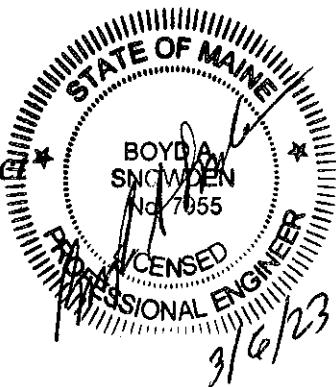


***Storm Water Management for
Auburn Suburban Baseball & Softball Field Project
in Auburn, Maine***
February 10, 2023 Rev March 5, 2023



Introduction:

This storm water narrative is being provided to complete the storm water section of the Site Location of Development Permit application being submitted by Auburn Suburban Baseball & Softball Association, for the proposed roadway and ball field development proposed on the south side of Stevens Mill Road in Auburn, Maine. The paragraphs below outline the existing conditions as well as the storm water management for the proposed improvements on the parcel.

The management plan provides attenuation of the peak runoff conditions for the 2, 10 and 25 year storm events, and complies with the latest Storm Water Management standards outlined in Chapter 500. Our storm water management modeling has been included for both the pre and post development areas within the watershed area.

The submission of this application includes the construction of the roadway, asphalt and gravel parking areas, 3 turf fields, and 1 grassed practice field. The total development areas proposed for this project parcel include the following:

1. Artificial Turf areas (3 fields) – 190,578 s.f.
2. Proposed Gravel areas – 45,345 s.f.
3. Proposed Asphalt areas – 22,040 s.f.
4. Landscaped/mowed lawn – 226,216 s.f.

For the purposes of the storm water management, all artificial turf areas are considered as impervious area, since the subsurface drainage is very close to the surface, and has limited time of concentration.

Existing Conditions:

Prior to 2008, the parcel included mostly wooded areas. A large portion of the partial has been delineated as wetlands by Jones Associates. Most of the parcel is relatively low sloping, draining in a southerly direction and discharging into an existing stream that runs along the southern edge of the parcel. This existing unnamed stream eventually flows in the Androscoggin River.

Proposed Conditions:

The proposed project includes the construction of asphalt roadway, asphalt and gravel parking areas, 3 artificial turf fields, 1 practice field, a 40' x 20' snack shack with attached 20' x 20' garage, and asphalt walkways linking the fields and parking areas.

In order to assess the requirement qualitative treatment, we analyzed the entire development as a non-linear project. Most of the roadway sections are within 50 feet from other impervious areas of the project, so these associated roadway segments could not be considered for linear standards. Chapter 500 definition indicates that any linear roadway that is within 50 feet from other associated

impervious areas cannot be counted as linear. Therefore, all are required to have at least 95 percent of new impervious area treated, while no less than 80 percent of the total developed area treated.

The proposed project includes four underdrain grass filters and one wooded buffer area, which are spread throughout the project area to treat storm water runoff generated from new developed areas. As evidenced in the following paragraphs, these treatment areas have been designed to meet the standards outlined in Chapter 500, and in accordance with the Maine Stormwater Management Design Manual, Technical Design Manual, Volume III, dated May 2016.

The proposed project consists of the improvements to the site as outlined above and shown in the design plan package. The following information shows that the site design meets the requirements of both the Storm Water section of the Maine Site Location of Development Law, as well as the City of Auburn Land Use Development Ordinance.

Our office uses HydroCAD software, version 10.10-4A to calculate the peak runoff for both the predevelopment and post development conditions. In order to develop the storm water model for this parcel, several assumptions were made. These assumptions include;

1. One day precipitation values were derived from the Storm Water Management for Maine, Best Management Practices. The 24-hour duration rainfalls for the 2, 10 and 25 year storm frequencies were 3.0, 4.3 and 5.4, respectively. The storm type used for the model was a Type III storm event.
2. An Antecedent Moisture Content (AMC) of 2 was used, which constitutes a normal saturation condition of the moisture content of the soils.
3. Sizing of the underdrain grass filters and forested buffer areas were based upon the Best Management Practices as defined by the Department of Environmental Protection Storm Water BMP Manual.

Using our HydroCAD storm water modeling software, our office has determined the following peak runoff for the project site with the proposed improvements outlined above.

Pre-Development Peak Runoff			
Storm	2-year	10-year	25-year
Analysis Pnt.	Storm	Storm	Storm
WAP 1	10.46 cfs	22.81 cfs	35.34 cfs
Subtotals	10.46 cfs	22.81 cfs	35.34 cfs

Post-Development Peak Runoff			
Storm	2-year	10-year	25-year
Analysis Pnt.	Storm	Storm	Storm
WAP 1	9.71 cfs	20.29 cfs	31.48 cfs
Subtotals	9.71 cfs	20.29 cfs	31.48 cfs

Quality Treatment

For the quality treatment portion of law, since the project drains into a stream which eventually drains into the Androscoggin River, the project is not required to meet the phosphorus standards. The following calculations and data show that the project meets the General Requirement Standards of Chapter 500, with more than 95 percent of the new impervious area treated, and more than 80 percent of the developed area treated.

Impervious Area Treatment Calculation

Total New Impervious Area 261,865 s.f.

Total New Impervious Area treated 251,210 s.f.

Total Offsite Impervious Area treated 25,716 s.f.

Percentage of New Impervious Area treated

$$(251,210 \text{ sf} + (25,716 \text{ sf} * 0.5)) \text{ s.f.} / 261,865 \text{ s.f.} = 1.0084 \text{ or } 100.84\%$$

Note: The offsite impervious calculations above include portions of Stevens Mill Road and upstream residential parcel areas, which are within the watershed of the proposed treatment systems and could not be routed out of those watersheds without considerable expense. The calculations assume taking only half credit for the treatment of these offsite locations, as the applicant does not retain ownership of these areas.

The three “turf fields” are modeled and included in these calculations as impervious area. The treatment areas are sized based upon that criteria.

Total New Developed Area 430,625 s.f.

Total New Developed Area treated 340,038 s.f.

Total Offsite Developed Area treated 81,910 s.f.

Percentage of New Developed Area treated

$$(340,038 \text{ s.f.} + (81,910 \text{ s.f.} * 0.5)) / 430,625 \text{ s.f.} = 0.885 \text{ or } 88.5\%$$

Auburn Suburban Baseball and Softball Development
Storm Water BMP Design - Underdrain Grass Filters

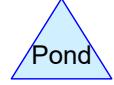
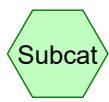
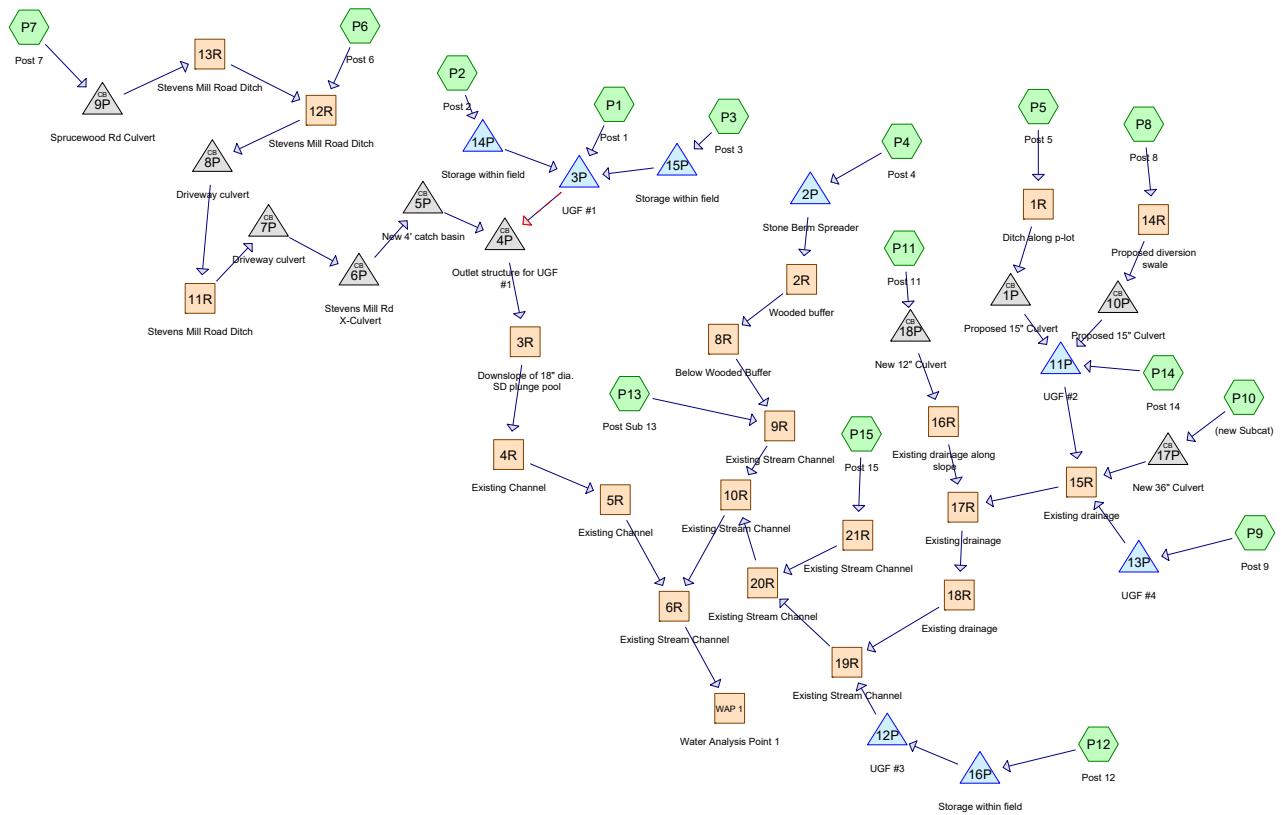
2/9/2023 rev 3/5/2023

Storm Water Treatment Design-BMP	Area Subtotal (Acres)	Req. Filter Area (s.f.)	Biofilter Area (s.f.)	Req. Filter Volume (c.f.)	Actual Filter Volume (c.f.)
1 Underdrain GF No. 1	4514	5005		7,524	18,103
Post Sub 1,2,3					
New Impervious Area	1.813				
Existing Impervious Area	0.102				
New Landscape Area	0.394				
2 Underdrain GF No. 2	4470	4646		7,449	14,679
Post Sub 5,8,14					
New Impervious Area	0.799				
Existing Impervious Area	0.468				
New Landscape Area	0.673				
Existing Landscape Area	1.290				
3 Underdrain GF No. 3	6027	6514		10,045	19,813
Post Sub 12					
New Impervious Area	2.652				
Landscape Area	0.288				
4 Underdrain GF No. 4	998	1018		1,663	3,987
Post Sub 9					
New Impervious Area	0.372				
Landscape Area	0.215				
Forebay Sizing	Imp. Area sanded	# Storm/yr	Lbs/acre*storm	Density (lbs/cf)	Req'd Volume (cf)
UGF # 2	0.14	10	500	90	7.8
Assumption is that all other areas within the development will not be sanded as they are seasonal.					

Auburn Suburban Baseball and Softball Development
Storm Water BMP Design - Vegetated Buffers

2/9/2023 rev. 3/5/2023

Treatment Design-BMP	Storm Water	Area Subtotal	Buffer Flow	Berm	Req'd Berm	Design Berm
		(Acres)	Path (Feet)	Slope (%)	Length (Feet)	Length (Feet)
1	Wooded Buffer 1		75	2.2	29	30
	Post Sub 4					
	New Impervious Area	0.151				
	Landscape Area	0.470				



Routing Diagram for Postdevelopment model_03_05_23
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Postdevelopment model_03_05_23

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year storm	Type III 24-hr		Default	24.00	1	3.00	2
2	10-year storm	Type III 24-hr		Default	24.00	1	4.30	2
3	25-year storm	Type III 24-hr		Default	24.00	1	5.40	2

Postdevelopment model_03_05_23

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.463	39	>75% Grass cover, Good, HSG A (P10, P11, P12, P15, P8)
3.315	74	>75% Grass cover, Good, HSG C (P1, P10, P11, P12, P13, P14, P4, P5, P8, P9)
0.229	80	>75% Grass cover, Good, HSG D (P11, P13, P15)
0.305	96	Gravel surface, HSG C (P10, P11, P13, P14, P5)
0.049	96	Gravel surface, HSG D (P11, P13)
1.098	71	Meadow, non-grazed, HSG C (P13, P14, P9)
1.964	78	Meadow, non-grazed, HSG D (P13)
2.347	98	New Turf Field, HSG C (P12, P3)
1.122	98	New Turf field, HSG A (P12)
0.932	98	Paved parking, HSG A (P7, P8)
1.107	98	Paved parking, HSG C (P1, P12, P13, P14, P4, P5, P8)
0.003	98	Paved parking, HSG D (P11)
0.399	83	Paved roads w/open ditches, 50% imp, HSG A (P6, P7)
0.190	92	Paved roads w/open ditches, 50% imp, HSG C (P6)
0.065	98	Roofs, HSG C (P8)
0.906	98	Turf Field, HSG C (P2)
0.236	98	Unconnected pavement, HSG A (P6)
0.172	98	Unconnected pavement, HSG C (P6)
0.102	98	Unconnected roofs, HSG A (P8)
0.033	98	Unconnected roofs, HSG C (P4)
0.361	98	Water Surface, HSG C (P9)
5.650	30	Woods, Good, HSG A (P10, P11, P15, P6, P7, P8)
4.226	70	Woods, Good, HSG C (P13, P5, P6, P8, P9)
12.632	77	Woods, Good, HSG D (P13, P15)
38.903	72	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
9.903	HSG A	P10, P11, P12, P15, P6, P7, P8
0.000	HSG B	
14.124	HSG C	P1, P10, P11, P12, P13, P14, P2, P3, P4, P5, P6, P8, P9
14.876	HSG D	P11, P13, P15
0.000	Other	
38.903		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchr Numbers
1.463	0.000	3.315	0.229	0.000	5.006	>75% Grass cover, Good	
0.000	0.000	0.305	0.049	0.000	0.354	Gravel surface	
0.000	0.000	1.098	1.964	0.000	3.062	Meadow, non-grazed	
0.000	0.000	2.347	0.000	0.000	2.347	New Turf Field	
1.122	0.000	0.000	0.000	0.000	1.122	New Turf field	
0.932	0.000	1.107	0.003	0.000	2.042	Paved parking	
0.399	0.000	0.190	0.000	0.000	0.589	Paved roads w/open ditches, 50% imp	
0.000	0.000	0.065	0.000	0.000	0.065	Roofs	
0.000	0.000	0.906	0.000	0.000	0.906	Turf Field	
0.236	0.000	0.172	0.000	0.000	0.408	Unconnected pavement	
0.102	0.000	0.033	0.000	0.000	0.134	Unconnected roofs	
0.000	0.000	0.361	0.000	0.000	0.361	Water Surface	
5.650	0.000	4.226	12.632	0.000	22.507	Woods, Good	
9.903	0.000	14.124	14.876	0.000	38.903	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	238.00	237.80	50.0	0.0040	0.013	15.0	0.0	0.0
2	3P	236.83	236.70	10.0	0.0130	0.010	6.0	0.0	0.0
3	4P	236.50	235.50	197.0	0.0051	0.013	18.0	0.0	0.0
4	5P	239.49	236.60	200.0	0.0145	0.013	15.0	0.0	0.0
5	6P	239.93	239.59	32.0	0.0106	0.025	15.0	0.0	0.0
6	7P	240.10	239.93	28.0	0.0061	0.025	12.0	0.0	0.0
7	8P	241.35	241.09	28.0	0.0093	0.025	12.0	0.0	0.0
8	9P	244.37	243.11	48.0	0.0262	0.025	18.0	0.0	0.0
9	10P	238.00	237.80	65.0	0.0031	0.013	15.0	0.0	0.0
10	11P	234.70	234.50	175.0	0.0011	0.013	15.0	0.0	0.0
11	12P	227.78	226.00	48.0	0.0371	0.013	12.0	0.0	0.0
12	13P	236.00	235.80	20.0	0.0100	0.013	12.0	0.0	0.0
13	14P	243.00	242.30	140.0	0.0050	0.010	12.0	1.0	0.0
14	14P	241.59	239.60	435.0	0.0046	0.010	8.0	0.0	0.0
15	14P	239.60	239.50	20.0	0.0050	0.010	12.0	0.0	0.0
16	15P	243.00	242.30	140.0	0.0050	0.010	12.0	1.0	0.0
17	15P	241.59	239.60	435.0	0.0046	0.010	8.0	0.0	0.0
18	15P	239.60	239.50	20.0	0.0050	0.010	12.0	0.0	0.0
19	16P	235.33	234.63	140.0	0.0050	0.010	12.0	1.0	0.0
20	16P	233.97	231.10	573.0	0.0050	0.010	8.0	0.0	0.0
21	16P	231.10	230.78	36.0	0.0089	0.010	12.0	0.0	0.0
22	17P	235.00	234.00	50.0	0.0200	0.020	36.0	0.0	0.0
23	18P	233.25	233.00	81.0	0.0031	0.013	12.0	0.0	0.0

Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP1: Post 1	Runoff Area=21,609 sf 20.63% Impervious Runoff Depth>1.09" Flow Length=49' Tc=6.5 min CN=79 Runoff=0.66 cfs 0.045 af
SubcatchmentP10: (new Subcat)	Runoff Area=36,875 sf 0.00% Impervious Runoff Depth>0.41" Flow Length=292' Tc=20.7 min CN=64 Runoff=0.22 cfs 0.029 af
SubcatchmentP11: Post 11	Runoff Area=23,246 sf 0.47% Impervious Runoff Depth>0.12" Flow Length=201' Tc=19.5 min CN=53 Runoff=0.02 cfs 0.005 af
SubcatchmentP12: Post 12	Runoff Area=128,031 sf 90.21% Impervious Runoff Depth>2.32" Flow Length=1' Tc=0.2 min CN=95 Runoff=9.17 cfs 0.569 af
SubcatchmentP13: Post Sub 13	Runoff Area=790,293 sf 0.50% Impervious Runoff Depth>0.91" Flow Length=512' Tc=42.2 min CN=76 Runoff=9.84 cfs 1.379 af
SubcatchmentP14: Post 14	Runoff Area=11,225 sf 0.12% Impervious Runoff Depth>1.15" Flow Length=25' Tc=2.2 min CN=80 Runoff=0.41 cfs 0.025 af
SubcatchmentP15: Post 15	Runoff Area=36,496 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=480' Tc=30.4 min CN=36 Runoff=0.00 cfs 0.000 af
SubcatchmentP2: Post 2	Runoff Area=39,484 sf 100.00% Impervious Runoff Depth>2.64" Flow Length=1' Tc=0.2 min CN=98 Runoff=3.01 cfs 0.199 af
SubcatchmentP3: Post 3	Runoff Area=39,484 sf 100.00% Impervious Runoff Depth>2.64" Flow Length=1' Tc=0.2 min CN=98 Runoff=3.01 cfs 0.199 af
SubcatchmentP4: Post 4	Runoff Area=27,045 sf 24.36% Impervious Runoff Depth>1.09" Flow Length=266' Tc=11.2 min UI Adjusted CN=79 Runoff=0.71 cfs 0.056 af
SubcatchmentP5: Post 5	Runoff Area=41,835 sf 30.05% Impervious Runoff Depth>1.21" Flow Length=69' Tc=16.0 min CN=81 Runoff=1.07 cfs 0.097 af
SubcatchmentP6: Post 6	Runoff Area=197,973 sf 12.87% Impervious Runoff Depth>0.05" Flow Length=500' Tc=68.1 min UI Adjusted CN=49 Runoff=0.04 cfs 0.019 af
SubcatchmentP7: Post 7	Runoff Area=135,817 sf 24.84% Impervious Runoff Depth>0.04" Flow Length=570' Tc=36.8 min CN=48 Runoff=0.02 cfs 0.011 af
SubcatchmentP8: Post 8	Runoff Area=140,411 sf 26.63% Impervious Runoff Depth>0.55" Flow Length=270' Tc=39.5 min UI Adjusted CN=68 Runoff=0.98 cfs 0.148 af
SubcatchmentP9: Post 9	Runoff Area=24,805 sf 63.32% Impervious Runoff Depth>1.70" Flow Length=132' Tc=8.9 min CN=88 Runoff=1.07 cfs 0.081 af
Reach 1R: Ditch along p-lot	Avg. Flow Depth=0.28' Max Vel=1.79 fps Inflow=1.07 cfs 0.097 af n=0.035 L=130.0' S=0.0171 '/' Capacity=16.19 cfs Outflow=1.06 cfs 0.097 af

Reach 2R: Wooded buffer	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af n=0.400 L=100.0' S=0.0165 '/' Capacity=2.38 cfs Outflow=0.00 cfs 0.000 af
Reach 3R: Downslope of 18" dia. SD	Avg. Flow Depth=0.06' Max Vel=0.06 fps Inflow=0.07 cfs 0.028 af n=0.400 L=100.0' S=0.0160 '/' Capacity=2.02 cfs Outflow=0.07 cfs 0.025 af
Reach 4R: Existing Channel	Avg. Flow Depth=0.02' Max Vel=0.35 fps Inflow=0.07 cfs 0.025 af n=0.025 L=325.0' S=0.0120 '/' Capacity=18.08 cfs Outflow=0.07 cfs 0.023 af
Reach 5R: Existing Channel	Avg. Flow Depth=0.03' Max Vel=0.64 fps Inflow=0.07 cfs 0.023 af n=0.025 L=420.0' S=0.0204 '/' Capacity=66.75 cfs Outflow=0.07 cfs 0.021 af
Reach 6R: Existing Stream Channel	Avg. Flow Depth=1.04' Max Vel=1.31 fps Inflow=9.76 cfs 1.434 af n=0.040 L=240.0' S=0.0018 '/' Capacity=33.56 cfs Outflow=9.71 cfs 1.425 af
Reach 8R: Below Wooded Buffer	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af n=0.025 L=240.0' S=0.0194 '/' Capacity=29.38 cfs Outflow=0.00 cfs 0.000 af
Reach 9R: Existing Stream Channel	Avg. Flow Depth=0.54' Max Vel=3.00 fps Inflow=9.84 cfs 1.379 af n=0.040 L=540.0' S=0.0194 '/' Capacity=110.28 cfs Outflow=9.79 cfs 1.371 af
Reach 10R: Existing Stream Channel	Avg. Flow Depth=1.04' Max Vel=1.33 fps Inflow=9.79 cfs 1.415 af n=0.040 L=65.0' S=0.0018 '/' Capacity=34.06 cfs Outflow=9.76 cfs 1.413 af
Reach 11R: Stevens Mill Road Ditch	Avg. Flow Depth=0.11' Max Vel=0.67 fps Inflow=0.07 cfs 0.029 af n=0.035 L=118.0' S=0.0084 '/' Capacity=32.56 cfs Outflow=0.07 cfs 0.028 af
Reach 12R: Stevens Mill Road Ditch	Avg. Flow Depth=0.10' Max Vel=0.76 fps Inflow=0.07 cfs 0.029 af n=0.035 L=105.0' S=0.0120 '/' Capacity=38.94 cfs Outflow=0.07 cfs 0.029 af
Reach 13R: Stevens Mill Road Ditch	Avg. Flow Depth=0.09' Max Vel=0.35 fps Inflow=0.02 cfs 0.011 af n=0.035 L=165.0' S=0.0030 '/' Capacity=19.57 cfs Outflow=0.02 cfs 0.010 af
Reach 14R: Proposed diversion swale	Avg. Flow Depth=0.23' Max Vel=2.20 fps Inflow=0.98 cfs 0.148 af n=0.035 L=270.0' S=0.0333 '/' Capacity=22.62 cfs Outflow=0.97 cfs 0.147 af
Reach 15R: Existing drainage	Avg. Flow Depth=0.05' Max Vel=0.71 fps Inflow=0.22 cfs 0.050 af n=0.025 L=185.0' S=0.0146 '/' Capacity=164.26 cfs Outflow=0.21 cfs 0.048 af
Reach 16R: Existing drainage along	Avg. Flow Depth=0.01' Max Vel=0.40 fps Inflow=0.02 cfs 0.005 af n=0.025 L=75.0' S=0.0160 '/' Capacity=144.38 cfs Outflow=0.02 cfs 0.005 af
Reach 17R: Existing drainage	Avg. Flow Depth=0.05' Max Vel=0.74 fps Inflow=0.22 cfs 0.054 af n=0.025 L=235.0' S=0.0162 '/' Capacity=172.90 cfs Outflow=0.21 cfs 0.051 af
Reach 18R: Existing drainage	Avg. Flow Depth=0.04' Max Vel=0.78 fps Inflow=0.21 cfs 0.051 af n=0.025 L=115.0' S=0.0191 '/' Capacity=188.06 cfs Outflow=0.21 cfs 0.051 af
Reach 19R: Existing Stream Channel	Avg. Flow Depth=0.06' Max Vel=0.67 fps Inflow=0.21 cfs 0.051 af n=0.040 L=200.0' S=0.0144 '/' Capacity=94.97 cfs Outflow=0.21 cfs 0.049 af
Reach 20R: Existing Stream Channel	Avg. Flow Depth=0.08' Max Vel=0.39 fps Inflow=0.21 cfs 0.049 af n=0.040 L=405.0' S=0.0034 '/' Capacity=46.28 cfs Outflow=0.16 cfs 0.044 af

Reach 21R: Existing Stream Channel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.040 L=765.0' S=0.0092 '/' Capacity=76.21 cfs Outflow=0.00 cfs 0.000 af

Reach WAP 1: Water Analysis Point 1 Inflow=9.71 cfs 1.425 af
Outflow=9.71 cfs 1.425 af

Pond 1P: Proposed 15" Culvert Peak Elev=239.55' Inflow=1.06 cfs 0.097 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=1.06 cfs 0.097 af

Pond 2P: Stone Berm Spreader Peak Elev=240.04' Storage=2,457 cf Inflow=0.71 cfs 0.056 af
Outflow=0.00 cfs 0.000 af

Pond 3P: UGF #1 Peak Elev=237.81' Storage=1,967 cf Inflow=0.66 cfs 0.045 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Outlet structure for UGF #1 Peak Elev=236.64' Inflow=0.07 cfs 0.028 af
18.0" Round Culvert n=0.013 L=197.0' S=0.0051 '/' Outflow=0.07 cfs 0.028 af

Pond 5P: New 4' catch basin Peak Elev=239.61' Inflow=0.07 cfs 0.028 af
15.0" Round Culvert n=0.013 L=200.0' S=0.0145 '/' Outflow=0.07 cfs 0.028 af

Pond 6P: Stevens Mill Rd X-Culvert Peak Elev=240.21' Inflow=0.07 cfs 0.028 af
15.0" Round Culvert n=0.025 L=32.0' S=0.0106 '/' Outflow=0.07 cfs 0.028 af

Pond 7P: Driveway culvert Peak Elev=240.83' Inflow=0.07 cfs 0.028 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0061 '/' Outflow=0.07 cfs 0.028 af

Pond 8P: Driveway culvert Peak Elev=241.64' Inflow=0.07 cfs 0.029 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0093 '/' Outflow=0.07 cfs 0.029 af

Pond 9P: Sprucewood Rd Culvert Peak Elev=244.47' Inflow=0.02 cfs 0.011 af
18.0" Round Culvert n=0.025 L=48.0' S=0.0262 '/' Outflow=0.02 cfs 0.011 af

Pond 10P: Proposed 15" Culvert Peak Elev=239.54' Inflow=0.97 cfs 0.147 af
15.0" Round Culvert n=0.013 L=65.0' S=0.0031 '/' Outflow=0.97 cfs 0.147 af

Pond 11P: UGF #2 Peak Elev=239.22' Storage=11,395 cf Inflow=1.53 cfs 0.268 af
Outflow=0.10 cfs 0.007 af

Pond 12P: UGF #3 Peak Elev=228.38' Storage=711 cf Inflow=1.20 cfs 0.016 af
Outflow=0.00 cfs 0.000 af

Pond 13P: UGF #4 Peak Elev=240.51' Storage=2,888 cf Inflow=1.07 cfs 0.081 af
Outflow=0.06 cfs 0.015 af

Pond 14P: Storage within field Peak Elev=242.91' Storage=1,255 cf Inflow=3.01 cfs 0.199 af
Discarded=0.92 cfs 0.199 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 0.199 af

Pond 15P: Storage within field Peak Elev=242.91' Storage=1,255 cf Inflow=3.01 cfs 0.199 af
Discarded=0.92 cfs 0.199 af Primary=0.00 cfs 0.000 af Outflow=0.92 cfs 0.199 af

Pond 16P: Storage within field

Peak Elev=235.38' Storage=852 cf Inflow=9.17 cfs 0.569 af
Discarded=5.57 cfs 0.553 af Primary=1.20 cfs 0.016 af Outflow=6.77 cfs 0.569 af

Pond 17P: New 36" Culvert

Peak Elev=235.19' Inflow=0.22 cfs 0.029 af
36.0" Round Culvert n=0.020 L=50.0' S=0.0200 '/' Outflow=0.22 cfs 0.029 af

Pond 18P: New 12" Culvert

Peak Elev=233.34' Inflow=0.02 cfs 0.005 af
12.0" Round Culvert n=0.013 L=81.0' S=0.0031 '/' Outflow=0.02 cfs 0.005 af

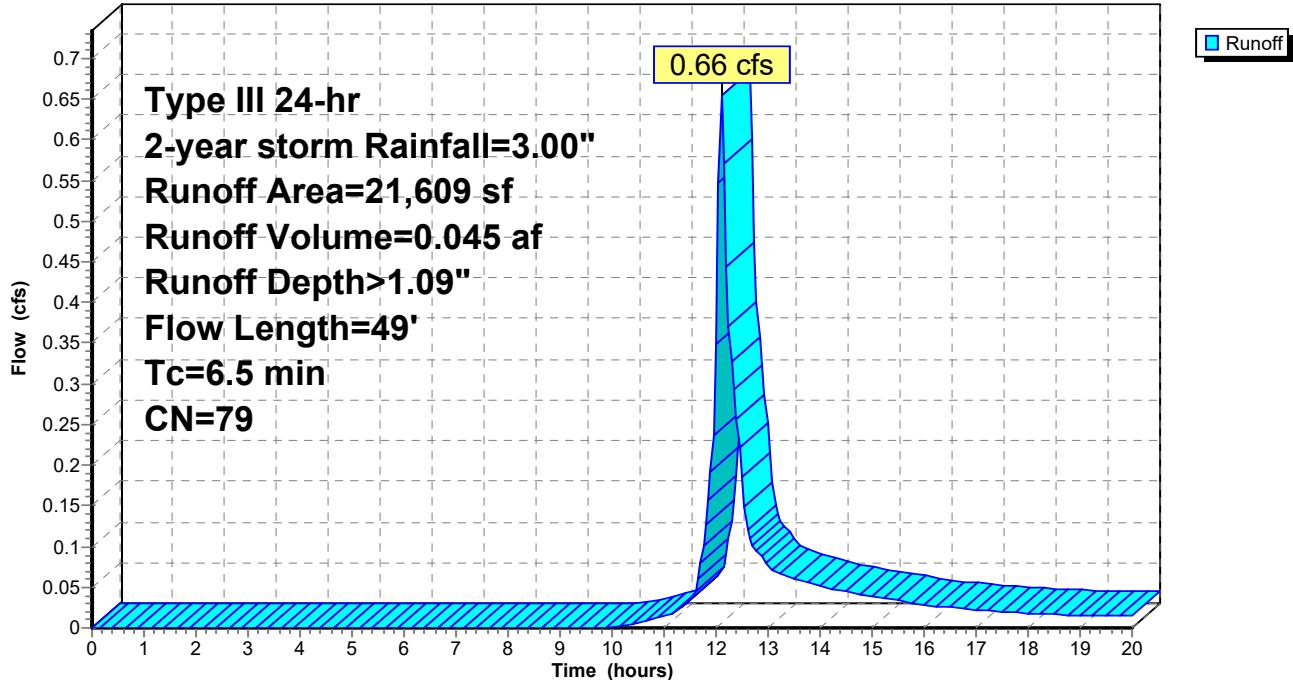
Total Runoff Area = 38.903 ac Runoff Volume = 2.863 af Average Runoff Depth = 0.88"
80.26% Pervious = 31.224 ac 19.74% Impervious = 7.679 ac

Summary for Subcatchment P1: Post 1

Runoff = 0.66 cfs @ 12.10 hrs, Volume= 0.045 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description			
4,457	98	Paved parking, HSG C			
17,152	74	>75% Grass cover, Good, HSG C			
21,609	79	Weighted Average			
17,152		79.37% Pervious Area			
4,457		20.63% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
6.2	35	0.0630	0.09		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
6.5	49	Total			

Subcatchment P1: Post 1**Hydrograph**

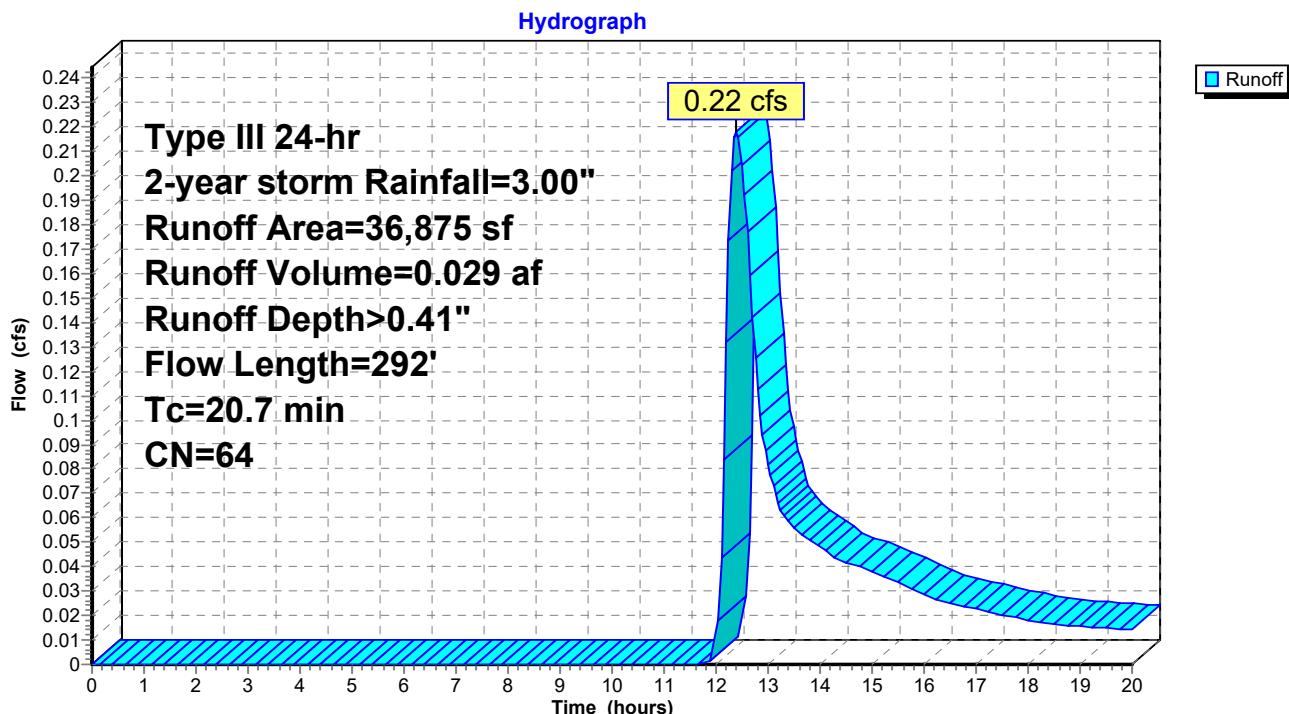
Summary for Subcatchment P10: (new Subcat)

Runoff = 0.22 cfs @ 12.39 hrs, Volume= 0.029 af, Depth> 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description			
11,265	39	>75% Grass cover, Good, HSG A			
485	30	Woods, Good, HSG A			
22,159	74	>75% Grass cover, Good, HSG C			
2,966	96	Gravel surface, HSG C			
36,875	64	Weighted Average			
36,875		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	120	0.0420	0.10		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
1.2	172	0.0259	2.41		Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
20.7	292				Total

Subcatchment P10: (new Subcat)



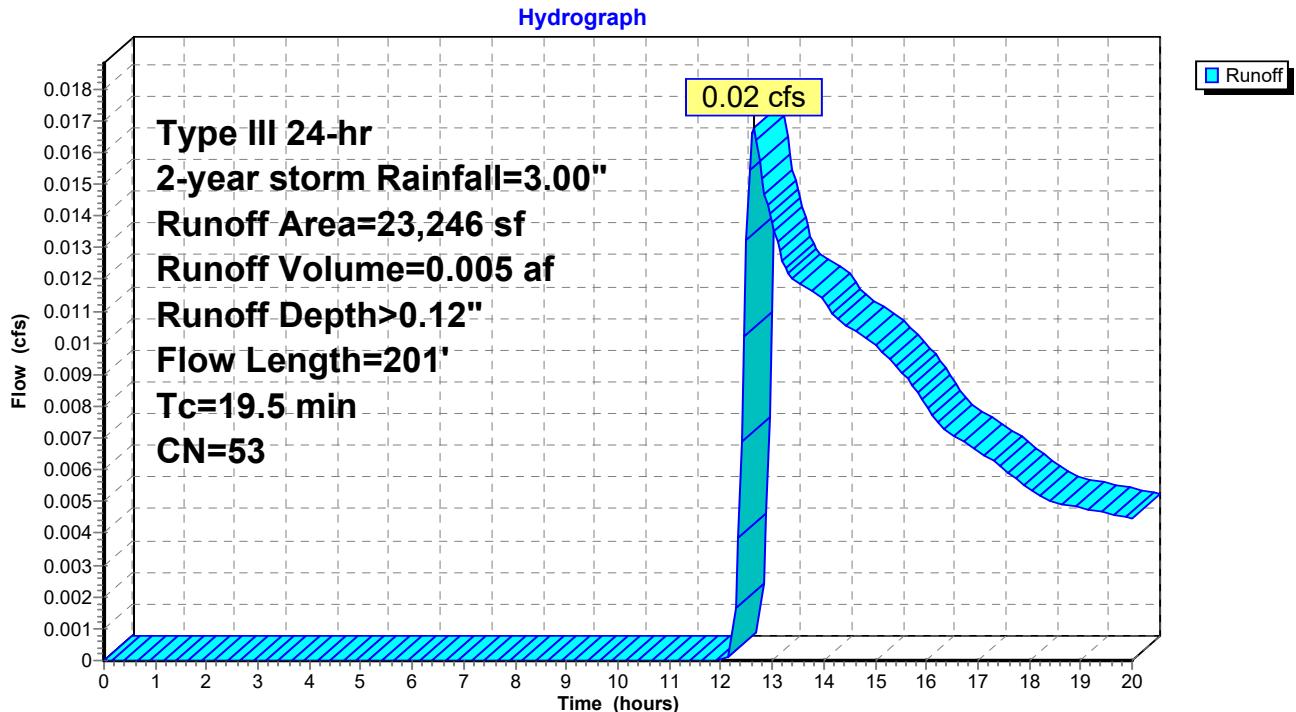
Summary for Subcatchment P11: Post 11

Runoff = 0.02 cfs @ 12.64 hrs, Volume= 0.005 af, Depth> 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
16,150	39	>75% Grass cover, Good, HSG A
143	30	Woods, Good, HSG A
2,251	74	>75% Grass cover, Good, HSG C
2,564	96	Gravel surface, HSG C
1,325	80	>75% Grass cover, Good, HSG D
110	98	Paved parking, HSG D
703	96	Gravel surface, HSG D
23,246	53	Weighted Average
23,136		99.53% Pervious Area
110		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	60	0.0200	0.07		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
4.2	32	0.1410	0.13		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
0.3	72	0.0140	4.28	17.10	Parabolic Channel, Vegetated Channel W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.030 Earth, grassed & winding
0.0	37	0.0810	14.75	118.03	Parabolic Channel, Vegetated channel W=6.00' D=2.00' Area=8.0 sf Perim=7.5' n= 0.030 Earth, grassed & winding
19.5	201	Total			

Subcatchment P11: Post 11

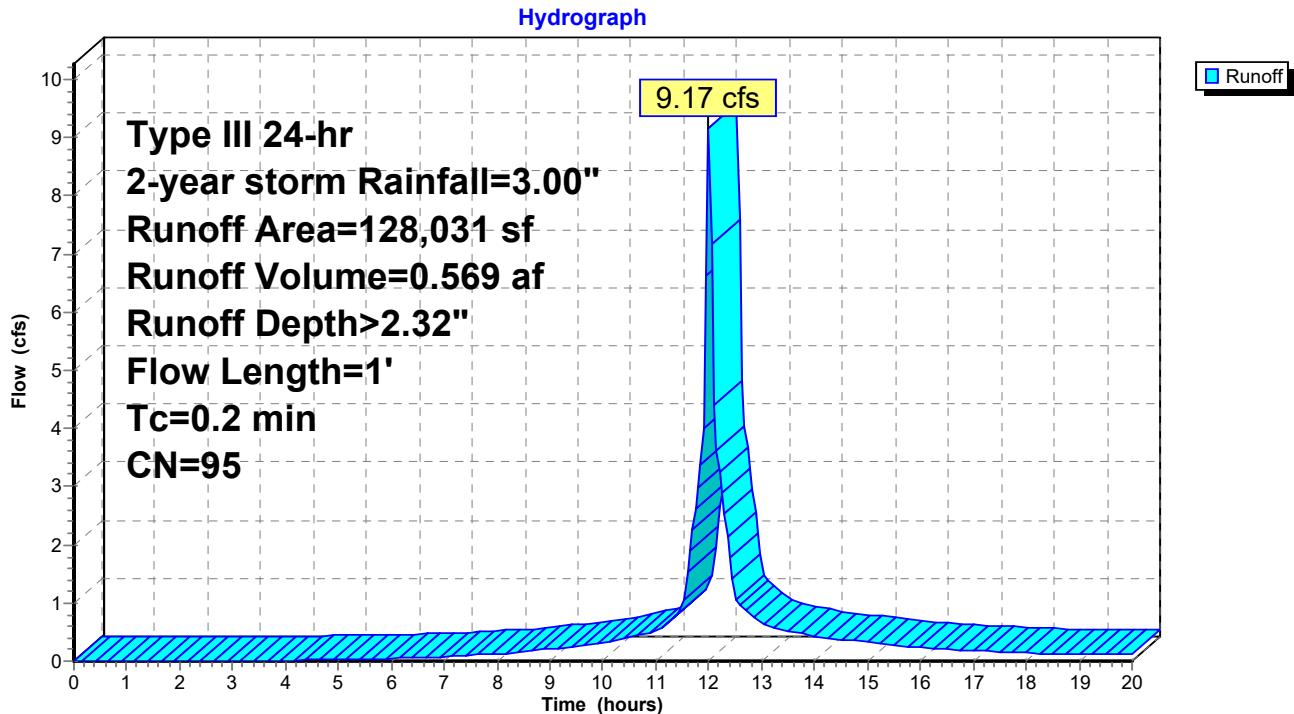
Summary for Subcatchment P12: Post 12

Runoff = 9.17 cfs @ 12.00 hrs, Volume= 0.569 af, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
866	39	>75% Grass cover, Good, HSG A
*	48,875	New Turf field, HSG A
11,665	74	>75% Grass cover, Good, HSG C
*	62,734	New Turf Field, HSG C
3,891	98	Paved parking, HSG C
128,031	95	Weighted Average
12,531		9.79% Pervious Area
115,500		90.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	1		0.10		Direct Entry, Flow through Turf

Subcatchment P12: Post 12

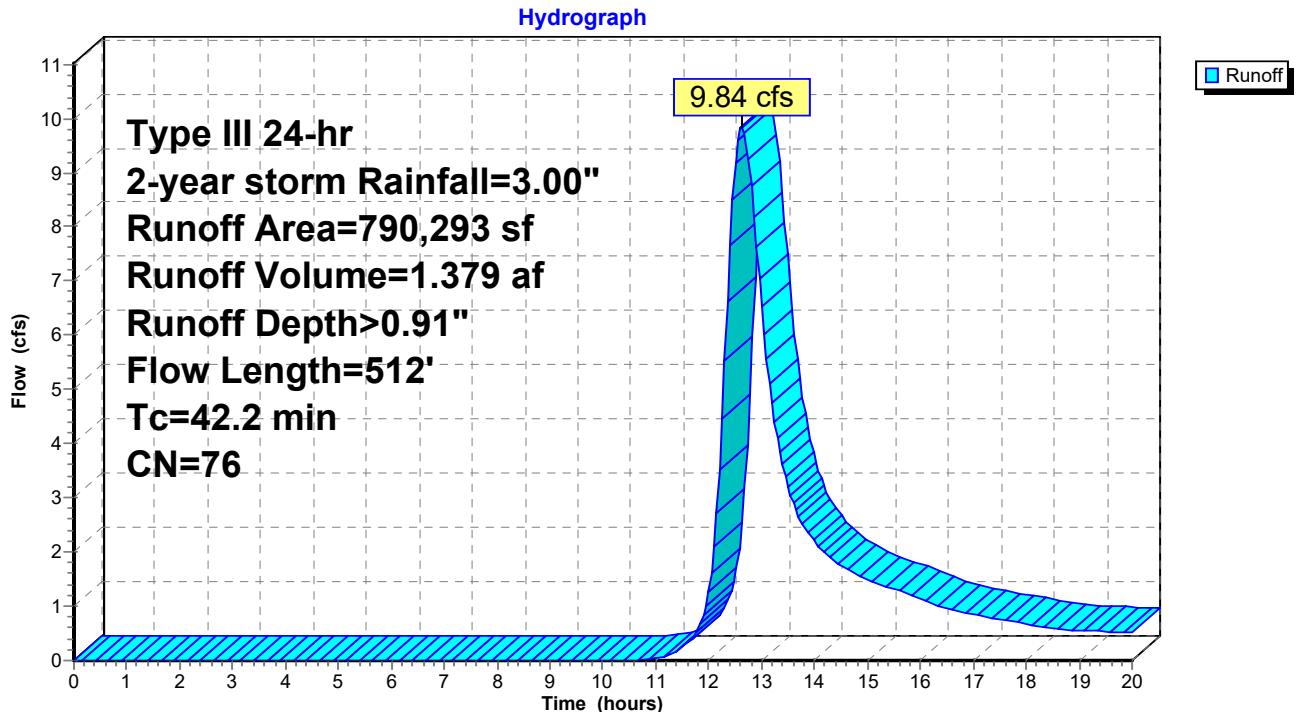
Summary for Subcatchment P13: Post Sub 13

Runoff = 9.84 cfs @ 12.62 hrs, Volume= 1.379 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
8,456	80	>75% Grass cover, Good, HSG D
1,440	96	Gravel surface, HSG D
85,560	78	Meadow, non-grazed, HSG D
546,270	77	Woods, Good, HSG D
17,074	74	>75% Grass cover, Good, HSG C
367	98	Paved parking, HSG C
2,503	96	Gravel surface, HSG C
41,424	71	Meadow, non-grazed, HSG C
83,580	70	Woods, Good, HSG C
3,619	98	Paved parking, HSG C
790,293	76	Weighted Average
786,307		99.50% Pervious Area
3,986		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0313	1.02		Sheet Flow, New Access Road Smooth surfaces n= 0.011 P2= 3.00"
1.1	3	0.0313	0.04		Sheet Flow, Grass Esplanade Grass: Bermuda n= 0.410 P2= 3.00"
0.1	5	0.0313	0.88		Sheet Flow, walkway Smooth surfaces n= 0.011 P2= 3.00"
28.7	131	0.0180	0.08		Sheet Flow, wooded/wetland Woods: Light underbrush n= 0.400 P2= 3.00"
12.1	362	0.0100	0.50		Shallow Concentrated Flow, woodland Woodland Kv= 5.0 fps
42.2	512	Total			

Subcatchment P13: Post Sub 13

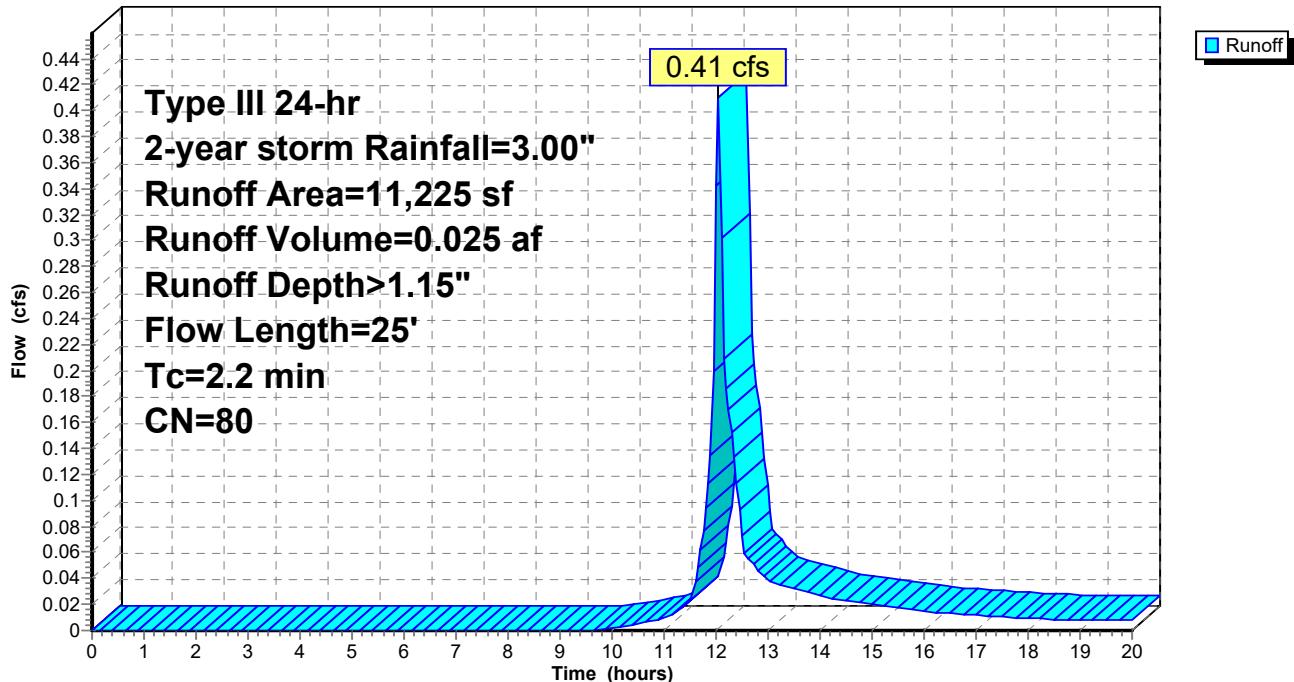
Summary for Subcatchment P14: Post 14

Runoff = 0.41 cfs @ 12.04 hrs, Volume= 0.025 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
7,811	74	>75% Grass cover, Good, HSG C
14	98	Paved parking, HSG C
3,289	96	Gravel surface, HSG C
111	71	Meadow, non-grazed, HSG C
11,225	80	Weighted Average
11,211		99.88% Pervious Area
14		0.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0310	1.02		Sheet Flow, New Road Smooth surfaces n= 0.011 P2= 3.00"
1.1	3	0.0310	0.04		Sheet Flow, Esplanade Grass: Bermuda n= 0.410 P2= 3.00"
0.1	5	0.0310	0.87		Sheet Flow, New Walkway Smooth surfaces n= 0.011 P2= 3.00"
0.8	6	0.3333	0.13		Sheet Flow, Road Slope Grass: Bermuda n= 0.410 P2= 3.00"
2.2	25	Total			

Subcatchment P14: Post 14**Hydrograph**

Summary for Subcatchment P15: Post 15

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

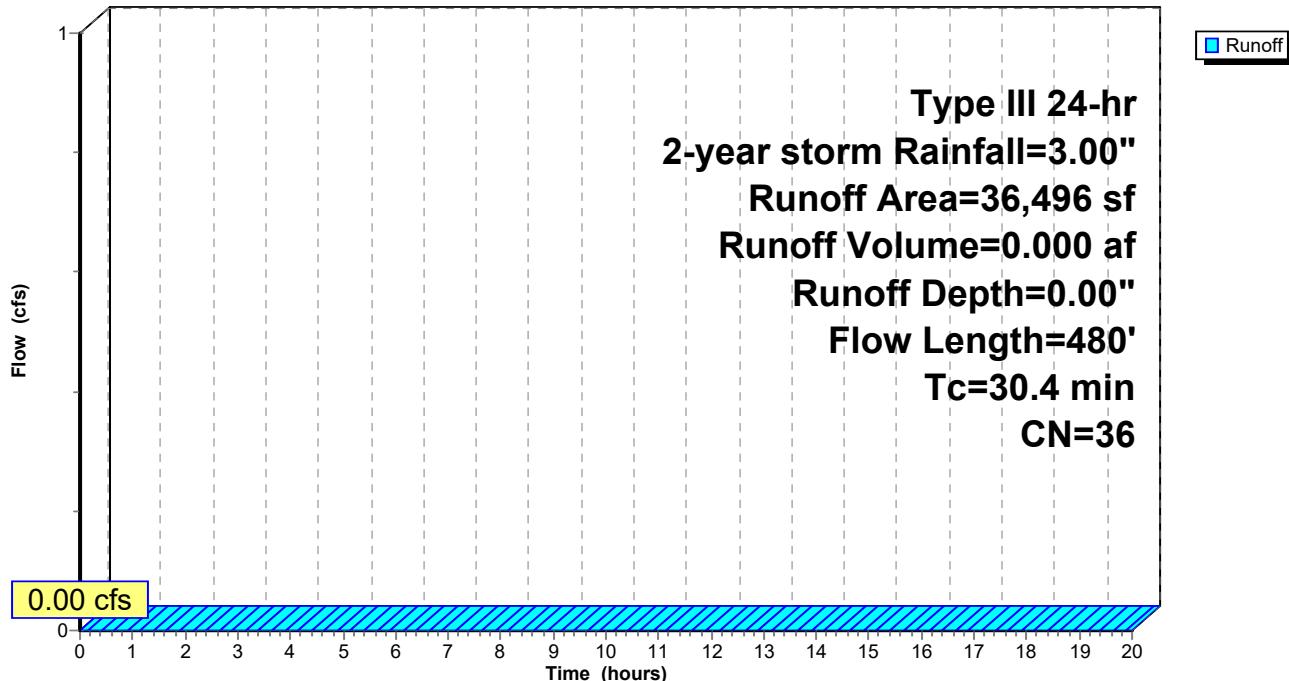
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
1,075	39	>75% Grass cover, Good, HSG A
31,275	30	Woods, Good, HSG A
179	80	>75% Grass cover, Good, HSG D
3,967	77	Woods, Good, HSG D
36,496	36	Weighted Average
36,496		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	150	0.0350	0.10		Sheet Flow, woods Woods: Light underbrush n= 0.400 P2= 3.00"
5.5	290	0.0310	0.88		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
0.4	40	0.1000	1.58		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
30.4	480	Total			

Subcatchment P15: Post 15

Hydrograph



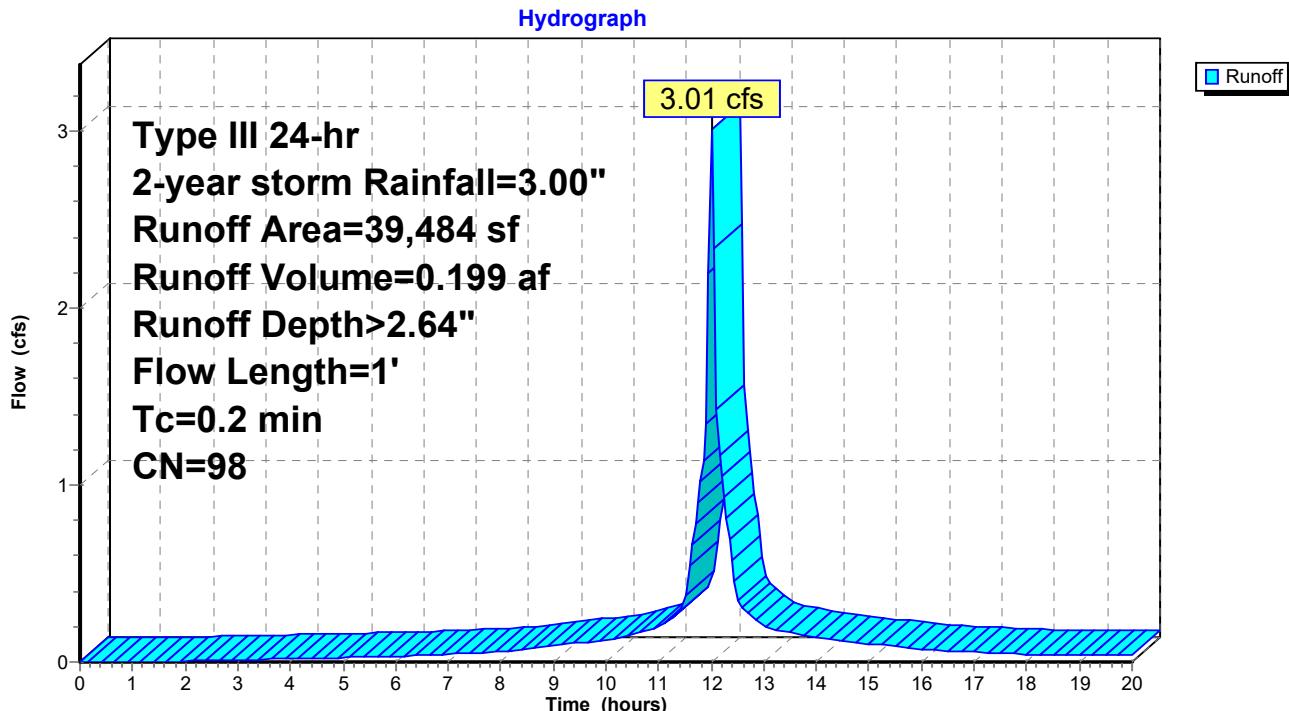
Summary for Subcatchment P2: Post 2

Runoff = 3.01 cfs @ 12.00 hrs, Volume= 0.199 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
* 39,484	98	Turf Field, HSG C
39,484		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	1		0.10		Direct Entry, Flow through Turf Field

Subcatchment P2: Post 2

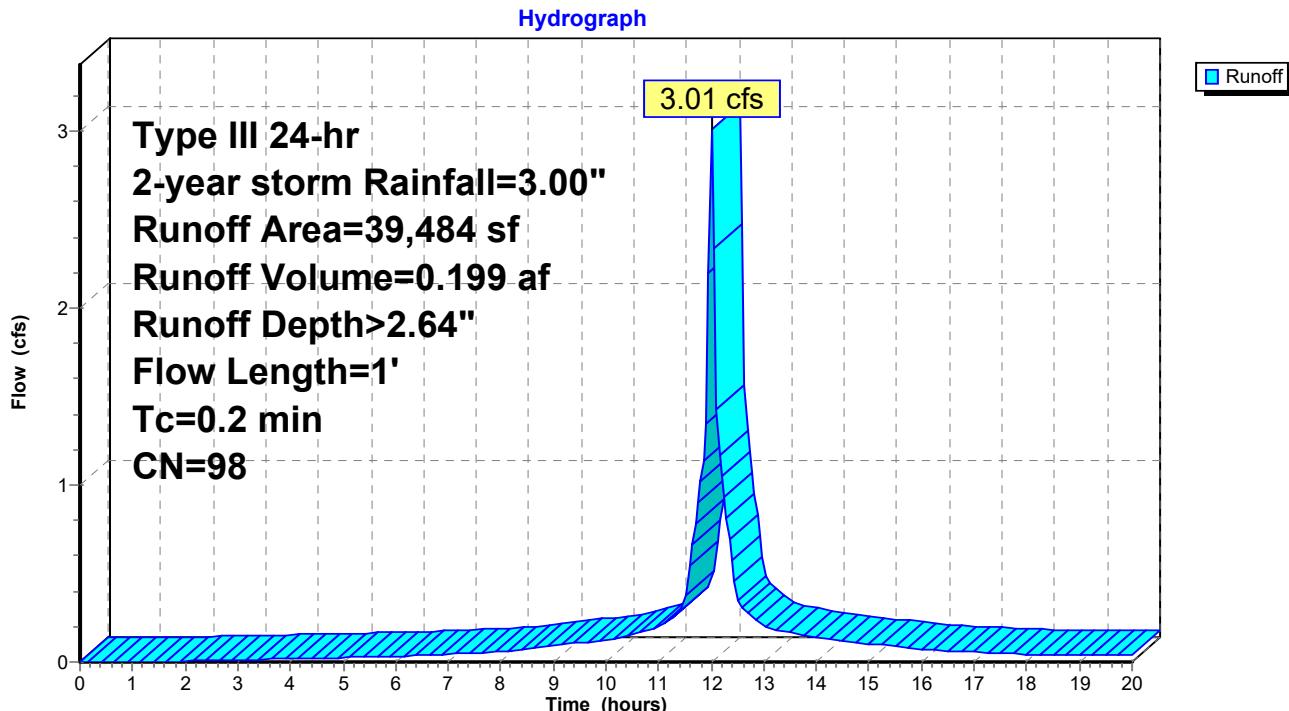
Summary for Subcatchment P3: Post 3

Runoff = 3.01 cfs @ 12.00 hrs, Volume= 0.199 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
* 39,484	98	New Turf Field, HSG C
39,484		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	1		0.10		Direct Entry, Flow through Turf

Subcatchment P3: Post 3

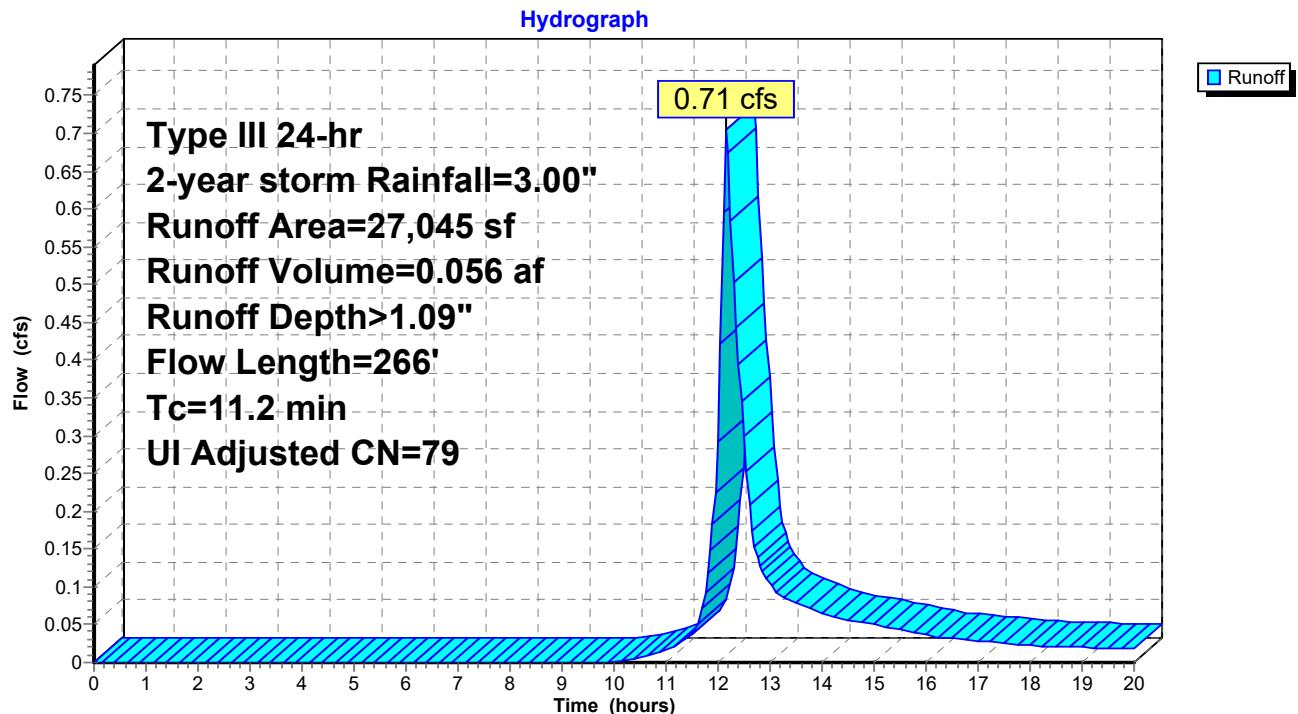
Summary for Subcatchment P4: Post 4

Runoff = 0.71 cfs @ 12.16 hrs, Volume= 0.056 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Adj	Description
4,305	98		Paved parking, HSG C
859	98		Paved parking, HSG C
1,425	98		Unconnected roofs, HSG C
20,456	74		>75% Grass cover, Good, HSG C
27,045	80	79	Weighted Average, UI Adjusted
20,456			75.64% Pervious Area
6,589			24.36% Impervious Area
1,425			21.63% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
9.9	40	0.0250	0.07		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
1.0	212	0.0127	3.46	13.85	Parabolic Channel, Vegetated swale W=8.00' D=0.75' Area=4.0 sf Perim=8.2' n= 0.030 Earth, grassed & winding
11.2	266	Total			

Subcatchment P4: Post 4

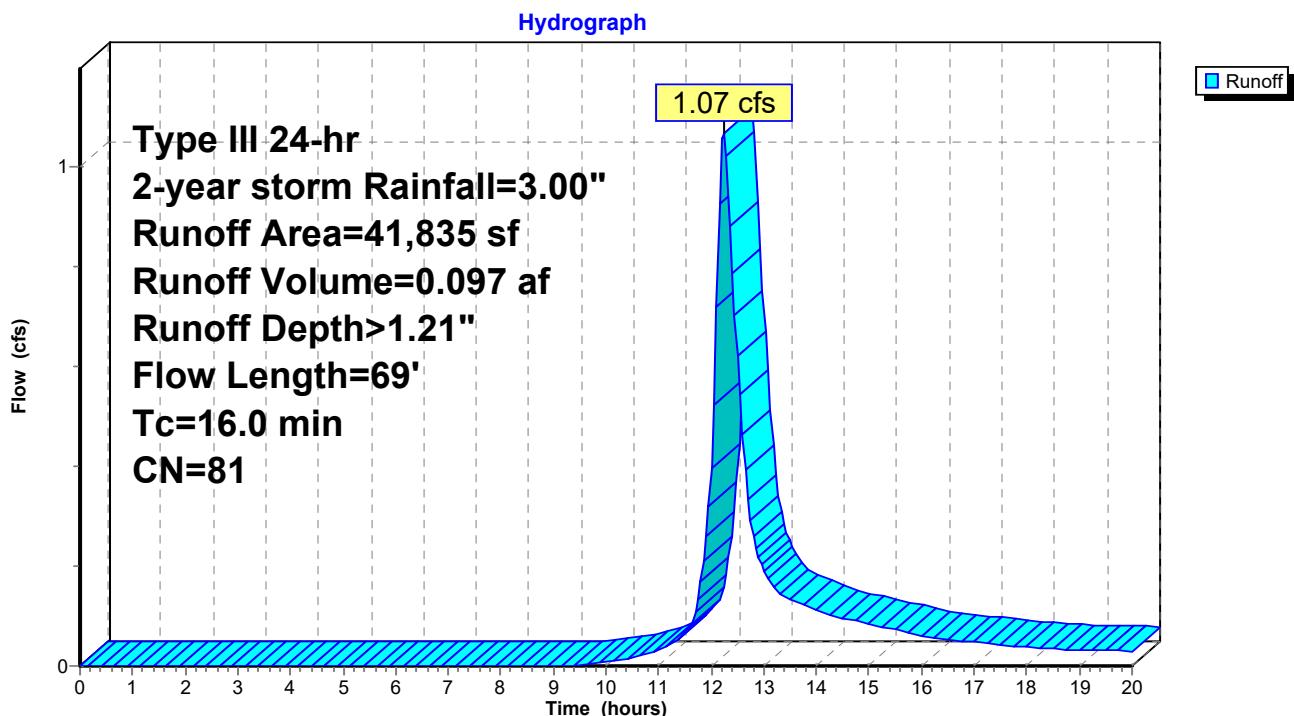
Summary for Subcatchment P5: Post 5

Runoff = 1.07 cfs @ 12.23 hrs, Volume= 0.097 af, Depth> 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
12,571	98	Paved parking, HSG C
11,876	74	>75% Grass cover, Good, HSG C
1,947	96	Gravel surface, HSG C
15,441	70	Woods, Good, HSG C
41,835	81	Weighted Average
29,264		69.95% Pervious Area
12,571		30.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
15.7	55	0.0150	0.06		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
16.0	69	Total			

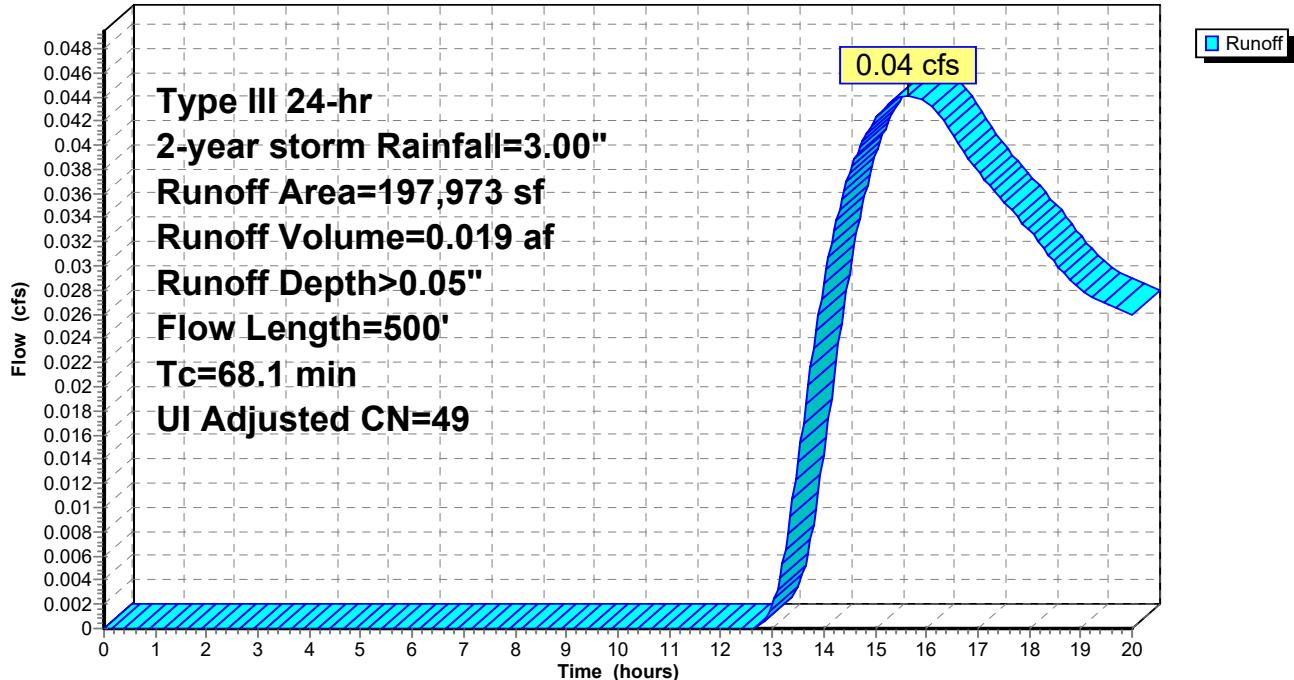
Subcatchment P5: Post 5

Summary for Subcatchment P6: Post 6

Runoff = 0.04 cfs @ 15.66 hrs, Volume= 0.019 af, Depth> 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Adj	Description	
8,288	92		Paved roads w/open ditches, 50% imp, HSG C	
7,140	83		Paved roads w/open ditches, 50% imp, HSG A	
471	98		Unconnected pavement, HSG C	
7,007	98		Unconnected pavement, HSG C	
10,292	98		Unconnected pavement, HSG A	
101,459	30		Woods, Good, HSG A	
54,560	70		Woods, Good, HSG C	
8,756	30		Woods, Good, HSG A	
197,973	52	49	Weighted Average, UI Adjusted	
172,489			87.13% Pervious Area	
25,484			12.87% Impervious Area	
17,770			69.73% Unconnected	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	
Capacity (cfs)	Description			
4.4	30	0.1050	0.11	Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
27.9	65	0.0050	0.04	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
23.9	55	0.0050	0.04	Sheet Flow, Woods - Good Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	240	0.0050	0.35	Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.6	110	0.0440	3.15	Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
68.1	500	Total		

Subcatchment P6: Post 6**Hydrograph**

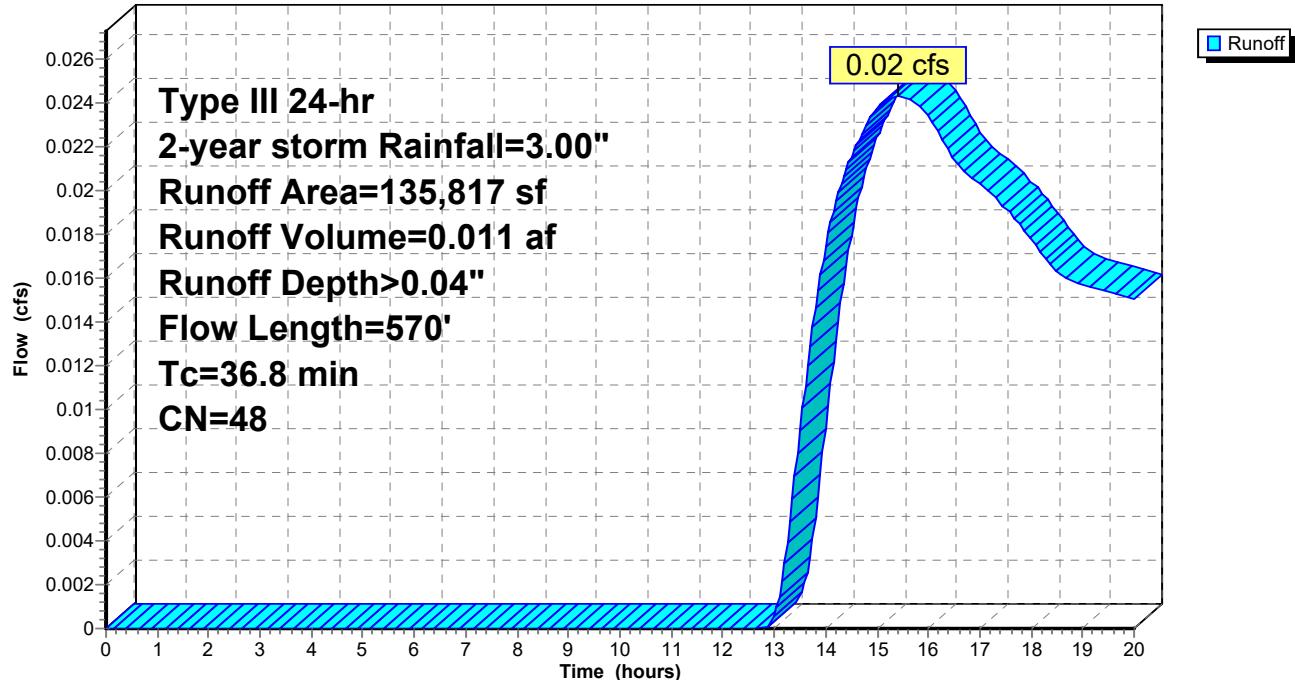
Summary for Subcatchment P7: Post 7

Runoff = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
10,242	83	Paved roads w/open ditches, 50% imp, HSG A
20,828	98	Paved parking, HSG A
7,787	98	Paved parking, HSG A
88,183	30	Woods, Good, HSG A
8,635	30	Woods, Good, HSG A
142	30	Woods, Good, HSG A
135,817	48	Weighted Average
102,081		75.16% Pervious Area
33,736		24.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0710	0.11		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
25.4	100	0.0150	0.07		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.2	205	0.0190	1.56	62.50	Parabolic Channel, Existing Wooded channel W=60.00' D=1.00' Area=40.0 sf Perim=60.0' n= 0.100 Heavy timber, flow below branches
0.8	100	0.0125	2.01	3.35	Parabolic Channel, lawn drainage swale W=10.00' D=0.25' Area=1.7 sf Perim=10.0' n= 0.025 Earth, clean & winding
0.6	115	0.0100	3.10	12.39	Parabolic Channel, Sprucewood Road ditch W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.035 Earth, dense weeds
36.8	570	Total			

Subcatchment P7: Post 7**Hydrograph**

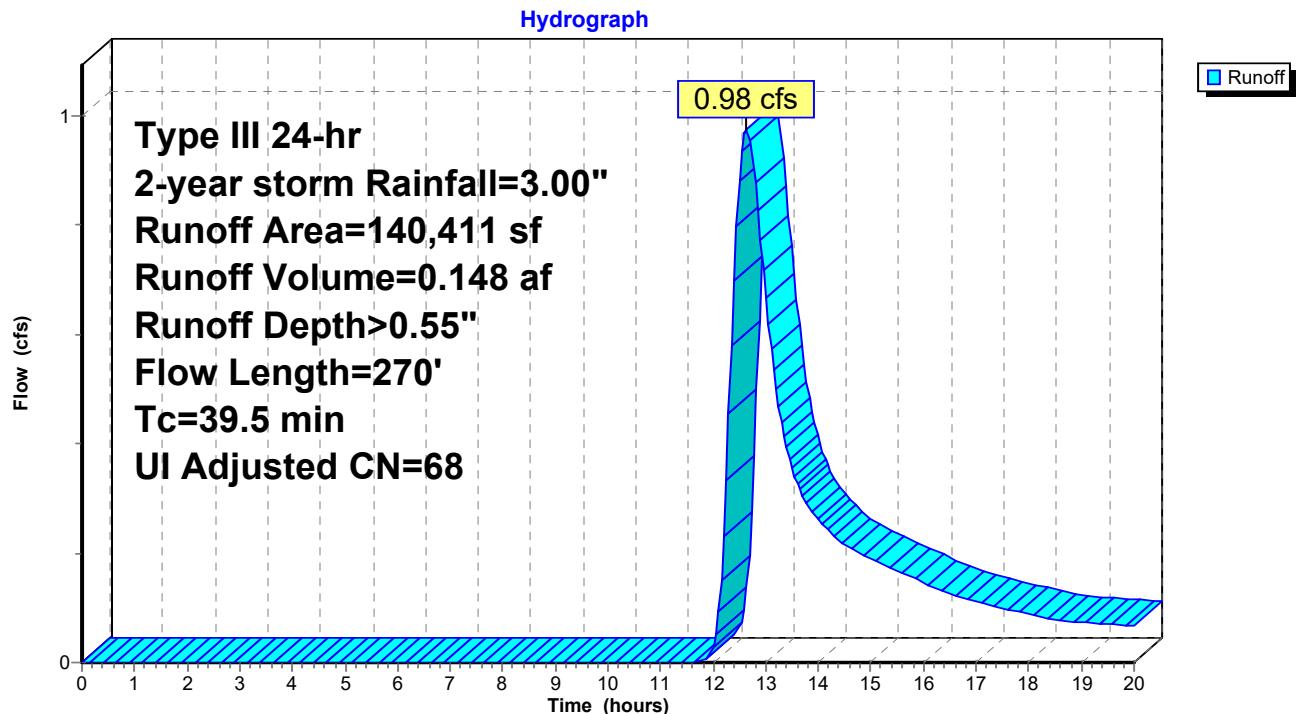
Summary for Subcatchment P8: Post 8

Runoff = 0.98 cfs @ 12.64 hrs, Volume= 0.148 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Adj	Description
7,015	30		Woods, Good, HSG A
4,423	98		Unconnected roofs, HSG A
11,991	98		Paved parking, HSG A
34,364	39		>75% Grass cover, Good, HSG A
9,643	74		>75% Grass cover, Good, HSG C
16,990	98		Paved parking, HSG C
30,169	70		Woods, Good, HSG C
2,818	98		Roofs, HSG C
1,168	98		Paved parking, HSG C
21,830	74		>75% Grass cover, Good, HSG C
140,411	69	68	Weighted Average, UI Adjusted
103,021			73.37% Pervious Area
37,390			26.63% Impervious Area
4,423			11.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
36.7	136	0.0110	0.06		Sheet Flow, Offsite lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.5	100	0.0180	0.67		Shallow Concentrated Flow, wooded Woodland Kv= 5.0 fps
0.0	20	0.3330	8.66		Shallow Concentrated Flow, lawn Grassed Waterway Kv= 15.0 fps
39.5	270	Total			

Subcatchment P8: Post 8

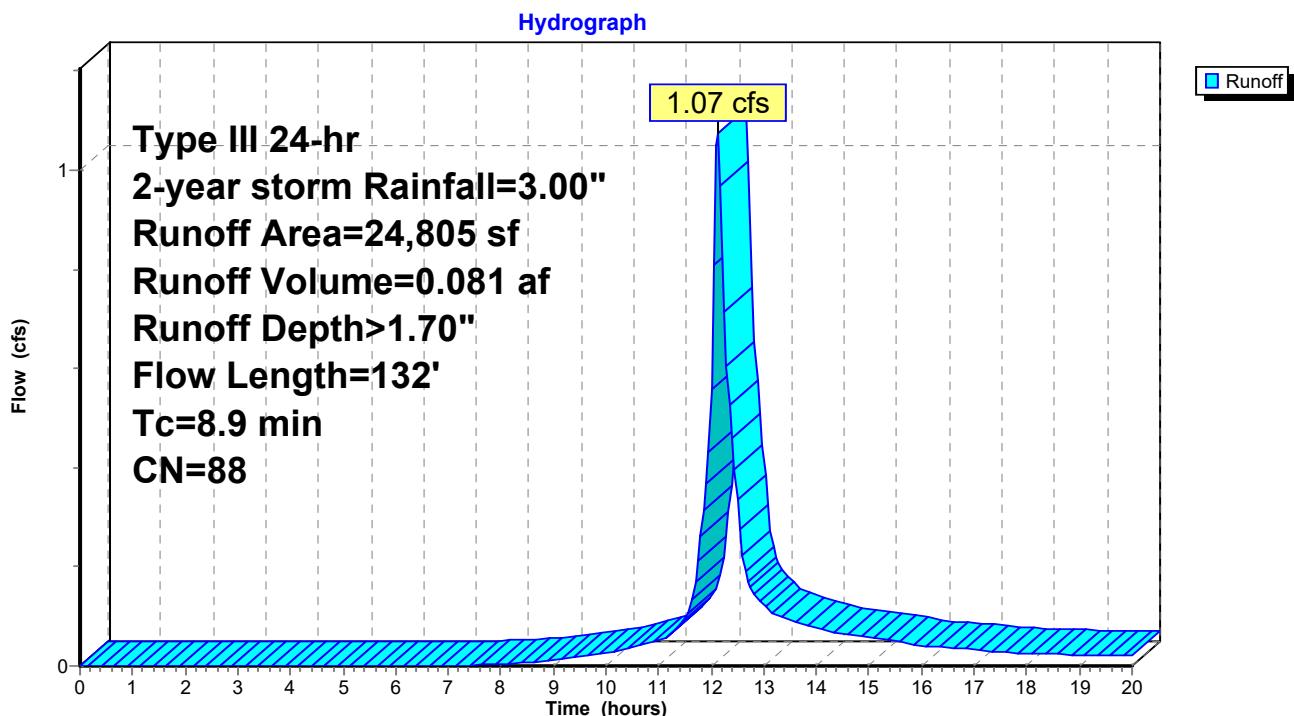
Summary for Subcatchment P9: Post 9

Runoff = 1.07 cfs @ 12.13 hrs, Volume= 0.081 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
2,474	74	>75% Grass cover, Good, HSG C
15,707	98	Water Surface, HSG C
6,288	71	Meadow, non-grazed, HSG C
336	70	Woods, Good, HSG C
24,805	88	Weighted Average
9,098		36.68% Pervious Area
15,707		63.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	72	0.0500	1.80		Sheet Flow, New gravel parking area Smooth surfaces n= 0.011 P2= 3.00"
8.2	60	0.0900	0.12		Sheet Flow, Lawn Area Grass: Bermuda n= 0.410 P2= 3.00"
8.9	132	Total			

Subcatchment P9: Post 9

Summary for Reach 1R: Ditch along p-lot

Inflow Area = 0.960 ac, 30.05% Impervious, Inflow Depth > 1.21" for 2-year storm event

Inflow = 1.07 cfs @ 12.23 hrs, Volume= 0.097 af

Outflow = 1.06 cfs @ 12.27 hrs, Volume= 0.097 af, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.79 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 0.77 fps, Avg. Travel Time= 2.8 min

Peak Storage= 77 cf @ 12.25 hrs

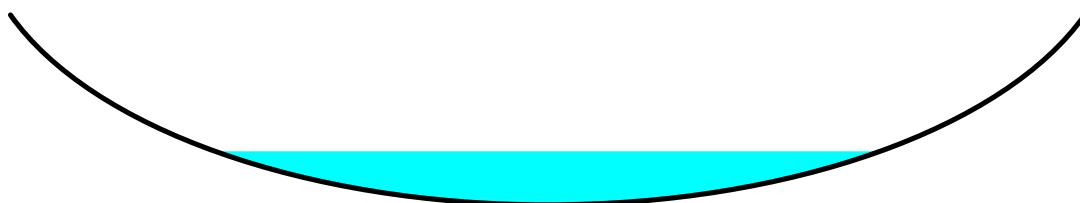
Average Depth at Peak Storage= 0.28' , Surface Width= 3.18'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 16.19 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

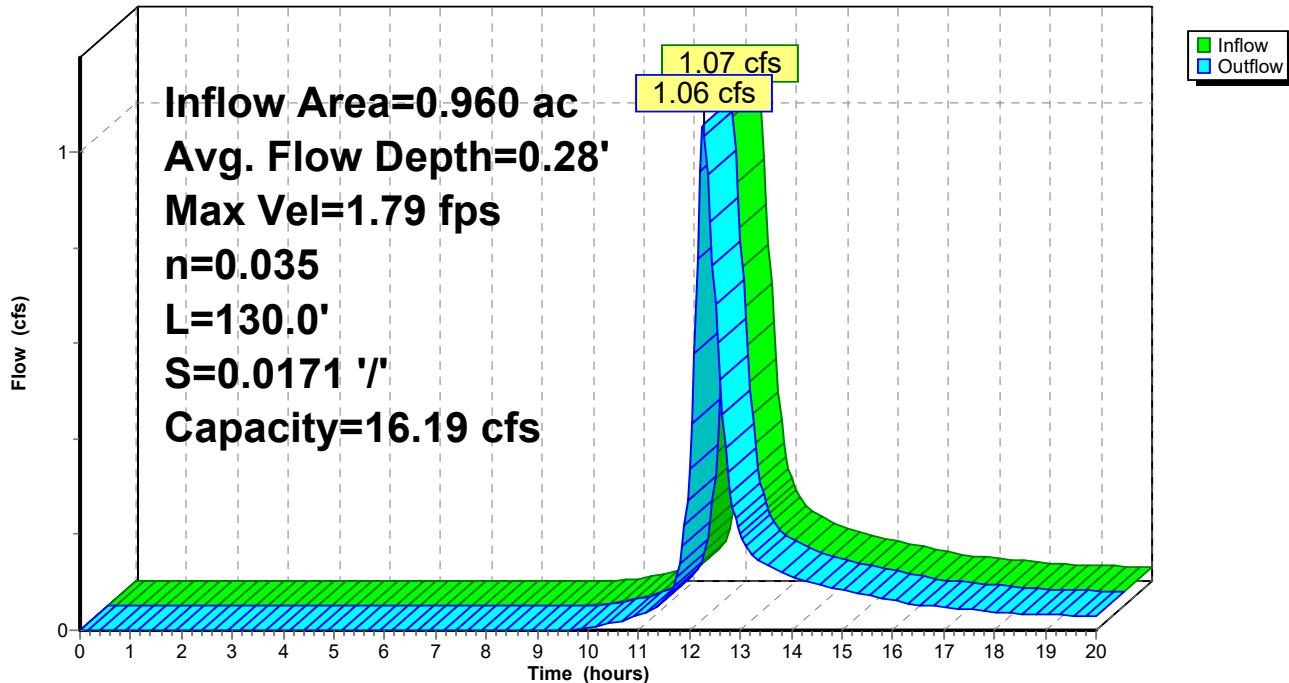
Length= 130.0' Slope= 0.0171 '/'

Inlet Invert= 241.22', Outlet Invert= 239.00'



Reach 1R: Ditch along p-lot

Hydrograph



Summary for Reach 2R: Wooded buffer

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth = 0.00" for 2-year storm event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 0.30' Flow Area= 13.5 sf, Capacity= 2.38 cfs

30.00' x 0.30' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 50.0 '/' Top Width= 60.00'

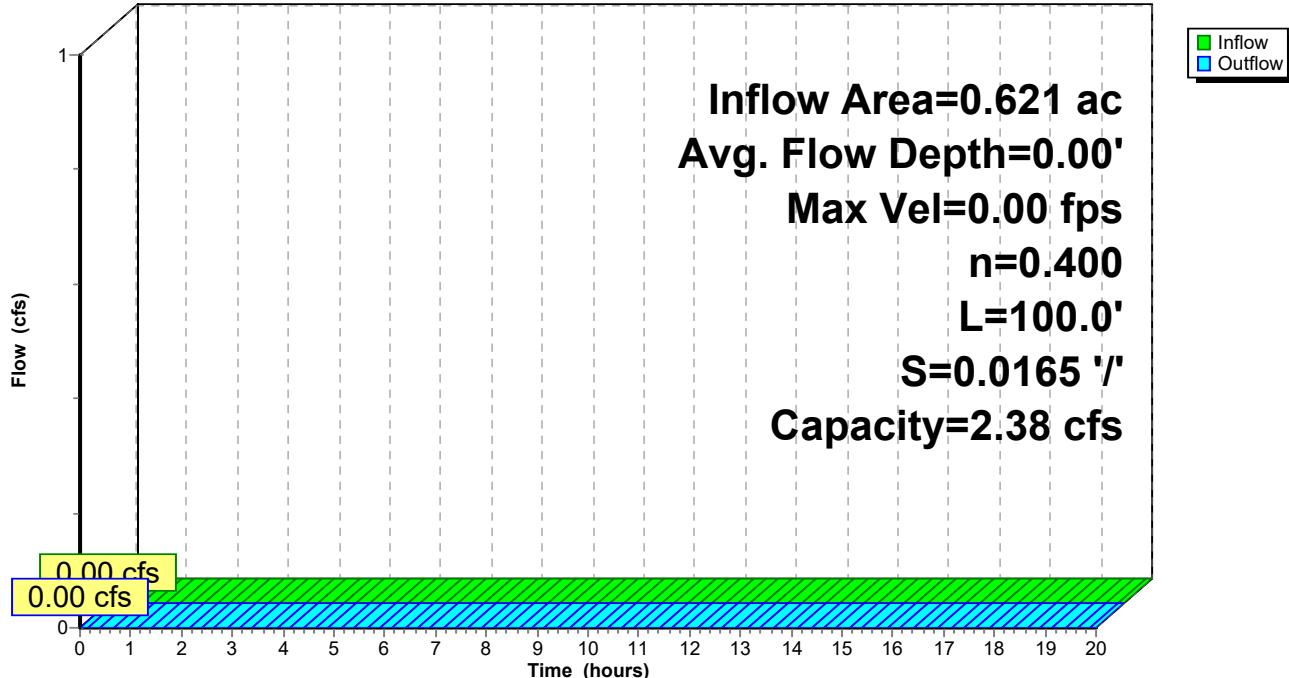
Length= 100.0' Slope= 0.0165 '/'

Inlet Invert= 238.30', Outlet Invert= 236.65'



Reach 2R: Wooded buffer

Hydrograph



Summary for Reach 3R: Downslope of 18" dia. SD plunge pool

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.03" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 16.63 hrs, Volume= 0.025 af, Atten= 1%, Lag= 50.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.06 fps, Min. Travel Time= 28.5 min

Avg. Velocity = 0.05 fps, Avg. Travel Time= 34.9 min

Peak Storage= 115 cf @ 16.16 hrs

Average Depth at Peak Storage= 0.06' , Surface Width= 26.18'

Bank-Full Depth= 0.30' Flow Area= 13.5 sf, Capacity= 2.02 cfs

15.00' x 0.30' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 100.0 '/' Top Width= 75.00'

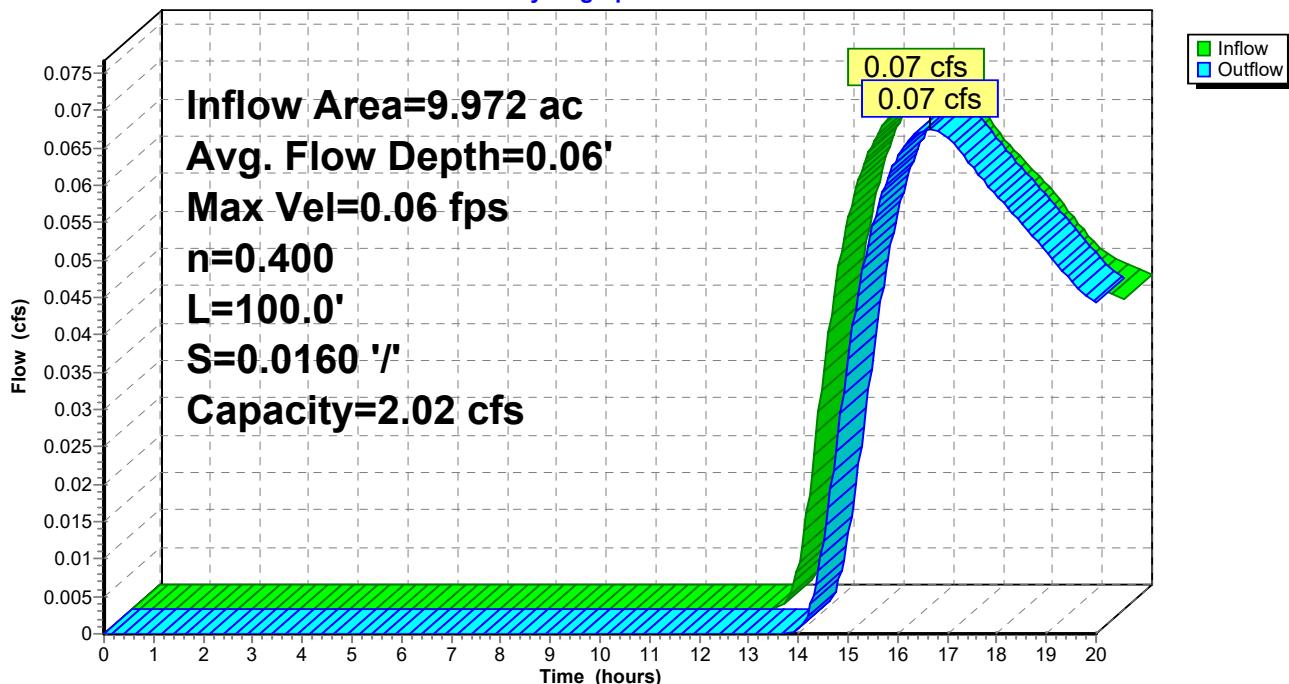
Length= 100.0' Slope= 0.0160 '

Inlet Invert= 235.50', Outlet Invert= 233.90'



Reach 3R: Downslope of 18" dia. SD plunge pool

Hydrograph



Summary for Reach 4R: Existing Channel

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.03" for 2-year storm event

Inflow = 0.07 cfs @ 16.63 hrs, Volume= 0.025 af

Outflow = 0.07 cfs @ 17.08 hrs, Volume= 0.023 af, Atten= 0%, Lag= 26.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.35 fps, Min. Travel Time= 15.3 min

Avg. Velocity = 0.30 fps, Avg. Travel Time= 18.4 min

Peak Storage= 62 cf @ 16.82 hrs

Average Depth at Peak Storage= 0.02' , Surface Width= 15.10'

Bank-Full Depth= 0.25' Flow Area= 9.2 sf, Capacity= 18.08 cfs

55.00' x 0.25' deep Parabolic Channel, n= 0.025 Earth, clean & winding

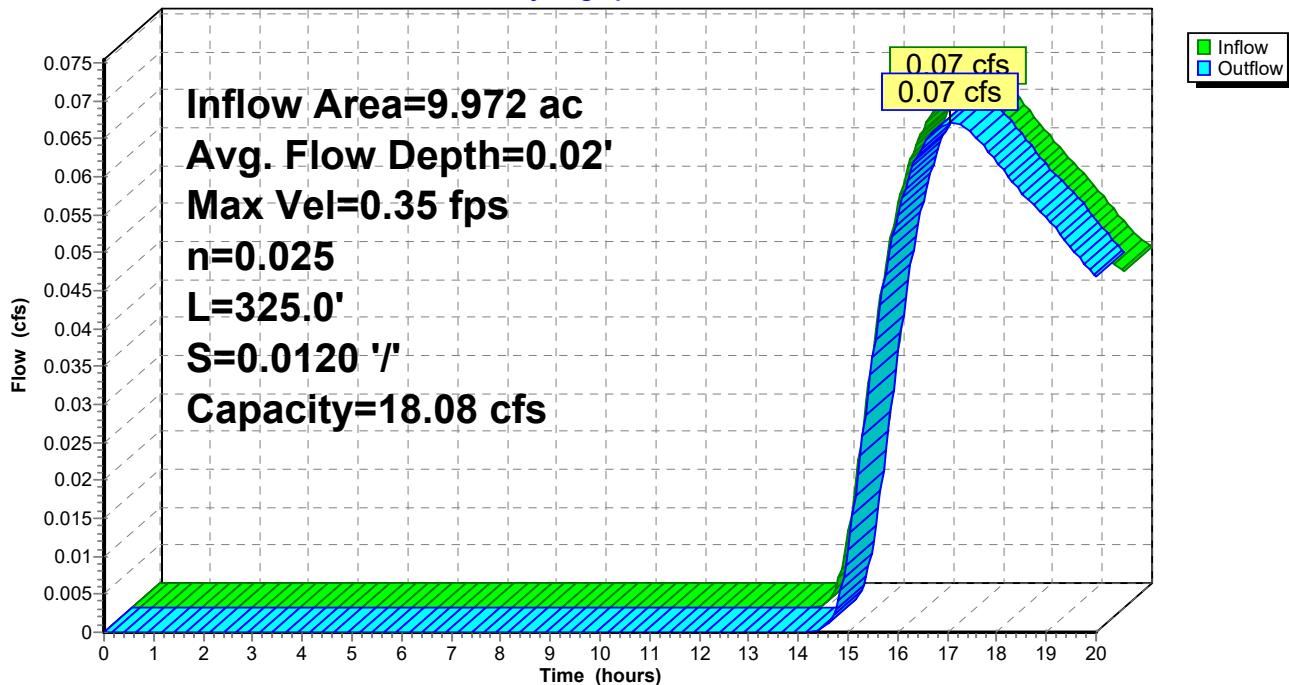
Length= 325.0' Slope= 0.0120 '/'

Inlet Invert= 233.90', Outlet Invert= 230.00'



Reach 4R: Existing Channel

Hydrograph



Summary for Reach 5R: Existing Channel

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.03" for 2-year storm event

Inflow = 0.07 cfs @ 17.08 hrs, Volume= 0.023 af

Outflow = 0.07 cfs @ 17.38 hrs, Volume= 0.021 af, Atten= 0%, Lag= 18.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.64 fps, Min. Travel Time= 10.9 min

Avg. Velocity = 0.55 fps, Avg. Travel Time= 12.8 min

Peak Storage= 44 cf @ 17.20 hrs

Average Depth at Peak Storage= 0.03' , Surface Width= 5.07'

Bank-Full Depth= 0.75' Flow Area= 12.5 sf, Capacity= 66.75 cfs

25.00' x 0.75' deep Parabolic Channel, n= 0.025 Earth, clean & winding

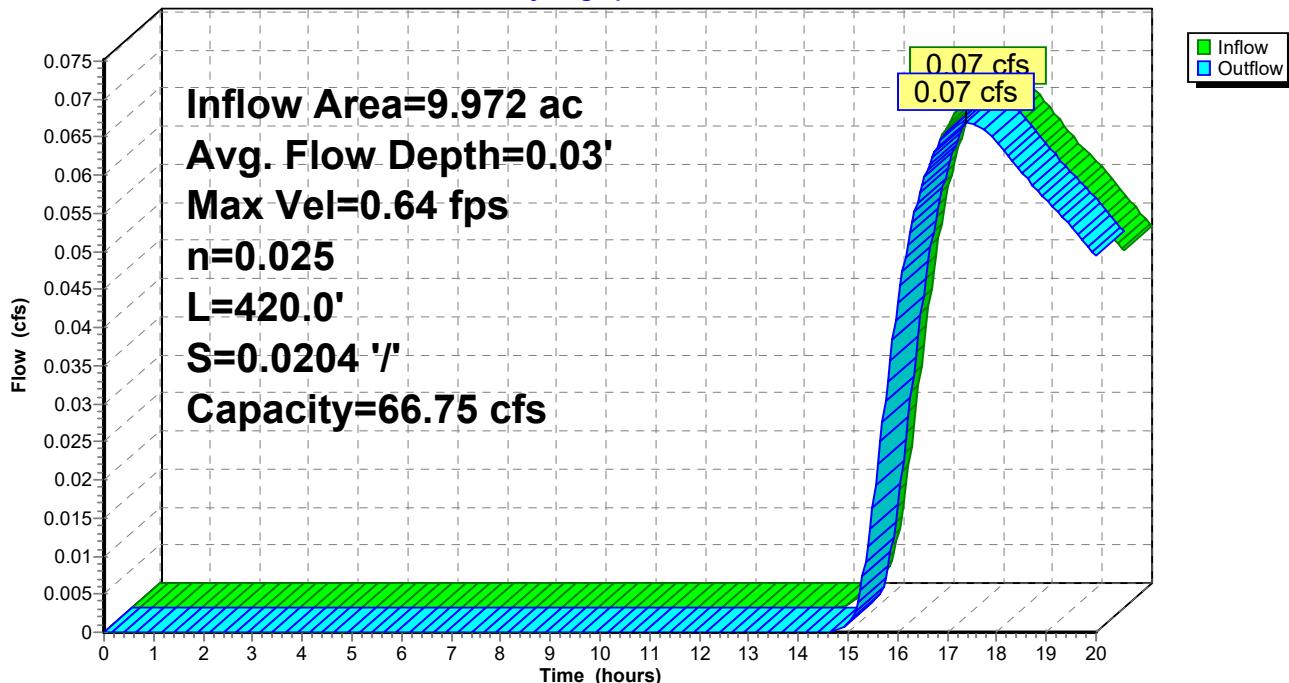
Length= 420.0' Slope= 0.0204 '/'

Inlet Invert= 230.00', Outlet Invert= 221.43'



Reach 5R: Existing Channel

Hydrograph



Summary for Reach 6R: Existing Stream Channel

Inflow Area = 38.903 ac, 19.74% Impervious, Inflow Depth > 0.44" for 2-year storm event

Inflow = 9.76 cfs @ 12.73 hrs, Volume= 1.434 af

Outflow = 9.71 cfs @ 12.82 hrs, Volume= 1.425 af, Atten= 1%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.31 fps, Min. Travel Time= 3.0 min

Avg. Velocity = 0.67 fps, Avg. Travel Time= 5.9 min

Peak Storage= 1,773 cf @ 12.77 hrs

Average Depth at Peak Storage= 1.04', Surface Width= 9.17'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 33.56 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 13.00'

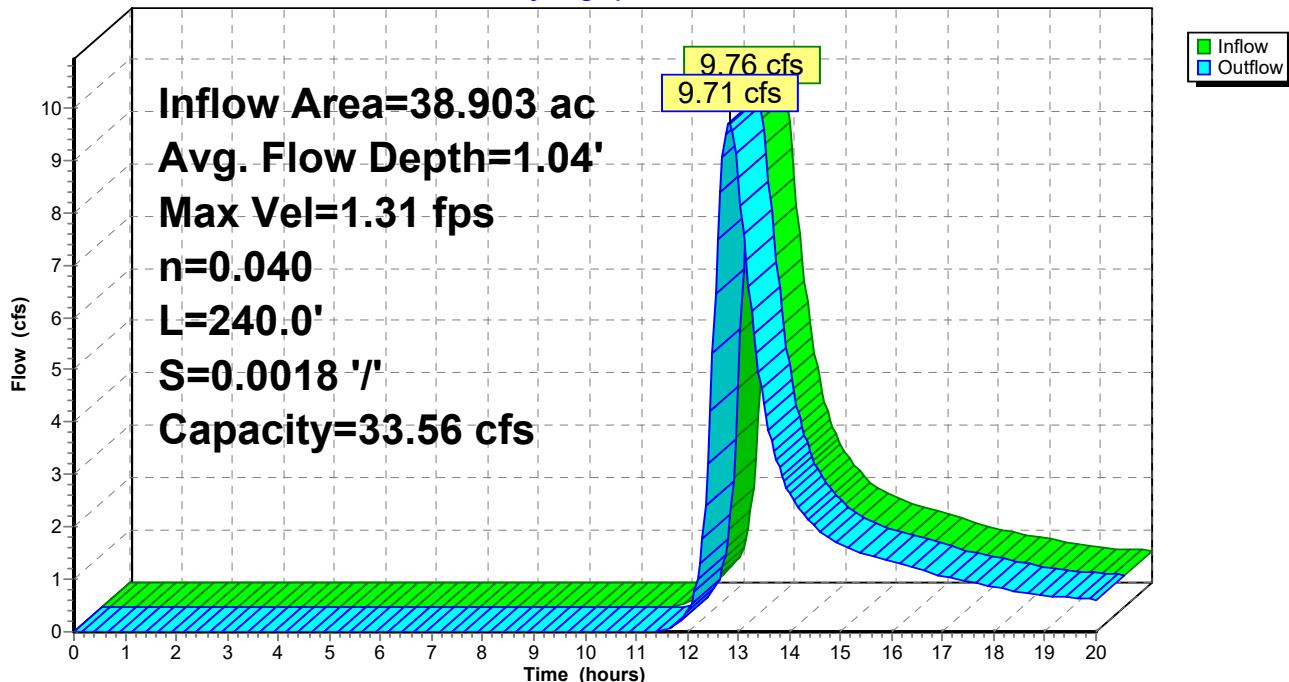
Length= 240.0' Slope= 0.0018 '/

Inlet Invert= 221.43', Outlet Invert= 221.00'



Reach 6R: Existing Stream Channel

Hydrograph



Summary for Reach 8R: Below Wooded Buffer

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth = 0.00" for 2-year storm event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 0.25' Flow Area= 10.6 sf, Capacity= 29.38 cfs

30.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 50.0 '/' Top Width= 55.00'

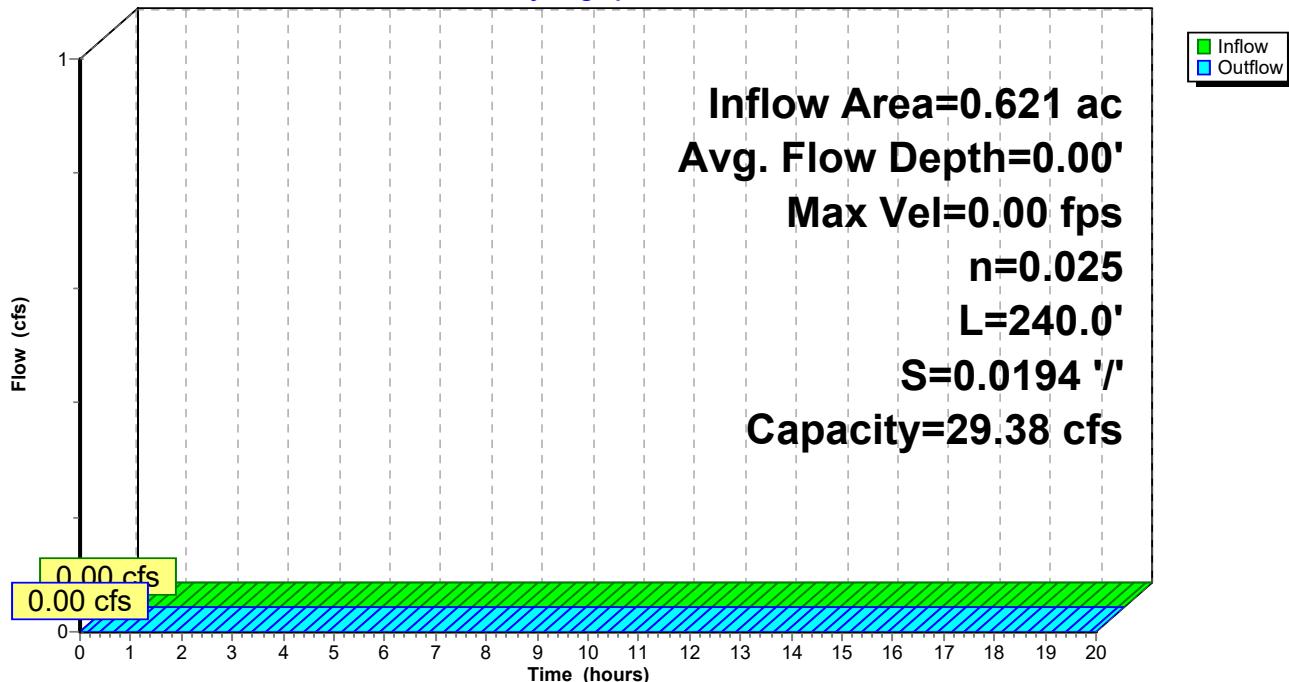
Length= 240.0' Slope= 0.0194 '/'

Inlet Invert= 236.65', Outlet Invert= 232.00'



Reach 8R: Below Wooded Buffer

Hydrograph



Summary for Reach 9R: Existing Stream Channel

Inflow Area = 18.763 ac, 1.29% Impervious, Inflow Depth > 0.88" for 2-year storm event

Inflow = 9.84 cfs @ 12.62 hrs, Volume= 1.379 af

Outflow = 9.79 cfs @ 12.71 hrs, Volume= 1.371 af, Atten= 1%, Lag= 5.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.00 fps, Min. Travel Time= 3.0 min

Avg. Velocity = 1.43 fps, Avg. Travel Time= 6.3 min

Peak Storage= 1,765 cf @ 12.66 hrs

Average Depth at Peak Storage= 0.54', Surface Width= 7.15'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 110.28 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 13.00'

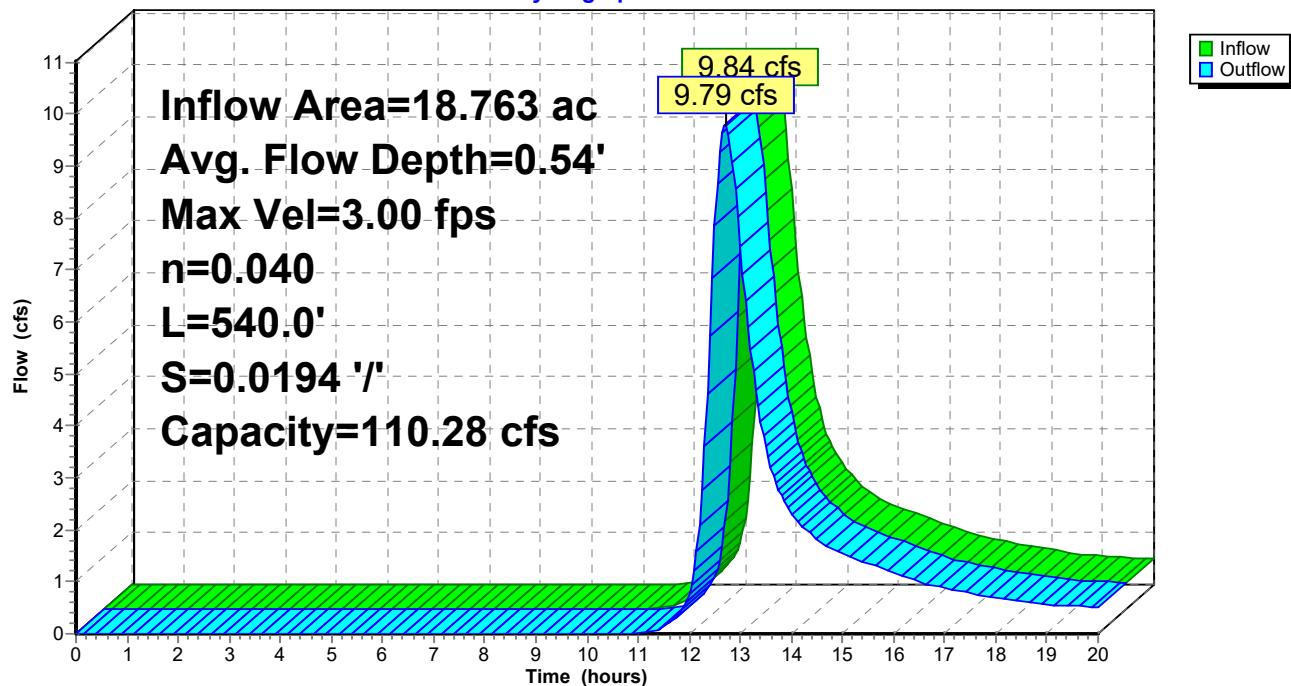
Length= 540.0' Slope= 0.0194 '

Inlet Invert= 232.00', Outlet Invert= 221.55'



Reach 9R: Existing Stream Channel

Hydrograph



Summary for Reach 10R: Existing Stream Channel

Inflow Area = 28.932 ac, 15.22% Impervious, Inflow Depth > 0.59" for 2-year storm event

Inflow = 9.79 cfs @ 12.71 hrs, Volume= 1.415 af

Outflow = 9.76 cfs @ 12.73 hrs, Volume= 1.413 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.33 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 0.67 fps, Avg. Travel Time= 1.6 min

Peak Storage= 478 cf @ 12.72 hrs

Average Depth at Peak Storage= 1.04', Surface Width= 9.15'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 34.06 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

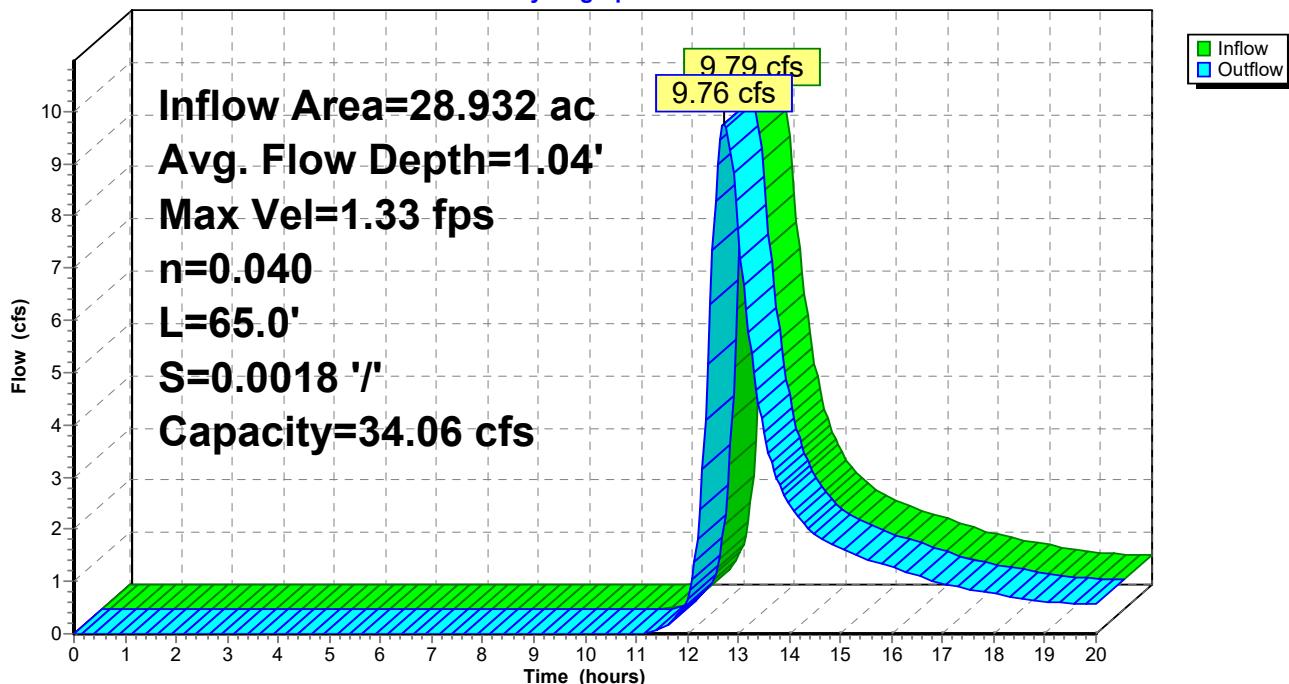
Length= 65.0' Slope= 0.0018 '/

Inlet Invert= 221.55', Outlet Invert= 221.43'



Reach 10R: Existing Stream Channel

Hydrograph



Summary for Reach 11R: Stevens Mill Road Ditch

Same as Pre 3R

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.05" for 2-year storm event
 Inflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af
 Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.67 fps, Min. Travel Time= 2.9 min

Avg. Velocity = 0.58 fps, Avg. Travel Time= 3.4 min

Peak Storage= 12 cf @ 15.75 hrs

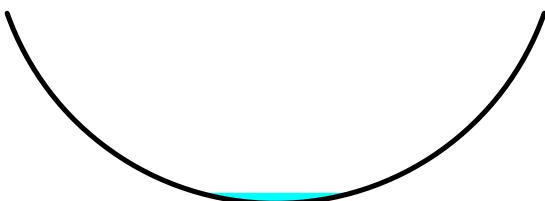
Average Depth at Peak Storage= 0.11', Surface Width= 1.40'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 32.56 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

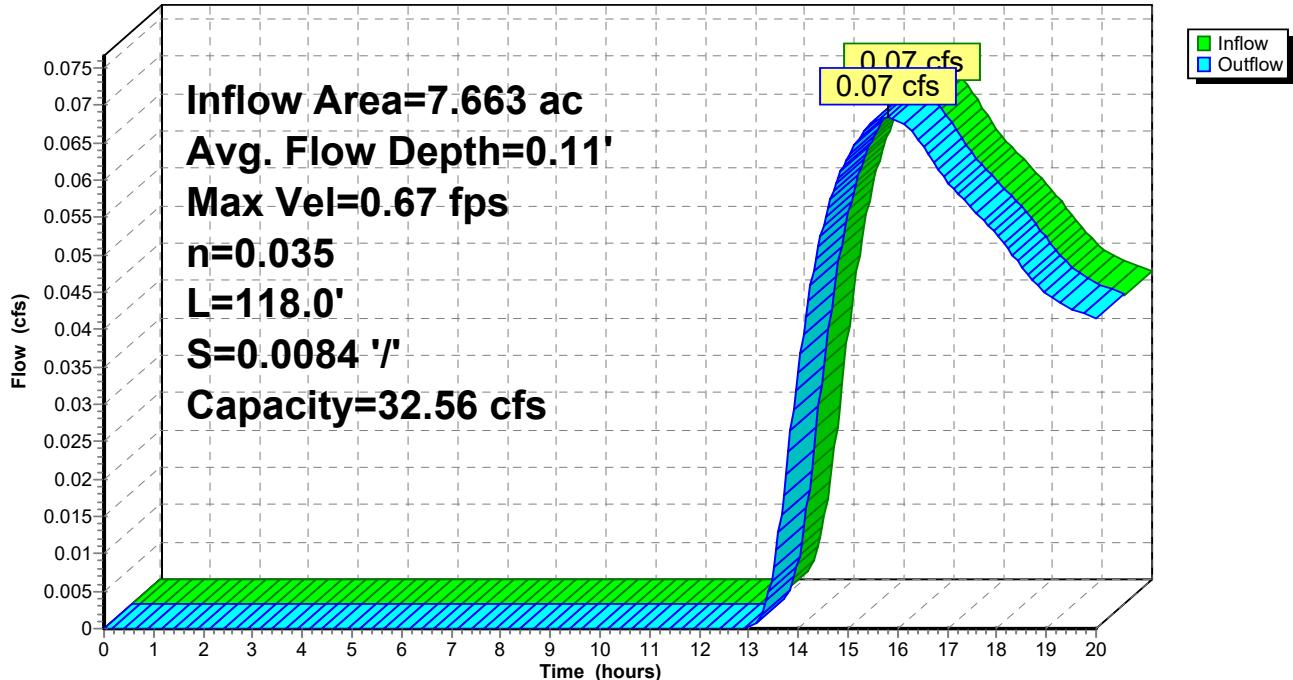
Length= 118.0' Slope= 0.0084 '/'

Inlet Invert= 241.09', Outlet Invert= 240.10'



Reach 11R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 12R: Stevens Mill Road Ditch

Same as Pre 2R

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.05" for 2-year storm event
 Inflow = 0.07 cfs @ 15.66 hrs, Volume= 0.029 af
 Outflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af, Atten= 0%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.76 fps, Min. Travel Time= 2.3 min

Avg. Velocity = 0.66 fps, Avg. Travel Time= 2.7 min

Peak Storage= 9 cf @ 15.68 hrs

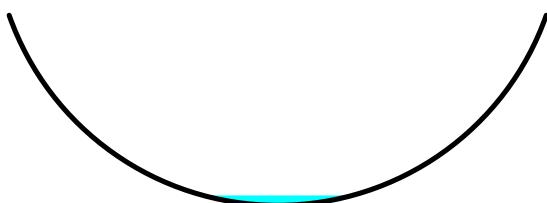
Average Depth at Peak Storage= 0.10' , Surface Width= 1.34'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 38.94 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

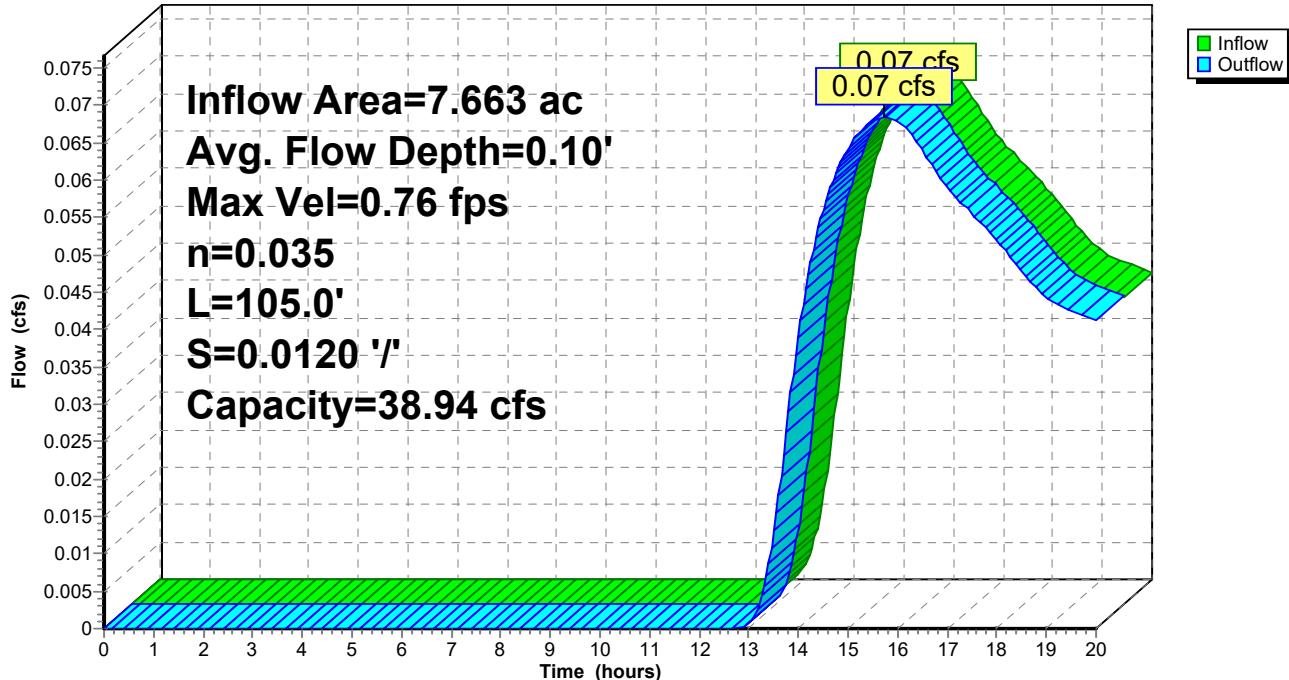
Length= 105.0' Slope= 0.0120 '/

Inlet Invert= 242.61', Outlet Invert= 241.35'



Reach 12R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 13R: Stevens Mill Road Ditch

Same as Pre 1R

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.04" for 2-year storm event
 Inflow = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 15.66 hrs, Volume= 0.010 af, Atten= 0%, Lag= 14.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.35 fps, Min. Travel Time= 8.0 min

Avg. Velocity = 0.30 fps, Avg. Travel Time= 9.0 min

Peak Storage= 12 cf @ 15.52 hrs

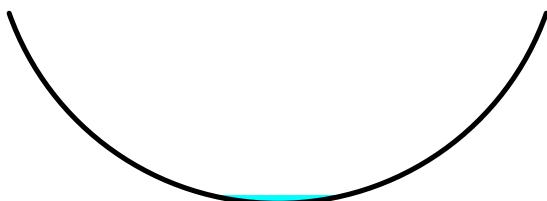
Average Depth at Peak Storage= 0.09', Surface Width= 1.24'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.57 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

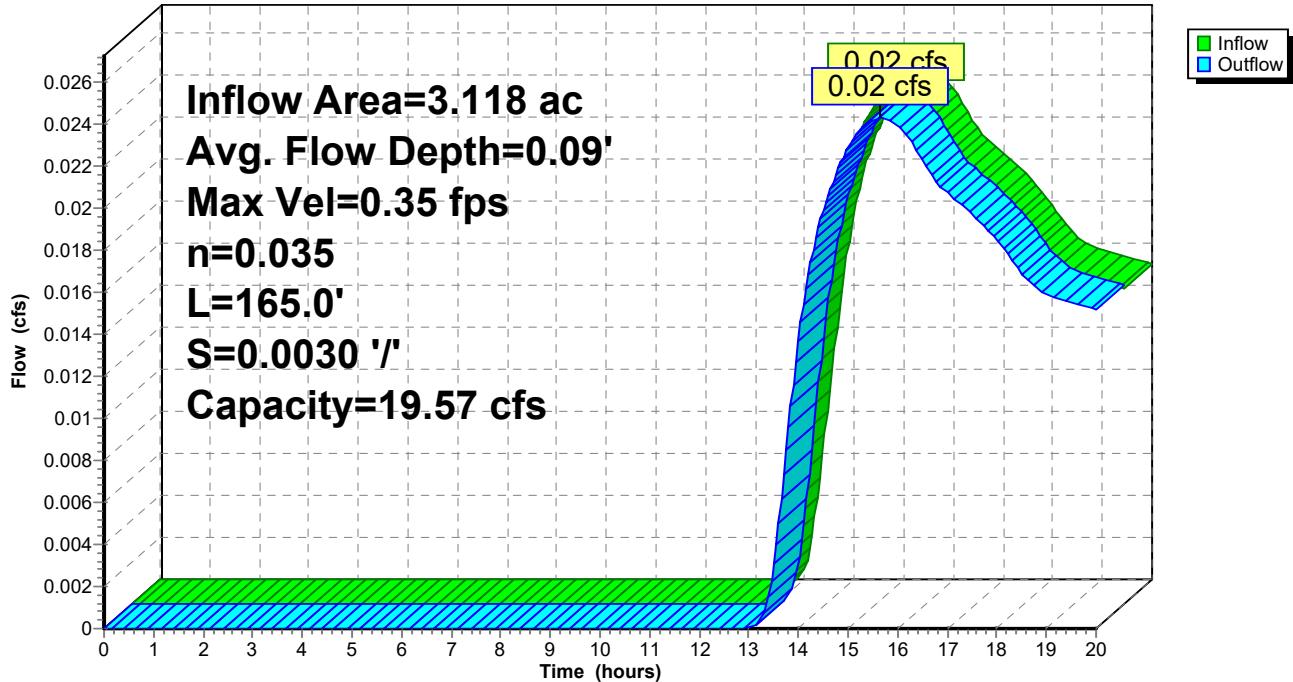
Length= 165.0' Slope= 0.0030 '/'

Inlet Invert= 243.11', Outlet Invert= 242.61'



Reach 13R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 14R: Proposed diversion swale

Inflow Area = 3.223 ac, 26.63% Impervious, Inflow Depth > 0.55" for 2-year storm event

Inflow = 0.98 cfs @ 12.64 hrs, Volume= 0.148 af

Outflow = 0.97 cfs @ 12.70 hrs, Volume= 0.147 af, Atten= 1%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.20 fps, Min. Travel Time= 2.0 min

Avg. Velocity = 1.27 fps, Avg. Travel Time= 3.5 min

Peak Storage= 120 cf @ 12.67 hrs

Average Depth at Peak Storage= 0.23' , Surface Width= 2.88'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 22.62 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

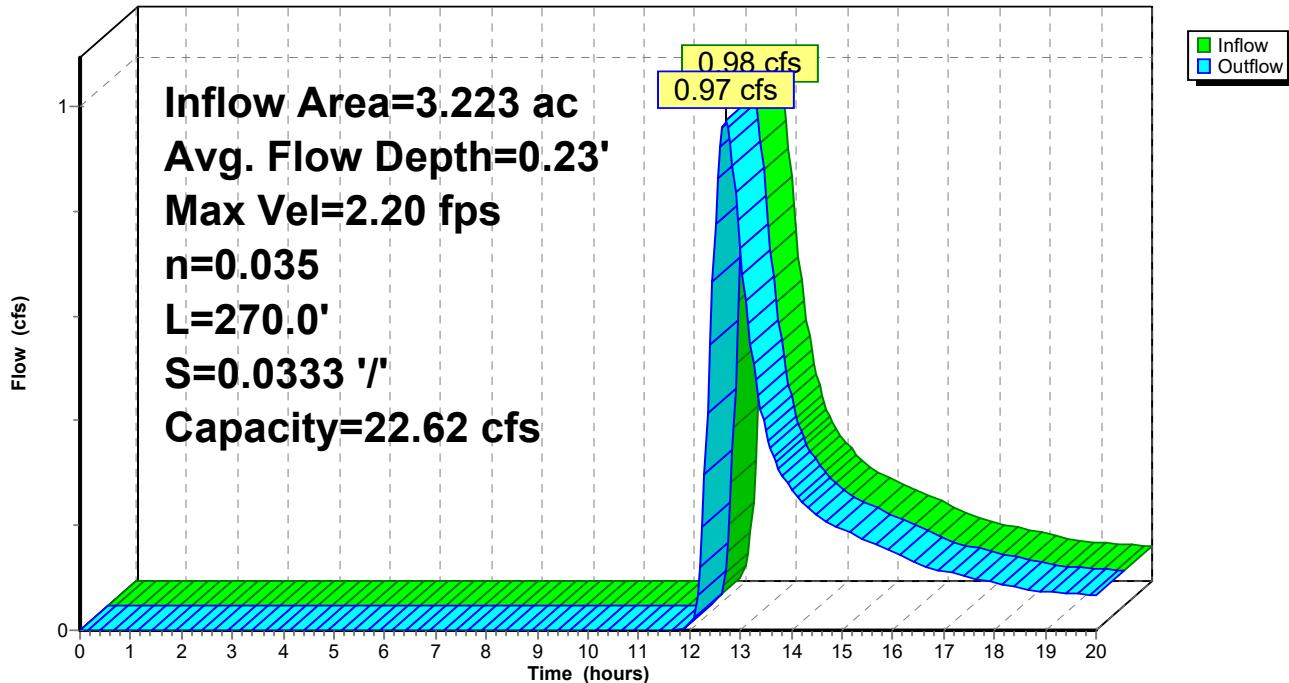
Length= 270.0' Slope= 0.0333 '/'

Inlet Invert= 247.00', Outlet Invert= 238.00'



Reach 14R: Proposed diversion swale

Hydrograph



Summary for Reach 15R: Existing drainage

Inflow Area = 5.857 ac, 25.74% Impervious, Inflow Depth > 0.10" for 2-year storm event

Inflow = 0.22 cfs @ 12.39 hrs, Volume= 0.050 af

Outflow = 0.21 cfs @ 12.53 hrs, Volume= 0.048 af, Atten= 3%, Lag= 8.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.71 fps, Min. Travel Time= 4.3 min

Avg. Velocity = 0.50 fps, Avg. Travel Time= 6.1 min

Peak Storage= 55 cf @ 12.46 hrs

Average Depth at Peak Storage= 0.05' , Surface Width= 9.67'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 164.26 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

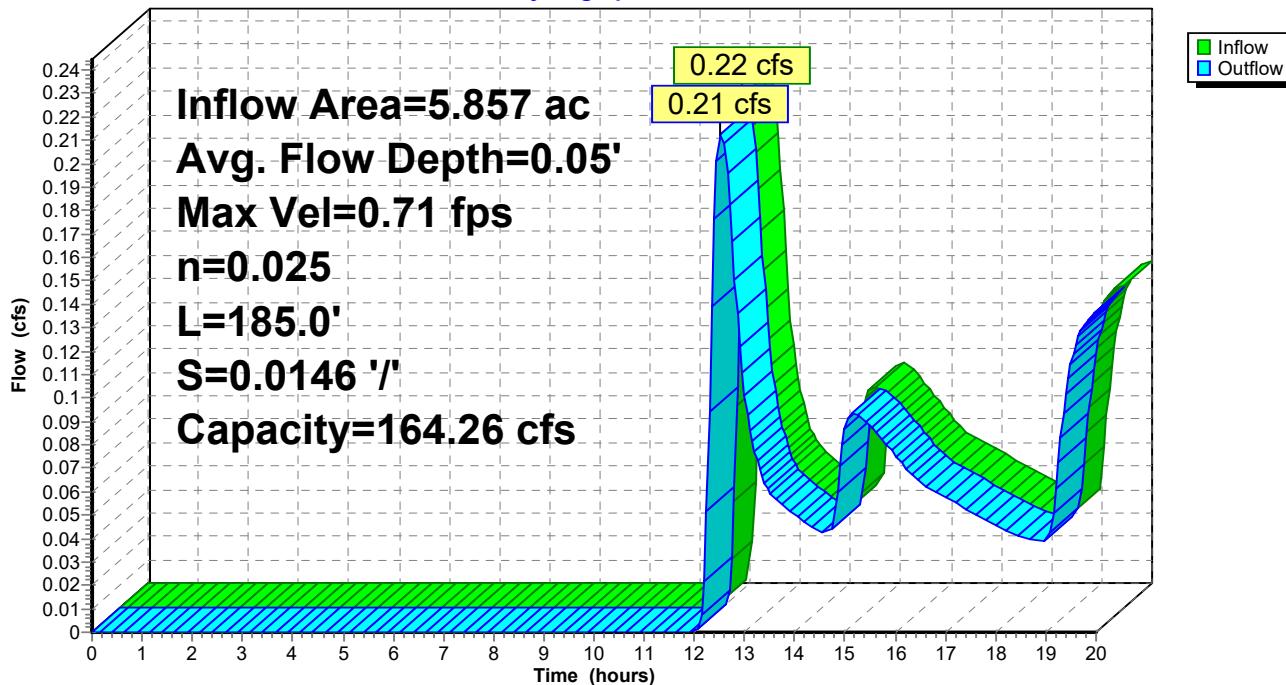
Length= 185.0' Slope= 0.0146 '/'

Inlet Invert= 234.50', Outlet Invert= 231.80'



Reach 15R: Existing drainage

Hydrograph



Summary for Reach 16R: Existing drainage along slope

Inflow Area = 0.534 ac, 0.47% Impervious, Inflow Depth > 0.12" for 2-year storm event

Inflow = 0.02 cfs @ 12.64 hrs, Volume= 0.005 af

Outflow = 0.02 cfs @ 12.73 hrs, Volume= 0.005 af, Atten= 1%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.40 fps, Min. Travel Time= 3.1 min

Avg. Velocity = 0.34 fps, Avg. Travel Time= 3.7 min

Peak Storage= 3 cf @ 12.68 hrs

Average Depth at Peak Storage= 0.01' , Surface Width= 3.65'

Bank-Full Depth= 1.00' Flow Area= 29.5 sf, Capacity= 144.38 cfs

3.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 50.0 3.0 '/' Top Width= 56.00'

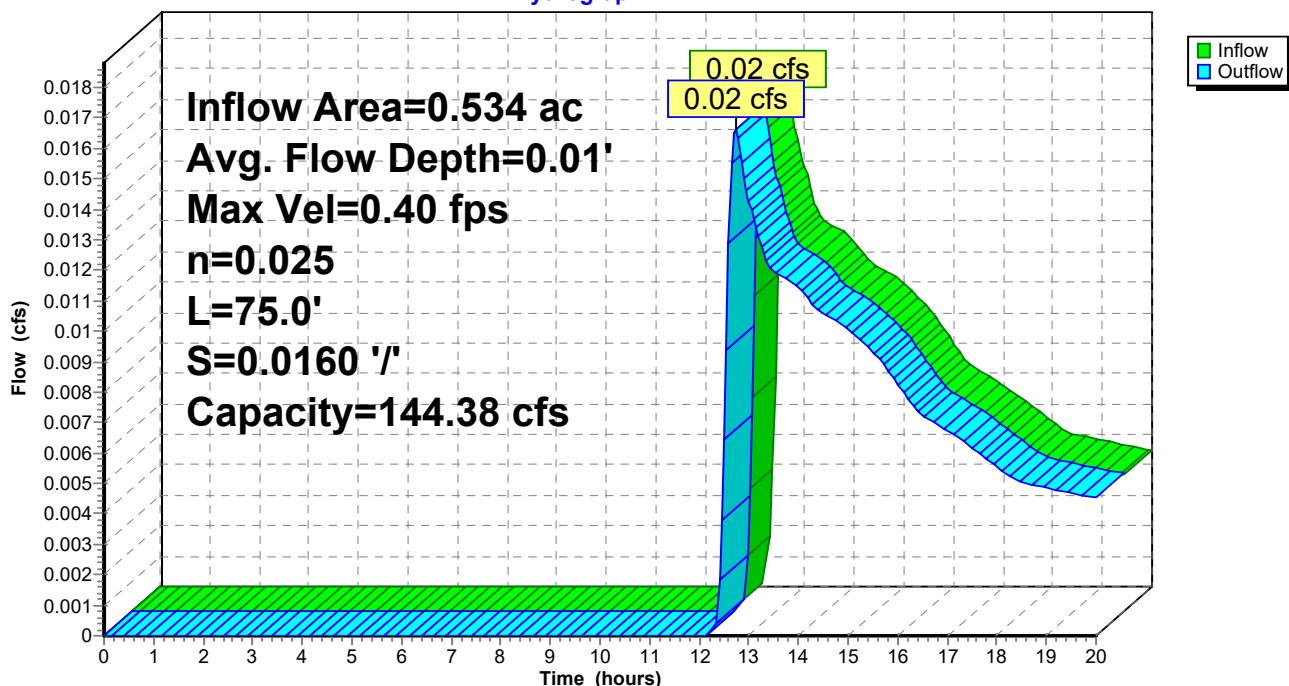
Length= 75.0' Slope= 0.0160 '/'

Inlet Invert= 233.00', Outlet Invert= 231.80'

†

Reach 16B: Existing drainage along slope

Hydrograph



Summary for Reach 17R: Existing drainage

Inflow Area = 6.391 ac, 23.63% Impervious, Inflow Depth > 0.10" for 2-year storm event

Inflow = 0.22 cfs @ 12.56 hrs, Volume= 0.054 af

Outflow = 0.21 cfs @ 12.72 hrs, Volume= 0.051 af, Atten= 3%, Lag= 10.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.74 fps, Min. Travel Time= 5.3 min

Avg. Velocity = 0.54 fps, Avg. Travel Time= 7.3 min

Peak Storage= 68 cf @ 12.63 hrs

Average Depth at Peak Storage= 0.05' , Surface Width= 9.57'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 172.90 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

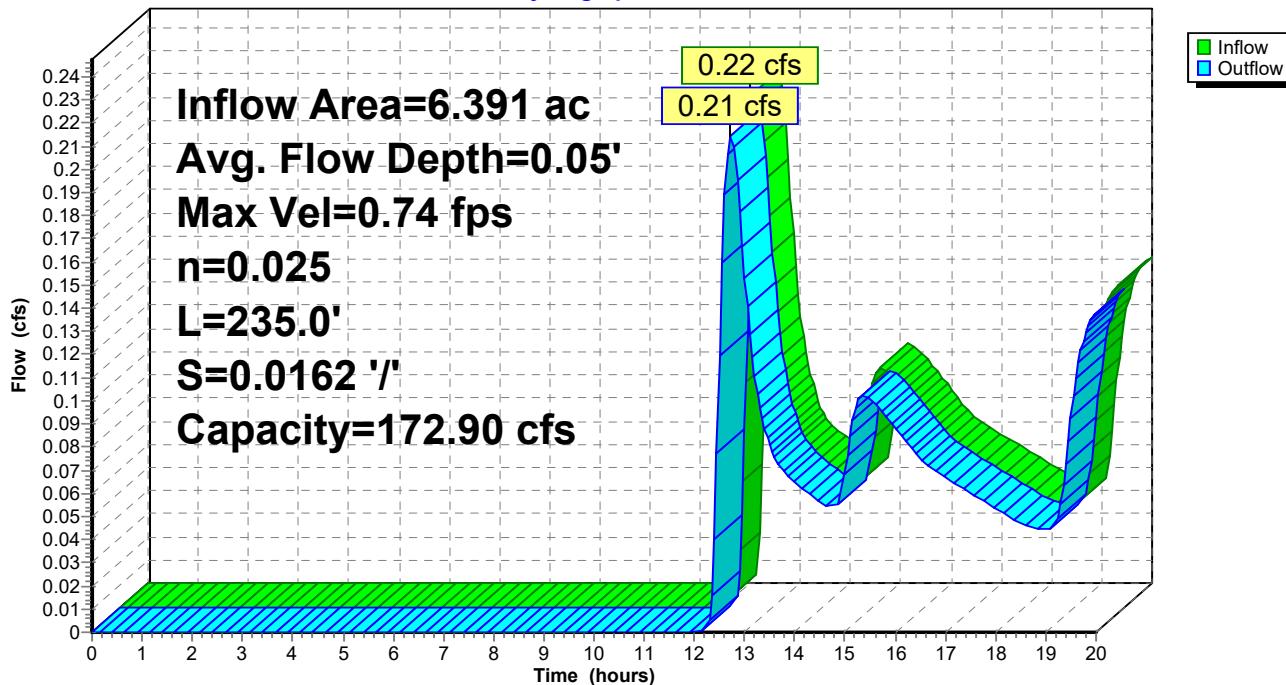
Length= 235.0' Slope= 0.0162 '/'

Inlet Invert= 231.80', Outlet Invert= 228.00'



Reach 17R: Existing drainage

Hydrograph



Summary for Reach 18R: Existing drainage

Inflow Area = 6.391 ac, 23.63% Impervious, Inflow Depth > 0.10" for 2-year storm event

Inflow = 0.21 cfs @ 12.72 hrs, Volume= 0.051 af

Outflow = 0.21 cfs @ 12.79 hrs, Volume= 0.051 af, Atten= 1%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.78 fps, Min. Travel Time= 2.4 min

Avg. Velocity = 0.56 fps, Avg. Travel Time= 3.4 min

Peak Storage= 31 cf @ 12.75 hrs

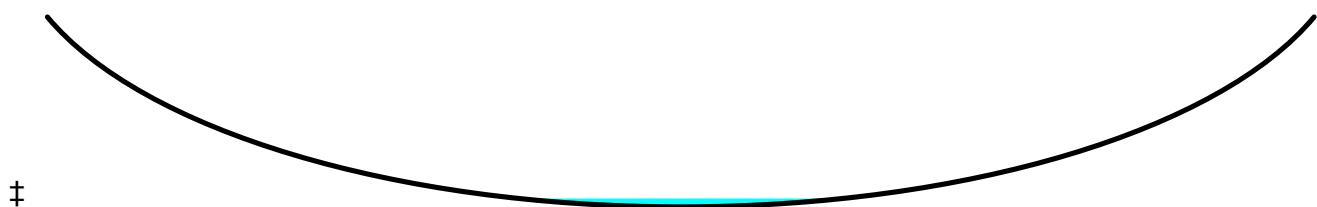
Average Depth at Peak Storage= 0.04', Surface Width= 9.37'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 188.06 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

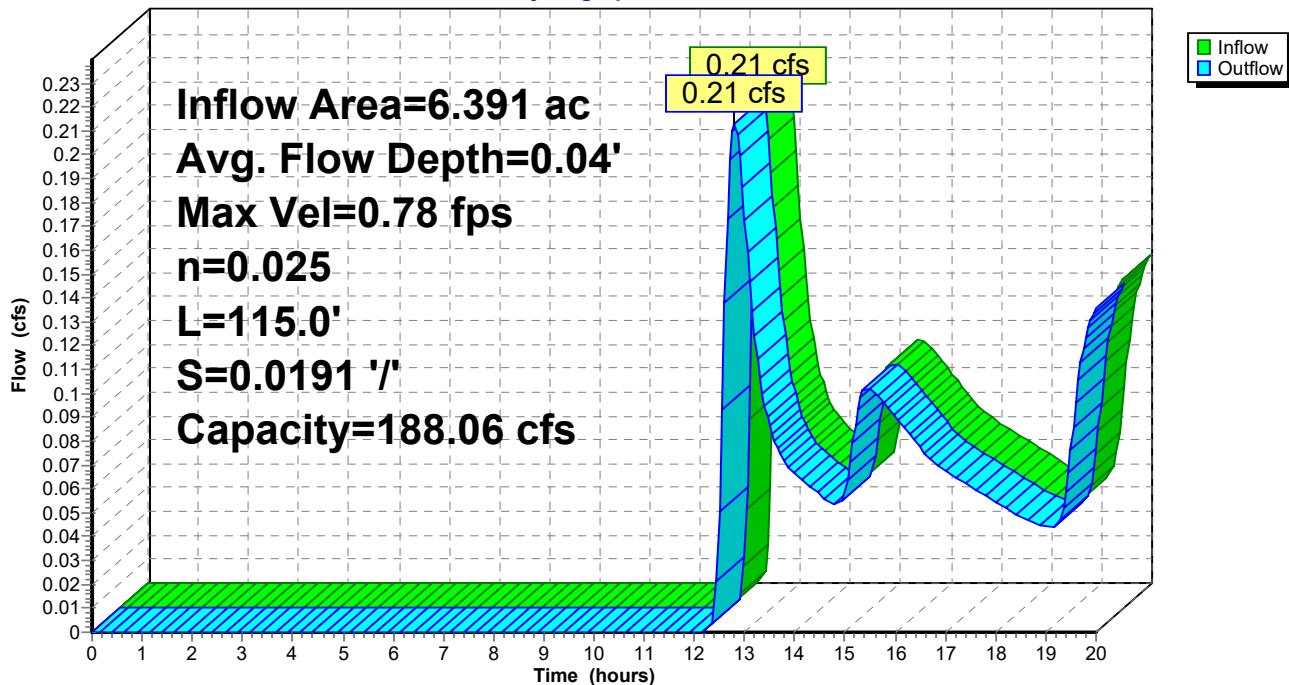
Length= 115.0' Slope= 0.0191 '/'

Inlet Invert= 228.00', Outlet Invert= 225.80'



Reach 18R: Existing drainage

Hydrograph



Summary for Reach 19R: Existing Stream Channel

Inflow Area = 9.330 ac, 44.61% Impervious, Inflow Depth > 0.06" for 2-year storm event

Inflow = 0.21 cfs @ 12.79 hrs, Volume= 0.051 af

Outflow = 0.21 cfs @ 12.95 hrs, Volume= 0.049 af, Atten= 3%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.67 fps, Min. Travel Time= 5.0 min

Avg. Velocity = 0.46 fps, Avg. Travel Time= 7.3 min

Peak Storage= 62 cf @ 12.86 hrs

Average Depth at Peak Storage= 0.06' , Surface Width= 5.24'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 94.97 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

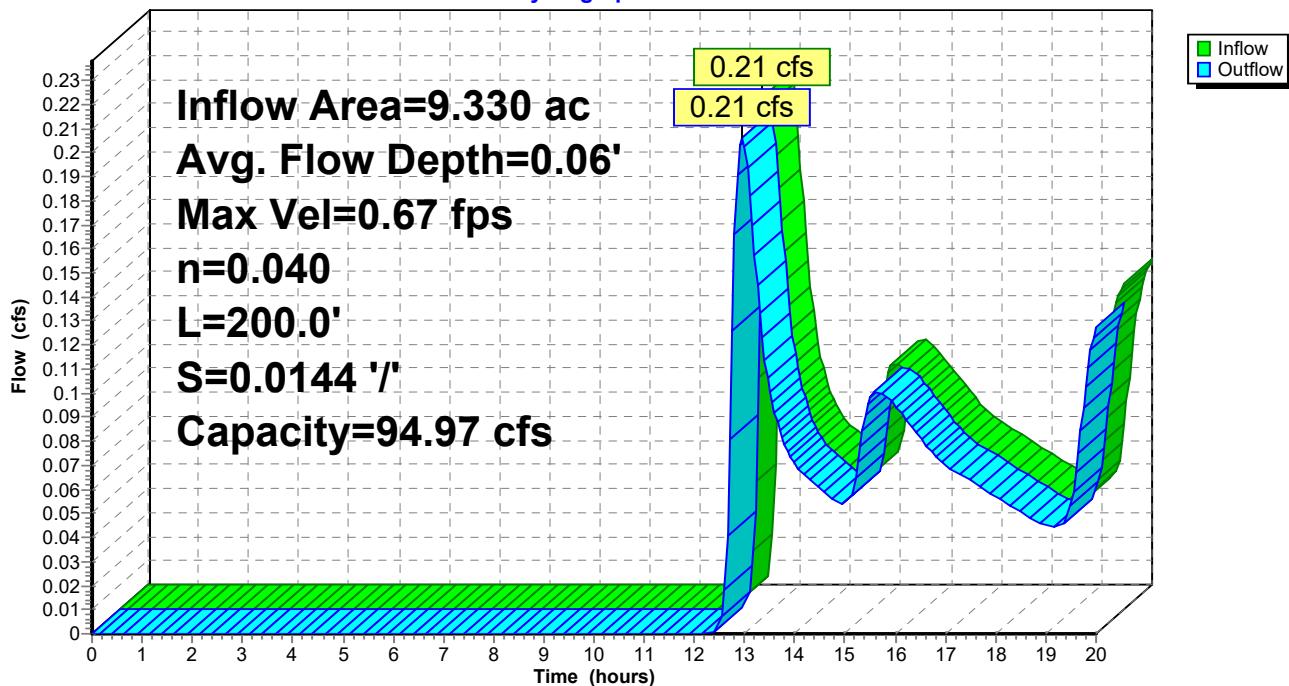
Length= 200.0' Slope= 0.0144 '/'

Inlet Invert= 225.80', Outlet Invert= 222.93'



Reach 19R: Existing Stream Channel

Hydrograph



Summary for Reach 20R: Existing Stream Channel

Inflow Area = 10.168 ac, 40.93% Impervious, Inflow Depth > 0.06" for 2-year storm event

Inflow = 0.21 cfs @ 12.95 hrs, Volume= 0.049 af

Outflow = 0.16 cfs @ 13.48 hrs, Volume= 0.044 af, Atten= 23%, Lag= 32.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.39 fps, Min. Travel Time= 17.3 min

Avg. Velocity = 0.28 fps, Avg. Travel Time= 23.7 min

Peak Storage= 166 cf @ 13.19 hrs

Average Depth at Peak Storage= 0.08' , Surface Width= 5.32'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 46.28 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 13.00'

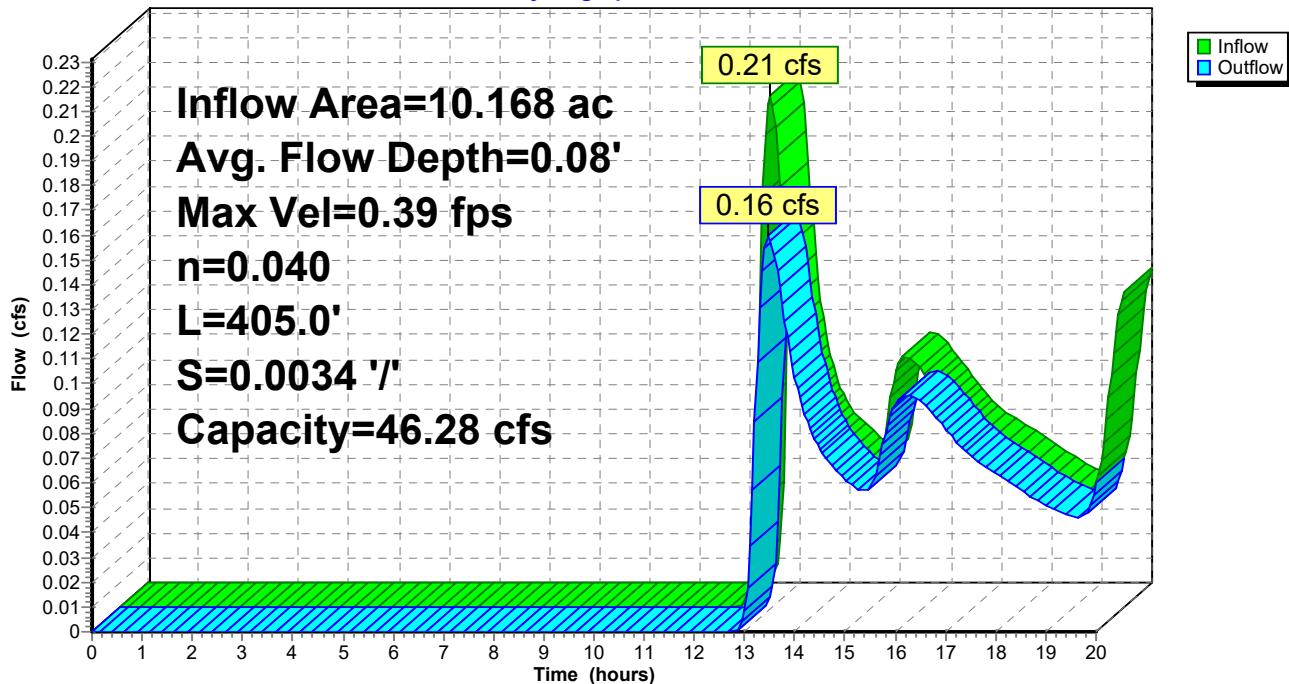
Length= 405.0' Slope= 0.0034 '/

Inlet Invert= 222.93', Outlet Invert= 221.55'



Reach 20R: Existing Stream Channel

Hydrograph



Summary for Reach 21R: Existing Stream Channel

Inflow Area = 0.838 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year storm event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 76.21 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

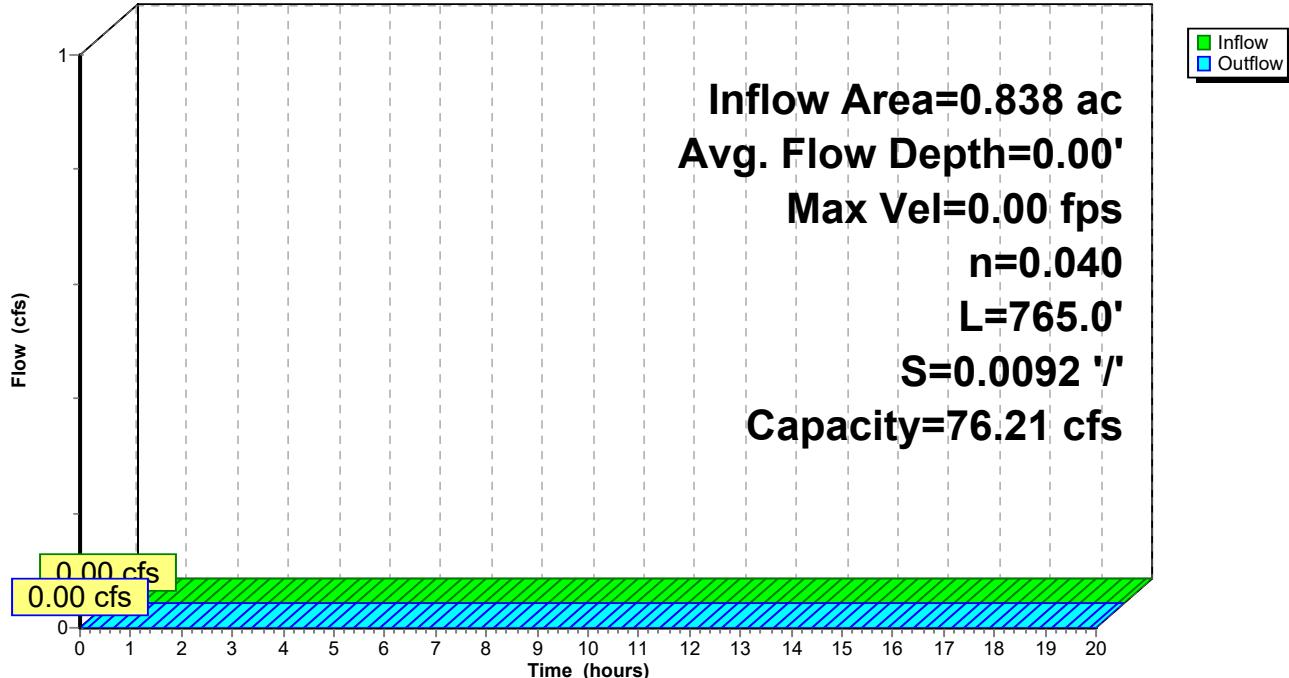
Length= 765.0' Slope= 0.0092 '/'

Inlet Invert= 230.00', Outlet Invert= 222.93'



Reach 21R: Existing Stream Channel

Hydrograph



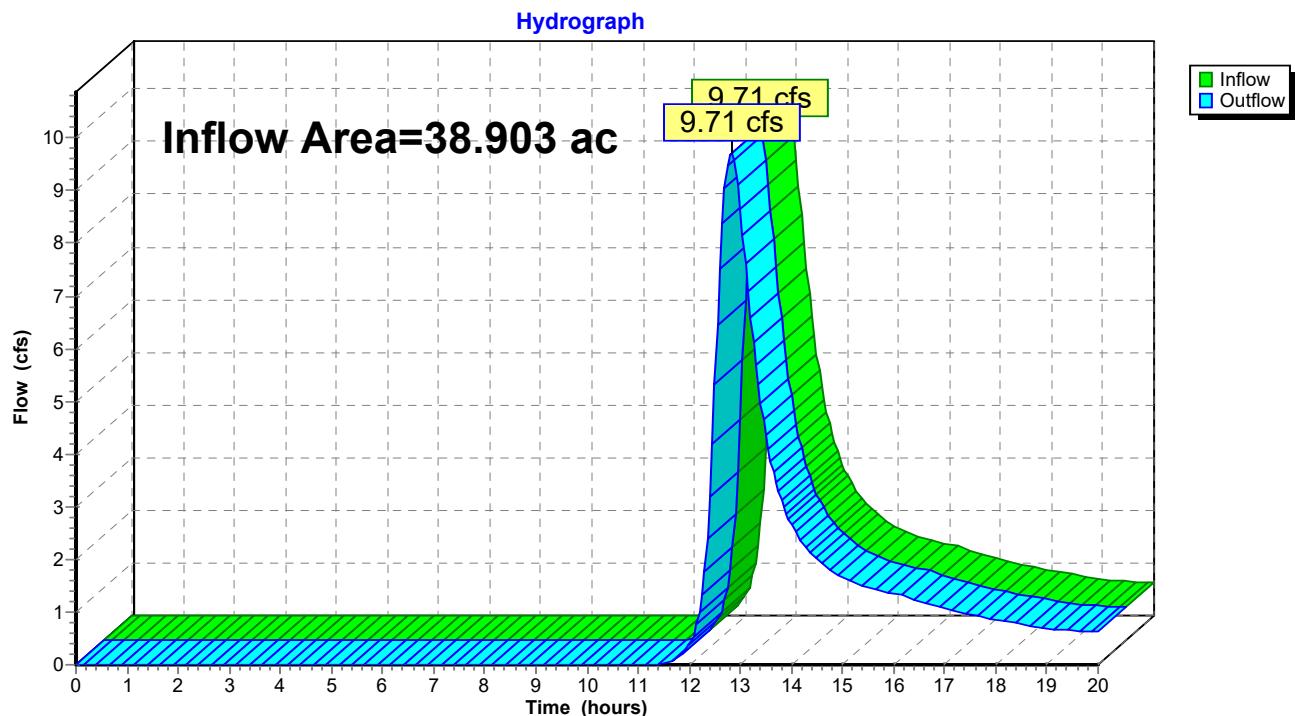
Summary for Reach WAP 1: Water Analysis Point 1

Inflow Area = 38.903 ac, 19.74% Impervious, Inflow Depth > 0.44" for 2-year storm event

Inflow = 9.71 cfs @ 12.82 hrs, Volume= 1.425 af

Outflow = 9.71 cfs @ 12.82 hrs, Volume= 1.425 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach WAP 1: Water Analysis Point 1

Summary for Pond 1P: Proposed 15" Culvert

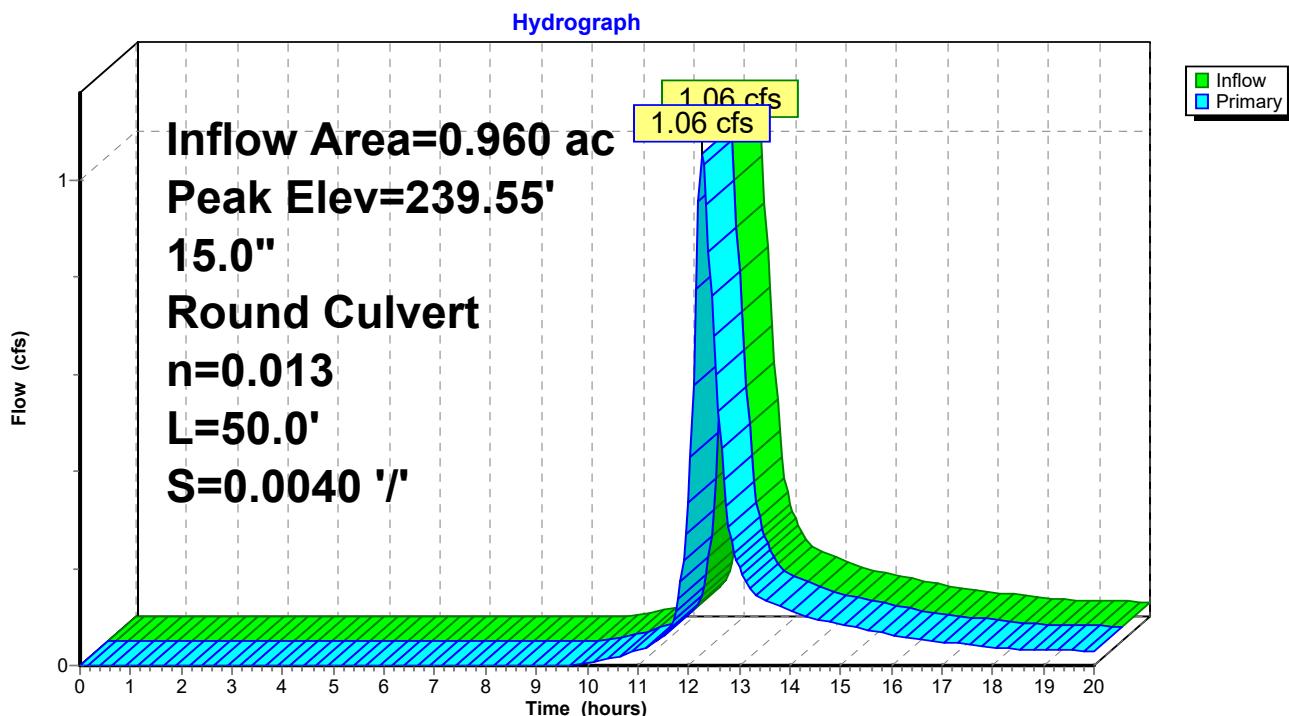
Inflow Area = 0.960 ac, 30.05% Impervious, Inflow Depth > 1.21" for 2-year storm event
 Inflow = 1.06 cfs @ 12.27 hrs, Volume= 0.097 af
 Outflow = 1.06 cfs @ 12.27 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.06 cfs @ 12.27 hrs, Volume= 0.097 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.55' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 238.00' / 237.80' S= 0.0040 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.05 cfs @ 12.27 hrs HW=239.55' TW=239.50' (Fixed TW Elev= 239.50')
 ↗1=Culvert (Inlet Controls 1.05 cfs @ 0.85 fps)

Pond 1P: Proposed 15" Culvert



Summary for Pond 2P: Stone Berm Spreader

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 1.09" for 2-year storm event

Inflow = 0.71 cfs @ 12.16 hrs, Volume= 0.056 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.04' @ 20.00 hrs Surf.Area= 3,724 sf Storage= 2,457 cf

Flood Elev= 241.80' Surf.Area= 4,960 sf Storage= 4,464 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

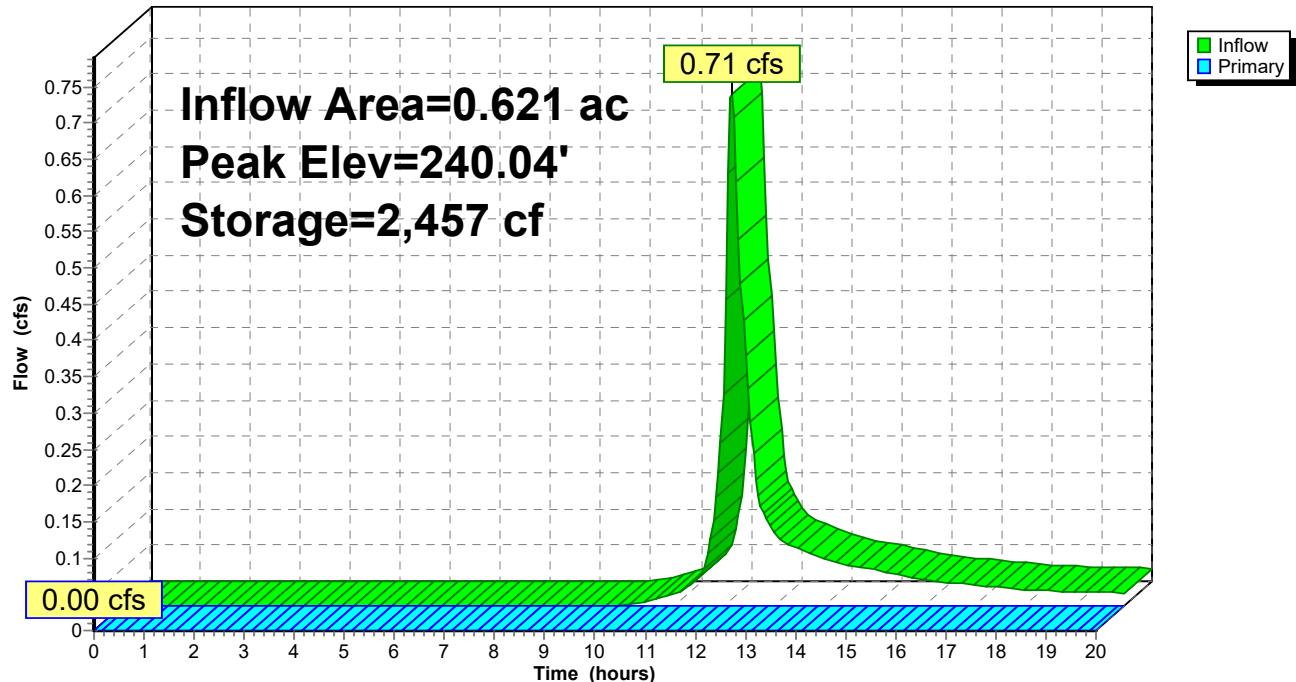
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description		
#1	239.00'	4,464 cf	Custom Stage Data (Irregular)	Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
239.00	1,225	175.0	0	0	1,225
240.00	3,635	425.0	2,323	2,323	13,165
240.50	4,960	440.0	2,140	4,464	14,220

Device	Routing	Invert	Outlet Devices										
#1	Primary	240.45'	30.0' long x 1.0' 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										
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31										
			3.30 3.31 3.32										

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=239.00' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Stone Berm Spreader**Hydrograph**

Summary for Pond 3P: UGF #1

Inflow Area = 2.309 ac, 82.95% Impervious, Inflow Depth > 0.23" for 2-year storm event

Inflow = 0.66 cfs @ 12.10 hrs, Volume= 0.045 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 237.81' @ 20.00 hrs Surf.Area= 5,005 sf Storage= 1,967 cf

Flood Elev= 241.50' Surf.Area= 9,356 sf Storage= 18,103 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

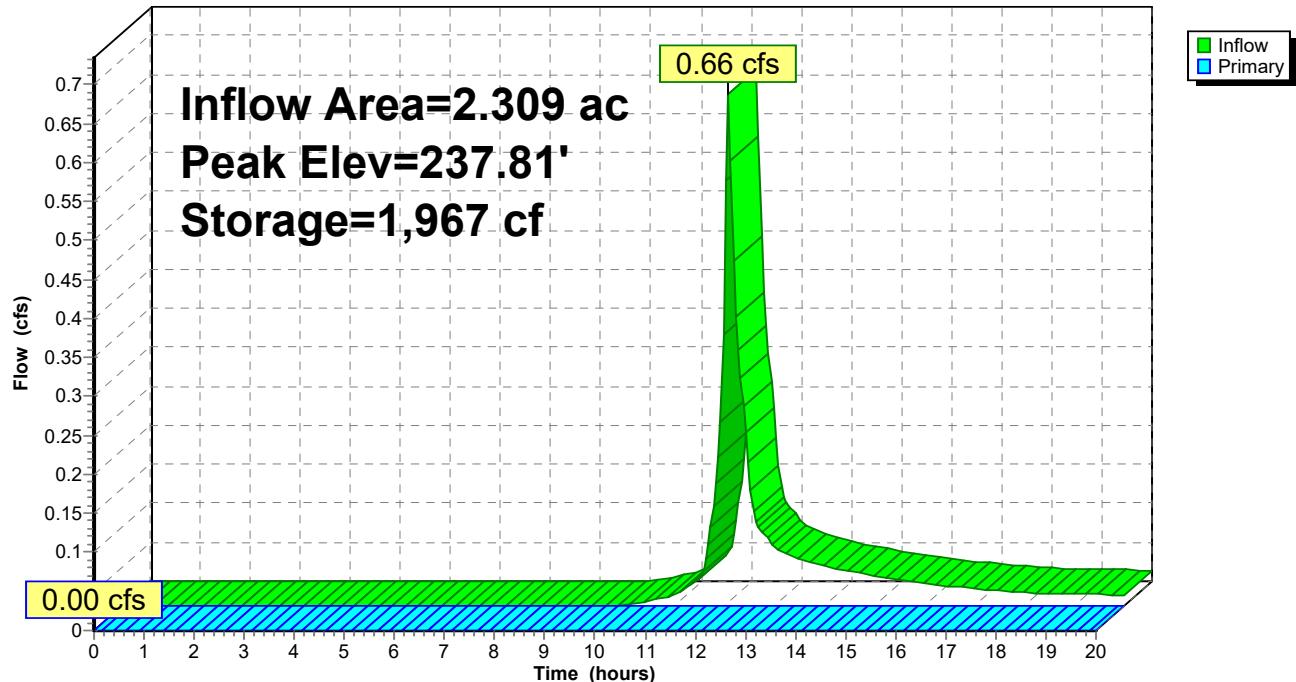
Volume	Invert	Avail.Storage	Storage Description			
#1	236.83'	18,103 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
236.83	5,005	405.8	0.0	0	0	5,005
236.84	5,005	405.8	40.0	20	20	5,009
238.00	5,005	405.8	40.0	2,322	2,342	5,480
238.01	5,005	405.8	10.0	5	2,347	5,484
239.40	5,005	405.8	10.0	696	3,043	6,048
239.50	5,005	405.8	100.0	500	3,544	6,088
240.00	6,375	496.0	100.0	2,838	6,382	12,565
241.00	8,291	543.5	100.0	7,312	13,694	16,529
241.50	9,356	587.2	100.0	4,409	18,103	20,471

Device	Routing	Invert	Outlet Devices
#1	Device 2	241.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	236.83'	6.0" Round Culvert L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 236.83' / 236.70' S= 0.0130 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=236.83' TW=237.19' (Fixed TW Elev= 237.19')

↑
2=Culvert (Controls 0.00 cfs)

↑
1=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: UGF #1**Hydrograph**

Summary for Pond 4P: Outlet structure for UGF #1

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.03" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 236.64' @ 15.80 hrs

Flood Elev= 241.00'

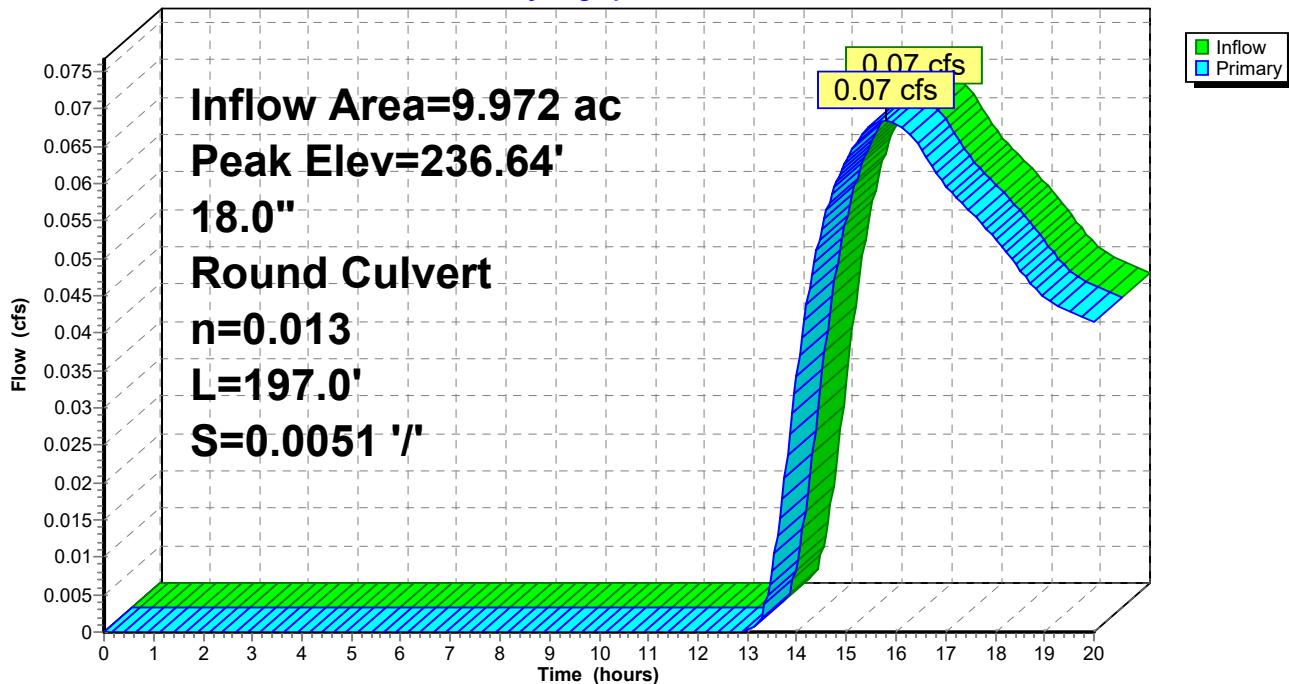
Device	Routing	Invert	Outlet Devices
#1	Primary	236.50'	18.0" Round Culvert L= 197.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 236.50' / 235.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.07 cfs @ 15.80 hrs HW=236.64' (Free Discharge)

↑ 1=Culvert (Barrel Controls 0.07 cfs @ 1.32 fps)

Pond 4P: Outlet structure for UGF #1

Hydrograph



Summary for Pond 5P: New 4' catch basin

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 239.61' @ 15.80 hrs

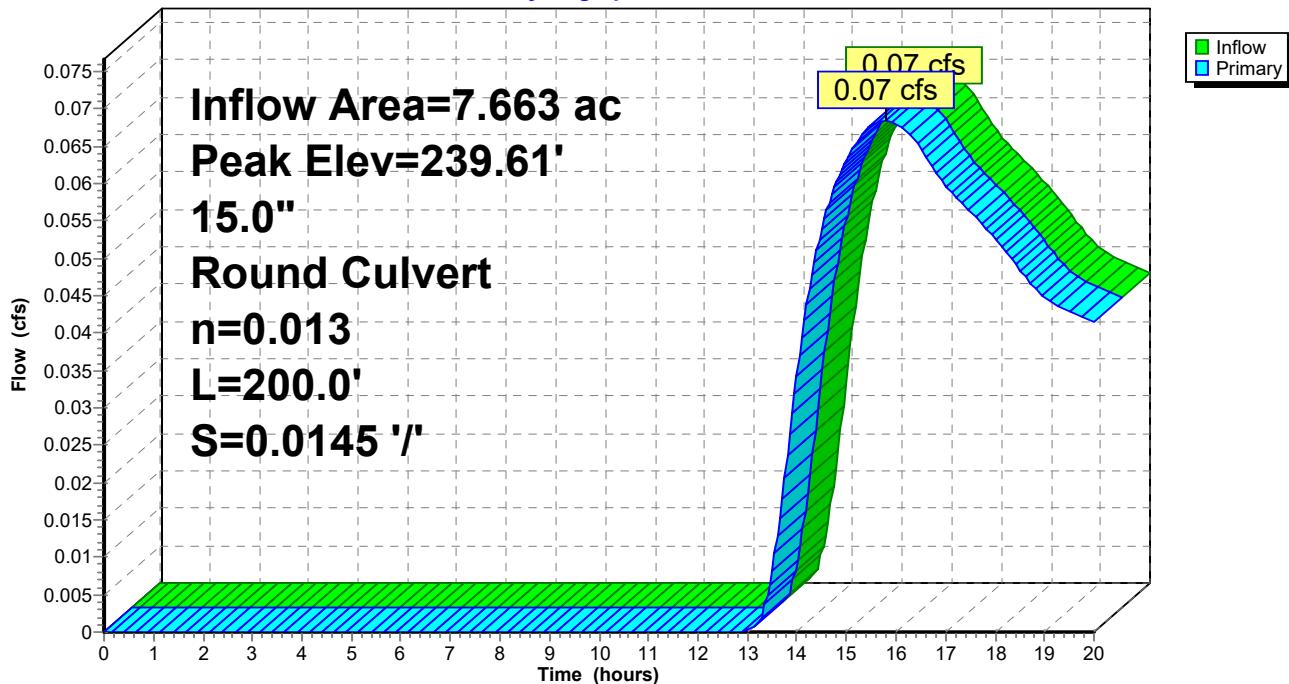
Flood Elev= 242.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.49'	15.0" Round Culvert L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 239.49' / 236.60' S= 0.0145 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.07 cfs @ 15.80 hrs HW=239.61' TW=237.19' (Fixed TW Elev= 237.19')
 ↗1=Culvert (Inlet Controls 0.07 cfs @ 1.17 fps)

Pond 5P: New 4' catch basin

Hydrograph



Summary for Pond 6P: Stevens Mill Rd X-Culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.21' @ 15.80 hrs

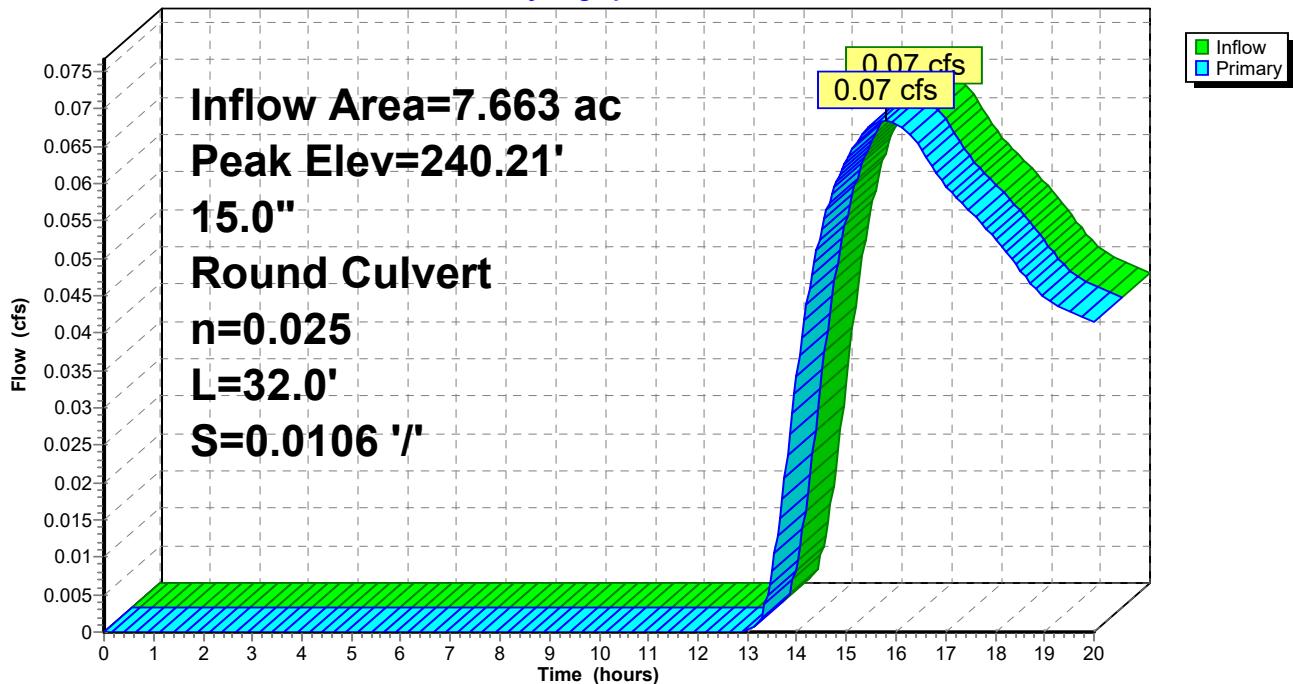
Flood Elev= 240.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.93'	15.0" Round Culvert L= 32.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 239.93' / 239.59' S= 0.0106 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=0.07 cfs @ 15.80 hrs HW=240.21' TW=240.16' (Fixed TW Elev= 240.16')
 ↗1=Culvert (Outlet Controls 0.07 cfs @ 0.51 fps)

Pond 6P: Stevens Mill Rd X-Culvert

Hydrograph



Summary for Pond 7P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.83' @ 15.80 hrs

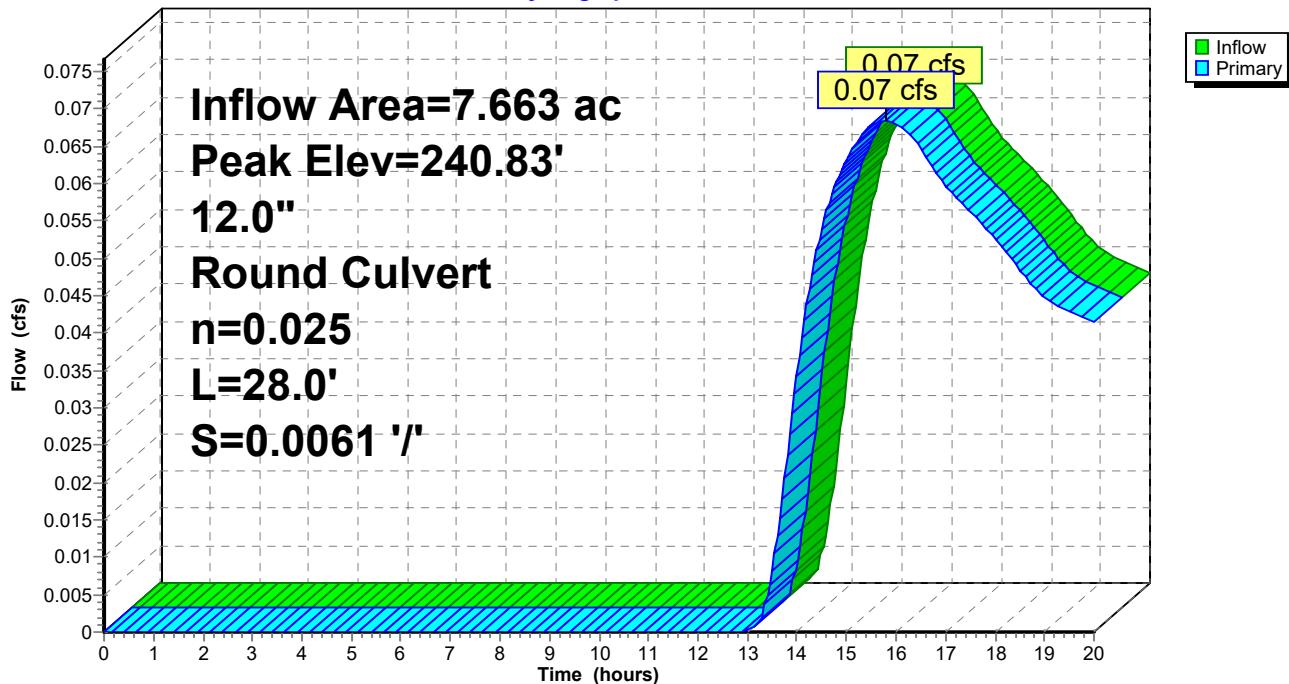
Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 240.10' / 239.93' S= 0.0061 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.13 cfs @ 15.80 hrs HW=240.83' TW=240.82' (Fixed TW Elev= 240.82')
 ↑1=Culvert (Outlet Controls 0.13 cfs @ 0.29 fps)

Pond 7P: Driveway culvert

Hydrograph



Summary for Pond 8P: Driveway culvert

Same as Pre 2P

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.05" for 2-year storm event
 Inflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af
 Outflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

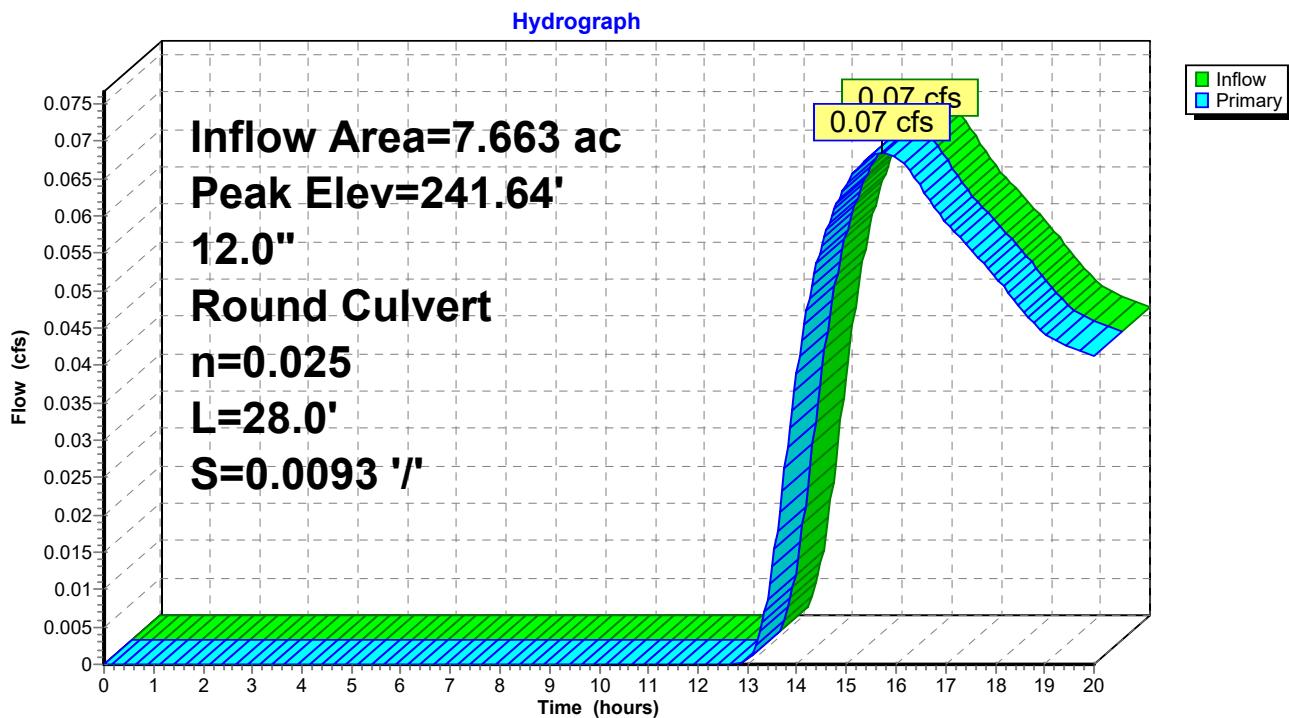
Peak Elev= 241.64' @ 15.72 hrs

Flood Elev= 243.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	241.35'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 241.35' / 241.09' S= 0.0093 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.07 cfs @ 15.72 hrs HW=241.64' TW=241.60' (Fixed TW Elev= 241.60')
 ↑=Culvert (Outlet Controls 0.07 cfs @ 0.54 fps)

Pond 8P: Driveway culvert



Summary for Pond 9P: Sprucewood Rd Culvert

Same as Pre 1P

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.04" for 2-year storm event
 Inflow = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 244.47' @ 15.41 hrs

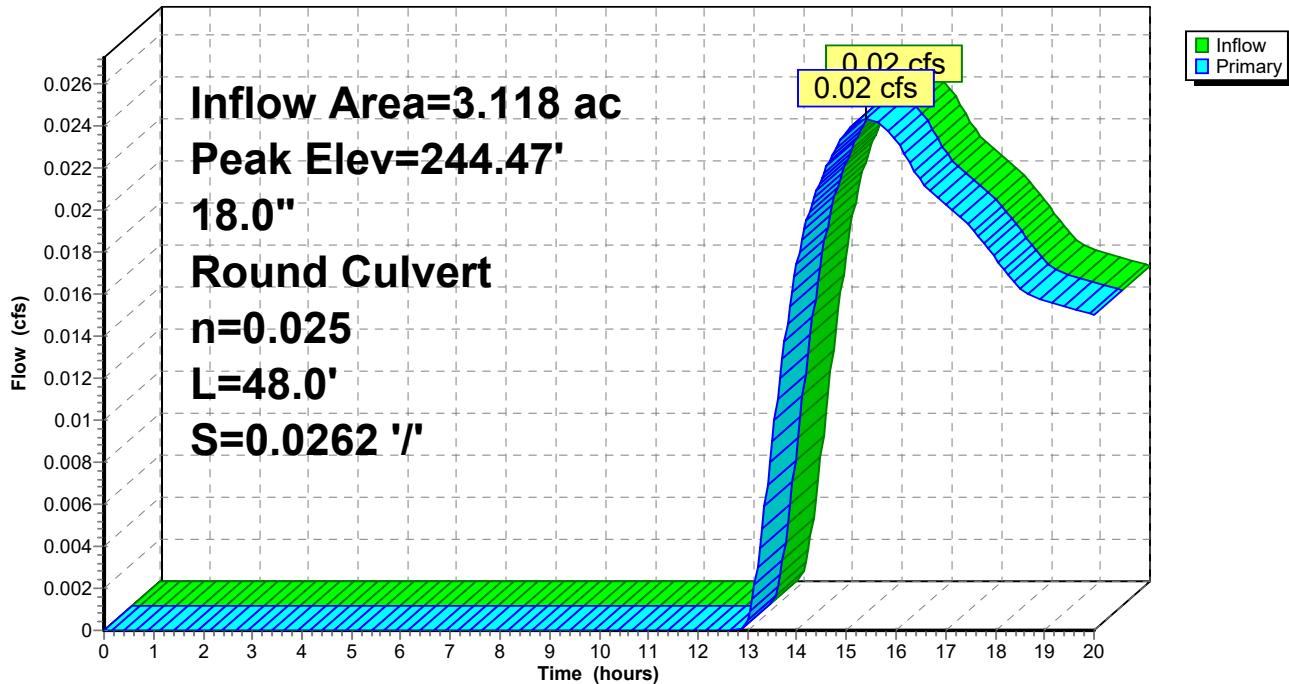
Flood Elev= 246.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	244.37'	18.0" Round Culvert L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 244.37' / 243.11' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.02 cfs @ 15.41 hrs HW=244.47' TW=244.00' (Fixed TW Elev= 244.00')
 ↑1=Culvert (Outlet Controls 0.02 cfs @ 0.76 fps)

Pond 9P: Sprucewood Rd Culvert

Hydrograph



Summary for Pond 10P: Proposed 15" Culvert

Inflow Area = 3.223 ac, 26.63% Impervious, Inflow Depth > 0.55" for 2-year storm event

Inflow = 0.97 cfs @ 12.70 hrs, Volume= 0.147 af

Outflow = 0.97 cfs @ 12.70 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

Primary = 0.97 cfs @ 12.70 hrs, Volume= 0.147 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

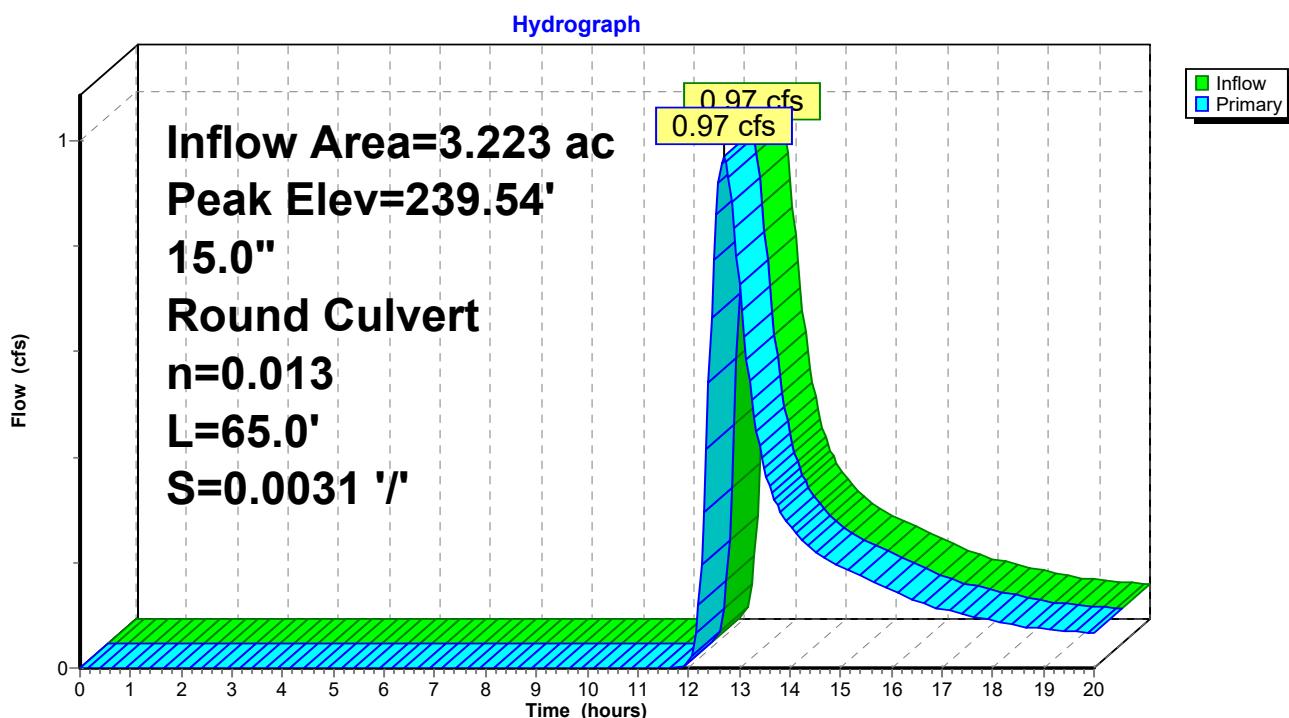
Peak Elev= 239.54' @ 12.70 hrs

Flood Elev= 241.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	15.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 238.00' / 237.80' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.99 cfs @ 12.70 hrs HW=239.54' TW=239.50' (Fixed TW Elev= 239.50')
 ↗1=Culvert (Inlet Controls 0.99 cfs @ 0.80 fps)

Pond 10P: Proposed 15" Culvert



Summary for Pond 11P: UGF #2

Inflow Area = 4.441 ac, 25.83% Impervious, Inflow Depth > 0.72" for 2-year storm event
 Inflow = 1.53 cfs @ 12.49 hrs, Volume= 0.268 af
 Outflow = 0.10 cfs @ 20.00 hrs, Volume= 0.007 af, Atten= 93%, Lag= 450.4 min
 Primary = 0.10 cfs @ 20.00 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.22' @ 20.00 hrs Surf.Area= 6,465 sf Storage= 11,395 cf
 Flood Elev= 239.70' Surf.Area= 7,182 sf Storage= 14,679 cf

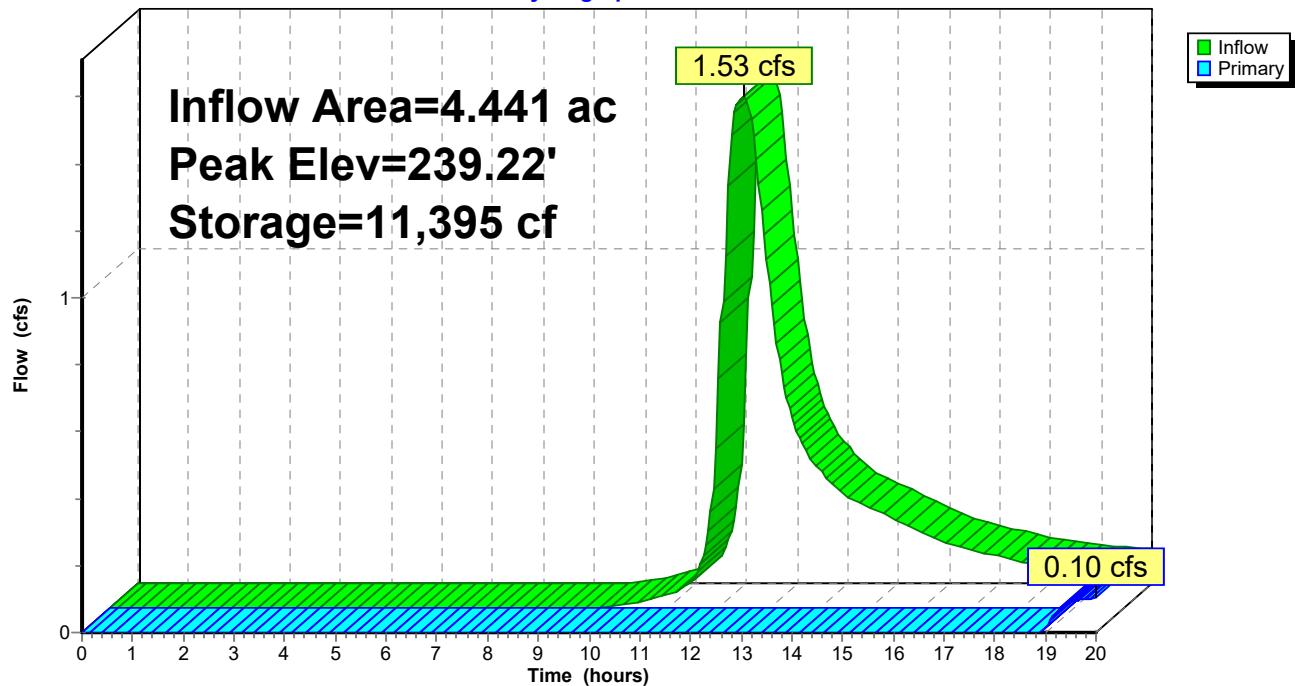
Plug-Flow detention time= 503.1 min calculated for 0.007 af (2% of inflow)
 Center-of-Mass det. time= 334.7 min (1,176.1 - 841.4)

Volume	Invert	Avail.Storage	Storage Description			
#1	235.03'	14,679 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
235.03	4,718	325.6	0.0	0	0	4,718
235.04	4,718	325.6	40.0	19	19	4,721
236.20	4,718	325.6	40.0	2,189	2,208	5,099
236.21	4,718	325.6	10.0	5	2,213	5,102
237.70	4,718	325.6	10.0	703	2,916	5,587
237.71	4,718	325.6	100.0	47	2,963	5,591
238.00	5,120	333.3	100.0	1,426	4,389	6,005
239.00	6,152	352.7	100.0	5,628	10,017	7,119
239.70	7,182	372.1	100.0	4,662	14,679	8,266

Device	Routing	Invert	Outlet Devices	
#1	Device 2	239.20'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	234.70'	15.0" Round Culvert L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 234.70' / 234.50' S= 0.0011 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf	

Primary OutFlow Max=0.08 cfs @ 20.00 hrs HW=239.22' (Free Discharge)

↑2=Culvert (Passes 0.08 cfs of 7.76 cfs potential flow)
 ↑1=Orifice/Grate (Weir Controls 0.08 cfs @ 0.44 fps)

Pond 11P: UGF #2**Hydrograph**

Summary for Pond 12P: UGF #3

Inflow Area = 2.939 ac, 90.21% Impervious, Inflow Depth > 0.07" for 2-year storm event

Inflow = 1.20 cfs @ 12.06 hrs, Volume= 0.016 af

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 228.38' @ 20.00 hrs Surf.Area= 6,514 sf Storage= 711 cf

Flood Elev= 232.78' Surf.Area= 9,647 sf Storage= 19,813 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

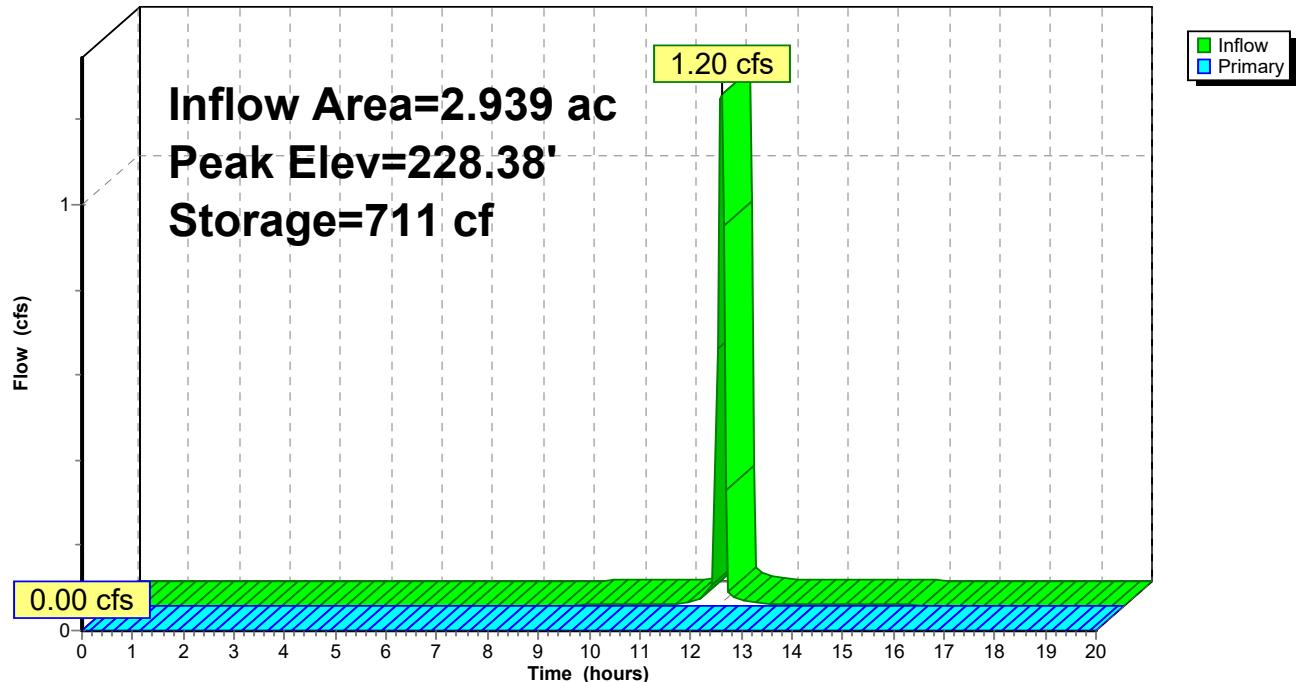
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description			
#1	228.11'	19,813 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.11	6,514	398.5	0.0	0	0	6,514
228.12	6,514	398.5	40.0	26	26	6,518
229.28	6,514	398.5	40.0	3,022	3,049	6,980
229.29	6,514	398.5	10.0	7	3,055	6,984
230.77	6,514	398.5	10.0	964	4,019	7,574
230.78	6,514	398.5	100.0	65	4,084	7,578
231.00	6,779	402.6	100.0	1,462	5,546	7,854
232.00	8,015	421.5	100.0	7,388	12,935	9,160
232.78	9,647	444.9	100.0	6,878	19,813	10,808

Device	Routing	Invert	Outlet Devices	
#1	Device 2	232.28'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	227.78'	12.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 227.78' / 226.00' S= 0.0371 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf	

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=228.11' (Free Discharge)

↑
2=Culvert (Passes 0.00 cfs of 0.44 cfs potential flow)
↑
1=Orifice/Grate (Controls 0.00 cfs)

Pond 12P: UGF #3**Hydrograph**

Summary for Pond 13P: UGF #4

Inflow Area = 0.569 ac, 63.32% Impervious, Inflow Depth > 1.70" for 2-year storm event
 Inflow = 1.07 cfs @ 12.13 hrs, Volume= 0.081 af
 Outflow = 0.06 cfs @ 15.05 hrs, Volume= 0.015 af, Atten= 95%, Lag= 175.3 min
 Primary = 0.06 cfs @ 15.05 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 240.51' @ 15.05 hrs Surf.Area= 2,051 sf Storage= 2,888 cf
 Flood Elev= 241.00' Surf.Area= 2,442 sf Storage= 3,987 cf

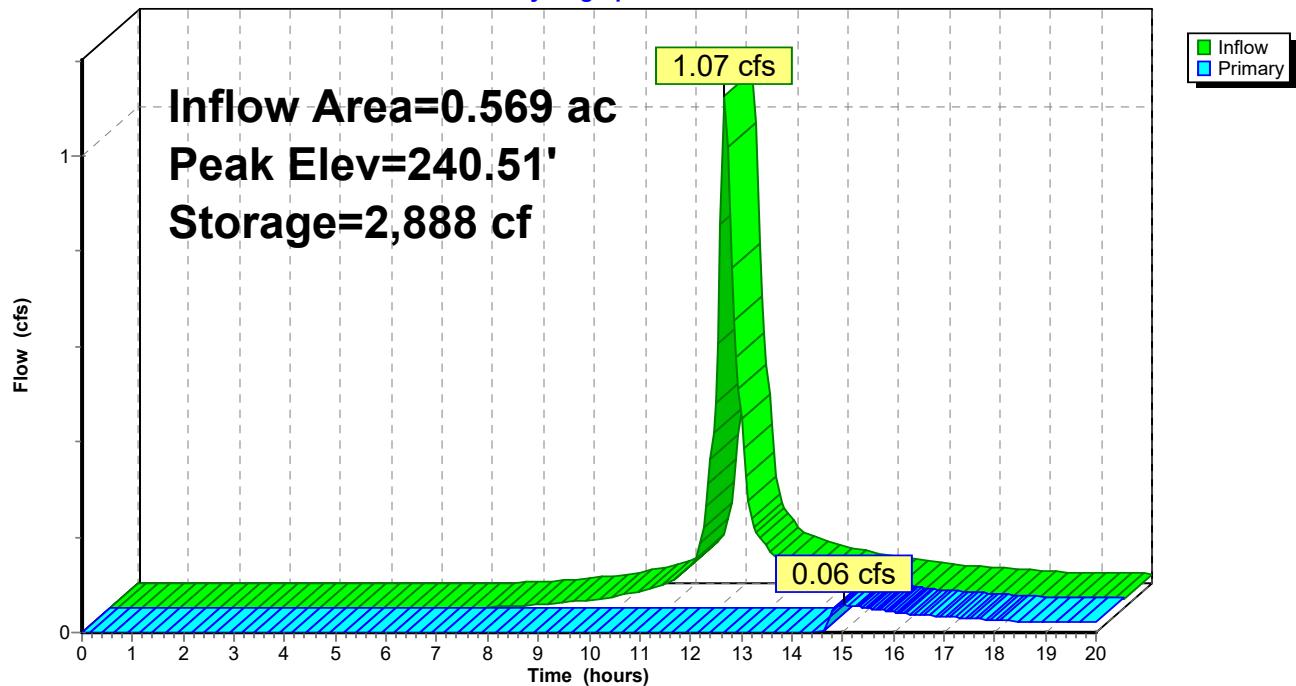
Plug-Flow detention time= 349.9 min calculated for 0.015 af (18% of inflow)
 Center-of-Mass det. time= 226.4 min (1,012.4 - 786.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	236.33'	3,987 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
236.33	988	214.0	0.0	0	0	988
236.34	988	214.0	40.0	4	4	990
237.50	988	214.0	40.0	458	462	1,238
237.51	988	214.0	10.0	1	463	1,241
238.99	988	214.0	10.0	146	610	1,557
239.00	988	214.0	100.0	10	619	1,559
240.00	1,680	246.0	100.0	1,319	1,938	2,753
241.00	2,442	264.0	100.0	2,049	3,987	3,527

Device	Routing	Invert	Outlet Devices
#1	Device 2	240.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	236.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 236.00' / 235.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.03 cfs @ 15.05 hrs HW=240.51' (Free Discharge)

↑ 2=Culvert (Passes 0.03 cfs of 7.57 cfs potential flow)
 ↑ 1=Orifice/Grate (Weir Controls 0.03 cfs @ 0.33 fps)

Pond 13P: UGF #4**Hydrograph**

Summary for Pond 14P: Storage within field

Inflow Area = 0.906 ac, 100.00% Impervious, Inflow Depth > 2.64" for 2-year storm event
 Inflow = 3.01 cfs @ 12.00 hrs, Volume= 0.199 af
 Outflow = 0.92 cfs @ 12.25 hrs, Volume= 0.199 af, Atten= 69%, Lag= 15.0 min
 Discarded = 0.92 cfs @ 12.25 hrs, Volume= 0.199 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 242.91' @ 12.25 hrs Surf.Area= 39,484 sf Storage= 1,255 cf

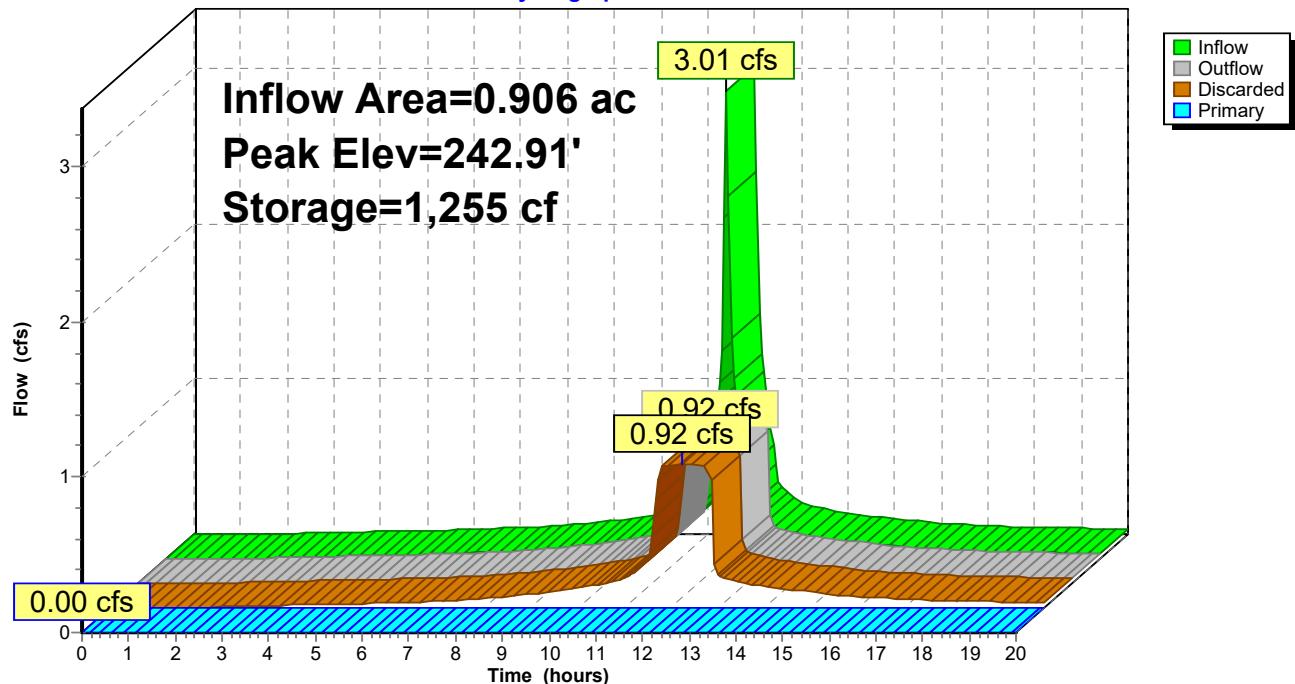
Plug-Flow detention time= 6.9 min calculated for 0.199 af (100% of inflow)
 Center-of-Mass det. time= 6.7 min (732.0 - 725.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	242.83'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.83	39,484	0.0	0	0
242.84	39,484	40.0	158	158
243.16	39,484	40.0	5,054	5,212
243.17	39,484	0.0	0	5,212
243.50	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	242.83'	1.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 235.00'
#2	Device 3	243.00'	12.0" W x 1.0" H Box Culvert X 16.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 243.00' / 242.30' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	241.59'	8.0" Round Culvert L= 435.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 241.59' / 239.60' S= 0.0046 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	239.60'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 239.60' / 239.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.92 cfs @ 12.25 hrs HW=242.91' (Free Discharge)
 ↑ 1=Exfiltration (Controls 0.92 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=242.83' TW=240.09' (Fixed TW Elev= 240.09')
 ↑ 4=Culvert (Passes 0.00 cfs of 6.25 cfs potential flow)
 ↑ 3=Culvert (Passes 0.00 cfs of 1.14 cfs potential flow)
 ↑ 2=Culvert (Controls 0.00 cfs)

Pond 14P: Storage within field**Hydrograph**

Summary for Pond 15P: Storage within field

Inflow Area = 0.906 ac, 100.00% Impervious, Inflow Depth > 2.64" for 2-year storm event
 Inflow = 3.01 cfs @ 12.00 hrs, Volume= 0.199 af
 Outflow = 0.92 cfs @ 12.25 hrs, Volume= 0.199 af, Atten= 69%, Lag= 15.0 min
 Discarded = 0.92 cfs @ 12.25 hrs, Volume= 0.199 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 242.91' @ 12.25 hrs Surf.Area= 39,484 sf Storage= 1,255 cf

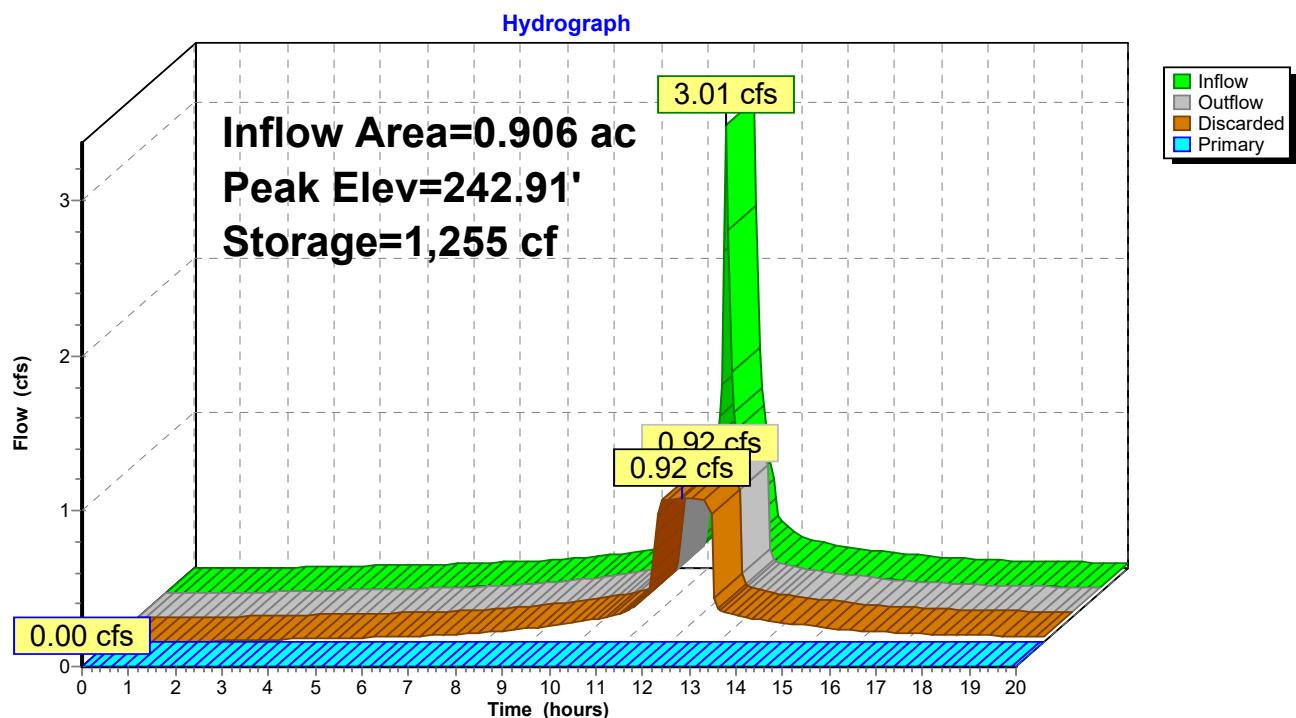
Plug-Flow detention time= 6.9 min calculated for 0.199 af (100% of inflow)
 Center-of-Mass det. time= 6.7 min (732.0 - 725.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	242.83'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.83	39,484	0.0	0	0
242.84	39,484	40.0	158	158
243.16	39,484	40.0	5,054	5,212
243.17	39,484	0.0	0	5,212
243.50	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	242.83'	1.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 235.00'
#2	Device 3	243.00'	12.0" W x 1.0" H Box Culvert X 16.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 243.00' / 242.30' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	241.59'	8.0" Round Culvert L= 435.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 241.59' / 239.60' S= 0.0046 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	239.60'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 239.60' / 239.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.92 cfs @ 12.25 hrs HW=242.91' (Free Discharge)
 ↑ 1=Exfiltration (Controls 0.92 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=242.83' TW=240.09' (Fixed TW Elev= 240.09')
 ↑ 4=Culvert (Passes 0.00 cfs of 6.25 cfs potential flow)
 ↑ 3=Culvert (Passes 0.00 cfs of 1.14 cfs potential flow)
 ↑ 2=Culvert (Controls 0.00 cfs)

Pond 15P: Storage within field

Summary for Pond 16P: Storage within field

Inflow Area = 2.939 ac, 90.21% Impervious, Inflow Depth > 2.32" for 2-year storm event
 Inflow = 9.17 cfs @ 12.00 hrs, Volume= 0.569 af
 Outflow = 6.77 cfs @ 12.06 hrs, Volume= 0.569 af, Atten= 26%, Lag= 3.3 min
 Discarded = 5.57 cfs @ 12.06 hrs, Volume= 0.553 af
 Primary = 1.20 cfs @ 12.06 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 235.38' @ 12.06 hrs Surf.Area= 39,484 sf Storage= 852 cf

Plug-Flow detention time= 0.6 min calculated for 0.569 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (749.4 - 748.8)

Volume	Invert	Avail.Storage	Storage Description	
#1	235.33'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.33	39,484	0.0	0	0
235.34	39,484	40.0	158	158
235.66	39,484	40.0	5,054	5,212
235.67	39,484	0.0	0	5,212
236.00	39,484	0.0	0	5,212

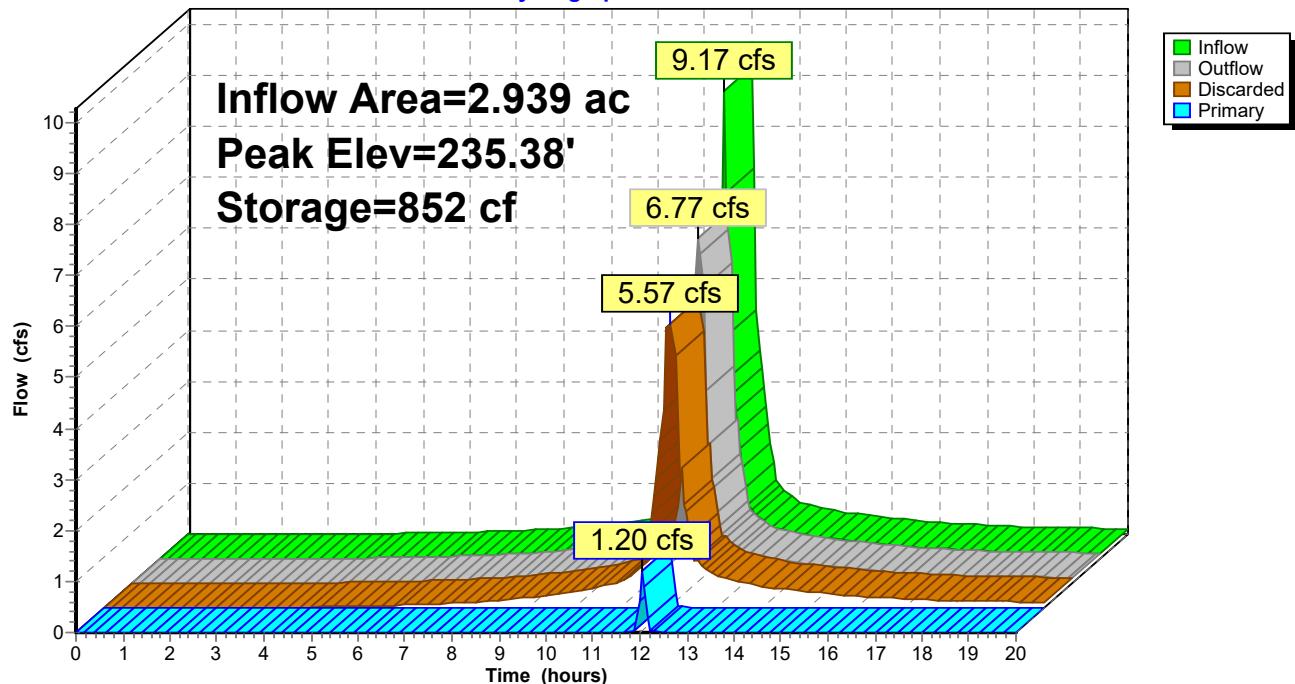
Device	Routing	Invert	Outlet Devices
#1	Discarded	235.33'	6.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 232.00'
#2	Device 3	235.33'	12.0" W x 1.0" H Box Culvert X 30.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 235.33' / 234.63' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	233.97'	8.0" Round Culvert L= 573.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 233.97' / 231.10' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	231.10'	12.0" Round Culvert L= 36.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 231.10' / 230.78' S= 0.0089 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=5.57 cfs @ 12.06 hrs HW=235.38' (Free Discharge)
 ↑ 1=Exfiltration (Controls 5.57 cfs)

Primary OutFlow Max=1.14 cfs @ 12.06 hrs HW=235.38' (Free Discharge)
 ↑ 4=Culvert (Passes 1.14 cfs of 7.35 cfs potential flow)
 ↑ 3=Culvert (Passes 1.14 cfs of 1.19 cfs potential flow)
 ↑ 2=Culvert (Inlet Controls 1.14 cfs @ 0.73 fps)

Pond 16P: Storage within field

Hydrograph



Summary for Pond 17P: New 36" Culvert

Inflow Area = 0.847 ac, 0.00% Impervious, Inflow Depth > 0.41" for 2-year storm event

Inflow = 0.22 cfs @ 12.39 hrs, Volume= 0.029 af

Outflow = 0.22 cfs @ 12.39 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Primary = 0.22 cfs @ 12.39 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 235.19' @ 12.39 hrs

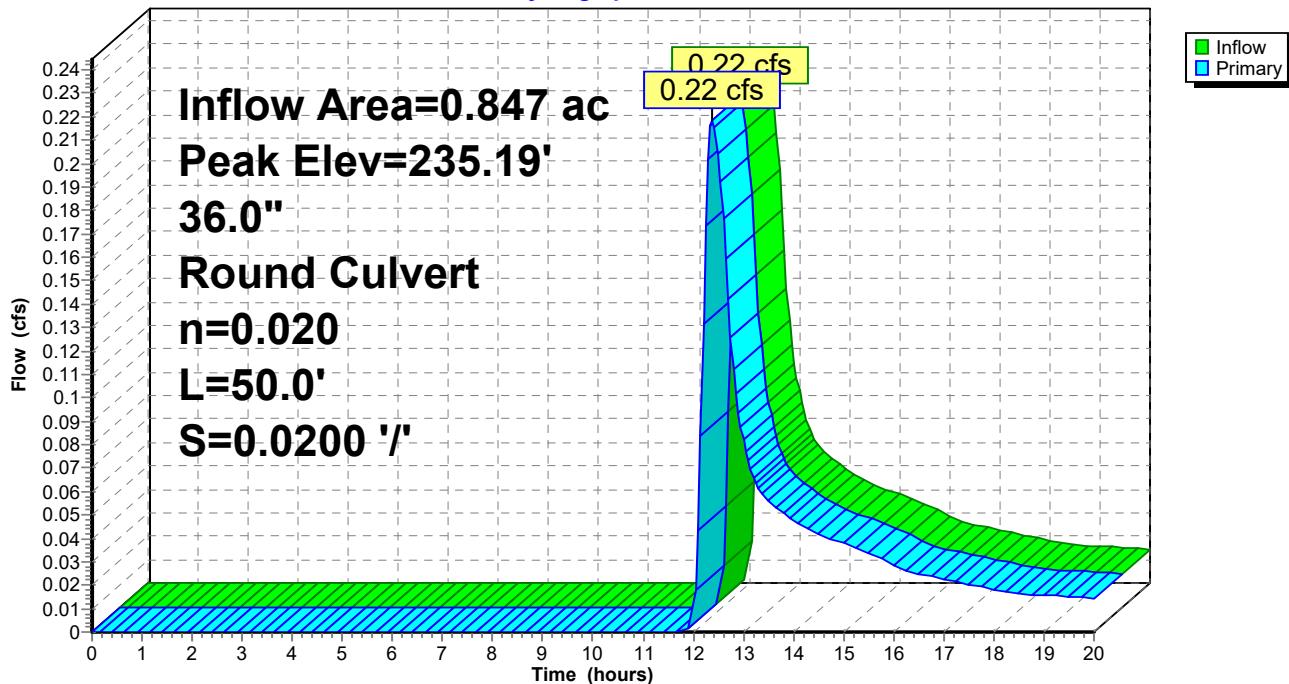
Flood Elev= 240.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	235.00'	36.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 235.00' / 234.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 7.07 sf

Primary OutFlow Max=0.22 cfs @ 12.39 hrs HW=235.19' TW=234.50' (Fixed TW Elev= 234.50')
 ↗1=Culvert (Outlet Controls 0.22 cfs @ 1.70 fps)

Pond 17P: New 36" Culvert

Hydrograph



Summary for Pond 18P: New 12" Culvert

Inflow Area = 0.534 ac, 0.47% Impervious, Inflow Depth > 0.12" for 2-year storm event
 Inflow = 0.02 cfs @ 12.64 hrs, Volume= 0.005 af
 Outflow = 0.02 cfs @ 12.64 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.02 cfs @ 12.64 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 233.34' @ 12.64 hrs

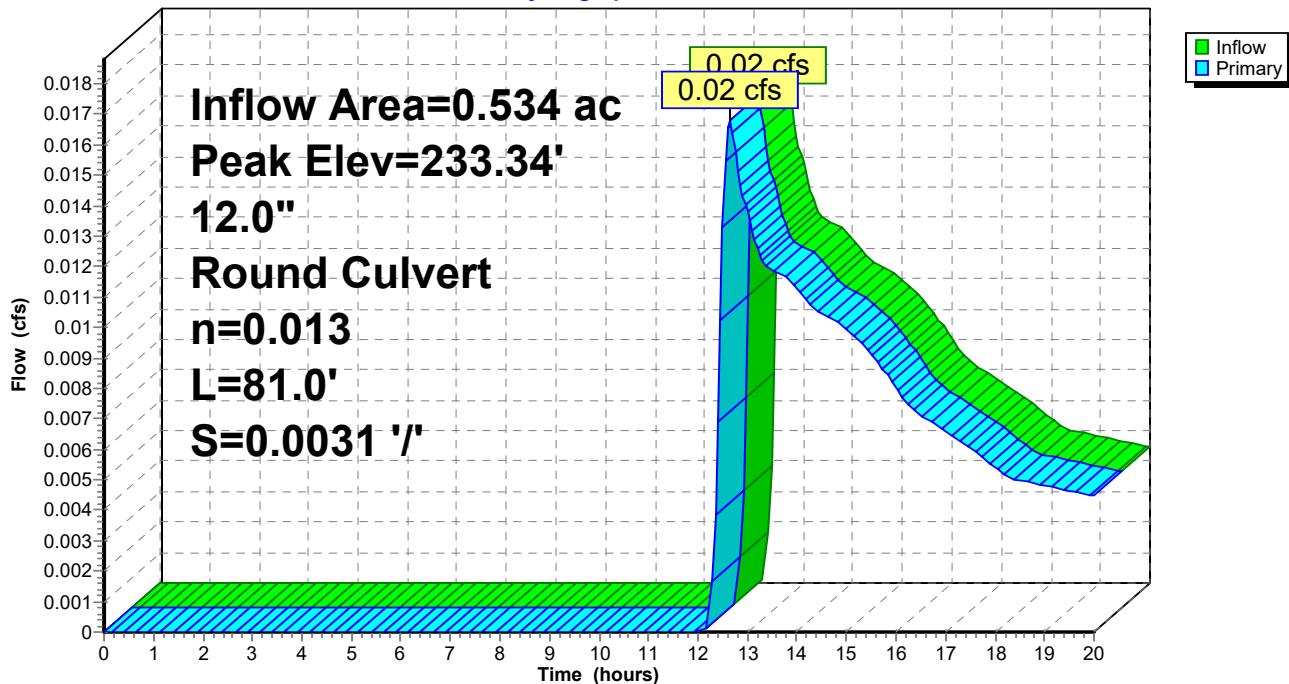
Flood Elev= 235.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	233.25'	12.0" Round Culvert L= 81.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 233.25' / 233.00' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.02 cfs @ 12.64 hrs HW=233.34' (Free Discharge)
 ↗1=Culvert (Barrel Controls 0.02 cfs @ 0.77 fps)

Pond 18P: New 12" Culvert

Hydrograph



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP1: Post 1	Runoff Area=21,609 sf 20.63% Impervious Runoff Depth>2.05" Flow Length=49' Tc=6.5 min CN=79 Runoff=1.24 cfs 0.085 af
SubcatchmentP10: (new Subcat)	Runoff Area=36,875 sf 0.00% Impervious Runoff Depth>1.03" Flow Length=292' Tc=20.7 min CN=64 Runoff=0.68 cfs 0.073 af
SubcatchmentP11: Post 11	Runoff Area=23,246 sf 0.47% Impervious Runoff Depth>0.48" Flow Length=201' Tc=19.5 min CN=53 Runoff=0.15 cfs 0.021 af
SubcatchmentP12: Post 12	Runoff Area=128,031 sf 90.21% Impervious Runoff Depth>3.55" Flow Length=1' Tc=0.2 min CN=95 Runoff=13.62 cfs 0.868 af
SubcatchmentP13: Post Sub 13	Runoff Area=790,293 sf 0.50% Impervious Runoff Depth>1.80" Flow Length=512' Tc=42.2 min CN=76 Runoff=19.89 cfs 2.720 af
SubcatchmentP14: Post 14	Runoff Area=11,225 sf 0.12% Impervious Runoff Depth>2.14" Flow Length=25' Tc=2.2 min CN=80 Runoff=0.76 cfs 0.046 af
SubcatchmentP15: Post 15	Runoff Area=36,496 sf 0.00% Impervious Runoff Depth>0.02" Flow Length=480' Tc=30.4 min CN=36 Runoff=0.00 cfs 0.001 af
SubcatchmentP2: Post 2	Runoff Area=39,484 sf 100.00% Impervious Runoff Depth>3.88" Flow Length=1' Tc=0.2 min CN=98 Runoff=4.35 cfs 0.293 af
SubcatchmentP3: Post 3	Runoff Area=39,484 sf 100.00% Impervious Runoff Depth>3.88" Flow Length=1' Tc=0.2 min CN=98 Runoff=4.35 cfs 0.293 af
SubcatchmentP4: Post 4	Runoff Area=27,045 sf 24.36% Impervious Runoff Depth>2.05" Flow Length=266' Tc=11.2 min UI Adjusted CN=79 Runoff=1.34 cfs 0.106 af
SubcatchmentP5: Post 5	Runoff Area=41,835 sf 30.05% Impervious Runoff Depth>2.21" Flow Length=69' Tc=16.0 min CN=81 Runoff=1.97 cfs 0.177 af
SubcatchmentP6: Post 6	Runoff Area=197,973 sf 12.87% Impervious Runoff Depth>0.31" Flow Length=500' Tc=68.1 min UI Adjusted CN=49 Runoff=0.40 cfs 0.119 af
SubcatchmentP7: Post 7	Runoff Area=135,817 sf 24.84% Impervious Runoff Depth>0.29" Flow Length=570' Tc=36.8 min CN=48 Runoff=0.31 cfs 0.075 af
SubcatchmentP8: Post 8	Runoff Area=140,411 sf 26.63% Impervious Runoff Depth>1.26" Flow Length=270' Tc=39.5 min UI Adjusted CN=68 Runoff=2.47 cfs 0.338 af
SubcatchmentP9: Post 9	Runoff Area=24,805 sf 63.32% Impervious Runoff Depth>2.83" Flow Length=132' Tc=8.9 min CN=88 Runoff=1.77 cfs 0.134 af
Reach 1R: Ditch along p-lot	Avg. Flow Depth=0.37' Max Vel=2.15 fps Inflow=1.97 cfs 0.177 af n=0.035 L=130.0' S=0.0171 '/' Capacity=16.19 cfs Outflow=1.94 cfs 0.176 af

Reach 2R: Wooded buffer	Avg. Flow Depth=0.03' Max Vel=0.04 fps Inflow=0.04 cfs 0.009 af n=0.400 L=100.0' S=0.0165 '/' Capacity=2.38 cfs Outflow=0.03 cfs 0.005 af
Reach 3R: Downslope of 18" dia. SD	Avg. Flow Depth=0.17' Max Vel=0.11 fps Inflow=0.66 cfs 0.192 af n=0.400 L=100.0' S=0.0160 '/' Capacity=2.02 cfs Outflow=0.62 cfs 0.184 af
Reach 4R: Existing Channel	Avg. Flow Depth=0.05' Max Vel=0.70 fps Inflow=0.62 cfs 0.184 af n=0.025 L=325.0' S=0.0120 '/' Capacity=18.08 cfs Outflow=0.61 cfs 0.180 af
Reach 5R: Existing Channel	Avg. Flow Depth=0.09' Max Vel=1.26 fps Inflow=0.61 cfs 0.180 af n=0.025 L=420.0' S=0.0204 '/' Capacity=66.75 cfs Outflow=0.61 cfs 0.177 af
Reach 6R: Existing Stream Channel	Avg. Flow Depth=1.55' Max Vel=1.62 fps Inflow=20.39 cfs 3.327 af n=0.040 L=240.0' S=0.0018 '/' Capacity=33.56 cfs Outflow=20.29 cfs 3.312 af
Reach 8R: Below Wooded Buffer	Avg. Flow Depth=0.00' Max Vel=0.24 fps Inflow=0.03 cfs 0.005 af n=0.025 L=240.0' S=0.0194 '/' Capacity=29.38 cfs Outflow=0.03 cfs 0.004 af
Reach 9R: Existing Stream Channel	Avg. Flow Depth=0.80' Max Vel=3.74 fps Inflow=19.89 cfs 2.723 af n=0.040 L=540.0' S=0.0194 '/' Capacity=110.28 cfs Outflow=19.78 cfs 2.712 af
Reach 10R: Existing Stream Channel	Avg. Flow Depth=1.54' Max Vel=1.64 fps Inflow=20.43 cfs 3.153 af n=0.040 L=65.0' S=0.0018 '/' Capacity=34.06 cfs Outflow=20.39 cfs 3.149 af
Reach 11R: Stevens Mill Road Ditch	Avg. Flow Depth=0.31' Max Vel=1.33 fps Inflow=0.66 cfs 0.193 af n=0.035 L=118.0' S=0.0084 '/' Capacity=32.56 cfs Outflow=0.66 cfs 0.192 af
Reach 12R: Stevens Mill Road Ditch	Avg. Flow Depth=0.29' Max Vel=1.51 fps Inflow=0.66 cfs 0.193 af n=0.035 L=105.0' S=0.0120 '/' Capacity=38.94 cfs Outflow=0.66 cfs 0.193 af
Reach 13R: Stevens Mill Road Ditch	Avg. Flow Depth=0.28' Max Vel=0.74 fps Inflow=0.31 cfs 0.075 af n=0.035 L=165.0' S=0.0030 '/' Capacity=19.57 cfs Outflow=0.31 cfs 0.074 af
Reach 14R: Proposed diversion swale	Avg. Flow Depth=0.36' Max Vel=2.92 fps Inflow=2.47 cfs 0.338 af n=0.035 L=270.0' S=0.0333 '/' Capacity=22.62 cfs Outflow=2.46 cfs 0.337 af
Reach 15R: Existing drainage	Avg. Flow Depth=0.13' Max Vel=1.40 fps Inflow=1.97 cfs 0.436 af n=0.025 L=185.0' S=0.0146 '/' Capacity=164.26 cfs Outflow=1.96 cfs 0.434 af
Reach 16R: Existing drainage along	Avg. Flow Depth=0.04' Max Vel=0.80 fps Inflow=0.15 cfs 0.021 af n=0.025 L=75.0' S=0.0160 '/' Capacity=144.38 cfs Outflow=0.15 cfs 0.021 af
Reach 17R: Existing drainage	Avg. Flow Depth=0.13' Max Vel=1.46 fps Inflow=2.01 cfs 0.455 af n=0.025 L=235.0' S=0.0162 '/' Capacity=172.90 cfs Outflow=1.99 cfs 0.452 af
Reach 18R: Existing drainage	Avg. Flow Depth=0.12' Max Vel=1.55 fps Inflow=1.99 cfs 0.452 af n=0.025 L=115.0' S=0.0191 '/' Capacity=188.06 cfs Outflow=1.99 cfs 0.451 af
Reach 19R: Existing Stream Channel	Avg. Flow Depth=0.23' Max Vel=1.57 fps Inflow=1.99 cfs 0.451 af n=0.040 L=200.0' S=0.0144 '/' Capacity=94.97 cfs Outflow=1.97 cfs 0.449 af
Reach 20R: Existing Stream Channel	Avg. Flow Depth=0.34' Max Vel=0.97 fps Inflow=1.97 cfs 0.449 af n=0.040 L=405.0' S=0.0034 '/' Capacity=46.28 cfs Outflow=1.88 cfs 0.441 af

Reach 21R: Existing Stream Channel Avg. Flow Depth=0.00' Max Vel=0.26 fps Inflow=0.00 cfs 0.001 af
n=0.040 L=765.0' S=0.0092 '/' Capacity=76.21 cfs Outflow=0.00 cfs 0.001 af

Reach WAP 1: Water Analysis Point 1 Inflow=20.29 cfs 3.312 af
Outflow=20.29 cfs 3.312 af

Pond 1P: Proposed 15" Culvert Peak Elev=239.67' Inflow=1.94 cfs 0.176 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=1.94 cfs 0.176 af

Pond 2P: Stone Berm Spreader Peak Elev=240.46' Storage=4,250 cf Inflow=1.34 cfs 0.106 af
Outflow=0.04 cfs 0.009 af

Pond 3P: UGF #1 Peak Elev=239.53' Storage=3,696 cf Inflow=1.24 cfs 0.085 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Outlet structure for UGF #1 Peak Elev=236.91' Inflow=0.66 cfs 0.192 af
18.0" Round Culvert n=0.013 L=197.0' S=0.0051 '/' Outflow=0.66 cfs 0.192 af

Pond 5P: New 4' catch basin Peak Elev=239.87' Inflow=0.66 cfs 0.192 af
15.0" Round Culvert n=0.013 L=200.0' S=0.0145 '/' Outflow=0.66 cfs 0.192 af

Pond 6P: Stevens Mill Rd X-Culvert Peak Elev=240.48' Inflow=0.66 cfs 0.192 af
15.0" Round Culvert n=0.025 L=32.0' S=0.0106 '/' Outflow=0.66 cfs 0.192 af

Pond 7P: Driveway culvert Peak Elev=240.94' Inflow=0.66 cfs 0.192 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0061 '/' Outflow=0.66 cfs 0.192 af

Pond 8P: Driveway culvert Peak Elev=241.94' Inflow=0.66 cfs 0.193 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0093 '/' Outflow=0.66 cfs 0.193 af

Pond 9P: Sprucewood Rd Culvert Peak Elev=244.68' Inflow=0.31 cfs 0.075 af
18.0" Round Culvert n=0.025 L=48.0' S=0.0262 '/' Outflow=0.31 cfs 0.075 af

Pond 10P: Proposed 15" Culvert Peak Elev=239.78' Inflow=2.46 cfs 0.337 af
15.0" Round Culvert n=0.013 L=65.0' S=0.0031 '/' Outflow=2.46 cfs 0.337 af

Pond 11P: UGF #2 Peak Elev=239.34' Storage=12,195 cf Inflow=3.54 cfs 0.559 af
Outflow=1.64 cfs 0.295 af

Pond 12P: UGF #3 Peak Elev=228.87' Storage=1,992 cf Inflow=1.21 cfs 0.046 af
Outflow=0.00 cfs 0.000 af

Pond 13P: UGF #4 Peak Elev=240.59' Storage=3,051 cf Inflow=1.77 cfs 0.134 af
Outflow=0.81 cfs 0.068 af

Pond 14P: Storage within field Peak Elev=243.00' Storage=2,657 cf Inflow=4.35 cfs 0.293 af
Discarded=0.93 cfs 0.293 af Primary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.293 af

Pond 15P: Storage within field Peak Elev=243.00' Storage=2,657 cf Inflow=4.35 cfs 0.293 af
Discarded=0.93 cfs 0.293 af Primary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.293 af

Pond 16P: Storage within field

Peak Elev=235.50' Storage=2,693 cf Inflow=13.62 cfs 0.868 af

Discarded=5.76 cfs 0.823 af Primary=1.21 cfs 0.046 af Outflow=6.98 cfs 0.868 af

Pond 17P: New 36" CulvertPeak Elev=235.34' Inflow=0.68 cfs 0.073 af
36.0" Round Culvert n=0.020 L=50.0' S=0.0200 '/' Outflow=0.68 cfs 0.073 af**Pond 18P: New 12" Culvert**Peak Elev=233.50' Inflow=0.15 cfs 0.021 af
12.0" Round Culvert n=0.013 L=81.0' S=0.0031 '/' Outflow=0.15 cfs 0.021 af**Total Runoff Area = 38.903 ac Runoff Volume = 5.349 af Average Runoff Depth = 1.65"**
80.26% Pervious = 31.224 ac 19.74% Impervious = 7.679 ac

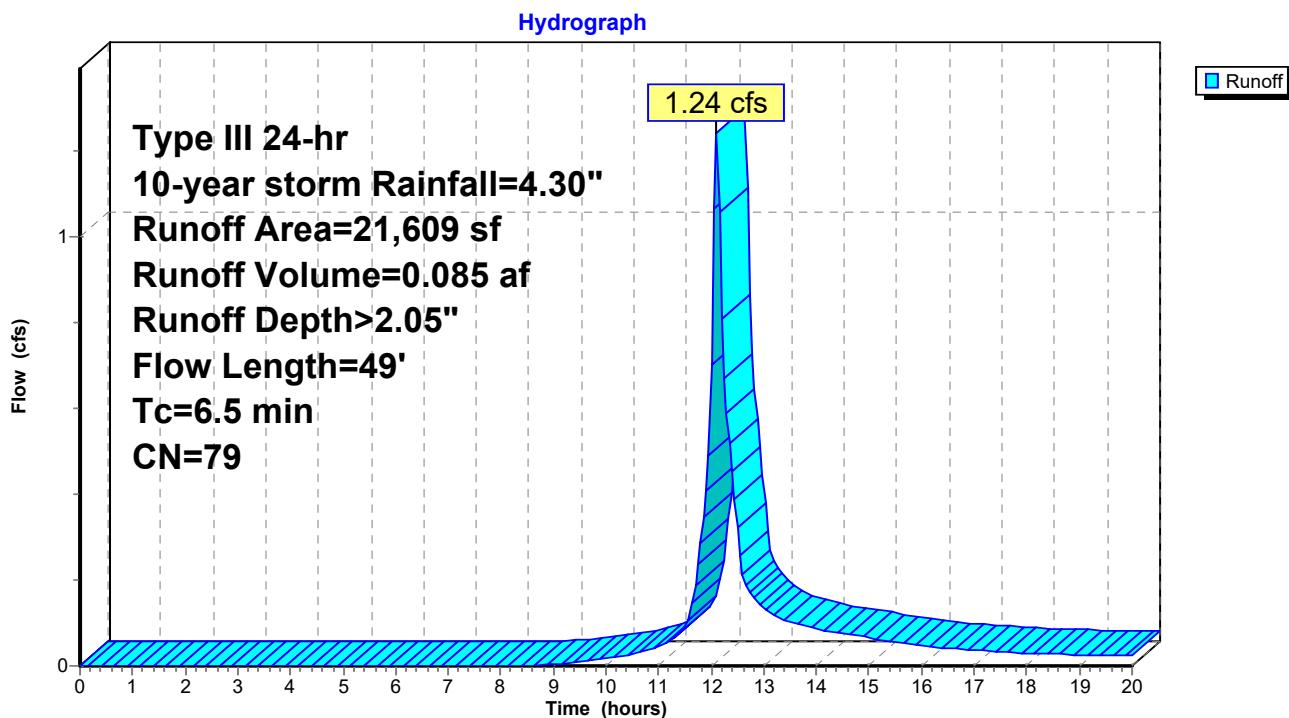
Summary for Subcatchment P1: Post 1

Runoff = 1.24 cfs @ 12.10 hrs, Volume= 0.085 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description		
4,457	98	Paved parking, HSG C		
17,152	74	>75% Grass cover, Good, HSG C		
21,609	79	Weighted Average		
17,152		79.37% Pervious Area		
4,457		20.63% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
0.3	14	0.0208	0.91	Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
6.2	35	0.0630	0.09	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
6.5	49	Total		

Subcatchment P1: Post 1



Summary for Subcatchment P10: (new Subcat)

Runoff = 0.68 cfs @ 12.32 hrs, Volume= 0.073 af, Depth> 1.03"

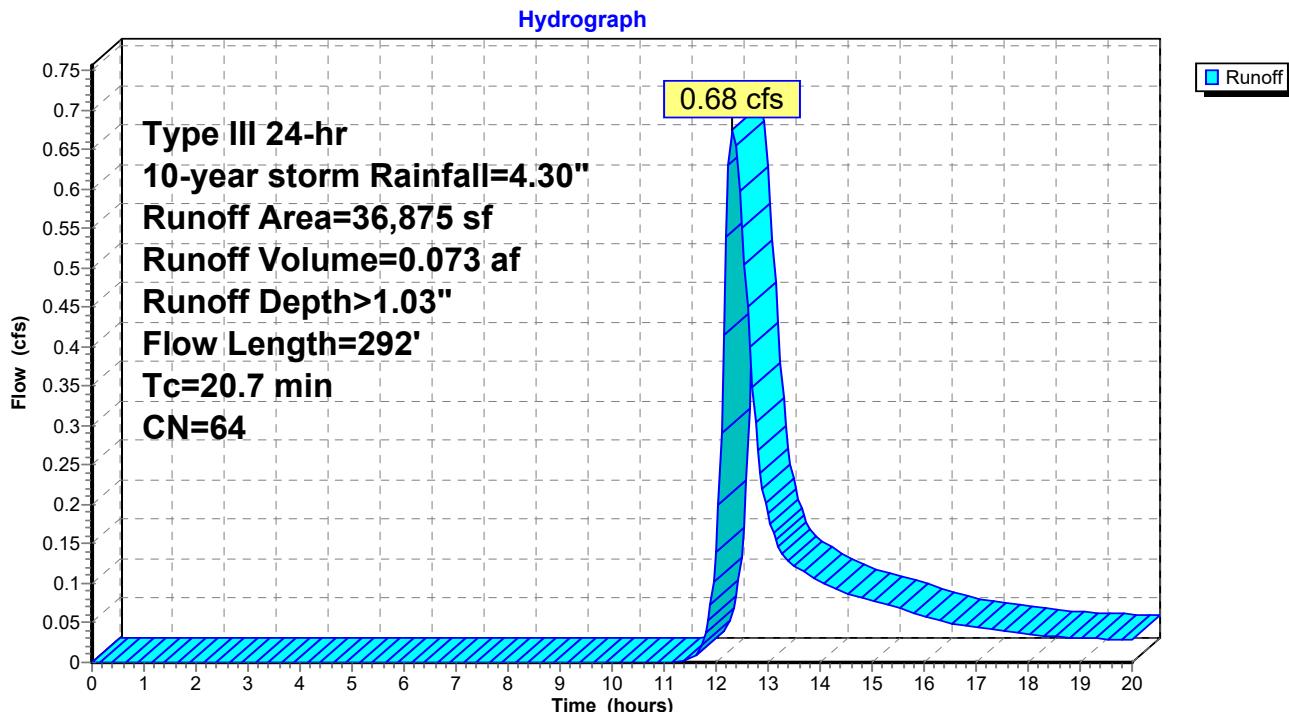
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
11,265	39	>75% Grass cover, Good, HSG A
485	30	Woods, Good, HSG A
22,159	74	>75% Grass cover, Good, HSG C
2,966	96	Gravel surface, HSG C
36,875	64	Weighted Average
36,875		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
19.5	120	0.0420	0.10		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
1.2	172	0.0259	2.41		Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps

20.7 292 Total

Subcatchment P10: (new Subcat)



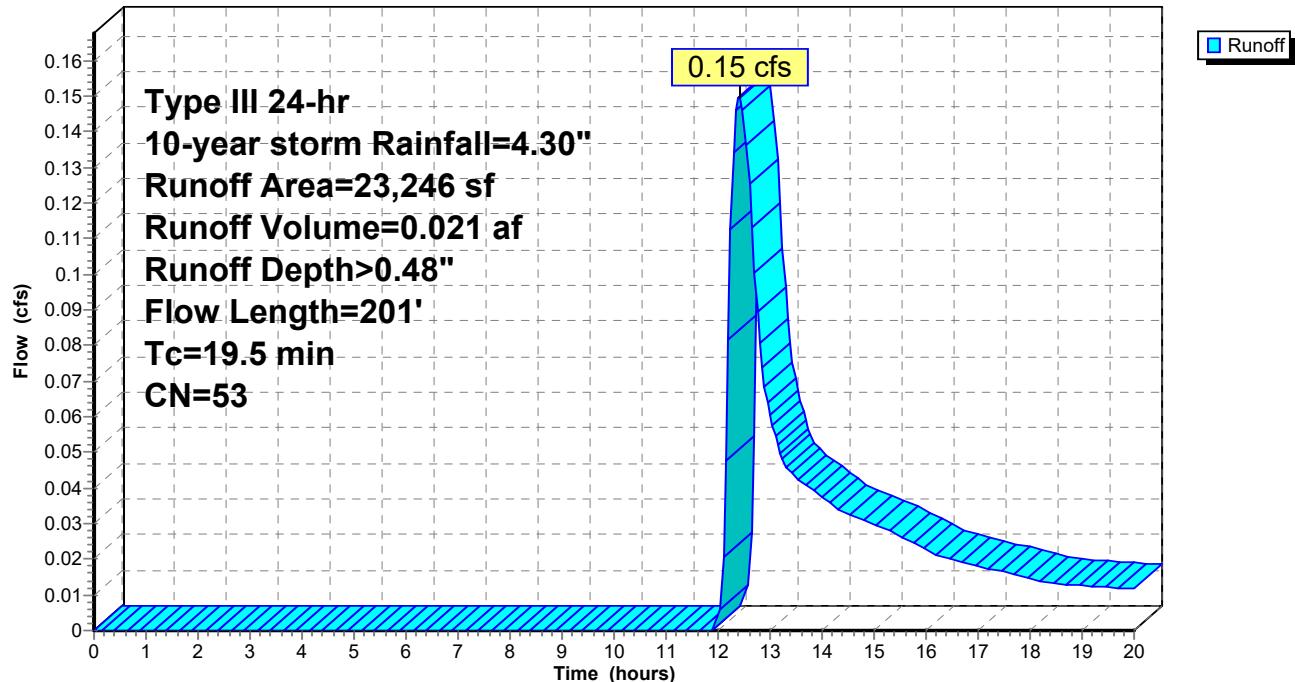
Summary for Subcatchment P11: Post 11

Runoff = 0.15 cfs @ 12.41 hrs, Volume= 0.021 af, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
16,150	39	>75% Grass cover, Good, HSG A
143	30	Woods, Good, HSG A
2,251	74	>75% Grass cover, Good, HSG C
2,564	96	Gravel surface, HSG C
1,325	80	>75% Grass cover, Good, HSG D
110	98	Paved parking, HSG D
703	96	Gravel surface, HSG D
23,246	53	Weighted Average
23,136		99.53% Pervious Area
110		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	60	0.0200	0.07		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
4.2	32	0.1410	0.13		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
0.3	72	0.0140	4.28	17.10	Parabolic Channel, Vegetated Channel W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.030 Earth, grassed & winding
0.0	37	0.0810	14.75	118.03	Parabolic Channel, Vegetated channel W=6.00' D=2.00' Area=8.0 sf Perim=7.5' n= 0.030 Earth, grassed & winding
19.5	201	Total			

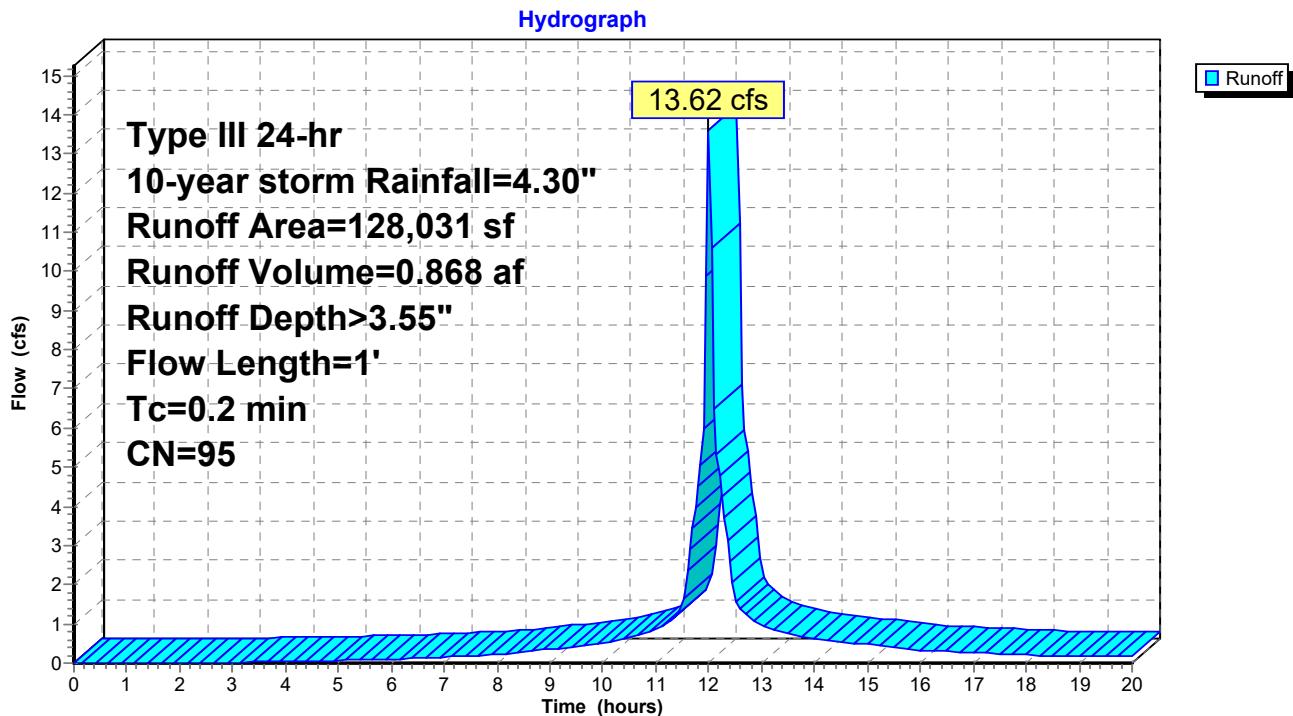
Subcatchment P11: Post 11**Hydrograph**

Summary for Subcatchment P12: Post 12

Runoff = 13.62 cfs @ 12.00 hrs, Volume= 0.868 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description			
866	39	>75% Grass cover, Good, HSG A			
*	48,875	New Turf field, HSG A			
11,665	74	>75% Grass cover, Good, HSG C			
*	62,734	New Turf Field, HSG C			
3,891	98	Paved parking, HSG C			
128,031	95	Weighted Average			
12,531		9.79% Pervious Area			
115,500		90.21% Impervious Area			
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
0.2	1		0.10		Direct Entry, Flow through Turf

Subcatchment P12: Post 12

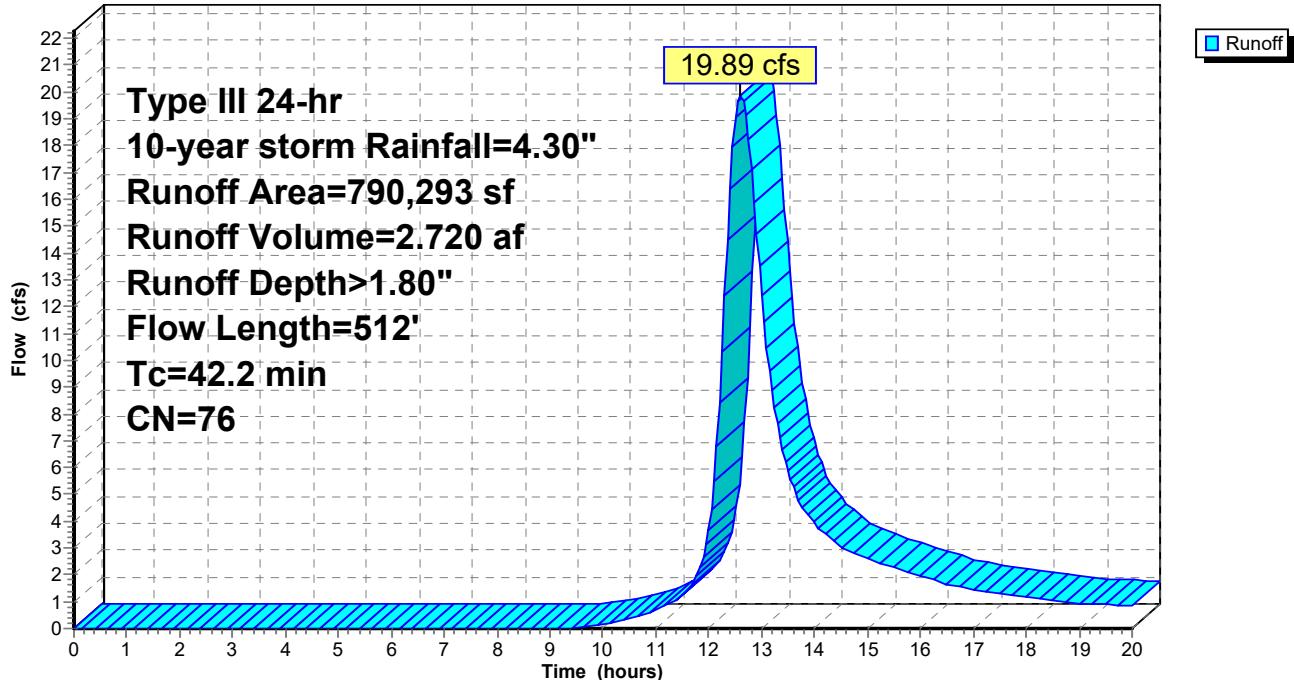
Summary for Subcatchment P13: Post Sub 13

Runoff = 19.89 cfs @ 12.60 hrs, Volume= 2.720 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
8,456	80	>75% Grass cover, Good, HSG D
1,440	96	Gravel surface, HSG D
85,560	78	Meadow, non-grazed, HSG D
546,270	77	Woods, Good, HSG D
17,074	74	>75% Grass cover, Good, HSG C
367	98	Paved parking, HSG C
2,503	96	Gravel surface, HSG C
41,424	71	Meadow, non-grazed, HSG C
83,580	70	Woods, Good, HSG C
3,619	98	Paved parking, HSG C
790,293	76	Weighted Average
786,307		99.50% Pervious Area
3,986		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0313	1.02		Sheet Flow, New Access Road Smooth surfaces n= 0.011 P2= 3.00"
1.1	3	0.0313	0.04		Sheet Flow, Grass Esplenade Grass: Bermuda n= 0.410 P2= 3.00"
0.1	5	0.0313	0.88		Sheet Flow, walkway Smooth surfaces n= 0.011 P2= 3.00"
28.7	131	0.0180	0.08		Sheet Flow, wooded/wetland Woods: Light underbrush n= 0.400 P2= 3.00"
12.1	362	0.0100	0.50		Shallow Concentrated Flow, woodland Woodland Kv= 5.0 fps
42.2	512	Total			

Subcatchment P13: Post Sub 13**Hydrograph**

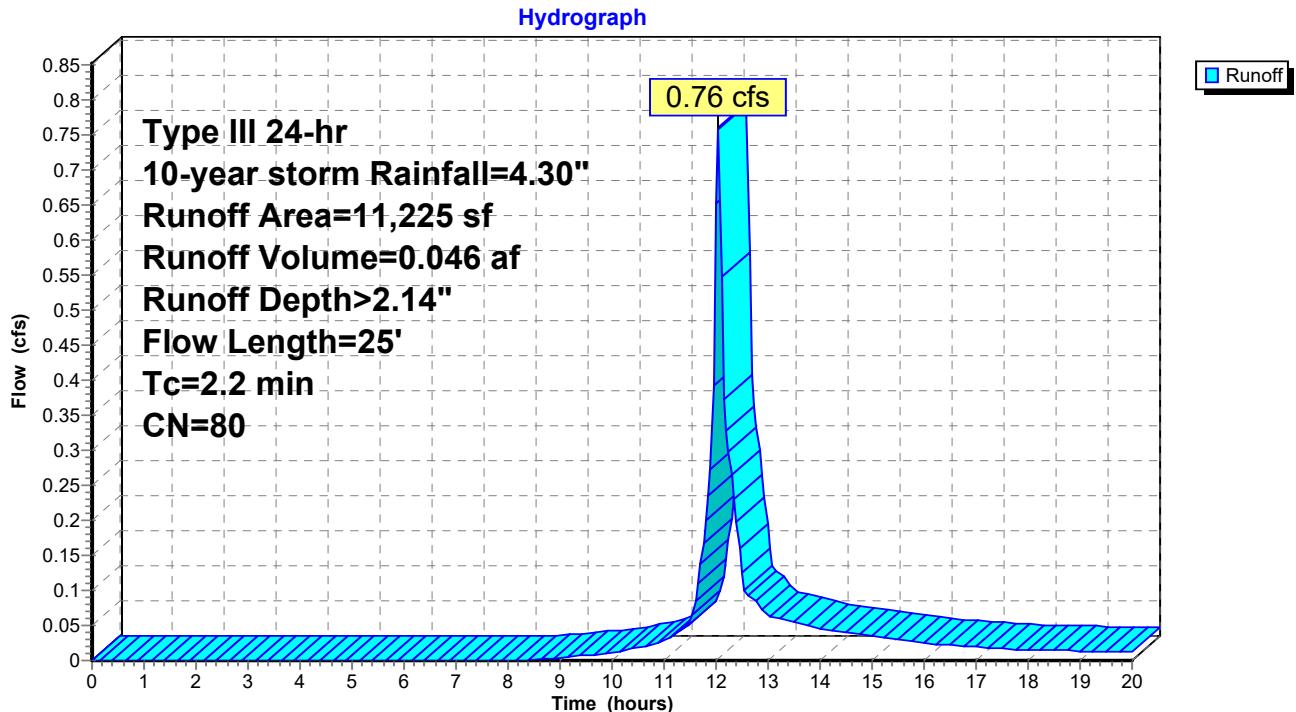
Summary for Subcatchment P14: Post 14

Runoff = 0.76 cfs @ 12.04 hrs, Volume= 0.046 af, Depth> 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
7,811	74	>75% Grass cover, Good, HSG C
14	98	Paved parking, HSG C
3,289	96	Gravel surface, HSG C
111	71	Meadow, non-grazed, HSG C
11,225	80	Weighted Average
11,211		99.88% Pervious Area
14		0.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0310	1.02		Sheet Flow, New Road Smooth surfaces n= 0.011 P2= 3.00"
1.1	3	0.0310	0.04		Sheet Flow, Esplanade Grass: Bermuda n= 0.410 P2= 3.00"
0.1	5	0.0310	0.87		Sheet Flow, New Walkway Smooth surfaces n= 0.011 P2= 3.00"
0.8	6	0.3333	0.13		Sheet Flow, Road Slope Grass: Bermuda n= 0.410 P2= 3.00"
2.2	25	Total			

Subcatchment P14: Post 14

Summary for Subcatchment P15: Post 15

Runoff = 0.00 cfs @ 17.55 hrs, Volume= 0.001 af, Depth> 0.02"

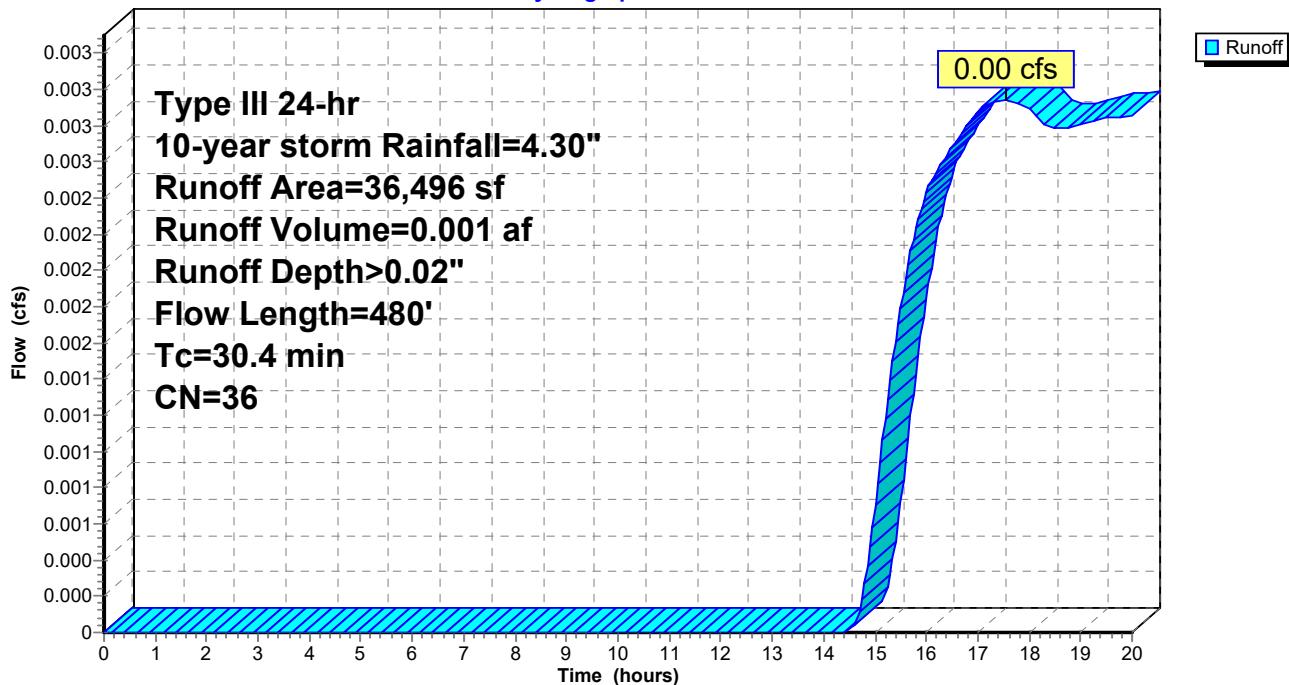
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
1,075	39	>75% Grass cover, Good, HSG A
31,275	30	Woods, Good, HSG A
179	80	>75% Grass cover, Good, HSG D
3,967	77	Woods, Good, HSG D
36,496	36	Weighted Average
36,496		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	150	0.0350	0.10		Sheet Flow, woods Woods: Light underbrush n= 0.400 P2= 3.00"
5.5	290	0.0310	0.88		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
0.4	40	0.1000	1.58		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
30.4	480	Total			

Subcatchment P15: Post 15

Hydrograph



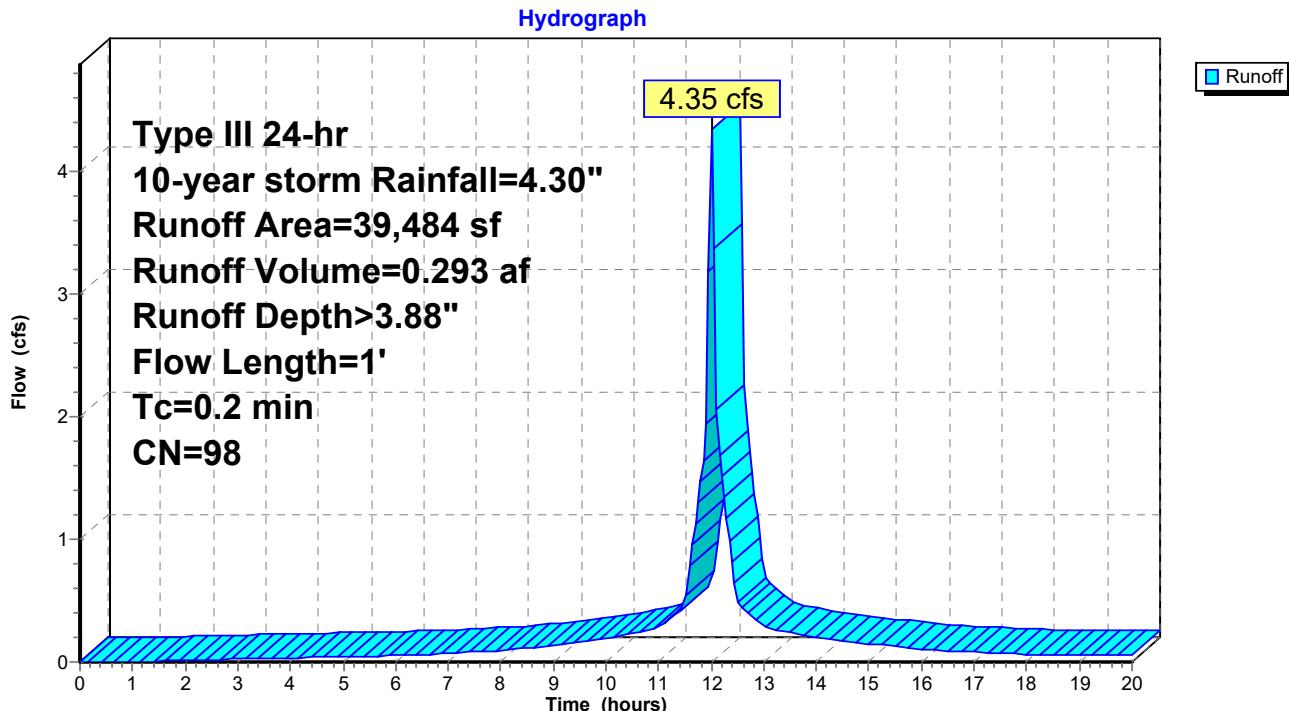
Summary for Subcatchment P2: Post 2

Runoff = 4.35 cfs @ 12.00 hrs, Volume= 0.293 af, Depth> 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
* 39,484	98	Turf Field, HSG C
39,484		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
0.2	1		0.10		Direct Entry, Flow through Turf Field

Subcatchment P2: Post 2

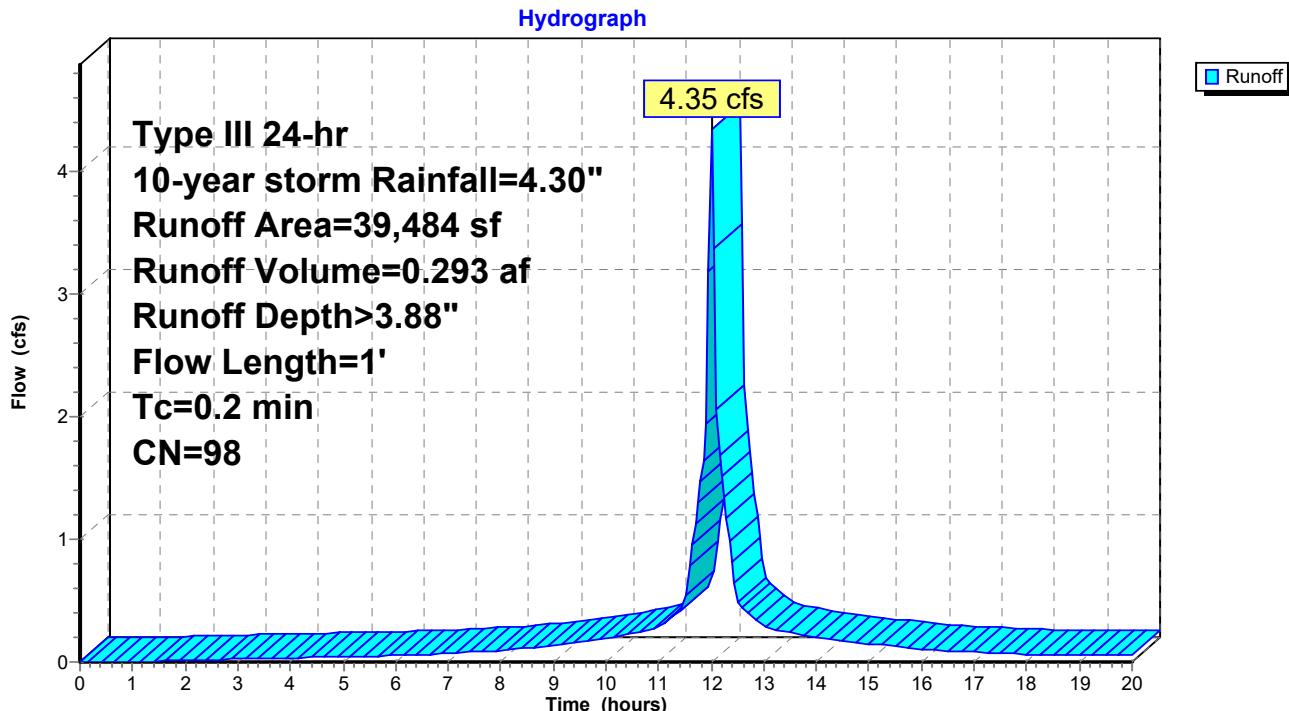
Summary for Subcatchment P3: Post 3

Runoff = 4.35 cfs @ 12.00 hrs, Volume= 0.293 af, Depth> 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
* 39,484	98	New Turf Field, HSG C
39,484		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
0.2	1		0.10		Direct Entry, Flow through Turf

Subcatchment P3: Post 3

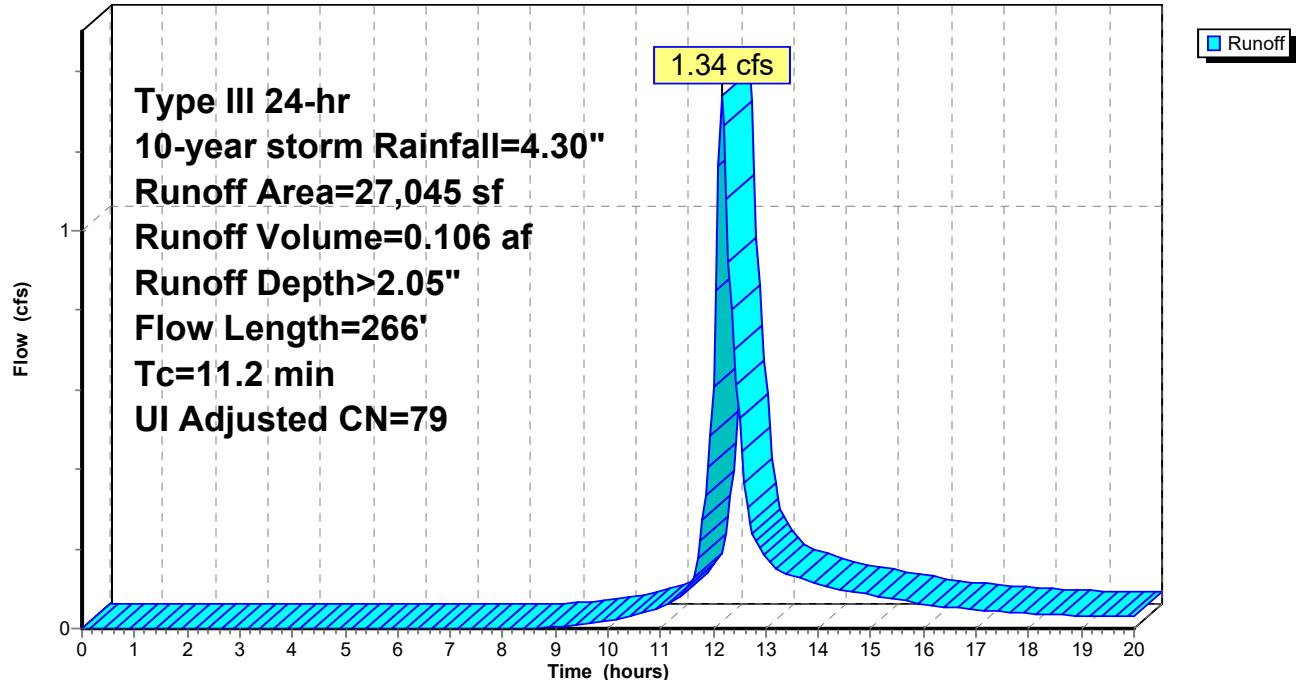
Summary for Subcatchment P4: Post 4

Runoff = 1.34 cfs @ 12.16 hrs, Volume= 0.106 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Adj	Description
4,305	98		Paved parking, HSG C
859	98		Paved parking, HSG C
1,425	98		Unconnected roofs, HSG C
20,456	74		>75% Grass cover, Good, HSG C
27,045	80	79	Weighted Average, UI Adjusted
20,456			75.64% Pervious Area
6,589			24.36% Impervious Area
1,425			21.63% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
9.9	40	0.0250	0.07		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
1.0	212	0.0127	3.46	13.85	Parabolic Channel, Vegetated swale W=8.00' D=0.75' Area=4.0 sf Perim=8.2' n= 0.030 Earth, grassed & winding
11.2	266	Total			

Subcatchment P4: Post 4**Hydrograph**

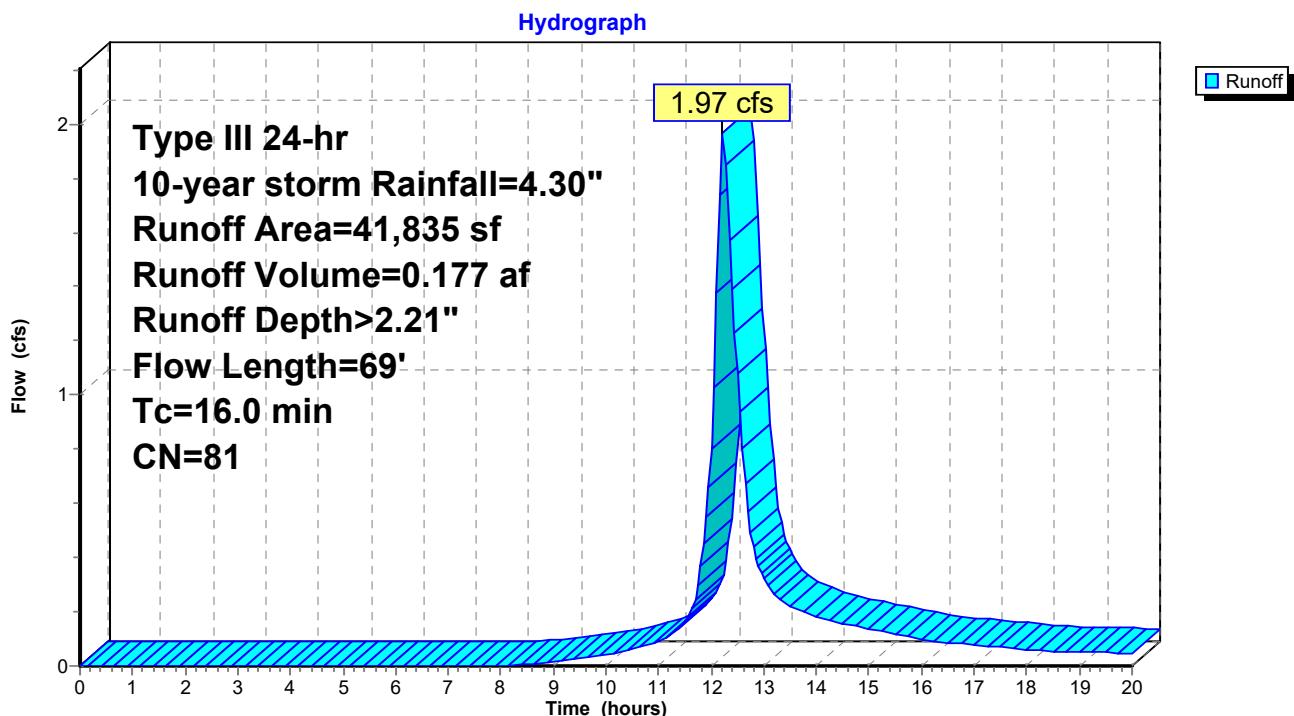
Summary for Subcatchment P5: Post 5

Runoff = 1.97 cfs @ 12.22 hrs, Volume= 0.177 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
12,571	98	Paved parking, HSG C
11,876	74	>75% Grass cover, Good, HSG C
1,947	96	Gravel surface, HSG C
15,441	70	Woods, Good, HSG C
41,835	81	Weighted Average
29,264		69.95% Pervious Area
12,571		30.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
15.7	55	0.0150	0.06		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
16.0	69	Total			

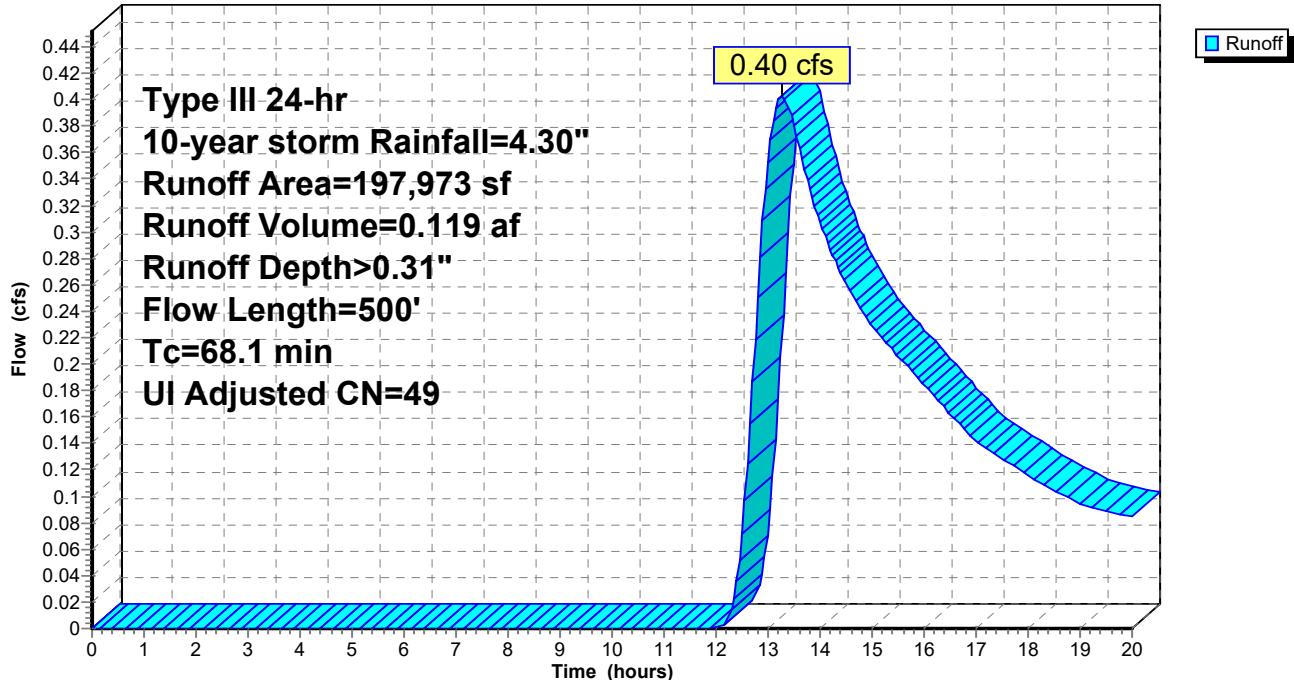
Subcatchment P5: Post 5

Summary for Subcatchment P6: Post 6

Runoff = 0.40 cfs @ 13.26 hrs, Volume= 0.119 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Adj	Description	
8,288	92		Paved roads w/open ditches, 50% imp, HSG C	
7,140	83		Paved roads w/open ditches, 50% imp, HSG A	
471	98		Unconnected pavement, HSG C	
7,007	98		Unconnected pavement, HSG C	
10,292	98		Unconnected pavement, HSG A	
101,459	30		Woods, Good, HSG A	
54,560	70		Woods, Good, HSG C	
8,756	30		Woods, Good, HSG A	
197,973	52	49	Weighted Average, UI Adjusted	
172,489			87.13% Pervious Area	
25,484			12.87% Impervious Area	
17,770			69.73% Unconnected	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	
Capacity (cfs)	Description			
4.4	30	0.1050	0.11	Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
27.9	65	0.0050	0.04	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
23.9	55	0.0050	0.04	Sheet Flow, Woods - Good Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	240	0.0050	0.35	Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.6	110	0.0440	3.15	Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
68.1	500	Total		

Subcatchment P6: Post 6**Hydrograph**

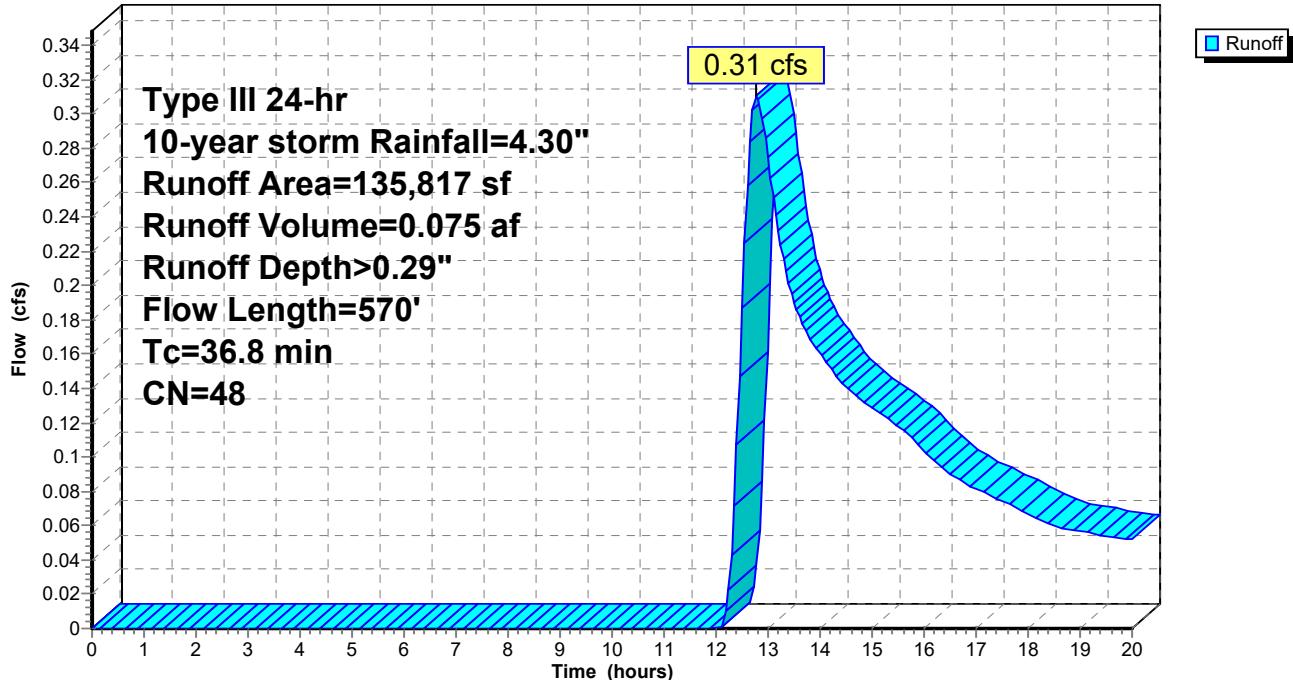
Summary for Subcatchment P7: Post 7

Runoff = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
10,242	83	Paved roads w/open ditches, 50% imp, HSG A
20,828	98	Paved parking, HSG A
7,787	98	Paved parking, HSG A
88,183	30	Woods, Good, HSG A
8,635	30	Woods, Good, HSG A
142	30	Woods, Good, HSG A
135,817	48	Weighted Average
102,081		75.16% Pervious Area
33,736		24.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0710	0.11		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
25.4	100	0.0150	0.07		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.2	205	0.0190	1.56	62.50	Parabolic Channel, Existing Wooded channel W=60.00' D=1.00' Area=40.0 sf Perim=60.0' n= 0.100 Heavy timber, flow below branches
0.8	100	0.0125	2.01	3.35	Parabolic Channel, lawn drainage swale W=10.00' D=0.25' Area=1.7 sf Perim=10.0' n= 0.025 Earth, clean & winding
0.6	115	0.0100	3.10	12.39	Parabolic Channel, Sprucewood Road ditch W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.035 Earth, dense weeds
36.8	570	Total			

Subcatchment P7: Post 7**Hydrograph**

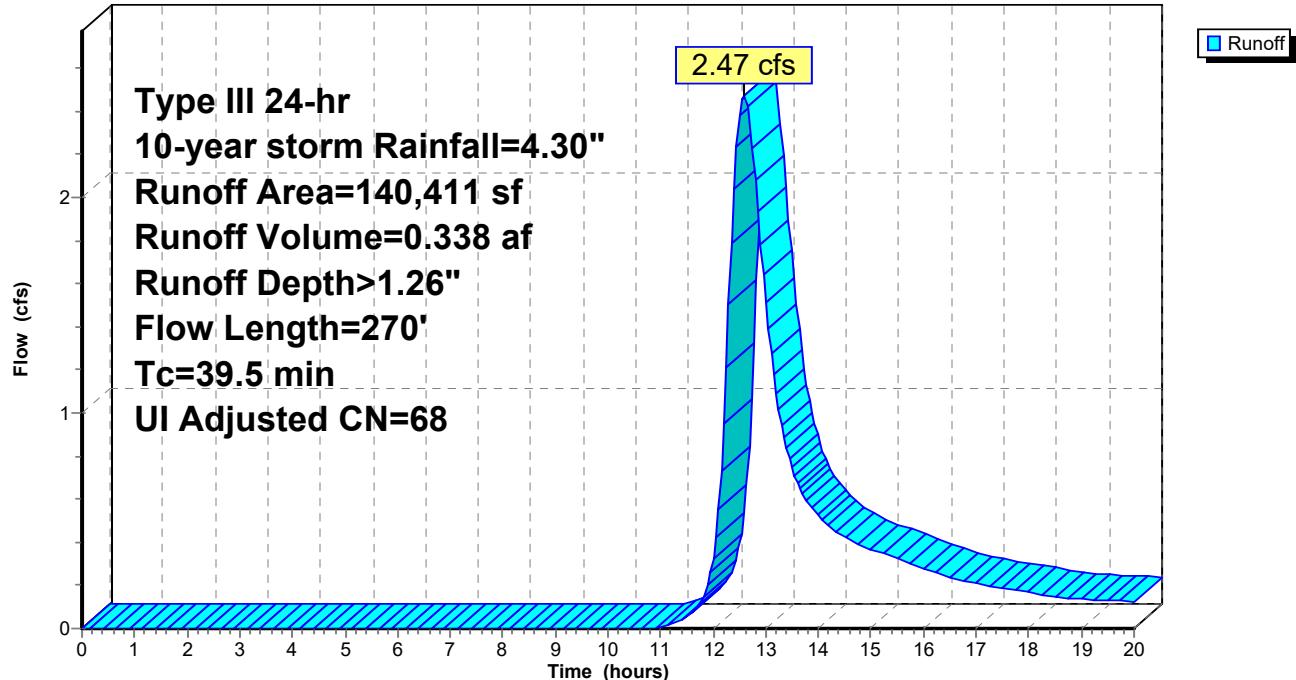
Summary for Subcatchment P8: Post 8

Runoff = 2.47 cfs @ 12.59 hrs, Volume= 0.338 af, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Adj	Description
7,015	30		Woods, Good, HSG A
4,423	98		Unconnected roofs, HSG A
11,991	98		Paved parking, HSG A
34,364	39		>75% Grass cover, Good, HSG A
9,643	74		>75% Grass cover, Good, HSG C
16,990	98		Paved parking, HSG C
30,169	70		Woods, Good, HSG C
2,818	98		Roofs, HSG C
1,168	98		Paved parking, HSG C
21,830	74		>75% Grass cover, Good, HSG C
140,411	69	68	Weighted Average, UI Adjusted
103,021			73.37% Pervious Area
37,390			26.63% Impervious Area
4,423			11.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
36.7	136	0.0110	0.06		Sheet Flow, Offsite lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.5	100	0.0180	0.67		Shallow Concentrated Flow, wooded Woodland Kv= 5.0 fps
0.0	20	0.3330	8.66		Shallow Concentrated Flow, lawn Grassed Waterway Kv= 15.0 fps
39.5	270	Total			

Subcatchment P8: Post 8**Hydrograph**

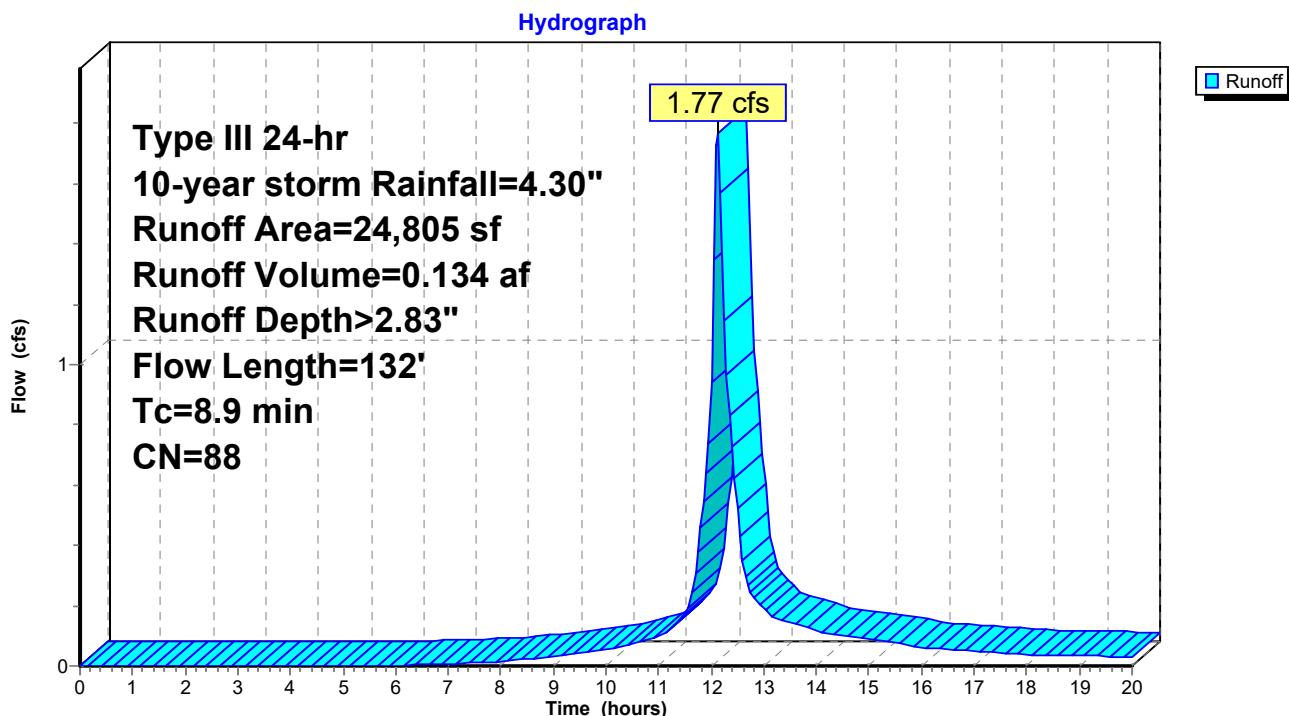
Summary for Subcatchment P9: Post 9

Runoff = 1.77 cfs @ 12.12 hrs, Volume= 0.134 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
2,474	74	>75% Grass cover, Good, HSG C
15,707	98	Water Surface, HSG C
6,288	71	Meadow, non-grazed, HSG C
336	70	Woods, Good, HSG C
24,805	88	Weighted Average
9,098		36.68% Pervious Area
15,707		63.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	72	0.0500	1.80		Sheet Flow, New gravel parking area Smooth surfaces n= 0.011 P2= 3.00"
8.2	60	0.0900	0.12		Sheet Flow, Lawn Area Grass: Bermuda n= 0.410 P2= 3.00"
8.9	132	Total			

Subcatchment P9: Post 9

Summary for Reach 1R: Ditch along p-lot

Inflow Area = 0.960 ac, 30.05% Impervious, Inflow Depth > 2.21" for 10-year storm event

Inflow = 1.97 cfs @ 12.22 hrs, Volume= 0.177 af

Outflow = 1.94 cfs @ 12.25 hrs, Volume= 0.176 af, Atten= 2%, Lag= 2.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.15 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 0.87 fps, Avg. Travel Time= 2.5 min

Peak Storage= 118 cf @ 12.24 hrs

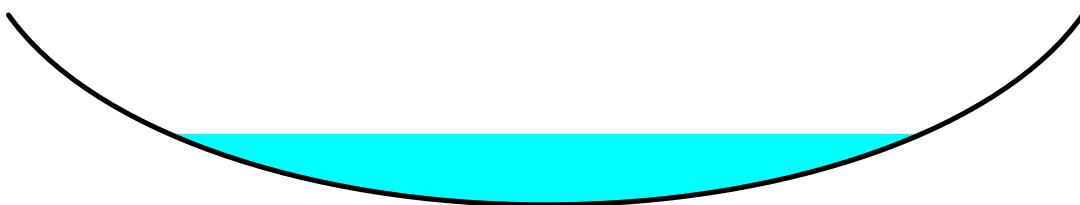
Average Depth at Peak Storage= 0.37' , Surface Width= 3.66'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 16.19 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

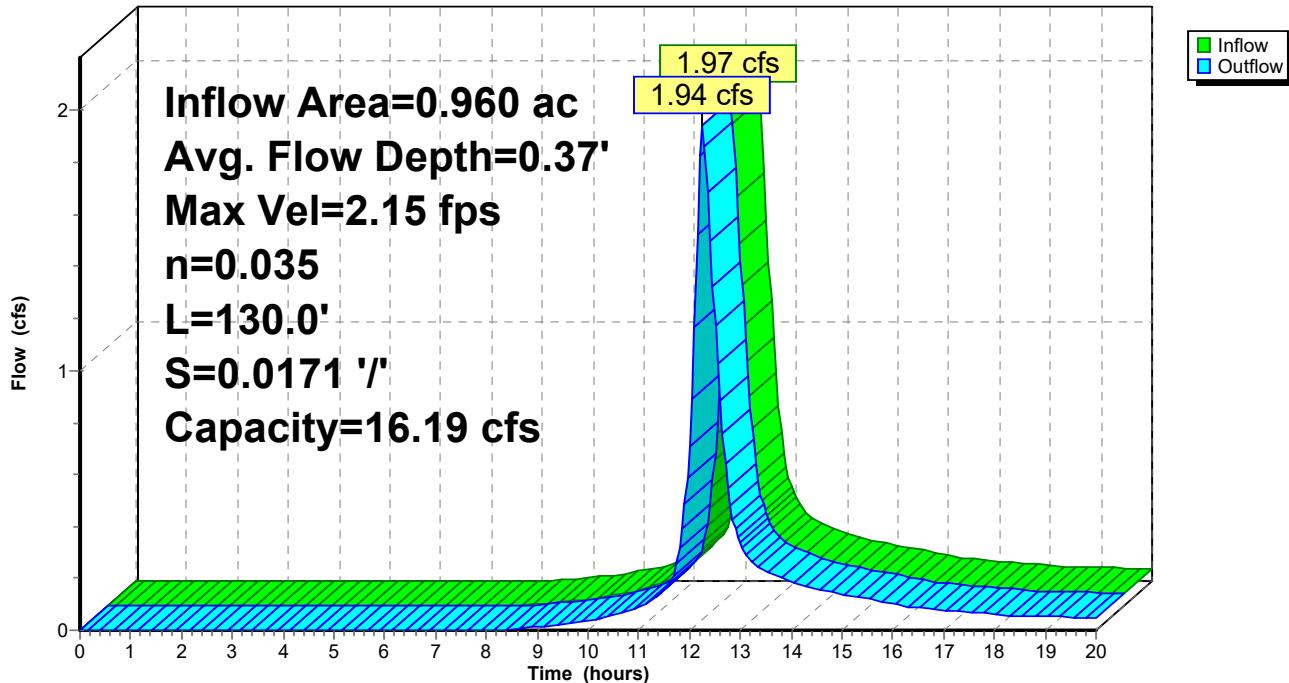
Length= 130.0' Slope= 0.0171 '/'

Inlet Invert= 241.22', Outlet Invert= 239.00'



Reach 1R: Ditch along p-lot

Hydrograph



Summary for Reach 2R: Wooded buffer

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 0.17" for 10-year storm event

Inflow = 0.04 cfs @ 17.46 hrs, Volume= 0.009 af

Outflow = 0.03 cfs @ 19.22 hrs, Volume= 0.005 af, Atten= 19%, Lag= 105.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.04 fps, Min. Travel Time= 40.2 min

Avg. Velocity = 0.04 fps, Avg. Travel Time= 46.2 min

Peak Storage= 84 cf @ 18.55 hrs

Average Depth at Peak Storage= 0.03' , Surface Width= 32.67'

Bank-Full Depth= 0.30' Flow Area= 13.5 sf, Capacity= 2.38 cfs

30.00' x 0.30' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 50.0 '/' Top Width= 60.00'

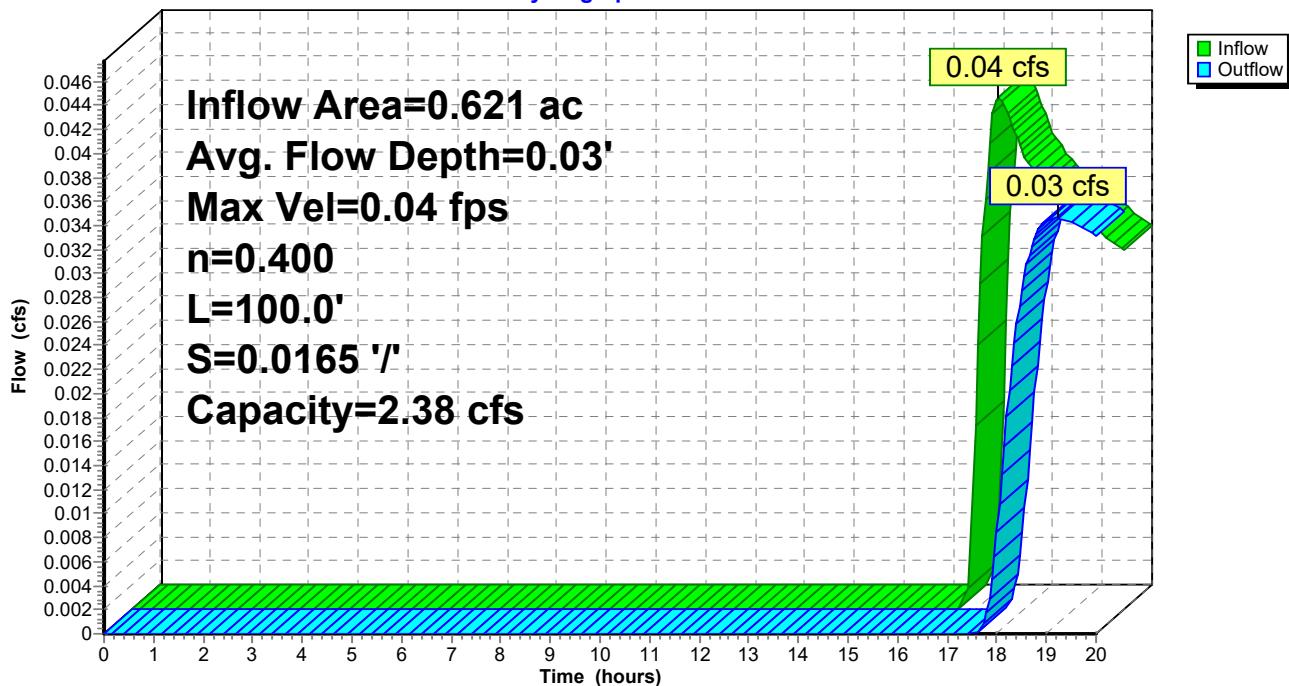
Length= 100.0' Slope= 0.0165 '/'

Inlet Invert= 238.30', Outlet Invert= 236.65'



Reach 2R: Wooded buffer

Hydrograph



Summary for Reach 3R: Downslope of 18" dia. SD plunge pool

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.23" for 10-year storm event

Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Outflow = 0.62 cfs @ 13.70 hrs, Volume= 0.184 af, Atten= 6%, Lag= 31.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.11 fps, Min. Travel Time= 15.2 min

Avg. Velocity = 0.08 fps, Avg. Travel Time= 19.7 min

Peak Storage= 563 cf @ 13.45 hrs

Average Depth at Peak Storage= 0.17' , Surface Width= 49.76'

Bank-Full Depth= 0.30' Flow Area= 13.5 sf, Capacity= 2.02 cfs

15.00' x 0.30' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 100.0 '/' Top Width= 75.00'

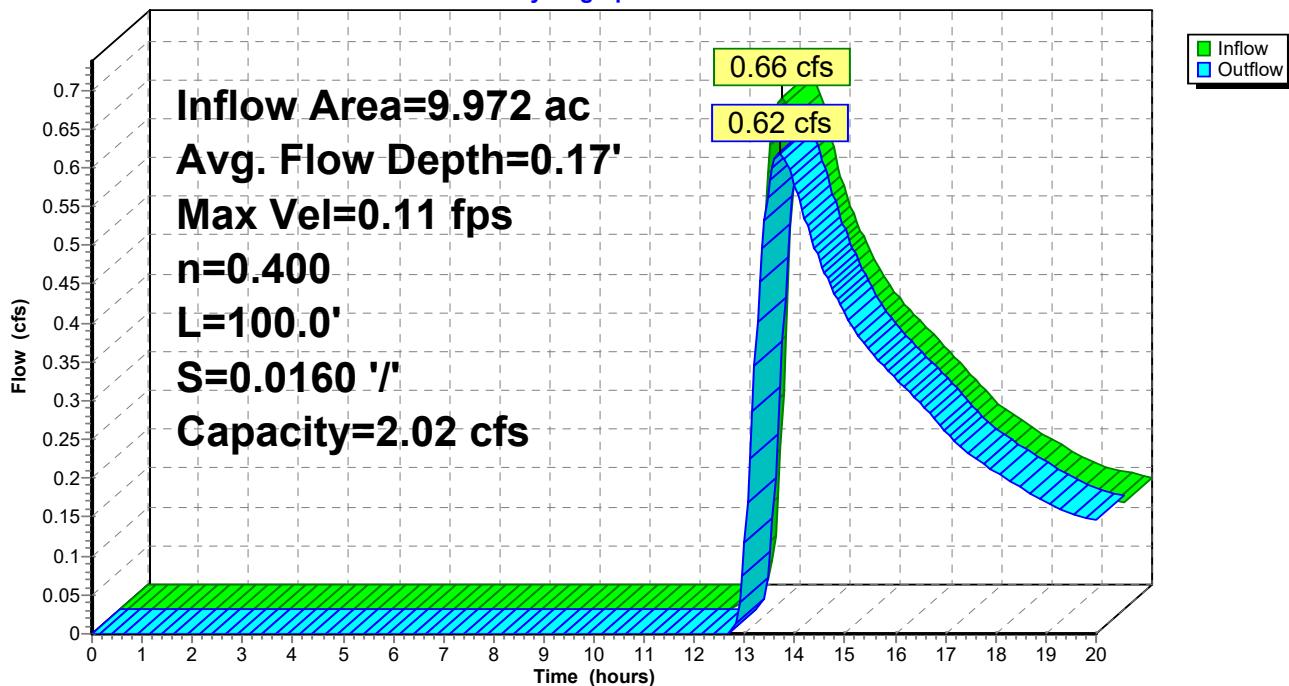
Length= 100.0' Slope= 0.0160 '/'

Inlet Invert= 235.50', Outlet Invert= 233.90'



Reach 3R: Downslope of 18" dia. SD plunge pool

Hydrograph



Summary for Reach 4R: Existing Channel

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.22" for 10-year storm event

Inflow = 0.62 cfs @ 13.70 hrs, Volume= 0.184 af

Outflow = 0.61 cfs @ 13.94 hrs, Volume= 0.180 af, Atten= 1%, Lag= 14.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.70 fps, Min. Travel Time= 7.8 min

Avg. Velocity = 0.53 fps, Avg. Travel Time= 10.2 min

Peak Storage= 286 cf @ 13.81 hrs

Average Depth at Peak Storage= 0.05' , Surface Width= 25.17'

Bank-Full Depth= 0.25' Flow Area= 9.2 sf, Capacity= 18.08 cfs

55.00' x 0.25' deep Parabolic Channel, n= 0.025 Earth, clean & winding

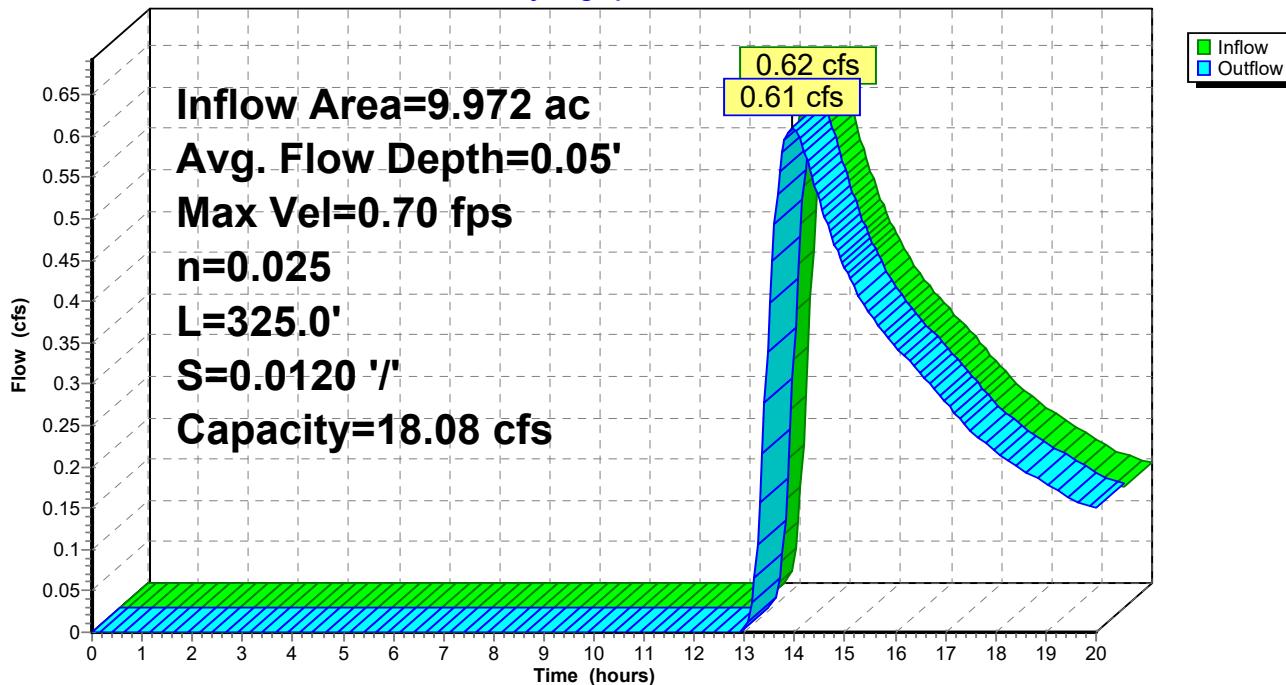
Length= 325.0' Slope= 0.0120 '/'

Inlet Invert= 233.90', Outlet Invert= 230.00'



Reach 4R: Existing Channel

Hydrograph



Summary for Reach 5R: Existing Channel

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.22" for 10-year storm event

Inflow = 0.61 cfs @ 13.94 hrs, Volume= 0.180 af

Outflow = 0.61 cfs @ 14.11 hrs, Volume= 0.177 af, Atten= 1%, Lag= 10.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.26 fps, Min. Travel Time= 5.6 min

Avg. Velocity = 0.98 fps, Avg. Travel Time= 7.1 min

Peak Storage= 203 cf @ 14.02 hrs

Average Depth at Peak Storage= 0.09' , Surface Width= 8.45'

Bank-Full Depth= 0.75' Flow Area= 12.5 sf, Capacity= 66.75 cfs

25.00' x 0.75' deep Parabolic Channel, n= 0.025 Earth, clean & winding

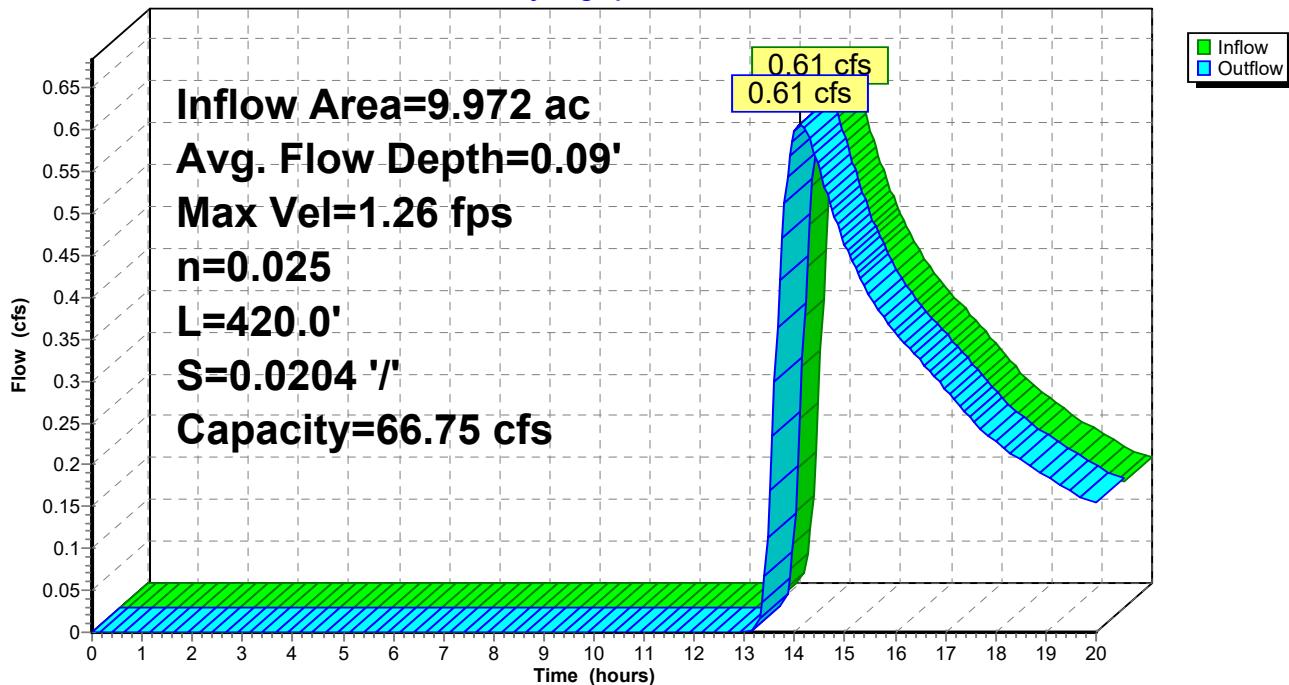
Length= 420.0' Slope= 0.0204 '/'

Inlet Invert= 230.00', Outlet Invert= 221.43'



Reach 5R: Existing Channel

Hydrograph



Summary for Reach 6R: Existing Stream Channel

Inflow Area = 38.903 ac, 19.74% Impervious, Inflow Depth > 1.03" for 10-year storm event

Inflow = 20.39 cfs @ 12.72 hrs, Volume= 3.327 af

Outflow = 20.29 cfs @ 12.79 hrs, Volume= 3.312 af, Atten= 0%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.62 fps, Min. Travel Time= 2.5 min

Avg. Velocity = 0.84 fps, Avg. Travel Time= 4.8 min

Peak Storage= 3,002 cf @ 12.75 hrs

Average Depth at Peak Storage= 1.55' , Surface Width= 11.18'

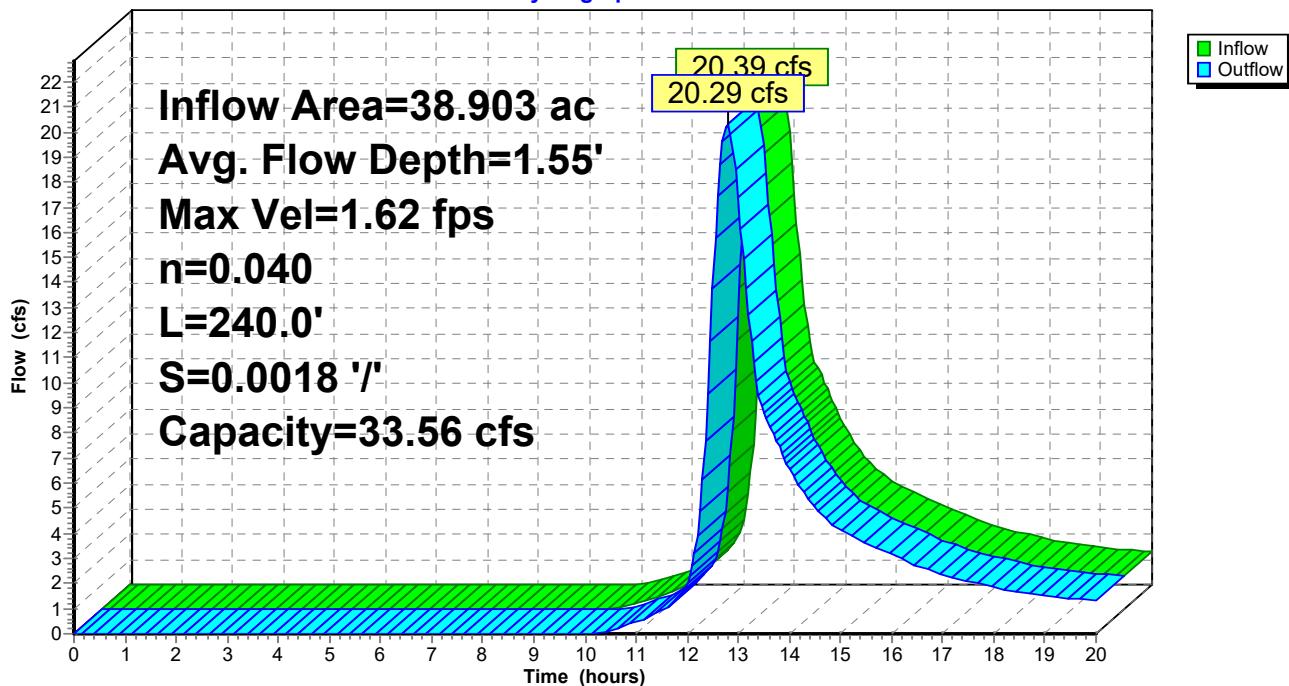
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 33.56 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

Length= 240.0' Slope= 0.0018 '

Inlet Invert= 221.43', Outlet Invert= 221.00'

**Reach 6R: Existing Stream Channel****Hydrograph**

Summary for Reach 8R: Below Wooded Buffer

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 0.10" for 10-year storm event

Inflow = 0.03 cfs @ 19.22 hrs, Volume= 0.005 af

Outflow = 0.03 cfs @ 19.81 hrs, Volume= 0.004 af, Atten= 1%, Lag= 35.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.24 fps, Min. Travel Time= 16.9 min

Avg. Velocity = 0.20 fps, Avg. Travel Time= 19.6 min

Peak Storage= 35 cf @ 19.52 hrs

Average Depth at Peak Storage= 0.00' , Surface Width= 30.48'

Bank-Full Depth= 0.25' Flow Area= 10.6 sf, Capacity= 29.38 cfs

30.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding

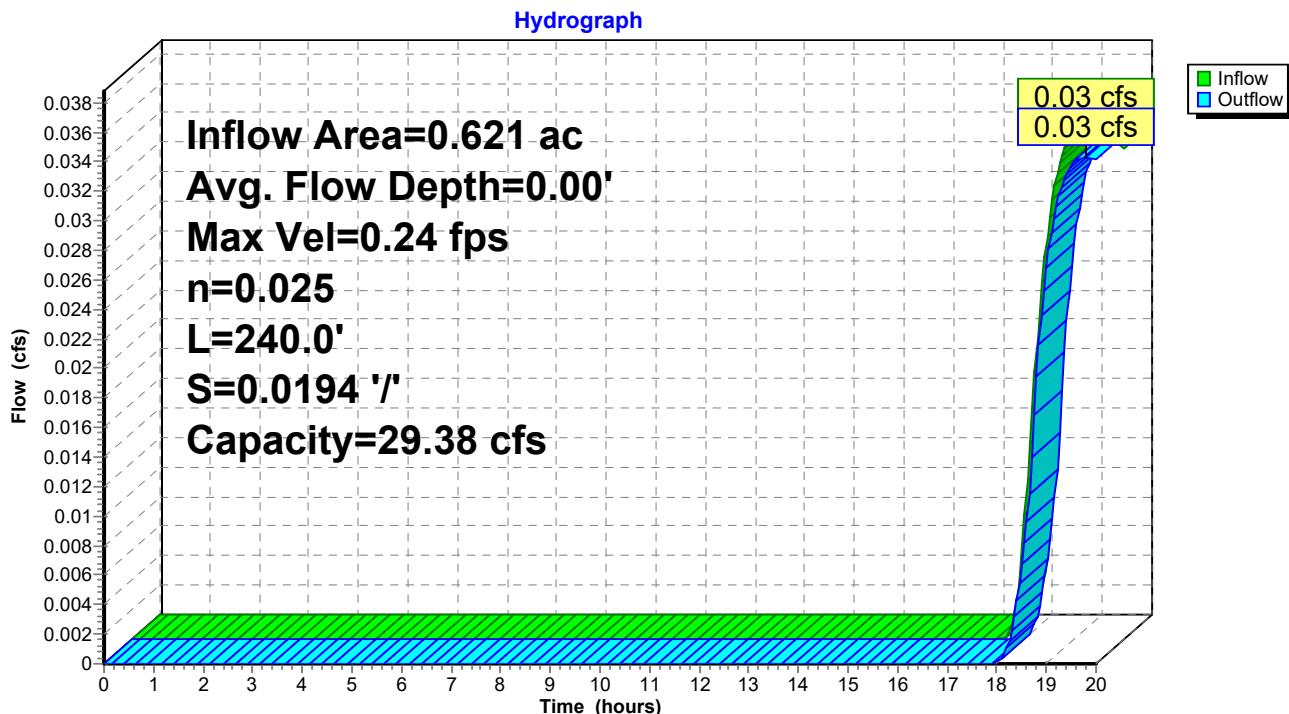
Side Slope Z-value= 50.0 '/' Top Width= 55.00'

Length= 240.0' Slope= 0.0194 '/'

Inlet Invert= 236.65', Outlet Invert= 232.00'



Reach 8R: Below Wooded Buffer



Summary for Reach 9R: Existing Stream Channel

Inflow Area = 18.763 ac, 1.29% Impervious, Inflow Depth > 1.74" for 10-year storm event

Inflow = 19.89 cfs @ 12.60 hrs, Volume= 2.723 af

Outflow = 19.78 cfs @ 12.67 hrs, Volume= 2.712 af, Atten= 1%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.74 fps, Min. Travel Time= 2.4 min

Avg. Velocity = 1.68 fps, Avg. Travel Time= 5.3 min

Peak Storage= 2,858 cf @ 12.63 hrs

Average Depth at Peak Storage= 0.80', Surface Width= 8.21'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 110.28 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

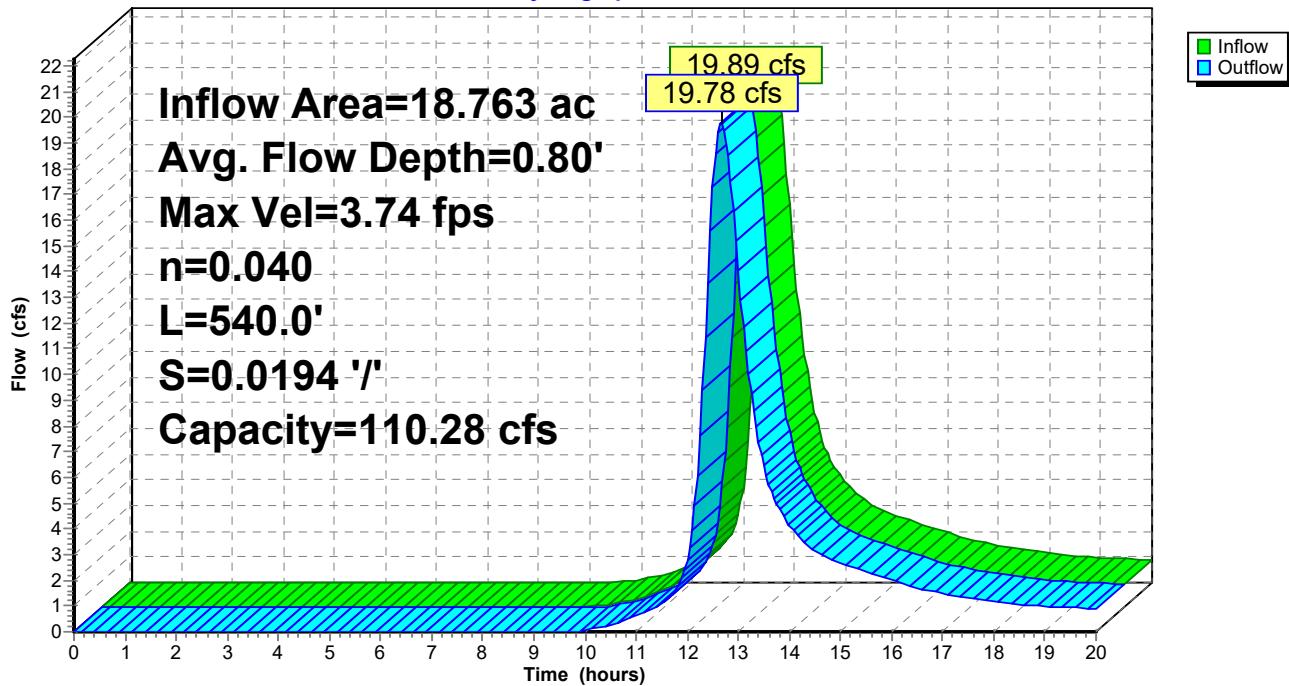
Length= 540.0' Slope= 0.0194 '

Inlet Invert= 232.00', Outlet Invert= 221.55'



Reach 9R: Existing Stream Channel

Hydrograph



Summary for Reach 10R: Existing Stream Channel

Inflow Area = 28.932 ac, 15.22% Impervious, Inflow Depth > 1.31" for 10-year storm event

Inflow = 20.43 cfs @ 12.70 hrs, Volume= 3.153 af

Outflow = 20.39 cfs @ 12.72 hrs, Volume= 3.149 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.64 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 0.82 fps, Avg. Travel Time= 1.3 min

Peak Storage= 807 cf @ 12.71 hrs

Average Depth at Peak Storage= 1.54', Surface Width= 11.15'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 34.06 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

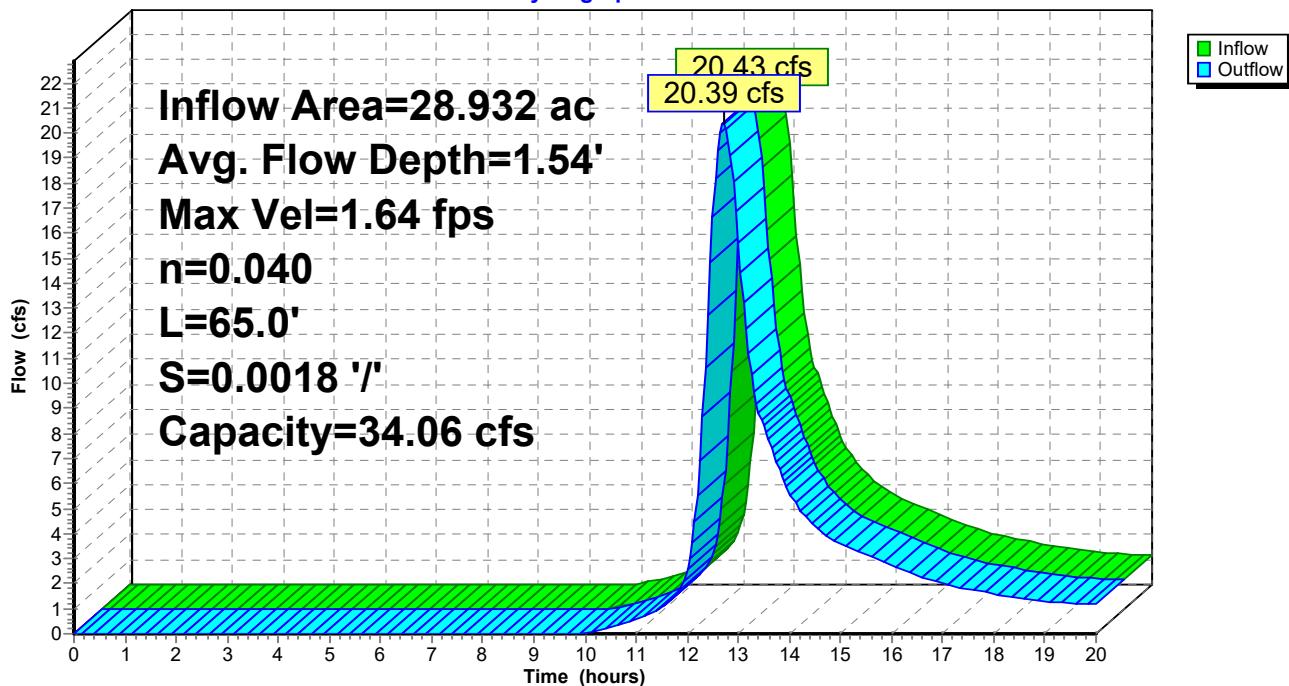
Length= 65.0' Slope= 0.0018 '

Inlet Invert= 221.55', Outlet Invert= 221.43'



Reach 10R: Existing Stream Channel

Hydrograph



Summary for Reach 11R: Stevens Mill Road Ditch

Same as Pre 3R

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.33 fps, Min. Travel Time= 1.5 min

Avg. Velocity = 1.00 fps, Avg. Travel Time= 2.0 min

Peak Storage= 58 cf @ 13.16 hrs

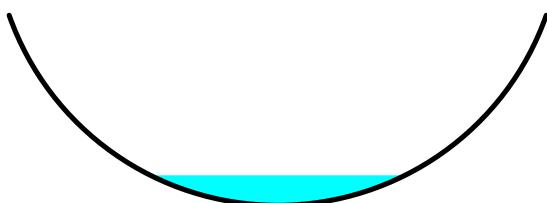
Average Depth at Peak Storage= 0.31', Surface Width= 2.37'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 32.56 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

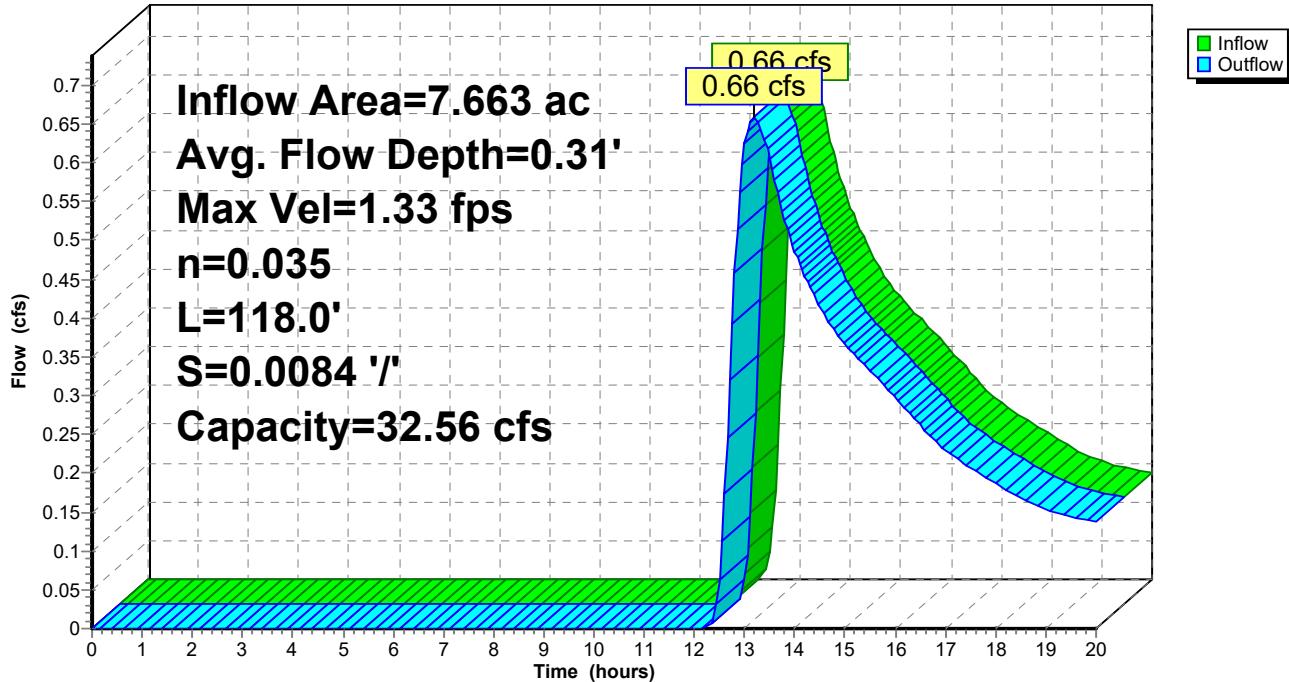
Length= 118.0' Slope= 0.0084 '/'

Inlet Invert= 241.09', Outlet Invert= 240.10'



Reach 11R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 12R: Stevens Mill Road Ditch

Same as Pre 2R

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.10 hrs, Volume= 0.193 af
 Outflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af, Atten= 0%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.51 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 1.14 fps, Avg. Travel Time= 1.5 min

Peak Storage= 46 cf @ 13.12 hrs

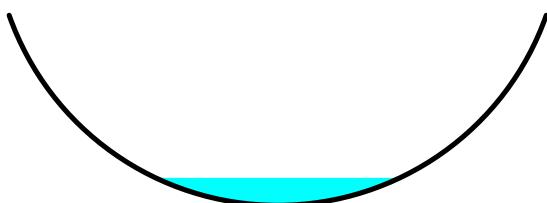
Average Depth at Peak Storage= 0.29' , Surface Width= 2.28'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 38.94 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

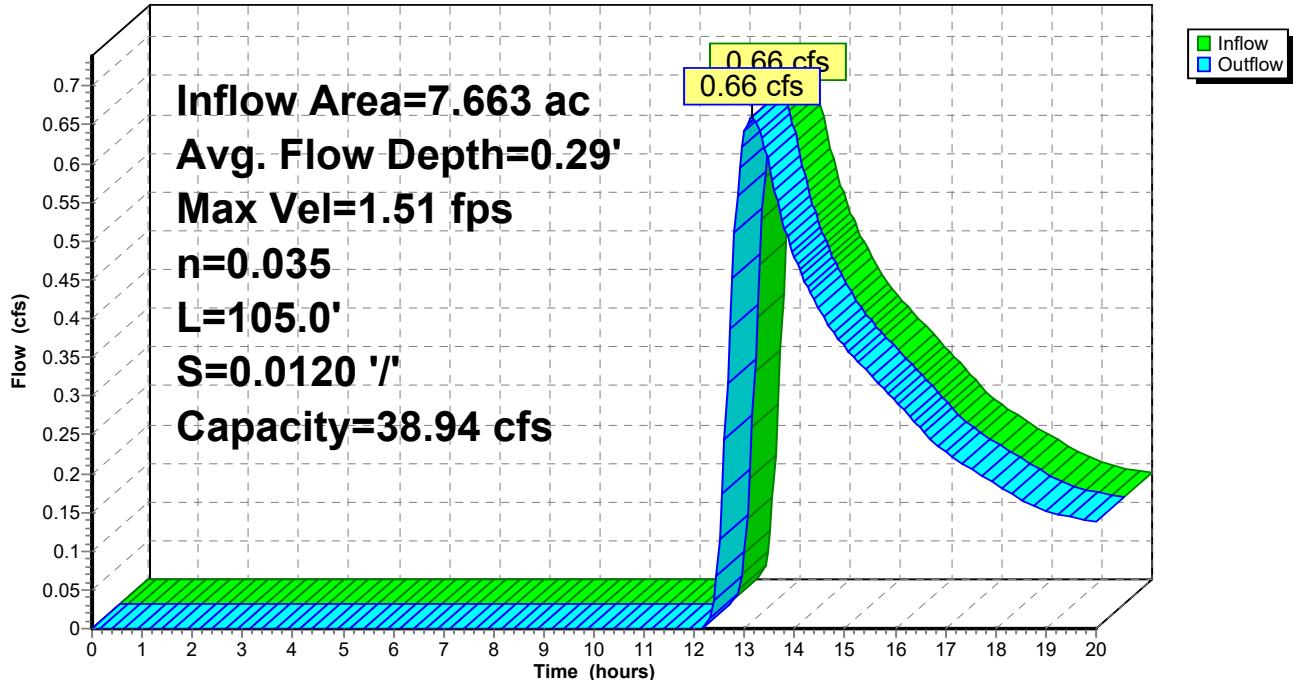
Length= 105.0' Slope= 0.0120 '/

Inlet Invert= 242.61', Outlet Invert= 241.35'



Reach 12R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 13R: Stevens Mill Road Ditch

Same as Pre 1R

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.29" for 10-year storm event
 Inflow = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af
 Outflow = 0.31 cfs @ 12.89 hrs, Volume= 0.074 af, Atten= 1%, Lag= 6.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.74 fps, Min. Travel Time= 3.7 min

Avg. Velocity = 0.53 fps, Avg. Travel Time= 5.2 min

Peak Storage= 69 cf @ 12.83 hrs

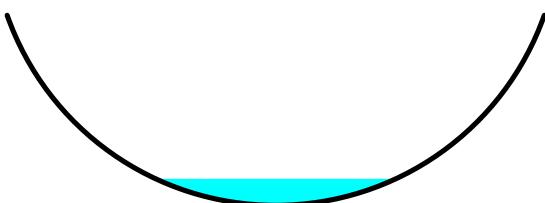
Average Depth at Peak Storage= 0.28' , Surface Width= 2.24'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.57 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

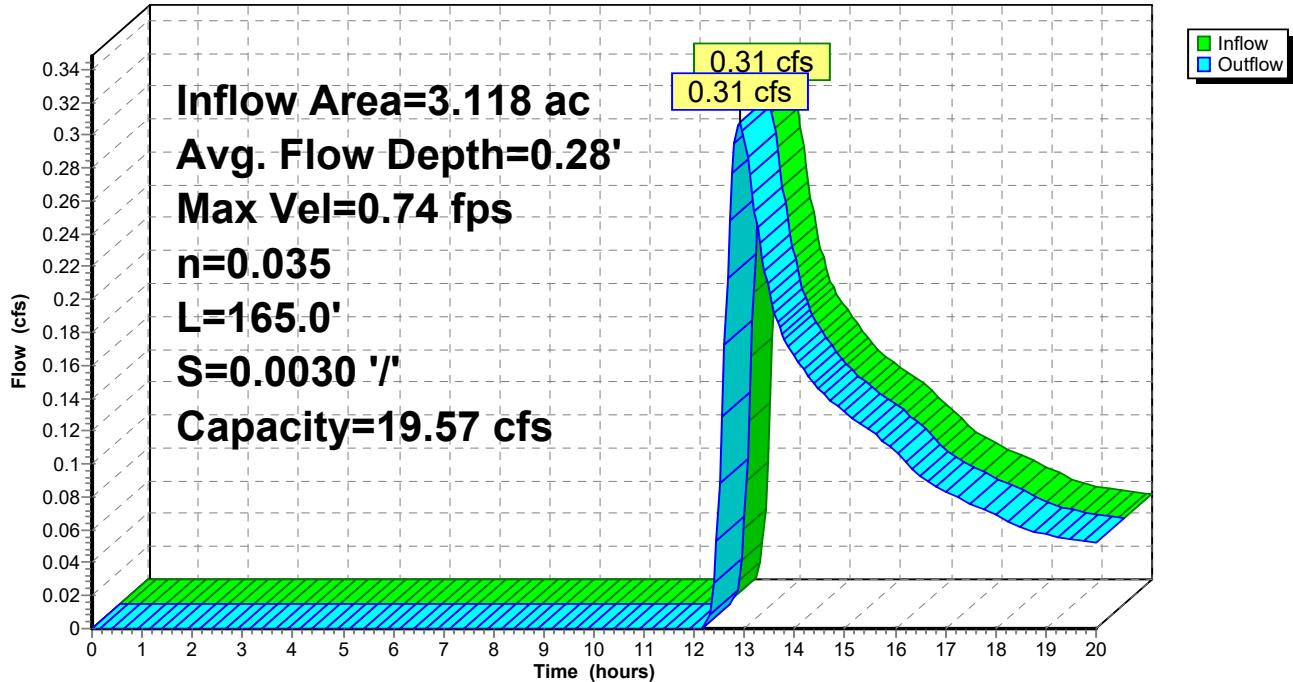
Length= 165.0' Slope= 0.0030 '/

Inlet Invert= 243.11', Outlet Invert= 242.61'



Reach 13R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 14R: Proposed diversion swale

Inflow Area = 3.223 ac, 26.63% Impervious, Inflow Depth > 1.26" for 10-year storm event

Inflow = 2.47 cfs @ 12.59 hrs, Volume= 0.338 af

Outflow = 2.46 cfs @ 12.64 hrs, Volume= 0.337 af, Atten= 0%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.92 fps, Min. Travel Time= 1.5 min

Avg. Velocity = 1.52 fps, Avg. Travel Time= 3.0 min

Peak Storage= 229 cf @ 12.61 hrs

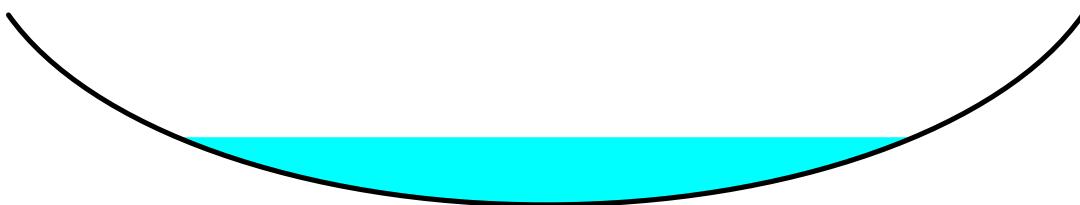
Average Depth at Peak Storage= 0.36' , Surface Width= 3.58'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 22.62 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

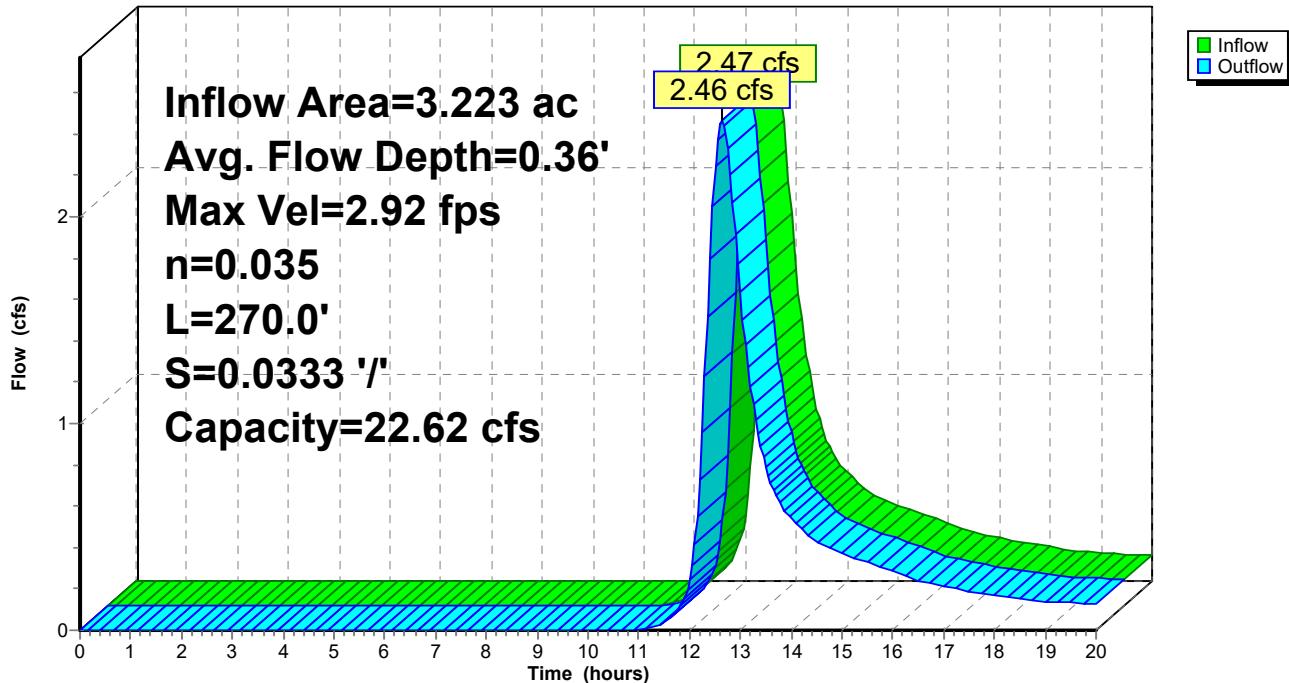
Length= 270.0' Slope= 0.0333 '/'

Inlet Invert= 247.00', Outlet Invert= 238.00'



Reach 14R: Proposed diversion swale

Hydrograph



Summary for Reach 15R: Existing drainage

Inflow Area = 5.857 ac, 25.74% Impervious, Inflow Depth > 0.89" for 10-year storm event

Inflow = 1.97 cfs @ 13.14 hrs, Volume= 0.436 af

Outflow = 1.96 cfs @ 13.21 hrs, Volume= 0.434 af, Atten= 1%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.40 fps, Min. Travel Time= 2.2 min

Avg. Velocity = 0.91 fps, Avg. Travel Time= 3.4 min

Peak Storage= 259 cf @ 13.17 hrs

Average Depth at Peak Storage= 0.13' , Surface Width= 16.20'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 164.26 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

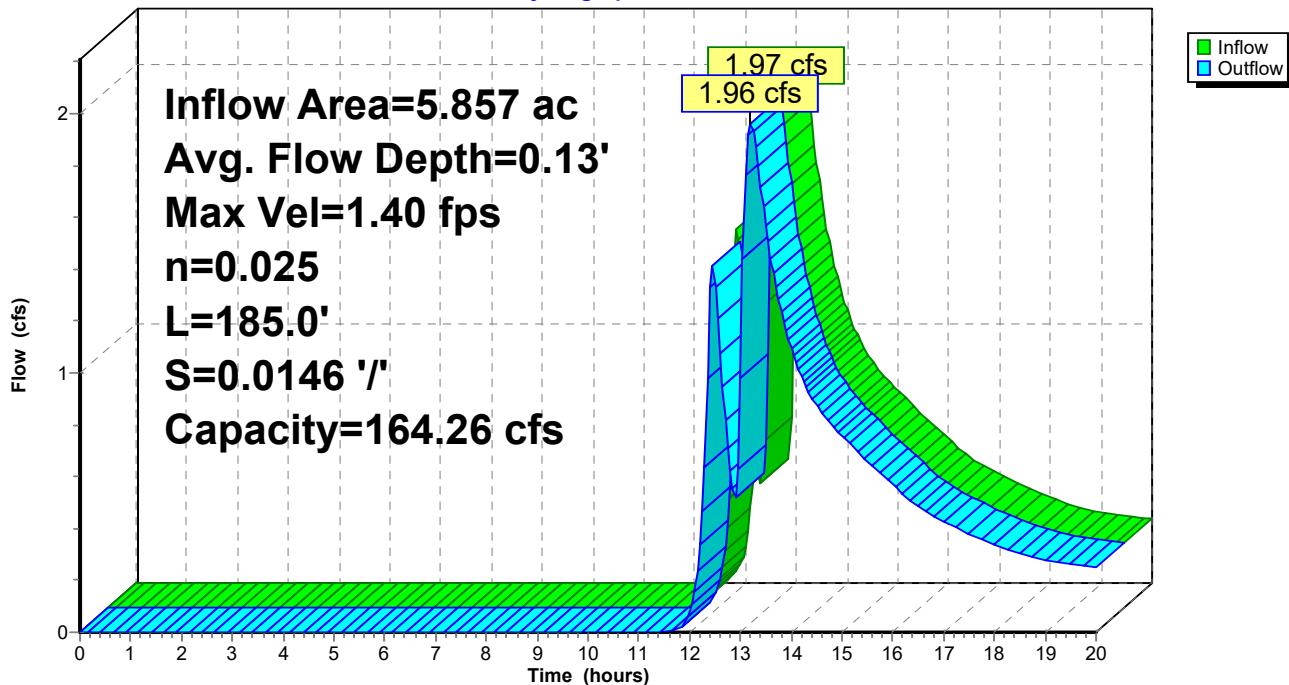
Length= 185.0' Slope= 0.0146 '/'

Inlet Invert= 234.50', Outlet Invert= 231.80'



Reach 15R: Existing drainage

Hydrograph



Summary for Reach 16R: Existing drainage along slope

Inflow Area = 0.534 ac, 0.47% Impervious, Inflow Depth > 0.48" for 10-year storm event

Inflow = 0.15 cfs @ 12.41 hrs, Volume= 0.021 af

Outflow = 0.15 cfs @ 12.46 hrs, Volume= 0.021 af, Atten= 1%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.80 fps, Min. Travel Time= 1.6 min

Avg. Velocity = 0.46 fps, Avg. Travel Time= 2.7 min

Peak Storage= 14 cf @ 12.43 hrs

Average Depth at Peak Storage= 0.04', Surface Width= 5.35'

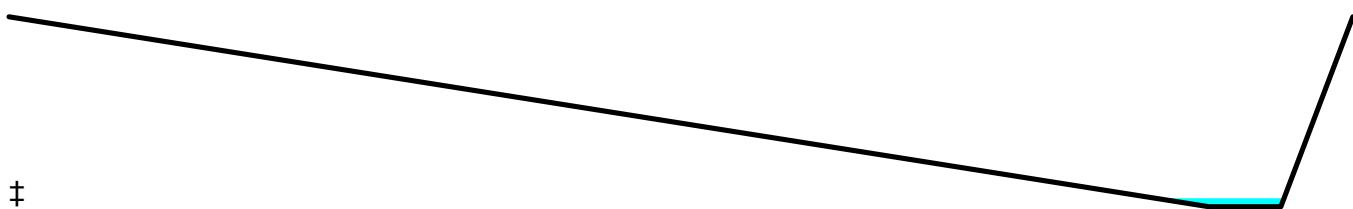
Bank-Full Depth= 1.00' Flow Area= 29.5 sf, Capacity= 144.38 cfs

3.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 50.0 3.0 '/' Top Width= 56.00'

Length= 75.0' Slope= 0.0160 '/'

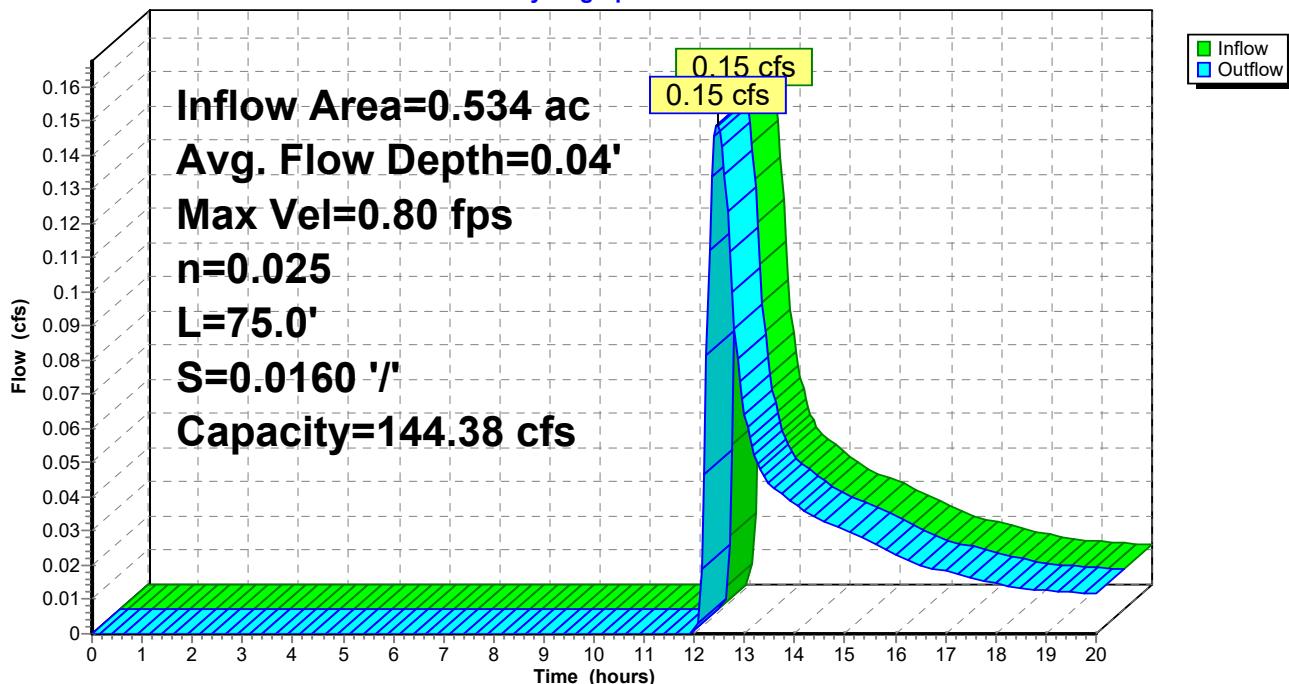
Inlet Invert= 233.00', Outlet Invert= 231.80'



‡

Reach 16R: Existing drainage along slope

Hydrograph



Summary for Reach 17R: Existing drainage

Inflow Area = 6.391 ac, 23.63% Impervious, Inflow Depth > 0.85" for 10-year storm event

Inflow = 2.01 cfs @ 13.20 hrs, Volume= 0.455 af

Outflow = 1.99 cfs @ 13.29 hrs, Volume= 0.452 af, Atten= 1%, Lag= 4.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.46 fps, Min. Travel Time= 2.7 min

Avg. Velocity = 0.96 fps, Avg. Travel Time= 4.1 min

Peak Storage= 321 cf @ 13.24 hrs

Average Depth at Peak Storage= 0.13' , Surface Width= 16.06'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 172.90 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

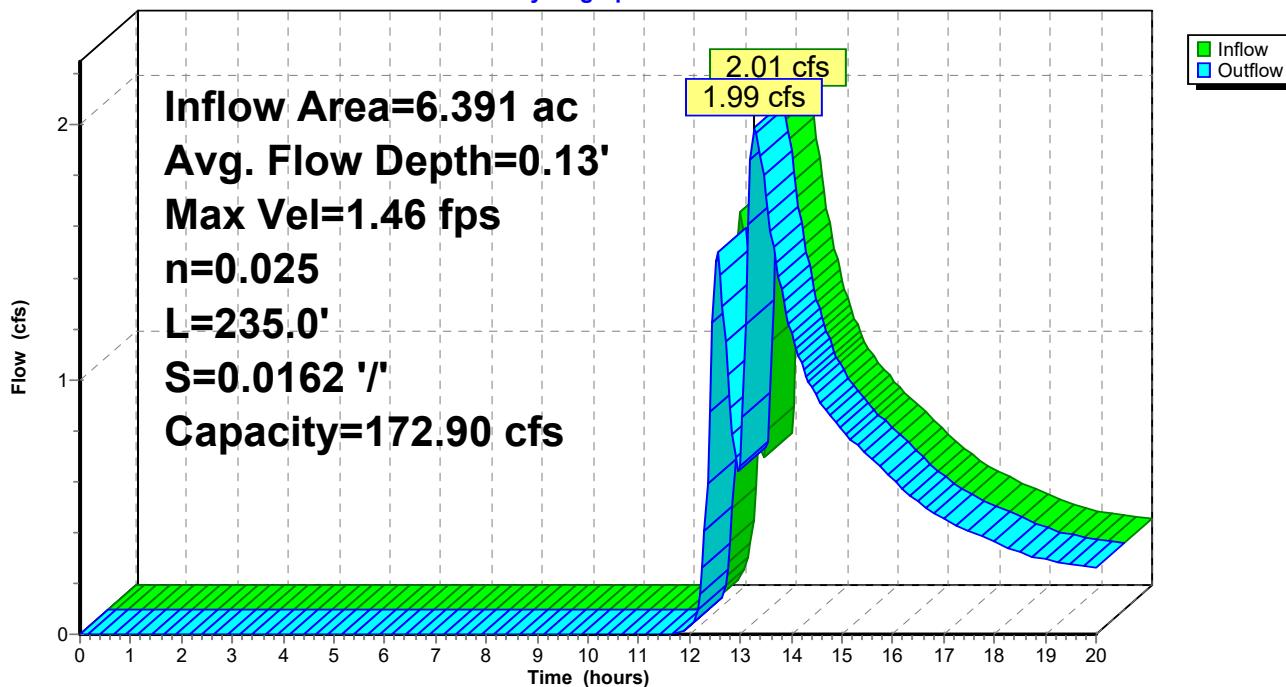
Length= 235.0' Slope= 0.0162 '/'

Inlet Invert= 231.80', Outlet Invert= 228.00'



Reach 17R: Existing drainage

Hydrograph



Summary for Reach 18R: Existing drainage

Inflow Area = 6.391 ac, 23.63% Impervious, Inflow Depth > 0.85" for 10-year storm event

Inflow = 1.99 cfs @ 13.29 hrs, Volume= 0.452 af

Outflow = 1.99 cfs @ 13.32 hrs, Volume= 0.451 af, Atten= 0%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.55 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 1.02 fps, Avg. Travel Time= 1.9 min

Peak Storage= 148 cf @ 13.30 hrs

Average Depth at Peak Storage= 0.12' , Surface Width= 15.75'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 188.06 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

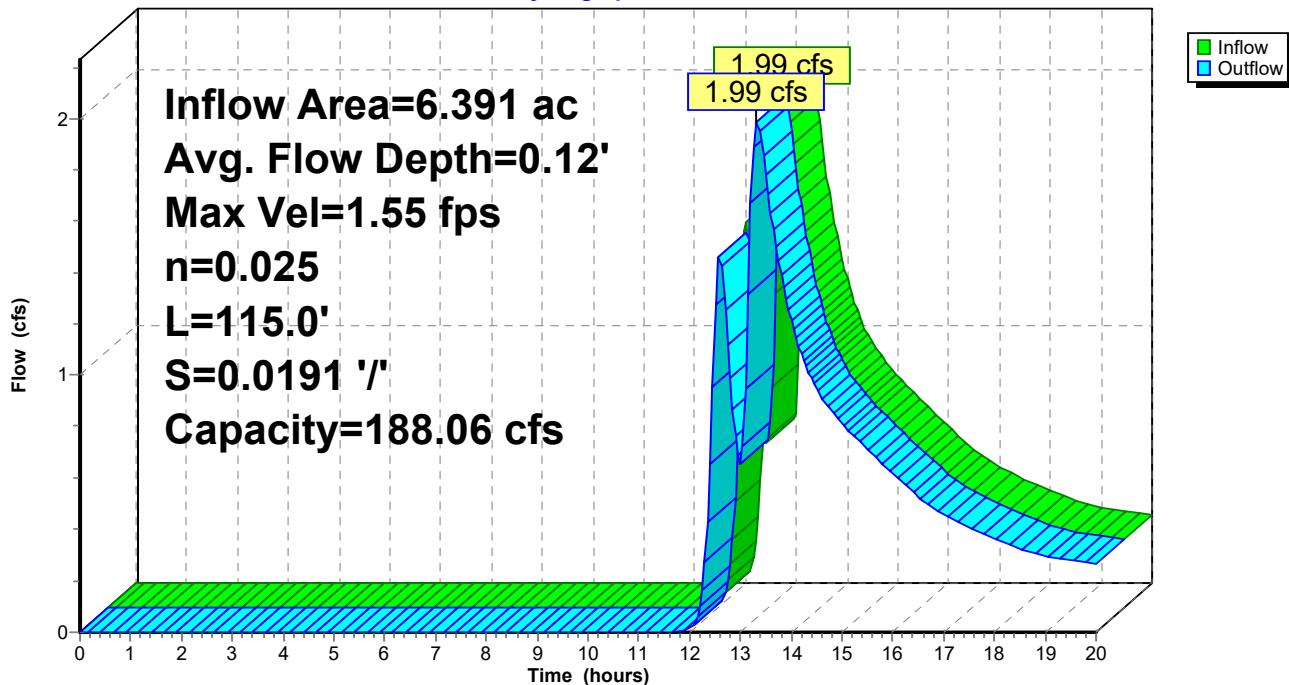
Length= 115.0' Slope= 0.0191 '/'

Inlet Invert= 228.00', Outlet Invert= 225.80'



Reach 18R: Existing drainage

Hydrograph



Summary for Reach 19R: Existing Stream Channel

Inflow Area = 9.330 ac, 44.61% Impervious, Inflow Depth > 0.58" for 10-year storm event

Inflow = 1.99 cfs @ 13.32 hrs, Volume= 0.451 af

Outflow = 1.97 cfs @ 13.39 hrs, Volume= 0.449 af, Atten= 1%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.57 fps, Min. Travel Time= 2.1 min

Avg. Velocity = 0.97 fps, Avg. Travel Time= 3.4 min

Peak Storage= 252 cf @ 13.35 hrs

Average Depth at Peak Storage= 0.23' , Surface Width= 5.92'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 94.97 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 13.00'

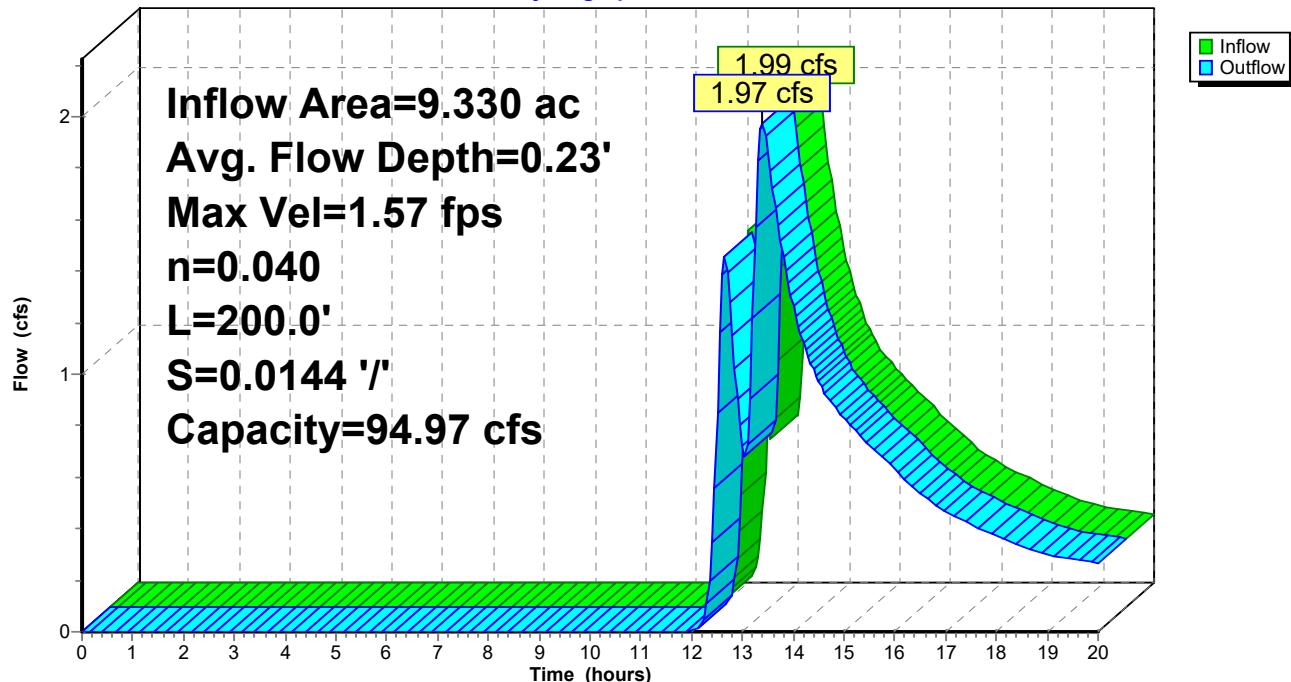
Length= 200.0' Slope= 0.0144 '/

Inlet Invert= 225.80', Outlet Invert= 222.93'



Reach 19R: Existing Stream Channel

Hydrograph



Summary for Reach 20R: Existing Stream Channel

Inflow Area = 10.168 ac, 40.93% Impervious, Inflow Depth > 0.53" for 10-year storm event

Inflow = 1.97 cfs @ 13.39 hrs, Volume= 0.449 af

Outflow = 1.88 cfs @ 13.61 hrs, Volume= 0.441 af, Atten= 5%, Lag= 13.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.97 fps, Min. Travel Time= 7.0 min

Avg. Velocity = 0.62 fps, Avg. Travel Time= 10.9 min

Peak Storage= 788 cf @ 13.50 hrs

Average Depth at Peak Storage= 0.34', Surface Width= 6.37'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 46.28 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 '/' Top Width= 13.00'

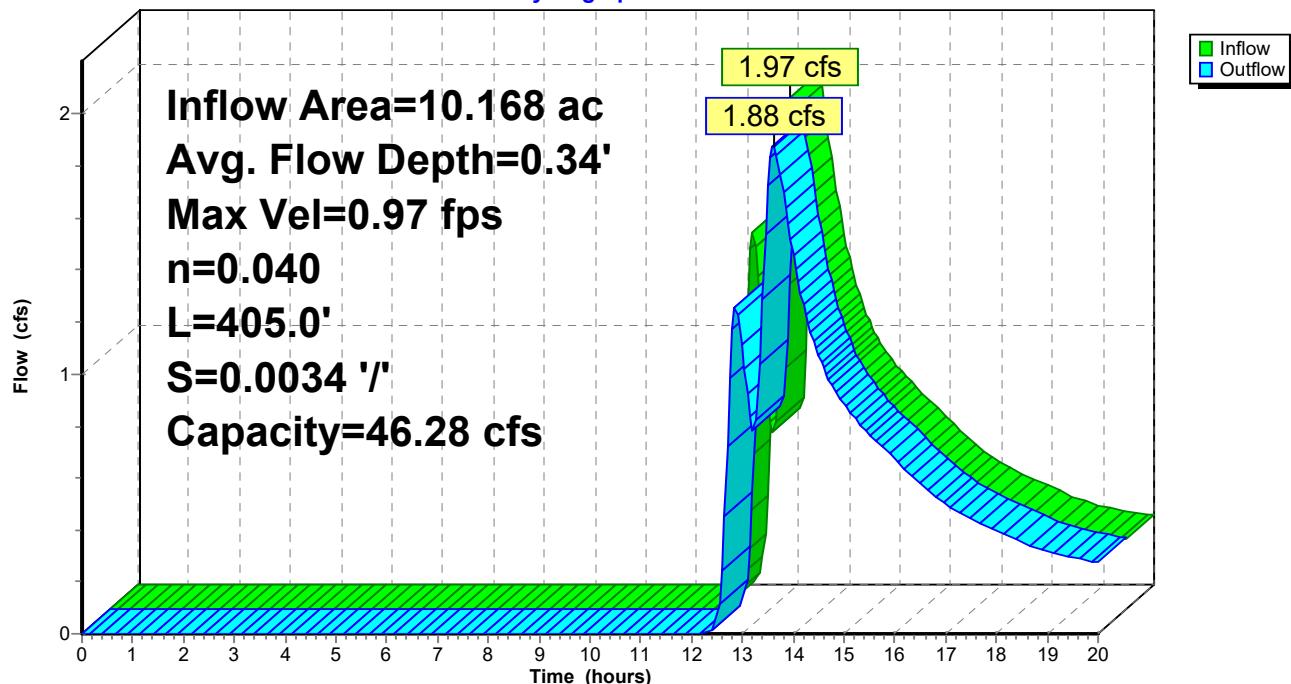
Length= 405.0' Slope= 0.0034 '/'

Inlet Invert= 222.93', Outlet Invert= 221.55'



Reach 20R: Existing Stream Channel

Hydrograph



Summary for Reach 21R: Existing Stream Channel

Inflow Area = 0.838 ac, 0.00% Impervious, Inflow Depth > 0.02" for 10-year storm event

Inflow = 0.00 cfs @ 17.55 hrs, Volume= 0.001 af

Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af, Atten= 5%, Lag= 147.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.26 fps, Min. Travel Time= 48.8 min

Avg. Velocity = 0.26 fps, Avg. Travel Time= 48.8 min

Peak Storage= 8 cf @ 20.00 hrs

Average Depth at Peak Storage= 0.00' , Surface Width= 5.01'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 76.21 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 13.00'

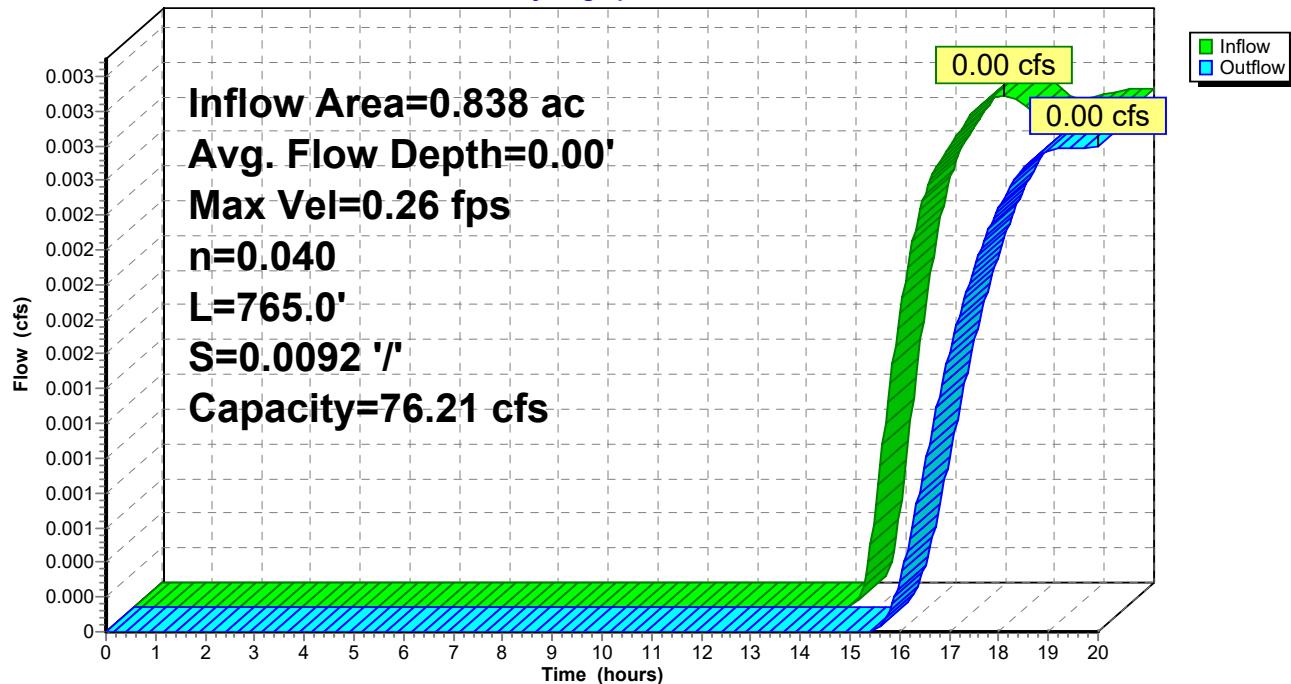
Length= 765.0' Slope= 0.0092 '

Inlet Invert= 230.00', Outlet Invert= 222.93'



Reach 21R: Existing Stream Channel

Hydrograph



Summary for Reach WAP 1: Water Analysis Point 1

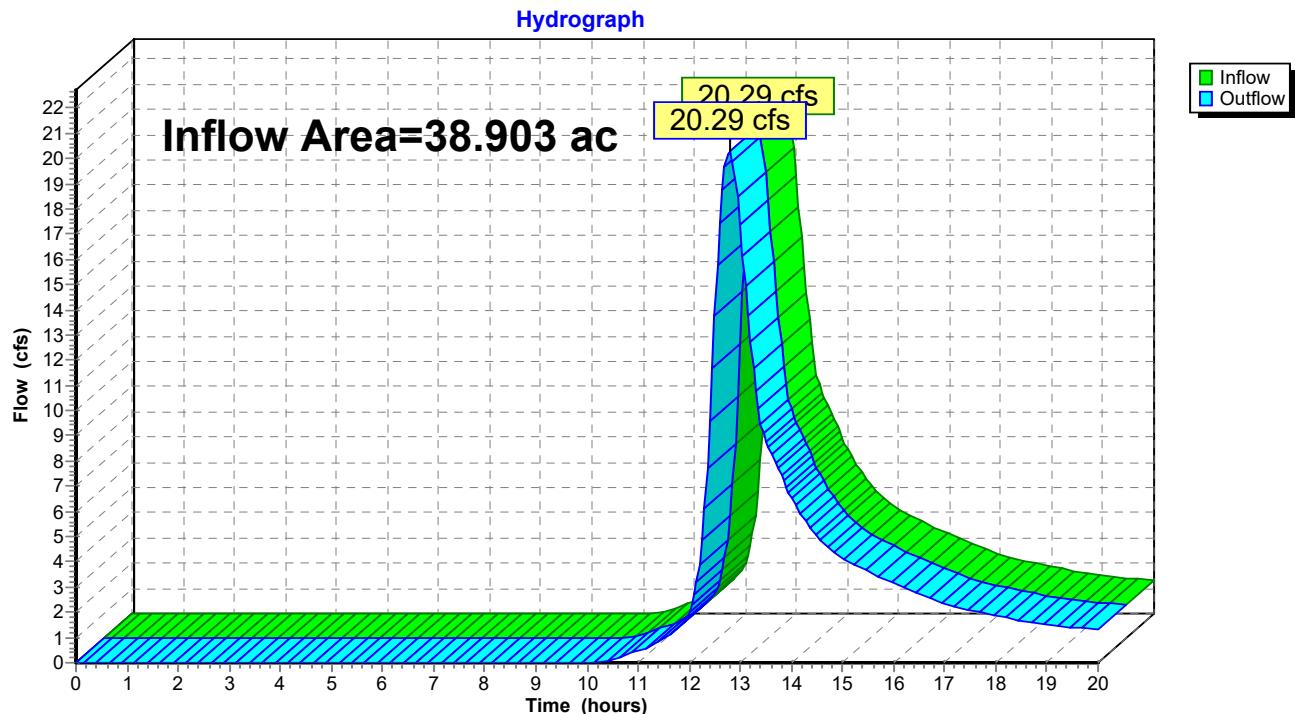
Inflow Area = 38.903 ac, 19.74% Impervious, Inflow Depth > 1.02" for 10-year storm event

Inflow = 20.29 cfs @ 12.79 hrs, Volume= 3.312 af

Outflow = 20.29 cfs @ 12.79 hrs, Volume= 3.312 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach WAP 1: Water Analysis Point 1



Summary for Pond 1P: Proposed 15" Culvert

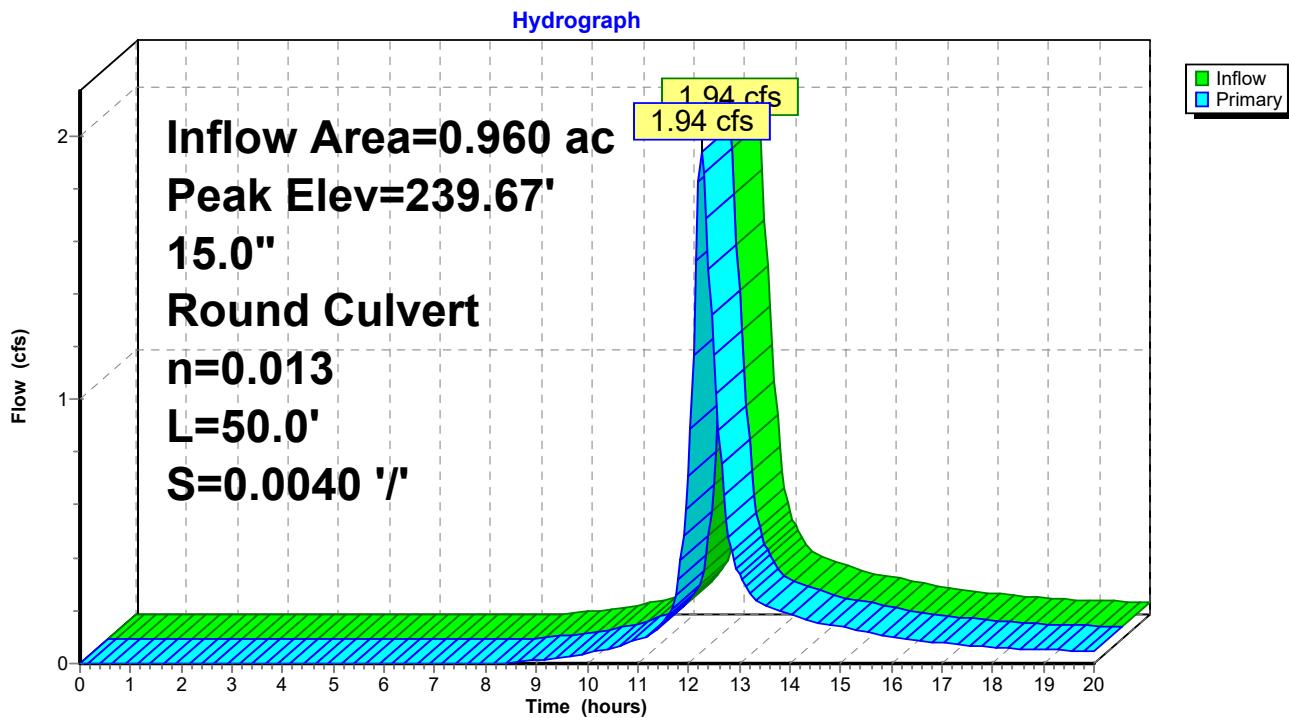
Inflow Area = 0.960 ac, 30.05% Impervious, Inflow Depth > 2.20" for 10-year storm event
 Inflow = 1.94 cfs @ 12.25 hrs, Volume= 0.176 af
 Outflow = 1.94 cfs @ 12.25 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.94 cfs @ 12.25 hrs, Volume= 0.176 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.67' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 238.00' / 237.80' S= 0.0040 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.93 cfs @ 12.25 hrs HW=239.67' TW=239.50' (Fixed TW Elev= 239.50')
 ↗1=Culvert (Inlet Controls 1.93 cfs @ 1.57 fps)

Pond 1P: Proposed 15" Culvert



Summary for Pond 2P: Stone Berm Spreader

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 2.05" for 10-year storm event

Inflow = 1.34 cfs @ 12.16 hrs, Volume= 0.106 af

Outflow = 0.04 cfs @ 17.46 hrs, Volume= 0.009 af, Atten= 97%, Lag= 318.2 min

Primary = 0.04 cfs @ 17.46 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.46' @ 17.46 hrs Surf.Area= 4,836 sf Storage= 4,250 cf

Flood Elev= 241.80' Surf.Area= 4,960 sf Storage= 4,464 cf

Plug-Flow detention time= 452.7 min calculated for 0.009 af (8% of inflow)

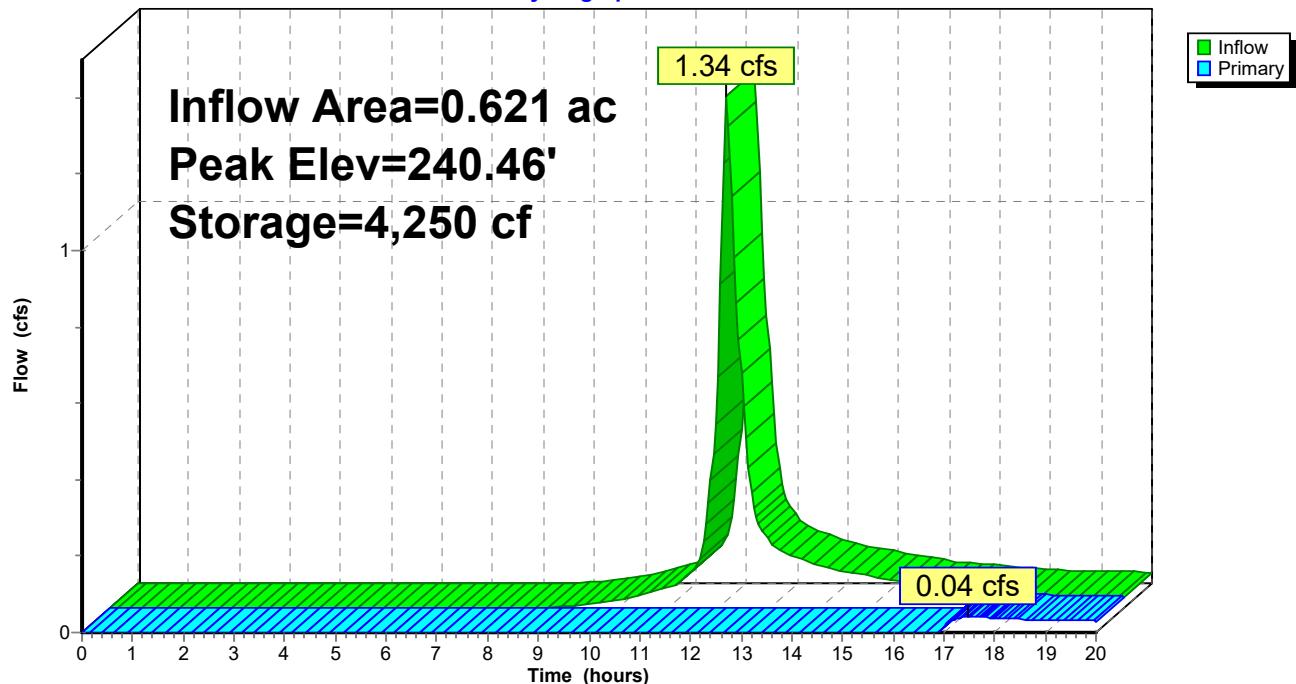
Center-of-Mass det. time= 308.2 min (1,107.0 - 798.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	239.00'	4,464 cf	Custom Stage Data (Irregular)	Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
239.00	1,225	175.0	0	0	1,225
240.00	3,635	425.0	2,323	2,323	13,165
240.50	4,960	440.0	2,140	4,464	14,220

Device	Routing	Invert	Outlet Devices										
#1	Primary	240.45'	30.0' long x 1.0' 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										
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31										
			3.30 3.31 3.32										

Primary OutFlow Max=0.04 cfs @ 17.46 hrs HW=240.46' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Weir Controls 0.04 cfs @ 0.21 fps)

Pond 2P: Stone Berm Spreader**Hydrograph**

Summary for Pond 3P: UGF #1

Inflow Area = 2.309 ac, 82.95% Impervious, Inflow Depth > 0.44" for 10-year storm event
 Inflow = 1.24 cfs @ 12.10 hrs, Volume= 0.085 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

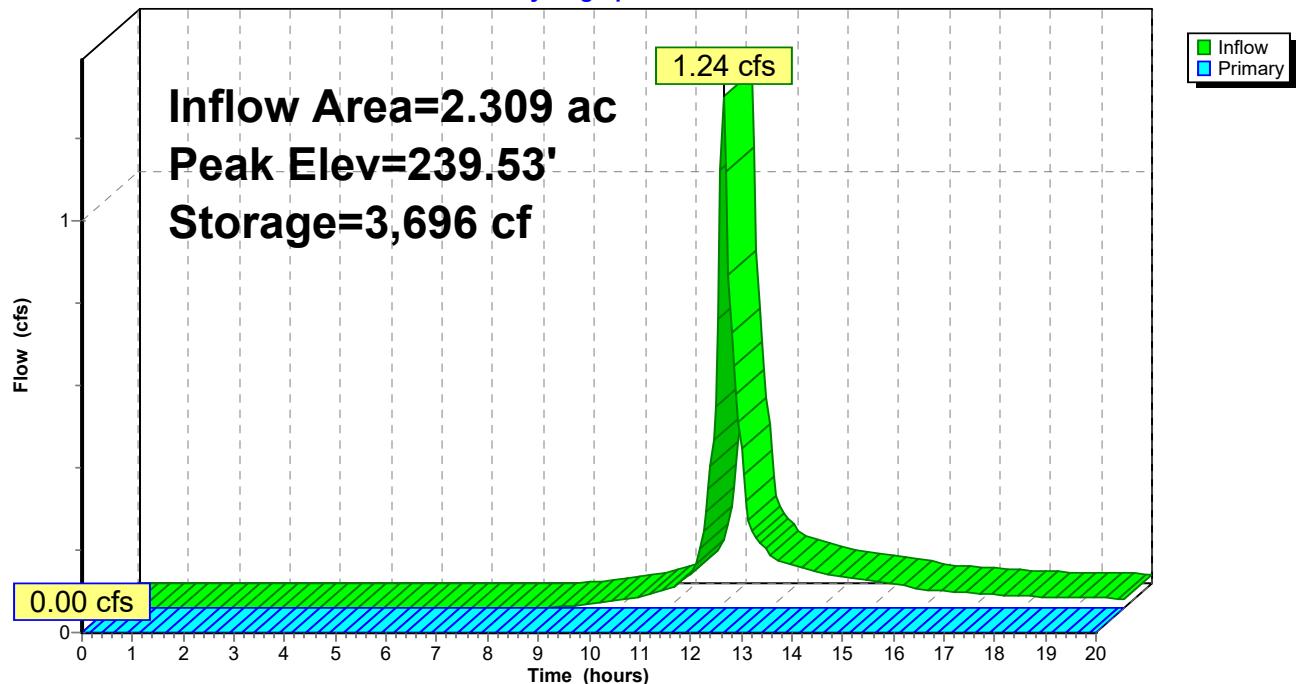
Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.53' @ 20.00 hrs Surf.Area= 5,083 sf Storage= 3,696 cf
 Flood Elev= 241.50' Surf.Area= 9,356 sf Storage= 18,103 cf

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

Volume	Invert	Avail.Storage	Storage Description			
#1	236.83'	18,103 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
236.83	5,005	405.8	0.0	0	0	5,005
236.84	5,005	405.8	40.0	20	20	5,009
238.00	5,005	405.8	40.0	2,322	2,342	5,480
238.01	5,005	405.8	10.0	5	2,347	5,484
239.40	5,005	405.8	10.0	696	3,043	6,048
239.50	5,005	405.8	100.0	500	3,544	6,088
240.00	6,375	496.0	100.0	2,838	6,382	12,565
241.00	8,291	543.5	100.0	7,312	13,694	16,529
241.50	9,356	587.2	100.0	4,409	18,103	20,471

Device	Routing	Invert	Outlet Devices
#1	Device 2	241.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	236.83'	6.0" Round Culvert L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 236.83' / 236.70' S= 0.0130 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=236.83' TW=237.19' (Fixed TW Elev= 237.19')
 ↗2=Culvert (Controls 0.00 cfs)
 ↗1=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: UGF #1**Hydrograph**

Summary for Pond 4P: Outlet structure for UGF #1

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.23" for 10-year storm event
 Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

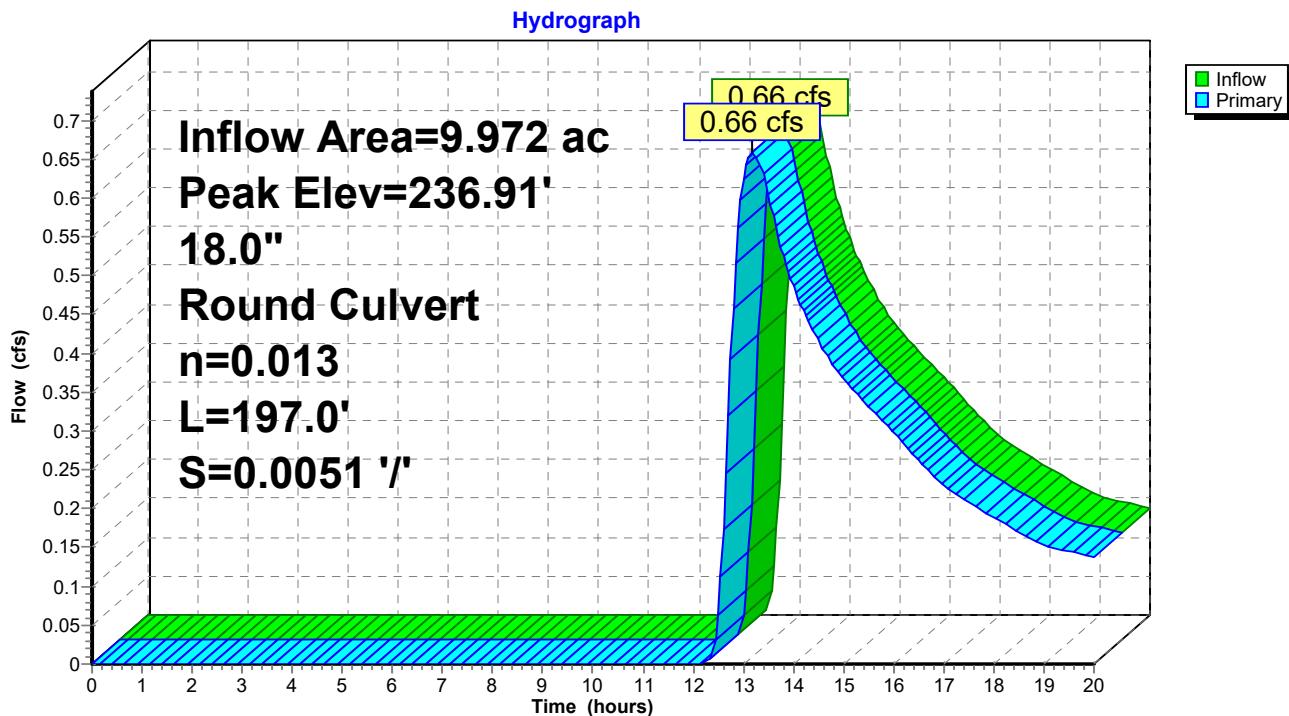
Peak Elev= 236.91' @ 13.18 hrs

Flood Elev= 241.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	236.50'	18.0" Round Culvert L= 197.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 236.50' / 235.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.66 cfs @ 13.18 hrs HW=236.91' (Free Discharge)
 ↑ 1=Culvert (Barrel Controls 0.66 cfs @ 2.56 fps)

Pond 4P: Outlet structure for UGF #1



Summary for Pond 5P: New 4' catch basin

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

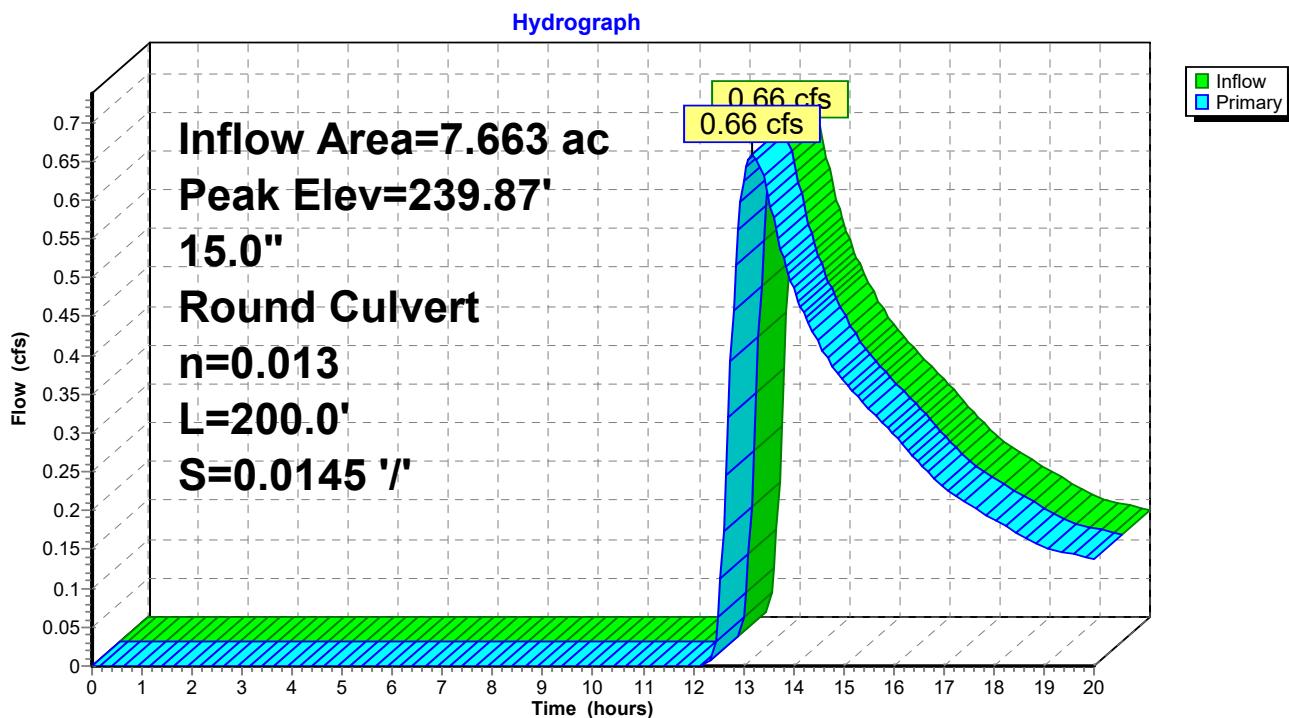
Peak Elev= 239.87' @ 13.18 hrs

Flood Elev= 242.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.49'	15.0" Round Culvert L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 239.49' / 236.60' S= 0.0145 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.66 cfs @ 13.18 hrs HW=239.87' TW=237.19' (Fixed TW Elev= 237.19')
 ↗1=Culvert (Inlet Controls 0.66 cfs @ 2.09 fps)

Pond 5P: New 4' catch basin



Summary for Pond 6P: Stevens Mill Rd X-Culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.48' @ 13.18 hrs

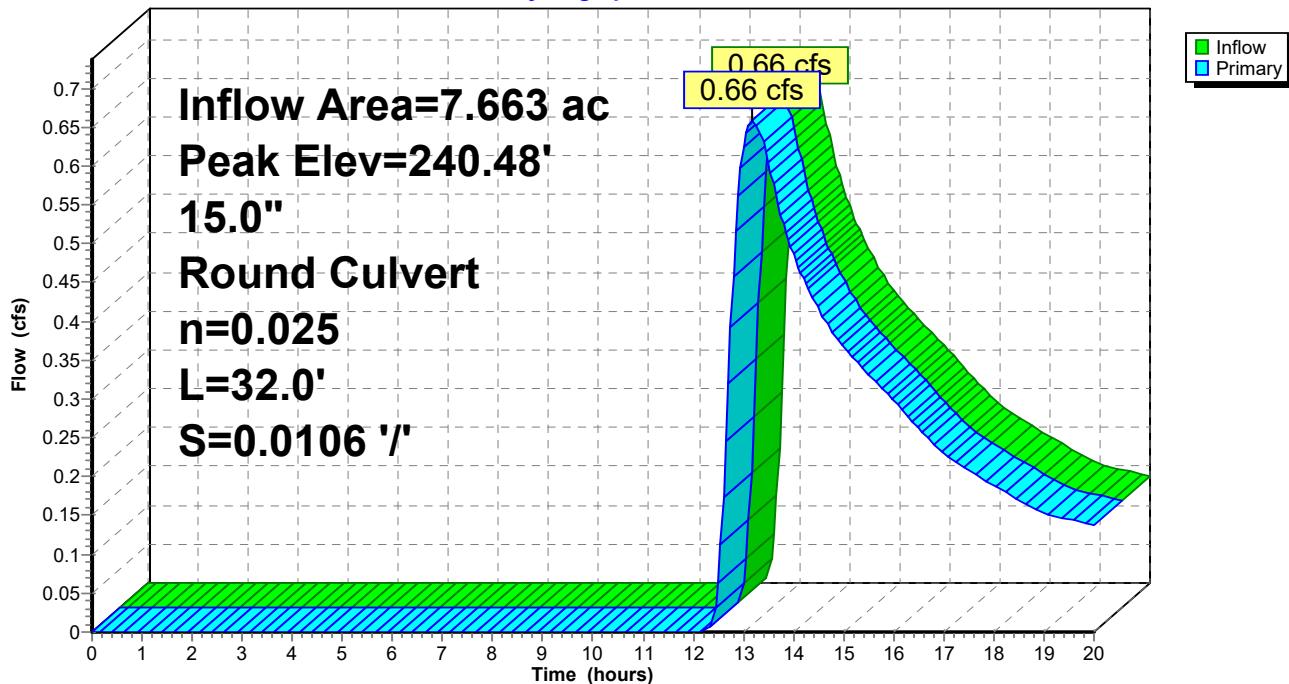
Flood Elev= 240.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.93'	15.0" Round Culvert L= 32.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 239.93' / 239.59' S= 0.0106 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=0.66 cfs @ 13.18 hrs HW=240.48' TW=240.16' (Fixed TW Elev= 240.16')
 ↪ 1=Culvert (Outlet Controls 0.66 cfs @ 1.86 fps)

Pond 6P: Stevens Mill Rd X-Culvert

Hydrograph



Summary for Pond 7P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

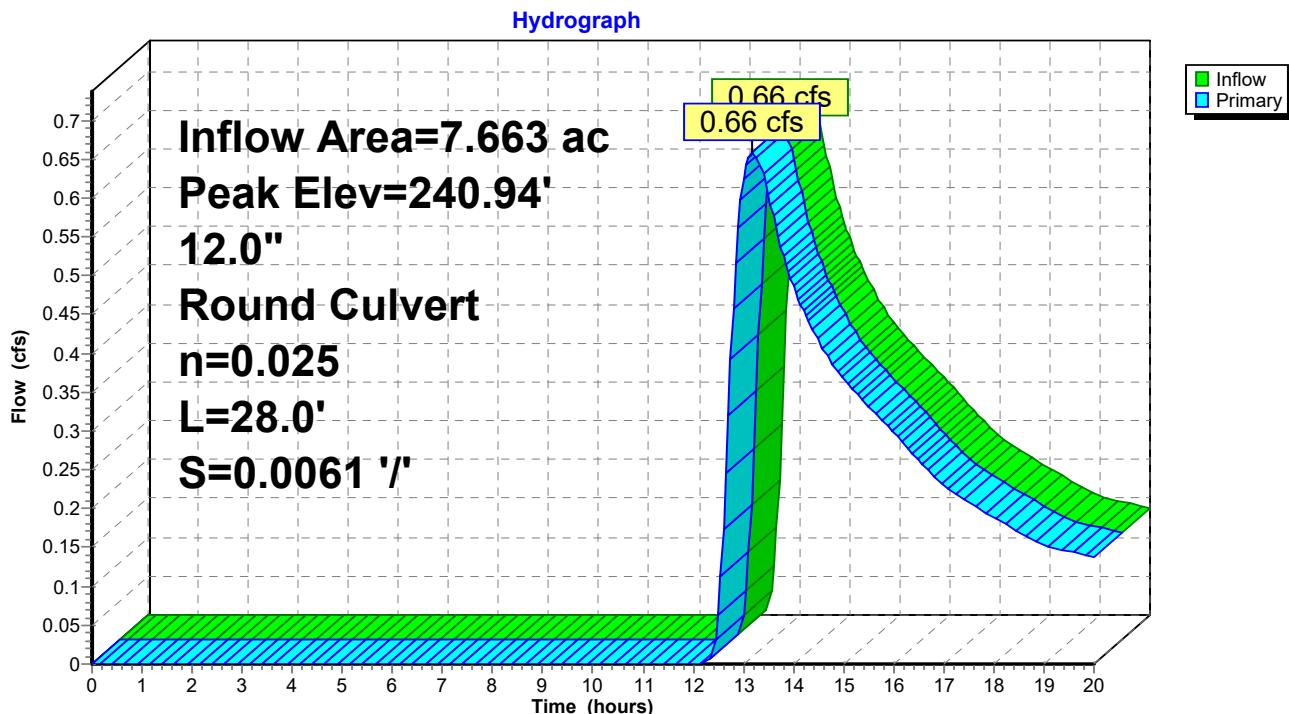
Peak Elev= 240.94' @ 13.18 hrs

Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 240.10' / 239.93' S= 0.0061 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 13.18 hrs HW=240.94' TW=240.82' (Fixed TW Elev= 240.82')
 ↗1=Culvert (Outlet Controls 0.66 cfs @ 1.27 fps)

Pond 7P: Driveway culvert



Summary for Pond 8P: Driveway culvert

Same as Pre 2P

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af
 Outflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 241.94' @ 13.14 hrs

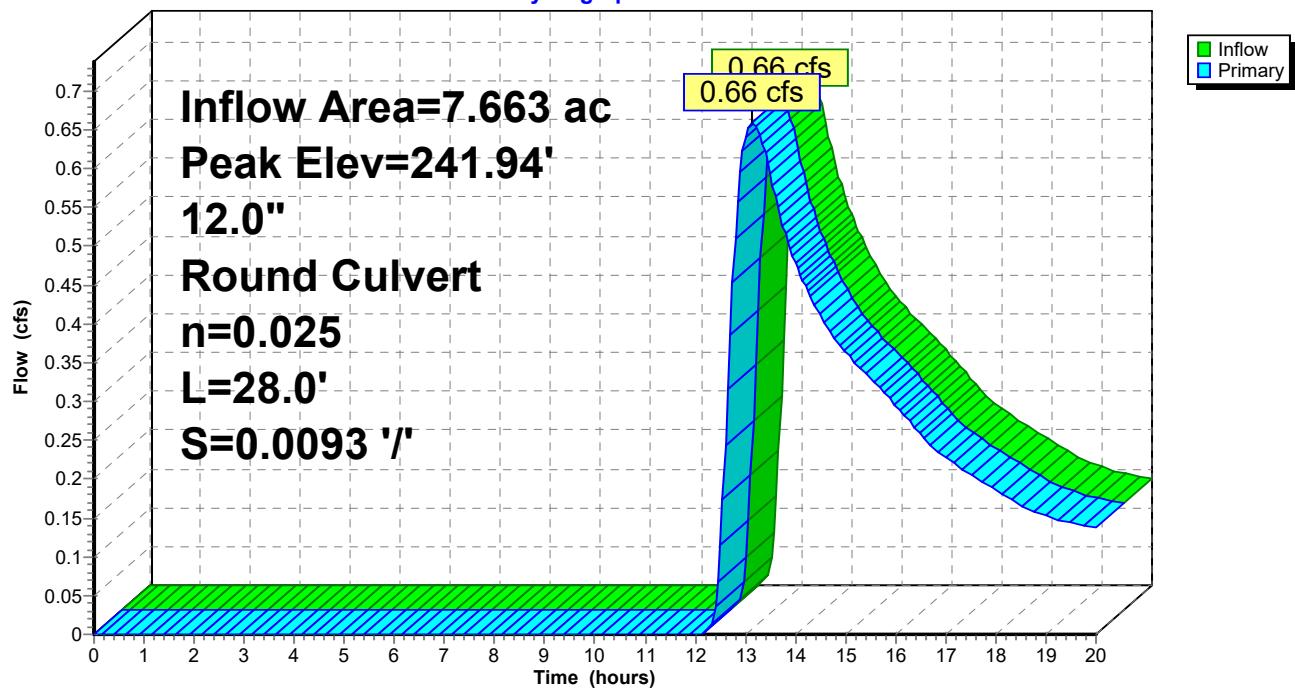
Flood Elev= 243.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	241.35'	12.0" Round Culvert $L= 28.0'$ CMP, projecting, no headwall, $Ke= 0.900$ Inlet / Outlet Invert= 241.35' / 241.09' $S= 0.0093 '$ $Cc= 0.900$ $n= 0.025$ Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 13.14 hrs HW=241.94' TW=241.60' (Fixed TW Elev= 241.60')
 ↑=Culvert (Outlet Controls 0.66 cfs @ 1.98 fps)

Pond 8P: Driveway culvert

Hydrograph



Summary for Pond 9P: Sprucewood Rd Culvert

Same as Pre 1P

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.29" for 10-year storm event
 Inflow = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af
 Outflow = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 244.68' @ 12.78 hrs

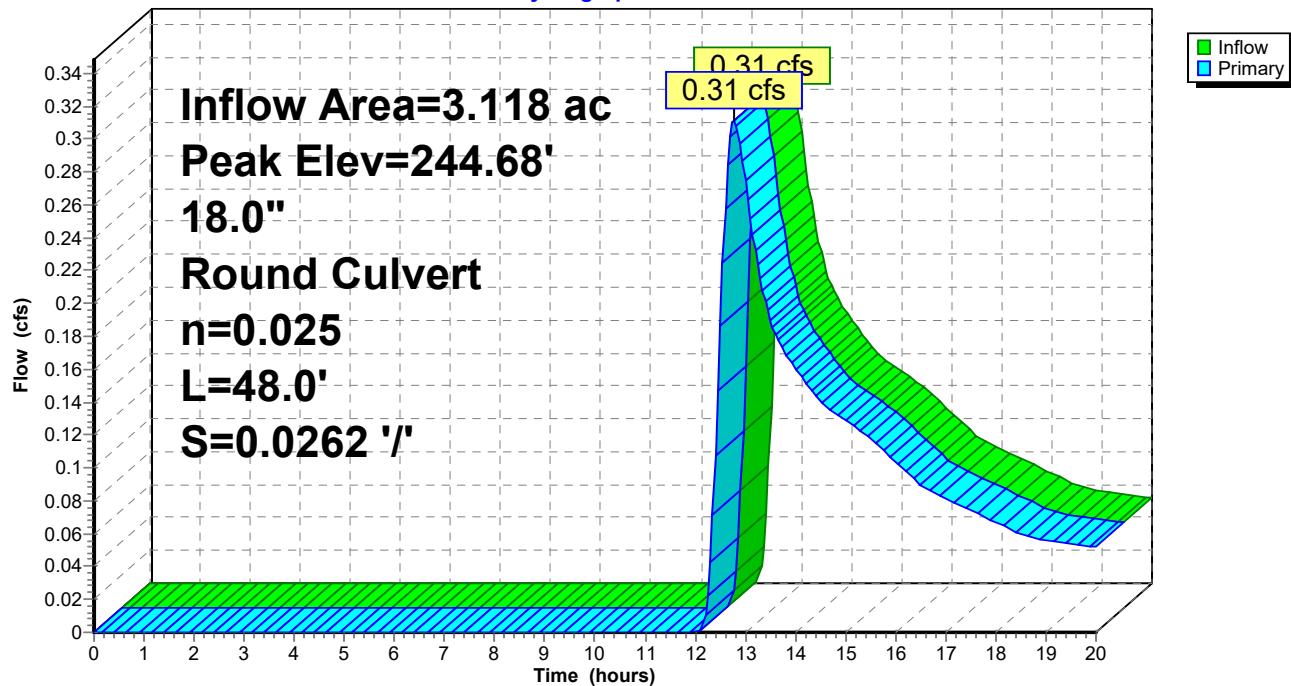
Flood Elev= 246.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	244.37'	18.0" Round Culvert L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 244.37' / 243.11' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.31 cfs @ 12.78 hrs HW=244.68' TW=244.00' (Fixed TW Elev= 244.00')
 ↑1=Culvert (Outlet Controls 0.31 cfs @ 1.79 fps)

Pond 9P: Sprucewood Rd Culvert

Hydrograph



Summary for Pond 10P: Proposed 15" Culvert

Inflow Area = 3.223 ac, 26.63% Impervious, Inflow Depth > 1.25" for 10-year storm event
 Inflow = 2.46 cfs @ 12.64 hrs, Volume= 0.337 af
 Outflow = 2.46 cfs @ 12.64 hrs, Volume= 0.337 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.46 cfs @ 12.64 hrs, Volume= 0.337 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

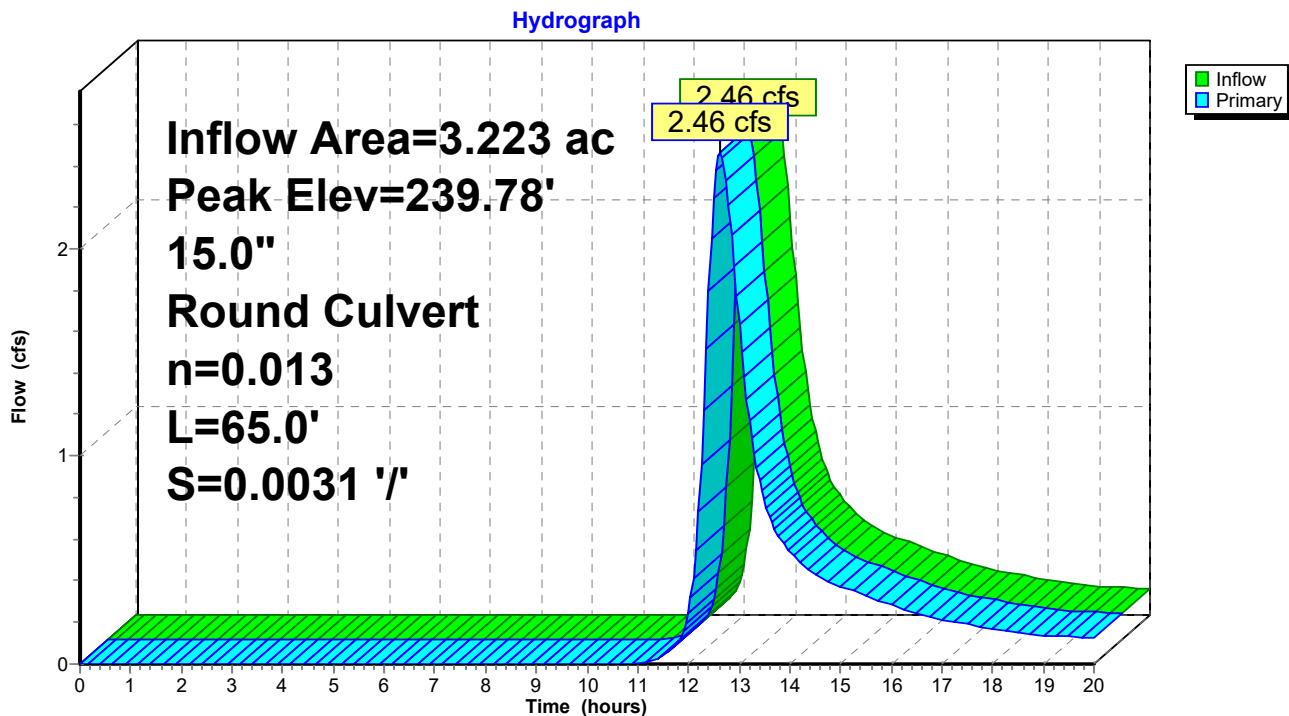
Peak Elev= 239.78' @ 12.64 hrs

Flood Elev= 241.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	15.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 238.00' / 237.80' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.46 cfs @ 12.64 hrs HW=239.78' TW=239.50' (Fixed TW Elev= 239.50')
 ↗1=Culvert (Inlet Controls 2.46 cfs @ 2.00 fps)

Pond 10P: Proposed 15" Culvert



Summary for Pond 11P: UGF #2

Inflow Area = 4.441 ac, 25.83% Impervious, Inflow Depth > 1.51" for 10-year storm event
 Inflow = 3.54 cfs @ 12.48 hrs, Volume= 0.559 af
 Outflow = 1.64 cfs @ 13.15 hrs, Volume= 0.295 af, Atten= 54%, Lag= 40.1 min
 Primary = 1.64 cfs @ 13.15 hrs, Volume= 0.295 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.34' @ 13.15 hrs Surf.Area= 6,643 sf Storage= 12,195 cf
 Flood Elev= 239.70' Surf.Area= 7,182 sf Storage= 14,679 cf

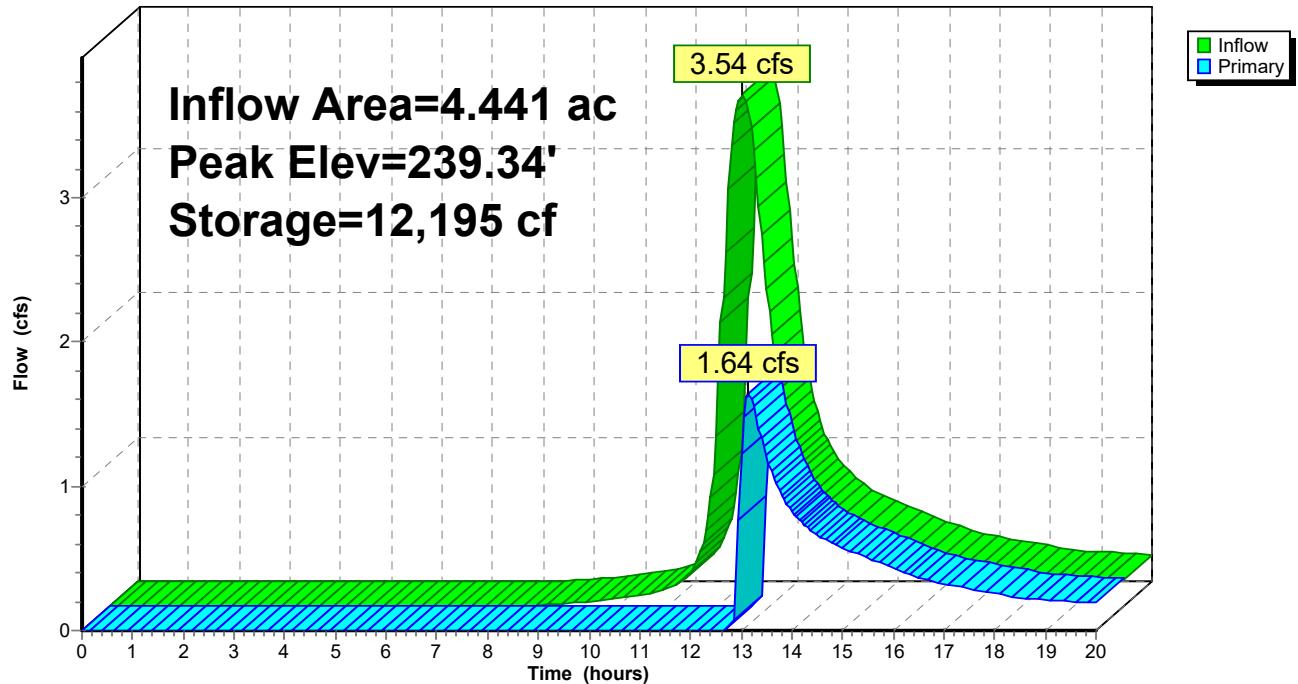
Plug-Flow detention time= 170.5 min calculated for 0.294 af (53% of inflow)
 Center-of-Mass det. time= 86.1 min (913.2 - 827.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	235.03'	14,679 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
235.03	4,718	325.6	0.0	0	0	4,718
235.04	4,718	325.6	40.0	19	19	4,721
236.20	4,718	325.6	40.0	2,189	2,208	5,099
236.21	4,718	325.6	10.0	5	2,213	5,102
237.70	4,718	325.6	10.0	703	2,916	5,587
237.71	4,718	325.6	100.0	47	2,963	5,591
238.00	5,120	333.3	100.0	1,426	4,389	6,005
239.00	6,152	352.7	100.0	5,628	10,017	7,119
239.70	7,182	372.1	100.0	4,662	14,679	8,266

Device	Routing	Invert	Outlet Devices
#1	Device 2	239.20'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	234.70'	15.0" Round Culvert L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 234.70' / 234.50' S= 0.0011 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.62 cfs @ 13.15 hrs HW=239.34' (Free Discharge)

↑
2=Culvert (Passes 1.62 cfs of 7.90 cfs potential flow)
↑
1=Orifice/Grate (Weir Controls 1.62 cfs @ 1.23 fps)

Pond 11P: UGF #2**Hydrograph**

Summary for Pond 12P: UGF #3

Inflow Area = 2.939 ac, 90.21% Impervious, Inflow Depth > 0.19" for 10-year storm event
 Inflow = 1.21 cfs @ 12.10 hrs, Volume= 0.046 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 228.87' @ 20.00 hrs Surf.Area= 6,514 sf Storage= 1,992 cf
 Flood Elev= 232.78' Surf.Area= 9,647 sf Storage= 19,813 cf

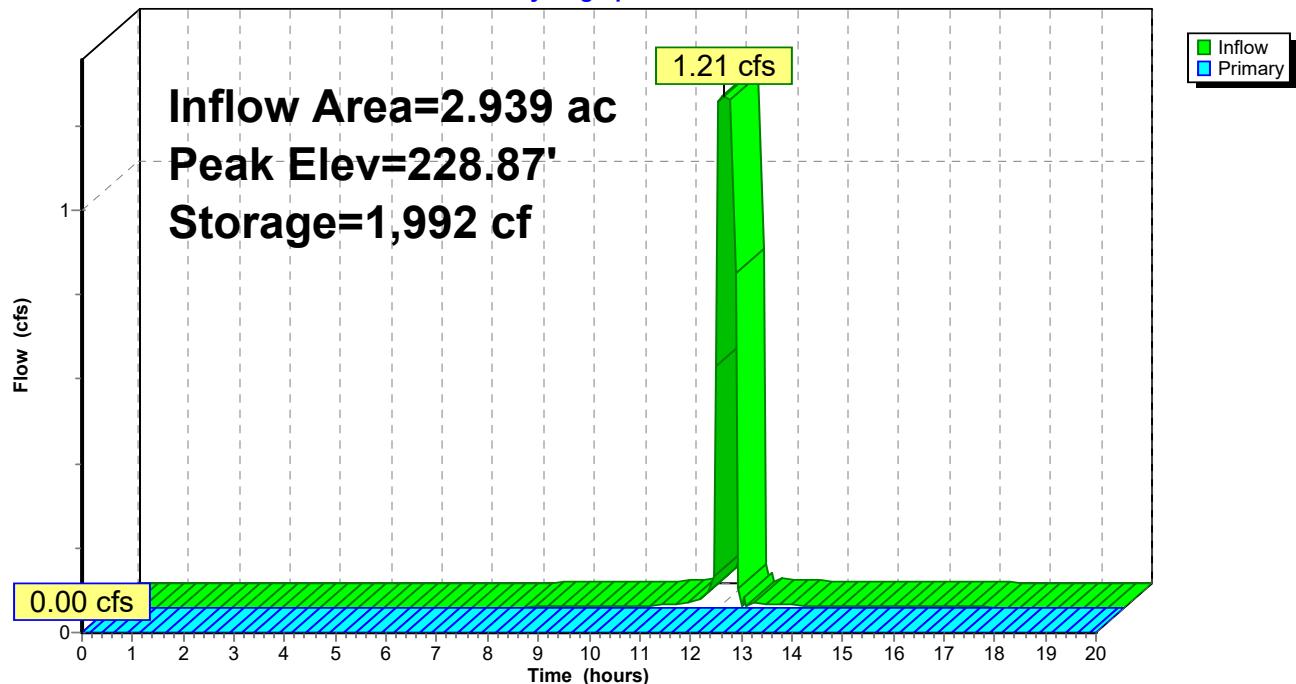
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description			
#1	228.11'	19,813 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.11	6,514	398.5	0.0	0	0	6,514
228.12	6,514	398.5	40.0	26	26	6,518
229.28	6,514	398.5	40.0	3,022	3,049	6,980
229.29	6,514	398.5	10.0	7	3,055	6,984
230.77	6,514	398.5	10.0	964	4,019	7,574
230.78	6,514	398.5	100.0	65	4,084	7,578
231.00	6,779	402.6	100.0	1,462	5,546	7,854
232.00	8,015	421.5	100.0	7,388	12,935	9,160
232.78	9,647	444.9	100.0	6,878	19,813	10,808

Device	Routing	Invert	Outlet Devices	
#1	Device 2	232.28'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	227.78'	12.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 227.78' / 226.00' S= 0.0371 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf	

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=228.11' (Free Discharge)

↑
2=Culvert (Passes 0.00 cfs of 0.44 cfs potential flow)
↑
1=Orifice/Grate (Controls 0.00 cfs)

Pond 12P: UGF #3**Hydrograph**

Summary for Pond 13P: UGF #4

Inflow Area = 0.569 ac, 63.32% Impervious, Inflow Depth > 2.83" for 10-year storm event
 Inflow = 1.77 cfs @ 12.12 hrs, Volume= 0.134 af
 Outflow = 0.81 cfs @ 12.37 hrs, Volume= 0.068 af, Atten= 54%, Lag= 15.0 min
 Primary = 0.81 cfs @ 12.37 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 240.59' @ 12.37 hrs Surf.Area= 2,111 sf Storage= 3,051 cf
 Flood Elev= 241.00' Surf.Area= 2,442 sf Storage= 3,987 cf

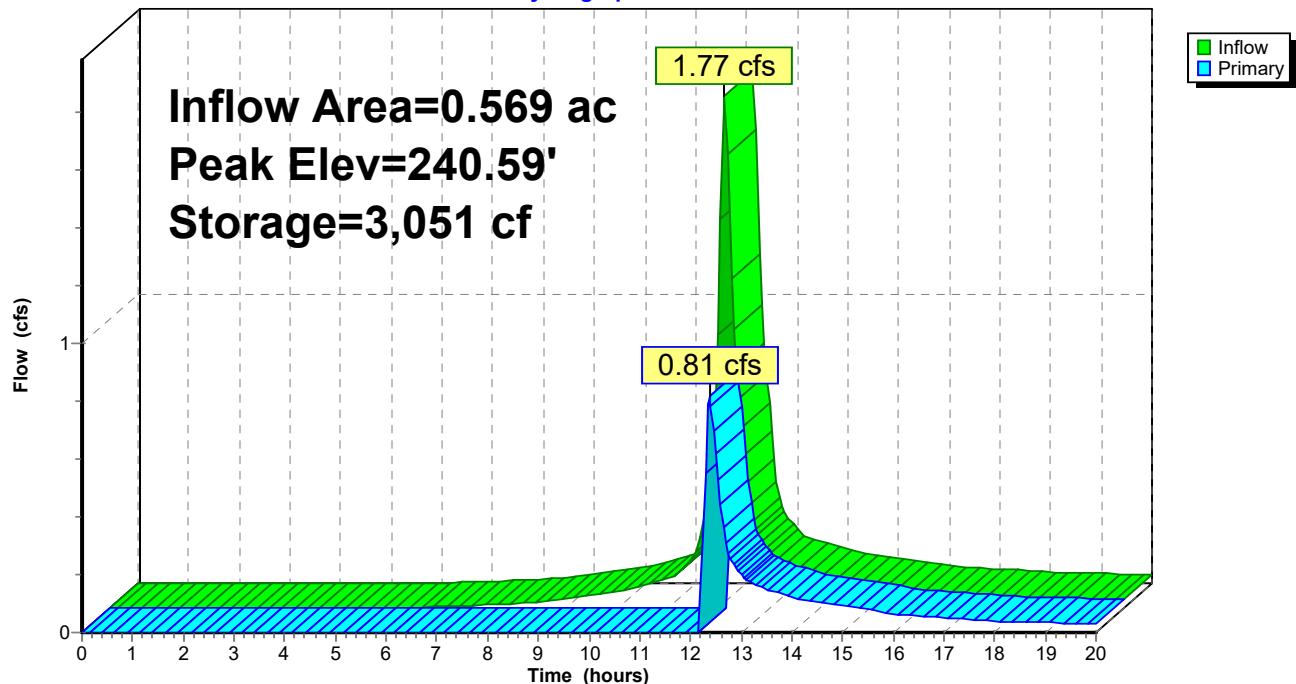
Plug-Flow detention time= 167.3 min calculated for 0.068 af (51% of inflow)
 Center-of-Mass det. time= 85.2 min (859.1 - 773.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	236.33'	3,987 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
236.33	988	214.0	0.0	0	0	988
236.34	988	214.0	40.0	4	4	990
237.50	988	214.0	40.0	458	462	1,238
237.51	988	214.0	10.0	1	463	1,241
238.99	988	214.0	10.0	146	610	1,557
239.00	988	214.0	100.0	10	619	1,559
240.00	1,680	246.0	100.0	1,319	1,938	2,753
241.00	2,442	264.0	100.0	2,049	3,987	3,527

Device	Routing	Invert	Outlet Devices	
#1	Device 2	240.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	236.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 236.00' / 235.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf	

Primary OutFlow Max=0.77 cfs @ 12.37 hrs HW=240.59' (Free Discharge)

↑ 2=Culvert (Passes 0.77 cfs of 7.64 cfs potential flow)
 ↑ 1=Orifice/Grate (Weir Controls 0.77 cfs @ 0.96 fps)

Pond 13P: UGF #4**Hydrograph**

Summary for Pond 14P: Storage within field

Inflow Area = 0.906 ac, 100.00% Impervious, Inflow Depth > 3.88" for 10-year storm event
 Inflow = 4.35 cfs @ 12.00 hrs, Volume= 0.293 af
 Outflow = 0.93 cfs @ 12.37 hrs, Volume= 0.293 af, Atten= 79%, Lag= 21.9 min
 Discarded = 0.93 cfs @ 12.37 hrs, Volume= 0.293 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 243.00' @ 12.37 hrs Surf.Area= 39,484 sf Storage= 2,657 cf

Plug-Flow detention time= 14.6 min calculated for 0.293 af (100% of inflow)
 Center-of-Mass det. time= 14.4 min (732.8 - 718.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	242.83'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.83	39,484	0.0	0	0
242.84	39,484	40.0	158	158
243.16	39,484	40.0	5,054	5,212
243.17	39,484	0.0	0	5,212
243.50	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	242.83'	1.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 235.00'
#2	Device 3	243.00'	12.0" W x 1.0" H Box Culvert X 16.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 243.00' / 242.30' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	241.59'	8.0" Round Culvert L= 435.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 241.59' / 239.60' S= 0.0046 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	239.60'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 239.60' / 239.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.93 cfs @ 12.37 hrs HW=243.00' (Free Discharge)

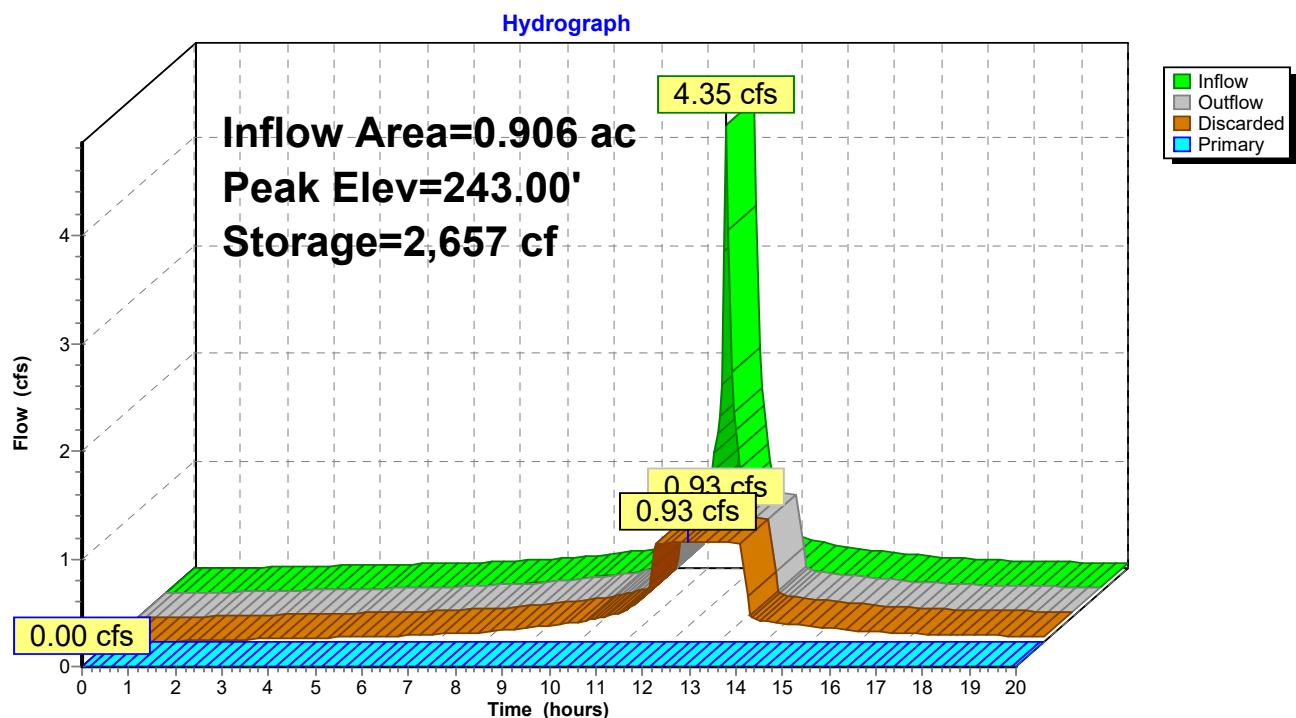
↑ 1=Exfiltration (Controls 0.93 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=242.83' TW=240.09' (Fixed TW Elev= 240.09')

↑ 4=Culvert (Passes 0.00 cfs of 6.25 cfs potential flow)

↑ 3=Culvert (Passes 0.00 cfs of 1.14 cfs potential flow)

↑ 2=Culvert (Controls 0.00 cfs)

Pond 14P: Storage within field

Summary for Pond 15P: Storage within field

Inflow Area = 0.906 ac, 100.00% Impervious, Inflow Depth > 3.88" for 10-year storm event
 Inflow = 4.35 cfs @ 12.00 hrs, Volume= 0.293 af
 Outflow = 0.93 cfs @ 12.37 hrs, Volume= 0.293 af, Atten= 79%, Lag= 21.9 min
 Discarded = 0.93 cfs @ 12.37 hrs, Volume= 0.293 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 243.00' @ 12.37 hrs Surf.Area= 39,484 sf Storage= 2,657 cf

Plug-Flow detention time= 14.6 min calculated for 0.293 af (100% of inflow)
 Center-of-Mass det. time= 14.4 min (732.8 - 718.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	242.83'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.83	39,484	0.0	0	0
242.84	39,484	40.0	158	158
243.16	39,484	40.0	5,054	5,212
243.17	39,484	0.0	0	5,212
243.50	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	242.83'	1.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 235.00'
#2	Device 3	243.00'	12.0" W x 1.0" H Box Culvert X 16.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 243.00' / 242.30' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	241.59'	8.0" Round Culvert L= 435.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 241.59' / 239.60' S= 0.0046 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	239.60'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 239.60' / 239.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.93 cfs @ 12.37 hrs HW=243.00' (Free Discharge)

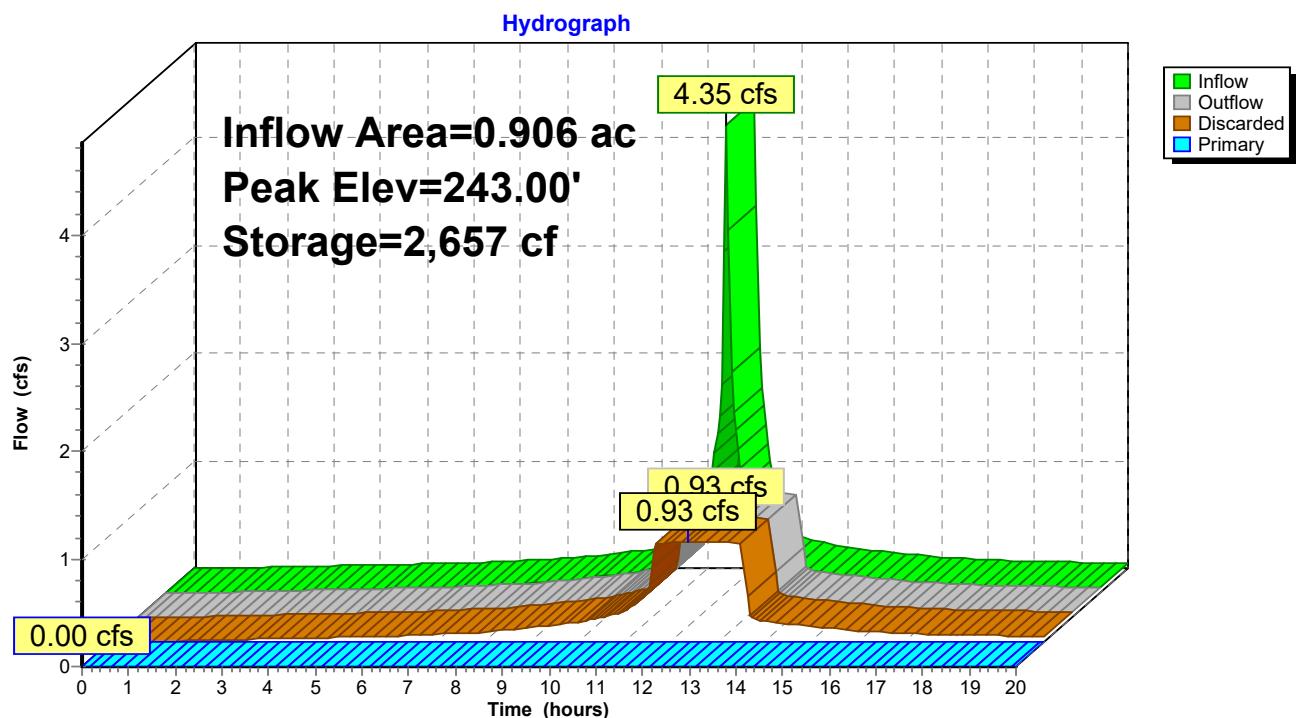
↑ 1=Exfiltration (Controls 0.93 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=242.83' TW=240.09' (Fixed TW Elev= 240.09')

↑ 4=Culvert (Passes 0.00 cfs of 6.25 cfs potential flow)

↑ 3=Culvert (Passes 0.00 cfs of 1.14 cfs potential flow)

↑ 2=Culvert (Controls 0.00 cfs)

Pond 15P: Storage within field

Summary for Pond 16P: Storage within field

Inflow Area = 2.939 ac, 90.21% Impervious, Inflow Depth > 3.55" for 10-year storm event
 Inflow = 13.62 cfs @ 12.00 hrs, Volume= 0.868 af
 Outflow = 6.98 cfs @ 12.10 hrs, Volume= 0.868 af, Atten= 49%, Lag= 6.1 min
 Discarded = 5.76 cfs @ 12.10 hrs, Volume= 0.823 af
 Primary = 1.21 cfs @ 12.10 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 235.50' @ 12.10 hrs Surf.Area= 39,484 sf Storage= 2,693 cf

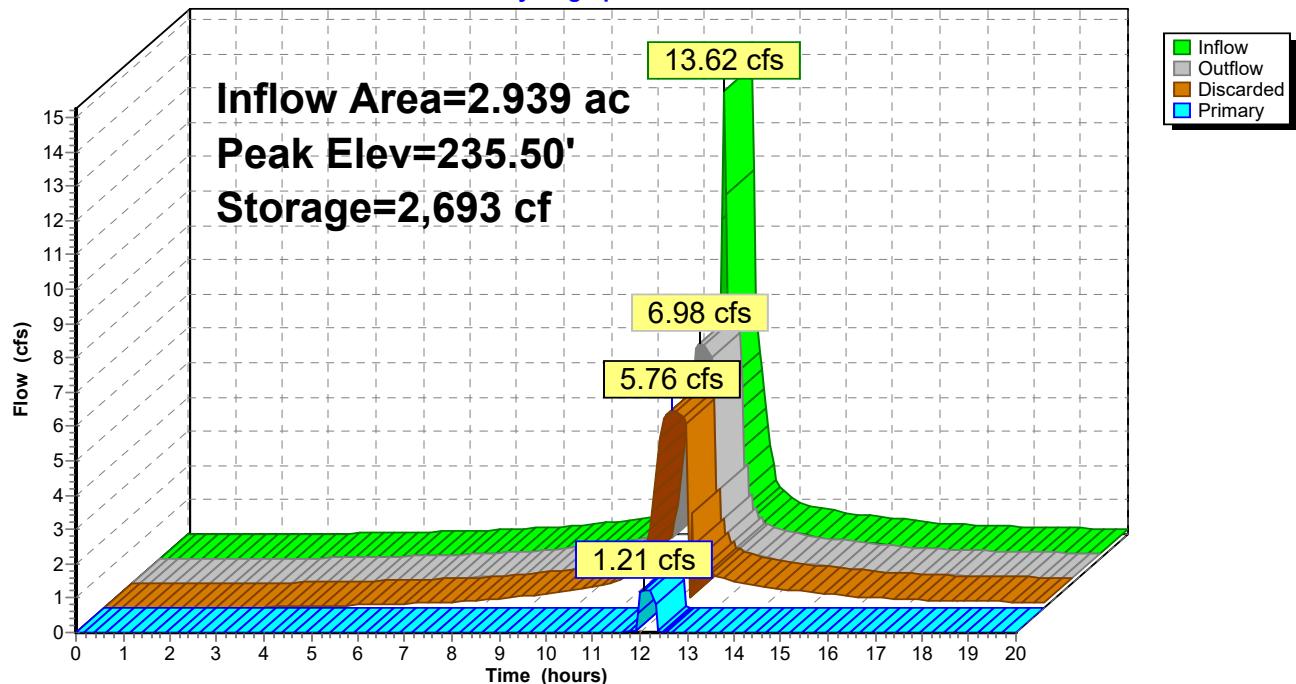
Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 1.4 min (740.4 - 739.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	235.33'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.33	39,484	0.0	0	0
235.34	39,484	40.0	158	158
235.66	39,484	40.0	5,054	5,212
235.67	39,484	0.0	0	5,212
236.00	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	235.33'	6.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 232.00'
#2	Device 3	235.33'	12.0" W x 1.0" H Box Culvert X 30.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 235.33' / 234.63' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	233.97'	8.0" Round Culvert L= 573.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 233.97' / 231.10' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	231.10'	12.0" Round Culvert L= 36.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 231.10' / 230.78' S= 0.0089 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=5.76 cfs @ 12.10 hrs HW=235.50' (Free Discharge)
 ↑ 1=Exfiltration (Controls 5.76 cfs)

Primary OutFlow Max=1.21 cfs @ 12.10 hrs HW=235.50' (Free Discharge)
 ↑ 4=Culvert (Passes 1.21 cfs of 7.47 cfs potential flow)
 ↑ 3=Culvert (Barrel Controls 1.21 cfs @ 3.47 fps)
 ↑ 2=Culvert (Passes 1.21 cfs of 3.09 cfs potential flow)

Pond 16P: Storage within field**Hydrograph**

Summary for Pond 17P: New 36" Culvert

Inflow Area = 0.847 ac, 0.00% Impervious, Inflow Depth > 1.03" for 10-year storm event
 Inflow = 0.68 cfs @ 12.32 hrs, Volume= 0.073 af
 Outflow = 0.68 cfs @ 12.32 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.68 cfs @ 12.32 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

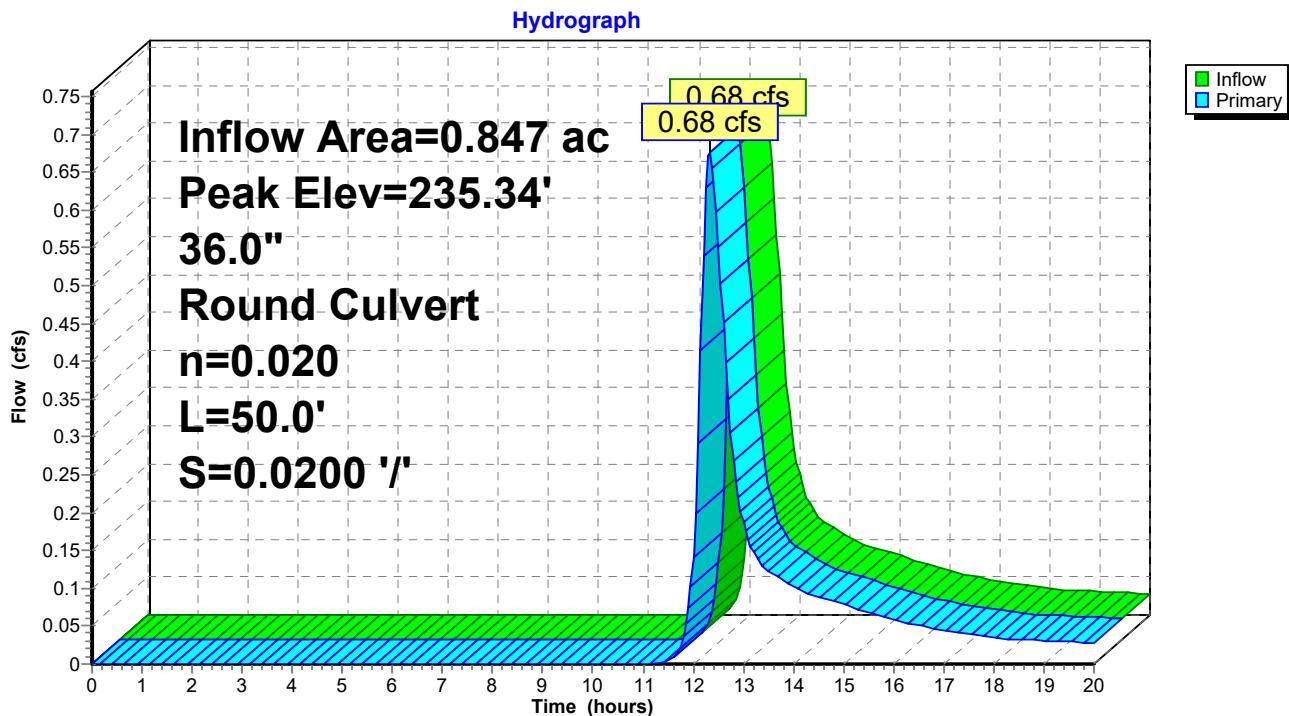
Peak Elev= 235.34' @ 12.32 hrs

Flood Elev= 240.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	235.00'	36.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 235.00' / 234.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 7.07 sf

Primary OutFlow Max=0.67 cfs @ 12.32 hrs HW=235.33' TW=234.50' (Fixed TW Elev= 234.50')
 ↗1=Culvert (Inlet Controls 0.67 cfs @ 1.55 fps)

Pond 17P: New 36" Culvert



Summary for Pond 18P: New 12" Culvert

Inflow Area = 0.534 ac, 0.47% Impervious, Inflow Depth > 0.48" for 10-year storm event
 Inflow = 0.15 cfs @ 12.41 hrs, Volume= 0.021 af
 Outflow = 0.15 cfs @ 12.41 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.41 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

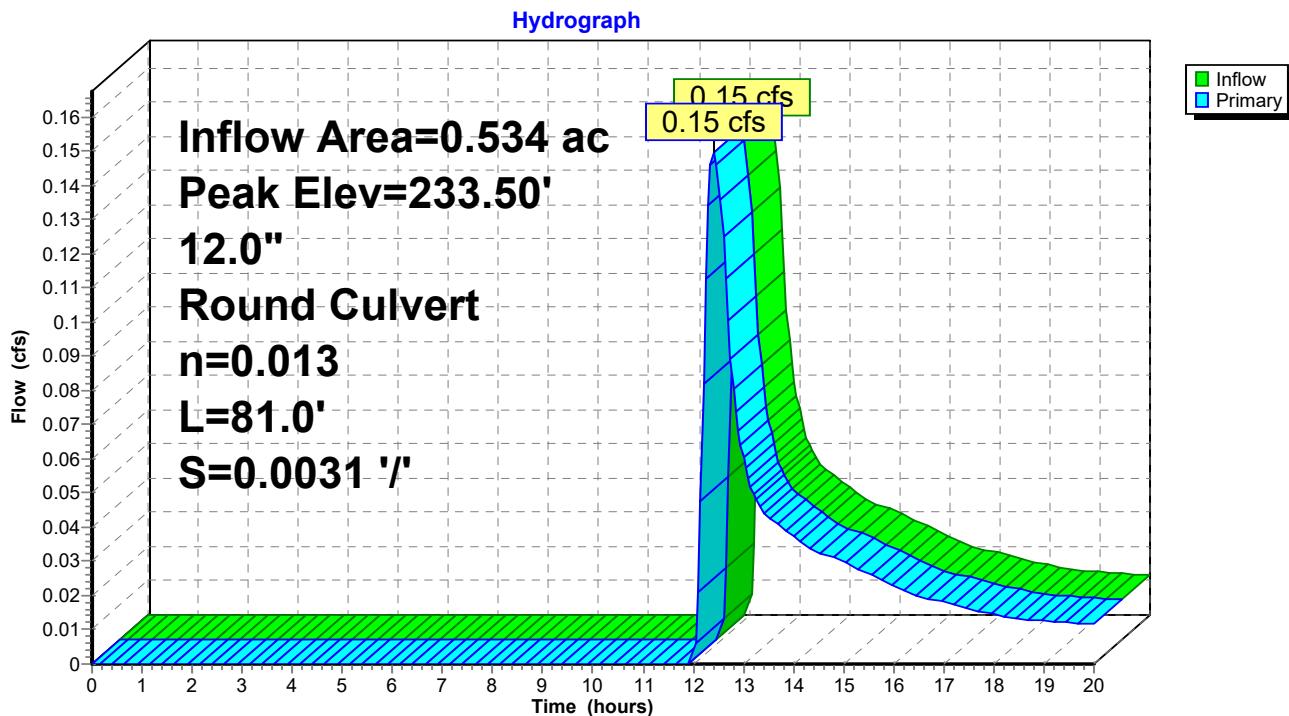
Peak Elev= 233.50' @ 12.41 hrs

Flood Elev= 235.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	233.25'	12.0" Round Culvert L= 81.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 233.25' / 233.00' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.41 hrs HW=233.50' (Free Discharge)
 ↗1=Culvert (Barrel Controls 0.15 cfs @ 1.48 fps)

Pond 18P: New 12" Culvert



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP1: Post 1

Runoff Area=21,609 sf 20.63% Impervious Runoff Depth>2.94"
Flow Length=49' Tc=6.5 min CN=79 Runoff=1.77 cfs 0.122 af

SubcatchmentP10: (new Subcat)

Runoff Area=36,875 sf 0.00% Impervious Runoff Depth>1.68"
Flow Length=292' Tc=20.7 min CN=64 Runoff=1.16 cfs 0.118 af

SubcatchmentP11: Post 11

Runoff Area=23,246 sf 0.47% Impervious Runoff Depth>0.93"
Flow Length=201' Tc=19.5 min CN=53 Runoff=0.35 cfs 0.041 af

SubcatchmentP12: Post 12

Runoff Area=128,031 sf 90.21% Impervious Runoff Depth>4.59"
Flow Length=1' Tc=0.2 min CN=95 Runoff=17.34 cfs 1.124 af

SubcatchmentP13: Post Sub 13

Runoff Area=790,293 sf 0.50% Impervious Runoff Depth>2.64"
Flow Length=512' Tc=42.2 min CN=76 Runoff=29.18 cfs 3.986 af

SubcatchmentP14: Post 14

Runoff Area=11,225 sf 0.12% Impervious Runoff Depth>3.04"
Flow Length=25' Tc=2.2 min CN=80 Runoff=1.07 cfs 0.065 af

SubcatchmentP15: Post 15

Runoff Area=36,496 sf 0.00% Impervious Runoff Depth>0.13"
Flow Length=480' Tc=30.4 min CN=36 Runoff=0.02 cfs 0.009 af

SubcatchmentP2: Post 2

Runoff Area=39,484 sf 100.00% Impervious Runoff Depth>4.93"
Flow Length=1' Tc=0.2 min CN=98 Runoff=5.48 cfs 0.373 af

SubcatchmentP3: Post 3

Runoff Area=39,484 sf 100.00% Impervious Runoff Depth>4.93"
Flow Length=1' Tc=0.2 min CN=98 Runoff=5.48 cfs 0.373 af

SubcatchmentP4: Post 4

Runoff Area=27,045 sf 24.36% Impervious Runoff Depth>2.94"
Flow Length=266' Tc=11.2 min UI Adjusted CN=79 Runoff=1.92 cfs 0.152 af

SubcatchmentP5: Post 5

Runoff Area=41,835 sf 30.05% Impervious Runoff Depth>3.12"
Flow Length=69' Tc=16.0 min CN=81 Runoff=2.76 cfs 0.250 af

SubcatchmentP6: Post 6

Runoff Area=197,973 sf 12.87% Impervious Runoff Depth>0.67"
Flow Length=500' Tc=68.1 min UI Adjusted CN=49 Runoff=1.11 cfs 0.256 af

SubcatchmentP7: Post 7

Runoff Area=135,817 sf 24.84% Impervious Runoff Depth>0.64"
Flow Length=570' Tc=36.8 min CN=48 Runoff=0.95 cfs 0.165 af

SubcatchmentP8: Post 8

Runoff Area=140,411 sf 26.63% Impervious Runoff Depth>1.97"
Flow Length=270' Tc=39.5 min UI Adjusted CN=68 Runoff=3.97 cfs 0.529 af

SubcatchmentP9: Post 9

Runoff Area=24,805 sf 63.32% Impervious Runoff Depth>3.82"
Flow Length=132' Tc=8.9 min CN=88 Runoff=2.35 cfs 0.181 af

Reach 1R: Ditch along p-lot

Avg. Flow Depth=0.44' Max Vel=2.38 fps Inflow=2.76 cfs 0.250 af
n=0.035 L=130.0' S=0.0171 '/' Capacity=16.19 cfs Outflow=2.72 cfs 0.249 af

Reach 2R: Wooded buffer	Avg. Flow Depth=0.07' Max Vel=0.08 fps Inflow=0.23 cfs 0.054 af n=0.400 L=100.0' S=0.0165 '/' Capacity=2.38 cfs Outflow=0.18 cfs 0.051 af
Reach 3R: Downslope of 18" dia. SD	Avg. Flow Depth=0.28' Max Vel=0.14 fps Inflow=1.85 cfs 0.418 af n=0.400 L=100.0' S=0.0160 '/' Capacity=2.02 cfs Outflow=1.76 cfs 0.408 af
Reach 4R: Existing Channel	Avg. Flow Depth=0.08' Max Vel=0.96 fps Inflow=1.76 cfs 0.408 af n=0.025 L=325.0' S=0.0120 '/' Capacity=18.08 cfs Outflow=1.74 cfs 0.402 af
Reach 5R: Existing Channel	Avg. Flow Depth=0.14' Max Vel=1.74 fps Inflow=1.74 cfs 0.402 af n=0.025 L=420.0' S=0.0204 '/' Capacity=66.75 cfs Outflow=1.73 cfs 0.398 af
Reach 6R: Existing Stream Channel	Avg. Flow Depth=1.94' Max Vel=1.83 fps Inflow=31.65 cfs 5.256 af n=0.040 L=240.0' S=0.0018 '/' Capacity=33.56 cfs Outflow=31.48 cfs 5.237 af
Reach 8R: Below Wooded Buffer	Avg. Flow Depth=0.01' Max Vel=0.45 fps Inflow=0.18 cfs 0.051 af n=0.025 L=240.0' S=0.0194 '/' Capacity=29.38 cfs Outflow=0.17 cfs 0.050 af
Reach 9R: Existing Stream Channel	Avg. Flow Depth=0.99' Max Vel=4.20 fps Inflow=29.18 cfs 4.035 af n=0.040 L=540.0' S=0.0194 '/' Capacity=110.28 cfs Outflow=29.04 cfs 4.021 af
Reach 10R: Existing Stream Channel	Avg. Flow Depth=1.93' Max Vel=1.86 fps Inflow=31.70 cfs 4.862 af n=0.040 L=65.0' S=0.0018 '/' Capacity=34.06 cfs Outflow=31.65 cfs 4.858 af
Reach 11R: Stevens Mill Road Ditch	Avg. Flow Depth=0.51' Max Vel=1.81 fps Inflow=1.85 cfs 0.419 af n=0.035 L=118.0' S=0.0084 '/' Capacity=32.56 cfs Outflow=1.85 cfs 0.418 af
Reach 12R: Stevens Mill Road Ditch	Avg. Flow Depth=0.47' Max Vel=2.05 fps Inflow=1.85 cfs 0.420 af n=0.035 L=105.0' S=0.0120 '/' Capacity=38.94 cfs Outflow=1.85 cfs 0.419 af
Reach 13R: Stevens Mill Road Ditch	Avg. Flow Depth=0.47' Max Vel=1.03 fps Inflow=0.95 cfs 0.165 af n=0.035 L=165.0' S=0.0030 '/' Capacity=19.57 cfs Outflow=0.94 cfs 0.164 af
Reach 14R: Proposed diversion swale	Avg. Flow Depth=0.44' Max Vel=3.36 fps Inflow=3.97 cfs 0.529 af n=0.035 L=270.0' S=0.0333 '/' Capacity=22.62 cfs Outflow=3.95 cfs 0.528 af
Reach 15R: Existing drainage	Avg. Flow Depth=0.21' Max Vel=1.93 fps Inflow=5.57 cfs 0.811 af n=0.025 L=185.0' S=0.0146 '/' Capacity=164.26 cfs Outflow=5.52 cfs 0.809 af
Reach 16R: Existing drainage along	Avg. Flow Depth=0.07' Max Vel=1.03 fps Inflow=0.35 cfs 0.041 af n=0.025 L=75.0' S=0.0160 '/' Capacity=144.38 cfs Outflow=0.35 cfs 0.041 af
Reach 17R: Existing drainage	Avg. Flow Depth=0.21' Max Vel=2.01 fps Inflow=5.71 cfs 0.850 af n=0.025 L=235.0' S=0.0162 '/' Capacity=172.90 cfs Outflow=5.67 cfs 0.847 af
Reach 18R: Existing drainage	Avg. Flow Depth=0.20' Max Vel=2.13 fps Inflow=5.67 cfs 0.847 af n=0.025 L=115.0' S=0.0191 '/' Capacity=188.06 cfs Outflow=5.62 cfs 0.845 af
Reach 19R: Existing Stream Channel	Avg. Flow Depth=0.43' Max Vel=2.26 fps Inflow=5.62 cfs 0.845 af n=0.040 L=200.0' S=0.0144 '/' Capacity=94.97 cfs Outflow=5.58 cfs 0.842 af
Reach 20R: Existing Stream Channel	Avg. Flow Depth=0.63' Max Vel=1.37 fps Inflow=5.58 cfs 0.850 af n=0.040 L=405.0' S=0.0034 '/' Capacity=46.28 cfs Outflow=5.39 cfs 0.841 af

Reach 21R: Existing Stream Channel Avg. Flow Depth=0.01' Max Vel=0.26 fps Inflow=0.02 cfs 0.009 af n=0.040 L=765.0' S=0.0092 '/' Capacity=76.21 cfs Outflow=0.02 cfs 0.008 af

Reach WAP 1: Water Analysis Point 1 Inflow=31.48 cfs 5.237 af
Outflow=31.48 cfs 5.237 af

Pond 1P: Proposed 15" Culvert Peak Elev=239.84' Inflow=2.72 cfs 0.249 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=2.72 cfs 0.249 af

Pond 2P: Stone Berm Spreader Peak Elev=240.47' Storage=4,303 cf Inflow=1.92 cfs 0.152 af
Outflow=0.23 cfs 0.054 af

Pond 3P: UGF #1 Peak Elev=240.09' Storage=6,983 cf Inflow=2.34 cfs 0.160 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Outlet structure for UGF #1 Peak Elev=237.19' Inflow=1.85 cfs 0.418 af
18.0" Round Culvert n=0.013 L=197.0' S=0.0051 '/' Outflow=1.85 cfs 0.418 af

Pond 5P: New 4' catch basin Peak Elev=240.16' Inflow=1.85 cfs 0.418 af
15.0" Round Culvert n=0.013 L=200.0' S=0.0145 '/' Outflow=1.85 cfs 0.418 af

Pond 6P: Stevens Mill Rd X-Culvert Peak Elev=240.81' Inflow=1.85 cfs 0.418 af
15.0" Round Culvert n=0.025 L=32.0' S=0.0106 '/' Outflow=1.85 cfs 0.418 af

Pond 7P: Driveway culvert Peak Elev=241.26' Inflow=1.85 cfs 0.418 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0061 '/' Outflow=1.85 cfs 0.418 af

Pond 8P: Driveway culvert Peak Elev=242.41' Inflow=1.85 cfs 0.419 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0093 '/' Outflow=1.85 cfs 0.419 af

Pond 9P: Sprucewood Rd Culvert Peak Elev=244.89' Inflow=0.95 cfs 0.165 af
18.0" Round Culvert n=0.025 L=48.0' S=0.0262 '/' Outflow=0.95 cfs 0.165 af

Pond 10P: Proposed 15" Culvert Peak Elev=240.22' Inflow=3.95 cfs 0.528 af
15.0" Round Culvert n=0.013 L=65.0' S=0.0031 '/' Outflow=3.95 cfs 0.528 af

Pond 11P: UGF #2 Peak Elev=239.48' Storage=13,155 cf Inflow=5.49 cfs 0.842 af
Outflow=4.64 cfs 0.578 af

Pond 12P: UGF #3 Peak Elev=229.37' Storage=3,104 cf Inflow=1.23 cfs 0.071 af
Outflow=0.00 cfs 0.000 af

Pond 13P: UGF #4 Peak Elev=240.66' Storage=3,209 cf Inflow=2.35 cfs 0.181 af
Outflow=2.02 cfs 0.115 af

Pond 14P: Storage within field Peak Elev=243.05' Storage=3,496 cf Inflow=5.48 cfs 0.373 af
Discarded=0.94 cfs 0.353 af Primary=0.60 cfs 0.019 af Outflow=1.54 cfs 0.372 af

Pond 15P: Storage within field Peak Elev=243.05' Storage=3,496 cf Inflow=5.48 cfs 0.373 af
Discarded=0.94 cfs 0.353 af Primary=0.60 cfs 0.019 af Outflow=1.54 cfs 0.372 af

Pond 16P: Storage within field

Peak Elev=235.63' Storage=4,802 cfs Inflow=17.34 cfs 1.124 af

Discarded=5.98 cfs 1.052 af Primary=1.23 cfs 0.071 af Outflow=7.22 cfs 1.123 af

Pond 17P: New 36" Culvert

Peak Elev=235.44' Inflow=1.16 cfs 0.118 af

36.0" Round Culvert n=0.020 L=50.0' S=0.0200 '/' Outflow=1.16 cfs 0.118 af

Pond 18P: New 12" Culvert

Peak Elev=233.64' Inflow=0.35 cfs 0.041 af

12.0" Round Culvert n=0.013 L=81.0' S=0.0031 '/' Outflow=0.35 cfs 0.041 af

Total Runoff Area = 38.903 ac Runoff Volume = 7.743 af Average Runoff Depth = 2.39"
80.26% Pervious = 31.224 ac 19.74% Impervious = 7.679 ac

Summary for Subcatchment P1: Post 1

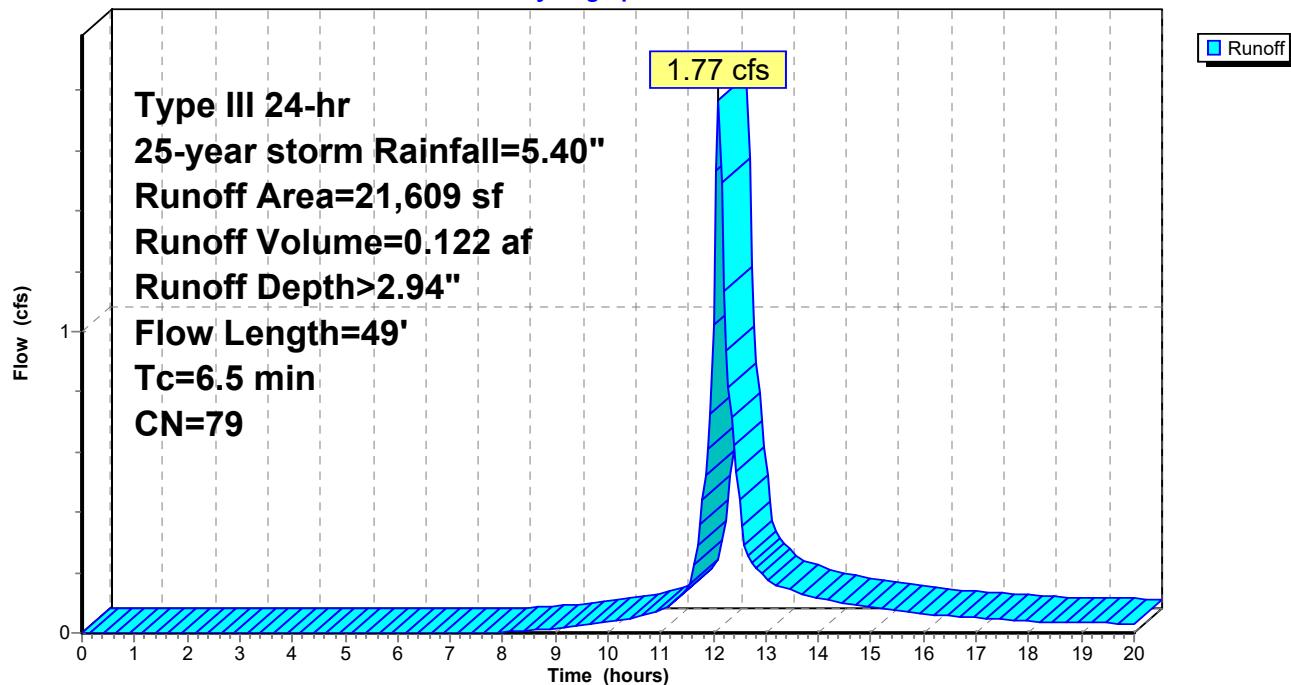
Runoff = 1.77 cfs @ 12.10 hrs, Volume= 0.122 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description		
4,457	98	Paved parking, HSG C		
17,152	74	>75% Grass cover, Good, HSG C		
21,609	79	Weighted Average		
17,152		79.37% Pervious Area		
4,457		20.63% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
0.3	14	0.0208	0.91	Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
6.2	35	0.0630	0.09	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
6.5	49	Total		

Subcatchment P1: Post 1

Hydrograph



Summary for Subcatchment P10: (new Subcat)

Runoff = 1.16 cfs @ 12.31 hrs, Volume= 0.118 af, Depth> 1.68"

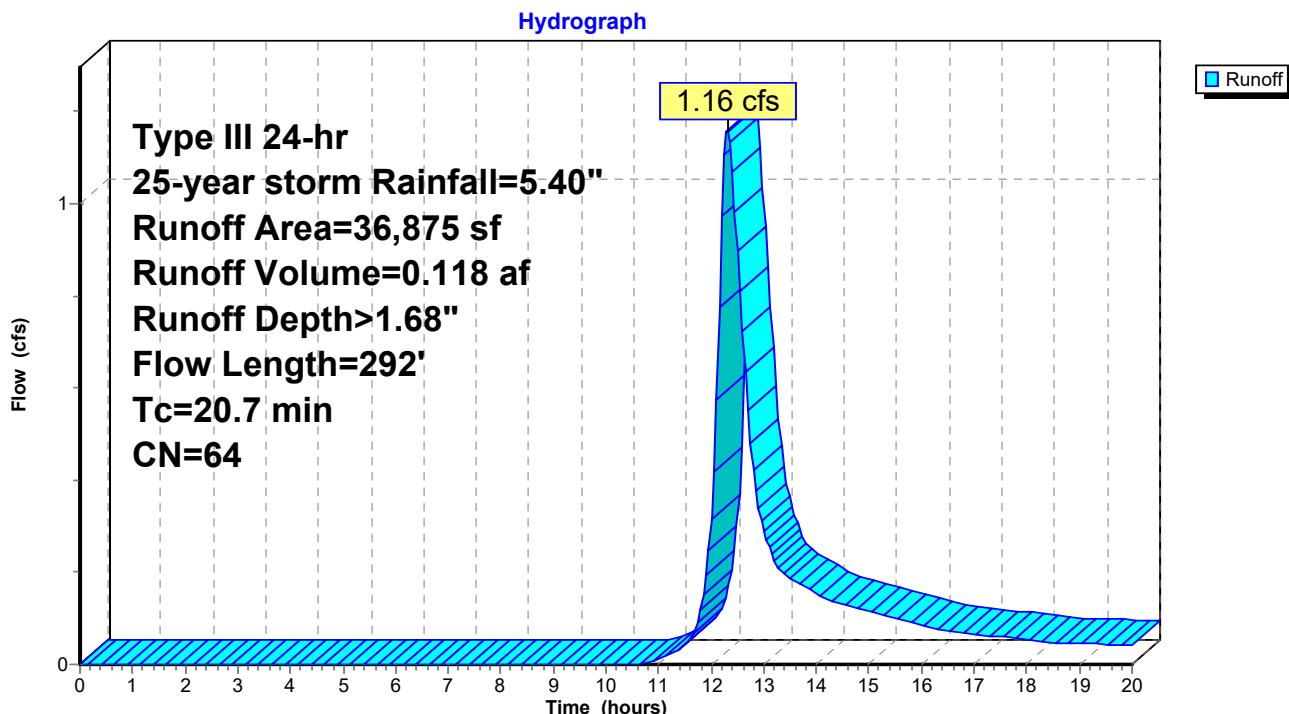
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
11,265	39	>75% Grass cover, Good, HSG A
485	30	Woods, Good, HSG A
22,159	74	>75% Grass cover, Good, HSG C
2,966	96	Gravel surface, HSG C
36,875	64	Weighted Average
36,875		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
19.5	120	0.0420	0.10		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
1.2	172	0.0259	2.41		Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps

20.7 292 Total

Subcatchment P10: (new Subcat)



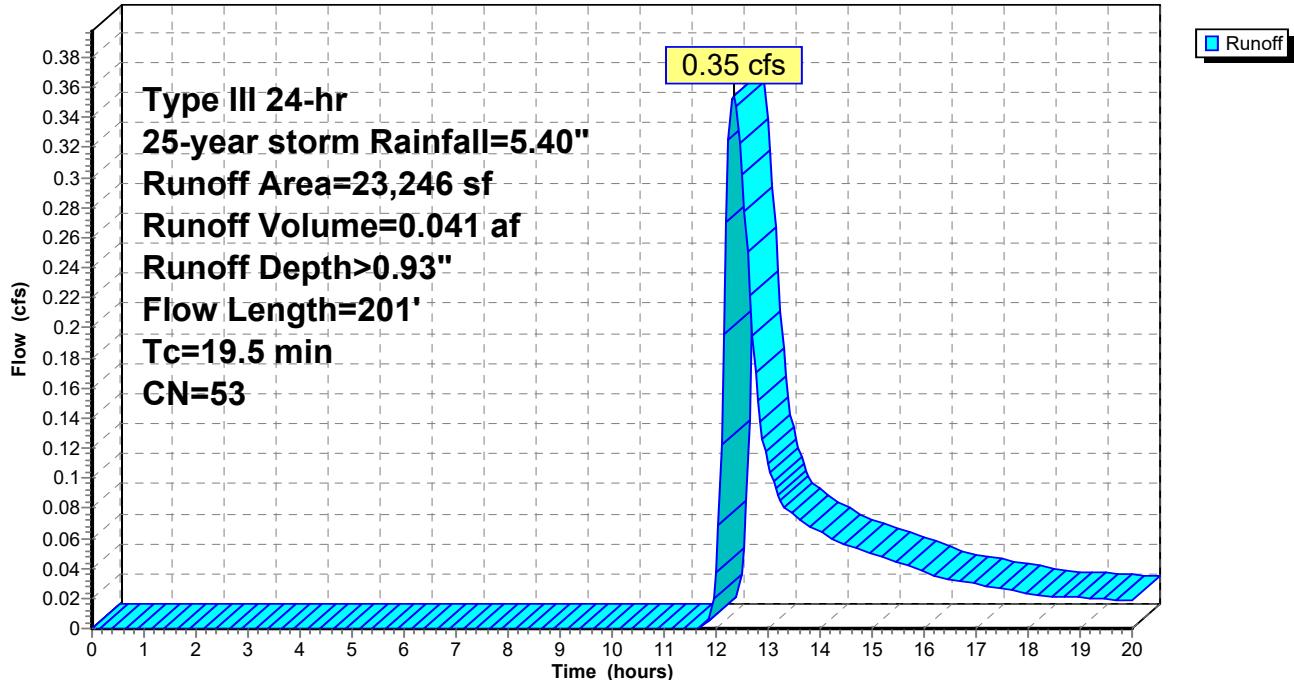
Summary for Subcatchment P11: Post 11

Runoff = 0.35 cfs @ 12.33 hrs, Volume= 0.041 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
16,150	39	>75% Grass cover, Good, HSG A
143	30	Woods, Good, HSG A
2,251	74	>75% Grass cover, Good, HSG C
2,564	96	Gravel surface, HSG C
1,325	80	>75% Grass cover, Good, HSG D
110	98	Paved parking, HSG D
703	96	Gravel surface, HSG D
23,246	53	Weighted Average
23,136		99.53% Pervious Area
110		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	60	0.0200	0.07		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
4.2	32	0.1410	0.13		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
0.3	72	0.0140	4.28	17.10	Parabolic Channel, Vegetated Channel W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.030 Earth, grassed & winding
0.0	37	0.0810	14.75	118.03	Parabolic Channel, Vegetated channel W=6.00' D=2.00' Area=8.0 sf Perim=7.5' n= 0.030 Earth, grassed & winding
19.5	201	Total			

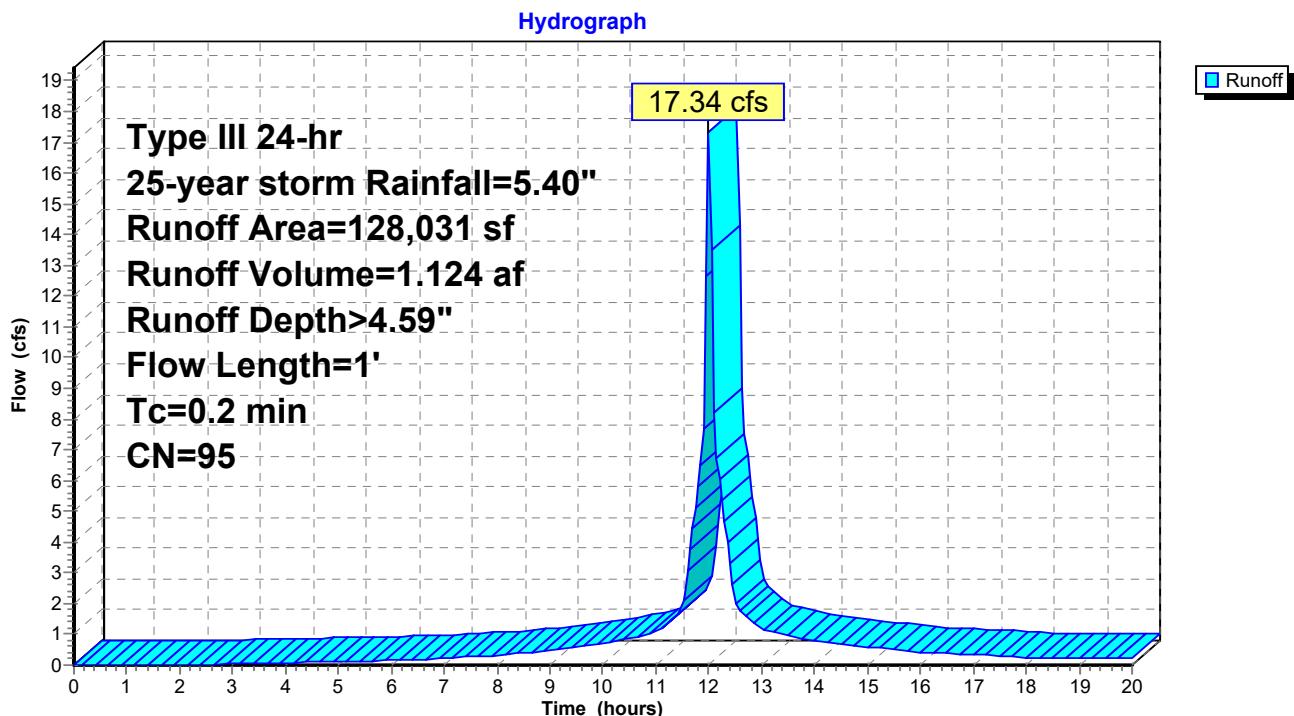
Subcatchment P11: Post 11**Hydrograph**

Summary for Subcatchment P12: Post 12

Runoff = 17.34 cfs @ 12.00 hrs, Volume= 1.124 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description			
866	39	>75% Grass cover, Good, HSG A			
*	48,875	New Turf field, HSG A			
11,665	74	>75% Grass cover, Good, HSG C			
*	62,734	New Turf Field, HSG C			
3,891	98	Paved parking, HSG C			
128,031	95	Weighted Average			
12,531		9.79% Pervious Area			
115,500		90.21% Impervious Area			
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
0.2	1		0.10		Direct Entry, Flow through Turf

Subcatchment P12: Post 12

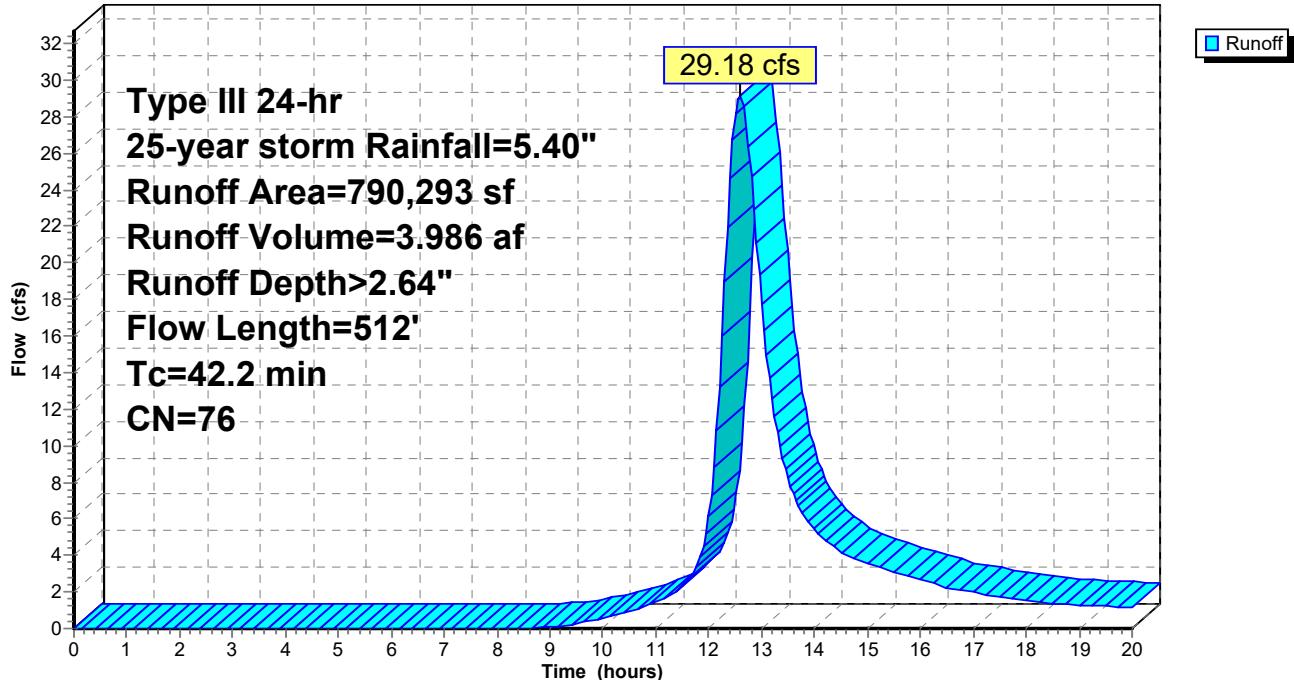
Summary for Subcatchment P13: Post Sub 13

Runoff = 29.18 cfs @ 12.59 hrs, Volume= 3.986 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
8,456	80	>75% Grass cover, Good, HSG D
1,440	96	Gravel surface, HSG D
85,560	78	Meadow, non-grazed, HSG D
546,270	77	Woods, Good, HSG D
17,074	74	>75% Grass cover, Good, HSG C
367	98	Paved parking, HSG C
2,503	96	Gravel surface, HSG C
41,424	71	Meadow, non-grazed, HSG C
83,580	70	Woods, Good, HSG C
3,619	98	Paved parking, HSG C
790,293	76	Weighted Average
786,307		99.50% Pervious Area
3,986		0.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0313	1.02		Sheet Flow, New Access Road Smooth surfaces n= 0.011 P2= 3.00"
1.1	3	0.0313	0.04		Sheet Flow, Grass Esplenade Grass: Bermuda n= 0.410 P2= 3.00"
0.1	5	0.0313	0.88		Sheet Flow, walkway Smooth surfaces n= 0.011 P2= 3.00"
28.7	131	0.0180	0.08		Sheet Flow, wooded/wetland Woods: Light underbrush n= 0.400 P2= 3.00"
12.1	362	0.0100	0.50		Shallow Concentrated Flow, woodland Woodland Kv= 5.0 fps
42.2	512	Total			

Subcatchment P13: Post Sub 13**Hydrograph**

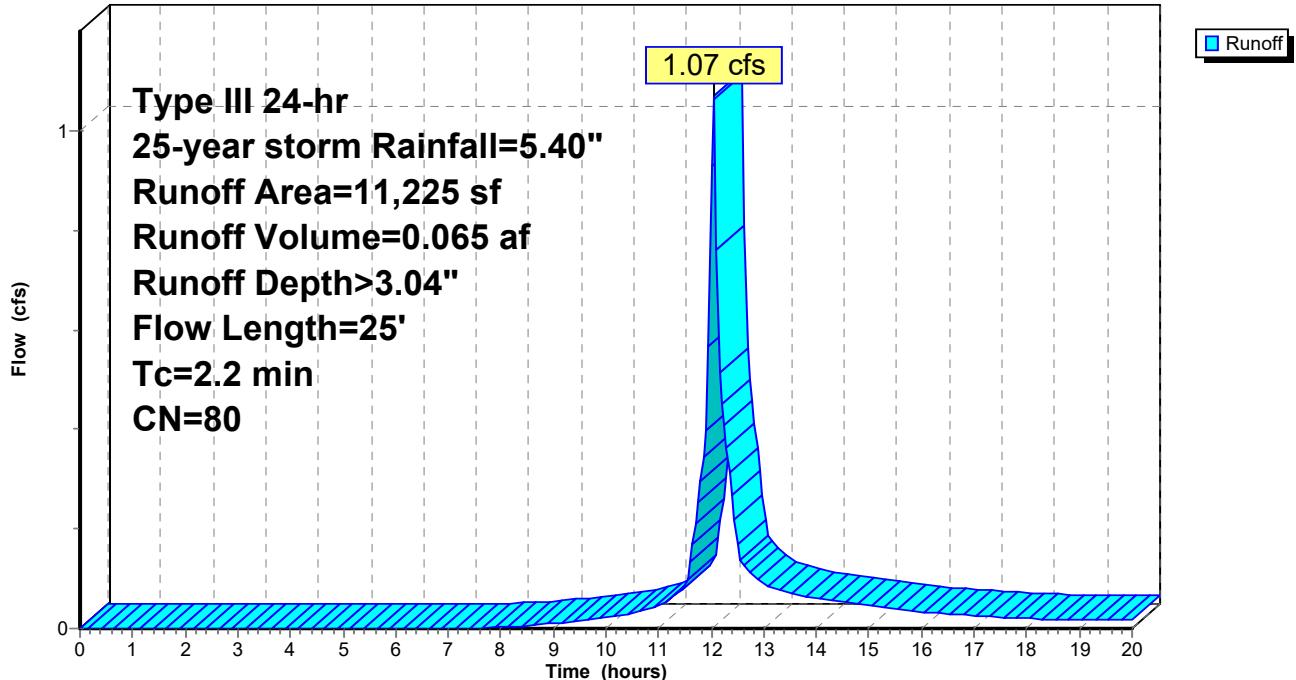
Summary for Subcatchment P14: Post 14

Runoff = 1.07 cfs @ 12.04 hrs, Volume= 0.065 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
7,811	74	>75% Grass cover, Good, HSG C
14	98	Paved parking, HSG C
3,289	96	Gravel surface, HSG C
111	71	Meadow, non-grazed, HSG C
11,225	80	Weighted Average
11,211		99.88% Pervious Area
14		0.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0310	1.02		Sheet Flow, New Road Smooth surfaces n= 0.011 P2= 3.00"
1.1	3	0.0310	0.04		Sheet Flow, Esplanade Grass: Bermuda n= 0.410 P2= 3.00"
0.1	5	0.0310	0.87		Sheet Flow, New Walkway Smooth surfaces n= 0.011 P2= 3.00"
0.8	6	0.3333	0.13		Sheet Flow, Road Slope Grass: Bermuda n= 0.410 P2= 3.00"
2.2	25	Total			

Subcatchment P14: Post 14**Hydrograph**

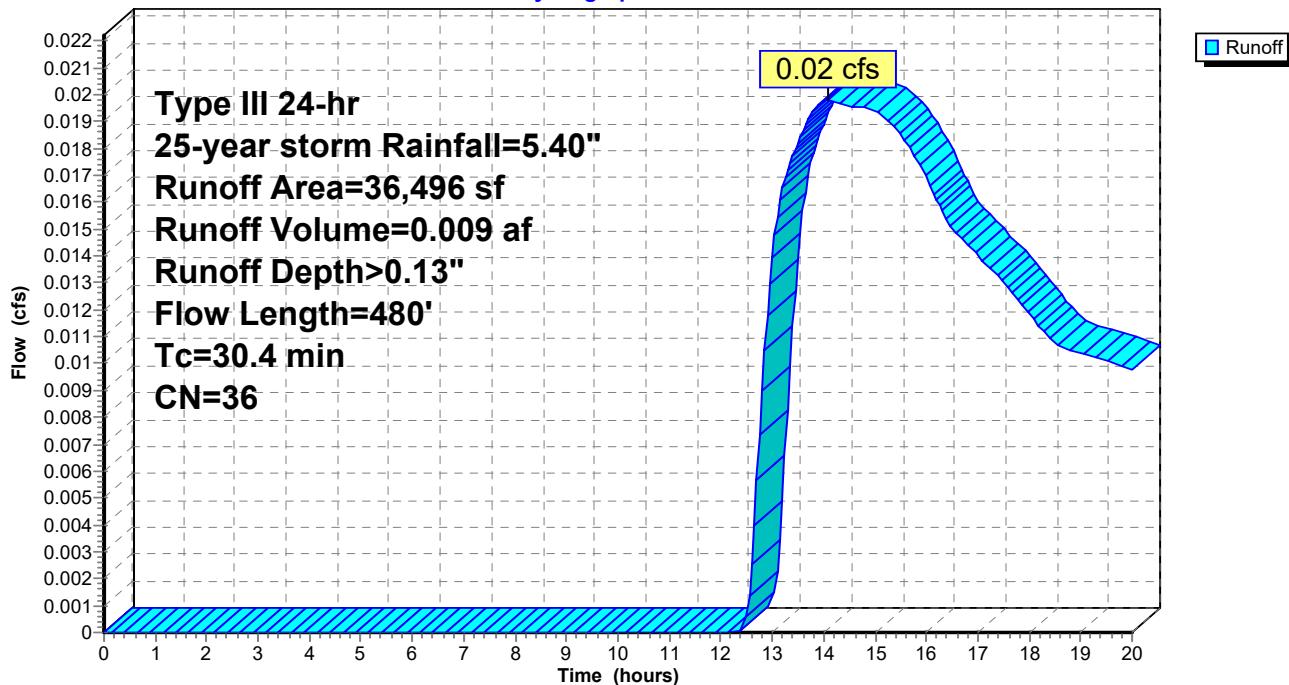
Summary for Subcatchment P15: Post 15

Runoff = 0.02 cfs @ 14.10 hrs, Volume= 0.009 af, Depth> 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
1,075	39	>75% Grass cover, Good, HSG A
31,275	30	Woods, Good, HSG A
179	80	>75% Grass cover, Good, HSG D
3,967	77	Woods, Good, HSG D
36,496	36	Weighted Average
36,496		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	150	0.0350	0.10		Sheet Flow, woods Woods: Light underbrush n= 0.400 P2= 3.00"
5.5	290	0.0310	0.88		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
0.4	40	0.1000	1.58		Shallow Concentrated Flow, Wooded Woodland Kv= 5.0 fps
30.4	480	Total			

Subcatchment P15: Post 15**Hydrograph**

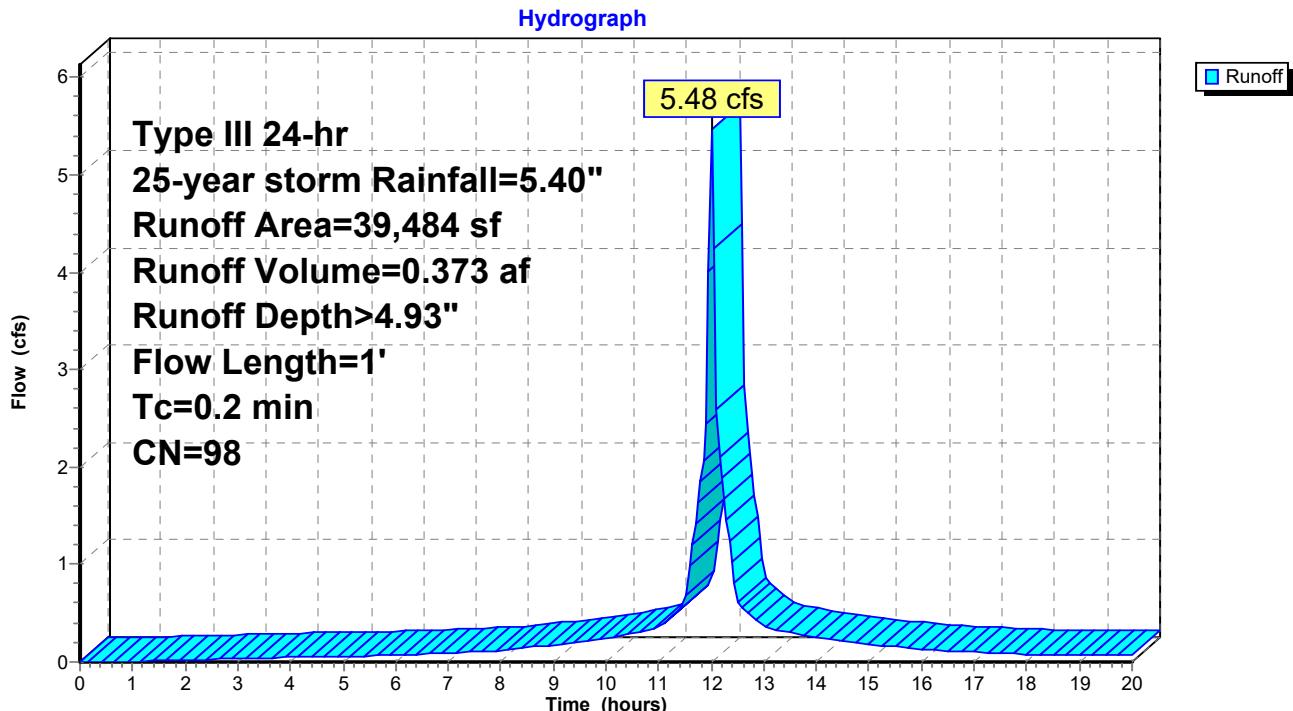
Summary for Subcatchment P2: Post 2

Runoff = 5.48 cfs @ 12.00 hrs, Volume= 0.373 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
* 39,484	98	Turf Field, HSG C
39,484		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
0.2	1		0.10		Direct Entry, Flow through Turf Field

Subcatchment P2: Post 2

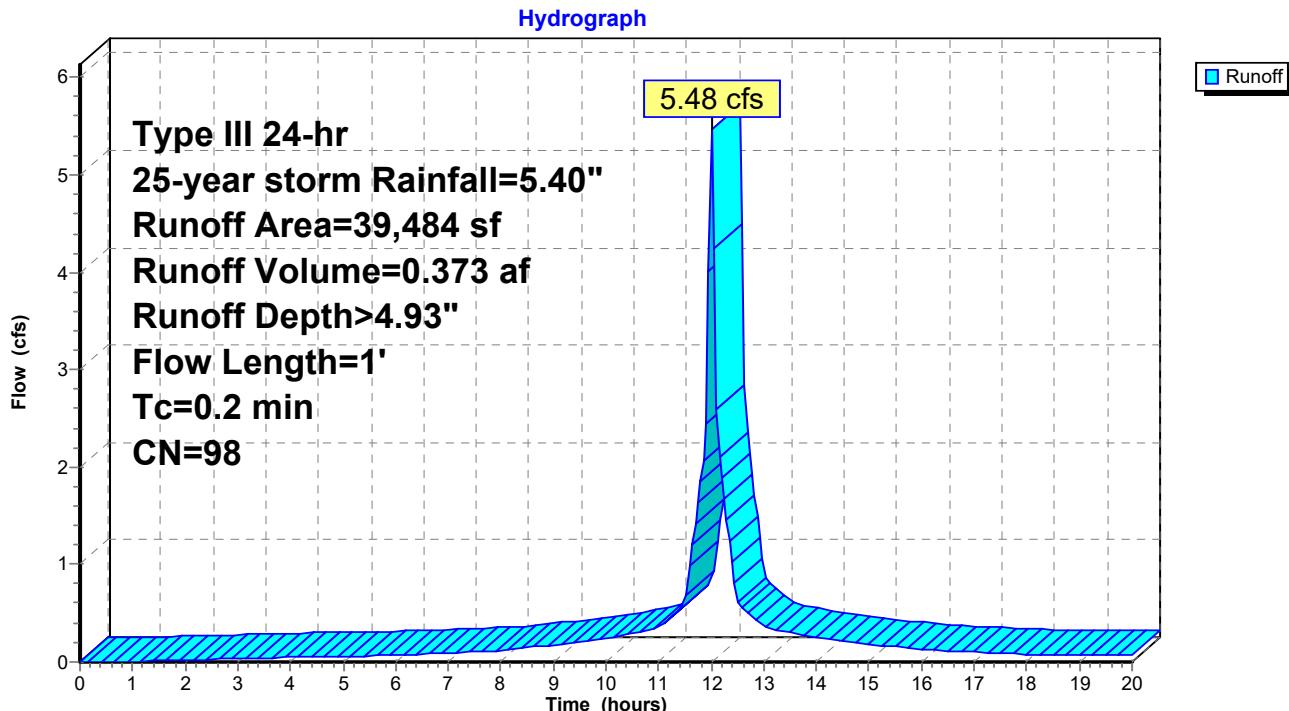
Summary for Subcatchment P3: Post 3

Runoff = 5.48 cfs @ 12.00 hrs, Volume= 0.373 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
* 39,484	98	New Turf Field, HSG C
39,484		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
0.2	1		0.10		Direct Entry, Flow through Turf

Subcatchment P3: Post 3

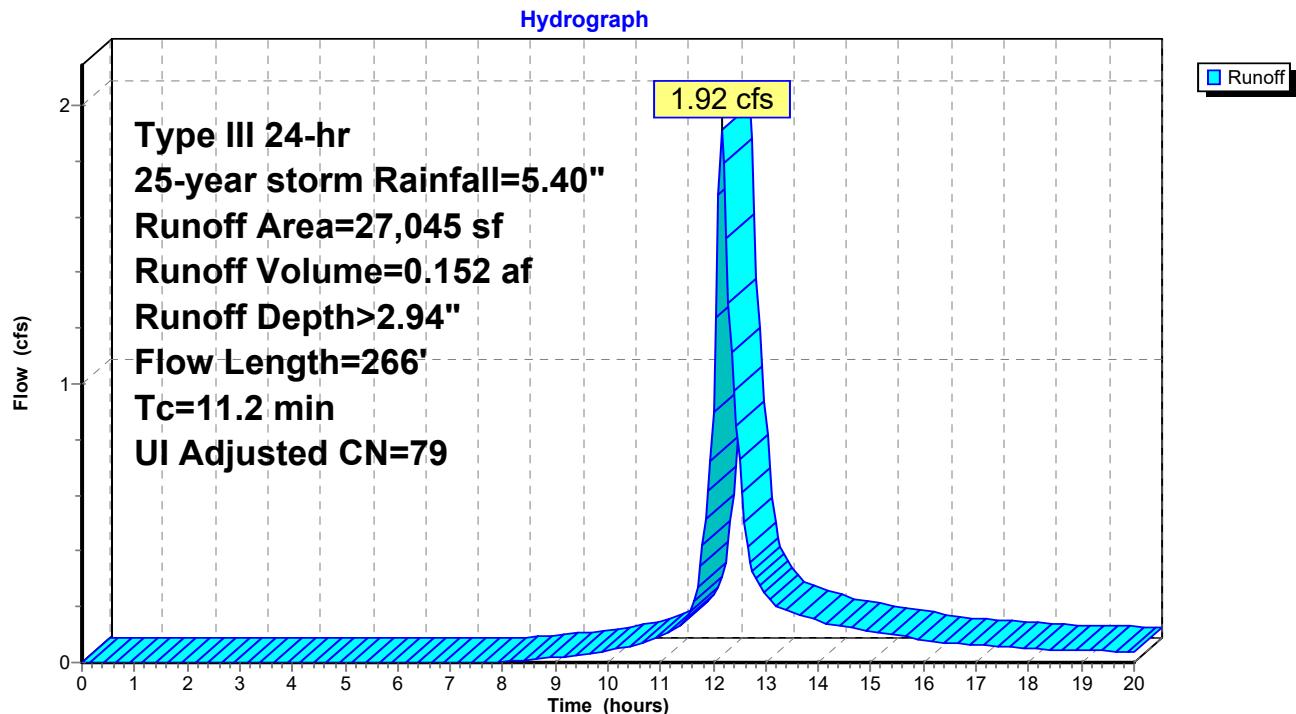
Summary for Subcatchment P4: Post 4

Runoff = 1.92 cfs @ 12.16 hrs, Volume= 0.152 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Adj	Description
4,305	98		Paved parking, HSG C
859	98		Paved parking, HSG C
1,425	98		Unconnected roofs, HSG C
20,456	74		>75% Grass cover, Good, HSG C
27,045	80	79	Weighted Average, UI Adjusted
20,456			75.64% Pervious Area
6,589			24.36% Impervious Area
1,425			21.63% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
9.9	40	0.0250	0.07		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
1.0	212	0.0127	3.46	13.85	Parabolic Channel, Vegetated swale W=8.00' D=0.75' Area=4.0 sf Perim=8.2' n= 0.030 Earth, grassed & winding
11.2	266	Total			

Subcatchment P4: Post 4

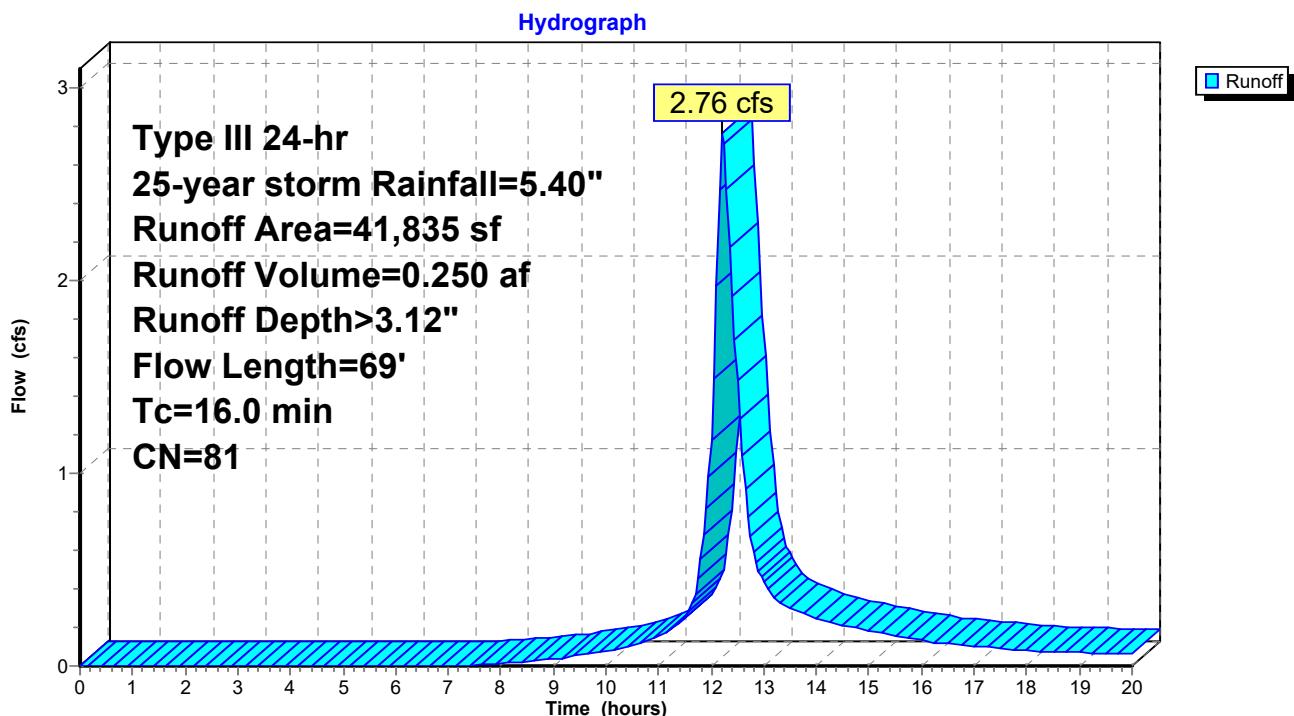
Summary for Subcatchment P5: Post 5

Runoff = 2.76 cfs @ 12.22 hrs, Volume= 0.250 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
12,571	98	Paved parking, HSG C
11,876	74	>75% Grass cover, Good, HSG C
1,947	96	Gravel surface, HSG C
15,441	70	Woods, Good, HSG C
41,835	81	Weighted Average
29,264		69.95% Pervious Area
12,571		30.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
15.7	55	0.0150	0.06		Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
16.0	69	Total			

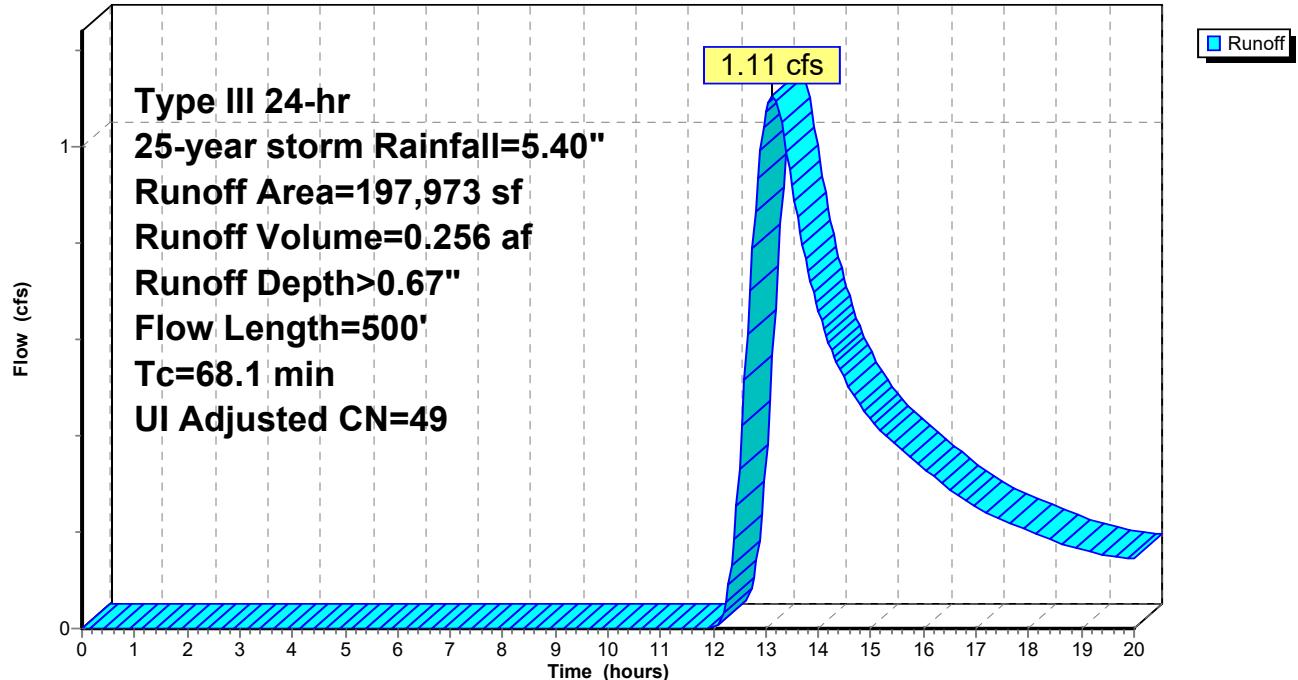
Subcatchment P5: Post 5

Summary for Subcatchment P6: Post 6

Runoff = 1.11 cfs @ 13.12 hrs, Volume= 0.256 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Adj	Description	
8,288	92		Paved roads w/open ditches, 50% imp, HSG C	
7,140	83		Paved roads w/open ditches, 50% imp, HSG A	
471	98		Unconnected pavement, HSG C	
7,007	98		Unconnected pavement, HSG C	
10,292	98		Unconnected pavement, HSG A	
101,459	30		Woods, Good, HSG A	
54,560	70		Woods, Good, HSG C	
8,756	30		Woods, Good, HSG A	
197,973	52	49	Weighted Average, UI Adjusted	
172,489			87.13% Pervious Area	
25,484			12.87% Impervious Area	
17,770			69.73% Unconnected	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	
Capacity (cfs)	Description			
4.4	30	0.1050	0.11	Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
27.9	65	0.0050	0.04	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
23.9	55	0.0050	0.04	Sheet Flow, Woods - Good Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	240	0.0050	0.35	Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.6	110	0.0440	3.15	Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
68.1	500	Total		

Subcatchment P6: Post 6**Hydrograph**

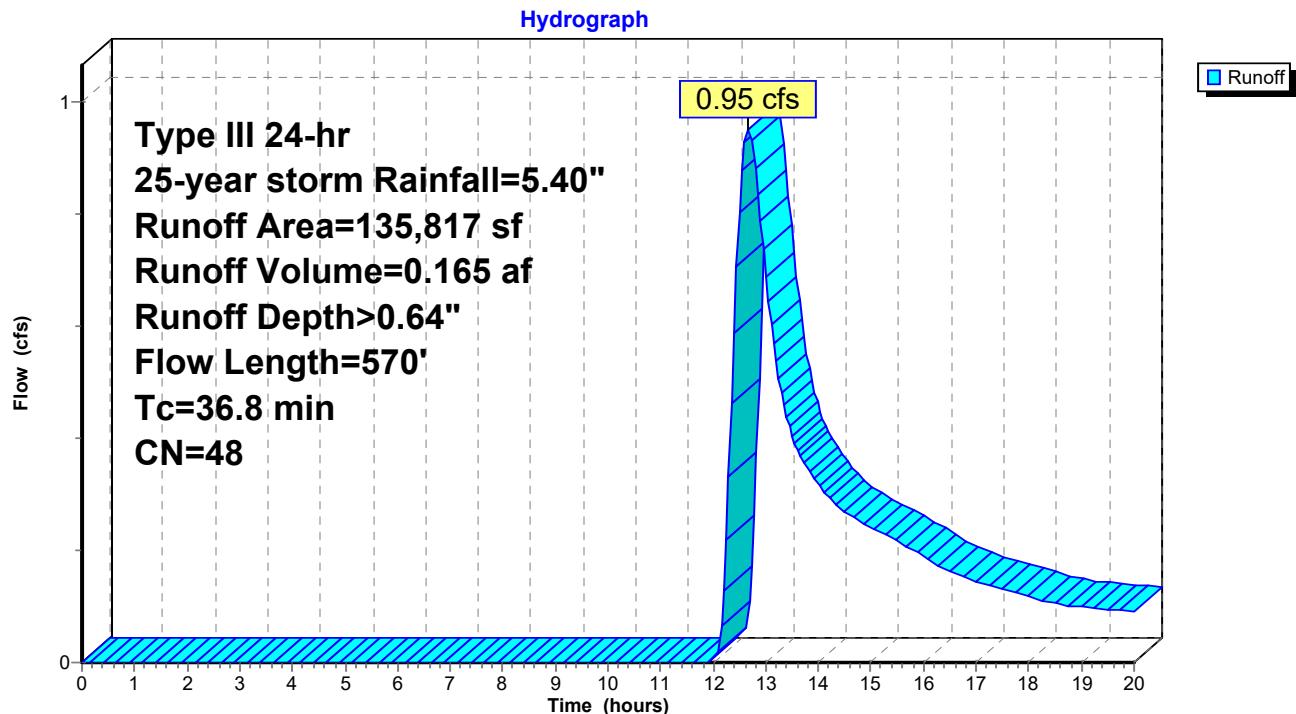
Summary for Subcatchment P7: Post 7

Runoff = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
10,242	83	Paved roads w/open ditches, 50% imp, HSG A
20,828	98	Paved parking, HSG A
7,787	98	Paved parking, HSG A
88,183	30	Woods, Good, HSG A
8,635	30	Woods, Good, HSG A
142	30	Woods, Good, HSG A
135,817	48	Weighted Average
102,081		75.16% Pervious Area
33,736		24.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0710	0.11		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
25.4	100	0.0150	0.07		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.2	205	0.0190	1.56	62.50	Parabolic Channel, Existing Wooded channel W=60.00' D=1.00' Area=40.0 sf Perim=60.0' n= 0.100 Heavy timber, flow below branches
0.8	100	0.0125	2.01	3.35	Parabolic Channel, lawn drainage swale W=10.00' D=0.25' Area=1.7 sf Perim=10.0' n= 0.025 Earth, clean & winding
0.6	115	0.0100	3.10	12.39	Parabolic Channel, Sprucewood Road ditch W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.035 Earth, dense weeds
36.8	570	Total			

Subcatchment P7: Post 7

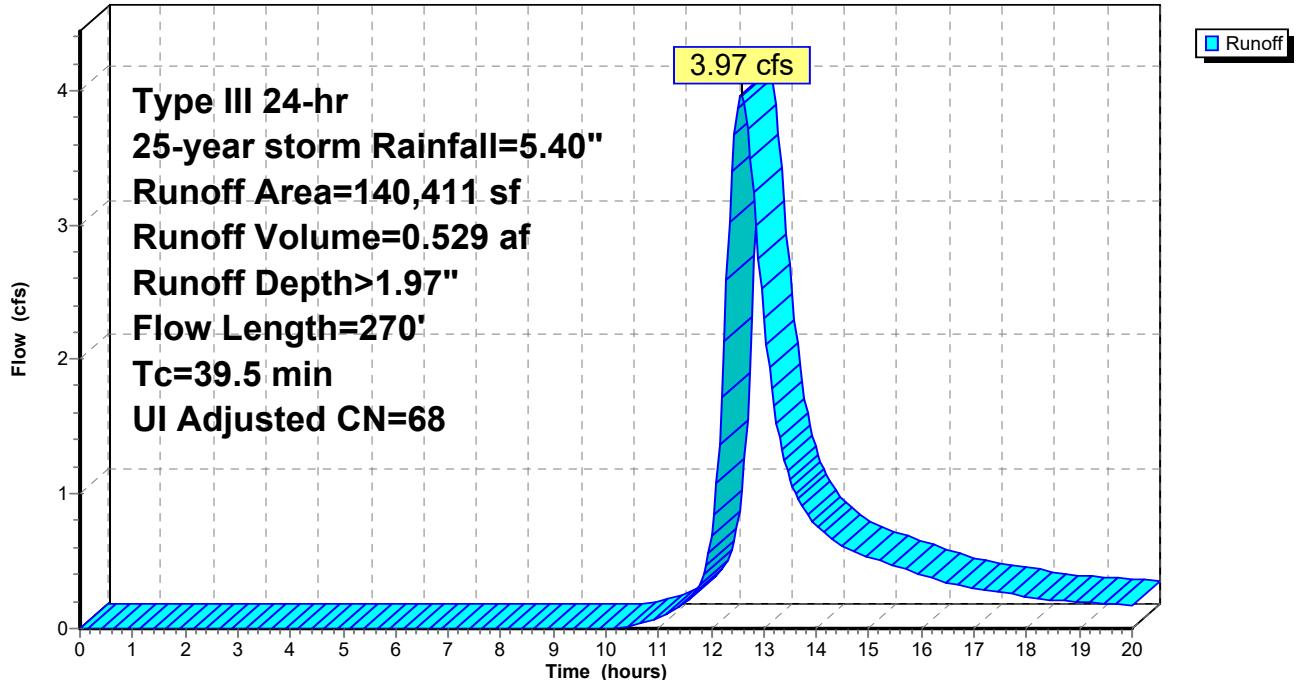
Summary for Subcatchment P8: Post 8

Runoff = 3.97 cfs @ 12.58 hrs, Volume= 0.529 af, Depth> 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Adj	Description
7,015	30		Woods, Good, HSG A
4,423	98		Unconnected roofs, HSG A
11,991	98		Paved parking, HSG A
34,364	39		>75% Grass cover, Good, HSG A
9,643	74		>75% Grass cover, Good, HSG C
16,990	98		Paved parking, HSG C
30,169	70		Woods, Good, HSG C
2,818	98		Roofs, HSG C
1,168	98		Paved parking, HSG C
21,830	74		>75% Grass cover, Good, HSG C
140,411	69	68	Weighted Average, UI Adjusted
103,021			73.37% Pervious Area
37,390			26.63% Impervious Area
4,423			11.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
36.7	136	0.0110	0.06		Sheet Flow, Offsite lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.5	100	0.0180	0.67		Shallow Concentrated Flow, wooded Woodland Kv= 5.0 fps
0.0	20	0.3330	8.66		Shallow Concentrated Flow, lawn Grassed Waterway Kv= 15.0 fps
39.5	270	Total			

Subcatchment P8: Post 8**Hydrograph**

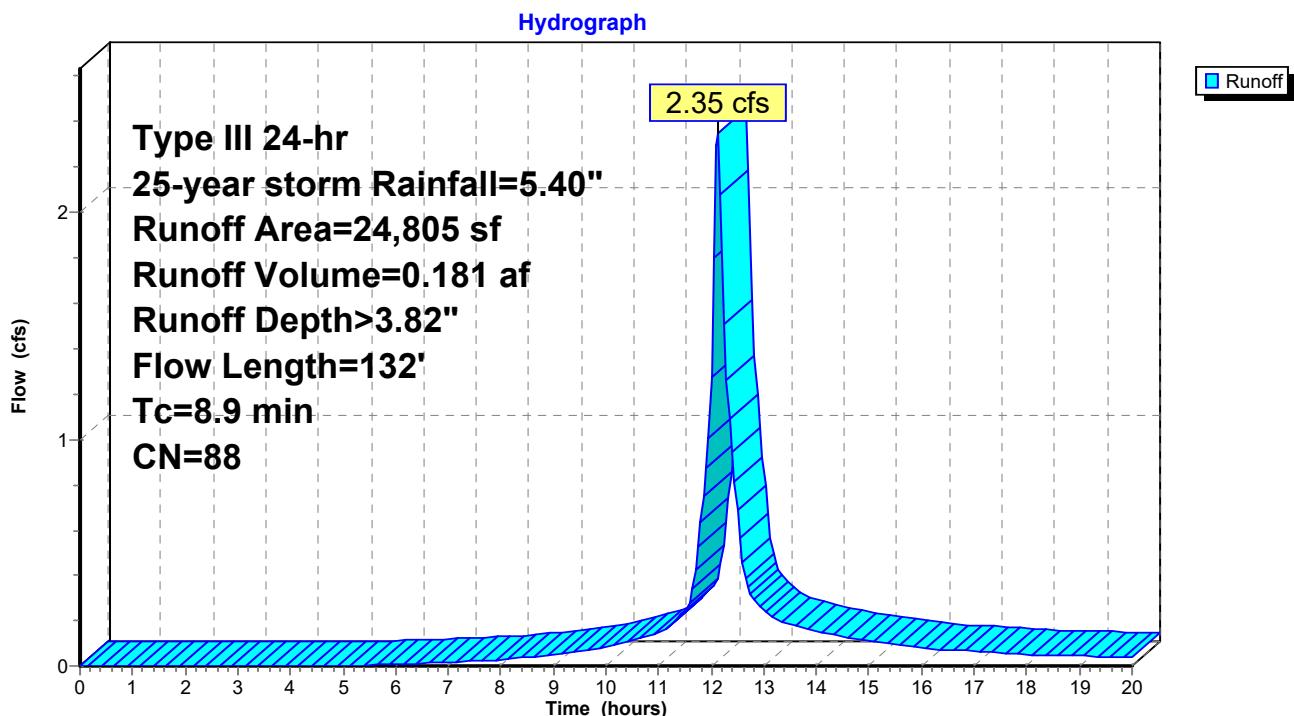
Summary for Subcatchment P9: Post 9

Runoff = 2.35 cfs @ 12.12 hrs, Volume= 0.181 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
2,474	74	>75% Grass cover, Good, HSG C
15,707	98	Water Surface, HSG C
6,288	71	Meadow, non-grazed, HSG C
336	70	Woods, Good, HSG C
24,805	88	Weighted Average
9,098		36.68% Pervious Area
15,707		63.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	72	0.0500	1.80		Sheet Flow, New gravel parking area Smooth surfaces n= 0.011 P2= 3.00"
8.2	60	0.0900	0.12		Sheet Flow, Lawn Area Grass: Bermuda n= 0.410 P2= 3.00"
8.9	132	Total			

Subcatchment P9: Post 9

Summary for Reach 1R: Ditch along p-lot

Inflow Area = 0.960 ac, 30.05% Impervious, Inflow Depth > 3.12" for 25-year storm event

Inflow = 2.76 cfs @ 12.22 hrs, Volume= 0.250 af

Outflow = 2.72 cfs @ 12.25 hrs, Volume= 0.249 af, Atten= 1%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.38 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 0.94 fps, Avg. Travel Time= 2.3 min

Peak Storage= 150 cf @ 12.23 hrs

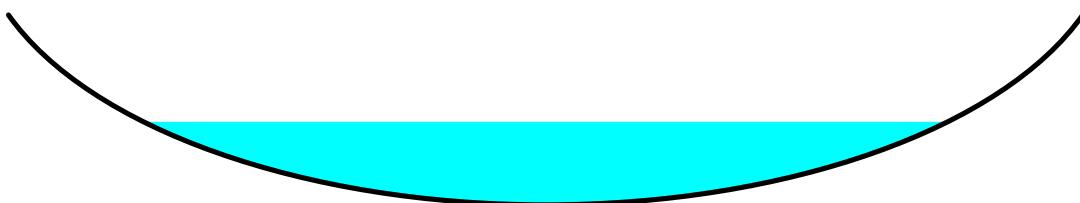
Average Depth at Peak Storage= 0.44', Surface Width= 3.96'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 16.19 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

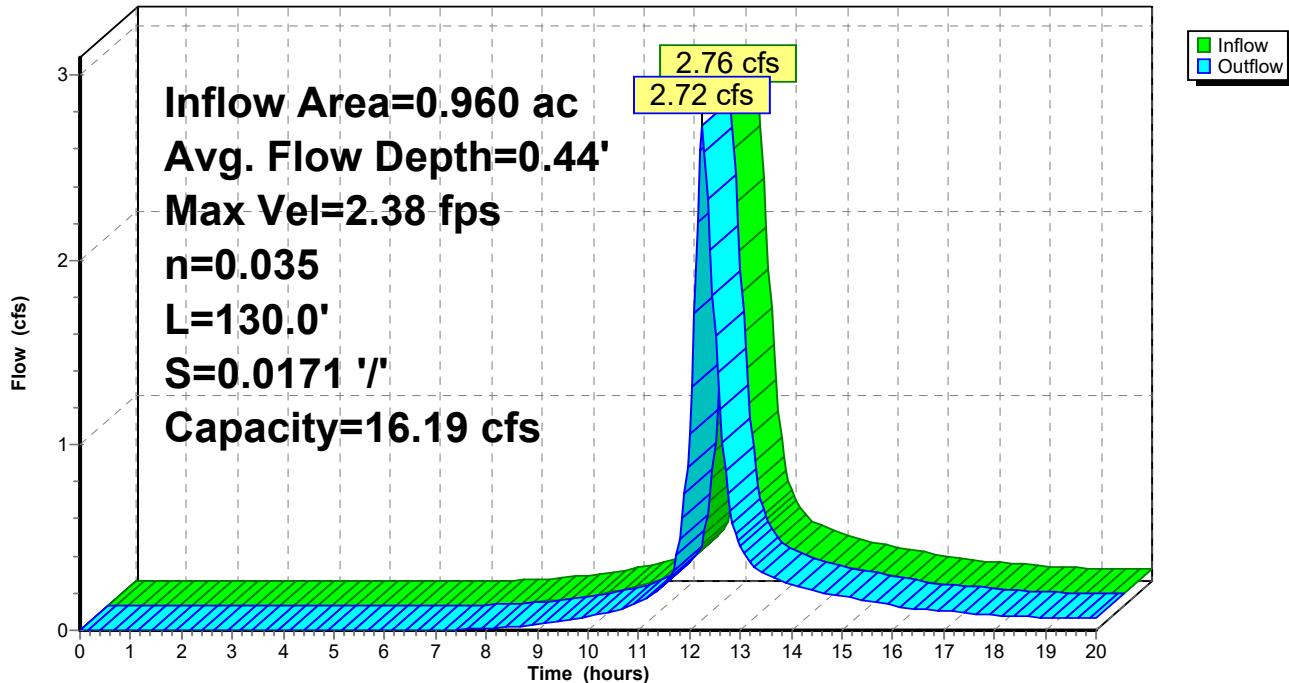
Length= 130.0' Slope= 0.0171 '/'

Inlet Invert= 241.22', Outlet Invert= 239.00'



Reach 1R: Ditch along p-lot

Hydrograph



Summary for Reach 2R: Wooded buffer

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 1.05" for 25-year storm event

Inflow = 0.23 cfs @ 13.08 hrs, Volume= 0.054 af

Outflow = 0.18 cfs @ 14.03 hrs, Volume= 0.051 af, Atten= 22%, Lag= 57.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.08 fps, Min. Travel Time= 22.0 min

Avg. Velocity = 0.06 fps, Avg. Travel Time= 29.4 min

Peak Storage= 233 cf @ 13.66 hrs

Average Depth at Peak Storage= 0.07' , Surface Width= 36.96'

Bank-Full Depth= 0.30' Flow Area= 13.5 sf, Capacity= 2.38 cfs

30.00' x 0.30' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 50.0 '/' Top Width= 60.00'

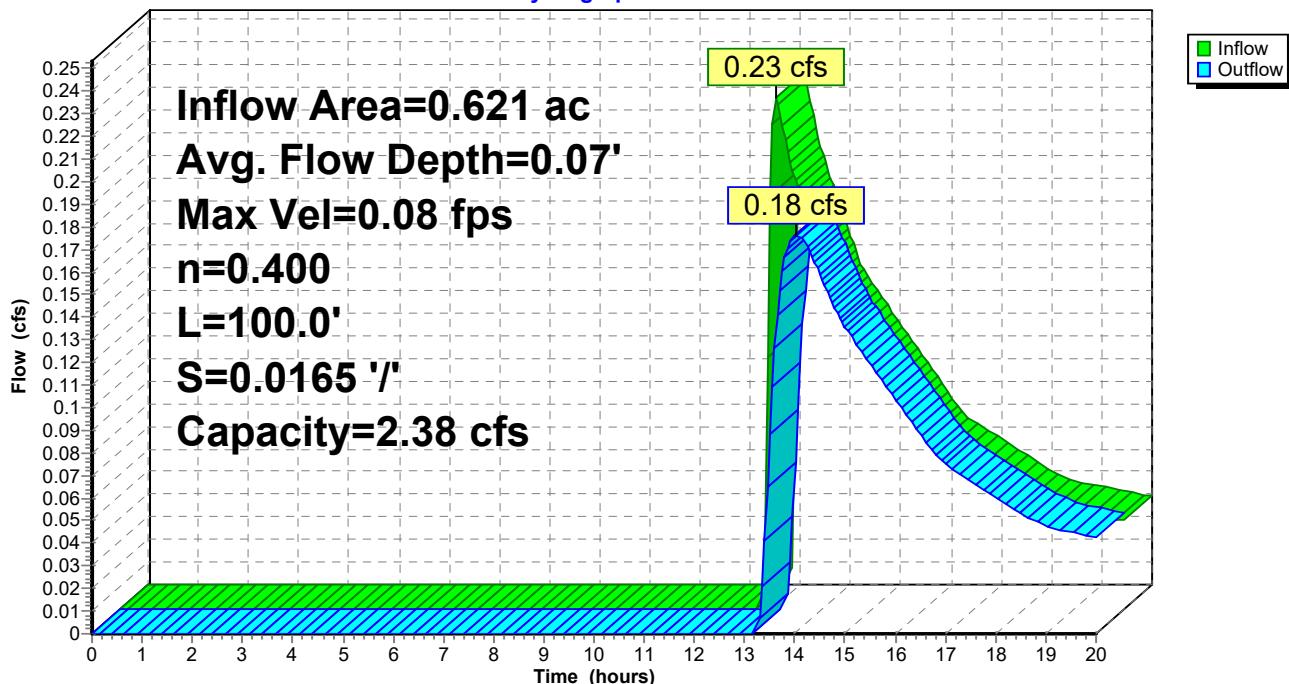
Length= 100.0' Slope= 0.0165 '/'

Inlet Invert= 238.30', Outlet Invert= 236.65'



Reach 2R: Wooded buffer

Hydrograph



Summary for Reach 3R: Downslope of 18" dia. SD plunge pool

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.50" for 25-year storm event

Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Outflow = 1.76 cfs @ 13.37 hrs, Volume= 0.408 af, Atten= 5%, Lag= 23.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.14 fps, Min. Travel Time= 11.5 min

Avg. Velocity = 0.10 fps, Avg. Travel Time= 16.2 min

Peak Storage= 1,216 cf @ 13.17 hrs

Average Depth at Peak Storage= 0.28', Surface Width= 71.35'

Bank-Full Depth= 0.30' Flow Area= 13.5 sf, Capacity= 2.02 cfs

15.00' x 0.30' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 100.0 '/' Top Width= 75.00'

Length= 100.0' Slope= 0.0160 '/'

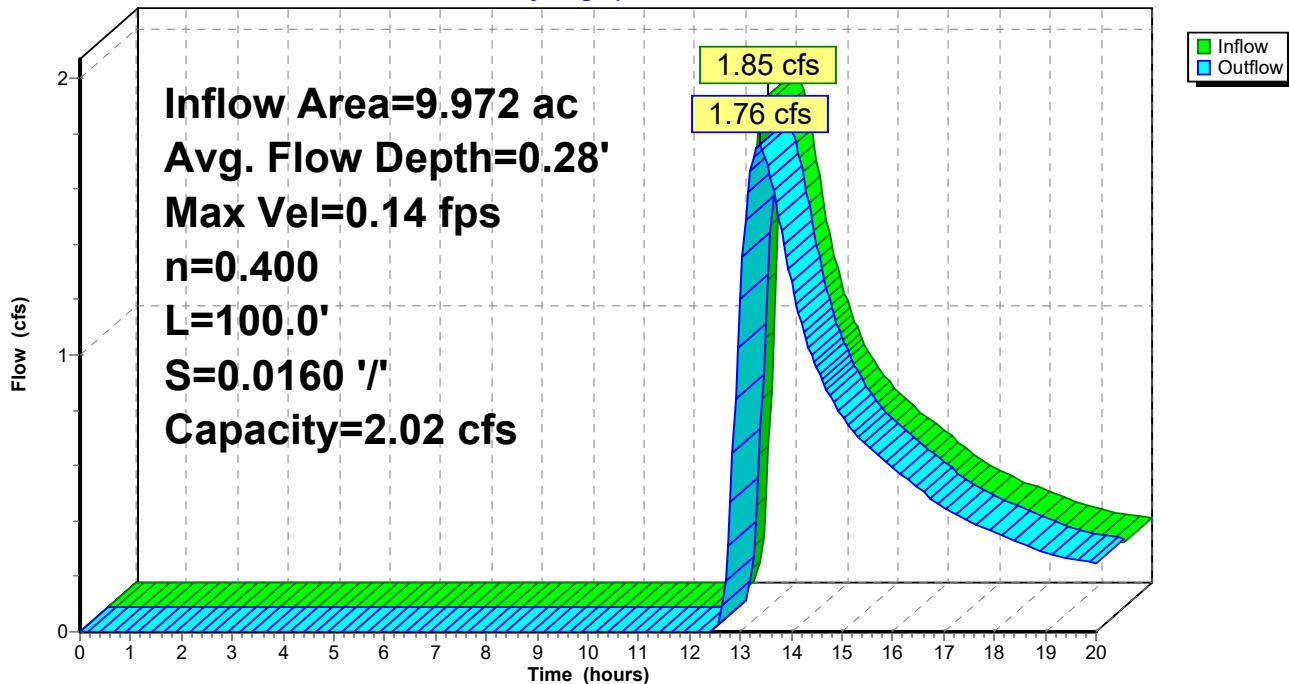
Inlet Invert= 235.50', Outlet Invert= 233.90'



‡

Reach 3R: Downslope of 18" dia. SD plunge pool

Hydrograph



Summary for Reach 4R: Existing Channel

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.49" for 25-year storm event

Inflow = 1.76 cfs @ 13.37 hrs, Volume= 0.408 af

Outflow = 1.74 cfs @ 13.54 hrs, Volume= 0.402 af, Atten= 1%, Lag= 10.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.96 fps, Min. Travel Time= 5.6 min

Avg. Velocity = 0.67 fps, Avg. Travel Time= 8.1 min

Peak Storage= 590 cf @ 13.44 hrs

Average Depth at Peak Storage= 0.08' , Surface Width= 32.05'

Bank-Full Depth= 0.25' Flow Area= 9.2 sf, Capacity= 18.08 cfs

55.00' x 0.25' deep Parabolic Channel, n= 0.025 Earth, clean & winding

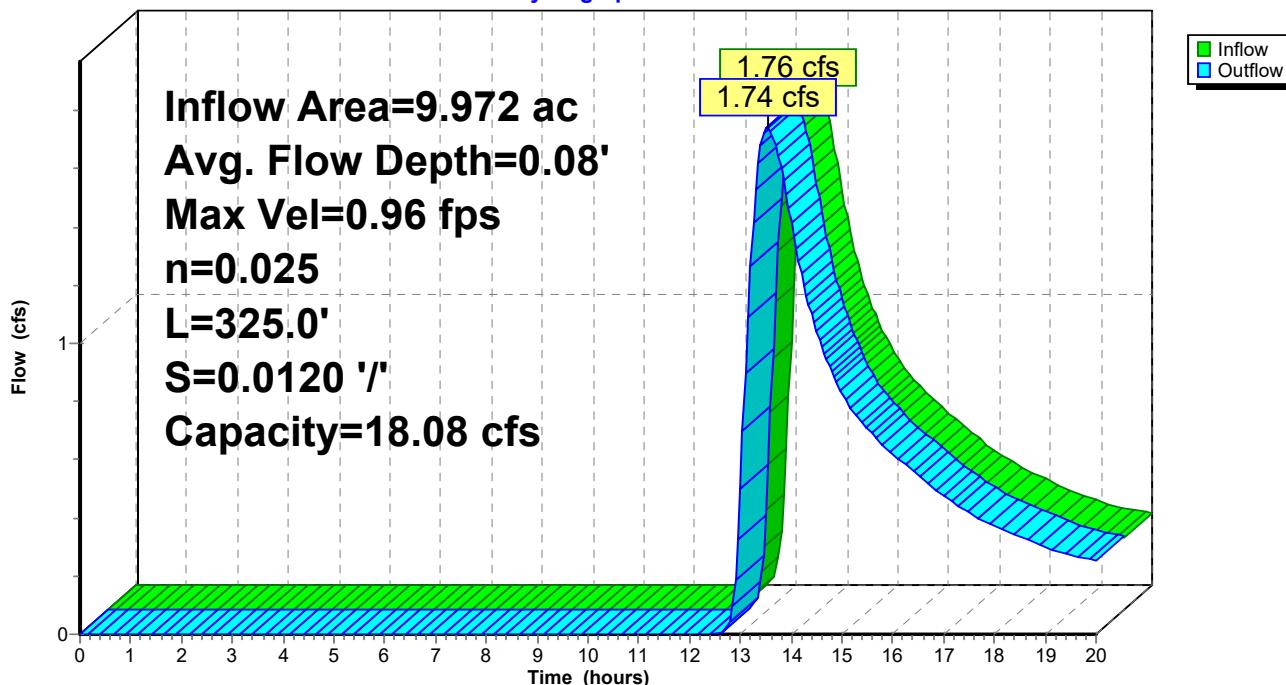
Length= 325.0' Slope= 0.0120 '/'

Inlet Invert= 233.90', Outlet Invert= 230.00'



Reach 4R: Existing Channel

Hydrograph



Summary for Reach 5R: Existing Channel

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.48" for 25-year storm event

Inflow = 1.74 cfs @ 13.54 hrs, Volume= 0.402 af

Outflow = 1.73 cfs @ 13.66 hrs, Volume= 0.398 af, Atten= 0%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.74 fps, Min. Travel Time= 4.0 min

Avg. Velocity = 1.22 fps, Avg. Travel Time= 5.7 min

Peak Storage= 419 cf @ 13.59 hrs

Average Depth at Peak Storage= 0.14' , Surface Width= 10.76'

Bank-Full Depth= 0.75' Flow Area= 12.5 sf, Capacity= 66.75 cfs

25.00' x 0.75' deep Parabolic Channel, n= 0.025 Earth, clean & winding

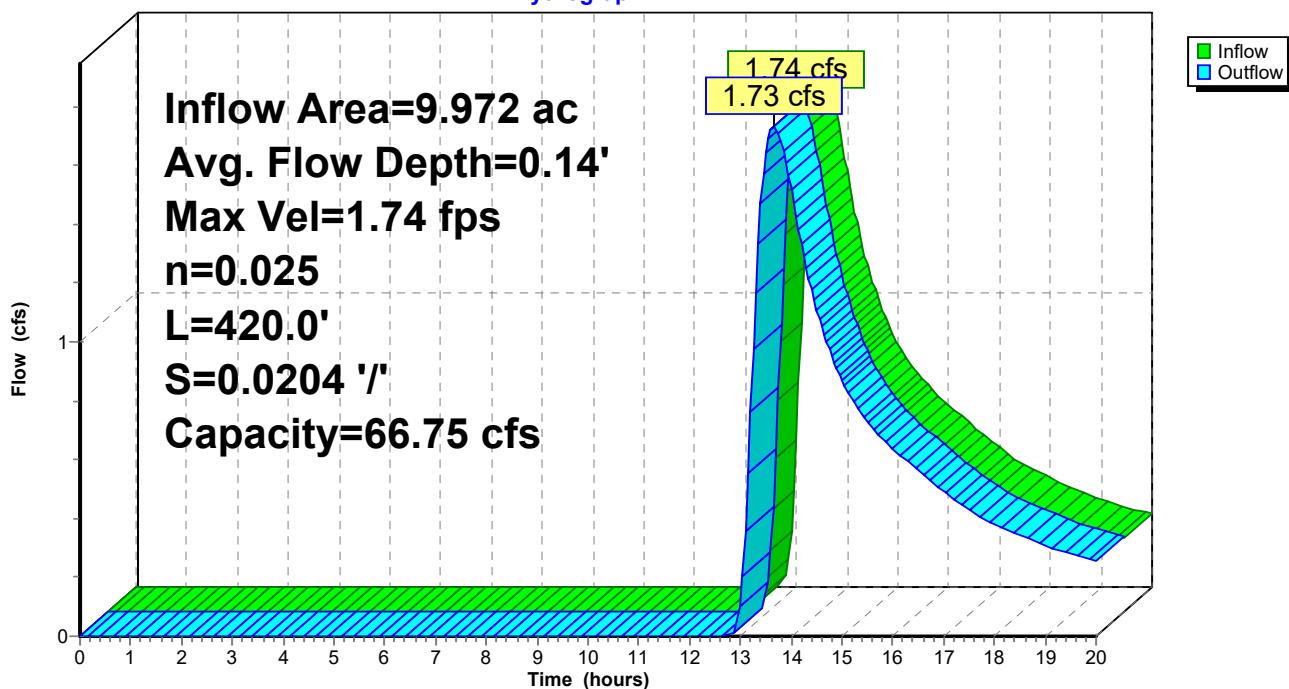
Length= 420.0' Slope= 0.0204 '/'

Inlet Invert= 230.00', Outlet Invert= 221.43'



Reach 5R: Existing Channel

Hydrograph



Summary for Reach 6R: Existing Stream Channel

Inflow Area = 38.903 ac, 19.74% Impervious, Inflow Depth > 1.62" for 25-year storm event

Inflow = 31.65 cfs @ 12.67 hrs, Volume= 5.256 af

Outflow = 31.48 cfs @ 12.74 hrs, Volume= 5.237 af, Atten= 1%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.83 fps, Min. Travel Time= 2.2 min

Avg. Velocity = 0.92 fps, Avg. Travel Time= 4.3 min

Peak Storage= 4,130 cf @ 12.70 hrs

Average Depth at Peak Storage= 1.94', Surface Width= 12.75'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 33.56 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' Top Width= 13.00'

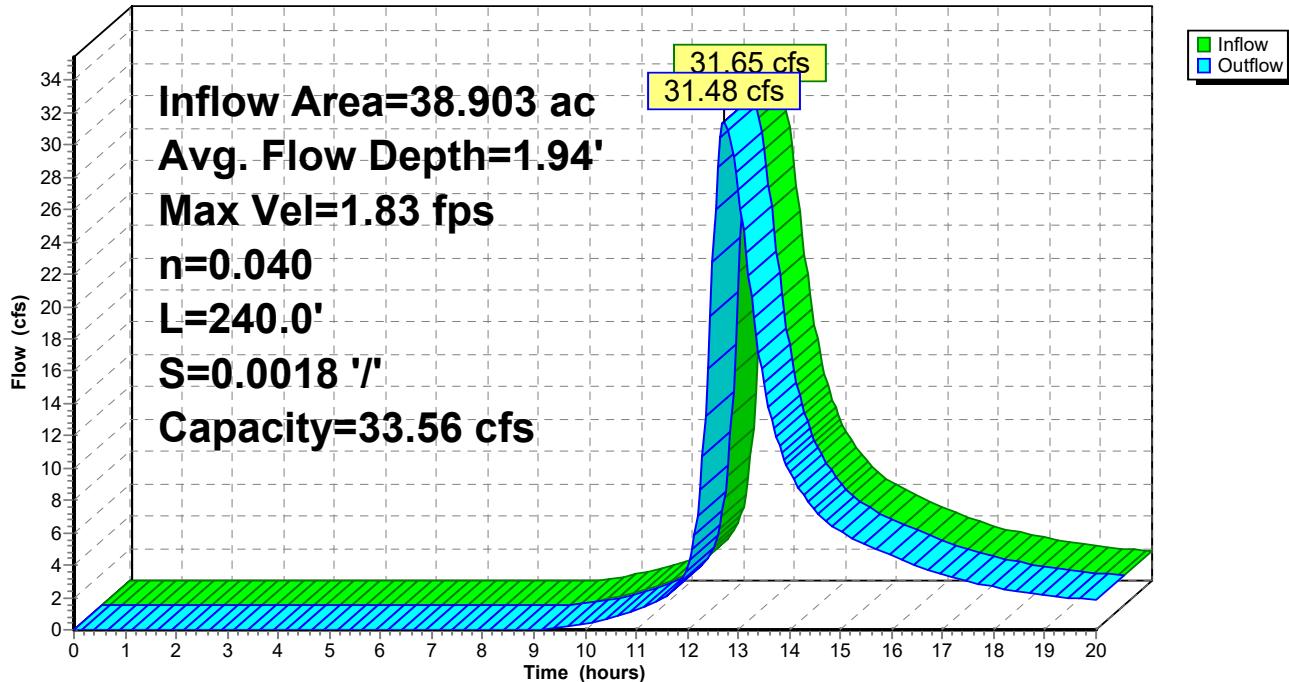
Length= 240.0' Slope= 0.0018 '

Inlet Invert= 221.43', Outlet Invert= 221.00'



Reach 6R: Existing Stream Channel

Hydrograph



Summary for Reach 8R: Below Wooded Buffer

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 0.99" for 25-year storm event

Inflow = 0.18 cfs @ 14.03 hrs, Volume= 0.051 af

Outflow = 0.17 cfs @ 14.30 hrs, Volume= 0.050 af, Atten= 1%, Lag= 16.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.45 fps, Min. Travel Time= 9.0 min

Avg. Velocity = 0.33 fps, Avg. Travel Time= 12.0 min

Peak Storage= 94 cf @ 14.15 hrs

Average Depth at Peak Storage= 0.01', Surface Width= 31.28'

Bank-Full Depth= 0.25' Flow Area= 10.6 sf, Capacity= 29.38 cfs

30.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 50.0 '/' Top Width= 55.00'

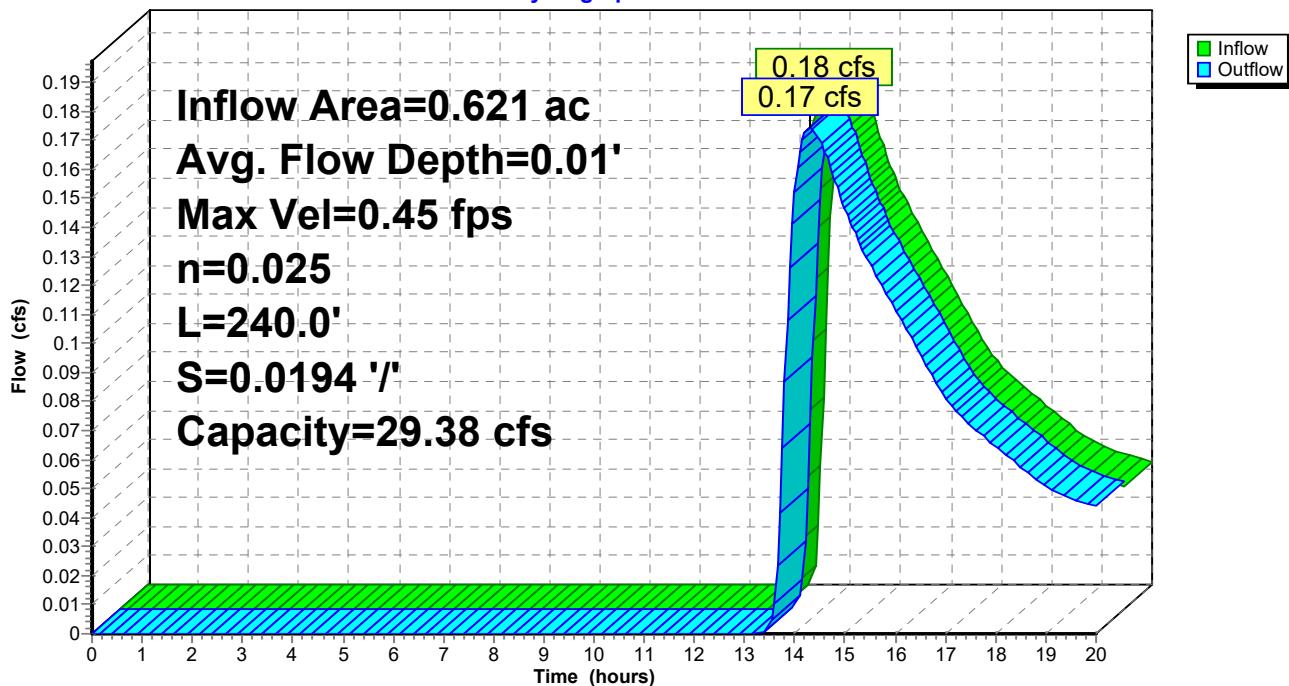
Length= 240.0' Slope= 0.0194 '/'

Inlet Invert= 236.65', Outlet Invert= 232.00'



Reach 8R: Below Wooded Buffer

Hydrograph



Summary for Reach 9R: Existing Stream Channel

Inflow Area = 18.763 ac, 1.29% Impervious, Inflow Depth > 2.58" for 25-year storm event

Inflow = 29.18 cfs @ 12.59 hrs, Volume= 4.035 af

Outflow = 29.04 cfs @ 12.65 hrs, Volume= 4.021 af, Atten= 0%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.20 fps, Min. Travel Time= 2.1 min

Avg. Velocity = 1.86 fps, Avg. Travel Time= 4.8 min

Peak Storage= 3,737 cf @ 12.61 hrs

Average Depth at Peak Storage= 0.99', Surface Width= 8.96'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 110.28 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 '/' Top Width= 13.00'

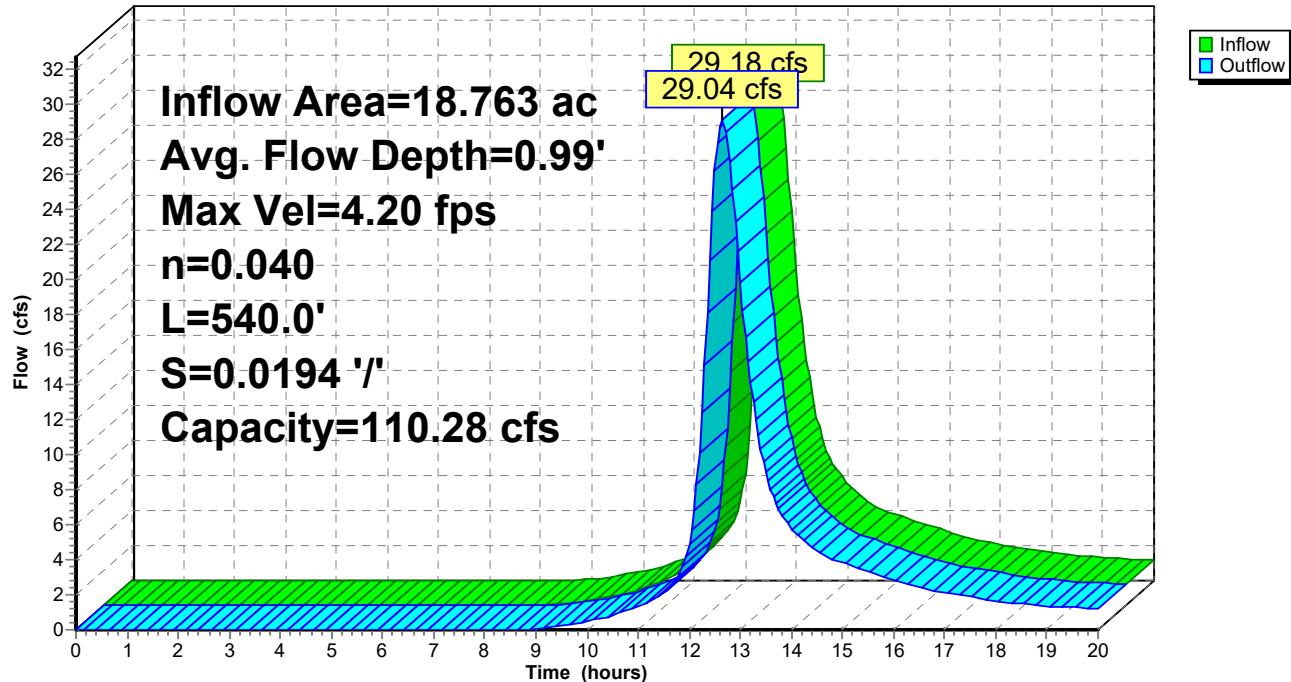
Length= 540.0' Slope= 0.0194 '/'

Inlet Invert= 232.00', Outlet Invert= 221.55'



Reach 9R: Existing Stream Channel

Hydrograph



Summary for Reach 10R: Existing Stream Channel

Inflow Area = 28.932 ac, 15.22% Impervious, Inflow Depth > 2.02" for 25-year storm event

Inflow = 31.70 cfs @ 12.65 hrs, Volume= 4.862 af

Outflow = 31.65 cfs @ 12.67 hrs, Volume= 4.858 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.86 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 0.90 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1,110 cf @ 12.66 hrs

Average Depth at Peak Storage= 1.93', Surface Width= 12.71'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 34.06 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 '/' Top Width= 13.00'

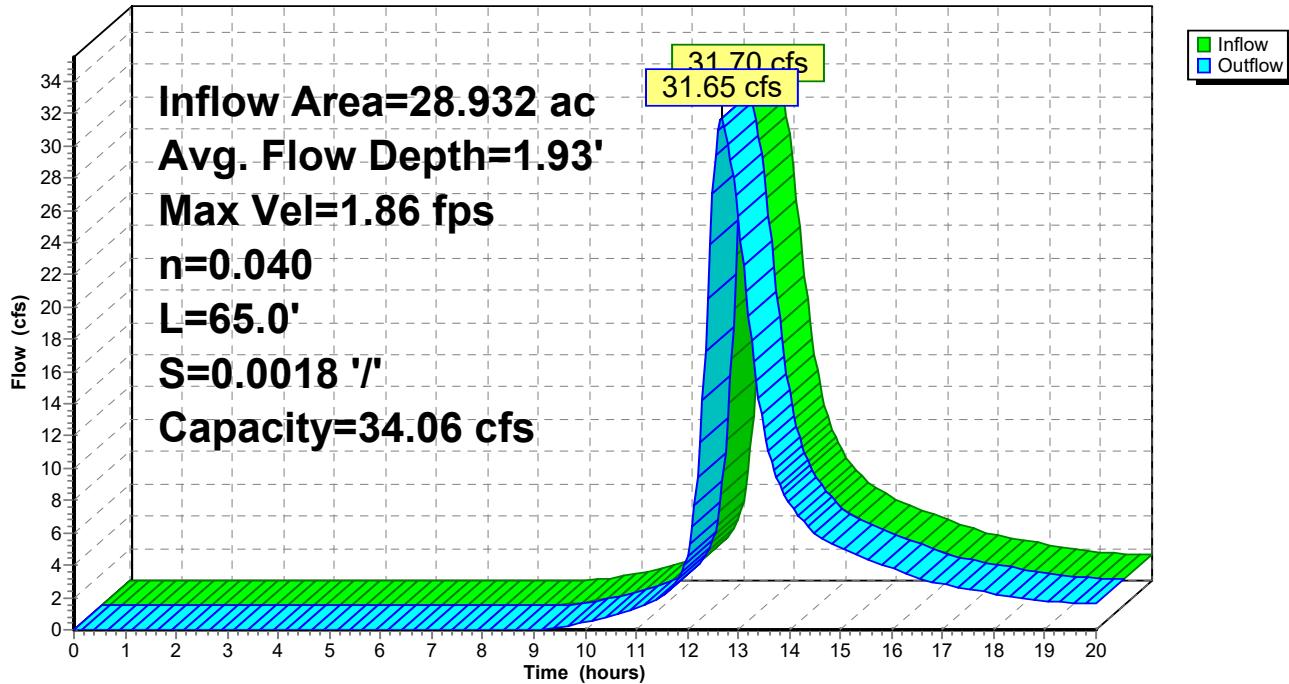
Length= 65.0' Slope= 0.0018 '/'

Inlet Invert= 221.55', Outlet Invert= 221.43'



Reach 10R: Existing Stream Channel

Hydrograph



Summary for Reach 11R: Stevens Mill Road Ditch

Same as Pre 3R

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.66" for 25-year storm event
 Inflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af
 Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.81 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 1.23 fps, Avg. Travel Time= 1.6 min

Peak Storage= 121 cf @ 12.96 hrs

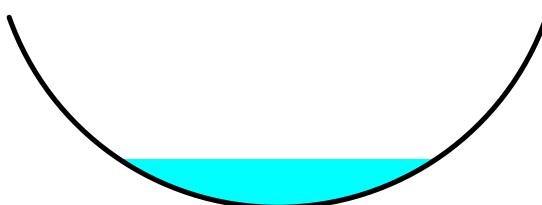
Average Depth at Peak Storage= 0.51', Surface Width= 3.02'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 32.56 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

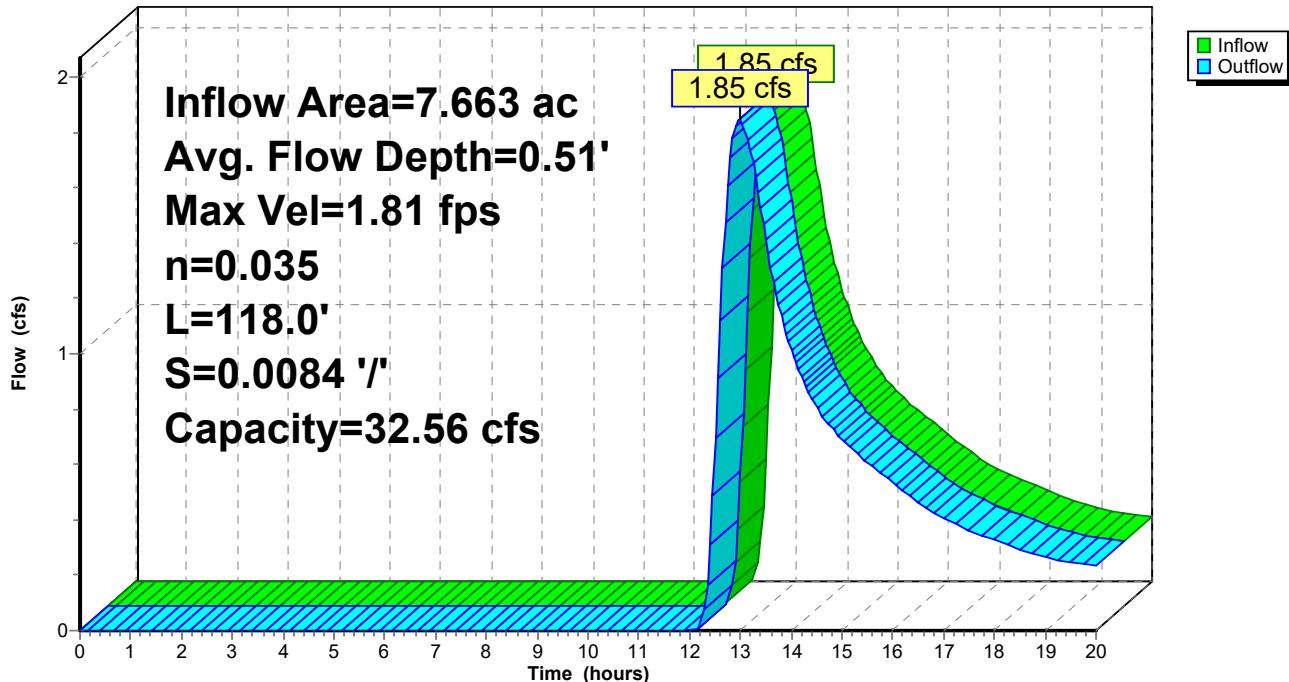
Length= 118.0' Slope= 0.0084 '/'

Inlet Invert= 241.09', Outlet Invert= 240.10'



Reach 11R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 12R: Stevens Mill Road Ditch

Same as Pre 2R

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.66" for 25-year storm event
 Inflow = 1.85 cfs @ 12.93 hrs, Volume= 0.420 af
 Outflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.05 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 1.40 fps, Avg. Travel Time= 1.2 min

Peak Storage= 95 cf @ 12.94 hrs

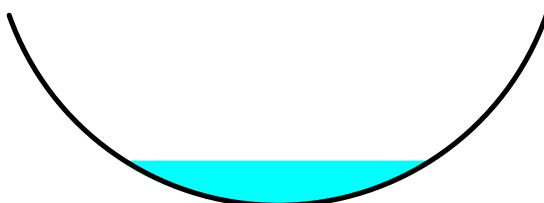
Average Depth at Peak Storage= 0.47' , Surface Width= 2.90'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 38.94 cfs

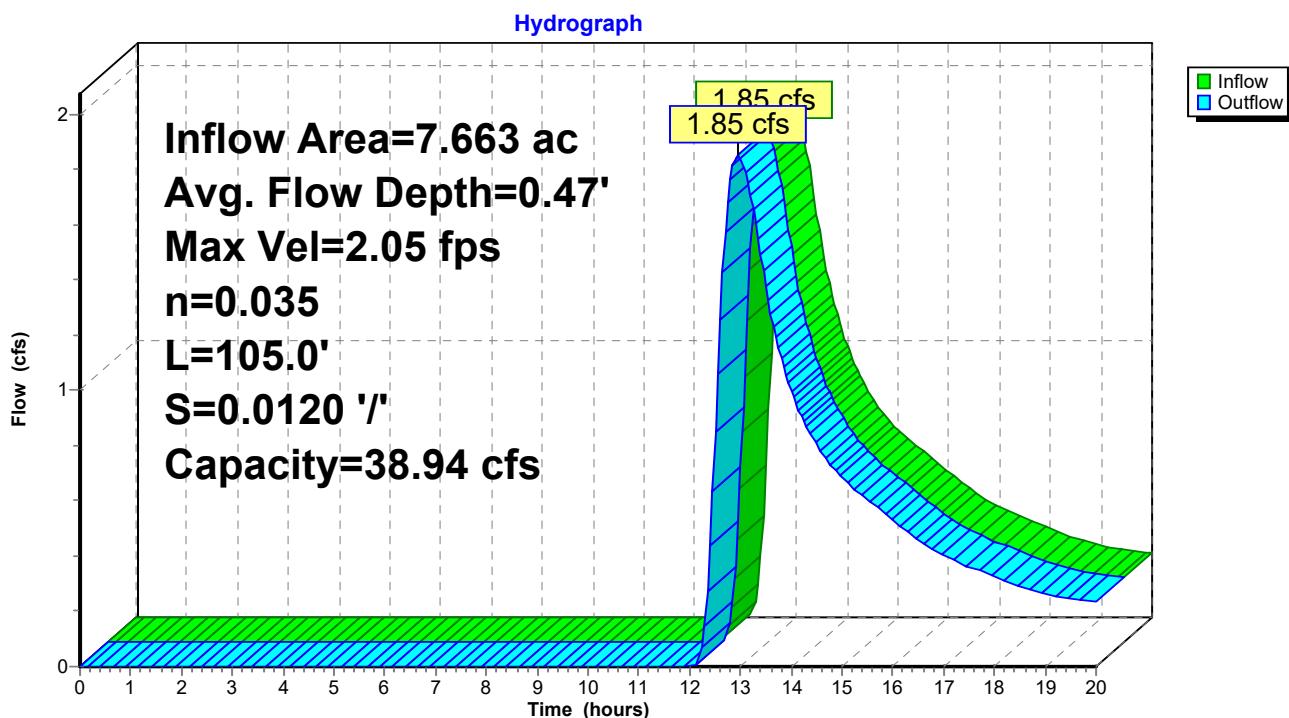
6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

Length= 105.0' Slope= 0.0120 '/'

Inlet Invert= 242.61', Outlet Invert= 241.35'



Reach 12R: Stevens Mill Road Ditch



Summary for Reach 13R: Stevens Mill Road Ditch

Same as Pre 1R

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.64" for 25-year storm event
 Inflow = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af
 Outflow = 0.94 cfs @ 12.74 hrs, Volume= 0.164 af, Atten= 1%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.03 fps, Min. Travel Time= 2.7 min

Avg. Velocity = 0.65 fps, Avg. Travel Time= 4.2 min

Peak Storage= 151 cf @ 12.70 hrs

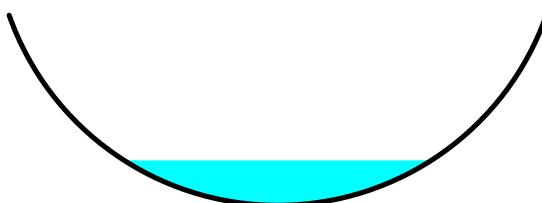
Average Depth at Peak Storage= 0.47' , Surface Width= 2.91'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.57 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

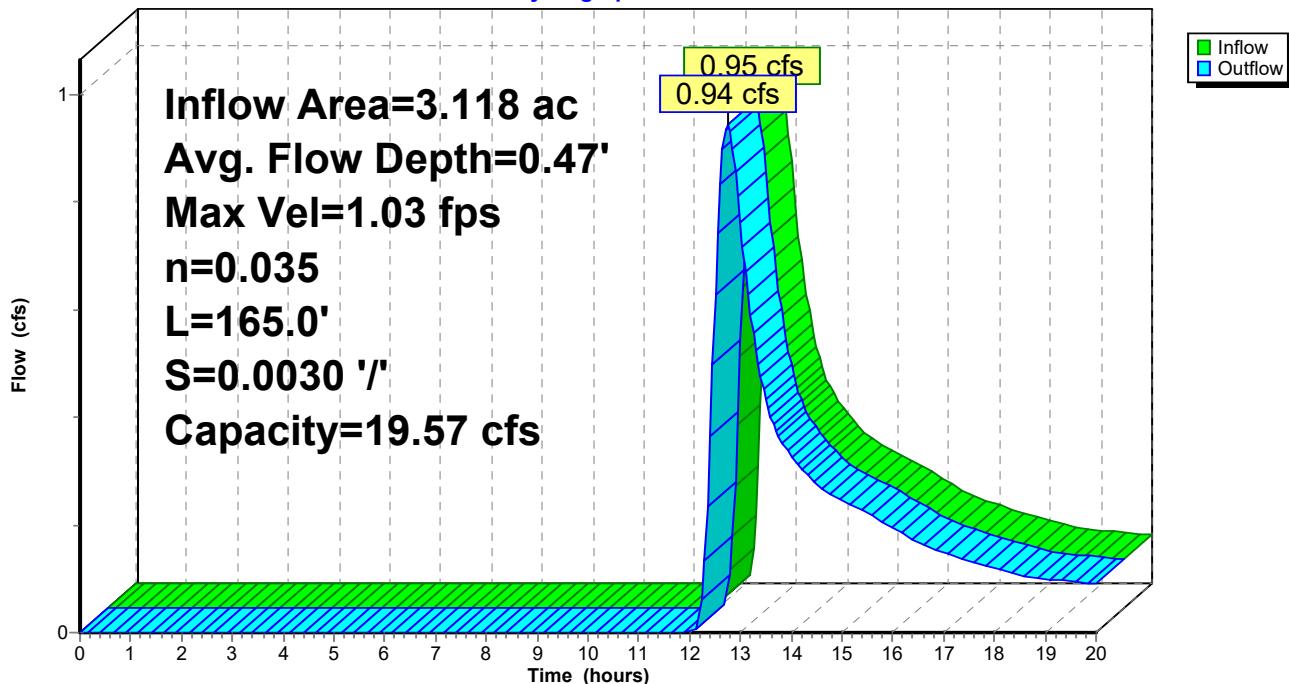
Length= 165.0' Slope= 0.0030 '/'

Inlet Invert= 243.11', Outlet Invert= 242.61'



Reach 13R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 14R: Proposed diversion swale

Inflow Area = 3.223 ac, 26.63% Impervious, Inflow Depth > 1.97" for 25-year storm event

Inflow = 3.97 cfs @ 12.58 hrs, Volume= 0.529 af

Outflow = 3.95 cfs @ 12.61 hrs, Volume= 0.528 af, Atten= 0%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.36 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 1.67 fps, Avg. Travel Time= 2.7 min

Peak Storage= 318 cf @ 12.59 hrs

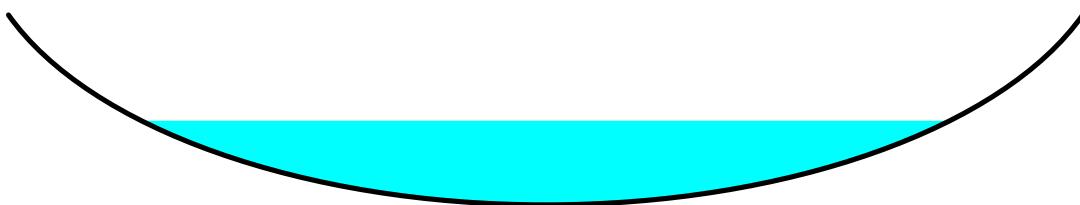
Average Depth at Peak Storage= 0.44', Surface Width= 3.99'

Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 22.62 cfs

6.00' x 1.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

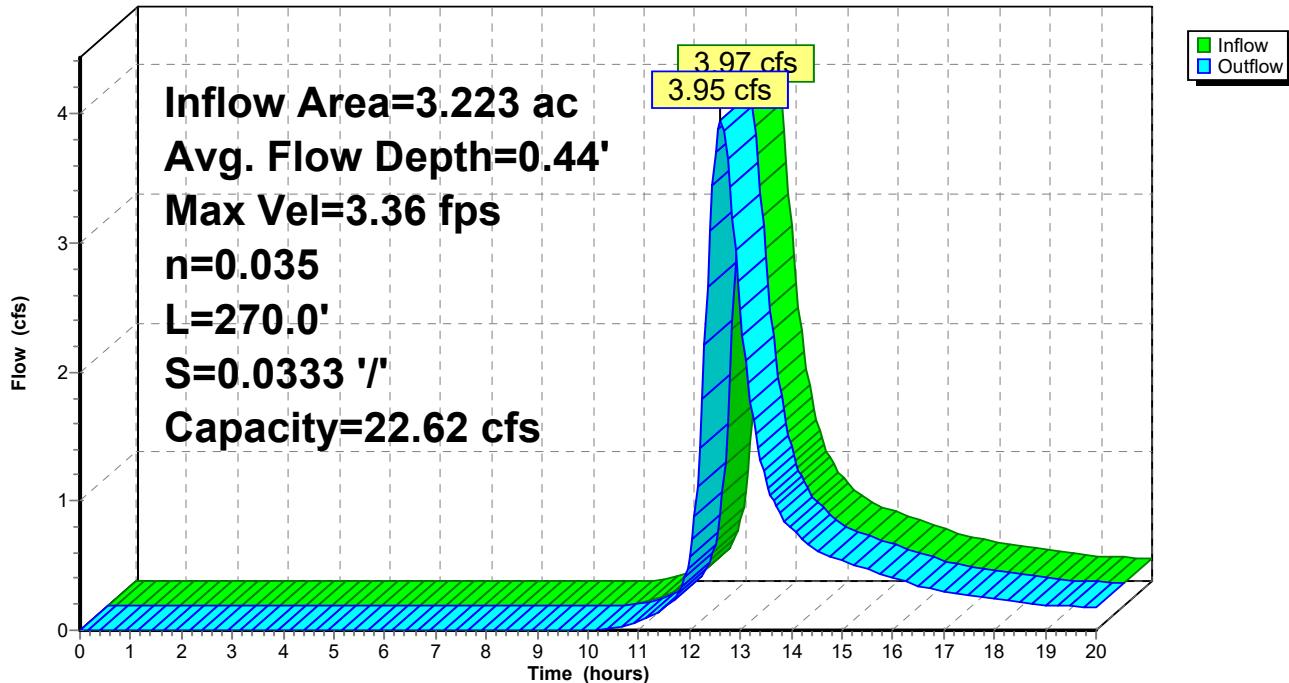
Length= 270.0' Slope= 0.0333 '/'

Inlet Invert= 247.00', Outlet Invert= 238.00'



Reach 14R: Proposed diversion swale

Hydrograph



Summary for Reach 15R: Existing drainage

Inflow Area = 5.857 ac, 25.74% Impervious, Inflow Depth > 1.66" for 25-year storm event

Inflow = 5.57 cfs @ 12.71 hrs, Volume= 0.811 af

Outflow = 5.52 cfs @ 12.76 hrs, Volume= 0.809 af, Atten= 1%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.93 fps, Min. Travel Time= 1.6 min

Avg. Velocity = 1.01 fps, Avg. Travel Time= 3.1 min

Peak Storage= 532 cf @ 12.72 hrs

Average Depth at Peak Storage= 0.21', Surface Width= 20.60'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 164.26 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

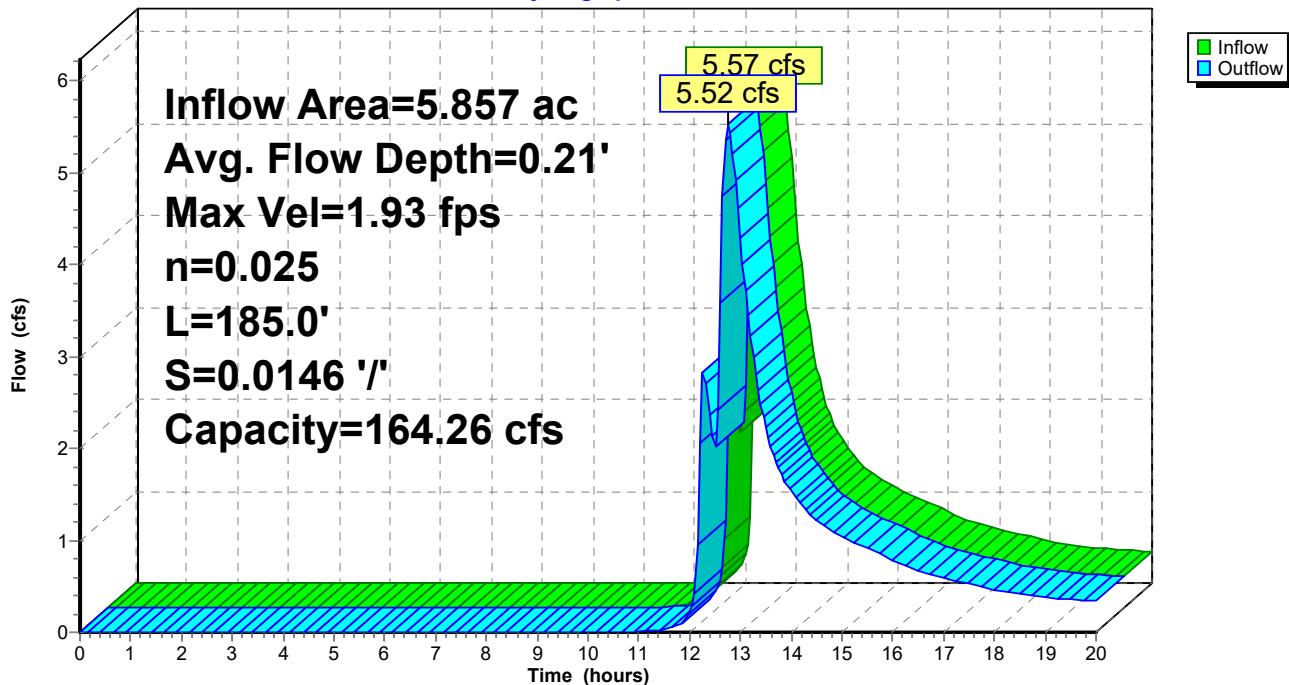
Length= 185.0' Slope= 0.0146 '/'

Inlet Invert= 234.50', Outlet Invert= 231.80'



Reach 15R: Existing drainage

Hydrograph



Summary for Reach 16R: Existing drainage along slope

Inflow Area = 0.534 ac, 0.47% Impervious, Inflow Depth > 0.93" for 25-year storm event

Inflow = 0.35 cfs @ 12.33 hrs, Volume= 0.041 af

Outflow = 0.35 cfs @ 12.37 hrs, Volume= 0.041 af, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.03 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 0.55 fps, Avg. Travel Time= 2.3 min

Peak Storage= 26 cf @ 12.35 hrs

Average Depth at Peak Storage= 0.07' , Surface Width= 6.74'

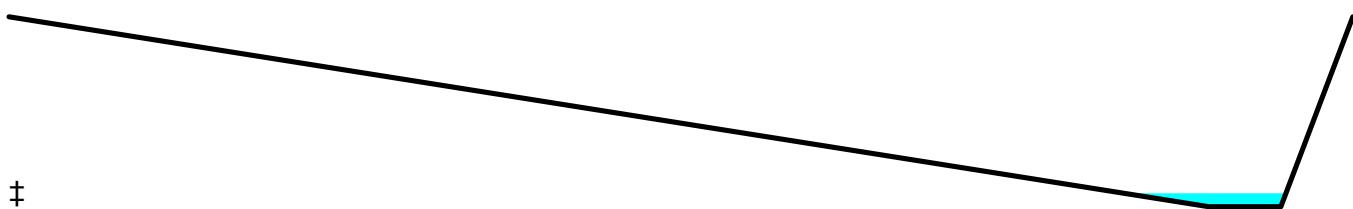
Bank-Full Depth= 1.00' Flow Area= 29.5 sf, Capacity= 144.38 cfs

3.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding

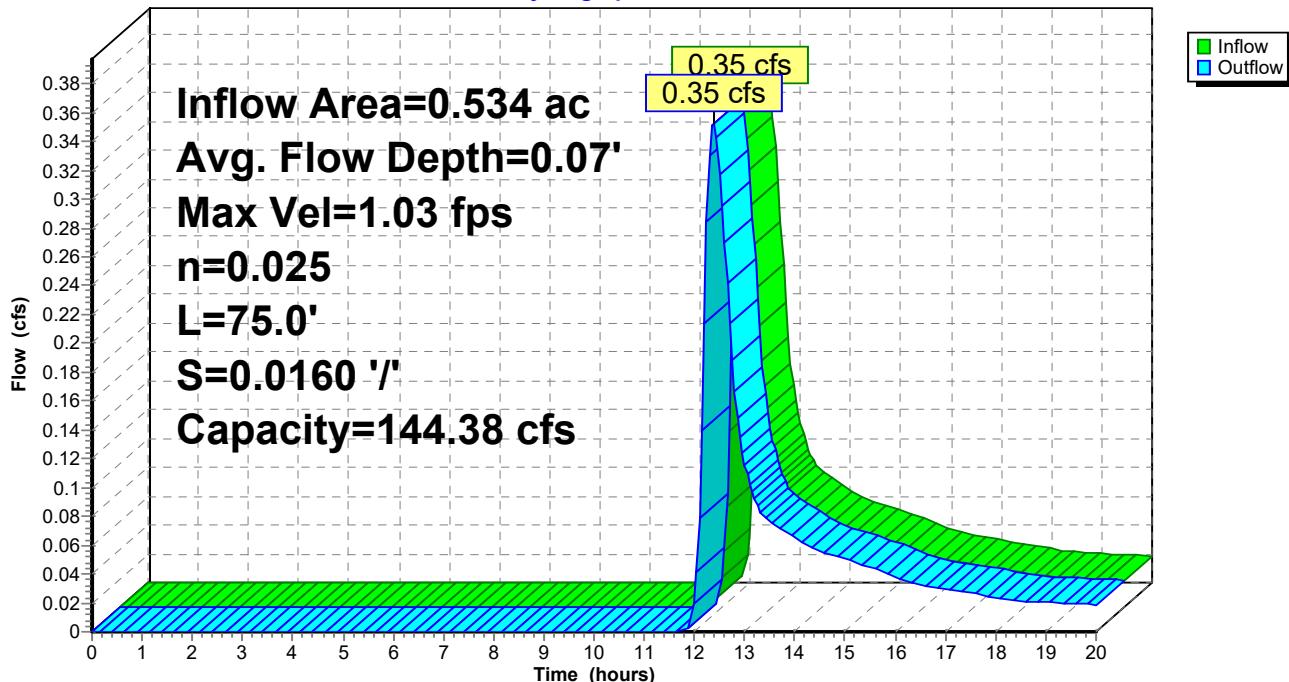
Side Slope Z-value= 50.0 3.0 '/' Top Width= 56.00'

Length= 75.0' Slope= 0.0160 '/'

Inlet Invert= 233.00', Outlet Invert= 231.80'



‡

Reach 16R: Existing drainage along slope**Hydrograph**

Summary for Reach 17R: Existing drainage

Inflow Area = 6.391 ac, 23.63% Impervious, Inflow Depth > 1.60" for 25-year storm event

Inflow = 5.71 cfs @ 12.75 hrs, Volume= 0.850 af

Outflow = 5.67 cfs @ 12.81 hrs, Volume= 0.847 af, Atten= 1%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.01 fps, Min. Travel Time= 1.9 min

Avg. Velocity = 1.06 fps, Avg. Travel Time= 3.7 min

Peak Storage= 664 cf @ 12.77 hrs

Average Depth at Peak Storage= 0.21', Surface Width= 20.47'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 172.90 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

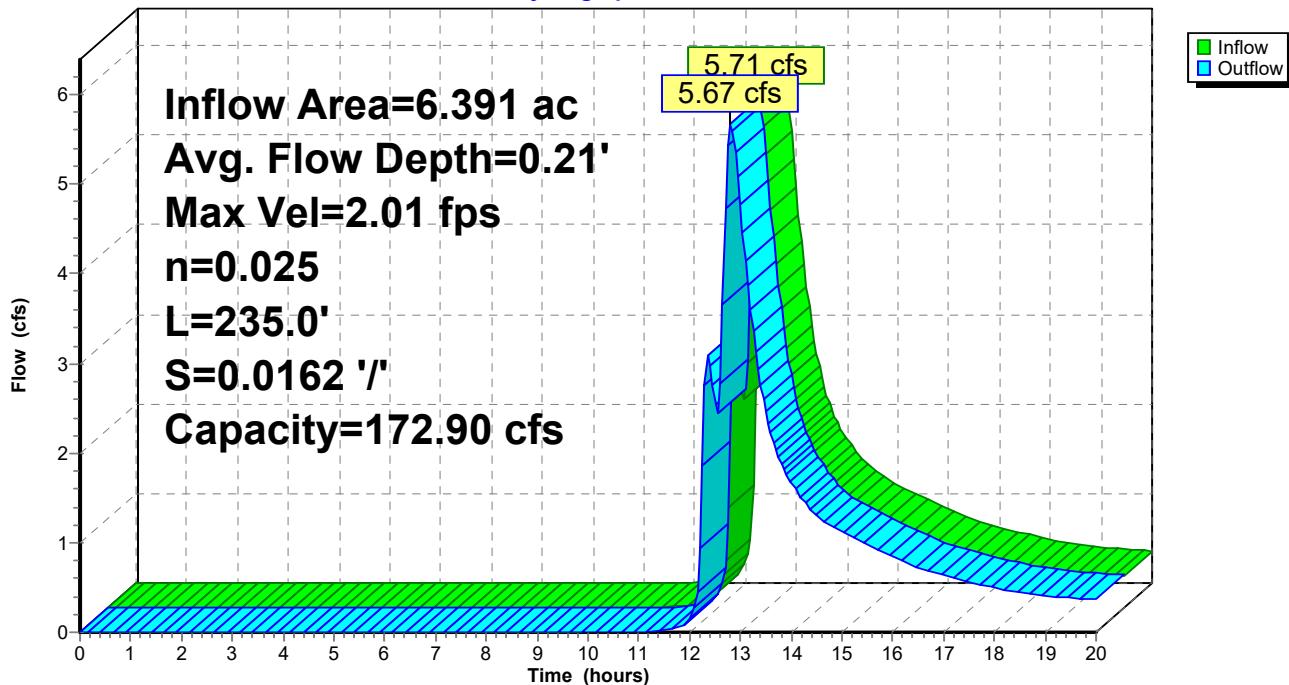
Length= 235.0' Slope= 0.0162 '/'

Inlet Invert= 231.80', Outlet Invert= 228.00'



Reach 17R: Existing drainage

Hydrograph



Summary for Reach 18R: Existing drainage

Inflow Area = 6.391 ac, 23.63% Impervious, Inflow Depth > 1.59" for 25-year storm event

Inflow = 5.67 cfs @ 12.81 hrs, Volume= 0.847 af

Outflow = 5.62 cfs @ 12.84 hrs, Volume= 0.845 af, Atten= 1%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.13 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 1.13 fps, Avg. Travel Time= 1.7 min

Peak Storage= 305 cf @ 12.82 hrs

Average Depth at Peak Storage= 0.20', Surface Width= 20.05'

Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 188.06 cfs

45.00' x 1.00' deep Parabolic Channel, n= 0.025 Earth, clean & winding

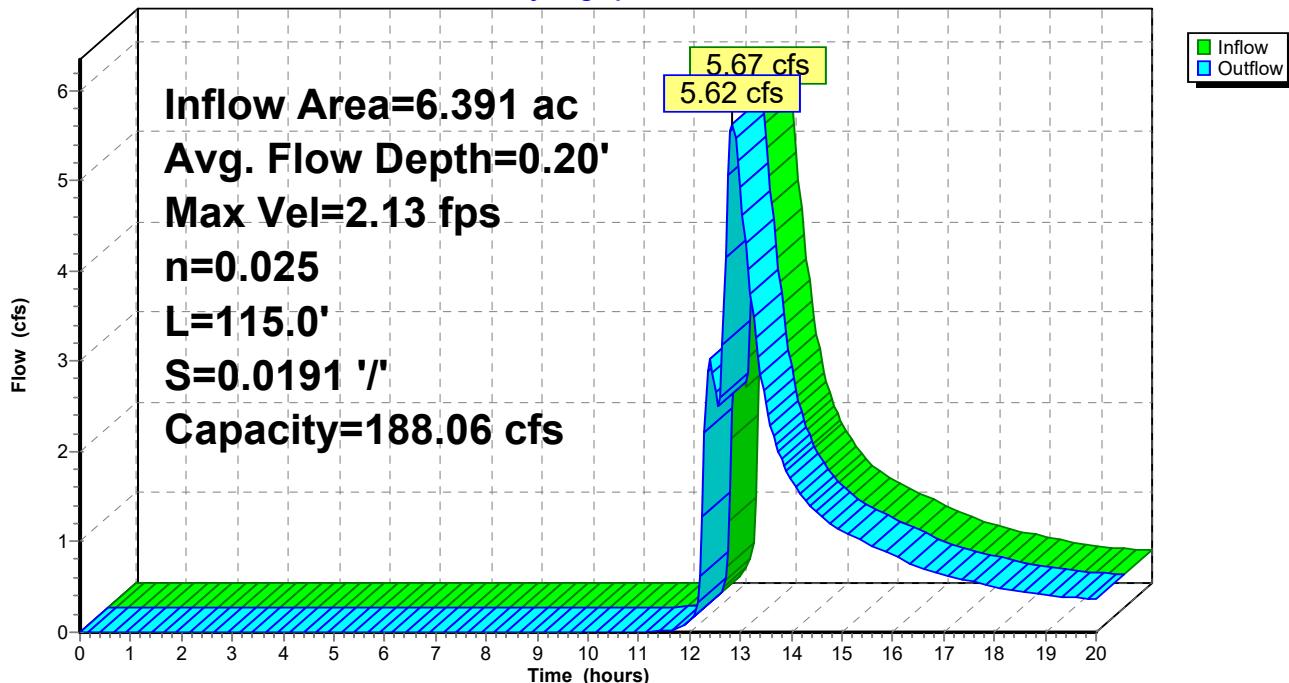
Length= 115.0' Slope= 0.0191 '/'

Inlet Invert= 228.00', Outlet Invert= 225.80'



Reach 18R: Existing drainage

Hydrograph



Summary for Reach 19R: Existing Stream Channel

Inflow Area = 9.330 ac, 44.61% Impervious, Inflow Depth > 1.09" for 25-year storm event

Inflow = 5.62 cfs @ 12.84 hrs, Volume= 0.845 af

Outflow = 5.58 cfs @ 12.89 hrs, Volume= 0.842 af, Atten= 1%, Lag= 2.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.26 fps, Min. Travel Time= 1.5 min

Avg. Velocity = 1.11 fps, Avg. Travel Time= 3.0 min

Peak Storage= 499 cf @ 12.86 hrs

Average Depth at Peak Storage= 0.43' , Surface Width= 6.70'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 94.97 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 13.00'

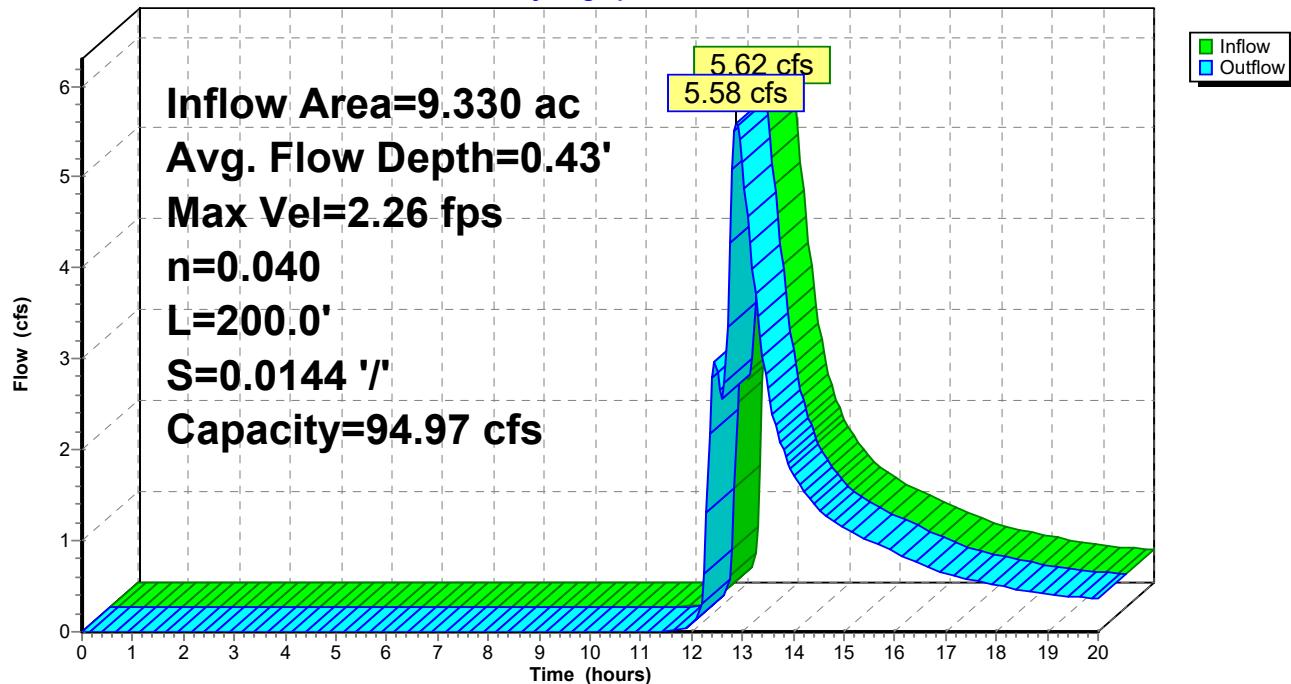
Length= 200.0' Slope= 0.0144 '/

Inlet Invert= 225.80', Outlet Invert= 222.93'



Reach 19R: Existing Stream Channel

Hydrograph



Summary for Reach 20R: Existing Stream Channel

Inflow Area = 10.168 ac, 40.93% Impervious, Inflow Depth > 1.00" for 25-year storm event

Inflow = 5.58 cfs @ 12.89 hrs, Volume= 0.850 af

Outflow = 5.39 cfs @ 13.04 hrs, Volume= 0.841 af, Atten= 3%, Lag= 9.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.37 fps, Min. Travel Time= 4.9 min

Avg. Velocity = 0.70 fps, Avg. Travel Time= 9.6 min

Peak Storage= 1,596 cf @ 12.96 hrs

Average Depth at Peak Storage= 0.63', Surface Width= 7.52'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 46.28 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 '/' Top Width= 13.00'

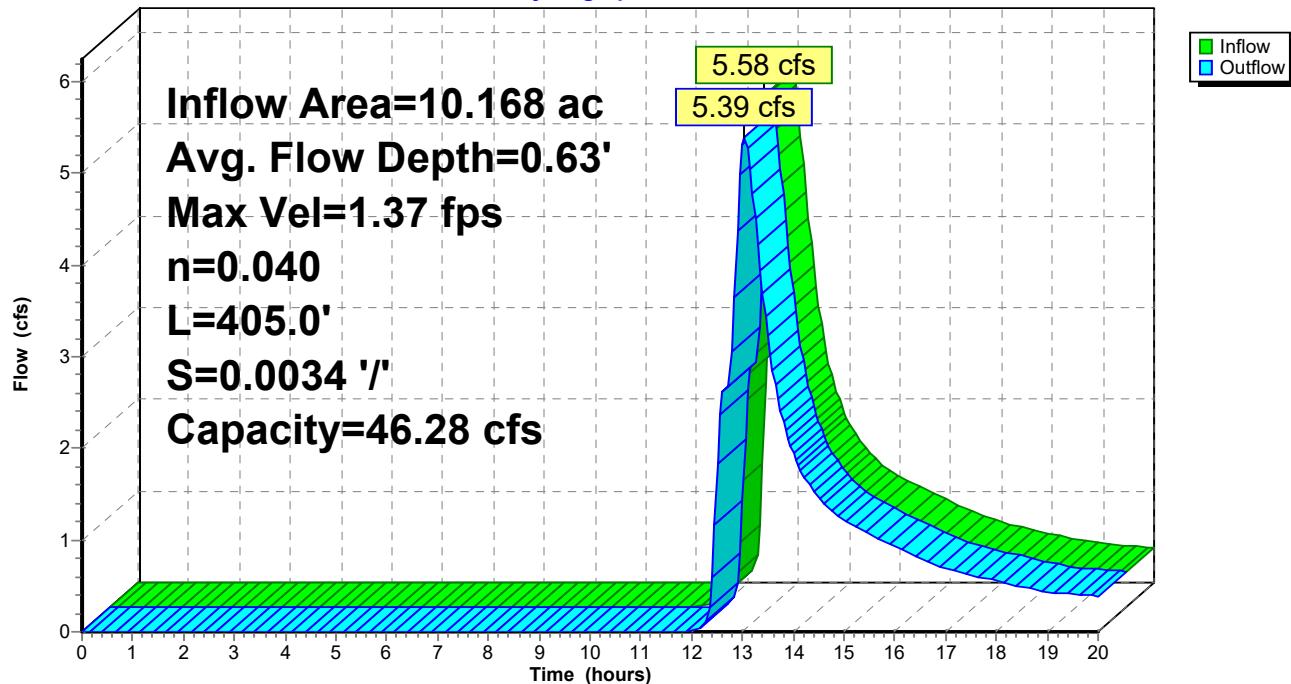
Length= 405.0' Slope= 0.0034 '/'

Inlet Invert= 222.93', Outlet Invert= 221.55'



Reach 20R: Existing Stream Channel

Hydrograph



Summary for Reach 21R: Existing Stream Channel

Inflow Area = 0.838 ac, 0.00% Impervious, Inflow Depth > 0.13" for 25-year storm event

Inflow = 0.02 cfs @ 14.10 hrs, Volume= 0.009 af

Outflow = 0.02 cfs @ 16.34 hrs, Volume= 0.008 af, Atten= 7%, Lag= 134.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.26 fps, Min. Travel Time= 48.8 min

Avg. Velocity = 0.26 fps, Avg. Travel Time= 48.8 min

Peak Storage= 54 cf @ 15.53 hrs

Average Depth at Peak Storage= 0.01', Surface Width= 5.06'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 76.21 cfs

5.00' x 2.00' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 '/' Top Width= 13.00'

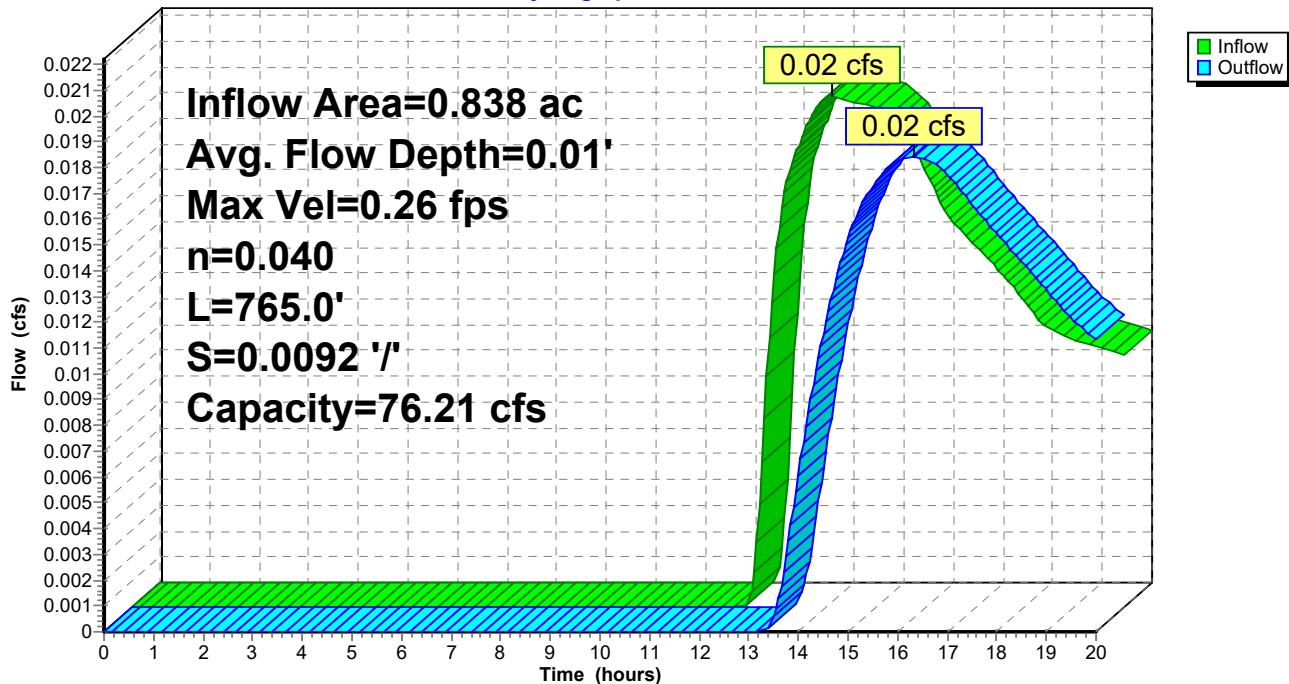
Length= 765.0' Slope= 0.0092 '/'

Inlet Invert= 230.00', Outlet Invert= 222.93'



Reach 21R: Existing Stream Channel

Hydrograph



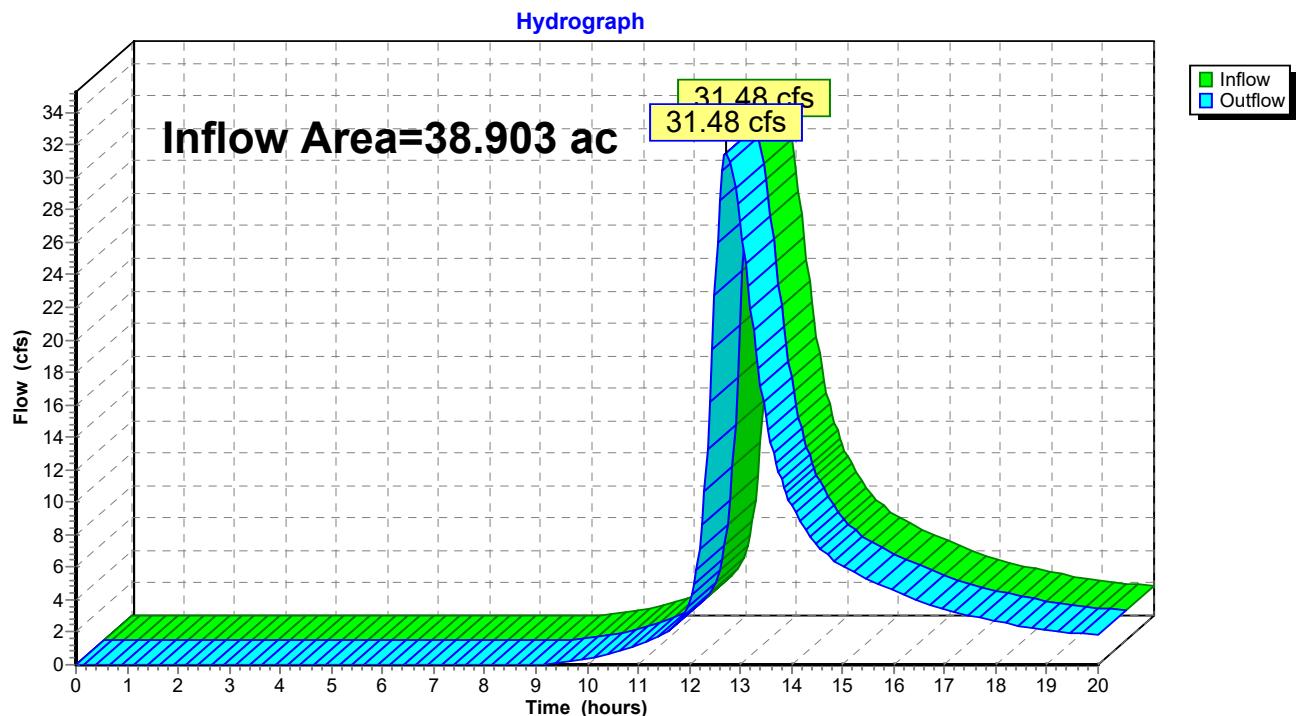
Summary for Reach WAP 1: Water Analysis Point 1

Inflow Area = 38.903 ac, 19.74% Impervious, Inflow Depth > 1.62" for 25-year storm event

Inflow = 31.48 cfs @ 12.74 hrs, Volume= 5.237 af

Outflow = 31.48 cfs @ 12.74 hrs, Volume= 5.237 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach WAP 1: Water Analysis Point 1

Summary for Pond 1P: Proposed 15" Culvert

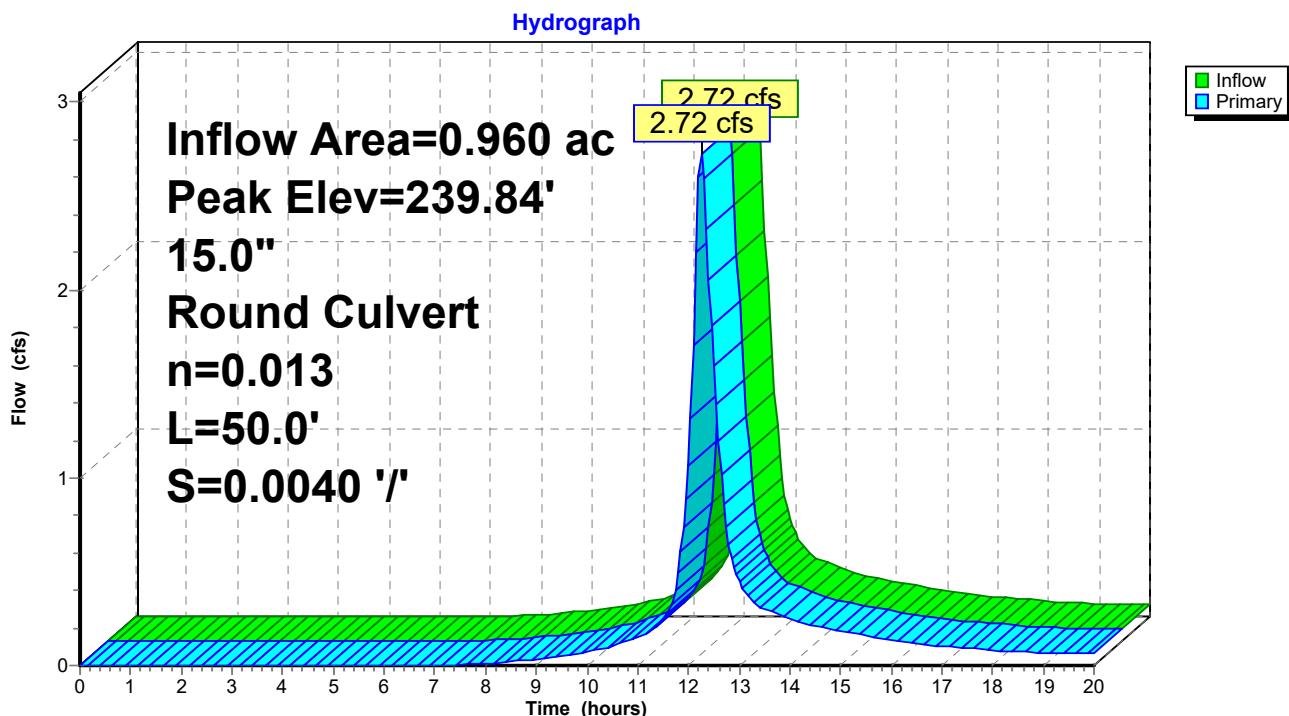
Inflow Area = 0.960 ac, 30.05% Impervious, Inflow Depth > 3.12" for 25-year storm event
 Inflow = 2.72 cfs @ 12.25 hrs, Volume= 0.249 af
 Outflow = 2.72 cfs @ 12.25 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.72 cfs @ 12.25 hrs, Volume= 0.249 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.84' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 238.00' / 237.80' S= 0.0040 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.72 cfs @ 12.25 hrs HW=239.84' TW=239.50' (Fixed TW Elev= 239.50')
 ↗1=Culvert (Inlet Controls 2.72 cfs @ 2.22 fps)

Pond 1P: Proposed 15" Culvert



Summary for Pond 2P: Stone Berm Spreader

Inflow Area = 0.621 ac, 24.36% Impervious, Inflow Depth > 2.94" for 25-year storm event

Inflow = 1.92 cfs @ 12.16 hrs, Volume= 0.152 af

Outflow = 0.23 cfs @ 13.08 hrs, Volume= 0.054 af, Atten= 88%, Lag= 55.0 min

Primary = 0.23 cfs @ 13.08 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.47' @ 13.08 hrs Surf.Area= 4,867 sf Storage= 4,303 cf

Flood Elev= 241.80' Surf.Area= 4,960 sf Storage= 4,464 cf

Plug-Flow detention time= 223.8 min calculated for 0.054 af (36% of inflow)

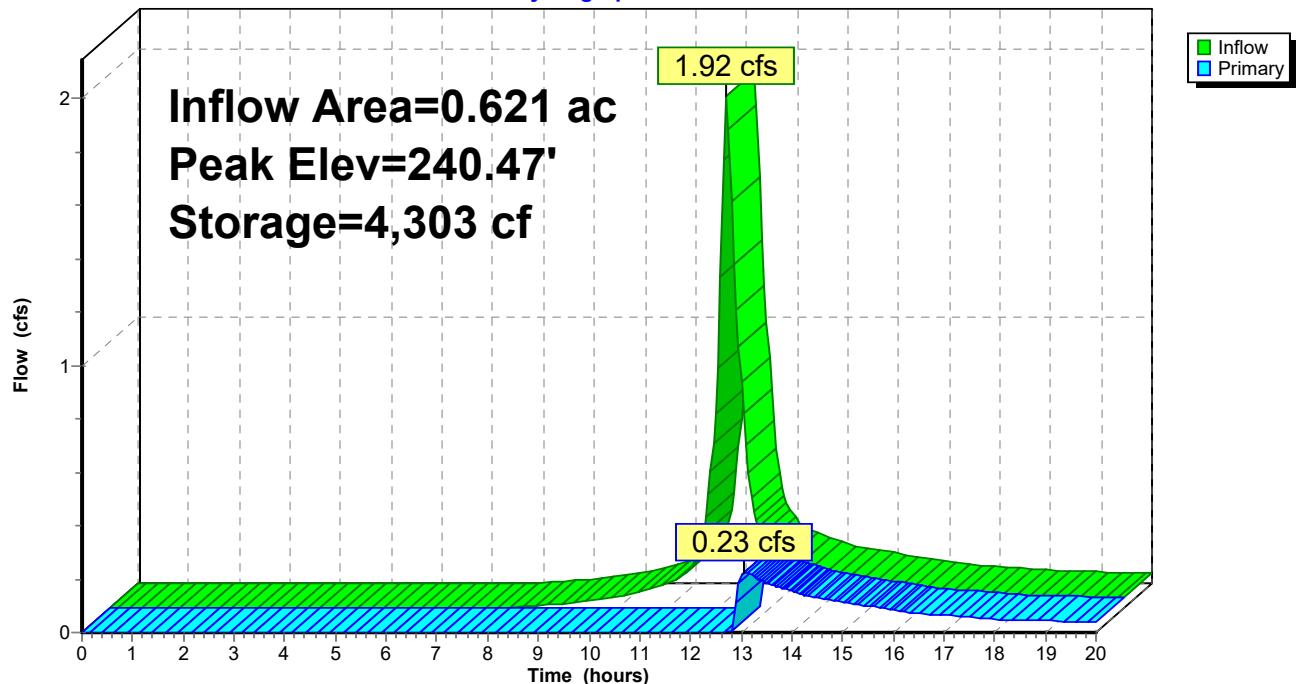
Center-of-Mass det. time= 131.7 min (922.3 - 790.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	239.00'	4,464 cf	Custom Stage Data (Irregular)	Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
239.00	1,225	175.0	0	0	1,225
240.00	3,635	425.0	2,323	2,323	13,165
240.50	4,960	440.0	2,140	4,464	14,220

Device	Routing	Invert	Outlet Devices										
#1	Primary	240.45'	30.0' long x 1.0' 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										
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31										
			3.30 3.31 3.32										

Primary OutFlow Max=0.18 cfs @ 13.08 hrs HW=240.47' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 0.35 fps)

Pond 2P: Stone Berm Spreader**Hydrograph**

Summary for Pond 3P: UGF #1

Inflow Area = 2.309 ac, 82.95% Impervious, Inflow Depth > 0.83" for 25-year storm event
 Inflow = 2.34 cfs @ 12.14 hrs, Volume= 0.160 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

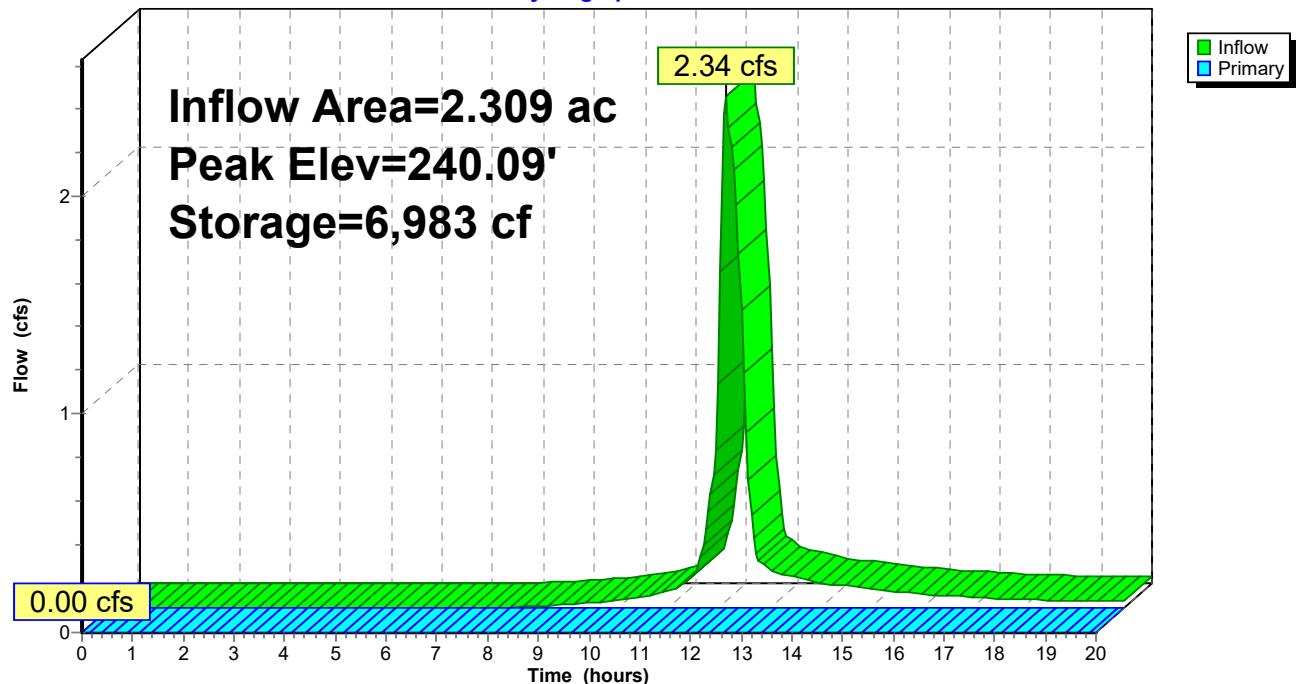
Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 240.09' @ 20.00 hrs Surf.Area= 6,543 sf Storage= 6,983 cf
 Flood Elev= 241.50' Surf.Area= 9,356 sf Storage= 18,103 cf

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

Volume	Invert	Avail.Storage	Storage Description			
#1	236.83'	18,103 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
236.83	5,005	405.8	0.0	0	0	5,005
236.84	5,005	405.8	40.0	20	20	5,009
238.00	5,005	405.8	40.0	2,322	2,342	5,480
238.01	5,005	405.8	10.0	5	2,347	5,484
239.40	5,005	405.8	10.0	696	3,043	6,048
239.50	5,005	405.8	100.0	500	3,544	6,088
240.00	6,375	496.0	100.0	2,838	6,382	12,565
241.00	8,291	543.5	100.0	7,312	13,694	16,529
241.50	9,356	587.2	100.0	4,409	18,103	20,471

Device	Routing	Invert	Outlet Devices
#1	Device 2	241.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	236.83'	6.0" Round Culvert L= 10.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 236.83' / 236.70' S= 0.0130 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=236.83' TW=237.19' (Fixed TW Elev= 237.19')
 ↗2=Culvert (Controls 0.00 cfs)
 ↗1=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: UGF #1**Hydrograph**

Summary for Pond 4P: Outlet structure for UGF #1

Inflow Area = 9.972 ac, 32.84% Impervious, Inflow Depth > 0.50" for 25-year storm event
 Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af
 Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

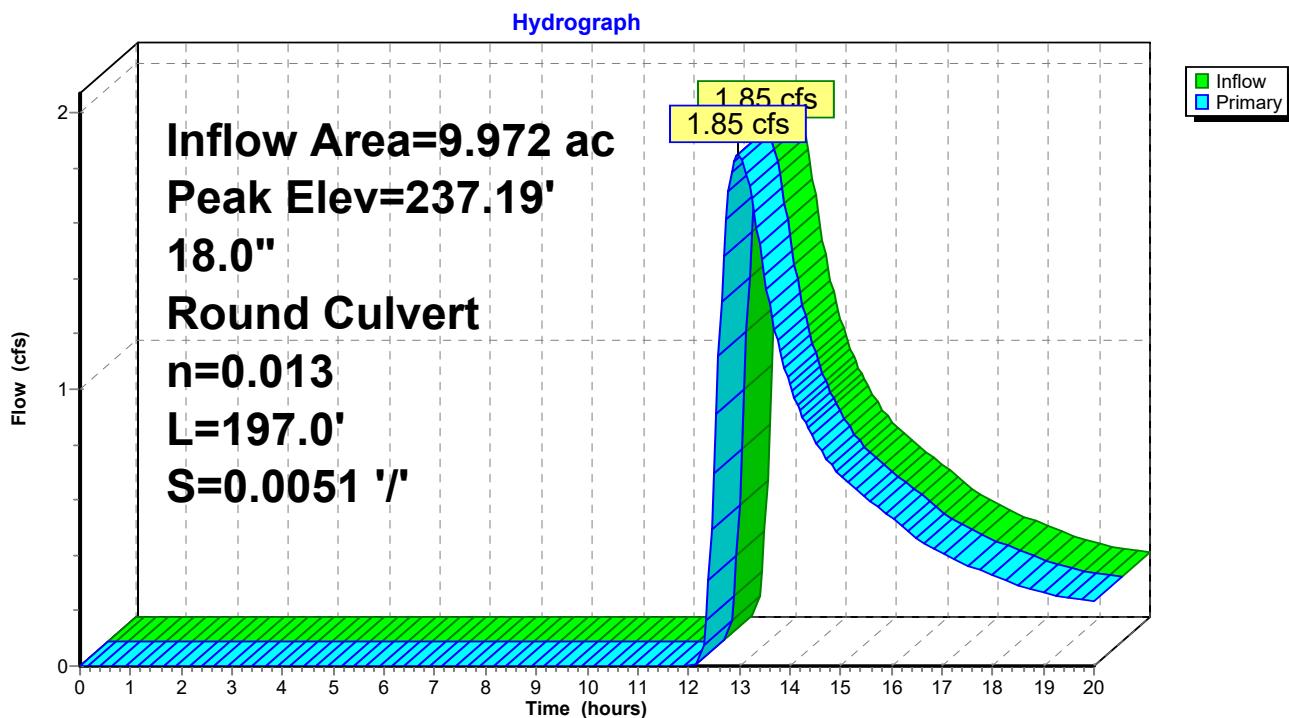
Peak Elev= 237.19' @ 12.98 hrs

Flood Elev= 241.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	236.50'	18.0" Round Culvert L= 197.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 236.50' / 235.50' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.84 cfs @ 12.98 hrs HW=237.19' (Free Discharge)
 ↗1=Culvert (Barrel Controls 1.84 cfs @ 3.38 fps)

Pond 4P: Outlet structure for UGF #1



Summary for Pond 5P: New 4' catch basin

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event
 Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af
 Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

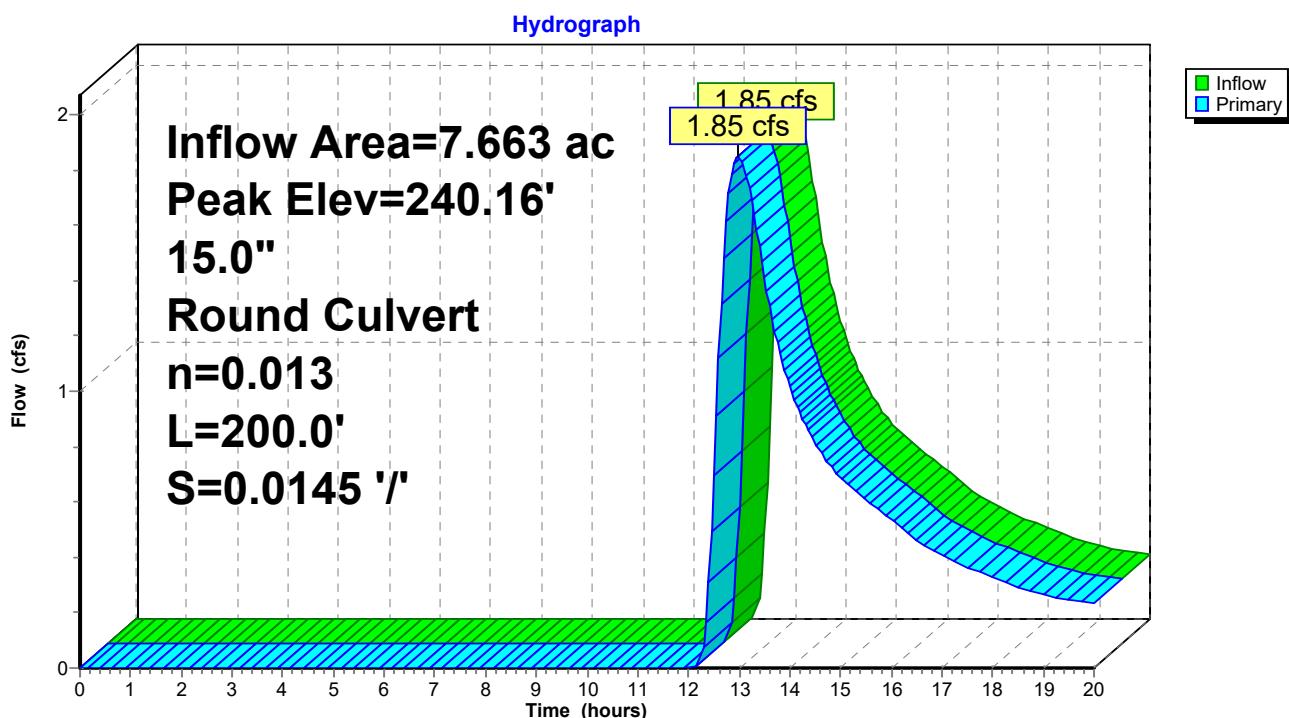
Peak Elev= 240.16' @ 12.98 hrs

Flood Elev= 242.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.49'	15.0" Round Culvert L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 239.49' / 236.60' S= 0.0145 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.84 cfs @ 12.98 hrs HW=240.16' TW=237.19' (Fixed TW Elev= 237.19')
 ↗1=Culvert (Inlet Controls 1.84 cfs @ 2.78 fps)

Pond 5P: New 4' catch basin



Summary for Pond 6P: Stevens Mill Rd X-Culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event
 Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af
 Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

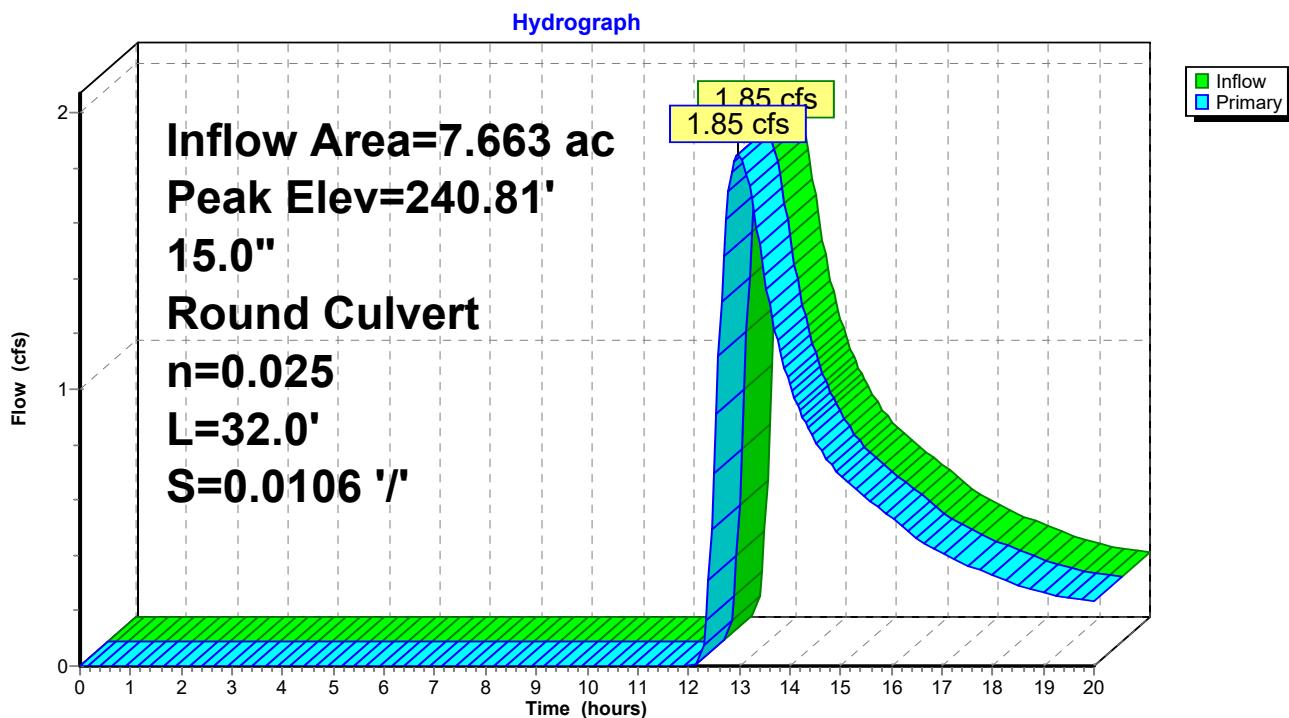
Peak Elev= 240.81' @ 12.98 hrs

Flood Elev= 240.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.93'	15.0" Round Culvert L= 32.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 239.93' / 239.59' S= 0.0106 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=1.84 cfs @ 12.98 hrs HW=240.81' TW=240.16' (Fixed TW Elev= 240.16')
 ↗1=Culvert (Barrel Controls 1.84 cfs @ 2.82 fps)

Pond 6P: Stevens Mill Rd X-Culvert



Summary for Pond 7P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event
 Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af
 Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

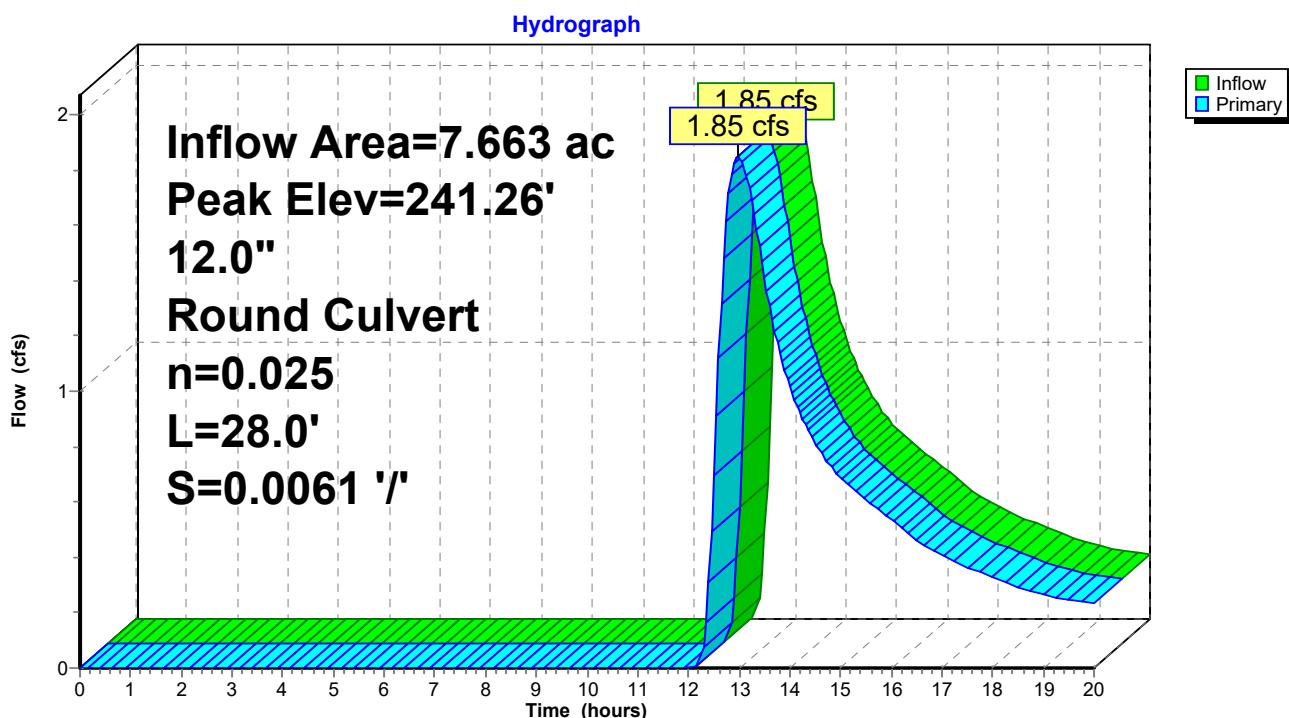
Peak Elev= 241.26' @ 12.98 hrs

Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 240.10' / 239.93' S= 0.0061 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.84 cfs @ 12.98 hrs HW=241.26' TW=240.82' (Fixed TW Elev= 240.82')
 ↗1=Culvert (Outlet Controls 1.84 cfs @ 2.54 fps)

Pond 7P: Driveway culvert



Summary for Pond 8P: Driveway culvert

Same as Pre 2P

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.66" for 25-year storm event
 Inflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af
 Outflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

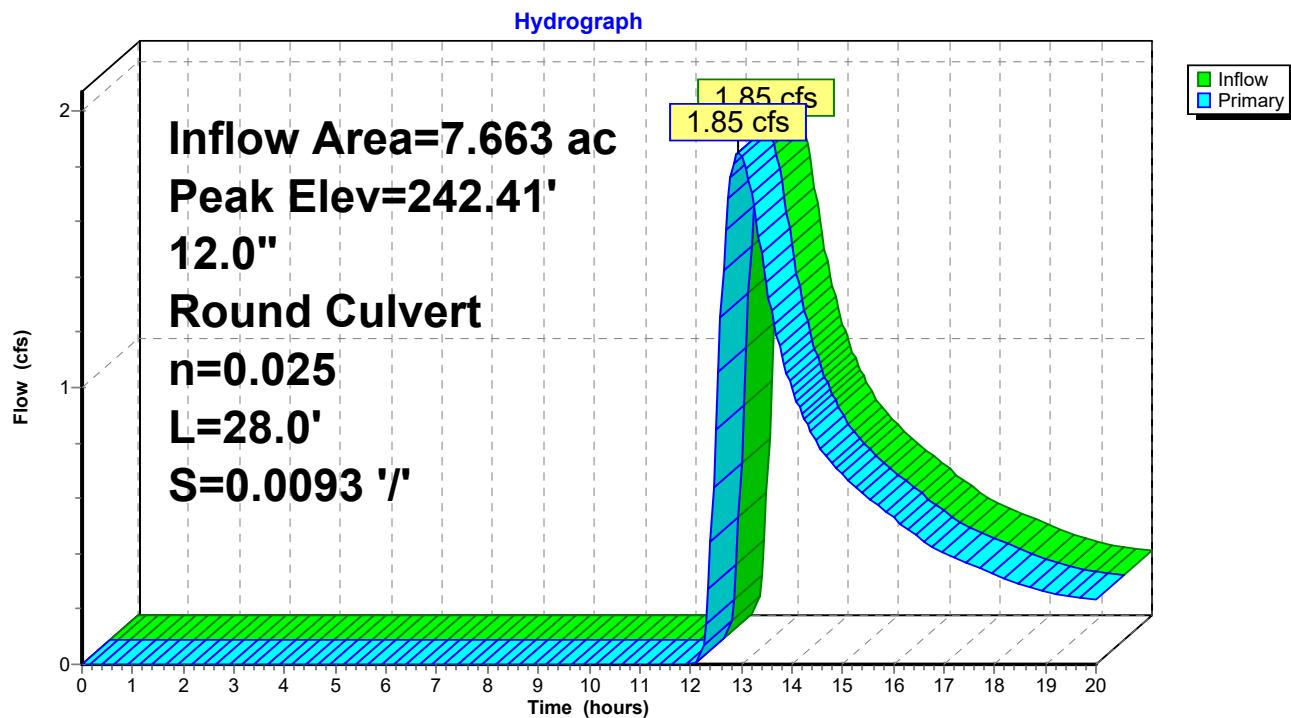
Peak Elev= 242.41' @ 12.95 hrs

Flood Elev= 243.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	241.35'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 241.35' / 241.09' S= 0.0093 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.95 hrs HW=242.41' TW=241.60' (Fixed TW Elev= 241.60')
 ↑1=Culvert (Barrel Controls 1.85 cfs @ 2.77 fps)

Pond 8P: Driveway culvert



Summary for Pond 9P: Sprucewood Rd Culvert

Same as Pre 1P

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.64" for 25-year storm event
 Inflow = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af
 Outflow = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

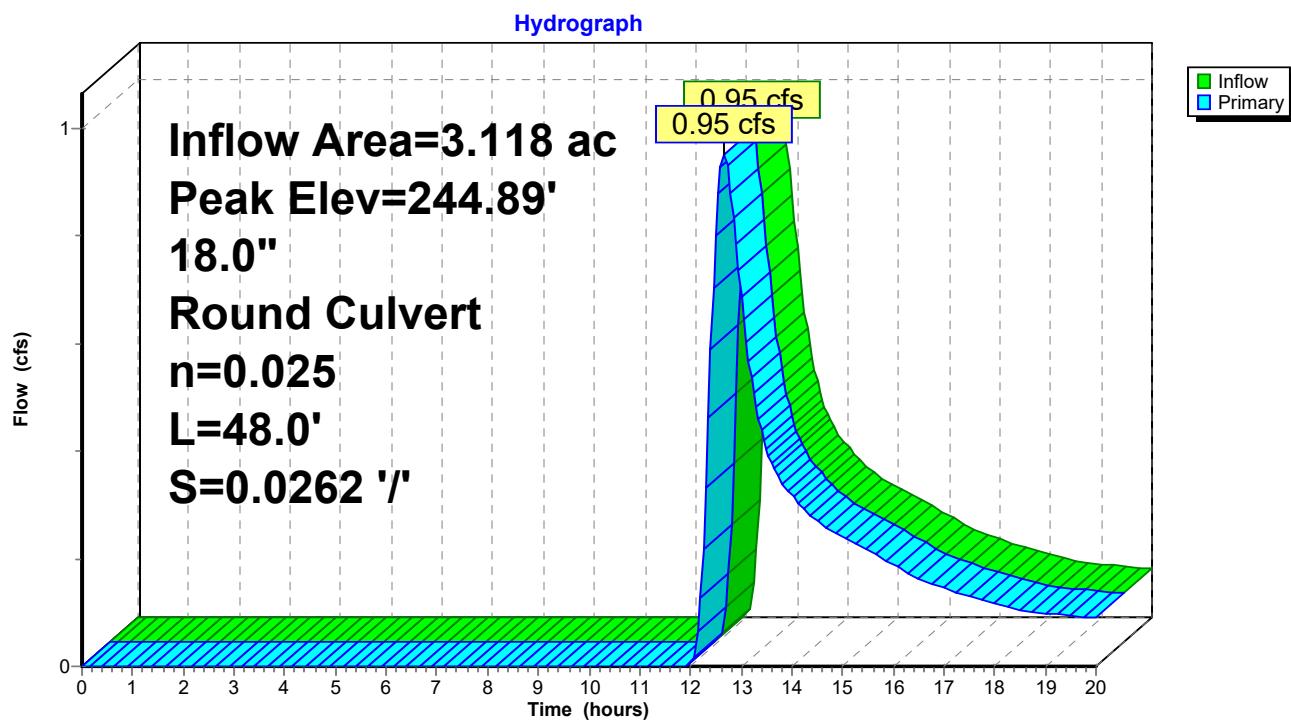
Peak Elev= 244.89' @ 12.67 hrs

Flood Elev= 246.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	244.37'	18.0" Round Culvert L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 244.37' / 243.11' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.95 cfs @ 12.67 hrs HW=244.89' TW=244.00' (Fixed TW Elev= 244.00')
 ↑ 1=Culvert (Outlet Controls 0.95 cfs @ 2.62 fps)

Pond 9P: Sprucewood Rd Culvert



Summary for Pond 10P: Proposed 15" Culvert

Inflow Area = 3.223 ac, 26.63% Impervious, Inflow Depth > 1.96" for 25-year storm event
 Inflow = 3.95 cfs @ 12.61 hrs, Volume= 0.528 af
 Outflow = 3.95 cfs @ 12.61 hrs, Volume= 0.528 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.95 cfs @ 12.61 hrs, Volume= 0.528 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

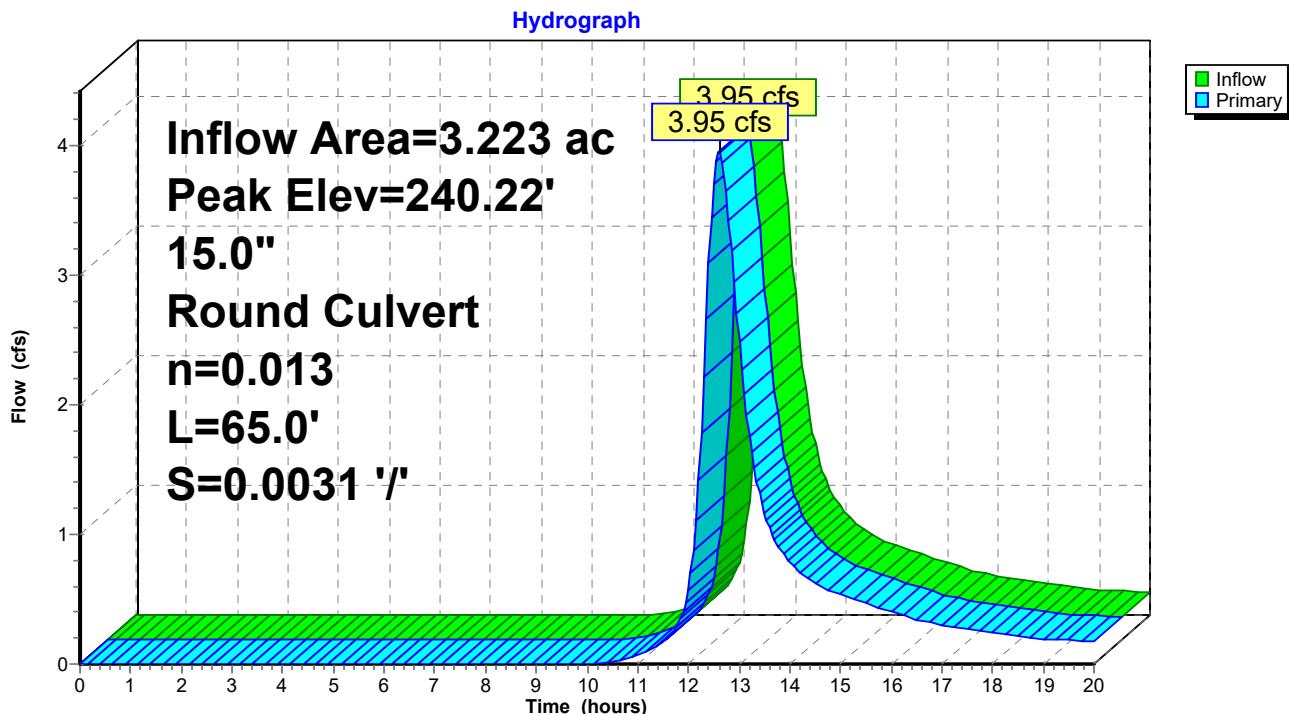
Peak Elev= 240.22' @ 12.61 hrs

Flood Elev= 241.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.00'	15.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 238.00' / 237.80' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.94 cfs @ 12.61 hrs HW=240.21' TW=239.50' (Fixed TW Elev= 239.50')
 ↗1=Culvert (Inlet Controls 3.94 cfs @ 3.21 fps)

Pond 10P: Proposed 15" Culvert



Summary for Pond 11P: UGF #2

Inflow Area = 4.441 ac, 25.83% Impervious, Inflow Depth > 2.28" for 25-year storm event
 Inflow = 5.49 cfs @ 12.47 hrs, Volume= 0.842 af
 Outflow = 4.64 cfs @ 12.73 hrs, Volume= 0.578 af, Atten= 15%, Lag= 15.4 min
 Primary = 4.64 cfs @ 12.73 hrs, Volume= 0.578 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 239.48' @ 12.73 hrs Surf.Area= 6,854 sf Storage= 13,155 cf
 Flood Elev= 239.70' Surf.Area= 7,182 sf Storage= 14,679 cf

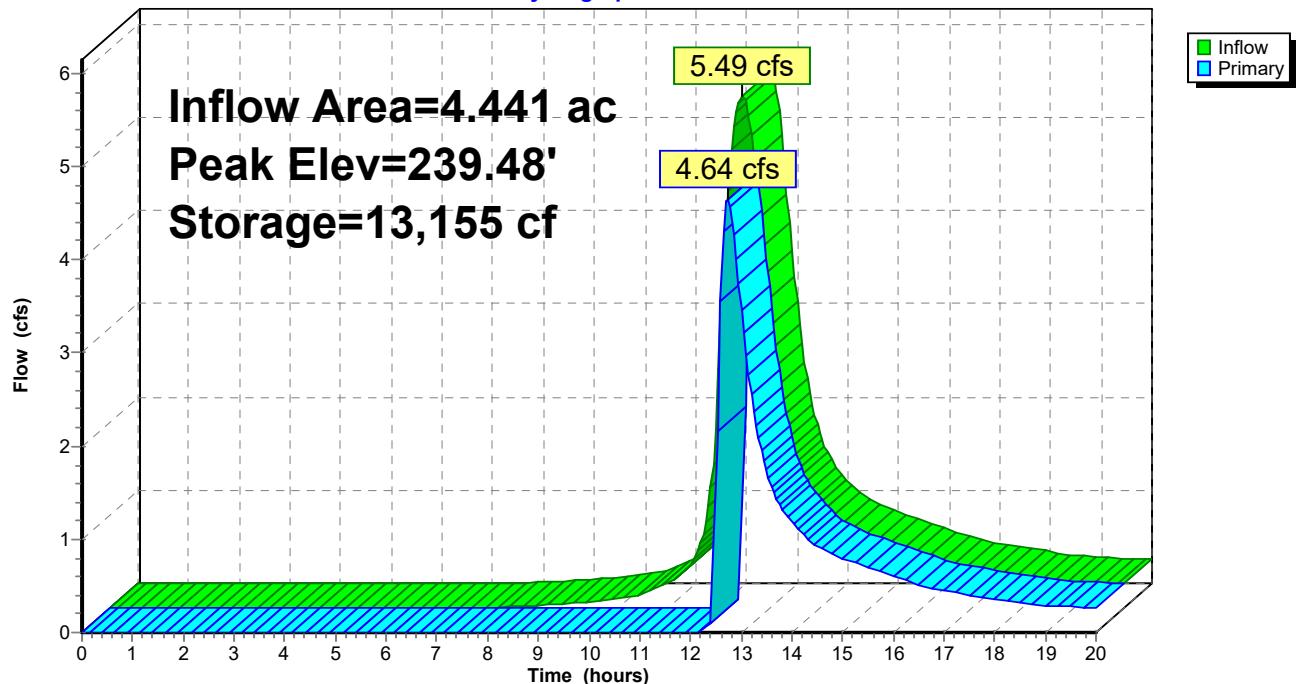
Plug-Flow detention time= 120.2 min calculated for 0.578 af (69% of inflow)
 Center-of-Mass det. time= 52.2 min (871.2 - 819.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	235.03'	14,679 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
235.03	4,718	325.6	0.0	0	0	4,718
235.04	4,718	325.6	40.0	19	19	4,721
236.20	4,718	325.6	40.0	2,189	2,208	5,099
236.21	4,718	325.6	10.0	5	2,213	5,102
237.70	4,718	325.6	10.0	703	2,916	5,587
237.71	4,718	325.6	100.0	47	2,963	5,591
238.00	5,120	333.3	100.0	1,426	4,389	6,005
239.00	6,152	352.7	100.0	5,628	10,017	7,119
239.70	7,182	372.1	100.0	4,662	14,679	8,266

Device	Routing	Invert	Outlet Devices	
#1	Device 2	239.20'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	234.70'	15.0" Round Culvert L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 234.70' / 234.50' S= 0.0011 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf	

Primary OutFlow Max=4.62 cfs @ 12.73 hrs HW=239.48' (Free Discharge)

↑
2=Culvert (Passes 4.62 cfs of 8.05 cfs potential flow)
↑
1=Orifice/Grate (Weir Controls 4.62 cfs @ 1.74 fps)

Pond 11P: UGF #2**Hydrograph**

Summary for Pond 12P: UGF #3

Inflow Area = 2.939 ac, 90.21% Impervious, Inflow Depth > 0.29" for 25-year storm event
 Inflow = 1.23 cfs @ 12.14 hrs, Volume= 0.071 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 229.37' @ 20.00 hrs Surf.Area= 6,514 sf Storage= 3,104 cf
 Flood Elev= 232.78' Surf.Area= 9,647 sf Storage= 19,813 cf

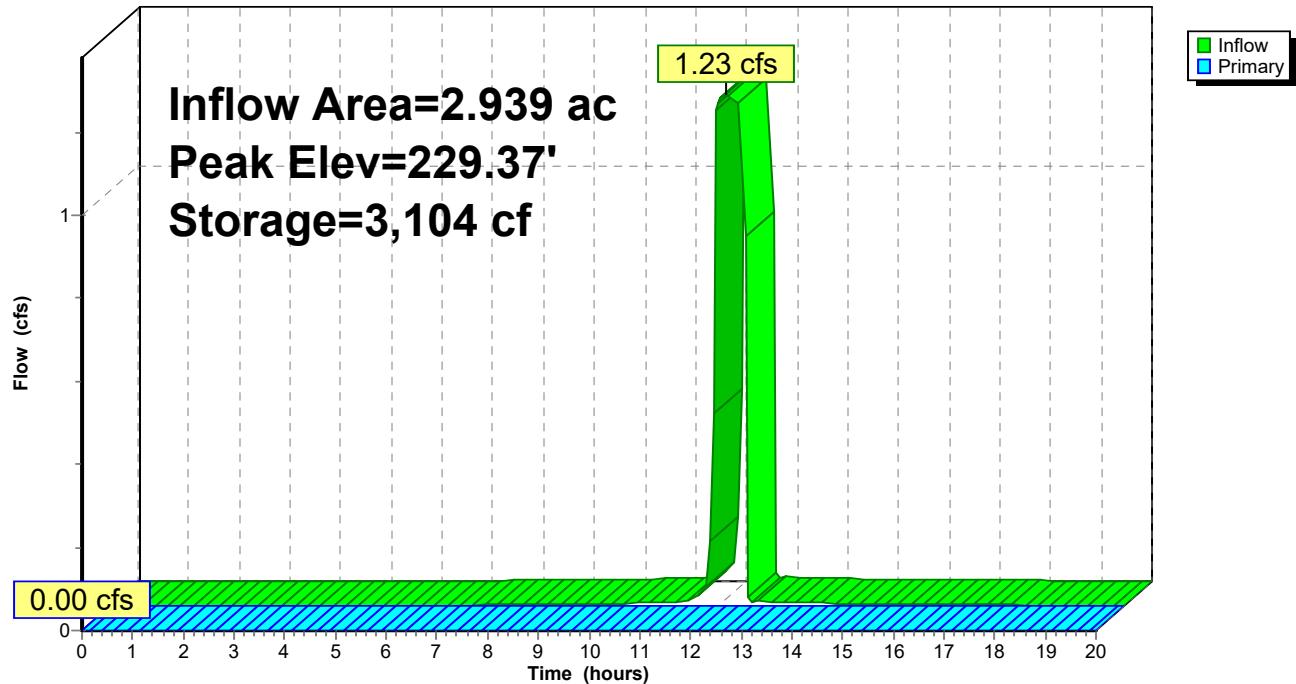
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description			
#1	228.11'	19,813 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.11	6,514	398.5	0.0	0	0	6,514
228.12	6,514	398.5	40.0	26	26	6,518
229.28	6,514	398.5	40.0	3,022	3,049	6,980
229.29	6,514	398.5	10.0	7	3,055	6,984
230.77	6,514	398.5	10.0	964	4,019	7,574
230.78	6,514	398.5	100.0	65	4,084	7,578
231.00	6,779	402.6	100.0	1,462	5,546	7,854
232.00	8,015	421.5	100.0	7,388	12,935	9,160
232.78	9,647	444.9	100.0	6,878	19,813	10,808

Device	Routing	Invert	Outlet Devices	
#1	Device 2	232.28'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	227.78'	12.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 227.78' / 226.00' S= 0.0371 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf	

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=228.11' (Free Discharge)

↑
2=Culvert (Passes 0.00 cfs of 0.44 cfs potential flow)
↑
1=Orifice/Grate (Controls 0.00 cfs)

Pond 12P: UGF #3**Hydrograph**

Summary for Pond 13P: UGF #4

Inflow Area = 0.569 ac, 63.32% Impervious, Inflow Depth > 3.82" for 25-year storm event
 Inflow = 2.35 cfs @ 12.12 hrs, Volume= 0.181 af
 Outflow = 2.02 cfs @ 12.20 hrs, Volume= 0.115 af, Atten= 14%, Lag= 4.7 min
 Primary = 2.02 cfs @ 12.20 hrs, Volume= 0.115 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 240.66' @ 12.20 hrs Surf.Area= 2,168 sf Storage= 3,209 cf
 Flood Elev= 241.00' Surf.Area= 2,442 sf Storage= 3,987 cf

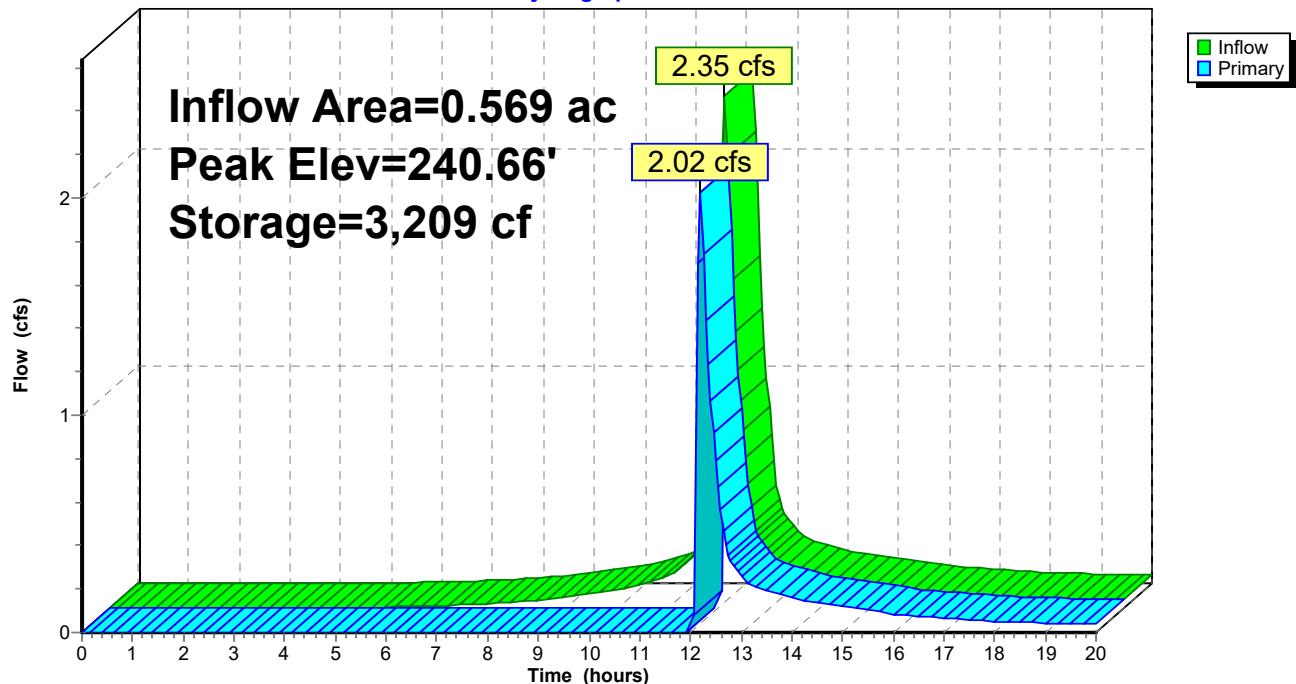
Plug-Flow detention time= 134.1 min calculated for 0.115 af (64% of inflow)
 Center-of-Mass det. time= 62.4 min (829.1 - 766.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	236.33'	3,987 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
236.33	988	214.0	0.0	0	0	988
236.34	988	214.0	40.0	4	4	990
237.50	988	214.0	40.0	458	462	1,238
237.51	988	214.0	10.0	1	463	1,241
238.99	988	214.0	10.0	146	610	1,557
239.00	988	214.0	100.0	10	619	1,559
240.00	1,680	246.0	100.0	1,319	1,938	2,753
241.00	2,442	264.0	100.0	2,049	3,987	3,527

Device	Routing	Invert	Outlet Devices	
#1	Device 2	240.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#2	Primary	236.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 236.00' / 235.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf	

Primary OutFlow Max=2.00 cfs @ 12.20 hrs HW=240.66' (Free Discharge)

↑ 2=Culvert (Passes 2.00 cfs of 7.71 cfs potential flow)
 ↑ 1=Orifice/Grate (Weir Controls 2.00 cfs @ 1.31 fps)

Pond 13P: UGF #4**Hydrograph**

Summary for Pond 14P: Storage within field

Inflow Area = 0.906 ac, 100.00% Impervious, Inflow Depth > 4.93" for 25-year storm event
 Inflow = 5.48 cfs @ 12.00 hrs, Volume= 0.373 af
 Outflow = 1.54 cfs @ 12.29 hrs, Volume= 0.372 af, Atten= 72%, Lag= 17.0 min
 Discarded = 0.94 cfs @ 12.29 hrs, Volume= 0.353 af
 Primary = 0.60 cfs @ 12.29 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 243.05' @ 12.29 hrs Surf.Area= 39,484 sf Storage= 3,496 cf

Plug-Flow detention time= 17.2 min calculated for 0.372 af (100% of inflow)
 Center-of-Mass det. time= 17.0 min (731.7 - 714.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	242.83'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.83	39,484	0.0	0	0
242.84	39,484	40.0	158	158
243.16	39,484	40.0	5,054	5,212
243.17	39,484	0.0	0	5,212
243.50	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	242.83'	1.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 235.00'
#2	Device 3	243.00'	12.0" W x 1.0" H Box Culvert X 16.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 243.00' / 242.30' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	241.59'	8.0" Round Culvert L= 435.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 241.59' / 239.60' S= 0.0046 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	239.60'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 239.60' / 239.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.94 cfs @ 12.29 hrs HW=243.05' (Free Discharge)

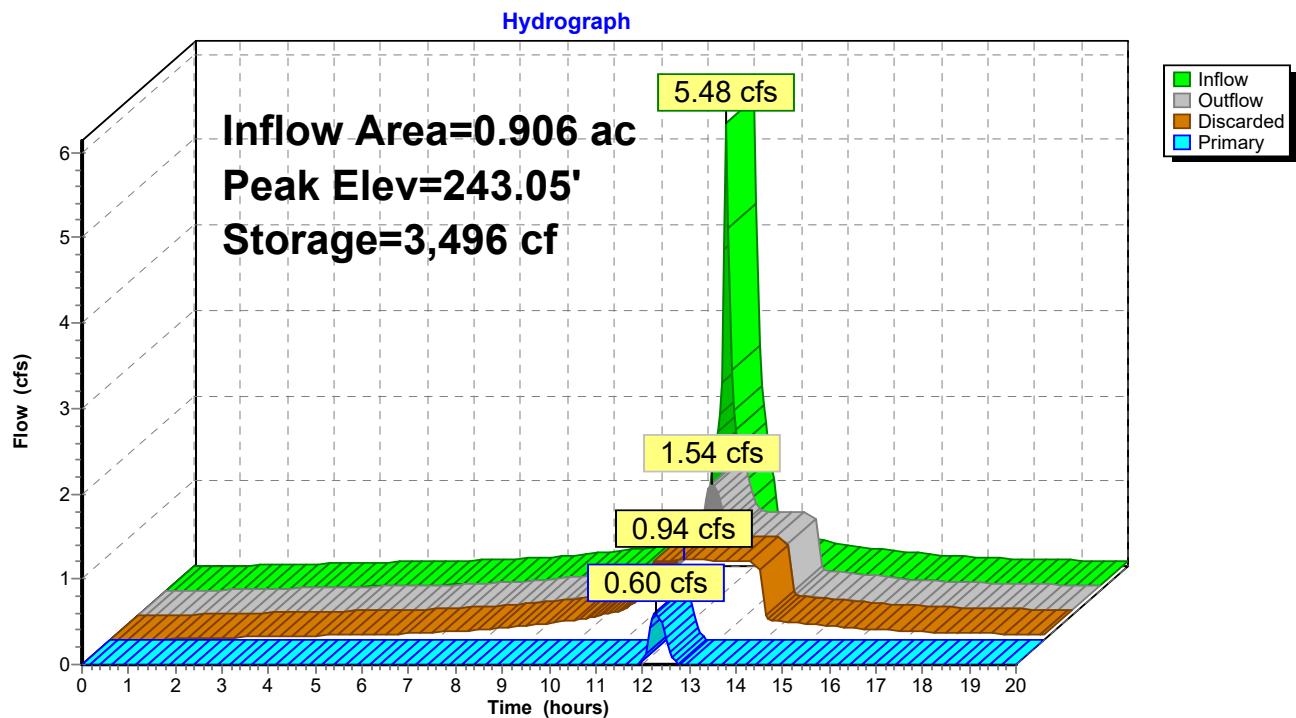
↑ 1=Exfiltration (Controls 0.94 cfs)

Primary OutFlow Max=0.59 cfs @ 12.29 hrs HW=243.05' TW=240.09' (Fixed TW Elev= 240.09')

↑ 4=Culvert (Passes 0.59 cfs of 6.50 cfs potential flow)

↑ 3=Culvert (Passes 0.59 cfs of 1.18 cfs potential flow)

↑ 2=Culvert (Inlet Controls 0.59 cfs @ 0.73 fps)

Pond 14P: Storage within field

Summary for Pond 15P: Storage within field

Inflow Area = 0.906 ac, 100.00% Impervious, Inflow Depth > 4.93" for 25-year storm event
 Inflow = 5.48 cfs @ 12.00 hrs, Volume= 0.373 af
 Outflow = 1.54 cfs @ 12.29 hrs, Volume= 0.372 af, Atten= 72%, Lag= 17.0 min
 Discarded = 0.94 cfs @ 12.29 hrs, Volume= 0.353 af
 Primary = 0.60 cfs @ 12.29 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 243.05' @ 12.29 hrs Surf.Area= 39,484 sf Storage= 3,496 cf

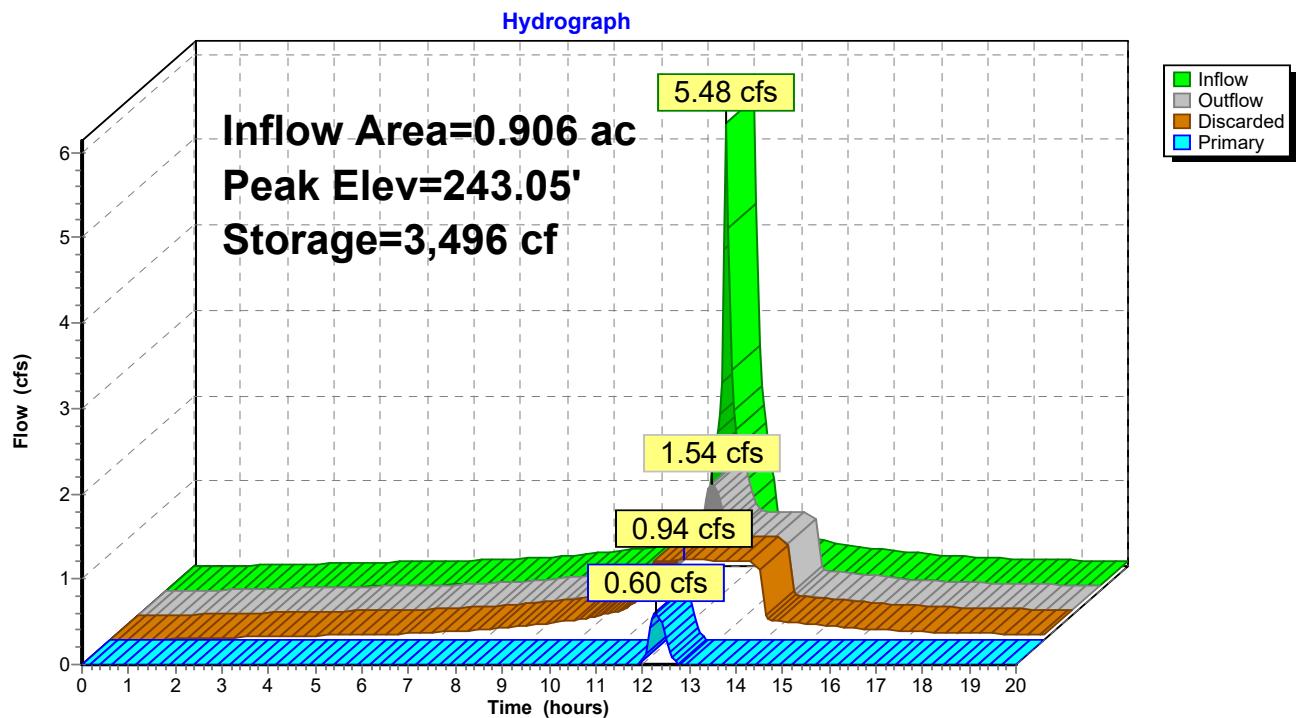
Plug-Flow detention time= 17.2 min calculated for 0.372 af (100% of inflow)
 Center-of-Mass det. time= 17.0 min (731.7 - 714.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	242.83'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
242.83	39,484	0.0	0	0
242.84	39,484	40.0	158	158
243.16	39,484	40.0	5,054	5,212
243.17	39,484	0.0	0	5,212
243.50	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	242.83'	1.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 235.00'
#2	Device 3	243.00'	12.0" W x 1.0" H Box Culvert X 16.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 243.00' / 242.30' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	241.59'	8.0" Round Culvert L= 435.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 241.59' / 239.60' S= 0.0046 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	239.60'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 239.60' / 239.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.94 cfs @ 12.29 hrs HW=243.05' (Free Discharge)
 ↑ 1=Exfiltration (Controls 0.94 cfs)

Primary OutFlow Max=0.59 cfs @ 12.29 hrs HW=243.05' TW=240.09' (Fixed TW Elev= 240.09')
 ↑ 4=Culvert (Passes 0.59 cfs of 6.50 cfs potential flow)
 ↑ 3=Culvert (Passes 0.59 cfs of 1.18 cfs potential flow)
 ↑ 2=Culvert (Inlet Controls 0.59 cfs @ 0.73 fps)

Pond 15P: Storage within field

Summary for Pond 16P: Storage within field

Inflow Area = 2.939 ac, 90.21% Impervious, Inflow Depth > 4.59" for 25-year storm event
 Inflow = 17.34 cfs @ 12.00 hrs, Volume= 1.124 af
 Outflow = 7.22 cfs @ 12.14 hrs, Volume= 1.123 af, Atten= 58%, Lag= 8.1 min
 Discarded = 5.98 cfs @ 12.14 hrs, Volume= 1.052 af
 Primary = 1.23 cfs @ 12.14 hrs, Volume= 0.071 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 235.63' @ 12.14 hrs Surf.Area= 39,484 sf Storage= 4,802 cf

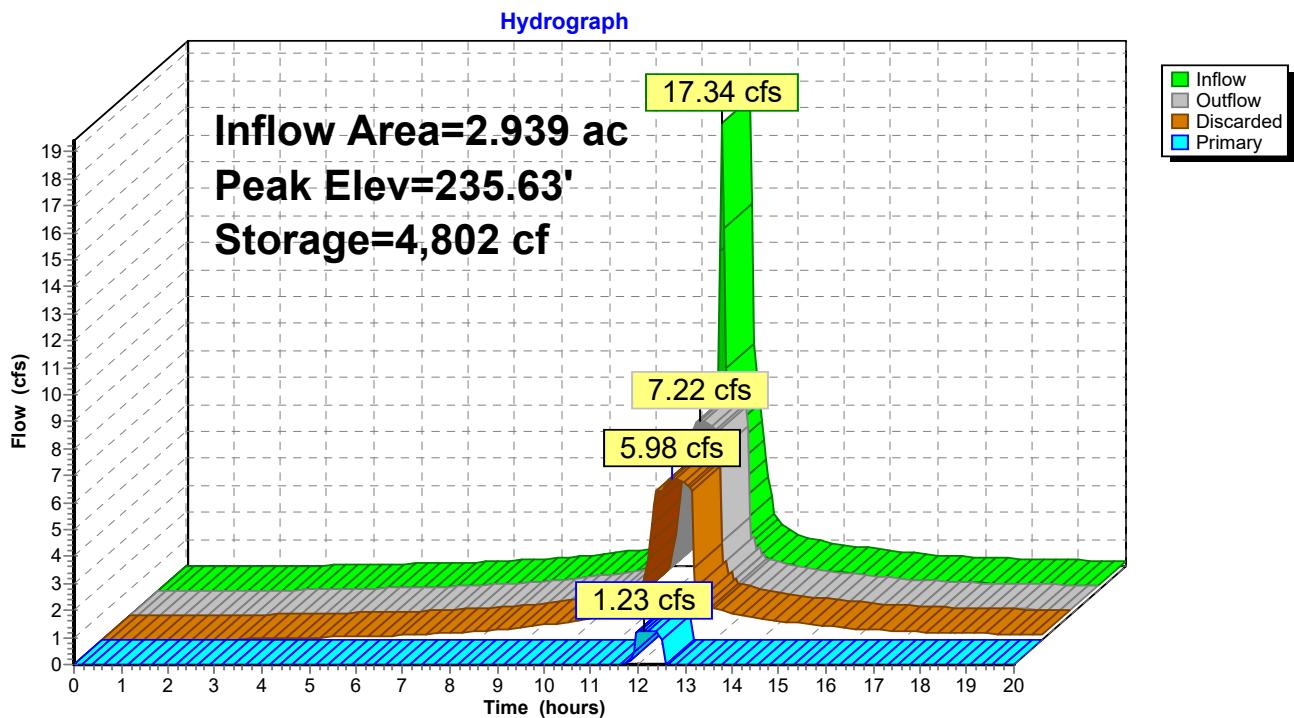
Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 2.7 min (736.1 - 733.4)

Volume	Invert	Avail.Storage	Storage Description	
#1	235.33'	5,212 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.33	39,484	0.0	0	0
235.34	39,484	40.0	158	158
235.66	39,484	40.0	5,054	5,212
235.67	39,484	0.0	0	5,212
236.00	39,484	0.0	0	5,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	235.33'	6.000 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 232.00'
#2	Device 3	235.33'	12.0" W x 1.0" H Box Culvert X 30.00 L= 140.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 235.33' / 234.63' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.08 sf
#3	Device 4	233.97'	8.0" Round Culvert L= 573.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 233.97' / 231.10' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#4	Primary	231.10'	12.0" Round Culvert L= 36.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 231.10' / 230.78' S= 0.0089 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=5.98 cfs @ 12.14 hrs HW=235.63' (Free Discharge)
 ↑ 1=Exfiltration (Controls 5.98 cfs)

Primary OutFlow Max=1.23 cfs @ 12.14 hrs HW=235.63' (Free Discharge)
 ↑ 4=Culvert (Passes 1.23 cfs of 7.59 cfs potential flow)
 ↑ 3=Culvert (Barrel Controls 1.23 cfs @ 3.53 fps)
 ↑ 2=Culvert (Passes 1.23 cfs of 3.35 cfs potential flow)

Pond 16P: Storage within field

Summary for Pond 17P: New 36" Culvert

Inflow Area = 0.847 ac, 0.00% Impervious, Inflow Depth > 1.68" for 25-year storm event
 Inflow = 1.16 cfs @ 12.31 hrs, Volume= 0.118 af
 Outflow = 1.16 cfs @ 12.31 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.16 cfs @ 12.31 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

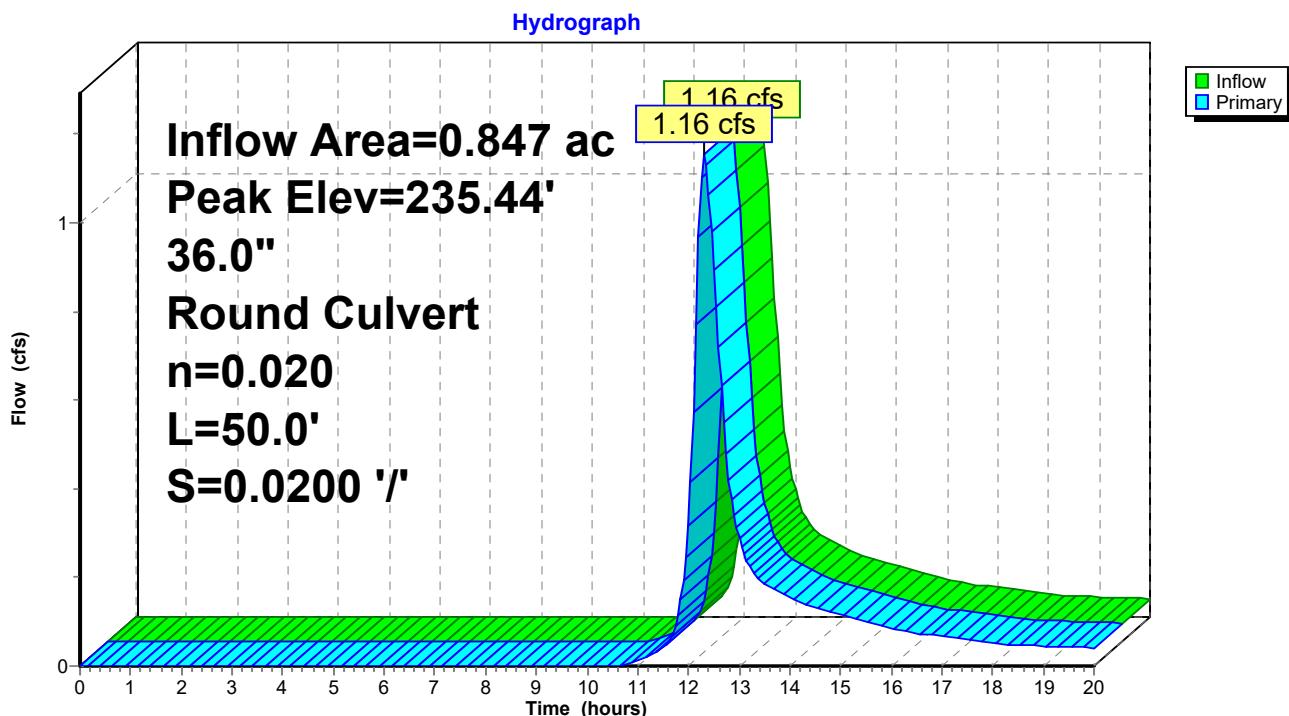
Peak Elev= 235.44' @ 12.31 hrs

Flood Elev= 240.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	235.00'	36.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 235.00' / 234.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 7.07 sf

Primary OutFlow Max=1.15 cfs @ 12.31 hrs HW=235.44' TW=234.50' (Fixed TW Elev= 234.50')
 ↗1=Culvert (Inlet Controls 1.15 cfs @ 1.78 fps)

Pond 17P: New 36" Culvert



Summary for Pond 18P: New 12" Culvert

Inflow Area = 0.534 ac, 0.47% Impervious, Inflow Depth > 0.93" for 25-year storm event
 Inflow = 0.35 cfs @ 12.33 hrs, Volume= 0.041 af
 Outflow = 0.35 cfs @ 12.33 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.35 cfs @ 12.33 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

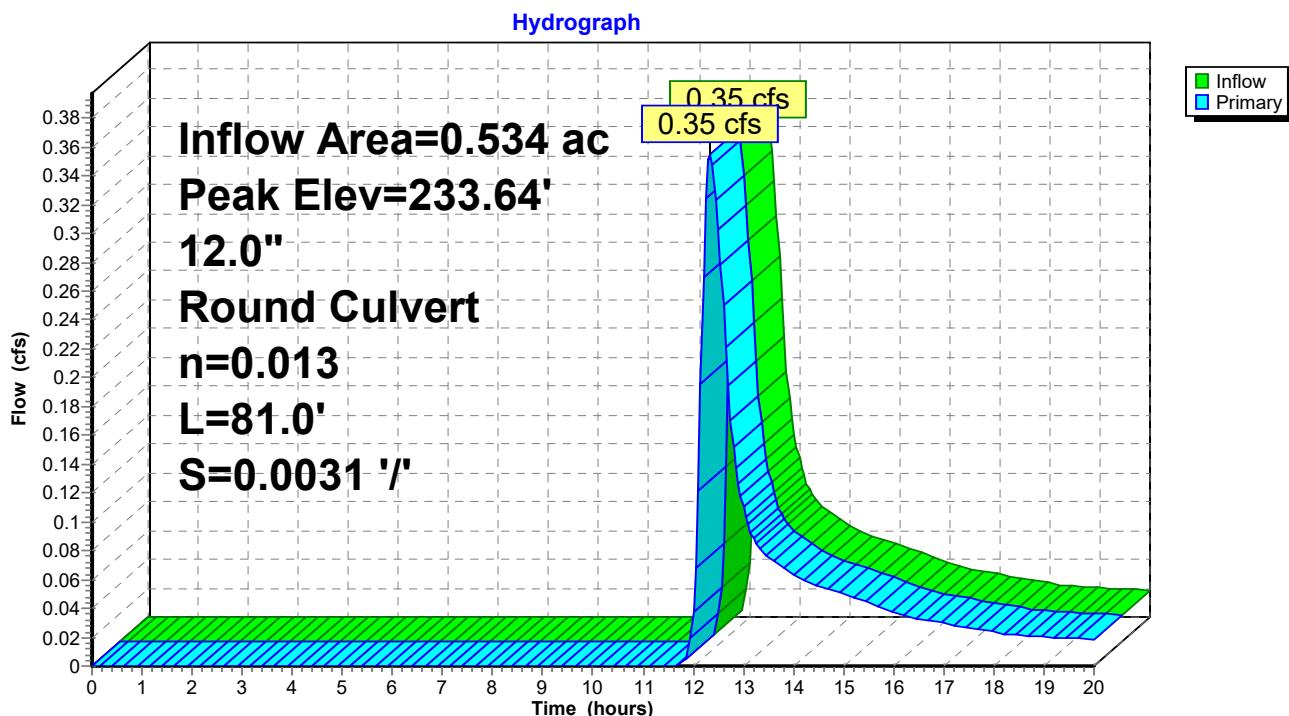
Peak Elev= 233.64' @ 12.33 hrs

Flood Elev= 235.50'

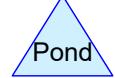
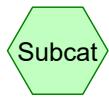
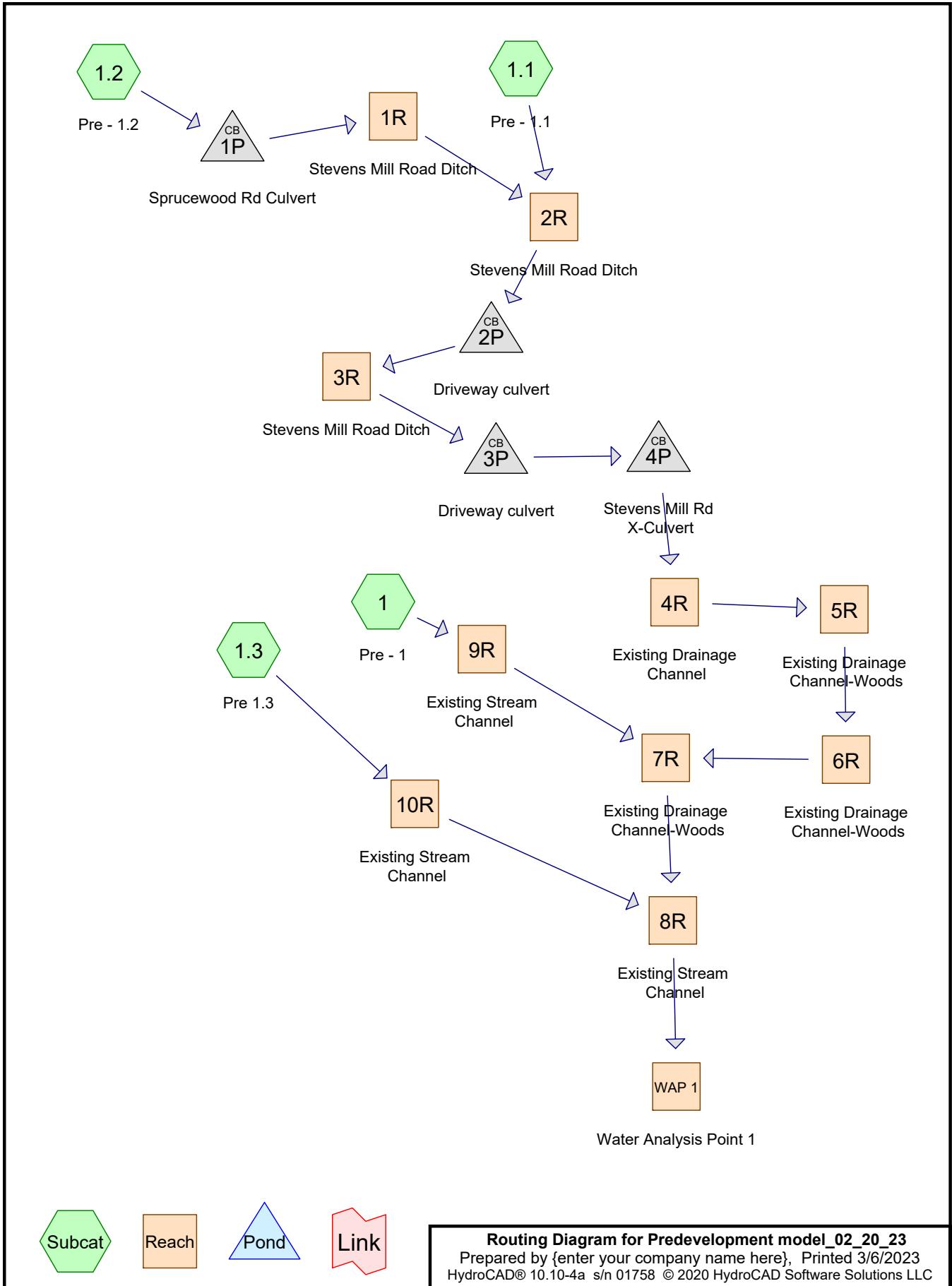
Device	Routing	Invert	Outlet Devices
#1	Primary	233.25'	12.0" Round Culvert L= 81.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 233.25' / 233.00' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.35 cfs @ 12.33 hrs HW=233.63' (Free Discharge)
 ↗1=Culvert (Barrel Controls 0.35 cfs @ 1.88 fps)

Pond 18P: New 12" Culvert



Pre-Development Model



Routing Diagram for Predevelopment model_02_20_23
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year storm	Type III 24-hr		Default	24.00	1	3.00	2
2	10-year storm	Type III 24-hr		Default	24.00	1	4.30	2
3	25-year storm	Type III 24-hr		Default	24.00	1	5.40	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.657	98	Paved parking, HSG A (1.2)
0.524	83	Paved roads w/open ditches, 50% imp, HSG A (1, 1.1, 1.2)
0.451	92	Paved roads w/open ditches, 50% imp, HSG C (1, 1.1)
0.488	98	Unconnected pavement, HSG A (1, 1.1)
0.190	98	Unconnected pavement, HSG C (1, 1.1)
8.836	30	Woods, Good, HSG A (1, 1.1, 1.2, 1.3)
10.003	70	Woods, Good, HSG C (1, 1.1)
17.776	77	Woods, Good, HSG D (1, 1.3)
38.926	66	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
10.505	HSG A	1, 1.1, 1.2, 1.3
0.000	HSG B	
10.644	HSG C	1, 1.1
17.776	HSG D	1, 1.3
0.000	Other	
38.926		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchr Numbers
0.657	0.000	0.000	0.000	0.000	0.657	Paved parking	
0.524	0.000	0.451	0.000	0.000	0.975	Paved roads w/open ditches, 50% imp	
0.488	0.000	0.190	0.000	0.000	0.679	Unconnected pavement	
8.836	0.000	10.003	17.776	0.000	36.615	Woods, Good	
10.505	0.000	10.644	17.776	0.000	38.926	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	244.37	243.11	48.0	0.0262	0.025	18.0	0.0	0.0
2	2P	241.35	241.09	28.0	0.0093	0.025	12.0	0.0	0.0
3	3P	240.10	239.93	28.0	0.0061	0.025	12.0	0.0	0.0
4	4P	239.93	239.59	32.0	0.0106	0.025	15.0	0.0	0.0

Time span=3.00-20.00 hrs, dt=0.05 hrs, 341 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: Pre - 1 Runoff Area=1,193,053 sf 1.69% Impervious Runoff Depth>0.76"
Flow Length=670' Tc=53.6 min UI Adjusted CN=73 Runoff=10.57 cfs 1.733 af

Subcatchment1.1: Pre - 1.1 Runoff Area=197,973 sf 12.87% Impervious Runoff Depth>0.05"
Flow Length=500' Tc=68.1 min UI Adjusted CN=49 Runoff=0.04 cfs 0.019 af

Subcatchment1.2: Pre - 1.2 Runoff Area=135,817 sf 24.84% Impervious Runoff Depth>0.04"
Flow Length=570' Tc=36.8 min CN=48 Runoff=0.02 cfs 0.011 af

Subcatchment1.3: Pre 1.3 Runoff Area=168,752 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=670' Tc=33.3 min CN=39 Runoff=0.00 cfs 0.000 af

Reach 1R: Stevens Mill Road Ditch Avg. Flow Depth=0.09' Max Vel=0.35 fps Inflow=0.02 cfs 0.011 af
n=0.035 L=165.0' S=0.0030 '/' Capacity=19.57 cfs Outflow=0.02 cfs 0.010 af

Reach 2R: Stevens Mill Road Ditch Avg. Flow Depth=0.10' Max Vel=0.76 fps Inflow=0.07 cfs 0.029 af
n=0.035 L=105.0' S=0.0120 '/' Capacity=38.94 cfs Outflow=0.07 cfs 0.029 af

Reach 3R: Stevens Mill Road Ditch Avg. Flow Depth=0.11' Max Vel=0.67 fps Inflow=0.07 cfs 0.029 af
n=0.035 L=118.0' S=0.0084 '/' Capacity=32.56 cfs Outflow=0.07 cfs 0.028 af

Reach 4R: Existing Drainage Channel Avg. Flow Depth=0.05' Max Vel=0.59 fps Inflow=0.07 cfs 0.028 af
n=0.025 L=255.0' S=0.0085 '/' Capacity=3.00 cfs Outflow=0.07 cfs 0.028 af

Reach 5R: Existing Drainage Avg. Flow Depth=0.04' Max Vel=0.68 fps Inflow=0.07 cfs 0.028 af
n=0.025 L=345.0' S=0.0157 '/' Capacity=2.07 cfs Outflow=0.07 cfs 0.026 af

Reach 6R: Existing Drainage Avg. Flow Depth=0.04' Max Vel=0.84 fps Inflow=0.07 cfs 0.026 af
n=0.025 L=295.0' S=0.0237 '/' Capacity=14.61 cfs Outflow=0.07 cfs 0.026 af

Reach 7R: Existing Drainage Avg. Flow Depth=0.70' Max Vel=2.77 fps Inflow=10.53 cfs 1.755 af
n=0.040 L=220.0' S=0.0159 '/' Capacity=54.77 cfs Outflow=10.51 cfs 1.750 af

Reach 8R: Existing Stream Channel Avg. Flow Depth=1.18' Max Vel=1.44 fps Inflow=10.51 cfs 1.750 af
n=0.040 L=280.0' S=0.0018 '/' Capacity=39.48 cfs Outflow=10.46 cfs 1.739 af

Reach 9R: Existing Stream Channel Avg. Flow Depth=0.56' Max Vel=3.81 fps Inflow=10.57 cfs 1.733 af
n=0.030 L=310.0' S=0.0226 '/' Capacity=37.22 cfs Outflow=10.53 cfs 1.729 af

Reach 10R: Existing Stream Channel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.040 L=1,015.0' S=0.0034 '/' Capacity=72.89 cfs Outflow=0.00 cfs 0.000 af

Reach WAP 1: Water Analysis Point 1 Inflow=10.46 cfs 1.739 af
Outflow=10.46 cfs 1.739 af

Pond 1P: Sprucewood Rd Culvert Peak Elev=244.47' Inflow=0.02 cfs 0.011 af
18.0" Round Culvert n=0.025 L=48.0' S=0.0262 '/' Outflow=0.02 cfs 0.011 af

Pond 2P: Driveway culvert

Peak Elev=241.64' Inflow=0.07 cfs 0.029 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0093 '/' Outflow=0.07 cfs 0.029 af

Pond 3P: Driveway culvert

Peak Elev=240.83' Inflow=0.07 cfs 0.028 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0061 '/' Outflow=0.07 cfs 0.028 af

Pond 4P: Stevens Mill Rd X-Culvert

Peak Elev=240.10' Inflow=0.07 cfs 0.028 af
15.0" Round Culvert n=0.025 L=32.0' S=0.0106 '/' Outflow=0.07 cfs 0.028 af

Total Runoff Area = 38.926 ac Runoff Volume = 1.763 af Average Runoff Depth = 0.54"
95.32% Pervious = 37.102 ac 4.68% Impervious = 1.823 ac

Summary for Subcatchment 1: Pre - 1

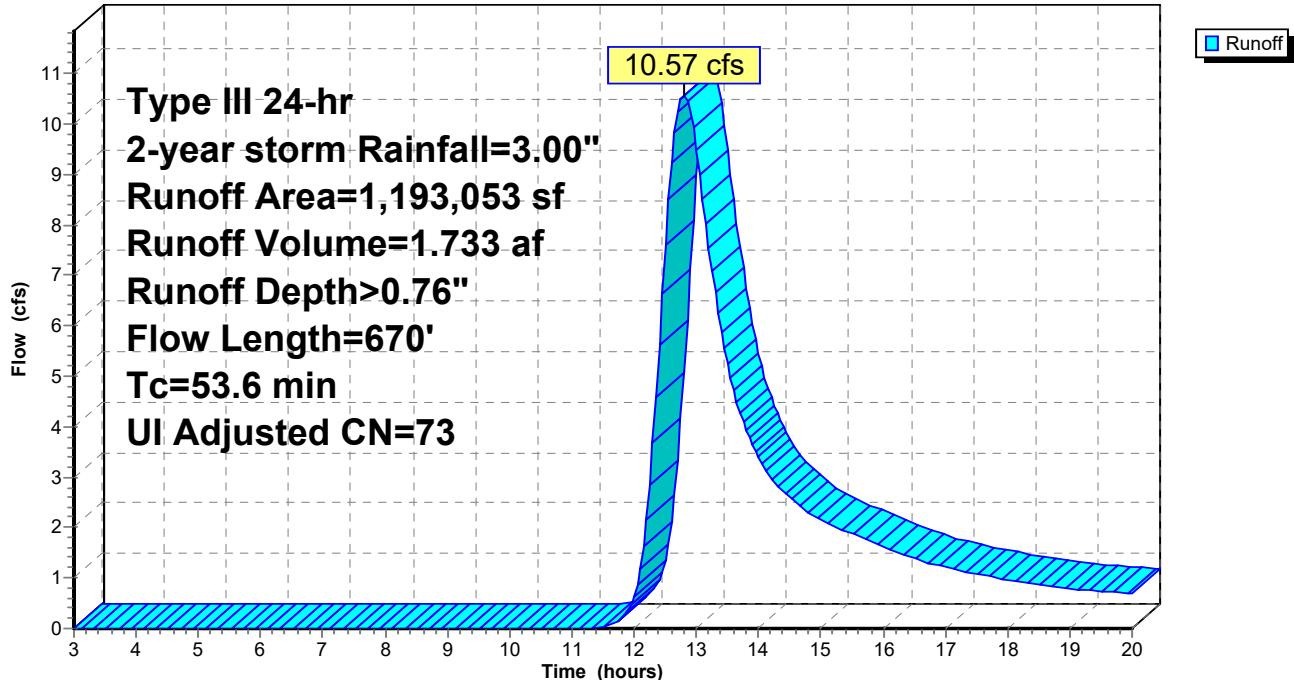
Runoff = 10.57 cfs @ 12.80 hrs, Volume= 1.733 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Adj	Description
11,361	92		Paved roads w/open ditches, 50% imp, HSG C
5,445	83		Paved roads w/open ditches, 50% imp, HSG A
10,970	98		Unconnected pavement, HSG A
818	98		Unconnected pavement, HSG C
41,300	30		Woods, Good, HSG A
381,159	70		Woods, Good, HSG C
742,000	77		Woods, Good, HSG D

1,193,053	74	73	Weighted Average, UI Adjusted
1,172,862			98.31% Pervious Area
20,191			1.69% Impervious Area
11,788			58.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
2.0	10	0.0083	0.08		Sheet Flow, Field/Meadow Range n= 0.130 P2= 3.00"
37.9	126	0.0083	0.06		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.00"
13.4	520	0.0167	0.65		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
53.6	670	Total			

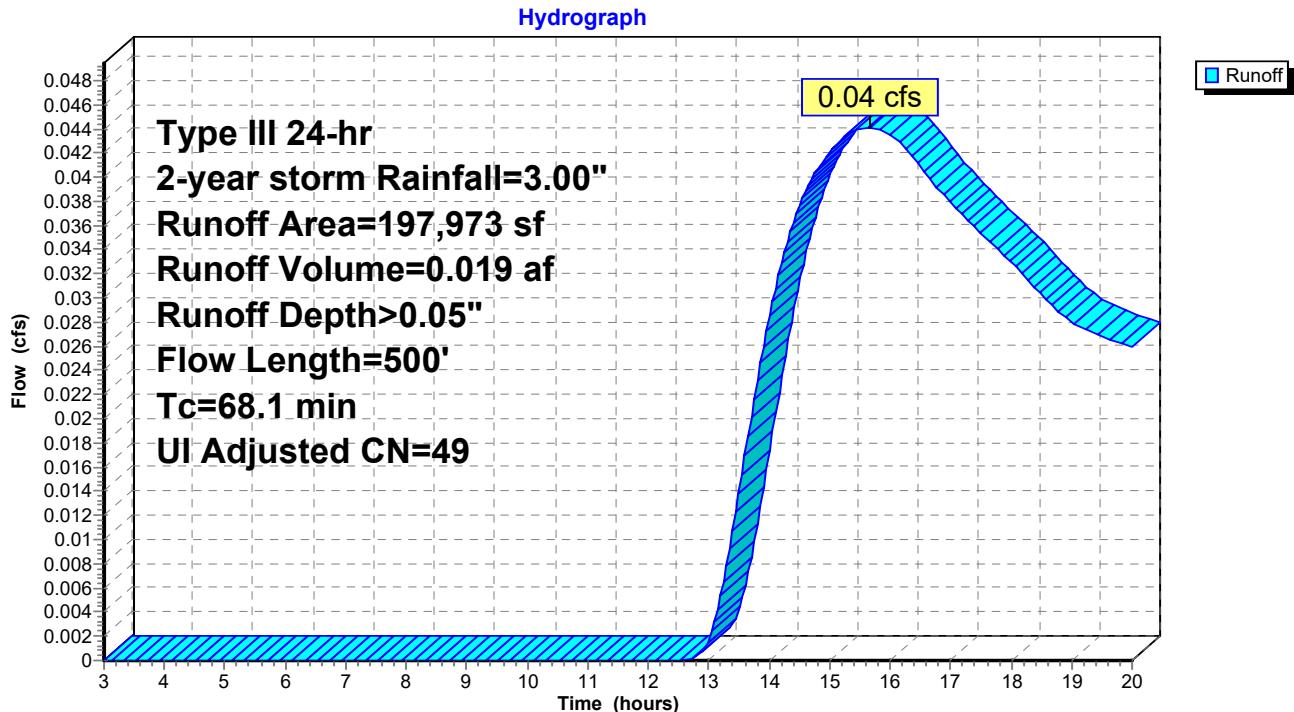
Subcatchment 1: Pre - 1**Hydrograph**

Summary for Subcatchment 1.1: Pre - 1.1

Runoff = 0.04 cfs @ 15.66 hrs, Volume= 0.019 af, Depth> 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Adj	Description	
8,288	92		Paved roads w/open ditches, 50% imp, HSG C	
7,140	83		Paved roads w/open ditches, 50% imp, HSG A	
471	98		Unconnected pavement, HSG C	
7,007	98		Unconnected pavement, HSG C	
10,292	98		Unconnected pavement, HSG A	
101,459	30		Woods, Good, HSG A	
54,560	70		Woods, Good, HSG C	
8,756	30		Woods, Good, HSG A	
197,973	52	49	Weighted Average, UI Adjusted	
172,489			87.13% Pervious Area	
25,484			12.87% Impervious Area	
17,770			69.73% Unconnected	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	
Capacity (cfs)	Description			
4.4	30	0.1050	0.11	Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
27.9	65	0.0050	0.04	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
23.9	55	0.0050	0.04	Sheet Flow, Woods - Good Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	240	0.0050	0.35	Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.6	110	0.0440	3.15	Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
68.1	500	Total		

Subcatchment 1.1: Pre - 1.1

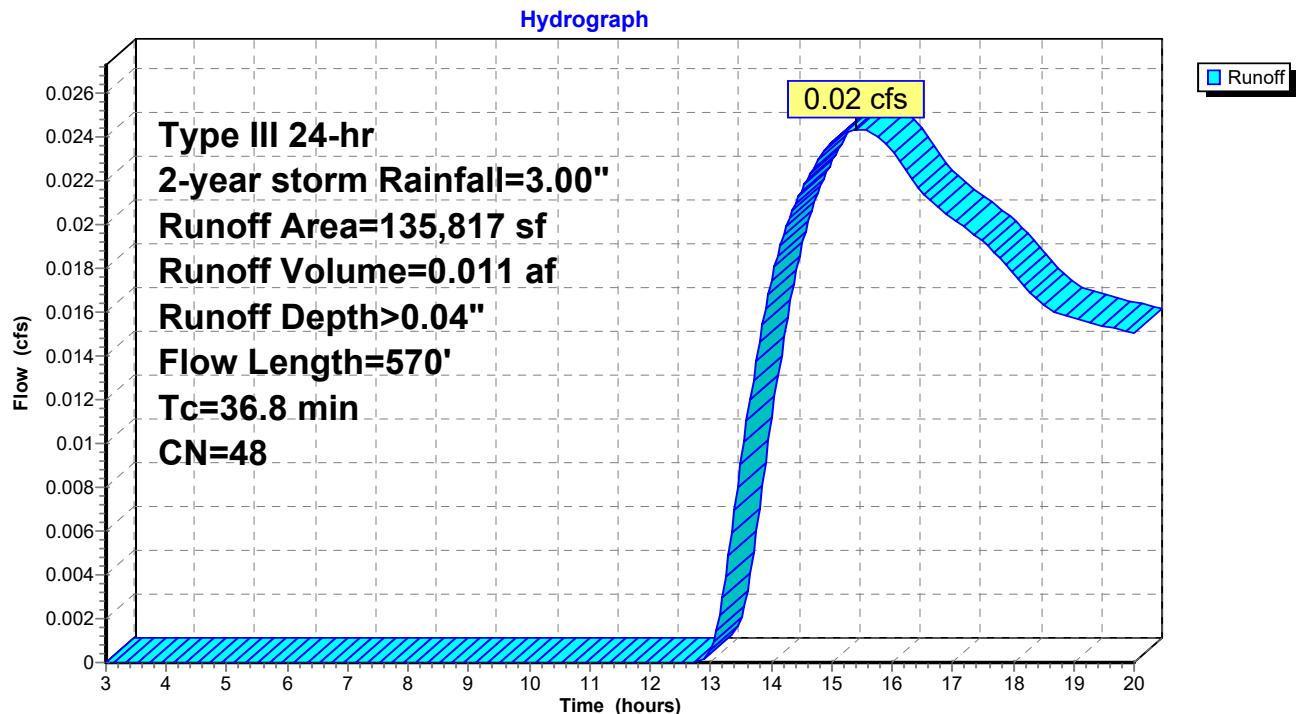
Summary for Subcatchment 1.2: Pre - 1.2

Runoff = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

Area (sf)	CN	Description
10,242	83	Paved roads w/open ditches, 50% imp, HSG A
20,828	98	Paved parking, HSG A
7,787	98	Paved parking, HSG A
88,183	30	Woods, Good, HSG A
8,635	30	Woods, Good, HSG A
142	30	Woods, Good, HSG A
135,817	48	Weighted Average
102,081		75.16% Pervious Area
33,736		24.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0710	0.11		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
25.4	100	0.0150	0.07		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.2	205	0.0190	1.56	62.50	Parabolic Channel, Existing Wooded channel W=60.00' D=1.00' Area=40.0 sf Perim=60.0' n= 0.100 Heavy timber, flow below branches
0.8	100	0.0125	2.01	3.35	Parabolic Channel, lawn drainage swale W=10.00' D=0.25' Area=1.7 sf Perim=10.0' n= 0.025 Earth, clean & winding
0.6	115	0.0100	3.10	12.39	Parabolic Channel, Sprucewood Road ditch W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.035 Earth, dense weeds
36.8	570	Total			

Subcatchment 1.2: Pre - 1.2

Summary for Subcatchment 1.3: Pre 1.3

Runoff = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-year storm Rainfall=3.00"

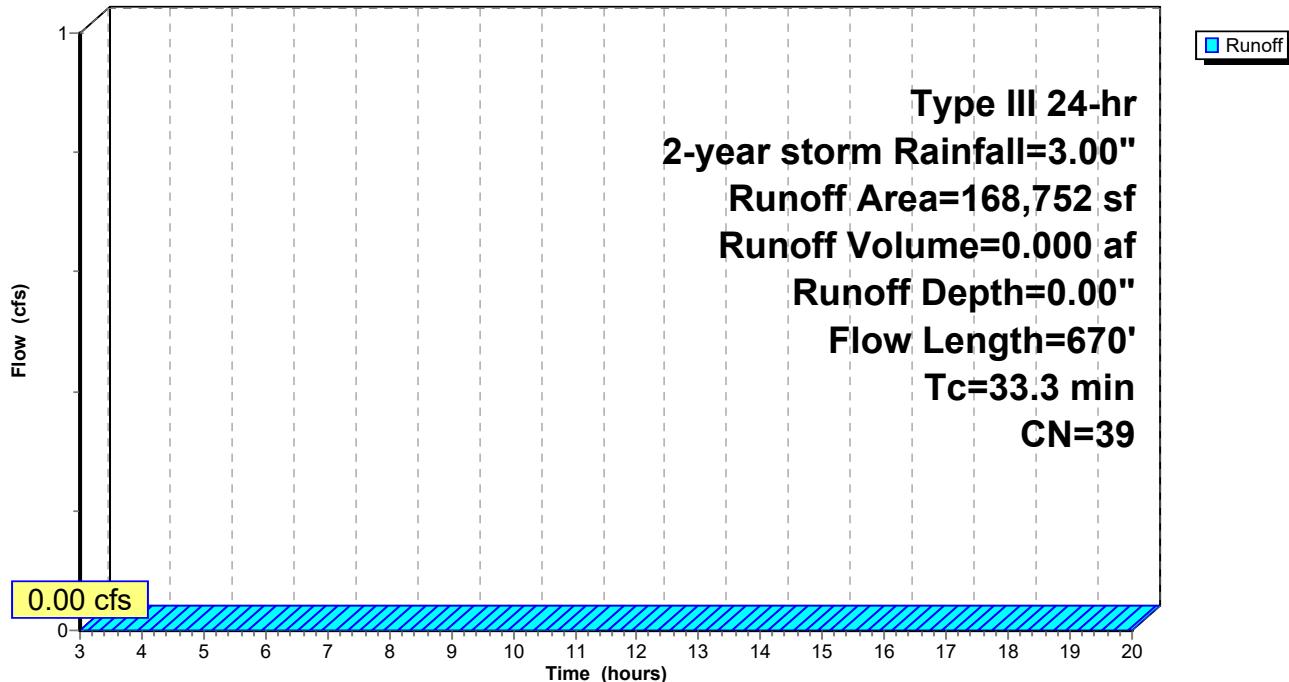
Area (sf)	CN	Description
136,436	30	Woods, Good, HSG A
32,316	77	Woods, Good, HSG D

168,752	39	Weighted Average
		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	150	0.0370	0.10		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.00"
9.3	520	0.0346	0.93		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
33.3	670				Total

Subcatchment 1.3: Pre 1.3

Hydrograph



Summary for Reach 1R: Stevens Mill Road Ditch

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af

Outflow = 0.02 cfs @ 15.66 hrs, Volume= 0.010 af, Atten= 0%, Lag= 14.7 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.35 fps, Min. Travel Time= 8.0 min

Avg. Velocity = 0.30 fps, Avg. Travel Time= 9.0 min

Peak Storage= 12 cf @ 15.52 hrs

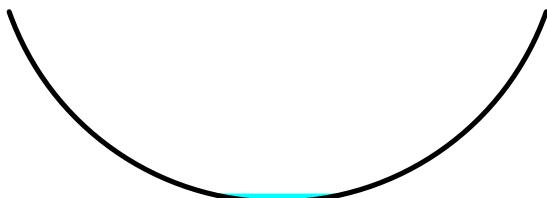
Average Depth at Peak Storage= 0.09' , Surface Width= 1.24'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.57 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

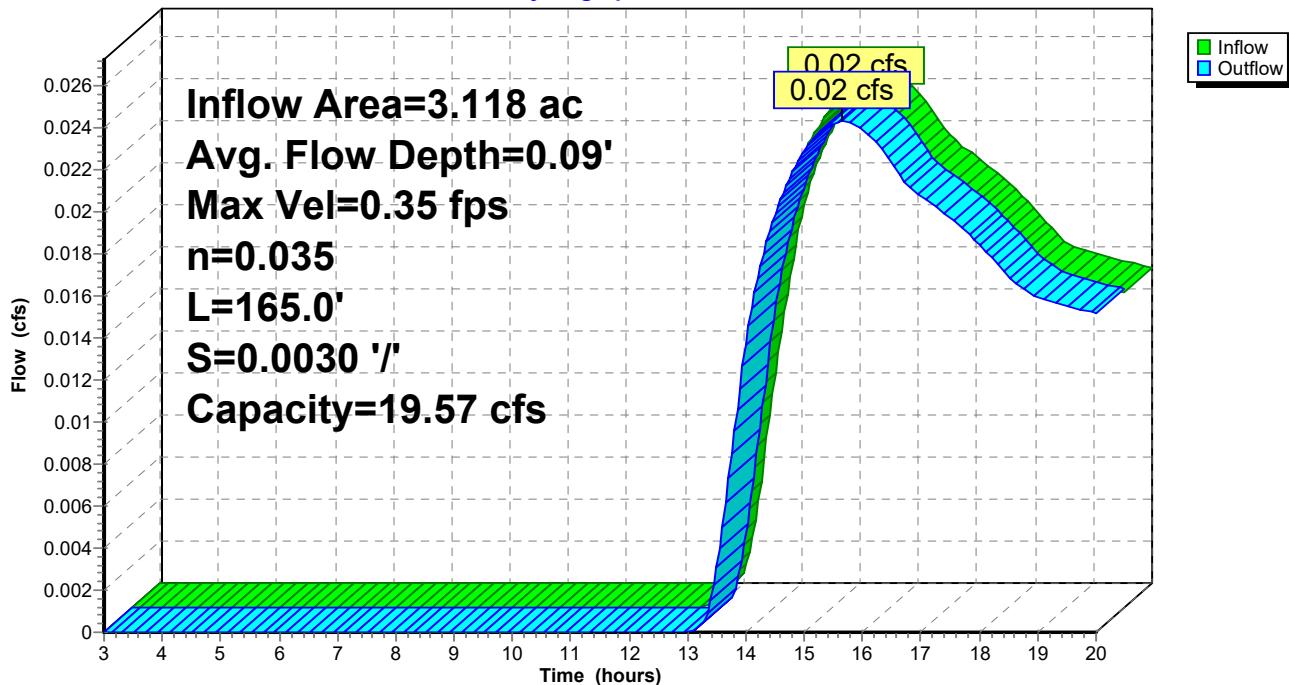
Length= 165.0' Slope= 0.0030 '/'

Inlet Invert= 243.11', Outlet Invert= 242.61'



Reach 1R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 2R: Stevens Mill Road Ditch

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.05" for 2-year storm event

Inflow = 0.07 cfs @ 15.66 hrs, Volume= 0.029 af

Outflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af, Atten= 0%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.76 fps, Min. Travel Time= 2.3 min

Avg. Velocity = 0.66 fps, Avg. Travel Time= 2.7 min

Peak Storage= 9 cf @ 15.68 hrs

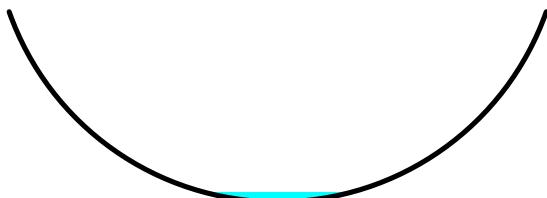
Average Depth at Peak Storage= 0.10' , Surface Width= 1.34'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 38.94 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

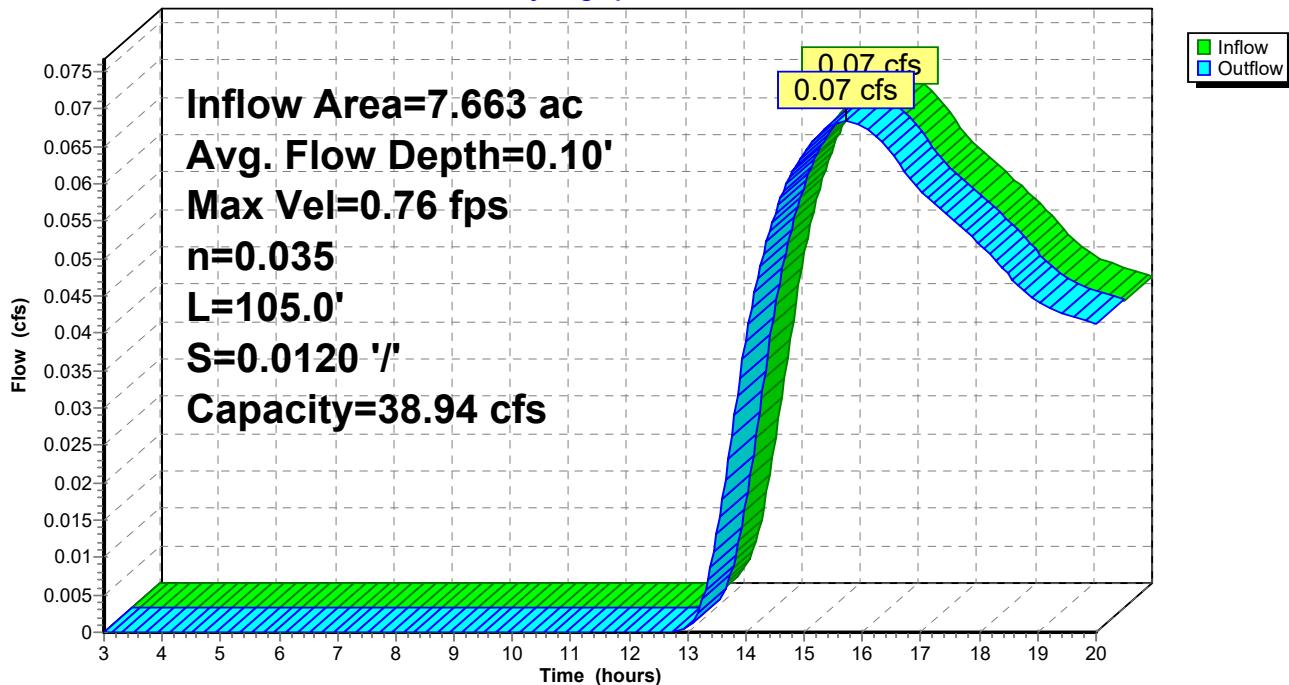
Length= 105.0' Slope= 0.0120 '/'

Inlet Invert= 242.61', Outlet Invert= 241.35'



Reach 2R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 3R: Stevens Mill Road Ditch

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.05" for 2-year storm event

Inflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.67 fps, Min. Travel Time= 2.9 min

Avg. Velocity = 0.58 fps, Avg. Travel Time= 3.4 min

Peak Storage= 12 cf @ 15.75 hrs

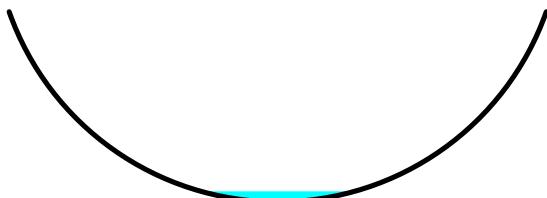
Average Depth at Peak Storage= 0.11', Surface Width= 1.40'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 32.56 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

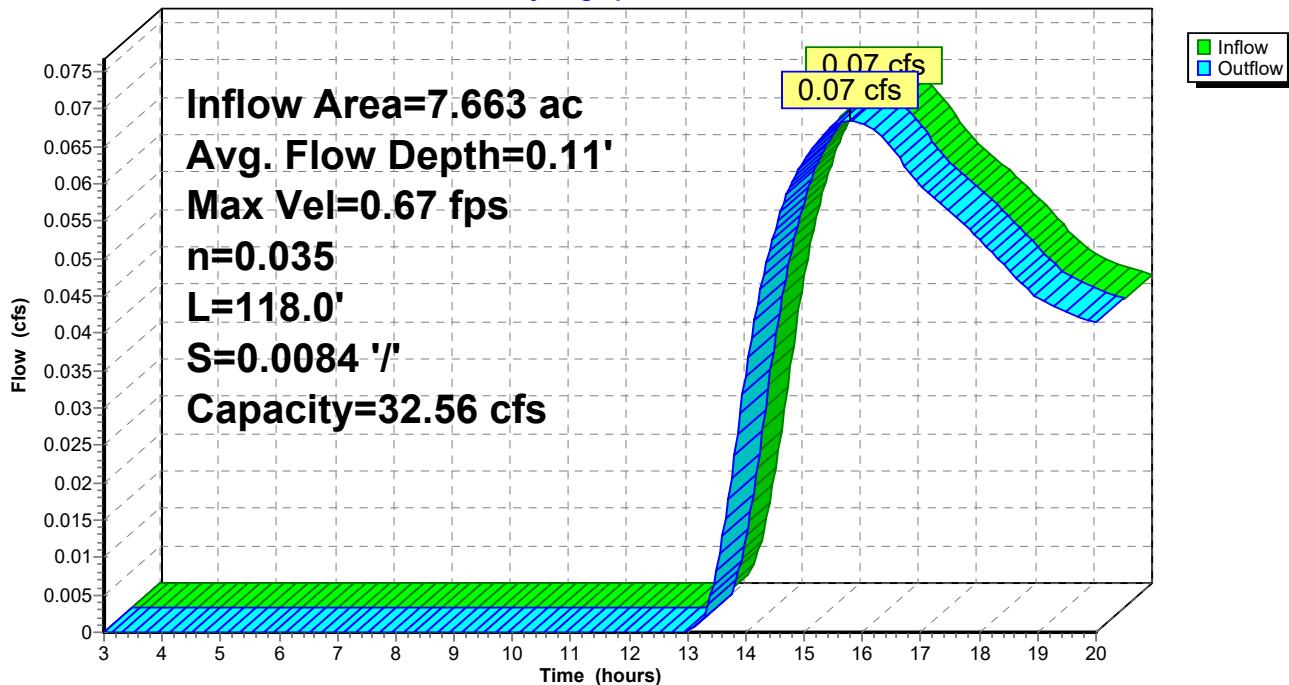
Length= 118.0' Slope= 0.0084 '/'

Inlet Invert= 241.09', Outlet Invert= 240.10'



Reach 3R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 4R: Existing Drainage Channel

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 16.00 hrs, Volume= 0.028 af, Atten= 0%, Lag= 12.2 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.59 fps, Min. Travel Time= 7.2 min

Avg. Velocity = 0.50 fps, Avg. Travel Time= 8.5 min

Peak Storage= 30 cf @ 15.88 hrs

Average Depth at Peak Storage= 0.05' , Surface Width= 3.34'

Bank-Full Depth= 0.30' Flow Area= 1.6 sf, Capacity= 3.00 cfs

8.00' x 0.30' deep Parabolic Channel, n= 0.025 Earth, clean & winding

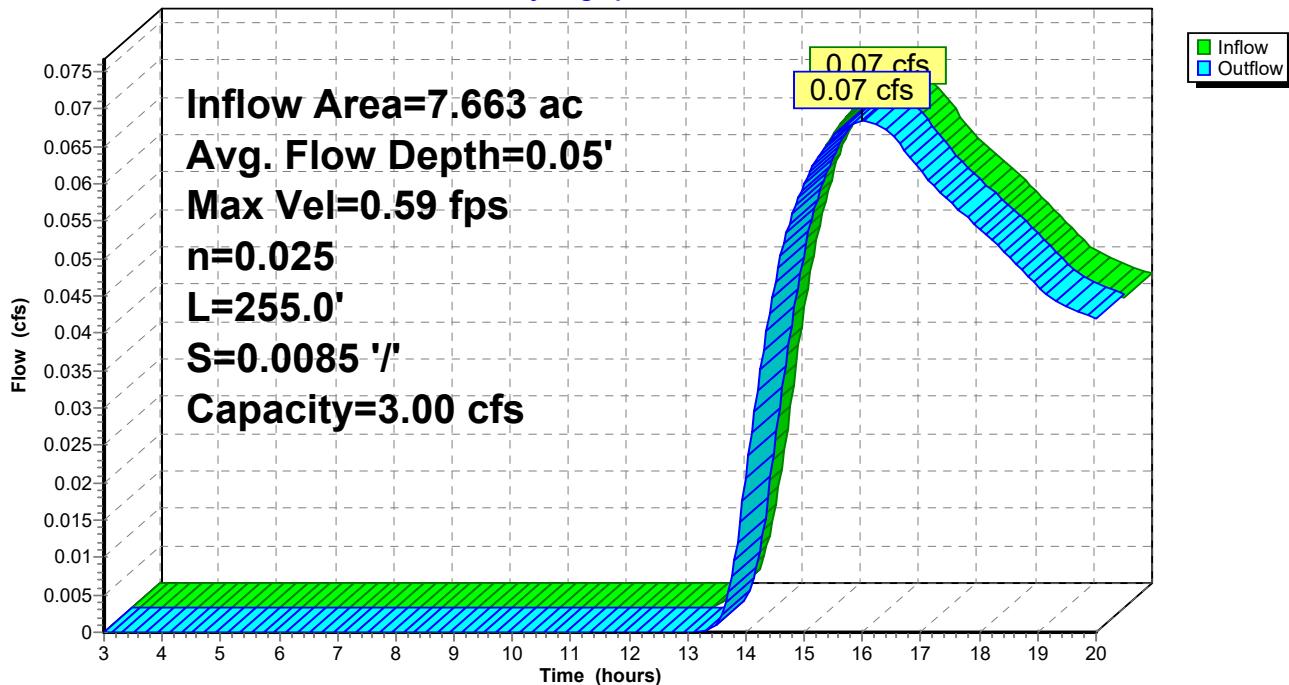
Length= 255.0' Slope= 0.0085 '/

Inlet Invert= 239.59', Outlet Invert= 237.41'



Reach 4R: Existing Drainage Channel

Hydrograph



Summary for Reach 5R: Existing Drainage Channel-Woods

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 16.00 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 16.25 hrs, Volume= 0.026 af, Atten= 0%, Lag= 14.4 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.68 fps, Min. Travel Time= 8.5 min

Avg. Velocity = 0.58 fps, Avg. Travel Time= 9.9 min

Peak Storage= 35 cf @ 16.10 hrs

Average Depth at Peak Storage= 0.04', Surface Width= 3.64'

Bank-Full Depth= 0.20' Flow Area= 1.1 sf, Capacity= 2.07 cfs

8.00' x 0.20' deep Parabolic Channel, n= 0.025 Earth, clean & winding

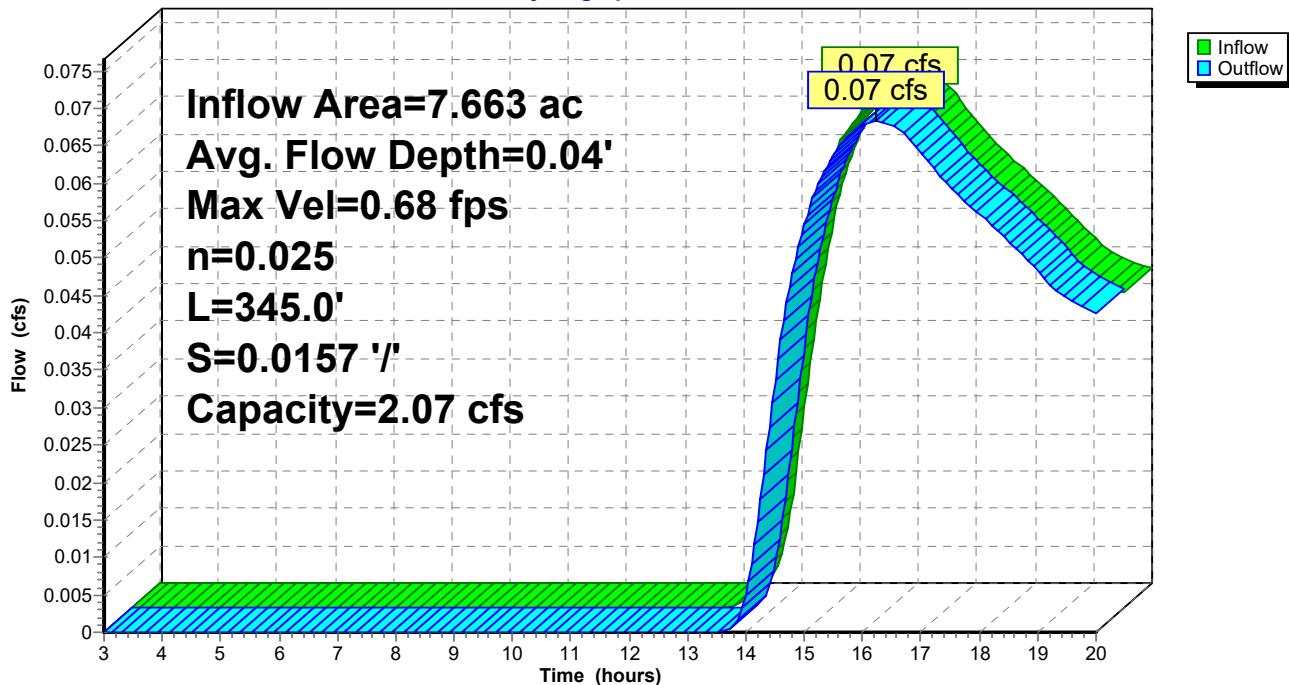
Length= 345.0' Slope= 0.0157 '/'

Inlet Invert= 237.41', Outlet Invert= 232.00'



Reach 5R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 6R: Existing Drainage Channel-Woods

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 16.25 hrs, Volume= 0.026 af

Outflow = 0.07 cfs @ 16.41 hrs, Volume= 0.026 af, Atten= 0%, Lag= 9.9 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.84 fps, Min. Travel Time= 5.8 min

Avg. Velocity = 0.74 fps, Avg. Travel Time= 6.7 min

Peak Storage= 24 cf @ 16.31 hrs

Average Depth at Peak Storage= 0.04', Surface Width= 2.89'

Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 14.61 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.025 Earth, clean & winding

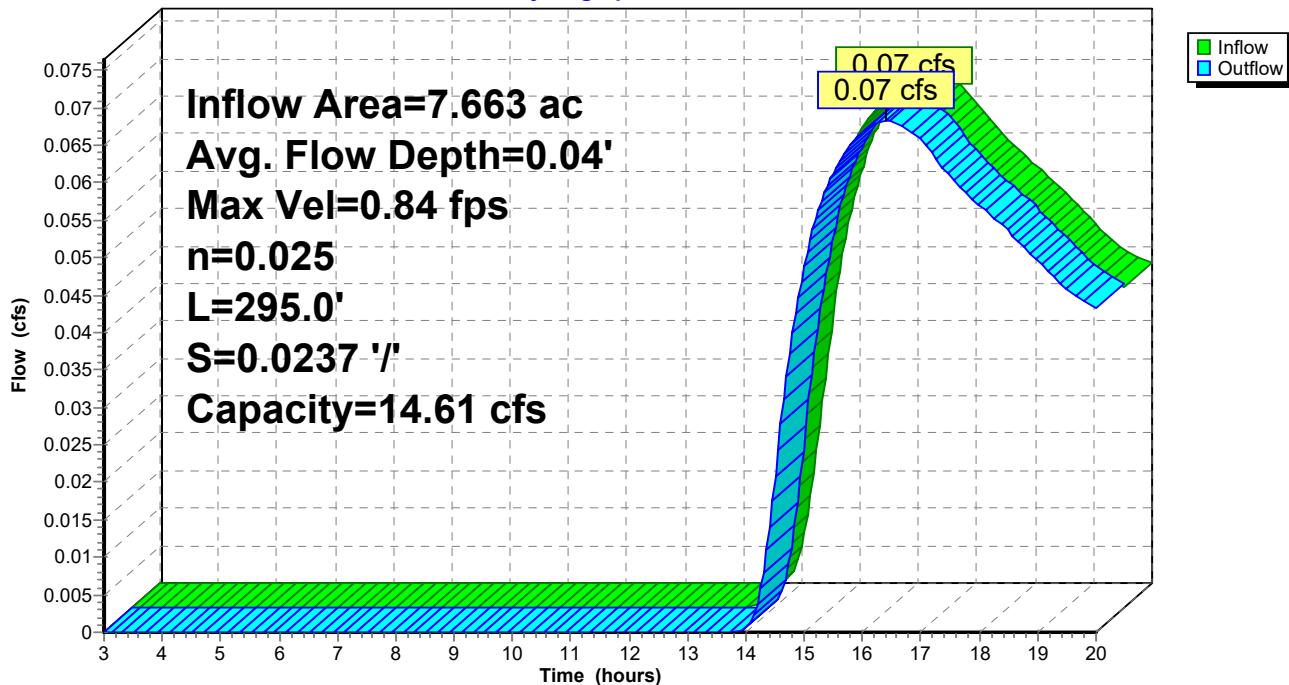
Length= 295.0' Slope= 0.0237 '/'

Inlet Invert= 232.00', Outlet Invert= 225.00'



Reach 6R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 7R: Existing Drainage Channel-Woods

Inflow Area = 35.051 ac, 5.20% Impervious, Inflow Depth > 0.60" for 2-year storm event

Inflow = 10.53 cfs @ 12.84 hrs, Volume= 1.755 af

Outflow = 10.51 cfs @ 12.88 hrs, Volume= 1.750 af, Atten= 0%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.77 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 1.58 fps, Avg. Travel Time= 2.3 min

Peak Storage= 835 cf @ 12.86 hrs

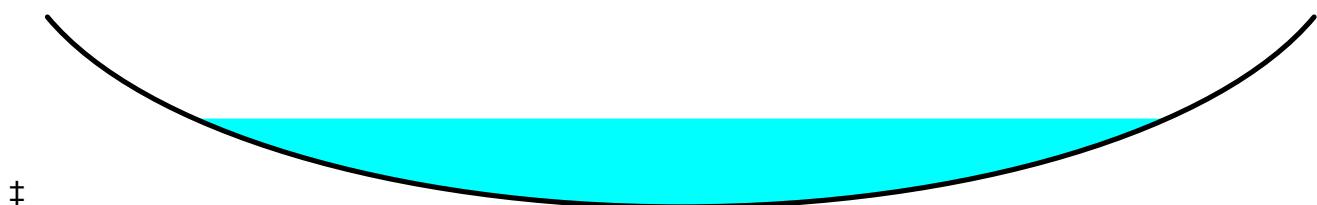
Average Depth at Peak Storage= 0.70' , Surface Width= 8.18'

Bank-Full Depth= 1.50' Flow Area= 12.0 sf, Capacity= 54.77 cfs

12.00' x 1.50' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals

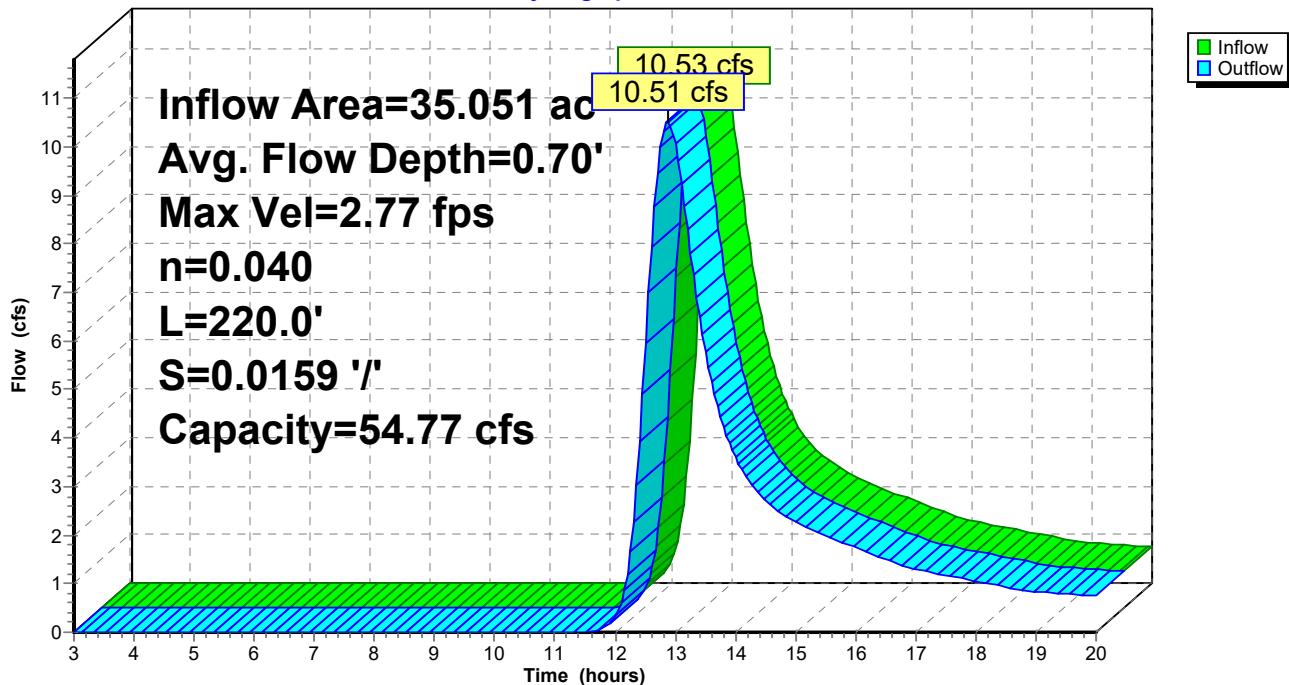
Length= 220.0' Slope= 0.0159 '/'

Inlet Invert= 225.00', Outlet Invert= 221.50'



Reach 7R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 8R: Existing Stream Channel

Inflow Area = 38.926 ac, 4.68% Impervious, Inflow Depth > 0.54" for 2-year storm event

Inflow = 10.51 cfs @ 12.88 hrs, Volume= 1.750 af

Outflow = 10.46 cfs @ 12.97 hrs, Volume= 1.739 af, Atten= 0%, Lag= 5.6 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.44 fps, Min. Travel Time= 3.3 min

Avg. Velocity = 0.78 fps, Avg. Travel Time= 6.0 min

Peak Storage= 2,041 cf @ 12.92 hrs

Average Depth at Peak Storage= 1.18', Surface Width= 7.36'

Bank-Full Depth= 2.50' Flow Area= 18.8 sf, Capacity= 39.48 cfs

5.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 1.0 '/' Top Width= 10.00'

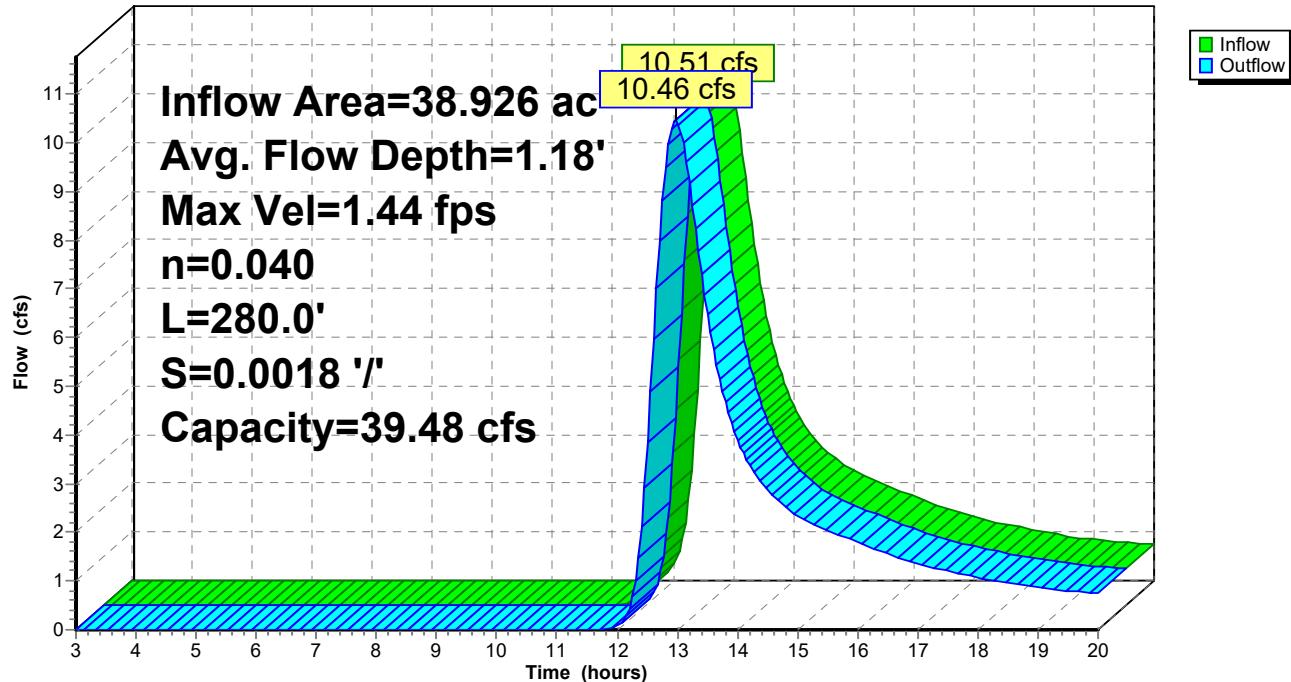
Length= 280.0' Slope= 0.0018 '/'

Inlet Invert= 221.50', Outlet Invert= 221.00'



Reach 8R: Existing Stream Channel

Hydrograph



Summary for Reach 9R: Existing Stream Channel

Inflow Area = 27.389 ac, 1.69% Impervious, Inflow Depth > 0.76" for 2-year storm event

Inflow = 10.57 cfs @ 12.80 hrs, Volume= 1.733 af

Outflow = 10.53 cfs @ 12.84 hrs, Volume= 1.729 af, Atten= 0%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.81 fps, Min. Travel Time= 1.4 min

Avg. Velocity = 2.14 fps, Avg. Travel Time= 2.4 min

Peak Storage= 859 cf @ 12.82 hrs

Average Depth at Peak Storage= 0.56', Surface Width= 7.46'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 37.22 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight

Length= 310.0' Slope= 0.0226 '/'

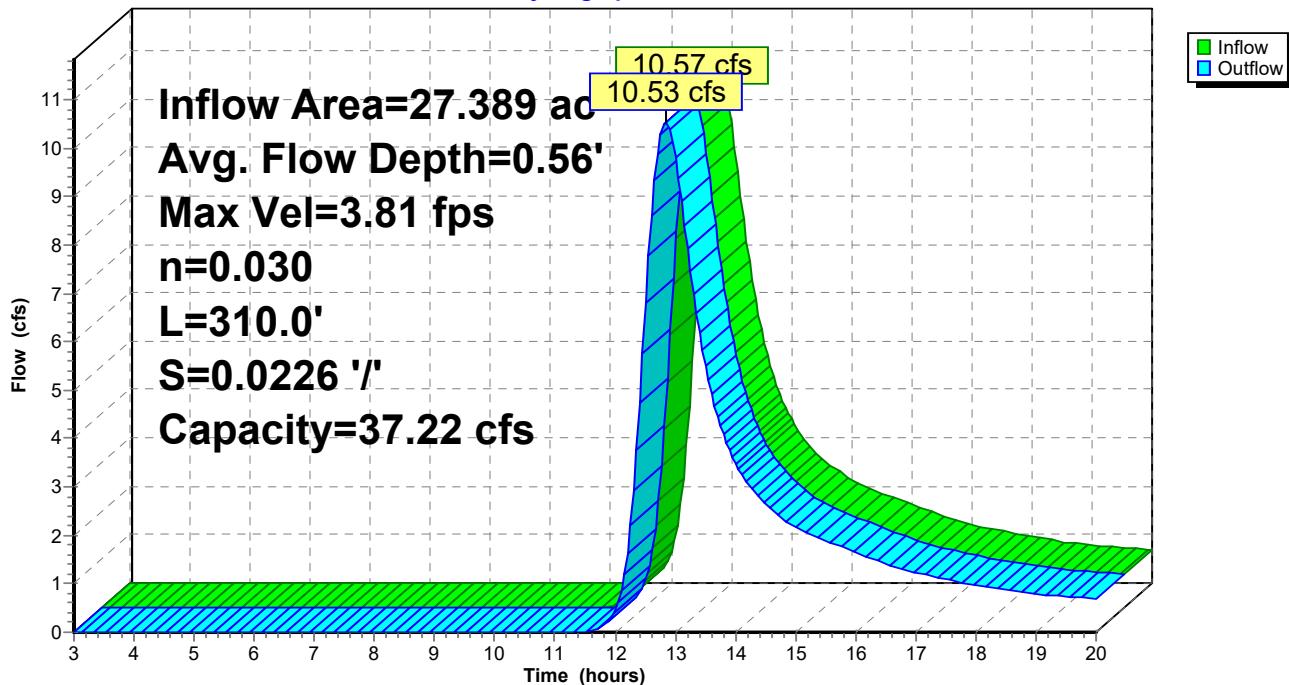
Inlet Invert= 232.00', Outlet Invert= 225.00'



‡

Reach 9R: Existing Stream Channel

Hydrograph



Summary for Reach 10R: Existing Stream Channel

Inflow Area = 3.874 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year storm event

Inflow = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af

Outflow = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 3.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 2.50' Flow Area= 25.0 sf, Capacity= 72.89 cfs

5.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 '/' Top Width= 15.00'

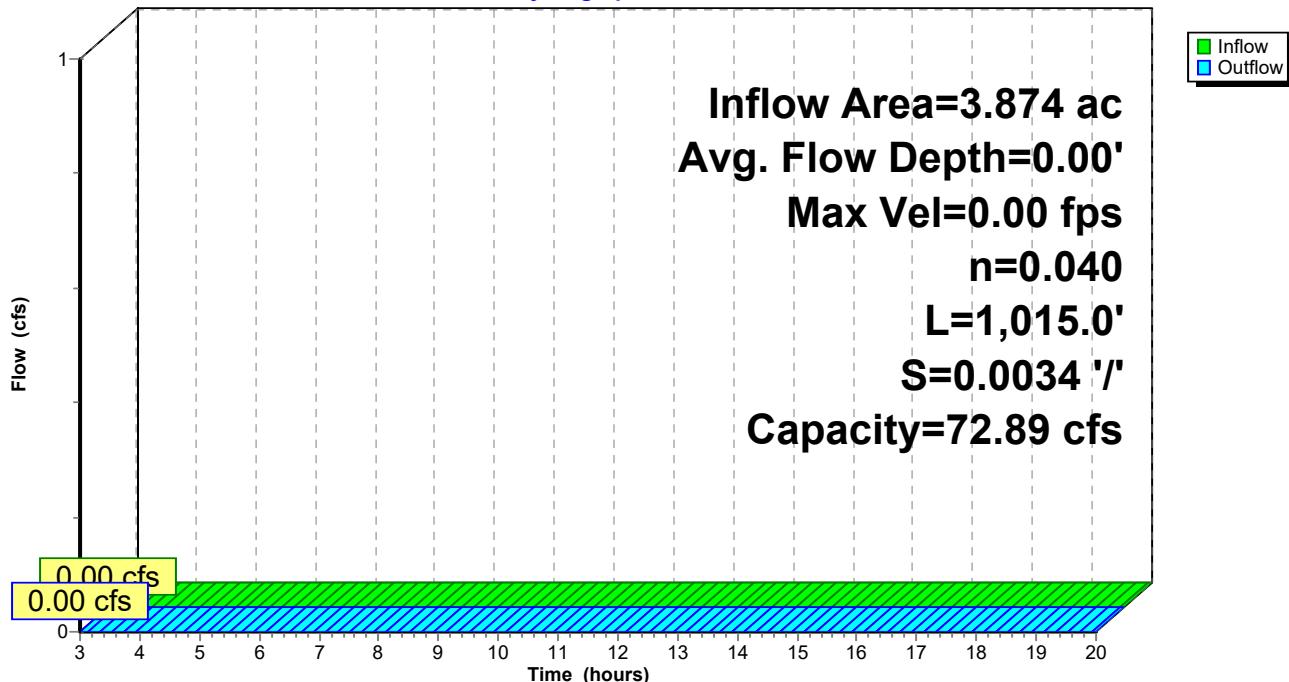
Length= 1,015.0' Slope= 0.0034 '/'

Inlet Invert= 225.00', Outlet Invert= 221.50'



Reach 10R: Existing Stream Channel

Hydrograph



Summary for Reach WAP 1: Water Analysis Point 1

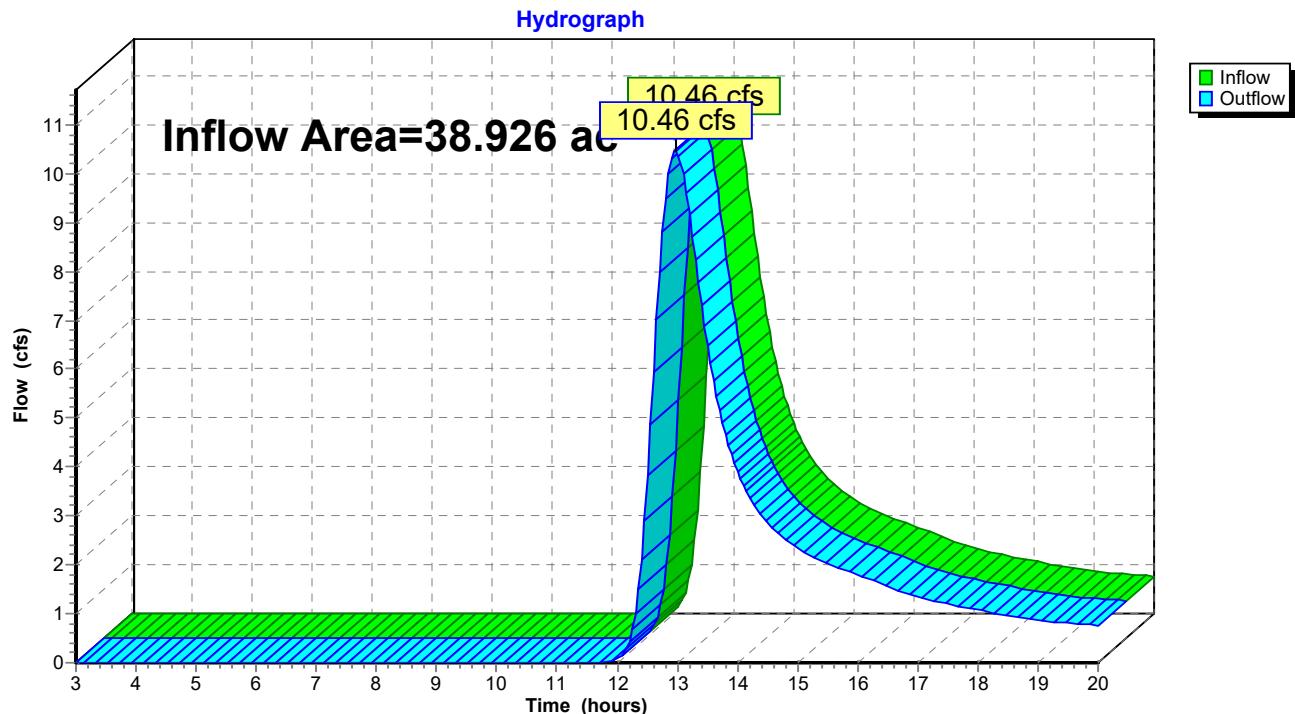
Inflow Area = 38.926 ac, 4.68% Impervious, Inflow Depth > 0.54" for 2-year storm event

Inflow = 10.46 cfs @ 12.97 hrs, Volume= 1.739 af

Outflow = 10.46 cfs @ 12.97 hrs, Volume= 1.739 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Reach WAP 1: Water Analysis Point 1



Summary for Pond 1P: Sprucewood Rd Culvert

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.04" for 2-year storm event
 Inflow = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.02 cfs @ 15.41 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

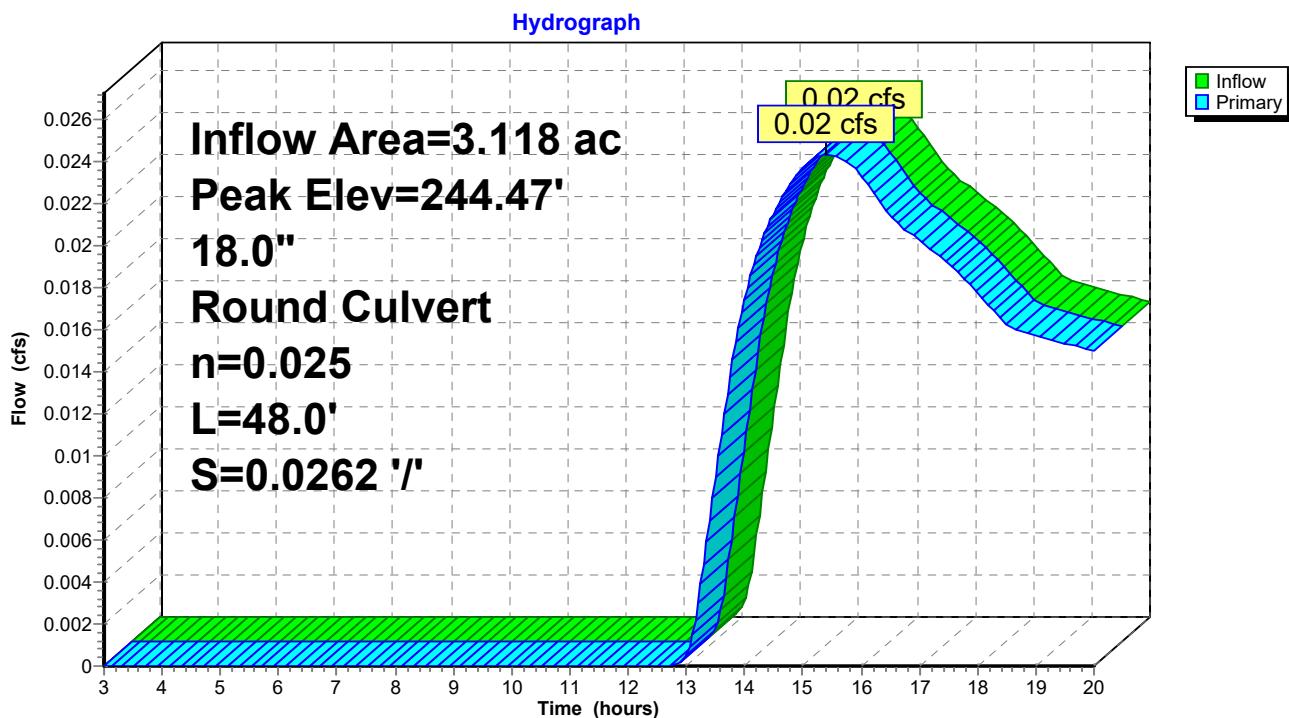
Peak Elev= 244.47' @ 15.41 hrs

Flood Elev= 246.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	244.37'	18.0" Round Culvert L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 244.37' / 243.11' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.02 cfs @ 15.41 hrs HW=244.47' TW=244.00' (Fixed TW Elev= 244.00')
 ↪ 1=Culvert (Outlet Controls 0.02 cfs @ 0.76 fps)

Pond 1P: Sprucewood Rd Culvert



Summary for Pond 2P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.05" for 2-year storm event

Inflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af

Outflow = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.72 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

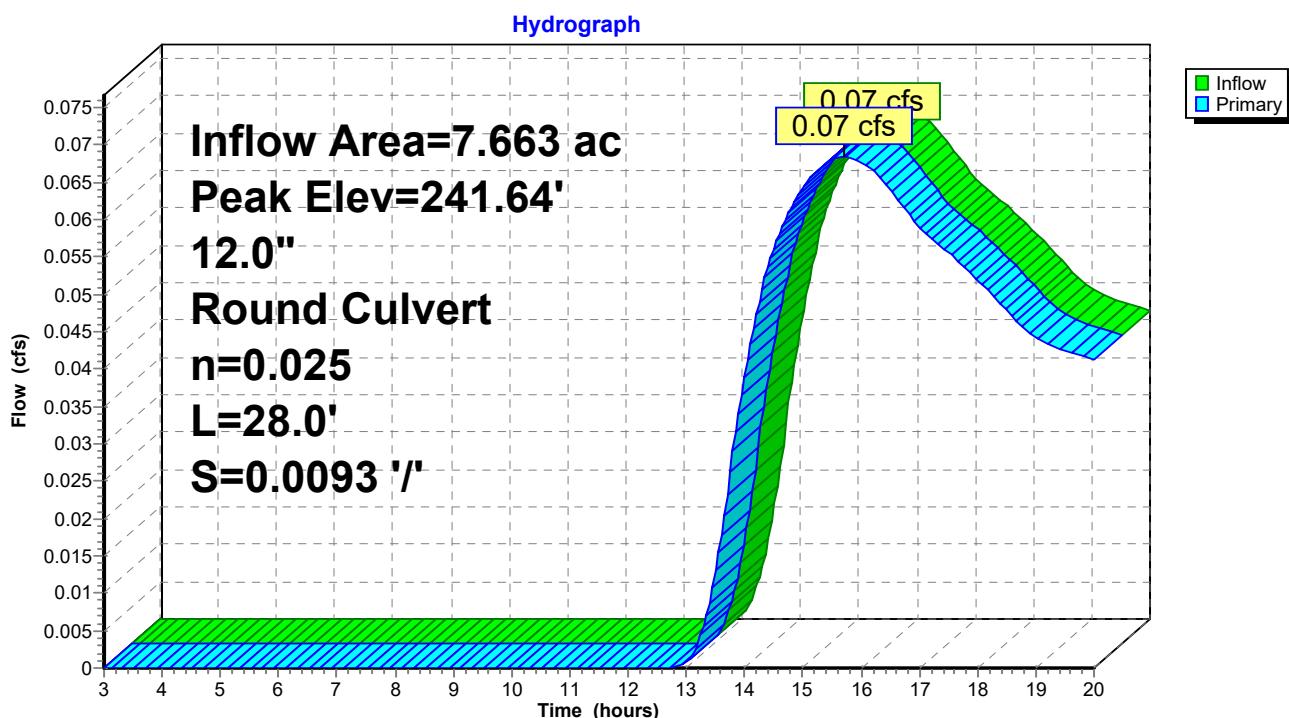
Peak Elev= 241.64' @ 15.72 hrs

Flood Elev= 243.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	241.35'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 241.35' / 241.09' S= 0.0093 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.07 cfs @ 15.72 hrs HW=241.64' TW=241.60' (Fixed TW Elev= 241.60')
 ↪ 1=Culvert (Outlet Controls 0.07 cfs @ 0.54 fps)

Pond 2P: Driveway culvert



Summary for Pond 3P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.83' @ 15.80 hrs

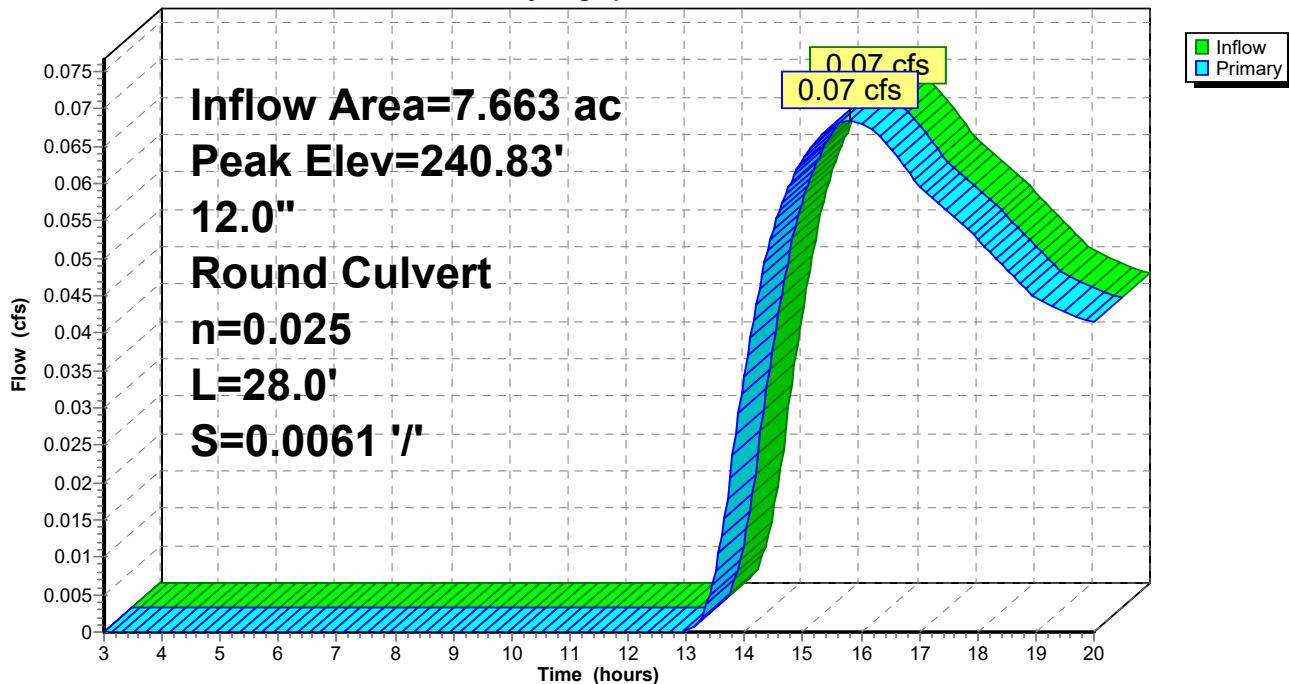
Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 240.10' / 239.93' S= 0.0061 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.13 cfs @ 15.80 hrs HW=240.83' TW=240.82' (Fixed TW Elev= 240.82')
 ↑1=Culvert (Outlet Controls 0.13 cfs @ 0.29 fps)

Pond 3P: Driveway culvert

Hydrograph



Summary for Pond 4P: Stevens Mill Rd X-Culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.04" for 2-year storm event

Inflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Outflow = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary = 0.07 cfs @ 15.80 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.10' @ 15.80 hrs

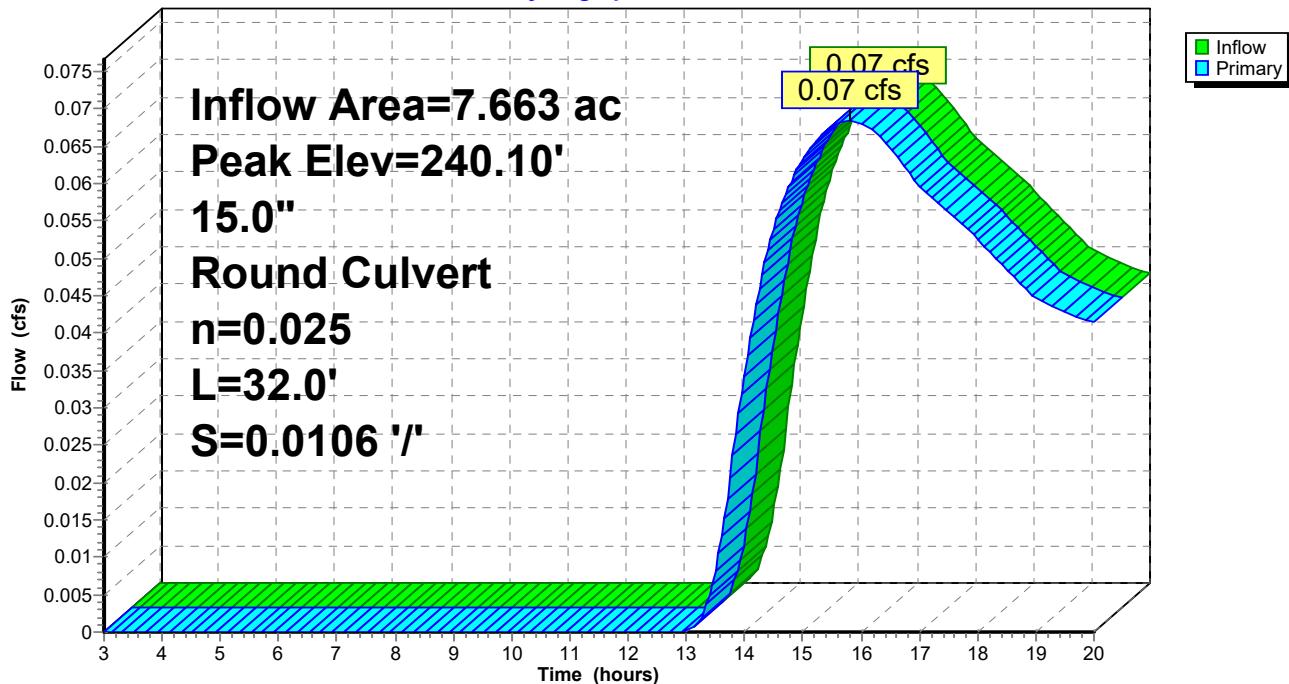
Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.93'	15.0" Round Culvert L= 32.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 239.93' / 239.59' S= 0.0106 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=0.07 cfs @ 15.80 hrs HW=240.10' TW=239.83' (Fixed TW Elev= 239.83')
 ↗1=Culvert (Outlet Controls 0.07 cfs @ 0.99 fps)

Pond 4P: Stevens Mill Rd X-Culvert

Hydrograph



Time span=3.00-20.00 hrs, dt=0.05 hrs, 341 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: Pre - 1 Runoff Area=1,193,053 sf 1.69% Impervious Runoff Depth>1.58"
Flow Length=670' Tc=53.6 min UI Adjusted CN=73 Runoff=22.96 cfs 3.597 af

Subcatchment1.1: Pre - 1.1 Runoff Area=197,973 sf 12.87% Impervious Runoff Depth>0.31"
Flow Length=500' Tc=68.1 min UI Adjusted CN=49 Runoff=0.40 cfs 0.119 af

Subcatchment1.2: Pre - 1.2 Runoff Area=135,817 sf 24.84% Impervious Runoff Depth>0.29"
Flow Length=570' Tc=36.8 min CN=48 Runoff=0.31 cfs 0.075 af

Subcatchment1.3: Pre 1.3 Runoff Area=168,752 sf 0.00% Impervious Runoff Depth>0.06"
Flow Length=670' Tc=33.3 min CN=39 Runoff=0.04 cfs 0.018 af

Reach 1R: Stevens Mill Road Ditch Avg. Flow Depth=0.28' Max Vel=0.74 fps Inflow=0.31 cfs 0.075 af
n=0.035 L=165.0' S=0.0030 '/' Capacity=19.57 cfs Outflow=0.31 cfs 0.074 af

Reach 2R: Stevens Mill Road Ditch Avg. Flow Depth=0.29' Max Vel=1.51 fps Inflow=0.66 cfs 0.193 af
n=0.035 L=105.0' S=0.0120 '/' Capacity=38.94 cfs Outflow=0.66 cfs 0.193 af

Reach 3R: Stevens Mill Road Ditch Avg. Flow Depth=0.31' Max Vel=1.33 fps Inflow=0.66 cfs 0.193 af
n=0.035 L=118.0' S=0.0084 '/' Capacity=32.56 cfs Outflow=0.66 cfs 0.192 af

Reach 4R: Existing Drainage Channel Avg. Flow Depth=0.15' Max Vel=1.18 fps Inflow=0.66 cfs 0.192 af
n=0.025 L=255.0' S=0.0085 '/' Capacity=3.00 cfs Outflow=0.66 cfs 0.190 af

Reach 5R: Existing Drainage Avg. Flow Depth=0.12' Max Vel=1.36 fps Inflow=0.66 cfs 0.190 af
n=0.025 L=345.0' S=0.0157 '/' Capacity=2.07 cfs Outflow=0.65 cfs 0.188 af

Reach 6R: Existing Drainage Avg. Flow Depth=0.12' Max Vel=1.69 fps Inflow=0.65 cfs 0.188 af
n=0.025 L=295.0' S=0.0237 '/' Capacity=14.61 cfs Outflow=0.65 cfs 0.186 af

Reach 7R: Existing Drainage Avg. Flow Depth=1.00' Max Vel=3.51 fps Inflow=22.93 cfs 3.778 af
n=0.040 L=220.0' S=0.0159 '/' Capacity=54.77 cfs Outflow=22.89 cfs 3.771 af

Reach 8R: Existing Stream Channel Avg. Flow Depth=1.84' Max Vel=1.81 fps Inflow=22.89 cfs 3.783 af
n=0.040 L=280.0' S=0.0018 '/' Capacity=39.48 cfs Outflow=22.81 cfs 3.765 af

Reach 9R: Existing Stream Channel Avg. Flow Depth=0.80' Max Vel=4.82 fps Inflow=22.96 cfs 3.597 af
n=0.030 L=310.0' S=0.0226 '/' Capacity=37.22 cfs Outflow=22.92 cfs 3.591 af

Reach 10R: Existing Stream Channel Avg. Flow Depth=0.03' Max Vel=0.23 fps Inflow=0.04 cfs 0.018 af
n=0.040 L=1,015.0' S=0.0034 '/' Capacity=72.89 cfs Outflow=0.04 cfs 0.012 af

Reach WAP 1: Water Analysis Point 1 Inflow=22.81 cfs 3.765 af
Outflow=22.81 cfs 3.765 af

Pond 1P: Sprucewood Rd Culvert Peak Elev=244.68' Inflow=0.31 cfs 0.075 af
18.0" Round Culvert n=0.025 L=48.0' S=0.0262 '/' Outflow=0.31 cfs 0.075 af

Pond 2P: Driveway culvert

Peak Elev=241.94' Inflow=0.66 cfs 0.193 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0093 '/' Outflow=0.66 cfs 0.193 af

Pond 3P: Driveway culvert

Peak Elev=240.94' Inflow=0.66 cfs 0.192 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0061 '/' Outflow=0.66 cfs 0.192 af

Pond 4P: Stevens Mill Rd X-Culvert

Peak Elev=240.43' Inflow=0.66 cfs 0.192 af
15.0" Round Culvert n=0.025 L=32.0' S=0.0106 '/' Outflow=0.66 cfs 0.192 af

Total Runoff Area = 38.926 ac Runoff Volume = 3.809 af Average Runoff Depth = 1.17"
95.32% Pervious = 37.102 ac 4.68% Impervious = 1.823 ac

Summary for Subcatchment 1: Pre - 1

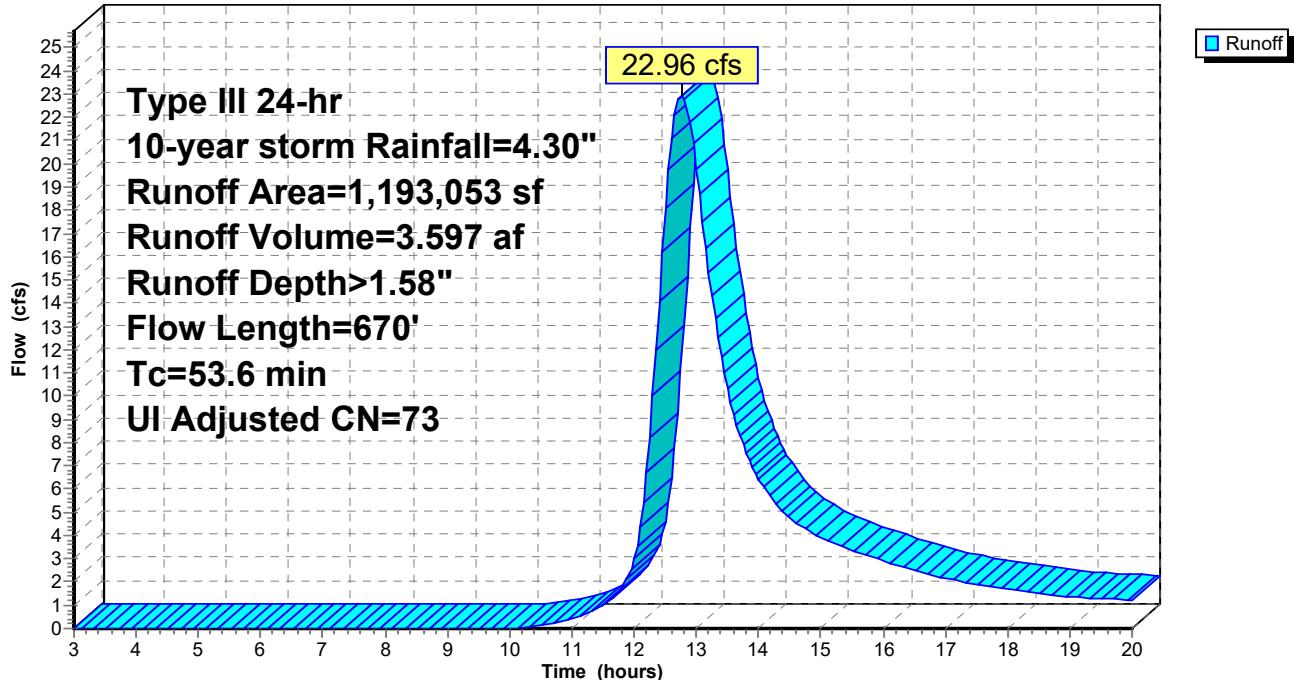
Runoff = 22.96 cfs @ 12.76 hrs, Volume= 3.597 af, Depth> 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Adj	Description
11,361	92		Paved roads w/open ditches, 50% imp, HSG C
5,445	83		Paved roads w/open ditches, 50% imp, HSG A
10,970	98		Unconnected pavement, HSG A
818	98		Unconnected pavement, HSG C
41,300	30		Woods, Good, HSG A
381,159	70		Woods, Good, HSG C
742,000	77		Woods, Good, HSG D

1,193,053	74	73	Weighted Average, UI Adjusted
1,172,862			98.31% Pervious Area
20,191			1.69% Impervious Area
11,788			58.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
2.0	10	0.0083	0.08		Sheet Flow, Field/Meadow Range n= 0.130 P2= 3.00"
37.9	126	0.0083	0.06		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.00"
13.4	520	0.0167	0.65		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
53.6	670	Total			

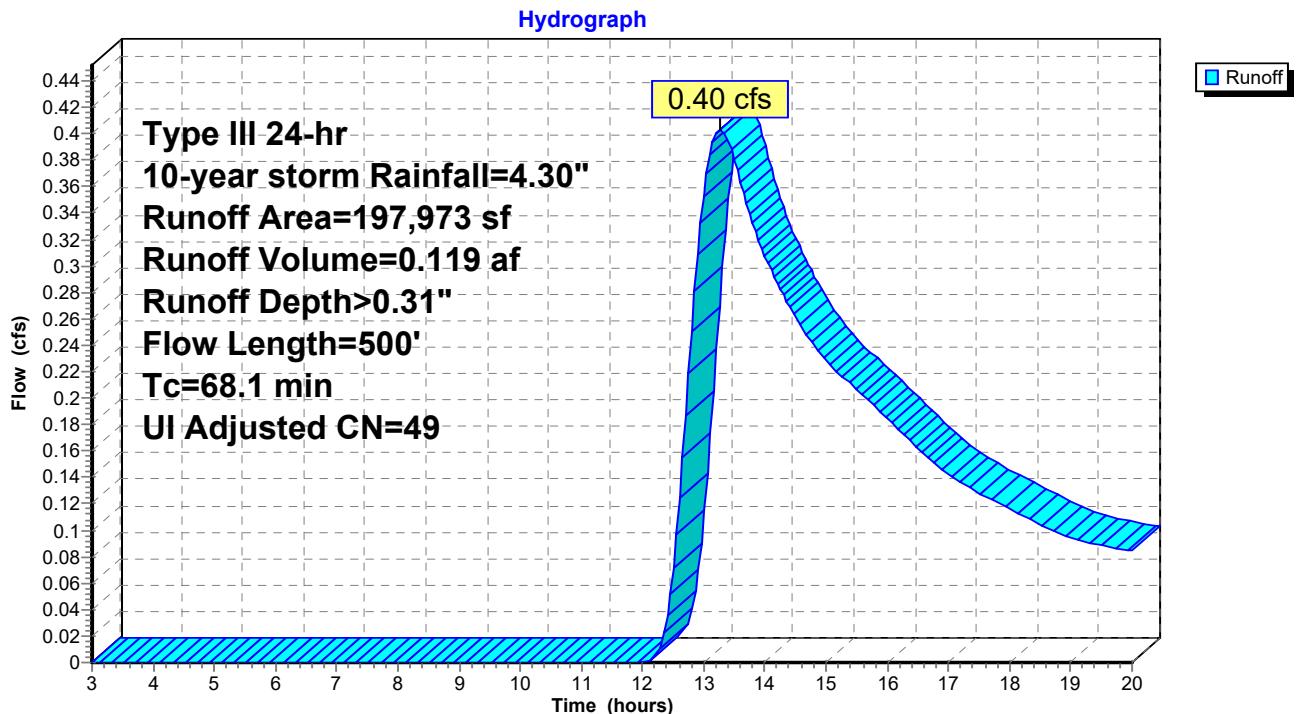
Subcatchment 1: Pre - 1**Hydrograph**

Summary for Subcatchment 1.1: Pre - 1.1

Runoff = 0.40 cfs @ 13.26 hrs, Volume= 0.119 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Adj	Description	
8,288	92		Paved roads w/open ditches, 50% imp, HSG C	
7,140	83		Paved roads w/open ditches, 50% imp, HSG A	
471	98		Unconnected pavement, HSG C	
7,007	98		Unconnected pavement, HSG C	
10,292	98		Unconnected pavement, HSG A	
101,459	30		Woods, Good, HSG A	
54,560	70		Woods, Good, HSG C	
8,756	30		Woods, Good, HSG A	
197,973	52	49	Weighted Average, UI Adjusted	
172,489			87.13% Pervious Area	
25,484			12.87% Impervious Area	
17,770			69.73% Unconnected	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	
Capacity (cfs)	Description			
4.4	30	0.1050	0.11	Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
27.9	65	0.0050	0.04	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
23.9	55	0.0050	0.04	Sheet Flow, Woods - Good Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	240	0.0050	0.35	Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.6	110	0.0440	3.15	Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
68.1	500	Total		

Subcatchment 1.1: Pre - 1.1

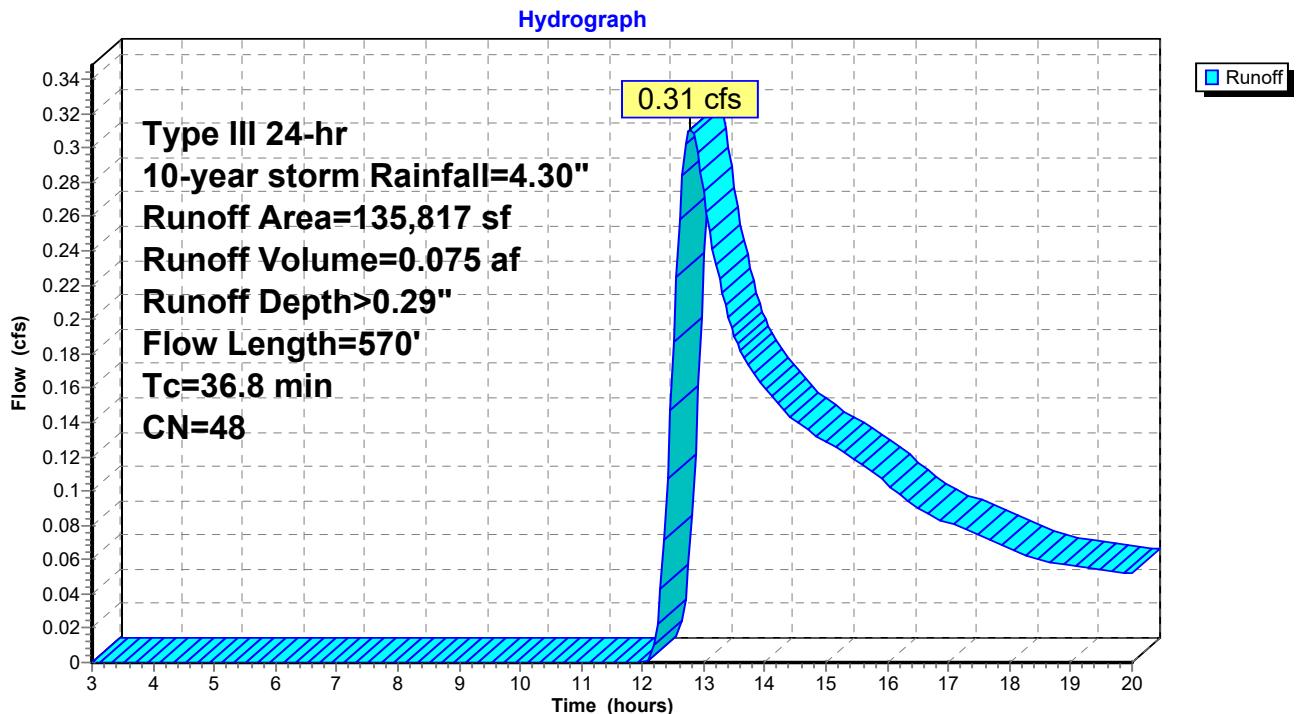
Summary for Subcatchment 1.2: Pre - 1.2

Runoff = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
10,242	83	Paved roads w/open ditches, 50% imp, HSG A
20,828	98	Paved parking, HSG A
7,787	98	Paved parking, HSG A
88,183	30	Woods, Good, HSG A
8,635	30	Woods, Good, HSG A
142	30	Woods, Good, HSG A
135,817	48	Weighted Average
102,081		75.16% Pervious Area
33,736		24.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0710	0.11		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
25.4	100	0.0150	0.07		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.2	205	0.0190	1.56	62.50	Parabolic Channel, Existing Wooded channel W=60.00' D=1.00' Area=40.0 sf Perim=60.0' n= 0.100 Heavy timber, flow below branches
0.8	100	0.0125	2.01	3.35	Parabolic Channel, lawn drainage swale W=10.00' D=0.25' Area=1.7 sf Perim=10.0' n= 0.025 Earth, clean & winding
0.6	115	0.0100	3.10	12.39	Parabolic Channel, Sprucewood Road ditch W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.035 Earth, dense weeds
36.8	570	Total			

Subcatchment 1.2: Pre - 1.2

Summary for Subcatchment 1.3: Pre 1.3

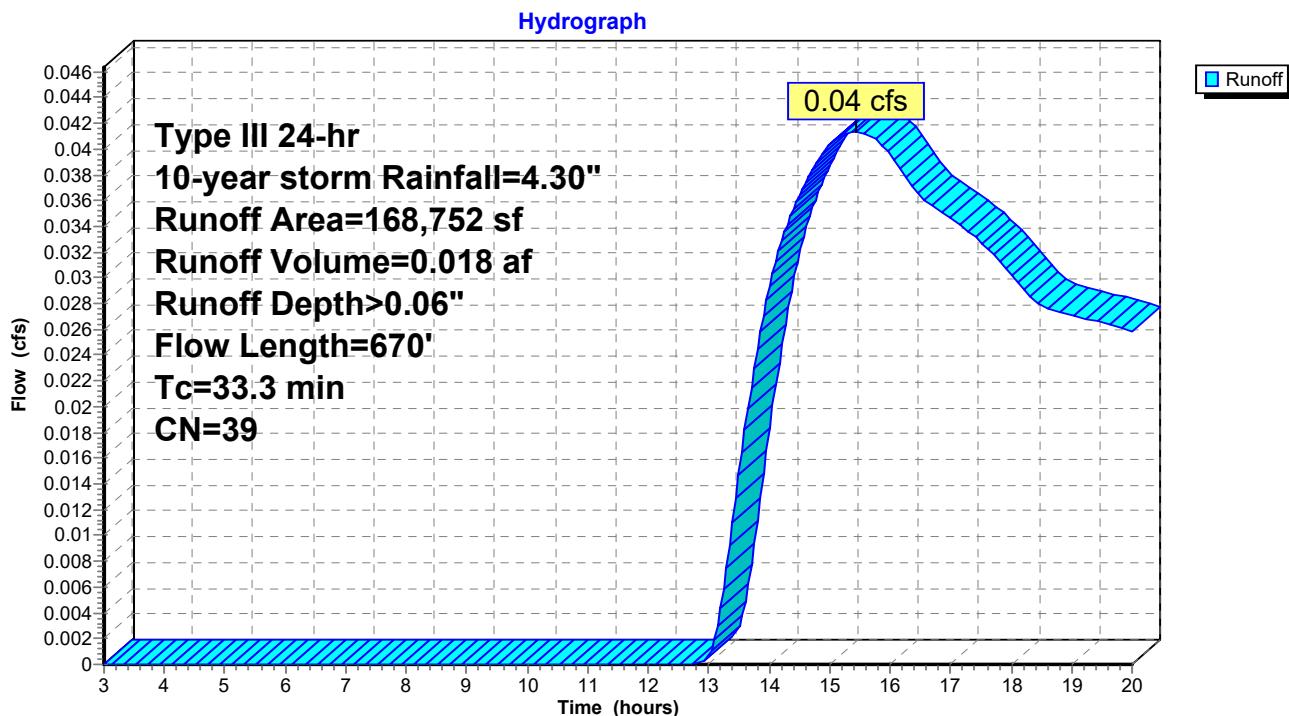
Runoff = 0.04 cfs @ 15.44 hrs, Volume= 0.018 af, Depth> 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-year storm Rainfall=4.30"

Area (sf)	CN	Description
136,436	30	Woods, Good, HSG A
32,316	77	Woods, Good, HSG D
168,752	39	Weighted Average
168,752		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	150	0.0370	0.10		Sheet Flow, Woodland
9.3	520	0.0346	0.93		Shallow Concentrated Flow, Woodland
33.3	670				Total

Subcatchment 1.3: Pre 1.3



Summary for Reach 1R: Stevens Mill Road Ditch

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.29" for 10-year storm event

Inflow = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af

Outflow = 0.31 cfs @ 12.89 hrs, Volume= 0.074 af, Atten= 1%, Lag= 6.8 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.74 fps, Min. Travel Time= 3.7 min

Avg. Velocity = 0.53 fps, Avg. Travel Time= 5.2 min

Peak Storage= 69 cf @ 12.83 hrs

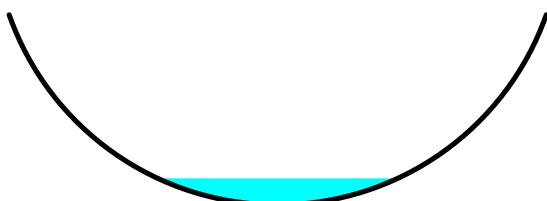
Average Depth at Peak Storage= 0.28' , Surface Width= 2.24'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.57 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

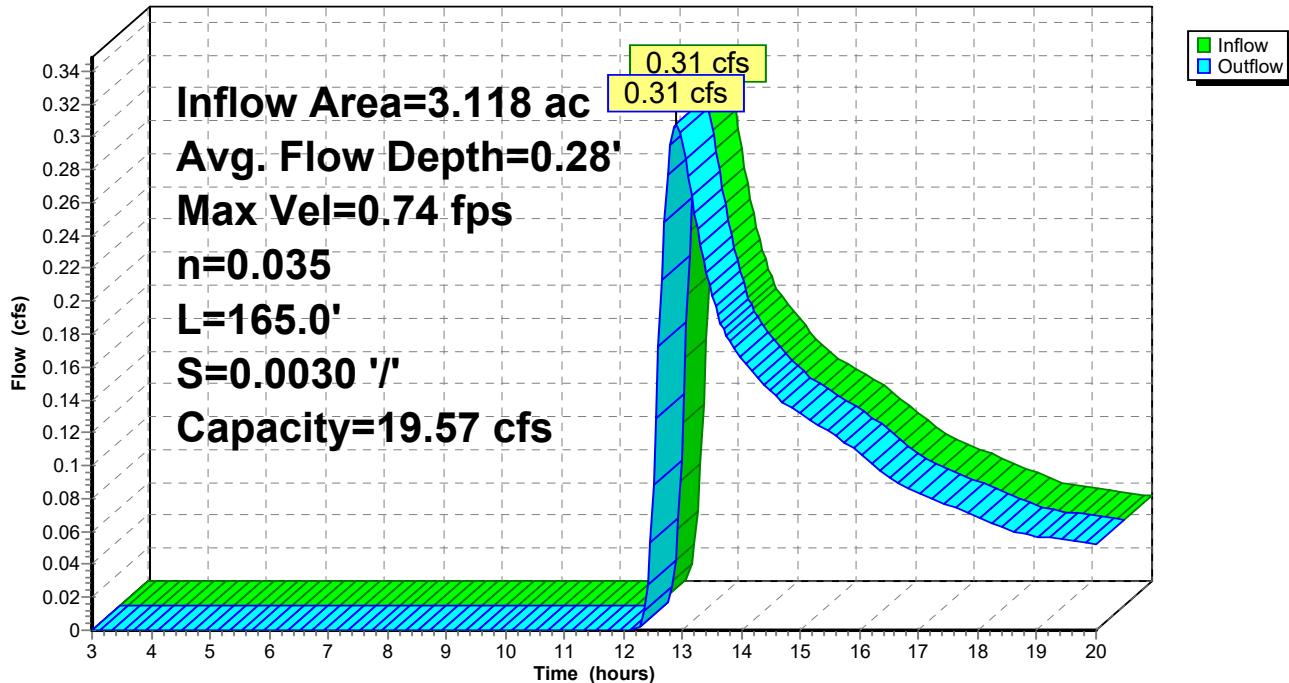
Length= 165.0' Slope= 0.0030 '/'

Inlet Invert= 243.11', Outlet Invert= 242.61'



Reach 1R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 2R: Stevens Mill Road Ditch

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event

Inflow = 0.66 cfs @ 13.10 hrs, Volume= 0.193 af

Outflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af, Atten= 0%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.51 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 1.14 fps, Avg. Travel Time= 1.5 min

Peak Storage= 46 cf @ 13.12 hrs

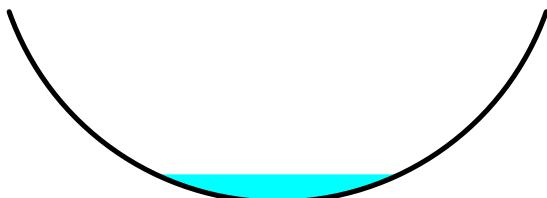
Average Depth at Peak Storage= 0.29' , Surface Width= 2.28'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 38.94 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

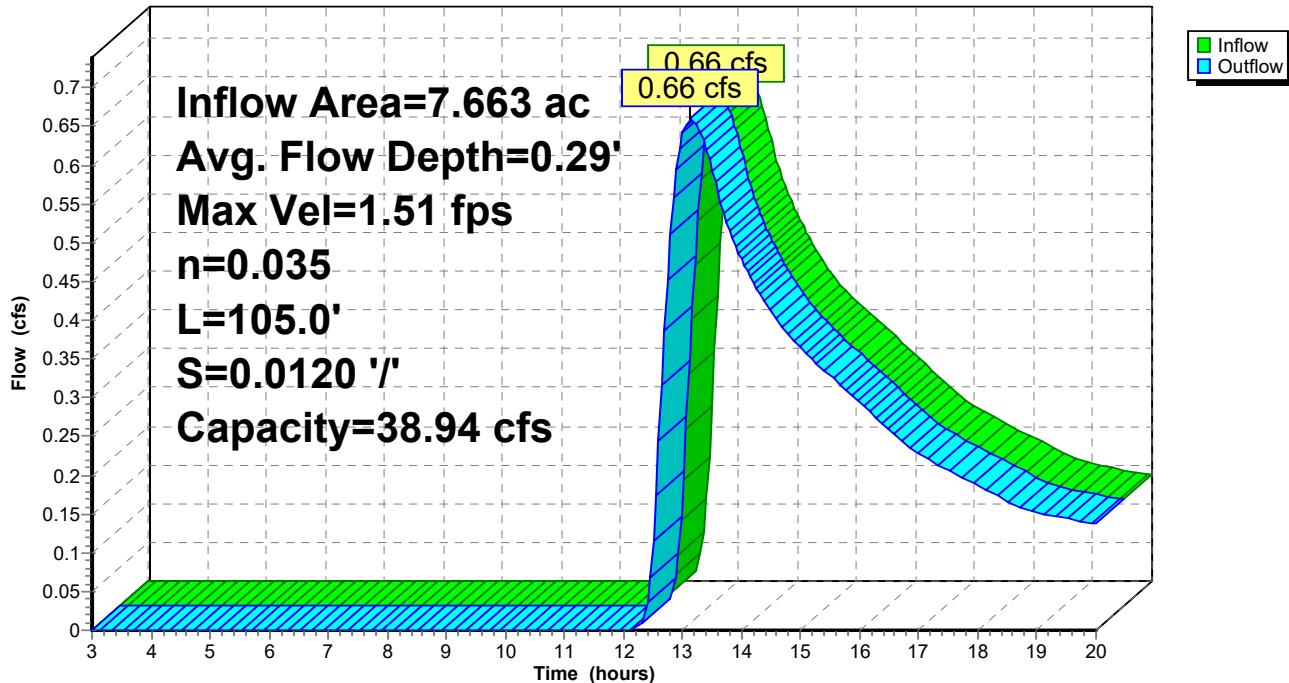
Length= 105.0' Slope= 0.0120 '/'

Inlet Invert= 242.61', Outlet Invert= 241.35'



Reach 2R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 3R: Stevens Mill Road Ditch

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event

Inflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af

Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.33 fps, Min. Travel Time= 1.5 min

Avg. Velocity = 1.00 fps, Avg. Travel Time= 2.0 min

Peak Storage= 58 cf @ 13.16 hrs

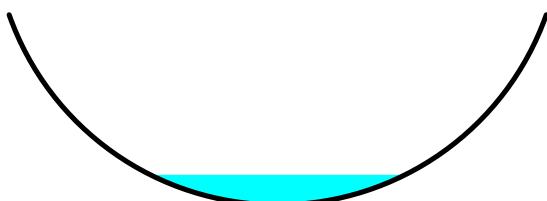
Average Depth at Peak Storage= 0.31', Surface Width= 2.37'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 32.56 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

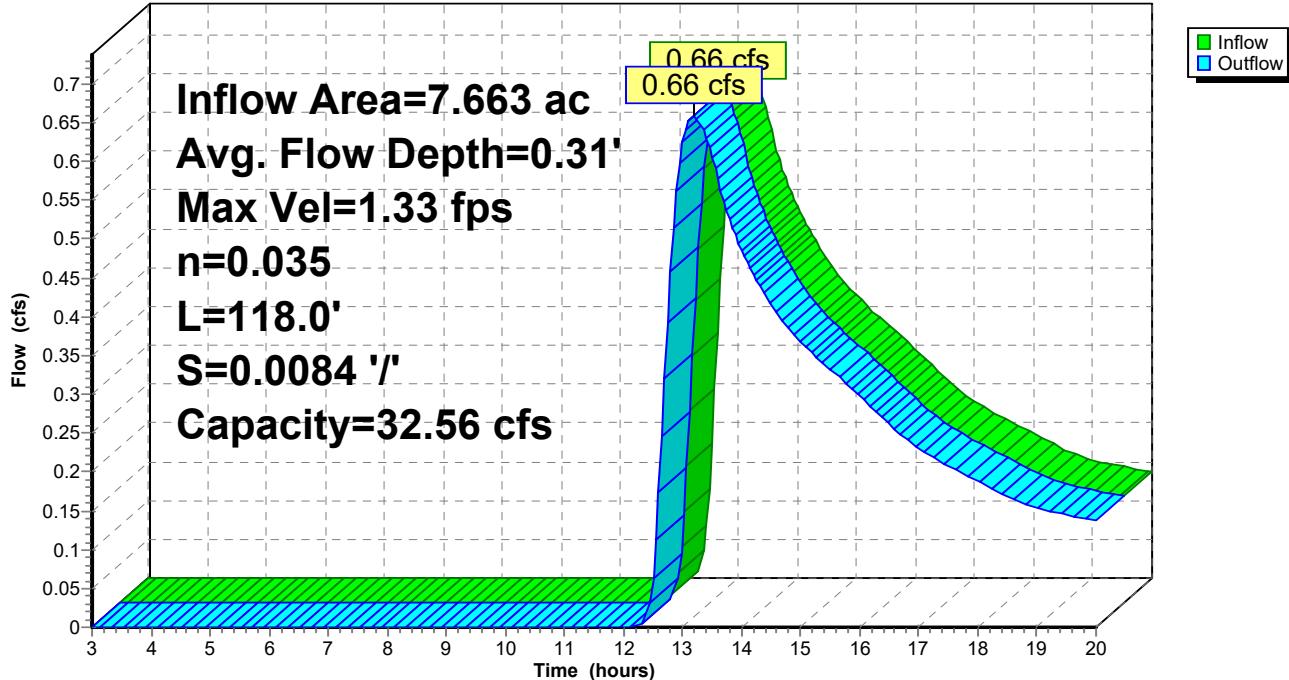
Length= 118.0' Slope= 0.0084 '/'

Inlet Invert= 241.09', Outlet Invert= 240.10'



Reach 3R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 4R: Existing Drainage Channel

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event

Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Outflow = 0.66 cfs @ 13.29 hrs, Volume= 0.190 af, Atten= 0%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.18 fps, Min. Travel Time= 3.6 min

Avg. Velocity = 0.88 fps, Avg. Travel Time= 4.8 min

Peak Storage= 142 cf @ 13.23 hrs

Average Depth at Peak Storage= 0.15' , Surface Width= 5.63'

Bank-Full Depth= 0.30' Flow Area= 1.6 sf, Capacity= 3.00 cfs

8.00' x 0.30' deep Parabolic Channel, n= 0.025 Earth, clean & winding

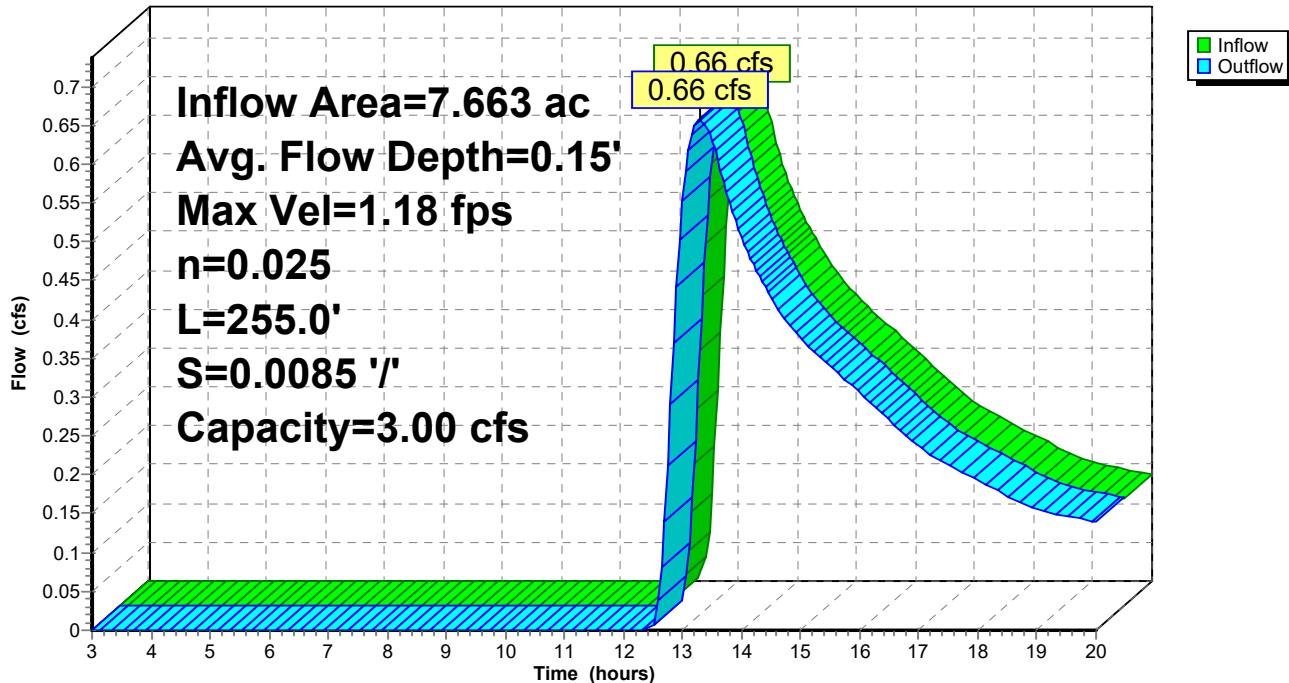
Length= 255.0' Slope= 0.0085 '/'

Inlet Invert= 239.59', Outlet Invert= 237.41'



Reach 4R: Existing Drainage Channel

Hydrograph



Summary for Reach 5R: Existing Drainage Channel-Woods

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event

Inflow = 0.66 cfs @ 13.29 hrs, Volume= 0.190 af

Outflow = 0.65 cfs @ 13.42 hrs, Volume= 0.188 af, Atten= 0%, Lag= 7.6 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.36 fps, Min. Travel Time= 4.2 min

Avg. Velocity = 1.02 fps, Avg. Travel Time= 5.6 min

Peak Storage= 166 cf @ 13.35 hrs

Average Depth at Peak Storage= 0.12' , Surface Width= 6.13'

Bank-Full Depth= 0.20' Flow Area= 1.1 sf, Capacity= 2.07 cfs

8.00' x 0.20' deep Parabolic Channel, n= 0.025 Earth, clean & winding

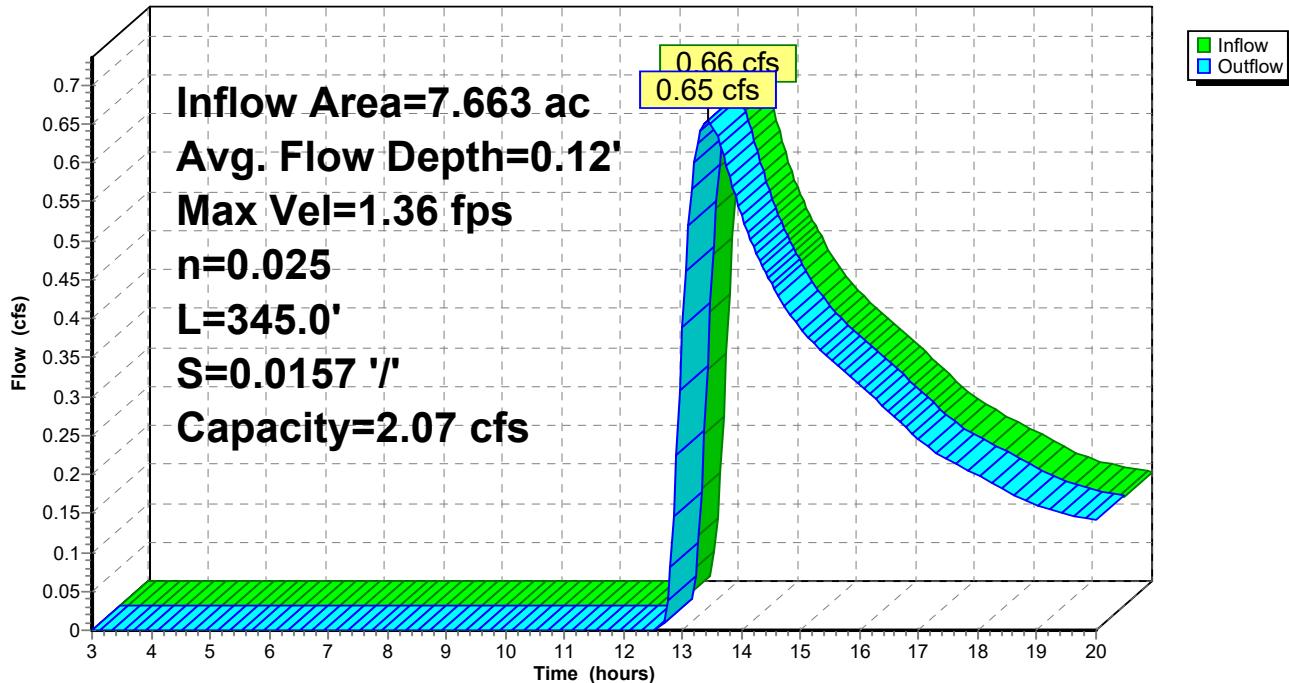
Length= 345.0' Slope= 0.0157 '/'

Inlet Invert= 237.41', Outlet Invert= 232.00'



Reach 5R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 6R: Existing Drainage Channel-Woods

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.29" for 10-year storm event

Inflow = 0.65 cfs @ 13.42 hrs, Volume= 0.188 af

Outflow = 0.65 cfs @ 13.50 hrs, Volume= 0.186 af, Atten= 0%, Lag= 5.1 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.69 fps, Min. Travel Time= 2.9 min

Avg. Velocity = 1.28 fps, Avg. Travel Time= 3.8 min

Peak Storage= 114 cf @ 13.46 hrs

Average Depth at Peak Storage= 0.12' , Surface Width= 4.88'

Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 14.61 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.025 Earth, clean & winding

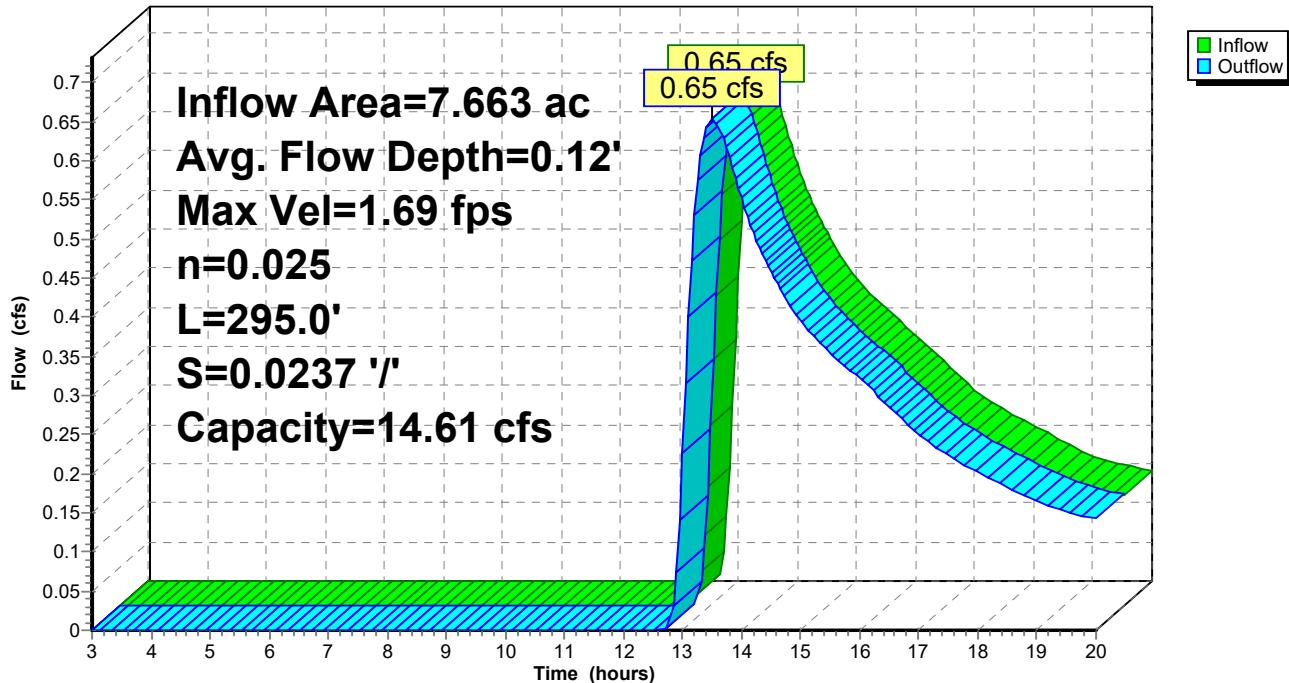
Length= 295.0' Slope= 0.0237 '/'

Inlet Invert= 232.00', Outlet Invert= 225.00'



Reach 6R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 7R: Existing Drainage Channel-Woods

Inflow Area = 35.051 ac, 5.20% Impervious, Inflow Depth > 1.29" for 10-year storm event

Inflow = 22.93 cfs @ 12.79 hrs, Volume= 3.778 af

Outflow = 22.89 cfs @ 12.82 hrs, Volume= 3.771 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.51 fps, Min. Travel Time= 1.0 min

Avg. Velocity = 1.85 fps, Avg. Travel Time= 2.0 min

Peak Storage= 1,436 cf @ 12.81 hrs

Average Depth at Peak Storage= 1.00' , Surface Width= 9.80'

Bank-Full Depth= 1.50' Flow Area= 12.0 sf, Capacity= 54.77 cfs

12.00' x 1.50' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals

Length= 220.0' Slope= 0.0159 '/'

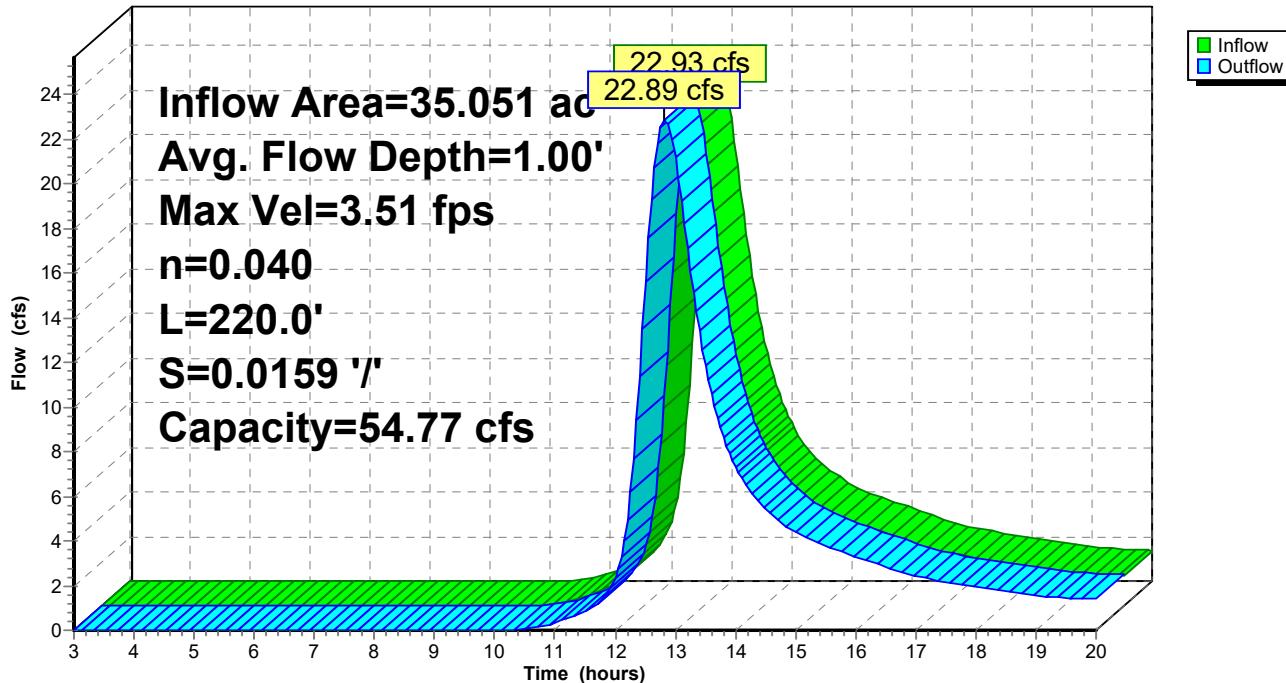
Inlet Invert= 225.00', Outlet Invert= 221.50'



‡

Reach 7R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 8R: Existing Stream Channel

Inflow Area = 38.926 ac, 4.68% Impervious, Inflow Depth > 1.17" for 10-year storm event

Inflow = 22.89 cfs @ 12.82 hrs, Volume= 3.783 af

Outflow = 22.81 cfs @ 12.90 hrs, Volume= 3.765 af, Atten= 0%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.81 fps, Min. Travel Time= 2.6 min

Avg. Velocity = 0.94 fps, Avg. Travel Time= 5.0 min

Peak Storage= 3,536 cf @ 12.86 hrs

Average Depth at Peak Storage= 1.84', Surface Width= 8.69'

Bank-Full Depth= 2.50' Flow Area= 18.8 sf, Capacity= 39.48 cfs

5.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 1.0 ' Top Width= 10.00'

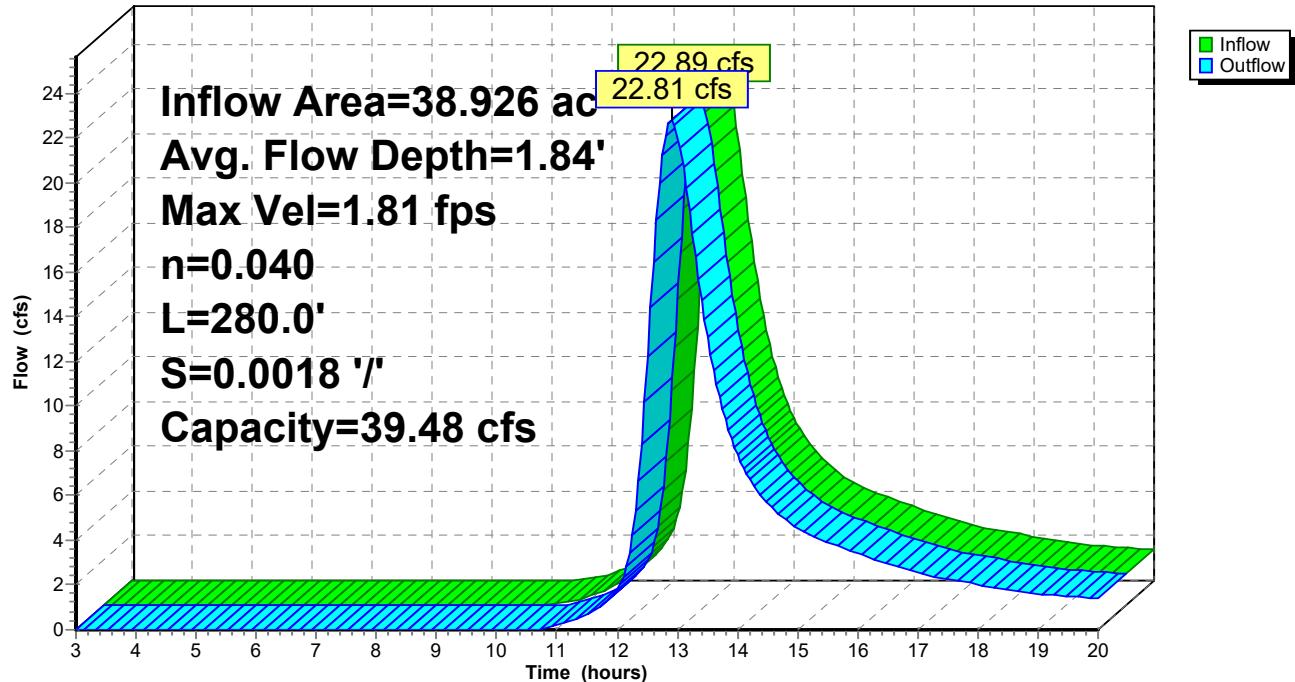
Length= 280.0' Slope= 0.0018 '

Inlet Invert= 221.50', Outlet Invert= 221.00'



Reach 8R: Existing Stream Channel

Hydrograph



Summary for Reach 9R: Existing Stream Channel

Inflow Area = 27.389 ac, 1.69% Impervious, Inflow Depth > 1.58" for 10-year storm event

Inflow = 22.96 cfs @ 12.76 hrs, Volume= 3.597 af

Outflow = 22.92 cfs @ 12.79 hrs, Volume= 3.591 af, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.82 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 2.48 fps, Avg. Travel Time= 2.1 min

Peak Storage= 1,476 cf @ 12.77 hrs

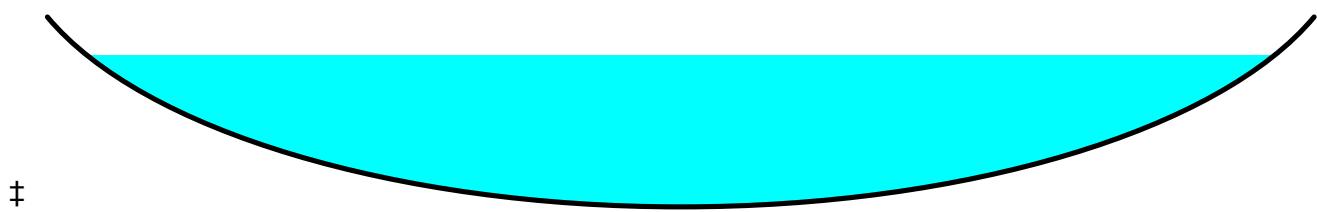
Average Depth at Peak Storage= 0.80' , Surface Width= 8.94'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 37.22 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight

Length= 310.0' Slope= 0.0226 '/'

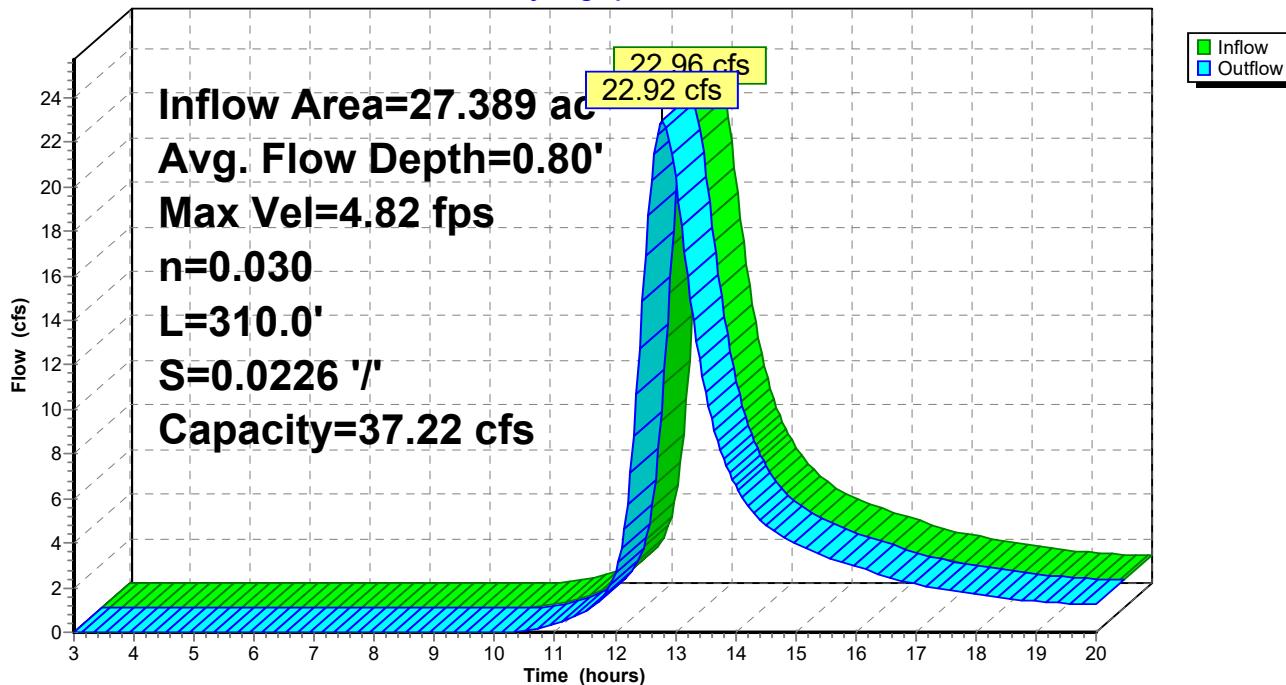
Inlet Invert= 232.00', Outlet Invert= 225.00'



‡

Reach 9R: Existing Stream Channel

Hydrograph



Summary for Reach 10R: Existing Stream Channel

Inflow Area = 3.874 ac, 0.00% Impervious, Inflow Depth > 0.06" for 10-year storm event

Inflow = 0.04 cfs @ 15.44 hrs, Volume= 0.018 af

Outflow = 0.04 cfs @ 17.68 hrs, Volume= 0.012 af, Atten= 11%, Lag= 134.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.23 fps, Min. Travel Time= 73.7 min

Avg. Velocity = 0.21 fps, Avg. Travel Time= 81.9 min

Peak Storage= 162 cf @ 16.45 hrs

Average Depth at Peak Storage= 0.03' , Surface Width= 5.13'

Bank-Full Depth= 2.50' Flow Area= 25.0 sf, Capacity= 72.89 cfs

5.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 15.00'

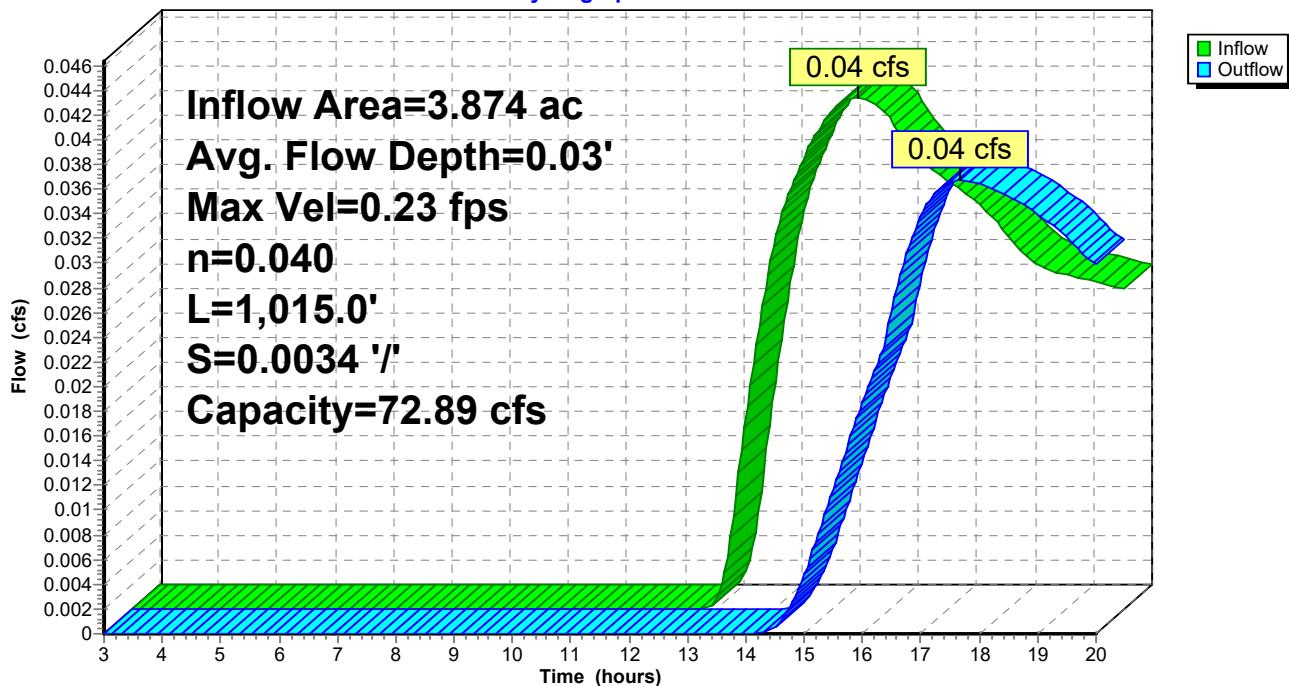
Length= 1,015.0' Slope= 0.0034 '/

Inlet Invert= 225.00', Outlet Invert= 221.50'



Reach 10R: Existing Stream Channel

Hydrograph



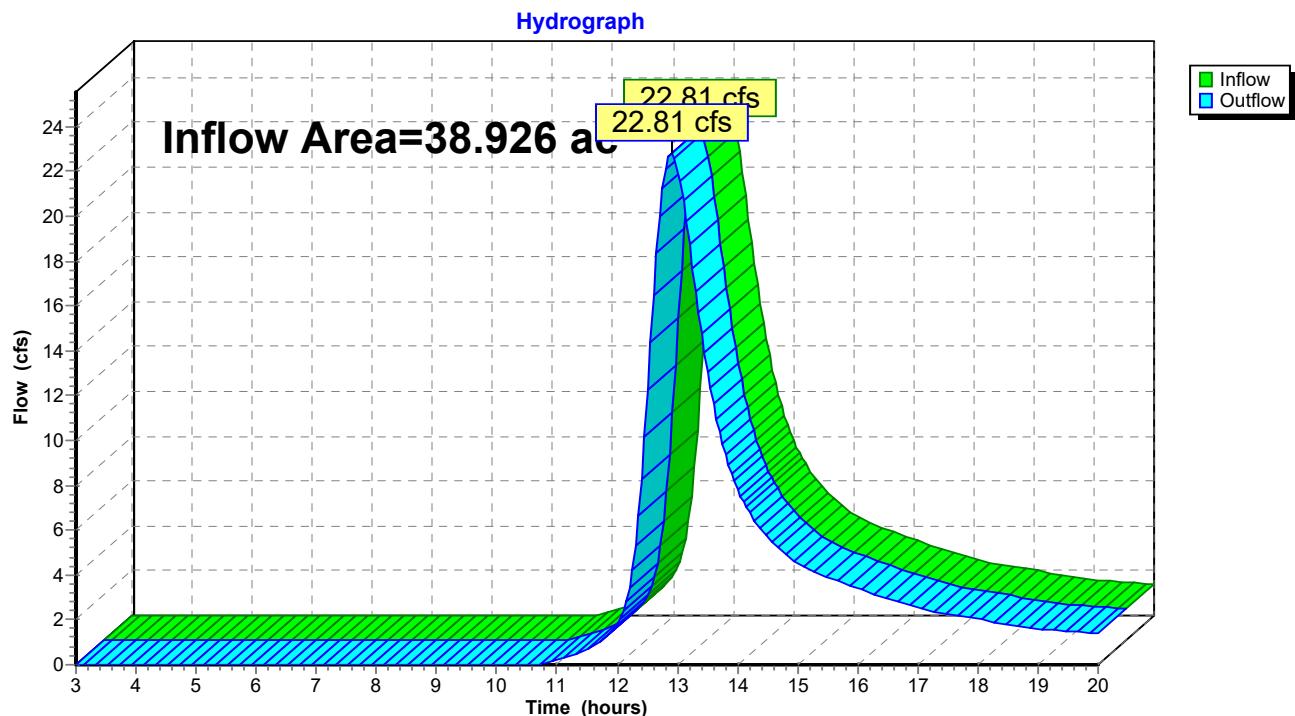
Summary for Reach WAP 1: Water Analysis Point 1

Inflow Area = 38.926 ac, 4.68% Impervious, Inflow Depth > 1.16" for 10-year storm event

Inflow = 22.81 cfs @ 12.90 hrs, Volume= 3.765 af

Outflow = 22.81 cfs @ 12.90 hrs, Volume= 3.765 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Reach WAP 1: Water Analysis Point 1

Summary for Pond 1P: Sprucewood Rd Culvert

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.29" for 10-year storm event

Inflow = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af

Outflow = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Primary = 0.31 cfs @ 12.78 hrs, Volume= 0.075 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 244.68' @ 12.78 hrs

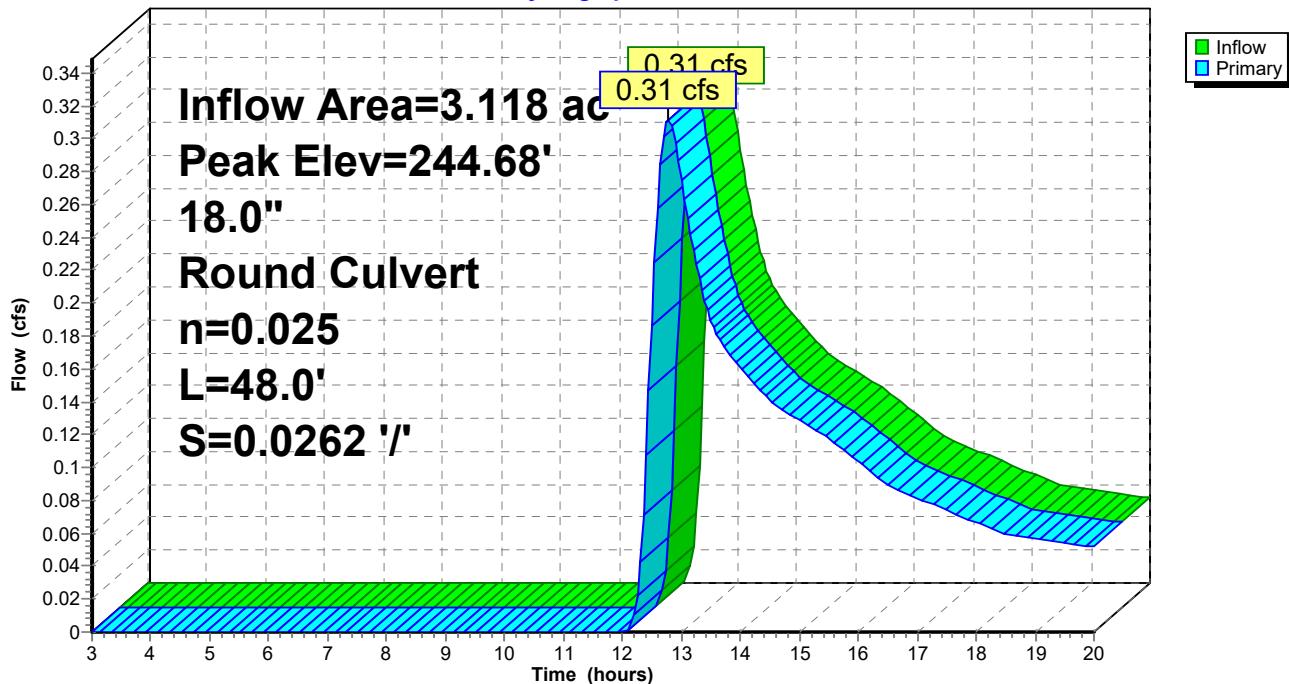
Flood Elev= 246.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	244.37'	18.0" Round Culvert L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 244.37' / 243.11' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.31 cfs @ 12.78 hrs HW=244.68' TW=244.00' (Fixed TW Elev= 244.00')
 ↑1=Culvert (Outlet Controls 0.31 cfs @ 1.79 fps)

Pond 1P: Sprucewood Rd Culvert

Hydrograph



Summary for Pond 2P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event

Inflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af

Outflow = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Primary = 0.66 cfs @ 13.14 hrs, Volume= 0.193 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 241.94' @ 13.14 hrs

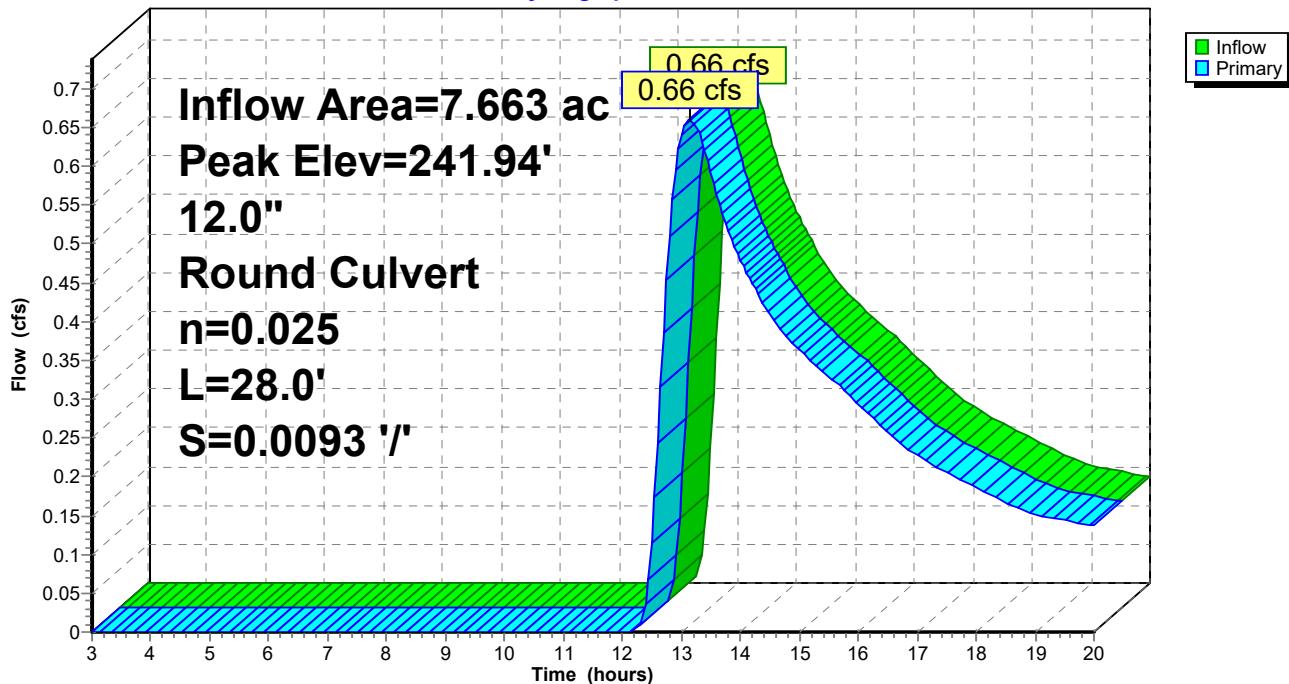
Flood Elev= 243.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	241.35'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 241.35' / 241.09' S= 0.0093 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 13.14 hrs HW=241.94' TW=241.60' (Fixed TW Elev= 241.60')
 ↑1=Culvert (Outlet Controls 0.66 cfs @ 1.98 fps)

Pond 2P: Driveway culvert

Hydrograph



Summary for Pond 3P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

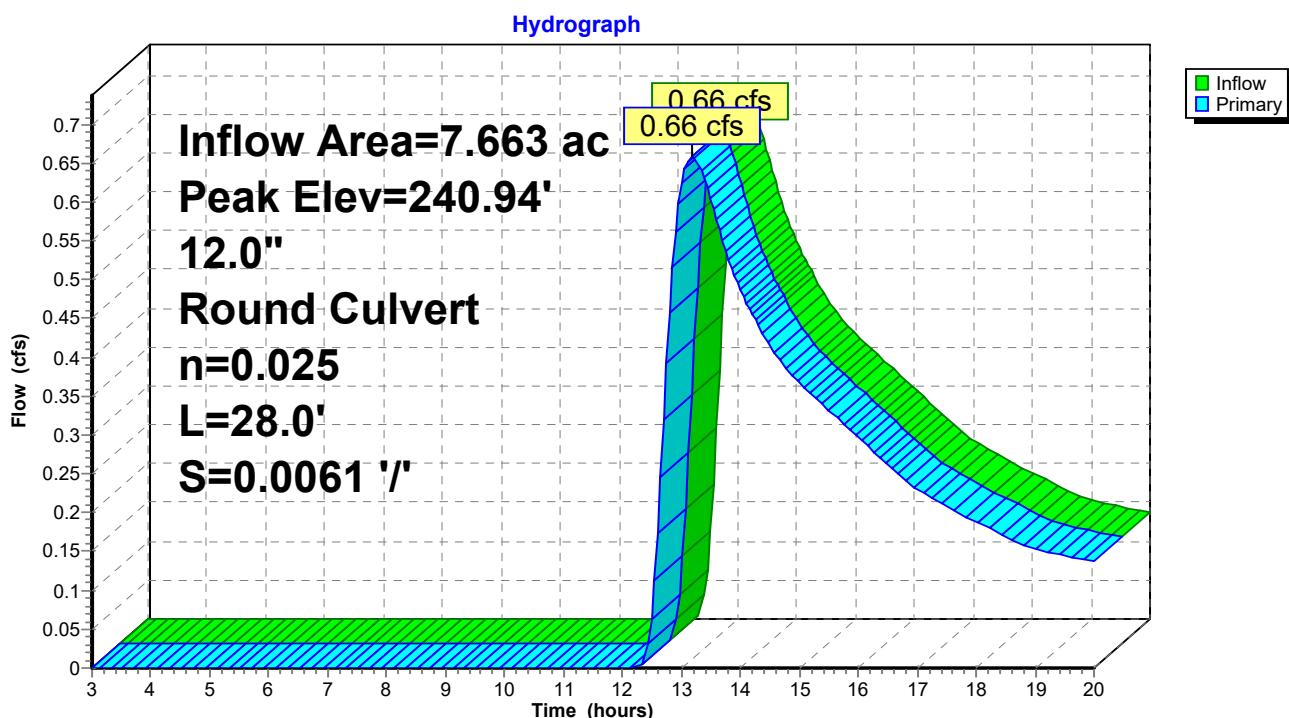
Peak Elev= 240.94' @ 13.18 hrs

Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 240.10' / 239.93' S= 0.0061 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 13.18 hrs HW=240.94' TW=240.82' (Fixed TW Elev= 240.82')
 ↗1=Culvert (Outlet Controls 0.66 cfs @ 1.27 fps)

Pond 3P: Driveway culvert



Summary for Pond 4P: Stevens Mill Rd X-Culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.30" for 10-year storm event
 Inflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af
 Outflow = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.66 cfs @ 13.18 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

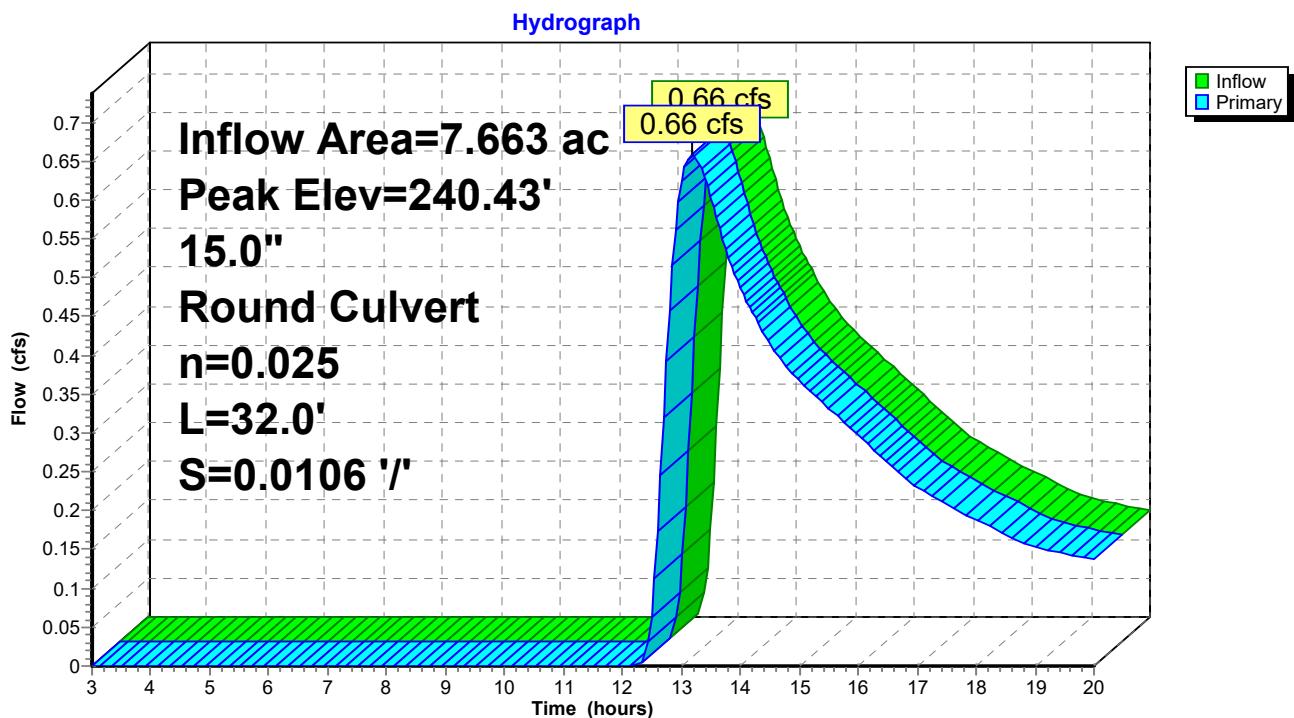
Peak Elev= 240.43' @ 13.18 hrs

Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.93'	15.0" Round Culvert L= 32.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 239.93' / 239.59' S= 0.0106 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=0.66 cfs @ 13.18 hrs HW=240.43' TW=239.83' (Fixed TW Elev= 239.83')
↑ 1=Culvert (Barrel Controls 0.66 cfs @ 2.14 fps)

Pond 4P: Stevens Mill Rd X-Culvert



Time span=3.00-20.00 hrs, dt=0.05 hrs, 341 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: Pre - 1 Runoff Area=1,193,053 sf 1.69% Impervious Runoff Depth>2.37"
Flow Length=670' Tc=53.6 min UI Adjusted CN=73 Runoff=34.74 cfs 5.399 af

Subcatchment1.1: Pre - 1.1 Runoff Area=197,973 sf 12.87% Impervious Runoff Depth>0.67"
Flow Length=500' Tc=68.1 min UI Adjusted CN=49 Runoff=1.11 cfs 0.256 af

Subcatchment1.2: Pre - 1.2 Runoff Area=135,817 sf 24.84% Impervious Runoff Depth>0.64"
Flow Length=570' Tc=36.8 min CN=48 Runoff=0.95 cfs 0.165 af

Subcatchment1.3: Pre 1.3 Runoff Area=168,752 sf 0.00% Impervious Runoff Depth>0.23"
Flow Length=670' Tc=33.3 min CN=39 Runoff=0.22 cfs 0.073 af

Reach 1R: Stevens Mill Road Ditch Avg. Flow Depth=0.47' Max Vel=1.03 fps Inflow=0.95 cfs 0.165 af
n=0.035 L=165.0' S=0.0030 '/' Capacity=19.57 cfs Outflow=0.94 cfs 0.164 af

Reach 2R: Stevens Mill Road Ditch Avg. Flow Depth=0.47' Max Vel=2.05 fps Inflow=1.85 cfs 0.420 af
n=0.035 L=105.0' S=0.0120 '/' Capacity=38.94 cfs Outflow=1.85 cfs 0.419 af

Reach 3R: Stevens Mill Road Ditch Avg. Flow Depth=0.51' Max Vel=1.81 fps Inflow=1.85 cfs 0.419 af
n=0.035 L=118.0' S=0.0084 '/' Capacity=32.56 cfs Outflow=1.85 cfs 0.418 af

Reach 4R: Existing Drainage Channel Avg. Flow Depth=0.24' Max Vel=1.61 fps Inflow=1.85 cfs 0.418 af
n=0.025 L=255.0' S=0.0085 '/' Capacity=3.00 cfs Outflow=1.84 cfs 0.415 af

Reach 5R: Existing Drainage Avg. Flow Depth=0.19' Max Vel=1.87 fps Inflow=1.84 cfs 0.415 af
n=0.025 L=345.0' S=0.0157 '/' Capacity=2.07 cfs Outflow=1.84 cfs 0.413 af

Reach 6R: Existing Drainage Avg. Flow Depth=0.19' Max Vel=2.32 fps Inflow=1.84 cfs 0.413 af
n=0.025 L=295.0' S=0.0237 '/' Capacity=14.61 cfs Outflow=1.83 cfs 0.411 af

Reach 7R: Existing Drainage Avg. Flow Depth=1.23' Max Vel=4.01 fps Inflow=35.52 cfs 5.802 af
n=0.040 L=220.0' S=0.0159 '/' Capacity=54.77 cfs Outflow=35.46 cfs 5.794 af

Reach 8R: Existing Stream Channel Avg. Flow Depth=2.35' Max Vel=2.04 fps Inflow=35.46 cfs 5.858 af
n=0.040 L=280.0' S=0.0018 '/' Capacity=39.48 cfs Outflow=35.34 cfs 5.836 af

Reach 9R: Existing Stream Channel Avg. Flow Depth=0.97' Max Vel=5.47 fps Inflow=34.74 cfs 5.399 af
n=0.030 L=310.0' S=0.0226 '/' Capacity=37.22 cfs Outflow=34.71 cfs 5.391 af

Reach 10R: Existing Stream Channel Avg. Flow Depth=0.08' Max Vel=0.40 fps Inflow=0.22 cfs 0.073 af
n=0.040 L=1,015.0' S=0.0034 '/' Capacity=72.89 cfs Outflow=0.16 cfs 0.064 af

Reach WAP 1: Water Analysis Point 1 Inflow=35.34 cfs 5.836 af
Outflow=35.34 cfs 5.836 af

Pond 1P: Sprucewood Rd Culvert Peak Elev=244.89' Inflow=0.95 cfs 0.165 af
18.0" Round Culvert n=0.025 L=48.0' S=0.0262 '/' Outflow=0.95 cfs 0.165 af

Pond 2P: Driveway culvert

Peak Elev=242.41' Inflow=1.85 cfs 0.419 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0093 '/' Outflow=1.85 cfs 0.419 af

Pond 3P: Driveway culvert

Peak Elev=241.26' Inflow=1.85 cfs 0.418 af
12.0" Round Culvert n=0.025 L=28.0' S=0.0061 '/' Outflow=1.85 cfs 0.418 af

Pond 4P: Stevens Mill Rd X-Culvert

Peak Elev=240.81' Inflow=1.85 cfs 0.418 af
15.0" Round Culvert n=0.025 L=32.0' S=0.0106 '/' Outflow=1.85 cfs 0.418 af

Total Runoff Area = 38.926 ac Runoff Volume = 5.893 af Average Runoff Depth = 1.82"
95.32% Pervious = 37.102 ac 4.68% Impervious = 1.823 ac

Summary for Subcatchment 1: Pre - 1

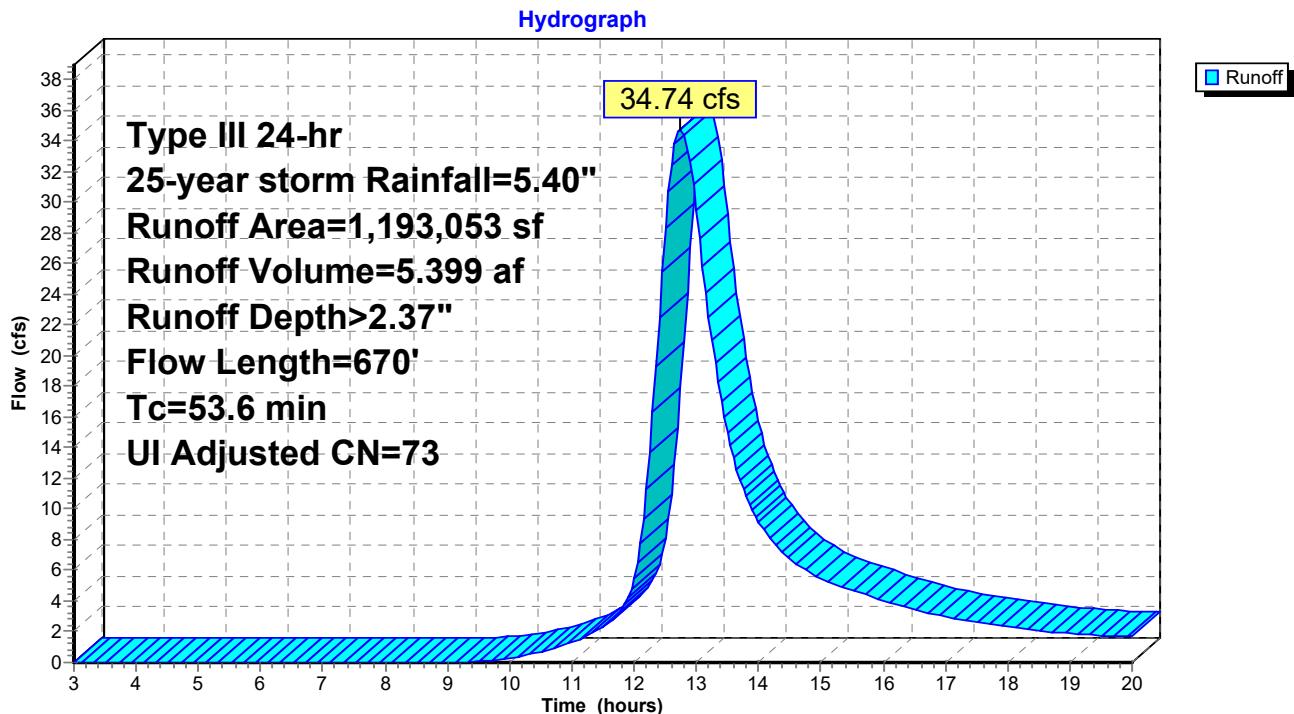
Runoff = 34.74 cfs @ 12.74 hrs, Volume= 5.399 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Adj	Description
11,361	92		Paved roads w/open ditches, 50% imp, HSG C
5,445	83		Paved roads w/open ditches, 50% imp, HSG A
10,970	98		Unconnected pavement, HSG A
818	98		Unconnected pavement, HSG C
41,300	30		Woods, Good, HSG A
381,159	70		Woods, Good, HSG C
742,000	77		Woods, Good, HSG D

1,193,053	74	73	Weighted Average, UI Adjusted
1,172,862			98.31% Pervious Area
20,191			1.69% Impervious Area
11,788			58.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0208	0.91		Sheet Flow, Stevens Mill Road Smooth surfaces n= 0.011 P2= 3.00"
2.0	10	0.0083	0.08		Sheet Flow, Field/Meadow Range n= 0.130 P2= 3.00"
37.9	126	0.0083	0.06		Sheet Flow, Woodland Woods: Light underbrush n= 0.400 P2= 3.00"
13.4	520	0.0167	0.65		Shallow Concentrated Flow, Woodland Woodland Kv= 5.0 fps
53.6	670	Total			

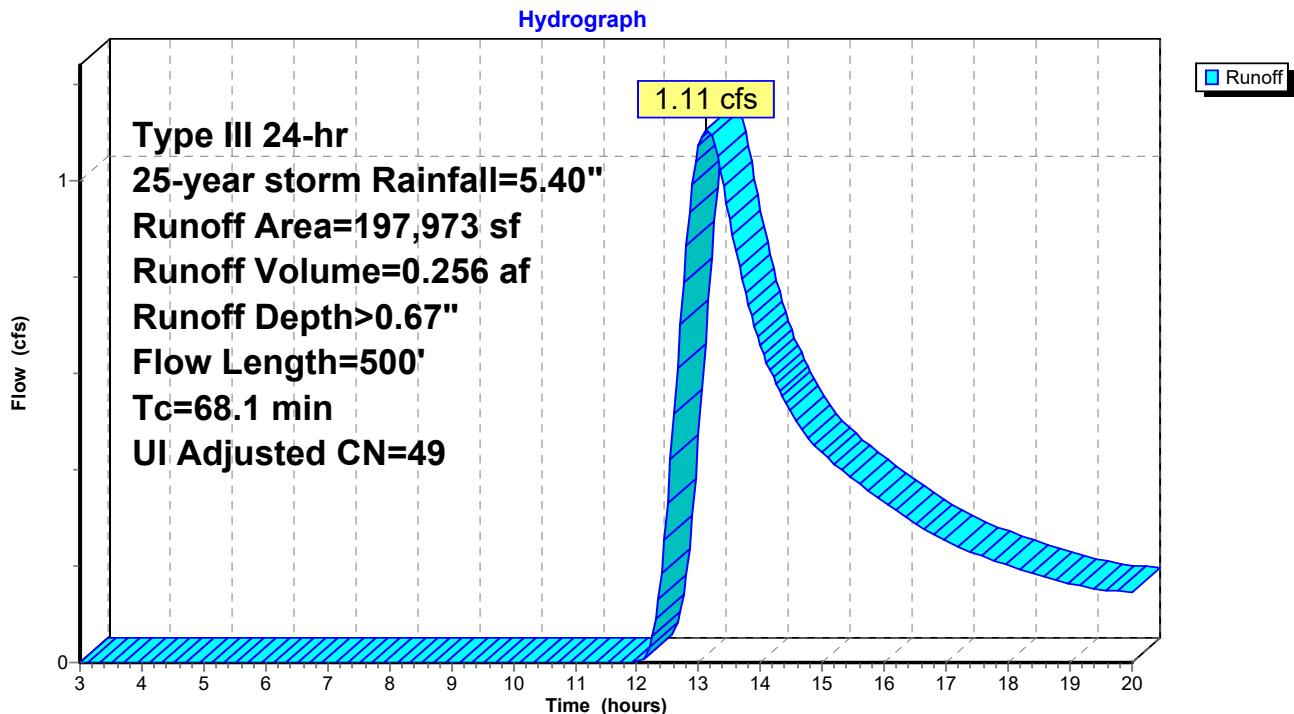
Subcatchment 1: Pre - 1

Summary for Subcatchment 1.1: Pre - 1.1

Runoff = 1.11 cfs @ 13.12 hrs, Volume= 0.256 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Adj	Description	
8,288	92		Paved roads w/open ditches, 50% imp, HSG C	
7,140	83		Paved roads w/open ditches, 50% imp, HSG A	
471	98		Unconnected pavement, HSG C	
7,007	98		Unconnected pavement, HSG C	
10,292	98		Unconnected pavement, HSG A	
101,459	30		Woods, Good, HSG A	
54,560	70		Woods, Good, HSG C	
8,756	30		Woods, Good, HSG A	
197,973	52	49	Weighted Average, UI Adjusted	
172,489			87.13% Pervious Area	
25,484			12.87% Impervious Area	
17,770			69.73% Unconnected	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	
Capacity (cfs)	Description			
4.4	30	0.1050	0.11	Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
27.9	65	0.0050	0.04	Sheet Flow, Lawn Grass: Bermuda n= 0.410 P2= 3.00"
23.9	55	0.0050	0.04	Sheet Flow, Woods - Good Woods: Light underbrush n= 0.400 P2= 3.00"
11.3	240	0.0050	0.35	Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.6	110	0.0440	3.15	Shallow Concentrated Flow, Lawn Grassed Waterway Kv= 15.0 fps
68.1	500	Total		

Subcatchment 1.1: Pre - 1.1

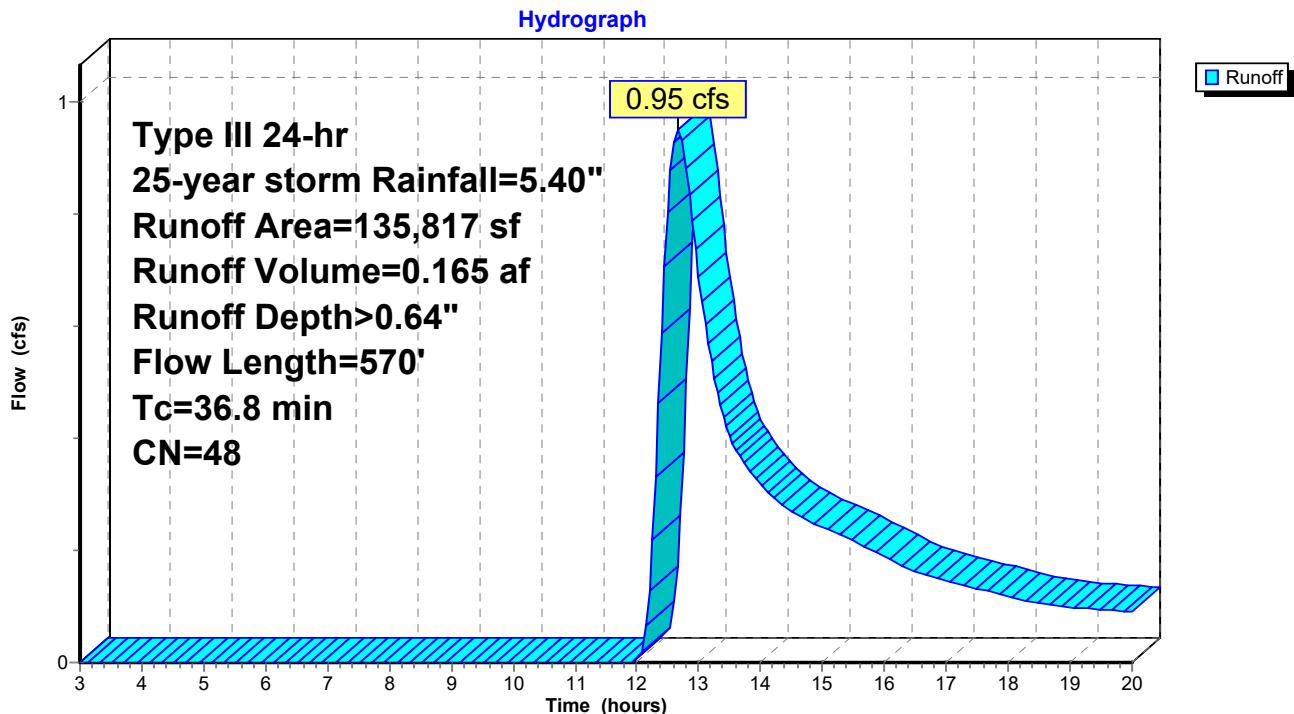
Summary for Subcatchment 1.2: Pre - 1.2

Runoff = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
10,242	83	Paved roads w/open ditches, 50% imp, HSG A
20,828	98	Paved parking, HSG A
7,787	98	Paved parking, HSG A
88,183	30	Woods, Good, HSG A
8,635	30	Woods, Good, HSG A
142	30	Woods, Good, HSG A
135,817	48	Weighted Average
102,081		75.16% Pervious Area
33,736		24.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0710	0.11		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
25.4	100	0.0150	0.07		Sheet Flow, lawn Grass: Bermuda n= 0.410 P2= 3.00"
2.2	205	0.0190	1.56	62.50	Parabolic Channel, Existing Wooded channel W=60.00' D=1.00' Area=40.0 sf Perim=60.0' n= 0.100 Heavy timber, flow below branches
0.8	100	0.0125	2.01	3.35	Parabolic Channel, lawn drainage swale W=10.00' D=0.25' Area=1.7 sf Perim=10.0' n= 0.025 Earth, clean & winding
0.6	115	0.0100	3.10	12.39	Parabolic Channel, Sprucewood Road ditch W=6.00' D=1.00' Area=4.0 sf Perim=6.4' n= 0.035 Earth, dense weeds
36.8	570	Total			

Subcatchment 1.2: Pre - 1.2

Summary for Subcatchment 1.3: Pre 1.3

Runoff = 0.22 cfs @ 12.87 hrs, Volume= 0.073 af, Depth> 0.23"

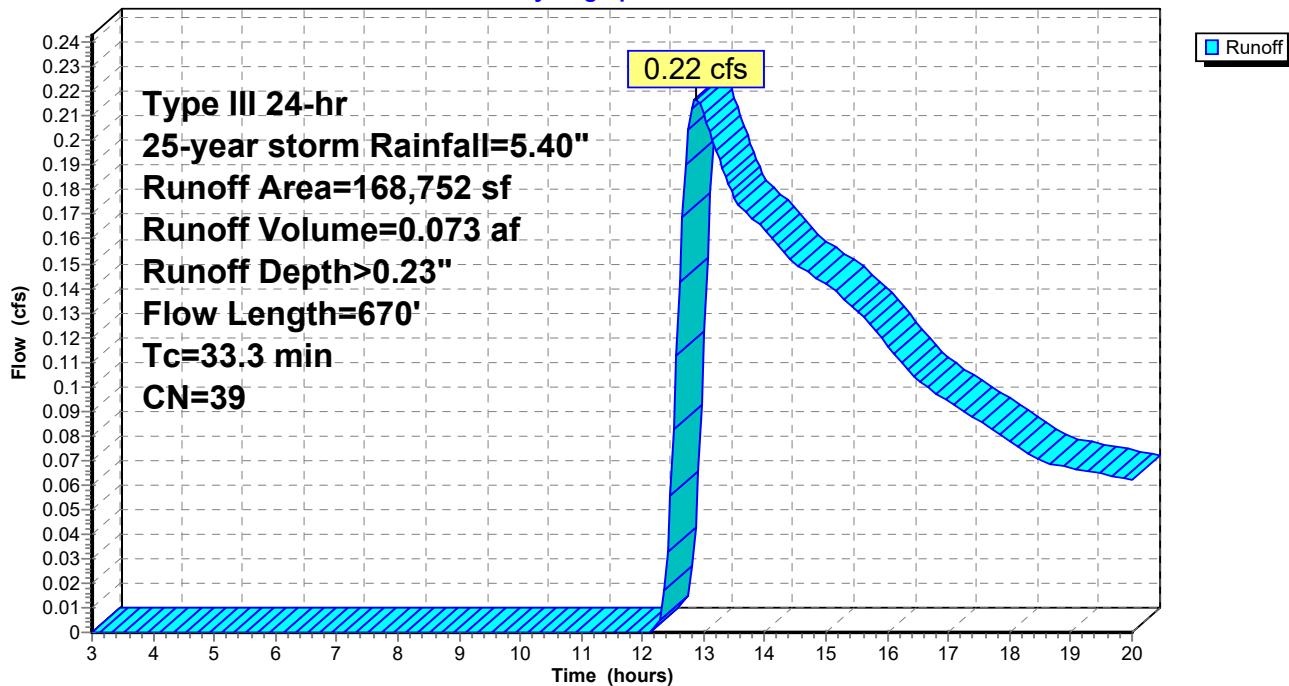
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year storm Rainfall=5.40"

Area (sf)	CN	Description
136,436	30	Woods, Good, HSG A
32,316	77	Woods, Good, HSG D
168,752	39	Weighted Average
168,752		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	150	0.0370	0.10		Sheet Flow, Woodland
9.3	520	0.0346	0.93		Shallow Concentrated Flow, Woodland
33.3	670				Total

Subcatchment 1.3: Pre 1.3

Hydrograph



Summary for Reach 1R: Stevens Mill Road Ditch

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.64" for 25-year storm event

Inflow = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af

Outflow = 0.94 cfs @ 12.74 hrs, Volume= 0.164 af, Atten= 1%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.03 fps, Min. Travel Time= 2.7 min

Avg. Velocity = 0.65 fps, Avg. Travel Time= 4.2 min

Peak Storage= 151 cf @ 12.70 hrs

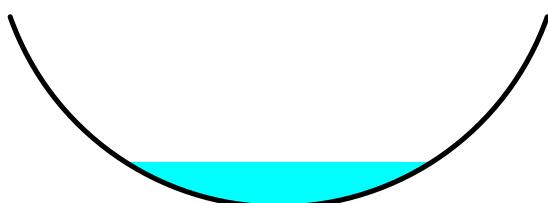
Average Depth at Peak Storage= 0.47' , Surface Width= 2.91'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 19.57 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

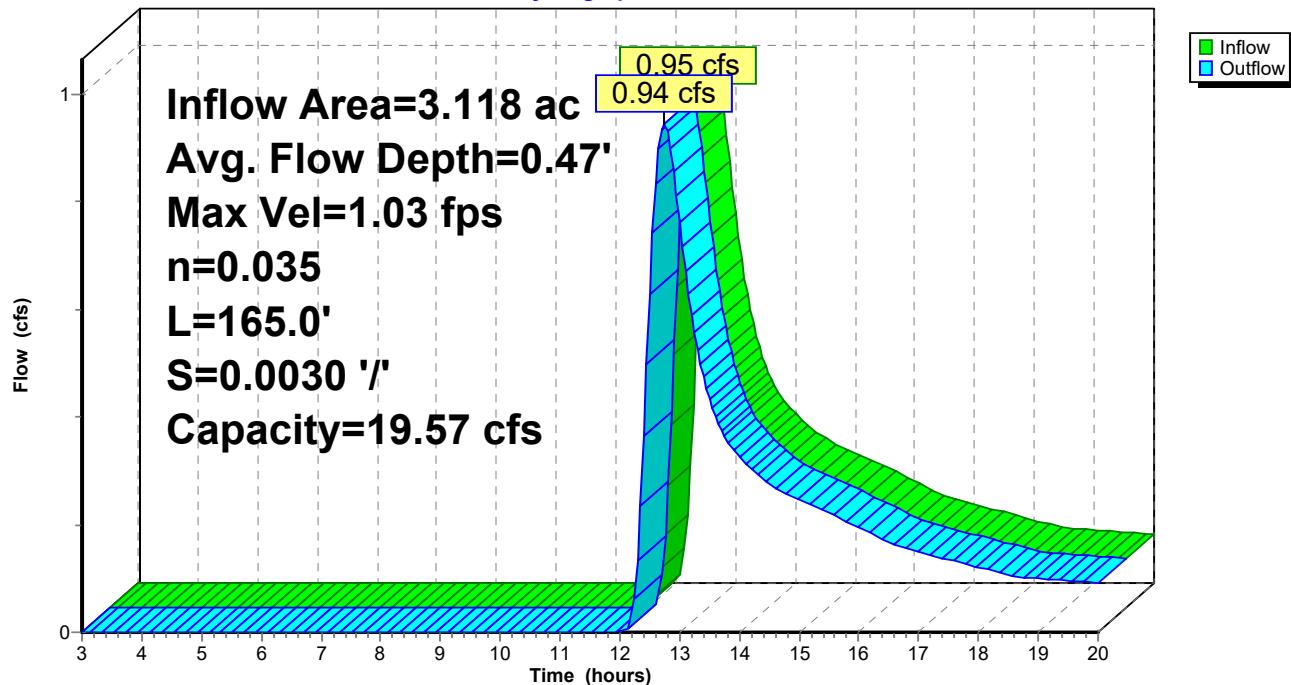
Length= 165.0' Slope= 0.0030 '/'

Inlet Invert= 243.11', Outlet Invert= 242.61'



Reach 1R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 2R: Stevens Mill Road Ditch

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.66" for 25-year storm event

Inflow = 1.85 cfs @ 12.93 hrs, Volume= 0.420 af

Outflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.05 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 1.40 fps, Avg. Travel Time= 1.2 min

Peak Storage= 95 cf @ 12.94 hrs

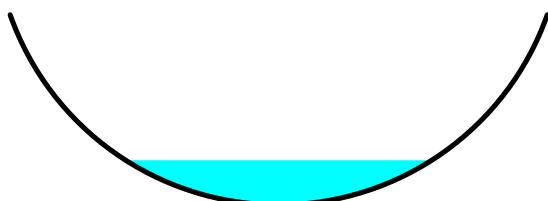
Average Depth at Peak Storage= 0.47', Surface Width= 2.90'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 38.94 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

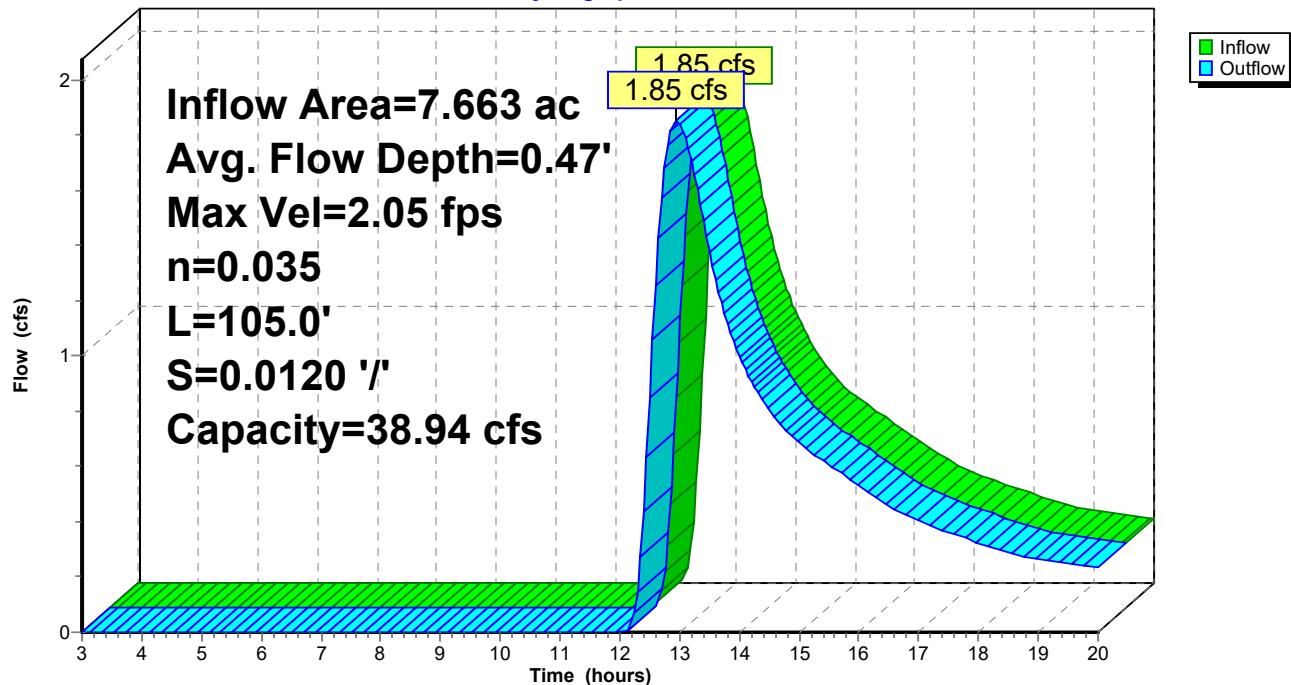
Length= 105.0' Slope= 0.0120 '/'

Inlet Invert= 242.61', Outlet Invert= 241.35'



Reach 2R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 3R: Stevens Mill Road Ditch

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.66" for 25-year storm event

Inflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af

Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.81 fps, Min. Travel Time= 1.1 min

Avg. Velocity = 1.23 fps, Avg. Travel Time= 1.6 min

Peak Storage= 121 cf @ 12.96 hrs

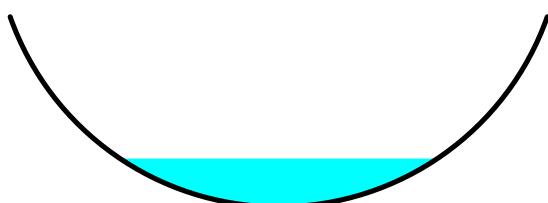
Average Depth at Peak Storage= 0.51', Surface Width= 3.02'

Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 32.56 cfs

6.00' x 2.00' deep Parabolic Channel, n= 0.035 Earth, dense weeds

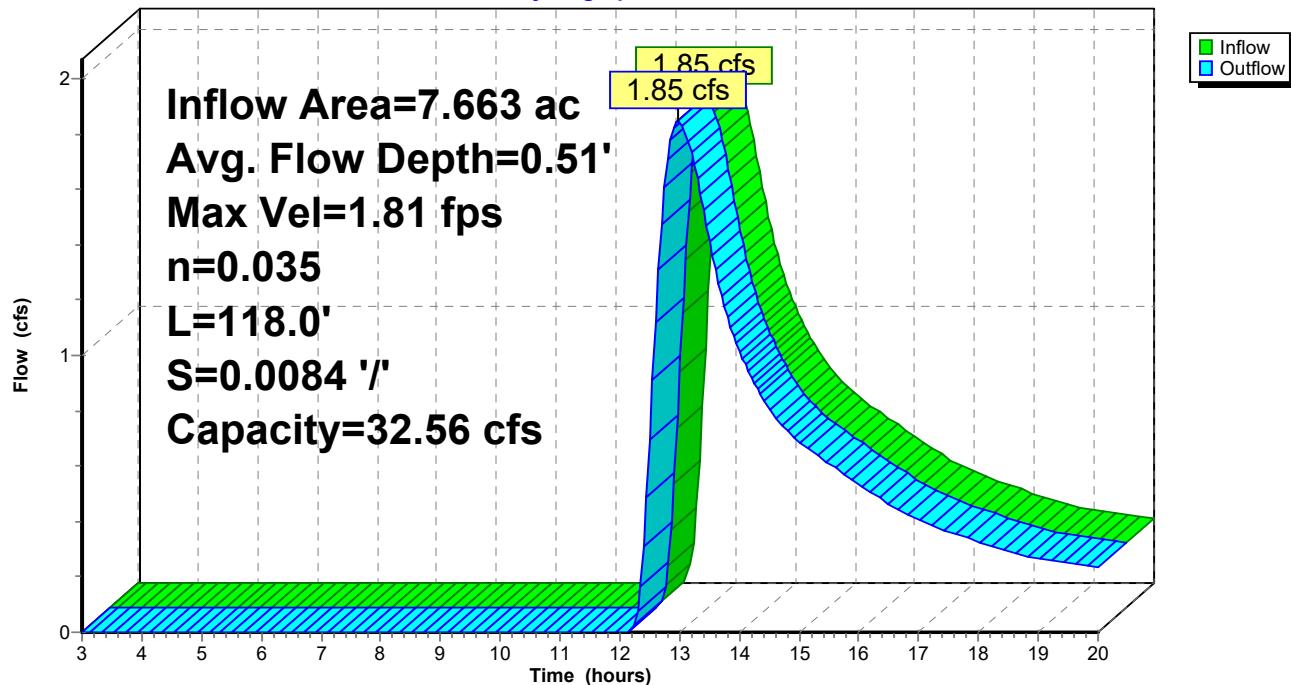
Length= 118.0' Slope= 0.0084 '/'

Inlet Invert= 241.09', Outlet Invert= 240.10'



Reach 3R: Stevens Mill Road Ditch

Hydrograph



Summary for Reach 4R: Existing Drainage Channel

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event

Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Outflow = 1.84 cfs @ 13.06 hrs, Volume= 0.415 af, Atten= 0%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.61 fps, Min. Travel Time= 2.6 min

Avg. Velocity = 1.09 fps, Avg. Travel Time= 3.9 min

Peak Storage= 291 cf @ 13.01 hrs

Average Depth at Peak Storage= 0.24', Surface Width= 7.15'

Bank-Full Depth= 0.30' Flow Area= 1.6 sf, Capacity= 3.00 cfs

8.00' x 0.30' deep Parabolic Channel, n= 0.025 Earth, clean & winding

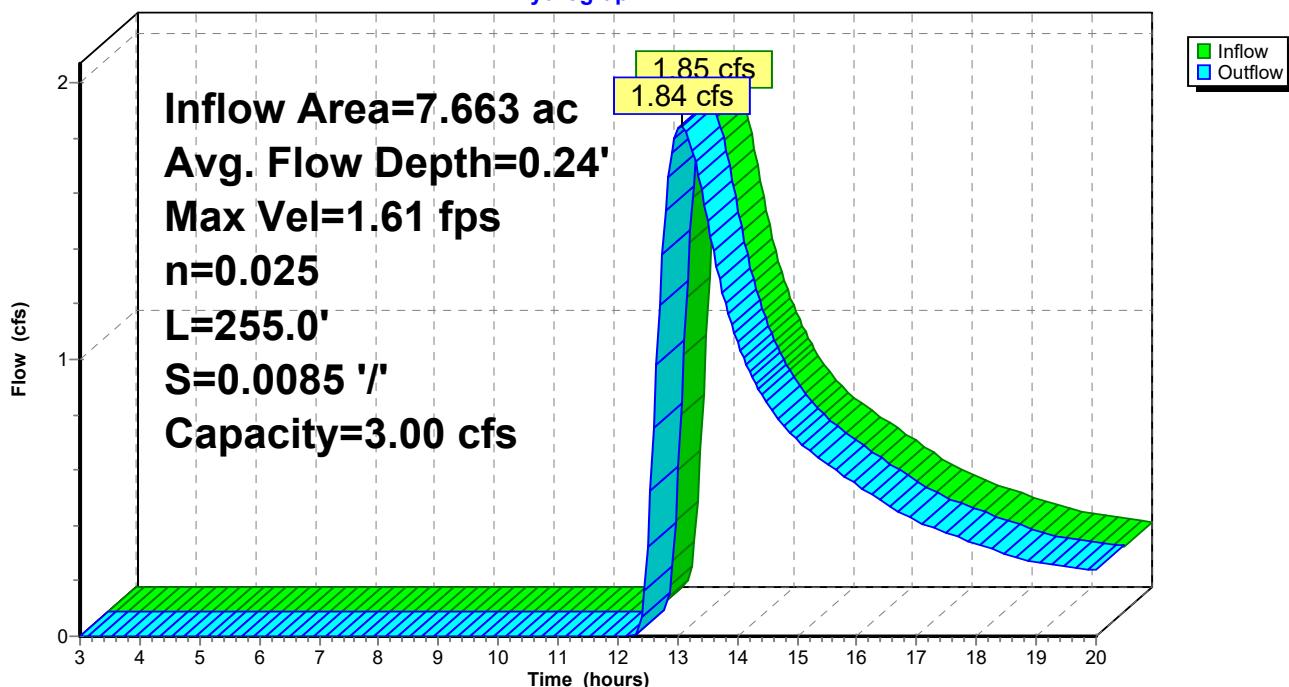
Length= 255.0' Slope= 0.0085 '/'

Inlet Invert= 239.59', Outlet Invert= 237.41'

‡

Reach 4R: Existing Drainage Channel

Hydrograph



Summary for Reach 5R: Existing Drainage Channel-Woods

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event

Inflow = 1.84 cfs @ 13.06 hrs, Volume= 0.415 af

Outflow = 1.84 cfs @ 13.15 hrs, Volume= 0.413 af, Atten= 0%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 1.87 fps, Min. Travel Time= 3.1 min

Avg. Velocity = 1.28 fps, Avg. Travel Time= 4.5 min

Peak Storage= 339 cf @ 13.10 hrs

Average Depth at Peak Storage= 0.19', Surface Width= 7.78'

Bank-Full Depth= 0.20' Flow Area= 1.1 sf, Capacity= 2.07 cfs

8.00' x 0.20' deep Parabolic Channel, n= 0.025 Earth, clean & winding

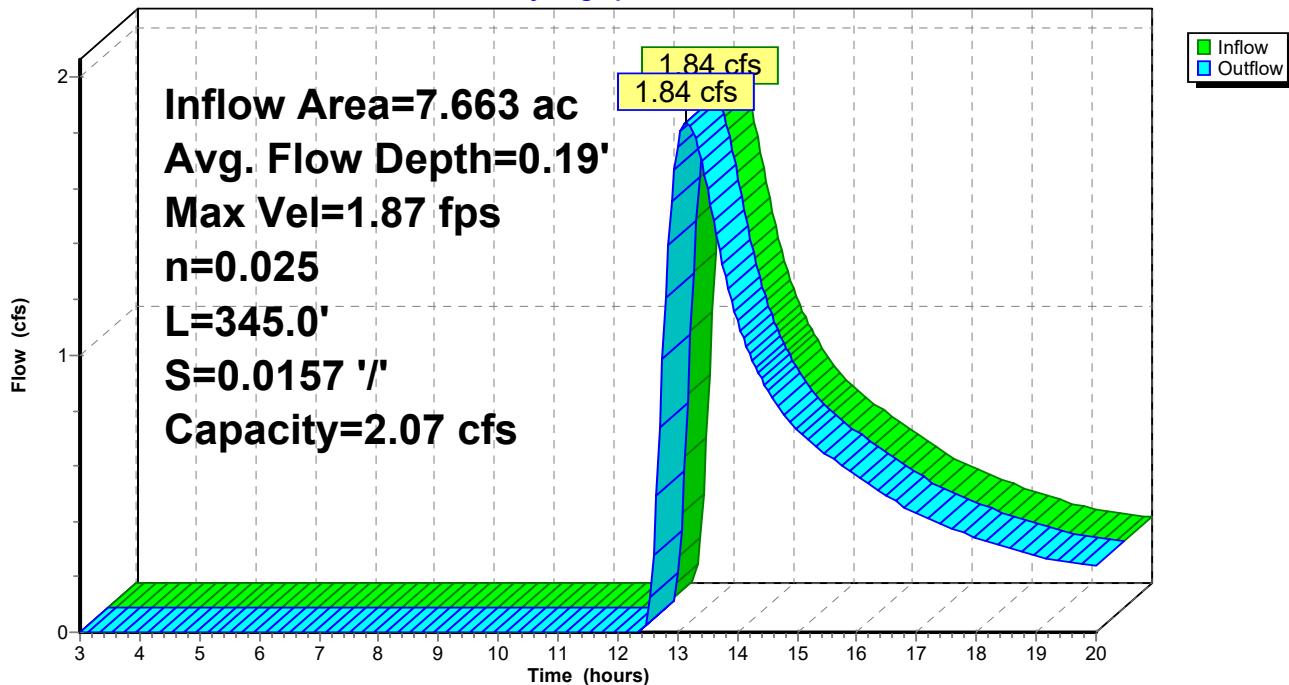
Length= 345.0' Slope= 0.0157 '/'

Inlet Invert= 237.41', Outlet Invert= 232.00'

‡

Reach 5R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 6R: Existing Drainage Channel-Woods

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event

Inflow = 1.84 cfs @ 13.15 hrs, Volume= 0.413 af

Outflow = 1.83 cfs @ 13.21 hrs, Volume= 0.411 af, Atten= 0%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.32 fps, Min. Travel Time= 2.1 min

Avg. Velocity = 1.60 fps, Avg. Travel Time= 3.1 min

Peak Storage= 233 cf @ 13.17 hrs

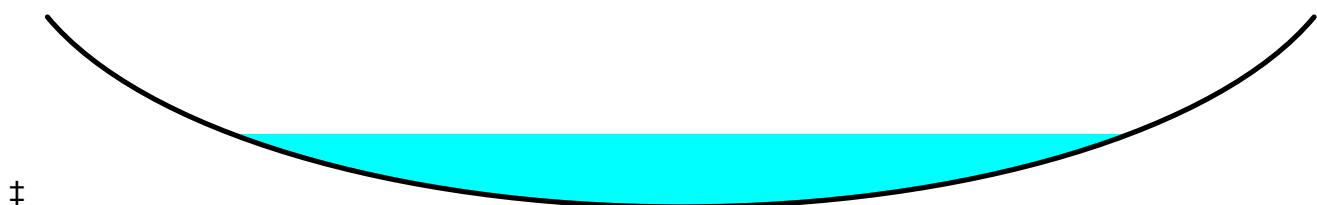
Average Depth at Peak Storage= 0.19', Surface Width= 6.19'

Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 14.61 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.025 Earth, clean & winding

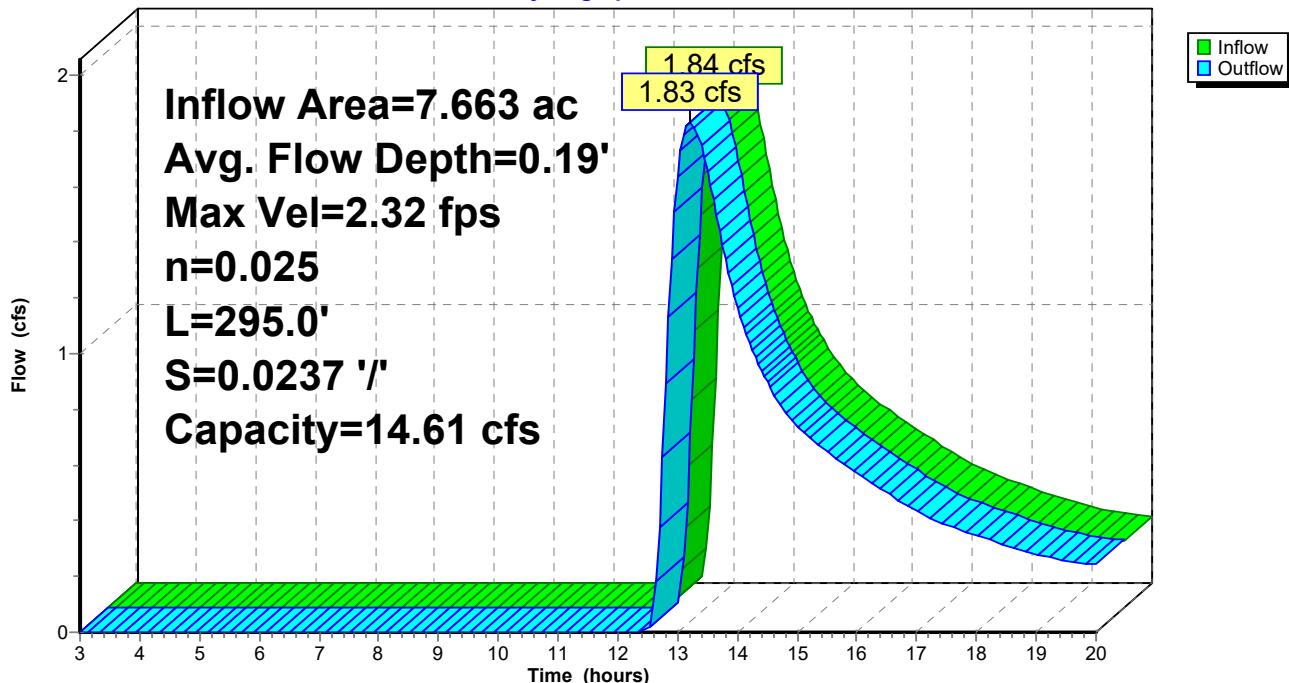
Length= 295.0' Slope= 0.0237 '/'

Inlet Invert= 232.00', Outlet Invert= 225.00'



Reach 6R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 7R: Existing Drainage Channel-Woods

Inflow Area = 35.051 ac, 5.20% Impervious, Inflow Depth > 1.99" for 25-year storm event

Inflow = 35.52 cfs @ 12.80 hrs, Volume= 5.802 af

Outflow = 35.46 cfs @ 12.83 hrs, Volume= 5.794 af, Atten= 0%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.01 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 2.03 fps, Avg. Travel Time= 1.8 min

Peak Storage= 1,949 cf @ 12.81 hrs

Average Depth at Peak Storage= 1.23', Surface Width= 10.85'

Bank-Full Depth= 1.50' Flow Area= 12.0 sf, Capacity= 54.77 cfs

12.00' x 1.50' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals

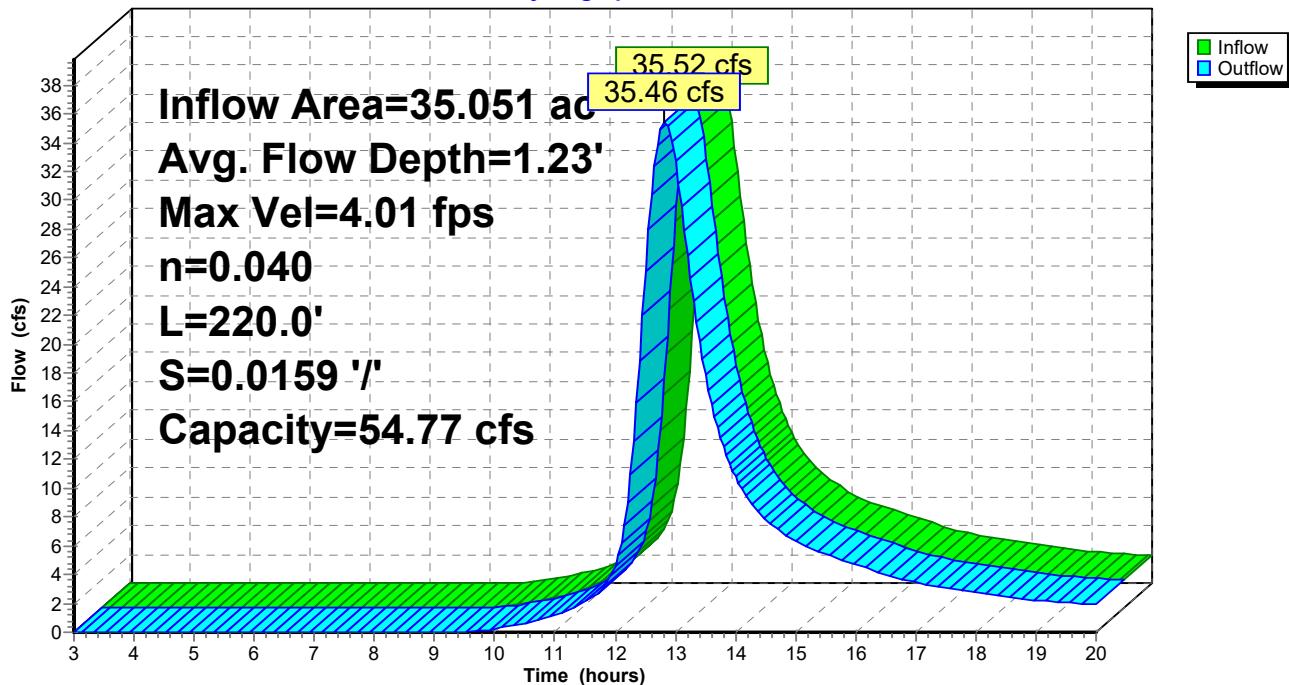
Length= 220.0' Slope= 0.0159 '/'

Inlet Invert= 225.00', Outlet Invert= 221.50'

‡

Reach 7R: Existing Drainage Channel-Woods

Hydrograph



Summary for Reach 8R: Existing Stream Channel

Inflow Area = 38.926 ac, 4.68% Impervious, Inflow Depth > 1.81" for 25-year storm event

Inflow = 35.46 cfs @ 12.83 hrs, Volume= 5.858 af

Outflow = 35.34 cfs @ 12.89 hrs, Volume= 5.836 af, Atten= 0%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.04 fps, Min. Travel Time= 2.3 min

Avg. Velocity = 1.04 fps, Avg. Travel Time= 4.5 min

Peak Storage= 4,848 cf @ 12.85 hrs

Average Depth at Peak Storage= 2.35' , Surface Width= 9.71'

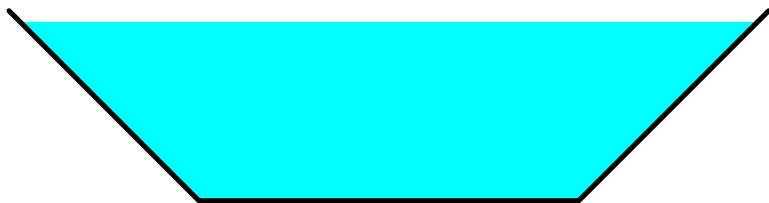
Bank-Full Depth= 2.50' Flow Area= 18.8 sf, Capacity= 39.48 cfs

5.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 1.0 ' Top Width= 10.00'

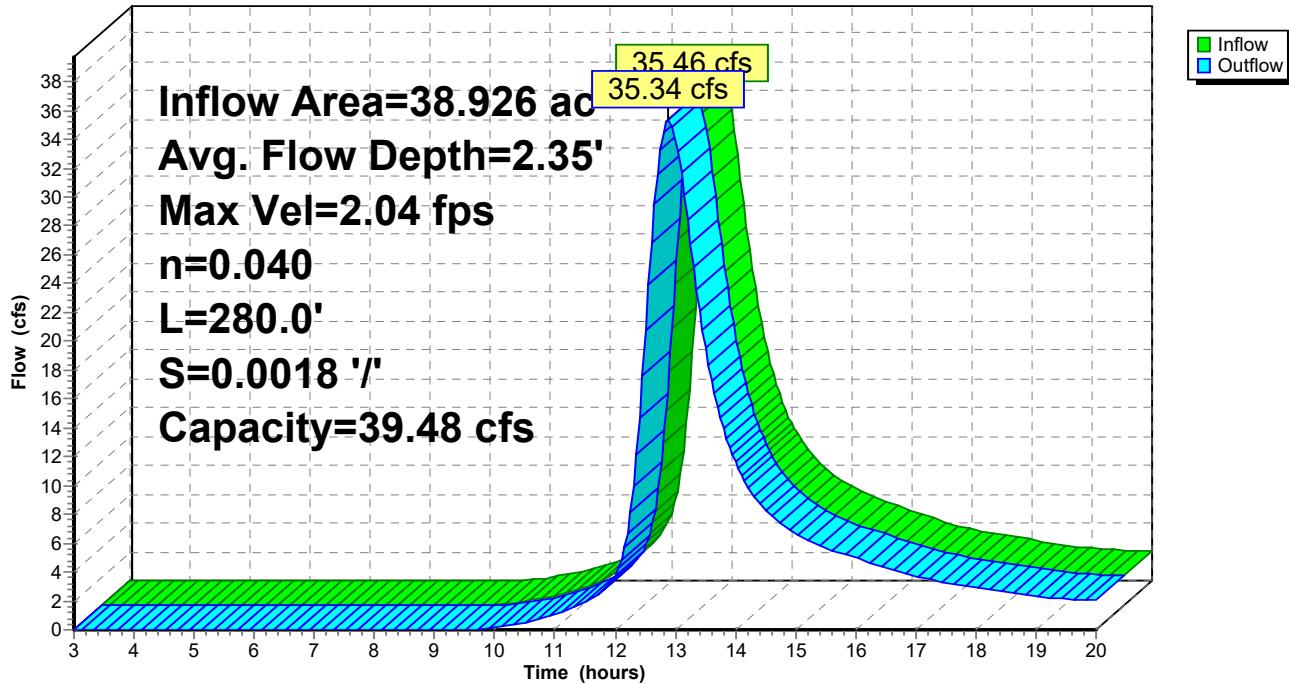
Length= 280.0' Slope= 0.0018 '

Inlet Invert= 221.50', Outlet Invert= 221.00'



Reach 8R: Existing Stream Channel

Hydrograph



Summary for Reach 9R: Existing Stream Channel

Inflow Area = 27.389 ac, 1.69% Impervious, Inflow Depth > 2.37" for 25-year storm event

Inflow = 34.74 cfs @ 12.74 hrs, Volume= 5.399 af

Outflow = 34.71 cfs @ 12.77 hrs, Volume= 5.391 af, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 5.47 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 2.70 fps, Avg. Travel Time= 1.9 min

Peak Storage= 1,970 cf @ 12.76 hrs

Average Depth at Peak Storage= 0.97', Surface Width= 9.84'

Bank-Full Depth= 1.00' Flow Area= 6.7 sf, Capacity= 37.22 cfs

10.00' x 1.00' deep Parabolic Channel, n= 0.030 Stream, clean & straight

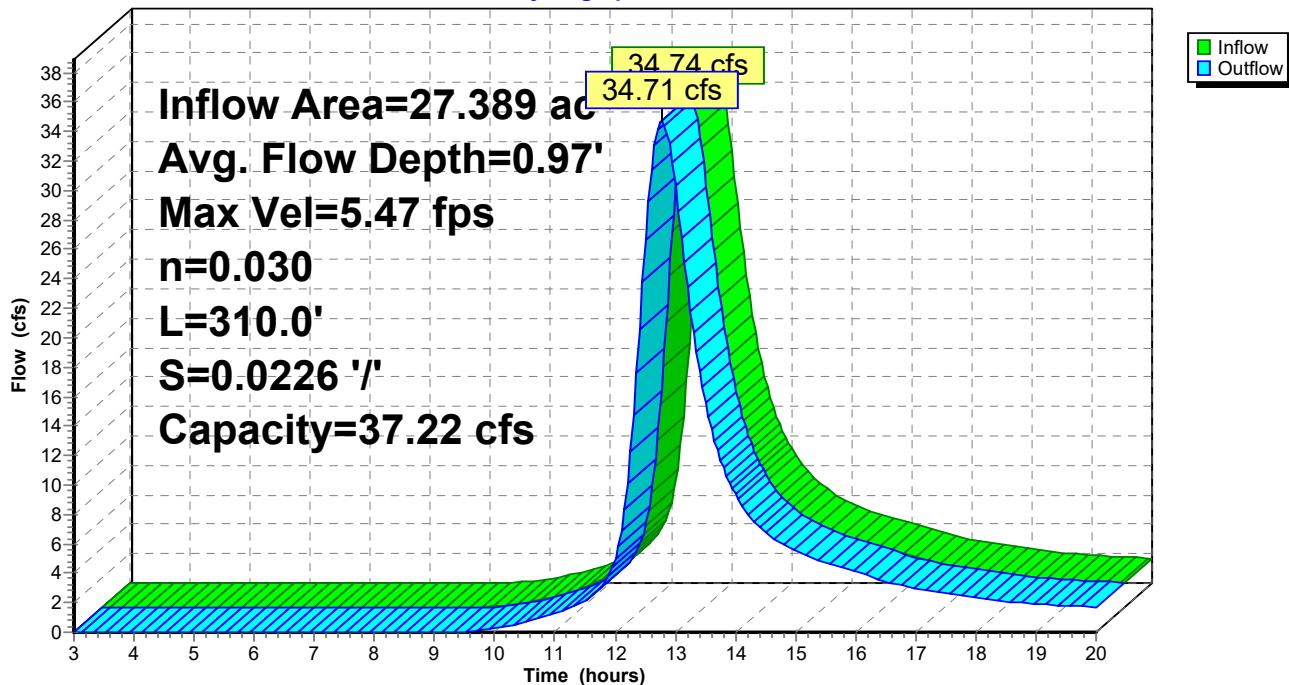
Length= 310.0' Slope= 0.0226 '/'

Inlet Invert= 232.00', Outlet Invert= 225.00'

‡

Reach 9R: Existing Stream Channel

Hydrograph



Summary for Reach 10R: Existing Stream Channel

Inflow Area = 3.874 ac, 0.00% Impervious, Inflow Depth > 0.23" for 25-year storm event

Inflow = 0.22 cfs @ 12.87 hrs, Volume= 0.073 af

Outflow = 0.16 cfs @ 14.70 hrs, Volume= 0.064 af, Atten= 24%, Lag= 109.7 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.40 fps, Min. Travel Time= 42.5 min

Avg. Velocity = 0.33 fps, Avg. Travel Time= 51.2 min

Peak Storage= 419 cf @ 13.99 hrs

Average Depth at Peak Storage= 0.08' , Surface Width= 5.32'

Bank-Full Depth= 2.50' Flow Area= 25.0 sf, Capacity= 72.89 cfs

5.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals

Side Slope Z-value= 2.0 ' / Top Width= 15.00'

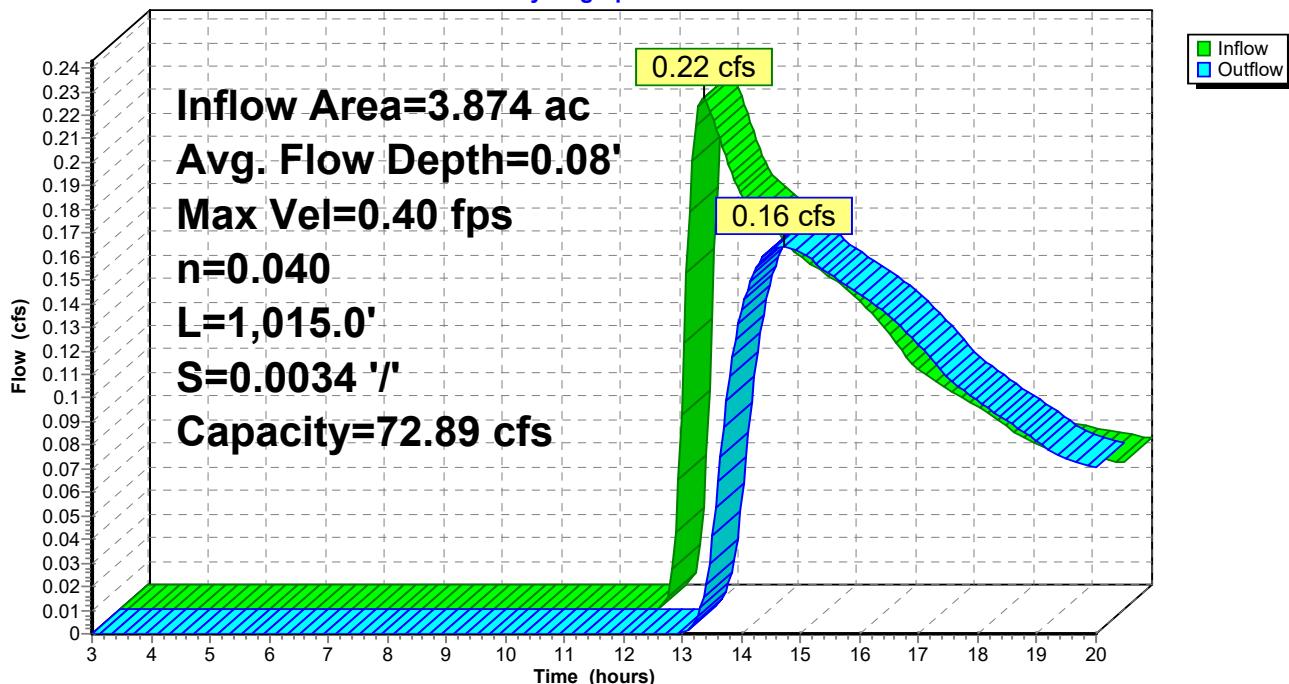
Length= 1,015.0' Slope= 0.0034 '/

Inlet Invert= 225.00', Outlet Invert= 221.50'



Reach 10R: Existing Stream Channel

Hydrograph



Summary for Reach WAP 1: Water Analysis Point 1

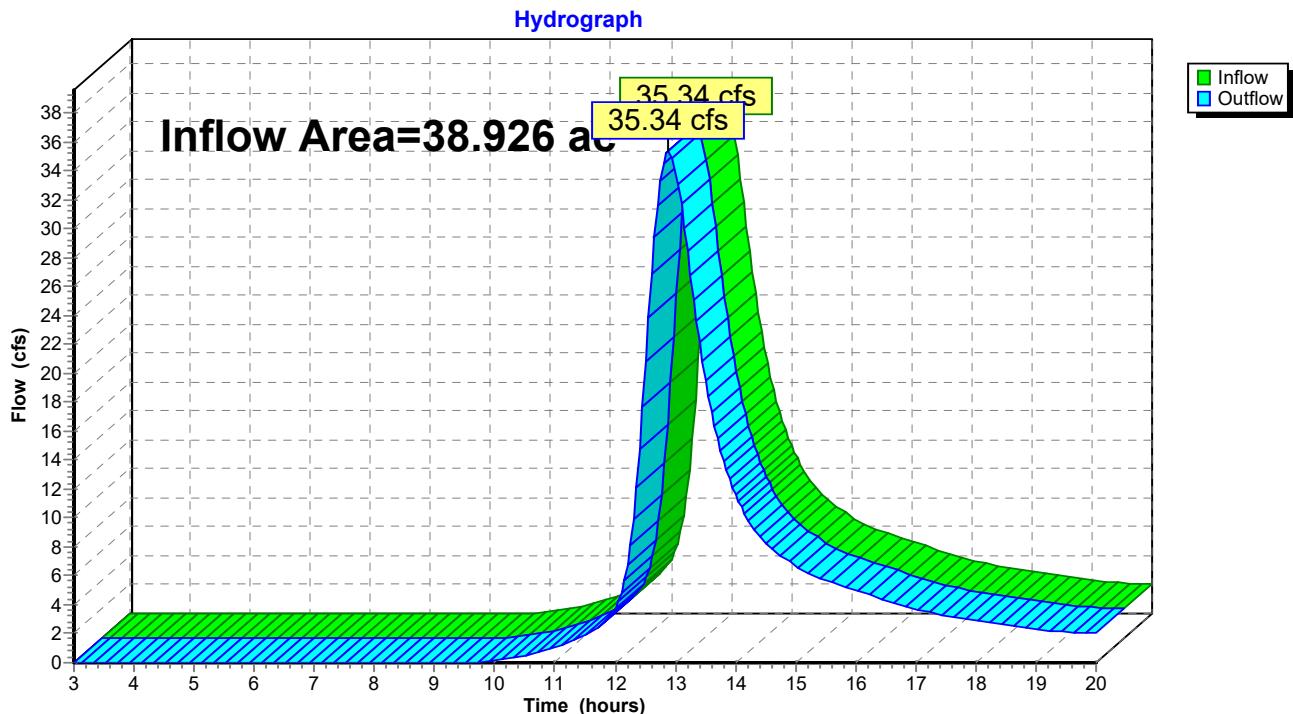
Inflow Area = 38.926 ac, 4.68% Impervious, Inflow Depth > 1.80" for 25-year storm event

Inflow = 35.34 cfs @ 12.89 hrs, Volume= 5.836 af

Outflow = 35.34 cfs @ 12.89 hrs, Volume= 5.836 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Reach WAP 1: Water Analysis Point 1



Summary for Pond 1P: Sprucewood Rd Culvert

Inflow Area = 3.118 ac, 24.84% Impervious, Inflow Depth > 0.64" for 25-year storm event
 Inflow = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af
 Outflow = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.95 cfs @ 12.67 hrs, Volume= 0.165 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

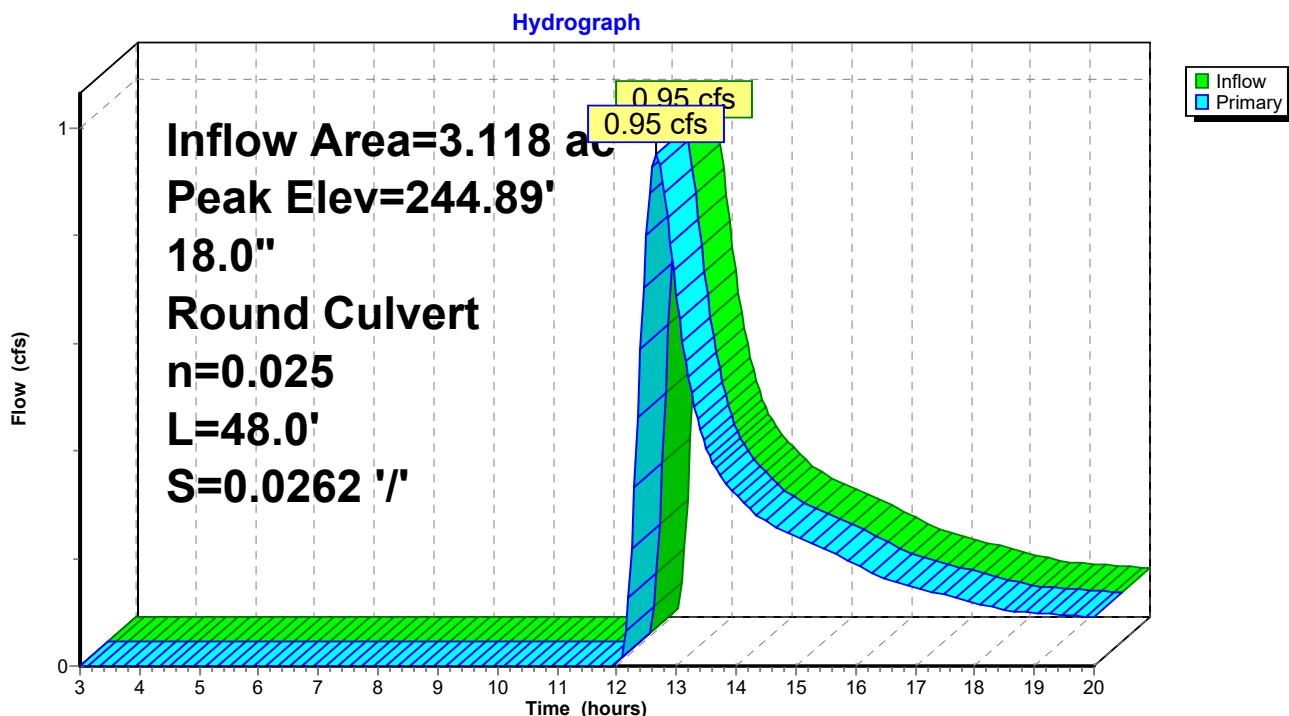
Peak Elev= 244.89' @ 12.67 hrs

Flood Elev= 246.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	244.37'	18.0" Round Culvert L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 244.37' / 243.11' S= 0.0262 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.95 cfs @ 12.67 hrs HW=244.89' TW=244.00' (Fixed TW Elev= 244.00')
 ↪ 1=Culvert (Outlet Controls 0.95 cfs @ 2.62 fps)

Pond 1P: Sprucewood Rd Culvert



Summary for Pond 2P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.66" for 25-year storm event
 Inflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af
 Outflow = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.95 hrs, Volume= 0.419 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

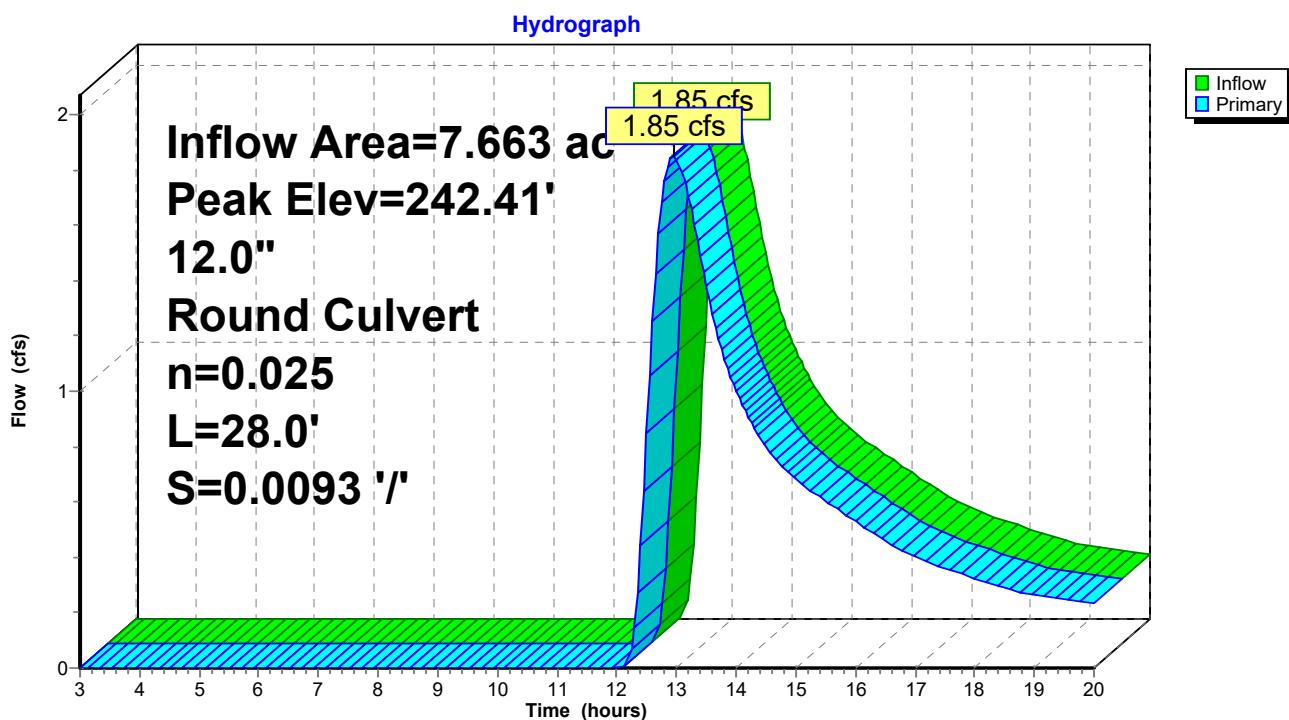
Peak Elev= 242.41' @ 12.95 hrs

Flood Elev= 243.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	241.35'	12.0" Round Culvert $L= 28.0'$ CMP, projecting, no headwall, $Ke= 0.900$ Inlet / Outlet Invert= 241.35' / 241.09' $S= 0.0093 '$ $Cc= 0.900$ $n= 0.025$ Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.95 hrs HW=242.41' TW=241.60' (Fixed TW Elev= 241.60')
 ↪1=Culvert (Barrel Controls 1.85 cfs @ 2.77 fps)

Pond 2P: Driveway culvert



Summary for Pond 3P: Driveway culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event

Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min

Primary = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

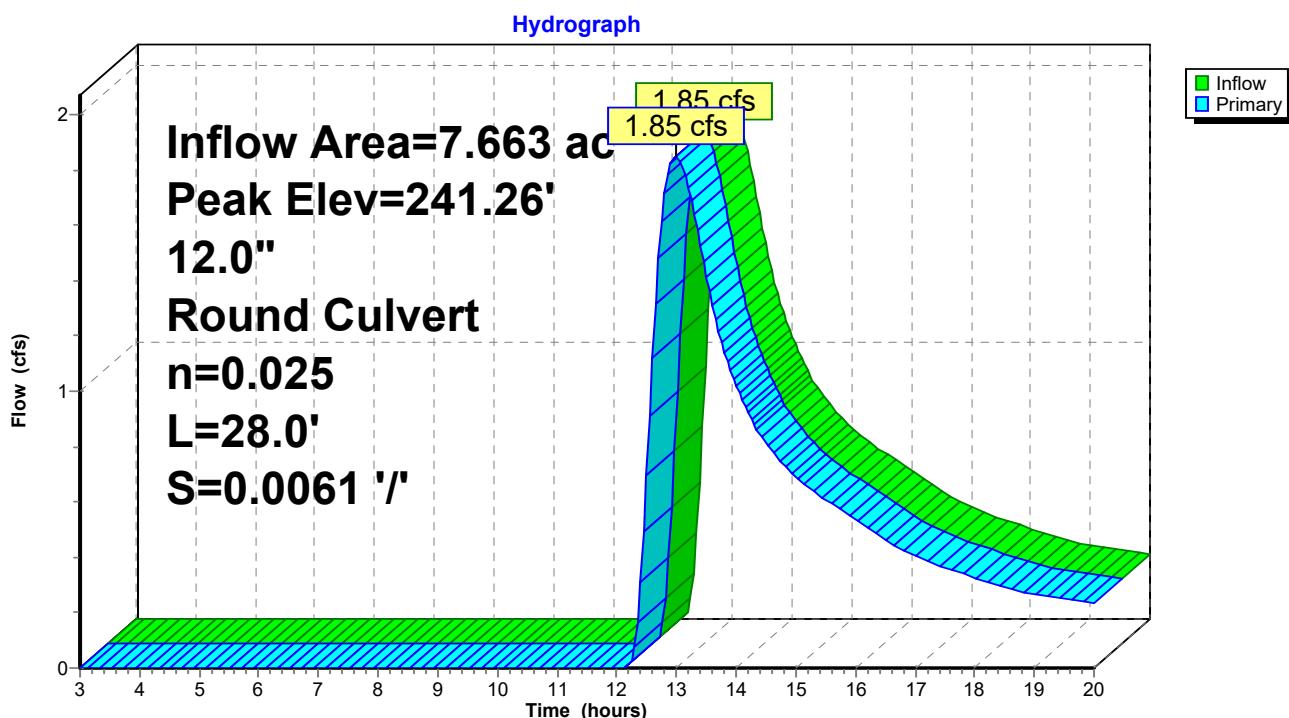
Peak Elev= 241.26' @ 12.98 hrs

Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	240.10'	12.0" Round Culvert L= 28.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 240.10' / 239.93' S= 0.0061 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.84 cfs @ 12.98 hrs HW=241.26' TW=240.82' (Fixed TW Elev= 240.82')
 ↗1=Culvert (Outlet Controls 1.84 cfs @ 2.54 fps)

Pond 3P: Driveway culvert



Summary for Pond 4P: Stevens Mill Rd X-Culvert

Inflow Area = 7.663 ac, 17.74% Impervious, Inflow Depth > 0.65" for 25-year storm event
 Inflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af
 Outflow = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.85 cfs @ 12.98 hrs, Volume= 0.418 af

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 240.81' @ 12.98 hrs

Flood Elev= 243.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	239.93'	15.0" Round Culvert L= 32.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 239.93' / 239.59' S= 0.0106 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

Primary OutFlow Max=1.84 cfs @ 12.98 hrs HW=240.81' TW=239.83' (Fixed TW Elev= 239.83')
 ↗1=Culvert (Barrel Controls 1.84 cfs @ 2.82 fps)

Pond 4P: Stevens Mill Rd X-Culvert

