.470 af, Atten= 57%, Lag= 18.4 min
Primary = 3.72 cfs @ 12.46 hrs, Volume= 0.470 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.28' @ 12.46 hrs Surf.Area= 5,783 sf Storage= 12,789 cf

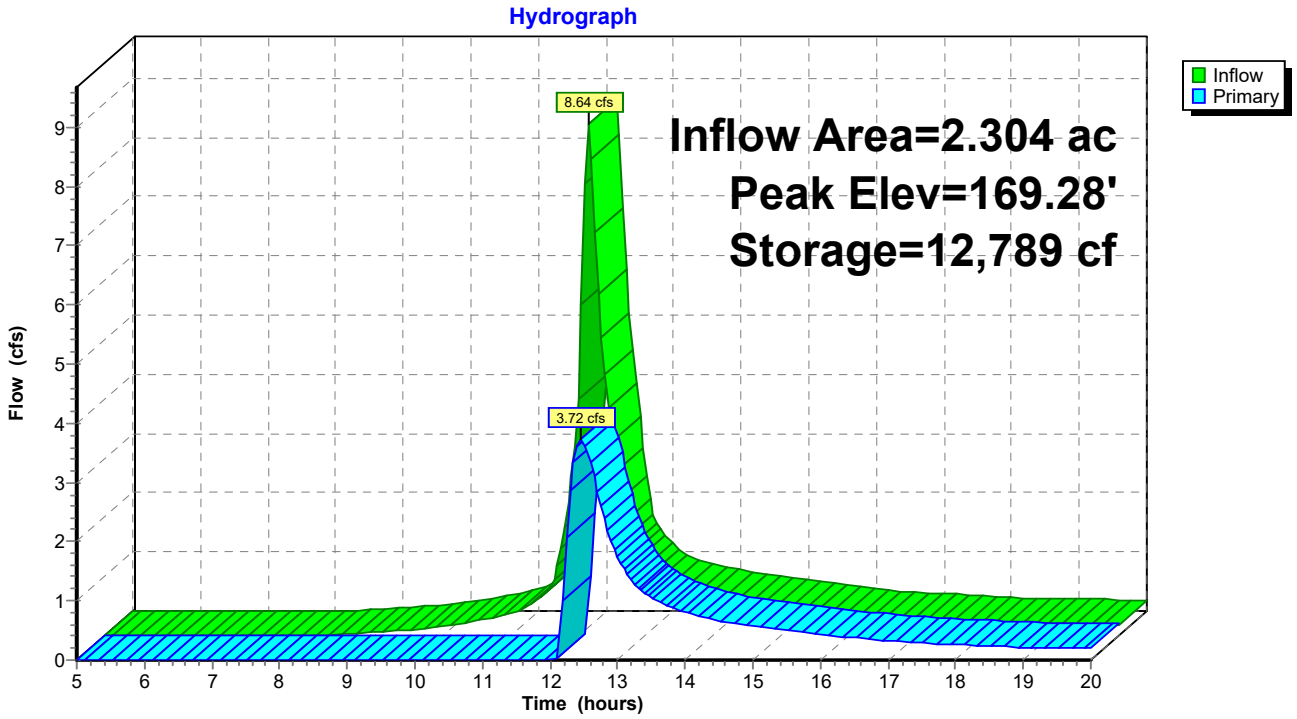
Plug-Flow detention time= 127.2 min calculated for 0.470 af (69% of inflow)
Center-of-Mass det. time= 59.8 min (854.6 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.70 cfs @ 12.46 hrs HW=169.28' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.70 cfs @ 2.37 fps)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 3.75" for 50 year event
Inflow = 5.27 cfs @ 12.08 hrs, Volume= 0.352 af
Outflow = 1.34 cfs @ 12.47 hrs, Volume= 0.198 af, Atten= 75%, Lag= 23.5 min
Primary = 1.34 cfs @ 12.47 hrs, Volume= 0.198 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 152.41' @ 12.47 hrs Surf.Area= 3,792 sf Storage= 9,998 cf (7,955 cf above start)

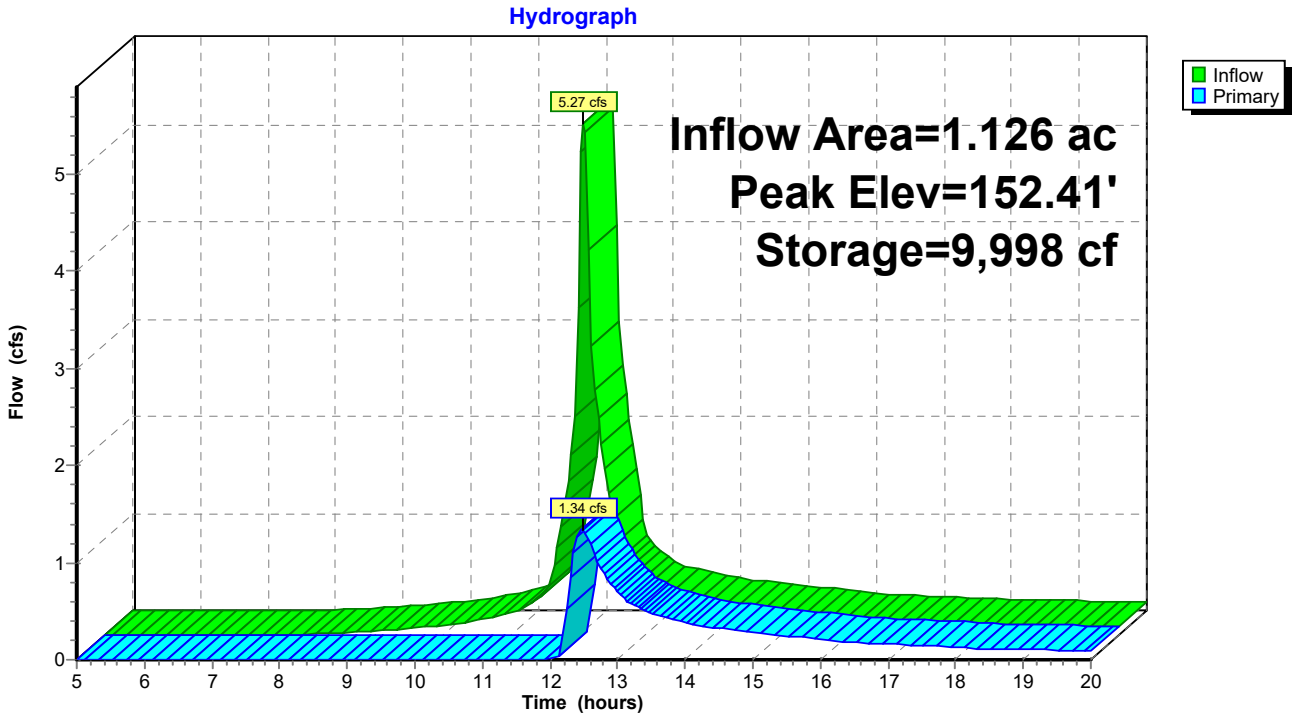
Plug-Flow detention time= 206.4 min calculated for 0.150 af (43% of inflow)
Center-of-Mass det. time= 82.4 min (869.1 - 786.7)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.33 cfs @ 12.47 hrs HW=152.41' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.33 cfs @ 1.63 fps)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 3.44" for 50 year event
Inflow = 14.74 cfs @ 12.12 hrs, Volume= 1.054 af
Outflow = 7.50 cfs @ 12.32 hrs, Volume= 0.854 af, Atten= 49%, Lag= 12.1 min
Primary = 7.50 cfs @ 12.32 hrs, Volume= 0.854 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 159.76' @ 12.32 hrs Surf.Area= 7,452 sf Storage= 23,018 cf (16,182 cf above start)

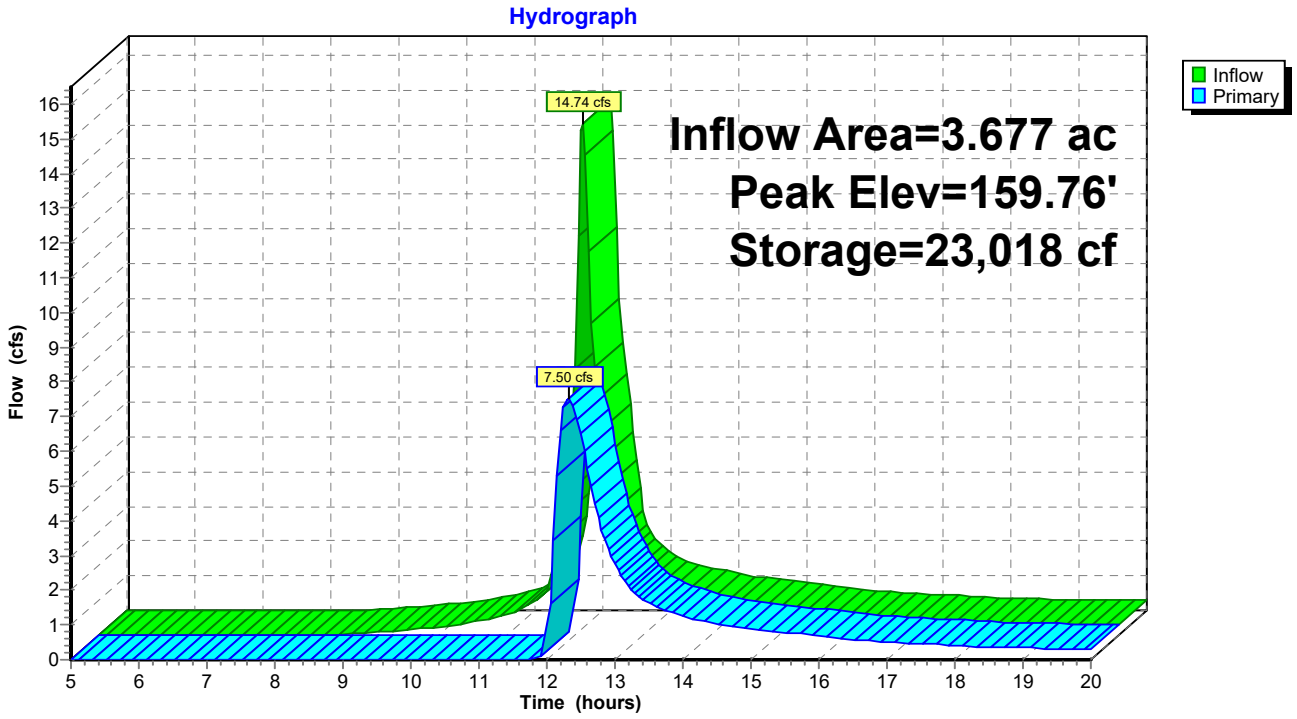
Plug-Flow detention time= 138.1 min calculated for 0.697 af (66% of inflow)
Center-of-Mass det. time= 43.1 min (837.3 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.47 cfs @ 12.32 hrs HW=159.75' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 7.47 cfs @ 2.98 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 3.85" for 50 year event
Inflow = 14.44 cfs @ 12.10 hrs, Volume= 1.001 af
Outflow = 6.64 cfs @ 12.31 hrs, Volume= 0.757 af, Atten= 54%, Lag= 12.6 min
Primary = 6.64 cfs @ 12.31 hrs, Volume= 0.757 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.67' @ 12.31 hrs Surf.Area= 17,825 sf Storage= 17,447 cf

Plug-Flow detention time= 111.6 min calculated for 0.755 af (75% of inflow)
Center-of-Mass det. time= 53.0 min (839.1 - 786.1)

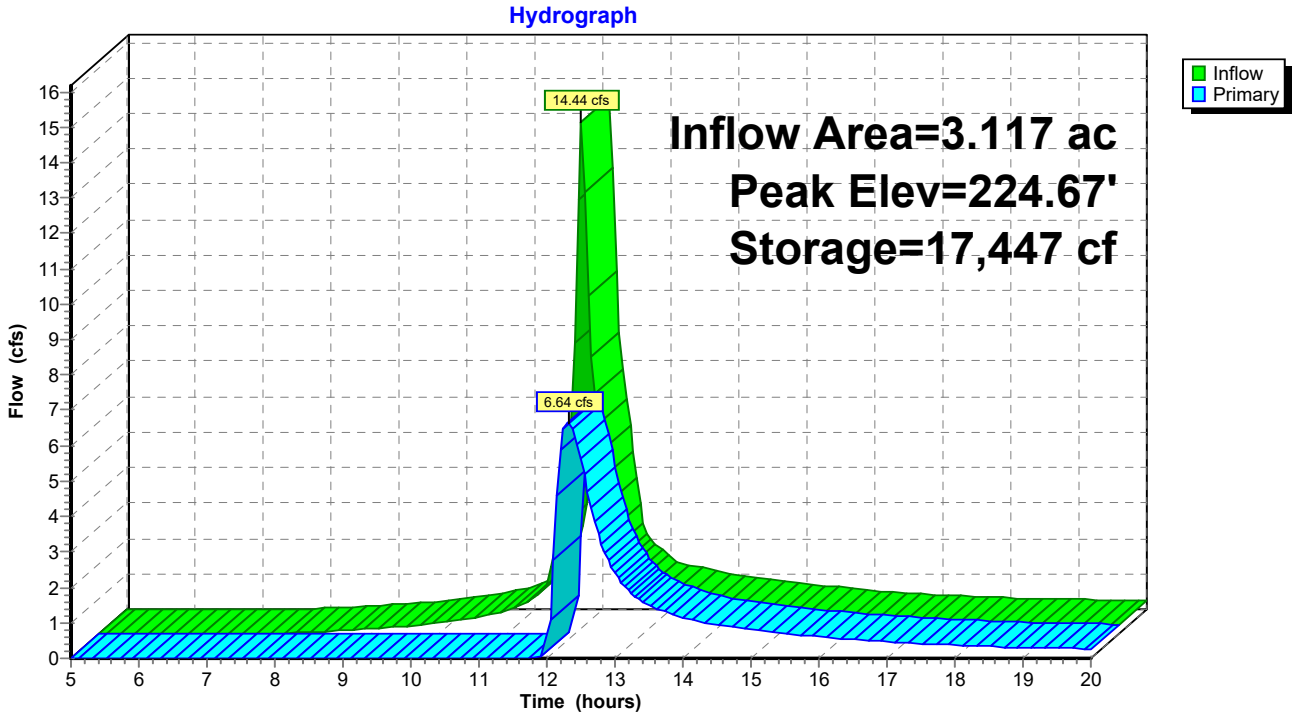
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.62 cfs @ 12.31 hrs HW=224.67' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.62 cfs @ 1.76 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area =	12.425 ac,	0.00% Impervious,	Inflow Depth >	3.46"	for 50 year event
Inflow =	36.98 cfs @	12.17 hrs,	Volume=	3.578 af	
Outflow =	7.30 cfs @	13.02 hrs,	Volume=	2.137 af,	Atten= 80%, Lag= 50.8 min
Discarded =	1.85 cfs @	13.02 hrs,	Volume=	1.336 af	
Primary =	5.45 cfs @	13.02 hrs,	Volume=	0.801 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.41' @ 13.02 hrs Surf.Area= 20,923 sf Storage= 75,679 cf

Plug-Flow detention time= 163.2 min calculated for 2.137 af (60% of inflow)
Center-of-Mass det. time= 84.9 min (889.2 - 804.3)

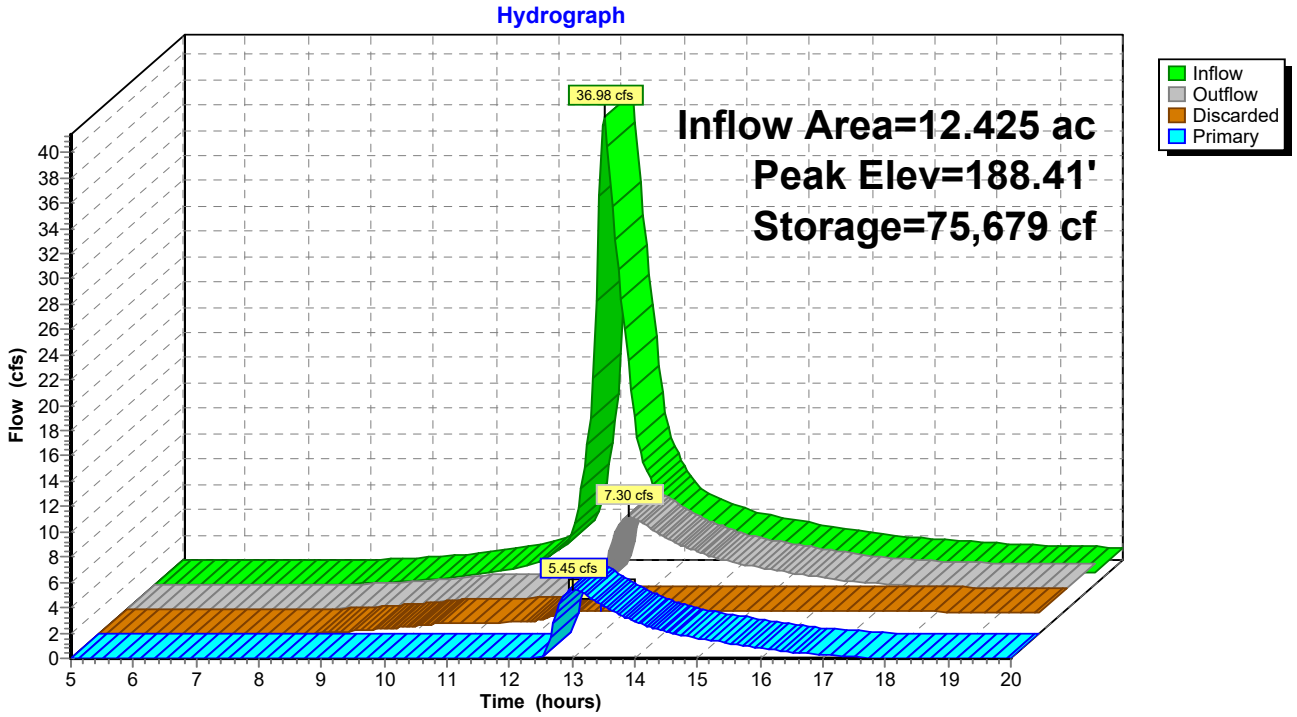
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.85 cfs @ 13.02 hrs HW=188.41' (Free Discharge)
└**2=Exfiltration** (Controls 1.85 cfs)

Primary OutFlow Max=5.43 cfs @ 13.02 hrs HW=188.41' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.43 cfs @ 1.64 fps)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area =	4.438 ac,	0.00% Impervious,	Inflow Depth >	3.04"	for 50 year event
Inflow =	15.00 cfs @	12.14 hrs,	Volume=	1.124 af	
Outflow =	8.23 cfs @	12.34 hrs,	Volume=	0.916 af,	Atten= 45%, Lag= 12.1 min
Discarded =	0.58 cfs @	12.34 hrs,	Volume=	0.343 af	
Primary =	7.64 cfs @	12.34 hrs,	Volume=	0.573 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 191.27' @ 12.34 hrs Surf.Area= 5,022 sf Storage= 15,209 cf

Plug-Flow detention time= 89.5 min calculated for 0.916 af (82% of inflow)
Center-of-Mass det. time= 38.9 min (841.1 - 802.2)

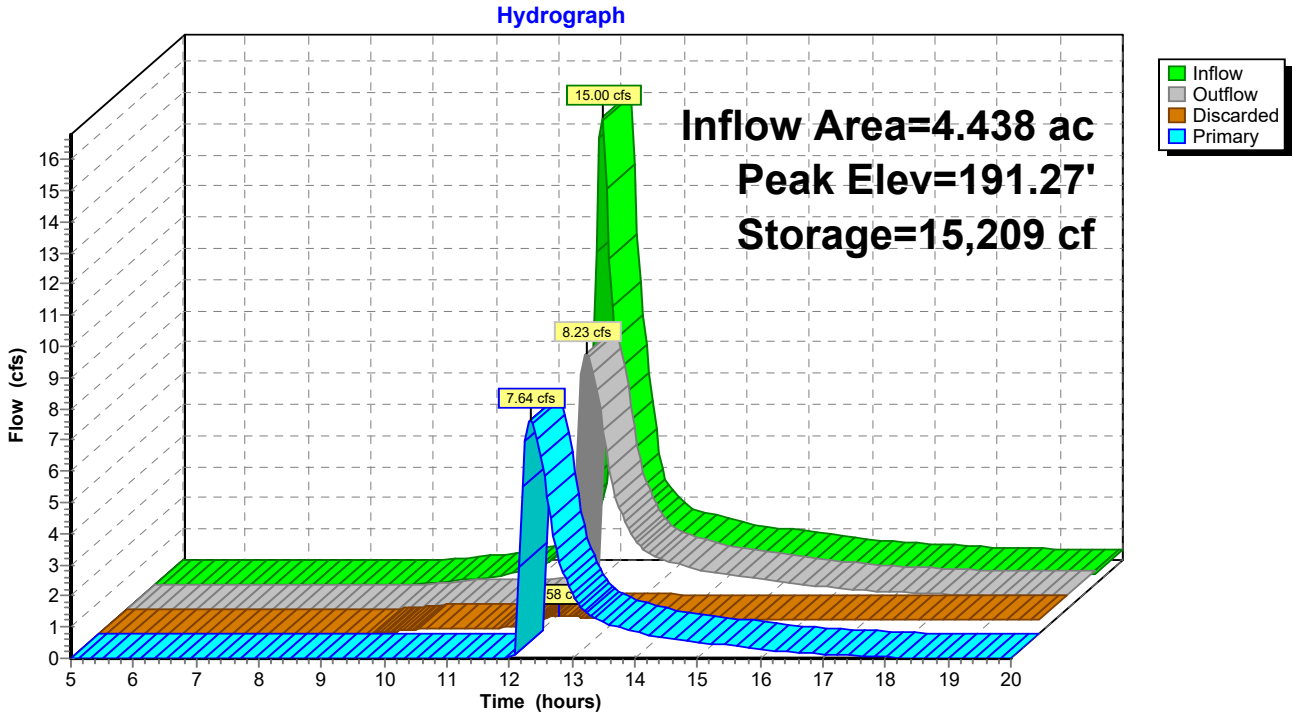
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.58 cfs @ 12.34 hrs HW=191.27' (Free Discharge)
└**2=Exfiltration** (Controls 0.58 cfs)

Primary OutFlow Max=7.61 cfs @ 12.34 hrs HW=191.27' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 7.61 cfs @ 3.00 fps)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 3.72" for 50 year event
Inflow = 44.36 cfs @ 12.43 hrs, Volume= 5.244 af
Outflow = 16.80 cfs @ 12.98 hrs, Volume= 2.849 af, Atten= 62%, Lag= 33.3 min
Primary = 16.80 cfs @ 12.98 hrs, Volume= 2.849 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 196.23' @ 12.98 hrs Surf.Area= 28,866 sf Storage= 151,820 cf (120,564 cf above start)

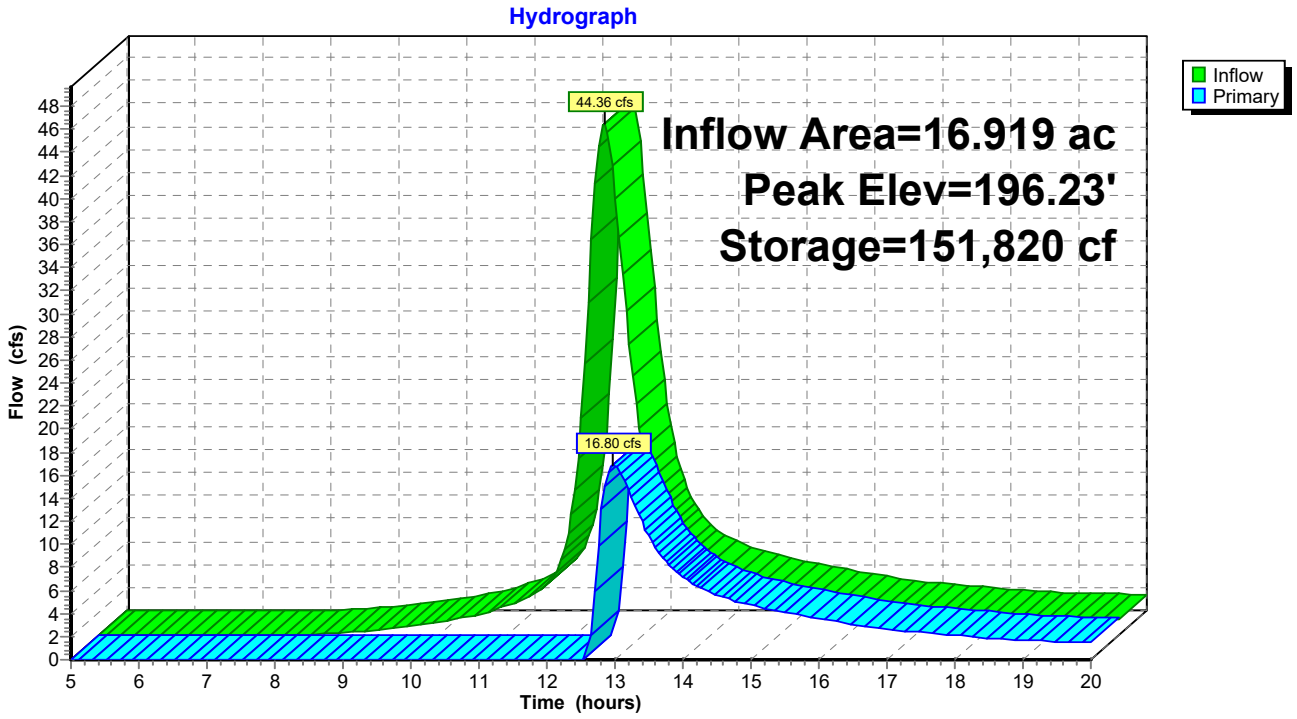
Plug-Flow detention time= 212.3 min calculated for 2.125 af (41% of inflow)
Center-of-Mass det. time= 86.0 min (893.0 - 807.0)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=16.75 cfs @ 12.98 hrs HW=196.23' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 16.75 cfs @ 2.29 fps)

Pond 16P: Pond 16



100-Year Storm Event – Proposed

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.006 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=470' Slope=0.0800 '/' Tc=8.0 min CN=70 Runoff=13.97 cfs 1.004 af

Subcatchment2: Subcat 2 Runoff Area=2.551 ac 0.00% Impervious Runoff Depth>4.22"
Flow Length=430' Tc=12.4 min CN=72 Runoff=10.93 cfs 0.897 af

Subcatchment2A: Subcat 2A Runoff Area=0.775 ac 0.00% Impervious Runoff Depth>3.46"
Tc=10.0 min CN=65 Runoff=2.92 cfs 0.224 af

Subcatchment3: Subcat 3 Runoff Area=2.550 ac 0.00% Impervious Runoff Depth>4.33"
Flow Length=620' Tc=12.6 min CN=73 Runoff=11.13 cfs 0.920 af

Subcatchment3A: Subcat 3A Runoff Area=0.324 ac 0.00% Impervious Runoff Depth>4.78"
Tc=10.0 min CN=77 Runoff=1.66 cfs 0.129 af

Subcatchment4: Subcat 4 Runoff Area=5.871 ac 0.00% Impervious Runoff Depth>4.33"
Flow Length=810' Tc=16.2 min CN=73 Runoff=23.39 cfs 2.117 af

Subcatchment5: Subcat 5 Runoff Area=2.637 ac 0.00% Impervious Runoff Depth>3.79"
Flow Length=510' Slope=0.0500 '/' Tc=10.4 min CN=68 Runoff=10.76 cfs 0.832 af

Subcatchment6: Subcat 6 Runoff Area=3.201 ac 0.00% Impervious Runoff Depth>4.34"
Flow Length=420' Slope=0.0700 '/' Tc=8.1 min CN=73 Runoff=15.98 cfs 1.157 af

Subcatchment6A: Subcat 6A Runoff Area=0.915 ac 0.00% Impervious Runoff Depth>3.68"
Tc=10.0 min CN=67 Runoff=3.67 cfs 0.280 af

Subcatchment6B: Subcat 6B Runoff Area=0.030 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.09 cfs 0.007 af

Subcatchment6C: Subcat 6C Runoff Area=0.694 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=2.03 cfs 0.158 af

Subcatchment7: Subcat 7 Runoff Area=1.170 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=200' Slope=0.0800 '/' Tc=5.8 min CN=70 Runoff=5.81 cfs 0.391 af

Subcatchment7A: Subcat 7A Runoff Area=0.202 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.59 cfs 0.046 af

Subcatchment8: Subcat 8 Runoff Area=4.686 ac 0.00% Impervious Runoff Depth>4.22"
Flow Length=650' Tc=10.1 min CN=72 Runoff=21.42 cfs 1.650 af

Subcatchment8A: Subcat 8A Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=2.26 cfs 0.175 af

Subcatchment9: Subcat 9 Runoff Area=1.521 ac 0.00% Impervious Runoff Depth>4.34"
Flow Length=230' Slope=0.0700 '/' Tc=6.4 min CN=73 Runoff=8.02 cfs 0.550 af

Subcatchment9A: Subcat 9A Runoff Area=0.259 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.76 cfs 0.059 af

Subcatchment10: Subcat 10 Runoff Area=2.304 ac 0.00% Impervious Runoff Depth>4.22"
Flow Length=410' Tc=11.0 min CN=72 Runoff=10.28 cfs 0.811 af

Subcatchment10A: Subcat 10A Runoff Area=0.287 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=0.84 cfs 0.065 af

Subcatchment11: Subcat 11 Runoff Area=1.126 ac 0.00% Impervious Runoff Depth>4.45"
Flow Length=210' Slope=0.1000 '/' Tc=5.3 min CN=74 Runoff=6.23 cfs 0.418 af

Subcatchment11A: Subcat 11A Runoff Area=0.428 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=1.25 cfs 0.097 af

Subcatchment12: Subcat 12 Runoff Area=3.677 ac 0.00% Impervious Runoff Depth>4.12"
Flow Length=500' Slope=0.0900 '/' Tc=7.9 min CN=71 Runoff=17.60 cfs 1.262 af

Subcatchment13.1: Subcat 13.1 Runoff Area=3.117 ac 0.00% Impervious Runoff Depth>4.56"
Flow Length=320' Slope=0.0800 '/' Tc=6.8 min CN=75 Runoff=17.02 cfs 1.185 af

Subcatchment13.2: Subcat 13.2 Runoff Area=9.308 ac 0.00% Impervious Runoff Depth>4.33"
Flow Length=800' Slope=0.0700 '/' Tc=11.5 min CN=73 Runoff=41.96 cfs 3.361 af

Subcatchment14: Subcat 14 Runoff Area=4.438 ac 0.00% Impervious Runoff Depth>3.68"
Flow Length=500' Tc=9.1 min CN=67 Runoff=18.18 cfs 1.361 af

Subcatchment16: Subcat 16 Runoff Area=16.919 ac 0.00% Impervious Runoff Depth>4.42"
Flow Length=910' Slope=0.0100 '/' Tc=30.9 min CN=74 Runoff=52.49 cfs 6.227 af

Subcatchment16A: Subcat 16A Runoff Area=0.619 ac 0.00% Impervious Runoff Depth>2.73"
Tc=10.0 min CN=58 Runoff=1.81 cfs 0.141 af

Reach 13.1R: Reach 13.1 Avg. Flow Depth=0.53' Max Vel=2.55 fps Inflow=9.16 cfs 0.940 af
n=0.035 L=500.0' S=0.0684 '/' Capacity=0.96 cfs Outflow=8.84 cfs 0.936 af

Pond 1P: Pond 1 Peak Elev=194.38' Storage=18,345 cf Inflow=13.97 cfs 1.004 af
Outflow=8.64 cfs 0.864 af

Pond 2P: Pond 2 Peak Elev=231.72' Storage=13,352 cf Inflow=10.93 cfs 0.897 af
Discarded=0.40 cfs 0.266 af Primary=6.50 cfs 0.415 af Outflow=6.90 cfs 0.681 af

Pond 3P: Pond 3 Peak Elev=228.23' Storage=14,478 cf Inflow=11.13 cfs 0.920 af
Outflow=6.04 cfs 0.768 af

Pond 4P: Pond 4 Peak Elev=188.76' Storage=57,384 cf Inflow=23.39 cfs 2.117 af
Outflow=14.21 cfs 1.496 af

Pond 5P: Pond 5 Peak Elev=219.09' Storage=12,784 cf Inflow=10.76 cfs 0.832 af
Outflow=6.09 cfs 0.648 af

Pond 6P: Pond 6 Peak Elev=210.20' Storage=22,788 cf Inflow=15.98 cfs 1.157 af
Outflow=10.50 cfs 0.929 af

Pond 7P: Pond 7 Peak Elev=226.61' Storage=5,802 cf Inflow=5.81 cfs 0.391 af
Discarded=0.26 cfs 0.169 af Primary=2.57 cfs 0.146 af Outflow=2.84 cfs 0.314 af

Pond 8P: Pond 8 Peak Elev=190.56' Storage=24,022 cf Inflow=21.42 cfs 1.650 af
Outflow=11.88 cfs 1.416 af

Pond 9P: Pond 9 Peak Elev=190.75' Storage=14,188 cf Inflow=8.02 cfs 0.550 af
Outflow=3.52 cfs 0.386 af

Pond 10P: Pond 10 Peak Elev=169.50' Storage=14,040 cf Inflow=10.28 cfs 0.811 af
Outflow=5.31 cfs 0.600 af

Pond 11P: Pond 11 Peak Elev=152.56' Storage=10,577 cf Inflow=6.23 cfs 0.418 af
Outflow=2.24 cfs 0.263 af

Pond 12P: Pond 12 Peak Elev=160.01' Storage=24,964 cf Inflow=17.60 cfs 1.262 af
Outflow=9.87 cfs 1.059 af

Pond 13.1P: Pond 13.1 Peak Elev=224.77' Storage=19,219 cf Inflow=17.02 cfs 1.185 af
Outflow=9.16 cfs 0.940 af

Pond 13P: Pond 13 Peak Elev=188.71' Storage=81,861 cf Inflow=45.84 cfs 4.297 af
Discarded=1.92 cfs 1.387 af Primary=12.75 cfs 1.428 af Outflow=14.67 cfs 2.815 af

Pond 14P: Pond 14 Peak Elev=191.61' Storage=16,929 cf Inflow=18.18 cfs 1.361 af
Discarded=0.62 cfs 0.358 af Primary=10.82 cfs 0.787 af Outflow=11.44 cfs 1.145 af

Pond 16P: Pond 16 Peak Elev=196.51' Storage=160,095 cf Inflow=52.49 cfs 6.227 af
Outflow=27.30 cfs 3.823 af

Total Runoff Area = 73.385 ac Runoff Volume = 25.524 af Average Runoff Depth = 4.17"
100.00% Pervious = 73.385 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

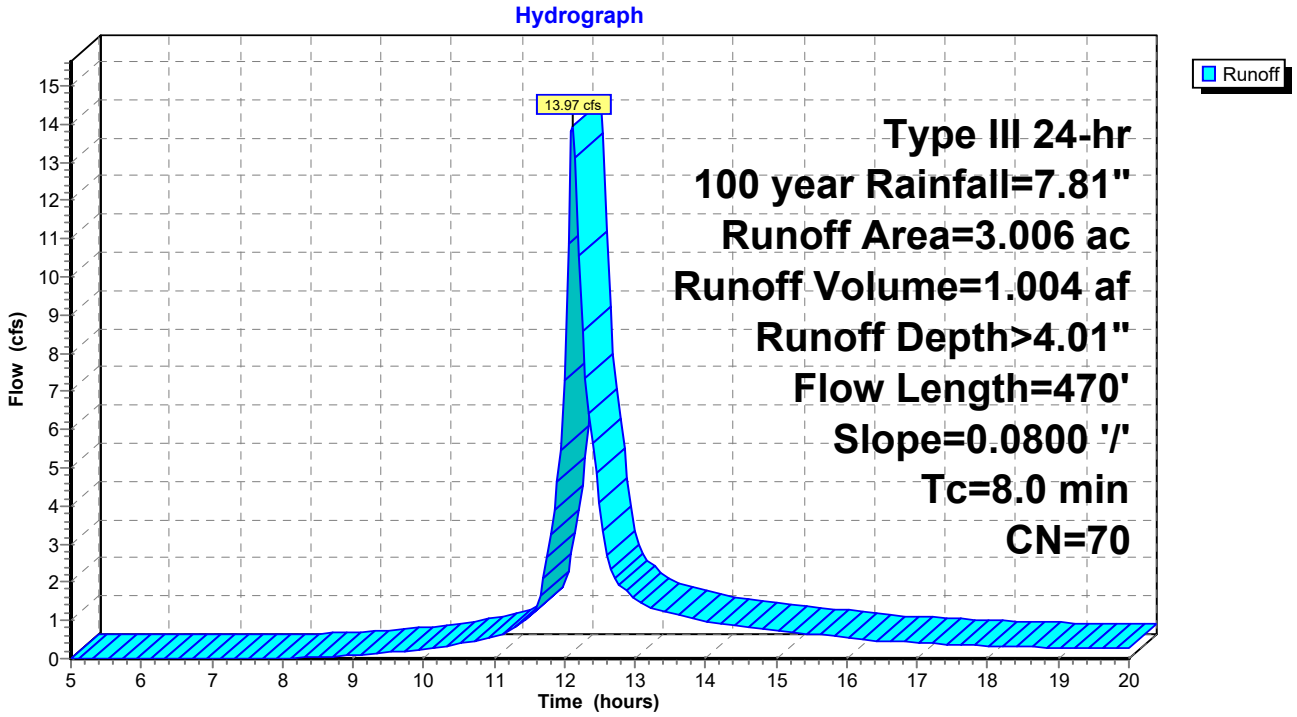
Runoff = 13.97 cfs @ 12.12 hrs, Volume= 1.004 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.756	74	>75% Grass cover, Good, HSG C
0.217	96	Gravel surface, HSG C
1.033	58	Meadow, non-grazed, HSG B
3.006	70	Weighted Average
3.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.5	420	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	470	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

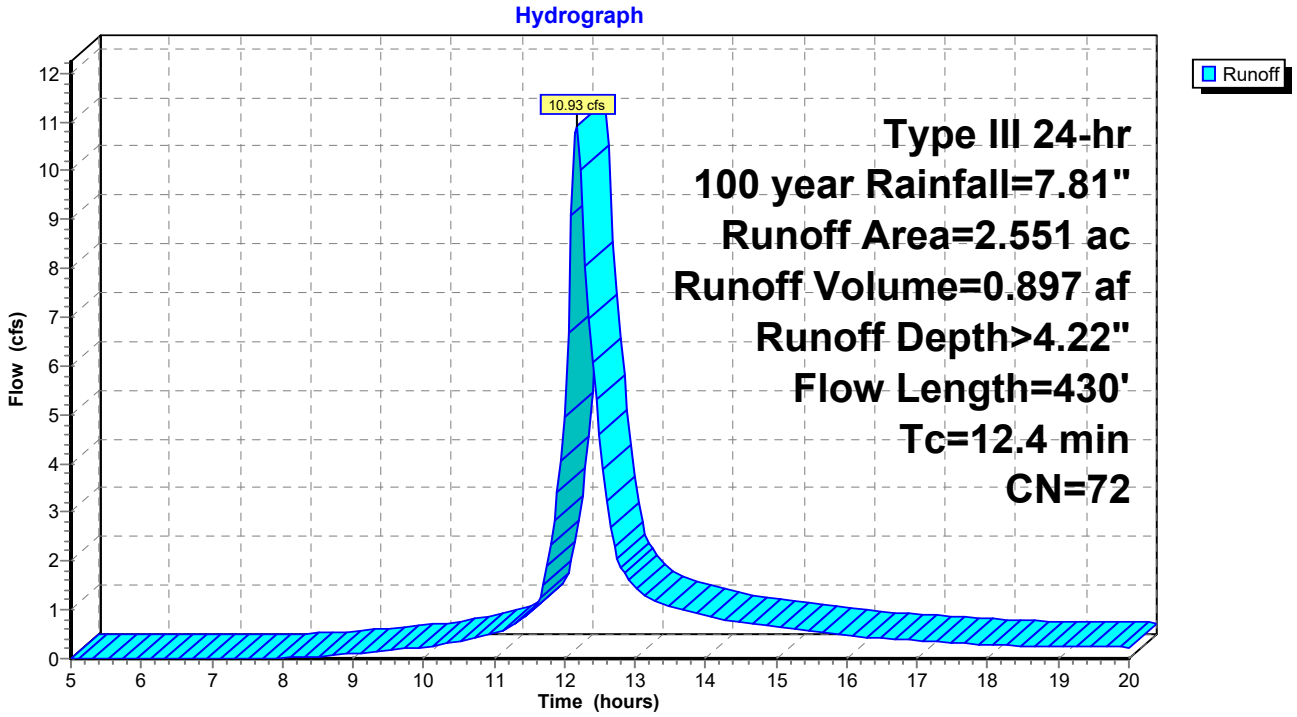
Runoff = 10.93 cfs @ 12.17 hrs, Volume= 0.897 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.748	74	>75% Grass cover, Good, HSG C
0.237	96	Gravel surface, HSG C
0.566	58	Meadow, non-grazed, HSG B
2.551	72	Weighted Average
2.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.5	380	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	430	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 2A: Subcat 2A

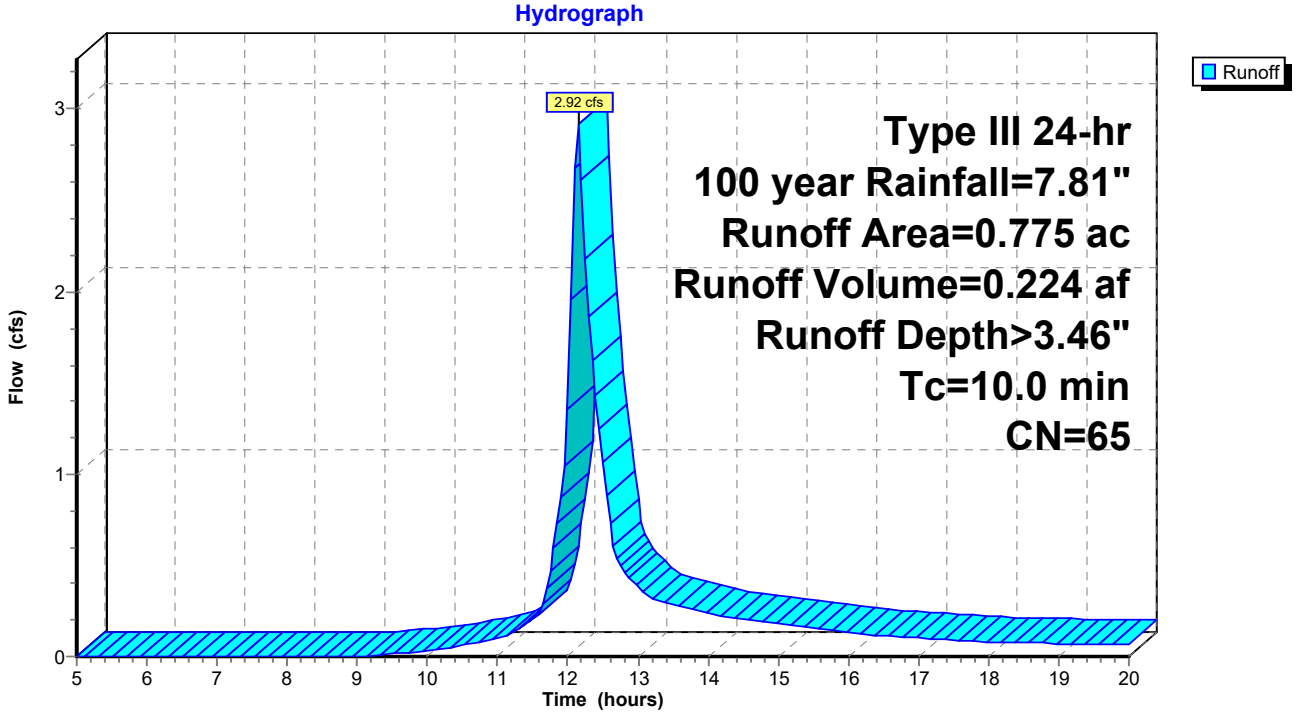
Runoff = 2.92 cfs @ 12.15 hrs, Volume= 0.224 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	96	Gravel surface, HSG B
0.488	58	Meadow, non-grazed, HSG B
0.287	78	Meadow, non-grazed, HSG D
0.775	65	Weighted Average
0.775		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 3: Subcat 3

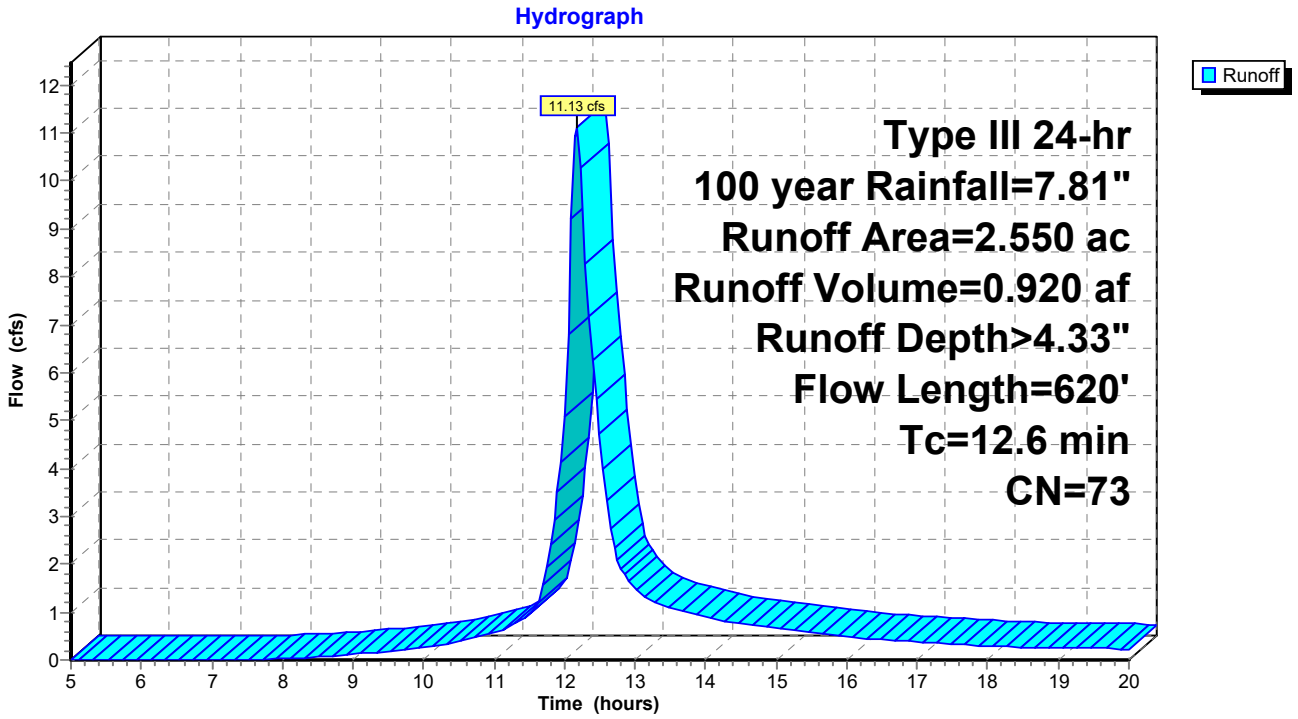
Runoff = 11.13 cfs @ 12.17 hrs, Volume= 0.920 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.135	74	>75% Grass cover, Good, HSG C
0.110	96	Gravel surface, HSG C
0.271	58	Meadow, non-grazed, HSG B
0.034	78	Meadow, non-grazed, HSG D
2.550	73	Weighted Average
2.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.0	500	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.6	620	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 3A: Subcat 3A

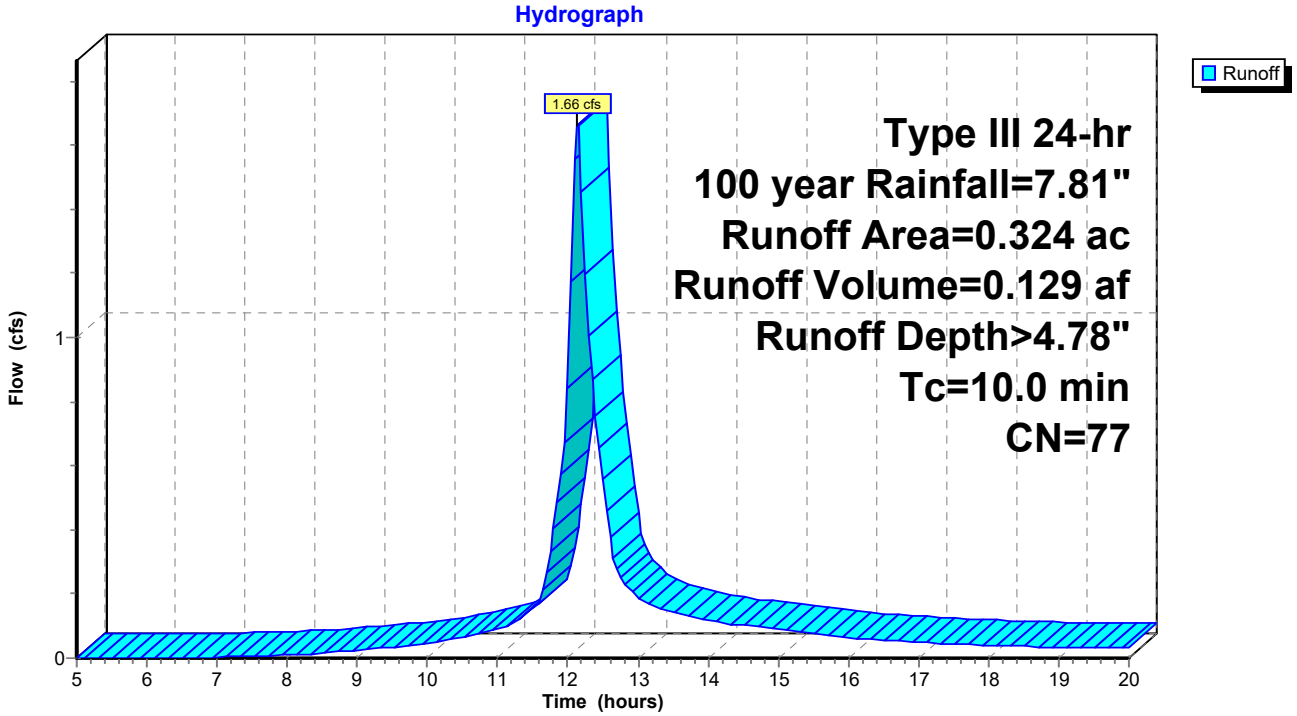
Runoff = 1.66 cfs @ 12.14 hrs, Volume= 0.129 af, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.009	58	Meadow, non-grazed, HSG B
0.315	78	Meadow, non-grazed, HSG D
0.324	77	Weighted Average
0.324		100.00% Pervious Area

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

Subcatchment 3A: Subcat 3A



Summary for Subcatchment 4: Subcat 4

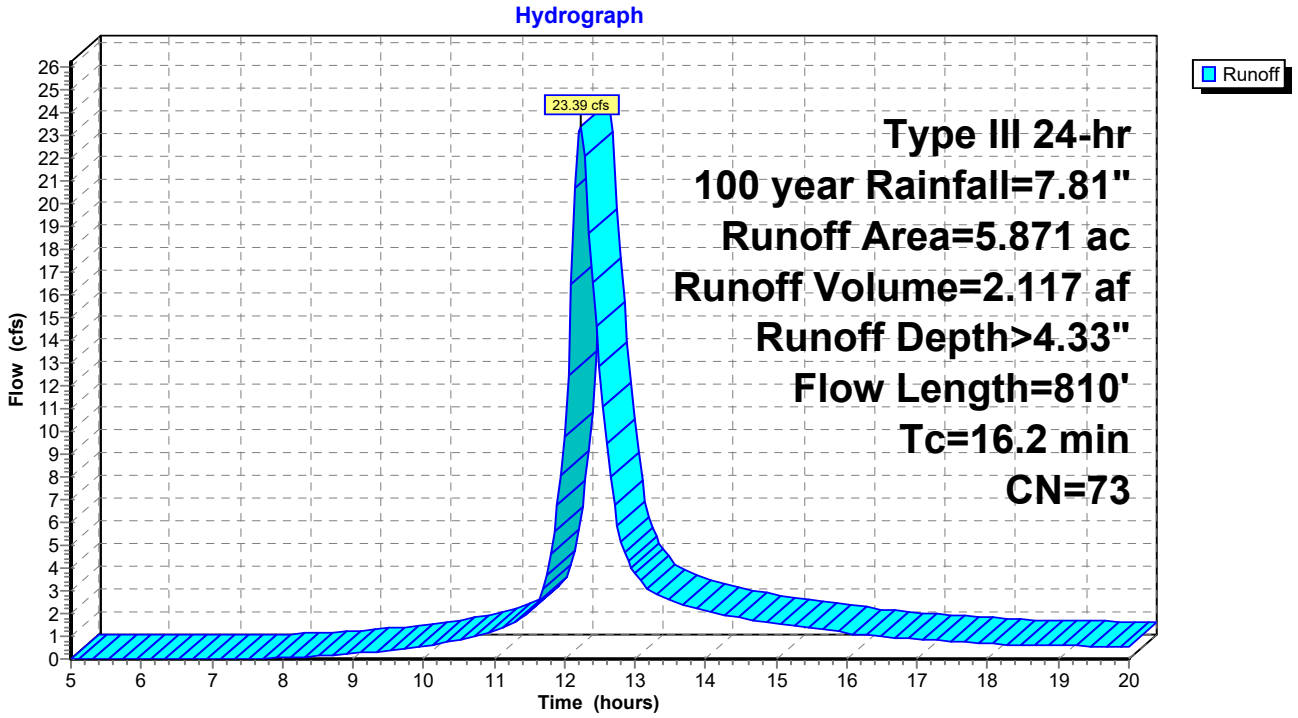
Runoff = 23.39 cfs @ 12.22 hrs, Volume= 2.117 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.281	74	>75% Grass cover, Good, HSG C
0.192	80	>75% Grass cover, Good, HSG D
0.197	96	Gravel surface, HSG C
0.095	96	Gravel surface, HSG D
1.100	58	Meadow, non-grazed, HSG B
1.006	78	Meadow, non-grazed, HSG D
5.871	73	Weighted Average
5.871		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	50	0.0150	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.3	360	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	400	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.2	810	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

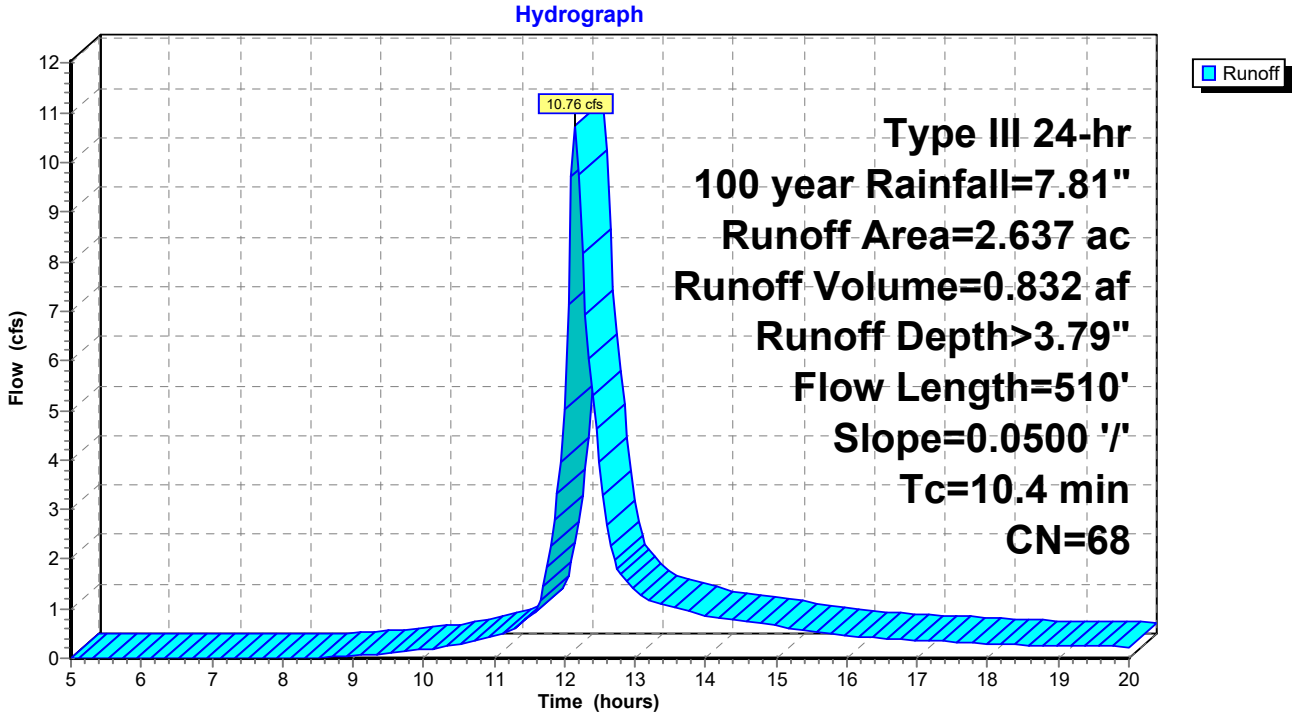
Runoff = 10.76 cfs @ 12.15 hrs, Volume= 0.832 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.616	74	>75% Grass cover, Good, HSG C
1.021	58	Meadow, non-grazed, HSG B
2.637	68	Weighted Average
2.637		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
4.9	460	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	510	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

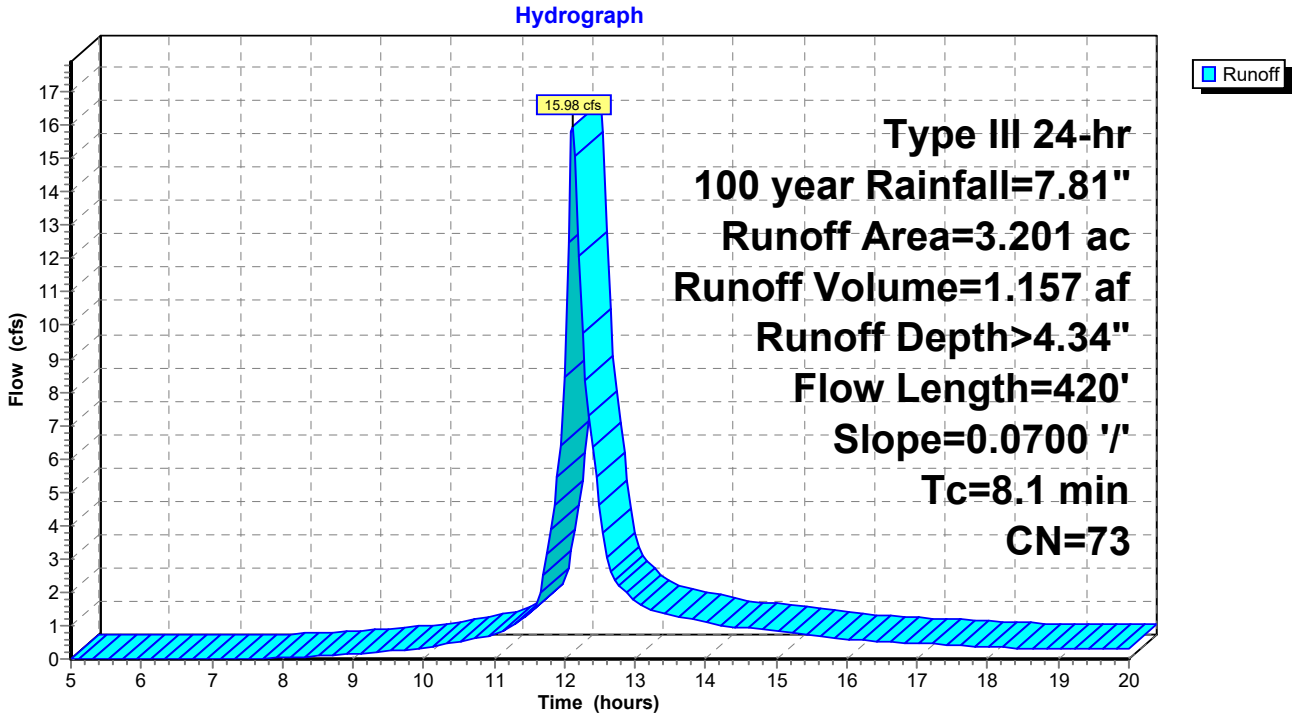
Runoff = 15.98 cfs @ 12.12 hrs, Volume= 1.157 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.401	74	>75% Grass cover, Good, HSG C
0.111	80	>75% Grass cover, Good, HSG D
0.211	96	Gravel surface, HSG C
0.001	96	Gravel surface, HSG D
0.637	58	Meadow, non-grazed, HSG B
0.489	78	Meadow, non-grazed, HSG D
0.032	60	Woods, Fair, HSG B
0.319	79	Woods, Fair, HSG D
3.201	73	Weighted Average
3.201		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.3	370	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.1	420	Total			

Subcatchment 6: Subcat 6



Summary for Subcatchment 6A: Subcat 6A

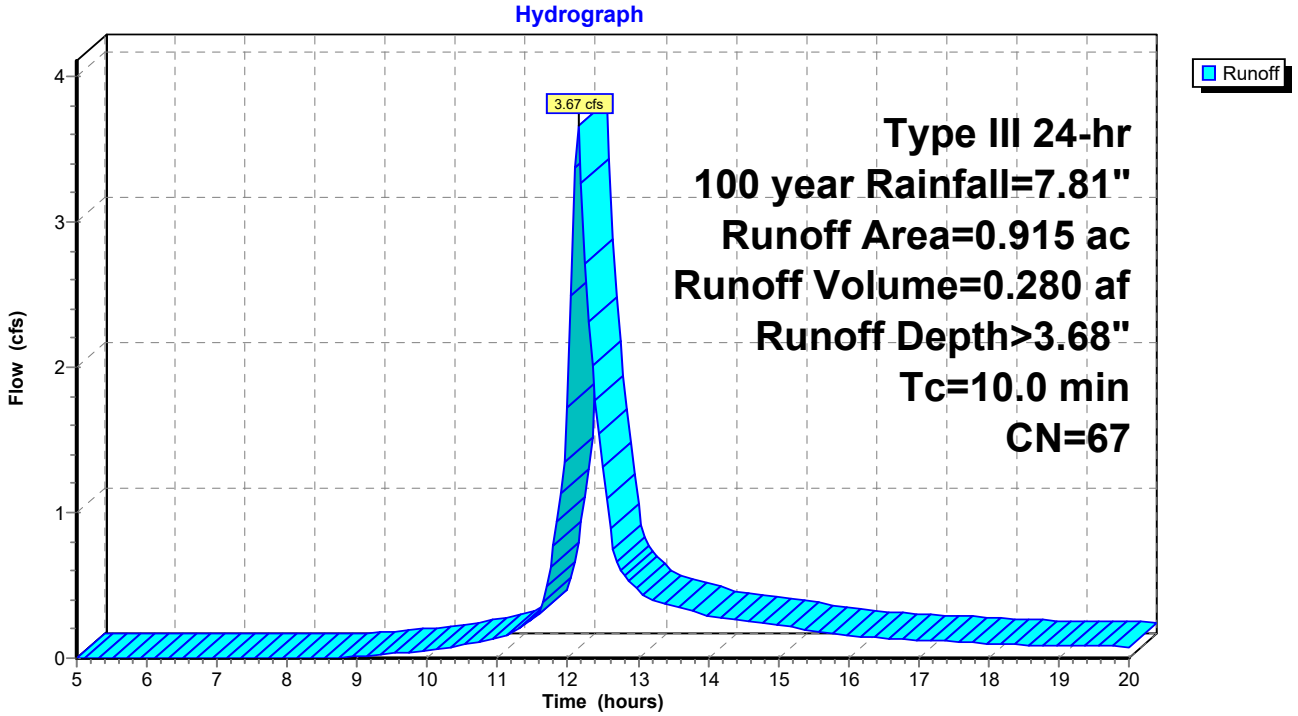
Runoff = 3.67 cfs @ 12.15 hrs, Volume= 0.280 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.517	58	Meadow, non-grazed, HSG B
0.398	78	Meadow, non-grazed, HSG D
0.915	67	Weighted Average
0.915		100.00% Pervious Area

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

Subcatchment 6A: Subcat 6A



Summary for Subcatchment 6B: Subcat 6B

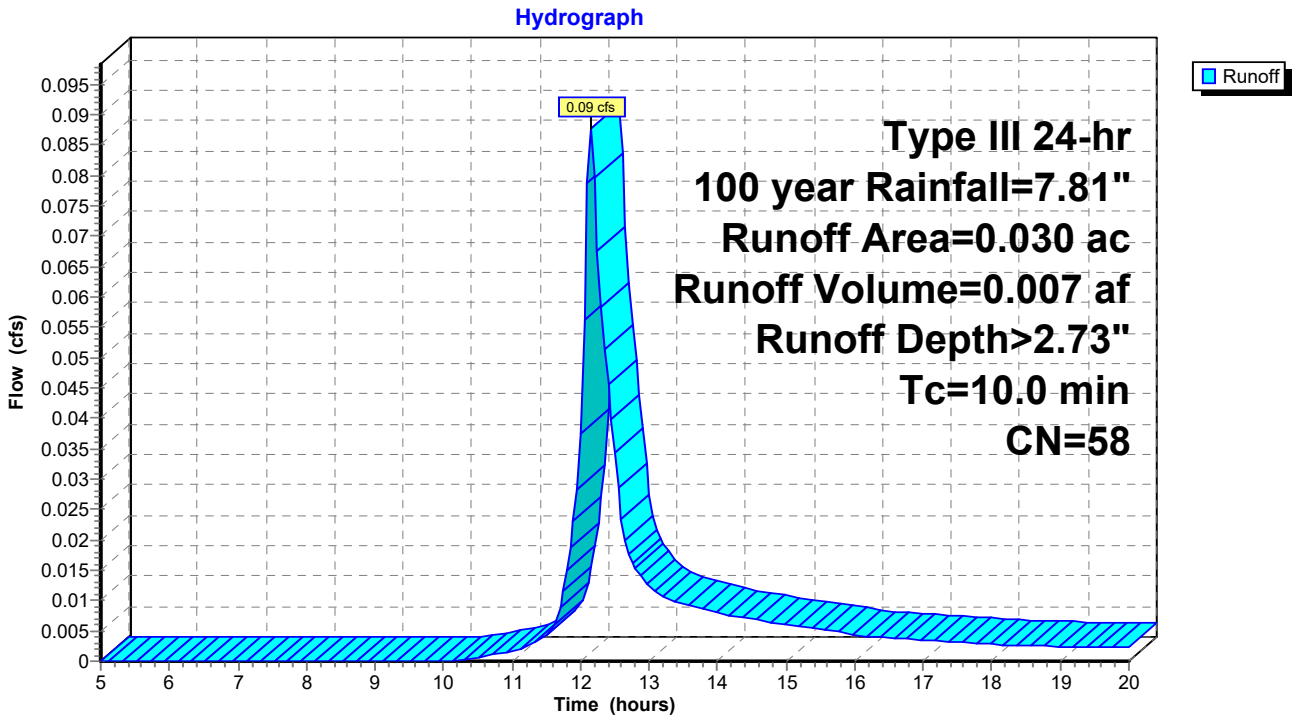
Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.007 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.030	58	Meadow, non-grazed, HSG B
0.030		100.00% Pervious Area

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

Subcatchment 6B: Subcat 6B



Summary for Subcatchment 6C: Subcat 6C

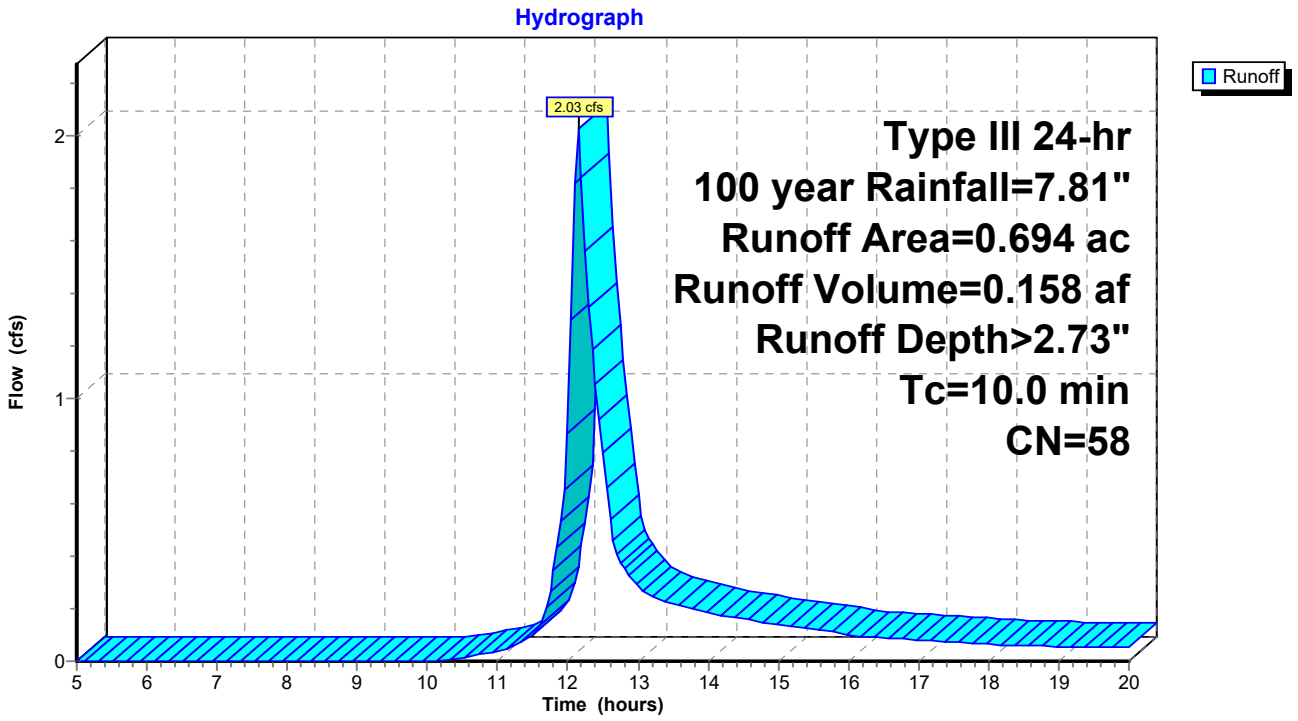
Runoff = 2.03 cfs @ 12.15 hrs, Volume= 0.158 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.694	58	Meadow, non-grazed, HSG B
0.694		100.00% Pervious Area

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

Subcatchment 6C: Subcat 6C



Summary for Subcatchment 7: Subcat 7

[49] Hint: Tc<2dt may require smaller dt

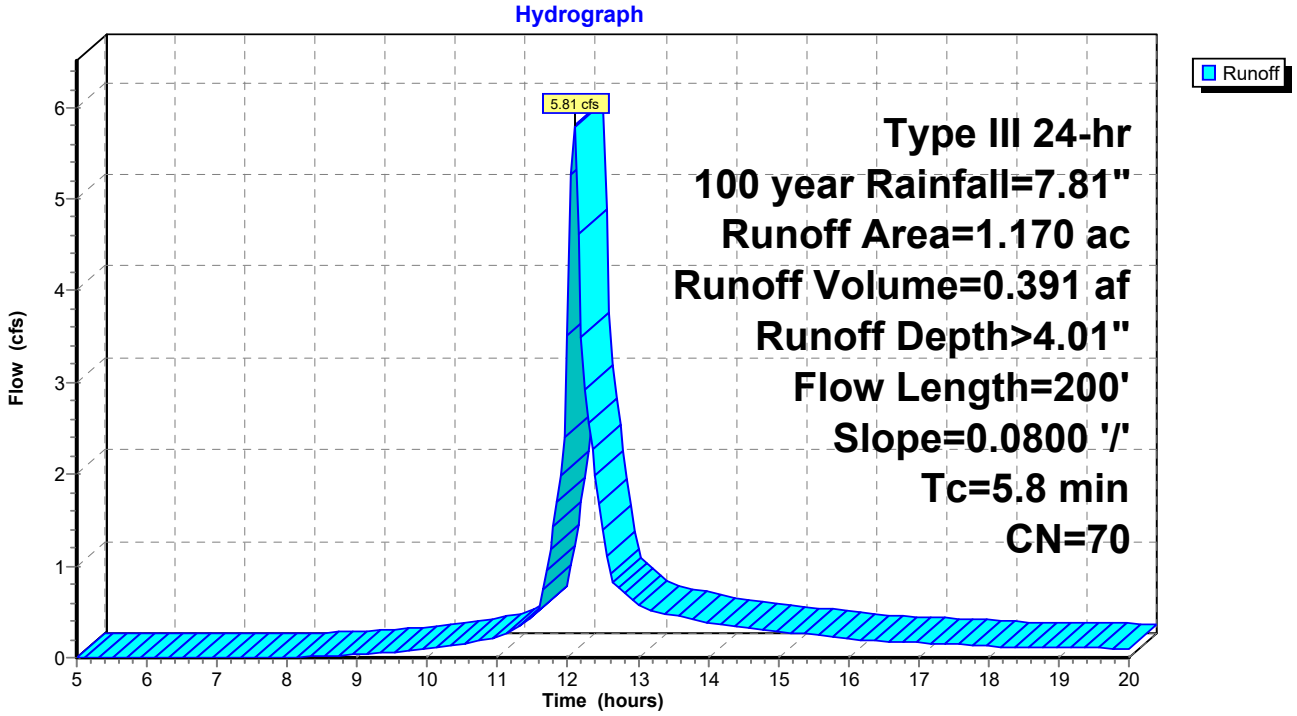
Runoff = 5.81 cfs @ 12.09 hrs, Volume= 0.391 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.634	74	>75% Grass cover, Good, HSG C
0.117	96	Gravel surface, HSG C
0.419	58	Meadow, non-grazed, HSG B
1.170	70	Weighted Average
1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.8	200	Total			

Subcatchment 7: Subcat 7



Summary for Subcatchment 7A: Subcat 7A

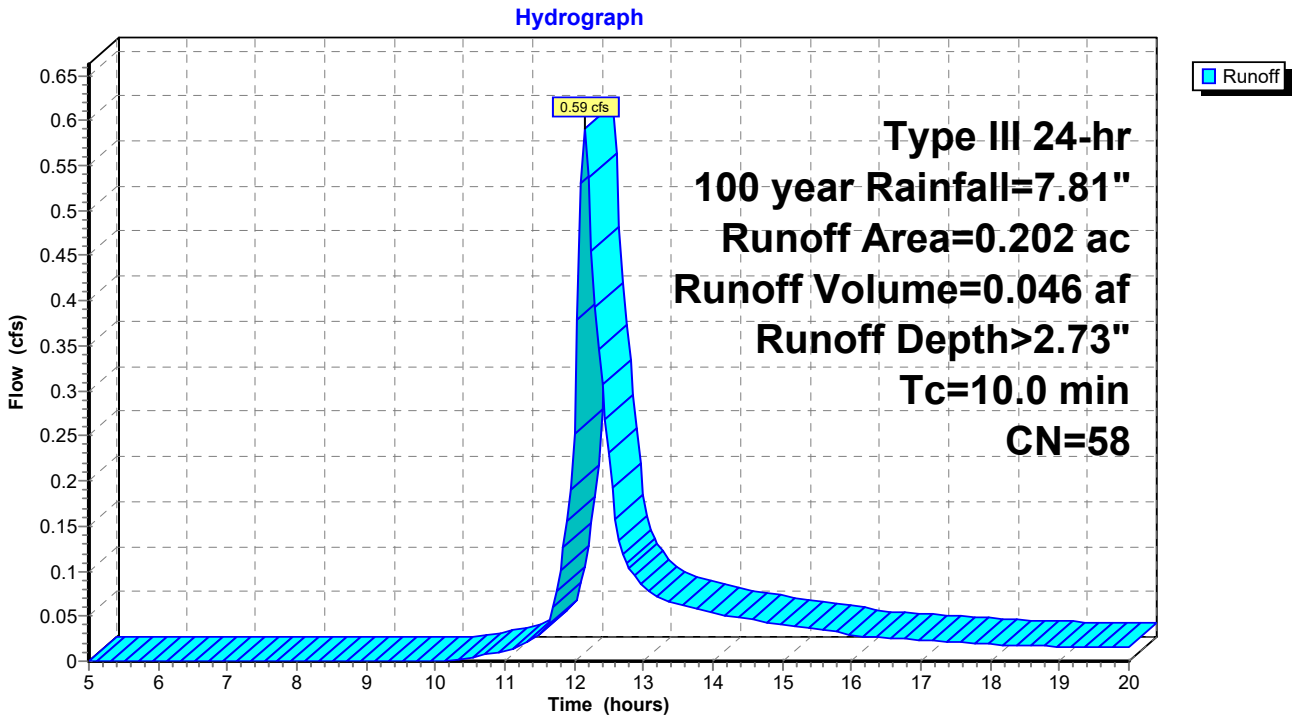
Runoff = 0.59 cfs @ 12.15 hrs, Volume= 0.046 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.202	58	Meadow, non-grazed, HSG B
0.202		100.00% Pervious Area

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

Subcatchment 7A: Subcat 7A



Summary for Subcatchment 8: Subcat 8

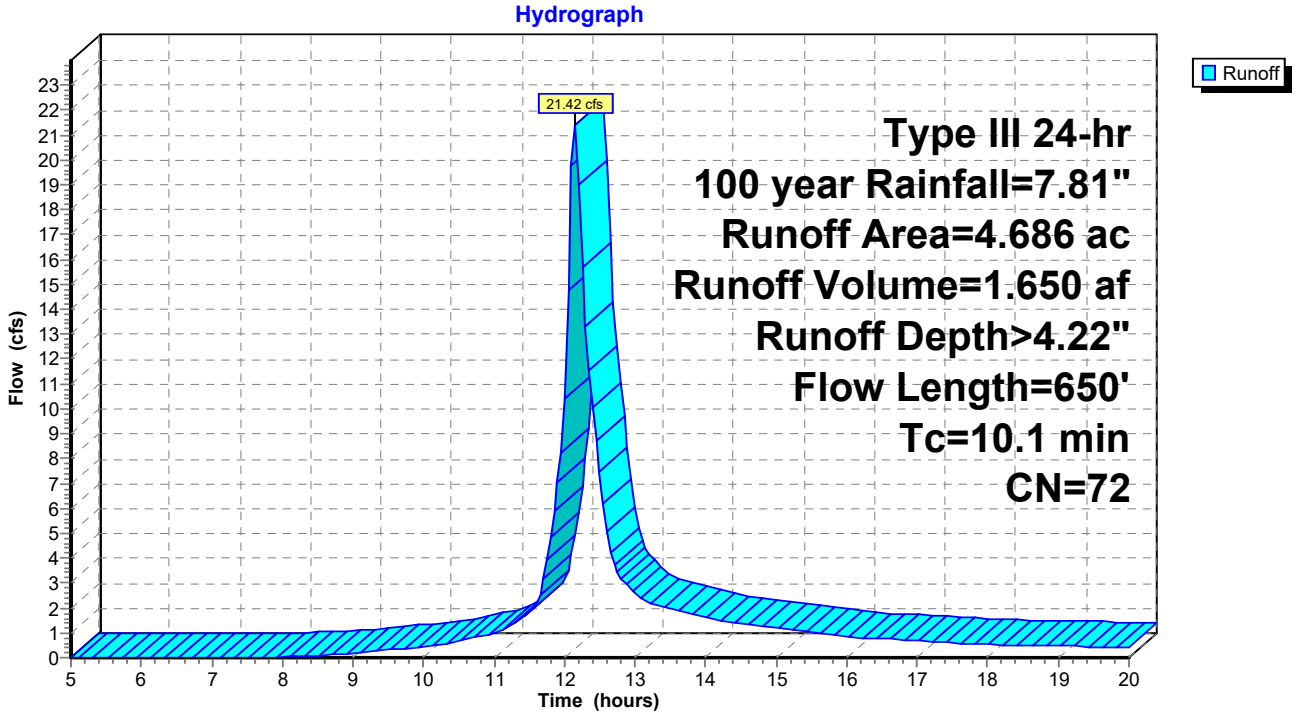
Runoff = 21.42 cfs @ 12.15 hrs, Volume= 1.650 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
3.284	74	>75% Grass cover, Good, HSG C
0.293	96	Gravel surface, HSG C
1.109	58	Meadow, non-grazed, HSG B
4.686	72	Weighted Average
4.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.1100	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.9	270	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.2	330	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	650	Total			

Subcatchment 8: Subcat 8



Summary for Subcatchment 8A: Subcat 8A

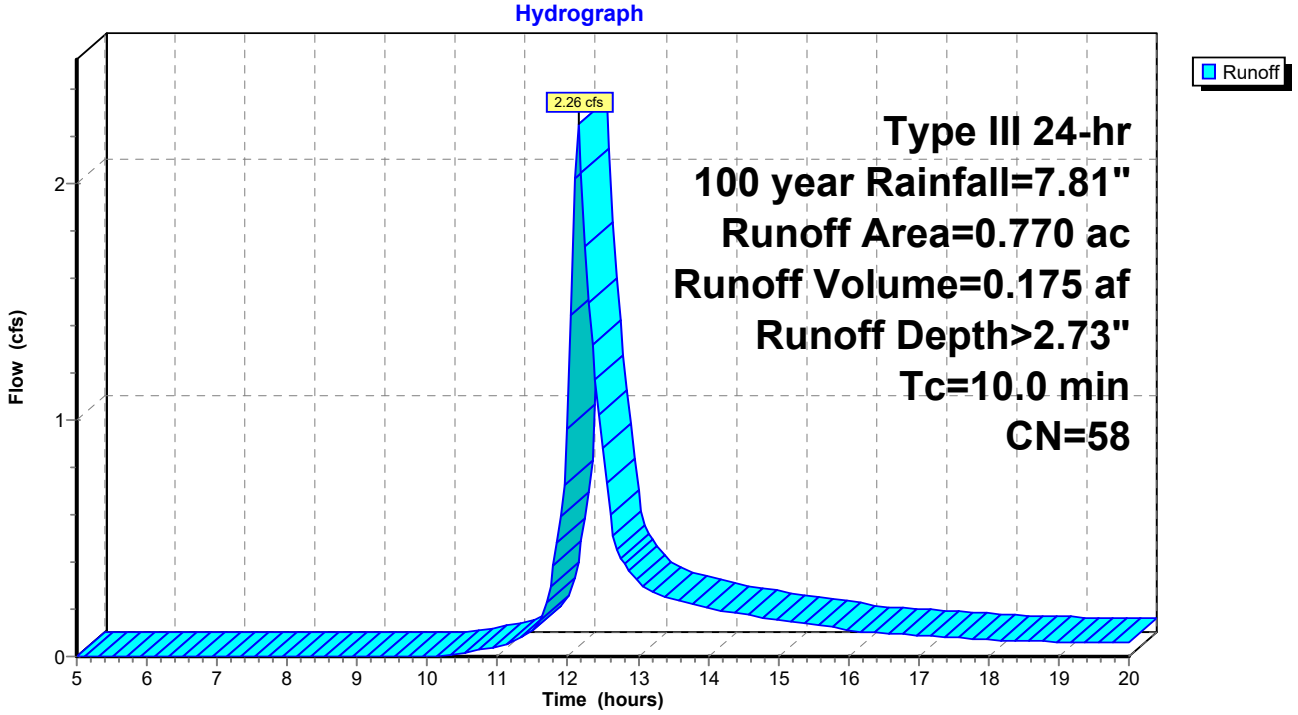
Runoff = 2.26 cfs @ 12.15 hrs, Volume= 0.175 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.000	61	>75% Grass cover, Good, HSG B
0.003	96	Gravel surface, HSG B
0.767	58	Meadow, non-grazed, HSG B
0.770	58	Weighted Average
0.770		100.00% Pervious Area

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

Subcatchment 8A: Subcat 8A



Summary for Subcatchment 9: Subcat 9

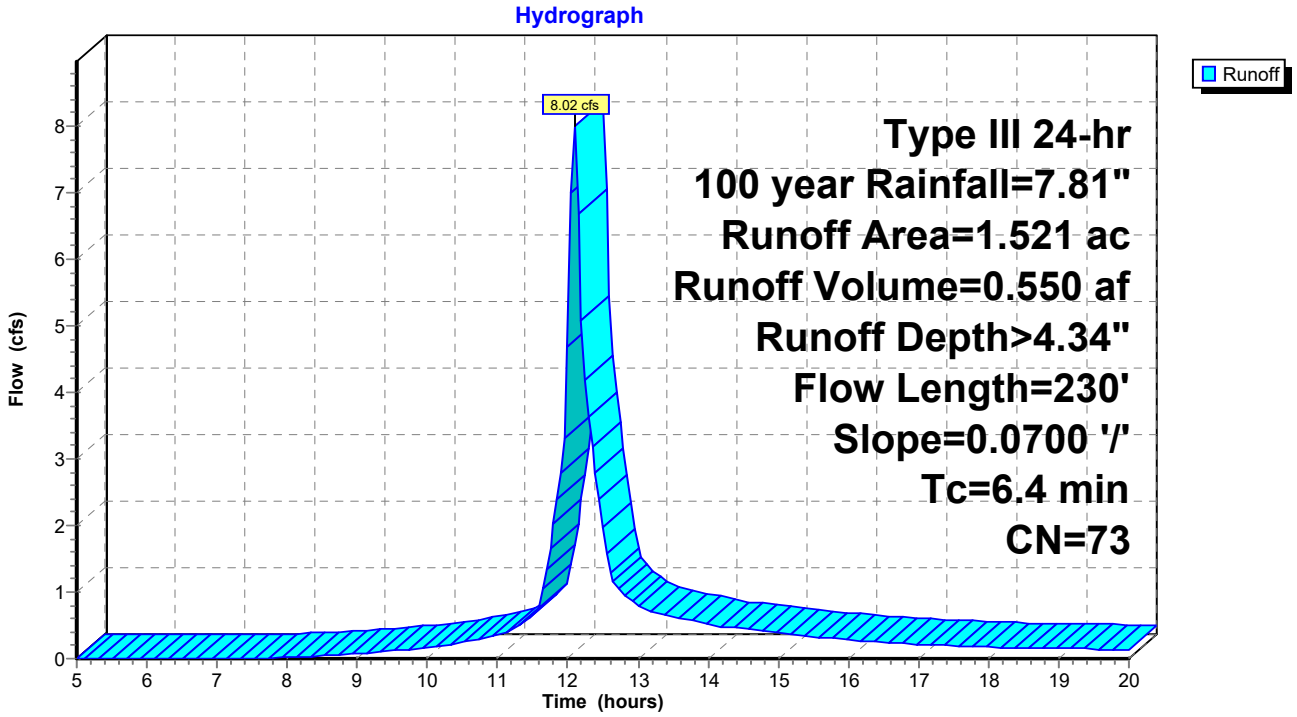
Runoff = 8.02 cfs @ 12.10 hrs, Volume= 0.550 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.918	74	>75% Grass cover, Good, HSG C
0.199	96	Gravel surface, HSG C
0.404	58	Meadow, non-grazed, HSG B
1.521	73	Weighted Average
1.521		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.6	180	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	230	Total			

Subcatchment 9: Subcat 9



Summary for Subcatchment 9A: Subcat 9A

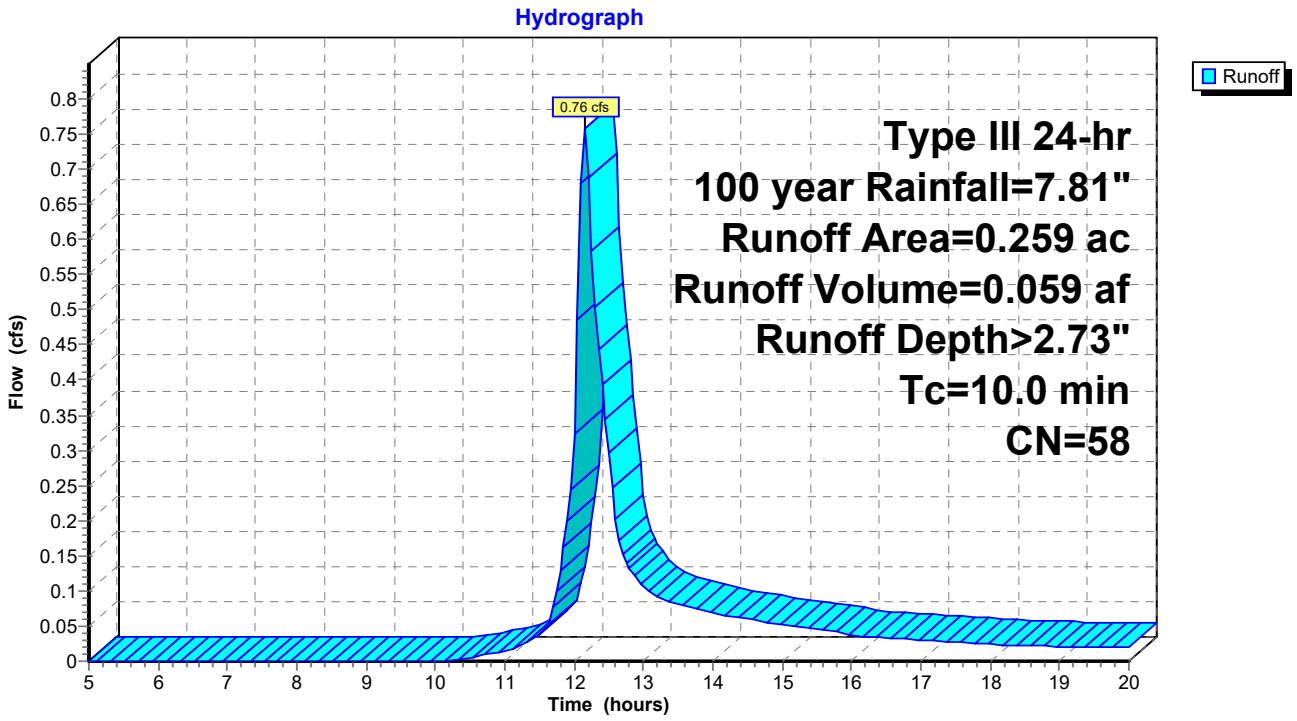
Runoff = 0.76 cfs @ 12.15 hrs, Volume= 0.059 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.259	58	Meadow, non-grazed, HSG B
0.259		100.00% Pervious Area

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

Subcatchment 9A: Subcat 9A



Summary for Subcatchment 10: Subcat 10

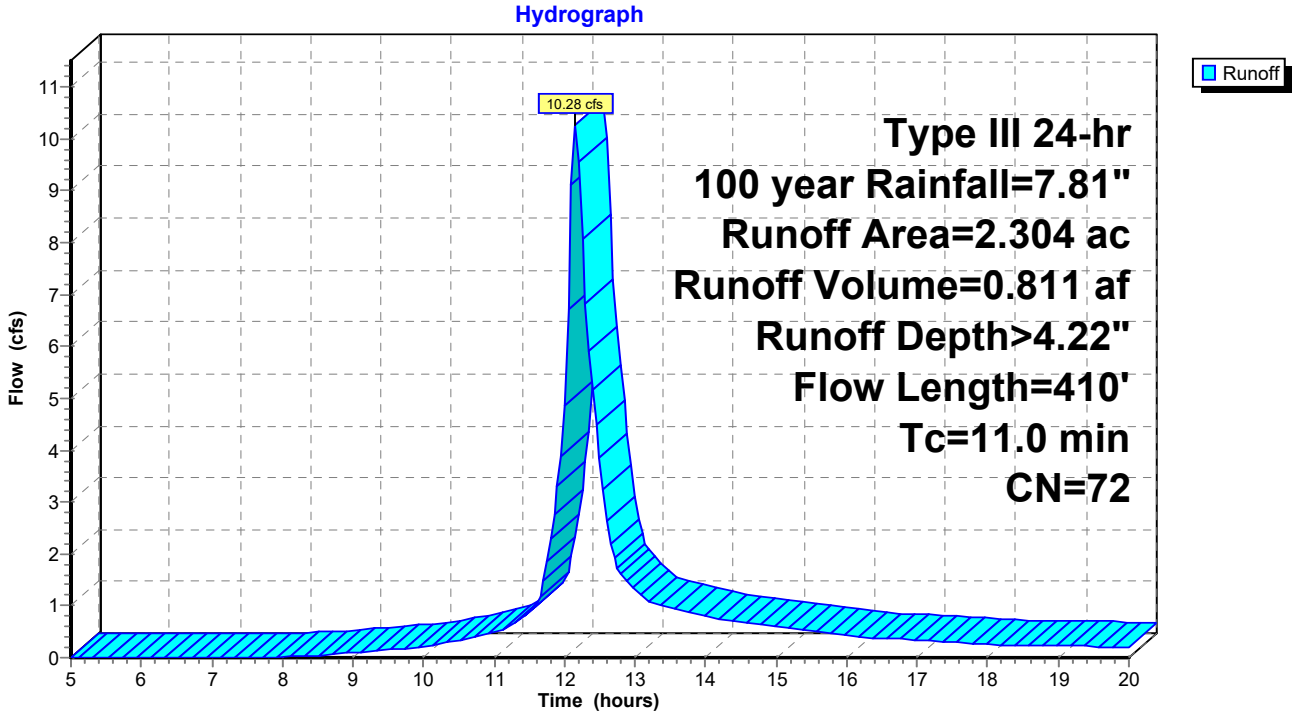
Runoff = 10.28 cfs @ 12.16 hrs, Volume= 0.811 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.640	74	>75% Grass cover, Good, HSG C
0.157	96	Gravel surface, HSG C
0.507	58	Meadow, non-grazed, HSG B
2.304	72	Weighted Average
2.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.0	270	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	90	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	410	Total			

Subcatchment 10: Subcat 10



Summary for Subcatchment 10A: Subcat 10A

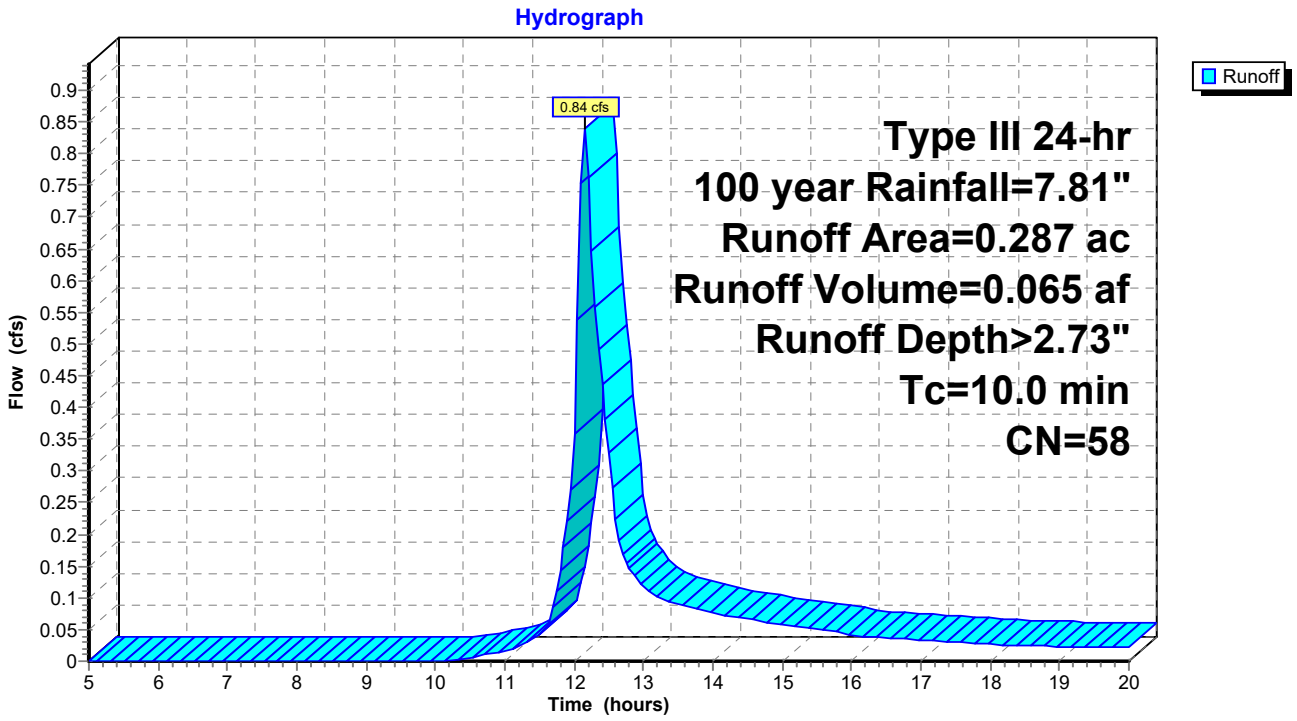
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 0.065 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.287	58	Meadow, non-grazed, HSG B
0.287		100.00% Pervious Area

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

Subcatchment 10A: Subcat 10A



Summary for Subcatchment 11: Subcat 11

[49] Hint: Tc<2dt may require smaller dt

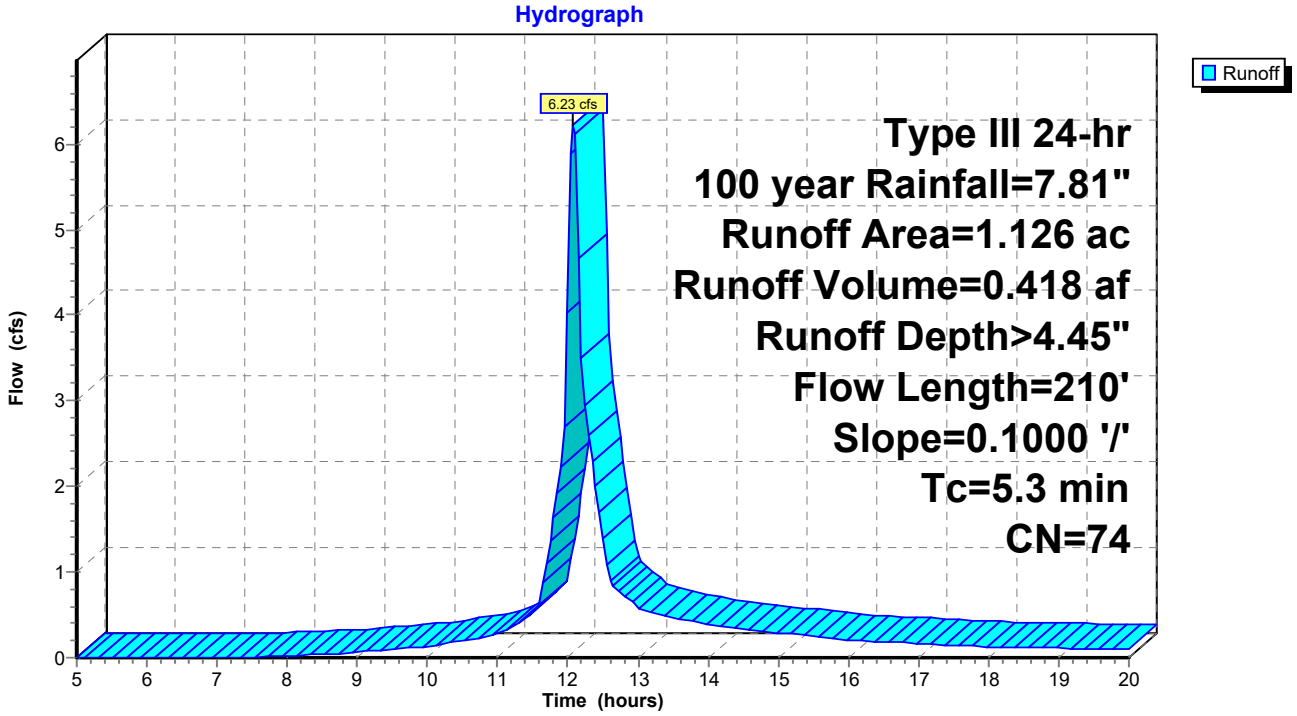
Runoff = 6.23 cfs @ 12.08 hrs, Volume= 0.418 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.813	74	>75% Grass cover, Good, HSG C
0.144	96	Gravel surface, HSG C
0.169	58	Meadow, non-grazed, HSG B
1.126	74	Weighted Average
1.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.1000	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	210	Total			

Subcatchment 11: Subcat 11



Summary for Subcatchment 11A: Subcat 11A

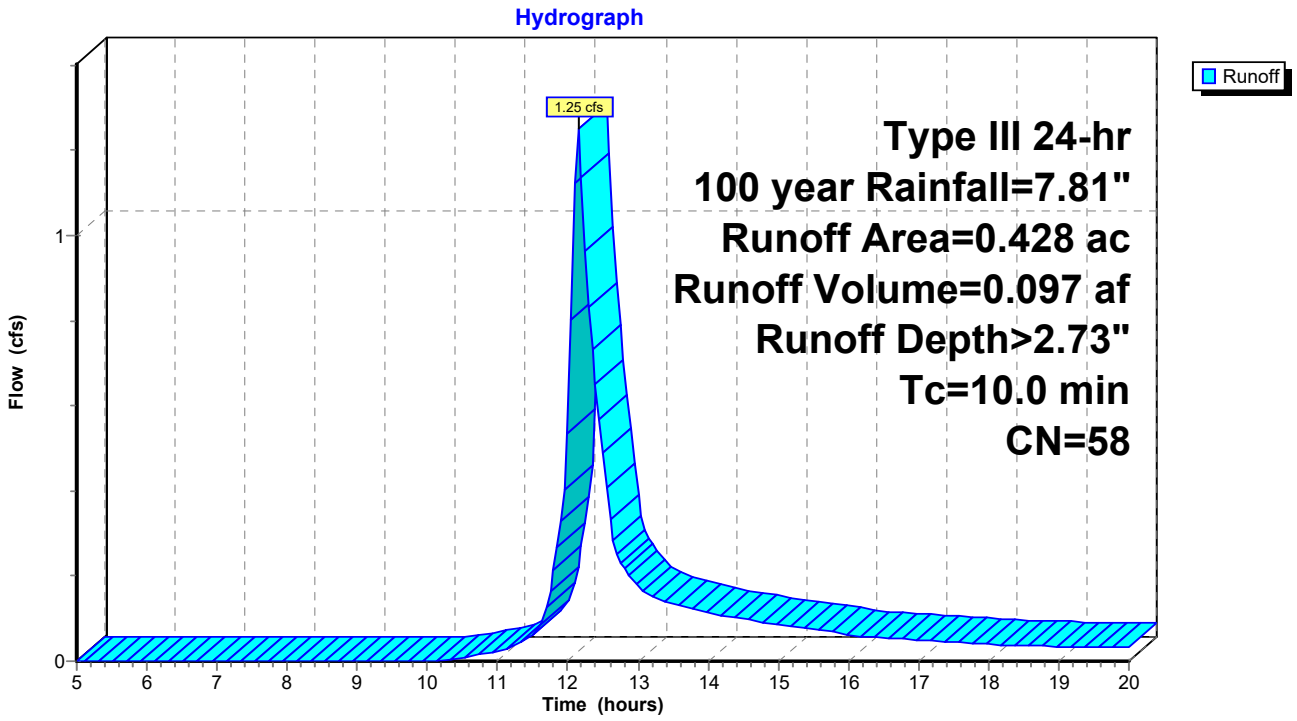
Runoff = 1.25 cfs @ 12.15 hrs, Volume= 0.097 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.428	58	Meadow, non-grazed, HSG B
0.428		100.00% Pervious Area

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

Subcatchment 11A: Subcat 11A



Summary for Subcatchment 12: Subcat 12

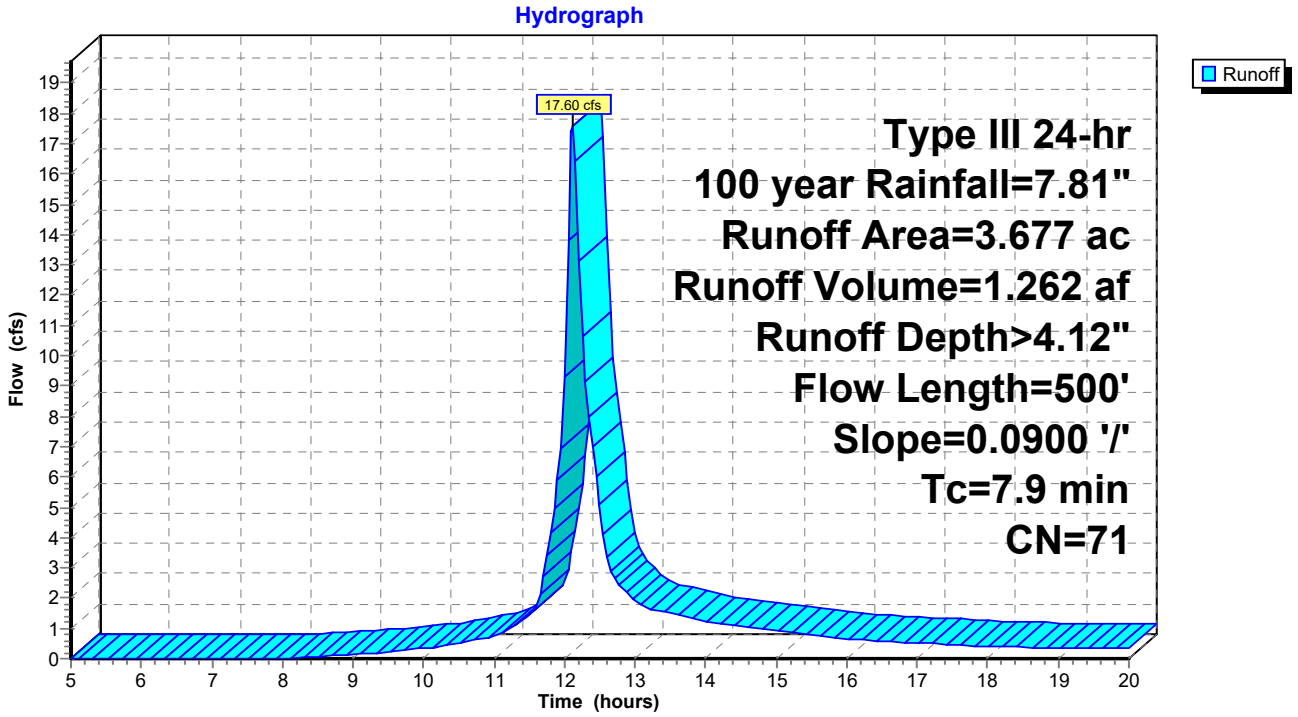
Runoff = 17.60 cfs @ 12.11 hrs, Volume= 1.262 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.738	74	>75% Grass cover, Good, HSG C
0.100	96	Gravel surface, HSG C
0.839	58	Meadow, non-grazed, HSG B
3.677	71	Weighted Average
3.677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0900	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
3.6	450	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	500	Total			

Subcatchment 12: Subcat 12



Summary for Subcatchment 13.1: Subcat 13.1

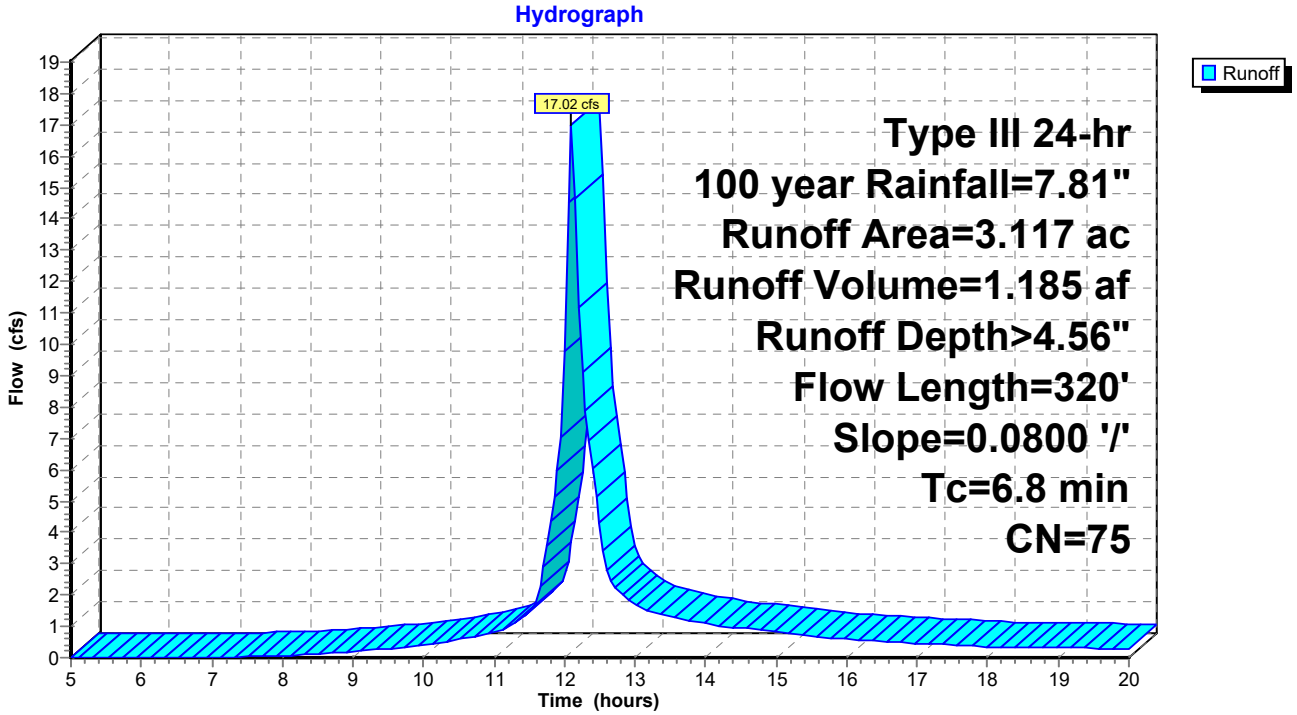
Runoff = 17.02 cfs @ 12.10 hrs, Volume= 1.185 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
2.825	74	>75% Grass cover, Good, HSG C
0.010	80	>75% Grass cover, Good, HSG D
0.216	96	Gravel surface, HSG C
0.050	58	Meadow, non-grazed, HSG B
0.016	78	Meadow, non-grazed, HSG D
3.117	75	Weighted Average
3.117		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0800	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
2.3	270	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.8	320	Total			

Subcatchment 13.1: Subcat 13.1



Summary for Subcatchment 13.2: Subcat 13.2

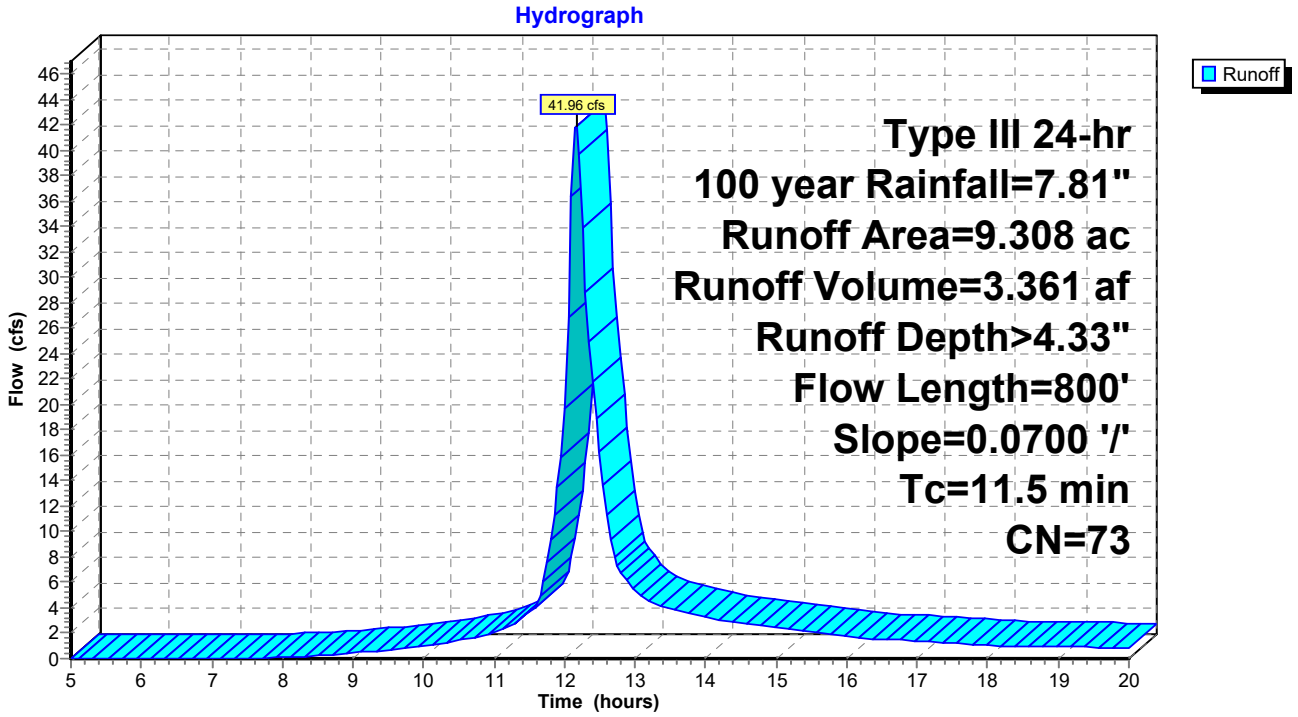
Runoff = 41.96 cfs @ 12.16 hrs, Volume= 3.361 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
7.145	74	>75% Grass cover, Good, HSG C
0.662	96	Gravel surface, HSG C
1.501	58	Meadow, non-grazed, HSG B
9.308	73	Weighted Average
9.308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
6.7	750	0.0700	1.85		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.5	800	Total			

Subcatchment 13.2: Subcat 13.2



Summary for Subcatchment 14: Subcat 14

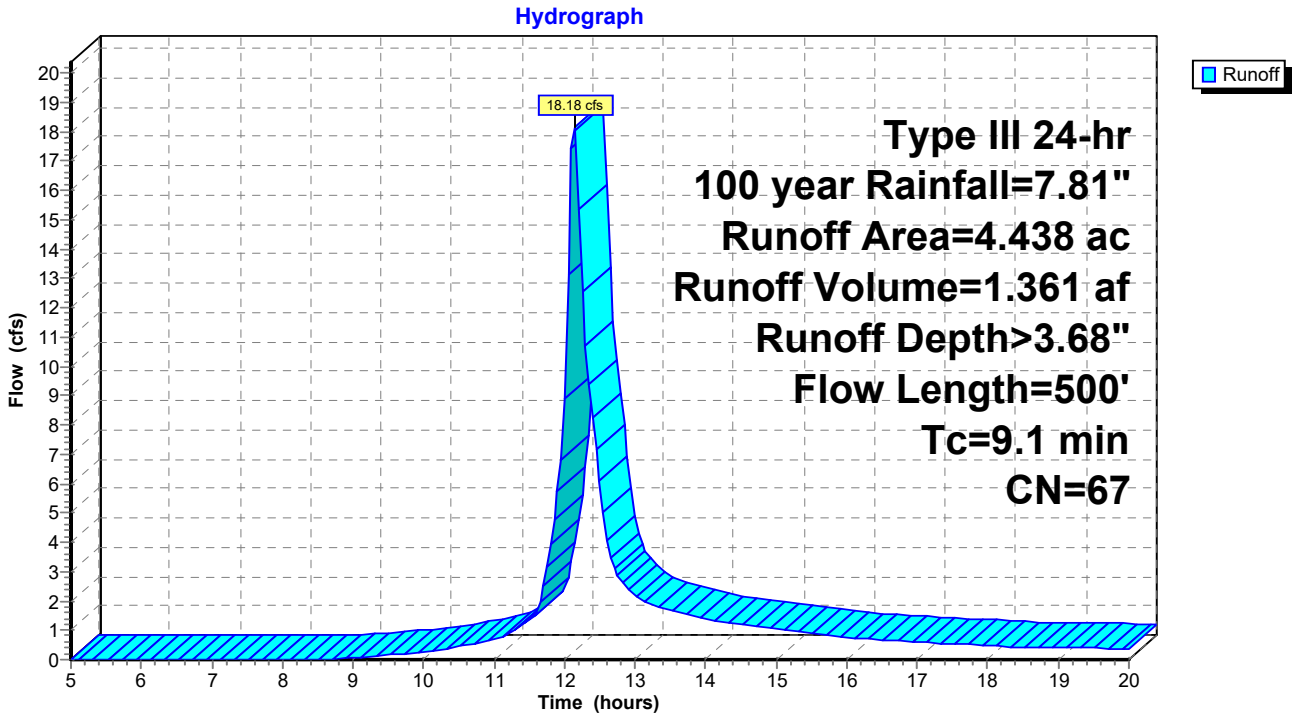
Runoff = 18.18 cfs @ 12.13 hrs, Volume= 1.361 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
1.956	74	>75% Grass cover, Good, HSG C
0.193	96	Gravel surface, HSG C
2.289	58	Meadow, non-grazed, HSG B
4.438	67	Weighted Average
4.438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
1.3	160	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	180	0.1300	2.52		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	110	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	500	Total			

Subcatchment 14: Subcat 14



Summary for Subcatchment 16: Subcat 16

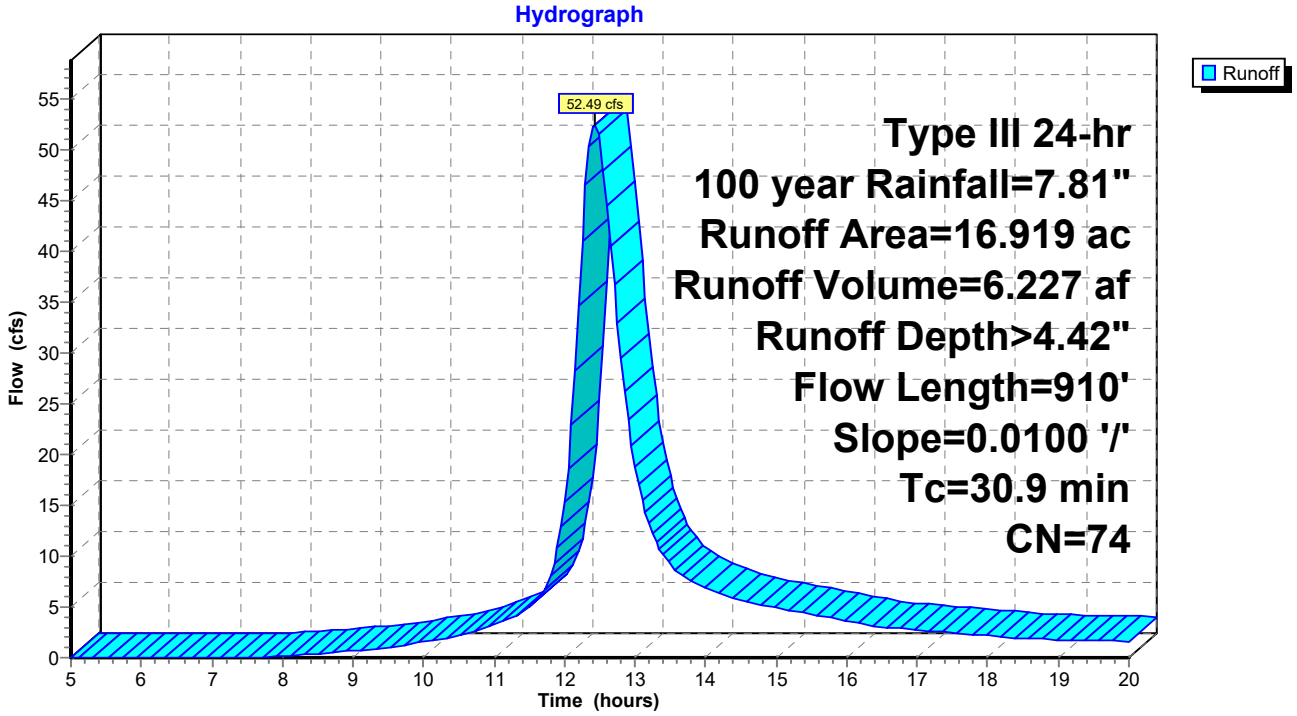
Runoff = 52.49 cfs @ 12.43 hrs, Volume= 6.227 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
14.551	74	>75% Grass cover, Good, HSG C
1.069	96	Gravel surface, HSG C
1.299	58	Meadow, non-grazed, HSG B
16.919	74	Weighted Average
16.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.45"
11.9	500	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	360	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.9	910	Total			

Subcatchment 16: Subcat 16



Summary for Subcatchment 16A: Subcat 16A

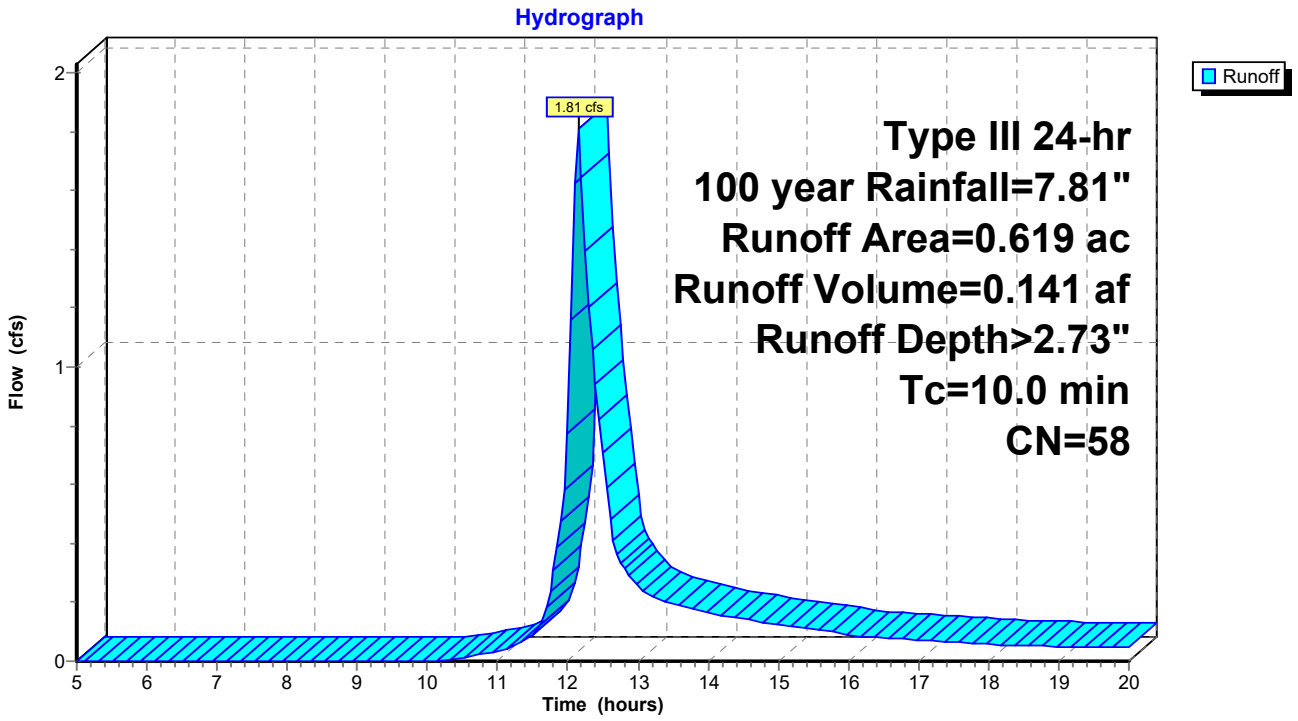
Runoff = 1.81 cfs @ 12.15 hrs, Volume= 0.141 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=7.81"

Area (ac)	CN	Description
0.619	58	Meadow, non-grazed, HSG B
0.619		100.00% Pervious Area

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

Subcatchment 16A: Subcat 16A



Summary for Reach 13.1R: Reach 13.1

[91] Warning: Storage range exceeded by 0.43'
[55] Hint: Peak inflow is 958% of Manning's capacity
[79] Warning: Submerged Pond 13.1P Primary device # 1 by 0.52'

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 3.62" for 100 year event
Inflow = 9.16 cfs @ 12.26 hrs, Volume= 0.940 af
Outflow = 8.84 cfs @ 12.38 hrs, Volume= 0.936 af, Atten= 3%, Lag= 7.3 min

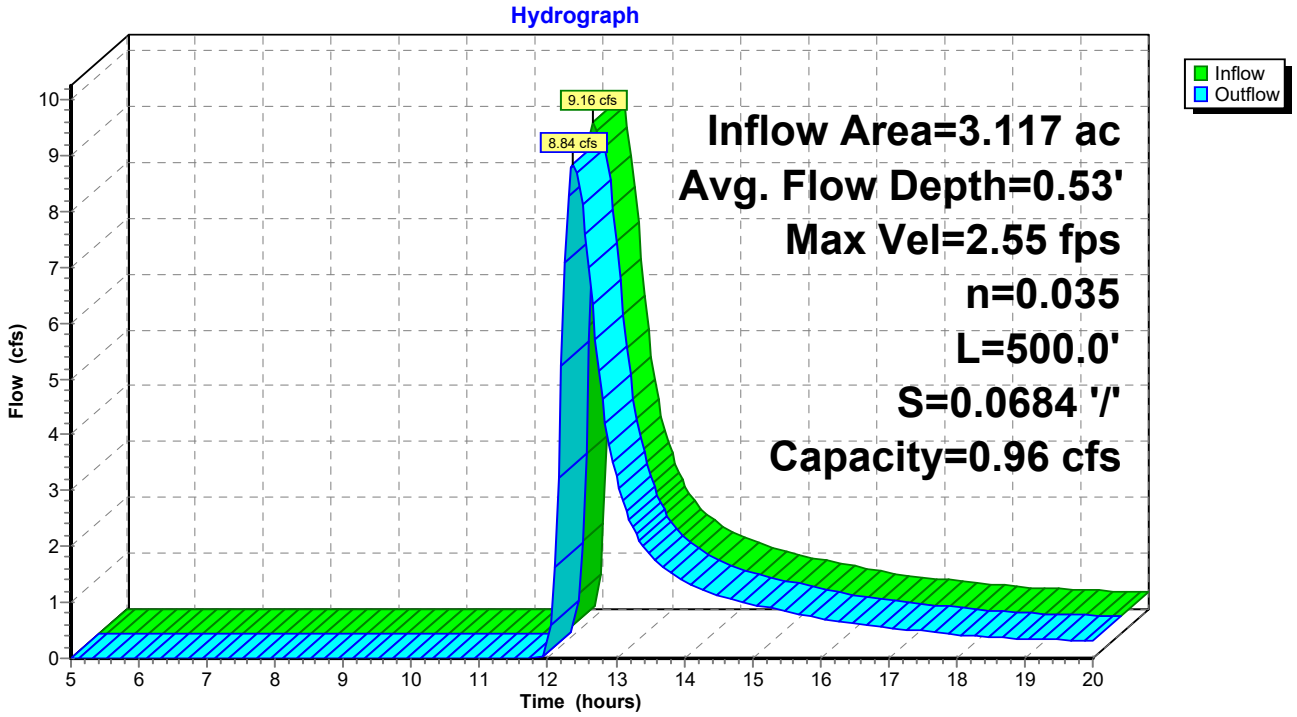
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 4.6 min

Peak Storage= 1,741 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 0.10' Flow Area= 0.5 sf, Capacity= 0.96 cfs

3.00' x 0.10' deep channel, n= 0.035
Side Slope Z-value= 20.0 '/' Top Width= 7.00'
Length= 500.0' Slope= 0.0684 '/'
Inlet Invert= 224.20', Outlet Invert= 190.00'

‡

Reach 13.1R: Reach 13.1



Summary for Pond 1P: Pond 1

Inflow Area = 3.006 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100 year event
Inflow = 13.97 cfs @ 12.12 hrs, Volume= 1.004 af
Outflow = 8.64 cfs @ 12.26 hrs, Volume= 0.864 af, Atten= 38%, Lag= 8.5 min
Primary = 8.64 cfs @ 12.26 hrs, Volume= 0.864 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.75' Surf.Area= 3,745 sf Storage= 5,323 cf
Peak Elev= 194.38' @ 12.26 hrs Surf.Area= 6,224 sf Storage= 18,345 cf (13,022 cf above start)

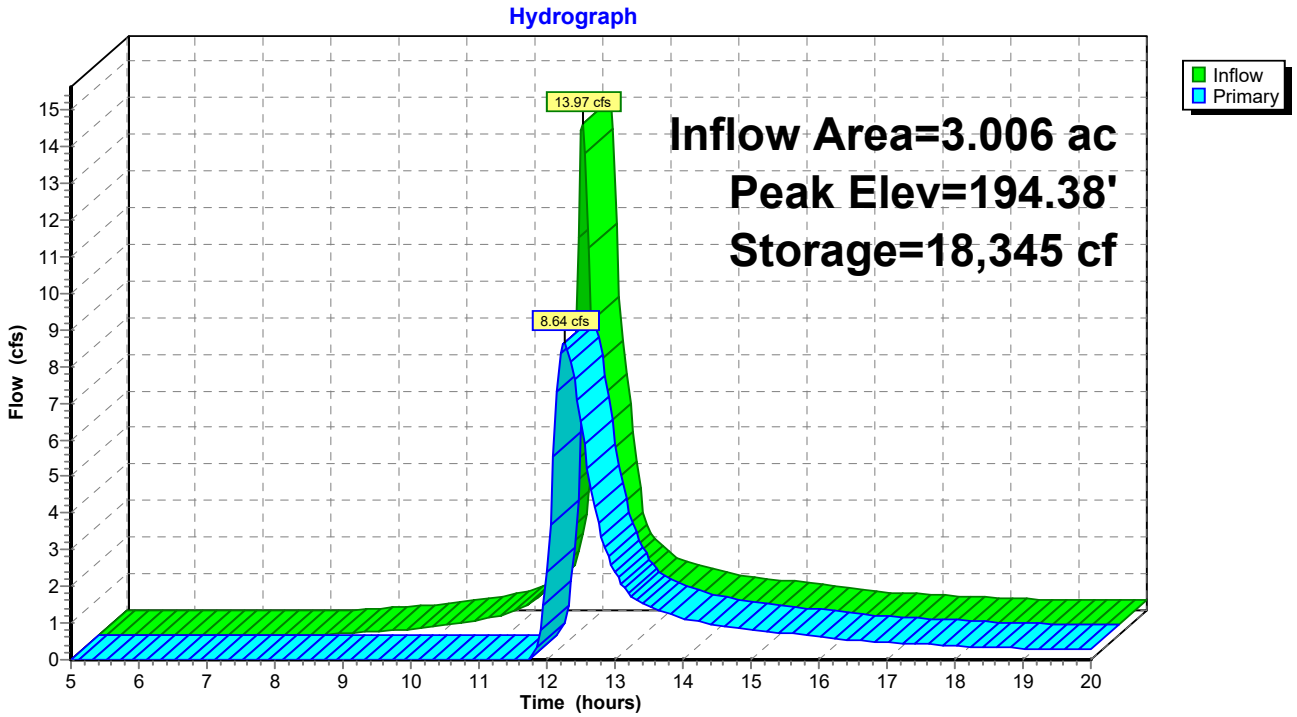
Plug-Flow detention time= 113.8 min calculated for 0.741 af (74% of inflow)
Center-of-Mass det. time= 34.6 min (826.5 - 791.9)

Volume	Invert	Avail.Storage	Storage Description
#1	190.00'	22,375 cf	**25.00'W x 95.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=8.61 cfs @ 12.26 hrs HW=194.38' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 8.61 cfs @ 3.12 fps)

Pond 1P: Pond 1



Summary for Pond 2P: Pond 2

Inflow Area =	2.551 ac,	0.00% Impervious,	Inflow Depth >	4.22"	for 100 year event
Inflow =	10.93 cfs @	12.17 hrs,	Volume=	0.897 af	
Outflow =	6.90 cfs @	12.36 hrs,	Volume=	0.681 af,	Atten= 37%, Lag= 11.4 min
Discarded =	0.40 cfs @	12.36 hrs,	Volume=	0.266 af	
Primary =	6.50 cfs @	12.36 hrs,	Volume=	0.415 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 231.72' @ 12.36 hrs Surf.Area= 5,048 sf Storage= 13,352 cf

Plug-Flow detention time= 104.3 min calculated for 0.681 af (76% of inflow)
Center-of-Mass det. time= 45.3 min (837.2 - 791.9)

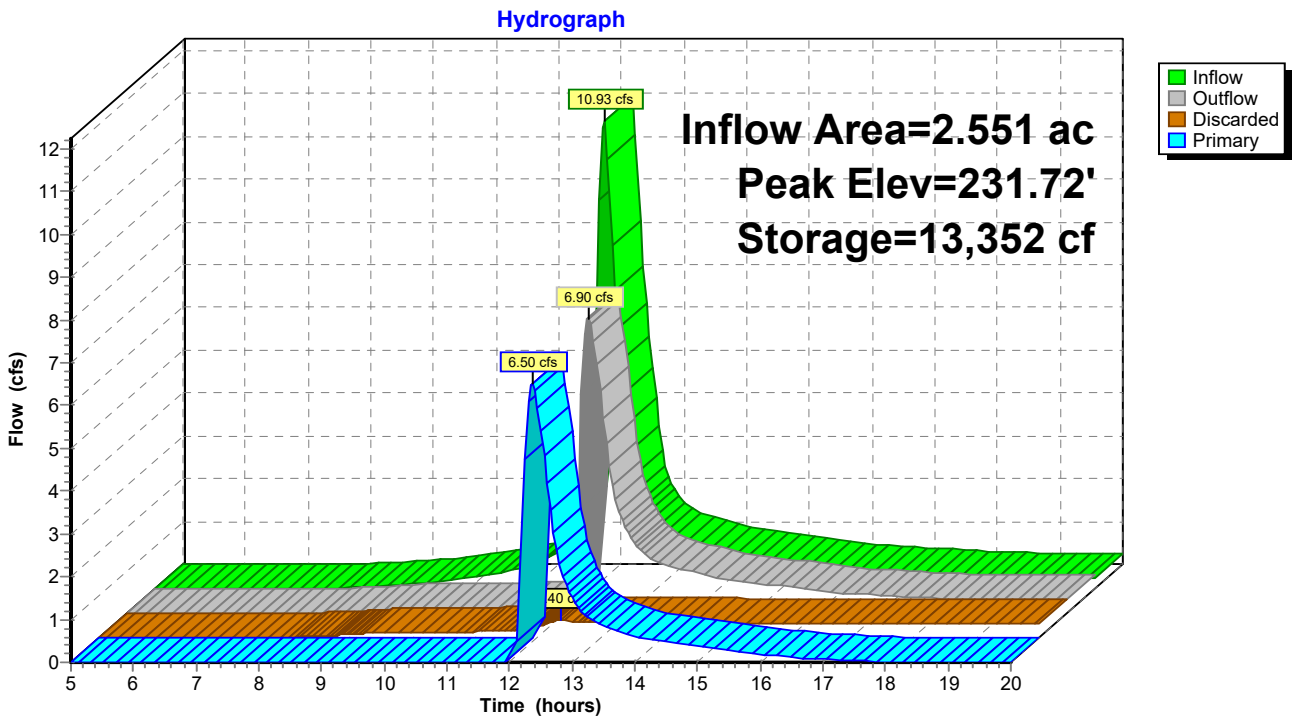
Volume	Invert	Avail.Storage	Storage Description
#1	227.50'	17,625 cf	**15.00'W x 100.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	231.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	227.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.40 cfs @ 12.36 hrs HW=231.71' (Free Discharge)
└**2=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=6.45 cfs @ 12.36 hrs HW=231.71' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.45 cfs @ 2.26 fps)

Pond 2P: Pond 2



Summary for Pond 3P: Pond 3

Inflow Area = 2.550 ac, 0.00% Impervious, Inflow Depth > 4.33" for 100 year event
Inflow = 11.13 cfs @ 12.17 hrs, Volume= 0.920 af
Outflow = 6.04 cfs @ 12.42 hrs, Volume= 0.768 af, Atten= 46%, Lag= 14.5 min
Primary = 6.04 cfs @ 12.42 hrs, Volume= 0.768 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 228.23' @ 12.42 hrs Surf.Area= 5,898 sf Storage= 14,478 cf

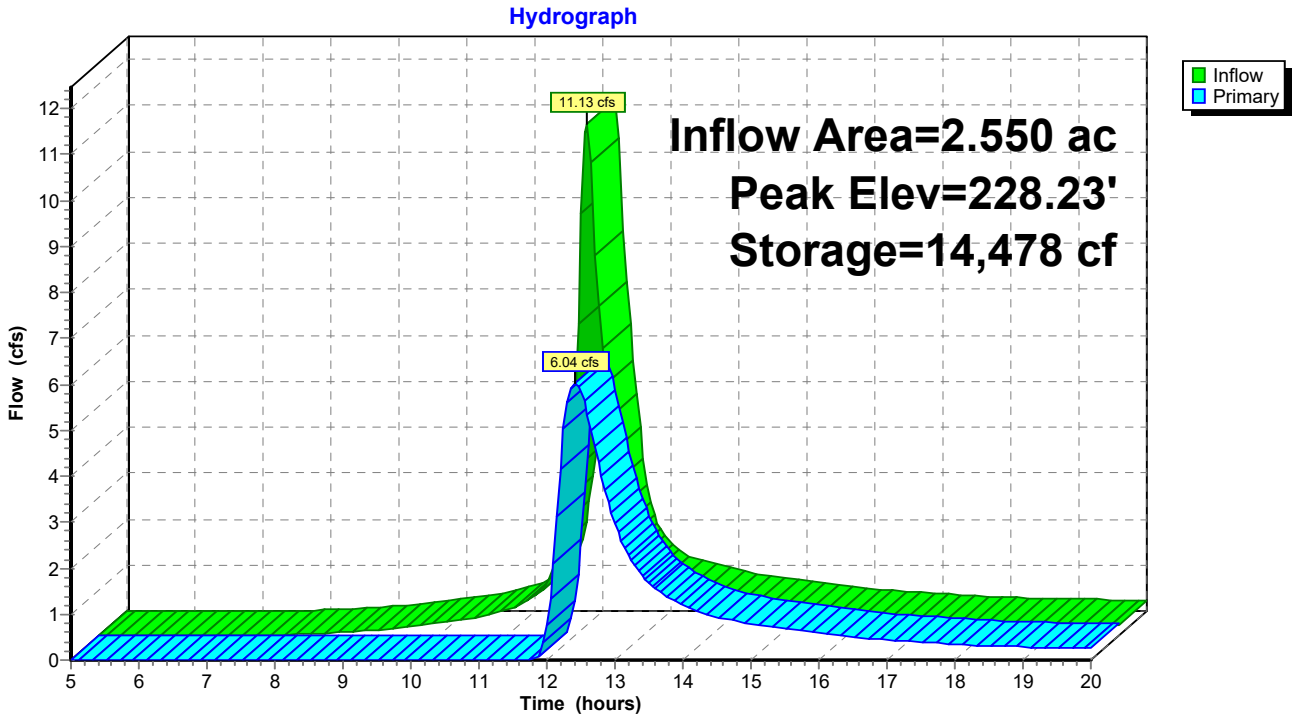
Plug-Flow detention time= 91.6 min calculated for 0.765 af (83% of inflow)
Center-of-Mass det. time= 46.2 min (836.5 - 790.3)

Volume	Invert	Avail.Storage	Storage Description
#1	225.00'	16,125 cf	**40.00'W x 80.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.50'	**1.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.02 cfs @ 12.42 hrs HW=228.22' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.02 cfs @ 3.49 fps)

Pond 3P: Pond 3



Summary for Pond 4P: Pond 4

Inflow Area = 5.871 ac, 0.00% Impervious, Inflow Depth > 4.33" for 100 year event
Inflow = 23.39 cfs @ 12.22 hrs, Volume= 2.117 af
Outflow = 14.21 cfs @ 12.46 hrs, Volume= 1.496 af, Atten= 39%, Lag= 14.5 min
Primary = 14.21 cfs @ 12.46 hrs, Volume= 1.496 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 186.00' Surf.Area= 11,484 sf Storage= 20,436 cf
Peak Elev= 188.76' @ 12.46 hrs Surf.Area= 15,384 sf Storage= 57,384 cf (36,948 cf above start)

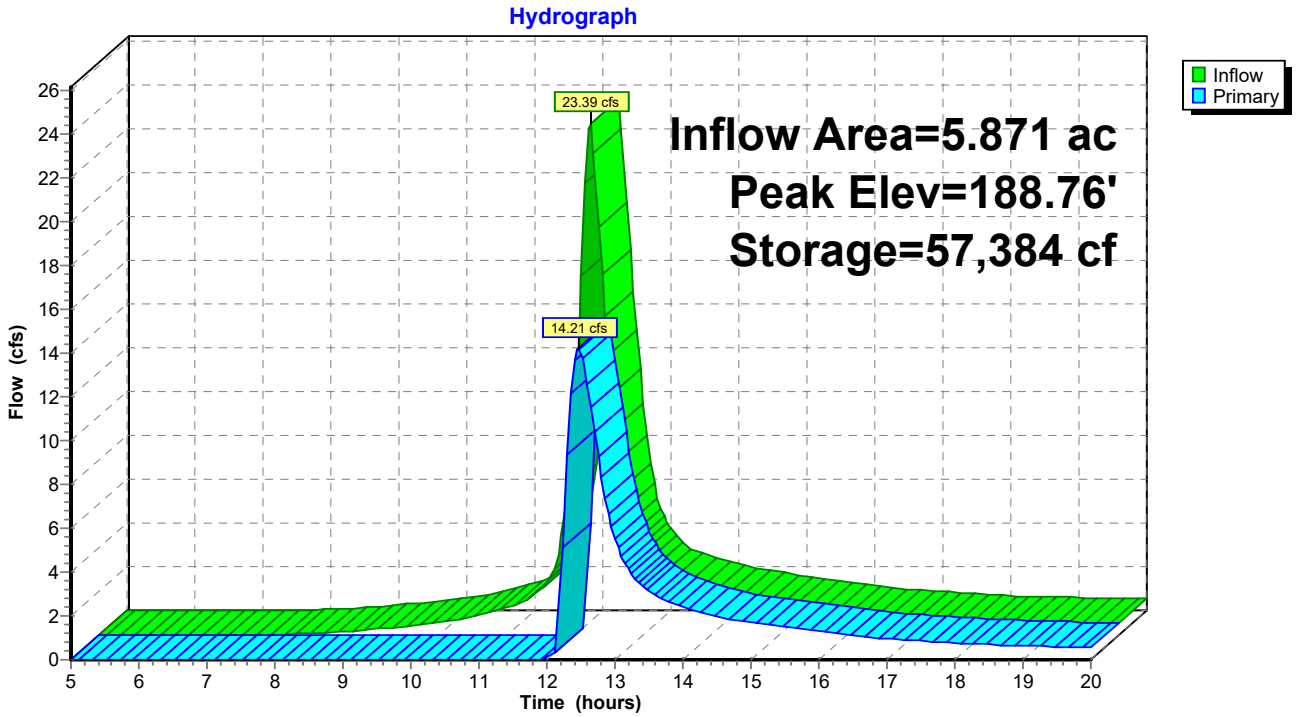
Plug-Flow detention time= 181.7 min calculated for 1.023 af (48% of inflow)
Center-of-Mass det. time= 54.4 min (847.6 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	77,652 cf	**75.00'W x 120.00'L x 6.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=14.14 cfs @ 12.46 hrs HW=188.76' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 14.14 cfs @ 2.33 fps)

Pond 4P: Pond 4



Summary for Pond 5P: Pond 5

Inflow Area = 2.637 ac, 0.00% Impervious, Inflow Depth > 3.79" for 100 year event
Inflow = 10.76 cfs @ 12.15 hrs, Volume= 0.832 af
Outflow = 6.09 cfs @ 12.35 hrs, Volume= 0.648 af, Atten= 43%, Lag= 12.1 min
Primary = 6.09 cfs @ 12.35 hrs, Volume= 0.648 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 219.09' @ 12.35 hrs Surf.Area= 5,385 sf Storage= 12,784 cf

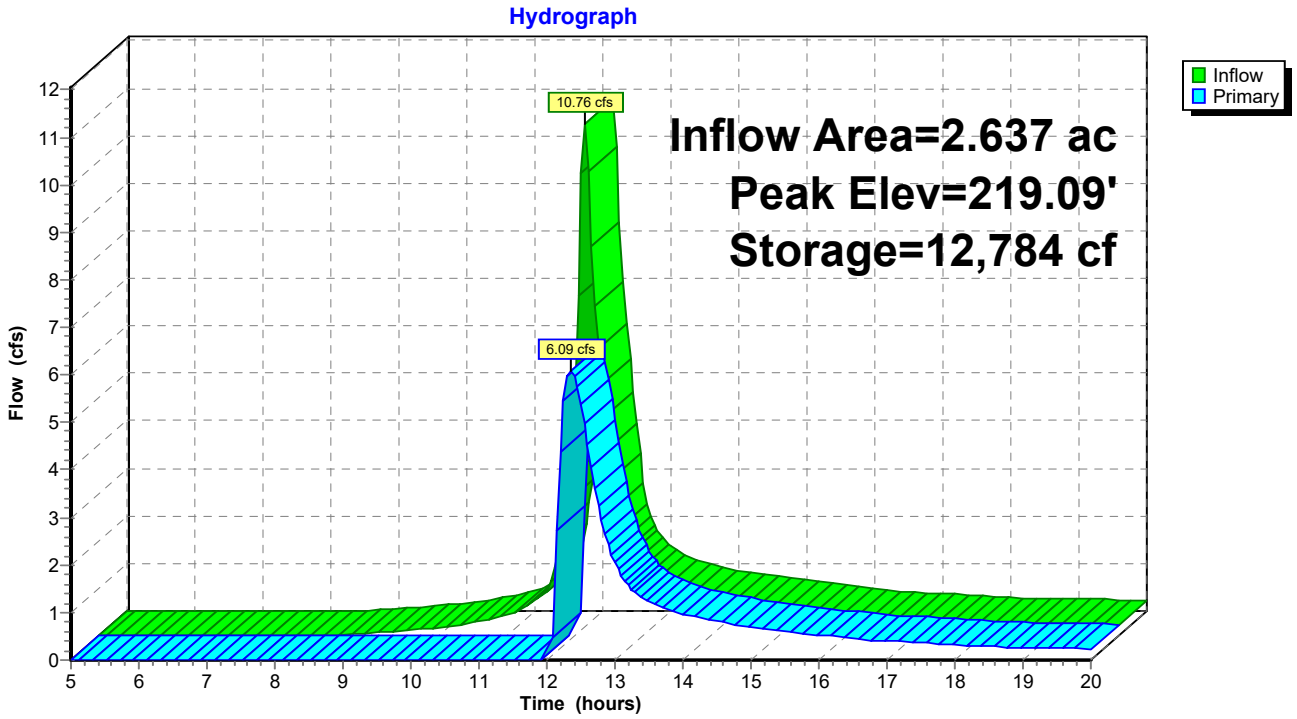
Plug-Flow detention time= 99.8 min calculated for 0.648 af (78% of inflow)
Center-of-Mass det. time= 43.6 min (840.8 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	18,048 cf	**60.00'W x 50.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.08 cfs @ 12.35 hrs HW=219.09' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.08 cfs @ 2.79 fps)

Pond 5P: Pond 5



Summary for Pond 6P: Pond 6

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth > 4.34" for 100 year event
Inflow = 15.98 cfs @ 12.12 hrs, Volume= 1.157 af
Outflow = 10.50 cfs @ 12.24 hrs, Volume= 0.929 af, Atten= 34%, Lag= 7.5 min
Primary = 10.50 cfs @ 12.24 hrs, Volume= 0.929 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 207.00' Surf.Area= 3,844 sf Storage= 6,296 cf
Peak Elev= 210.20' @ 12.24 hrs Surf.Area= 6,592 sf Storage= 22,788 cf (16,492 cf above start)

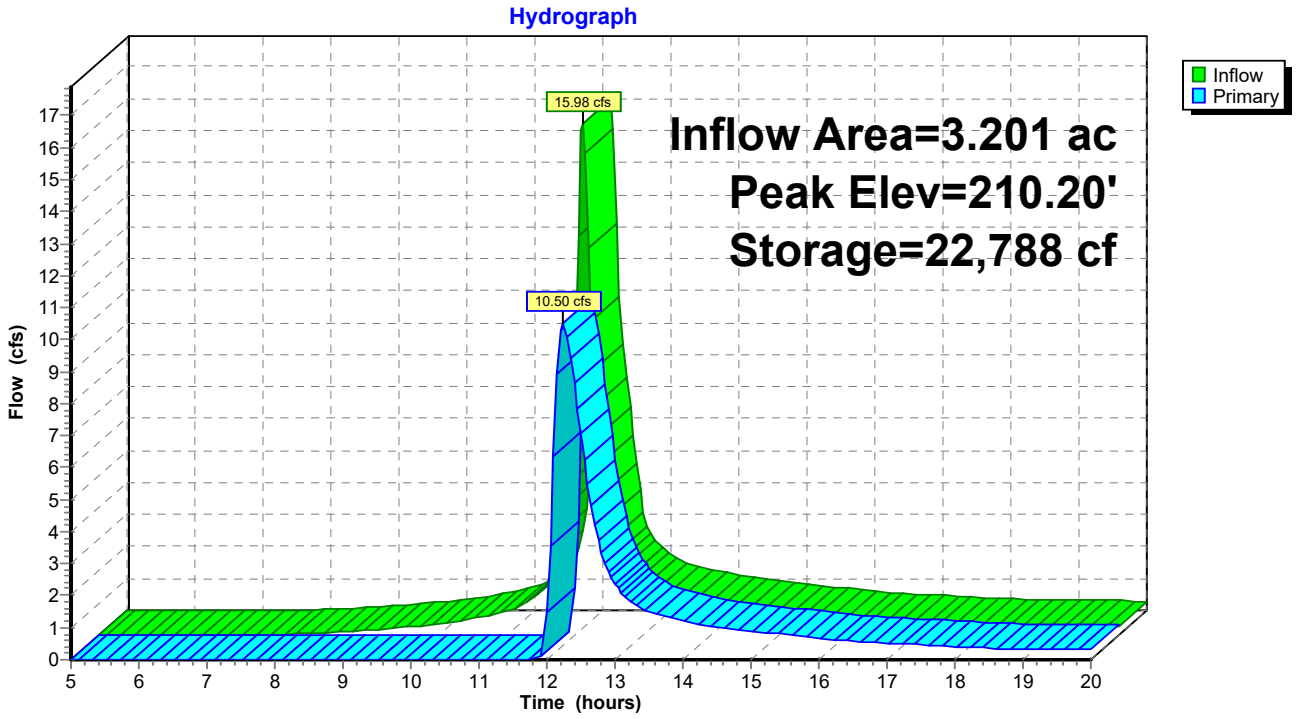
Plug-Flow detention time= 127.6 min calculated for 0.784 af (68% of inflow)
Center-of-Mass det. time= 40.3 min (827.1 - 786.8)

Volume	Invert	Avail.Storage	Storage Description
#1	205.00'	24,822 cf	**50.00'W x 50.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	209.00'	**3.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=10.46 cfs @ 12.24 hrs HW=210.19' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 10.46 cfs @ 2.92 fps)

Pond 6P: Pond 6



Summary for Pond 7P: Pond 7

Inflow Area =	1.170 ac,	0.00% Impervious,	Inflow Depth >	4.01"	for 100 year event
Inflow =	5.81 cfs @	12.09 hrs,	Volume=	0.391 af	
Outflow =	2.84 cfs @	12.27 hrs,	Volume=	0.314 af,	Atten= 51%, Lag= 10.8 min
Discarded =	0.26 cfs @	12.27 hrs,	Volume=	0.169 af	
Primary =	2.57 cfs @	12.27 hrs,	Volume=	0.146 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 226.61' @ 12.27 hrs Surf.Area= 2,570 sf Storage= 5,802 cf

Plug-Flow detention time= 109.6 min calculated for 0.314 af (80% of inflow)
Center-of-Mass det. time= 57.0 min (847.1 - 790.2)

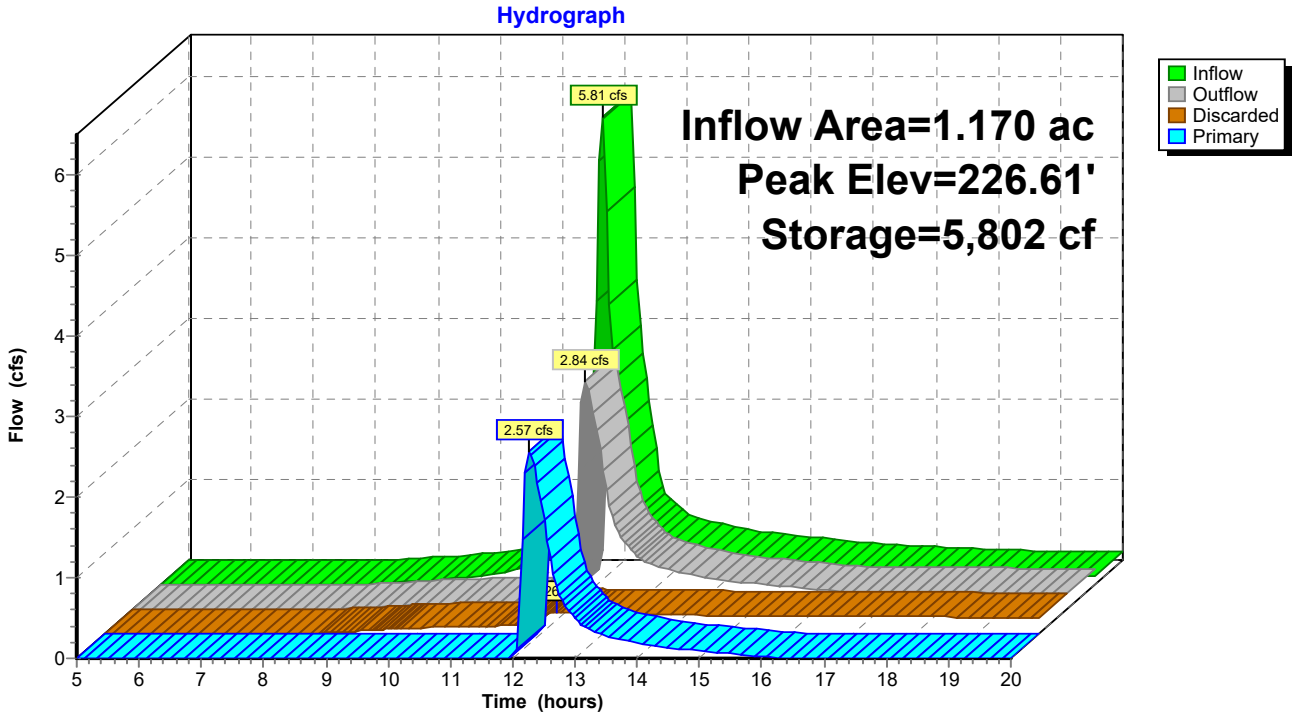
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	8,339 cf	**20.00'W x 40.00'L x 4.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	223.00'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 200.00'

Discarded OutFlow Max=0.26 cfs @ 12.27 hrs HW=226.61' (Free Discharge)
└**2=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=2.54 cfs @ 12.27 hrs HW=226.61' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.54 cfs @ 2.09 fps)

Pond 7P: Pond 7



Summary for Pond 8P: Pond 8

Inflow Area = 4.686 ac, 0.00% Impervious, Inflow Depth > 4.22" for 100 year event
Inflow = 21.42 cfs @ 12.15 hrs, Volume= 1.650 af
Outflow = 11.88 cfs @ 12.34 hrs, Volume= 1.416 af, Atten= 45%, Lag= 11.9 min
Primary = 11.88 cfs @ 12.34 hrs, Volume= 1.416 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 190.56' @ 12.34 hrs Surf.Area= 8,657 sf Storage= 24,022 cf

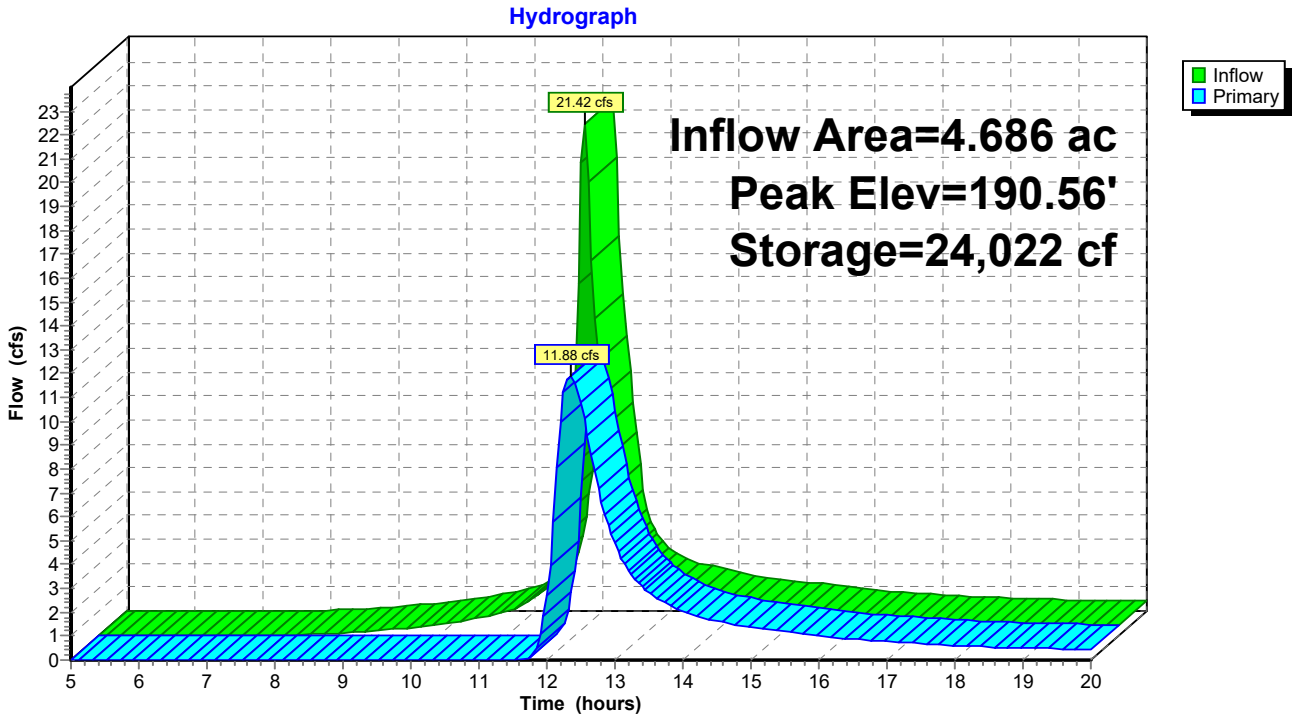
Plug-Flow detention time= 82.0 min calculated for 1.411 af (86% of inflow)
Center-of-Mass det. time= 41.0 min (831.1 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	27,968 cf	**50.00'W x 100.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.50'	**1.5' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=11.87 cfs @ 12.34 hrs HW=190.56' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 11.87 cfs @ 3.85 fps)

Pond 8P: Pond 8



Summary for Pond 9P: Pond 9

Inflow Area = 1.521 ac, 0.00% Impervious, Inflow Depth > 4.34" for 100 year event
Inflow = 8.02 cfs @ 12.10 hrs, Volume= 0.550 af
Outflow = 3.52 cfs @ 12.32 hrs, Volume= 0.386 af, Atten= 56%, Lag= 13.2 min
Primary = 3.52 cfs @ 12.32 hrs, Volume= 0.386 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 188.00' Surf.Area= 2,664 sf Storage= 4,116 cf
Peak Elev= 190.75' @ 12.32 hrs Surf.Area= 4,739 sf Storage= 14,188 cf (10,072 cf above start)

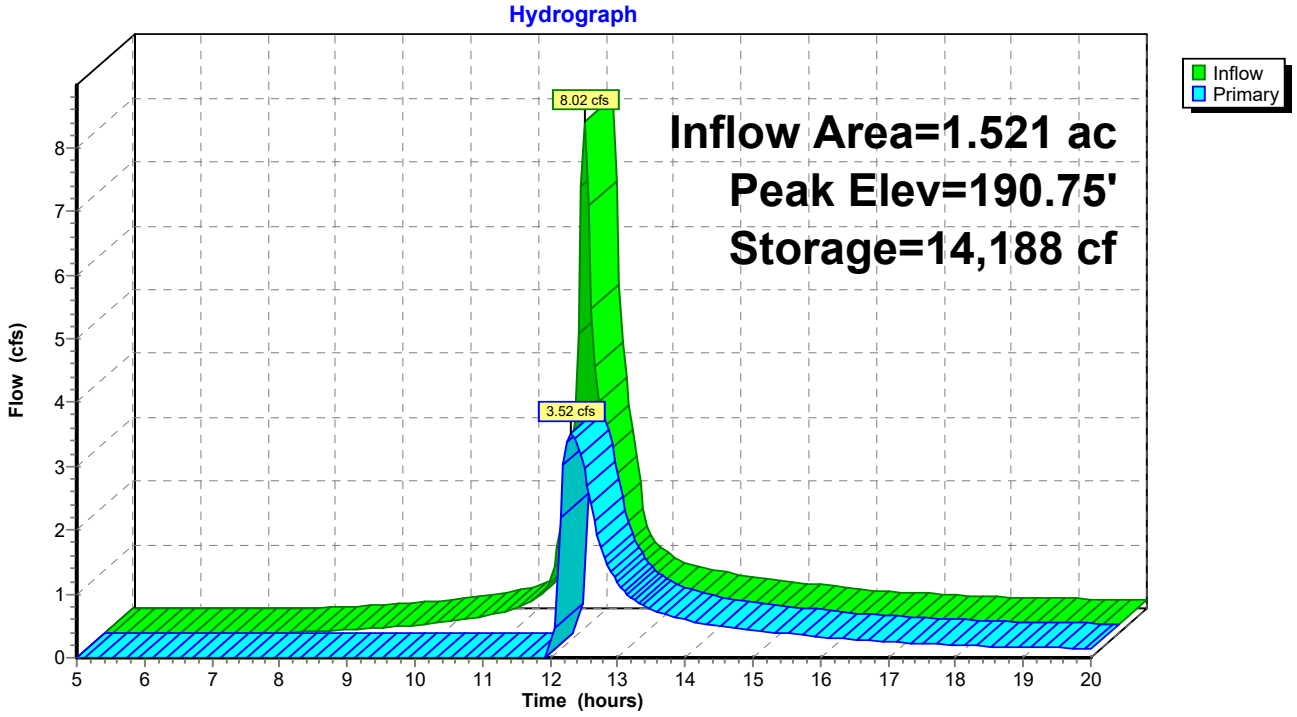
Plug-Flow detention time= 170.8 min calculated for 0.291 af (53% of inflow)
Center-of-Mass det. time= 57.3 min (842.7 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	17,960 cf	**25.00'W x 60.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.50 cfs @ 12.32 hrs HW=190.75' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 2.33 fps)

Pond 9P: Pond 9



Summary for Pond 10P: Pond 10

Inflow Area = 2.304 ac, 0.00% Impervious, Inflow Depth > 4.22" for 100 year event
Inflow = 10.28 cfs @ 12.16 hrs, Volume= 0.811 af
Outflow = 5.31 cfs @ 12.39 hrs, Volume= 0.600 af, Atten= 48%, Lag= 14.3 min
Primary = 5.31 cfs @ 12.39 hrs, Volume= 0.600 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.50' @ 12.39 hrs Surf.Area= 5,980 sf Storage= 14,040 cf

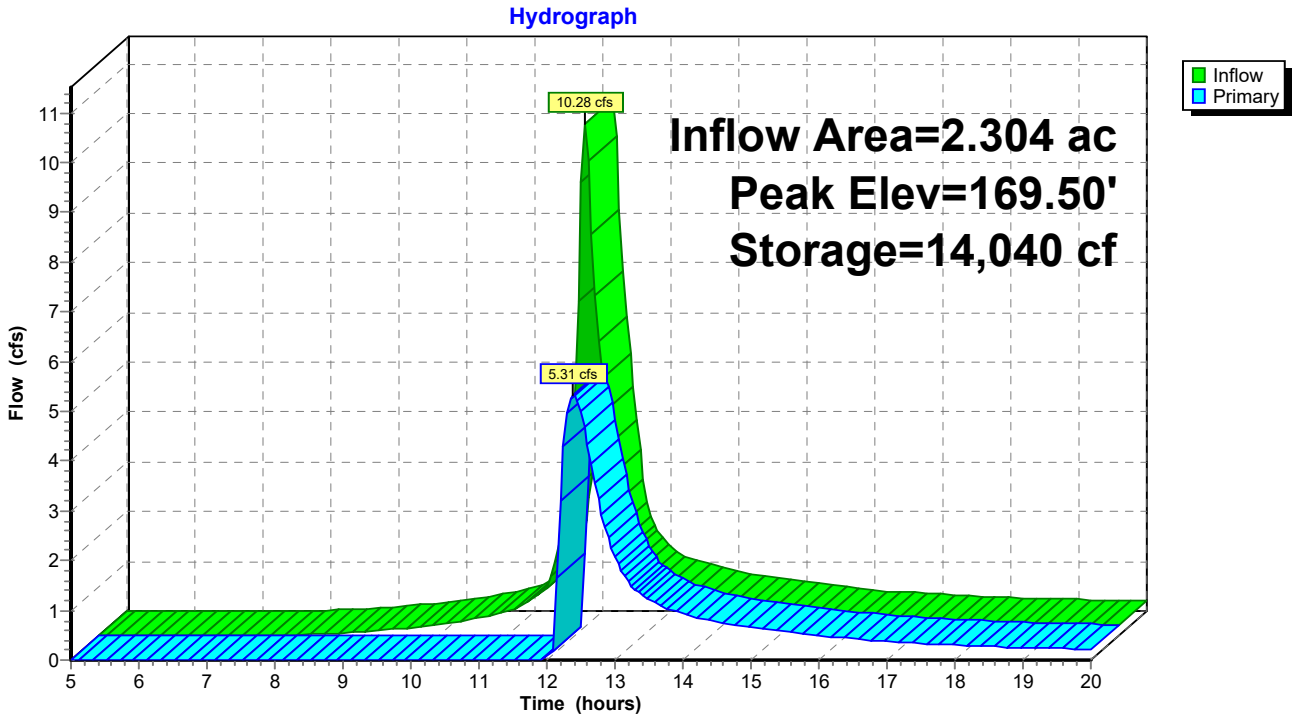
Plug-Flow detention time= 113.8 min calculated for 0.600 af (74% of inflow)
Center-of-Mass det. time= 52.4 min (843.2 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	166.50'	17,175 cf	**50.00'W x 70.00'L x 3.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	168.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.30 cfs @ 12.39 hrs HW=169.49' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.30 cfs @ 2.66 fps)

Pond 10P: Pond 10



Summary for Pond 11P: Pond 11

Inflow Area = 1.126 ac, 0.00% Impervious, Inflow Depth > 4.45" for 100 year event
Inflow = 6.23 cfs @ 12.08 hrs, Volume= 0.418 af
Outflow = 2.24 cfs @ 12.36 hrs, Volume= 0.263 af, Atten= 64%, Lag= 16.9 min
Primary = 2.24 cfs @ 12.36 hrs, Volume= 0.263 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 149.50' Surf.Area= 1,776 sf Storage= 2,043 cf
Peak Elev= 152.56' @ 12.36 hrs Surf.Area= 3,913 sf Storage= 10,577 cf (8,534 cf above start)

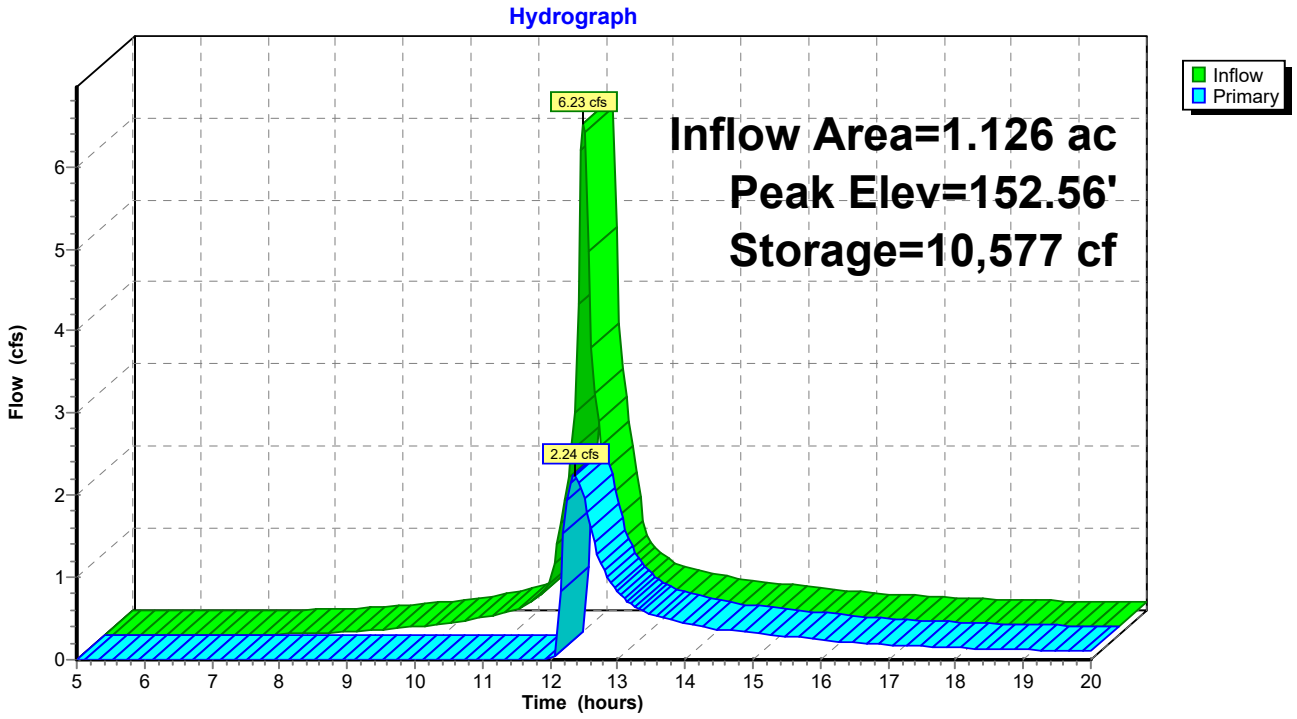
Plug-Flow detention time= 174.8 min calculated for 0.216 af (52% of inflow)
Center-of-Mass det. time= 68.6 min (851.4 - 782.8)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	14,619 cf	**15.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.22 cfs @ 12.36 hrs HW=152.56' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 2.22 cfs @ 1.99 fps)

Pond 11P: Pond 11



Summary for Pond 12P: Pond 12

Inflow Area = 3.677 ac, 0.00% Impervious, Inflow Depth > 4.12" for 100 year event
Inflow = 17.60 cfs @ 12.11 hrs, Volume= 1.262 af
Outflow = 9.87 cfs @ 12.28 hrs, Volume= 1.059 af, Atten= 44%, Lag= 9.8 min
Primary = 9.87 cfs @ 12.28 hrs, Volume= 1.059 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 157.00' Surf.Area= 4,384 sf Storage= 6,836 cf
Peak Elev= 160.01' @ 12.28 hrs Surf.Area= 7,764 sf Storage= 24,964 cf (18,128 cf above start)

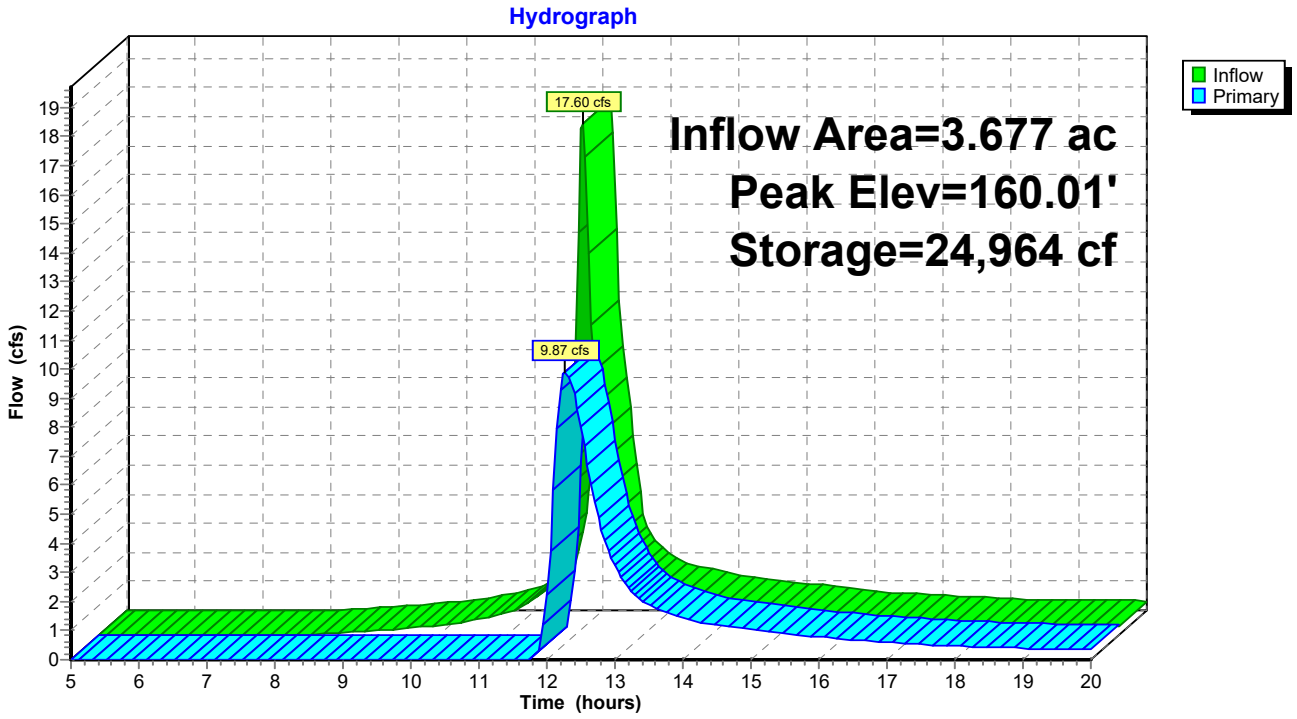
Plug-Flow detention time= 121.8 min calculated for 0.899 af (71% of inflow)
Center-of-Mass det. time= 39.6 min (829.7 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	28,905 cf	**20.00'W x 125.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	158.50'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=9.83 cfs @ 12.28 hrs HW=160.01' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 9.83 cfs @ 3.26 fps)

Pond 12P: Pond 12



Summary for Pond 13.1P: Pond 13.1

Inflow Area = 3.117 ac, 0.00% Impervious, Inflow Depth > 4.56" for 100 year event
Inflow = 17.02 cfs @ 12.10 hrs, Volume= 1.185 af
Outflow = 9.16 cfs @ 12.26 hrs, Volume= 0.940 af, Atten= 46%, Lag= 9.4 min
Primary = 9.16 cfs @ 12.26 hrs, Volume= 0.940 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 224.77' @ 12.26 hrs Surf.Area= 18,412 sf Storage= 19,219 cf

Plug-Flow detention time= 101.5 min calculated for 0.936 af (79% of inflow)
Center-of-Mass det. time= 48.5 min (830.6 - 782.1)

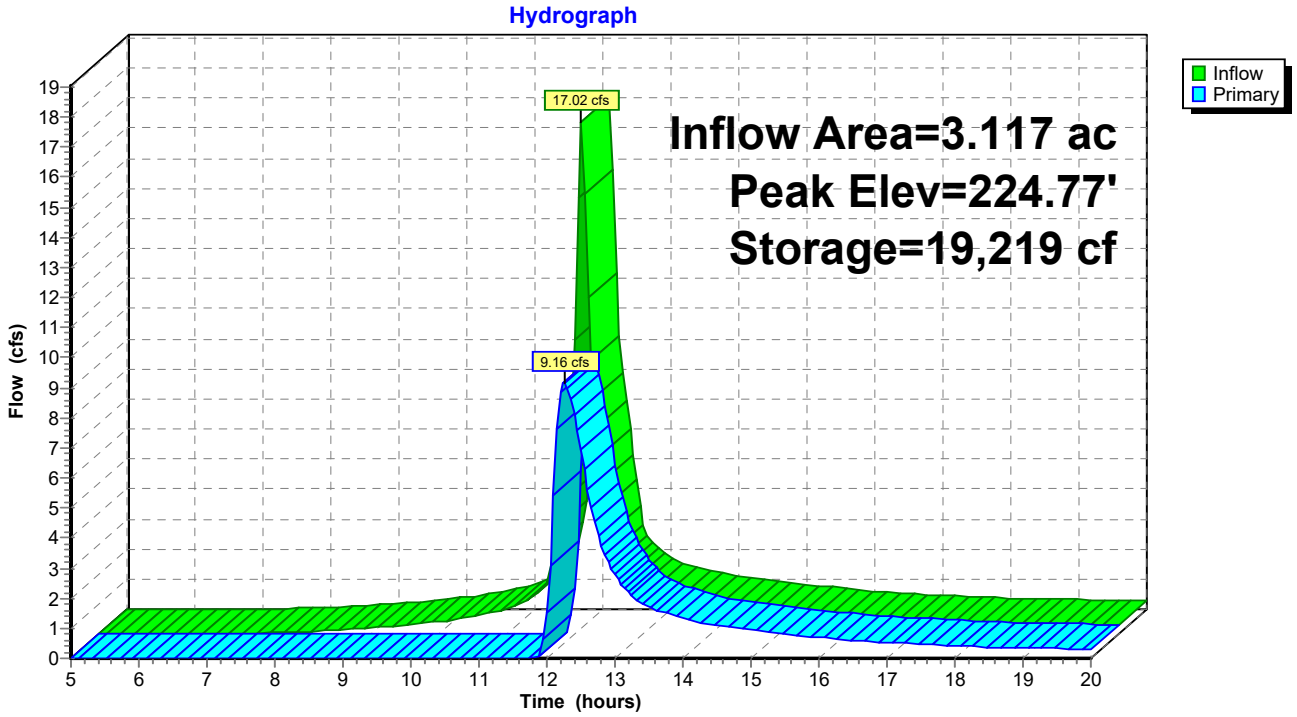
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	27,720 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.00	1,200	0	0
224.20	15,000	9,720	9,720
225.20	21,000	18,000	27,720

Device	Routing	Invert	Outlet Devices
#1	Primary	224.20'	**8.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=9.12 cfs @ 12.26 hrs HW=224.77' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 9.12 cfs @ 2.01 fps)

Pond 13.1P: Pond 13.1



Summary for Pond 13P: Pond 13

Inflow Area = 12.425 ac, 0.00% Impervious, Inflow Depth > 4.15" for 100 year event
Inflow = 45.84 cfs @ 12.17 hrs, Volume= 4.297 af
Outflow = 14.67 cfs @ 12.68 hrs, Volume= 2.815 af, Atten= 68%, Lag= 30.2 min
Discarded = 1.92 cfs @ 12.68 hrs, Volume= 1.387 af
Primary = 12.75 cfs @ 12.68 hrs, Volume= 1.428 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 188.71' @ 12.68 hrs Surf.Area= 21,456 sf Storage= 81,861 cf

Plug-Flow detention time= 137.0 min calculated for 2.806 af (65% of inflow)
Center-of-Mass det. time= 65.9 min (865.5 - 799.6)

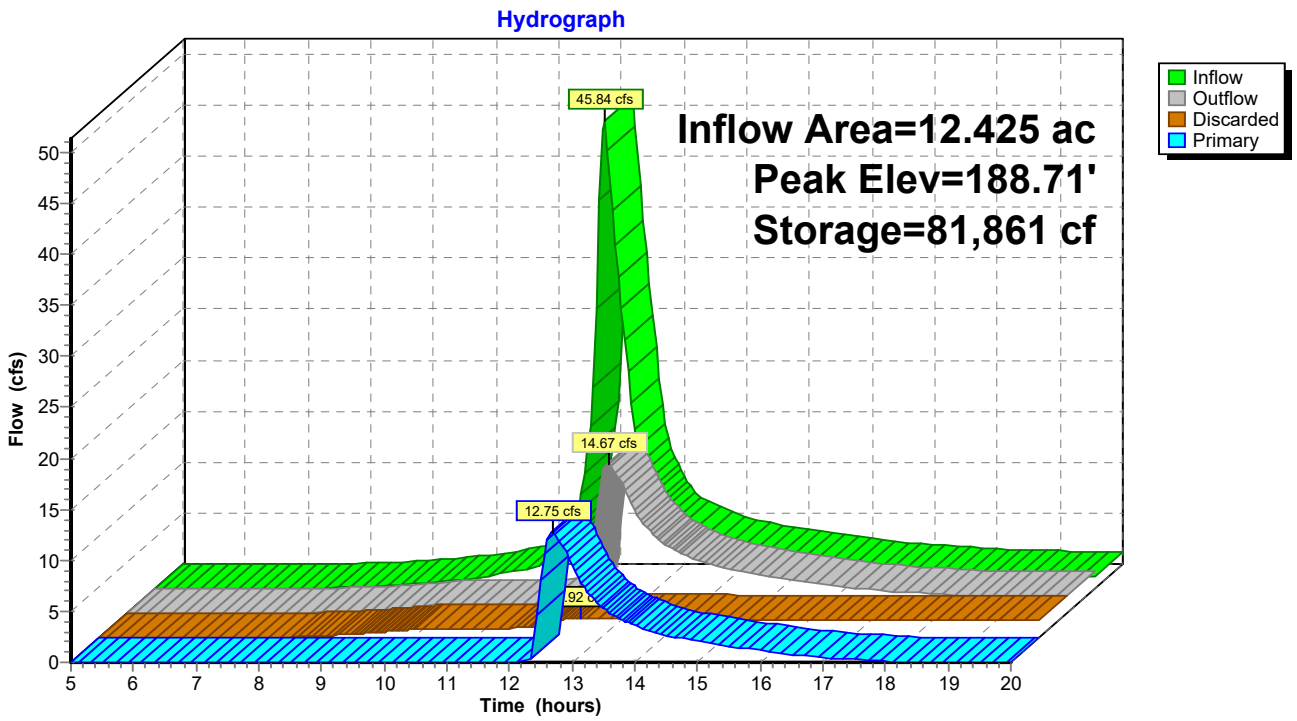
Volume	Invert	Avail.Storage	Storage Description
#1	184.00'	99,484 cf	**80.00'W x 170.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	188.00'	**8.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	184.00'	**2.700 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=1.92 cfs @ 12.68 hrs HW=188.70' (Free Discharge)
└**2=Exfiltration** (Controls 1.92 cfs)

Primary OutFlow Max=12.70 cfs @ 12.68 hrs HW=188.70' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 12.70 cfs @ 2.25 fps)

Pond 13P: Pond 13



Summary for Pond 14P: Pond 14

Inflow Area =	4.438 ac,	0.00% Impervious,	Inflow Depth >	3.68"	for 100 year event
Inflow =	18.18 cfs @	12.13 hrs,	Volume=	1.361 af	
Outflow =	11.44 cfs @	12.28 hrs,	Volume=	1.145 af,	Atten= 37%, Lag= 9.0 min
Discarded =	0.62 cfs @	12.28 hrs,	Volume=	0.358 af	
Primary =	10.82 cfs @	12.28 hrs,	Volume=	0.787 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 191.61' @ 12.28 hrs Surf.Area= 5,320 sf Storage= 16,929 cf

Plug-Flow detention time= 77.0 min calculated for 1.141 af (84% of inflow)
Center-of-Mass det. time= 32.1 min (830.0 - 797.9)

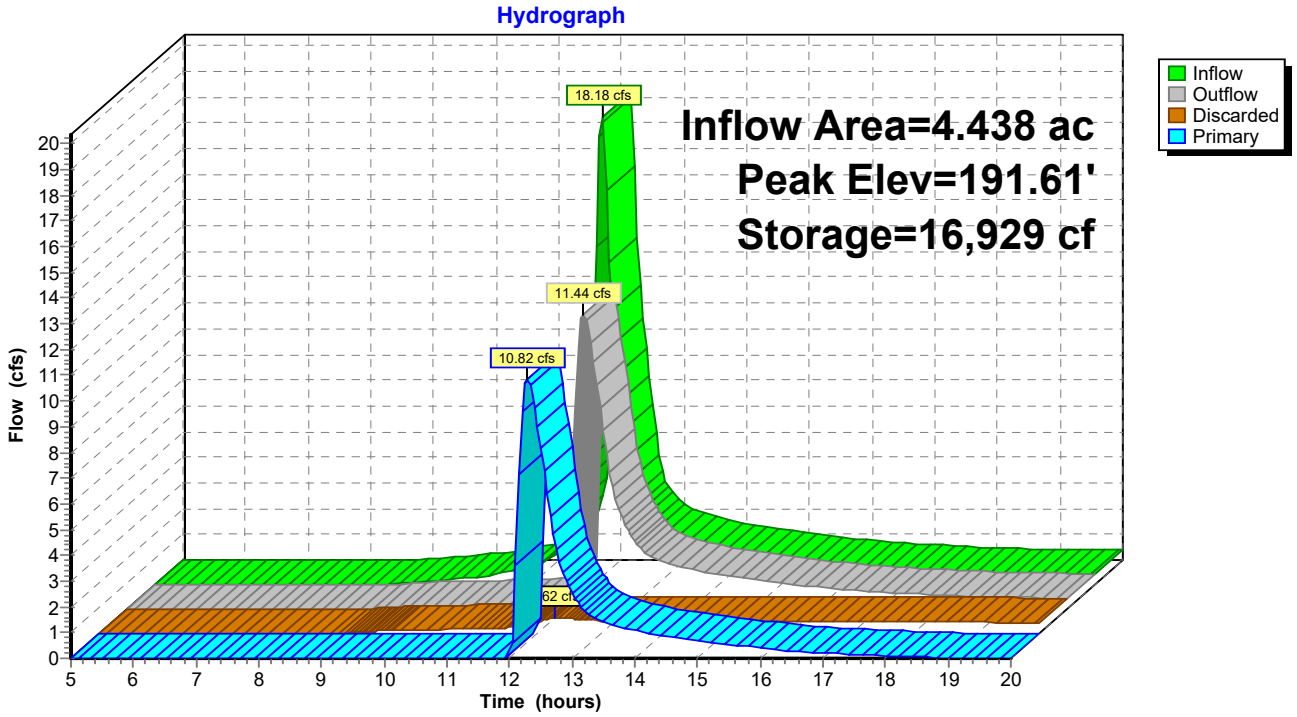
Volume	Invert	Avail.Storage	Storage Description
#1	186.50'	19,102 cf	**25.00'W x 65.00'L x 5.50'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	**2.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	186.50'	**3.900 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 175.00'

Discarded OutFlow Max=0.62 cfs @ 12.28 hrs HW=191.60' (Free Discharge)
└**2=Exfiltration** (Controls 0.62 cfs)

Primary OutFlow Max=10.76 cfs @ 12.28 hrs HW=191.60' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 10.76 cfs @ 3.36 fps)

Pond 14P: Pond 14



Summary for Pond 16P: Pond 16

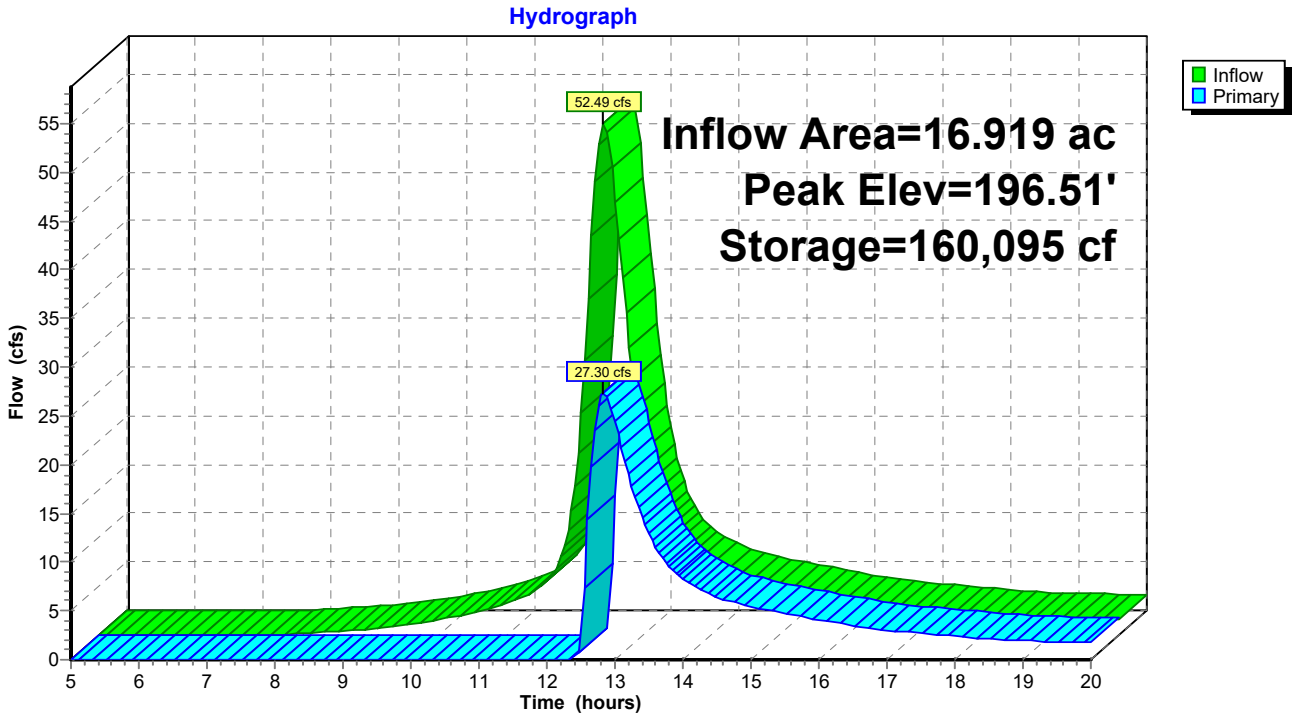
Inflow Area = 16.919 ac, 0.00% Impervious, Inflow Depth > 4.42" for 100 year event
Inflow = 52.49 cfs @ 12.43 hrs, Volume= 6.227 af
Outflow = 27.30 cfs @ 12.84 hrs, Volume= 3.823 af, Atten= 48%, Lag= 24.7 min
Primary = 27.30 cfs @ 12.84 hrs, Volume= 3.823 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 191.00' Surf.Area= 17,554 sf Storage= 31,256 cf
Peak Elev= 196.51' @ 12.84 hrs Surf.Area= 29,535 sf Storage= 160,095 cf (128,839 cf above start)

Plug-Flow detention time= 177.8 min calculated for 3.095 af (50% of inflow)
Center-of-Mass det. time= 71.7 min (874.7 - 803.1)

Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	174,704 cf	**55.00'W x 250.00'L x 8.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	195.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=27.23 cfs @ 12.84 hrs HW=196.51' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 27.23 cfs @ 2.69 fps)

Pond 16P: Pond 16