STORMWATER REPORT

North Haven Solar One

122 Mill Road
North Haven, Connecticut

PREPARED FOR

North Haven Solar One, LLC
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Hartford, CT 06103

PREPARED BY

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September 22, 2022

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1

Project Summary

Project Description

The Petitioner, North Haven Solar One, LLC, is proposing to construct a ±1.625 MW solar farm on undeveloped farmland and wooded areas 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 Project will be removed and the land will be restored in accordance with the decommissioning plan.

Site Description

The Project Site will be comprised on approximately ±9 acres east of Mill Road, (ID 039-009 in North Haven, Connecticut (see Figure 1). The site is bounded by Mill Road to the west, by residential houses to the north, and by a cemetery to the east and south. The development site is all within the R-40 zone (Residential) and all surrounding parcels are zoned R-40 (Residential).

The project area under existing conditions is being actively farmed during the growing season and is planted over the winter to maintain soil composition. There are three (3) delineated on-site wetland systems in proximity to the development area. Wetland system 1 is located in the tree line on the western portions of the property and discharges under Mill Road, wetland system 2 is located south of the development and is a floodplain area of Muddy Brook, and wetland system 3 is located in the tree line to the east of the development ultimately discharging to Muddy Brook on site. Under existing conditions, runoff from the project area generally flows overland to these wetland systems before exiting the site.

According to available soil mapping[1], a variety of soils exist on the site representing Hydrologic Soil Groups A, B, C, and D. See Appendix B for NRCS Web Soil Survey output.

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

According to available CTDEEP Groundwater Classification maps, groundwater at the site is GA (see Appendix A). According to CTDEEP Aquifer Protection Area maps, the site is not listed as an Aquifer Protection Area (see Appendix A).

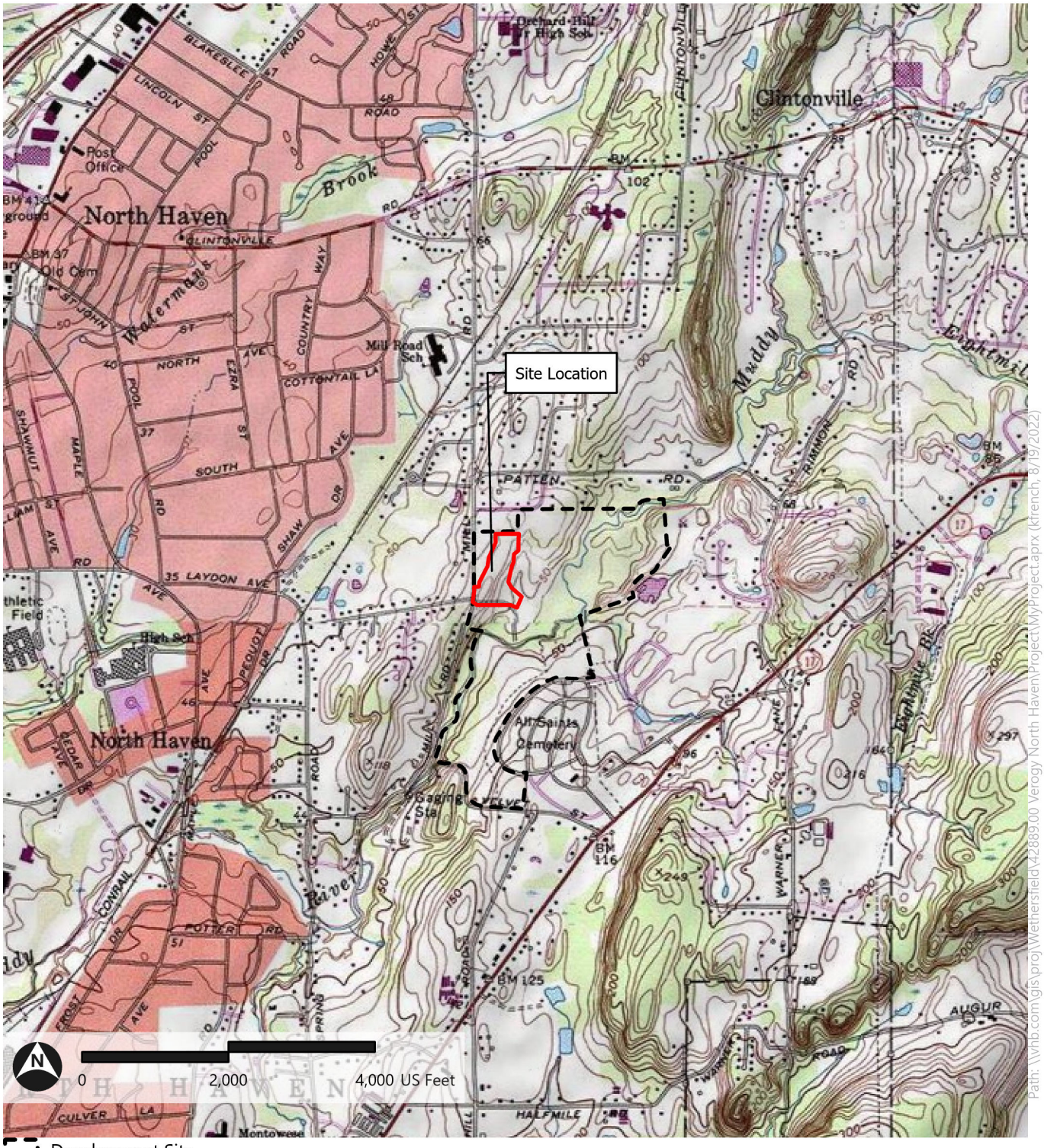
Methodology

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 predevelopment rates at any of the critical design points analyzed and stormwater quality leaving the site will be improved from existing conditions.

Figure 1: Site Location Map

Figure 1: USGS Site Location Map

North Haven Solar One | North Haven, CT



Source: USGS

2

Existing Drainage Conditions

Summary

Under existing conditions, runoff from the project area generally flows overland to the onsite wetland systems before exiting the site. The Site is generally at its highest elevation in the central portion of the development area. The majority of the Project area is comprised of actively-farmed fields ranging in slopes between 5% and 10%, while the wooded area proposed to be cleared and developed ranges in slopes between 15% and 20%. All wetland systems flow off the property towards Mill Road, and ultimately to Quinnipiac River.

Hydrologic Information

For the existing conditions hydrologic analysis, the Site has been divided into two (2) subwatershed areas, which have been identified as areas at the Project limits where flow enters the wetland systems. 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 area have been considered in the hydrologic analysis.

Drainage Area 1 - This ±1.6-acre area is located at the western portion of the Project. Untreated stormwater in this area generally flows over farm fields to the west into the wetland system within the tree line.

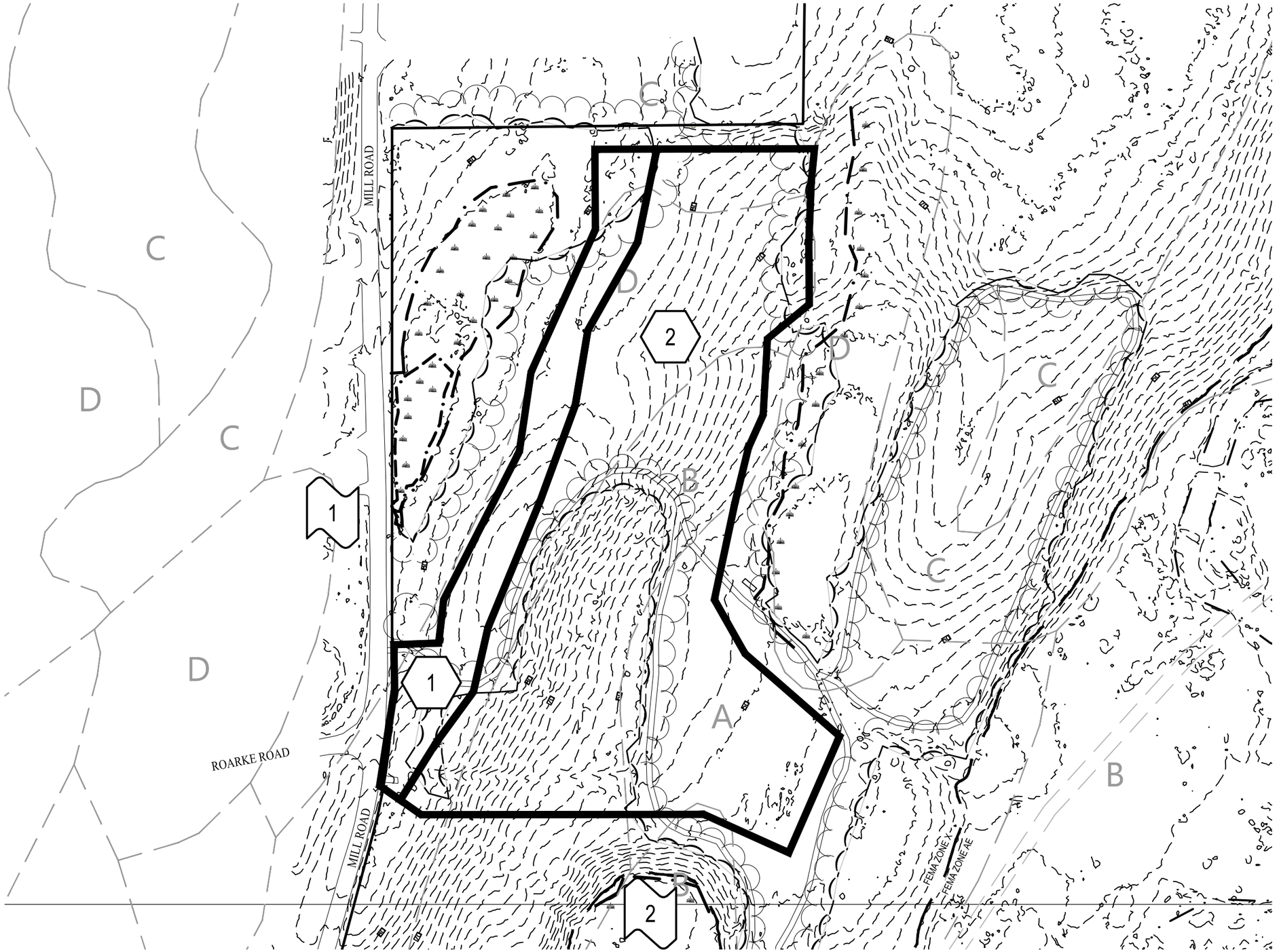
Drainage Area 2 - This ±7.7-acre area is located at the eastern portion of the Project. Untreated stormwater in this area generally flows over farm fields to the east into the wetland systems tributary to Muddy Brook within the tree line.

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

Table 1 Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Western Wetland	1.6	86	10
2	Eastern Wetlands	7.7	72	10

Figure 2: Existing Drainage Areas



Legend

SYMBOLS

X — DESIGN POINT

X — **DRAINAGE AREA DESIGNATION**

LINETYPES

DRAINAGE AREA BOUNDARY

HSG BOUNDARY

WETLAND BOUNDARY

0 75 150 Feet

vhb

Existing Drainage Conditions

Figure 2

122 Mill Road
North Haven, CT

9/22/2022

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Proposed Drainage Conditions

Summary

The Site has been designed to maintain existing topography and mimic existing drainage patterns to the maximum extents feasible. Across the majority of the proposed development 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 will be preserved to the maximum extents practicable and tree clearing is held to a minimum. As a result, the Project will have minimal impact to surrounding ecologically sensitive areas.

The only impervious surfaces proposed to be constructed are small concrete pads for utility equipment. Once operational, vehicular access to the Project will be limited to infrequent maintenance visits. The vegetated buffers held to the wetlands will provide adequate residence time and treatment capabilities for the de minimis amount of imperviousness of the project.

In accordance with CTDEEP Stormwater General Permit, it is not proposed to install solar panels within 100 feet of the eastern and western wetland systems onsite, nor is it proposed to perform any land disturbance (i.e. tree clearing, grading, swales, stormwater basins, fences) within 50 feet of these systems.

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 two (2) drainage areas from existing conditions. In accordance with CTDEEP Stormwater General Permit, 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. No grading over a two-foot change is proposed that would require reducing HSG by a full step.

Drainage Area 1 - This ±1.6-acre area is located at the western portion of the Project. Stormwater in this area will generally flow under the solar panels towards the western wetland. The introduction of permanent meadowy vegetation and grass will serve to improve water quality from the active farming under existing conditions.

Drainage Area 2A - This ±2.2-acre area is located at the northeastern portion of the Project. Stormwater in this area will generally flow under the solar panels towards the eastern wetlands. The introduction of permanent meadowy vegetation and grass will serve to improve water quality from the active farming under existing conditions.

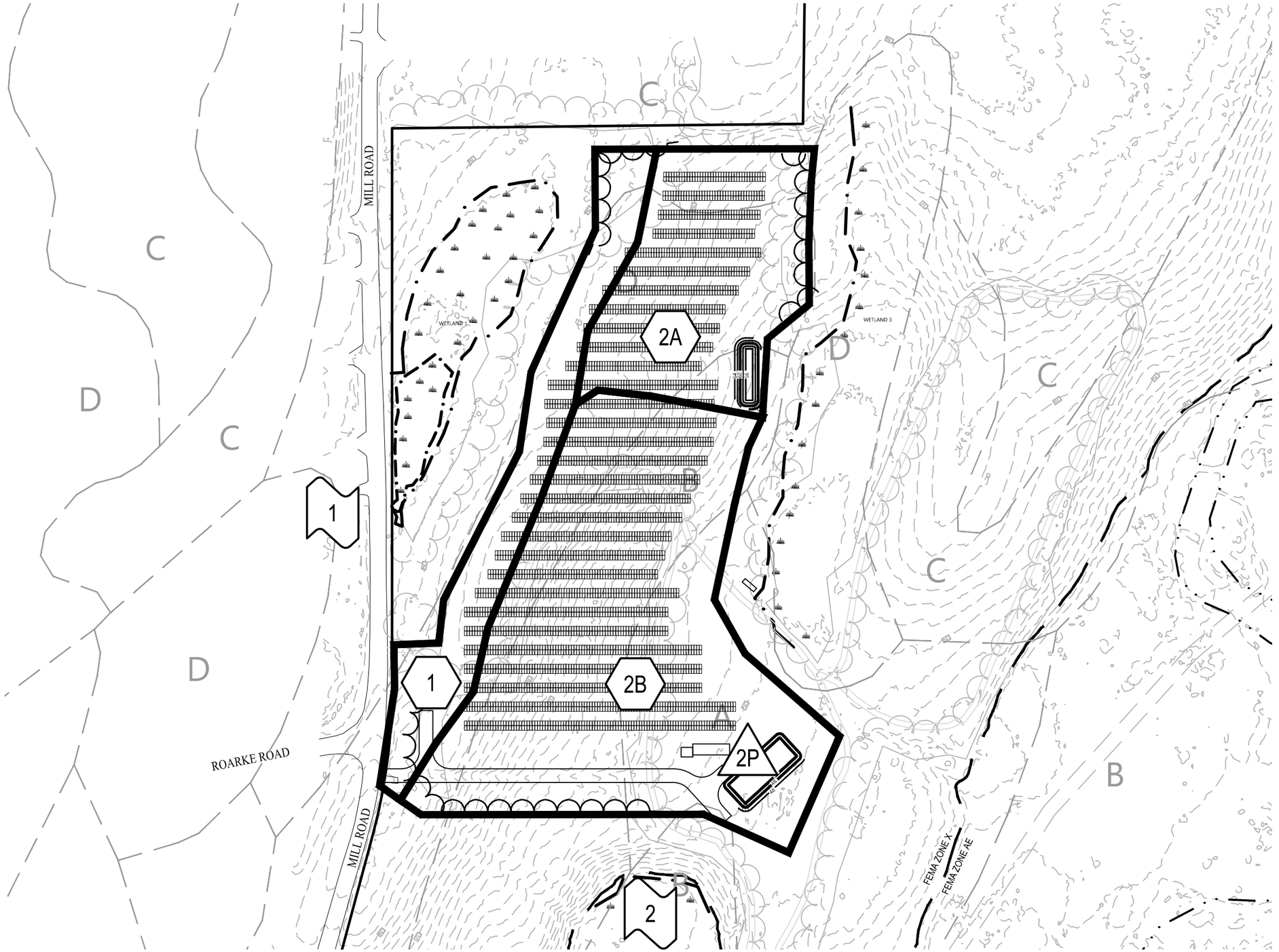
Drainage Area 2B - This ±5.4-acre area is located at the southeastern portion of the Project. Stormwater in this area will generally flow under the solar panels towards the eastern wetlands. The introduction of permanent meadowy vegetation and grass, along with a permanent stormwater basin, will serve to improve water quality from the active farming under existing conditions.

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

Table 2 Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Western Wetland	1.6	81	10
2A	Eastern Wetlands	2.2	80	10
2B	Muddy River	5.4	64	10

Figure 3: Proposed Drainage Areas



Legend

SYMBOLS

X — DESIGN POINT

X — **DRAINAGE AREA DESIGNATION**

XP — **PERMANENT STORMWATER BASIN**

LINETYPES

DRAINAGE AREA BOUNDARY

HSG BOUNDARY

WETLAND BOUNDARY

0 75 150 Feet

vhb

Proposed Drainage Conditions

Figure 3

122 Mill Road
North Haven, CT

9/22/2022

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Hydrologic Analysis

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 3.48, 6.53, 7.40, and 8.34 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, the proposed conditions for development areas 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 within all watersheds for all design storms by reducing curve numbers.

Table 3 presents a summary of the existing and proposed conditions peak discharge rates.

Table 3 Peak Discharge Rates (cfs*)

Watershed	2-year	25-year	50-year	100-year
Watershed 1				
Existing	3.36	7.74	8.99	10.33
Proposed	2.73	7.01	8.26	9.61
Watershed 2				
Existing	8.10	26.61	32.37	38.70
Proposed	4.81	16.53	31.36	38.05

* Expressed in cubic feet per second

Floodplain Information / Analysis

Based upon the most recent Federal Emergency Management Agency (FEMA) mapping (FEMA Flood Insurance Rate Map No. 09009C0314J and No. 09009C0452J, each dated May 16, 2017), the site does contain listed Flood Hazard Areas (1% Annual Chance or greater, and floodway) associated with Muddy Brook. No portions of the Project are proposed within a flood hazard area. This mapping is included in Appendix A.

Water Quality Volume

Water Quality Volume (WQV) is based upon the first inch of rainfall, or a 1-inch rainfall event, over the acreage of proposed impervious surfaces for the development. Neither the solar panels nor the concrete equipment pads will be subject to vehicular access nor will they produce any pollutants to stormwater runoff. The site will have vehicular travel infrequently upon completion of construction, and the meadowy buffer areas will provide residence and treatment time. A proposed permanent stormwater basin in the southeast portion of the Project will also capture and treat water quality volume prior to discharge from the site.

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.

Appendix A:

FEMA Flood Insurance Rate Map

NOAA Rainfall Depth Estimates

CTDEEP Groundwater Classification Map

Aquifer Protection Area Map

FEMA Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA

72°50'32"W 41°22'49"N

72°49'54"W 41°22'22"N

Feet

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

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

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

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

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

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

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

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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

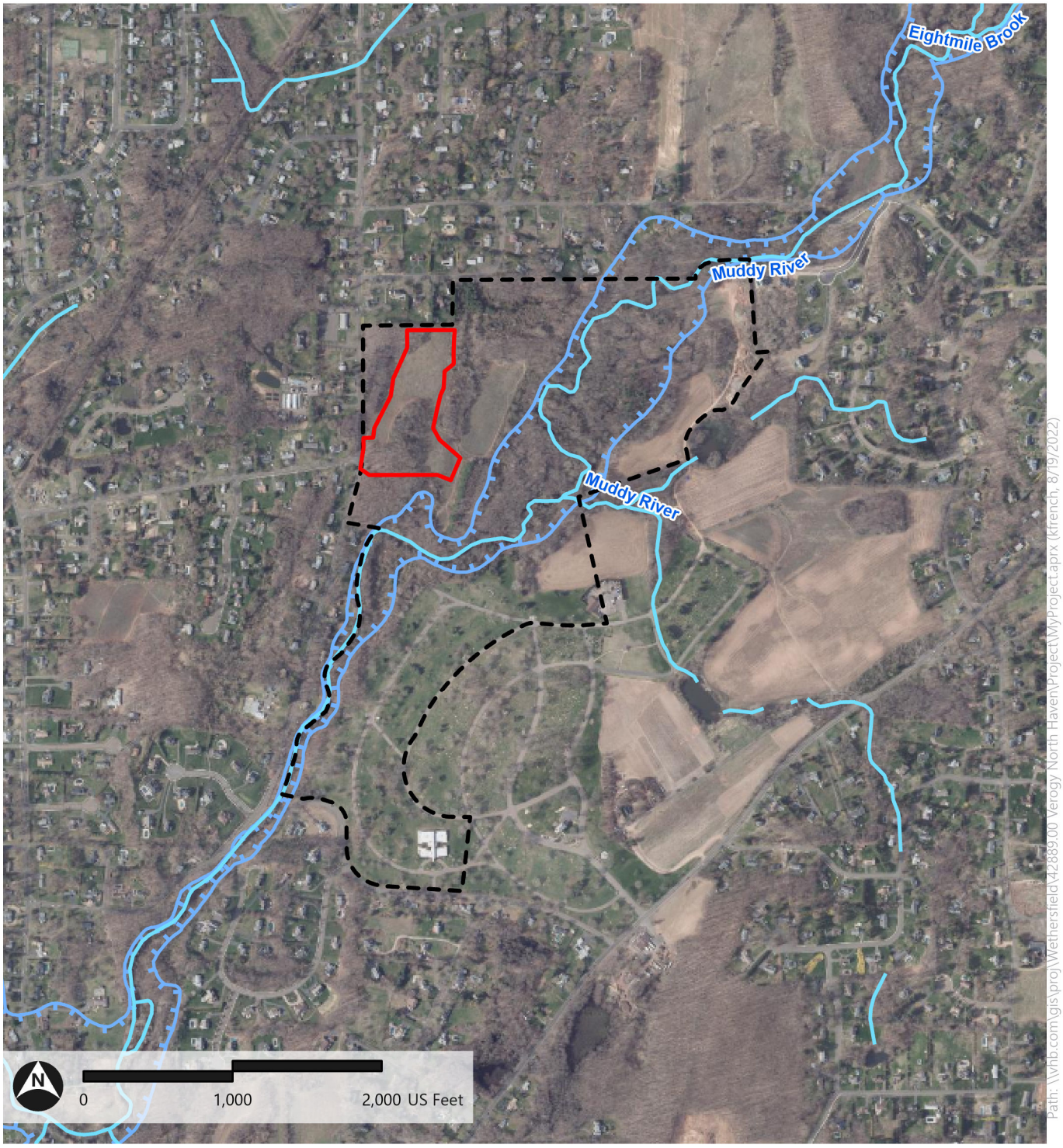
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/18/2022 at 3:06 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

FEMA Map

North Haven Solar One | North Haven, CT



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Source: CTDEEP, ArcGIS Online

NOAA Rainfall Depth Estimates

NOAA Atlas 14, Volume 10, Version 3
Location name: North Haven, Connecticut, USA*
Latitude: 41.3751°, Longitude: -72.835°
Elevation: 34.17 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.343 (0.270-0.425)	0.415 (0.326-0.515)	0.533 (0.417-0.664)	0.632 (0.492-0.791)	0.767 (0.577-1.01)	0.868 (0.640-1.17)	0.975 (0.697-1.36)	1.10 (0.739-1.56)	1.27 (0.824-1.88)	1.41 (0.894-2.13)
10-min	0.486 (0.382-0.602)	0.588 (0.462-0.730)	0.755 (0.592-0.940)	0.894 (0.697-1.12)	1.09 (0.817-1.43)	1.23 (0.907-1.65)	1.38 (0.987-1.93)	1.55 (1.05-2.22)	1.80 (1.17-2.66)	2.00 (1.27-3.03)
15-min	0.572 (0.450-0.709)	0.692 (0.544-0.859)	0.889 (0.696-1.11)	1.05 (0.820-1.32)	1.28 (0.962-1.68)	1.45 (1.07-1.94)	1.62 (1.16-2.27)	1.83 (1.23-2.61)	2.12 (1.37-3.13)	2.36 (1.49-3.56)
30-min	0.793 (0.624-0.983)	0.959 (0.753-1.19)	1.23 (0.964-1.53)	1.45 (1.13-1.82)	1.76 (1.33-2.31)	2.00 (1.47-2.68)	2.24 (1.60-3.13)	2.52 (1.70-3.59)	2.92 (1.89-4.32)	3.25 (2.06-4.91)
60-min	1.01 (0.798-1.26)	1.23 (0.963-1.52)	1.57 (1.23-1.96)	1.86 (1.45-2.33)	2.25 (1.69-2.95)	2.54 (1.88-3.42)	2.86 (2.04-3.98)	3.21 (2.17-4.58)	3.72 (2.41-5.50)	4.14 (2.62-6.25)
2-hr	1.33 (1.05-1.64)	1.60 (1.26-1.97)	2.04 (1.61-2.52)	2.40 (1.88-2.99)	2.90 (2.20-3.79)	3.28 (2.43-4.38)	3.68 (2.65-5.11)	4.14 (2.81-5.87)	4.82 (3.14-7.08)	5.39 (3.42-8.08)
3-hr	1.54 (1.23-1.89)	1.85 (1.47-2.27)	2.36 (1.87-2.90)	2.78 (2.19-3.44)	3.36 (2.56-4.36)	3.79 (2.82-5.04)	4.25 (3.07-5.89)	4.79 (3.25-6.76)	5.58 (3.64-8.18)	6.25 (3.98-9.35)
6-hr	1.96 (1.57-2.39)	2.35 (1.89-2.87)	3.00 (2.39-3.67)	3.53 (2.80-4.35)	4.27 (3.27-5.51)	4.81 (3.61-6.37)	5.40 (3.93-7.45)	6.09 (4.16-8.55)	7.13 (4.67-10.4)	8.01 (5.11-11.9)
12-hr	2.43 (1.96-2.94)	2.93 (2.36-3.54)	3.75 (3.01-4.55)	4.42 (3.53-5.41)	5.36 (4.13-6.88)	6.05 (4.57-7.96)	6.80 (4.98-9.32)	7.68 (5.26-10.7)	9.02 (5.92-13.0)	10.1 (6.49-15.0)
24-hr	2.85 (2.32-3.42)	3.48 (2.83-4.18)	4.51 (3.65-5.44)	5.36 (4.31-6.50)	6.53 (5.08-8.34)	7.40 (5.63-9.69)	8.34 (6.17-11.4)	9.49 (6.52-13.1)	11.3 (7.41-16.1)	12.8 (8.19-18.7)
2-day	3.20 (2.62-3.81)	3.97 (3.25-4.74)	5.23 (4.26-6.26)	6.27 (5.08-7.56)	7.71 (6.05-9.81)	8.76 (6.73-11.5)	9.93 (7.42-13.6)	11.4 (7.86-15.7)	13.7 (9.06-19.6)	15.8 (10.1-22.9)
3-day	3.47 (2.86-4.12)	4.31 (3.55-5.13)	5.70 (4.67-6.80)	6.85 (5.58-8.22)	8.43 (6.64-10.7)	9.59 (7.40-12.5)	10.9 (8.16-14.8)	12.5 (8.65-17.1)	15.1 (9.99-21.4)	17.4 (11.2-25.2)
4-day	3.72 (3.07-4.40)	4.62 (3.81-5.47)	6.09 (5.00-7.24)	7.30 (5.96-8.74)	8.98 (7.09-11.4)	10.2 (7.89-13.3)	11.6 (8.70-15.7)	13.3 (9.21-18.2)	16.0 (10.6-22.7)	18.4 (11.9-26.6)
7-day	4.43 (3.69-5.21)	5.42 (4.50-6.39)	7.04 (5.82-8.32)	8.38 (6.88-9.97)	10.2 (8.11-12.8)	11.6 (8.98-14.9)	13.1 (9.84-17.6)	14.9 (10.4-20.3)	17.8 (11.8-25.1)	20.3 (13.1-29.1)
10-day	5.14 (4.29-6.02)	6.18 (5.15-7.25)	7.88 (6.54-9.28)	9.29 (7.66-11.0)	11.2 (8.92-14.0)	12.7 (9.83-16.2)	14.2 (10.7-19.0)	16.1 (11.2-21.8)	19.0 (12.7-26.6)	21.5 (13.9-30.7)
20-day	7.31 (6.15-8.51)	8.43 (7.09-9.82)	10.3 (8.59-12.0)	11.8 (9.79-13.9)	13.9 (11.1-17.1)	15.4 (12.0-19.4)	17.1 (12.8-22.3)	19.0 (13.3-25.4)	21.6 (14.5-30.1)	23.9 (15.5-33.9)
30-day	9.14 (7.72-10.6)	10.3 (8.69-11.9)	12.2 (10.3-14.2)	13.8 (11.5-16.1)	15.9 (12.8-19.4)	17.6 (13.7-21.9)	19.3 (14.4-24.9)	21.1 (14.9-28.1)	23.6 (15.8-32.6)	25.5 (16.6-36.1)
45-day	11.4 (9.69-13.2)	12.6 (10.7-14.6)	14.6 (12.3-16.9)	16.2 (13.6-18.9)	18.4 (14.8-22.3)	20.2 (15.7-24.9)	21.9 (16.3-27.9)	23.6 (16.7-31.3)	25.8 (17.4-35.5)	27.5 (17.9-38.7)
60-day	13.3 (11.3-15.3)	14.5 (12.4-16.7)	16.5 (14.0-19.1)	18.2 (15.3-21.2)	20.5 (16.5-24.7)	22.3 (17.4-27.4)	24.1 (17.9-30.5)	25.7 (18.3-33.9)	27.7 (18.8-38.0)	29.2 (19.1-40.9)

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

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

Please refer to NOAA Atlas 14 document for more information.

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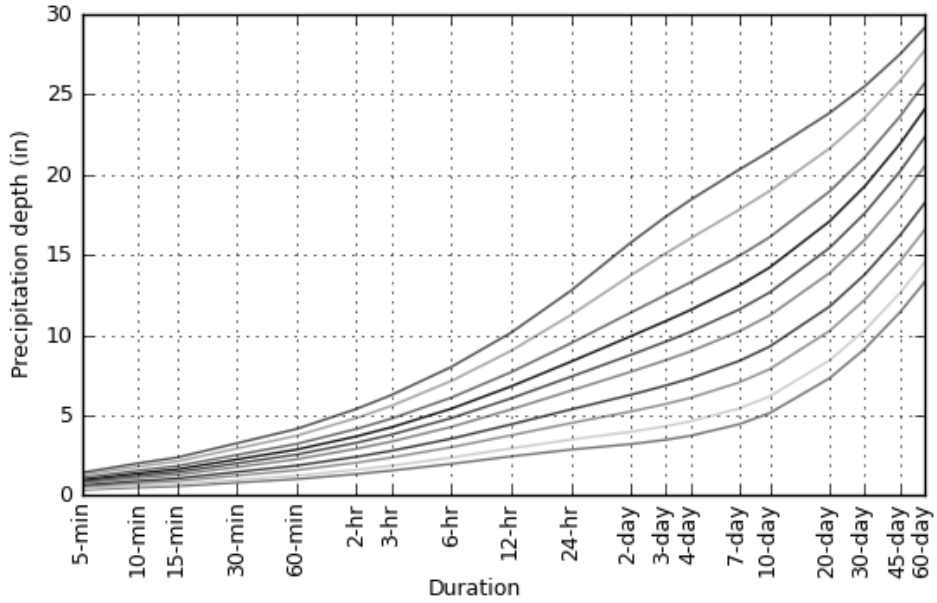
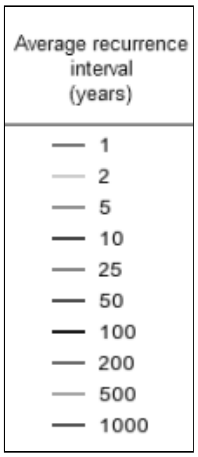
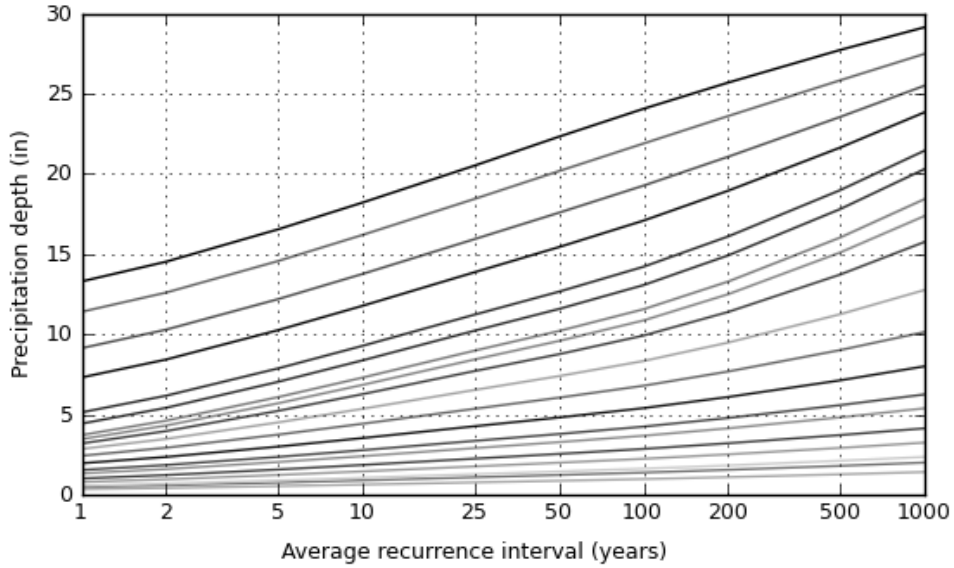
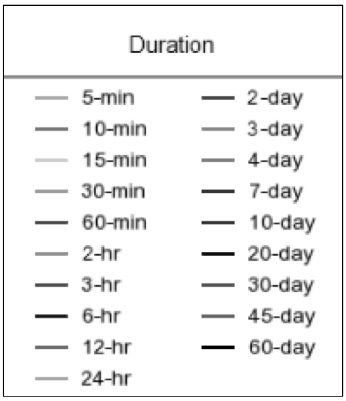
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.3751°, Longitude: -72.8350°









NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Jun 9 13:37:46 2022

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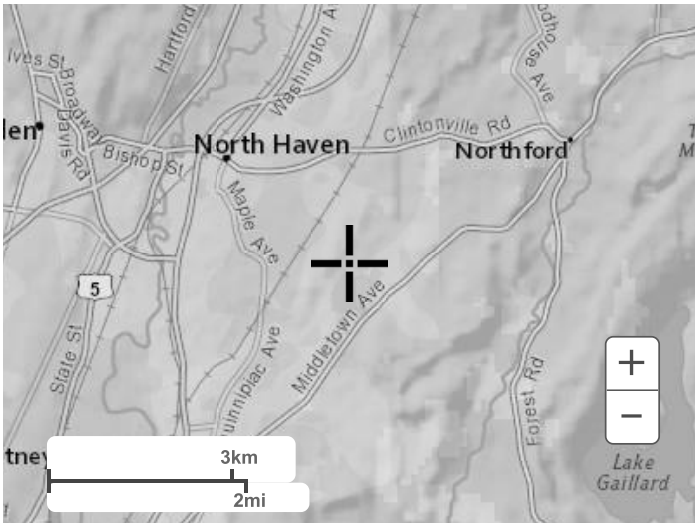
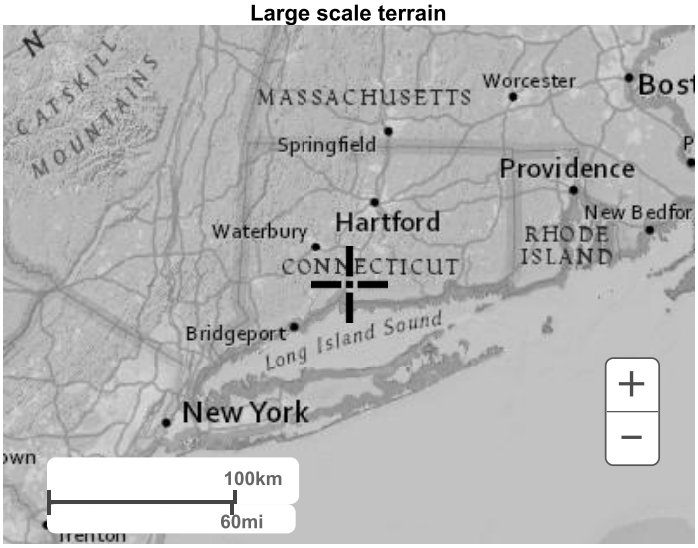
Maps & aerials

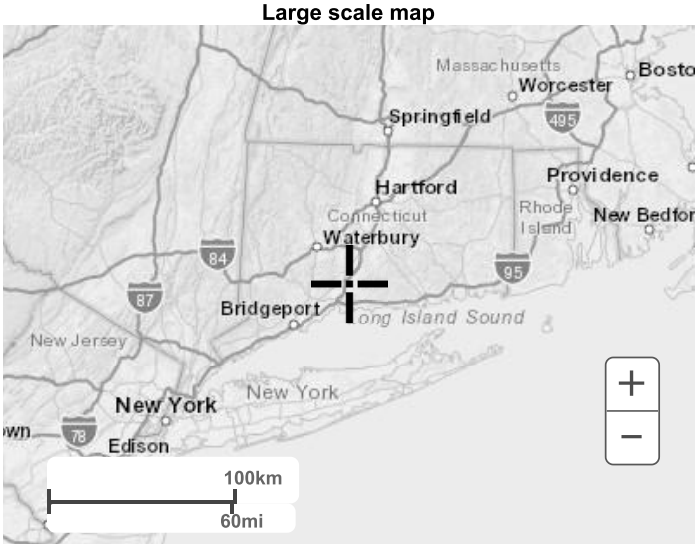
Small scale terrain



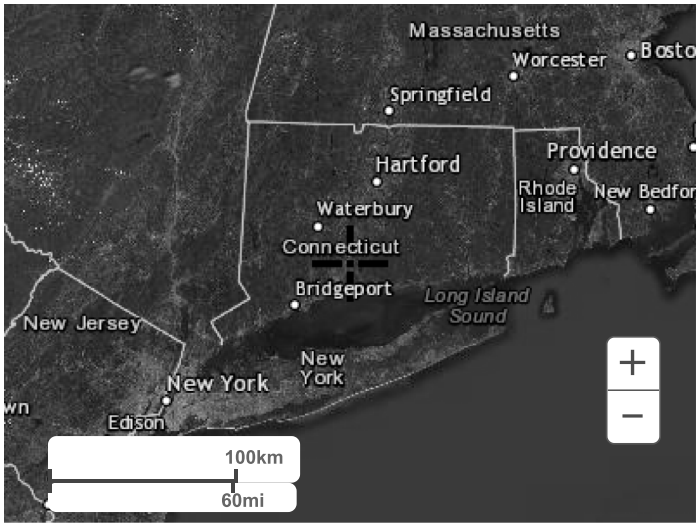
Large scale terrain



Large scale map



Large scale aerial



Back to Top

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

Disclaimer

CTDEEP Groundwater Classification Map

WATER QUALITY CLASSIFICATIONS
NORTH HAVEN, CT

SURFACE WATER QUALITY CLASSES

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

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

GROUND WATER QUALITY CLASSES

GA (white background)
GAA, GAAs
GA, GAA may not meet current standards
GB
GC
Area of Contribution to Public Supply Well
Final Aquifer Protection Area (Level A)
Major Basin Boundary

EXPLANATION

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

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

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

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

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

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

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

DATA SOURCES

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

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

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

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

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

ADOPTED DATES

Water Quality Standards
February 25, 2011

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

Connecticut River and South Central Coastal Basins: February 1993

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

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

MAP LOCATION

State Plane Coordinate System of 1983, Zone 2526
Lambert Conformal Conic Projection
North American Datum of 1983

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

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

Map created by CT DEEP
October 2018

Map is not colorblast
Protect from light and moisture

PROSPECT
CHESHIRE
WALLINGFORD
DURHAM
BETHANY
HAMDEN
WOODBRIDGE
NORTH HAVEN
SITE
NORTH BRANFORD
GUILFORD
NEW HAVEN
EAST HAVEN
BRANFORD
ORANGE
WEST HAVEN

Aquifer Protection Area Map

AQUIFER PROTECTION AREAS

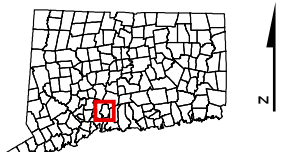
North Haven, CT

December 23, 2021

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

NOTE: The Aquifer Protection Areas were delineated through Connecitcut'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. Masschusetts 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/deep/aquiferprotection



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

A 121
North Sleeping Giant
09/17/2008

A 122
South Sleeping Giant
09/17/2008

A 123
Mount Carmel
09/17/2008

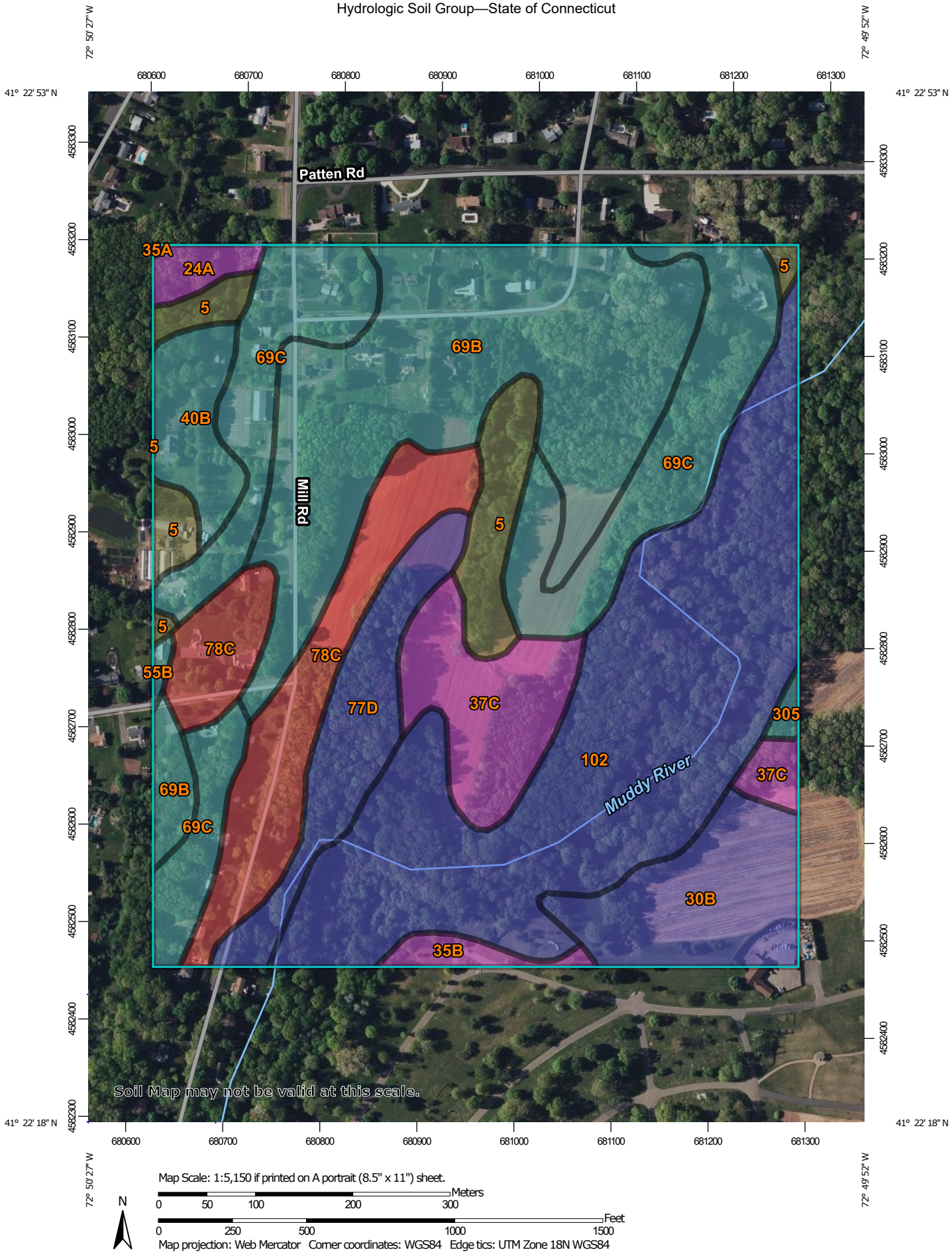
A 123
Mount Carmel
04/02/2012

Bethany
Hamden
North Haven
Wallingford
SITE
Wharton Brook
Quinnipiac
Exit 14
Exit 13
Exit 13
Exit 12
Exit 11
Exit 63
Exit 62
Exit 61
Exit 60
Exit 10
Exit 10
Exit 9
Exit 9
Exit 8
Exit 1
Exit 1
91
40
15
10
5
150
22
17
103
80
100

Appendix B:

NRCS Soil Survey Information

NRCS Soil Survey Information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72° 49' 52" W
41° 22' 53" N
41° 22' 18" N
680600
680700
680800
680900
681000
681100
681200
681300
4583300
4583200
4583100
4583000
4582900
4582800
4582700
4582600
4582500
4582400
4582300
Patten Rd
Mill Rd
Muddy River
35A
24A
5
69C
69B
40B
78C
55B
77D
37C
102
305
30B
35B
Soil Map may not be valid at this scale.
Map Scale: 1:5,150 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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 21, Sep 7, 2021

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

Date(s) aerial images were photographed: Data not available.

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5	Wilbraham silt loam, 0 to 3 percent slopes	C/D	5.9	4.8%
24A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	1.2	1.0%
30B	Branford silt loam, 3 to 8 percent slopes	B	7.5	6.2%
35A	Penwood loamy sand, 0 to 3 percent slopes	A	0.0	0.0%
35B	Penwood loamy sand, 3 to 8 percent slopes	A	1.1	0.9%
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	A	7.5	6.1%
40B	Ludlow silt loam, 3 to 8 percent slopes	C	3.6	3.0%
55B	Watchaug fine sandy loam, 3 to 8 percent slopes	C	0.2	0.2%
69B	Yalesville fine sandy loam, 3 to 8 percent slopes	C	26.3	21.5%
69C	Yalesville fine sandy loam, 8 to 15 percent slopes	C	18.9	15.5%
77D	Cheshire-Holyoke complex, 15 to 35 percent slopes, very rocky	B	6.5	5.3%
78C	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	D	11.6	9.5%
102	Pootatuck fine sandy loam	B	31.4	25.7%
305	Udorthents-Pits complex, gravelly	C	0.4	0.3%
Totals for Area of Interest			**122.3**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix C:

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

Erosion and Sedimentation Control Checklist

North Haven Solar One – North Haven, CT – 122 Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Construction Practices

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

Stormwater Control Manager _____

Long Term Stormwater Operation and Maintenance Measures

North Haven Solar One – North Haven, CT – 122 Mill Road

Best Management Practices – Maintenance/ Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Trash/Litter	Routinely pick up and remove litter from entire property as required.						
Stormwater Basin	Inspect bi-annually. Check stabilized riprap spillway, side slopes, and clean accumulated sediment if infiltration is impeded.						
Vegetated Areas	Inspect bi-annually. Replant bare areas upon identification.						

Stormwater Control Manager _____

Project Information

Site

Project Name:	North Haven Solar One
Address or Locus:	122 Mill Road
City, State & Zip:	North Haven, CT 06473

Developer

Client Name:	North Haven Solar One, LLC
Client Address:	150 Trumbull Street, 4th Floor
Client City, State & Zip:	Hartford, CT 06103
Client Telephone No.:	(860) 288-7215
Client Cell Phone:	(203) 814-6866
Client E-Mail:	bparsons@verogy.com

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 Sizing
Water Quality Computations
HydroCAD: Existing Conditions
HydroCAD: Proposed Conditions

Diversion Swale & Sediment Trap Sizing

Swale Sizing

Swale 1

48,500 sf

1.11 ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.037	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q100 (fallow soil) =	7.71	cfs	
Bottom width, w =	3	ft	
Side slopes, X:1 =	2		
Estimated flow depth, d =	0.49	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**1.00**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.95	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	5.19	ft	
R = A / P =	0.38	ft	
A * R^(2/3) =	**1.02**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.13**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**3.95**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale	2A	
109,600	sf	
2.52	ac	

Reference DOT Drainage Manual 2000

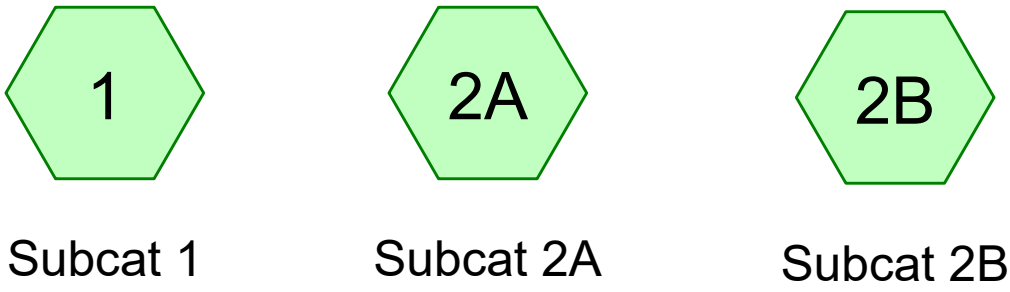
Swale Slope, S =	0.022	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q100 (fallow soil) =	16.25	cfs	
Bottom width, w =	3	ft	
Side slopes, X:1 =	2		
Estimated flow depth, d =	0.84	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**2.74**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	3.93	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	6.76	ft	
R = A / P =	0.58	ft	
A * R^(2/3) =	**2.74**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.15**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**4.13**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale	2B	
33,200	sf	
0.76	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.075	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q100 (fallow soil) =	4.92	cfs	
Bottom width, w =	3	ft	
Side slopes, X:1 =	2		
Estimated flow depth, d =	0.31	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.45**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.12	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.39	ft	
R = A / P =	0.26	ft	
A * R^(2/3) =	**0.45**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**1.45**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**4.38**	fps	< 5.00 fps for ECB - OK



Subcat Reach Pond Link

Routing Diagram for 42889.00 - Swales
Prepared by VHB, Printed 9/22/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.661	77	Fallow, bare soil, HSG A (2A, 2B)
1.839	86	Fallow, bare soil, HSG B (2A, 2B)
0.372	91	Fallow, bare soil, HSG C (1)
1.520	94	Fallow, bare soil, HSG D (1, 2A, 2B)
4.392	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.661	HSG A	2A, 2B
1.839	HSG B	2A, 2B
0.372	HSG C	1
1.520	HSG D	1, 2A, 2B
0.000	Other	
4.392		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.661	1.839	0.372	1.520	0.000	4.392	Fallow, bare soil	1, 2A, 2B
0.661	**1.839**	**0.372**	**1.520**	**0.000**	**4.392**	**TOTAL AREA**	

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=48,500 sf 0.00% Impervious Runoff Depth>7.04"
Tc=10.0 min CN=93 Runoff=7.71 cfs 0.654 af

Subcatchment2A: Subcat 2A Runoff Area=109,600 sf 0.00% Impervious Runoff Depth>6.29"
Tc=10.0 min CN=86 Runoff=16.25 cfs 1.319 af

Subcatchment2B: Subcat 2B Runoff Area=33,200 sf 0.00% Impervious Runoff Depth>6.29"
Tc=10.0 min CN=86 Runoff=4.92 cfs 0.400 af

Total Runoff Area = 4.392 ac Runoff Volume = 2.372 af Average Runoff Depth = 6.48"
100.00% Pervious = 4.392 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

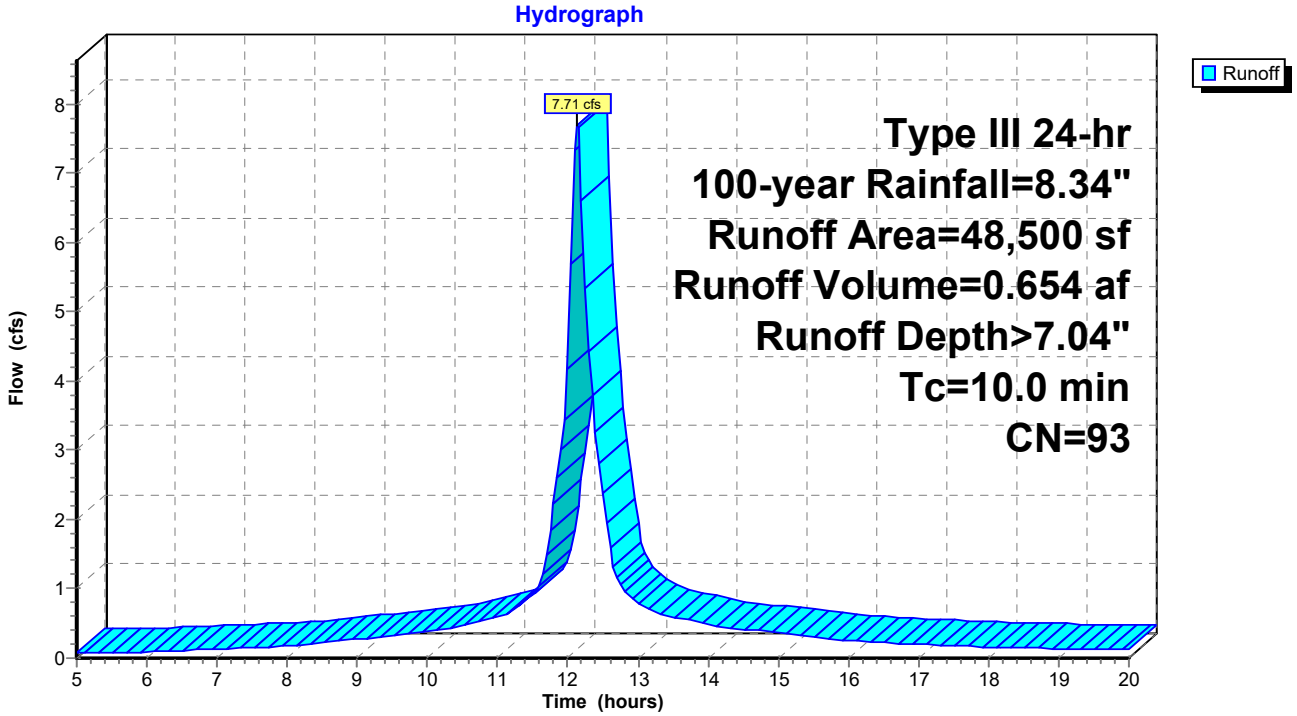
Runoff = 7.71 cfs @ 12.14 hrs, Volume= 0.654 af, Depth> 7.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.34"

Area (sf)	CN	Description
32,300	94	Fallow, bare soil, HSG D
16,200	91	Fallow, bare soil, HSG C
48,500	93	Weighted Average
48,500		100.00% Pervious Area

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2A: Subcat 2A

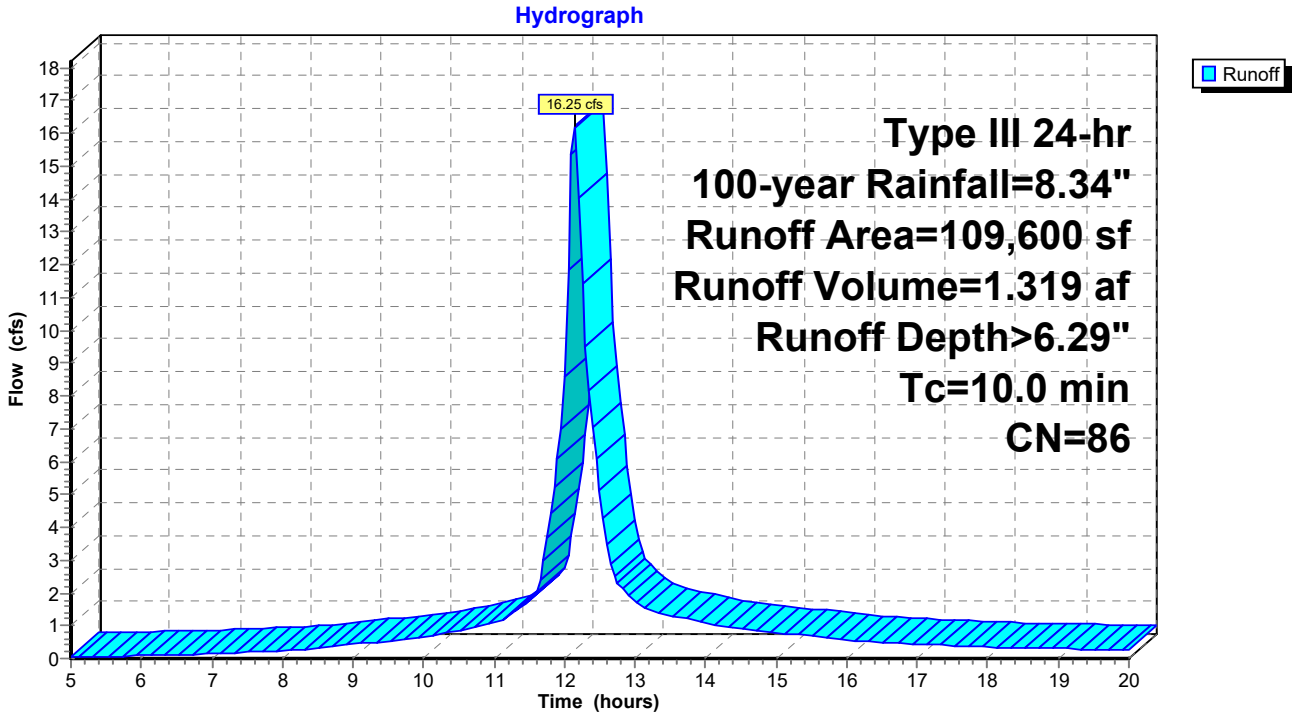
Runoff = 16.25 cfs @ 12.14 hrs, Volume= 1.319 af, Depth> 6.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.34"

Area (sf)	CN	Description
27,900	94	Fallow, bare soil, HSG D
57,200	86	Fallow, bare soil, HSG B
24,500	77	Fallow, bare soil, HSG A
109,600	86	Weighted Average
109,600		100.00% Pervious Area

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

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 2B: Subcat 2B

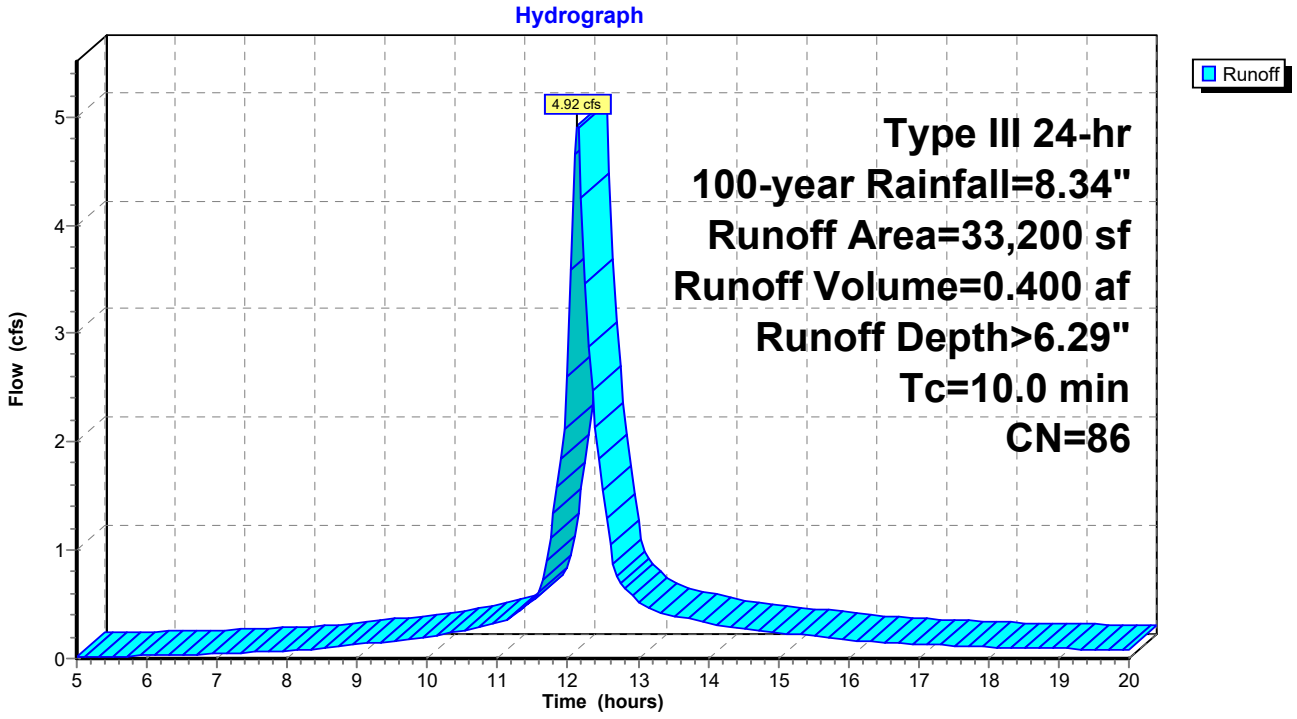
Runoff = 4.92 cfs @ 12.14 hrs, Volume= 0.400 af, Depth> 6.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.34"

Area (sf)	CN	Description
6,000	94	Fallow, bare soil, HSG D
22,900	86	Fallow, bare soil, HSG B
4,300	77	Fallow, bare soil, HSG A
33,200	86	Weighted Average
33,200		100.00% Pervious Area

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

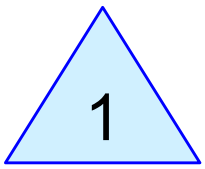
Subcatchment 2B: Subcat 2B



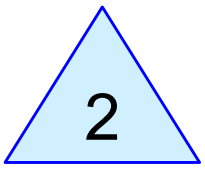
Sediment Trap Sizing
Verogy North Haven Solar
September 2022

TST #	Tributary Acreage, ac	*(134 cy / acre)** Volume Required Below Top of Spillway, cf	Volume Provided in Permanent Basin Below Top of Spillway, cf
1	1.9	6,874	7,304
2	4.5	16,196	18,661

* Per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control



(new Pond)



(new Pond)

Subcat Reach Pond Link

Routing Diagram for 42889.00 - Sediment Traps
Prepared by VHB, Printed 9/22/2022

Summary for Pond 1: (new Pond)

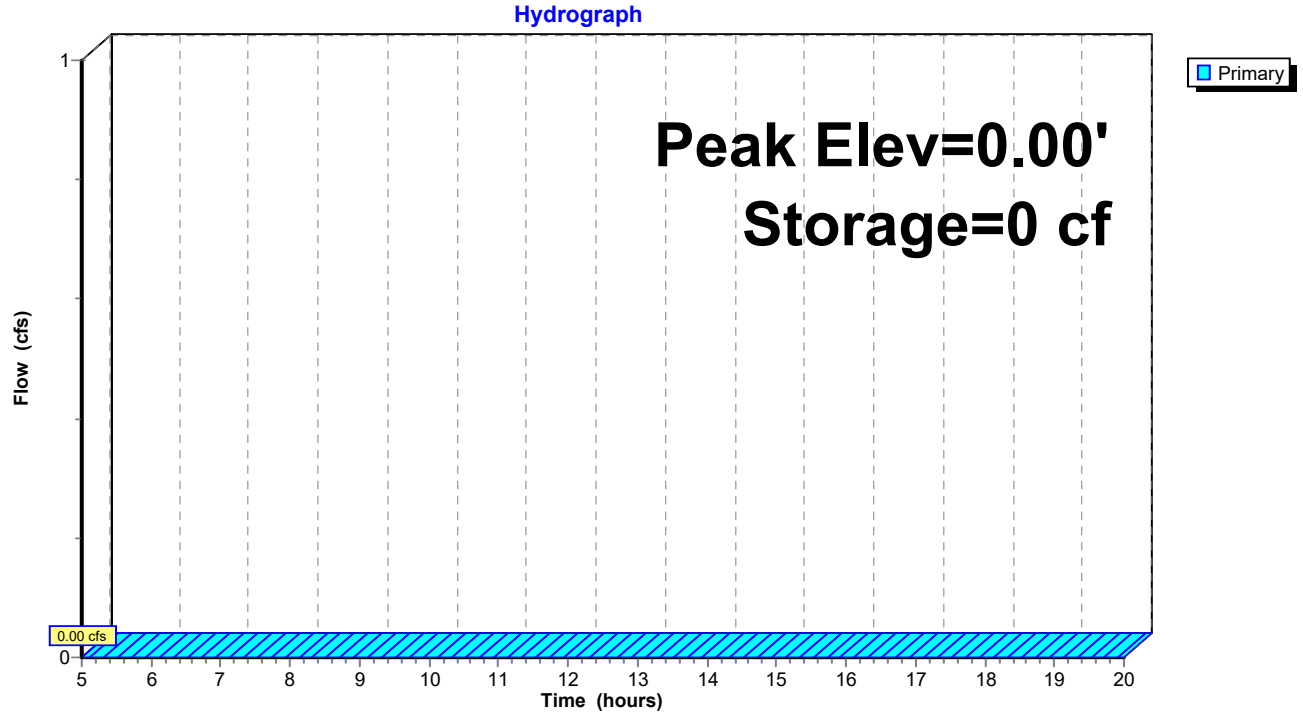
[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	7,304 cf	**10.00'W x 75.00'L x 4.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	59.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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

Pond 1: (new Pond)



Summary for Pond 2: (new Pond)

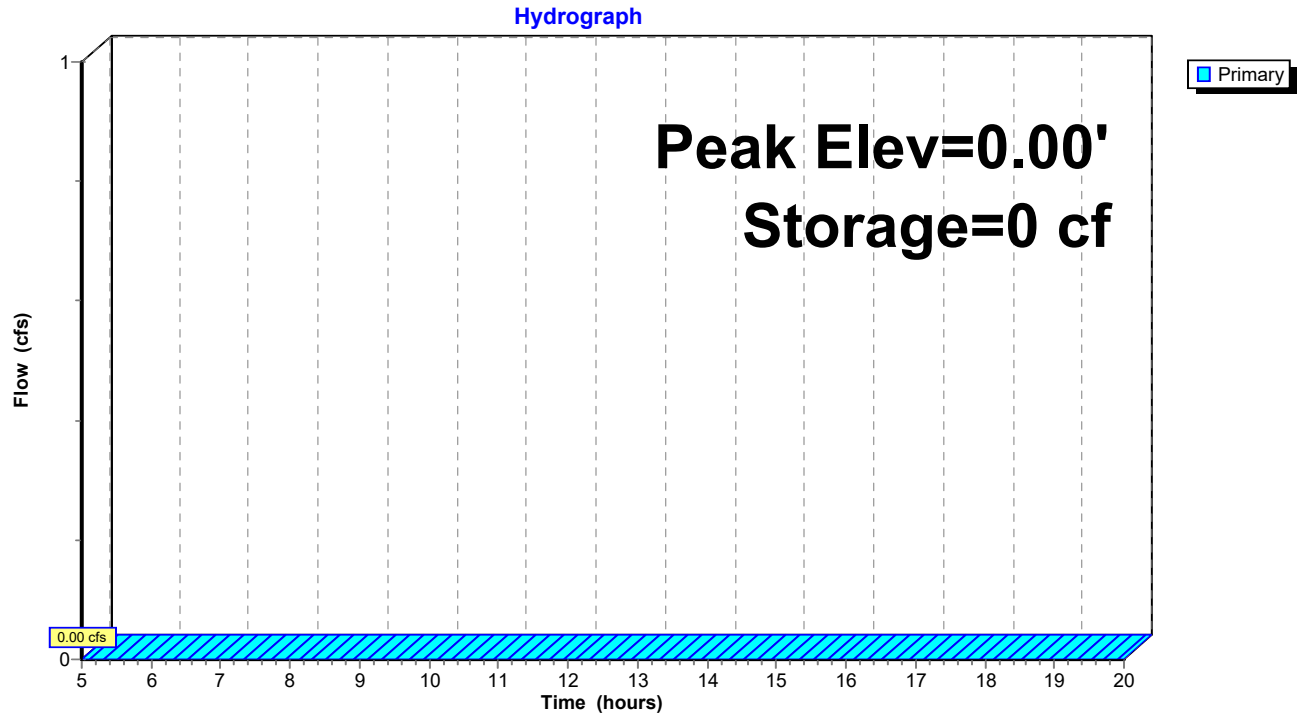
[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	45.00'	18,661 cf	**35.00'W x 100.00'L x 4.00'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

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

Pond 2: (new Pond)



Water Quality Computations

Water Quality Volume Calculations

Project: North Haven Solar One By: SJK Date: 9/22/22
Location: 122 Mill Road, North Haven, CT Checked: PV Date: 9/22/22

Basin Name	**2**					
Rainfall, P	1.0 in.					a
Area, A	5.45 ac					b
Impervious Cover Area	2.03 ac					c
% Impervious, I	37 %*					
Volumetric Runoff Coeff., R	0.385					d
Water Quality Volume, WQV	0.175 ac-ft					e
	7,621 cf					

Water Quality Volume Provided	**0.300 ac-ft**					f
	13,068 cf					

* Includes equipment pads, gravel access drive, and solar panels due to steep slopes

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

[b] Area tributary to the stormwater management basin

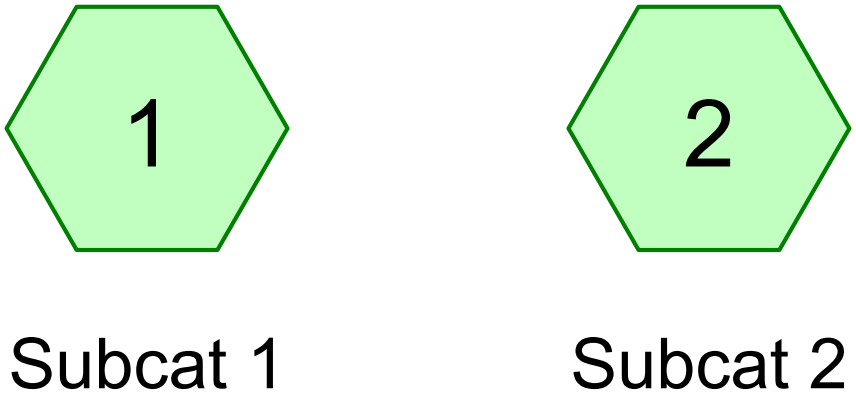
[c] Impervious cover area tributary to the stormwater management basin

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

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

[f] Storage volume beneath the crest of the proposed basin spillway

HydroCAD Analysis: Existing Conditions



Subcat Reach Pond Link

Routing Diagram for 42889.00 - HydroCAD Existing
Prepared by VHB, Printed 8/18/2022

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	3.48	2
2	25-year	Type III 24-hr		Default	24.00	1	6.53	2
3	50-year	Type III 24-hr		Default	24.00	1	7.40	2
4	100-year	Type III 24-hr		Default	24.00	1	8.34	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.079	72	Dirt roads, HSG A (2)
0.048	82	Dirt roads, HSG B (2)
0.004	87	Dirt roads, HSG C (1)
0.091	89	Dirt roads, HSG D (1, 2)
1.690	67	Row crops, straight row, Good, HSG A (2)
0.888	78	Row crops, straight row, Good, HSG B (2)
0.439	85	Row crops, straight row, Good, HSG C (1, 2)
3.302	89	Row crops, straight row, Good, HSG D (1, 2)
0.005	98	Unconnected pavement, HSG D (1)
0.133	30	Woods, Good, HSG A (2)
1.894	55	Woods, Good, HSG B (2)
0.153	70	Woods, Good, HSG C (1, 2)
0.536	77	Woods, Good, HSG D (1, 2)
9.263	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.902	HSG A	2
2.830	HSG B	2
0.597	HSG C	1, 2
3.934	HSG D	1, 2
0.000	Other	
9.263		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.079	0.048	0.004	0.091	0.000	0.222	Dirt roads	1, 2
1.690	0.888	0.439	3.302	0.000	6.319	Row crops, straight row, Good	1, 2
0.000	0.000	0.000	0.005	0.000	0.005	Unconnected pavement	1
0.133	1.894	0.153	0.536	0.000	2.717	Woods, Good	1, 2
1.902	**2.830**	**0.597**	**3.934**	**0.000**	**9.263**	**TOTAL AREA**	

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=1.599 ac 0.31% Impervious Runoff Depth>1.94"
Tc=10.0 min CN=86 Runoff=3.36 cfs 0.259 af

Subcatchment2: Subcat 2 Runoff Area=7.664 ac 0.00% Impervious Runoff Depth>1.01"
Tc=10.0 min CN=72 Runoff=8.10 cfs 0.644 af

Total Runoff Area = 9.263 ac Runoff Volume = 0.903 af Average Runoff Depth = 1.17"
99.95% Pervious = 9.258 ac 0.05% Impervious = 0.005 ac

Summary for Subcatchment 1: Subcat 1

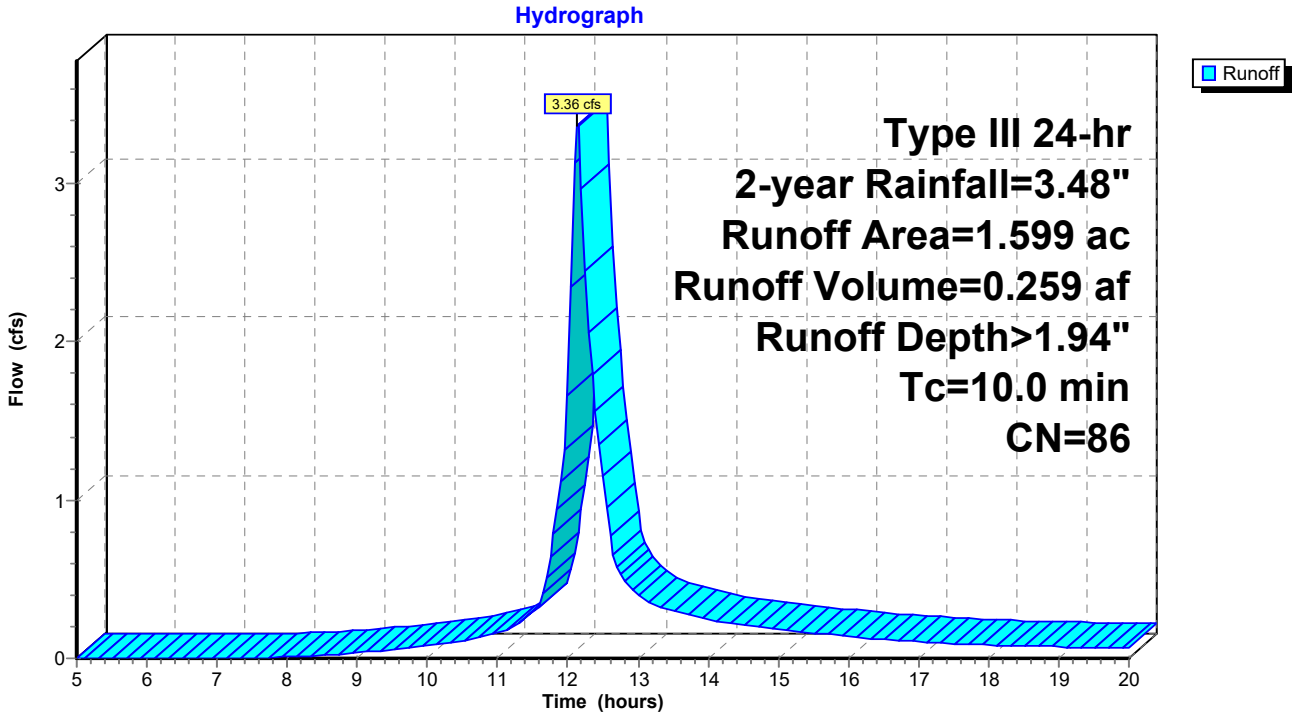
Runoff = 3.36 cfs @ 12.14 hrs, Volume= 0.259 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

Area (ac)	CN	Description
0.005	98	Unconnected pavement, HSG D
0.021	89	Dirt roads, HSG D
0.030	77	Woods, Good, HSG D
0.162	77	Woods, Good, HSG D
1.057	89	Row crops, straight row, Good, HSG D
0.158	89	Row crops, straight row, Good, HSG D
0.004	87	Dirt roads, HSG C
0.145	70	Woods, Good, HSG C
0.007	85	Row crops, straight row, Good, HSG C
0.001	85	Row crops, straight row, Good, HSG C
0.009	85	Row crops, straight row, Good, HSG C
1.599	86	Weighted Average
1.594		99.69% Pervious Area
0.005		0.31% Impervious Area
0.005		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

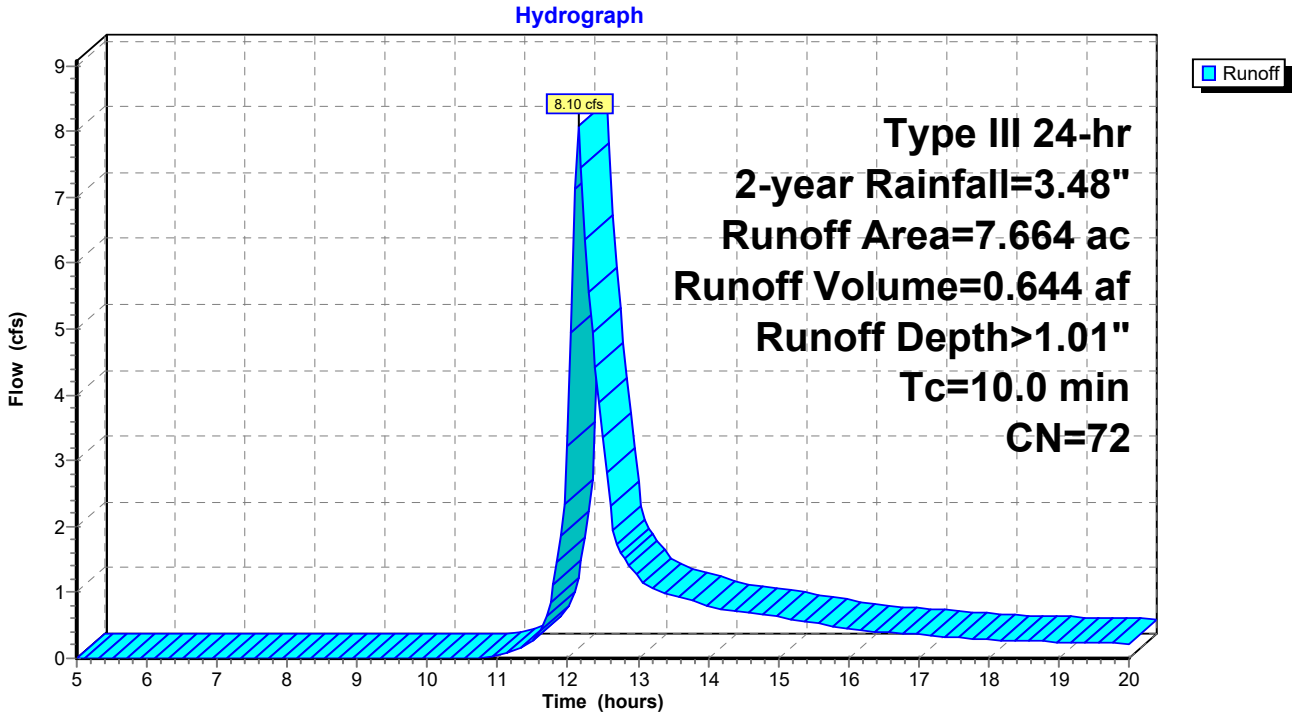
Runoff = 8.10 cfs @ 12.15 hrs, Volume= 0.644 af, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

Area (ac)	CN	Description
0.000	77	Woods, Good, HSG D
0.053	89	Row crops, straight row, Good, HSG D
1.959	89	Row crops, straight row, Good, HSG D
0.009	89	Row crops, straight row, Good, HSG D
0.059	89	Row crops, straight row, Good, HSG D
0.104	77	Woods, Good, HSG D
0.074	77	Woods, Good, HSG D
0.164	77	Woods, Good, HSG D
0.070	89	Dirt roads, HSG D
0.003	70	Woods, Good, HSG C
0.423	85	Row crops, straight row, Good, HSG C
0.005	70	Woods, Good, HSG C
1.496	67	Row crops, straight row, Good, HSG A
0.062	67	Row crops, straight row, Good, HSG A
0.131	67	Row crops, straight row, Good, HSG A
0.000	30	Woods, Good, HSG A
0.133	30	Woods, Good, HSG A
0.012	72	Dirt roads, HSG A
0.067	72	Dirt roads, HSG A
0.007	89	Row crops, straight row, Good, HSG D
0.001	77	Woods, Good, HSG D
0.000	77	Woods, Good, HSG D
0.048	82	Dirt roads, HSG B
1.894	55	Woods, Good, HSG B
0.011	78	Row crops, straight row, Good, HSG B
0.150	78	Row crops, straight row, Good, HSG B
0.714	78	Row crops, straight row, Good, HSG B
0.013	78	Row crops, straight row, Good, HSG B
7.664	72	Weighted Average
7.664		100.00% Pervious Area

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

Subcatchment 2: Subcat 2



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

Subcatchment1: Subcat 1 Runoff Area=1.599 ac 0.31% Impervious Runoff Depth>4.64"
Tc=10.0 min CN=86 Runoff=7.74 cfs 0.618 af

Subcatchment2: Subcat 2 Runoff Area=7.664 ac 0.00% Impervious Runoff Depth>3.19"
Tc=10.0 min CN=72 Runoff=26.61 cfs 2.037 af

Total Runoff Area = 9.263 ac Runoff Volume = 2.654 af Average Runoff Depth = 3.44"
99.95% Pervious = 9.258 ac 0.05% Impervious = 0.005 ac

Summary for Subcatchment 1: Subcat 1

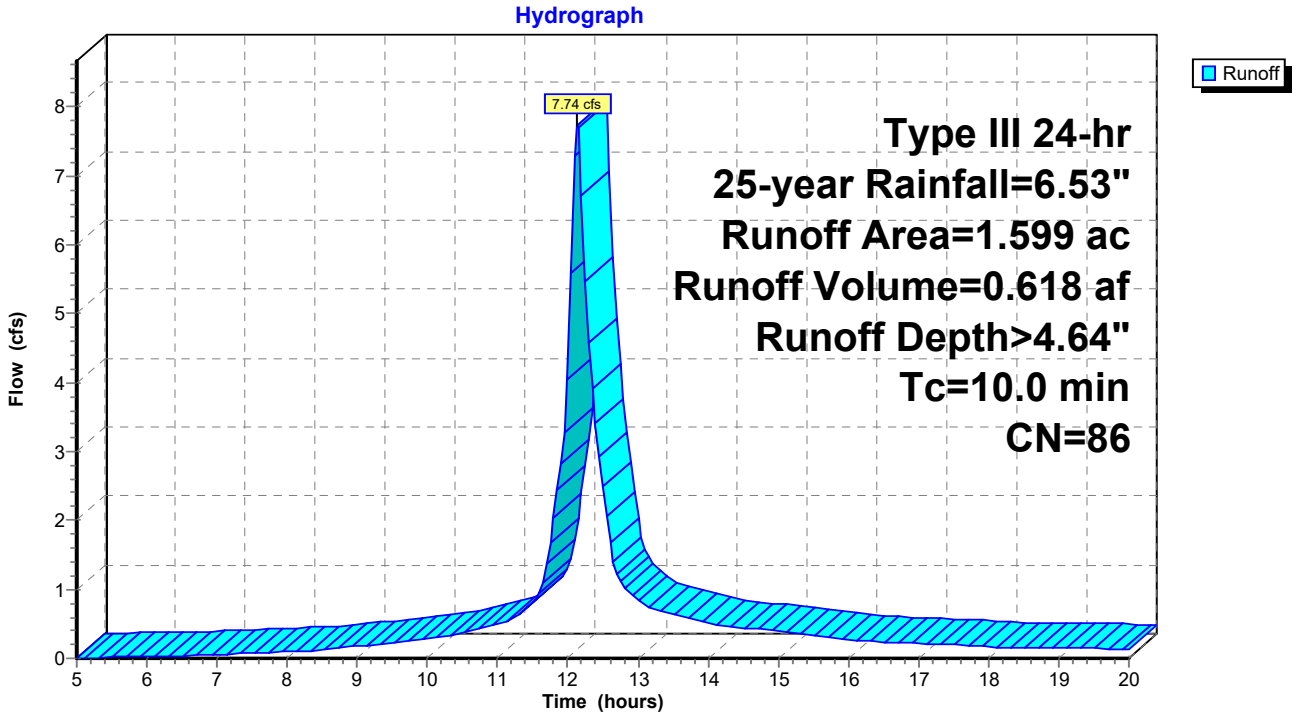
Runoff = 7.74 cfs @ 12.14 hrs, Volume= 0.618 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.53"

Area (ac)	CN	Description
0.005	98	Unconnected pavement, HSG D
0.021	89	Dirt roads, HSG D
0.030	77	Woods, Good, HSG D
0.162	77	Woods, Good, HSG D
1.057	89	Row crops, straight row, Good, HSG D
0.158	89	Row crops, straight row, Good, HSG D
0.004	87	Dirt roads, HSG C
0.145	70	Woods, Good, HSG C
0.007	85	Row crops, straight row, Good, HSG C
0.001	85	Row crops, straight row, Good, HSG C
0.009	85	Row crops, straight row, Good, HSG C
1.599	86	Weighted Average
1.594		99.69% Pervious Area
0.005		0.31% Impervious Area
0.005		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

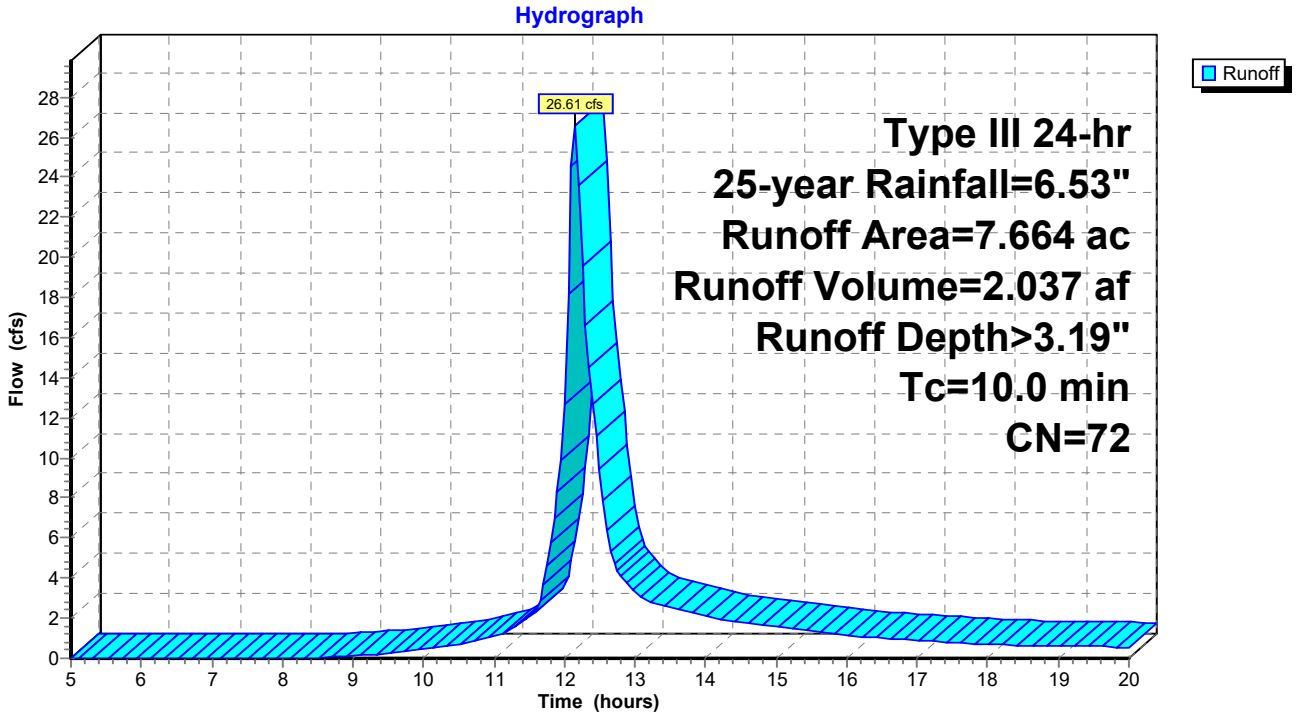
Runoff = 26.61 cfs @ 12.15 hrs, Volume= 2.037 af, Depth> 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.53"

Area (ac)	CN	Description
0.000	77	Woods, Good, HSG D
0.053	89	Row crops, straight row, Good, HSG D
1.959	89	Row crops, straight row, Good, HSG D
0.009	89	Row crops, straight row, Good, HSG D
0.059	89	Row crops, straight row, Good, HSG D
0.104	77	Woods, Good, HSG D
0.074	77	Woods, Good, HSG D
0.164	77	Woods, Good, HSG D
0.070	89	Dirt roads, HSG D
0.003	70	Woods, Good, HSG C
0.423	85	Row crops, straight row, Good, HSG C
0.005	70	Woods, Good, HSG C
1.496	67	Row crops, straight row, Good, HSG A
0.062	67	Row crops, straight row, Good, HSG A
0.131	67	Row crops, straight row, Good, HSG A
0.000	30	Woods, Good, HSG A
0.133	30	Woods, Good, HSG A
0.012	72	Dirt roads, HSG A
0.067	72	Dirt roads, HSG A
0.007	89	Row crops, straight row, Good, HSG D
0.001	77	Woods, Good, HSG D
0.000	77	Woods, Good, HSG D
0.048	82	Dirt roads, HSG B
1.894	55	Woods, Good, HSG B
0.011	78	Row crops, straight row, Good, HSG B
0.150	78	Row crops, straight row, Good, HSG B
0.714	78	Row crops, straight row, Good, HSG B
0.013	78	Row crops, straight row, Good, HSG B
7.664	72	Weighted Average
7.664		100.00% Pervious Area

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

Subcatchment 2: Subcat 2



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

Subcatchment1: Subcat 1 Runoff Area=1.599 ac 0.31% Impervious Runoff Depth>5.43"
Tc=10.0 min CN=86 Runoff=8.99 cfs 0.724 af

Subcatchment2: Subcat 2 Runoff Area=7.664 ac 0.00% Impervious Runoff Depth>3.89"
Tc=10.0 min CN=72 Runoff=32.37 cfs 2.483 af

Total Runoff Area = 9.263 ac Runoff Volume = 3.207 af Average Runoff Depth = 4.15"
99.95% Pervious = 9.258 ac 0.05% Impervious = 0.005 ac

Summary for Subcatchment 1: Subcat 1

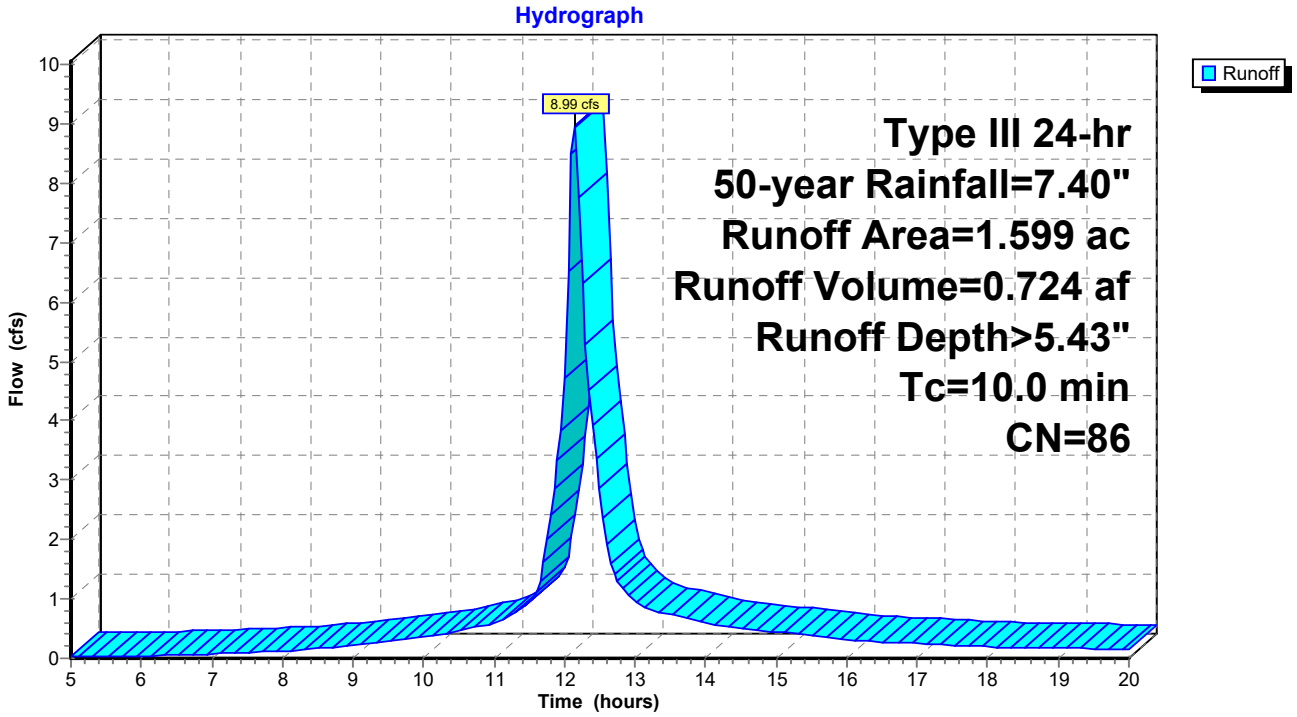
Runoff = 8.99 cfs @ 12.14 hrs, Volume= 0.724 af, Depth> 5.43"

Runoff 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=7.40"

Area (ac)	CN	Description
0.005	98	Unconnected pavement, HSG D
0.021	89	Dirt roads, HSG D
0.030	77	Woods, Good, HSG D
0.162	77	Woods, Good, HSG D
1.057	89	Row crops, straight row, Good, HSG D
0.158	89	Row crops, straight row, Good, HSG D
0.004	87	Dirt roads, HSG C
0.145	70	Woods, Good, HSG C
0.007	85	Row crops, straight row, Good, HSG C
0.001	85	Row crops, straight row, Good, HSG C
0.009	85	Row crops, straight row, Good, HSG C
1.599	86	Weighted Average
1.594		99.69% Pervious Area
0.005		0.31% Impervious Area
0.005		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

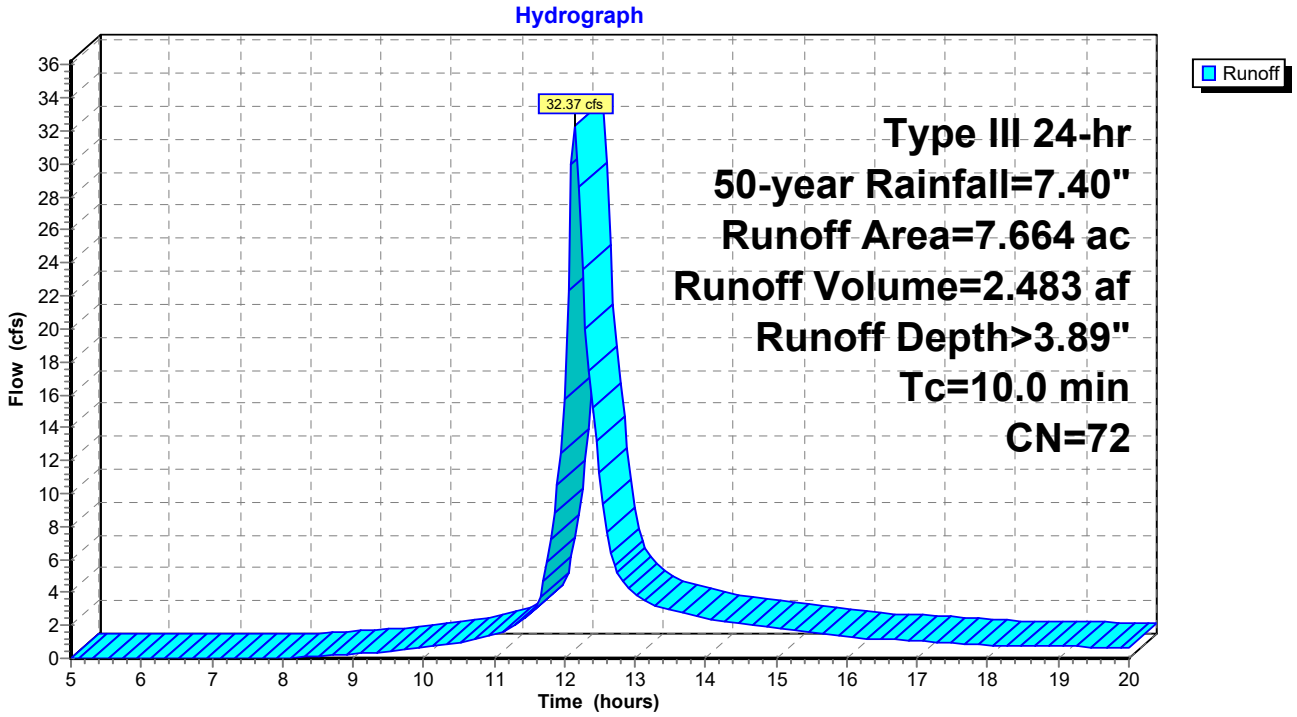
Runoff = 32.37 cfs @ 12.14 hrs, Volume= 2.483 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=7.40"

Area (ac)	CN	Description
0.000	77	Woods, Good, HSG D
0.053	89	Row crops, straight row, Good, HSG D
1.959	89	Row crops, straight row, Good, HSG D
0.009	89	Row crops, straight row, Good, HSG D
0.059	89	Row crops, straight row, Good, HSG D
0.104	77	Woods, Good, HSG D
0.074	77	Woods, Good, HSG D
0.164	77	Woods, Good, HSG D
0.070	89	Dirt roads, HSG D
0.003	70	Woods, Good, HSG C
0.423	85	Row crops, straight row, Good, HSG C
0.005	70	Woods, Good, HSG C
1.496	67	Row crops, straight row, Good, HSG A
0.062	67	Row crops, straight row, Good, HSG A
0.131	67	Row crops, straight row, Good, HSG A
0.000	30	Woods, Good, HSG A
0.133	30	Woods, Good, HSG A
0.012	72	Dirt roads, HSG A
0.067	72	Dirt roads, HSG A
0.007	89	Row crops, straight row, Good, HSG D
0.001	77	Woods, Good, HSG D
0.000	77	Woods, Good, HSG D
0.048	82	Dirt roads, HSG B
1.894	55	Woods, Good, HSG B
0.011	78	Row crops, straight row, Good, HSG B
0.150	78	Row crops, straight row, Good, HSG B
0.714	78	Row crops, straight row, Good, HSG B
0.013	78	Row crops, straight row, Good, HSG B
7.664	72	Weighted Average
7.664		100.00% Pervious Area

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

Subcatchment 2: Subcat 2



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

Subcatchment1: Subcat 1 Runoff Area=1.599 ac 0.31% Impervious Runoff Depth>6.29"
Tc=10.0 min CN=86 Runoff=10.33 cfs 0.838 af

Subcatchment2: Subcat 2 Runoff Area=7.664 ac 0.00% Impervious Runoff Depth>4.67"
Tc=10.0 min CN=72 Runoff=38.70 cfs 2.980 af

Total Runoff Area = 9.263 ac Runoff Volume = 3.818 af Average Runoff Depth = 4.95"
99.95% Pervious = 9.258 ac 0.05% Impervious = 0.005 ac

Summary for Subcatchment 1: Subcat 1

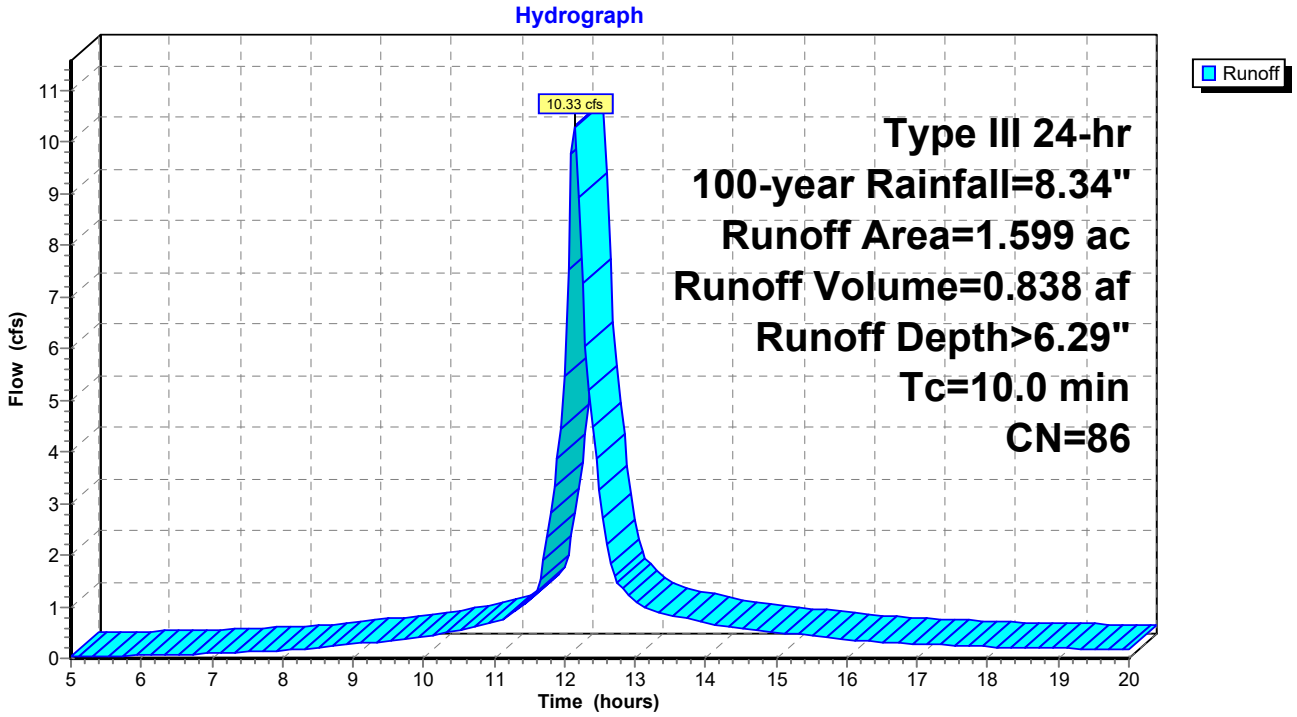
Runoff = 10.33 cfs @ 12.14 hrs, Volume= 0.838 af, Depth> 6.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.34"

Area (ac)	CN	Description
0.005	98	Unconnected pavement, HSG D
0.021	89	Dirt roads, HSG D
0.030	77	Woods, Good, HSG D
0.162	77	Woods, Good, HSG D
1.057	89	Row crops, straight row, Good, HSG D
0.158	89	Row crops, straight row, Good, HSG D
0.004	87	Dirt roads, HSG C
0.145	70	Woods, Good, HSG C
0.007	85	Row crops, straight row, Good, HSG C
0.001	85	Row crops, straight row, Good, HSG C
0.009	85	Row crops, straight row, Good, HSG C
1.599	86	Weighted Average
1.594		99.69% Pervious Area
0.005		0.31% Impervious Area
0.005		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

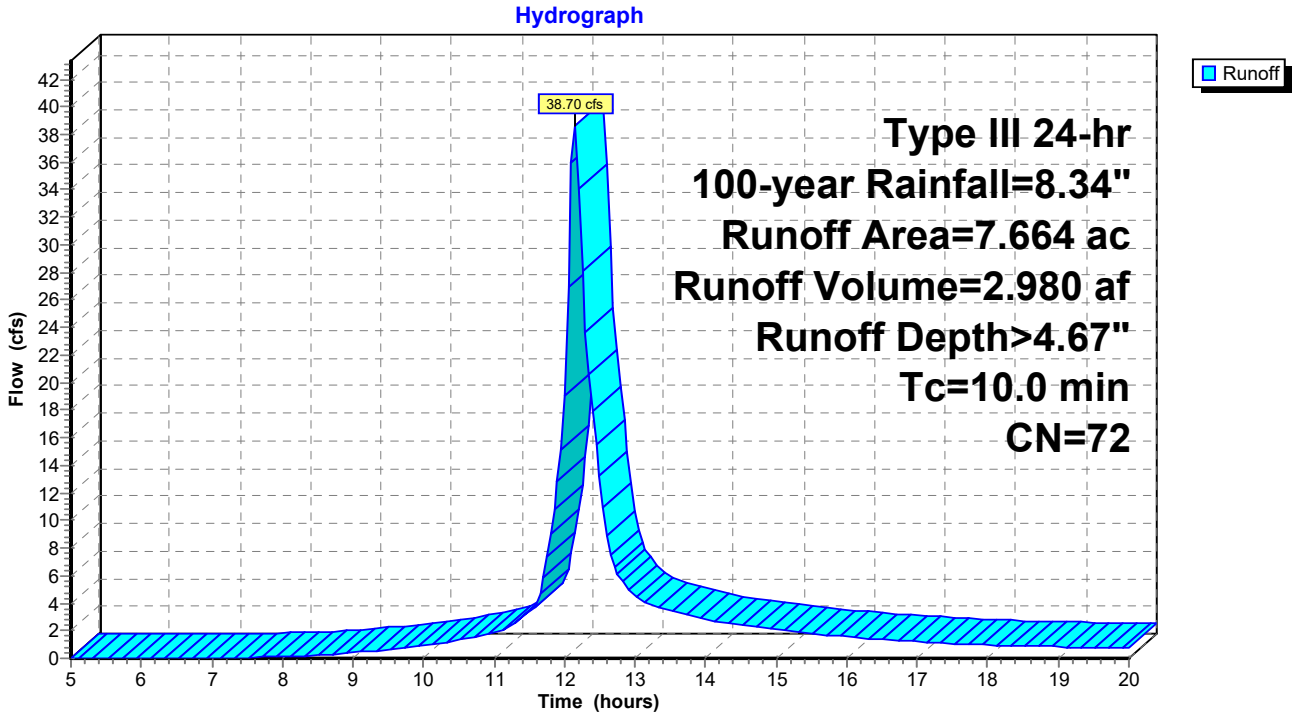
Runoff = 38.70 cfs @ 12.14 hrs, Volume= 2.980 af, Depth> 4.67"

Runoff 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=8.34"

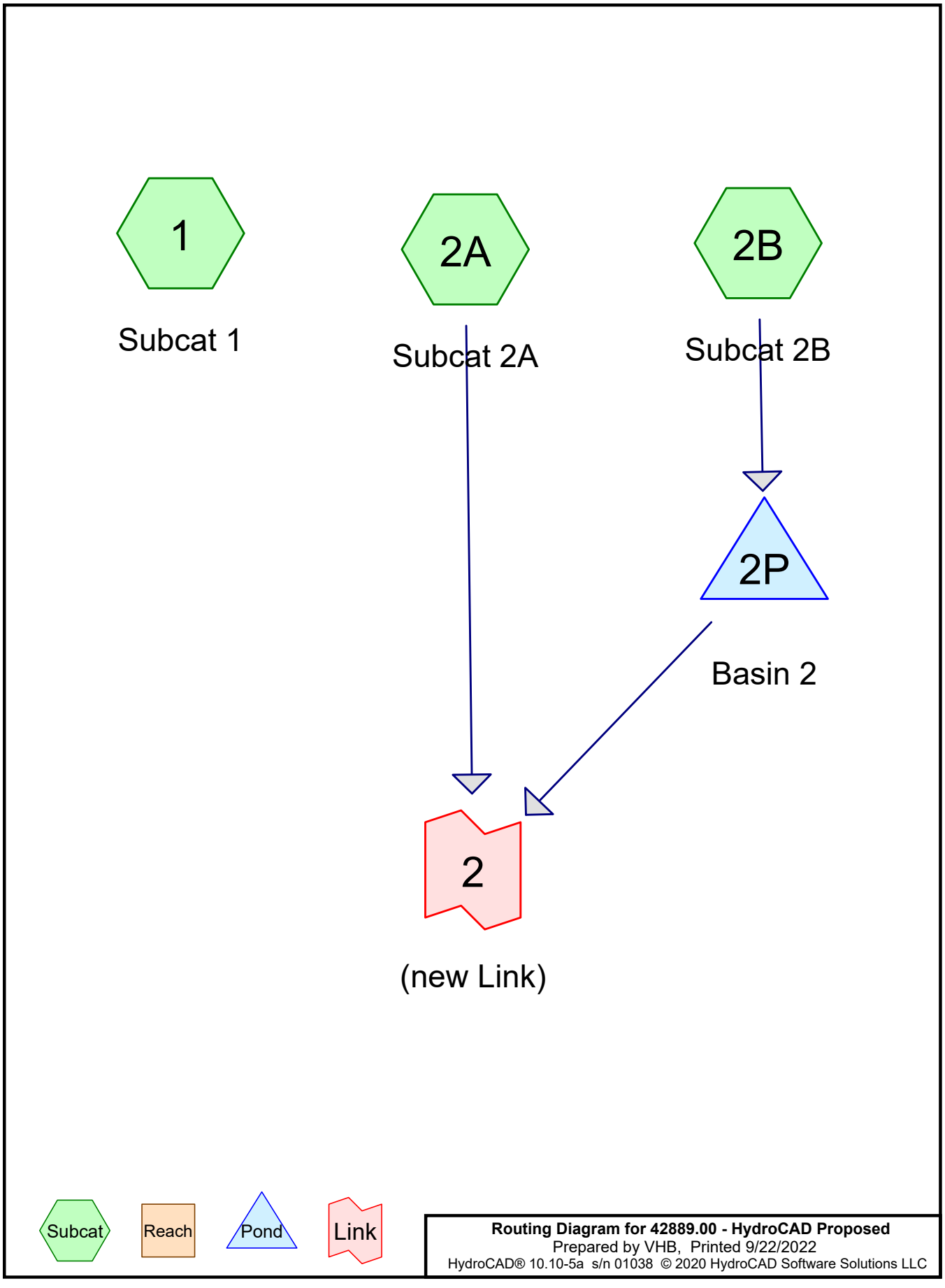
Area (ac)	CN	Description
0.000	77	Woods, Good, HSG D
0.053	89	Row crops, straight row, Good, HSG D
1.959	89	Row crops, straight row, Good, HSG D
0.009	89	Row crops, straight row, Good, HSG D
0.059	89	Row crops, straight row, Good, HSG D
0.104	77	Woods, Good, HSG D
0.074	77	Woods, Good, HSG D
0.164	77	Woods, Good, HSG D
0.070	89	Dirt roads, HSG D
0.003	70	Woods, Good, HSG C
0.423	85	Row crops, straight row, Good, HSG C
0.005	70	Woods, Good, HSG C
1.496	67	Row crops, straight row, Good, HSG A
0.062	67	Row crops, straight row, Good, HSG A
0.131	67	Row crops, straight row, Good, HSG A
0.000	30	Woods, Good, HSG A
0.133	30	Woods, Good, HSG A
0.012	72	Dirt roads, HSG A
0.067	72	Dirt roads, HSG A
0.007	89	Row crops, straight row, Good, HSG D
0.001	77	Woods, Good, HSG D
0.000	77	Woods, Good, HSG D
0.048	82	Dirt roads, HSG B
1.894	55	Woods, Good, HSG B
0.011	78	Row crops, straight row, Good, HSG B
0.150	78	Row crops, straight row, Good, HSG B
0.714	78	Row crops, straight row, Good, HSG B
0.013	78	Row crops, straight row, Good, HSG B
7.664	72	Weighted Average
7.664		100.00% Pervious Area

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

Subcatchment 2: Subcat 2



HydroCAD Analysis: Proposed Conditions



Routing Diagram for 42889.00 - HydroCAD Proposed
Prepared by VHB, Printed 9/22/2022

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	3.48	2
2	25-year	Type III 24-hr		Default	24.00	1	6.53	2
3	50-year	Type III 24-hr		Default	24.00	1	7.40	2
4	100-year	Type III 24-hr		Default	24.00	1	8.34	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.819	59	50-75% Grass cover, Fair, HSG A-B (2B)
2.078	74	50-75% Grass cover, Fair, HSG B-C (2A, 2B)
0.303	81	50-75% Grass cover, Fair, HSG C-D (1, 2A)
2.928	84	50-75% Grass cover, Fair, HSG D (1, 2A, 2B)
0.082	76	Gravel roads, HSG A (2B)
0.111	85	Gravel roads, HSG B (2B)
0.096	91	Gravel roads, HSG D (1, 2B)
1.000	30	Meadow, non-grazed, HSG A (2B)
0.628	58	Meadow, non-grazed, HSG B (2A, 2B)
0.294	71	Meadow, non-grazed, HSG C (1, 2A)
0.775	78	Meadow, non-grazed, HSG D (1, 2A, 2B)
0.012	98	Unconnected pavement, HSG B (2B)
0.012	98	Unconnected pavement, HSG D (1, 2B)
0.121	77	Woods, Good, HSG D (1, 2B)
9.259	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.901	HSG A	2B
2.829	HSG B	2A, 2B
0.597	HSG C	1, 2A
3.932	HSG D	1, 2A, 2B
0.000	Other	
9.259		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.819	2.078	0.303	2.928	0.000	6.128	50-75% Grass cover, Fair	1, 2A, 2B
0.082	0.111	0.000	0.096	0.000	0.289	Gravel roads	1, 2B
1.000	0.628	0.294	0.775	0.000	2.697	Meadow, non-grazed	1, 2A, 2B
0.000	0.012	0.000	0.012	0.000	0.024	Unconnected pavement	1, 2B
0.000	0.000	0.000	0.121	0.000	0.121	Woods, Good	1, 2B
1.901	**2.829**	**0.597**	**3.932**	**0.000**	**9.259**	**TOTAL AREA**	

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=1.598 ac 0.56% Impervious Runoff Depth>1.57"
Tc=10.0 min CN=81 Runoff=2.73 cfs 0.209 af

Subcatchment2A: Subcat 2A Runoff Area=2.215 ac 0.00% Impervious Runoff Depth>1.50"
Tc=0.0 min CN=80 Runoff=4.81 cfs 0.278 af

Subcatchment2B: Subcat 2B Runoff Area=5.446 ac 0.28% Impervious Runoff Depth>0.62"
Tc=0.0 min CN=64 Runoff=4.12 cfs 0.282 af

Pond 2P: Basin 2 Peak Elev=46.91' Storage=0.177 af Inflow=4.12 cfs 0.282 af
Discarded=0.17 cfs 0.113 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.113 af

Link 2: (new Link) Inflow=4.81 cfs 0.278 af
Primary=4.81 cfs 0.278 af

Total Runoff Area = 9.259 ac Runoff Volume = 0.768 af Average Runoff Depth = 1.00"
99.74% Pervious = 9.235 ac 0.26% Impervious = 0.024 ac

Summary for Subcatchment 1: Subcat 1

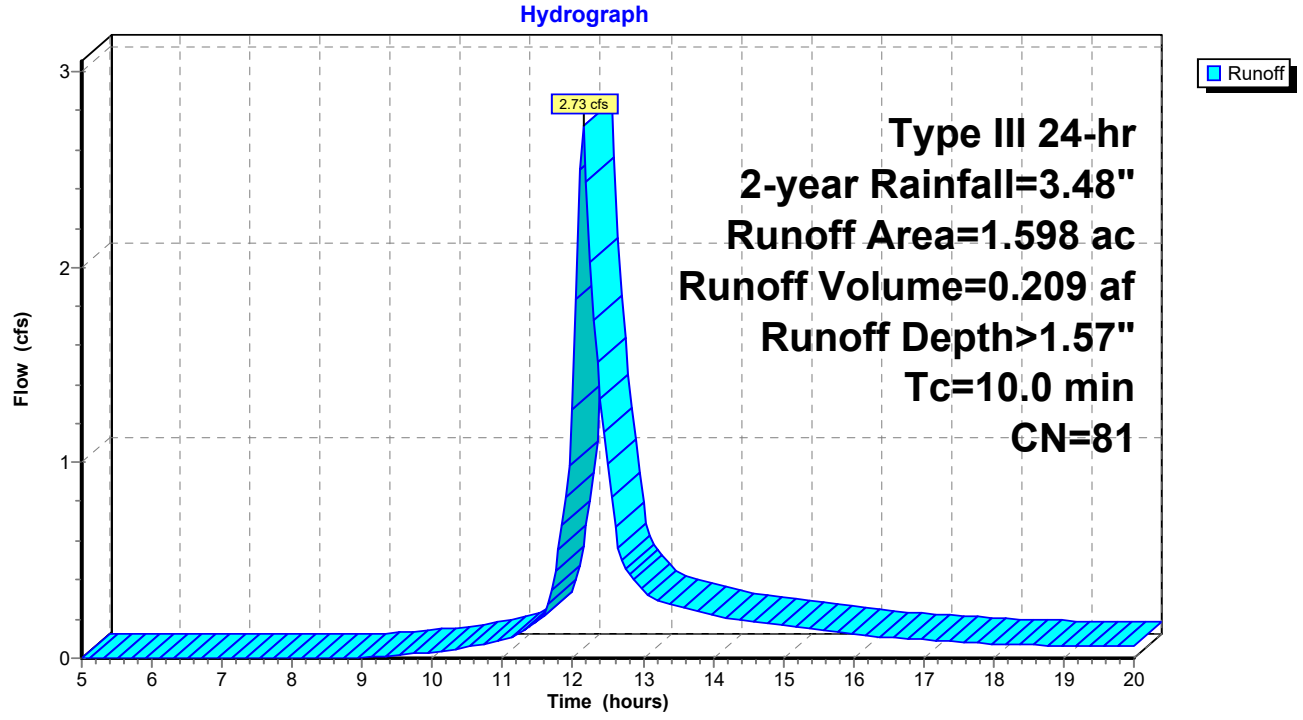
Runoff = 2.73 cfs @ 12.15 hrs, Volume= 0.209 af, Depth> 1.57"

Runoff 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=3.48"

	Area (ac)	CN	Description
	0.437	78	Meadow, non-grazed, HSG D
	0.015	77	Woods, Good, HSG D
	0.005	91	Gravel roads, HSG D
	0.022	91	Gravel roads, HSG D
	0.009	98	Unconnected pavement, HSG D
	0.868	84	50-75% Grass cover, Fair, HSG D
	0.077	77	Woods, Good, HSG D
	0.162	71	Meadow, non-grazed, HSG C
*	0.003	81	50-75% Grass cover, Fair, HSG C-D
	1.598	81	Weighted Average
	1.589		99.44% Pervious Area
	0.009		0.56% Impervious Area
	0.009		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2A: Subcat 2A

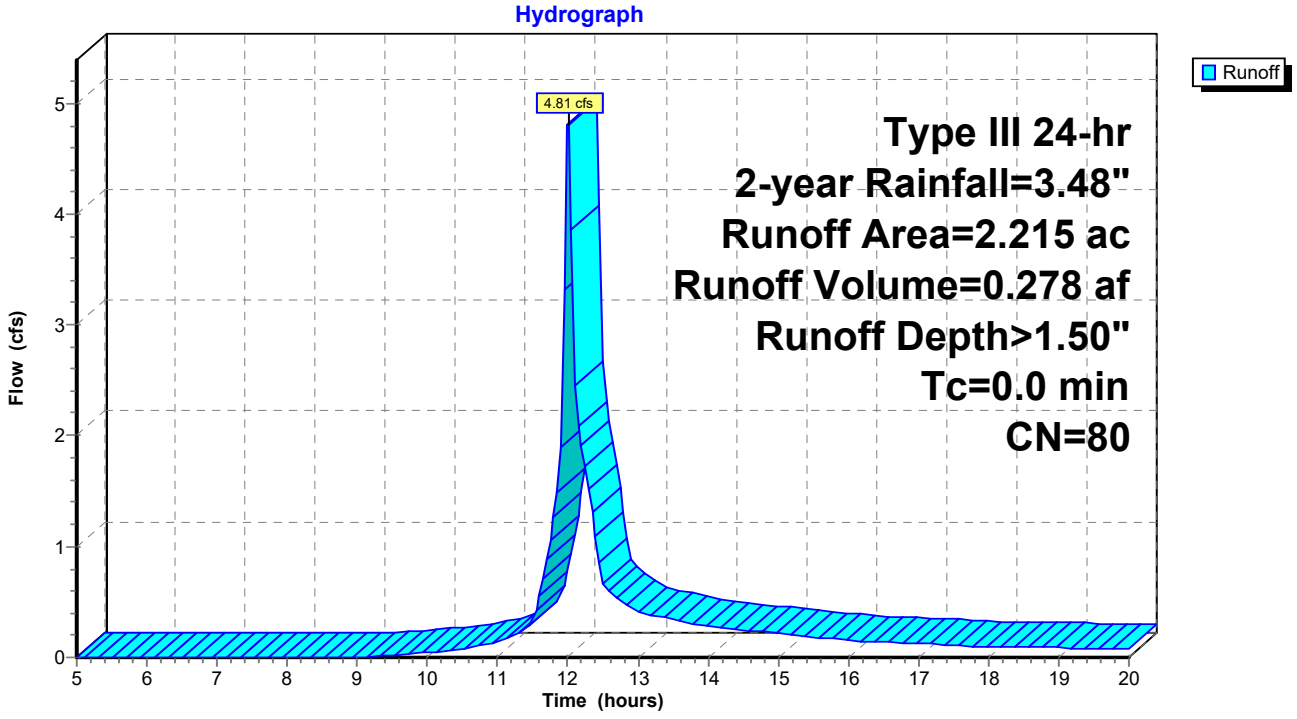
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 4.81 cfs @ 12.01 hrs, Volume= 0.278 af, Depth> 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.48"

	Area (ac)	CN	Description
	0.274	78	Meadow, non-grazed, HSG D
	1.296	84	50-75% Grass cover, Fair, HSG D
	0.132	71	Meadow, non-grazed, HSG C
*	0.300	81	50-75% Grass cover, Fair, HSG C-D
	0.009	78	Meadow, non-grazed, HSG D
	0.102	58	Meadow, non-grazed, HSG B
*	0.102	74	50-75% Grass cover, Fair, HSG B-C
	2.215	80	Weighted Average
	2.215		100.00% Pervious Area

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 2B: Subcat 2B

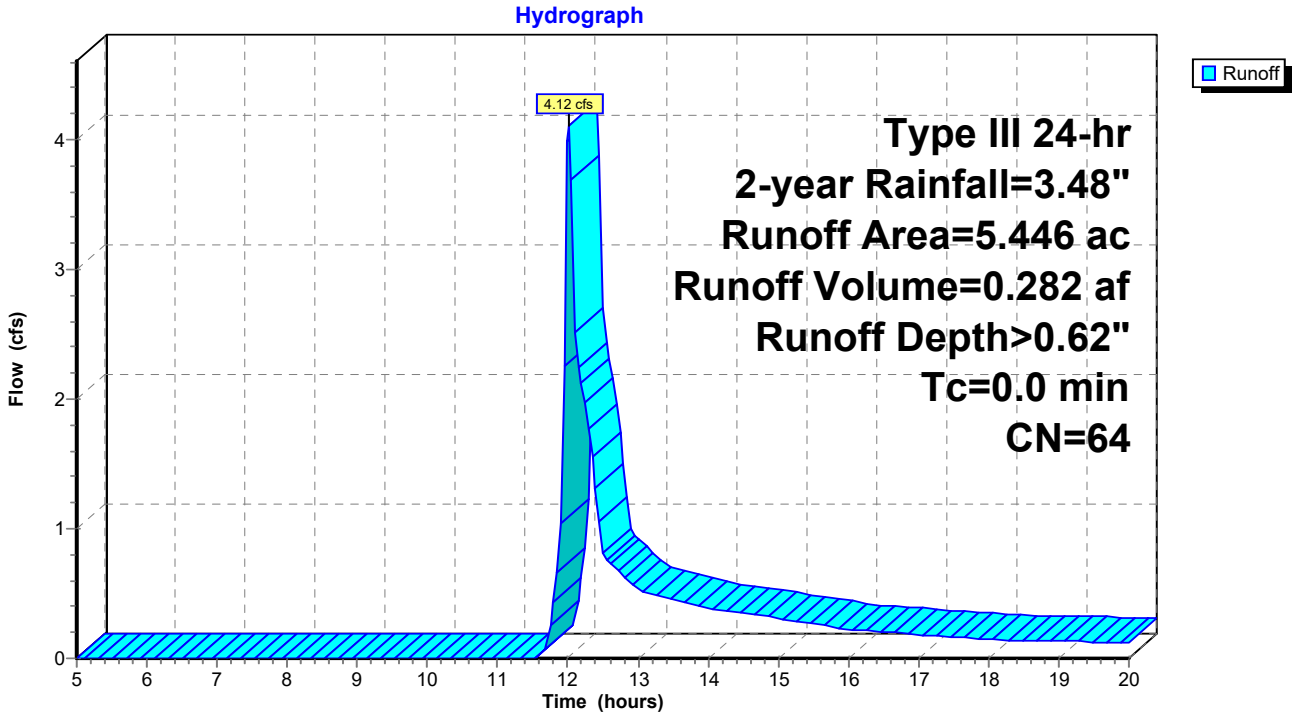
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 4.12 cfs @ 12.02 hrs, Volume= 0.282 af, Depth> 0.62"

Runoff 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=3.48"

	Area (ac)	CN	Description
	0.003	98	Unconnected pavement, HSG D
	0.000	98	Unconnected pavement, HSG D
	0.029	77	Woods, Good, HSG D
	0.013	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.042	78	Meadow, non-grazed, HSG D
	0.755	84	50-75% Grass cover, Fair, HSG D
	0.009	84	50-75% Grass cover, Fair, HSG D
	0.069	91	Gravel roads, HSG D
	1.000	30	Meadow, non-grazed, HSG A
*	0.819	59	50-75% Grass cover, Fair, HSG A-B
	0.082	76	Gravel roads, HSG A
	0.012	98	Unconnected pavement, HSG B
	0.111	85	Gravel roads, HSG B
*	1.976	74	50-75% Grass cover, Fair, HSG B-C
	0.513	58	Meadow, non-grazed, HSG B
	0.013	58	Meadow, non-grazed, HSG B
	5.446	64	Weighted Average
	5.431		99.72% Pervious Area
	0.015		0.28% Impervious Area
	0.015		100.00% Unconnected

Subcatchment 2B: Subcat 2B



Summary for Pond 2P: Basin 2

Inflow Area = 5.446 ac, 0.28% Impervious, Inflow Depth > 0.62" for 2-year event
Inflow = 4.12 cfs @ 12.02 hrs, Volume= 0.282 af
Outflow = 0.17 cfs @ 17.34 hrs, Volume= 0.113 af, Atten= 96%, Lag= 319.3 min
Discarded = 0.17 cfs @ 17.34 hrs, Volume= 0.113 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= 46.91' @ 17.34 hrs Surf.Area= 0.105 ac Storage= 0.177 af

Plug-Flow detention time= 232.2 min calculated for 0.112 af (40% of inflow)
Center-of-Mass det. time= 124.8 min (960.3 - 835.5)

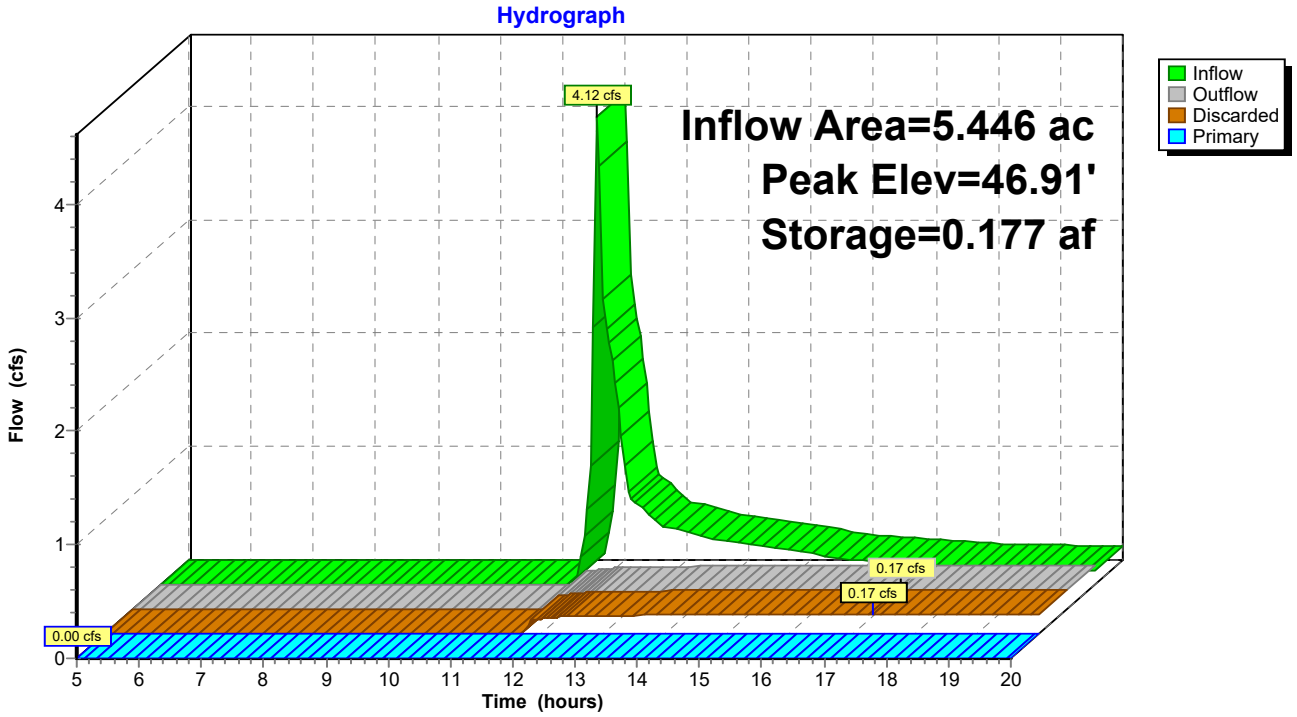
Volume	Invert	Avail.Storage	Storage Description
#1	45.00'	0.428 af	**35.00'W x 100.00'L x 4.00'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	45.00'	**1.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.17 cfs @ 17.34 hrs HW=46.91' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Basin 2

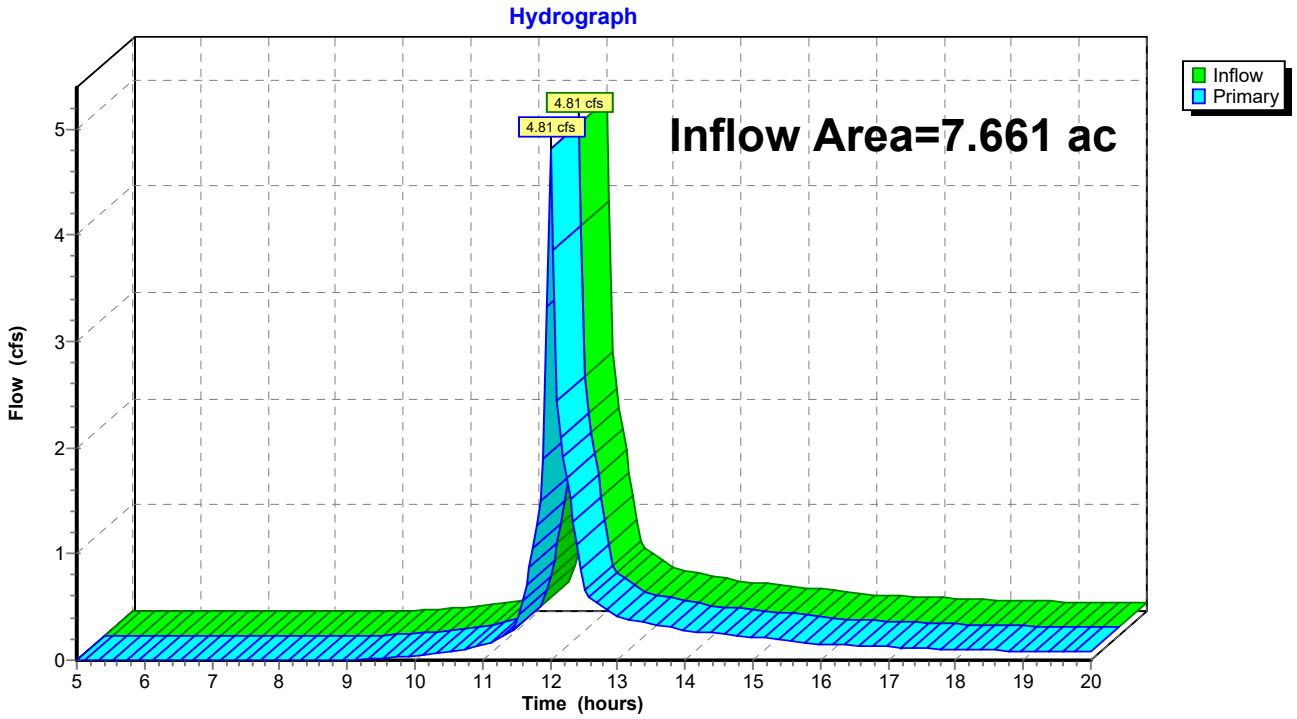


Summary for Link 2: (new Link)

Inflow Area = 7.661 ac, 0.20% Impervious, Inflow Depth > 0.43" for 2-year event
Inflow = 4.81 cfs @ 12.01 hrs, Volume= 0.278 af
Primary = 4.81 cfs @ 12.01 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min

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

Link 2: (new Link)



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=1.598 ac 0.56% Impervious Runoff Depth>4.10"
Tc=10.0 min CN=81 Runoff=7.01 cfs 0.546 af

Subcatchment2A: Subcat 2A Runoff Area=2.215 ac 0.00% Impervious Runoff Depth>4.01"
Tc=0.0 min CN=80 Runoff=12.62 cfs 0.740 af

Subcatchment2B: Subcat 2B Runoff Area=5.446 ac 0.28% Impervious Runoff Depth>2.44"
Tc=0.0 min CN=64 Runoff=19.11 cfs 1.109 af

Pond 2P: Basin 2 Peak Elev=48.47' Storage=0.358 af Inflow=19.11 cfs 1.109 af
Discarded=0.22 cfs 0.156 af Primary=8.34 cfs 0.649 af Outflow=8.55 cfs 0.806 af

Link 2: (new Link) Inflow=13.36 cfs 1.389 af
Primary=13.36 cfs 1.389 af

Total Runoff Area = 9.259 ac Runoff Volume = 2.395 af Average Runoff Depth = 3.10"
99.74% Pervious = 9.235 ac 0.26% Impervious = 0.024 ac

Summary for Subcatchment 1: Subcat 1

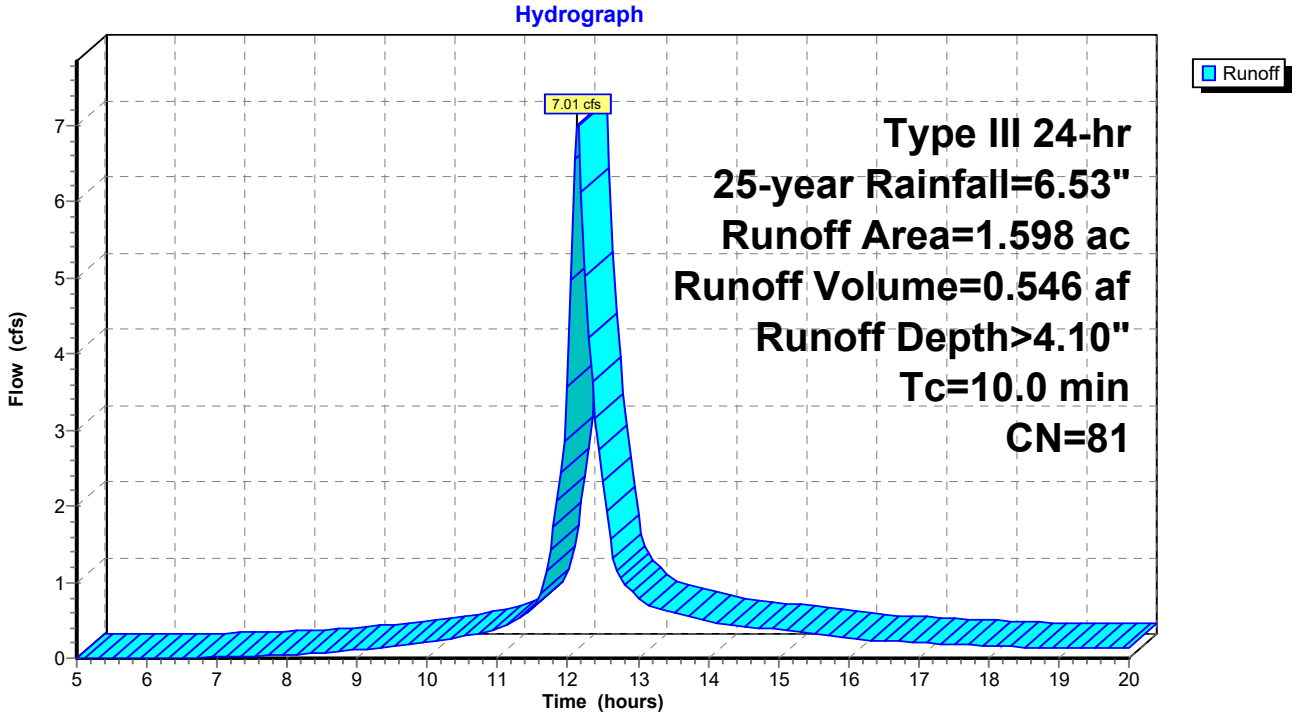
Runoff = 7.01 cfs @ 12.14 hrs, Volume= 0.546 af, Depth> 4.10"

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 25-year Rainfall=6.53"

	Area (ac)	CN	Description
	0.437	78	Meadow, non-grazed, HSG D
	0.015	77	Woods, Good, HSG D
	0.005	91	Gravel roads, HSG D
	0.022	91	Gravel roads, HSG D
	0.009	98	Unconnected pavement, HSG D
	0.868	84	50-75% Grass cover, Fair, HSG D
	0.077	77	Woods, Good, HSG D
	0.162	71	Meadow, non-grazed, HSG C
*	0.003	81	50-75% Grass cover, Fair, HSG C-D
	1.598	81	Weighted Average
	1.589		99.44% Pervious Area
	0.009		0.56% Impervious Area
	0.009		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2A: Subcat 2A

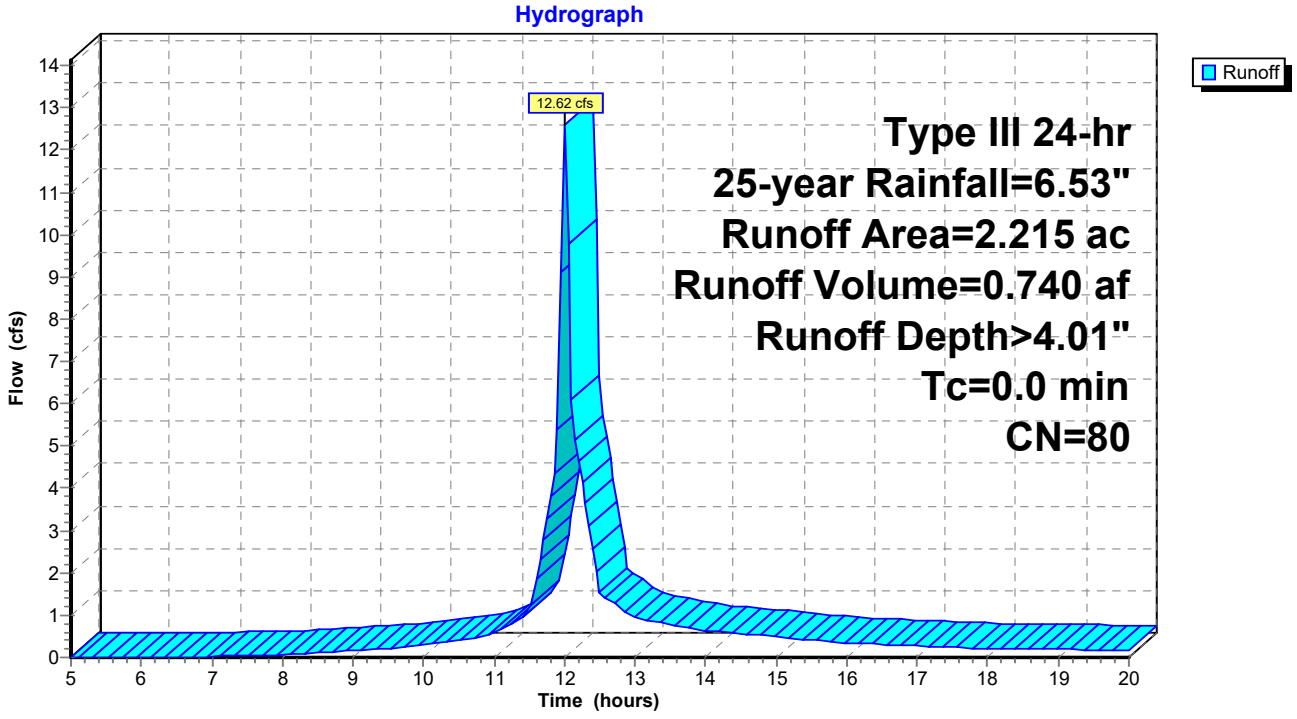
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 12.62 cfs @ 12.00 hrs, Volume= 0.740 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.53"

	Area (ac)	CN	Description
	0.274	78	Meadow, non-grazed, HSG D
	1.296	84	50-75% Grass cover, Fair, HSG D
	0.132	71	Meadow, non-grazed, HSG C
*	0.300	81	50-75% Grass cover, Fair, HSG C-D
	0.009	78	Meadow, non-grazed, HSG D
	0.102	58	Meadow, non-grazed, HSG B
*	0.102	74	50-75% Grass cover, Fair, HSG B-C
	2.215	80	Weighted Average
	2.215		100.00% Pervious Area

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 2B: Subcat 2B

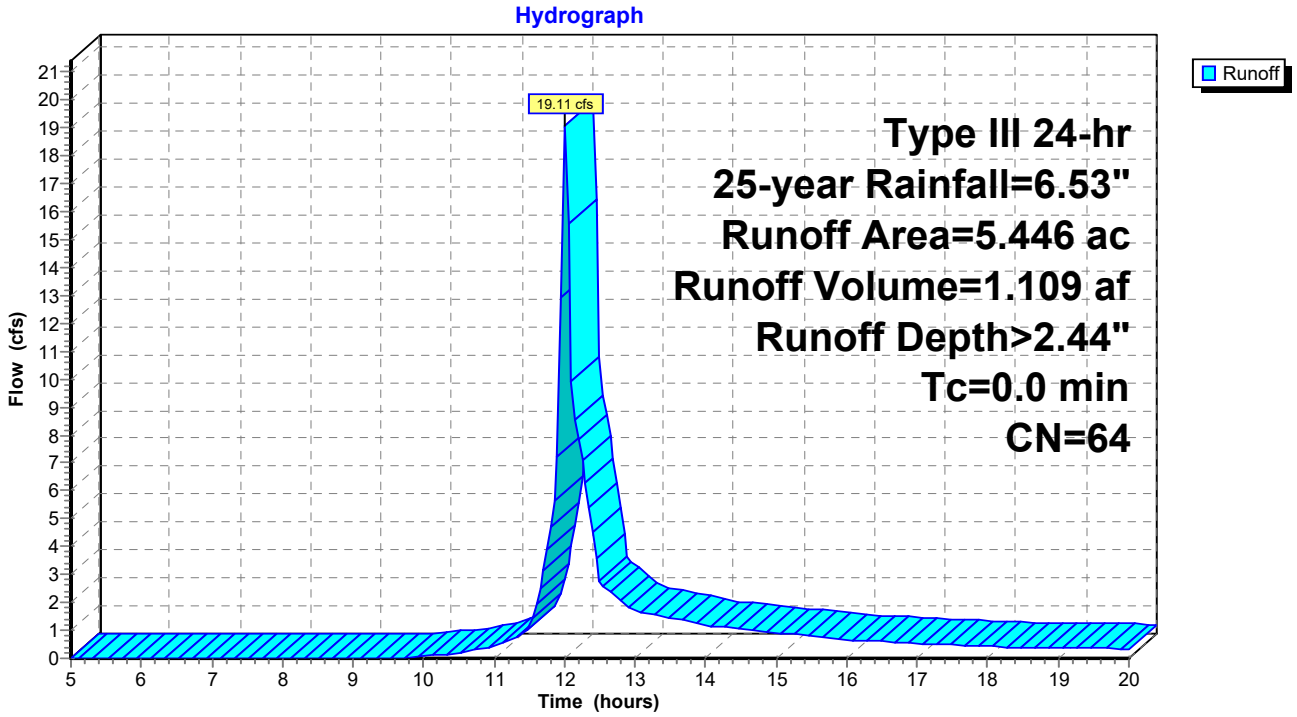
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 19.11 cfs @ 12.01 hrs, Volume= 1.109 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.53"

	Area (ac)	CN	Description
	0.003	98	Unconnected pavement, HSG D
	0.000	98	Unconnected pavement, HSG D
	0.029	77	Woods, Good, HSG D
	0.013	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.042	78	Meadow, non-grazed, HSG D
	0.755	84	50-75% Grass cover, Fair, HSG D
	0.009	84	50-75% Grass cover, Fair, HSG D
	0.069	91	Gravel roads, HSG D
	1.000	30	Meadow, non-grazed, HSG A
*	0.819	59	50-75% Grass cover, Fair, HSG A-B
	0.082	76	Gravel roads, HSG A
	0.012	98	Unconnected pavement, HSG B
	0.111	85	Gravel roads, HSG B
*	1.976	74	50-75% Grass cover, Fair, HSG B-C
	0.513	58	Meadow, non-grazed, HSG B
	0.013	58	Meadow, non-grazed, HSG B
	5.446	64	Weighted Average
	5.431		99.72% Pervious Area
	0.015		0.28% Impervious Area
	0.015		100.00% Unconnected

Subcatchment 2B: Subcat 2B



Summary for Pond 2P: Basin 2

Inflow Area = 5.446 ac, 0.28% Impervious, Inflow Depth > 2.44" for 25-year event
Inflow = 19.11 cfs @ 12.01 hrs, Volume= 1.109 af
Outflow = 8.55 cfs @ 12.17 hrs, Volume= 0.806 af, Atten= 55%, Lag= 9.8 min
Discarded = 0.22 cfs @ 12.17 hrs, Volume= 0.156 af
Primary = 8.34 cfs @ 12.17 hrs, Volume= 0.649 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.47' @ 12.17 hrs Surf.Area= 0.128 ac Storage= 0.358 af

Plug-Flow detention time= 106.9 min calculated for 0.803 af (72% of inflow)
Center-of-Mass det. time= 41.0 min (844.1 - 803.0)

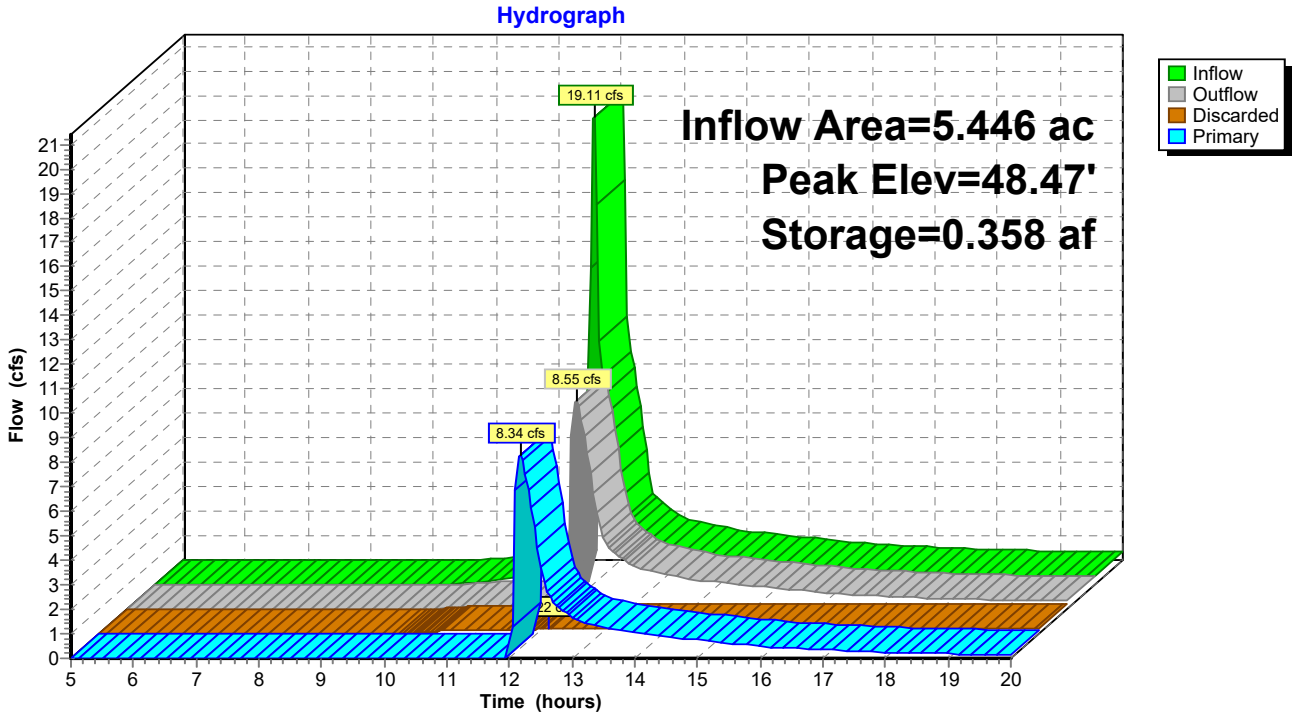
Volume	Invert	Avail.Storage	Storage Description
#1	45.00'	0.428 af	**35.00'W x 100.00'L x 4.00'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	45.00'	**1.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 12.17 hrs HW=48.46' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=8.15 cfs @ 12.17 hrs HW=48.46' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 8.15 cfs @ 1.76 fps)

Pond 2P: Basin 2

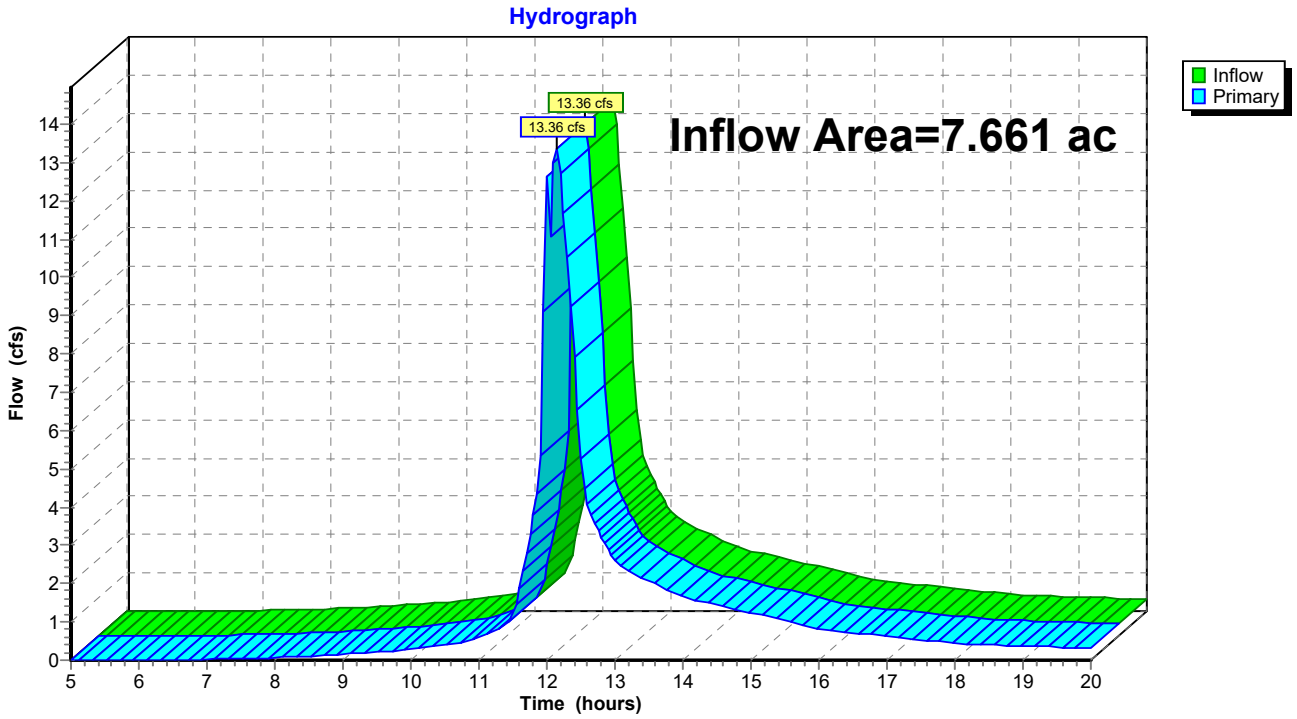


Summary for Link 2: (new Link)

Inflow Area = 7.661 ac, 0.20% Impervious, Inflow Depth > 2.18" for 25-year event
Inflow = 13.36 cfs @ 12.14 hrs, Volume= 1.389 af
Primary = 13.36 cfs @ 12.14 hrs, Volume= 1.389 af, Atten= 0%, Lag= 0.0 min

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

Link 2: (new Link)



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=1.598 ac 0.56% Impervious Runoff Depth>4.87"
Tc=10.0 min CN=81 Runoff=8.26 cfs 0.648 af

Subcatchment2A: Subcat 2A Runoff Area=2.215 ac 0.00% Impervious Runoff Depth>4.77"
Tc=0.0 min CN=80 Runoff=14.91 cfs 0.881 af

Subcatchment2B: Subcat 2B Runoff Area=5.446 ac 0.28% Impervious Runoff Depth>3.07"
Tc=0.0 min CN=64 Runoff=24.10 cfs 1.391 af

Pond 2P: Basin 2 Peak Elev=48.70' Storage=0.388 af Inflow=24.10 cfs 1.391 af
Discarded=0.22 cfs 0.163 af Primary=15.64 cfs 0.924 af Outflow=15.87 cfs 1.086 af

Link 2: (new Link) Inflow=26.65 cfs 1.804 af
Primary=26.65 cfs 1.804 af

Total Runoff Area = 9.259 ac Runoff Volume = 2.921 af Average Runoff Depth = 3.79"
99.74% Pervious = 9.235 ac 0.26% Impervious = 0.024 ac

Summary for Subcatchment 1: Subcat 1

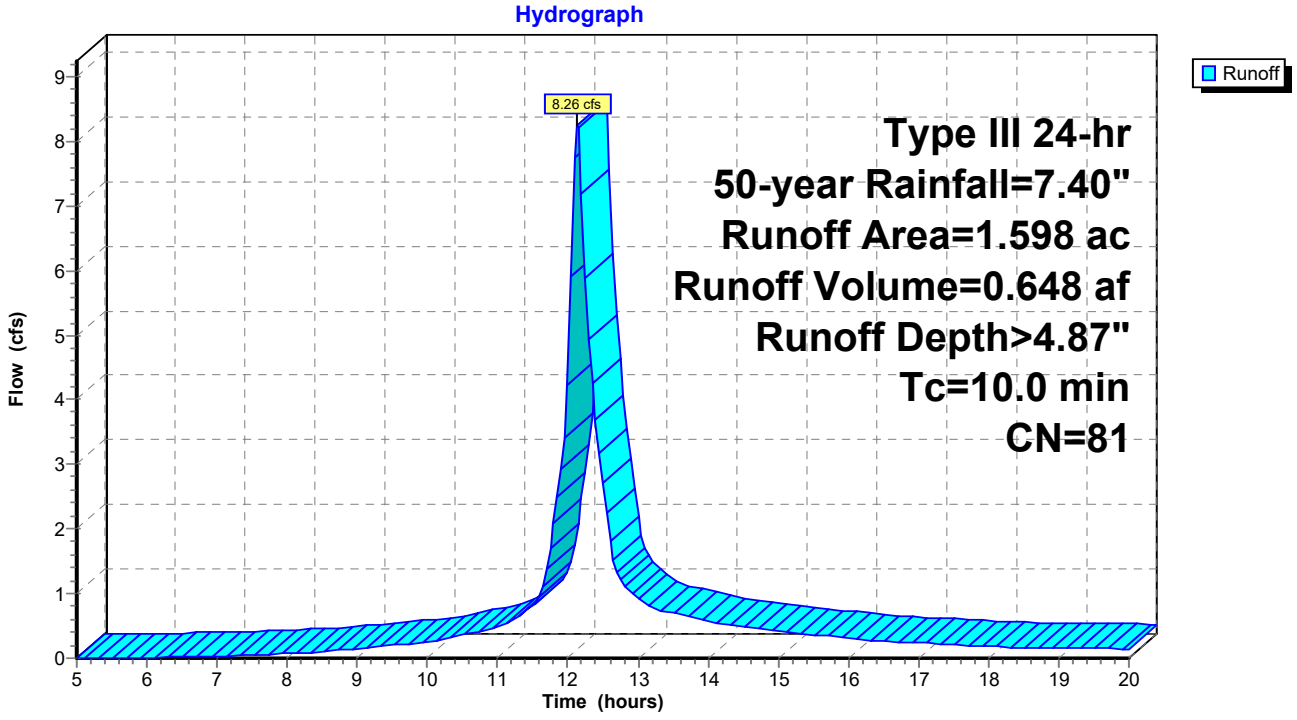
Runoff = 8.26 cfs @ 12.14 hrs, Volume= 0.648 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=7.40"

	Area (ac)	CN	Description
	0.437	78	Meadow, non-grazed, HSG D
	0.015	77	Woods, Good, HSG D
	0.005	91	Gravel roads, HSG D
	0.022	91	Gravel roads, HSG D
	0.009	98	Unconnected pavement, HSG D
	0.868	84	50-75% Grass cover, Fair, HSG D
	0.077	77	Woods, Good, HSG D
	0.162	71	Meadow, non-grazed, HSG C
*	0.003	81	50-75% Grass cover, Fair, HSG C-D
	1.598	81	Weighted Average
	1.589		99.44% Pervious Area
	0.009		0.56% Impervious Area
	0.009		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2A: Subcat 2A

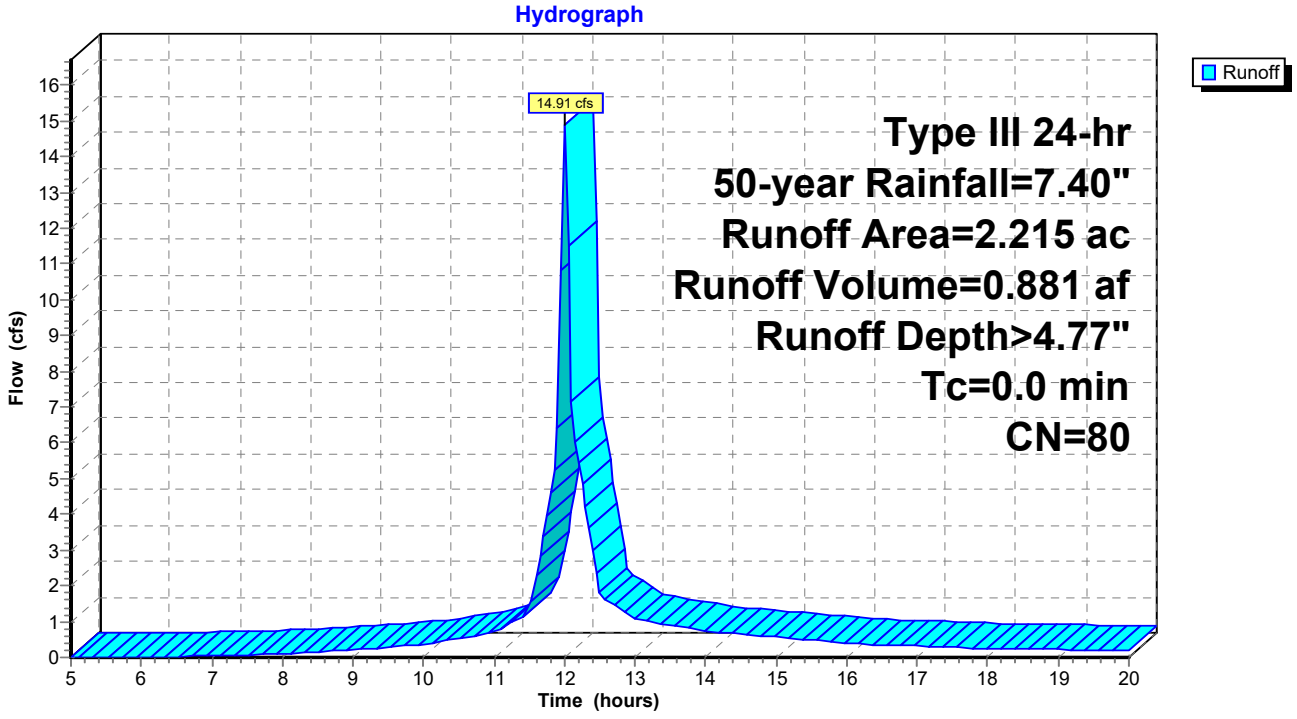
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 14.91 cfs @ 12.00 hrs, Volume= 0.881 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 50-year Rainfall=7.40"

	Area (ac)	CN	Description
	0.274	78	Meadow, non-grazed, HSG D
	1.296	84	50-75% Grass cover, Fair, HSG D
	0.132	71	Meadow, non-grazed, HSG C
*	0.300	81	50-75% Grass cover, Fair, HSG C-D
	0.009	78	Meadow, non-grazed, HSG D
	0.102	58	Meadow, non-grazed, HSG B
*	0.102	74	50-75% Grass cover, Fair, HSG B-C
	2.215	80	Weighted Average
	2.215		100.00% Pervious Area

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 2B: Subcat 2B

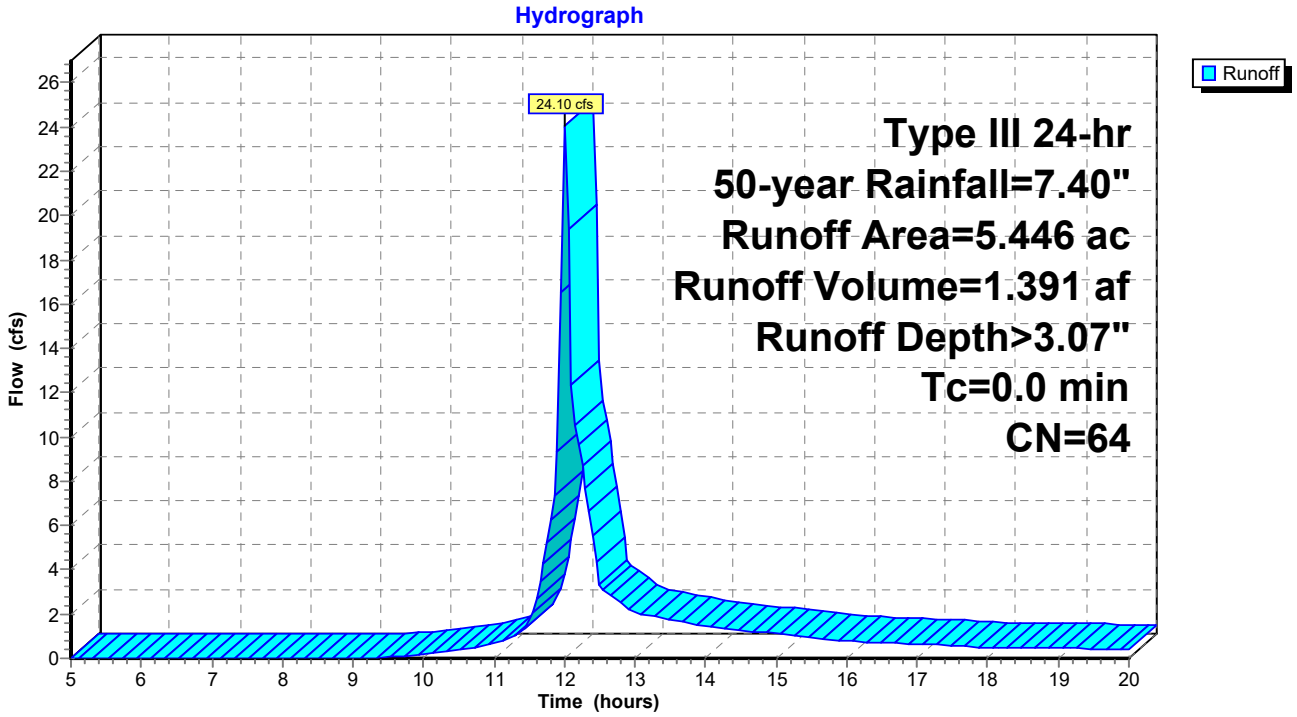
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 24.10 cfs @ 12.01 hrs, Volume= 1.391 af, Depth> 3.07"

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 50-year Rainfall=7.40"

	Area (ac)	CN	Description
	0.003	98	Unconnected pavement, HSG D
	0.000	98	Unconnected pavement, HSG D
	0.029	77	Woods, Good, HSG D
	0.013	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.042	78	Meadow, non-grazed, HSG D
	0.755	84	50-75% Grass cover, Fair, HSG D
	0.009	84	50-75% Grass cover, Fair, HSG D
	0.069	91	Gravel roads, HSG D
	1.000	30	Meadow, non-grazed, HSG A
*	0.819	59	50-75% Grass cover, Fair, HSG A-B
	0.082	76	Gravel roads, HSG A
	0.012	98	Unconnected pavement, HSG B
	0.111	85	Gravel roads, HSG B
*	1.976	74	50-75% Grass cover, Fair, HSG B-C
	0.513	58	Meadow, non-grazed, HSG B
	0.013	58	Meadow, non-grazed, HSG B
	5.446	64	Weighted Average
	5.431		99.72% Pervious Area
	0.015		0.28% Impervious Area
	0.015		100.00% Unconnected

Subcatchment 2B: Subcat 2B



Summary for Pond 2P: Basin 2

Inflow Area = 5.446 ac, 0.28% Impervious, Inflow Depth > 3.07" for 50-year event
Inflow = 24.10 cfs @ 12.01 hrs, Volume= 1.391 af
Outflow = 15.87 cfs @ 12.08 hrs, Volume= 1.086 af, Atten= 34%, Lag= 4.6 min
Discarded = 0.22 cfs @ 12.08 hrs, Volume= 0.163 af
Primary = 15.64 cfs @ 12.08 hrs, Volume= 0.924 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.70' @ 12.08 hrs Surf.Area= 0.131 ac Storage= 0.388 af

Plug-Flow detention time= 89.0 min calculated for 1.083 af (78% of inflow)
Center-of-Mass det. time= 32.1 min (830.0 - 797.9)

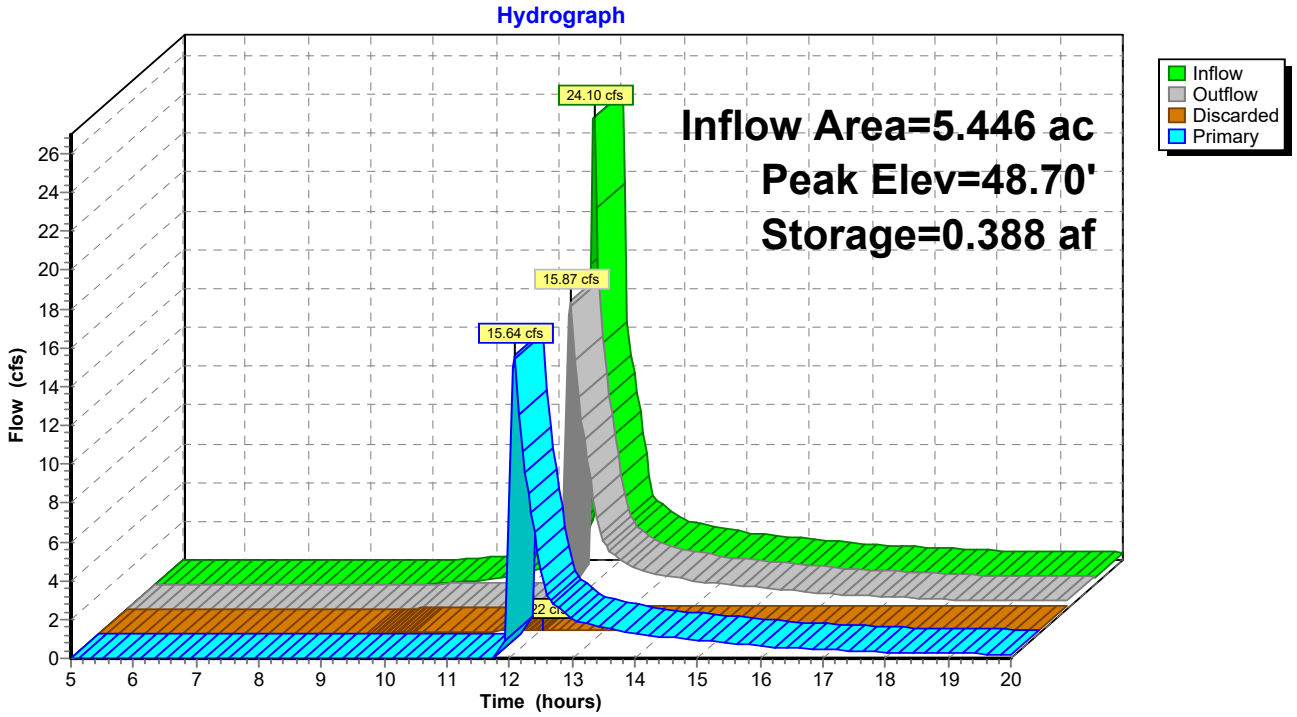
Volume	Invert	Avail.Storage	Storage Description
#1	45.00'	0.428 af	**35.00'W x 100.00'L x 4.00'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	45.00'	**1.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.22 cfs @ 12.08 hrs HW=48.68' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=15.26 cfs @ 12.08 hrs HW=48.68' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 15.26 cfs @ 2.23 fps)

Pond 2P: Basin 2

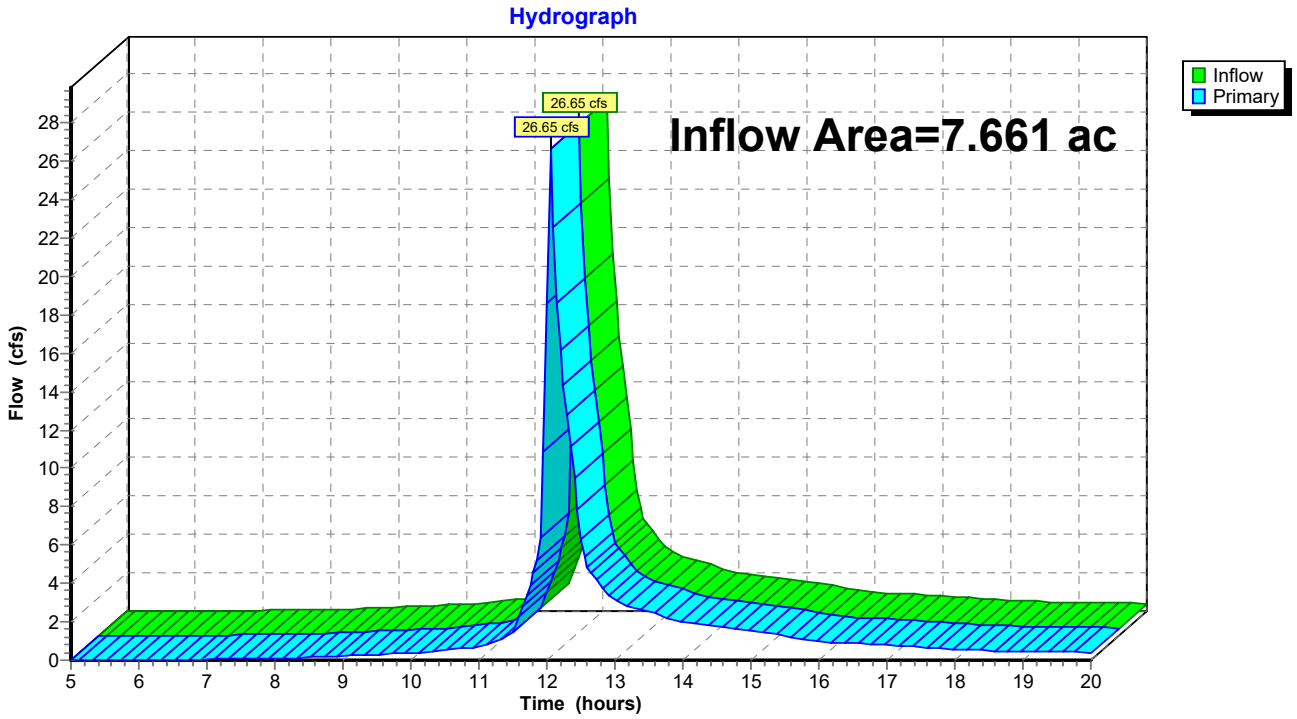


Summary for Link 2: (new Link)

Inflow Area = 7.661 ac, 0.20% Impervious, Inflow Depth > 2.83" for 50-year event
Inflow = 26.65 cfs @ 12.06 hrs, Volume= 1.804 af
Primary = 26.65 cfs @ 12.06 hrs, Volume= 1.804 af, Atten= 0%, Lag= 0.0 min

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

Link 2: (new Link)



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=1.598 ac 0.56% Impervious Runoff Depth>5.71"
Tc=10.0 min CN=81 Runoff=9.61 cfs 0.761 af

Subcatchment2A: Subcat 2A Runoff Area=2.215 ac 0.00% Impervious Runoff Depth>5.61"
Tc=0.0 min CN=80 Runoff=17.39 cfs 1.036 af

Subcatchment2B: Subcat 2B Runoff Area=5.446 ac 0.28% Impervious Runoff Depth>3.77"
Tc=0.0 min CN=64 Runoff=29.68 cfs 1.710 af

Pond 2P: Basin 2 Peak Elev=48.93' Storage=0.419 af Inflow=29.68 cfs 1.710 af
Discarded=0.23 cfs 0.169 af Primary=24.20 cfs 1.235 af Outflow=24.44 cfs 1.404 af

Link 2: (new Link) Inflow=38.05 cfs 2.271 af
Primary=38.05 cfs 2.271 af

Total Runoff Area = 9.259 ac Runoff Volume = 3.506 af Average Runoff Depth = 4.54"
99.74% Pervious = 9.235 ac 0.26% Impervious = 0.024 ac

Summary for Subcatchment 1: Subcat 1

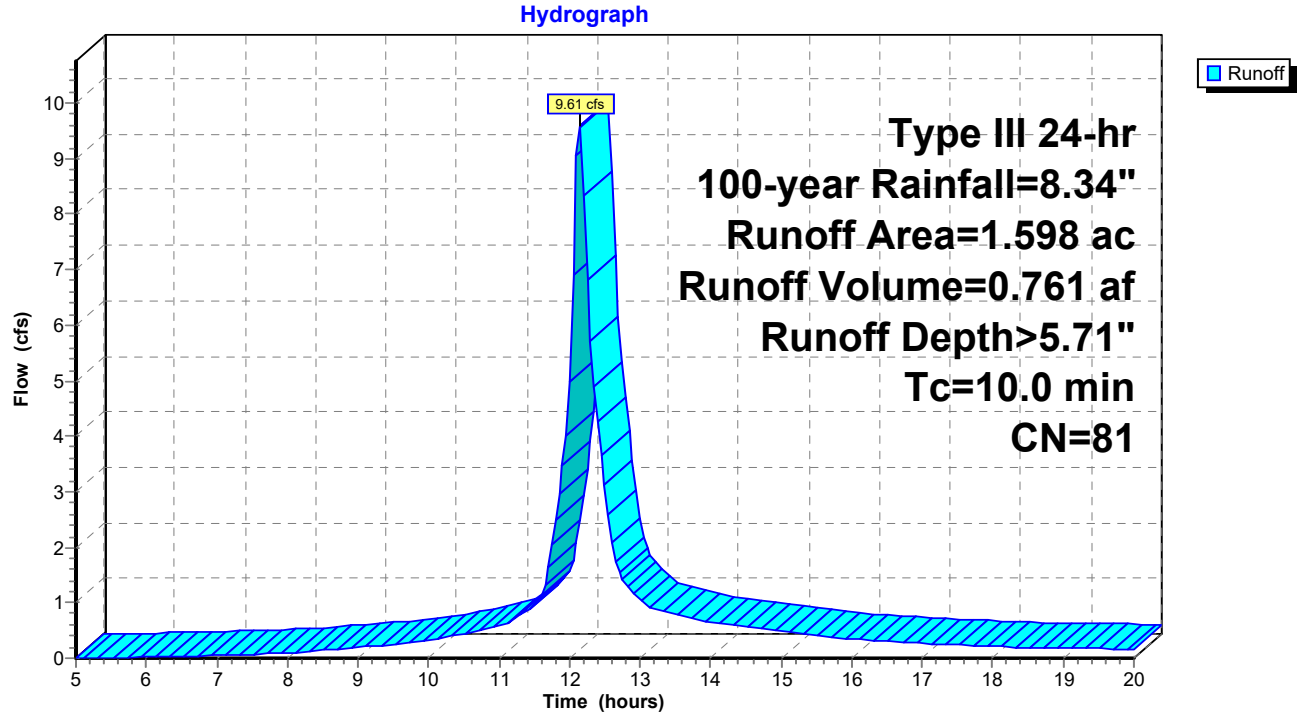
Runoff = 9.61 cfs @ 12.14 hrs, Volume= 0.761 af, Depth> 5.71"

Runoff 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=8.34"

	Area (ac)	CN	Description
	0.437	78	Meadow, non-grazed, HSG D
	0.015	77	Woods, Good, HSG D
	0.005	91	Gravel roads, HSG D
	0.022	91	Gravel roads, HSG D
	0.009	98	Unconnected pavement, HSG D
	0.868	84	50-75% Grass cover, Fair, HSG D
	0.077	77	Woods, Good, HSG D
	0.162	71	Meadow, non-grazed, HSG C
*	0.003	81	50-75% Grass cover, Fair, HSG C-D
	1.598	81	Weighted Average
	1.589		99.44% Pervious Area
	0.009		0.56% Impervious Area
	0.009		100.00% Unconnected

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

Subcatchment 1: Subcat 1



Summary for Subcatchment 2A: Subcat 2A

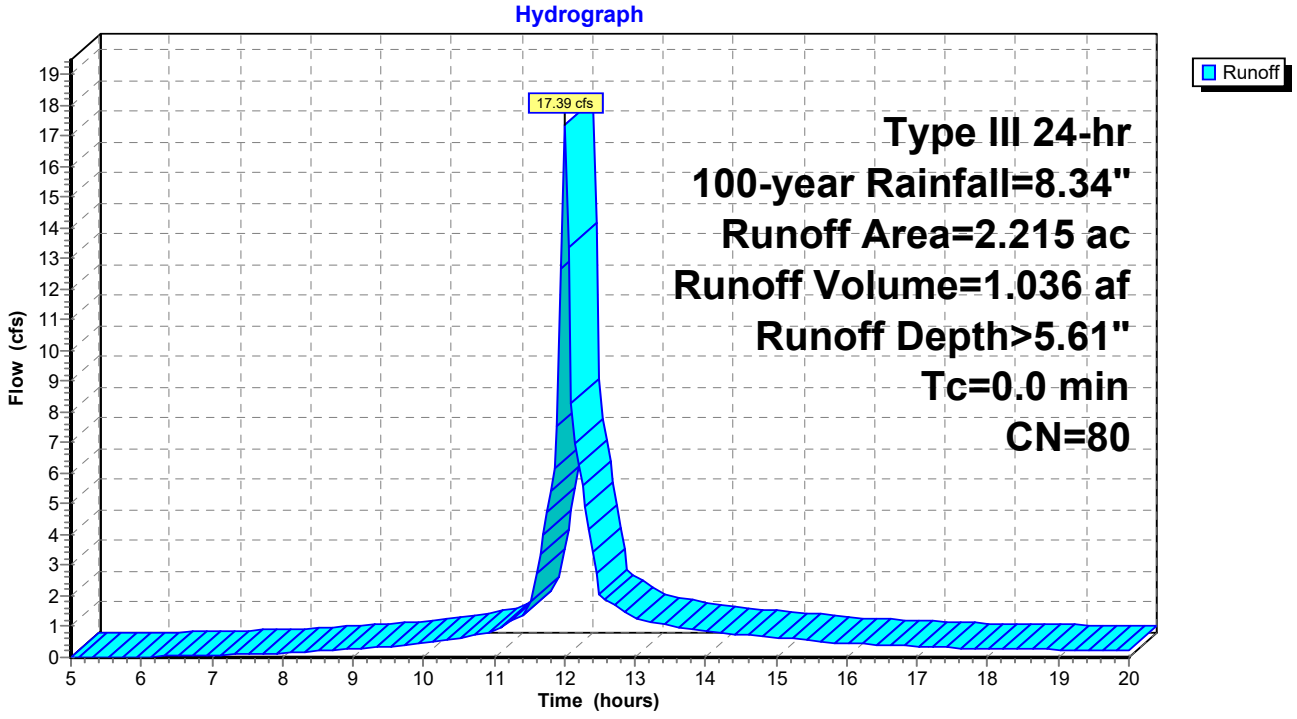
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 17.39 cfs @ 12.00 hrs, Volume= 1.036 af, Depth> 5.61"

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=8.34"

	Area (ac)	CN	Description
	0.274	78	Meadow, non-grazed, HSG D
	1.296	84	50-75% Grass cover, Fair, HSG D
	0.132	71	Meadow, non-grazed, HSG C
*	0.300	81	50-75% Grass cover, Fair, HSG C-D
	0.009	78	Meadow, non-grazed, HSG D
	0.102	58	Meadow, non-grazed, HSG B
*	0.102	74	50-75% Grass cover, Fair, HSG B-C
	2.215	80	Weighted Average
	2.215		100.00% Pervious Area

Subcatchment 2A: Subcat 2A



Summary for Subcatchment 2B: Subcat 2B

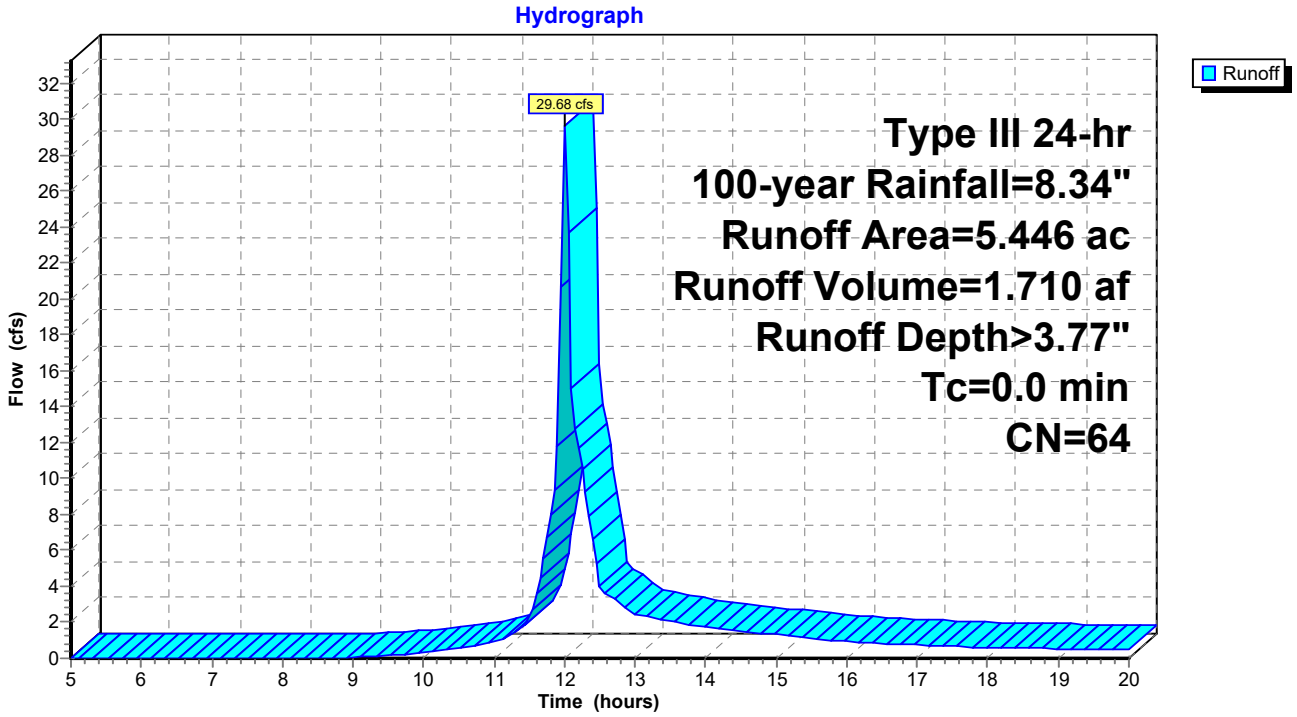
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 29.68 cfs @ 12.01 hrs, Volume= 1.710 af, Depth> 3.77"

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=8.34"

	Area (ac)	CN	Description
	0.003	98	Unconnected pavement, HSG D
	0.000	98	Unconnected pavement, HSG D
	0.029	77	Woods, Good, HSG D
	0.013	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.000	78	Meadow, non-grazed, HSG D
	0.042	78	Meadow, non-grazed, HSG D
	0.755	84	50-75% Grass cover, Fair, HSG D
	0.009	84	50-75% Grass cover, Fair, HSG D
	0.069	91	Gravel roads, HSG D
	1.000	30	Meadow, non-grazed, HSG A
*	0.819	59	50-75% Grass cover, Fair, HSG A-B
	0.082	76	Gravel roads, HSG A
	0.012	98	Unconnected pavement, HSG B
	0.111	85	Gravel roads, HSG B
*	1.976	74	50-75% Grass cover, Fair, HSG B-C
	0.513	58	Meadow, non-grazed, HSG B
	0.013	58	Meadow, non-grazed, HSG B
	5.446	64	Weighted Average
	5.431		99.72% Pervious Area
	0.015		0.28% Impervious Area
	0.015		100.00% Unconnected

Subcatchment 2B: Subcat 2B



Summary for Pond 2P: Basin 2

Inflow Area = 5.446 ac, 0.28% Impervious, Inflow Depth > 3.77" for 100-year event
Inflow = 29.68 cfs @ 12.01 hrs, Volume= 1.710 af
Outflow = 24.44 cfs @ 12.06 hrs, Volume= 1.404 af, Atten= 18%, Lag= 3.1 min
Discarded = 0.23 cfs @ 12.06 hrs, Volume= 0.169 af
Primary = 24.20 cfs @ 12.06 hrs, Volume= 1.235 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.93' @ 12.06 hrs Surf.Area= 0.135 ac Storage= 0.419 af

Plug-Flow detention time= 76.4 min calculated for 1.400 af (82% of inflow)
Center-of-Mass det. time= 26.8 min (820.1 - 793.3)

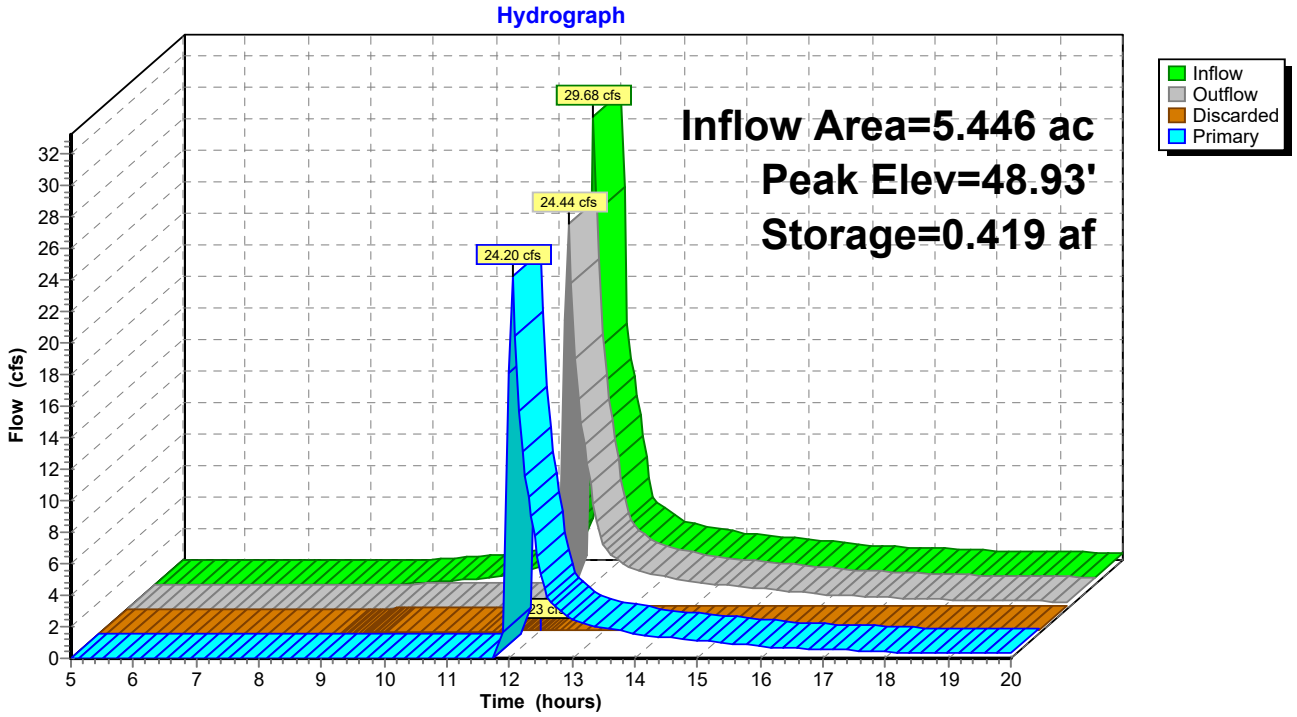
Volume	Invert	Avail.Storage	Storage Description
#1	45.00'	0.428 af	**35.00'W x 100.00'L x 4.00'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	45.00'	**1.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'

Discarded OutFlow Max=0.23 cfs @ 12.06 hrs HW=48.92' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=23.68 cfs @ 12.06 hrs HW=48.92' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 23.68 cfs @ 2.57 fps)

Pond 2P: Basin 2



Summary for Link 2: (new Link)

Inflow Area = 7.661 ac, 0.20% Impervious, Inflow Depth > 3.56" for 100-year event
Inflow = 38.05 cfs @ 12.03 hrs, Volume= 2.271 af
Primary = 38.05 cfs @ 12.03 hrs, Volume= 2.271 af, Atten= 0%, Lag= 0.0 min

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

Link 2: (new Link)