

## Gary Goeschel

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**From:** Tim MAY <mayengineering@sbcglobal.net>  
**Sent:** Monday, June 19, 2023 11:27 PM  
**To:** wScheer@eltownhall.com  
**Cc:** Kristen Clarke; Paul Geraghty; Gary Goeschel  
**Subject:** Revised Drainage calculations to address Town Engineer comments - Nehantic Highlands) subdivision  
**Attachments:** Revised Nehantic Highlands Subdivision Drainage Report.docx.pdf

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William Scheer, PE

Please find attached the revised drainage report for Nehantic Highlands Subdivision. I have addressed the seven comments from your June 7th letter.

*1. The Time of Concentration calculations used, and rainfall data should be provided. Typically, a drainage area map showing existing versus proposed conditions is also provided.*

-Hydrocad TR-20 software was used to model undeveloped and developed conditions for sub catchment Areas A & B. Pertinent data and information ( Tc, weighted CN etc) is included in the appendix for each storm event iteration see results in appendix of this report

*2. Per the Town of East Lyme Subdivision Regulations Section 6-8-2(A), peak flows should not be increased for the 2-, 5-, 10-, 25-, 50-, and 100-year storms.*

*3. Per the Town of East Lyme Subdivision Regulations Section 6-8-2 (B) a volume comparison from existing to proposed conditions should be provided. The applicant has only provided a comparison summary for peak flow rate.*

All storm events (2, 5, 10, 25, 50, 100 -year) have been evaluated and now show a decrease in peak run off. Also run off volumes have been included for the existing and developed condition, these too show a decrease in storm water volume reduction.

*4. Sizing calculations for the driveway treatment sediment forebay BMPs should be provided.*

*5. The applicant should provide operation and maintenance guidelines for all proposed BMPs.*

Sediment forebay sizing methodology is provided in the appendix of this report, Also the operational / maintenance is included in the report and to the drawing as well.

*6. Limits of disturbance should be clearly identified.*

*7. Proposed grading should be indicated through areas within the limits of disturbance.*

Limits of clearing and grading was made more visible on drainage plan (sheet 6 of 10) and is included in the appendix of this report

Please contact me if you have comments or questions

**May  
Engineering, LLC**

**Civil Engineering, Site Planning, and Consulting**

1297 RT 163 Oakdale, CT 06370 Cell: 860 884-9671 Email: [mayengineering@sbcglobal.net](mailto:mayengineering@sbcglobal.net)

## DRAINAGE REPORT

June 16, 2023

**Property Located at:**

Upper Walnut Hill and Holmes Rd.  
EAST LYME CT

**Prepared For:**

Port Side Holdings Inc. &  
English Harbour Capital Partners LLC  
Tenants in Common  
207 Clarendon Ave  
Southport, NC 28461

**Applicant:**

Nehantic Highlands Subdivision  
Kristen Clarke P.E. & Shelly Harney.

**Prepared By:**

Timothy A. May, P.E.  
May Engineering, LLC  
1297 Rte 163  
Oakdale, CT 03670

Timothy May



Digitally signed by Timothy May, PE  
DN: O="May Engineering, LLC", CN="Timothy May, PE",  
E="mayengineering@sbcglobal.net"  
Reason: I am the author of this document  
Location: Office  
Date: 2023.06.19 22:39:13  
Foxit Reader/PDF Version: 9.7.5

# May Engineering, LLC

Civil Engineering, Site Planning, and Consulting

1297 RT 163 Oakdale, CT 06370 Cell: 860 884-9671 Email: mayengineering@sbcglobal.net

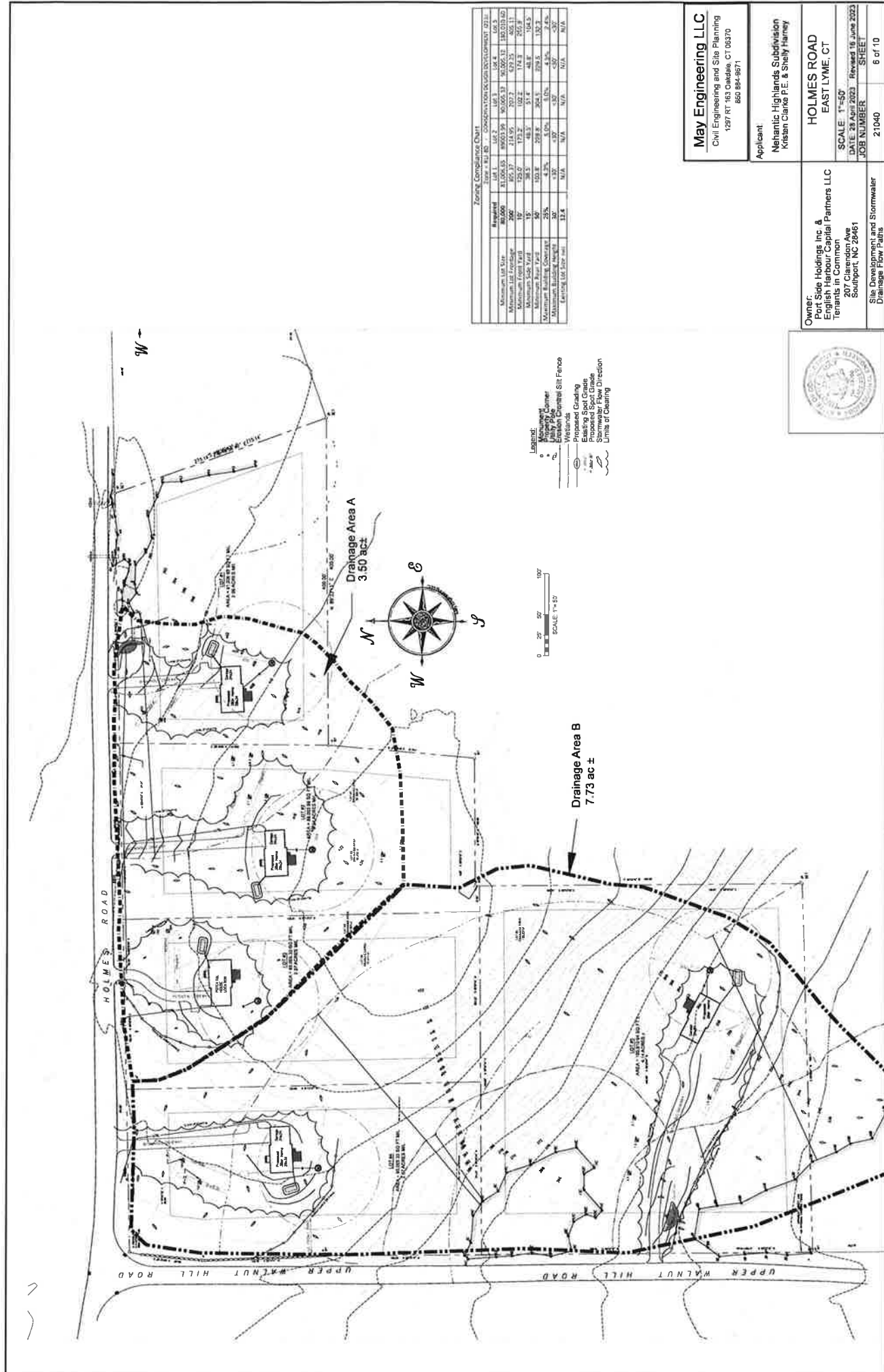
		STORM EVENT					
		2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
<b>Drainage Area A</b>							
<u>Area A Undeveloped</u>	Peak Flow (CFS)	1.35	2.25	3.22	4.60	5.58	6.94
	Runoff Volume (AF)	0.192	0.265	0.418	0.588	0.708	0.876
<u>Area A Developed</u>	Peak Flow (CFS)	<b>0.94</b>	<b>1.40</b>	<b>2.50</b>	<b>3.69</b>	<b>4.54</b>	<b>5.72</b>
	Runoff Volume (AF)	<b>0.155</b>	<b>0.250</b>	<b>0.360</b>	<b>0.517</b>	<b>0.630</b>	<b>0.789</b>
<b>Drainage Area B</b>							
		STORM EVENT					
		2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
<u>Area B Undeveloped</u>	Peak Flow (CFS)	2.58	3.89	6.37	9.20	11.21	13.99
	Runoff Volume (AF)	0.395	0.520	0.879	1.244	1.504	1.869
<u>Area B Developed</u>	Peak Flow (CFS)	<b>2.35</b>	<b>3.62</b>	<b>6.02</b>	<b>8.79</b>	<b>10.76</b>	<b>13.50</b>
	Runoff Volume (AF)	0.368	0.490	0.837	1.193	1.448	1.806

Listed are the tabulated results for the existing and proposed development conditions for Lots #1-5.

## SUMMARY

The 12.39 ac parcel was evaluated to determine the existing and developed conditions for stormwater peak runoff and runoff volumetric flows. Stormwater calculations presented have determined that a reduction of both peak runoff and runoff volumetric stormwater flows.

Rain gardens and sediment forebays are proposed to remove stormwater sediment and by design to slow stormwater velocities. The flow paths and time of concentration are increased as a result of these BMP methods implemented. These BMP methods are considered a beneficial part of the Water Quality Volume reduction and stormwater management by reducing the sediment loading and significantly increasing the stormwater infiltration potential as compared to the existing condition.



**Zone Compliance Chart**  
Zone: R-1.2 (R-1.2)

Regulation	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5
Minimum Lot Size	80,000	80,000	80,000	80,000	80,000
Minimum Front Yard Setback	15'	15'	15'	15'	15'
Minimum Side Yard Setback	15'	15'	15'	15'	15'
Minimum Rear Yard Setback	15'	15'	15'	15'	15'
Maximum Building Coverage	25%	25%	25%	25%	25%
Maximum Lot Area	13.4	N/A	N/A	N/A	N/A

**May Engineering LLC**  
Civil Engineering and Site Planning  
1287 RT 163, Coldeas, CT 06370  
860-894-9871

**Applicant**  
Nehantic Highlands Subdivision  
Kristen Clarke P.E. & Shelly Harney

**HOLMES ROAD**  
EAST LYME, CT

SCALE: 1"=50'  
DATE: 28 April 2023 Revised: 16 June 2023  
JOB NUMBER: SHEET  
21040 6 of 10

**Owner:**  
Port Side Holdings Inc. &  
English Harbour Capital Partners LLC  
Tenants: 1000 Main Ave  
207 Clear Lake Ave  
Southport, NC 28461

Site Development and Stormwater  
Drainage Flow Paths



## MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Soils		Stony Spot
	Soil Map Unit Polygons		Very Stony Spot
	Soil Map Unit Lines		Wet Spot
	Soil Map Unit Points		Other
	Special Point Features		Special Line Features
	Blowout		Water Features
	Borrow Pit		Streams and Canals
	Clay Spot		Transportation
	Closed Depression		Rails
	Gravel Pit		Interstate Highways
	Gravelly Spot		US Routes
	Landfill		Major Roads
	Lava Flow		Local Roads
	Marsh or swamp		Background
	Mine or Quarry		Aerial Photography
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

## MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: [www.nrcs.usda.gov/wss](http://www.nrcs.usda.gov/wss)  
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 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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.

Map Unit Symbol	Map Unit Name	Acres In AOI	Percent of AOI
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	20.9	1.5%
71E	Nipmuck-Brimfield-Rock outcrop complex, 15 to 45 percent slopes	75.8	5.4%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	148.1	10.6%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	50.0	3.6%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	35.8	2.6%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	28.1	2.0%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	30.8	2.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	134.9	9.6%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	25.1	1.8%
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	8.3	0.6%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	85.3	6.1%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	39.0	2.8%
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony	13.1	0.9%
306	Udorthents-Urban land complex	3.0	0.2%
<b>Totals for Area of Interest</b>		<b>1,398.2</b>	<b>100.0%</b>

**Summary for Subcatchment 1S: Area A Undeveloped**

Runoff = 3.22 cfs @ 12.54 hrs, Volume= 0.418 af, Depth> 1.43"

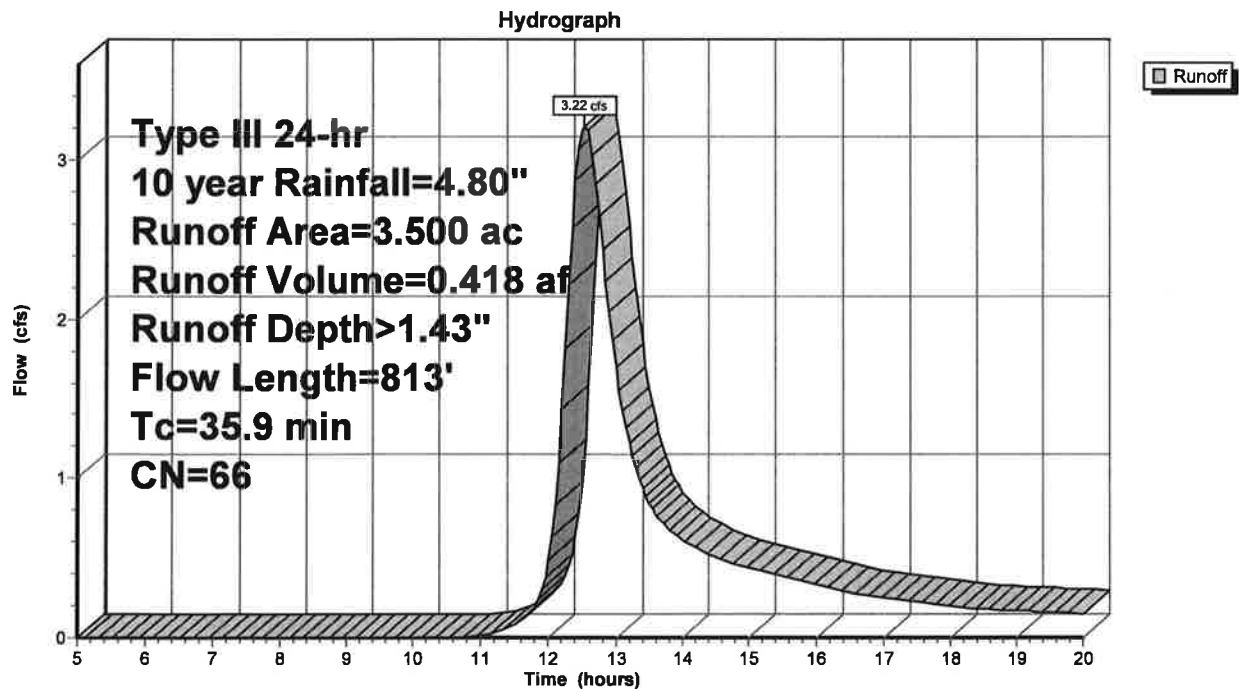
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 year Rainfall=4.80"

Area (ac)	CN	Description
3.500	66	Woods, Poor, HSG B
3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
5.6	373	0.0500	1.12		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
35.9	813	Total			

**Subcatchment 1S: Area A Undeveloped**



**Summary for Subcatchment 1S: Area A Undeveloped**

Runoff = 5.58 cfs @ 12.52 hrs, Volume= 0.708 af, Depth> 2.43"

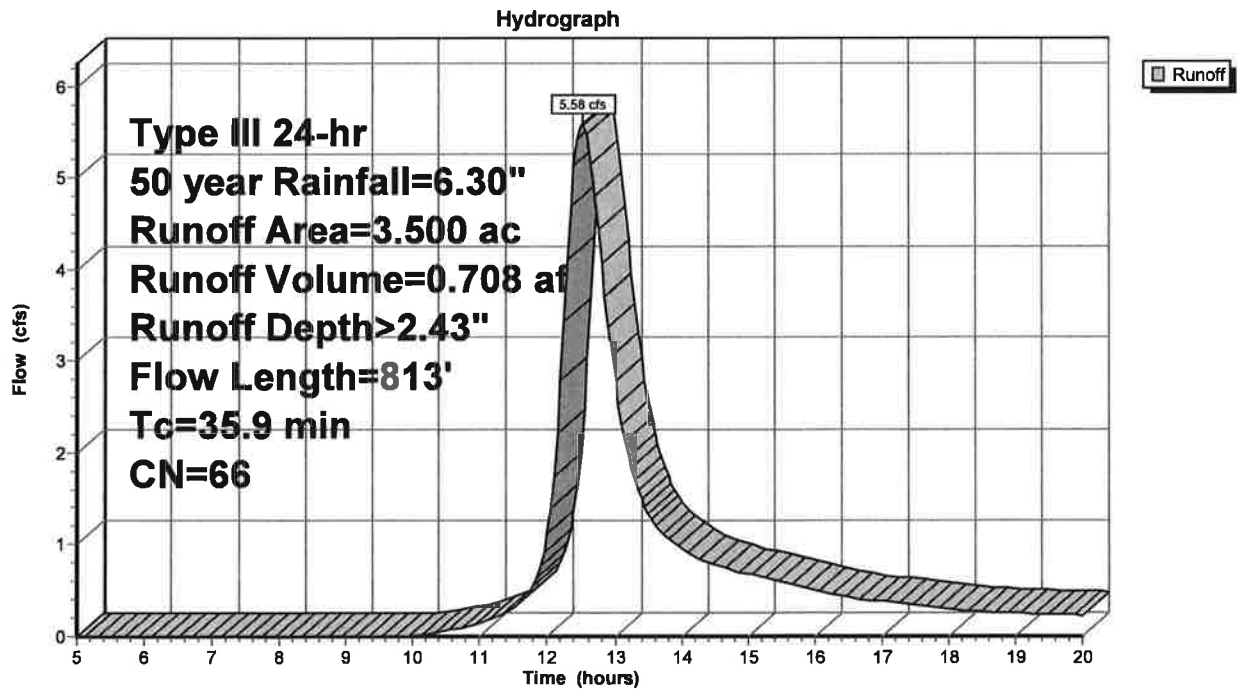
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.30"

Area (ac)	CN	Description
3.500	66	Woods, Poor, HSG B
3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
5.6	373	0.0500	1.12		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
35.9	813	Total			

**Subcatchment 1S: Area A Undeveloped**





**Summary for Subcatchment 2S: Area A Developed**

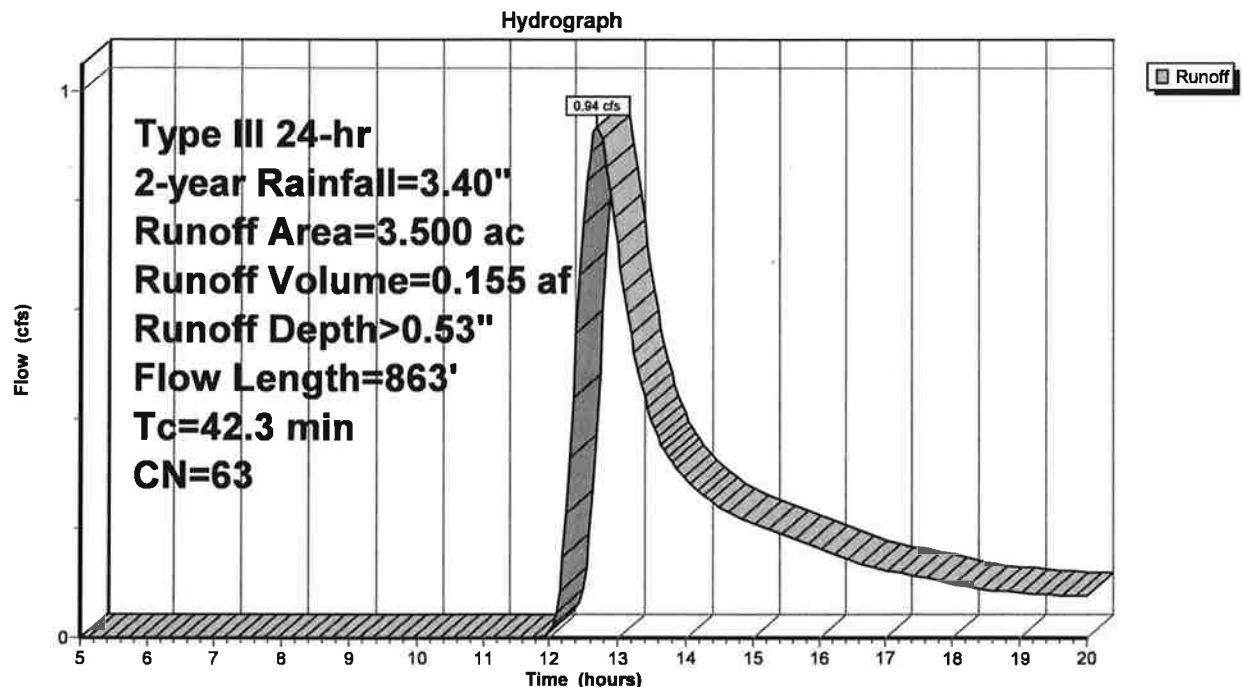
Runoff = 0.94 cfs @ 12.70 hrs, Volume= 0.155 af, Depth> 0.53"

Runoff 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=3.40"

Area (ac)	CN	Description
* 2.096	65	Woods, Fair, HSG B
* 1.390	60	2 acre lots, 12% imp, HSG B
* 0.014	25	raingarden
3.500	63	Weighted Average
3.333		95.23% Pervious Area
0.167		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b>
					Woods: Dense underbrush n= 0.800 P2= 3.35"
11.1	373	0.0500	0.56		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b>
					Forest w/Heavy Litter Kv= 2.5 fps
8.0	450	0.0350	0.94		<b>Shallow Concentrated Flow, 2nd leg</b>
					Woodland Kv= 5.0 fps
42.3	863	Total			

**Subcatchment 2S: Area A Developed**



**Summary for Subcatchment 2S: Area A Developed**

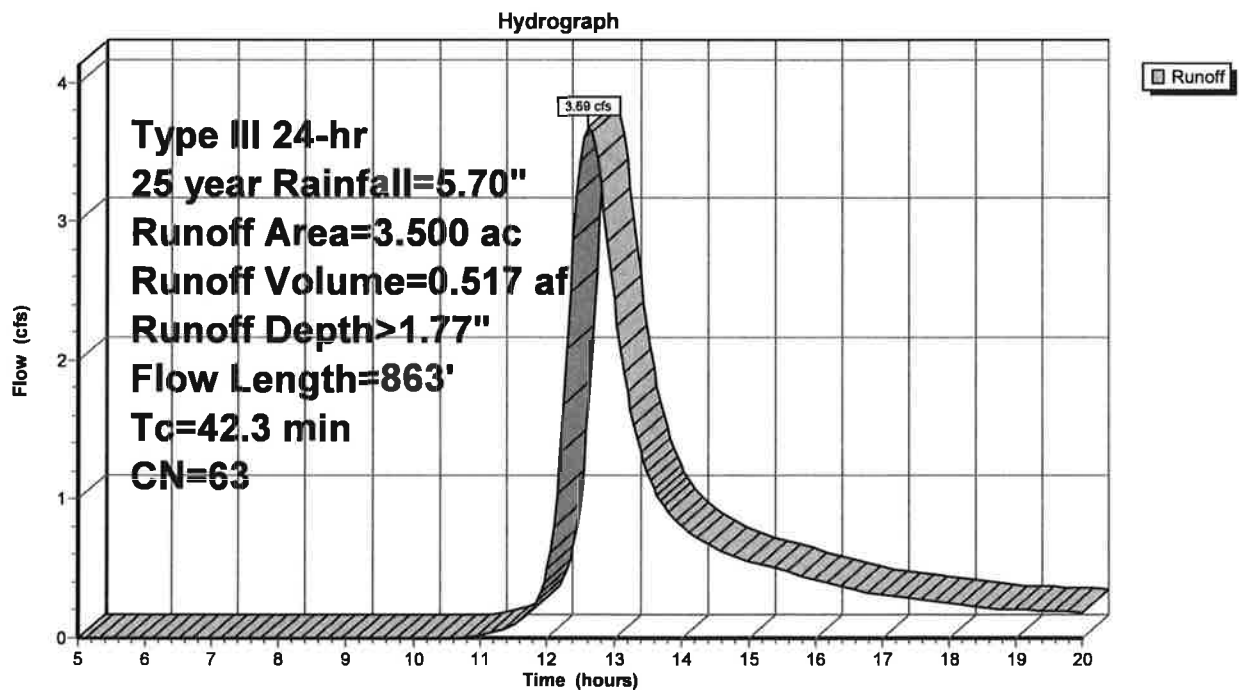
Runoff = 3.69 cfs @ 12.63 hrs, Volume= 0.517 af, Depth> 1.77"

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 25 year Rainfall=5.70"

Area (ac)	CN	Description
* 2.096	65	Woods, Fair, HSG B
* 1.390	60	2 acre lots, 12% imp, HSG B
* 0.014	25	raingarden
3.500	63	Weighted Average
3.333		95.23% Pervious Area
0.167		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b>
					Woods: Dense underbrush n= 0.800 P2= 3.35"
11.1	373	0.0500	0.56		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b>
					Forest w/Heavy Litter Kv= 2.5 fps
8.0	450	0.0350	0.94		<b>Shallow Concentrated Flow, 2nd leg</b>
					Woodland Kv= 5.0 fps
42.3	863	Total			

**Subcatchment 2S: Area A Developed**



**Summary for Subcatchment 2S: Area A Developed**

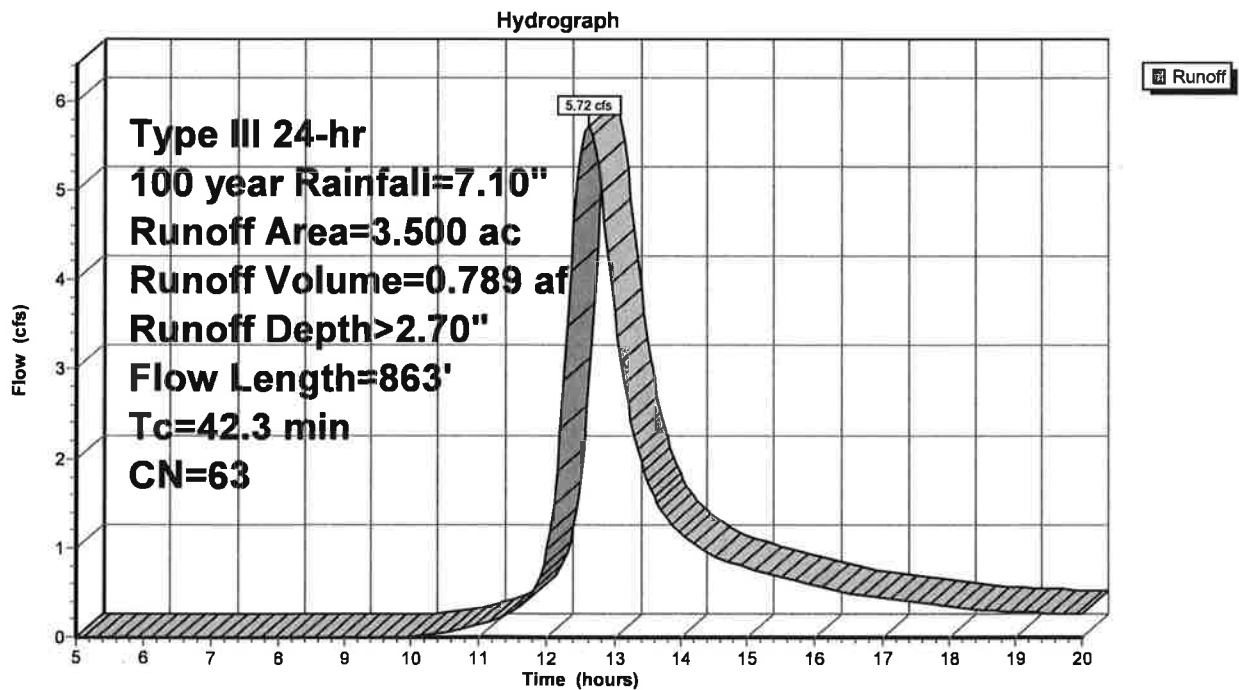
Runoff = 5.72 cfs @ 12.61 hrs, Volume= 0.789 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100 year Rainfall=7.10"

Area (ac)	CN	Description
* 2.096	65	Woods, Fair, HSG B
* 1.390	60	2 acre lots, 12% imp, HSG B
* 0.014	25	raingarden
3.500	63	Weighted Average
3.333		95.23% Pervious Area
0.167		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b>
11.1	373	0.0500	0.56		Woods: Dense underbrush n= 0.800 P2= 3.35"
8.0	450	0.0350	0.94		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Forest w/Heavy Litter Kv= 2.5 fps
					<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
42.3	863	Total			

**Subcatchment 2S: Area A Developed**



**Summary for Subcatchment 2S: Area B Undeveloped**

Runoff = 6.37 cfs @ 12.60 hrs, Volume= 0.879 af, Depth> 1.36"

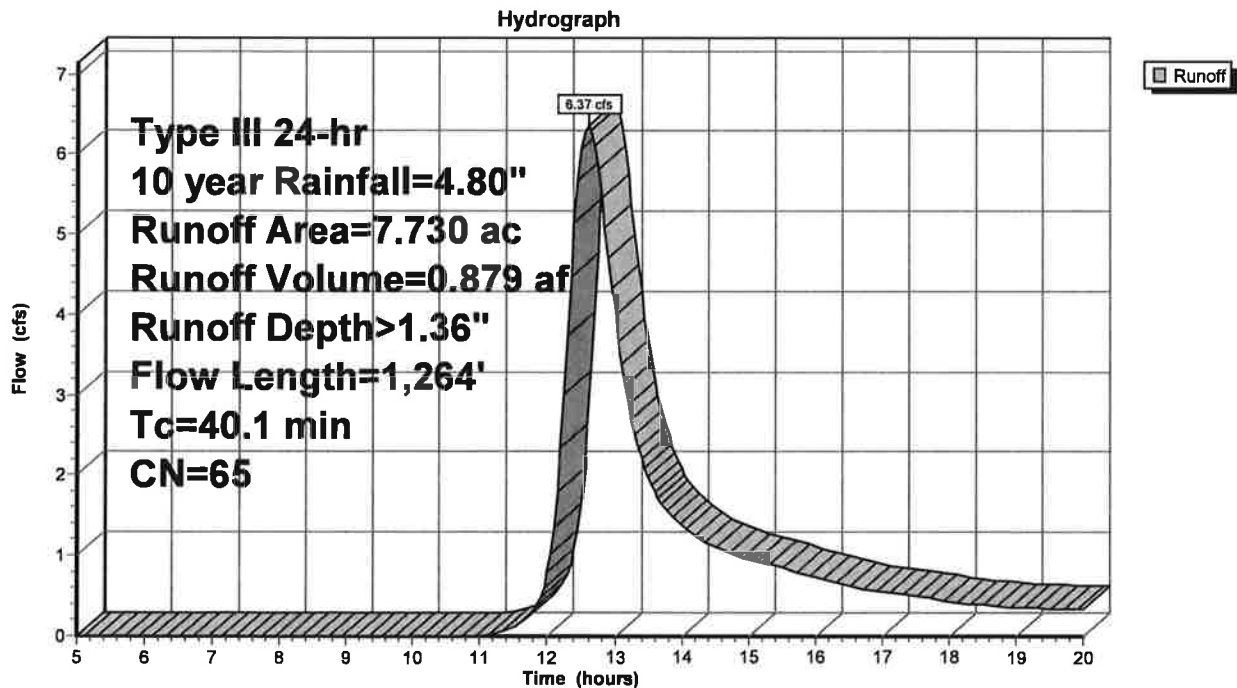
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 year Rainfall=4.80"

Area (ac)	CN	Description
* 7.730	65	Woods, Fair, HSG B
7.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
13.5	968	0.0570	1.19		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
3.4	256	0.0620	1.24		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
40.1	1,264	Total			

**Subcatchment 2S: Area B Undeveloped**



### Summary for Subcatchment 2S: Area B Undeveloped

Runoff = 11.21 cfs @ 12.58 hrs, Volume= 1.504 af, Depth> 2.34"

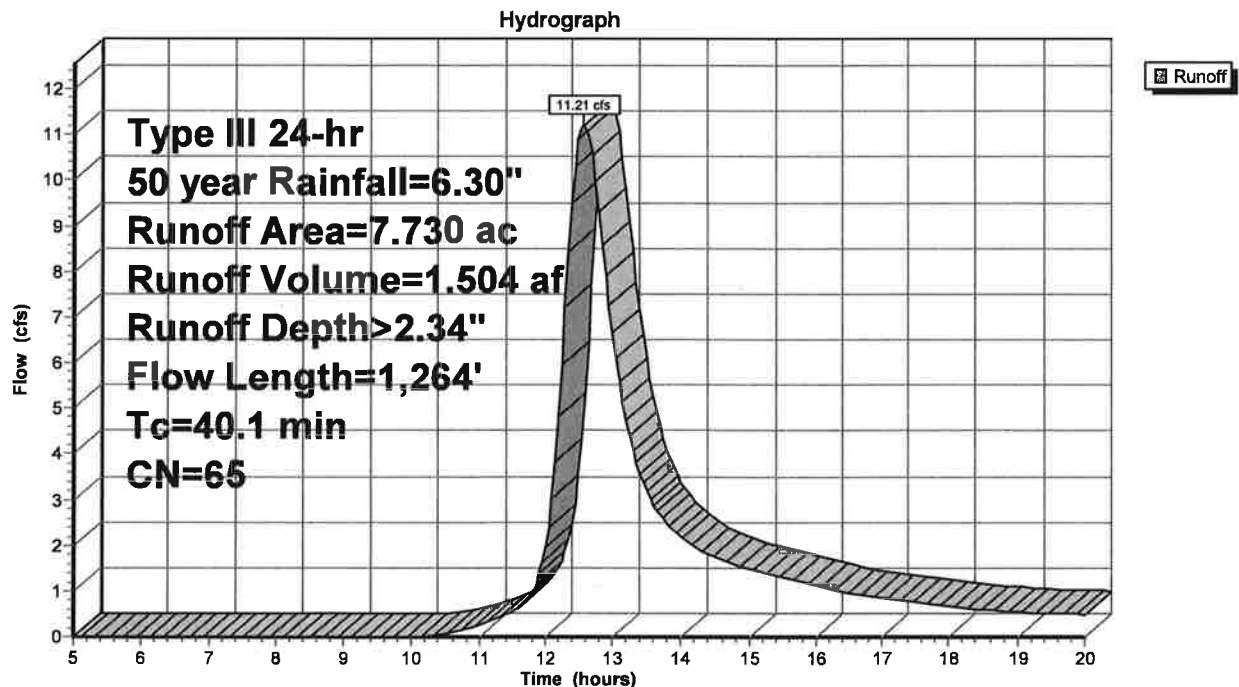
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 50 year Rainfall=6.30"

Area (ac)	CN	Description
* 7.730	65	Woods, Fair, HSG B
7.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
13.5	968	0.0570	1.19		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
3.4	256	0.0620	1.24		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
40.1	1,264	Total			

### Subcatchment 2S: Area B Undeveloped



**Summary for Subcatchment 2S: Area B Developed**

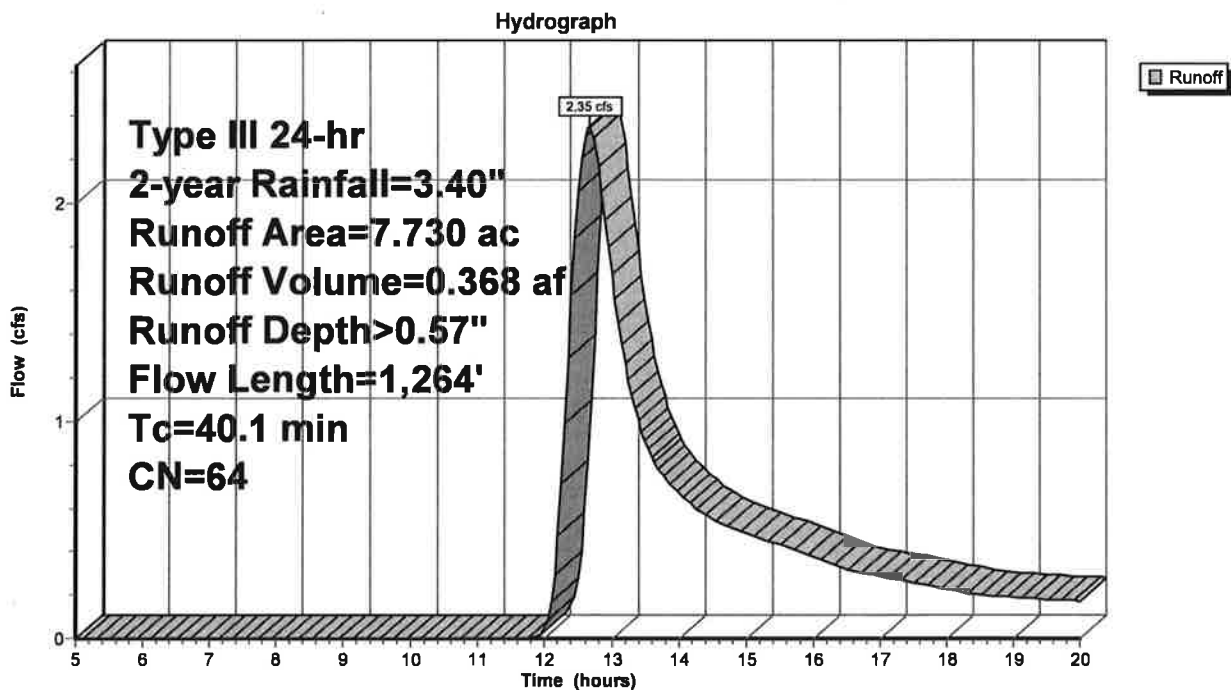
Runoff = 2.35 cfs @ 12.66 hrs, Volume= 0.368 af, Depth> 0.57"

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=3.40"

Area (ac)	CN	Description
* 6.591	65	Woods, Fair, HSG B
* 1.130	60	2 acre lots, 12% imp, HSG B
* 0.009	25	Rain garden
7.730	64	Weighted Average
7.594		98.25% Pervious Area
0.136		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
13.5	968	0.0570	1.19		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
3.4	256	0.0620	1.24		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
40.1	1,264	Total			

**Subcatchment 2S: Area B Developed**



**Summary for Subcatchment 2S: Area B Developed**

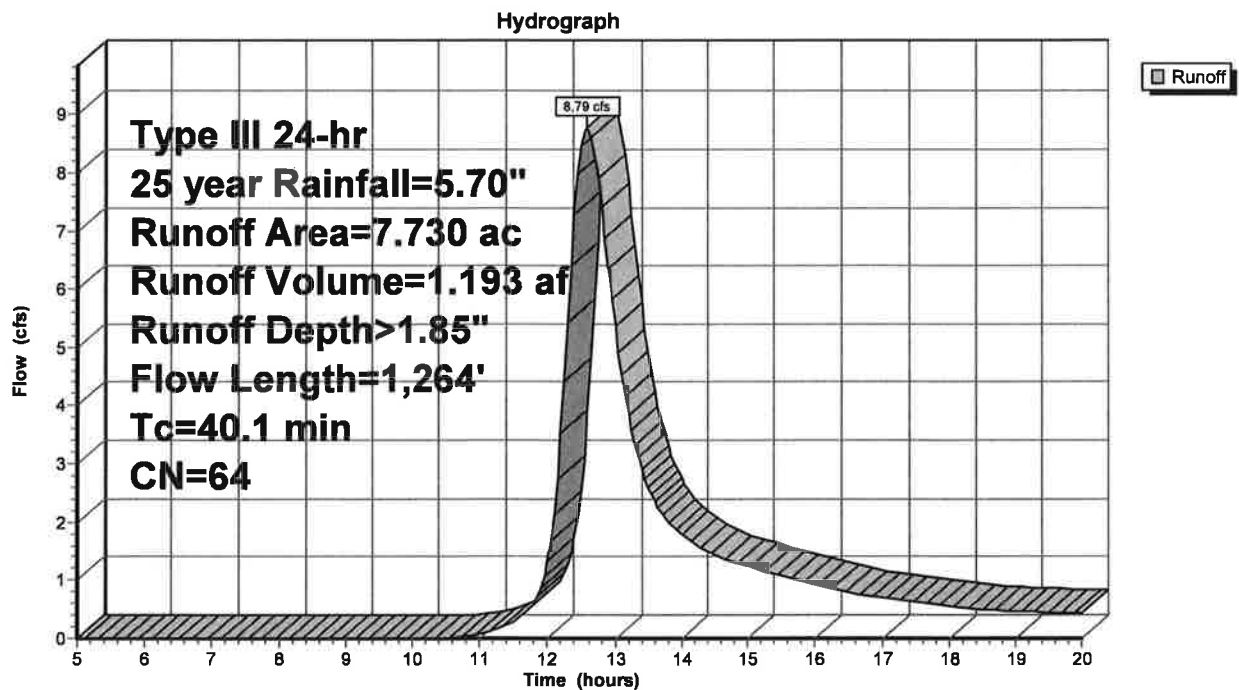
Runoff = 8.79 cfs @ 12.59 hrs, Volume= 1.193 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 year Rainfall=5.70"

Area (ac)	CN	Description
* 6.591	65	Woods, Fair, HSG B
* 1.130	60	2 acre lots, 12% imp, HSG B
* 0.009	25	Rain garden
7.730	64	Weighted Average
7.594		98.25% Pervious Area
0.136		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
13.5	968	0.0570	1.19		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
3.4	256	0.0620	1.24		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
40.1	1,264	Total			

**Subcatchment 2S: Area B Developed**



**Summary for Subcatchment 2S: Area B Developed**

Runoff = 13.50 cfs @ 12.58 hrs, Volume= 1.806 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 year Rainfall=7.10"

Area (ac)	CN	Description
* 6.591	65	Woods, Fair, HSG B
* 1.130	60	2 acre lots, 12% imp, HSG B
* 0.009	25	Rain garden
7.730	64	Weighted Average
7.594		98.25% Pervious Area
0.136		1.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2	40	0.0100	0.03		<b>Sheet Flow, sheet flow</b> Woods: Dense underbrush n= 0.800 P2= 3.35"
13.5	968	0.0570	1.19		<b>Shallow Concentrated Flow, shallow 1st leg 5%</b> Woodland Kv= 5.0 fps
3.4	256	0.0620	1.24		<b>Shallow Concentrated Flow, 2nd leg</b> Woodland Kv= 5.0 fps
40.1	1,264	Total			

**Subcatchment 2S: Area B Developed**

