

# Mulnite II Solar

Mulnite Farms  
East Windsor, Connecticut

PREPARED FOR

Greenskies Clean Energy LLC  
127 Washington Ave  
West Building, Garden Level  
North Haven, CT 06473

PREPARED BY

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July 23, 2021



# Table of Contents

<b>Table of Contents .....</b>	<b>i</b>
<b>Project Summary .....</b>	<b>1</b>
Project Description .....	1
Site Description .....	1
Methodology .....	2
<b>Existing Drainage Conditions .....</b>	<b>3</b>
Summary .....	3
Hydrologic Information .....	3
<b>Proposed Drainage Conditions .....</b>	<b>6</b>
Summary .....	6
Hydrologic Information .....	6
<b>Hydrologic Analysis .....</b>	<b>8</b>
Hydrologic Analysis .....	8
Floodplain Information / Analysis .....	9
Water Quality Volume .....	9
Water Quality Flow .....	10
Stream Channel Protection .....	10



### **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
- Aquifer Protection Area Mapping

Appendix B: NRCS Soil Survey Information

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

# Project Summary

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## Project Description

The Petitioner, Greenskies Clean Energy, LLC, is proposing to construct a 5 MW solar farm on undeveloped farmland 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 prepared by others under separate cover.

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## Site Description

The Project Site will be comprised of two parcels. The parcel to the north is on approximately ±24.8 acres west of Rockville Road and the parcel to the south is on approximately ±26.2 acres east of Miller Road, (Map, Block, Lot: 038-68-030 and 028-68-023) in East Windsor, Connecticut (see Figure 1). The development site parcel to the north is bounded by active farm field on all sides. The parcels to the north, west, and east are zoned R-3 (Single Family Residential) and the parcel to the south is zoned A-1 (Agricultural/ Residential). The development site parcel to the south is surrounded by farm fields to the north and residential uses to the south, west, and east. The parcels to the north, south, east, and west are zoned A-1 (Agricultural/ Residential). The development site parcel to the north is within the R-3 zone (Single Family Residential) and the development site parcel to the south is within the A-1 (Agricultural/Residential).

The project area under existing conditions is active farmland. There is one delineated on-site wetland system on the development site. The wetland is located in the southeast corner of the southern parcel. However, no portions of the development area discharge runoff to this wetland. Under existing conditions, runoff from the project in the northern parcel flows northeast along a farm road and in the southern parcel runoff from the project generally flows southwest off the property. There are five sub-watersheds that make up the full development area: one path collects and follows along a farm road eventually discharging across residential property to a culvert that crosses Rockville Road to Windsorville Pond, two areas collect and discharge stormwater runoff towards residential property to the west,



another path collects and flows into a stream flowing parallel to the southern property line, and the final path flows across farm fields off the property towards residential properties in the northeast direction.

According to available soil mapping<sup>1</sup>, the on-site soils are not expected to have restrictive layers up to 8 feet in depth. Soil profiles across the development area are anticipated to be extremely homogenous silt loams underlain with sand, displaying Hydraulic Soil Group "B". See Appendix B for NRCS Web Soil Survey output. It is proposed to perform on-site geotechnical investigations following the current on-site farming harvest.

According to available CTDEEP Groundwater Classification maps, groundwater at the site is GA (see Appendix A). The CTDEEP Aquifer Protection Areas Mapping website does not show the site as being within an Aquifer Protection Area.

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## Methodology

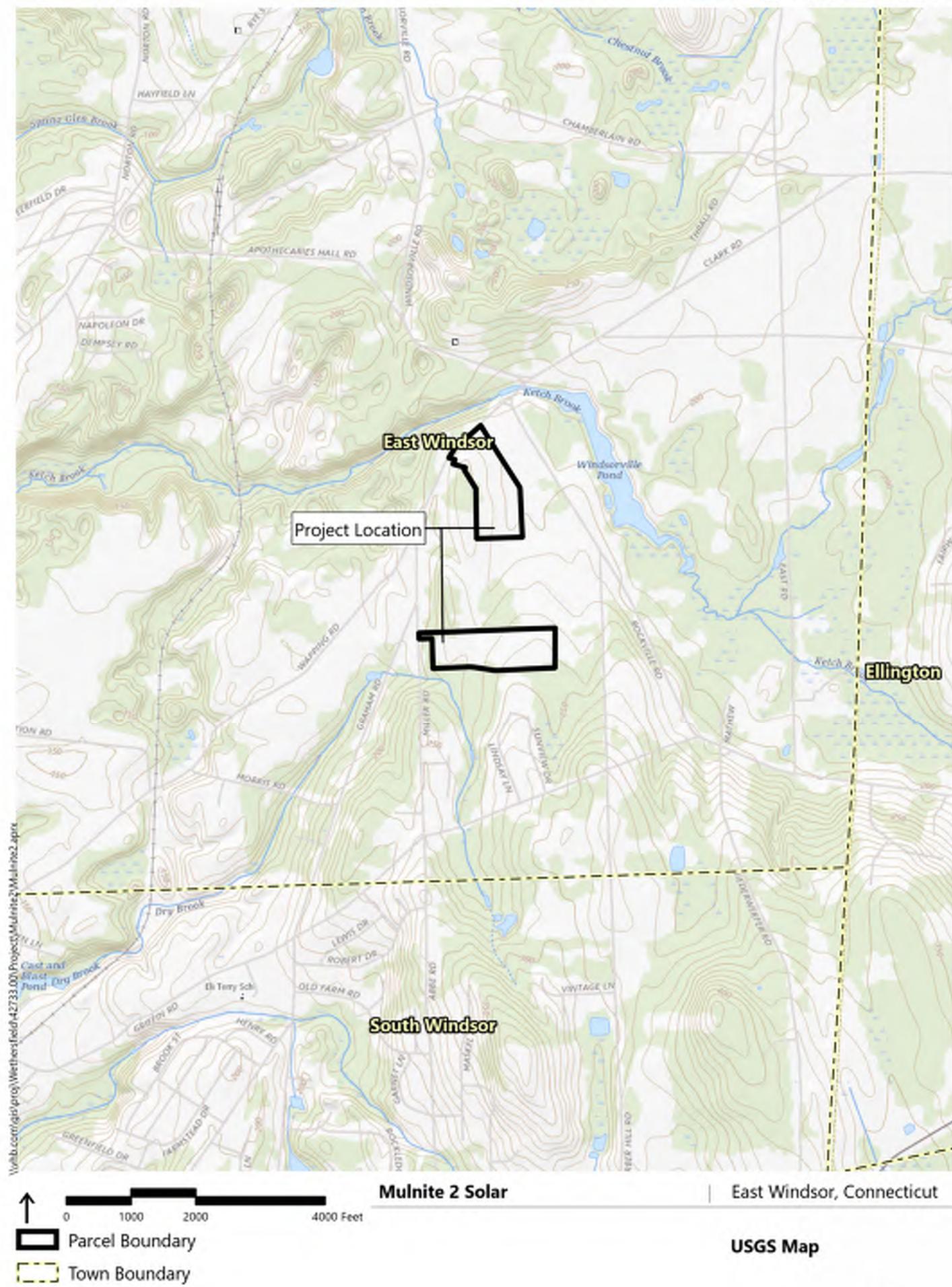
The Project was designed to incorporate measures provided in the Connecticut Stormwater Quality Manual (CTDEEP 2004) as well as the CTDEEP Stormwater General Permit effective December 31, 2020. The conclusion of this analysis is that the proposed improvements will not increase the post-development peak 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 treated prior to discharge from the Site. It is also proposed to meet State stream channel protection requirements for frequent rainfall events.

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<sup>1</sup> <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>



**Figure 1: Site Location Map**



## Existing Drainage Conditions

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### Summary

Under existing conditions, runoff from the project in the northern parcel flows northeast and in the southern parcel runoff from the project generally flows southwest off the property. There are five sub-watersheds that make up the full development areas: one path collects and follows along a farm road eventually discharging across residential property to a culvert that crosses Rockville Road to Windsorville Pond, two areas collect and discharge stormwater runoff towards residential property to the west, another path collects and flows into a stream flowing parallel to the southern property line, and the final path flows across farm fields off the property towards residential properties in the northeast direction.

The Site is generally at its highest elevation in the central southern portion of the Project and slopes down into the west and east sides of the site. The entirety of the Project area is comprised of farmland. Terrain slopes in the Project area range from 0% to approximately 5% with no slopes exceeding 15% existing slope.

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### Hydrologic Information

For the existing conditions hydrologic analysis, the Site has been divided into five (5) drainage areas, which have been identified as areas at the Project limits where flow begins to concentrate naturally before exiting the development areas. Table 1 provides a summary of the existing conditions hydrologic data. Figure 2 illustrates the existing drainage patterns on the Site. All portions of the Project site and tributary offsite areas have been considered in the hydrologic analysis discharging to the Design Points. All existing areas to be developed have been modelled as row crops with exception of the existing farm roads.

**Drainage Area 1** - This ±4.9-acre area is located in the southern portion of the northern parcel. Stormwater in this area flows untreated generally in the east direction to the edge of the farm field. The stormwater then travels north along the farm road eventually discharging across a residential property to a culvert that crosses Rockville Road.



**Drainage Area 2** – This ±1.3 acre area is located at the northwestern portion of the Site in the southern parcel. Stormwater in this area flows untreated generally west of the site over farm fields and ultimately towards residential property.

**Drainage Area 3** – This ±2.0 acre area is located at the southwestern portion of the Site in the southern parcel. Stormwater in this area flows untreated generally west of the site over farm fields and ultimately towards residential property.

**Drainage Area 4** – This ±20.1-acre area is located at the central portion of the Site in the southern parcel. Stormwater in this area flows untreated generally towards the Eversource easement area. The stormwater then flows south under the Eversource easement to an existing stream that flows west, parallel with the southern property line.

**Drainage Area 5** – This ±1.9-acre area is located at the eastern portion of the Site in the southern parcel. Stormwater in this area flows untreated generally to the north/northeast to the corner of the property and then towards residential property.

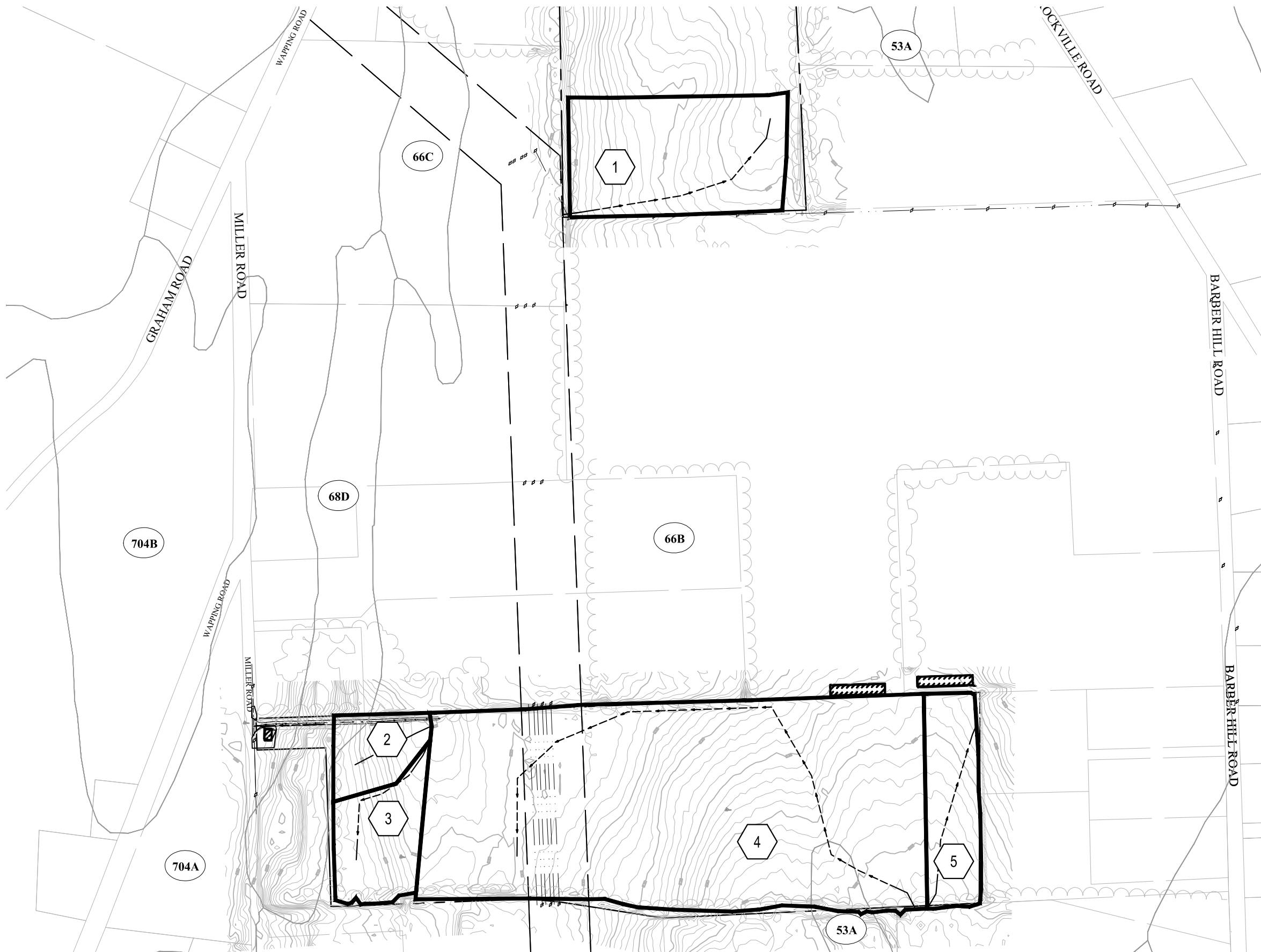
Table 1 summarizes the key hydrologic parameters for each drainage area used in the existing conditions analysis.

**Table 1 Existing Conditions Hydrologic Data**

<b>Drainage Area</b>	<b>Discharge Location</b>	<b>Area (acres)</b>	<b>Curve Number</b>	<b>Time of Concentration (min)</b>
1	Farm Road to North	4.9	77	13.5
2	Miller Road residence	1.3	77	7.5
3	Miller Road residence	2.0	78	9.3
4	Southern Stream	20.1	79	34.9
5	Barber Hill Road residence	1.9	79	14.1



**Figure 2: Existing Drainage Areas**



## Legend

### Symbols

DRAINAGE AREA DESIGNATION

DRAINAGE POND

### Linetypes

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

SOIL TYPE BOUNDARY

WETLAND BOUNDARY

### SCS Soil Classifications

WAPPING VERY FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES

NARRAGANSETT SILT LOAM, 2 TO 8 PERCENT SLOPES

NARRAGANSETT SILT LOAM, 8 TO 15 PERCENT SLOPES

NARRAGANSETT SILT LOAM, 15 TO 25 PERCENT SLOPES, EXTREMELY STONY

ENFIELD SILT LOAM, 0 TO 3 PERCENT SLOPES

ENFIELD SILT LOAM, 3 TO 8 PERCENT SLOPES



Existing Drainage Conditions

Figure 2

Mulnite II  
Mulnite Farms - East Windsor, CT



0 150 300 Feet

7/23/2021

## Proposed Drainage Conditions

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### Summary

The Site has been designed to maintain existing topography and mimic existing drainage patterns to the maximum extents feasible. 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 and no tree clearing is proposed. As a result, the Project will have minimal impact to surrounding ecologically sensitive areas.

The only impervious surfaces proposed to be constructed are access roads and small concrete pads for utility equipment. Once operational, vehicular access to the Project will be limited to infrequent maintenance visits. The vegetated buffers and proposed stormwater basins will provide water quality treatment in all portions of the Site.

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### 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 utilizes the same five (5) drainage areas from existing conditions. In accordance with CTDEEP Stormwater General Permit effective December 31, 2020, a reduction in Hydrologic Soil Group of half a step has been considered in the proposed conditions hydrologic model for developed portions of the site.

**Drainage Area 1** - This ±4.9-acre area is located in the southern portion of the northern parcel. Stormwater in this area flows generally in the east direction to Stormwater Basin 1. After being treated by this basin, the stormwater then travels north along the farm road eventually discharging across a residential property to a culvert that crosses Rockville Road.



**Drainage Area 2** – This  $\pm 1.3$  acre area is located at the northwestern portion of the Site in the southern parcel. Stormwater in this area flows generally west of the site under the proposed panel array to Stormwater Basin 2. After being treated by this basin, stormwater runoff ultimately discharges towards residential property.

**Drainage Area 3** – This  $\pm 2.0$  acre area is located at the northwestern portion of the Site in the southern parcel. Stormwater in this area flows generally west of the site under the proposed panel array to Stormwater Basin 3. After being treated by this basin, stormwater runoff ultimately discharges towards residential property.

**Drainage Area 4** – This  $\pm 20.1$ -acre area is located at the central portion of the Site in the southern parcel. Stormwater in this area flows generally towards the Eversource easement area and is collected by Stormwater Basin 4. After being treated by this basin, the stormwater is discharged to the existing stream on the southern property line.

**Drainage Area 5** – This  $\pm 1.9$ -acre area is located at the eastern portion of the Site in the southern parcel. Stormwater in this area flows untreated generally to the north/northeast to the corner of the property and then towards residential property. It is not proposed to install any solar infrastructure or other development in this watershed and it will only be planted.

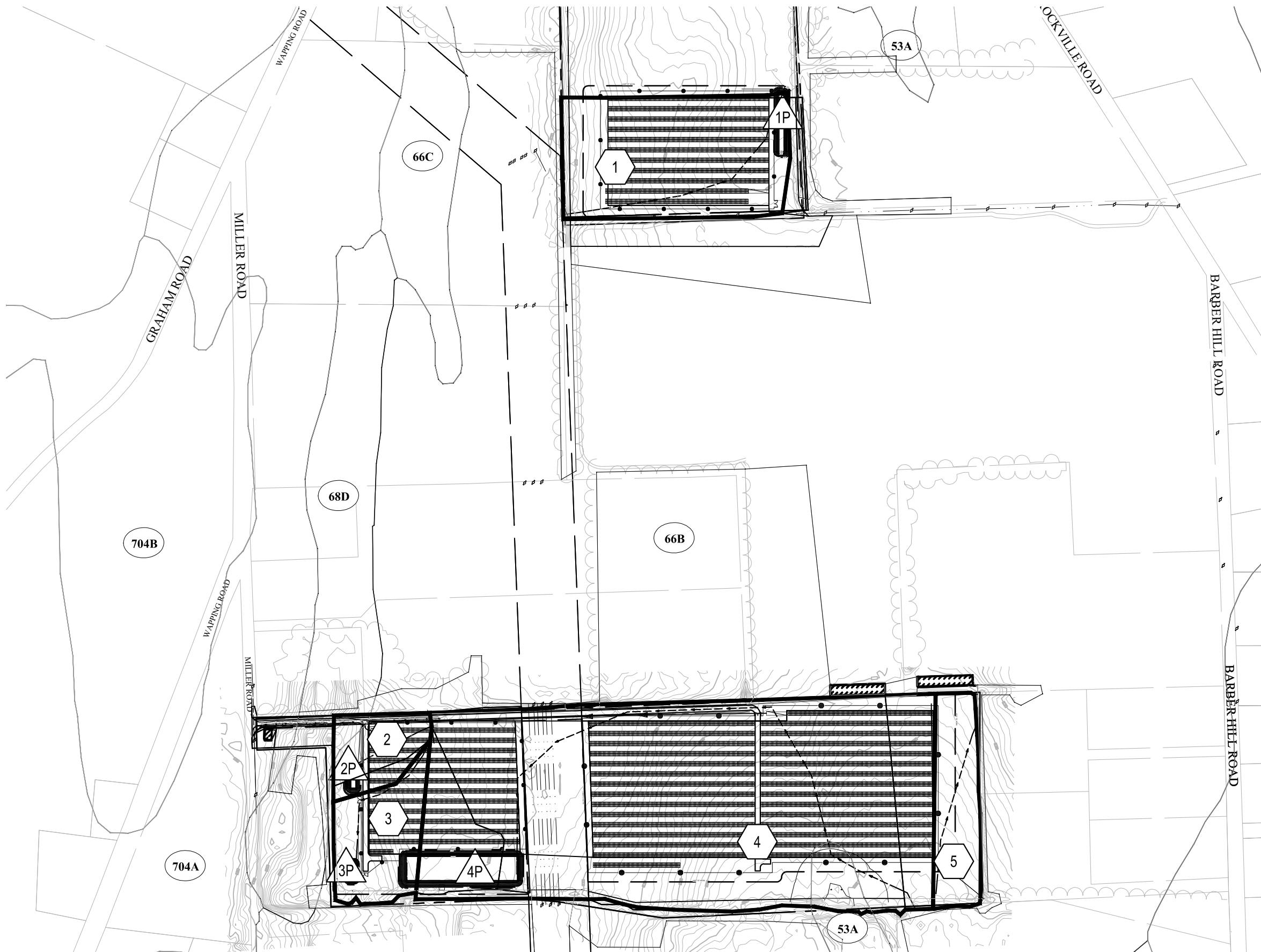
Table 2 summarizes the key hydrologic parameters for each drainage area used in the proposed conditions analysis.

**Table 2 Proposed Conditions Hydrologic Data**

<b>Drainage Area</b>	<b>Discharge Location</b>	<b>Area (acres)</b>	<b>Curve Number</b>	<b>Time of Concentration (min)</b>
1	Farm Road to North	4.9	75	13.5
2	Miller Road residence	1.3	76	7.5
3	Miller Road residence	2.0	74	9.3
4	Southern Stream	20.1	75	34.9
5	Barber Hill Road residence	1.9	70	14.1



**Figure 3: Proposed Drainage Areas**



## Legend

### SYMBOLS



DRAINAGE AREA DESIGNATION

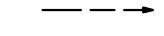


DRAINAGE POND

### LINETYPES



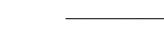
DRAINAGE AREA BOUNDARY



TIME OF CONCENTRATION FLOW LINE



SOIL TYPE BOUNDARY



WETLAND BOUNDARY

### SCS SOIL CLASSIFICATIONS



WAPPING VERY FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES



NARRAGANSETT SILT LOAM, 2 TO 8 PERCENT SLOPES



NARRAGANSETT SILT LOAM, 8 TO 15 PERCENT SLOPES



NARRAGANSETT SILT LOAM, 15 TO 25 PERCENT SLOPES, EXTREMELY STONY



ENFIELD SILT LOAM, 0 TO 3 PERCENT SLOPES



ENFIELD SILT LOAM, 3 TO 8 PERCENT SLOPES



Proposed Drainage Conditions

Figure 3

Mulnite II  
Mulnite Farms - East Windsor, CT

7/23/2021



0 150 300 Feet

# 4

## Hydrologic Analysis

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### Hydrologic Analysis

The rainfall-runoff was evaluated for the 2-, 25-, 50-, 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 3.16, 6.15, 6.99, 7.92 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 Stormwater General Permit effective December 31, 2020, the proposed conditions have been modelled with a loss of one-half 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 discharge points for all design storms with the implementation of the proposed permanent stormwater basins. It is proposed to perform field geotechnical investigations in the vicinity of each proposed basin location once the active farming has been harvested for the season. No more than one-half of the lowest field-tested infiltration rate for each infiltration basin will be used in the hydrologic model, in accordance with 2004 CTDEEP Stormwater Quality Manual. At this time the current design does not reflect infiltration rates.



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\*)**

<u>Watershed</u>	<u>2-year</u>	<u>25-year</u>	<u>50-year</u>	<u>100-year</u>
<b>1</b>				
Existing	5.46	16.70	20.04	23.76
Proposed	0.27	9.27	14.91	20.68
<b>2</b>				
Existing	1.71	5.22	6.26	7.41
Proposed	0.12	4.69	5.71	6.83
<b>3</b>				
Existing	2.35	7.39	8.90	10.58
Proposed	0.06	6.00	8.12	9.73
<b>4</b>				
Existing	15.92	47.29	56.61	66.96
Proposed	0.00	10.04	21.83	36.23
<b>5</b>				
Existing	2.14	6.36	7.60	8.98
Proposed	1.19	4.85	6.02	7.34

\* Expressed in cubic feet per second

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## Floodplain Information / Analysis

The entire portion of the Site is within the Federal Emergency Management Agency (FEMA) mapped "Area of Minimal Flood Hazard" as shown on the FEMA Flood Insurance Rate Map No. 09003C0245F, dated September 26, 2008 (included in Appendix A).

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## 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.



Water quality computations have been performed assuming that the existing and proposed access roads serving the facility are the only impervious areas which require treatment. These water quality volumes are addressed in the design of the proposed permanent stormwater basins. Computations can be found in Appendix D.

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## 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.

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## 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% or less of the 2-year, 24-hour pre-development peak flow for each watershed containing development.



# **Appendix A:**

FEMA Flood Insurance Rate Map  
NOAA Rainfall Depth Estimates  
CTDEEP Groundwater Classification Map  
Aquifer Protection Area Mapping



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## FEMA Flood Insurance Rate Map

# National Flood Hazard Layer FIRMette



72°32'35"W 41°53'8"N



## 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

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 OF FLOOD HAZARD

NO SCREEN Area of Minimal Flood Hazard Zone X

Effective LOMRs

Area of Undetermined Flood Hazard Zone D

### OTHER AREAS

— Channel, Culvert, or Storm Sewer

||||| Levee, Dike, or Floodwall

20.2 Cross Sections with 1% Annual Chance

17.5 Water Surface Elevation

8 — Coastal Transect

~~~ 513 ~~~ Base Flood Elevation Line (BFE)

— Limit of Study

— Jurisdiction Boundary

— Coastal Transect Baseline

— Profile Baseline

— Hydrographic Feature

Digital Data Available

No Digital Data Available

Unmapped



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 4/12/2021 at 11:02 AM 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.



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## NOAA Rainfall Depth Estimates



**NOAA Atlas 14, Volume 10, Version 3**  
**Location name: Broad Brook, Connecticut, USA\***  
**Latitude: 41.8776°, Longitude: -72.5417°**  
**Elevation: 205.7 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

| Duration | Average recurrence interval (years) |                        |                        |                        |                       |                       |                       |                      |                      |                      |
|----------|-------------------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|
|          | 1                                   | 2                      | 5                      | 10                     | 25                    | 50                    | 100                   | 200                  | 500                  | 1000                 |
| 5-min    | 0.336<br>(0.258-0.438)              | 0.407<br>(0.312-0.531) | 0.523<br>(0.399-0.684) | 0.619<br>(0.470-0.815) | 0.751<br>(0.554-1.03) | 0.851<br>(0.616-1.20) | 0.955<br>(0.674-1.39) | 1.07<br>(0.719-1.60) | 1.24<br>(0.803-1.92) | 1.38<br>(0.873-2.17) |
| 10-min   | 0.476<br>(0.365-0.621)              | 0.577<br>(0.441-0.752) | 0.741<br>(0.565-0.970) | 0.877<br>(0.666-1.15)  | 1.06<br>(0.785-1.46)  | 1.21<br>(0.873-1.69)  | 1.35<br>(0.954-1.97)  | 1.52<br>(1.02-2.27)  | 1.76<br>(1.14-2.71)  | 1.96<br>(1.24-3.08)  |
| 15-min   | 0.560<br>(0.429-0.730)              | 0.678<br>(0.519-0.885) | 0.871<br>(0.665-1.14)  | 1.03<br>(0.783-1.36)   | 1.25<br>(0.923-1.72)  | 1.42<br>(1.03-1.99)   | 1.59<br>(1.12-2.32)   | 1.79<br>(1.20-2.66)  | 2.07<br>(1.34-3.19)  | 2.30<br>(1.46-3.62)  |
| 30-min   | 0.755<br>(0.578-0.984)              | 0.916<br>(0.701-1.20)  | 1.18<br>(0.900-1.54)   | 1.40<br>(1.06-1.84)    | 1.70<br>(1.25-2.34)   | 1.93<br>(1.39-2.71)   | 2.16<br>(1.53-3.16)   | 2.43<br>(1.63-3.62)  | 2.82<br>(1.82-4.34)  | 3.13<br>(1.98-4.93)  |
| 60-min   | 0.949<br>(0.727-1.24)               | 1.15<br>(0.883-1.51)   | 1.49<br>(1.14-1.95)    | 1.77<br>(1.34-2.33)    | 2.15<br>(1.58-2.96)   | 2.44<br>(1.76-3.42)   | 2.74<br>(1.93-3.99)   | 3.08<br>(2.06-4.58)  | 3.56<br>(2.30-5.50)  | 3.96<br>(2.51-6.23)  |
| 2-hr     | 1.22<br>(0.942-1.59)                | 1.48<br>(1.14-1.92)    | 1.89<br>(1.45-2.47)    | 2.24<br>(1.71-2.93)    | 2.71<br>(2.02-3.72)   | 3.07<br>(2.24-4.31)   | 3.45<br>(2.46-5.04)   | 3.90<br>(2.62-5.78)  | 4.57<br>(2.97-7.01)  | 5.14<br>(3.26-8.04)  |
| 3-hr     | 1.41<br>(1.09-1.82)                 | 1.70<br>(1.31-2.20)    | 2.18<br>(1.67-2.83)    | 2.57<br>(1.97-3.36)    | 3.12<br>(2.32-4.27)   | 3.52<br>(2.58-4.93)   | 3.96<br>(2.84-5.78)   | 4.49<br>(3.02-6.63)  | 5.30<br>(3.44-8.10)  | 6.00<br>(3.81-9.35)  |
| 6-hr     | 1.77<br>(1.37-2.27)                 | 2.14<br>(1.66-2.76)    | 2.76<br>(2.13-3.56)    | 3.27<br>(2.51-4.25)    | 3.97<br>(2.98-5.42)   | 4.49<br>(3.31-6.27)   | 5.05<br>(3.65-7.37)   | 5.76<br>(3.89-8.46)  | 6.85<br>(4.47-10.4)  | 7.81<br>(4.98-12.1)  |
| 12-hr    | 2.17<br>(1.70-2.78)                 | 2.66<br>(2.08-3.41)    | 3.46<br>(2.69-4.45)    | 4.13<br>(3.19-5.33)    | 5.04<br>(3.80-6.84)   | 5.71<br>(4.23-7.95)   | 6.45<br>(4.68-9.37)   | 7.37<br>(5.00-10.8)  | 8.82<br>(5.77-13.3)  | 10.1<br>(6.45-15.5)  |
| 24-hr    | 2.54<br>(1.99-3.23)                 | 3.16<br>(2.47-4.02)    | 4.16<br>(3.25-5.32)    | 5.00<br>(3.88-6.42)    | 6.15<br>(4.66-8.32)   | 6.99<br>(5.21-9.70)   | 7.92<br>(5.80-11.5)   | 9.11<br>(6.20-13.2)  | 11.0<br>(7.21-16.5)  | 12.7<br>(8.13-19.4)  |
| 2-day    | 2.85<br>(2.25-3.61)                 | 3.59<br>(2.83-4.55)    | 4.80<br>(3.77-6.10)    | 5.80<br>(4.53-7.41)    | 7.18<br>(5.48-9.69)   | 8.18<br>(6.15-11.3)   | 9.30<br>(6.87-13.5)   | 10.8<br>(7.36-15.6)  | 13.2<br>(8.67-19.7)  | 15.3<br>(9.88-23.3)  |
| 3-day    | 3.11<br>(2.46-3.92)                 | 3.92<br>(3.10-4.94)    | 5.24<br>(4.13-6.64)    | 6.34<br>(4.97-8.07)    | 7.85<br>(6.01-10.6)   | 8.94<br>(6.75-12.4)   | 10.2<br>(7.55-14.8)   | 11.8<br>(8.07-17.0)  | 14.5<br>(9.55-21.6)  | 16.9<br>(10.9-25.6)  |
| 4-day    | 3.34<br>(2.65-4.21)                 | 4.20<br>(3.33-5.30)    | 5.61<br>(4.43-7.10)    | 6.78<br>(5.33-8.62)    | 8.40<br>(6.44-11.3)   | 9.56<br>(7.23-13.2)   | 10.9<br>(8.08-15.7)   | 12.6<br>(8.64-18.1)  | 15.5<br>(10.2-23.0)  | 18.0<br>(11.6-27.2)  |
| 7-day    | 3.99<br>(3.18-5.00)                 | 4.96<br>(3.95-6.22)    | 6.55<br>(5.20-8.25)    | 7.88<br>(6.21-9.96)    | 9.69<br>(7.46-12.9)   | 11.0<br>(8.34-15.1)   | 12.5<br>(9.29-17.9)   | 14.4<br>(9.91-20.6)  | 17.6<br>(11.6-25.9)  | 20.4<br>(13.2-30.6)  |
| 10-day   | 4.63<br>(3.70-5.79)                 | 5.67<br>(4.52-7.09)    | 7.36<br>(5.85-9.23)    | 8.76<br>(6.93-11.0)    | 10.7<br>(8.23-14.2)   | 12.1<br>(9.16-16.5)   | 13.7<br>(10.1-19.4)   | 15.7<br>(10.8-22.3)  | 18.9<br>(12.5-27.7)  | 21.7<br>(14.1-32.5)  |
| 20-day   | 6.67<br>(5.36-8.28)                 | 7.77<br>(6.23-9.66)    | 9.56<br>(7.65-11.9)    | 11.1<br>(8.79-13.9)    | 13.1<br>(10.1-17.2)   | 14.6<br>(11.1-19.6)   | 16.3<br>(12.0-22.6)   | 18.2<br>(12.6-25.7)  | 21.2<br>(14.1-30.9)  | 23.7<br>(15.4-35.2)  |
| 30-day   | 8.40<br>(6.77-10.4)                 | 9.53<br>(7.67-11.8)    | 11.4<br>(9.11-14.1)    | 12.9<br>(10.3-16.1)    | 15.0<br>(11.6-19.5)   | 16.6<br>(12.5-21.9)   | 18.2<br>(13.3-25.0)   | 20.1<br>(13.9-28.1)  | 22.7<br>(15.2-32.9)  | 24.8<br>(16.2-36.7)  |
| 45-day   | 10.6<br>(8.55-13.1)                 | 11.7<br>(9.47-14.5)    | 13.6<br>(11.0-16.9)    | 15.2<br>(12.2-18.9)    | 17.3<br>(13.4-22.4)   | 19.0<br>(14.3-24.9)   | 20.7<br>(15.1-27.9)   | 22.4<br>(15.6-31.2)  | 24.6<br>(16.5-35.5)  | 26.3<br>(17.2-38.8)  |
| 60-day   | 12.4<br>(10.1-15.3)                 | 13.6<br>(11.0-16.8)    | 15.5<br>(12.5-19.2)    | 17.2<br>(13.8-21.3)    | 19.4<br>(15.0-24.8)   | 21.1<br>(15.9-27.5)   | 22.8<br>(16.6-30.5)   | 24.4<br>(17.1-33.9)  | 26.3<br>(17.7-37.9)  | 27.7<br>(18.1-40.7)  |

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

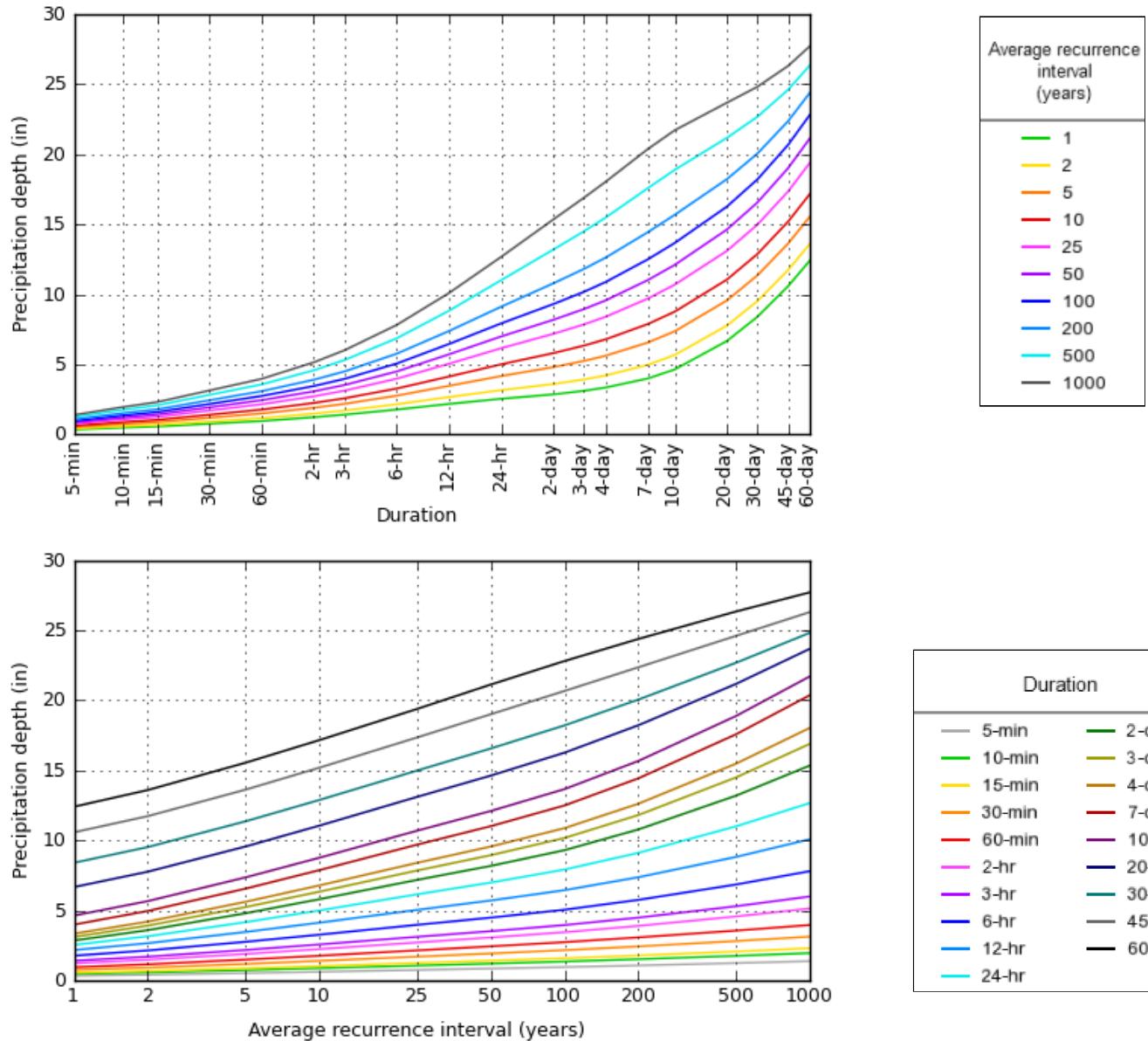
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper 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](#)

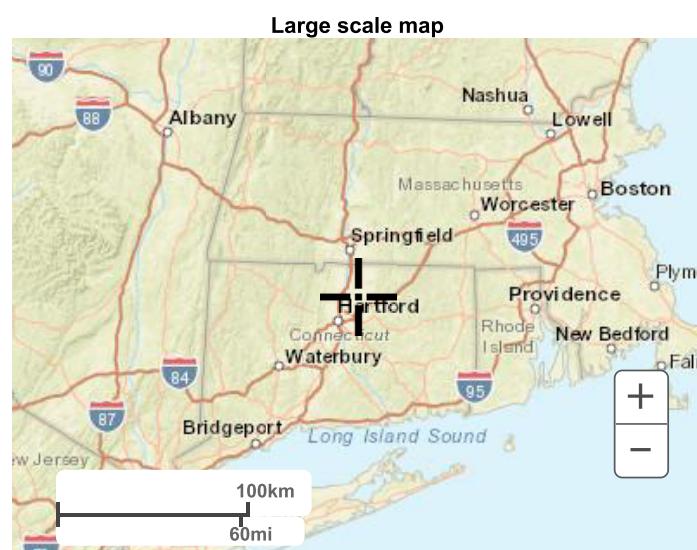
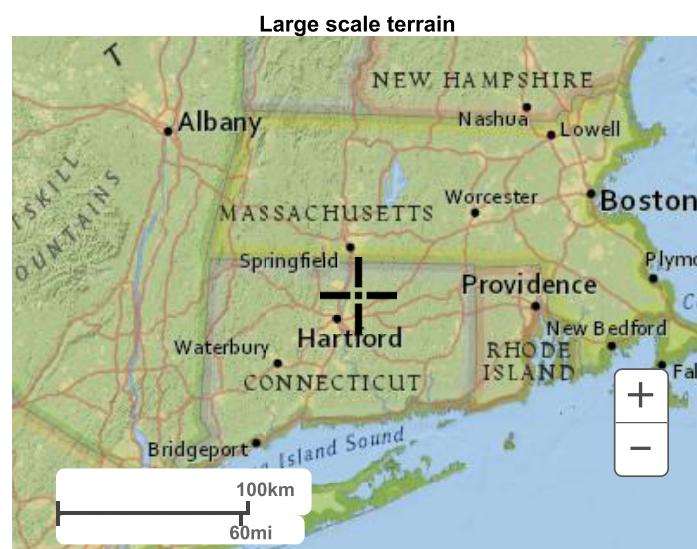
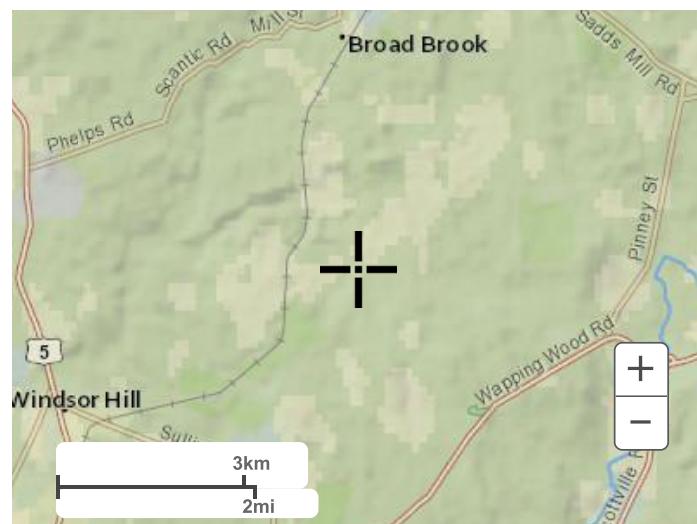
### PF graphical

PDS-based depth-duration-frequency (DDF) curves  
Latitude: 41.8776°, Longitude: -72.5417°

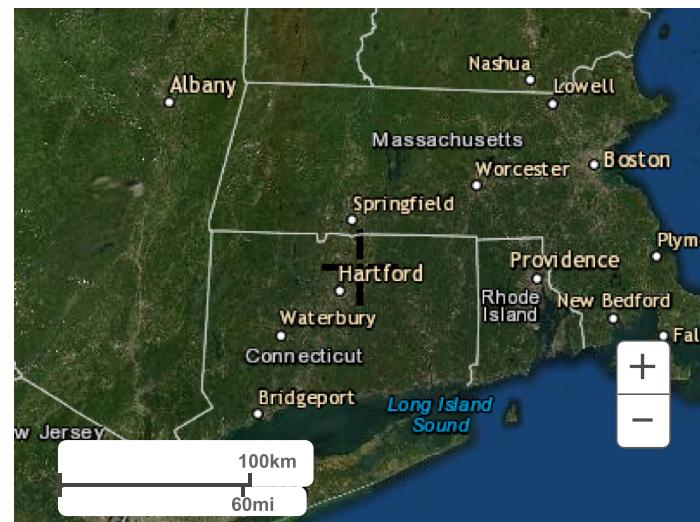


## Maps & aerials

[Small scale terrain](#)



Large scale aerial

[Back to Top](#)

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[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](mailto:HDSC.Questions@noaa.gov)

[Disclaimer](#)



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## CTDEEP Groundwater Classification Map





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## Aquifer Protection Area Mapping

# AQUIFER PROTECTION AREAS

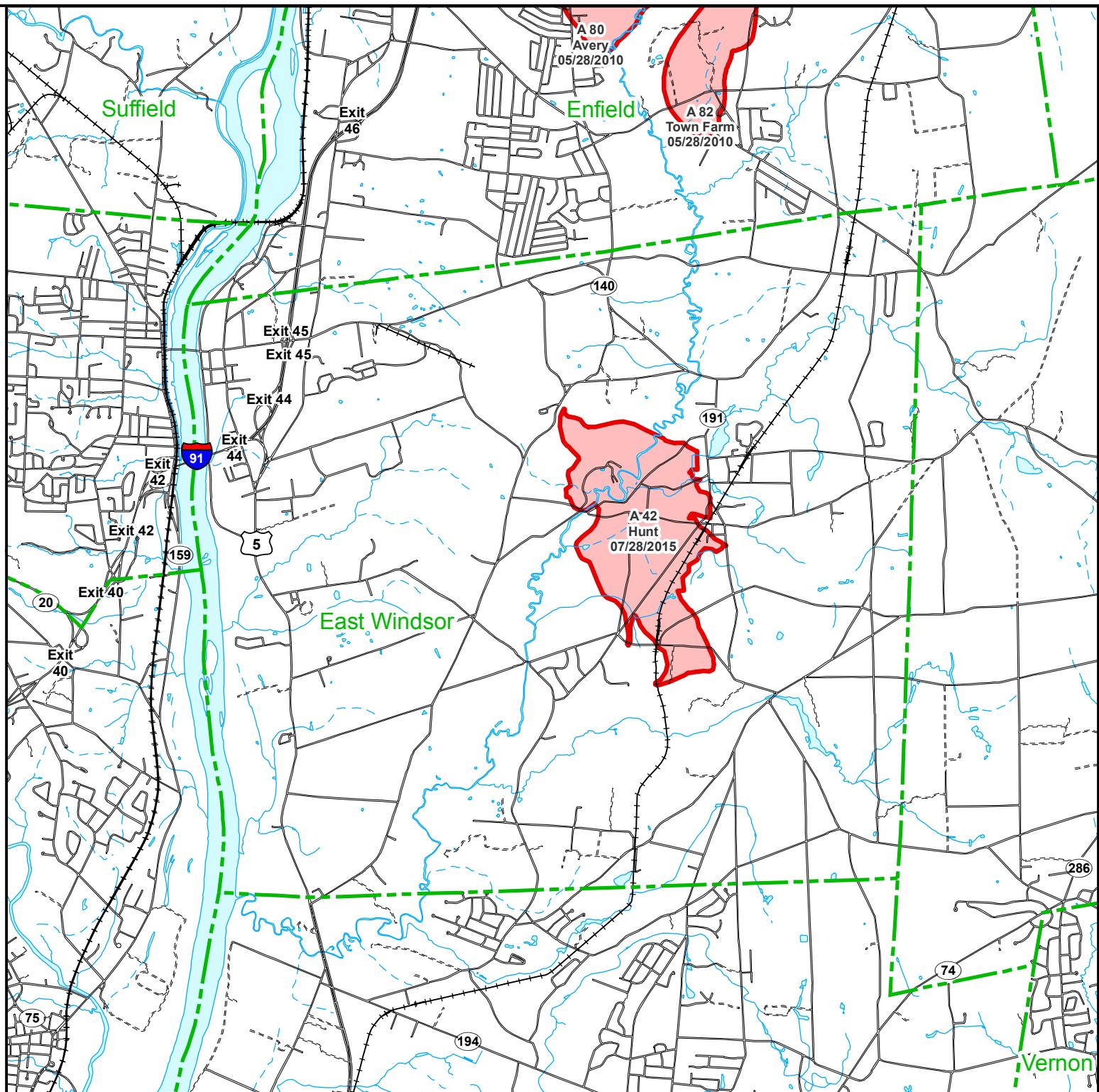
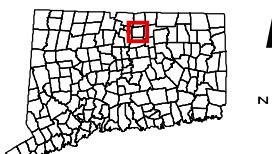
## East Windsor, CT

August 26, 2019

- Level A APA (Final Adopted)
- Level A APA (Final)
- Level B APA (Preliminary)
- Town Boundary

NOTE: The Aquifer Protection Areas were delineated through Connecticut's Level A and Level B Mapping Processes. Aquifer Protection Areas are delineated for active public water supply wells in stratified drift that serve more than 1000 people, in accordance with Sections 22a-354c and 22a-354z of the Connecticut General Statutes. Level B Mapping delineates a preliminary aquifer protection area, providing an estimate of the land area from which the well draws its water. Level A Mapping delineates the final Aquifer Protection Area, which becomes the regulatory boundary for land use controls designed to protect the well from contamination. As Level A Mapping is completed for each well field and approved by DEEP, it replaces the Level B Mapping. Final Adopted Level A Areas are those where towns have land use regulations for them. Massachusetts and Rhode Island Wellhead Protection Areas may be shown for informational purposes.

QUESTIONS:  
Bureau of Water Protection and Land Reuse  
Planning and Standards Division  
Phone: (860) 424-3020  
[www.ct.gov/dep/aquiferprotection](http://www.ct.gov/dep/aquiferprotection)



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



## **Appendix B:**

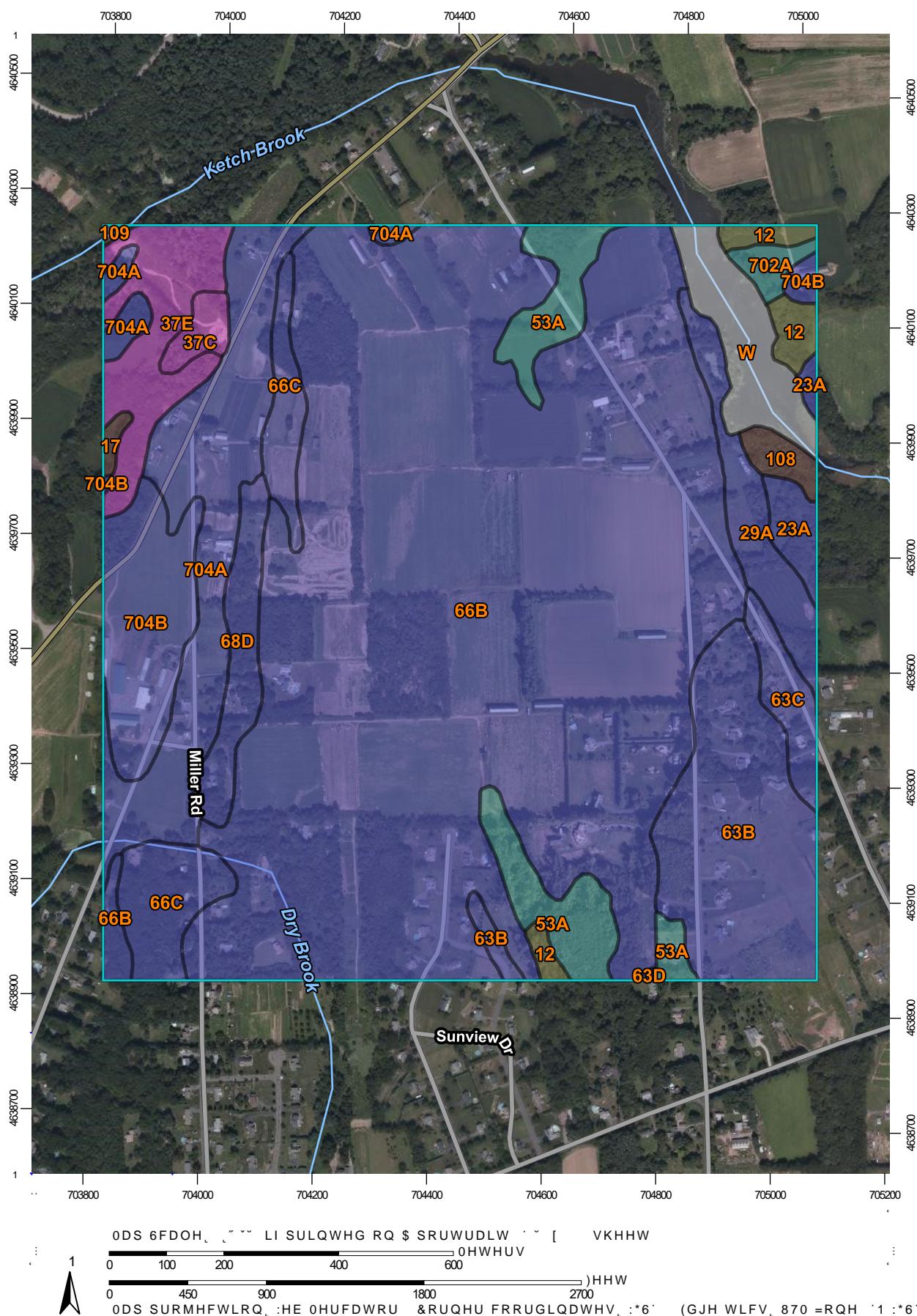
### NRCS Soil Survey Information



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## NRCS Soil Survey Information

Hydrologic Soil Group—State of Connecticut



0 \$ 3 / ( \* ( 1 '

\$ U H D R I , Q W H U H V W \$ 2,  
 Area of Interest (AOI)

6 R L O V  
 6 R L O 5 D W L Q J 3 R O \ J R Q V

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

6 R L O 5 D W L Q J / L Q H V

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

6 R L O 5 D W L Q J 3 R L Q W V

 A  
 A/D  
 B  
 B/D

C  
 C/D  
 D  
 Not rated or not available  
 : D W H U ) H D W X U H V  
 Streams and Canals  
 7 U D Q V S R U W D W L R Q  
 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads  
 Aerial Photography

0 \$ 3 , 1 ) 2 5 0 \$ 7 , 2 1

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 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Aug 24, 2019—Oct 24, 2019

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.

## + \ G U R O R J L F 6 R L O \* U R X S

| 0 D S X Q L W V \ | P E R C O D S X Q L W Q                                          | D P H | 5 D W L Q J | \$ F U H V L Q \$ | 2, 3 H U F H Q W R I | \$ 2 , |
|-------------------|------------------------------------------------------------------|-------|-------------|-------------------|----------------------|--------|
| 12                | Raypol silt loam                                                 | C/D   |             | 4.6               |                      | 1.1%   |
| 17                | Timakwa and Natchaug soils, 0 to 2 percent slopes                | B/D   |             | 0.7               |                      | 0.2%   |
| 23A               | Sudbury sandy loam, 0 to 5 percent slopes                        | B     |             | 3.8               |                      | 0.9%   |
| 29A               | Agawam fine sandy loam, 0 to 3 percent slopes                    | B     |             | 9.6               |                      | 2.4%   |
| 37C               | Manchester gravelly sandy loam, 3 to 15 percent slopes           | A     |             | 2.5               |                      | 0.6%   |
| 37E               | Manchester gravelly sandy loam, 15 to 45 percent slopes          | A     |             | 13.8              |                      | 3.4%   |
| 53A               | Wapping very fine sandy loam, 0 to 3 percent slopes              | C     |             | 15.4              |                      | 3.8%   |
| 63B               | Cheshire fine sandy loam, 3 to 8 percent slopes                  | B     |             | 32.0              |                      | 7.9%   |
| 63C               | Cheshire fine sandy loam, 8 to 15 percent slopes                 | B     |             | 5.1               |                      | 1.3%   |
| 63D               | Cheshire fine sandy loam, 15 to 25 percent slopes                | B     |             | 0.1               |                      | 0.0%   |
| 66B               | Narragansett silt loam, 2 to 8 percent slopes                    | B     |             | 231.6             |                      | 57.1%  |
| 66C               | Narragansett silt loam, 8 to 15 percent slopes                   | B     |             | 13.6              |                      | 3.3%   |
| 68D               | Narragansett silt loam, 15 to 25 percent slopes, extremely stony | B     |             | 8.3               |                      | 2.0%   |
| 108               | Saco silt loam                                                   | B/D   |             | 2.3               |                      | 0.6%   |
| 109               | Fluvaquents-Udifluvents complex, frequently flooded              | B/D   |             | 0.3               |                      | 0.1%   |
| 702A              | Tisbury silt loam, 0 to 3 percent slopes                         | C     |             | 2.1               |                      | 0.5%   |
| 704A              | Enfield silt loam, 0 to 3 percent slopes                         | B     |             | 32.6              |                      | 8.0%   |
| 704B              | Enfield silt loam, 3 to 8 percent slopes                         | B     |             | 17.1              |                      | 4.2%   |

|                                                             |                                              |
|-------------------------------------------------------------|----------------------------------------------|
| 0 D S X Q L W V \ P E R O O D S X Q L W Q D P H 5 D W L Q J | \$ F U H V L Q \$ 2, 3 H U F H Q W R I \$ 2, |
| W Water                                                     | 10.3 2.5%                                    |
| 7 R W D O V I R U \$ U H D R I , Q W H U H V W              |                                              |

## ' H V F U L S W L R Q

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.

## 5 D W L Q J 2 S W L R Q V

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher





## **Appendix C:**

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



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## Erosion and Sedimentation Control Checklist

**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<br><input type="checkbox"/> yes <input type="checkbox"/> 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 \_\_\_\_\_



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## **Long Term Stormwater Operation and Maintenance Measures**

# Mulnite Farms Solar – East Windsor, CT – Rockville 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<br><input type="checkbox"/> yes <input type="checkbox"/> 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. |                |           |                                            |                                                                                                 |                         |              |
| 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 \_\_\_\_\_



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## Project Information

### Site

|                    |                        |
|--------------------|------------------------|
| Project Name:      | Mulnite II Solar       |
| Address or Locus:  | Mulnite Farms          |
| City, State & Zip: | East Windsor, CT 06016 |

---

### Developer

|                           |                                            |
|---------------------------|--------------------------------------------|
| Client Name:              | Greenskies Clean Energy, LLC               |
| Client Address:           | 127 Washington Ave, West Bldg, Lower Level |
| Client City, State & Zip: | North Haven, CT 06473                      |
| Client Telephone No.:     | (860) 398-5408                             |
| 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



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## Diversion Swale & Sediment Trap/Basin Sizing

Swale Sizing

Swale 1

0 sf

0.00 ac

Swale has almost zero tributary area, so proposed to use minimum-size swale.

Swale Sizing

Swale 2

20,900 sf

0.48 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) = 2.34 cfs

Bottom width, w = 1 ft

Side slopes, X:1 = 3

Estimated flow depth, d = 0.51 ft

$$Q = (1/n) * A * R^{(2/3)} * S^{(1/2)}$$

$$A * R^{(2/3)} = Q / (1/n) / S^{(1/2)} = \mathbf{0.59} \text{ (target for variable depth)}$$

$$A = (w * d) + 2 * (0.5d * Xd) = 1.29 \text{ sf}$$

$$P = w + 2 * (\sqrt{d^2 + (Xd)^2}) = 4.23 \text{ ft}$$

$$R = A / P = 0.31 \text{ ft}$$

$$A * R^{(2/3)} = \mathbf{0.59} \text{ (must be close to target)}$$

$$y = 62.4 \text{ pcf}$$

$$td = y * d * S = \mathbf{0.32} \text{ psf} \quad < 1.55 \text{ psf for ECB - OK}$$

$$\text{Velocity, } V = Q / A = \mathbf{1.81} \text{ fps} \quad < 5.00 \text{ fps for ECB - OK}$$

Swale Sizing

Swale 3

30,400 sf

0.70 ac

Reference DOT Drainage Manual 2000

Swale Slope, S = 0.007 ft / ft

Manning's n for bare soil / ECB, n = 0.025

Q25 (disturbed soil & forest) = 3.2 cfs

Bottom width, w = 1 ft

Side slopes, X:1 = 3

Estimated flow depth, d = 0.64 ft

$$Q = (1/n) * A * R^{(2/3)} * S^{(1/2)}$$

$$A * R^{(2/3)} = Q / (1/n) / S^{(1/2)} = \mathbf{0.96} \text{ (target for variable depth)}$$

$$A = (w * d) + 2 * (0.5d * Xd) = 1.87 \text{ sf}$$

$$P = w + 2 * (\sqrt{d^2 + (Xd)^2}) = 5.05 \text{ ft}$$

$$R = A / P = 0.37 \text{ ft}$$

$$A * R^{(2/3)} = \mathbf{0.96} \text{ (must be close to target)}$$

$$y = 62.4 \text{ pcf}$$

$$td = y * d * S = \mathbf{0.28} \text{ psf} \quad < 1.55 \text{ psf for ECB - OK}$$

$$\text{Velocity, } V = Q / A = \mathbf{1.71} \text{ fps} \quad < 5.00 \text{ fps for ECB - OK}$$

Swale Sizing

Swale 4

370,300 sf

8.50 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 & forest) = 23.43 cfs

Bottom width, w = 3.5 ft

Side slopes, X:1 = 3

Estimated flow depth, d = 0.92 ft

$$Q = (1/n) * A * R^{(2/3)} * S^{(1/2)}$$

$$A * R^{(2/3)} = Q / (1/n) / S^{(1/2)} = \mathbf{4.14} \text{ (target for variable depth)}$$

$$A = (w * d) + 2 * (0.5d * Xd) = 5.76 \text{ sf}$$

$$P = w + 2 * (\sqrt{d^2 + (Xd)^2}) = 9.32 \text{ ft}$$

$$R = A / P = 0.62 \text{ ft}$$

$$A * R^{(2/3)} = \mathbf{4.18} \text{ (must be close to target)}$$

$$y = 62.4 \text{ pcf}$$

$$td = y * d * S = \mathbf{1.15} \text{ psf} \quad < 1.55 \text{ psf for ECB - OK}$$

$$\text{Velocity, } V = Q / A = \mathbf{4.07} \text{ fps} \quad < 5.00 \text{ fps for ECB - OK}$$

Sediment Trap Sizing  
GCE Mulnite Farms 2 Solar  
July 2021

| TST # | Tributary<br>Acreage, ac | (134 cy / acre)*                             |                                                                 |
|-------|--------------------------|----------------------------------------------|-----------------------------------------------------------------|
|       |                          | Volume<br>Required Below<br>Top of Spillway, | Volume Provided in<br>Permanent Basin<br>Below Top of Spillway, |
|       |                          | cf                                           | cf                                                              |
| 1     | 4.9                      | 17,728                                       | 24,642                                                          |
| 2     | 1.3                      | 4,623                                        | 6,494                                                           |
| 3     | 2.0                      | 7,192                                        | 8,714                                                           |

\* Per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control

**SEDIMENT BASIN SIZING**

SB 4

DA, drainage area = sf  
20.14 ac  
0.031 sq mi.Construction Duration: 6 months  
(DA) (A) = 20.14 ac \* 50 tons = 1007 tons / year  
504 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 = **5,692 cf**

10-year, 24-hour rainfall, P = 5 in.

Vr (half fallow &amp; half compacted grass, from Hydrographs) = 2.68 watershed inches

Q10 = Qi (half fallow &amp; half compacted grass, from Hydrographs) = 35.92 cfs

Qi / DA = 1.78

Qo / Qi (from Figure SB-13) = 0.095

Qo = 3.41 cfs

Release rate = Qo \* 640 / DA = 108.4 csm

Vs (from Figure DB-6) = 1.5 watershed inches

Vs = Vs \* DA / 12 \* 43,560 = **109,662 cf****Minimum volume required below crest of emergency spillway = 115,355 cf*****Minimum volume provided below crest of emergency spillway = 125,600 cf***



---

## Water Quality Computations

## Water Quality Volume Calculations

Project: Mulnite II Solar

Location: Mulnite Farms, East Windsor, CT

By: JDW

Date: 7/9/21

Checked: SJK

Date: 7/9/21

| Basin Name                    | 1           | 2           | 3           | 4           |   |
|-------------------------------|-------------|-------------|-------------|-------------|---|
| Rainfall, P                   | 1.0 in.     | 1.0 in.     | 1.0 in.     | 1.0 in.     | a |
| Area, A                       | 4.92 ac     | 1.28 ac     | 1.99 ac     | 20.14 ac    | b |
| Impervious Cover Area         | 0.12 ac     | 0.17 ac     | 0.09 ac     | 1.16 ac     | c |
| % Impervious, I               | 2 %         | 13 %        | 5 %         | 6 %         |   |
| Volumetric Runoff Coeff., R   | 0.072       | 0.170       | 0.091       | 0.102       | d |
| Water Quality Volume, WQV     | 0.030 ac-ft | 0.018 ac-ft | 0.015 ac-ft | 0.171 ac-ft | e |
|                               | 1,285 cf    | 788 cf      | 655 cf      | 7,445 cf    |   |
| Water Quality Volume Provided | 0.456 ac-ft | 0.075 ac-ft | 0.146 ac-ft | 2.883 ac-ft |   |
|                               | 19,848 cf   | 3,249 cf    | 6,348 cf    | 125,600 cf  |   |

<sup>a</sup> First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

<sup>b</sup> Area tributary to the stormwater management basin

<sup>c</sup> Impervious cover area tributary to the stormwater management basin

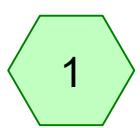
<sup>d</sup>  $R=0.05+0.009*I$ ; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

<sup>e</sup>  $WQV=P*R*A/12$ ; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual



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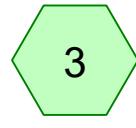
## HydroCAD Analysis: Existing Conditions



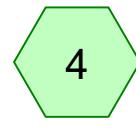
Subcat 1



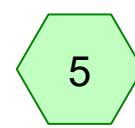
Subcat 2



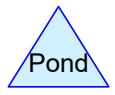
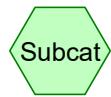
Subcat 3



Subcat 4



Subcat 5



**Routing Diagram for 42733.00 - Existing Conditions2**

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**42733.00 - Existing Conditions2**

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Page 2

**Rainfall Events Listing**

| Event# | Event Name | Storm Type     | Curve | Mode    | Duration (hours) | B/B | Depth (inches) | AMC |
|--------|------------|----------------|-------|---------|------------------|-----|----------------|-----|
| 1      | 2 year     | Type III 24-hr |       | Default | 24.00            | 1   | 3.16           | 2   |
| 2      | 25 year    | Type III 24-hr |       | Default | 24.00            | 1   | 6.15           | 2   |
| 3      | 50 year    | Type III 24-hr |       | Default | 24.00            | 1   | 6.99           | 2   |
| 4      | 100 year   | Type III 24-hr |       | Default | 24.00            | 1   | 7.92           | 2   |

## 42733.00 - Existing Conditions2

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Page 3

### Area Listing (all nodes)

| Area<br>(acres) | CN        | Description<br>(subcatchment-numbers)                |
|-----------------|-----------|------------------------------------------------------|
| 1.260           | 98        | Farm roads (1, 2, 4, 5)                              |
| 28.270          | 78        | Row crops, straight row, Good, HSG B (1, 2, 3, 4, 5) |
| 0.650           | 60        | Woods, Fair, HSG B (2, 3, 4)                         |
| <b>30.180</b>   | <b>78</b> | <b>TOTAL AREA</b>                                    |

## 42733.00 - Existing Conditions2

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Page 4

### Soil Listing (all nodes)

| Area<br>(acres) | Soil<br>Group | Subcatchment<br>Numbers |
|-----------------|---------------|-------------------------|
| 0.000           | HSG A         |                         |
| 28.920          | HSG B         | 1, 2, 3, 4, 5           |
| 0.000           | HSG C         |                         |
| 0.000           | HSG D         |                         |
| 1.260           | Other         | 1, 2, 4, 5              |
| <b>30.180</b>   |               | <b>TOTAL AREA</b>       |

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Page 5

**Ground Covers (all nodes)**

| HSG-A<br>(acres) | HSG-B<br>(acres) | HSG-C<br>(acres) | HSG-D<br>(acres) | Other<br>(acres) | Total<br>(acres) | Ground<br>Cover               | Subcatchment<br>Numbers |
|------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|-------------------------|
| 0.000            | 0.000            | 0.000            | 0.000            | 1.260            | 1.260            | Farm roads                    | 1,<br>2,<br>4, 5        |
| 0.000            | 28.270           | 0.000            | 0.000            | 0.000            | 28.270           | Row crops, straight row, Good | 1,<br>2,<br>3,<br>4, 5  |
| 0.000            | 0.650            | 0.000            | 0.000            | 0.000            | 0.650            | Woods, Fair                   | 2,<br>3, 4              |
| <b>0.000</b>     | <b>28.920</b>    | <b>0.000</b>     | <b>0.000</b>     | <b>1.260</b>     | <b>30.180</b>    | <b>TOTAL AREA</b>             |                         |



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## 2-Year Storm Event – Existing

**42733.00 - Existing Conditions2**

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Type III 24-hr 2 year Rainfall=3.16"

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Page 6

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=4.920 ac 2.44% Impervious Runoff Depth>1.14"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=78 Runoff=5.46 cfs 0.468 af

**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 7.81% Impervious Runoff Depth>1.14"  
Flow Length=250' Tc=7.5 min CN=78 Runoff=1.71 cfs 0.122 af

**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 0.00% Impervious Runoff Depth>1.08"  
Flow Length=450' Tc=9.3 min CN=77 Runoff=2.35 cfs 0.180 af

**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 4.92% Impervious Runoff Depth>1.19"  
Flow Length=1,700' Tc=34.9 min CN=79 Runoff=15.92 cfs 1.997 af

**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>1.20"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=79 Runoff=2.14 cfs 0.185 af

**Total Runoff Area = 30.180 ac Runoff Volume = 2.952 af Average Runoff Depth = 1.17"**  
**95.83% Pervious = 28.920 ac 4.17% Impervious = 1.260 ac**

**42733.00 - Existing Conditions2**

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Type III 24-hr 2 year Rainfall=3.16"

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Page 7

**Summary for Subcatchment 1: Subcat 1**

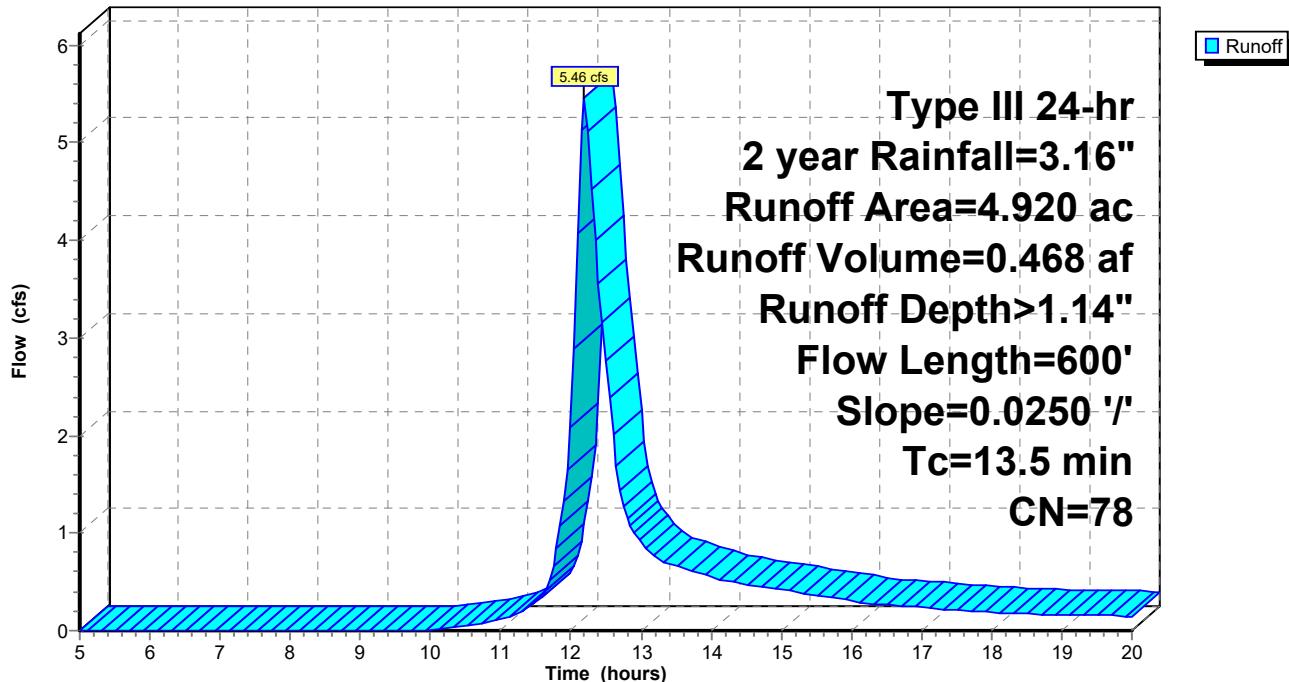
Runoff = 5.46 cfs @ 12.20 hrs, Volume= 0.468 af, Depth&gt; 1.14"

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 2 year Rainfall=3.16"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 4.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 78            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

**Subcatchment 1: Subcat 1**

Hydrograph



### Summary for Subcatchment 2: Subcat 2

Runoff = 1.71 cfs @ 12.11 hrs, Volume= 0.122 af, Depth> 1.14"

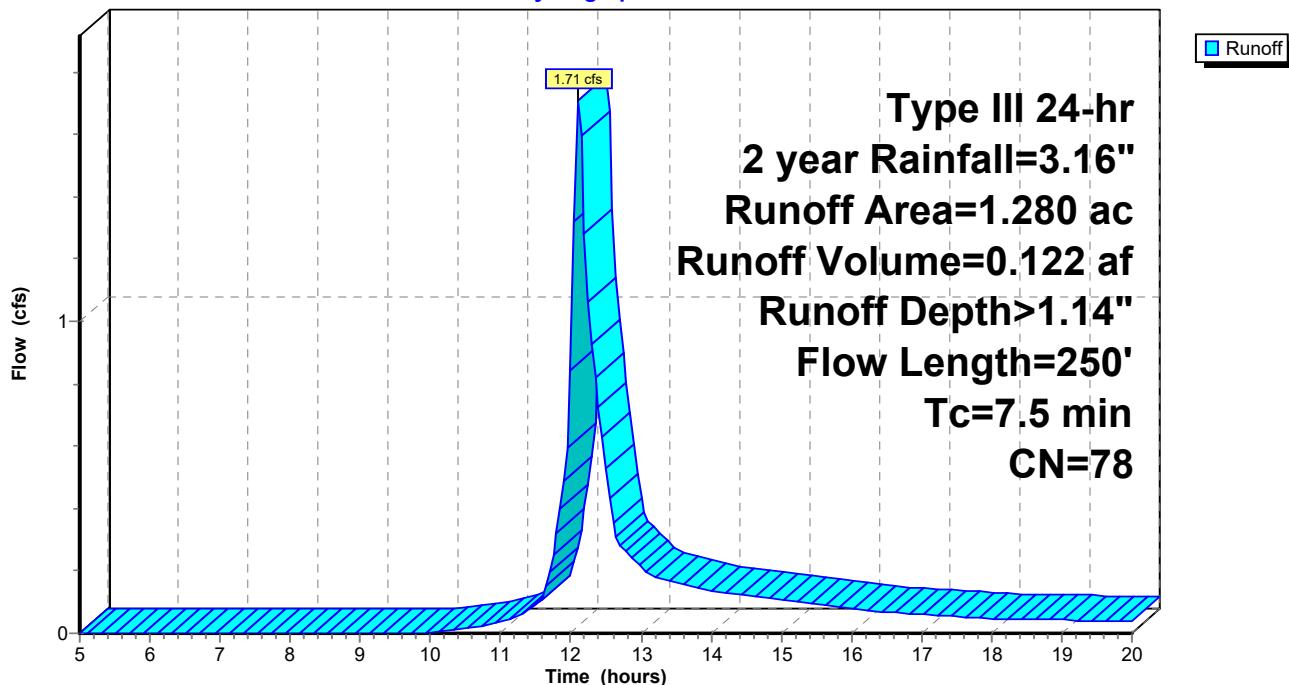
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 year Rainfall=3.16"

| Area (ac) | CN | Description                          |
|-----------|----|--------------------------------------|
| 1.080     | 78 | Row crops, straight row, Good, HSG B |
| 0.100     | 60 | Woods, Fair, HSG B                   |
| *         | 98 | Farm roads                           |
| 1.280     | 78 | Weighted Average                     |
| 1.180     |    | 92.19% Pervious Area                 |
| 0.100     |    | 7.81% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              | Total            |                      |                   |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



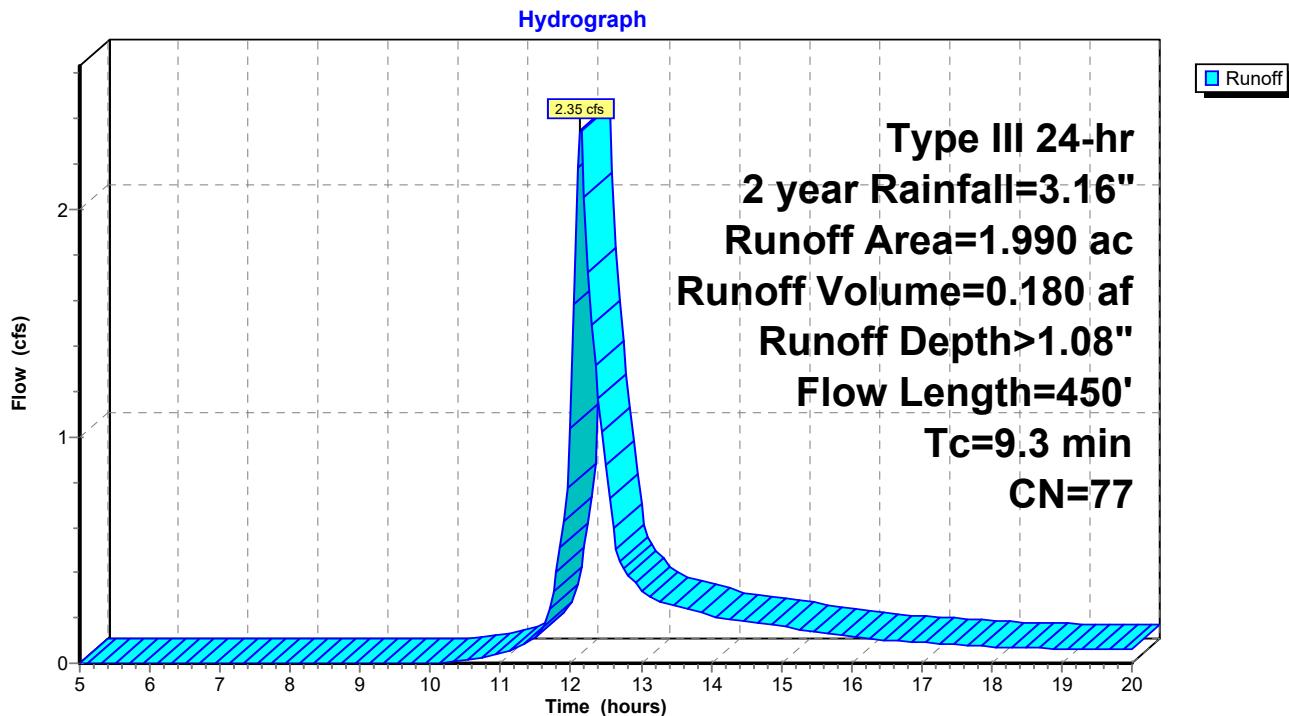
### Summary for Subcatchment 3: Subcat 3

Runoff = 2.35 cfs @ 12.14 hrs, Volume= 0.180 af, Depth> 1.08"

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=3.16"

| Area (ac) | CN            | Description                          |                   |                |                                                                      |
|-----------|---------------|--------------------------------------|-------------------|----------------|----------------------------------------------------------------------|
| 1.890     | 78            | Row crops, straight row, Good, HSG B |                   |                |                                                                      |
| 0.100     | 60            | Woods, Fair, HSG B                   |                   |                |                                                                      |
| 1.990     | 77            | Weighted Average                     |                   |                |                                                                      |
| 1.990     |               | 100.00% Pervious Area                |                   |                |                                                                      |
|           |               |                                      |                   |                |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft)                        | Velocity (ft/sec) | Capacity (cfs) | Description                                                          |
| 5.7       | 50            | 0.0200                               | 0.15              |                | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6       | 400           | 0.0700                               | 1.85              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3       | 450           | Total                                |                   |                |                                                                      |

### Subcatchment 3: Subcat 3



### Summary for Subcatchment 4: Subcat 4

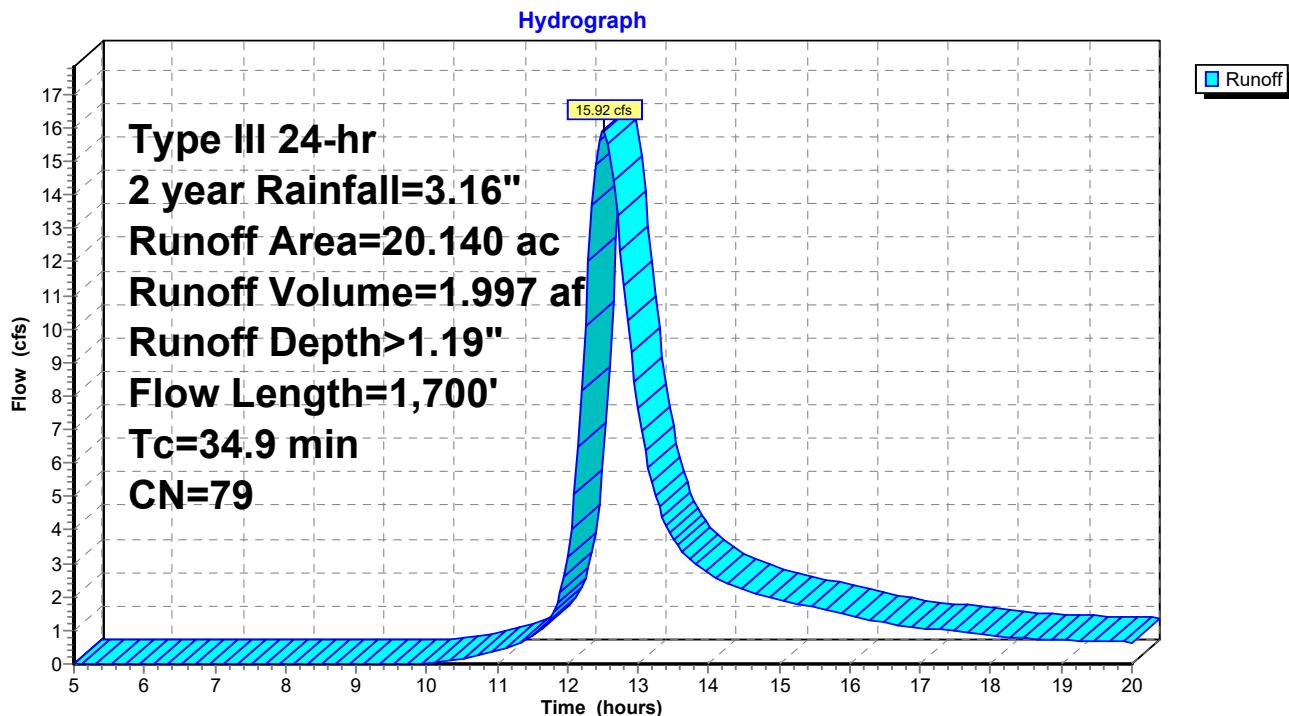
Runoff = 15.92 cfs @ 12.51 hrs, Volume= 1.997 af, Depth> 1.19"

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 2 year Rainfall=3.16"

| Area (ac) | CN    | Description                          |
|-----------|-------|--------------------------------------|
| 18.700    | 78    | Row crops, straight row, Good, HSG B |
| 0.450     | 60    | Woods, Fair, HSG B                   |
| *         | 0.990 | Farm roads                           |
| 20.140    | 79    | Weighted Average                     |
| 19.150    |       | 95.08% Pervious Area                 |
| 0.990     |       | 4.92% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            | Total            |                      |                   |                                                                      |

### Subcatchment 4: Subcat 4



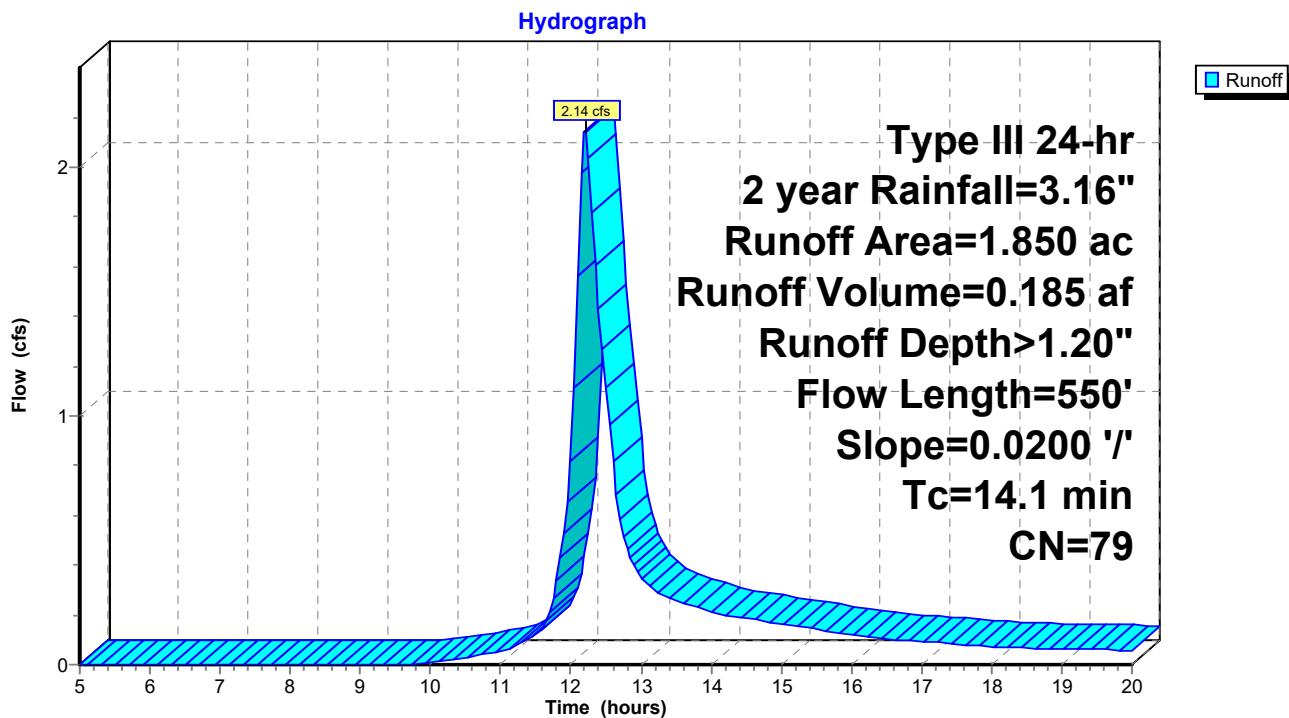
### Summary for Subcatchment 5: Subcat 5

Runoff = 2.14 cfs @ 12.21 hrs, Volume= 0.185 af, Depth> 1.20"

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=3.16"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 79            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5





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## 25-Year Storm Event – Existing

**42733.00 - Existing Conditions2**

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Type III 24-hr 25 year Rainfall=6.15"

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Page 12

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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=4.920 ac 2.44% Impervious Runoff Depth>3.46"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=78 Runoff=16.70 cfs 1.421 af**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 7.81% Impervious Runoff Depth>3.47"  
Flow Length=250' Tc=7.5 min CN=78 Runoff=5.22 cfs 0.370 af**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 0.00% Impervious Runoff Depth>3.37"  
Flow Length=450' Tc=9.3 min CN=77 Runoff=7.39 cfs 0.559 af**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 4.92% Impervious Runoff Depth>3.54"  
Flow Length=1,700' Tc=34.9 min CN=79 Runoff=47.29 cfs 5.941 af**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>3.56"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=79 Runoff=6.36 cfs 0.549 af**Total Runoff Area = 30.180 ac Runoff Volume = 8.840 af Average Runoff Depth = 3.51"**  
**95.83% Pervious = 28.920 ac 4.17% Impervious = 1.260 ac**

### Summary for Subcatchment 1: Subcat 1

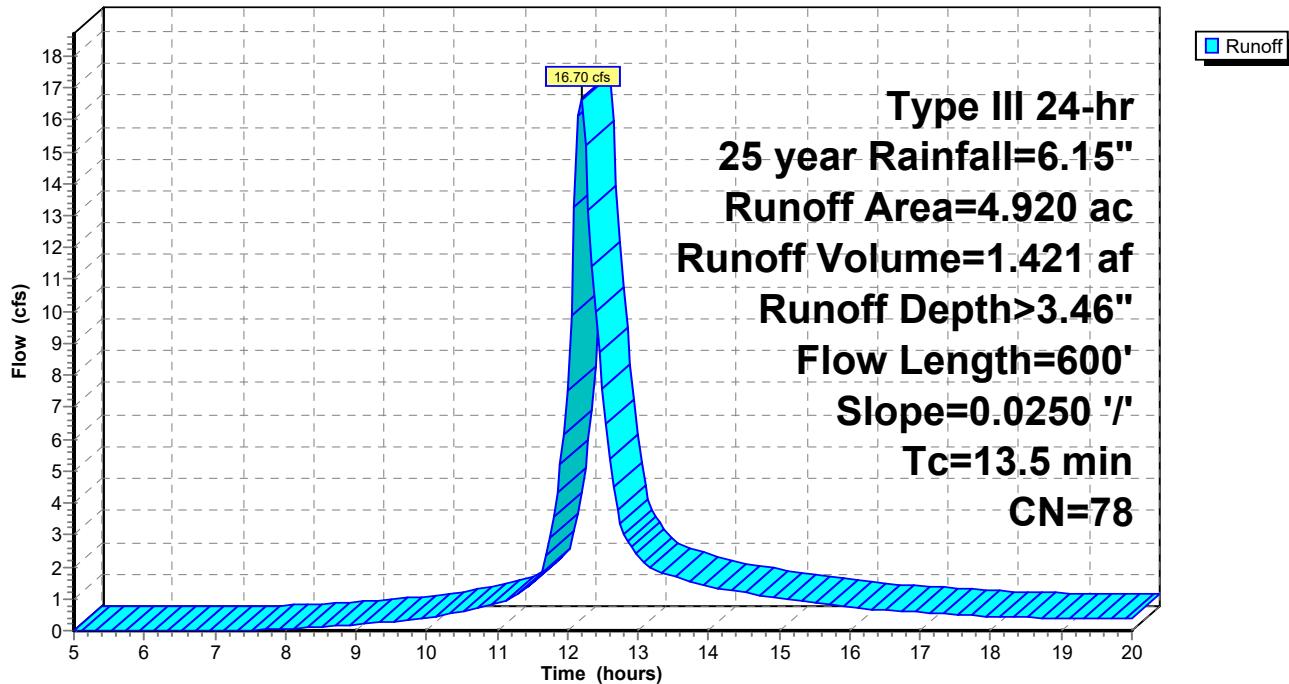
Runoff = 16.70 cfs @ 12.19 hrs, Volume= 1.421 af, Depth> 3.46"

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 25 year Rainfall=6.15"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 4.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 78            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

### Subcatchment 1: Subcat 1

Hydrograph



### Summary for Subcatchment 2: Subcat 2

Runoff = 5.22 cfs @ 12.11 hrs, Volume= 0.370 af, Depth> 3.47"

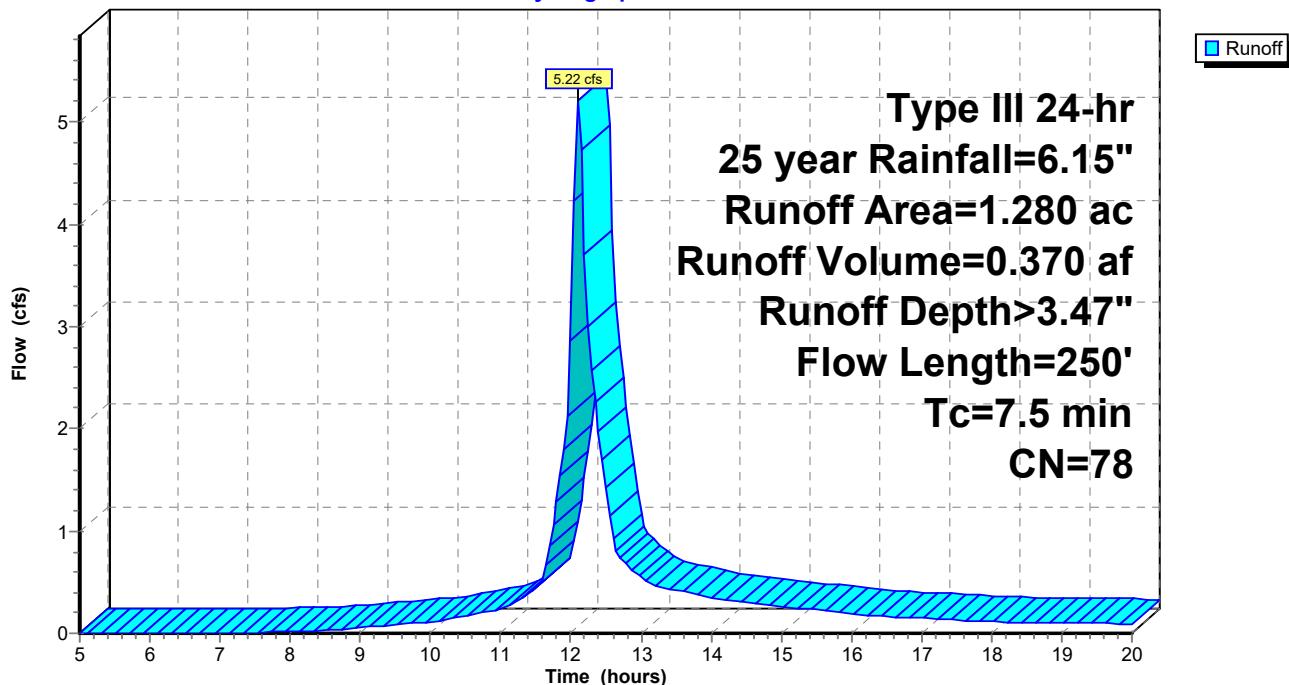
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 year Rainfall=6.15"

| Area (ac) | CN | Description                          |
|-----------|----|--------------------------------------|
| 1.080     | 78 | Row crops, straight row, Good, HSG B |
| 0.100     | 60 | Woods, Fair, HSG B                   |
| *         | 98 | Farm roads                           |
| 1.280     | 78 | Weighted Average                     |
| 1.180     |    | 92.19% Pervious Area                 |
| 0.100     |    | 7.81% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              | Total            |                      |                   |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



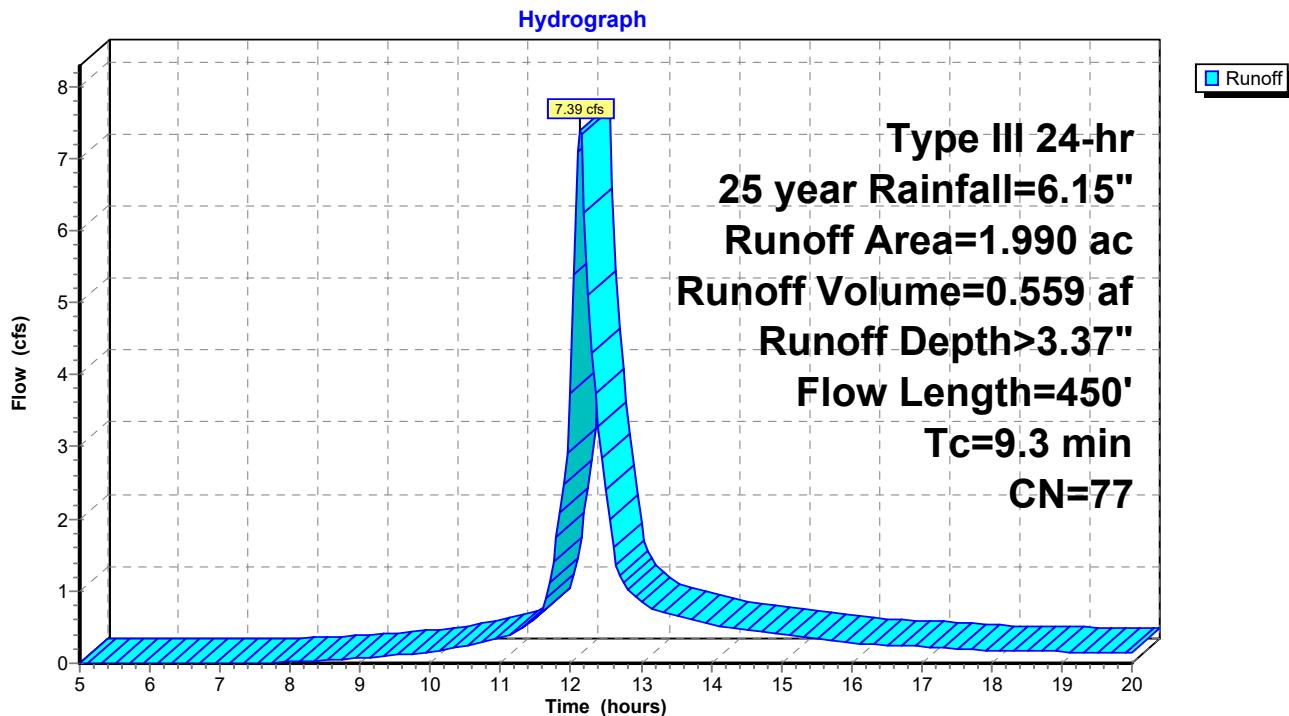
### Summary for Subcatchment 3: Subcat 3

Runoff = 7.39 cfs @ 12.13 hrs, Volume= 0.559 af, Depth> 3.37"

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 25 year Rainfall=6.15"

| Area (ac) | CN            | Description                          |                   |                |                                                                      |
|-----------|---------------|--------------------------------------|-------------------|----------------|----------------------------------------------------------------------|
| 1.890     | 78            | Row crops, straight row, Good, HSG B |                   |                |                                                                      |
| 0.100     | 60            | Woods, Fair, HSG B                   |                   |                |                                                                      |
| 1.990     | 77            | Weighted Average                     |                   |                |                                                                      |
| 1.990     |               | 100.00% Pervious Area                |                   |                |                                                                      |
|           |               |                                      |                   |                |                                                                      |
| Tc        | Length (feet) | Slope (ft/ft)                        | Velocity (ft/sec) | Capacity (cfs) | Description                                                          |
| 5.7       | 50            | 0.0200                               | 0.15              |                | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6       | 400           | 0.0700                               | 1.85              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3       | 450           | Total                                |                   |                |                                                                      |

### Subcatchment 3: Subcat 3



### Summary for Subcatchment 4: Subcat 4

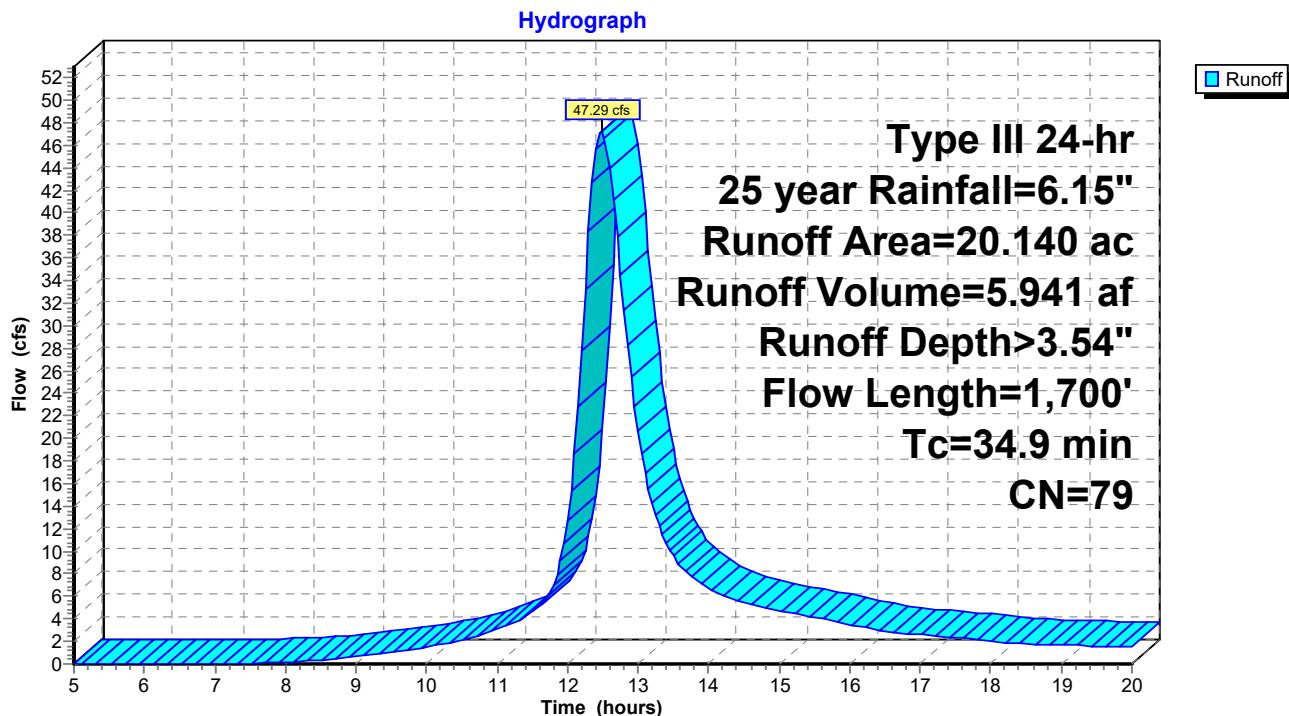
Runoff = 47.29 cfs @ 12.48 hrs, Volume= 5.941 af, Depth> 3.54"

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 25 year Rainfall=6.15"

| Area (ac) | CN    | Description                          |
|-----------|-------|--------------------------------------|
| 18.700    | 78    | Row crops, straight row, Good, HSG B |
| 0.450     | 60    | Woods, Fair, HSG B                   |
| *         | 0.990 | Farm roads                           |
| 20.140    | 79    | Weighted Average                     |
| 19.150    |       | 95.08% Pervious Area                 |
| 0.990     |       | 4.92% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            | Total            |                      |                   |                                                                      |

### Subcatchment 4: Subcat 4



### Summary for Subcatchment 5: Subcat 5

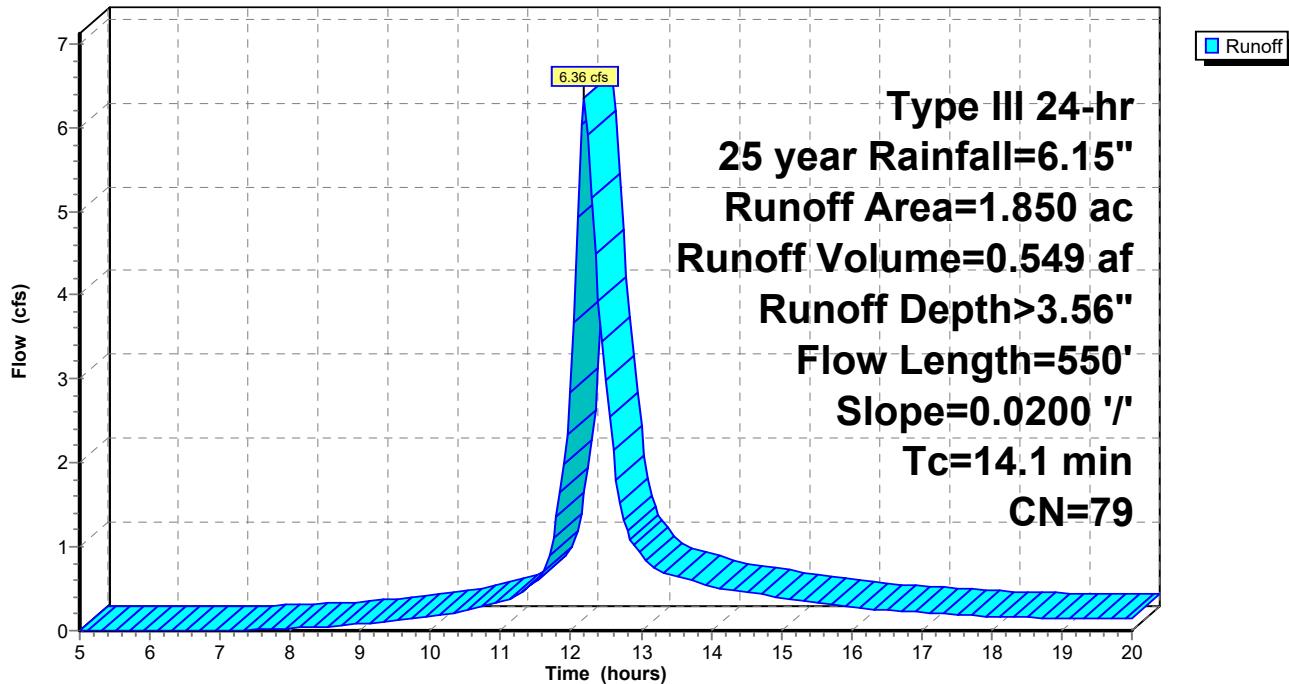
Runoff = 6.36 cfs @ 12.20 hrs, Volume= 0.549 af, Depth> 3.56"

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 25 year Rainfall=6.15"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 79            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5

Hydrograph





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## 50-Year Storm Event- Existing

**42733.00 - Existing Conditions2**

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Type III 24-hr 50 year Rainfall=6.99"

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Page 18

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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=4.920 ac 2.44% Impervious Runoff Depth>4.18"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=78 Runoff=20.04 cfs 1.713 af**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 7.81% Impervious Runoff Depth>4.19"  
Flow Length=250' Tc=7.5 min CN=78 Runoff=6.26 cfs 0.447 af**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 0.00% Impervious Runoff Depth>4.08"  
Flow Length=450' Tc=9.3 min CN=77 Runoff=8.90 cfs 0.676 af**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 4.92% Impervious Runoff Depth>4.26"  
Flow Length=1,700' Tc=34.9 min CN=79 Runoff=56.61 cfs 7.145 af**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>4.28"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=79 Runoff=7.60 cfs 0.661 af**Total Runoff Area = 30.180 ac Runoff Volume = 10.641 af Average Runoff Depth = 4.23"**  
**95.83% Pervious = 28.920 ac 4.17% Impervious = 1.260 ac**

### Summary for Subcatchment 1: Subcat 1

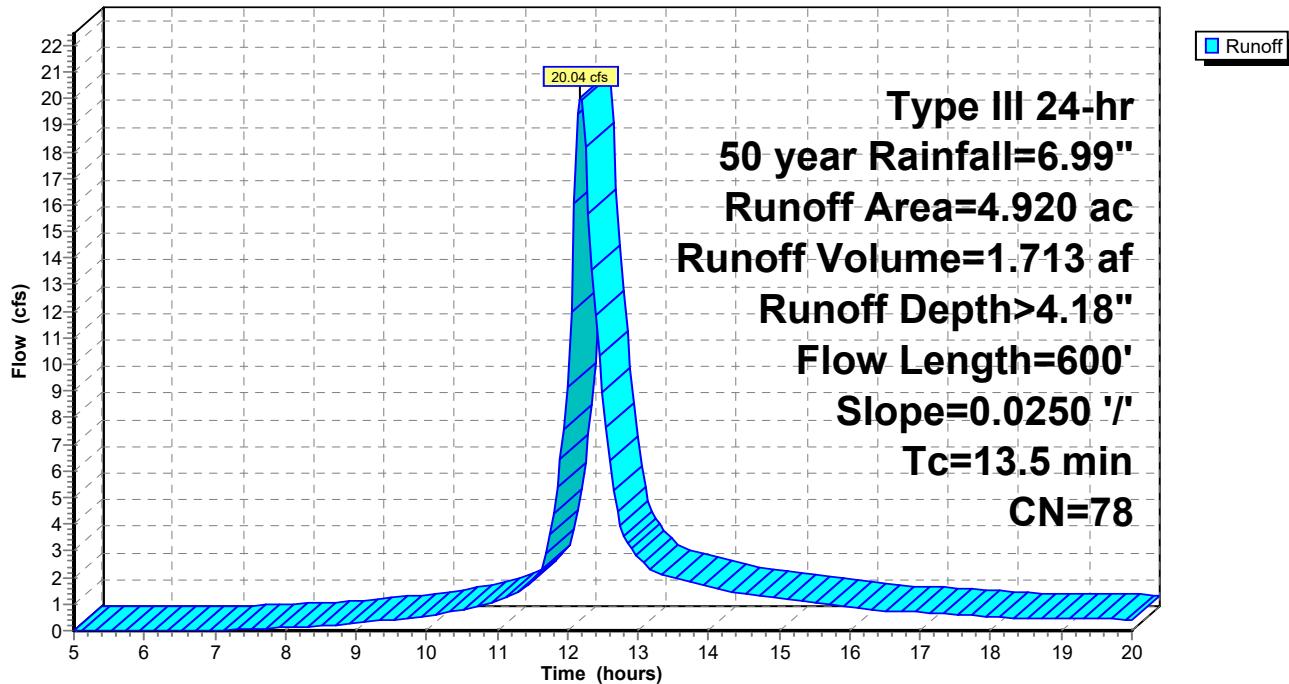
Runoff = 20.04 cfs @ 12.19 hrs, Volume= 1.713 af, Depth> 4.18"

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=6.99"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 4.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 78            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

### Subcatchment 1: Subcat 1

Hydrograph



### Summary for Subcatchment 2: Subcat 2

Runoff = 6.26 cfs @ 12.11 hrs, Volume= 0.447 af, Depth> 4.19"

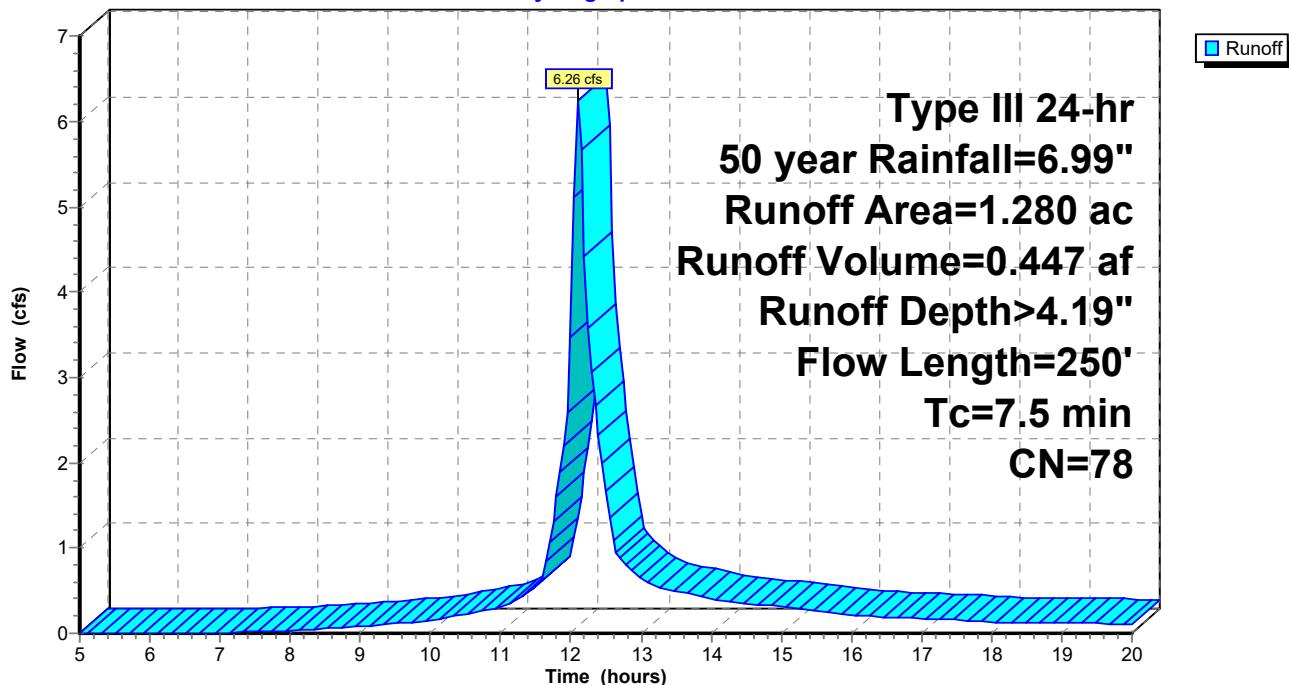
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.99"

| Area (ac) | CN | Description                          |
|-----------|----|--------------------------------------|
| 1.080     | 78 | Row crops, straight row, Good, HSG B |
| 0.100     | 60 | Woods, Fair, HSG B                   |
| *         | 98 | Farm roads                           |
| 1.280     | 78 | Weighted Average                     |
| 1.180     |    | 92.19% Pervious Area                 |
| 0.100     |    | 7.81% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              | Total            |                      |                   |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



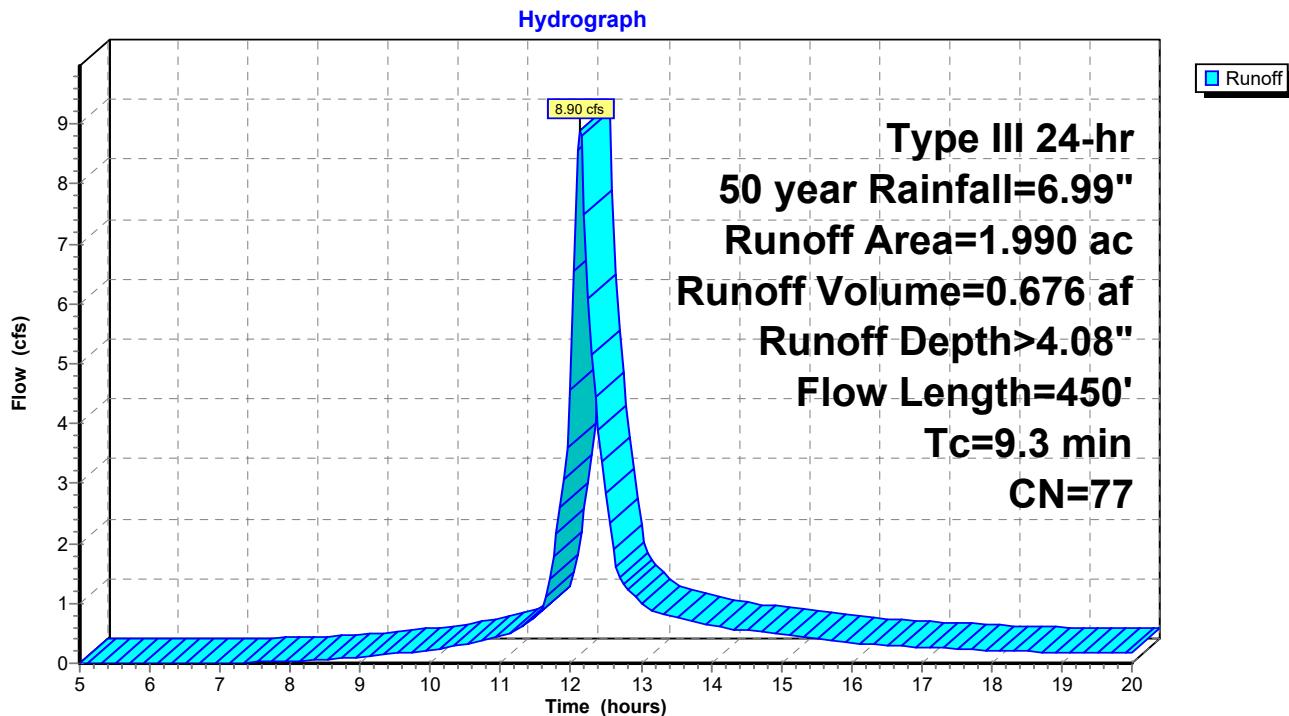
### Summary for Subcatchment 3: Subcat 3

Runoff = 8.90 cfs @ 12.13 hrs, Volume= 0.676 af, Depth> 4.08"

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=6.99"

| Area (ac) | CN            | Description                          |                   |                |                                                                      |
|-----------|---------------|--------------------------------------|-------------------|----------------|----------------------------------------------------------------------|
| 1.890     | 78            | Row crops, straight row, Good, HSG B |                   |                |                                                                      |
| 0.100     | 60            | Woods, Fair, HSG B                   |                   |                |                                                                      |
| 1.990     | 77            | Weighted Average                     |                   |                |                                                                      |
| 1.990     |               | 100.00% Pervious Area                |                   |                |                                                                      |
|           |               |                                      |                   |                |                                                                      |
| Tc        | Length (feet) | Slope (ft/ft)                        | Velocity (ft/sec) | Capacity (cfs) | Description                                                          |
| 5.7       | 50            | 0.0200                               | 0.15              |                | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6       | 400           | 0.0700                               | 1.85              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3       | 450           | Total                                |                   |                |                                                                      |

### Subcatchment 3: Subcat 3



### Summary for Subcatchment 4: Subcat 4

Runoff = 56.61 cfs @ 12.47 hrs, Volume= 7.145 af, Depth> 4.26"

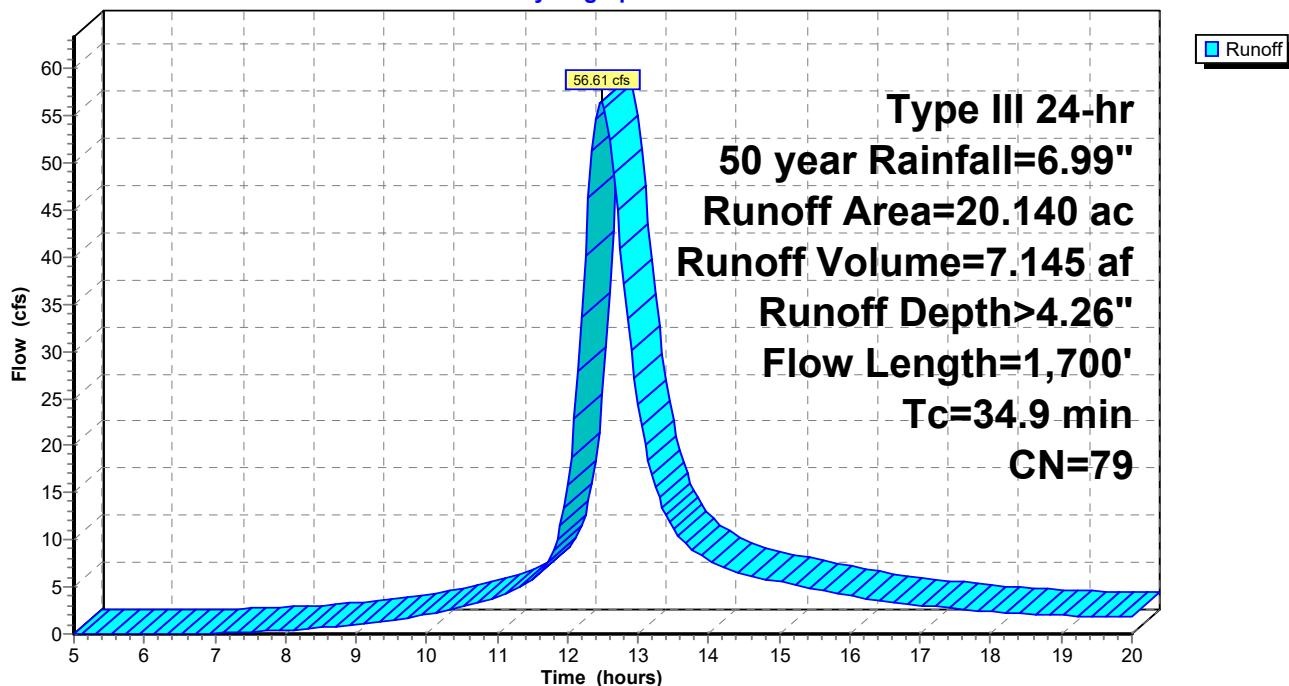
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.99"

| Area (ac) | CN | Description                          |
|-----------|----|--------------------------------------|
| 18.700    | 78 | Row crops, straight row, Good, HSG B |
| 0.450     | 60 | Woods, Fair, HSG B                   |
| *         | 98 | Farm roads                           |
| 20.140    | 79 | Weighted Average                     |
| 19.150    |    | 95.08% Pervious Area                 |
| 0.990     |    | 4.92% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            | Total            |                      |                   |                                                                      |

### Subcatchment 4: Subcat 4

Hydrograph



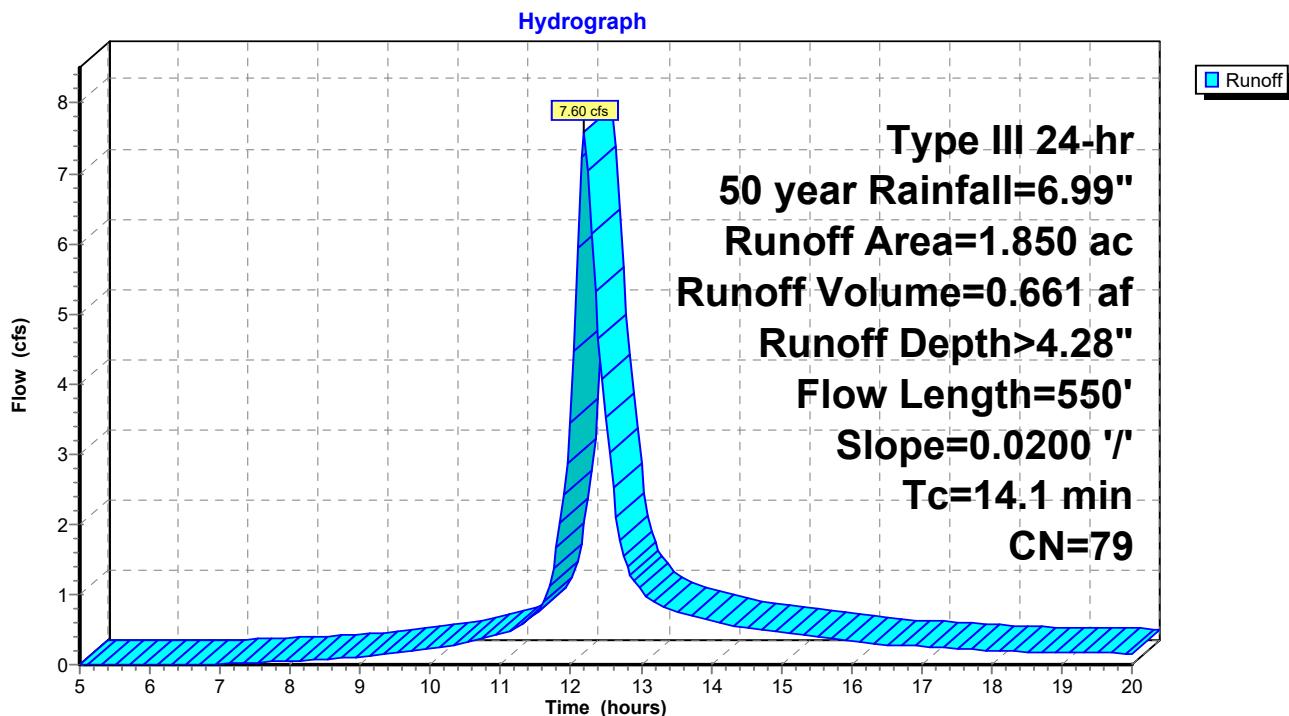
### Summary for Subcatchment 5: Subcat 5

Runoff = 7.60 cfs @ 12.19 hrs, Volume= 0.661 af, Depth> 4.28"

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 50 year Rainfall=6.99"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 79            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5





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## 100-Year Storm Event – Existing

**42733.00 - Existing Conditions2**

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Type III 24-hr 100 year Rainfall=7.92"

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Page 24

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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=4.920 ac 2.44% Impervious Runoff Depth>4.99"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=78 Runoff=23.76 cfs 2.044 af**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 7.81% Impervious Runoff Depth>4.99"  
Flow Length=250' Tc=7.5 min CN=78 Runoff=7.41 cfs 0.533 af**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 0.00% Impervious Runoff Depth>4.88"  
Flow Length=450' Tc=9.3 min CN=77 Runoff=10.58 cfs 0.809 af**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 4.92% Impervious Runoff Depth>5.07"  
Flow Length=1,700' Tc=34.9 min CN=79 Runoff=66.96 cfs 8.504 af**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>5.10"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=79 Runoff=8.98 cfs 0.786 af**Total Runoff Area = 30.180 ac Runoff Volume = 12.676 af Average Runoff Depth = 5.04"**  
**95.83% Pervious = 28.920 ac 4.17% Impervious = 1.260 ac**

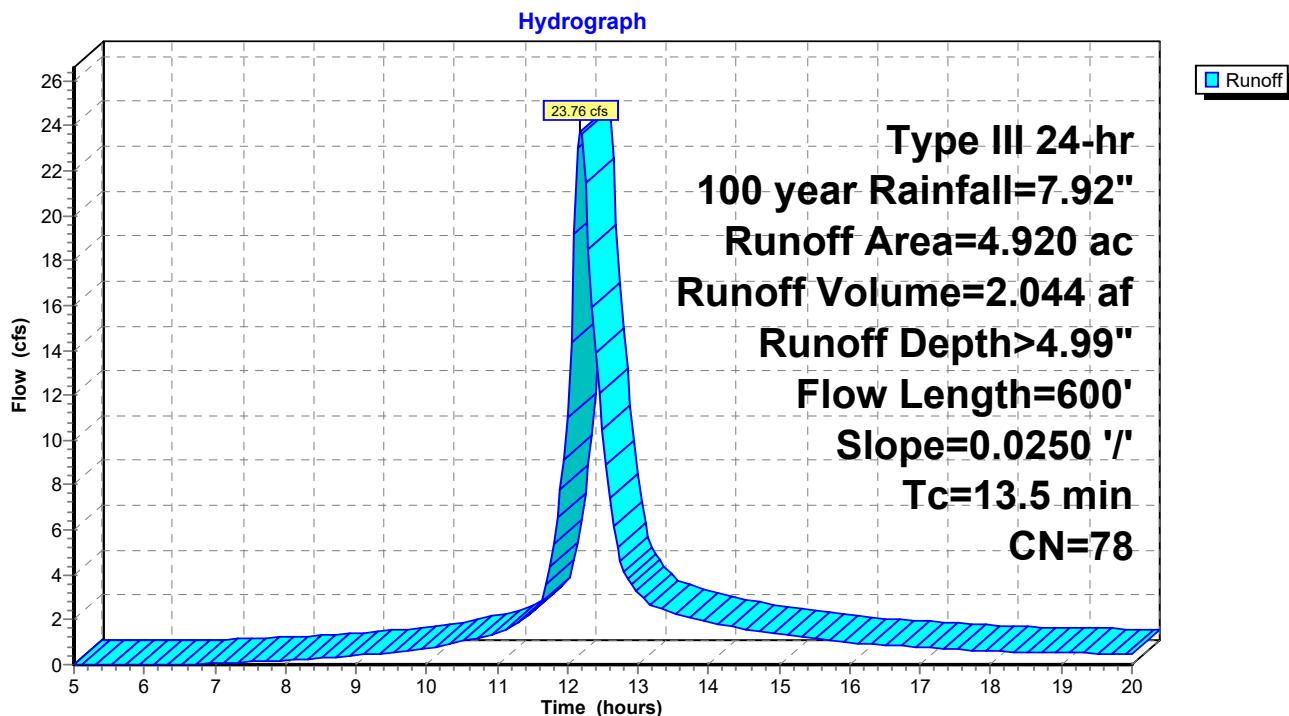
### Summary for Subcatchment 1: Subcat 1

Runoff = 23.76 cfs @ 12.19 hrs, Volume= 2.044 af, Depth> 4.99"

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 100 year Rainfall=7.92"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 4.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 78            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

### Subcatchment 1: Subcat 1



### Summary for Subcatchment 2: Subcat 2

Runoff = 7.41 cfs @ 12.11 hrs, Volume= 0.533 af, Depth> 4.99"

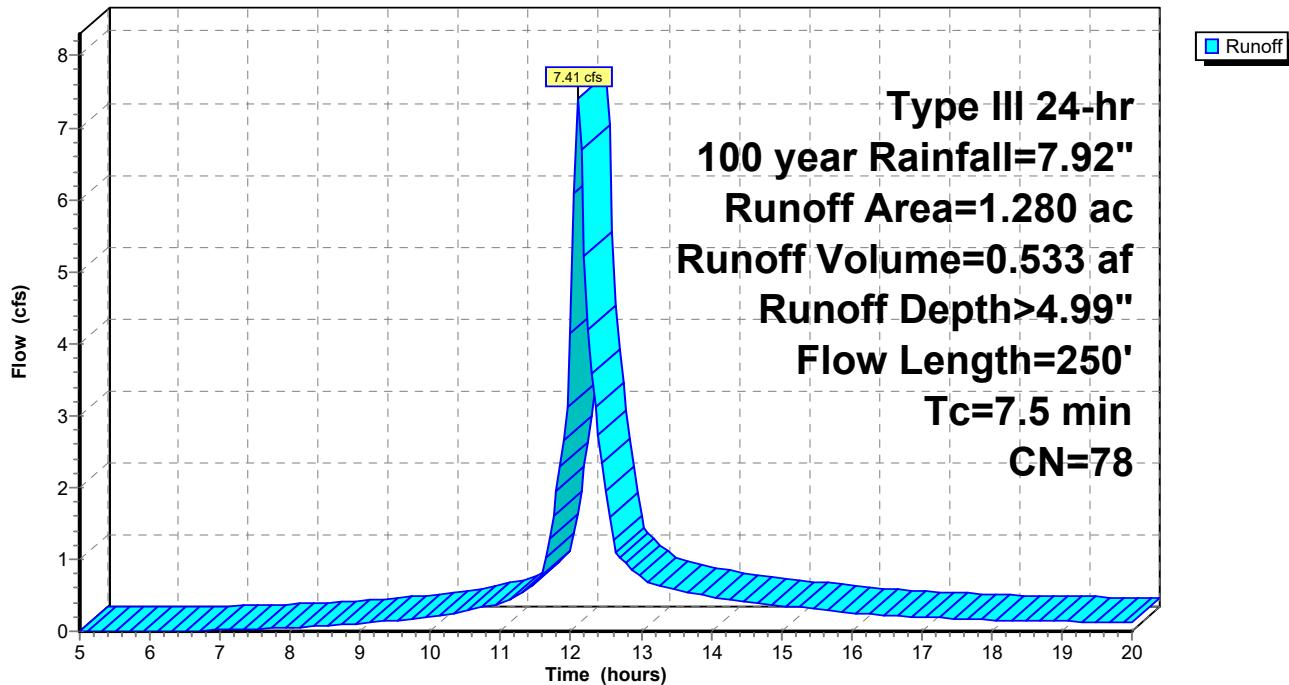
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100 year Rainfall=7.92"

| Area (ac) | CN | Description                          |
|-----------|----|--------------------------------------|
| 1.080     | 78 | Row crops, straight row, Good, HSG B |
| 0.100     | 60 | Woods, Fair, HSG B                   |
| *         | 98 | Farm roads                           |
| 1.280     | 78 | Weighted Average                     |
| 1.180     |    | 92.19% Pervious Area                 |
| 0.100     |    | 7.81% Impervious Area                |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              | Total            |                      |                   |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



### Summary for Subcatchment 3: Subcat 3

Runoff = 10.58 cfs @ 12.13 hrs, Volume= 0.809 af, Depth> 4.88"

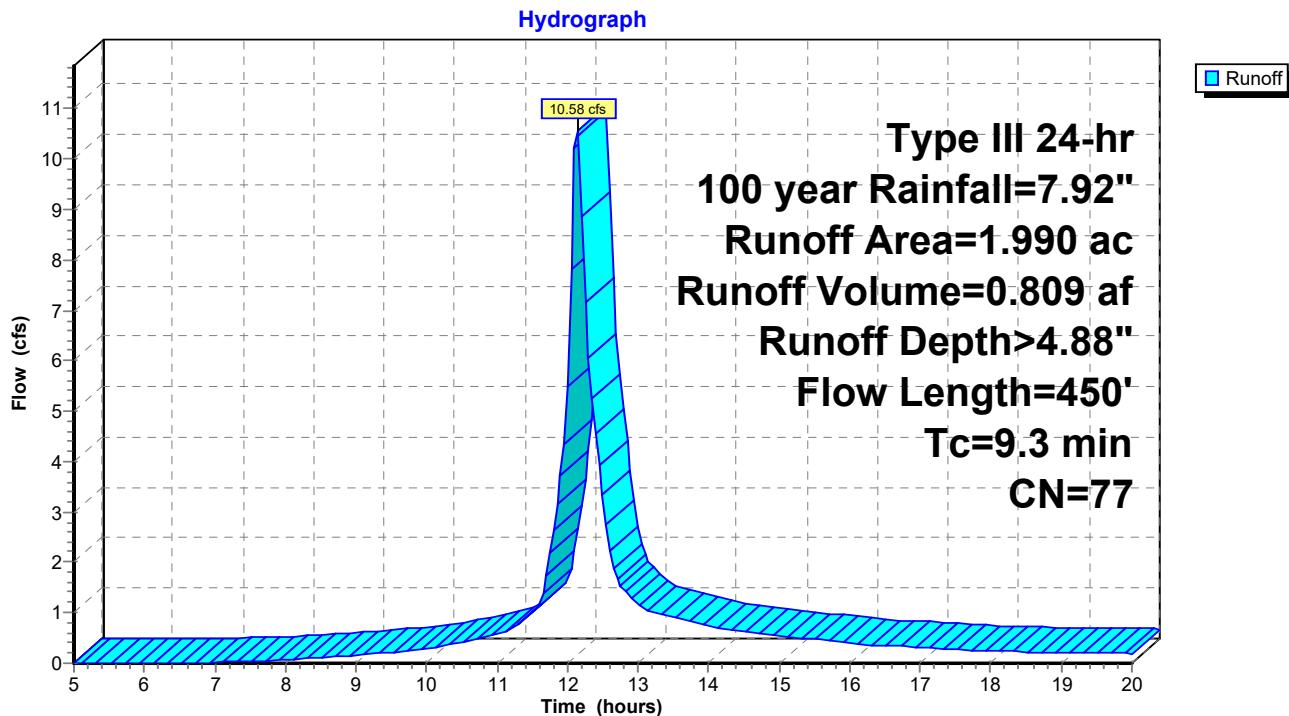
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100 year Rainfall=7.92"

| Area (ac) | CN | Description                          |
|-----------|----|--------------------------------------|
| 1.890     | 78 | Row crops, straight row, Good, HSG B |
| 0.100     | 60 | Woods, Fair, HSG B                   |

|       |    |                       |
|-------|----|-----------------------|
| 1.990 | 77 | Weighted Average      |
| 1.990 |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6         | 400              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3         | 450              |                  |                      | Total             |                                                                      |

### Subcatchment 3: Subcat 3



### Summary for Subcatchment 4: Subcat 4

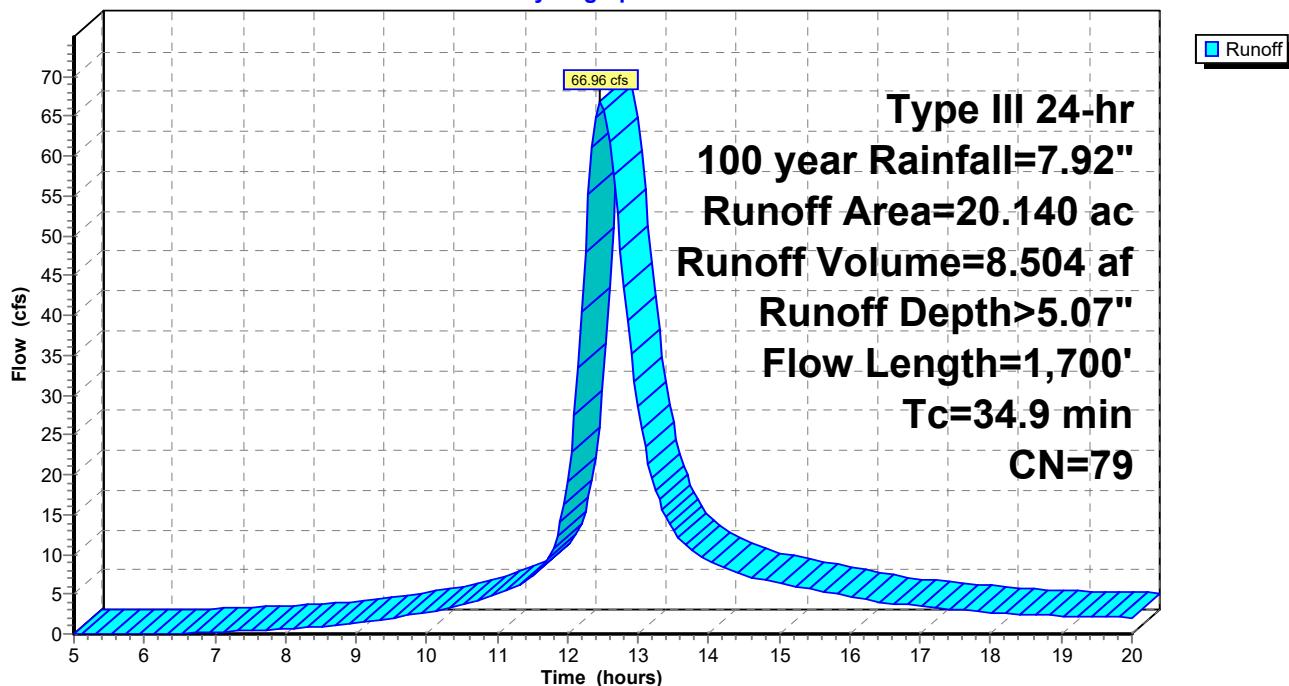
Runoff = 66.96 cfs @ 12.47 hrs, Volume= 8.504 af, Depth> 5.07"

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=7.92"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 18.700    | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| 0.450     | 60            | Woods, Fair, HSG B                                         |      |                                                                      |
| * 0.990   | 98            | Farm roads                                                 |      |                                                                      |
| 20.140    | 79            | Weighted Average                                           |      |                                                                      |
| 19.150    |               | 95.08% Pervious Area                                       |      |                                                                      |
| 0.990     |               | 4.92% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3      | 1,150         | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9      | 500           | 0.0100                                                     | 0.70 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9      | 1,700         | Total                                                      |      |                                                                      |

### Subcatchment 4: Subcat 4

Hydrograph



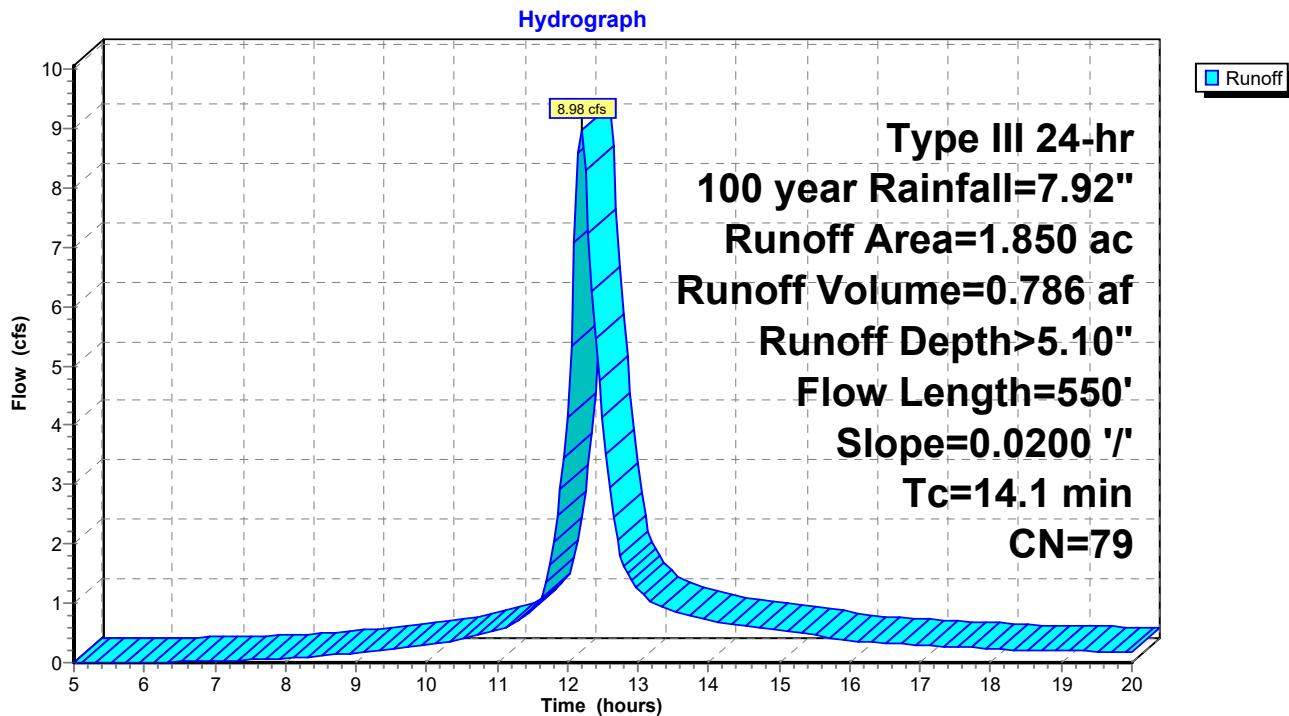
### Summary for Subcatchment 5: Subcat 5

Runoff = 8.98 cfs @ 12.19 hrs, Volume= 0.786 af, Depth> 5.10"

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 100 year Rainfall=7.92"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 78            | Row crops, straight row, Good, HSG B                       |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 79            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

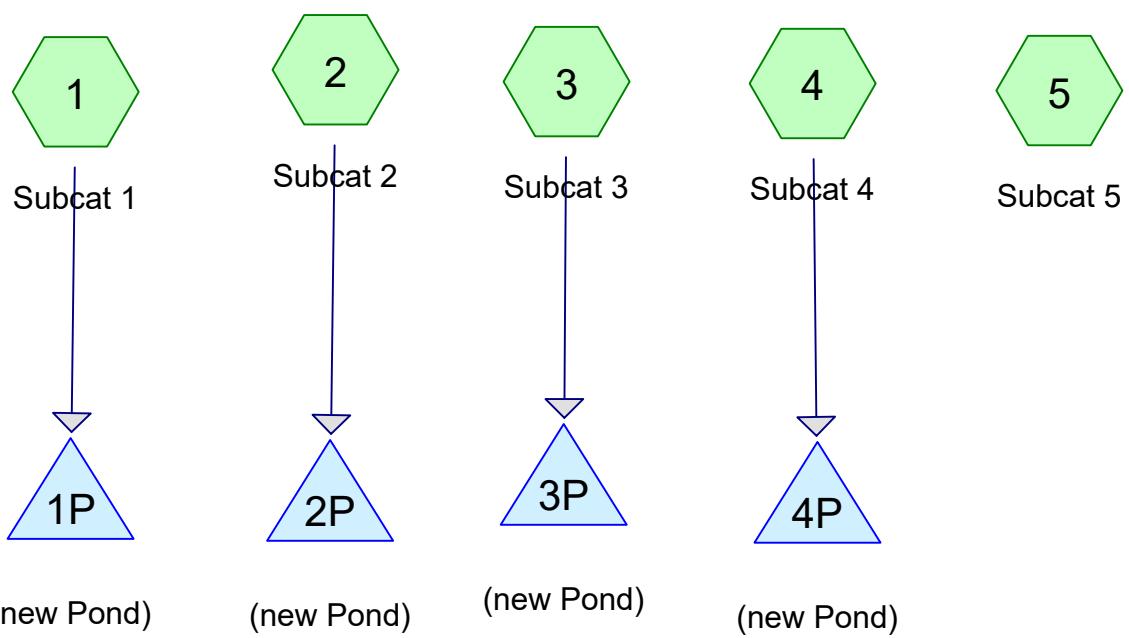
### Subcatchment 5: Subcat 5





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## HydroCAD Analysis: Proposed Conditions



**42733.00 - Proposed Conditions2**

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Page 2

**Rainfall Events Listing**

| Event# | Event Name | Storm Type     | Curve | Mode    | Duration (hours) | B/B | Depth (inches) | AMC |
|--------|------------|----------------|-------|---------|------------------|-----|----------------|-----|
| 1      | 2 year     | Type III 24-hr |       | Default | 24.00            | 1   | 3.16           | 2   |
| 2      | 25 year    | Type III 24-hr |       | Default | 24.00            | 1   | 6.15           | 2   |
| 3      | 50 year    | Type III 24-hr |       | Default | 24.00            | 1   | 6.99           | 2   |
| 4      | 100 year   | Type III 24-hr |       | Default | 24.00            | 1   | 7.92           | 2   |

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Page 3

### Area Listing (all nodes)

| Area<br>(acres) | CN        | Description<br>(subcatchment-numbers)          |
|-----------------|-----------|------------------------------------------------|
| 1.800           | 69        | 50-75% Grass cover, Fair, HSG B (5)            |
| 26.140          | 74        | 50-75% Grass cover, Fair, HSG B-C (1, 2, 3, 4) |
| 1.260           | 98        | Farm roads (1, 2, 4, 5)                        |
| 0.070           | 98        | Proposed gravel road (2)                       |
| 0.260           | 98        | Proposed gravel roads (3, 4)                   |
| 0.650           | 60        | Woods, Fair, HSG B (2, 3, 4)                   |
| <b>30.180</b>   | <b>75</b> | <b>TOTAL AREA</b>                              |

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Page 4

**Soil Listing (all nodes)**

| Area<br>(acres) | Soil<br>Group | Subcatchment<br>Numbers |
|-----------------|---------------|-------------------------|
| 0.000           | HSG A         |                         |
| 28.590          | HSG B         | 1, 2, 3, 4, 5           |
| 0.000           | HSG C         |                         |
| 0.000           | HSG D         |                         |
| 1.590           | Other         | 1, 2, 3, 4, 5           |
| <b>30.180</b>   |               | <b>TOTAL AREA</b>       |

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Page 5

**Ground Covers (all nodes)**

| HSG-A<br>(acres) | HSG-B<br>(acres) | HSG-C<br>(acres) | HSG-D<br>(acres) | Other<br>(acres) | Total<br>(acres) | Ground<br>Cover          | Subcatchment<br>Numbers |
|------------------|------------------|------------------|------------------|------------------|------------------|--------------------------|-------------------------|
| 0.000            | 27.940           | 0.000            | 0.000            | 0.000            | 27.940           | 50-75% Grass cover, Fair | 1, 2, 3,<br>4, 5        |
| 0.000            | 0.000            | 0.000            | 0.000            | 1.260            | 1.260            | Farm roads               | 1, 2, 4, 5              |
| 0.000            | 0.000            | 0.000            | 0.000            | 0.070            | 0.070            | Proposed gravel road     | 2                       |
| 0.000            | 0.000            | 0.000            | 0.000            | 0.260            | 0.260            | Proposed gravel roads    | 3, 4                    |
| 0.000            | 0.650            | 0.000            | 0.000            | 0.000            | 0.650            | Woods, Fair              | 2, 3, 4                 |
| <b>0.000</b>     | <b>28.590</b>    | <b>0.000</b>     | <b>0.000</b>     | <b>1.590</b>     | <b>30.180</b>    | <b>TOTAL AREA</b>        |                         |



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## 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=4.920 ac 2.44% Impervious Runoff Depth>0.97"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=75 Runoff=4.57 cfs 0.398 af

**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 13.28% Impervious Runoff Depth>1.03"  
Flow Length=250' Tc=7.5 min CN=76 Runoff=1.52 cfs 0.110 af

**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 4.52% Impervious Runoff Depth>0.92"  
Flow Length=450' Tc=9.3 min CN=74 Runoff=1.96 cfs 0.153 af

**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 5.76% Impervious Runoff Depth>0.96"  
Flow Length=1,700' Tc=34.9 min CN=75 Runoff=12.62 cfs 1.615 af

**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>0.72"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=70 Runoff=1.19 cfs 0.111 af

**Pond 1P: (new Pond)** Peak Elev=195.61' Storage=10,675 cf Inflow=4.57 cfs 0.398 af  
Discarded=0.27 cfs 0.181 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.181 af

**Pond 2P: (new Pond)** Peak Elev=212.03' Storage=3,304 cf Inflow=1.52 cfs 0.110 af  
Outflow=0.12 cfs 0.035 af

**Pond 3P: (new Pond)** Peak Elev=211.01' Storage=6,379 cf Inflow=1.96 cfs 0.153 af  
Outflow=0.06 cfs 0.006 af

**Pond 4P: (new Pond)** Peak Elev=216.24' Storage=70,294 cf Inflow=12.62 cfs 1.615 af  
Outflow=0.00 cfs 0.000 af

**Total Runoff Area = 30.180 ac Runoff Volume = 2.387 af Average Runoff Depth = 0.95"**  
**94.73% Pervious = 28.590 ac 5.27% Impervious = 1.590 ac**

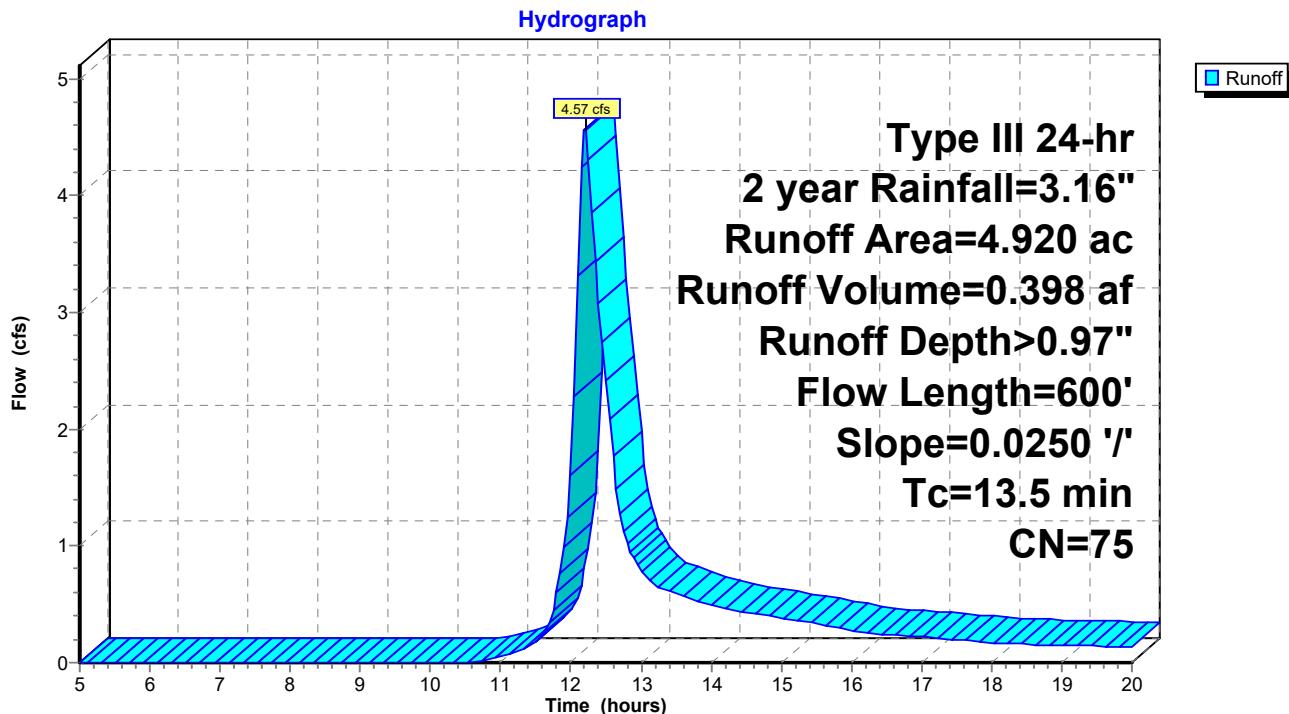
### Summary for Subcatchment 1: Subcat 1

Runoff = 4.57 cfs @ 12.20 hrs, Volume= 0.398 af, Depth> 0.97"

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=3.16"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| * 4.800   | 74            | 50-75% Grass cover, Fair, HSG B-C                          |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 75            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

### Subcatchment 1: Subcat 1



### Summary for Subcatchment 2: Subcat 2

Runoff = 1.52 cfs @ 12.12 hrs, Volume= 0.110 af, Depth> 1.03"

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=3.16"

#### Area (ac) CN Description

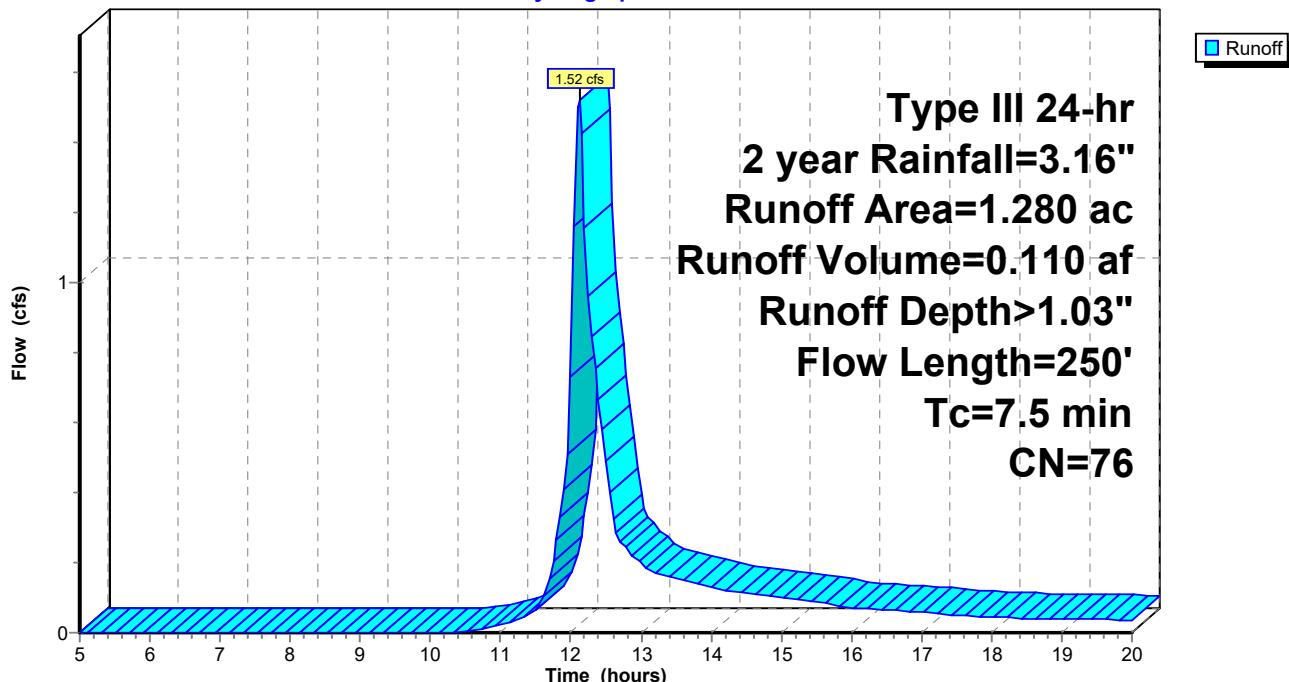
|   |       |    |                                   |
|---|-------|----|-----------------------------------|
| * | 1.010 | 74 | 50-75% Grass cover, Fair, HSG B-C |
|   | 0.100 | 60 | Woods, Fair, HSG B                |
| * | 0.100 | 98 | Farm roads                        |
| * | 0.070 | 98 | Proposed gravel road              |
|   | 1.280 | 76 | Weighted Average                  |
|   | 1.110 |    | 86.72% Pervious Area              |
|   | 0.170 |    | 13.28% Impervious Area            |

#### Tc Length Slope Velocity Capacity Description

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              | Total            |                      |                   |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



### Summary for Subcatchment 3: Subcat 3

Runoff = 1.96 cfs @ 12.15 hrs, Volume= 0.153 af, Depth> 0.92"

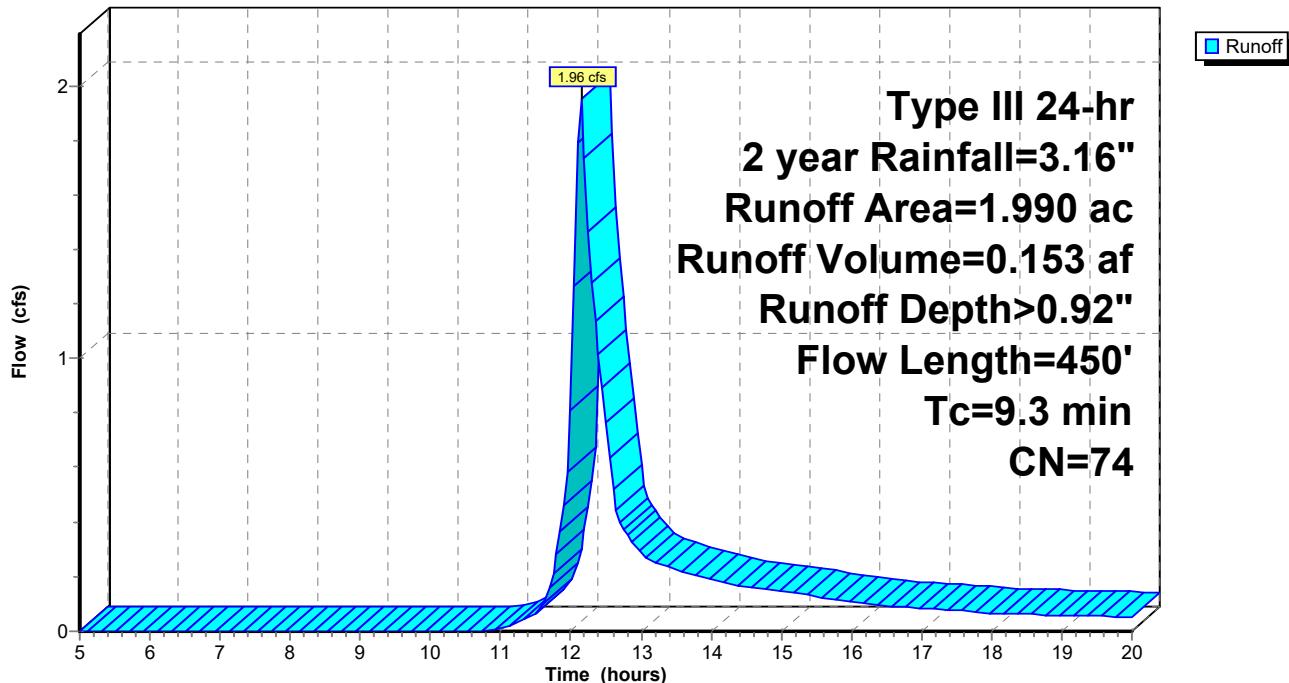
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 year Rainfall=3.16"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 1.800   | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.100     | 60 | Woods, Fair, HSG B                |
| * 0.090   | 98 | Proposed gravel roads             |
| 1.990     | 74 | Weighted Average                  |
| 1.900     |    | 95.48% Pervious Area              |
| 0.090     |    | 4.52% Impervious Area             |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                          |
|----------|---------------|---------------|-------------------|----------------|----------------------------------------------------------------------|
| 5.7      | 50            | 0.0200        | 0.15              |                | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6      | 400           | 0.0700        | 1.85              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3      | 450           | Total         |                   |                |                                                                      |

### Subcatchment 3: Subcat 3

Hydrograph



### Summary for Subcatchment 4: Subcat 4

Runoff = 12.62 cfs @ 12.52 hrs, Volume= 1.615 af, Depth> 0.96"

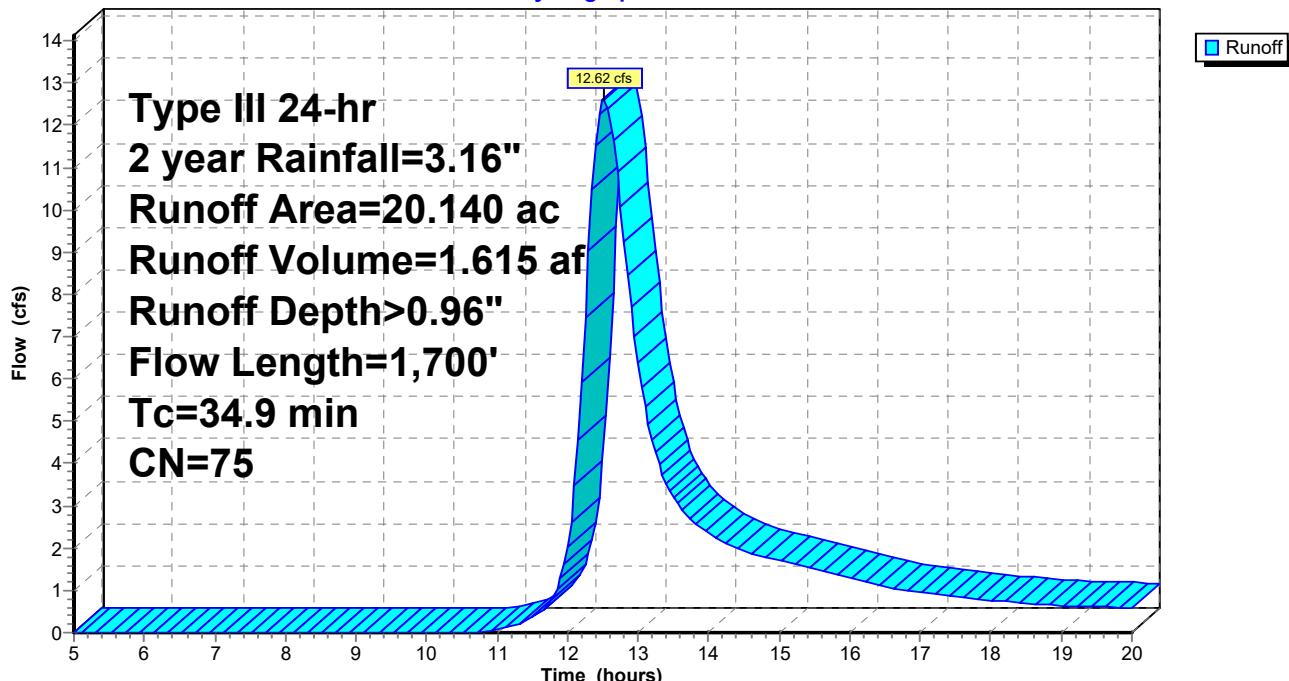
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 year Rainfall=3.16"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 18.530  | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.450     | 60 | Woods, Fair, HSG B                |
| * 0.990   | 98 | Farm roads                        |
| * 0.170   | 98 | Proposed gravel roads             |
| 20.140    | 75 | Weighted Average                  |
| 18.980    |    | 94.24% Pervious Area              |
| 1.160     |    | 5.76% Impervious Area             |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            |                  |                      |                   | Total                                                                |

### Subcatchment 4: Subcat 4

Hydrograph



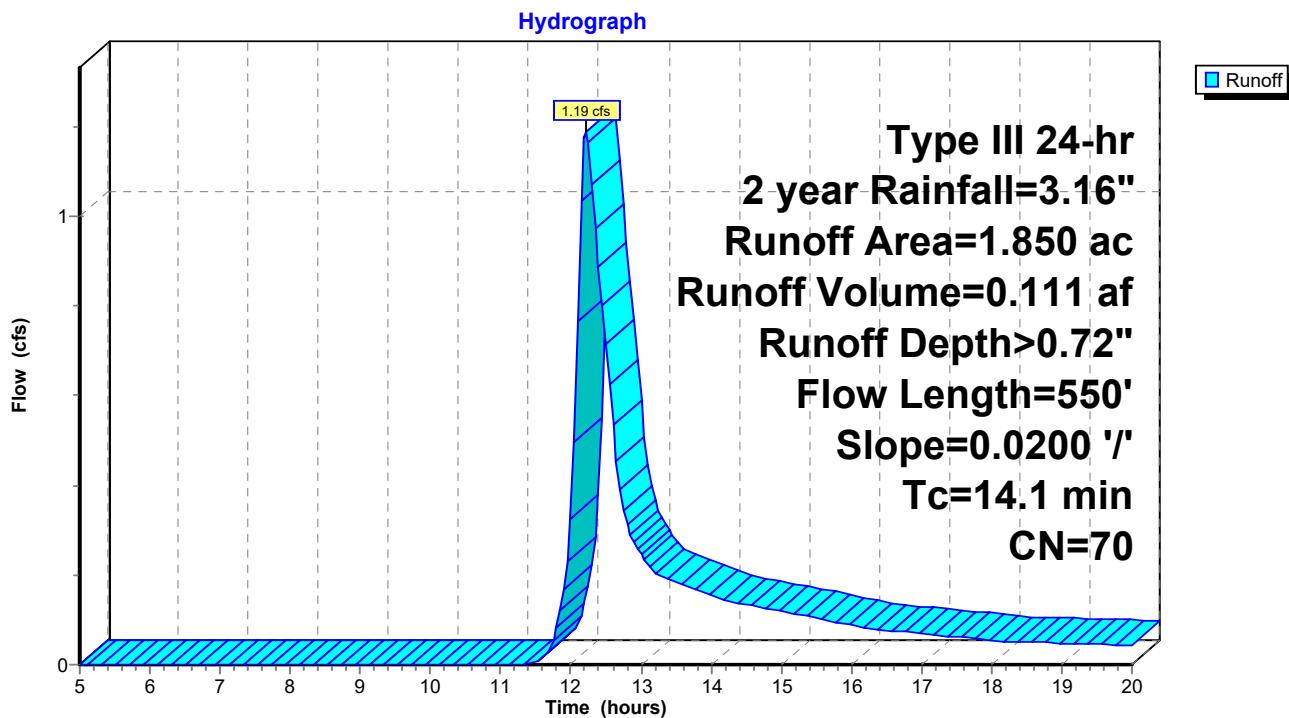
### Summary for Subcatchment 5: Subcat 5

Runoff = 1.19 cfs @ 12.22 hrs, Volume= 0.111 af, Depth> 0.72"

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 2 year Rainfall=3.16"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 69            | 50-75% Grass cover, Fair, HSG B                            |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 70            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5



### Summary for Pond 1P: (new Pond)

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 0.97" for 2 year event  
 Inflow = 4.57 cfs @ 12.20 hrs, Volume= 0.398 af  
 Outflow = 0.27 cfs @ 16.04 hrs, Volume= 0.181 af, Atten= 94%, Lag= 230.1 min  
 Discarded = 0.27 cfs @ 16.04 hrs, Volume= 0.181 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= 195.61' @ 16.04 hrs Surf.Area= 5,698 sf Storage= 10,675 cf

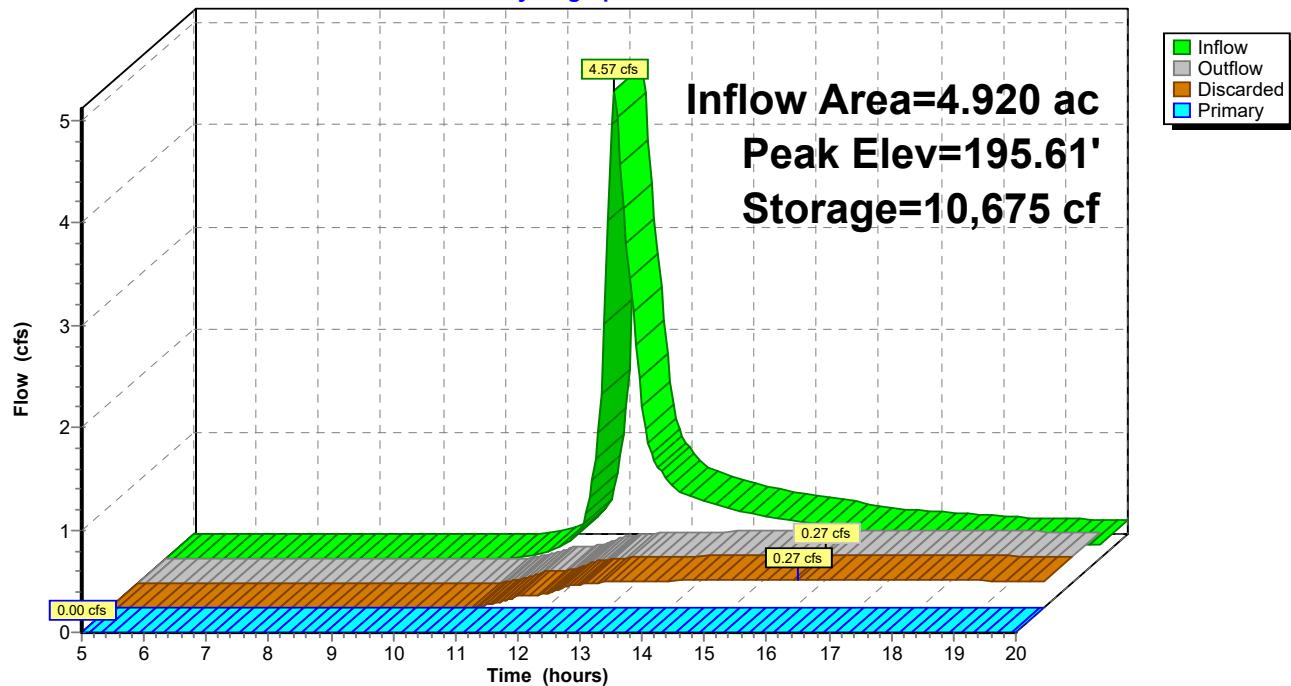
Plug-Flow detention time= 224.1 min calculated for 0.181 af (45% of inflow)  
 Center-of-Mass det. time= 133.1 min ( 955.3 - 822.2 )

| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 193.00' | 24,642 cf     | <b>15.00'W x 170.00'L x 4.60'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 197.00' | <b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88<br><b>#2 Discarded</b> 193.00' <b>2.000 in/hr Exfiltration over Wetted area</b><br>Conductivity to Groundwater Elevation = 10.00' |

**Discarded OutFlow** Max=0.27 cfs @ 16.04 hrs HW=195.61' (Free Discharge)  
 ↑ 2=Exfiltration ( Controls 0.27 cfs )

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=193.00' (Free Discharge)  
 ↑ 1=Broad-Crested Rectangular Weir ( Controls 0.00 cfs )

**Pond 1P: (new Pond)****Hydrograph**

### Summary for Pond 2P: (new Pond)

Inflow Area = 1.280 ac, 13.28% Impervious, Inflow Depth > 1.03" for 2 year event  
 Inflow = 1.52 cfs @ 12.12 hrs, Volume= 0.110 af  
 Outflow = 0.12 cfs @ 14.15 hrs, Volume= 0.035 af, Atten= 92%, Lag= 121.9 min  
 Primary = 0.12 cfs @ 14.15 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 212.03' @ 14.15 hrs Surf.Area= 1,765 sf Storage= 3,304 cf

Plug-Flow detention time= 256.6 min calculated for 0.035 af (31% of inflow)  
 Center-of-Mass det. time= 159.8 min ( 975.0 - 815.2 )

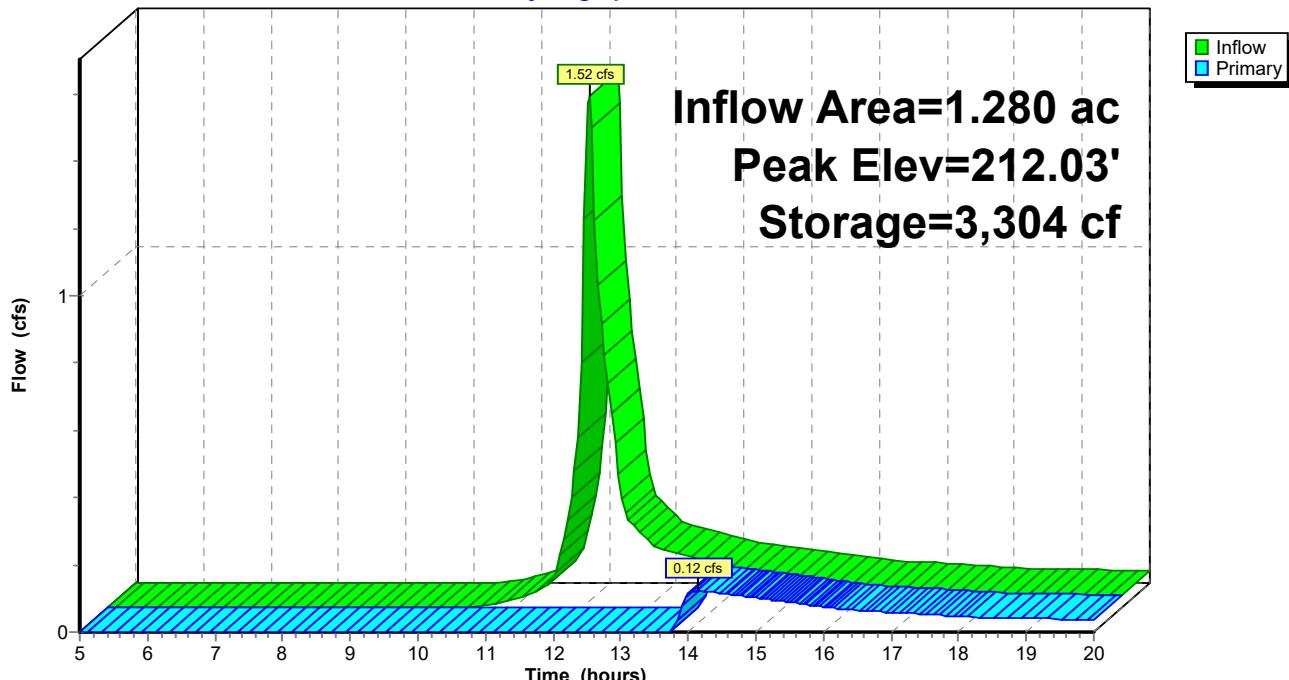
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 209.00' | 6,494 cf      | <b>15.00'W x 35.00'L x 4.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 212.00' | <b>8.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=0.10 cfs @ 14.15 hrs HW=212.03' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 0.10 cfs @ 0.42 fps)

### Pond 2P: (new Pond)

Hydrograph



### Summary for Pond 3P: (new Pond)

Inflow Area = 1.990 ac, 4.52% Impervious, Inflow Depth > 0.92" for 2 year event  
 Inflow = 1.96 cfs @ 12.15 hrs, Volume= 0.153 af  
 Outflow = 0.06 cfs @ 19.21 hrs, Volume= 0.006 af, Atten= 97%, Lag= 423.9 min  
 Primary = 0.06 cfs @ 19.21 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 211.01' @ 19.21 hrs Surf.Area= 2,698 sf Storage= 6,379 cf

Plug-Flow detention time= 463.6 min calculated for 0.006 af (4% of inflow)  
 Center-of-Mass det. time= 339.4 min ( 1,160.8 - 821.4 )

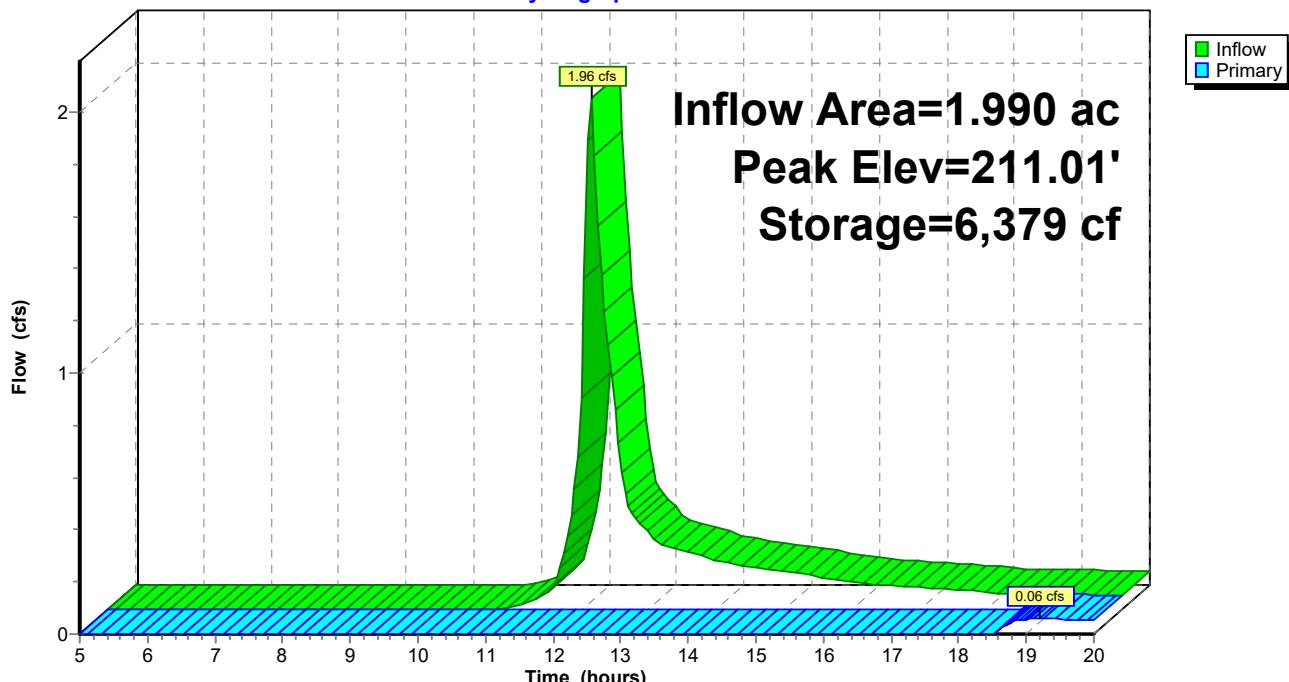
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 207.00' | 8,714 cf      | <b>15.00'W x 45.00'L x 4.80'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 211.00' | <b>12.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

**Primary OutFlow** Max=0.03 cfs @ 19.21 hrs HW=211.01' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 0.03 cfs @ 0.25 fps)

### Pond 3P: (new Pond)

Hydrograph



### Summary for Pond 4P: (new Pond)

Inflow Area = 20.140 ac, 5.76% Impervious, Inflow Depth > 0.96" for 2 year event  
 Inflow = 12.62 cfs @ 12.52 hrs, Volume= 1.615 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= 216.24' @ 20.00 hrs Surf.Area= 29,072 sf Storage= 70,294 cf

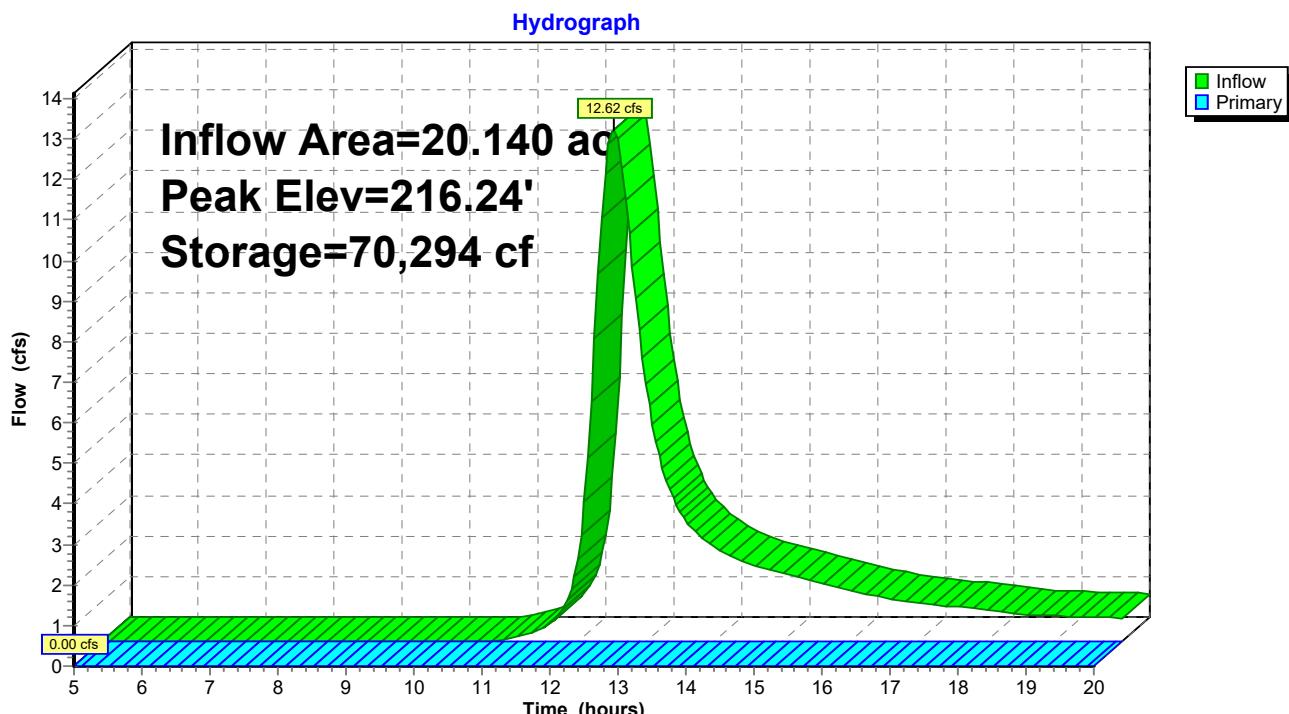
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)  
 Center-of-Mass det. time= (not calculated: no outflow)

| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 213.50' | 160,589 cf    | <b>70.00'W x 320.00'L x 5.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 218.00' | <b>16.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=213.50' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

### Pond 4P: (new Pond)





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## 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=4.920 ac 2.44% Impervious Runoff Depth>3.17"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=75 Runoff=15.36 cfs 1.301 af

**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 13.28% Impervious Runoff Depth>3.28"  
Flow Length=250' Tc=7.5 min CN=76 Runoff=4.94 cfs 0.349 af

**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 4.52% Impervious Runoff Depth>3.08"  
Flow Length=450' Tc=9.3 min CN=74 Runoff=6.79 cfs 0.511 af

**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 5.76% Impervious Runoff Depth>3.15"  
Flow Length=1,700' Tc=34.9 min CN=75 Runoff=42.34 cfs 5.284 af

**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>2.70"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=70 Runoff=4.85 cfs 0.417 af

**Pond 1P: (new Pond)** Peak Elev=197.32' Storage=22,352 cf Inflow=15.36 cfs 1.301 af  
Discarded=0.39 cfs 0.283 af Primary=8.88 cfs 0.562 af Outflow=9.27 cfs 0.845 af

**Pond 2P: (new Pond)** Peak Elev=212.38' Storage=3,954 cf Inflow=4.94 cfs 0.349 af  
Outflow=4.69 cfs 0.274 af

**Pond 3P: (new Pond)** Peak Elev=211.35' Storage=7,322 cf Inflow=6.79 cfs 0.511 af  
Outflow=6.00 cfs 0.363 af

**Pond 4P: (new Pond)** Peak Elev=218.40' Storage=139,192 cf Inflow=42.34 cfs 5.284 af  
Outflow=10.04 cfs 2.309 af

**Total Runoff Area = 30.180 ac Runoff Volume = 7.862 af Average Runoff Depth = 3.13"**  
**94.73% Pervious = 28.590 ac 5.27% Impervious = 1.590 ac**

### Summary for Subcatchment 1: Subcat 1

Runoff = 15.36 cfs @ 12.19 hrs, Volume= 1.301 af, Depth> 3.17"

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 25 year Rainfall=6.15"

#### Area (ac) CN Description

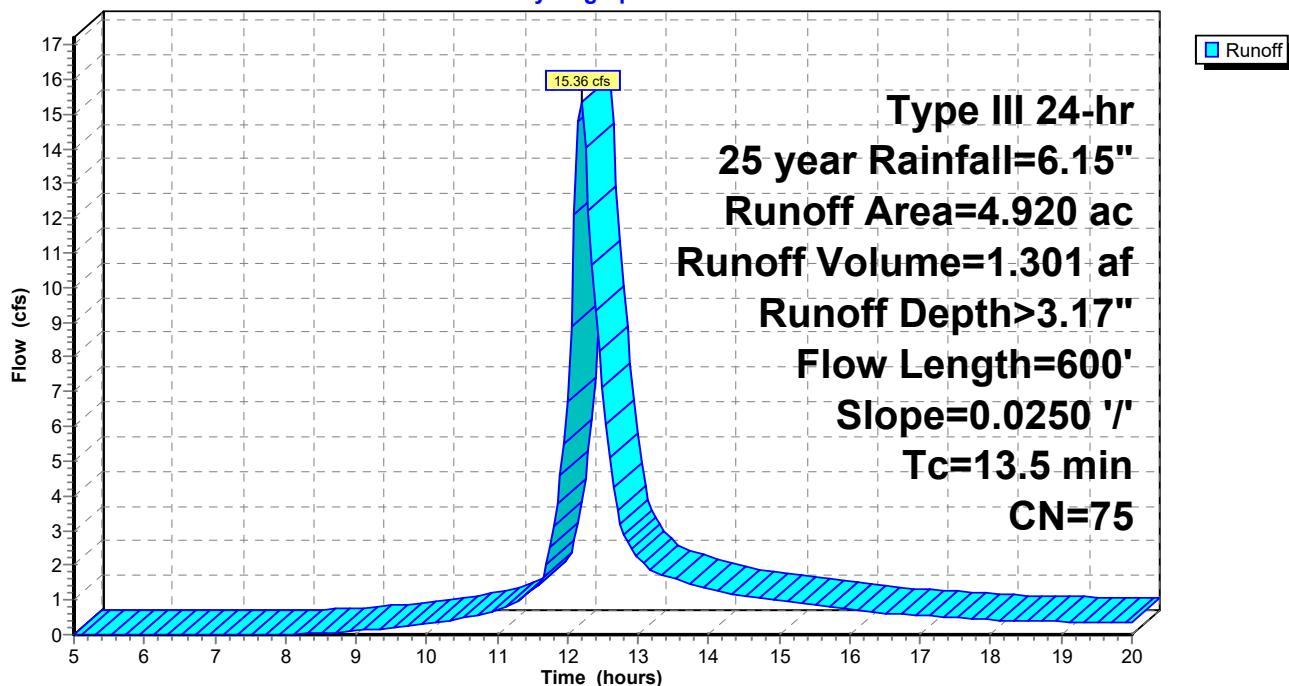
| Area (ac) | CN    | Description                          |
|-----------|-------|--------------------------------------|
| *         | 4.800 | 74 50-75% Grass cover, Fair, HSG B-C |
| *         | 0.120 | 98 Farm roads                        |
|           | 4.920 | Weighted Average                     |
|           | 4.800 | 97.56% Pervious Area                 |
|           | 0.120 | 2.44% Impervious Area                |

#### Tc Length Slope Velocity Capacity Description

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.2         | 50               | 0.0250           | 0.16                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3         | 550              | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5        | 600              | Total            |                      |                   |                                                                      |

### Subcatchment 1: Subcat 1

#### Hydrograph



### Summary for Subcatchment 2: Subcat 2

Runoff = 4.94 cfs @ 12.11 hrs, Volume= 0.349 af, Depth> 3.28"

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 25 year Rainfall=6.15"

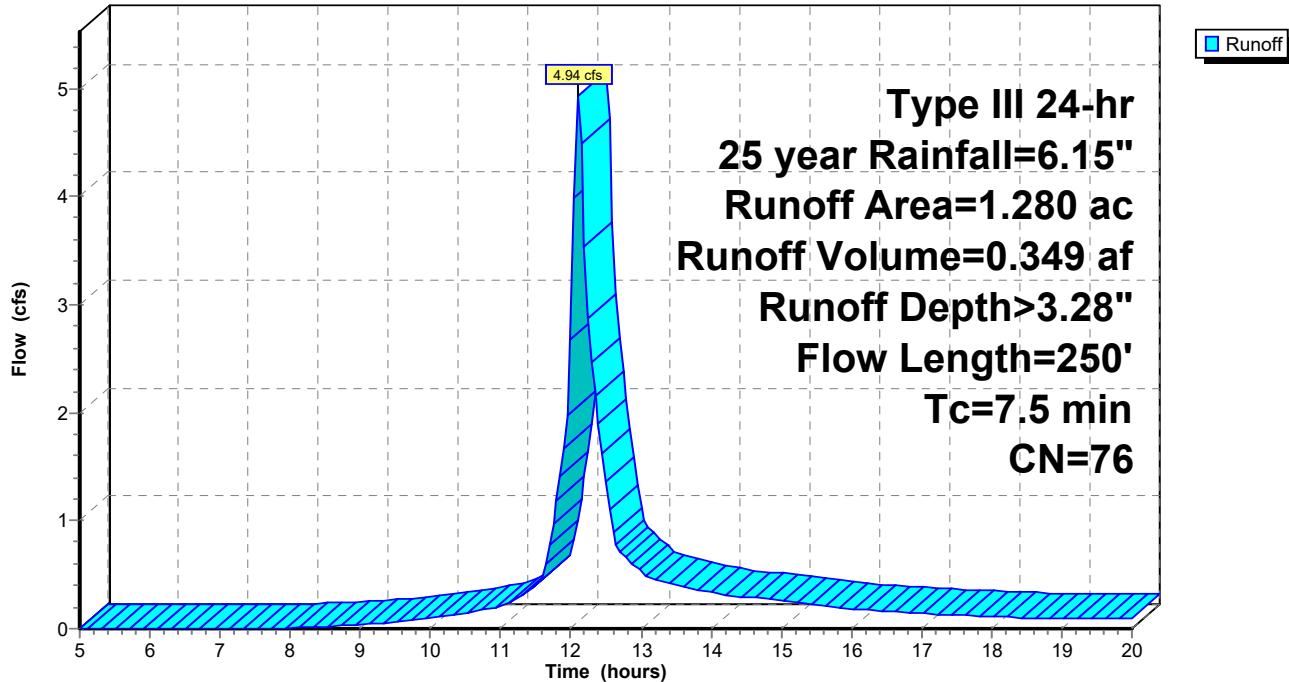
#### Area (ac) CN Description

|   |       |    |                                   |
|---|-------|----|-----------------------------------|
| * | 1.010 | 74 | 50-75% Grass cover, Fair, HSG B-C |
|   | 0.100 | 60 | Woods, Fair, HSG B                |
| * | 0.100 | 98 | Farm roads                        |
| * | 0.070 | 98 | Proposed gravel road              |
|   | 1.280 | 76 | Weighted Average                  |
|   | 1.110 |    | 86.72% Pervious Area              |
|   | 0.170 |    | 13.28% Impervious Area            |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              |                  |                      | Total             |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



### Summary for Subcatchment 3: Subcat 3

Runoff = 6.79 cfs @ 12.14 hrs, Volume= 0.511 af, Depth> 3.08"

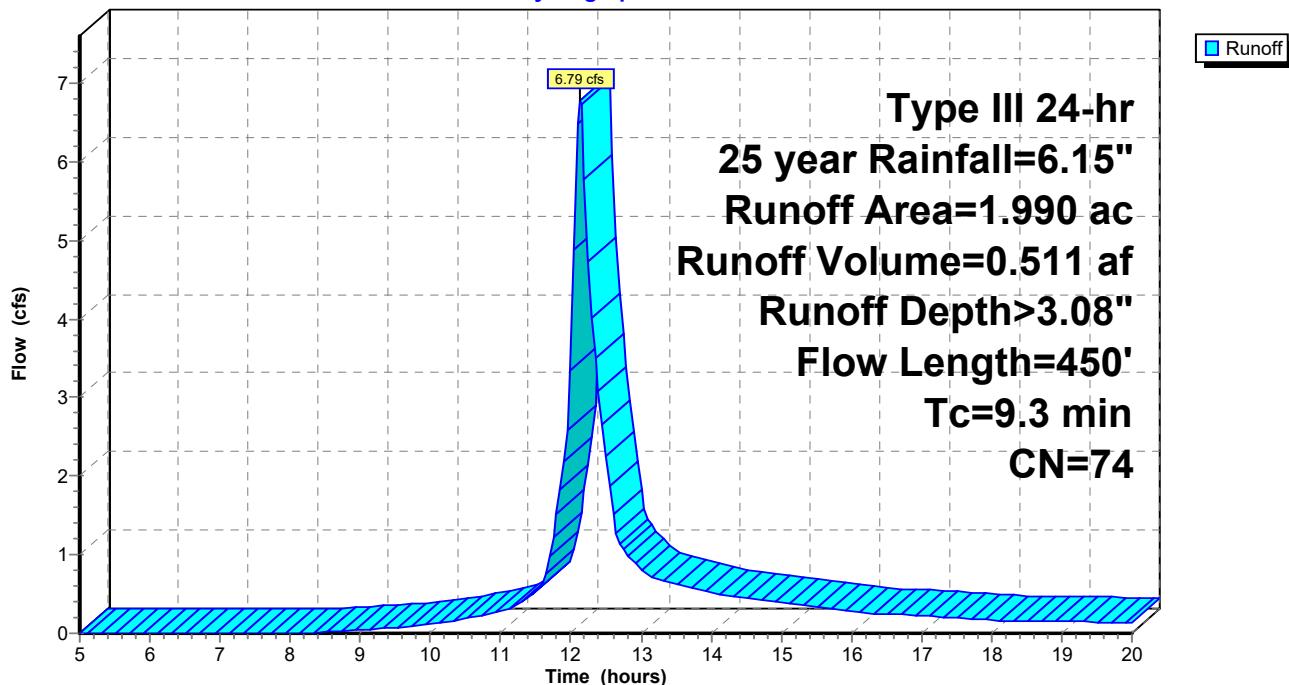
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 year Rainfall=6.15"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 1.800   | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.100     | 60 | Woods, Fair, HSG B                |
| * 0.090   | 98 | Proposed gravel roads             |
| 1.990     | 74 | Weighted Average                  |
| 1.900     |    | 95.48% Pervious Area              |
| 0.090     |    | 4.52% Impervious Area             |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                          |
|----------|---------------|---------------|-------------------|----------------|----------------------------------------------------------------------|
| 5.7      | 50            | 0.0200        | 0.15              |                | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6      | 400           | 0.0700        | 1.85              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3      | 450           | Total         |                   |                |                                                                      |

### Subcatchment 3: Subcat 3

Hydrograph



### Summary for Subcatchment 4: Subcat 4

Runoff = 42.34 cfs @ 12.49 hrs, Volume= 5.284 af, Depth> 3.15"

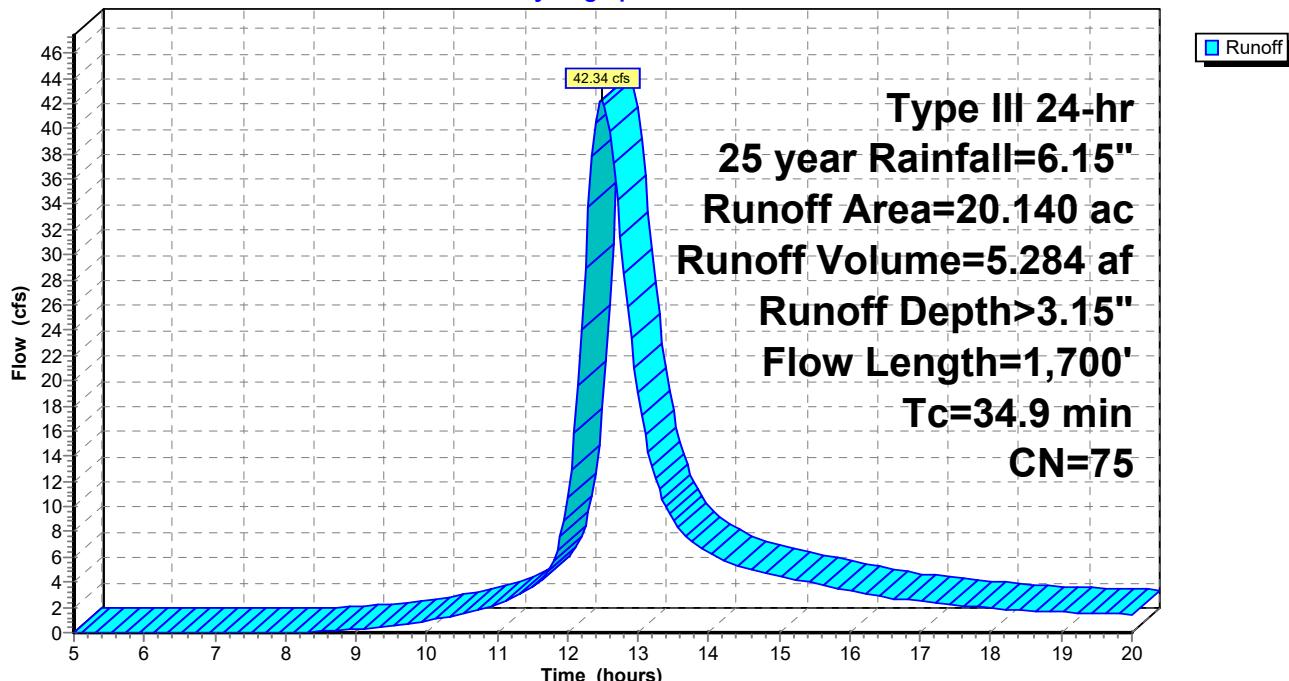
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 year Rainfall=6.15"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 18.530  | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.450     | 60 | Woods, Fair, HSG B                |
| * 0.990   | 98 | Farm roads                        |
| * 0.170   | 98 | Proposed gravel roads             |
| 20.140    | 75 | Weighted Average                  |
| 18.980    |    | 94.24% Pervious Area              |
| 1.160     |    | 5.76% Impervious Area             |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            |                  |                      |                   | Total                                                                |

### Subcatchment 4: Subcat 4

Hydrograph



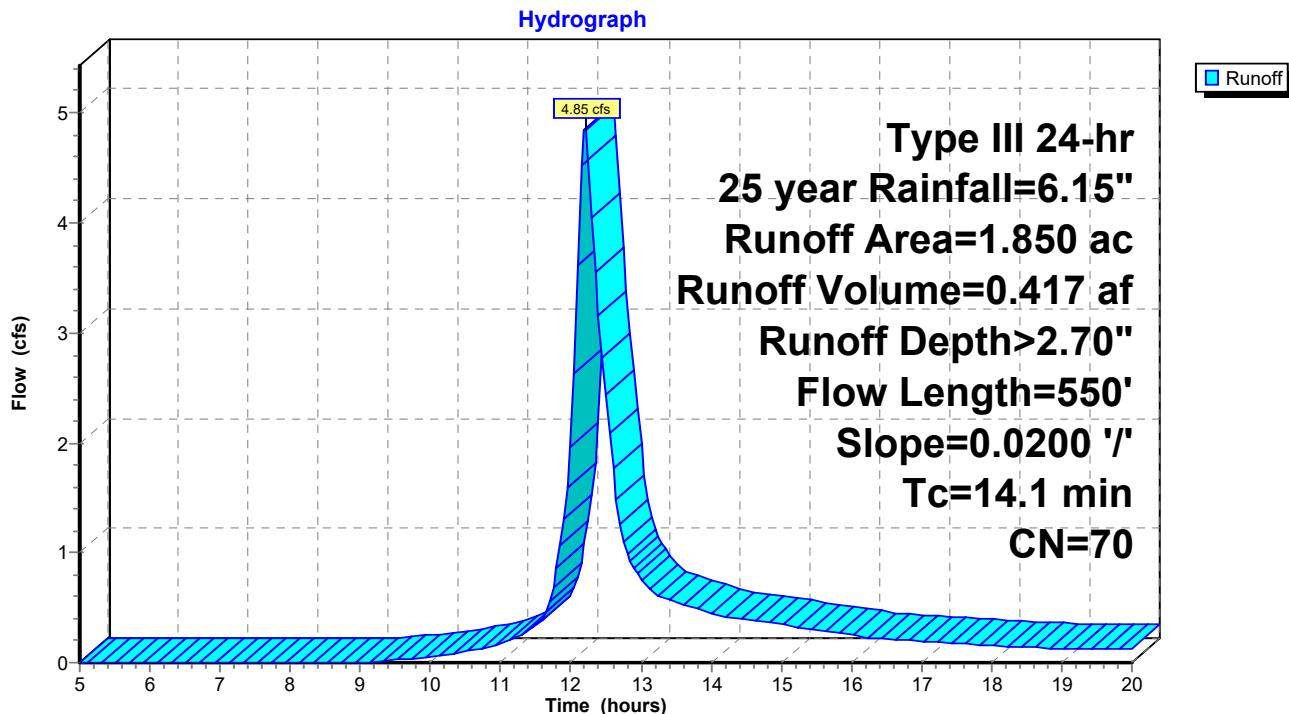
### Summary for Subcatchment 5: Subcat 5

Runoff = 4.85 cfs @ 12.20 hrs, Volume= 0.417 af, Depth> 2.70"

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=6.15"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 69            | 50-75% Grass cover, Fair, HSG B                            |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 70            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5



### Summary for Pond 1P: (new Pond)

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 3.17" for 25 year event  
 Inflow = 15.36 cfs @ 12.19 hrs, Volume= 1.301 af  
 Outflow = 9.27 cfs @ 12.42 hrs, Volume= 0.845 af, Atten= 40%, Lag= 13.6 min  
 Discarded = 0.39 cfs @ 12.42 hrs, Volume= 0.283 af  
 Primary = 8.88 cfs @ 12.42 hrs, Volume= 0.562 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 197.32' @ 12.42 hrs Surf.Area= 8,019 sf Storage= 22,352 cf

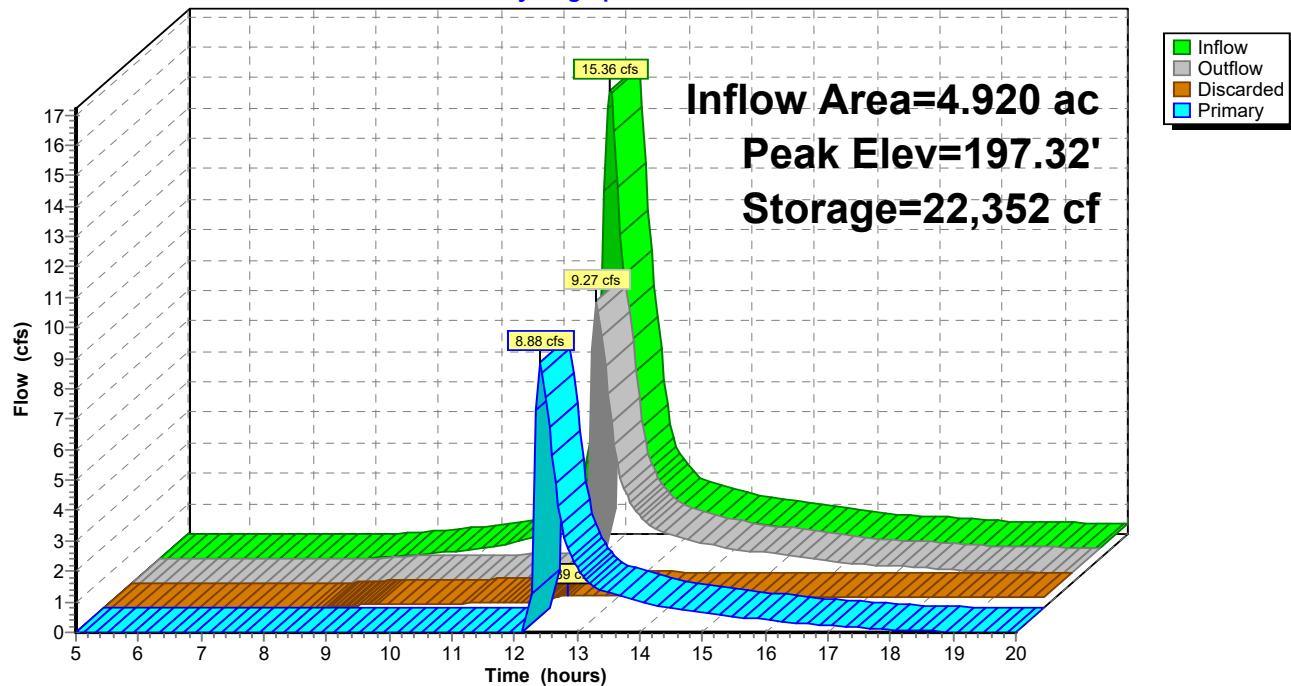
Plug-Flow detention time= 122.3 min calculated for 0.845 af (65% of inflow)  
 Center-of-Mass det. time= 50.9 min ( 846.7 - 795.8 )

| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 193.00' | 24,642 cf     | <b>15.00'W x 170.00'L x 4.60'H Prismatoid Z=3.0</b> |

| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 197.00' | <b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |
| #2     | Discarded | 193.00' | <b>2.000 in/hr Exfiltration over Wetted area</b><br>Conductivity to Groundwater Elevation = 10.00'                                                                                                                                                                           |

**Discarded OutFlow** Max=0.39 cfs @ 12.42 hrs HW=197.32' (Free Discharge)  
 ↑ 2=Exfiltration ( Controls 0.39 cfs)

**Primary OutFlow** Max=8.67 cfs @ 12.42 hrs HW=197.32' (Free Discharge)  
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 8.67 cfs @ 1.37 fps)

**Pond 1P: (new Pond)****Hydrograph**

### Summary for Pond 2P: (new Pond)

Inflow Area = 1.280 ac, 13.28% Impervious, Inflow Depth > 3.28" for 25 year event  
 Inflow = 4.94 cfs @ 12.11 hrs, Volume= 0.349 af  
 Outflow = 4.69 cfs @ 12.15 hrs, Volume= 0.274 af, Atten= 5%, Lag= 2.2 min  
 Primary = 4.69 cfs @ 12.15 hrs, Volume= 0.274 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 212.38' @ 12.15 hrs Surf.Area= 1,951 sf Storage= 3,954 cf

Plug-Flow detention time= 89.1 min calculated for 0.274 af (78% of inflow)  
 Center-of-Mass det. time= 33.6 min ( 822.8 - 789.1 )

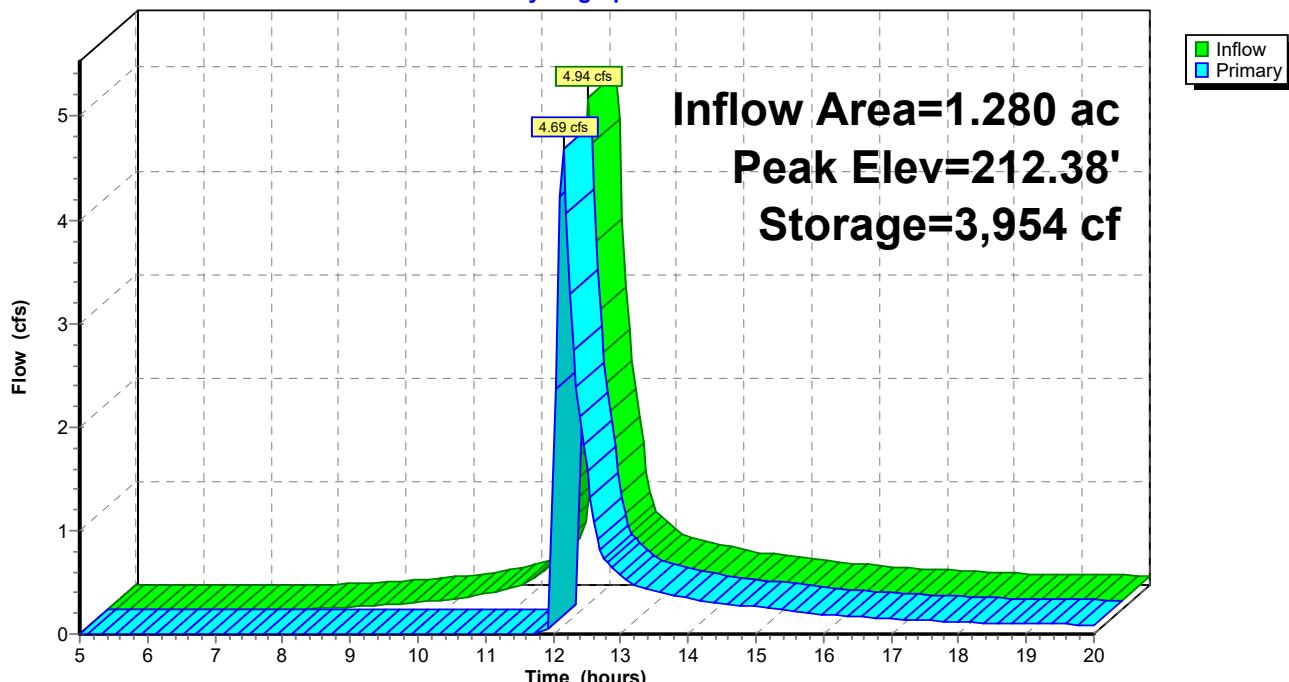
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 209.00' | 6,494 cf      | <b>15.00'W x 35.00'L x 4.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 212.00' | <b>8.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=4.64 cfs @ 12.15 hrs HW=212.38' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir(Weir Controls 4.64 cfs @ 1.53 fps)

### Pond 2P: (new Pond)

Hydrograph



### Summary for Pond 3P: (new Pond)

Inflow Area = 1.990 ac, 4.52% Impervious, Inflow Depth > 3.08" for 25 year event  
 Inflow = 6.79 cfs @ 12.14 hrs, Volume= 0.511 af  
 Outflow = 6.00 cfs @ 12.22 hrs, Volume= 0.363 af, Atten= 12%, Lag= 4.9 min  
 Primary = 6.00 cfs @ 12.22 hrs, Volume= 0.363 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 211.35' @ 12.22 hrs Surf.Area= 2,920 sf Storage= 7,322 cf

Plug-Flow detention time= 107.4 min calculated for 0.362 af (71% of inflow)  
 Center-of-Mass det. time= 42.9 min ( 837.3 - 794.4 )

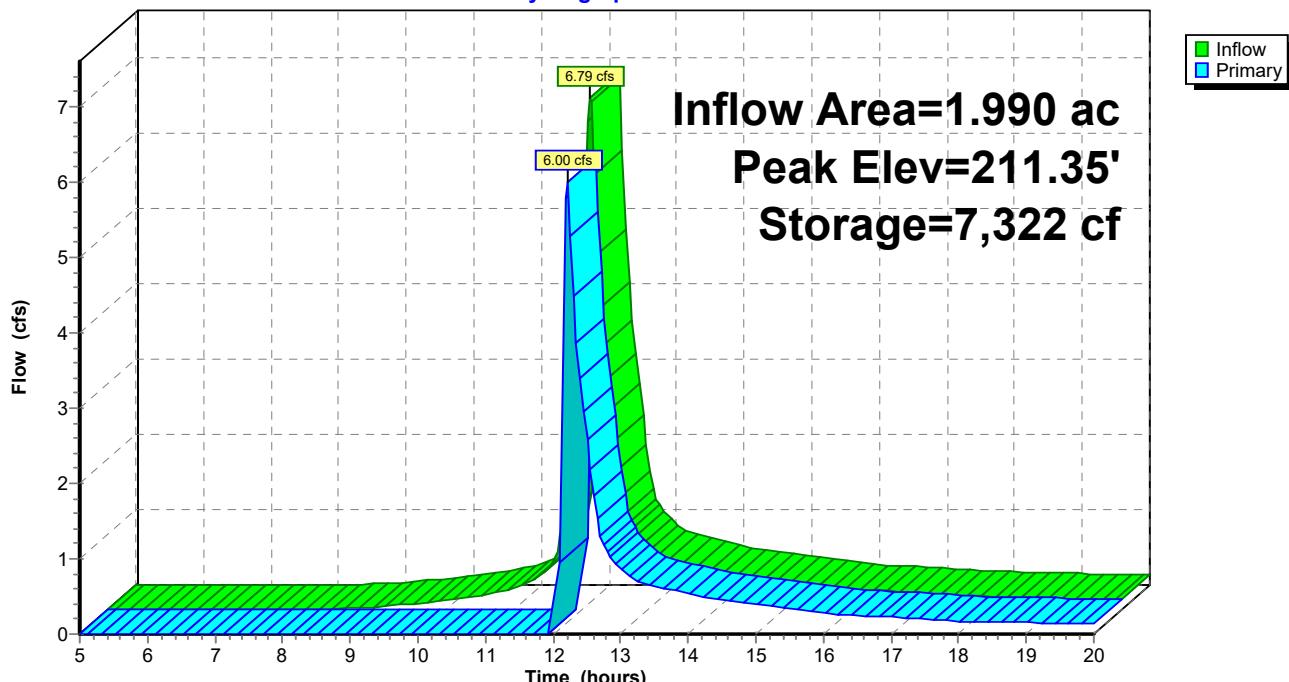
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 207.00' | 8,714 cf      | <b>15.00'W x 45.00'L x 4.80'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 211.00' | <b>12.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

**Primary OutFlow** Max=5.60 cfs @ 12.22 hrs HW=211.33' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir(Weir Controls 5.60 cfs @ 1.41 fps)

### Pond 3P: (new Pond)

Hydrograph



### Summary for Pond 4P: (new Pond)

Inflow Area = 20.140 ac, 5.76% Impervious, Inflow Depth > 3.15" for 25 year event  
 Inflow = 42.34 cfs @ 12.49 hrs, Volume= 5.284 af  
 Outflow = 10.04 cfs @ 13.40 hrs, Volume= 2.309 af, Atten= 76%, Lag= 54.8 min  
 Primary = 10.04 cfs @ 13.40 hrs, Volume= 2.309 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 218.40' @ 13.40 hrs Surf.Area= 34,725 sf Storage= 139,192 cf

Plug-Flow detention time= 197.6 min calculated for 2.309 af (44% of inflow)  
 Center-of-Mass det. time= 112.0 min ( 924.6 - 812.6 )

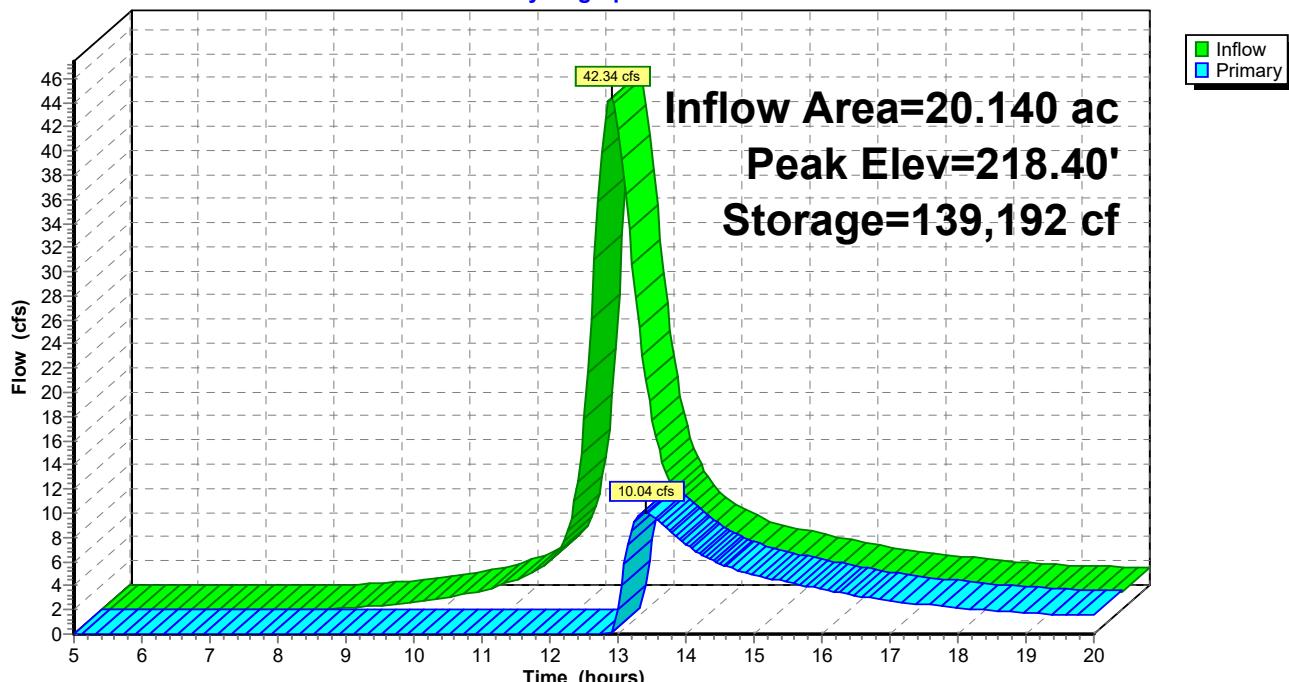
| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 213.50' | 160,589 cf    | <b>70.00'W x 320.00'L x 5.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 218.00' | <b>16.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

**Primary OutFlow** Max=10.03 cfs @ 13.40 hrs HW=218.40' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 10.03 cfs @ 1.58 fps)

### Pond 4P: (new Pond)

Hydrograph





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## 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=4.920 ac 2.44% Impervious Runoff Depth>3.86"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=75 Runoff=18.64 cfs 1.584 af

**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 13.28% Impervious Runoff Depth>3.97"  
Flow Length=250' Tc=7.5 min CN=76 Runoff=5.97 cfs 0.424 af

**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 4.52% Impervious Runoff Depth>3.76"  
Flow Length=450' Tc=9.3 min CN=74 Runoff=8.26 cfs 0.624 af

**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 5.76% Impervious Runoff Depth>3.83"  
Flow Length=1,700' Tc=34.9 min CN=75 Runoff=51.40 cfs 6.436 af

**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>3.35"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=70 Runoff=6.02 cfs 0.516 af

**Pond 1P: (new Pond)** Peak Elev=197.43' Storage=23,267 cf Inflow=18.64 cfs 1.584 af  
Discarded=0.40 cfs 0.293 af Primary=14.51 cfs 0.834 af Outflow=14.91 cfs 1.127 af

**Pond 2P: (new Pond)** Peak Elev=212.43' Storage=4,049 cf Inflow=5.97 cfs 0.424 af  
Outflow=5.71 cfs 0.348 af

**Pond 3P: (new Pond)** Peak Elev=211.42' Storage=7,528 cf Inflow=8.26 cfs 0.624 af  
Outflow=8.12 cfs 0.476 af

**Pond 4P: (new Pond)** Peak Elev=218.63' Storage=147,489 cf Inflow=51.40 cfs 6.436 af  
Outflow=21.83 cfs 3.451 af

**Total Runoff Area = 30.180 ac Runoff Volume = 9.584 af Average Runoff Depth = 3.81"**  
**94.73% Pervious = 28.590 ac 5.27% Impervious = 1.590 ac**

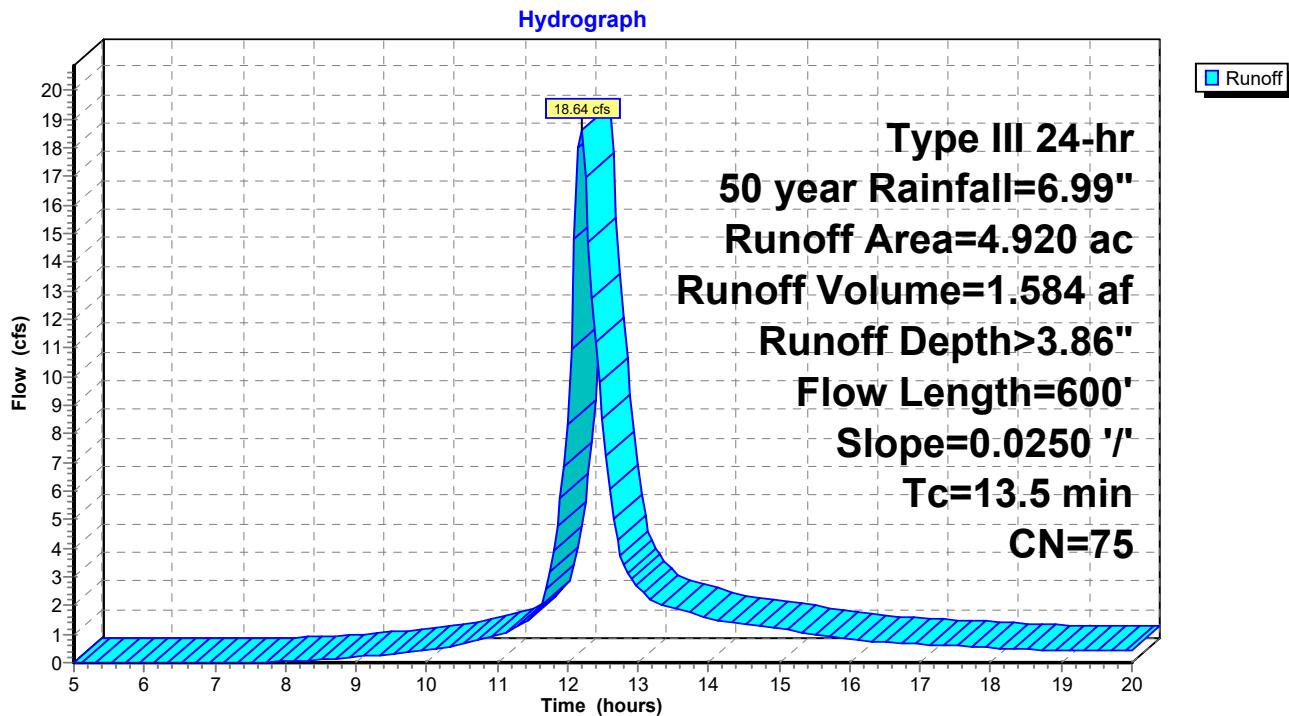
### Summary for Subcatchment 1: Subcat 1

Runoff = 18.64 cfs @ 12.19 hrs, Volume= 1.584 af, Depth> 3.86"

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 50 year Rainfall=6.99"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| * 4.800   | 74            | 50-75% Grass cover, Fair, HSG B-C                          |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 75            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

### Subcatchment 1: Subcat 1



### Summary for Subcatchment 2: Subcat 2

Runoff = 5.97 cfs @ 12.11 hrs, Volume= 0.424 af, Depth> 3.97"

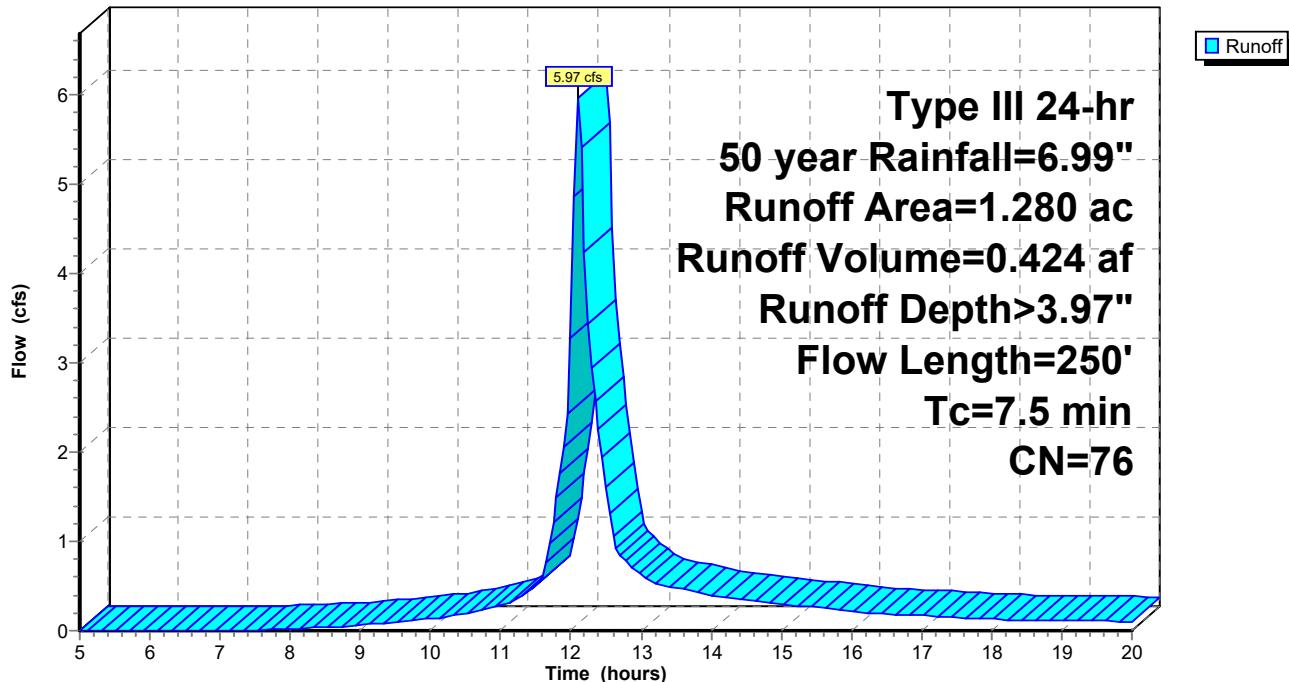
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.99"

| Area (ac) | CN    | Description                          |
|-----------|-------|--------------------------------------|
| *         | 1.010 | 74 50-75% Grass cover, Fair, HSG B-C |
|           | 0.100 | 60 Woods, Fair, HSG B                |
| *         | 0.100 | 98 Farm roads                        |
| *         | 0.070 | Proposed gravel road                 |
| 1.280     | 76    | Weighted Average                     |
| 1.110     |       | 86.72% Pervious Area                 |
| 0.170     |       | 13.28% Impervious Area               |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              | Total            |                      |                   |                                                                      |

### Subcatchment 2: Subcat 2

Hydrograph



### Summary for Subcatchment 3: Subcat 3

Runoff = 8.26 cfs @ 12.13 hrs, Volume= 0.624 af, Depth> 3.76"

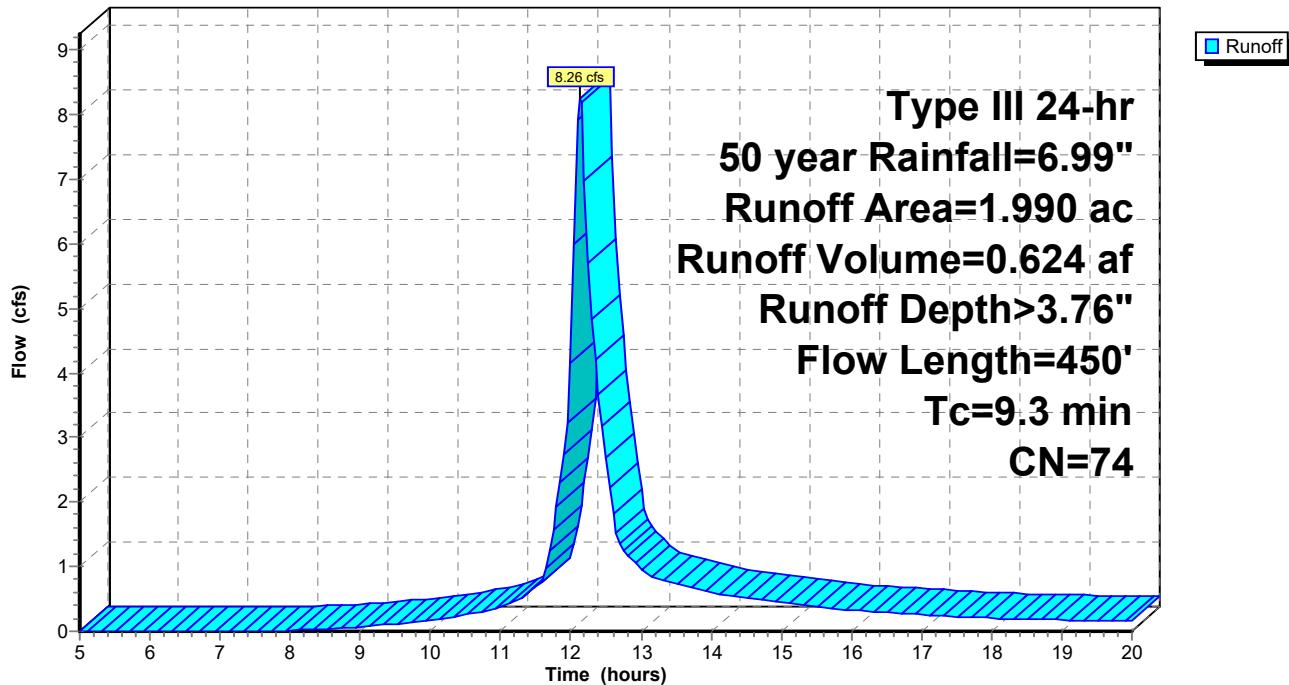
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.99"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 1.800   | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.100     | 60 | Woods, Fair, HSG B                |
| * 0.090   | 98 | Proposed gravel roads             |
| 1.990     | 74 | Weighted Average                  |
| 1.900     |    | 95.48% Pervious Area              |
| 0.090     |    | 4.52% Impervious Area             |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                          |
|----------|---------------|---------------|-------------------|----------------|----------------------------------------------------------------------|
| 5.7      | 50            | 0.0200        | 0.15              |                | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6      | 400           | 0.0700        | 1.85              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3      | 450           | Total         |                   |                |                                                                      |

### Subcatchment 3: Subcat 3

Hydrograph



### Summary for Subcatchment 4: Subcat 4

Runoff = 51.40 cfs @ 12.48 hrs, Volume= 6.436 af, Depth> 3.83"

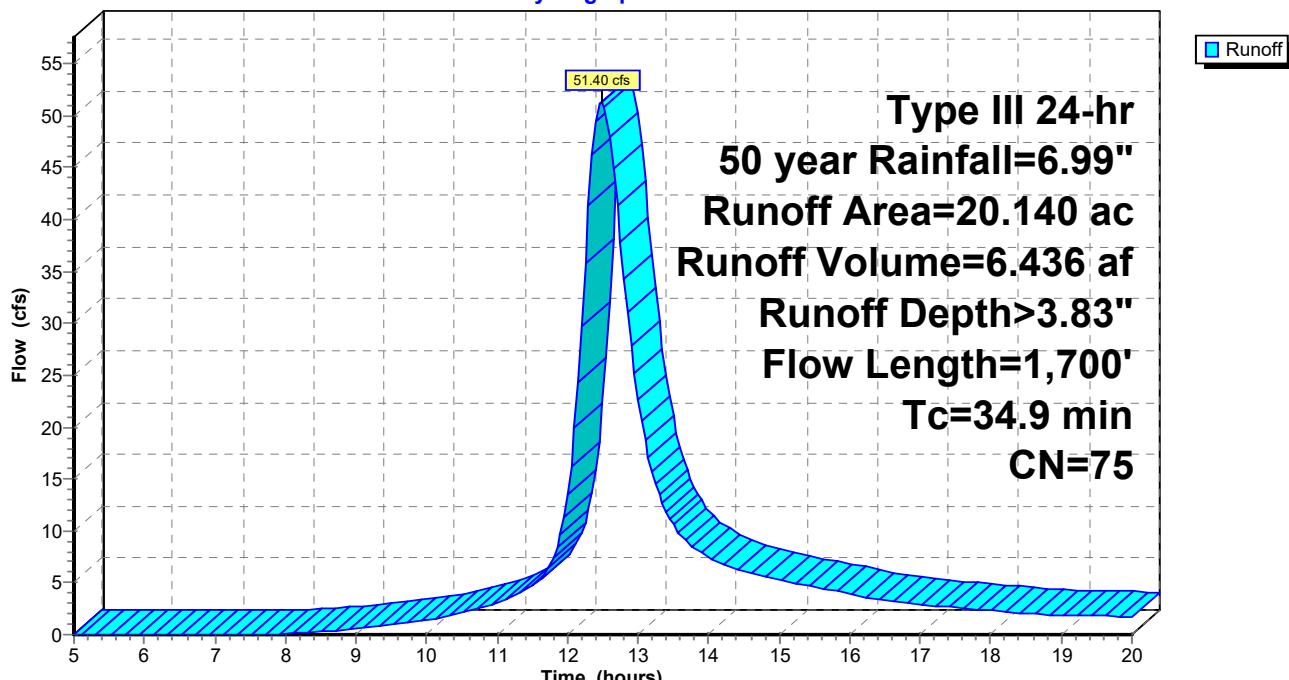
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.99"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 18.530  | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.450     | 60 | Woods, Fair, HSG B                |
| * 0.990   | 98 | Farm roads                        |
| * 0.170   | 98 | Proposed gravel roads             |
| 20.140    | 75 | Weighted Average                  |
| 18.980    |    | 94.24% Pervious Area              |
| 1.160     |    | 5.76% Impervious Area             |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            |                  |                      |                   | Total                                                                |

### Subcatchment 4: Subcat 4

Hydrograph



### Summary for Subcatchment 5: Subcat 5

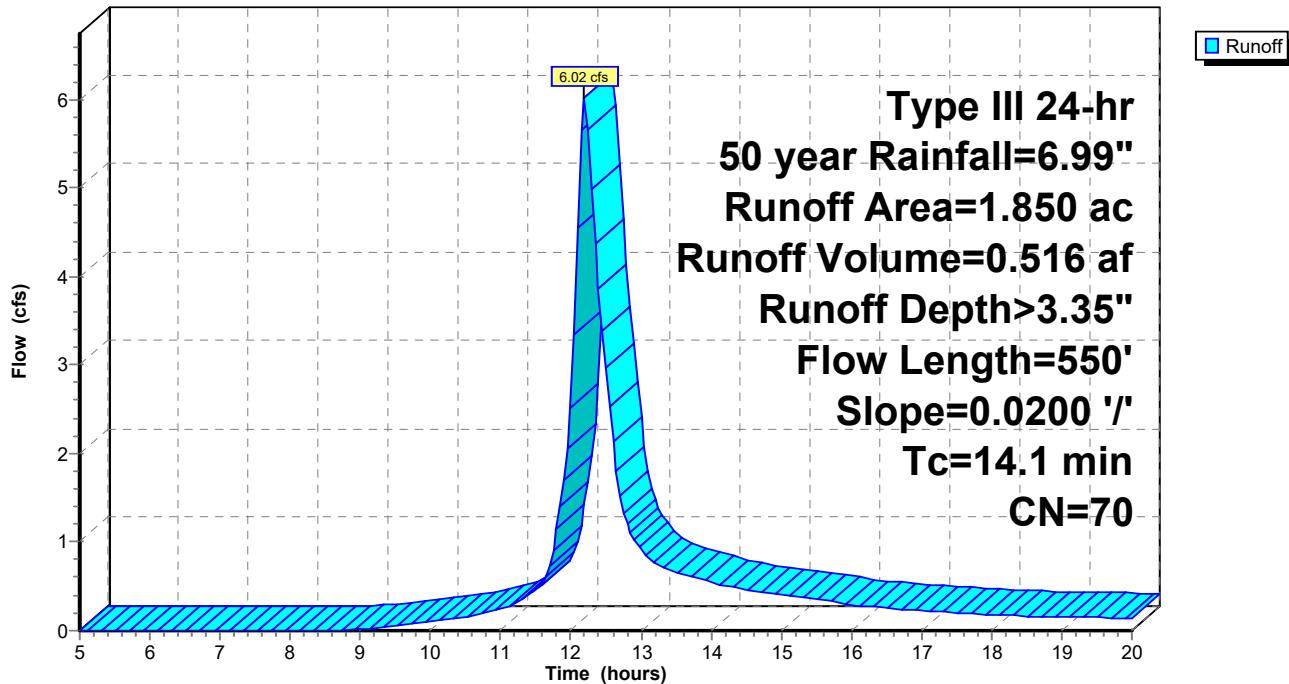
Runoff = 6.02 cfs @ 12.20 hrs, Volume= 0.516 af, Depth> 3.35"

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=6.99"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 69            | 50-75% Grass cover, Fair, HSG B                            |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 70            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5

Hydrograph



### Summary for Pond 1P: (new Pond)

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 3.86" for 50 year event  
 Inflow = 18.64 cfs @ 12.19 hrs, Volume= 1.584 af  
 Outflow = 14.91 cfs @ 12.32 hrs, Volume= 1.127 af, Atten= 20%, Lag= 7.6 min  
 Discarded = 0.40 cfs @ 12.32 hrs, Volume= 0.293 af  
 Primary = 14.51 cfs @ 12.32 hrs, Volume= 0.834 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 197.43' @ 12.32 hrs Surf.Area= 8,180 sf Storage= 23,267 cf

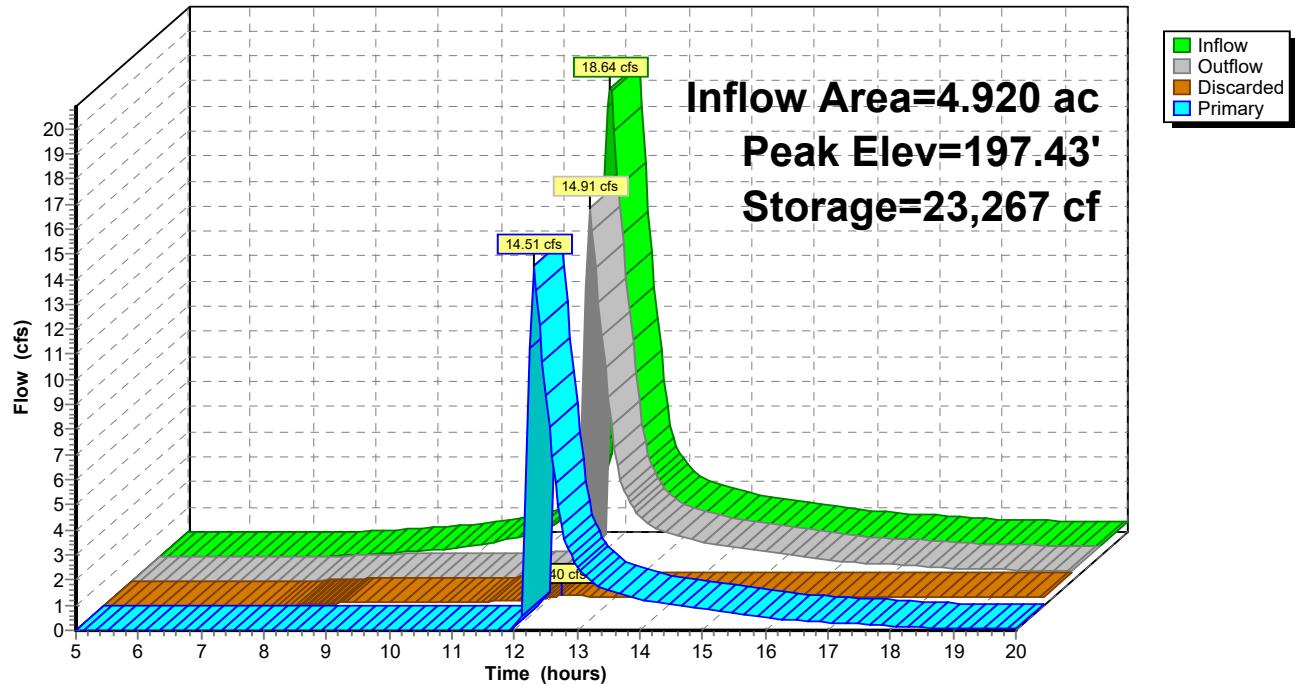
Plug-Flow detention time= 106.2 min calculated for 1.127 af (71% of inflow)  
 Center-of-Mass det. time= 41.4 min ( 832.7 - 791.3 )

| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 193.00' | 24,642 cf     | <b>15.00'W x 170.00'L x 4.60'H Prismatoid Z=3.0</b> |

| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 197.00' | <b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |
| #2     | Discarded | 193.00' | <b>2.000 in/hr Exfiltration over Wetted area</b><br>Conductivity to Groundwater Elevation = 10.00'                                                                                                                                                                           |

**Discarded OutFlow** Max=0.40 cfs @ 12.32 hrs HW=197.43' (Free Discharge)  
 ↑ 2=Exfiltration ( Controls 0.40 cfs)

**Primary OutFlow** Max=14.08 cfs @ 12.32 hrs HW=197.43' (Free Discharge)  
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 14.08 cfs @ 1.65 fps)

**Pond 1P: (new Pond)****Hydrograph**

### Summary for Pond 2P: (new Pond)

Inflow Area = 1.280 ac, 13.28% Impervious, Inflow Depth > 3.97" for 50 year event  
 Inflow = 5.97 cfs @ 12.11 hrs, Volume= 0.424 af  
 Outflow = 5.71 cfs @ 12.14 hrs, Volume= 0.348 af, Atten= 4%, Lag= 1.9 min  
 Primary = 5.71 cfs @ 12.14 hrs, Volume= 0.348 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 212.43' @ 12.14 hrs Surf.Area= 1,977 sf Storage= 4,049 cf

Plug-Flow detention time= 78.1 min calculated for 0.347 af (82% of inflow)  
 Center-of-Mass det. time= 30.0 min ( 814.6 - 784.7 )

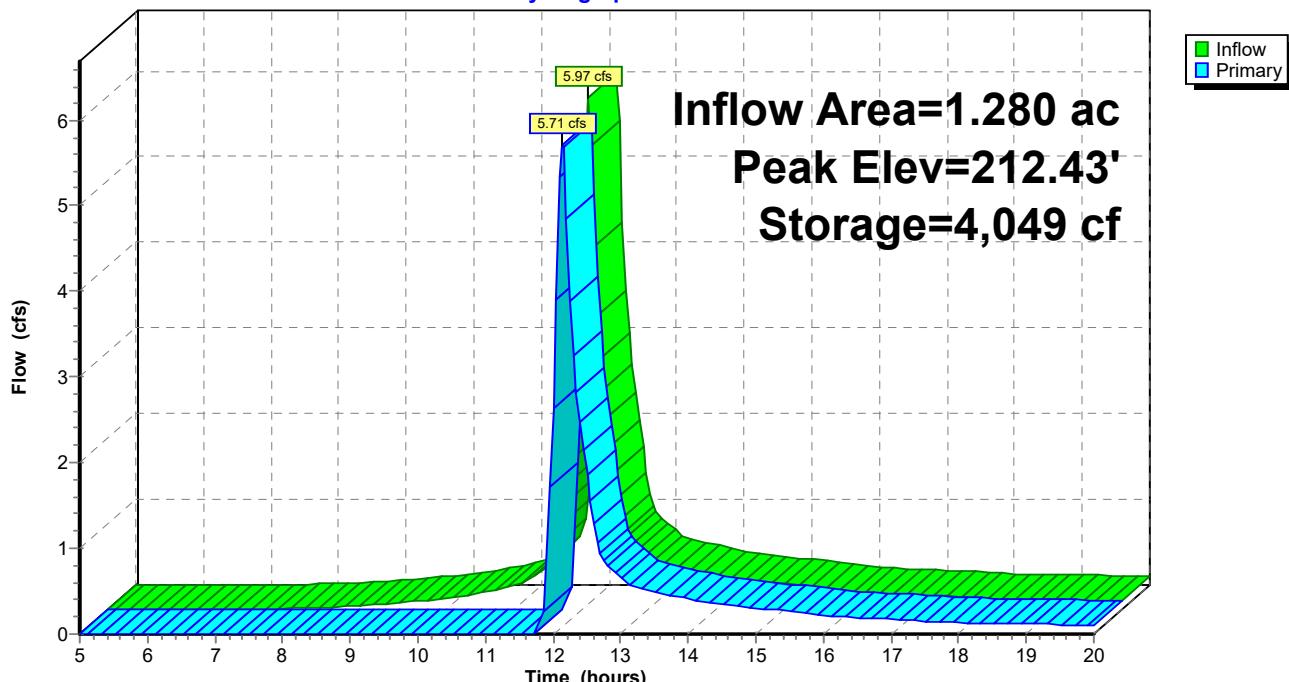
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 209.00' | 6,494 cf      | <b>15.00'W x 35.00'L x 4.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 212.00' | <b>8.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

**Primary OutFlow** Max=5.60 cfs @ 12.14 hrs HW=212.43' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 5.60 cfs @ 1.65 fps)

### Pond 2P: (new Pond)

Hydrograph



### Summary for Pond 3P: (new Pond)

Inflow Area = 1.990 ac, 4.52% Impervious, Inflow Depth > 3.76" for 50 year event  
 Inflow = 8.26 cfs @ 12.13 hrs, Volume= 0.624 af  
 Outflow = 8.12 cfs @ 12.17 hrs, Volume= 0.476 af, Atten= 2%, Lag= 2.1 min  
 Primary = 8.12 cfs @ 12.17 hrs, Volume= 0.476 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 211.42' @ 12.17 hrs Surf.Area= 2,968 sf Storage= 7,528 cf

Plug-Flow detention time= 93.6 min calculated for 0.475 af (76% of inflow)  
 Center-of-Mass det. time= 36.2 min ( 826.0 - 789.8 )

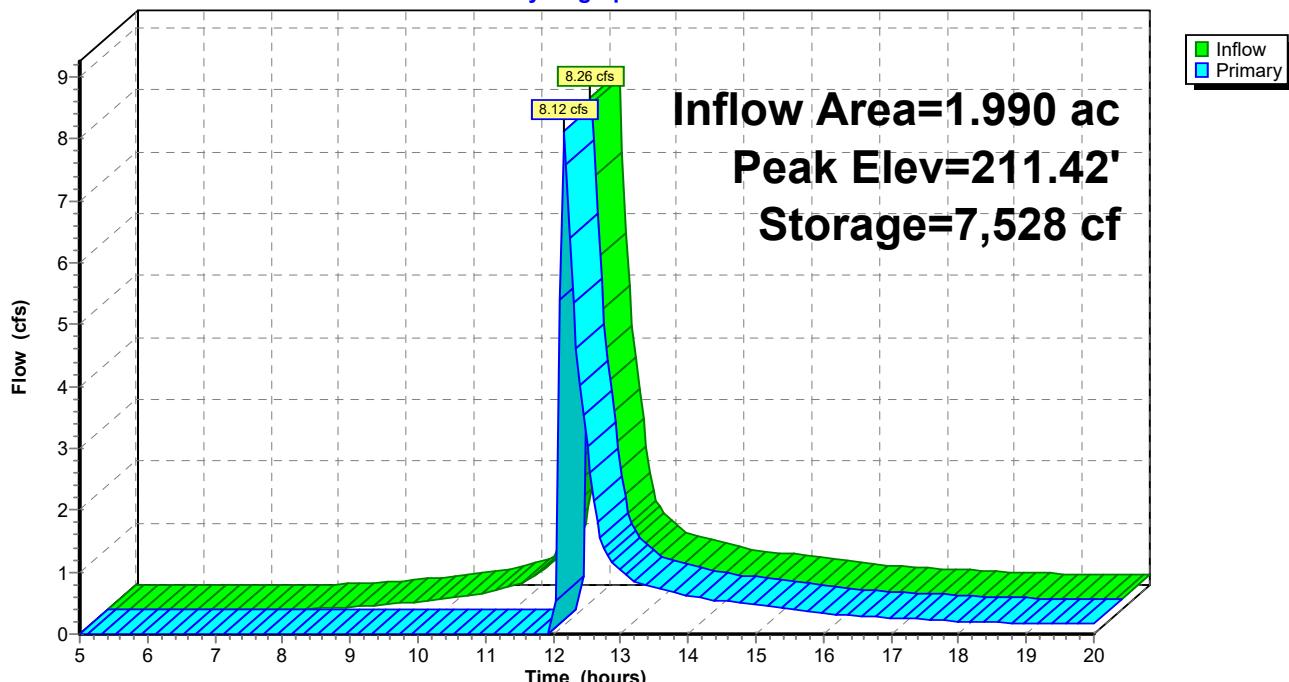
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 207.00' | 8,714 cf      | <b>15.00'W x 45.00'L x 4.80'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 211.00' | <b>12.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

**Primary OutFlow** Max=7.77 cfs @ 12.17 hrs HW=211.41' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir(Weir Controls 7.77 cfs @ 1.60 fps)

### Pond 3P: (new Pond)

Hydrograph



### Summary for Pond 4P: (new Pond)

Inflow Area = 20.140 ac, 5.76% Impervious, Inflow Depth > 3.83" for 50 year event  
 Inflow = 51.40 cfs @ 12.48 hrs, Volume= 6.436 af  
 Outflow = 21.83 cfs @ 13.02 hrs, Volume= 3.451 af, Atten= 58%, Lag= 32.5 min  
 Primary = 21.83 cfs @ 13.02 hrs, Volume= 3.451 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 218.63' @ 13.02 hrs Surf.Area= 35,364 sf Storage= 147,489 cf

Plug-Flow detention time= 163.5 min calculated for 3.451 af (54% of inflow)  
 Center-of-Mass det. time= 85.6 min ( 893.8 - 808.2 )

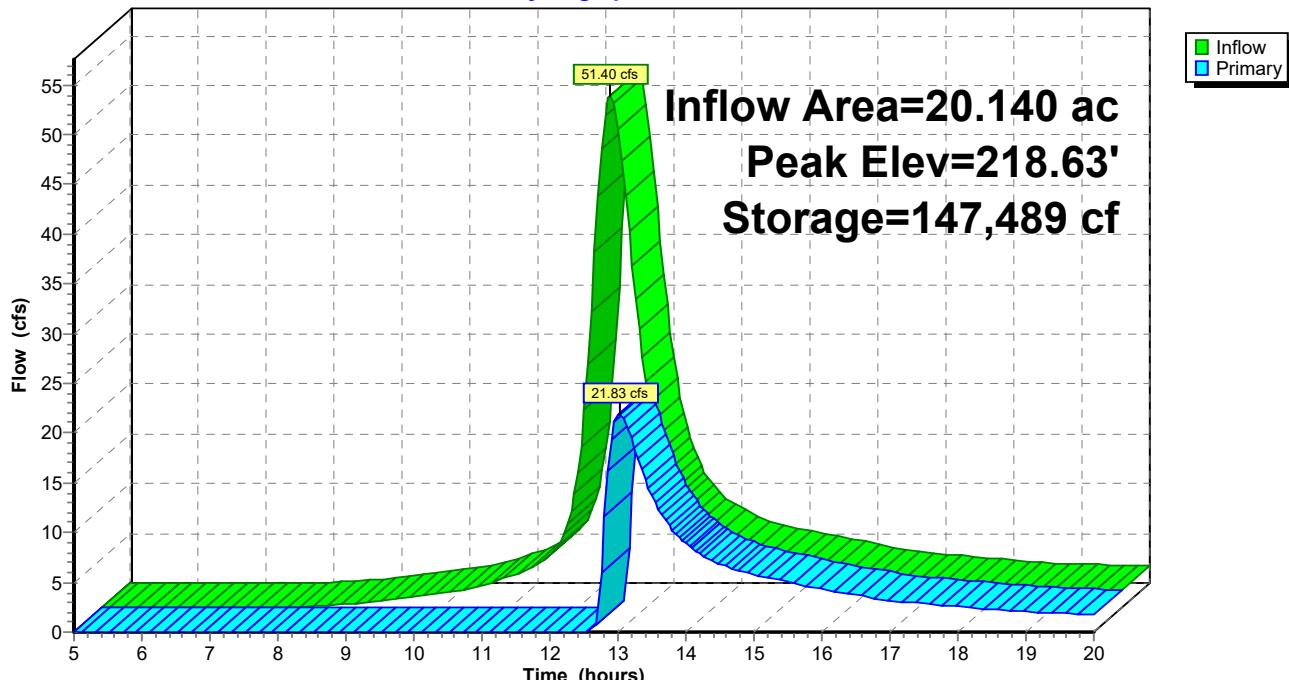
| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 213.50' | 160,589 cf    | <b>70.00'W x 320.00'L x 5.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 218.00' | <b>16.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=21.73 cfs @ 13.02 hrs HW=218.63' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 21.73 cfs @ 2.15 fps)

### Pond 4P: (new Pond)

Hydrograph





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## 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=4.920 ac 2.44% Impervious Runoff Depth>4.65"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=75 Runoff=22.32 cfs 1.905 af

**Subcatchment2: Subcat 2** Runoff Area=1.280 ac 13.28% Impervious Runoff Depth>4.77"  
Flow Length=250' Tc=7.5 min CN=76 Runoff=7.12 cfs 0.509 af

**Subcatchment3: Subcat 3** Runoff Area=1.990 ac 4.52% Impervious Runoff Depth>4.54"  
Flow Length=450' Tc=9.3 min CN=74 Runoff=9.92 cfs 0.753 af

**Subcatchment4: Subcat 4** Runoff Area=20.140 ac 5.76% Impervious Runoff Depth>4.61"  
Flow Length=1,700' Tc=34.9 min CN=75 Runoff=61.59 cfs 7.745 af

**Subcatchment5: Subcat 5** Runoff Area=1.850 ac 2.70% Impervious Runoff Depth>4.09"  
Flow Length=550' Slope=0.0200 '/' Tc=14.1 min CN=70 Runoff=7.34 cfs 0.630 af

**Pond 1P: (new Pond)** Peak Elev=197.53' Storage=24,051 cf Inflow=22.32 cfs 1.905 af  
Discarded=0.41 cfs 0.304 af Primary=20.27 cfs 1.144 af Outflow=20.68 cfs 1.447 af

**Pond 2P: (new Pond)** Peak Elev=212.48' Storage=4,146 cf Inflow=7.12 cfs 0.509 af  
Outflow=6.83 cfs 0.433 af

**Pond 3P: (new Pond)** Peak Elev=211.46' Storage=7,668 cf Inflow=9.92 cfs 0.753 af  
Outflow=9.73 cfs 0.605 af

**Pond 4P: (new Pond)** Peak Elev=218.89' Storage=156,739 cf Inflow=61.59 cfs 7.745 af  
Outflow=36.23 cfs 4.750 af

**Total Runoff Area = 30.180 ac Runoff Volume = 11.542 af Average Runoff Depth = 4.59"**  
**94.73% Pervious = 28.590 ac 5.27% Impervious = 1.590 ac**

### Summary for Subcatchment 1: Subcat 1

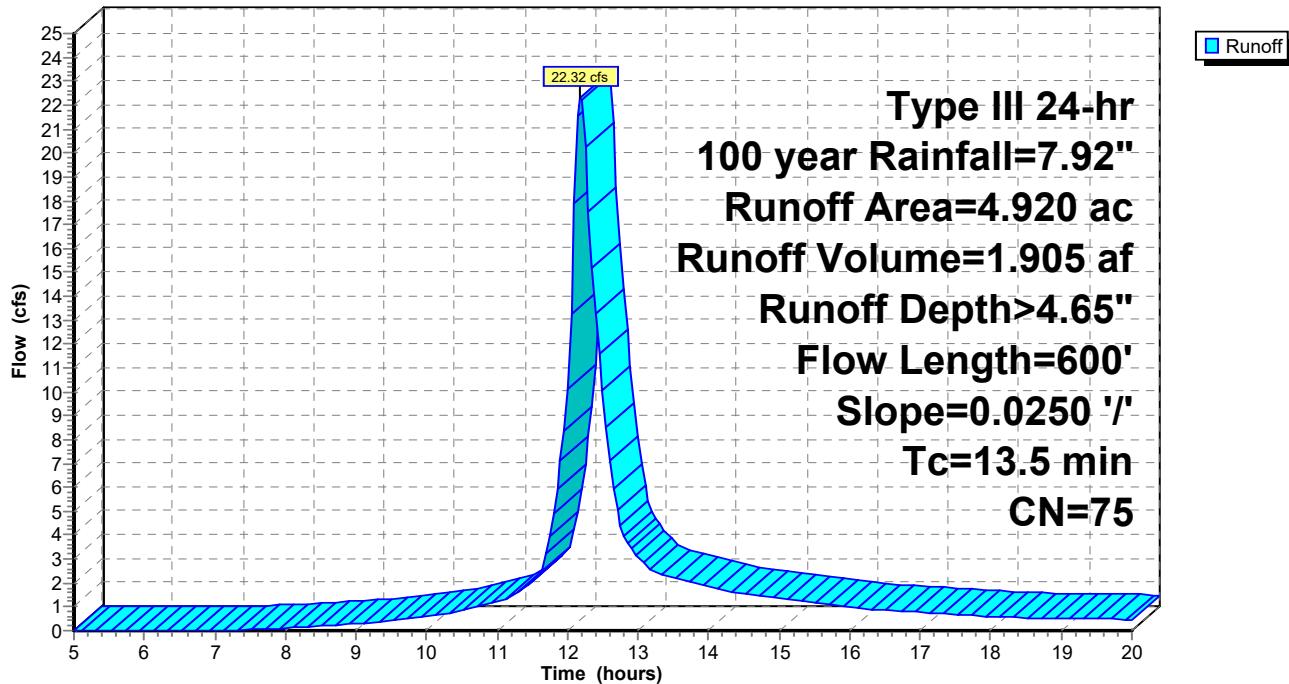
Runoff = 22.32 cfs @ 12.19 hrs, Volume= 1.905 af, Depth> 4.65"

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 100 year Rainfall=7.92"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| * 4.800   | 74            | 50-75% Grass cover, Fair, HSG B-C                          |      |                                                                      |
| * 0.120   | 98            | Farm roads                                                 |      |                                                                      |
| 4.920     | 75            | Weighted Average                                           |      |                                                                      |
| 4.800     |               | 97.56% Pervious Area                                       |      |                                                                      |
| 0.120     |               | 2.44% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.2       | 50            | 0.0250                                                     | 0.16 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.3       | 550           | 0.0250                                                     | 1.11 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 13.5      | 600           | Total                                                      |      |                                                                      |

### Subcatchment 1: Subcat 1

Hydrograph



### Summary for Subcatchment 2: Subcat 2

Runoff = 7.12 cfs @ 12.11 hrs, Volume= 0.509 af, Depth> 4.77"

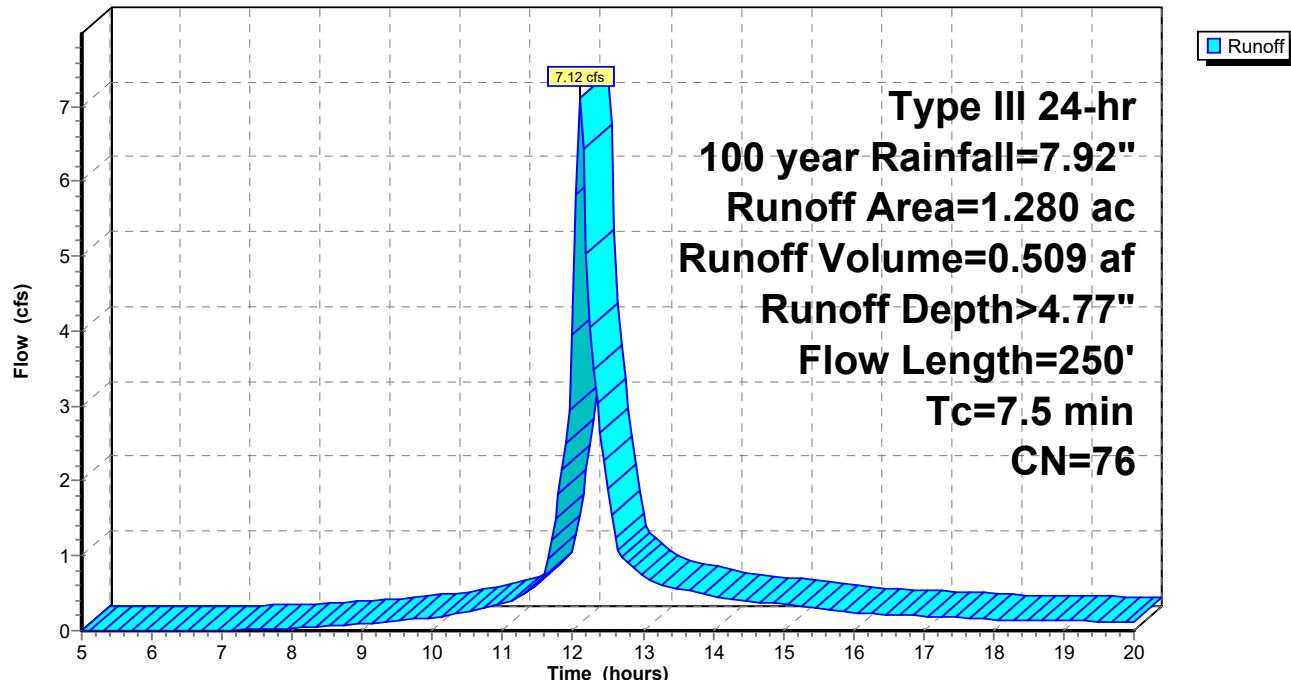
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100 year Rainfall=7.92"

| Area (ac) | CN    | Description                          |
|-----------|-------|--------------------------------------|
| *         | 1.010 | 74 50-75% Grass cover, Fair, HSG B-C |
|           | 0.100 | 60 Woods, Fair, HSG B                |
| *         | 0.100 | 98 Farm roads                        |
| *         | 0.070 | Proposed gravel road                 |
| 1.280     | 76    | Weighted Average                     |
| 1.110     |       | 86.72% Pervious Area                 |
| 0.170     |       | 13.28% Impervious Area               |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 1.8         | 200              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 7.5         | 250              |                  |                      |                   | Total                                                                |

### Subcatchment 2: Subcat 2

Hydrograph



### Summary for Subcatchment 3: Subcat 3

Runoff = 9.92 cfs @ 12.13 hrs, Volume= 0.753 af, Depth> 4.54"

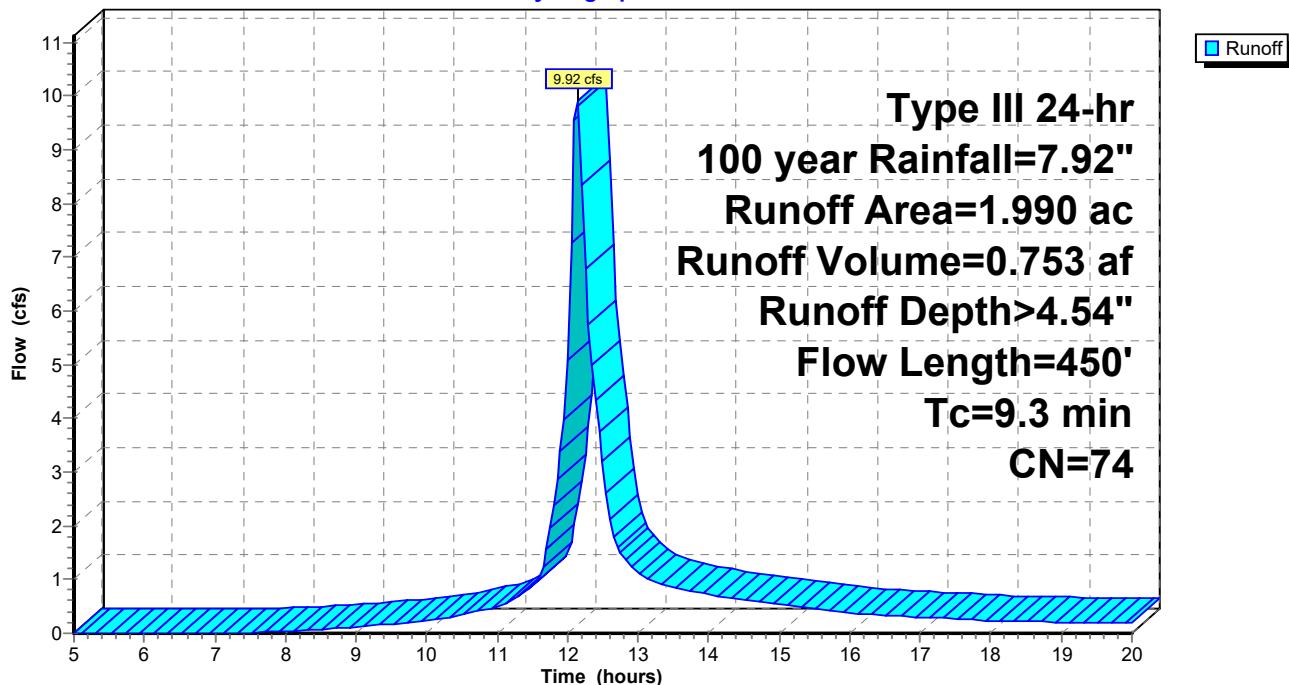
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100 year Rainfall=7.92"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 1.800   | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.100     | 60 | Woods, Fair, HSG B                |
| * 0.090   | 98 | Proposed gravel roads             |
| 1.990     | 74 | Weighted Average                  |
| 1.900     |    | 95.48% Pervious Area              |
| 0.090     |    | 4.52% Impervious Area             |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 3.6         | 400              | 0.0700           | 1.85                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 9.3         | 450              | Total            |                      |                   |                                                                      |

### Subcatchment 3: Subcat 3

Hydrograph



### Summary for Subcatchment 4: Subcat 4

Runoff = 61.59 cfs @ 12.48 hrs, Volume= 7.745 af, Depth> 4.61"

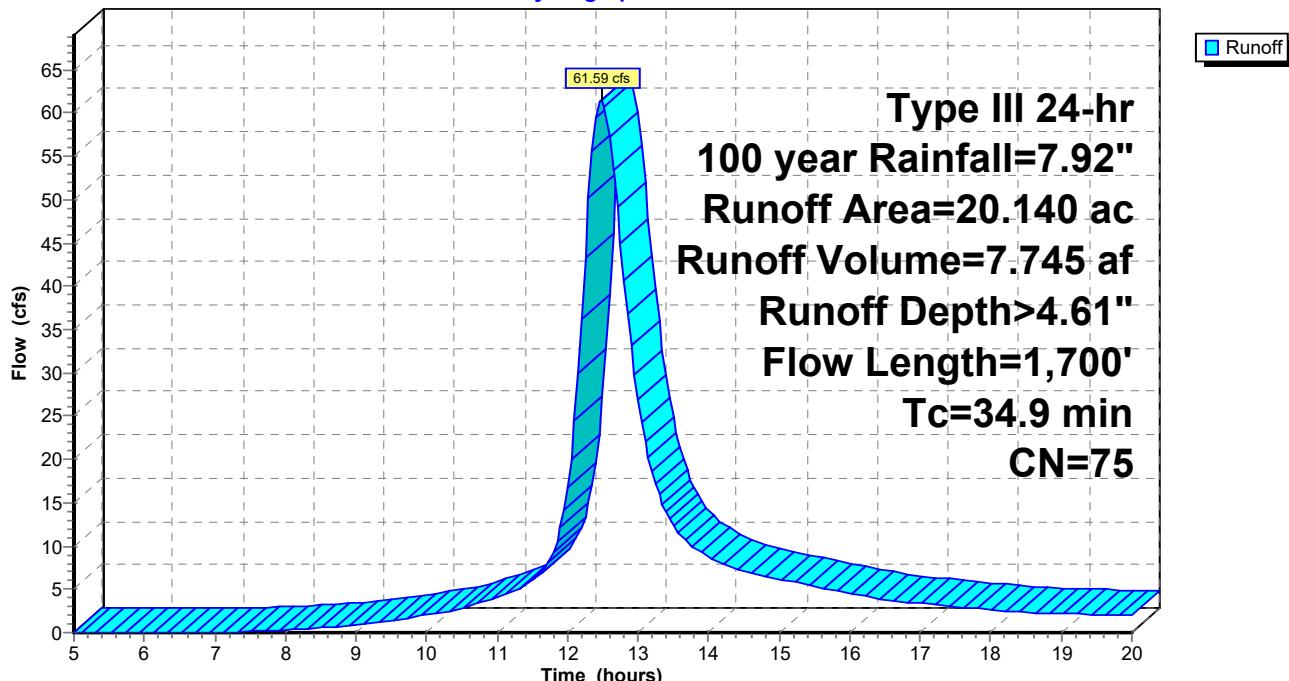
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100 year Rainfall=7.92"

| Area (ac) | CN | Description                       |
|-----------|----|-----------------------------------|
| * 18.530  | 74 | 50-75% Grass cover, Fair, HSG B-C |
| 0.450     | 60 | Woods, Fair, HSG B                |
| * 0.990   | 98 | Farm roads                        |
| * 0.170   | 98 | Proposed gravel roads             |
| 20.140    | 75 | Weighted Average                  |
| 18.980    |    | 94.24% Pervious Area              |
| 1.160     |    | 5.76% Impervious Area             |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------------------------------------------------------|
| 5.7         | 50               | 0.0200           | 0.15                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 17.3        | 1,150            | 0.0250           | 1.11                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 11.9        | 500              | 0.0100           | 0.70                 |                   | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 34.9        | 1,700            |                  |                      |                   | Total                                                                |

### Subcatchment 4: Subcat 4

Hydrograph



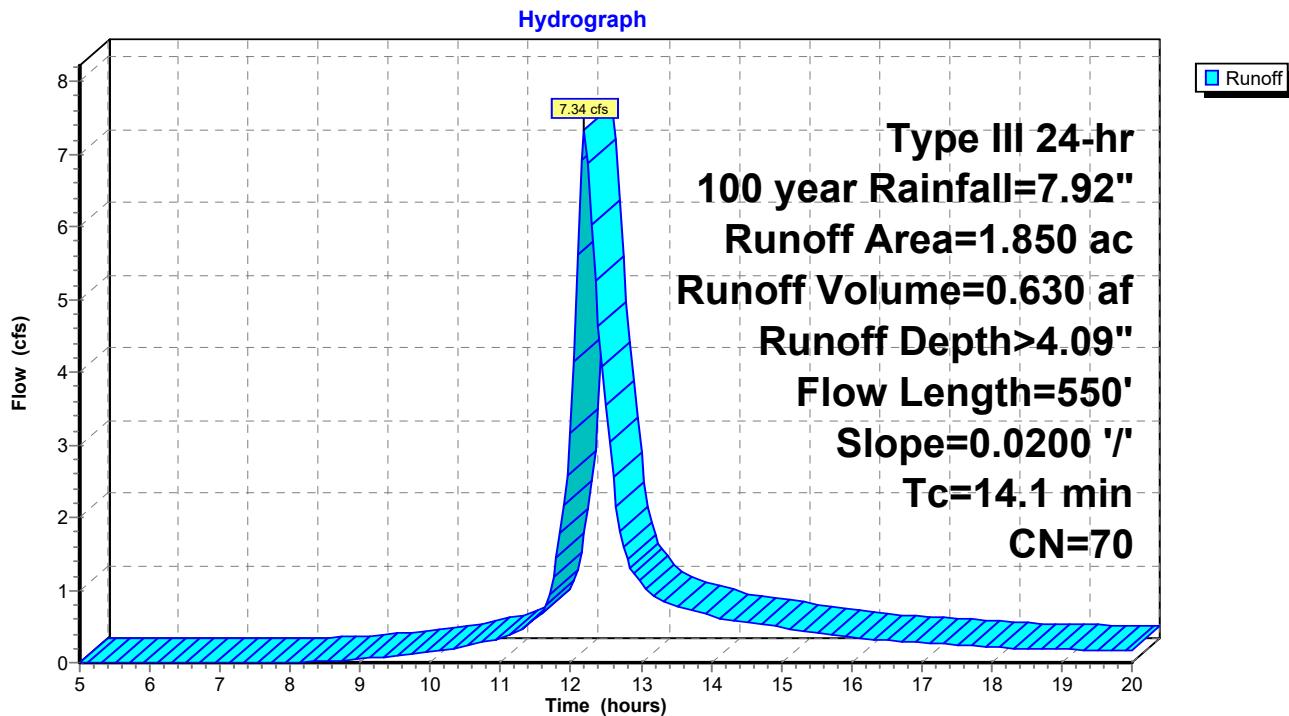
### Summary for Subcatchment 5: Subcat 5

Runoff = 7.34 cfs @ 12.20 hrs, Volume= 0.630 af, Depth> 4.09"

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 100 year Rainfall=7.92"

| Area (ac) | CN            | Description                                                |      |                                                                      |
|-----------|---------------|------------------------------------------------------------|------|----------------------------------------------------------------------|
| 1.800     | 69            | 50-75% Grass cover, Fair, HSG B                            |      |                                                                      |
| * 0.050   | 98            | Farm roads                                                 |      |                                                                      |
| 1.850     | 70            | Weighted Average                                           |      |                                                                      |
| 1.800     |               | 97.30% Pervious Area                                       |      |                                                                      |
| 0.050     |               | 2.70% Impervious Area                                      |      |                                                                      |
| Tc (min)  | Length (feet) | Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description |      |                                                                      |
| 5.7       | 50            | 0.0200                                                     | 0.15 | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.16"                |
| 8.4       | 500           | 0.0200                                                     | 0.99 | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps |
| 14.1      | 550           | Total                                                      |      |                                                                      |

### Subcatchment 5: Subcat 5



### Summary for Pond 1P: (new Pond)

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 4.65" for 100 year event  
 Inflow = 22.32 cfs @ 12.19 hrs, Volume= 1.905 af  
 Outflow = 20.68 cfs @ 12.26 hrs, Volume= 1.447 af, Atten= 7%, Lag= 4.2 min  
 Discarded = 0.41 cfs @ 12.26 hrs, Volume= 0.304 af  
 Primary = 20.27 cfs @ 12.26 hrs, Volume= 1.144 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 197.53' @ 12.26 hrs Surf.Area= 8,316 sf Storage= 24,051 cf

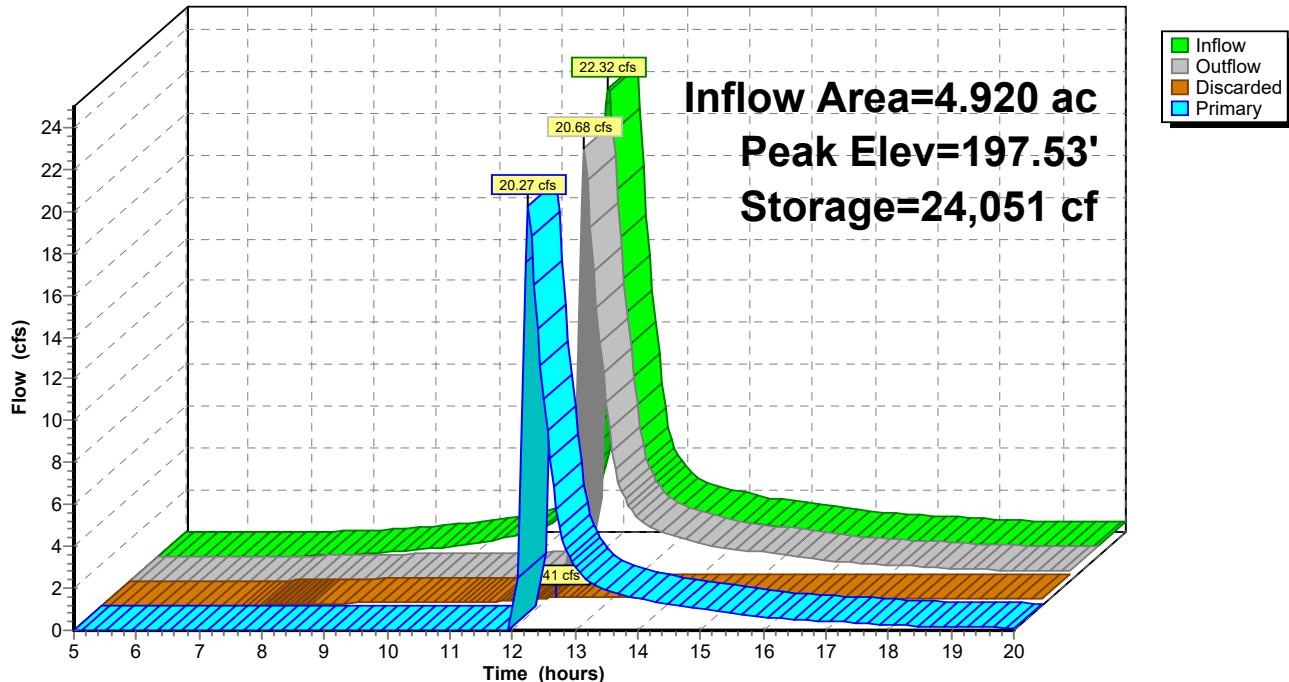
Plug-Flow detention time= 94.0 min calculated for 1.447 af (76% of inflow)  
 Center-of-Mass det. time= 35.5 min ( 822.5 - 787.0 )

| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 193.00' | 24,642 cf     | <b>15.00'W x 170.00'L x 4.60'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 197.00' | <b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88<br><b>#2 Discarded</b> 193.00' <b>2.000 in/hr Exfiltration over Wetted area</b><br>Conductivity to Groundwater Elevation = 10.00' |

**Discarded OutFlow** Max=0.41 cfs @ 12.26 hrs HW=197.53' (Free Discharge)  
 ↑ 2=Exfiltration ( Controls 0.41 cfs)

**Primary OutFlow** Max=20.00 cfs @ 12.26 hrs HW=197.53' (Free Discharge)  
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 20.00 cfs @ 1.90 fps)

**Pond 1P: (new Pond)****Hydrograph**

### Summary for Pond 2P: (new Pond)

Inflow Area = 1.280 ac, 13.28% Impervious, Inflow Depth > 4.77" for 100 year event  
 Inflow = 7.12 cfs @ 12.11 hrs, Volume= 0.509 af  
 Outflow = 6.83 cfs @ 12.14 hrs, Volume= 0.433 af, Atten= 4%, Lag= 1.7 min  
 Primary = 6.83 cfs @ 12.14 hrs, Volume= 0.433 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 212.48' @ 12.14 hrs Surf.Area= 2,004 sf Storage= 4,146 cf

Plug-Flow detention time= 70.9 min calculated for 0.433 af (85% of inflow)  
 Center-of-Mass det. time= 27.6 min ( 808.0 - 780.4 )

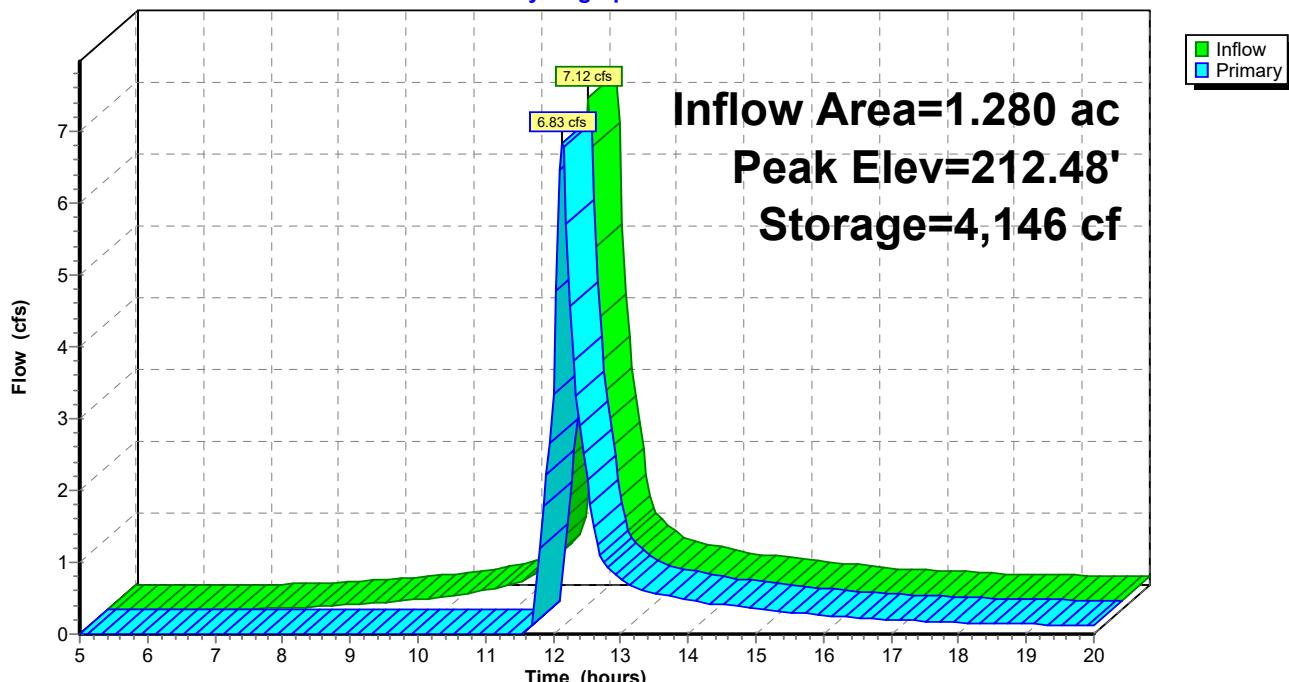
| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 209.00' | 6,494 cf      | <b>15.00'W x 35.00'L x 4.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 212.00' | <b>8.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=6.69 cfs @ 12.14 hrs HW=212.47' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 6.69 cfs @ 1.77 fps)

### Pond 2P: (new Pond)

Hydrograph



### Summary for Pond 3P: (new Pond)

Inflow Area = 1.990 ac, 4.52% Impervious, Inflow Depth > 4.54" for 100 year event  
 Inflow = 9.92 cfs @ 12.13 hrs, Volume= 0.753 af  
 Outflow = 9.73 cfs @ 12.16 hrs, Volume= 0.605 af, Atten= 2%, Lag= 1.6 min  
 Primary = 9.73 cfs @ 12.16 hrs, Volume= 0.605 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 211.46' @ 12.16 hrs Surf.Area= 3,000 sf Storage= 7,668 cf

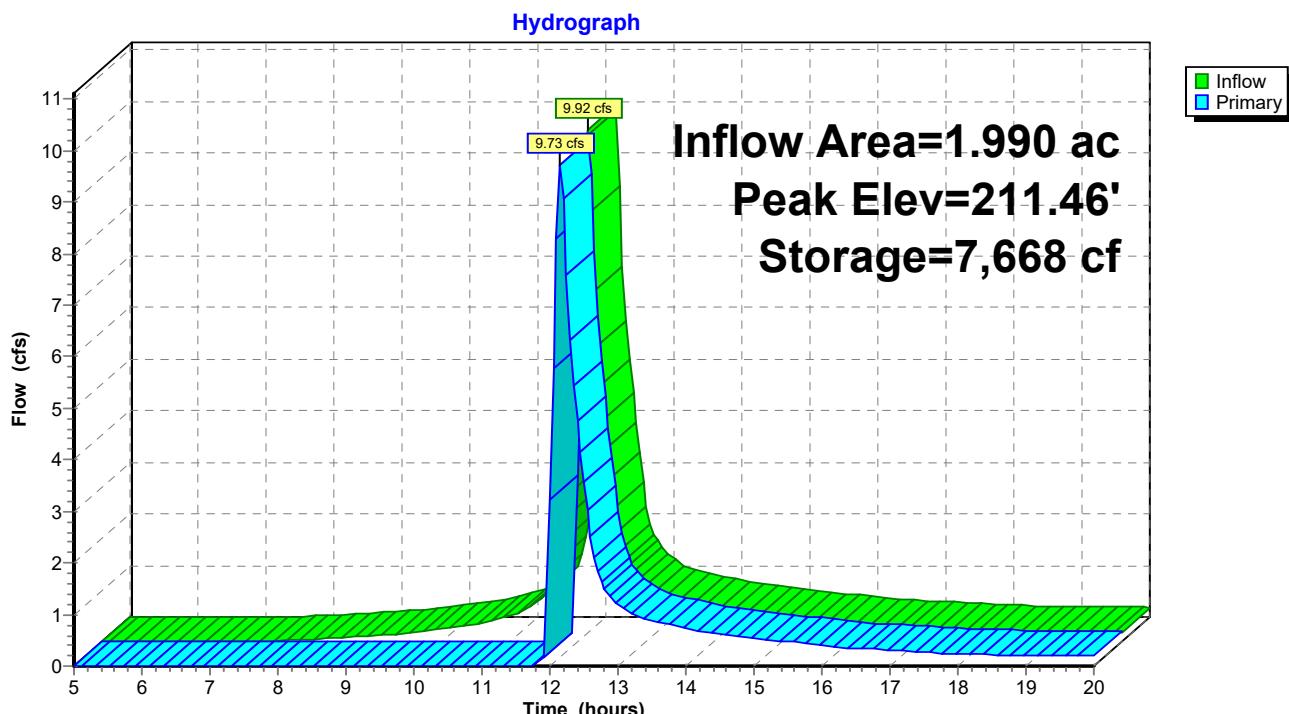
Plug-Flow detention time= 83.1 min calculated for 0.603 af (80% of inflow)  
 Center-of-Mass det. time= 32.1 min ( 817.6 - 785.5 )

| Volume | Invert  | Avail.Storage | Storage Description                                |
|--------|---------|---------------|----------------------------------------------------|
| #1     | 207.00' | 8,714 cf      | <b>15.00'W x 45.00'L x 4.80'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 211.00' | <b>12.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=9.57 cfs @ 12.16 hrs HW=211.46' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir(Weir Controls 9.57 cfs @ 1.74 fps)

### Pond 3P: (new Pond)



### Summary for Pond 4P: (new Pond)

Inflow Area = 20.140 ac, 5.76% Impervious, Inflow Depth > 4.61" for 100 year event  
 Inflow = 61.59 cfs @ 12.48 hrs, Volume= 7.745 af  
 Outflow = 36.23 cfs @ 12.86 hrs, Volume= 4.750 af, Atten= 41%, Lag= 23.0 min  
 Primary = 36.23 cfs @ 12.86 hrs, Volume= 4.750 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 218.89' @ 12.86 hrs Surf.Area= 36,068 sf Storage= 156,739 cf

Plug-Flow detention time= 141.7 min calculated for 4.750 af (61% of inflow)  
 Center-of-Mass det. time= 70.1 min ( 874.2 - 804.0 )

| Volume | Invert  | Avail.Storage | Storage Description                                 |
|--------|---------|---------------|-----------------------------------------------------|
| #1     | 213.50' | 160,589 cf    | <b>70.00'W x 320.00'L x 5.50'H Prismatoid Z=3.0</b> |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                                                                               |
|--------|---------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 218.00' | <b>16.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65<br>2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=36.12 cfs @ 12.86 hrs HW=218.89' (Free Discharge)  
 ↑=Broad-Crested Rectangular Weir (Weir Controls 36.12 cfs @ 2.53 fps)

### Pond 4P: (new Pond)

Hydrograph

